

MICROCYLINDERS

Series 1200

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Microcylinders accord. to standard ISO 6432 threaded end covers	1.1÷1.4
Microcylinders accord. to standard ISO 6432 "MIR" - rolled end covers -	1.5÷1.8
Microcylinders accord. to standard ISO 6432 "MIR-INOX" - rolled end covers -	1.9÷1.11
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General

Microcylinders are the most widespread linear actuators in common use due to their reduced dimensions. They can be applied in the most varied of sectors, from packaging to textiles, from woodworking machines to the ceramic sector and so on.

Starting from these premises we have designed a light and sturdy component of pleasing appearance realized in three version: with threaded end covers, rolled end covers and rolled end covers with all components stainless steel.

Threaded end covers version: hard anodized aluminium end covers, threaded into the anodized aluminium barrel. Bores from diameter 8 to 25mm. are made according to ISO 6432, while the diameters 32, 40 and 50 out of norms are produced to complete the range.

Starting from this base, we have derived the special designs which we are describing herebelow:

- single-acting with front or rear spring (max. stroke 40 mm; for longer strokes the length increase is not proportional to the stroke in order to provide lodging for the spring);
- double and single-acting with flat bottom instead of clevis;
- push-pull rod;
- hexagonal non-rotating rod;
- stainless steel rod on all versions;
- THERBAN® seals on all versions for high temperature operations (120°C max);
- microcylinders with magnetic piston (from Ø 10 to Ø 50)
- stationary rubber cushions (standard);
- adjustable cushions (from Ø 16 to Ø 50).

"MIR", rolled end covers version: hard aluminium end covers, rolled on the AISI 304 stainless steel barrel, magnetic piston and standard AISI 303 piston rod on all versions. Also for these microcylinders, bores from diameter 8 to 25mm are made according to ISO 6432, while diameters 32 out of norms is completing the range.

Starting from this base, we have derived the special designs which we are describing herebelow:

- single-acting with front or rear spring (max. stroke 50 mm; for longer strokes the length increase is not proportional to the stroke in order to provide lodging for the spring);
- double and single-acting with flat bottom instead of clevis;
- push-pull rod;
- chromed stainless steel piston rod, compulsory on piston rod locking version;
- THERBAN® seals on all versions for high temperature operations (120°C max);
- stationary rubber cushions (standard);
- adjustable cushions (from Ø 16 to Ø 32).

"MIR-INOX", stainless steel rolled end covers version: this version is very similar to previous one for technical and assembling characteristics, but all componenets are stainless steel.

Bores from Ø16 to Ø25 are made according to ISO 6432 while diameter 32 out of norms is completing the range.

The production of a stainless steel cylinder is requested for particular working ambiances where resistance to hard chemicals conditions is necessary (zoothechnics, chemicals); at the same true also chemical neutrality must be guaranted (food industry, medicals).

Main characteristics:

- AISI 316 end covers
- AISI 304 barrel
- AISI 304 mountings
- Standard magnetic piston
- NBR seals (except for piston rod seals which are in polyur.)
- Stationary rubber cushions (standard)

Available special designs:

- Push-pull rod
- VITON® seals (150°C max)
- pneumatic progressive cushions (non adjustable)



Construction characteristics

End covers	hard anodized aluminium
Barrel	anodized aluminium (brass for ø8 and 10)
Piston rod	hard chrome-plated C43 steel (stainless steel for ø8 and 10 as well as ø 12, 16 and 20 on magnetic microcylinders)
Piston	aluminium
Piston seals	NBR oil-resistant rubber THERBAN® for high temperatures 120°C on request
Rod seals	mixing polyurethane self-lubrication 90 Shore or VITON®
End cover seals	NBR oil-resistant rubber O Rings
Shock absorbing seals	NBR oil-resistant rubber or THERBAN®
Mounting	steel painted in cataphoresis
Forks	cadmium plated steel
Single-acting springs	steel for springs and stainless steel
Cushioning length	ø 16 - 20 - 25 - 32 - 40 - 50 mm 15 - 18 - 18 - 18 - 22 - 22

Technical characteristics

Fluid	filtered air and preferably lubricated
Max. pressure	10 bar
Min. and max temperature	-5°C ÷ 70° C (120° C THERBAN® seals)

"Attention: We recommend using dry air if the working temperature is lower than 0°C"

Use and maintenance

The microcylinder is basically a simple and rugged component which can be used maintenance-free for a long time and several million cycles. Essential factors for a long life are:

- good quality of the air (which must be filtered and moderately lubricated with suitable oils);
- correct alignment during assembly with regard to applied load, which shall not create radial components with bending effect on the rod;
- avoiding having simultaneously high speeds, long strokes and considerable loads which produce kinetic energies that the microcylinder could not absorb if used as a limit stop of traversed masses (in this case always use outside mechanical stops);
- checking the ambient conditions in which the microcylinder operates (high temperature, aggressive atmosphere, dust, humidity, etc.) and consequently choose the most suitable type.

In case of doubt, our Engineering Office can supply information on the best solution to adopt. In order to carry out proper maintenance of the microcylinder, unscrew the front head, remove the rod with the piston and replace the piston (or its gaskets) and the gasket of the rod. The O.rings providing the seal between the heads and the barrel are usually not replaced, but are included in the sets of spares. Clean the barrel and rod carefully, check that they are undamaged and after lubricating the sliding surfaces and gaskets with suitable grease, assemble again lining up the air inlet ports of the heads.

Warning: the heads are screwed to the jacket using a small amount of a thread locking liquid to avoid accidental unscrewing under heavy stresses. The thread lock might hinder disassembly: in this case warm the part involved to 212°F to neutralize the glueing effect of the thread lock.

For lubrication please use class H hydraulic oils, for example MAGNA GC 32 Castrol.

Standard strokes

ø 8 and ø 10

15 - 25 - 50 - 75 - 80 - 100 mm

ø 12 and ø 16

15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 mm

ø 20 and ø 25

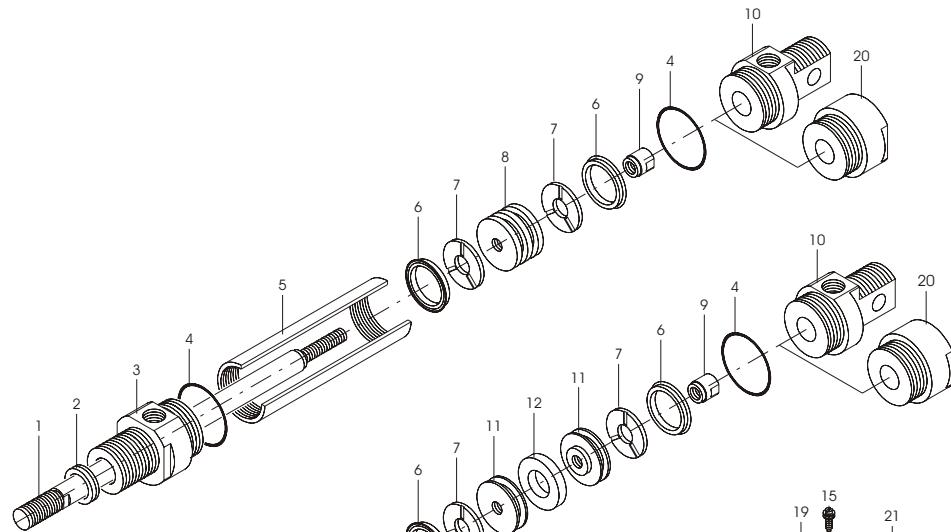
15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 - 320 - 350 - 400 mm

ø 32, ø 40 and ø 50

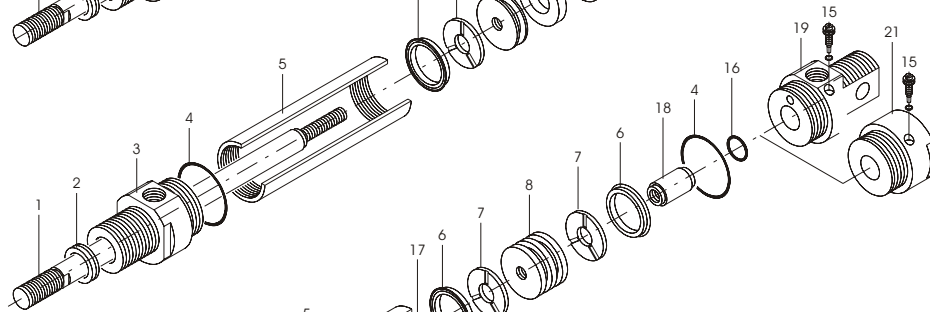
15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 - 320 - 350 - 400 - 450 - 500 mm

Drawing

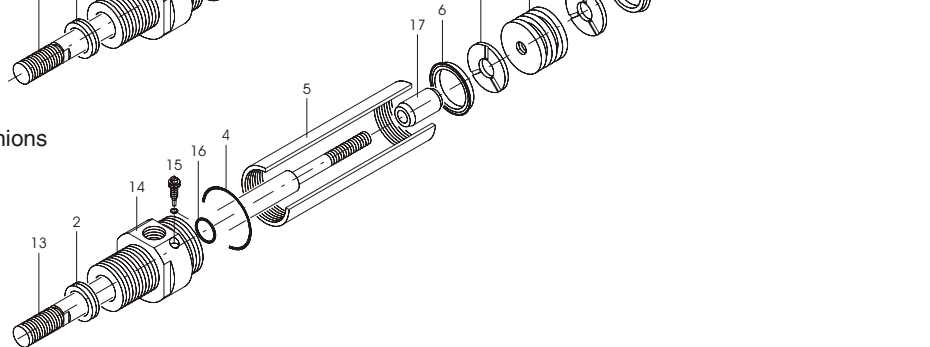
Basic version



Magnetic basic version

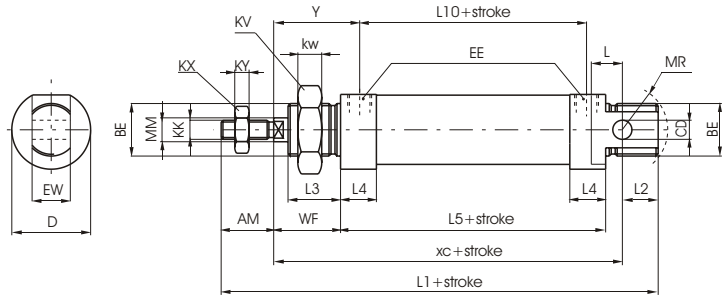


Basic version with cushions



Pos.	Description	N. Pieces
1	Piston rod	1
2	Piston rod seal	1
3	Front cover	1
4	Cover seal	2
5	Barrel	1
6	Piston seal	2
7	Shock absorbing washer	2
8	Piston	1
9	Threaded bush	1
10	Rear cover	1
11	Half piston for magnetic version	2
12	Magnet	1
13	Piston rod cushioned version	1
14	Front cover for cushioned version	1
15	Cushion adjusting pin	2
16	Cushion seal	2
17	Front cushion bearing	1
18	Rear cushion bearing	1
19	Rear cover for cushioned version	1
20	Rear cover without rear eye	1
21	Rear cover without rear eye for cushion	1

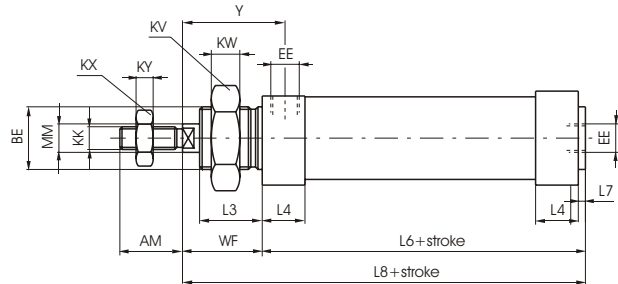
Basic version



Standard execution, fully complying with ISO standards from $\varnothing 8$ to $\varnothing 25$. Diameters 32, 40 and 50 not included in the standard, comply with our own specifications. Can use all available mountings. For single acting type, the maximum stroke is 40 mm., after which overall dimensions increase in length to an extent not proportional to the stroke (and in any case not longer than stroke 100).

Ordering code	Description
1260.Ø.stroke	Basic
1271.Ø.stroke	Basic front spring (max stroke 40 mm. from $\varnothing 12$)
1272.Ø.stroke	Basic rear spring (max stroke 40 mm. from $\varnothing 12$)
12--Ø.stroke.A	Adjustable cushions (from $\varnothing 16$)
12--Ø.stroke.M	Magnetic piston (from $\varnothing 10$)
12--Ø.stroke.X	Stainless steel chromed rod
12--Ø.stroke.A.M	Cushioned with magnetic piston
12--Ø.stroke.A.M.X	Cushioned, magnetic piston and stainless steel chromed rod
12--Ø.stroke... T	THERBAN® seals version

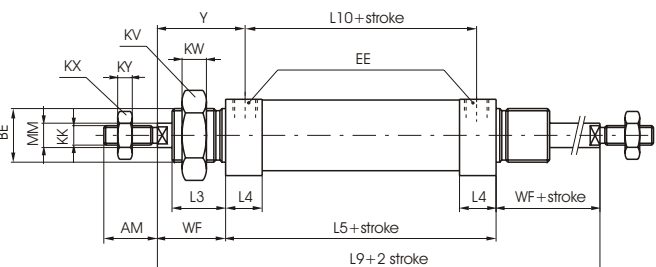
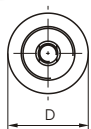
Without rear eye version



Version derived from standard execution 1260 and not included in ISO standard. Not having a rear eye it is shorter and the air inlet is from the rear or at 90° like it is on the front. The considerations made for the basic type 1260 apply for all single-acting types.

Ordering code	Description
1261.Ø.stroke	Without rear eye
1273.Ø.stroke	Without rear eye front spring (max stroke 40 mm. from $\varnothing 12$)
1274.Ø.stroke	Without rear eye rear spring (max stroke 40 mm. from $\varnothing 12$)
12--Ø.stroke.A	Without rear eye adjustable cushions (from $\varnothing 16$)
12--Ø.stroke.M	Without rear eye magnetic piston (from $\varnothing 10$)
12--Ø.stroke.X	Without rear eye stainless steel chromed rod
12--Ø.stroke.A.M	Cushioned with magnetic piston
12--Ø.stroke.A.M.X	Cushioned, magnetic piston and stainless steel chromed rod
12--Ø.stroke... T	THERBAN® seals version
12--Ø.stroke... L	Air inlet at 90° version

Push/Pull rod version

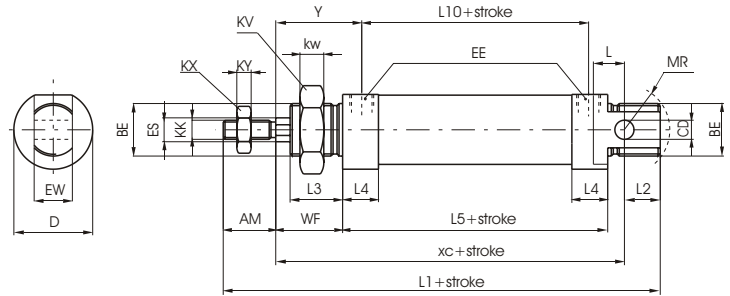


Execution by rod coming out from both end plates, with overall dimensions, except for the rod, equal to 1260 version. Not available with $\varnothing 8$ and 10).

Ordering code	Description
1262.Ø.stroke	Push/pull rod
1262.Ø.stroke.A	Adjustable cushions (from $\varnothing 16$)
1262.Ø.stroke.M	Magnetic piston (from $\varnothing 10$)
1262.Ø.stroke.X	Stainless steel chromed rod
1262.Ø.stroke.E	Hexagon rod (from $\varnothing 12$)
1262.Ø.stroke.A.M	Cushioned with magnetic piston
1262.Ø.stroke.A.M.X	Cushioned, magnetic piston and stainless steel chromed rod
1262.Ø.stroke... T	THERBAN® seals version



Non rotating hexagonal rod



Similar overall dimensions as 1260 basic type, it differs because of the hexagonal rod (instead of circular) to avoid the rotation. It is particularly suited when it is used as a guide and support to the linked element. Not for use with high frequencies and long strokes. For which, whenever possible use front spring.

Ordering Code	Description
1260.Ø.stroke.E	Non rotating hexagonal rod
1271.Ø.stroke.E	Non rotating hexagonal rod front spring (max stroke 40 mm.)
1272.Ø.stroke.E	Non rotating hexagonal rod rear spring (max stroke 40 mm.)
12--Ø.stroke.E.M	Non rotating hexagonal rod magnetic piston (from ø 12)
12--Ø.stroke.E.X	Non rotating hexagonal stainless steel chromed rod

Table of dimensions

	8	10	12	16	20	25	32	40	50
Bore	8	10	12	16	20	25	32	40	50
AM (-0,2)	12	12	16	16	20	22	20	25	25
BE	M12x1,25	M12x1,25	M16x1,5	M16x1,5	M22x1,5	M22x1,5	M30x1,5	M40x1,5	M40x1,5
CD (H9)	4	4	6	6	8	8	12	14	14
D (-0,3)	16	17	19	24	28	33	40	48	58
EE	M5	M5	M5	M5	G 1/8"	G 1/8"	G 1/8"	G 1/4"	G 1/4"
ES	-	-	6	6	8	10	12	12	12
EW (d13)	8	8	12	12	16	16	26	30	30
KK (6g)	M4x0,7	M4x0,7	M6x1	M6x1	M8x1,25	M10x1,25	M10x1,25	M12x1,75	M12x1,75
KV	17	17	22	22	30	30	42	52	52
KW	5,5	5,5	6	6	7	7	8	9	9
KX	7	7	10	10	13	17	17	19	19
KY	3	3	4	4	5	6	6	7	7
L	6	6	9	9	12	13	13	16	16
L1 (±1) *	85	85	105	111	130	141	139	164	167
L2	9	9	14	13	15	15	14	16	16
L3	11	11	17	17	18	22	22	25	25
L4	10	10	9,5	10,5	15	15	15	18	18
L5 (±1) *	46	46	50	56	68	69	69	79	82
L6 (±1) *	48	48	52	58	70,5	71,5	71,5	82	85
L7	2	2	2	2	2,5	2,5	2,5	3	3
L8 (±1) *	64	64	74	80	94,5	99,5	99,5	117	120
L9 (±1,2) *	78	78	94	100	116	125	125	149	152
L10 (±1) *	35	35	40	45	52	53	53	60	63
MM (f7)	4	4	6	6	8	10	12	14	14
MR (min)	12	12	16	16	18	19	22	28	28
WF (±1,2)	16	16	22	22	24	28	28	35	35
XC (±1) *	64	64	75	82	95	104	105	123	126
Y (±1,2)	21,5	21,5	27	27,5	32	36	36	44,5	44,5

STROKE TOLERANCE: until stroke 100 mm - 1,5, beyond + 2 mm.

Weight	stroke 0	55	60	80	100	175	240	365	610	790
gr.	every 10 mm	6	7	5	5	8	11	15	19	21

Variations of the versions:

Without rear eye version

Weight	stroke 0	50	55	75	95	170	230	345	570	750
gr.	every 10 mm	6	7	5	5	8	11	15	19	21

Push/pull rod version

Weight	stroke 0	55	60	95	120	220	310	450	760	950
gr.	every 10 mm	7	8	7	7	12	17	24	31	33

Hexagonal rod version

Weight	stroke 0	-	-	85	105	180	250	370	590	760
gr.	every 10 mm	-	-	5	6	8	12	16	17	19

(*) These dimensions increase of 10 mm for microcylinders equipped with magnetic piston and spring return, and of 9 mm for microcylinders with 10 mm diameter magnetic piston



Construction characteristics

End covers	hard anodized aluminium
Barrel	stainless steel AISI 304
Piston rod	stainless steel AISI 303 chromed
Piston	brass (ø8-10-12) aluminium (ø16-20-25)
Piston seals	NBR oil-resistant rubber therban for high temperatures 120° C on request
Rod seals	polyurethane self-lubrication mix or VITON®
End cover seals	NBR oil-resistant rubber
Shock absorbing seals	NBR oil-resistant rubber or THERBAN®
Mounting	steel painted in cataphoresis
Forks	zinc plated steel
Single-acting springs	C98 zinc plated steel for spring
Cushioning lenght	ø 16 - 20 - 25 - 32 mm 15 - 18 - 18 - 18

Technical characteristics

Fluid	filtered and lubricated air or non
Maximum working pressure	10 bar
Working temperature	-5°C ÷ +70° C with polyrethane seals -5°C ÷ +120° C with THERBAN® seals

"Attention: We recommend using dry air if the working temperature is lower than 0°C"

Minimum and maximum springs load

Bore	8	10	12	16	20	25	32
Min. load (N)	2.2	2.2	4	7.5	11	16.5	23
Max load (N)	4.2	4.2	8.7	21	22	30.7	52.5

Standards stroke

ø 8 and ø 10

15 - 25 - 50 - 75 - 80 - 100 mm

ø 12 and ø 16

15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 mm

ø 20 and ø 25

15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 - 320 - 350 - 400 mm

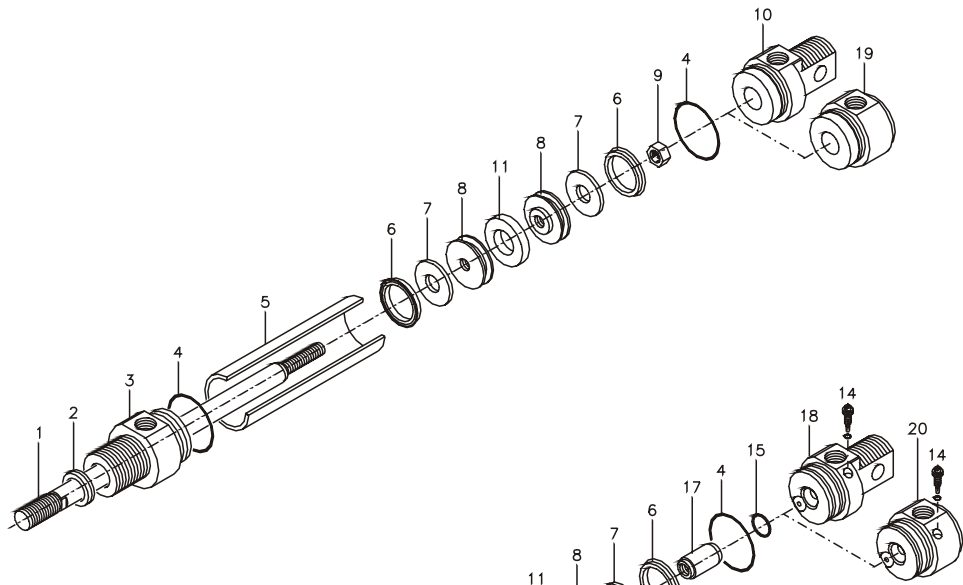
ø 32

15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 - 320 - 350 - 400 - 450 - 500 mm

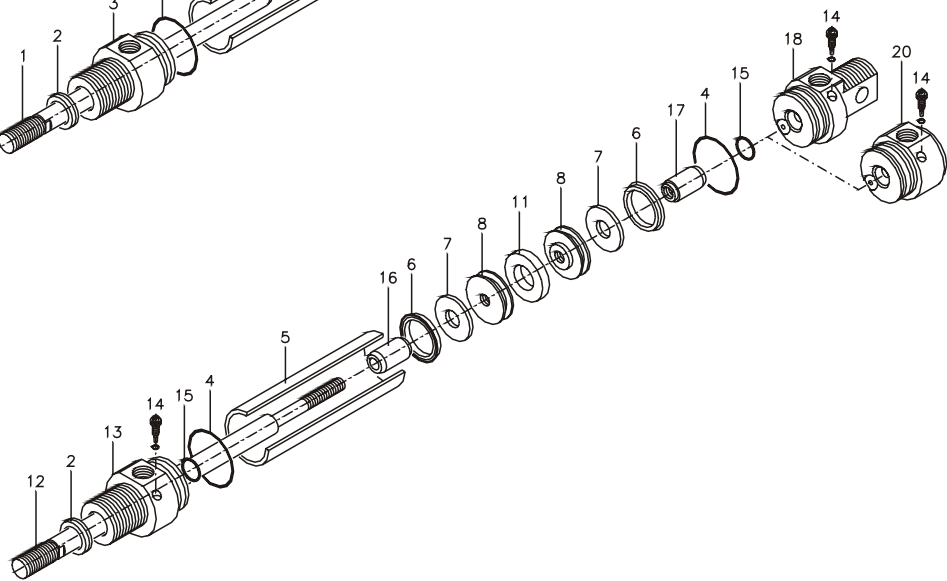
For single acting front spring version, max stroke is 50 mm, while single acting rear spring version is available from ø 16, max stroke 50 mm.

Drawing

Basic version



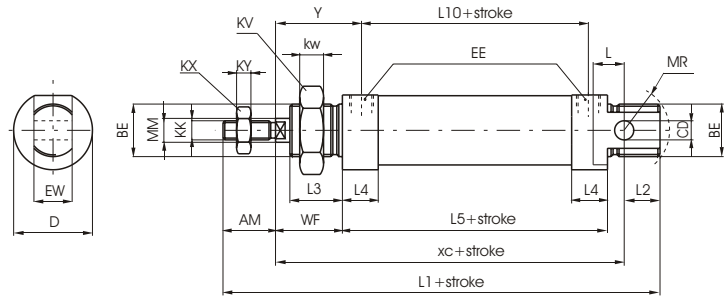
Basic version with cushions



Pos.	Description	N. Pieces
1	Piston rod	1
2	Piston rod seal	1
3	Front cover	1
4	Cover seal	2
5	Barrel	1
6	Piston seal	2
7	Shock absorbing washer	2
8	Piston	2
9	Nut	1
10	Rear cover	1
11	Magnet	1
12	Piston rod cushioned version	1
13	Front cover for cushioned version	1
14	Cushion adjusting pin	2
15	Cushion seal	2
16	Front cushion bearing	1
17	Rear cushion bearing	1
18	Rear cover for cushioned version	1
19	Rear cover without rear eye	1
20	Rear cover without rear eye for cushion	1



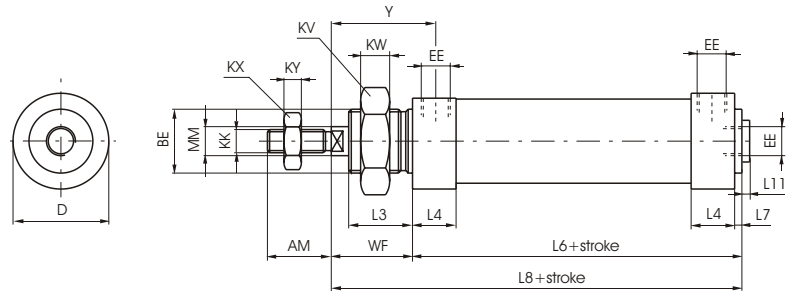
Basic version



Standard execution, fully complying with ISO standards. Can use all available mountings. For single acting type, the maximum stroke is 50 mm., after which overall dimensions increase in length to an extent not proportional to the stroke (and in any case not longer than stroke 100).

Ordering code	Description
1280.Ø.stroke.M	Basic magnetic version
1291.Ø.stroke.M	Basic magnetic front spring (max stroke 50 mm)
1292.Ø.stroke.M	Basic magnetic rear spring from ø16 (max stroke 50 mm)
12--.Ø.stroke.A.M	Cushioned with magnetic piston (from ø16)
12--.Ø.stroke..T	THERBAN® seals version

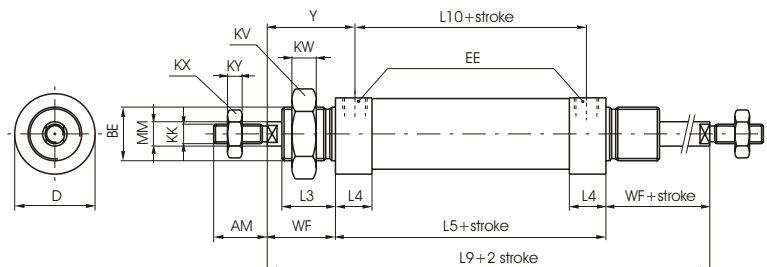
Without rear eye version



Version derived from standard execution 1260 and not included in ISO standard. Not having a rear eye it is shorter. Rear inlet connection is at 90 like the front one, in line and plugged. The considerations made for the basic type 1280 apply for all single-acting types.

Ordering code	Description
1281.Ø.stroke.M	Basic magnetic version
1293.Ø.stroke.M	Basic magnetic front spring (max stroke 50 mm)
1294.Ø.stroke.M	Basic magnetic rear spring from ø16(max stroke 50 mm)
12--.Ø.stroke.A.M	Cushioned with magnetic piston (from ø16)
12--.Ø.stroke..T	THERBAN® seals version

Push/Pull rod version



Execution by rod coming out from both end plates, with overall dimensions, except for the rod, equal to 1280 version. This version is not suggestable for Ø8 and Ø10 to difficulty in anchoring the pistons to rods.

Ordering code	Description
1282.Ø.stroke.M	Magnetic push/pull rod
1282.Ø.stroke.A.M	Magnetic adjustable cushions (from ø16)
1282.Ø.stroke..T	THERBAN® seals version



Table of dimensions

	Bore							
	8	10	12	16	20	25	32	
AM (-0,2)	12	12	16	16	20	22	20	
BE	M12X1,25	M12X1,25	M16X1,5	M16X1,5	M22X1,5	M22X1,5	M30X1,5	
CD (H9)	4	4	6	6	8	8	12	
D (h11)	16	16	20	21	27	30	38	
EE	M5	M5	M5	M5	G1/8"	G1/8"	G1/8"	
EW (d13)	8	8	12	12	16	16	26	
KK (6g)	M4X0,7	M4X0,7	M6X1	M6X1	M8X1,25	M10X1,25	M10X1,25	
KV	17	17	22	22	30	30	42	
KW	5,5	5,5	6	6	7	7	8	
KX	7	7	10	10	13	17	17	
KY	3	3	4	4	5	6	6	
L	6	6	9	9	12	14	13	
L1 (±1) *	86	86	105	111	130	140	139	
L2	10	10	14	13	15	14	14	
L3	12	12	17	17	18	22	22	
L4	9	9	9	11	15,5	15,5	14,5	
L5 (±1) *	46	46	50	56	68	68	69	
L6 *	48	48	52	58	70,5	70,5	71,5	
L7	2	2	2	2	2,5	2,5	2,5	
L8 *	64	64	74	80	94,5	98,5	99,5	
L9 (±1,2) *	78	78	94	100	116	125	125	
L10 (±1) *	37	37	41	45	52,5	52,5	54,5	
L11	1,5	1,5	1,5	1,5	2	2	2	
MM (f7)	4	4	6	6	8	10	12	
MR	12	12	16	16	18	18	22	
WF (±1,2)	16	16	22	22	24	28	28	
XC (±1) *	64	64	75	82	95	104	105	
Y (±1,2)	20,5	20,5	26,5	27,5	32	36	35	
Stroke tolerance: until stroke 100 +1,5 mm, beyond +2 mm								
Weight	stroke 0	30	35	65	80	160	200	310
gr.	every10mm	2	2,5	4	5	7,5	11,5	18
Variations of the versions								
<i>without rear eye version</i>								
Weight	stroke 0	25	30	60	75	150	185	290
gr.	every10mm	2	2,5	4	5	7,5	11,5	18
<i>Push/pull rod version</i>								
Weight	stroke 0	35	40	75	95	200	250	370
gr.	every10mm	2,5	3	6	7	10,5	15,5	24

Dimensions marked with * do not increase proportionally to stroke for rear spring version (over 25 mm stroke).



Construction characteristics

End covers	Stainless steel AISI 316
Barrel	Stainless steel AISI 304
Piston rod	Stainless steel AISI 316
Piston	Aluminium
Piston seals	NBR oil - resistant rubber VITON® for high temperatures 150°C on request
Rod seals	Polyurethane self- lubrication mix (viton on request)
End cover seals	NBR oil-resistant rubber (VITON®on request)
Shock absorbing seals	NBR oil-resistant rubber (VITON®on request)
Mounting	Stainless steel AISI 304
Forks	Stainless steel AISI 304

Technical characteristics

Fluid	Filtered and lubricated air or non
Maximum working pressure	10 bar
Working temperature	-5°C ÷ 70°C with standard seals -5°C ÷ 150°C with VITON® seals

"Attention: We recommend using dry air if the working temperature is lower than 0°C"

Standards stroke

ø 16

15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 mm

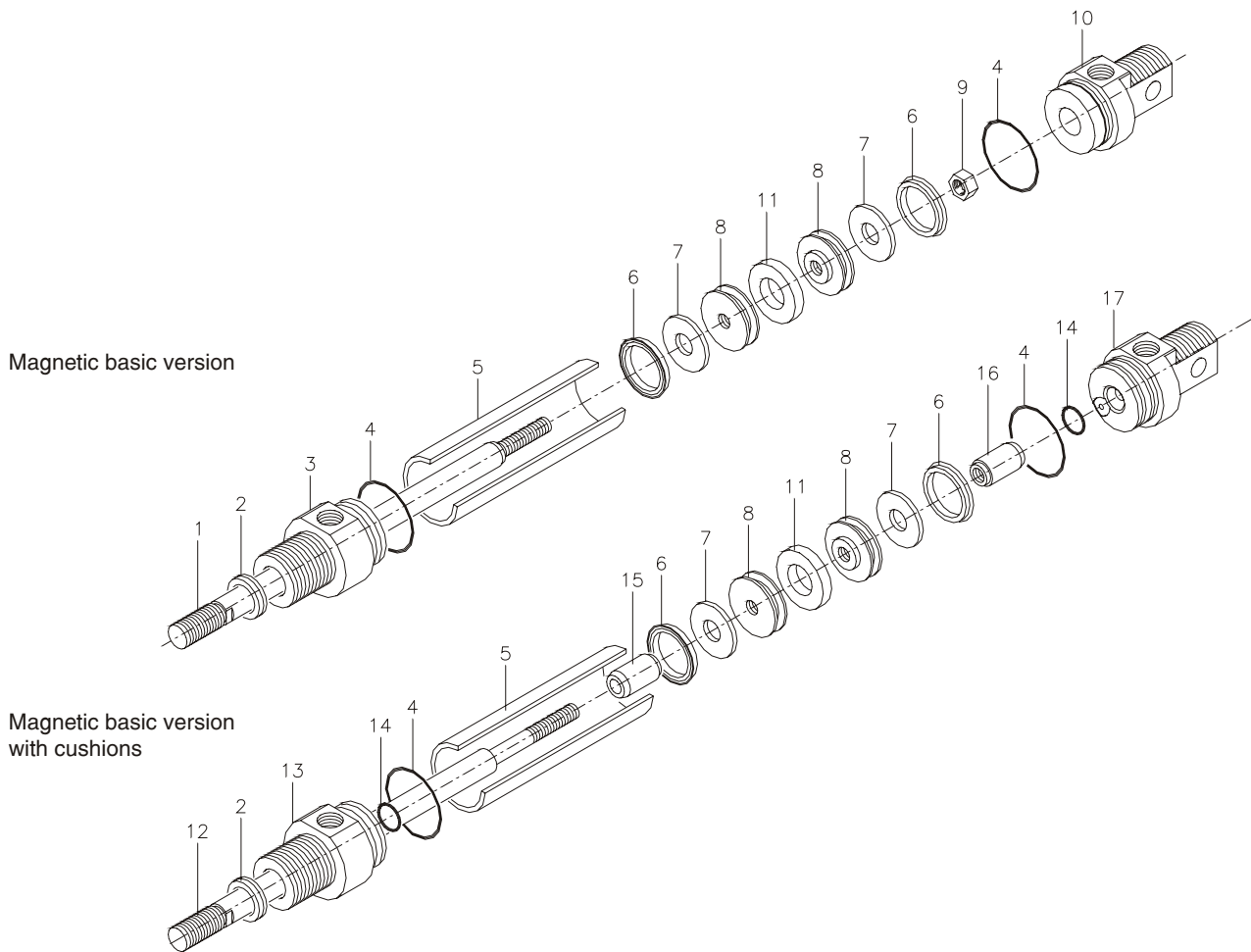
ø 20 and ø 25

15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 - 320 - 350 - 400 mm

ø 32

15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 - 320 - 350 - 400 - 450 - 500 mm

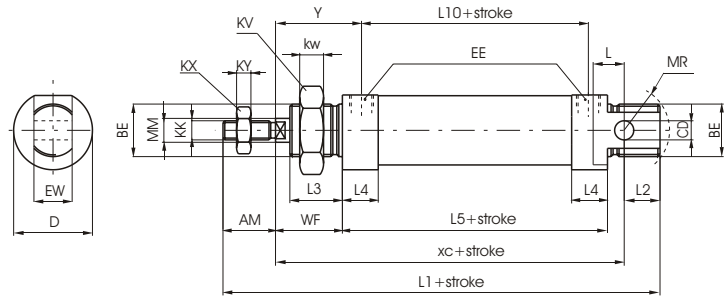
Drawing



Pos.	Description	N. pieces
1	Piston rod	1
2	Piston rod seals	1
3	Front cover	1
4	Cover seal	2
5	Barrel	1
6	Piston seal	2
7	Shock absorbing washer	2
8	Half piston for magnetic version	2
9	Nut	1
10	Rear cover	1
11	Magnet	1
12	Piston rod cushioned version	1
13	Front cover cushioned version	1
14	Cushion seal	2
15	Front cushion bearing	1
16	Rear cushion bearing	1
17	Rear cover for cushioned version	1

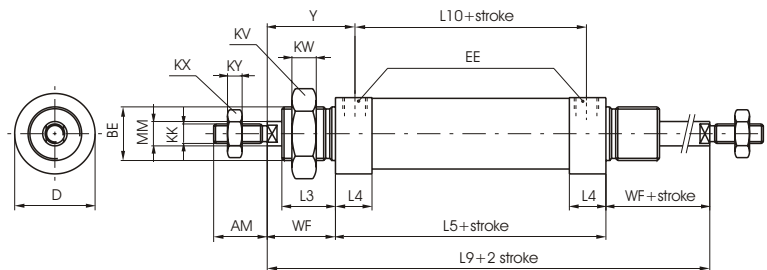


Magnetic basic version



Standard execution, fully complying with ISO standards.

Push/pull rod magnetic version



Execution by rod coming out from both end plates, with overall dimensions, except for the rod, equal to 1280 version.

Ordering code

128 .Ø.stroke.

- MX = inox magnetic version, NBR seals and poliur. piston seals
- MXV = inox magnetic version, VITON® seals
- AMX = inox magnetic version with cushions, NBR seals and poliur. piston seals
- AMXV = inox magnetic version with cushions, VITON® seals
- 0 = basic version
- 2 = push/pull rod magnetic version

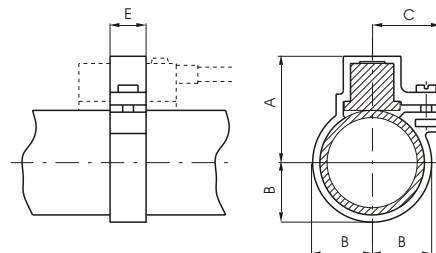
Table of dimensions

Bore	AM	BE	CD	D	EE	EW	KK	KV	KW	KX	KY	L	L1	L2	L3	L4	L5	L9	L10	MM	MR	WF	XC	Y
16	16	M16X1,5	6	21	M5	12	M6X1	22	6	10	4	9	111	13	17	10,5	56	100	45	6	16	22	82	27,5
20	20	M22X1,5	8	27	G1/8"	16	M8X1,25	30	7	13	5	12	130	15	18	10,5	68	116	52,5	8	18	24	95	32
25	22	M22X1,5	8	30	G1/8"	16	M10X1,25	30	7	17	6	13	140	15	22	15,5	68	125	52,5	10	18	28	104	36
32	20	M30X1,5	12	38	G1/8"	26	M10X1,25	42	8	17	6	13	139	14	22	14,5	69	125	54,5	12	22	28	105	35

Bore	Weight for basic version (gr)		Weight push-pull version (gr)	
	Stroke 0	every 10 mm	Stroke 0	every 10 mm
16	145	5	180	7
20	280	8	330	11
25	370	12	440	16
32	580	18	660	24



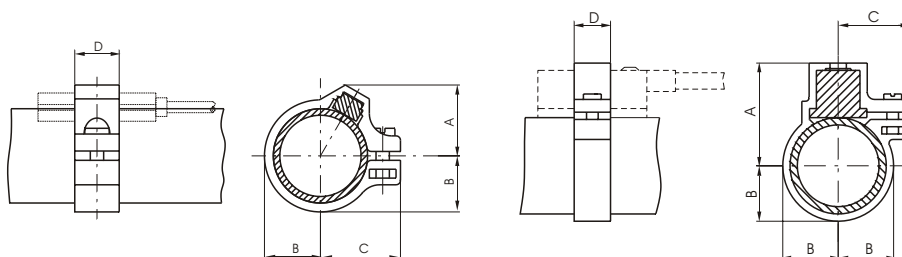
Sensor clamps for microcylinders with threaded end covers



Bore	10 and 12	16	20	25	32	40	50
A	23	25	27	29,5	33	37	42
B	10	12	14	16,5	20	24	29
C	15	16,5	17,5	19	20	22	24
E	10	10	10	10	10	10	10
Ordering code	1260.Ø.F						
Weight gr.	2	3	5	7	10	14	16

Sensor clamps for microcylinders with rolled end covers

These clamps allow the use of mini sensors series 1580 from series from bore 8 to 32 (for MIR-INOX version, from Ø16) and standard sensors series 1500 from bore 16 to 32.



Ordering code	For miniaturized sensors - series 1580								For std. sensors - series 1500			
	only for "MIR" version											
For sensor series 1580	Bore	8	10	12	16	20	25	32	16	20	25	32
MIR 1280.Ø.FS	A	11	12	13	14,5	16	17,5	19,5	24	25,5	28,5	31,8
MIR-INOX 1280.Ø.FSX	B	6,5	7,5	8,5	10,5	12,5	15,3	18,8	10,5	12,5	15,5	18,8
For sensors series 1500	C	12,5	13,5	15	16	18	20,5	24	16,5	17,5	19	20
MIR 1280.Ø.F	D	10	10	10	10	10	10	10	10	10	10	10
MIR-INOX 1280.Ø.FX	Weight gr.	2	2	2	3	5	7	10	3	5	7	10

Sensor for microcylinders

For technical characteristics and ordering codes see page 8.0

General

The linear control units are used as non-rotating device with 20 and 25 microcylinders bore.
The high precision makes it ideal in application for assembly, packaging machines, automatic handling machine tools and so on.
The combination of different linear control unit makes them particularly suitable for the robotic manipulation.
The cylinders with magnetic piston and sensor give the facility to monitor the position on the unit giving an electrical signal to the control system.
The units are equipped with threaded mounting holes, located on the body and front plate for fixing to the machine and the load to be moved.

Construction characteristics

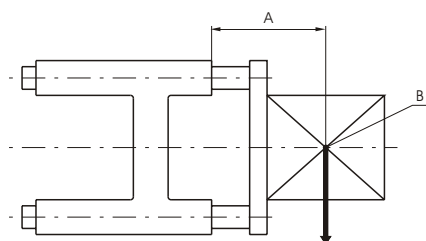
Body	extruded shape anodized aluminium alloy 6060
Bushings	sintered bronze
Wiper	oil resistant NBR rubber
Rods	chromed C43 steel
Plate	plated zinc steel
Mounting block	plated zinc steel

Technical characteristics

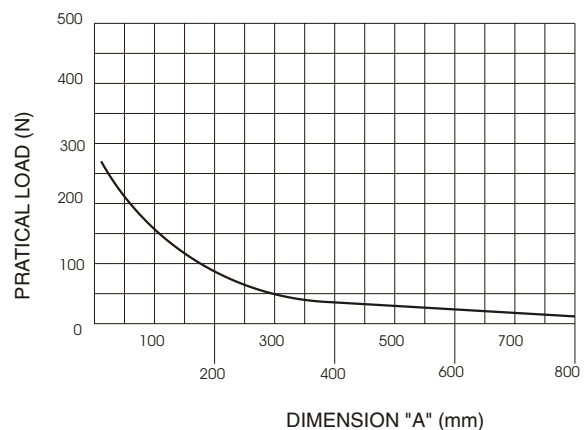
Max. suggested strokes:

Diameter	20	25
Stroke mm.	200	250

Loading diagram based on dimension "A"

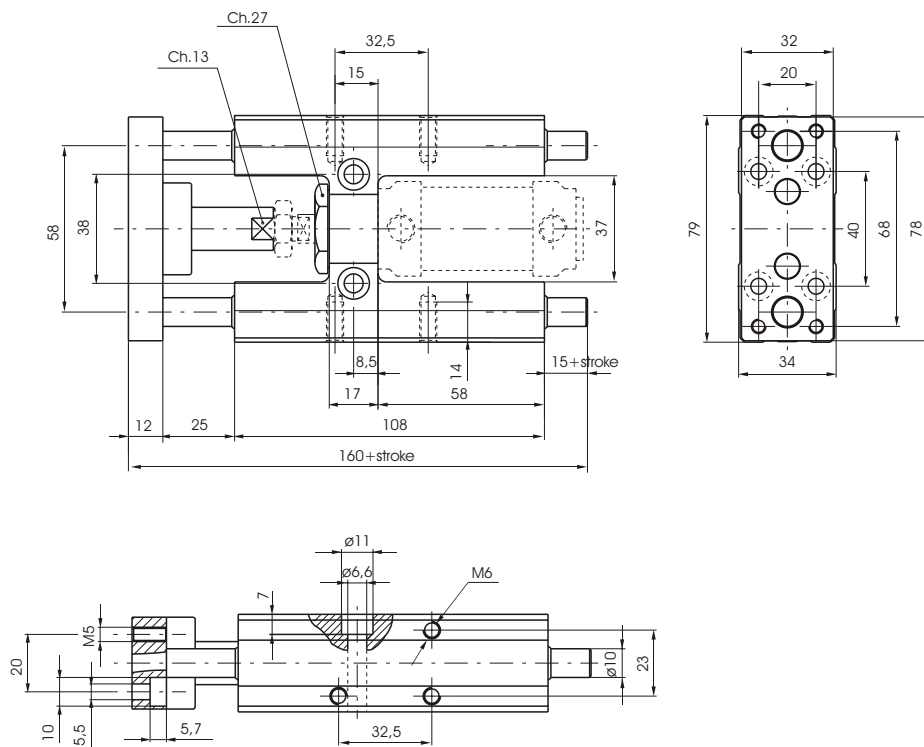


A = Protusion
B = Load centre of Gravity



Use and maintenance

Follow the indication of the above diagram as far as loads are concerned.
A large quantity of grease is placed between the two wipers during assembly, therefore the linear control units should not require special maintenance.



Ordering code
1260.Ø.stroke.GLB (Microcylinders ISO 6432 must be ordered separately)

Weight gr.	
stroke 100	every 50 mm
970	60

Standard strokes:

Bore 20
100 - 150 - 200 mm

Bore 25
100 - 150 - 200 - 250 mm

Sensors and sensor clamps : Use standard sensors and clamps.



General

The piston rod lock devices are clamping units mounted on microcylinders front head. They allow to lock the piston rod in any position.

Piston rod clamping is mechanically obtained by springs actuated purpose-made jaws. This method allows to lock the cylinder in the desired position, should the air pressure drop.

The piston rod lock device is not a safety device.

The clamping force is higher than the one developed by the microcylinder operating at 6 bar (maximum suggested pressure), however, it is suggestible to slow down the cylinder speed in order to decrease the kinetic energy before actuating the piston rod lock. It is advisable to balance the pressure in the cylinders chambers with pressurized centre distributors once locked.

The piston rod lock device cannot be used with stainless steel or exagonal cylinder piston rod.

Microcylinders Ø 12, Ø 16 and Ø 20 equipped with magnetic piston will be supplied with chromed stainless steel piston rod.

This piston rod lock do not prevent the piston rod rotation as it works axially.

Construction characteristics

Mounting bracket	anodized aluminium
Body	anodized aluminium
Clamping jaws	hardened alloy copper
Piston	acetal resin
Seal	NBR oil-resitant rubber
Springs	springs steel

Technical characteristics

Fluid	clean air								
Working pressure	3 bar ÷ 6 bar								
Working temperature	-5°C ÷ +70°C								
Functioning	mechanical - double jaws								
Locking	axial, two-directions (normally locked)								
Unlocking	pneumatic								
Clamping force with static load for different bores	<table border="1"> <tr> <th>Ø 12</th> <th>Ø 16</th> <th>Ø 20</th> <th>Ø 25</th> </tr> <tr> <td>180 N</td> <td>180 N</td> <td>350 N</td> <td>350 N</td> </tr> </table>	Ø 12	Ø 16	Ø 20	Ø 25	180 N	180 N	350 N	350 N
Ø 12	Ø 16	Ø 20	Ø 25						
180 N	180 N	350 N	350 N						

"Attention: We recommend using dry air if the working temperature is lower than 0°C"

Use and maintenance

Do not exceed the above technical data.

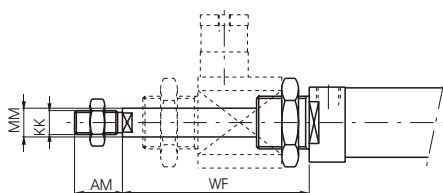
The piston rod lock does not require maintenance if properly utilized. However, it can be disassembled if needed.

The working inlet port has to be pressurized for assembling the piston rod lock device on cylinder. Alternatively adjust the jaws with screw located on connection. Spare parts are not available.

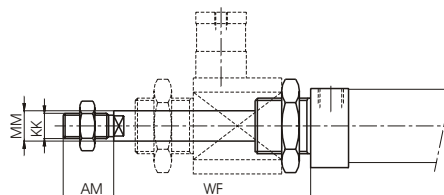


Microcylinders for piston rod lock

Threaded end covers version



Rolled end covers version (only "MIR" version)

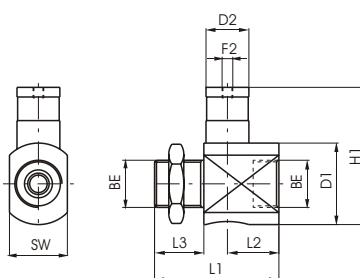


Order piston rod lock separately.
Do not use with stainless steel or hexagonal piston rod.

Ordering code
12_ _Ø.stroke.B

Order piston rod lock separately.
Do not use with stainless steel piston rod, but whit chromed stainless steel piston rod.

Piston rod lock complete

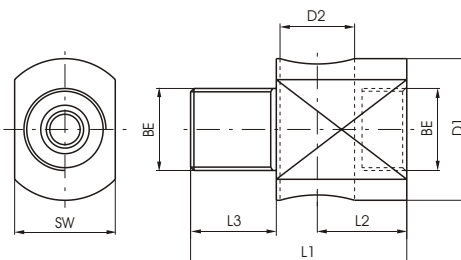


Ordering code
1260.Ø.51BS

Do not use as safety device

Bore	Weight gr.
12	82
16	82
20	140
25	140

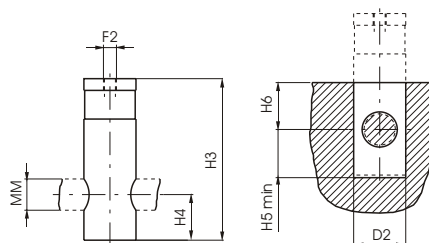
Piston rod lock bracket



Ordering code
1260.Ø.51S

Bore	Weight gr.
12	60
16	60
20	85
25	85

Piston rod lock and housing



Ordering code
1260.Ø.51B

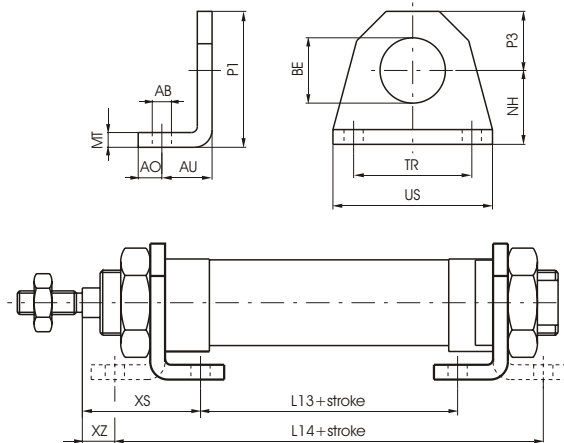
Do not use as safety device

Bore	Weight gr.
12	22
16	22
20	55
25	55

Table of dimensions

Bore	AM	BE	D1	D2	F2	H1	H3	H4	H5	H6	KK	L1	L2	L3	MM	SW	WF
12	16	M16x1,5	20	16	M5	35	35	10	11	10	M6x1	42	21	12	6	20	55
16	16	M16x1,5	20	16	M5	35	35	10	11	10	M6x1	42	21	12	6	20	55
20	20	M22x1,5	38	20	M5	64	62	17,5	19	18	M8x1,25	58	24	23	8	27	73
25	22	M22x1,5	38	20	M5	64	62	17,5	19	18	M10x1,25	58	24	23	10	27	77

Foot



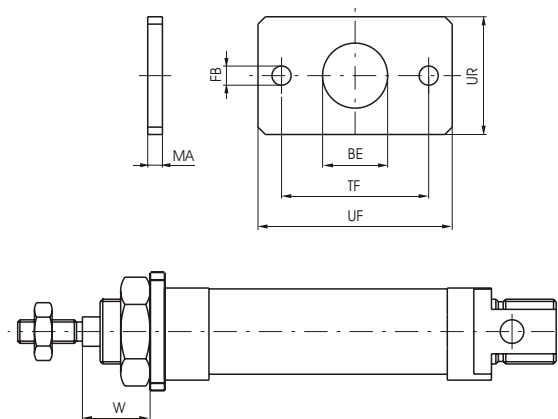
Used to mount the cylinder on the mounting plane with the rod parallel to said plane. Use one for short strokes and two for long strokes. It is made of stamped steel, made corrosion resistant by cathophoresis treatment. Attached to the end plates by means of nuts (or lock nuts) 05.

Attention: the dimensions of microcylinders with threaded end covers (*) increase of 10 mm. for microcylinders equipped with magnetic piston and spring return, and of 9 mm. for microcylinders with 10 mm. diameter magnetic piston.

Bore	8	10	12	16	20	25	32	40	50
AB (H13)	4,5	4,5	5,5	5,5	6,5	6,5	6,5	8,5	8,5
AO	5	5	6	6	8	8	8	10	10
AU	11	11	14	14	17	17	17	20	20
BE	12	12	16	16	22	22	30	40	40
L13 (±1) *	30	30	30	36	44	45	45	49	52
L14 (±1) *	68	68	78	84	102	103	103	119	122
MT	3	3	4	4	5	5	5	5	5
NH (±0,3)	16	16	20	20	25	25	28	40	40
P1	26	26	33	33	45	45	50	70	70
P3	10	10	13	13	20	20	22	30	30
TR (JS14)	25	25	32	32	40	40	52	70	70
US	35	35	42	42	54	54	66	90	90
XS (±1,4)	24	24	32	32	36	40	40	50	50
XZ (±1,4)	5	5	8	8	7	11	11	15	15
Weight gr.	22	22	45	45	90	90	110	210	210

Ordering code	
1200.Ø.01 (1 piece)	

Flange



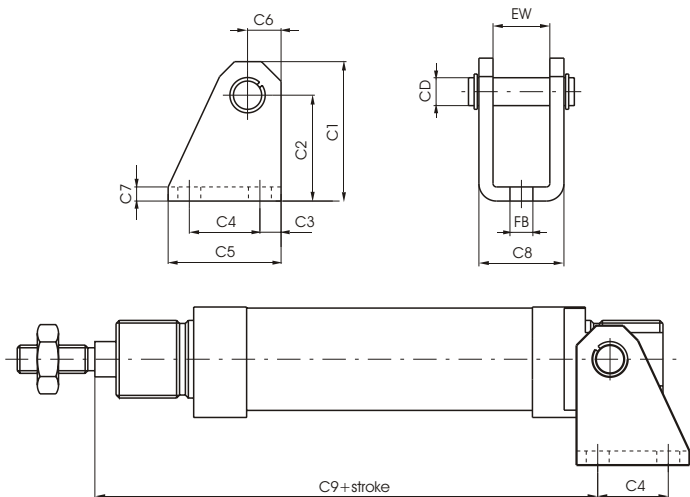
Used to mount the microcylinder at a right angle to the mounting plane. Attached to the front (or rear) endcap by a nut (or lock nut) 05. Made of extruded steel, made corrosion resistant by cathophoresis.

Bore	8	10	12	16	20	25	32	40	50
BE	12	12	16	16	22	22	30	40	40
FB (H13)	4,5	4,5	5,5	5,5	6,5	6,5	6,5	8,5	8,5
UF	40	40	53	53	66	66	68	90	90
UR	25	25	30	30	40	40	50	60	60
MA	3	3	4	4	5	5	5	5	5
TF (JS14)	30	30	40	40	50	50	52	70	70
W (±1,4)	13	13	18	18	19	23	23	30	30
Weight gr.	20	20	40	40	85	85	100	150	150

Ordering code	
1200.Ø.02	



Rear eye



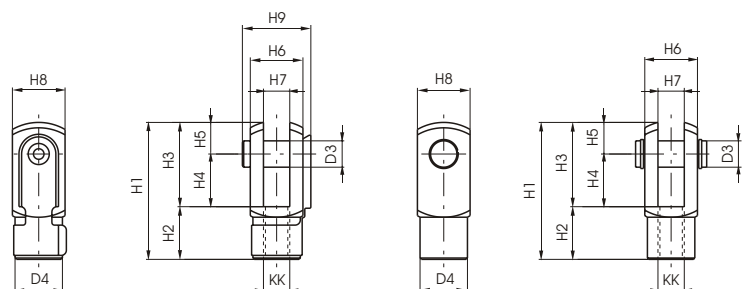
Used to mount by using the rear and cover to mount either parallel or at a right angle to the mounting plane. Allows the cylinder to oscillate and self-align with the linked element to the rod. Necessary to use when the rod may be subject to lateral forces during travel. Made of stamped steel, corrosion resistant by cataphoresis treatment.

Attention: the dimensions of microcylinders with threaded end covers (*) increase of 10 mm. for microcylinders equipped with magnetic piston and spring return, and of 9 mm. for microcylinders with 10 mm. diameter magnetic piston.

Bore	8	10	12	16	20	25	32	40	50
CD	4	4	6	6	8	8	12	14	14
C1	28,5	28,5	33,5	33,5	39,5	39,5	44,5	53,5	53,5
C2 (±0,3)	24	24	27	27	30	30	33	40	40
C3	3,5	3,5	5	5	6	6	7	10	10
C4	12,5	12,5	15	15	20	20	24	28	28
C5	20	20	25	25	32	32	38	45	45
C6	4,5	4,5	6,5	6,5	9,5	9,5	11,5	13,5	13,5
C7	2,5	2,5	3	3	4	4	4	4	4
C8	13	13	18	18	24	24	34	38	38
C9 (±0,4) *	63	63	73,5	80,5	91,5	100,5	100,5	119,5	122,5
EW	8,1	8,1	12,1	12,1	16,1	16,1	26,1	30,1	30,1
FB (H13)	4,5	4,5	5,5	5,5	6,5	6,5	6,5	8,5	8,5
Weight gr.	20	20	35	35	75	75	135	180	180

Ordering code	
1200.Ø.03	

Cylinder rod forks



Similar to hinge 03, mounted on the rod thread, assures a regular operation even in the presence of significant forces to the linked element. Made of zinc plated steel.

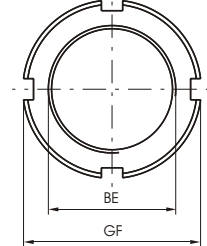
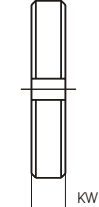
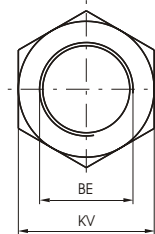
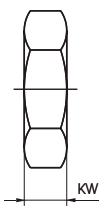
Bore	8	10	12	16	20	25	32	40	50
D3	4	4	6	6	8	10	10	12	12
D4	8	8	10	10	14	18	18	20	20
H1	24	24	31	31	42	52	52	62	62
H2	10	10	12	12	16	20	20	24	24
H3	14	14	19	19	26	32	32	38	38
H4	8	8	12	12	16	20	20	24	24
H5	6	6	7	7	10	12	12	14	14
H6	10	10	12	12	16	20	20	24	24
H7 (B 12)	4	4	6	6	8	10	10	12	12
H8	10	10	12	12	16	20	20	24	24
H9	12,5	12,5	15	15	22	26	26	30	30
KK	M4x0,7	M4x0,7	M6x1	M6x1	M8x1,25	M10x1,25	M10x1,25	M12x1,75	M12x1,75
Weight gr.	12	12	20	20	45	90	90	145	145

* Available from Bore Ø12

Ordering code	
1200.Ø.04 (with pin) *	
1200.Ø.04/1 (with clips)	



Nut or lock nut for the endcaps

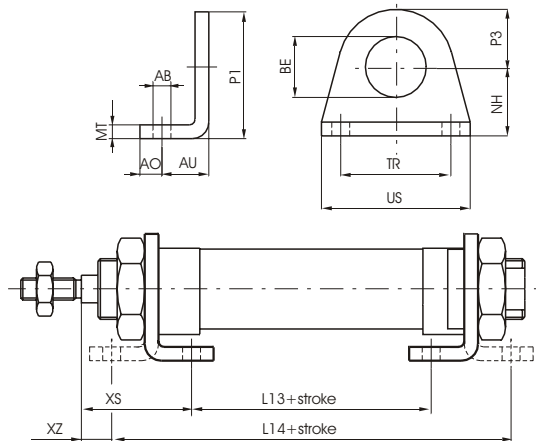


Used to fasten flanges or feet to the endcaps of the microcylinder. The nuts are mounted on diameters that go from 8 to 25, the lock nuts on 32, 40 and 50. Both are supplied (one piece) with the microcylinders.

Bore	8	10	12	16	20	25	32	40	50
BE	M12x1,25	M12x1,25	M16x1,5	M16x1,5	M22x1,5	M22x1,5	M30x1,5	M40x1,5	M40x1,5
KV	17	17	22	22	30	30	-	-	-
GF	-	-	-	-	-	-	42	52	52
KW	5,5	5,5	6	6	7	7	8	9	9
Weight gr.	7	7	16	16	25	25	42	60	60
Ordering code									
1200.Ø.05									



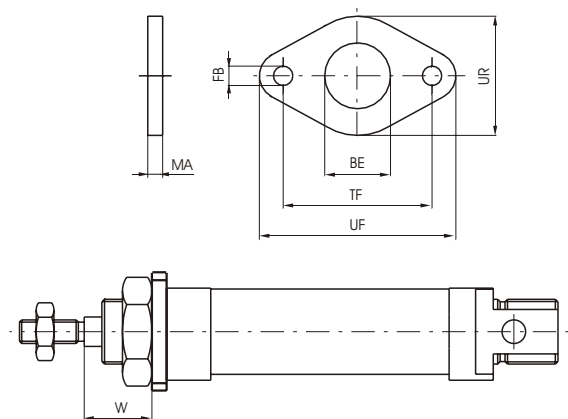
Foot



Used to mount the cylinder on the mounting plane with the rod parallel to said plane. Use one for short strokes and two for long strokes. It is made stamped stainless steel AISI 304. Attached to the end plates by means of nuts (or lock nuts) 05X.

Bore	16	20	25	32
AB (H13)	5,5	6,5	6,5	6,5
AO	6	8	8	8
AU	14	17	17	17
BE	16	22	22	30
L13 (±1)	36	44	44	45
L14 (±1)	84	102	102	103
MT	4	5	5	5
NH (±0,3)	20	25	25	28
P1	33	45	45	50
P3	13	20	20	22
TR (JS14)	32	40	40	52
US	42	54	54	66
XS (±1,4)	32	36	40	40
XZ (±1,4)	8	7	11	11
Ordering code				
1200.Ø.01X (1 piece)				
Weight gr.	45	90	90	110

Flange

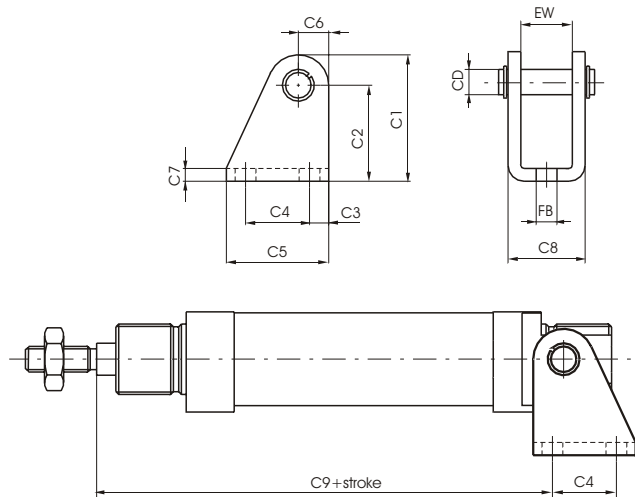


Use to mount the microcylinder at a right angle to the mounting plane. Attached to the front (or rear) endcap by a nut (or lock nut)05X. Made of stainless steel AISI 304.

Alésage	16	20	25	32
BE	16	22	22	30
FB (H13)	5,5	6,5	6,5	6,5
UF	53	66	66	68
UR	30	40	40	50
MA	4	5	5	5
TF (JS14)	40	50	50	52
W (±1,4)	18	19	23	23
Ordering code				
1200.Ø.02X				
Weight gr.	40	85	85	100



Rear eye

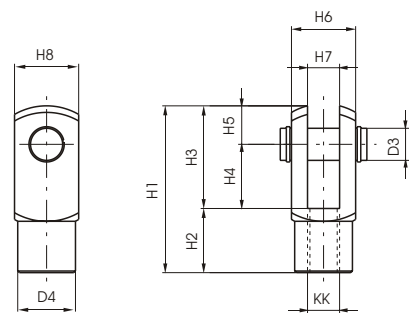


Used to mount by using the rear and cover to mount either parallel or at a right angle to the mounting plane. Allows the cylinder to oscillate and self-align with the linked element to the rod. Necessary to use when the rod may be subject to lateral forces during travel. Made of stamped stainless steel AISI 304.

Bore	16	20	25	32
CD	6	8	8	12
C1	33,5	39,5	39,5	44,5
C2 (±0,3)	27	30	30	33
C3	5	6	6	7
C4	15	20	20	24
C5	25	32	32	38
C6	6,5	9,5	9,5	11,5
C7	3	4	4	4
C8	18	24	24	34
C9 (±0,4)	80,5	91,5	100,5	100,5
EW	12,1	16,1	16,1	26,1
FB (H13)	5,5	6,5	6,5	6,5
Weight gr.	35	75	75	135

Ordering code	
1200.Ø.03X	

Cylinder rod fork

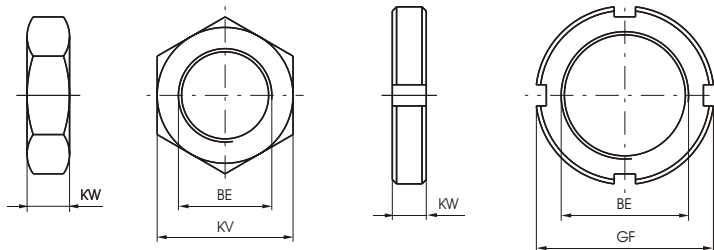


Similar to hinge 03X, mounted on the rod thread, assures a regular operation even in the presence of significant forces to the linked element. Made of stainless steel AISI 304.

Bore	16	20	25	32
D3	6	8	10	10
D4	10	14	18	18
H1	31	42	52	52
H2	12	16	20	20
H3	19	26	32	32
H4	12	16	20	20
H5	7	10	12	12
H6	12	16	20	20
H7 (B12)	6	8	10	10
H8	12	16	20	20
KK	M6X1	M8X1,25	M10X1,25	M10X1,25
Weight gr.	20	45	90	90

Ordering code	
1200.Ø.04X	

Nut or lock nut for the endcaps



Used to fasten flanges or feet to the endcaps of the microcylinder. The nuts are mounted on diameters that go from 16 to 25, the lock nuts on 32. Both are supplied (one piece) with the microcylinders.

Bore	16	20	25	32
BE	M16X1,5	M22X1,5	M22X1,5	M30X1,5
KV	22	30	30	-
GF	-	-	-	42
KW	6	7	7	8
Ordering code	1200.Ø.05X			
Weight gr.	16	25	25	42

General

In some application, a further miniaturization of the ISO 6432 is necessary, having a bore less then 8 mm.

Because of this, components have been developed for a particular use in automation where reduced overall dimensions machines and modest forces are required.

These microcylinders have bores fo 4, 6, 8 and 10 mm. and are all single-acting with a front spring. The 6, 8 and 10 mm. bores have an external threaded body to assure proper mounting, using two nuts, on a perforated plane.

Construction characteristics

Body	nickel-plated brass
Rod / piston	stainless steel (C43 for ø 10)
Rod bushing	brass
Spring	stainless steel
Seal	NBR

Technical characteristics

Fluid	filtered and lubricated air
Pressure	min. 3 bar - max. 7 bar
Temperature	min. -5°C - max +70°C

"Attention: We recommend using dry air if the working temperature is lower than 0°C"

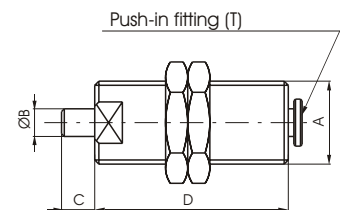
Maintenance and use

When using, respect the technical advice and don't stress the component beyond necessity: remember that microcylinder use involves special mechanical functions. (For example avoid that the rod travels repeatedly without load and at maximum pressure).

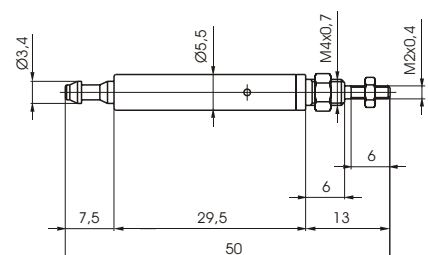
The product cannot be disassembled and it is not possible to carry out maintainance with replacement of seals.

Threaded body - simple acting front spring

Ordering code	Bore	Stroke	A	B	C	D	T
1213.6.5	6	5	M10x1	3	5	30,5	4/2
1213.6.10	6	10	M10x1	3	5	35,5	4/2
1213.6.20	6	20	M10x1	3	5	49,5	4/2
1213.8.5	8	5	M12x1	3	6	28	4/2
1213.10.3	10	3	M15x1,5	5	1	44	4/2
1213.10.5	10	5	M15x1,5	5	5	40	4/2
1213.10.10	10	10	M15x1,5	5	12	44	4/2



Simple acting front spring ø 4



Ordering code
1273.4.10

CYLINDERS - Series 1303 ÷ 1308

according to stanadrd CNOMO - CETOP - ISO

Heavy duty tie rods series

Non magnetic Cylinders
series 1303-1304-1305

3.0÷3.5

Magnetic Cylinders
series 1306-1307-1308

3.6÷3.9

Accessories

3.10÷3.15

ISO Cylinders ø250 and accessories

3.16÷3.17



General

As an alternative to the cylinders of series 1300 (1301-1302) which have been previously illustrated, let's consider and analyze the cylinders of the 1303 CNOMO (1304 CETOP - 1305 ISO) series.

As we have already mentioned in the general description, these cylinders are particularly strong and reliable, they can be used in many ways and fitted with various elements so that they can solve all sorts of problems. Their construction is similar to that of low pressure hydraulic cylinders: strong aluminium piston, lip seal, teflon guide shoe on piston; cylinder heads are obtained from bar up to 100 in diameter and from chill casting followed by a radiographic control from the diameter 125 to 200. Also they are designed to withstand such stresses as to make cylinders suitable for operating with oil up to 20 Bar. In this case, the rod-guide bushing is slightly modified, suitable seals are used and tie-rods are strengthened to provide further safety. Obviously, all versions of our cylinders come with shock absorbing systems and quick start with a particularly fine deceleration control. Even in this type of cylinder, the rod-guide bushing is dismantlable from the end-cape and it is always made with anti-friction material.

The anchorage devices (clamps) are the same as those of the series 1300, with small variation only on the flange threads to attach tie-rods, which are substituted by spot-facing for socket head screw. In fact, for such a series of cylinders, tie-rods do not protrude from the cylinder heads but they are partially kept by female thread screws. In fact, the remaining part of the screws thread is used for locking the clamps by socket head or hexagonal-head screws.

Among the various specifications there are also standard stroke cylinders, with strokes not superior to 50 mm. The ordering code is obtained by adding the letters MA for the front spring and MP for the rear spring.

For example: **1303.32.50.01MA**
1303.40.25.01MP

Construction characteristics

End plates	solid aluminium bar up to Ø 100, alloy aluminium from Ø 125 to Ø200
Rod	C43 chromed steel, by thickness or stainless steel AISI 303
Barrel	polished extruded cold steel of high quality with roughness max RA 0,15 or barrels in oxidized aluminium, chromed steel by thickness, burnished steel and extruded polished brass
Tie rods	steel with rolled threads
Cushion bearings	aluminium
Rod-guide bushing	brass (Ø 32, 40, 50) in aluminium with self-lubricating bearings in sinterized bronze for the remaining diameters
Piston	aluminium lathed from bar
Piston seals	NBR 80 Shore rubber (or VITON®)
Rod seals	mixing polyurethane self-lubricating 90 Shore or VITON®

Technical characteristics

Fluid	filtered and lubricated air - hydraulic oil									
Pressure	max 12 bar (air) - 20 bar (oil)									
Operating temperature	-5 °C to + 70°C (150 °C with VITON®)									
Cushioning length	Ø	32	40	50	63	80	100	125	160	200
	mm.	20	20	22	24	24	25	27	35	35

"Attention: We recommend using dry air if the working temperature is lower than 0°C"

Standard strokes

From 0 to 150 every 25 mm; from 150 to 500 every 50 mm; from 500 to 1000 every 100 mm. (For all diameters)



Maintenance and use

The cylinder is a very simple and sturdy component. A correct use will provide it with a reliable and long life for many millions of cycles.

Clean and lubricated air is rule number one. When assembling the cylinder, align correctly in relation to the loaded capacity which does not generate radial components and/or bending the rod. Avoid the combination of a heavy load, long stroke, and high velocity (in this case please contact our engineering dept for eventual application of extra cushionings). Evaluating with care processing conditions sometimes allows avoiding frequent maintenance interventions.

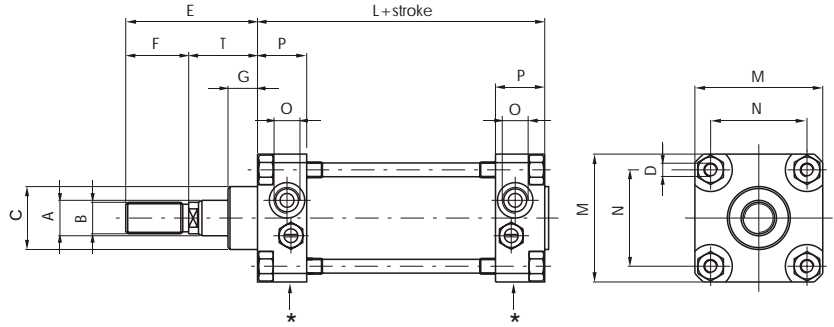
When the cylinder needs to be repaired, use the standard practices. Disassemble the cylinder, wash all parts in a mild degreasing media (petrol, oil, etc.) and, after having checked and replaced the worn parts, lubricate with special grease and reassemble. Particular attention must be paid to all sliding surfaces, barrel and rod. If damaged, they will shortly wear out the newly replaced seals. Check that play between bushing and rod isn't over 0.2 mm (again the tolerance is +0.05 +0.07 mm). Whenever the tolerance exceeds 0.2 mm, the seals become ineffective. Finally, please bear in mind that under bad conditions and with air condensation, one of the most delicate points of the cylinder is the non-treated steel barrel, which is very sensitive to rust. This provokes irreversible damage to the internal surface of the barrel and the accelerated wear of the seals. When in doubt, the burnished barrels should be used. For lubrication use class H hydraulic oils, for example Castrol MAGNAGC 32.

Important

We recommend an adequate programmed lubrication and inspection of the fixing devices such as intermediate trunnion, rear trunnion, clevis, and so on for verifying their efficiency.

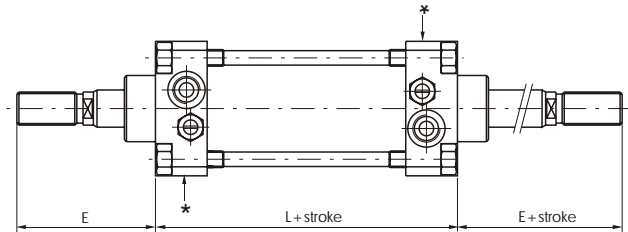


Basic version



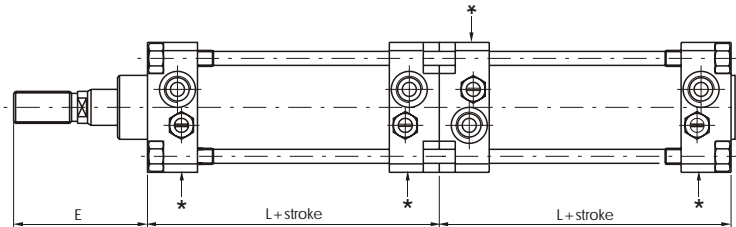
Ordering code	Available barrels
1303.Ø.stroke.01 (CNOMO) steel barrel	1303 (1304 - 1305).Ø.stroke.01A aluminium barrel
1304.Ø.stroke.01 (CETOP) steel barrel	1303 (1304 - 1305).Ø.stroke.01C chromed barrel
1305.Ø.stroke.01 (ISO) steel barrel	1303 (1304 - 1305).Ø.stroke.01D brass barrel

Push/Pull version



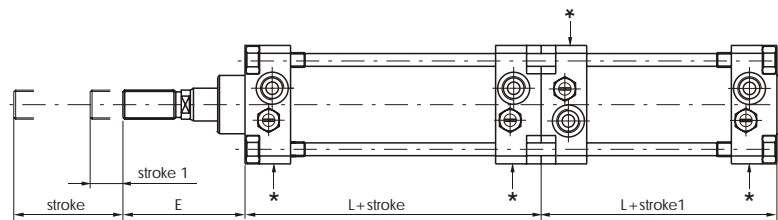
Ordering code	Available barrels
1303.Ø.stroke.02 (CNOMO) steel barrel	1303 (1304 - 1305).Ø.stroke.02A aluminium barrel
1304.Ø.stroke.02 (CETOP) steel barrel	1303 (1304 - 1305).Ø.stroke.02C chromed barrel
1305.Ø.stroke.02 (ISO) steel barrel	1303 (1304 - 1305).Ø.stroke.02D brass barrel

Tandem push with a common rod



Ordering code	Available barrels
1303.Ø.stroke.G (CNOMO) steel barrel	1303 (1304 - 1305).Ø.stroke.H aluminium barrel
1304.Ø.stroke.G (CETOP) steel barrel	1304 (1304 - 1305).Ø.stroke.L chromed barrel
1305.Ø.stroke.G (ISO) steel barrel	1305 (1304 - 1305).Ø.stroke.M brass barrel

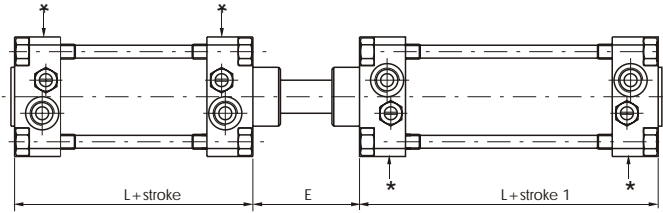
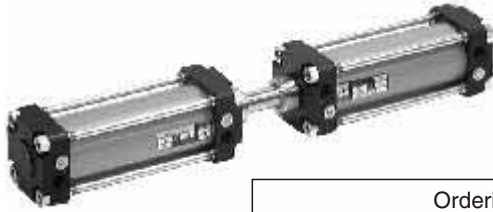
Tandem push with independent rods



Ordering code	Available barrels
1303.Ø.stroke.stroke1.F (CNOMO) steel barrel	1303 (1304 - 1305).Ø.stroke.stroke1.N aluminium barrel
1304.Ø.stroke.stroke1.F (CETOP) steel barrel	1304 (1304 - 1305).Ø.stroke.stroke1.P chromed barrel
1305.Ø.stroke.stroke1.F (ISO) steel barrel	1305 (1304 - 1305).Ø.stroke.stroke1.Q brass barrel

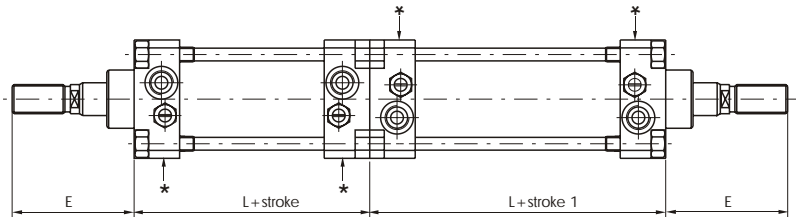


Opposed tandem with common rods



Ordering code	Available barrels
1303.Ø.stroke.stroke1.D (CNOMO) steel barrel 1304.Ø.stroke.stroke1.D (CETOP) steel barrel 1305.Ø.stroke.stroke1.D (ISO) steel barrel	1303 (1304 - 1305).Ø.stroke.stroke1.R aluminium barrel 1304 (1304 - 1305).Ø.stroke.stroke1.S chromed barrel 1305 (1304 - 1305).Ø.stroke.stroke1.T brass barrel

Tandem with opposed rods



Ordering code	Available barrels
1303.Ø.stroke.stroke1.E (CNOMO) steel barrel 1304.Ø.stroke.stroke1.E (CETOP) steel barrel 1305.Ø.stroke.stroke1.E (ISO) steel barrel	1303 (1304 - 1305).Ø.stroke.stroke1.U aluminium barrel 1304 (1304 - 1305).Ø.stroke.stroke1.V chromed barrel 1305 (1304 - 1305).Ø.stroke.stroke1.Z brass barrel

NOTE: to order cylinders with STAINLESS STEEL chromed rods add "X" to the cylinder code. Example:1303.32.250.01X.
to order cylinders with VITON® seals add "V" to the cylinder code. Example:1303.32.250.01V.

Cushion adjustment (for Ø 32, Ø 40, Ø 125, Ø 160 and Ø 200) is on the side indicated by★ (see drawings).

Table of dimensions

	32	40	50	63	80	100	125	160	200
Bore	32	40	50	63	80	100	125	160	200
A (f7)	12	18	18	22	22	30	30	40	40
B - CNOMO (6g)	M10x1,5	M16x1,5	M16x1,5	M20x1,5	M20x1,5	M27x2	M27x2	M36x2	M36x2
B - CETOP (6g)	M10x1,25	M12x1,25	M16x1,5	M16x1,5	M20x1,5	M20x1,5	M24x2	M36x2	M36x2
B - ISO (6g)	M10x1,25	M12x1,25	M16x1,5	M16x1,5	M20x1,5	M20x1,5	M27x2	M36x2	M36x2
C (d11)	25	32	32	45	45	55	55	65	65
D	M6	M6	M8	M8	M10	M10	M12	M16	M16
E - CNOMO	45	70	70	85	85	110	110	135	135
E - CETOP	44	52	67	67	82	87	109	152	162
E - ISO	46	52	67	67	82	87	115	152	162
F - CNOMO	20	36	36	46	46	63	63	85	85
F - CETOP	20	24	32	32	40	40	48	72	72
F - ISO	22	24	32	32	40	40	54	72	72
G	15	15	15	20	20	20	20	25	25
M	45	52	65	75	95	115	140	180	220
N	33	40	49	59	75	90	110	140	175
O	G 1/8"	G 1/4"	G 1/4"	G 3/8"	G 3/8"	G 1/2"	G 1/2"	G 3/4"	G 3/4"
P	16	23	25	31	31	35	36	45	45
T - CNOMO	25	34	34	39	39	47	47	50	50
T - CETOP-ISO	24	28	35	35	42	47	61	80	90
L - CNOMO (±1)	80	110	110	125	125	145	145	180	180
L - CETOP-ISO (±1)	98	110	110	125	136	145	168	180	190

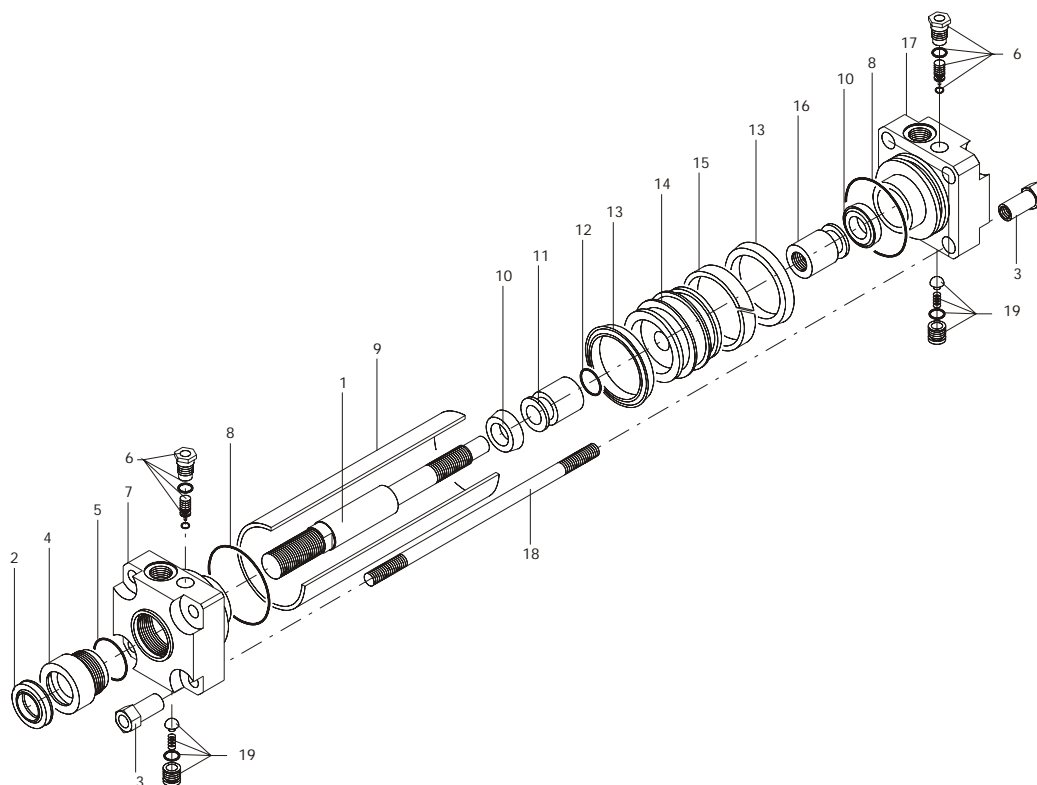
STROKE TOLLERANCE: + 2 mm.

WEIGHT IN gr. OF THE CYLINDERS WITH VARIOUS BARRELS (BASIC VERSION)

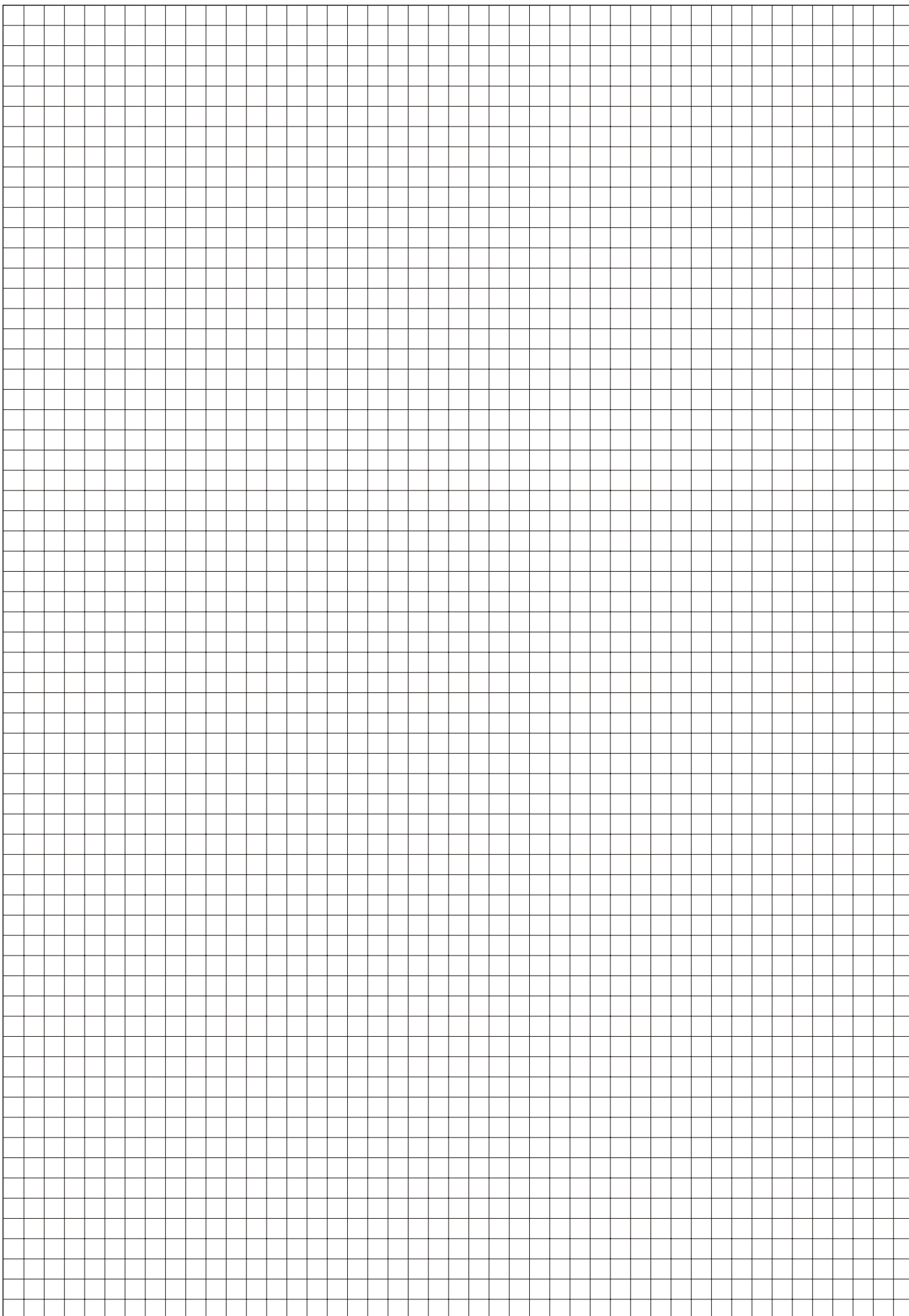
		32	40	50	63	80	100	125	160	200
Steel	stroke 0	650	1090	1500	2300	3600	5750	8150	14500	20000
	every 0 mm.	35	51	69	96	104	155	200	365	415
Aluminium	stroke 0	580	1010	1350	2110	3350	5400	7450	13300	18300
	every 10 mm.	24	38	47	63	75	117	130	235	250
Brass	stroke 0	655	1100	1520	2330	3650	5800	8250	14700	20200
	every 10 mm.	36	52	72	100	110	160	210	285	435

FOR CYLINDERS IN TANDEM THE WEIGHT IS APPROXIMATELY DOUBLE

Drawing



Pos.	Description	N. Pieces
1	Cylinder rod	1
2	Piston rod bearing seal	1
3	Tie rod nut	8
4	Piston rod bearing	1
5	Seals bearing-cover	1
6	Cushion adjustment	2
7	Front cover	1
8	Cover seal	2
9	Barrel	1
10	Cushion seal	2
11	Front cushion bearing	1
12	Cushion bearing seal	1
13	Piston seal	2
14	Piston	1
15	Teflon wear ring	1
16	Rear cushion bearing	1
17	Rear cover	1
18	Tie rod	4
19	Quick start valve	2

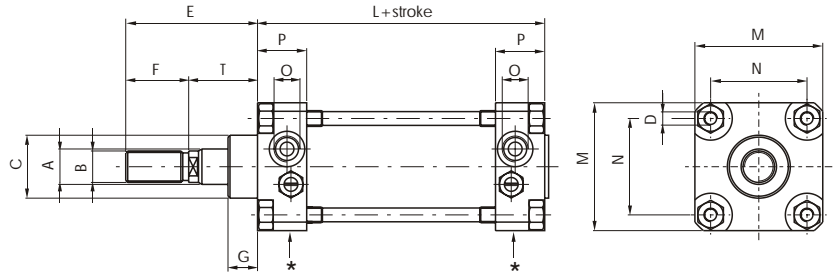




General

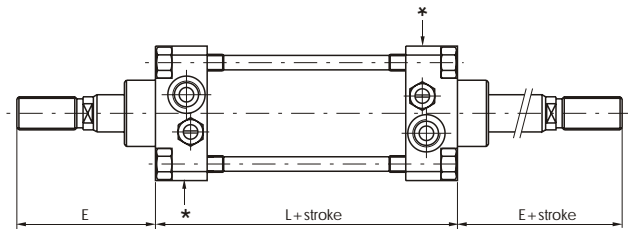
These cylinders, manufactured in sizes 1-1/4" through 8" diameter, are derived from the 1303 CNOMO (1304 - 1305 CETOP - ISO) series. They come with a piston with plastoferrite magnetic inserts. The adoption of a diamagnetic barrel in brass (or oxidized aluminium) permits the magnetic field generated by the piston to activate reed contacts mounted externally on the barrel. It is a high quality cylinder, adapt at any use, even the heaviest ones; long strokes and slightly off-balanced loads are conditions that this type of cylinder supports easily since it is equipped with a teflon guide shoe. In the use of magnetic cylinders, special attention must be paid to the technical notes shown on the pages about the 1200 series sensors, which are the same as this series of cylinders. The accessories for mounting are the same used for the 1303 - 1304 - 1305 series, given that the overall dimensions are the same.

Basic version



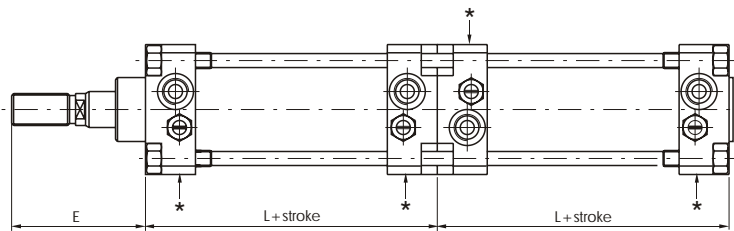
Ordering code	Available barrel
1306.Ø.stroke.01 (CNOMO) brass barrel	1306.Ø.stroke.01A aluminium barrel
1307.Ø.stroke.01 (CETOP) brass barrel	1307.Ø.stroke.01A aluminium barrel
1308.Ø.stroke.01 (ISO) brass barrel	1308.Ø.stroke.01A aluminium barrel

Push/Pull Version



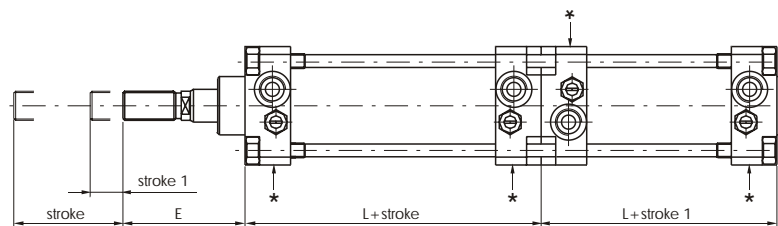
Ordering code	Available barrel
1306.Ø.stroke.02 (CNOMO) brass barrel	1306.Ø.stroke.02A aluminium barrel
1307.Ø.stroke.02 (CETOP) brass barrel	1307.Ø.stroke.02A aluminium barrel
1308.Ø.stroke.02 (ISO) brass barrel	1308.Ø.stroke.02A aluminium barrel

Tandem push with a common rod



Ordering code	Available barrel
1306.Ø.stroke.M (CNOMO) brass barrel	1306.Ø.stroke.H aluminium barrel
1307.Ø.stroke.M (CETOP) brass barrel	1307.Ø.stroke.H aluminium barrel
1308.Ø.stroke.M (ISO) brass barrel	1308.Ø.stroke.H aluminium barrel

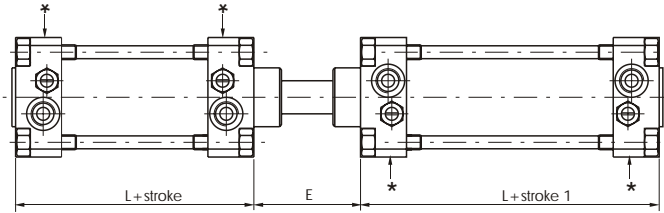
Tandem push with independent rods



Ordering code	Available barrel
1306.Ø.stroke.stroke1.Q (CNOMO) brass barrel	1306.Ø.stroke.stroke1.N aluminium barrel
1307.Ø.stroke.stroke1.Q (CETOP) brass barrel	1307.Ø.stroke.stroke1.N aluminium barrel
1308.Ø.stroke.stroke1.Q (ISO) brass barrel	1308.Ø.stroke.stroke1.N aluminium barrel

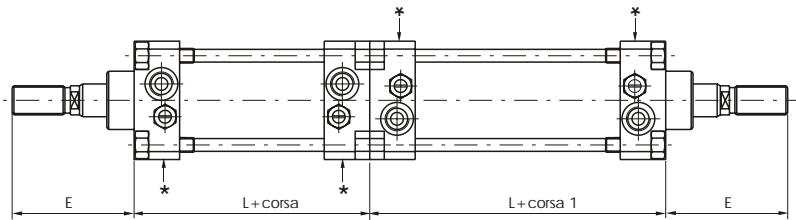


Opposed tandem with common rods



Ordering code	Available barrel
1306.Ø.stroke.stroke1.T (CNOMO) brass barrel	1306.Ø.stroke.stroke1.R aluminium barrel
1307.Ø.stroke.stroke1.T (CETOP) brass barrel	1307.Ø.stroke.stroke1.R aluminium barrel
1308.Ø.stroke.stroke1.T (ISO) brass barrel	1308.Ø.stroke.stroke1.R aluminium barrel

Tandem with opposed rods



Ordering code	Available barrel
1306.Ø.stroke.stroke1.Z (CNOMO) brass barrel	1306.Ø.stroke.stroke1.U aluminium barrel
1307.Ø.stroke.stroke1.Z (CETOP) brass barrel	1307.Ø.stroke.stroke1.U aluminium barrel
1308.Ø.stroke.stroke1.Z (ISO) brass barrel	1308.Ø.stroke.stroke1.U aluminium barrel

NOTE: to order cylinders with STAINLESS STEEL chromed rods add "X" to the cylinder code. Example:**1306.32.250.01X**.
to order cylinders with VITON® seals add "V" to the cylinder code. Example:**1306.32.250.01V**.

Cushion adjustment (for Ø 32, Ø 40, Ø 125, Ø 160 and Ø 200) is on the side indicated by * (see drawings).

Table of dimensions

Bore	32	40	50	63	80	100	125	160	200
A (f7)	12	18	18	22	22	30	30	40	40
B - CNOMO (6g)	M10x1,5	M16x1,5	M16x1,5	M20x1,5	M20x1,5	M27x2	M27x2	M36x2	M36x2
B - CETOP (6g)	M10x1,25	M12x1,25	M16x1,5	M16x1,5	M20x1,5	M20x1,5	M24x2	M36x2	M36x2
B - ISO (6g)	M10x1,25	M12x1,25	M16x1,5	M16x1,5	M20x1,5	M20x1,5	M27x2	M36x2	M36x2
C (d11)	25	32	32	45	45	55	55	65	65
D	M6	M6	M8	M8	M10	M10	M12	M16	M16
E - CNOMO	45	70	70	85	85	110	110	135	135
E - CETOP	44	52	67	67	82	87	109	152	162
E - ISO	46	52	67	67	82	87	115	152	162
F - CNOMO	20	36	36	46	46	63	63	85	85
F - CETOP	20	24	32	32	40	40	48	72	72
F - ISO	22	24	32	32	40	40	54	72	72
G	15	15	15	20	20	20	20	25	25
M	45	52	65	75	95	115	140	180	220
N	33	40	49	59	75	90	110	140	175
O	G 1/8"	G 1/4"	G 1/4"	G 3/8"	G 3/8"	G 1/2"	G 1/2"	G 3/4"	G 3/4"
P	16	23	25	31	31	35	36	45	45
T - CNOMO	25	34	34	39	39	47	47	50	50
T - CETOP-ISO	24	28	35	35	42	47	61	80	90
L - CNOMO (±1)	80	110	110	125	125	145	145	180	180
L - CETOP-ISO (±1)	98	110	110	125	136	145	168	180	190

STROKE TOLLERANCE: + 2 mm.

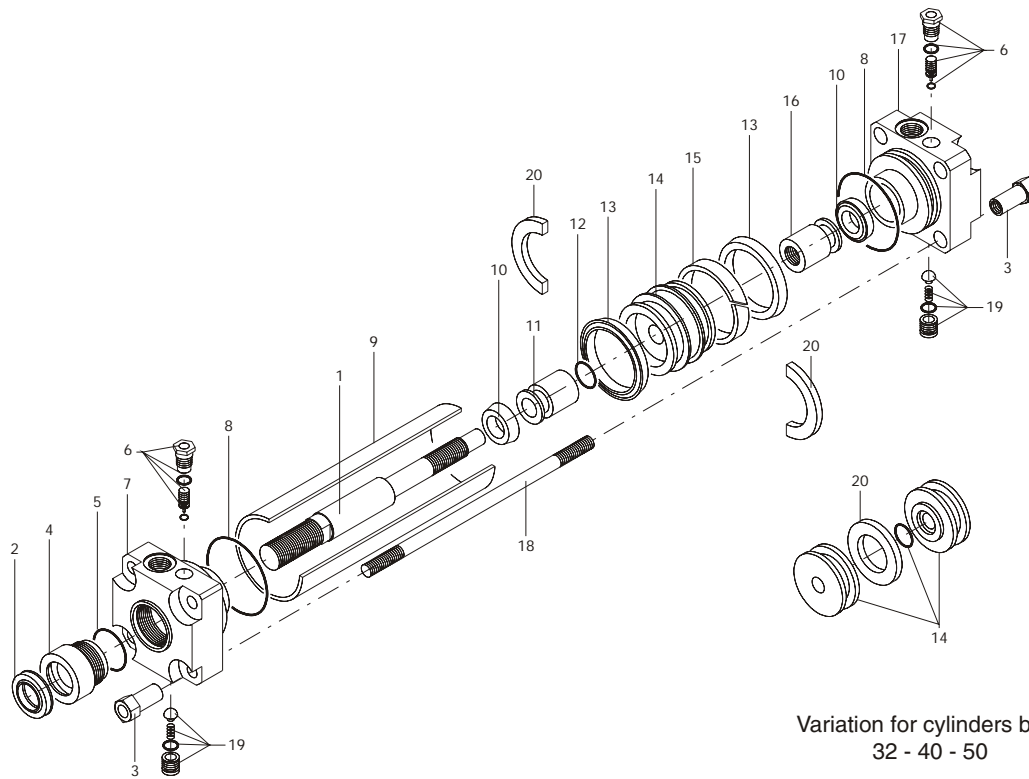
WEIGHT IN gr. OF THE CYLINDERS WITH VARIOUS BARRELS (BASIC VERSION)

Bore		32	40	50	63	80	100	125	160	200
Aluminium	stroke 0	580	1010	1350	2110	3350	5400	7450	13300	18300
	every 10 mm.	24	38	47	63	75	117	130	235	250
Brass	stroke 0	655	1100	1520	2330	3650	5800	8250	14700	20200
	every 10 mm.	36	52	72	100	110	160	210	285	435

FOR CYLINDERS IN TANDEM THE WEIGHT IS APPROXIMATELY DOUBLE



Drawing



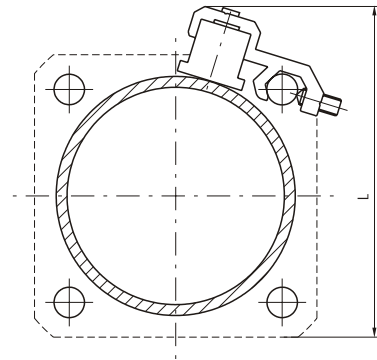
Pos.	Description	N. Pieces
1	Rod	1
2	Piston rod bearing seal	1
3	Tie rod nut	8
4	Piston rod bearing	1
5	Seals bearing-cover	1
6	Cushion adjustment	2
7	Front cover	1
8	Cover seal	2
9	Barrel	1
10	Cushion seal	2
11	Front cushion bearing	1
12	Cushion bearing seal	1
13	Piston seal	2
14	Piston	1
15	Teflon wear ring	1
16	Rear cushion bearing	1
17	Rear cover	1
18	Tie rod	4
19	Quick start valve	2
20	Magnet	2



Sensor brackets

Dimensions

Bore	L
Ø 32	59
Ø 40	65
Ø 50	76
Ø 63	87
Ø 80	103
Ø 100	121
Ø 125	144
Ø 160	179
Ø 200	215
Ø 250	275



Ordering code	1306.A	Bracket for cylinder sensors Ø 32 ÷ 63
	1306.B	Bracket for cylinder sensors Ø 80 ÷ 125
	1306.C	Bracket for cylinder sensors Ø 160 - 200
	1306.D	Bracket for cylinder sensors Ø 250 (only for ISO version, page. 3.16)

Sensors for cylinders

For technical characteristics and ordering code see page 8.0 and following.

Front and rear flanges

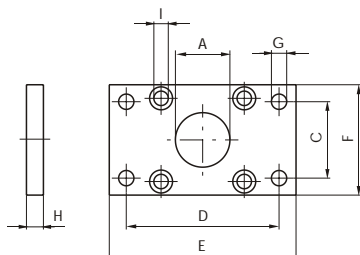
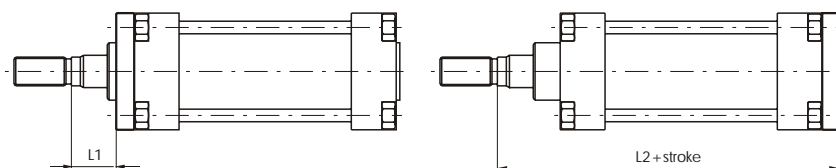


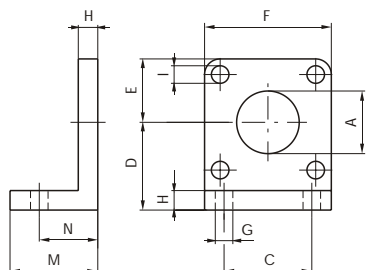
Plate which allows anchorage of the cylinder at a right angle to the plane. It is made of zinc-plated extruded steel.



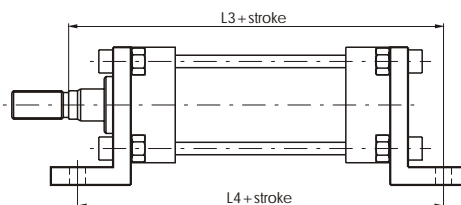
Bore	32	40	50	63	80	100	125	160	200
A (H 11)	25	32	32	45	45	55	55	65	65
C - CNOMO (JS 14)	33	40	49	59	75	90	110	140	175
C - CETOP - ISO (JS 14)	32	36	45	50	63	75	90	115	135
D - CNOMO (JS 14)	68	78	94	104	130	150	180	228	268
D - CETOP - ISO (JS 14)	64	72	90	100	126	150	180	230	270
E	80	90	110	120	150	170	205	260	300
F	45	52	65	75	95	115	140	180	220
G - CNOMO (H 13)	9	9	11	11	14	14	18	22	22
G - CETOP - ISO (H 13)	7	9	9	9	12	14	16	18	22
H (JS 14)	8	8	10	10	12	12	16	20	20
I (TCEI)	6x10	6x10	8x12	8x16	10x20	10x20	12x25	16x30	16x30
L1 - CNOMO	17	26	24	29	27	35	31	30	30
L1 - CETOP - ISO	16	20	25	25	30	35	45	60	70
L2 - CNOMO	113	152	154	174	176	204	208	250	250
L2 - CETOP - ISO	130	145	155	170	190	205	245	280	300
Weight gr.	165	200	540	1060	1460	1510	3100	6400	9500

Ordering code	
<i>Front</i>	
1303.Ø.03F (CNOMO)	
1304.Ø.03F (CETOP - ISO)	
<i>Rear</i>	
1303.Ø.04F (CNOMO)	
1304.Ø.04F (CETOP - ISO)	

Standard feet



Elements used to anchor the cylinder parallel to the mounting plane. They are made of cast aluminium, painted black.

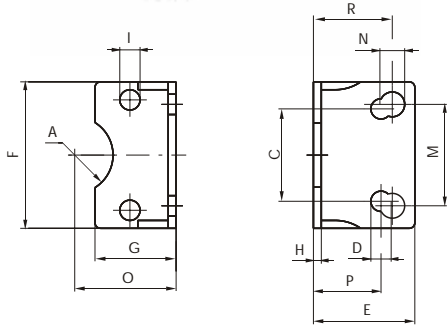


Bore	32	40	50	63	80	100	125	160	200
A (H 11)	25	32	32	45	45	55	55	65	65
C - CNOMO (JS 14)	28	36	45	55	70	90	100	130	170
C - CETOP - ISO (JS 14)	32	36	45	50	63	75	90	115	135
D - CNOMO (JS 15)	32	36	45	50	63	73	91	115	135
D - CETOP - ISO (JS 15)	32	36	45	50	63	71	90	115	135
E	22	26	32	37	47	57	70	90	110
F	45	52	65	75	95	115	140	180	220
G - CNOMO (H 14)	9	9	11	11	14	14	18	22	22
G - CETOP (H 14)	7	9	9	9	12	14	16	18	22
G - ISO (H 14)	7	9	9	9	12	14	16	18	22
H	8	8	10	10	12	12	16	20	20
I	7	7	9	9	11	11	13	17	17
M	35	35	45	45	55	55	68	82	91
N - CNOMO (±0,2)	27	27	35	35	43	43	52	62	62
N - CETOP - ISO (±0,2)	22	25,5	30	30	37	37,5	41	60	65
L3 - CNOMO	132	171	179	199	207	235	244	292	292
L3 - CETOP - ISO	144	163	175	190	215	230	270	320	345
L4 - CNOMO	134	164	180	195	211	231	249	304	304
L4 - CETOP - ISO	142	161	170	185	210	220	250	300	320
Weight gr.	55	70	150	175	260	550	920	2200	3200

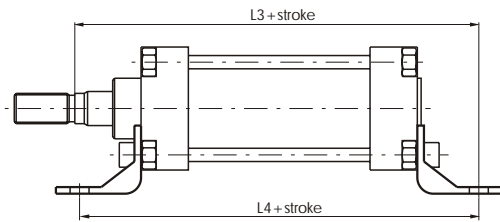
Ordering code	
1303.Ø.05F (CNOMO)	
1304.Ø.05F (CETOP - ISO)	



Short sheet metal feet



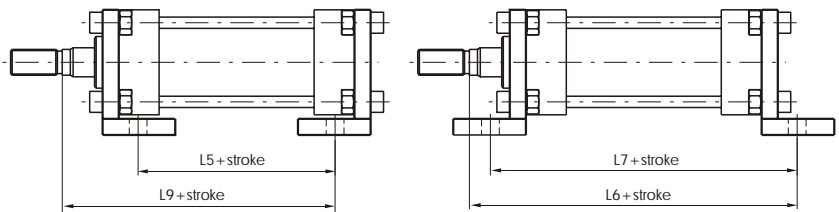
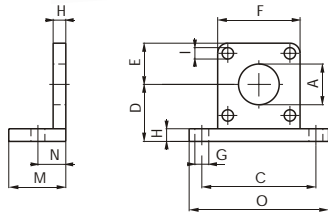
Elements used to anchor the cylinder parallel to the mounting plane. They are made of stamped and pierced sheet metal and painted in black. The mounting holes allow use with CNOMO, CETOP and ISO. Available up to 100 mm. diameter.



Bore	32	40	50	63	80	100
A	13	17	17	23,5	23,5	-
C - CETOP - ISO (JS 14)	32	36	45	50	63	75
D - CETOP - ISO (JS 15)	7	9	9	9	12	14
E	35	36	45	45	55	56
F	45	52	65	75	95	115
G	30	30	36	35	45	44
H	3,5	3,5	3,5	4,5	5	5
I	7	7	9	9	11	11
M - CNOMO (JS 14)	28	36	45	55	70	90
N - CNOMO (JS 15)	9	9	11	11	13	13
O - CNOMO (JS 15)	32	36	45	50	63	73
O - CETOP - ISO (JS 15)	32	36	45	50	63	71
P - CETOP - ISO (±0,2)	22	25,5	30	30	37	37,5
R - CNOMO (±0,2)	27	27	35	35	43	43
L3 - CNOMO	132	171	179	199	207	235
L3 - CETOP - ISO	144	163	175	190	215	230
L4 - CNOMO	134	164	180	195	211	231
L4 - CETOP - ISO	142	161	170	185	210	220
Weight gr.	58	70	118	184	305	385

Ordering code	
1303.Ø.05/1F (CNOMO - CETOP - ISO)	

Large internal and external feet

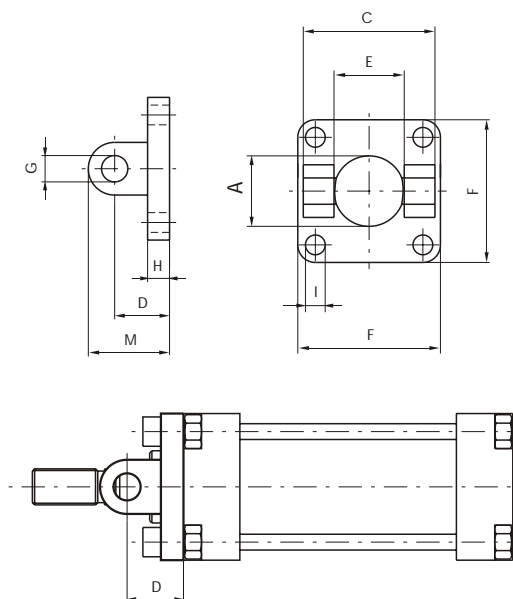


Elements used to anchor the cylinder parallel to the mounting plane. They are made of aluminium alloy and painted black.

Bore	32	40	50	63	80	100	125	160	200
A (H 11)	25	32	32	45	45	55	55	65	65
C (JS 14)	65	72	90	100	126	148	180	230	270
D (JS 15)	32	36	45	50	63	73	91	115	135
E	22	26	32	37	47	57	70	90	110
F	45	52	65	75	95	115	140	180	220
G (H 14)	9	9	11	11	14	14	18	22	22
H	8	8	10	10	12	12	16	20	20
I	7	7	9	9	11	11	13	17	17
M	35	35	45	45	55	55	67	80	80
N (±0,2)	18	18	22	22	28	28	32	40	40
O	82	90	110	120	155	180	215	275	315
L5 - CNOMO	60	90	86	101	93	113	113	140	140
L5 - CETOP - ISO	78	90	86	101	104	113	136	140	150
L6 - CNOMO	123	162	166	186	192	220	224	270	270
L6 - CETOP - ISO	141	162	166	186	203	220	247	270	280
L7 - CNOMO	116	146	154	169	181	201	209	260	260
L7 - CETOP - ISO	134	146	154	169	192	201	232	260	270
L9 - CNOMO	95	134	132	152	148	176	176	210	210
L9 - CETOP - ISO	112	128	133	148	162	176	213	240	250
Weight gr.	80	90	190	210	460	600	1080	2400	3100

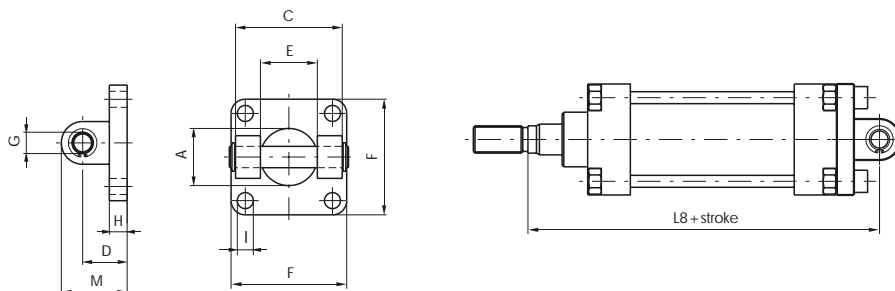
Ordering code	
<i>Internal</i>	
1303.Ø.06F (CNOMO)	
(May be used with CETOP-ISO cylinders but are not specified in the standards)	
<i>External</i>	
1303.Ø.07F (CNOMO)	

Front clevis



This type of mounting allows anchorage of the cylinder both parallel and at a right angle to the plane; the cylinder rod can oscillate and self-align as necessary. It is made of aluminium alloy and painted black.

Rear clevis complete with pin



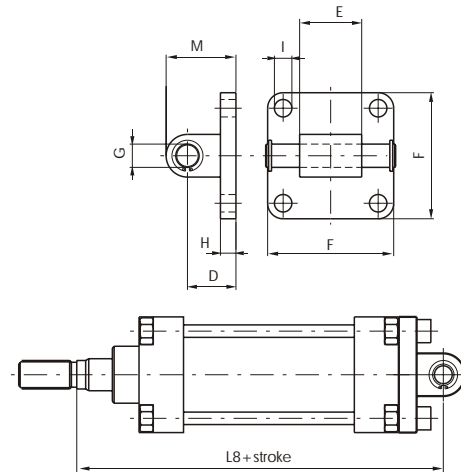
This type of mounting allows anchorage of the cylinder both parallel and at a right angle to the plane; the cylinder rod can oscillate and self-align as necessary. It is made of aluminium alloy and painted black.

Bore	32	40	50	63	80	100	125	160	200
A	25	32	32	45	45	55	55	65	65
C - CNOMO (H 11)	45	52	65	75	95	115	140	180	220
C - CETOP - ISO (H 14)	45	52	60	70	90	110	130	170	170
D - CNOMO (±0,2)	18	24	26	30	32	37	41	55	55
D - CETOP - ISO (±0,2)	20	22	25	30	32	37	46	55	55
E - CNOMO (H 14)	26	33	33	47	47	57	57	72	72
E - CETOP - ISO (H 14)	26	28	32	40	50	60	70	90	90
F	45	52	65	75	95	115	140	180	220
G - CNOMO (H 9)	8	12	12	16	16	20	20	25	25
G - CETOP - ISO (H 9)	10	12	12	16	16	20	25	30	30
H	8	8	10	10	12	12	16	19	19
I	7	7	9	9	11	11	13	17	17
M - CNOMO	26	36	38	46	48	57	61	80	80
M - CETOP - ISO	30	35	37	46	48	57	71	85	85
L8 - CNOMO	123	168	170	194	196	229	233	285	285
L8 - CETOP - ISO	142	160	170	190	210	230	275	315	335
Weight gr. (08F)	55	60	120	145	325	510	900	2080	3100
Weight gr. (09F)	75	110	190	280	490	820	1270	2800	3900

Ordering code
<i>Front</i>
1303.Ø.08F (CNOMO)
1304.Ø.08F (CETOP - ISO)
<i>Rear</i>
1303.Ø.09F (CNOMO)
1304.Ø.09F (CETOP - ISO)



Rear male clevis



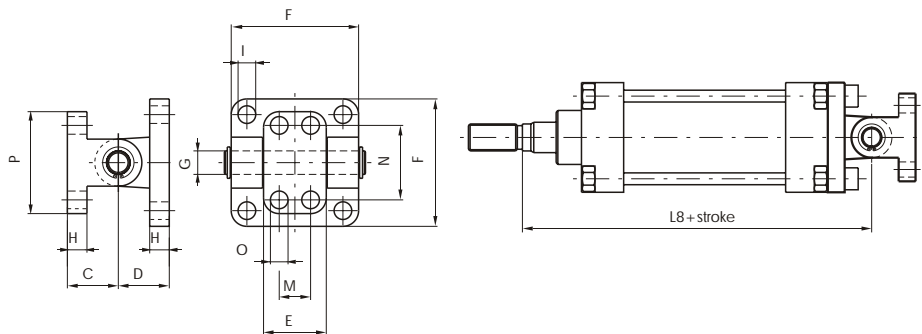
Similar to 09 clevis except for the connection, which is male rather than female. It can also be used as a counter clevis for type 10 (only CETOP - ISO). Allows mounting of cylinder at right angle to the plane of the cylinder rod.

Ordering code	
1304.Ø.09/1F (For CETOP - ISO cylinders . May be used with CNOMO cylinders but is not specified in the standards)	

Bore	32	40	50	63	80	100	125	160	200
D (±0,2)	20	22	25	30	32	37	46	55	55
E (H 14)	26	28	32	40	50	60	70	90	90
F	45	52	65	75	95	115	140	180	220
G (H 9)	10	12	12	16	16	20	25	30	30
H	8	8	8	10	12	12	16	20	20
I	7	7	9	9	11	11	14	18	18
M	30	35	36	45	47	57	71	80	80
L8 - CNOMO	125	166	169	194	196	229	233	285	285
L8 - CETOP - ISO	142	160	170	190	210	230	275	315	335
Weight gr.	50	80	110	185	325	460	1300	2850	3980

3

Rear clevis bracket

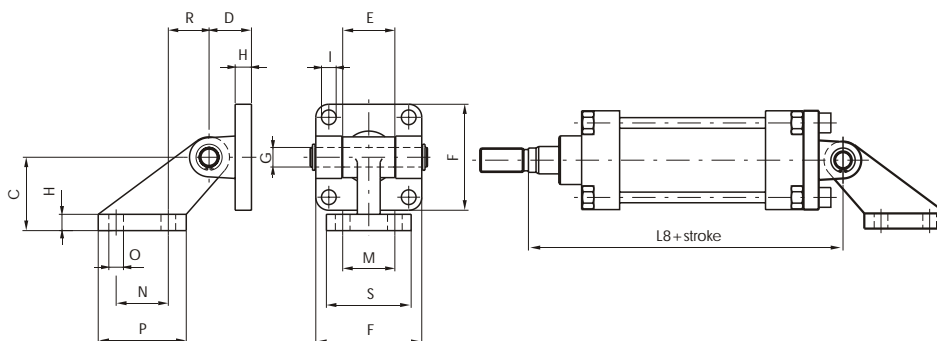


Mounting consists of clevis 09 and counter clevis. Used to mount cylinders at a right angle to the plane to which the counter clevis is attached. Allows self-alignment of the cylinder rod under load with an oscillation of ± 60 degrees.

Ordering code	
1303.Ø.10F (CNOMO) (May be used with CETOP - ISO cylinders but is not specified in the standards)	

Bore	32	40	50	63	80	100	125	160	200
C (±0,2)	18	26	26	34	34	41	41	55	55
D (±0,2)	18	24	26	30	32	37	41	55	55
E	25	32	32	46	46	56	56	71	71
F	45	52	65	75	95	115	140	180	220
G (H 9)	8	12	12	16	16	20	20	25	25
H	8	10	10	12	12	16	16	20	20
I	7	7	9	9	11	11	13	17	17
M (JS 14)	-	16	16	25	25	32	32	43	43
N (JS 14)	28	38	38	54	54	90	90	150	150
O (H 13)	7	9	9	11	11	14	14	18	18
P	40	52	52	75	75	115	115	180	180
L8 - CNOMO	123	168	170	194	196	229	233	285	285
L8 - CETOP - ISO	140	162	171	190	210	229	270	315	335
Weight gr.	90	165	240	470	665	1190	1660	3700	4700

Trunnion with support bracket

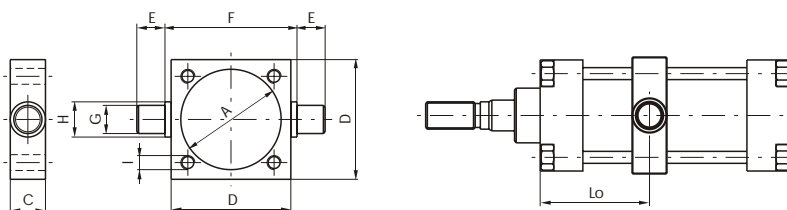


Mounting consists of clevis 09 and right angle counter clevis. Used to mount cylinders parallel to the plane to which the counterclevis is attached. Allows self-alignment of the cylinder rod under load with an oscillation up to 90 degrees from the mounting plane.

Ordering code	
1303.Ø.11F (CNOMO) (May be used with CETOP - ISO cylinders but is not specified in the standards)	

Bore	32	40	50	63	80	100	125	160	200
C (JS 15)	32	45	45	63	63	90	90	140	140
D (±0,2)	18	24	26	30	32	37	41	55	55
E	25	32	32	46	46	56	56	71	71
F	45	52	65	75	95	115	140	180	220
G (H 9)	8	12	12	16	16	20	20	25	25
H	8	10	10	12	12	16	16	20	20
I	7	7	9	9	11	11	13	17	17
M (JS 14)	25	32	32	40	40	50	50	63	63
N (JS 14)	20	32	32	50	50	70	70	110	110
O (JS 13)	7	9	9	11	11	14	14	18	18
P	37	54	54	75	75	102	102	154	154
R	18	25	25	32	32	40	40	50	50
S	41	51	51	62	62	80	80	110	110
L8 - CNOMO	123	168	170	194	196	229	233	285	285
L8 - CETOP - ISO	140	162	171	190	210	229	270	315	335
Weight gr.	125	250	325	600	800	1570	2100	4600	5700

Intermediate trunnion



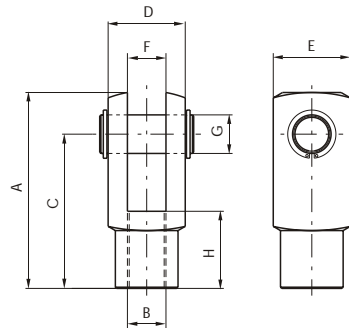
Clevis to be mounted between the endcaps of the cylinder allowing rotation at any point along the barrel. One piece construction from zinc-plated stamped steel. Can be mounted in fixed position or attached to adjustable tie rods.
NOTE: Lo max means at stroke 0.

Ordering code	
1300.Ø.12F	

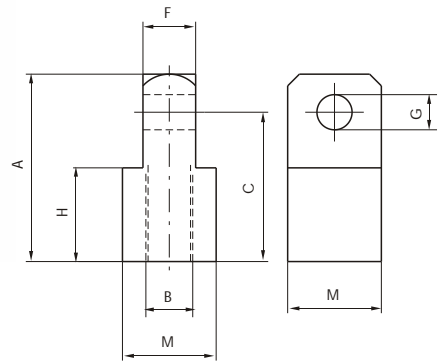
Bore	32	40	50	63	80	100	125	160	200
A	37	46	56	69	87	107	133	170	211
C	15	20	20	25	25	30	32	40	40
D	46	59	69	84	102	125	155	190	240
E (h 14)	12	16	16	20	20	25	25	32	32
F (h 14)	50	63	73	90	108	131	160	200	250
G (e 9)	12	16	16	20	20	25	25	32	32
H	15	20	20	25	25	30	30	40	40
I	M6	M6	M8	M8	M10	M10	M12	M16	M16
Lo min.	32	35	40	47	53	55	61	78	79
Lo max. + stroke - CNOMO	48	75	70	80	72	90	84	103	102
Lo max. + stroke - CETOP - ISO	67	75	70	80	84	90	107	103	112
Weight gr.	130	310	370	700	900	1590	2600	4300	7500



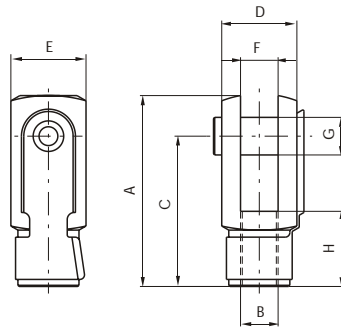
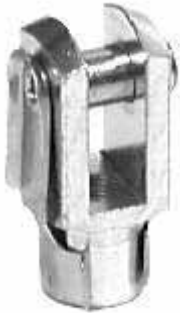
Fork with pin



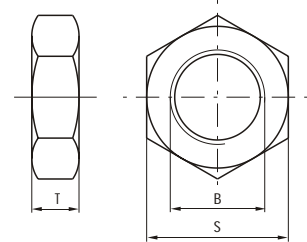
Male fork



**Fork with clips
from Ø 32 to Ø 100**



Rod lock nut



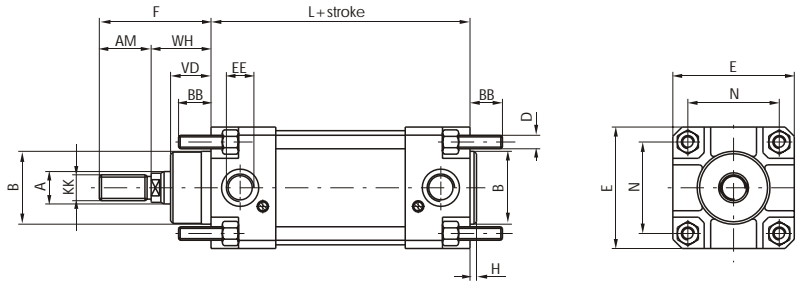
3

Bore	32	40	50	63	80	100	125	160	200	
A - CNOMO	45	64	64	80	80	105	105	140	140	
A - CETOP - ISO	51	62	82	82	105	105	132/148	188	188	
B - CNOMO (6 H)	M10x1,5	M16x1,5	M16x1,5	M20x1,5	M20x1,5	M27x2	M27x2	M36x2	M36x2	
B - CETOP (6 H)	M10x1,25	M12x1,25	M16x1,5	M16x1,5	M20x1,5	M20x1,5	M24x2	M36x2	M36x2	
B - ISO (6 H)	M10x1,25	M12x1,25	M16x1,5	M16x1,5	M20x1,5	M20x1,5	M27x2	M36x2	M36x2	
C - CNOMO	36	51	51	63	63	85	85	115	115	
C - CETOP - ISO	40	48	64	64	80	80	100/110	144	144	
D - CNOMO	22	36	36	45	45	63	63	80	80	
D - CETOP - ISO	20	24	32	32	40	40	50/55	70	70	
E - CNOMO	22	26	26	34	34	42	42	50	50	
E - CETOP - ISO	20	24	32	32	40	40	50/55	70	70	
F - CNOMO (H 14)	11	18	18	22	22	30	30	40	40	
F - CETOP - ISO (B 12)	10	12	16	16	20	20	25/30	35	35	
G - CNOMO (H 9)	8	12	12	16	16	20	20	25	25	
G - CETOP - ISO (H 9)	10	12	16	16	20	20	25/30	35	35	
H - CNOMO	20	26	26	30	30	45	45	75	75	
H - CETOP - ISO	20	24	32	32	40	40	50/56	72	72	
M	22	32	32	36	36	45	45	70	70	
S - CNOMO	17	24	24	30	30	41	41	55	55	
S - CETOP	17	19	24	24	30	30	36	55	55	
S - ISO	17	19	24	24	30	30	41	55	55	
T - CNOMO	6	8	8	9	9	12	12	18	18	
T - CETOP	6	7	8	8	9	9	10	18	18	
T - ISO	6	7	8	8	9	9	12	18	18	
Weight gr.	Fork	90	150	350	350	680	680	2500	4000	4000
	Rod lock nut	10	20	20	35	35	80	80	210	210
	Male fork	110	330	330	500	500	1300	1300	3500	3500

Code
<i>Fork with pin</i>
1300.Ø.13F (CNOMO)
1301.Ø.13F (CETOP)
1302.Ø.13F (ISO)
<i>Male fork</i>
1300.Ø.14F (only for CNOMO cylinders)
<i>Fork with clips</i>
1300.Ø.13/1F (CNOMO)
1301.Ø.13/1F (CETOP)
1302.Ø.13/1F (ISO)
<i>Rod lock nut</i>
1300.Ø.18F (CNOMO)
1301.Ø.18F (CETOP)
1302.Ø.18F (ISO)



Basic version

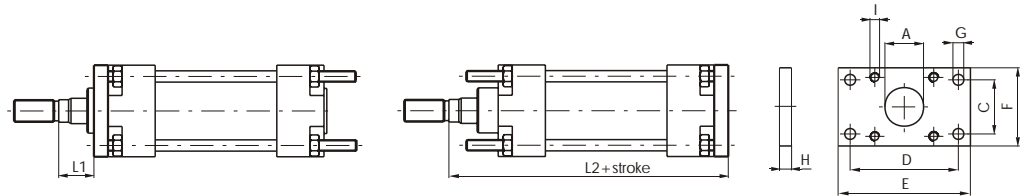


Ordering code

1305.250.stroke.01A (ISO)
non magnetic piston, aluminium barrel
1308.250.stroke.01A (ISO)
magnetic piston, aluminium barrel
VITON® seal version
add "V" to the cylinder code

$\varnothing A$	AM	$\varnothing B$	BB	D	E	EE	F	H	KK	L	N	P	VD	WH
50	84	90	50	M20	270	G1"	189	4	M42x2	200	220	54	65	105

Front and rear flanges

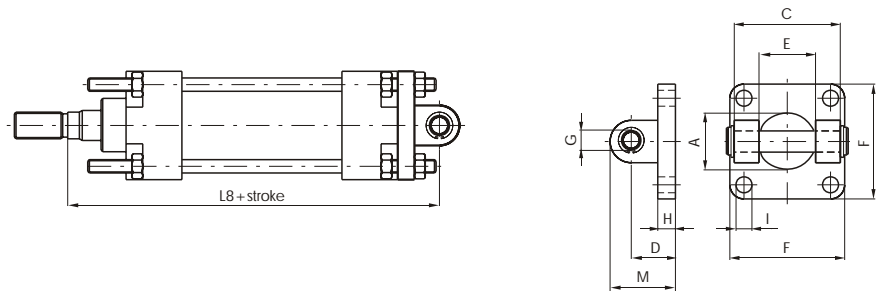


Ordering code

1305.250.03F front
1305.250.04F rear

A (H11)	C(JS14)	D(JS14)	E	F	G (JS14)	H (JS14)	I	L1	L2	Weight gr.
90	165	330	380	270	26	25	M20	80	330	1.825

Rear clevis complete with pin

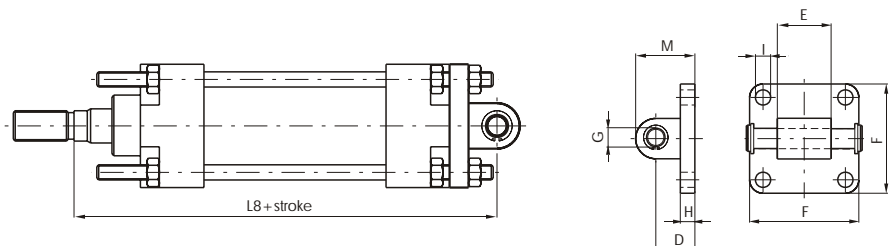


Ordering code

1305.250.09F

A	C(H14)	D(± 0.2)	E(H14)	F	G (H9)	H	I	M	L8	Weight gr.
90	200	70	110	270	40	25	22	112	351	7.800

Rear male clevis



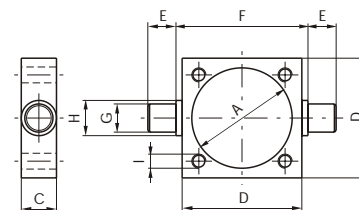
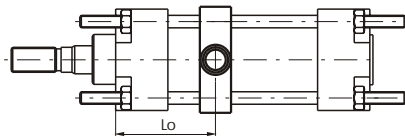
Ordering code

1305.250.09/1F

D(± 0.2)	E(H14)	F	G (H9)	H	I	M	L8	Weight gr.
70	110	270	40	25	22	112	351	8.300



Intermediate trunnion

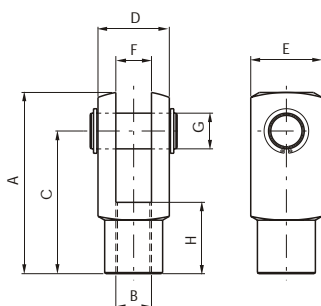


Ordering code

1305.250.12F

A	C	D	E(h14)	F(h14)	G (E2)	H	I	Lo min	Lo max.+stroke	Weight gr.
267	50	296	40	320	40	60	M20	83	117	1.300

Fork with pin

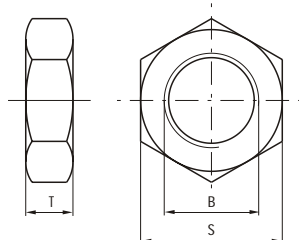


Ordering code

1302.250.13F

A	B(H6)	C	D	E	F(B12)	G(H9)	H	Weight gr.
188	M42X2	144	70	70	35	35	72	3.700

Rod lock nut



Ordering code

1302.250.18F

B	S	T	Weight gr.
M42x2	65	21	260

CYLINDRES

according to Standard ISO 15552 - VDMA 24562

Cylinders series 1319 ÷ 1321	3.0÷3.3
Cylinders, Non rotating series 1348 ÷ 1350	3.4÷3.7
Twin rod cylinders series 1325-1326 1345-1347	3.8÷3.11
Rotary actuators series 1330-1333	3.12÷3.15
Clean profile cylinders series 1380 ÷ 1382	3.16÷3.19
Accessories	3.20÷3.43
Sensor brackets	
Linear control units	
Piston rod lock	
Fixing devices	



General

This series of pneumatic cylinders is manufactured according to ISO 6431 standards adapted to VDMA 24562 and CNOMO/AFNOR 49003 that guarantee the interchangeability of the cylinders even without mounted anchoring.

It differs from the 1300 and 1303 series mainly due to the different pitch of the mounting holes on the end plates and of the barrel made of anodized and shaped aluminium; the tie rods have been eliminated for bores from 32 to 125 mm and the end covers are mounted directly on the barrel with special male/female screws, while for bore 160 and 200 mm it is still used the tie rods going through the barrel fixing holes.

The barrel is extruded on the inside to guarantee precision with low friction; oxydation hardens the sliding surface of the seals allowing work even without lubrication.

The magnetic piston can be mounted to activate the limit switch with Reed contact and all types of anchorings are available according to ISO-VDMA standards, that can be fixed to the end plates with socket head screws.

To order single acting cylinders (up to Ø 125, 50 mm maximum stroke), add to the code of the chosen cylinder abbreviation MA for the front spring and MP for the rear spring.

For example: **1320.32.50.01MA** **1320.50.25.01MP**

Construction characteristics

End plates	from Ø32 to Ø125: UNI 5079 aluminium alloy casting painted black by cataphoresis from Ø160 to Ø200: UNI 3051 aluminium chilled painted black by cataphoresis
Rod	chromed AISI 303 stainless steel or C43 chromed steel
Barrel	aluminium alloy, anodized 25 micron Ra = 0,3 ÷ 0,5
Cushion bushings	hardened aluminium
Rod-guide bushing	self-lubricating sintered bronze
Piston	vulcanized NBR 80 shore rubber monobloc on steel core with incorporated plastoferrite permanent magnet. NBR 80 shore rubber monobloc on without magnet for the non magnetic version plus rear spacer VITON® monobloc for high temperature, available on request for magnetic and non magnetic cylinder
Piston rod and cushion seals	self-lubricating 90 shore mixing polyurethane (VITON® on request for high temperature)
Other seals	rubber NBR 80 shore
Cushion adjustment screws	nickel-plated steel

Technical characteristics

Fluid	filtered and preferably lubricated air
Pressure	10 bar
Operating temperature	-5°C ÷ +70°C (VITON®, 150°C)
Bore	Ø 32 - 40 - 50 - 63 - 80 - 100 - 125 - 160 - 200
Cushioning length	mm 28 - 32 - 32 - 40 - 44 - 50 - 55 - 55 - 55

Attention: We recommend using dry air if the working temperature is lower than 0°C.

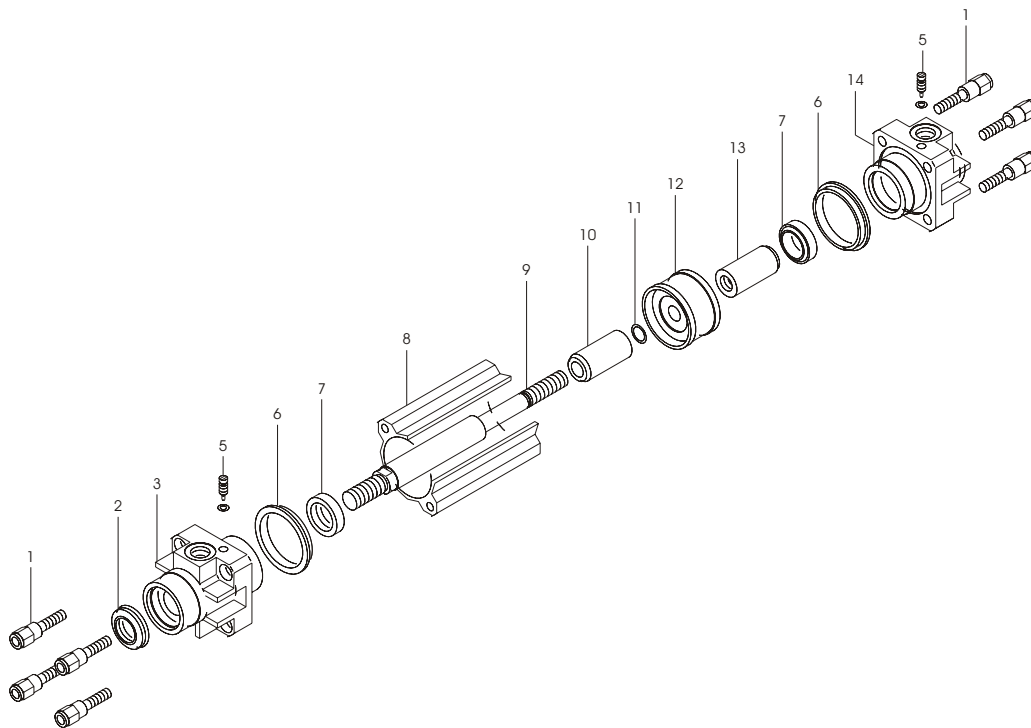
Standard strokes (for all diameters)

from 0 up to 150, every 25 mm
over 150 up to 500, every 50 mm
over 500 up to 1000, every 100 mm

Stroke tolerance (ISO 6431)

Bore	Stroke	Tolerance
32 - 40 - 50	up to 500	+2 0
	over 500 up to 1250	+3,2 0
63 - 80 - 100	up to 500	+2,5 0
	over 500 up to 1250	+4 0
125 - 160 - 200	up to 500	+4 0
	over 500 up to 1250	+5 0

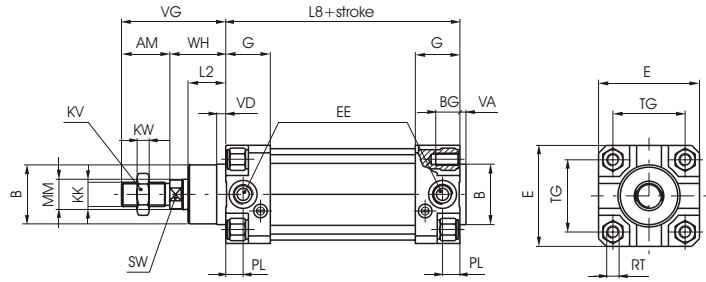
Drawing



Pos.	Description	N. Pieces
1	Tie nut	8
2	Rod seal	1
3	Front cover	1
5	Cushioning adjustment screw	2
6	Cover seal	2
7	Cushion seal	2
8	Barrel	1
9	Rod	1
10	Front bushing cushion	1
11	Front bushing cushion seal	1
12	Piston	1
13	Rear bushing cushion	1
14	Rear cover	1



Basic version

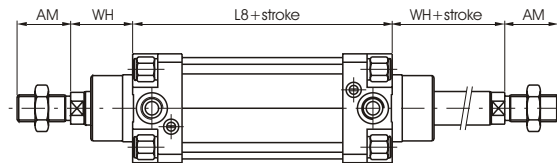


This is the configuration that represents the basic cylinder according to ISO-VDMA standards. It can be directly anchored on machine parts using the four thread on the end cover. For other applications see the following pages where different types of attachments are shown.

Ordering code

- 1319.Ø.stroke.01** magnetic chromed rod
- 1320.Ø.stroke.01** magnetic stainless steel chromed rod
- 1321.Ø.stroke.01** non magnetic chromed rod
- 13- -Ø.stroke.01V** non magnetic VITON® seals

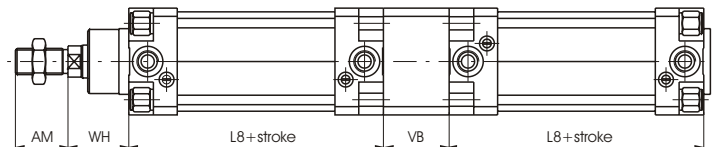
Push/Pull version



Ordering code

- 1319.Ø.stroke.02** magnetic chromed rod
- 1320.Ø.stroke.02** magnetic stainless steel chromed rod
- 1321.Ø.stroke.02** non magnetic chromed rod
- 13- -Ø.stroke.02V** non magnetic VITON® seals

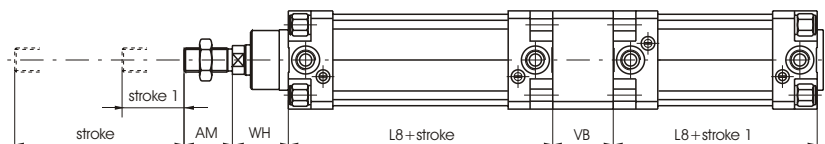
Tandem push with a common rod



Ordering code

- 1319.Ø.stroke.G** magnetic chromed rod
- 1320.Ø.stroke.G** magnetic stainless steel chromed rod
- 1321.Ø.stroke.G** non magnetic stainless steel chromed rod

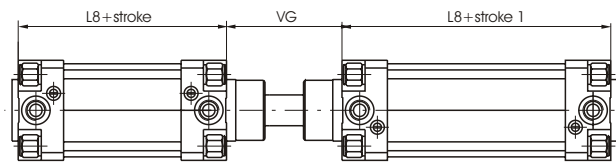
Tandem push with independent rods



Ordering code

- 1319.Ø.stroke.F** magnetic chromed rod
- 1320.Ø.stroke.F** magnetic stainless steel chromed rod
- 1321.Ø.stroke.F** non magnetic stainless steel chromed rod

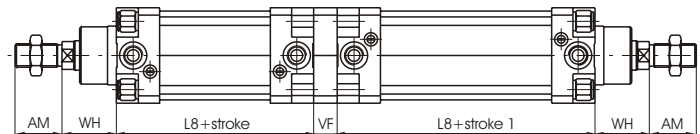
Opposed tandem with common rods



Ordering code

1319.Ø.stroke.stroke1.D magnetic chromed rod
1320.Ø.stroke.stroke1.D magnetic stainless steel chromed rod
1321.Ø.stroke.stroke1.D non magnetic stainless steel chromed rod

Tandem with opposed rods



Ordering code

1319.Ø.stroke.stroke1.E magnetic chromed rod
1320.Ø.stroke.stroke1.E magnetic stainless steel chromed rod
1321.Ø.stroke.stroke1.E non magnetic stainless steel chromed rod

Table of dimensions

Bore	32	40	50	63	80	100	125	160	200	
AM	22	24	32	32	40	40	54	72	72	
B (e 11)	30	35	40	45	45	55	60	65	75	
BG	12	12	16	16	20	20	20	24	24	
E	46	52	65	75	95	115	140	180	220	
EE	G 1/8"	G 1/4"	G 1/4"	G 3/8"	G 3/8"	G 1/2"	G 1/2"	G 3/4"	G 3/4"	
G	25	29	29,5	36	36	40	45	49	49	
KK	M10X1,25	M12X1,25	M16x1,5	M16x1,5	M20x1,5	M20x1,5	M27x2	M36x2	M36x2	
KV	17	19	24	24	30	30	41	55	55	
KW	6	7	8	8	9	9	12	18	18	
L 2	16	20	25	25	32	35	45	50	60	
L 8	94	105	106	121	128	138	160	180	180	
MM	12	16	20	20	25	25	32	40	40	
PL	9	11,5	13	14	16	18	19	24	24	
RT	M6	M6	M8	M8	M10	M10	M12	M16	M16	
SW	10	13	17	17	22	22	27	32	32	
TG	32,5	38	46,5	56,5	72	89	110	140	175	
VA	4	4	4	4	4	4	6	5	5	
VB	25	30	40	40	50	50	75	70	75	
VD	5	6	6	6	8	8	10	10	10	
VF	12	12	16	16	20	20	25	30	30	
VG	48	54	69	69	86	91	119	152	167	
WH	26	30	37	37	46	51	65	80	95	
Weight gr.	Stroke 0	480	730	1150	1600	2800	3600	7800	15000	21500
	every 10 mm	25	32	56	60	90	100	140	265	325



General

Derived from 1320 series ISO 15552 the twin rod cylinders are suitable for applications that require the non rotation of the piston rod and resistance of flexion. This is done mounting the cylinder with the rod parallel to the radial load action.

The technical characteristics are similar to 1320 series of which many components are interchangeable.

The accuracy of the mechanical processing of the front cover, piston and flange allow a particularly soft movement and efficient cushioning. For long stroke it is possible to obtain a better guided and precise movements by using cylinders with front head longer then 25 mm.

The steel front flange can be directly fixed to the load and can be fitted with a threaded nipple to conform to ISO standard 6431.

The mounting brackets for the front cover derive from 1320 series with some modifications, while all other mountings remain the same.

Construction characteristics

Front cover	anodized aluminium
Rear cover	UNI 5079 aluminium alloy casting
Rod	C43 chromed steel AISI 303 stainless steel chromed
Barrel	Ra = 0,3-0,5 anodized aluminium
Cushion bushings	hard aluminium
Piston	vulcanized NBR 80 shore rubber block on steel core with incorporated permanent magnet; NBR 80 shore rubber block without magnet plus rear spacer (for non-magnetic version)
Flange	zinc plated steel
Rod seal	self-lubricating 90 shore hardness polyurethane
Other seals	NBR 80 shore rubber
Cushioning adjustment screws	nickel-plated steel

Technical characteristics

Fluid	filtered and lubricated air
Max pressure	10 bar
Working temperature	-5°C ÷ +70°C

Attention: We recommend using dry air if the working temperature is lower than 0°C.

Cushioning lengths

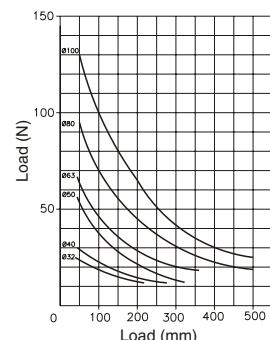
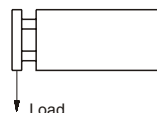
Bore	Ø	32	40	50	63	80	100
Front lenght	mm	22	22	24	32	32	32
Rear lenght	mm	28	32	32	40	44	50

Standard strokes

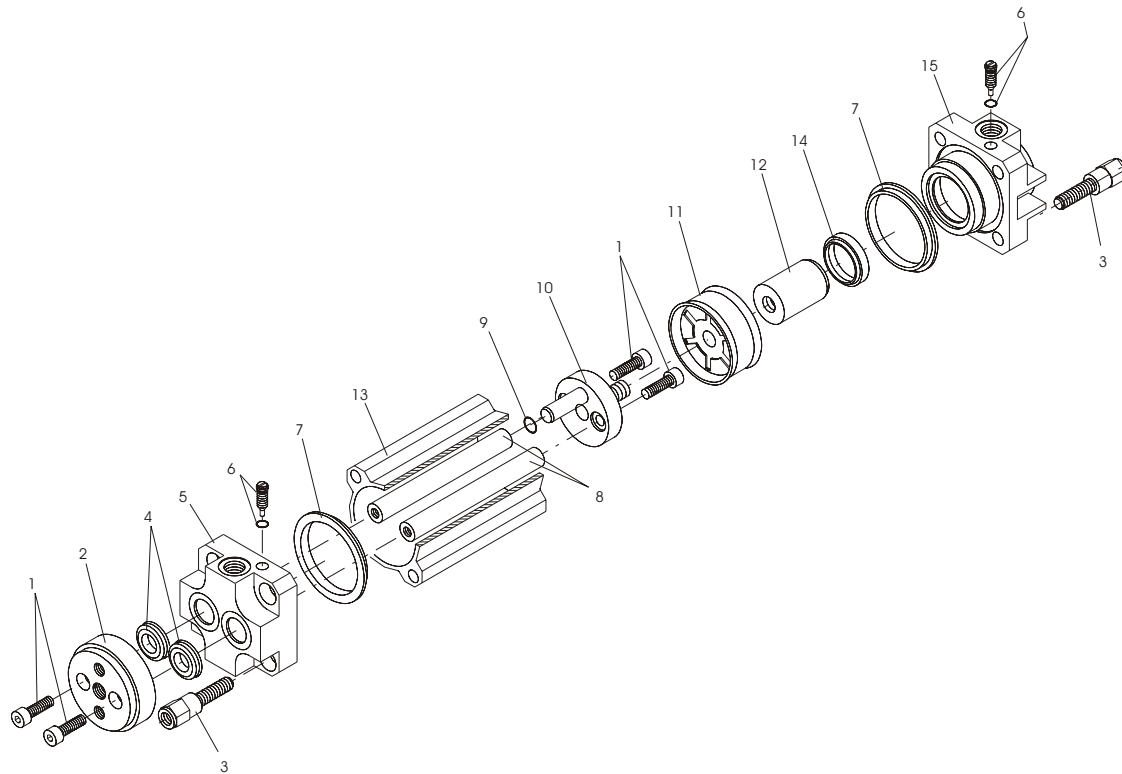
- Ø 32 25 - 50 - 75 - 100 - 150 - 200 mm
- Ø 40 25 - 50 - 75 - 100 - 150 - 200 - 250 mm
- Ø 50 25 - 50 - 75 - 100 - 150 - 200 - 250 - 300 mm
- Ø 63 25 - 50 - 75 - 100 - 150 - 200 - 250 - 300 - 350 mm
- Ø 80 25 - 50 - 75 - 100 - 150 - 200 - 250 - 300 - 350 - 400 - 500 mm
- Ø 100 25 - 50 - 75 - 100 - 150 - 200 - 250 - 300 - 350 - 400 - 500 mm

Stroke tolerance (ISO 6431)

Bore	Stroke	Tolerance
32 - 40 - 50	Up to 500 mm	+2
63 - 80 - 100		0



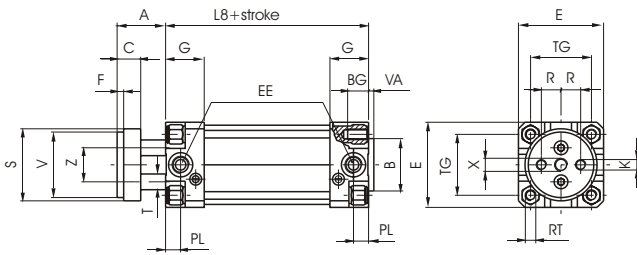
Drawing



Pos.	Description	N. Pieces
1	Screw	4
2	Flange	1
3	Tie nut	8
4	Rod seal	2
5	Front cover	1
6	Front cushioning adjustment screw	1
7	Cover seal	2
8	Rods	2
9	Front cushion seal	1
10	Front cushion bearing	1
11	Piston	1
12	Rear cushion bearing	1
13	Barrel	1
14	Rear cushion seal	1
15	Rear cover	1



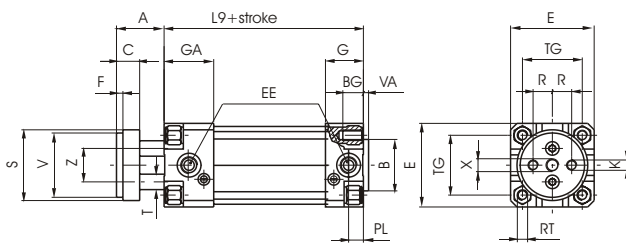
Basic version



Ordering code	
1325.Ø.stroke.01	magnetic
1326.Ø.stroke.01	non magnetic
1325.Ø.stroke.01X	magnetic chromed stainless steel
1326.Ø.stroke.01X	non magnetic chromed stainless steel

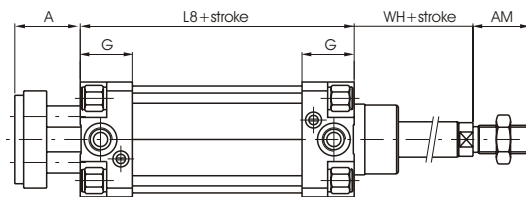
Bore	32	40	50	63	80	100	
A	26	30	37	37	46	51	
AM	22	24	32	32	40	40	
B	30	35	40	45	45	55	
BG	12	12	16	16	20	20	
C	15	15	18	22	22	22	
E	46	52	65	75	95	115	
EE	G 1/8"	G 1/4"	G 1/4"	G 3/8"	G 3/8"	G 1/2"	
F	4	4	5	5	5	5	
G	25	29	29,5	36	36	40	
GA	50	54	54,5	61	61	65	
K	M6	M8	M8	M10	M12	M12	
L 8	94	105	106	121	128	138	
L 9	119	130	131	146	153	163	
PL	9	11,5	11,5	14	14	16	
R	9,5	11,25	15	19	25	35	
RT	M6	M6	M8	M8	M10	M10	
S	35	45	55	70	85	105	
T	8	10	12	16	20	20	
TG	32,5	38	46,5	56,5	72	89	
V	32	40	50	63	80	100	
VA	4	4	4	4	4	4	
Z	18	22	26	35	40	50	
WH	26	30	37	37	46	51	
X	M8	M10	M10	M12	M14	M14	
Weight gr.	Stroke 0	560	810	1380	2300	3680	5740
		650	950	1500	2500	4100	6300
Every 10 mm.		20	26	30	40	80	90

Extended front cover



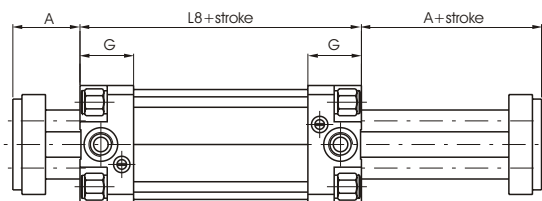
Ordering code	
1345.Ø.stroke.01	magnetic
1347.Ø.stroke.01	non magnetic
1345.Ø.stroke.01X	magnetic chromed stainless steel
1347.Ø.stroke.01X	non magnetic chromed stainless steel

Push-pull rod version with ISO standard



Ordering code		Ordering code	
1325.Ø.stroke.02	magnetic	1325.Ø.stroke.02X	magnetic chromed stainless steel
1326.Ø.stroke.02	non magnetic	1326.Ø.stroke.02X	non magnetic chromed stainless steel

Twin rod push-pull version



Ordering code		Ordering code	
1325.Ø.stroke.06	magnetic	1325.Ø.stroke.06X	magnetic chromed stainless steel
1326.Ø.stroke.06	non magnetic	1326.Ø.stroke.06X	non magnetic chromed stainless steel



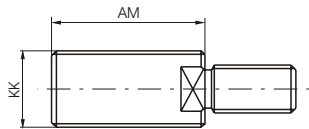
Magnetic sensors

The magnetic sensors used with this series of cylinders are the same as the 1320 series.

Accessories

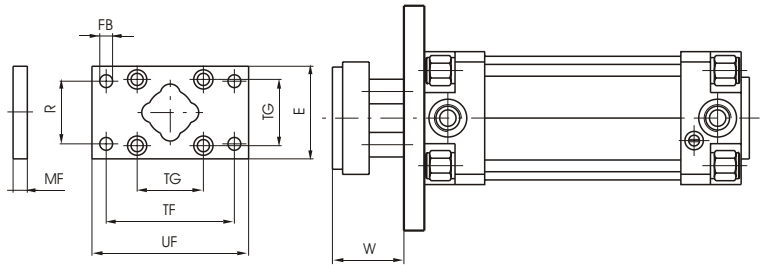
All of the attachments of the 1320 series can be mounted, with the exclusion of the front flange and the foot mounting bracket that, although they are part of the same series, need a small adjustment in the exit zone of the rods. For these there is a different code and the dimensions are indicated below.

Threaded Nipple



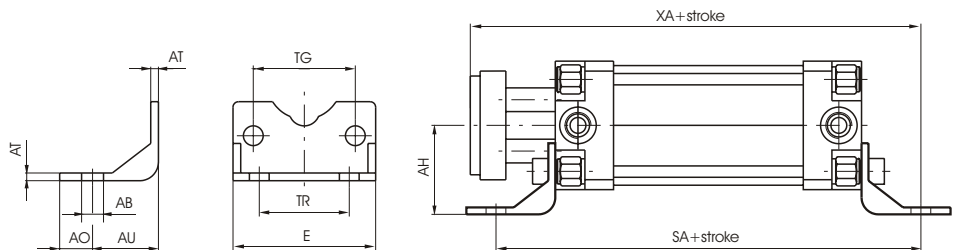
Bore	32	40	50	63	80	100
AM	22	24	32	32	40	40
KK	M10x1,25	M12x1,25	M16x1,5	M16x1,5	M20x1,5	M20x1,5
Weight gr	17	27	63	65	110	110
Ordering code				1325.Ø.17F		

Front flange



Bore	32	40	50	63	80	100
E	45	52	65	75	95	115
FB (H 13)	7	9	9	9	12	14
MF (JS 14)	10	10	12	12	16	16
R (JS 14)	32	36	45	50	63	75
TF (JS 14)	64	72	90	100	126	150
TG	32,5	38	46,5	56,5	72	89
UF	80	90	110	120	150	170
W	16	20	25	25	30	35
Ordering code				1325.Ø.03F		
Weight gr	160	250	480	620	1430	3500

Front foot mounting bracket (short)



Bore	32	40	50	63	80	100
AB (H 14)	7	9	9	9	12	14
AH (JS 15)	32	36	45	50	63	71
AO (±0,2)	11	8	13	13	14	15
AT	3,5	3,5	3,5	4,5	5	5
AU	24	28	32	32	41	41
E	45	52	65	75	95	115
SA	142	161	170	185	210	220
TG	32,5	38	46,5	56,5	72	89
TR (JS 14)	32	36	45	50	63	75
XA	144	163	175	190	215	230
Ordering code				1325.Ø.05/1F (1 piece)		
Weight gr	50	70	120	180	320	400

**General**

These rotary actuators transform the linear motion of a piston into the rotary motion of a shaft. The uses in automation are varying and always convenient compares with other solutions.

Considering the bores from Ø 32 to Ø 100 and the wide range of rotary motions (from 1 degree to 360 degrees) it is possible to solve any problems one might have.

As seen from the enlarged diagram, the mechanism is formed by a rack anchored to a piston which transmits the movement to the grooved pinion with torque in proportion to the sections of the cylinders and dimensions of the pinion. Sphere shaped cushions for the pinion and sliding shoe for the cog guarantee a precise and reliable movement over a long period of time.

The box containing the movement is waterproof, protecting the pinion and cog against oxydation. To attach the rotating cylinders threaded holes are provided on the central part for the flange and foot mounts from series 1320 can be used. In the magnetic piston version sensors (from series 1320) can be mounted to reveal the position of the angular movement.

Upon request, rotation angle adjustment registers can be mounted for easier tuning (± 10 degrees). The cylinders are cushioned according to the series. For the cylinders without adjustment registers one has to bear in mind that the rotation angle is never perfect and the tolerance is around +1 degree. Also, it must be taken into account that even a minimum play between rack and pinion does not guarantee the repetition of the rotation limit switch.

Construction characteristics

Cover plates	UNI 5079 aluminium alloy casting
Central body	oxidized aluminium
Pinion	18 NiCrMo4 cemented and tempered
Rack	C43
Barrel	anodized aluminium RA = 0,3-0,5
Sliding shoe	acetal resin
Cushion bushings	hardened aluminium
Piston	vulcanized NBR 80 shore rubber block on steel core with incorporated permanent magnet NBR 80 shore rubber block without magnet polus rear spacer (for non-magnetic version)
Seals	NBR 80 shore rubber
Cushion adjustment screws	nickel plated steel
Rotating angle adjustment assy	nickel plated brass

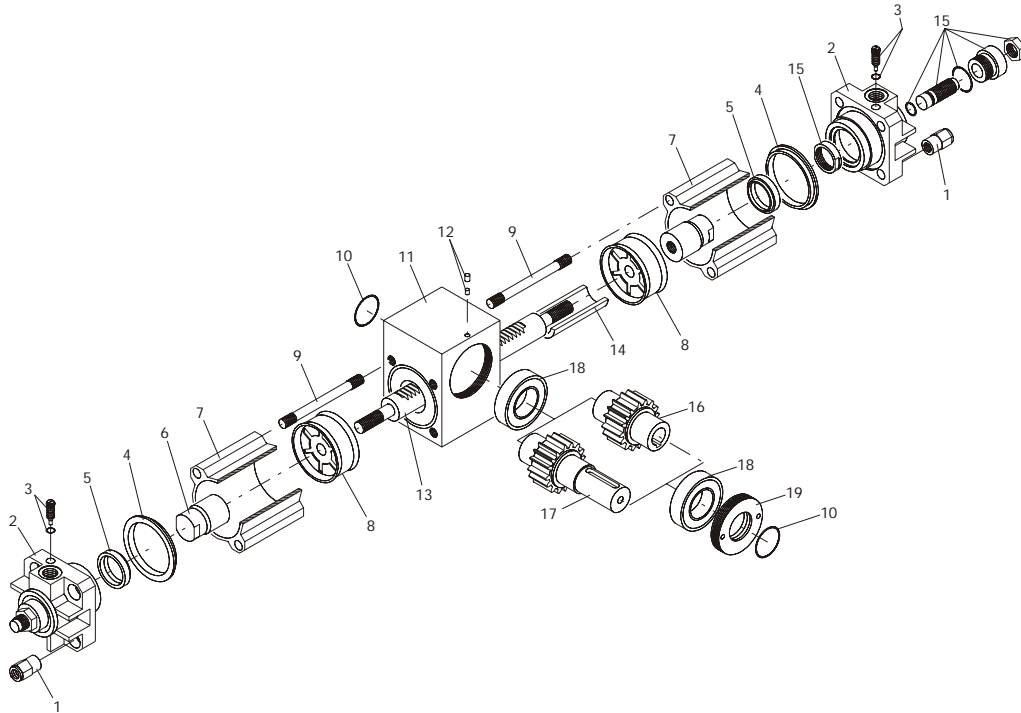
Technical characteristics

Fluid	filterd and preferably lubricated air
Max pressure	10 bar
Working temperature	-5°C ÷ +70°C
Standard rotation	90° - 180° - 270° - 360°
Rotating angle adjustment	$\pm 10^\circ$

Attention: We recommend using dry air if the working temperature is lower than 0°C.

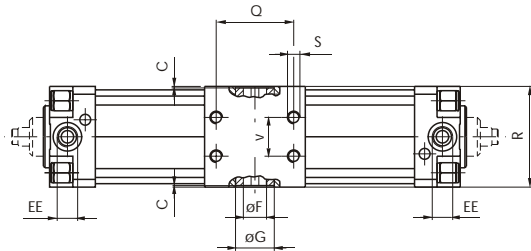
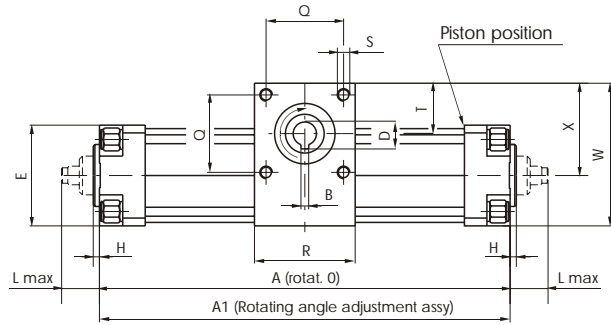
Bore	32	40	50	63	80	100
Torque moments Nm/bar	0,9	1,7	2,9	5,55	13,2	23,8
Axis load max. kg.	8	10	10	12	18	22
Cushioning angle	60°	60°	50°	50°	40°	40°

Drawing



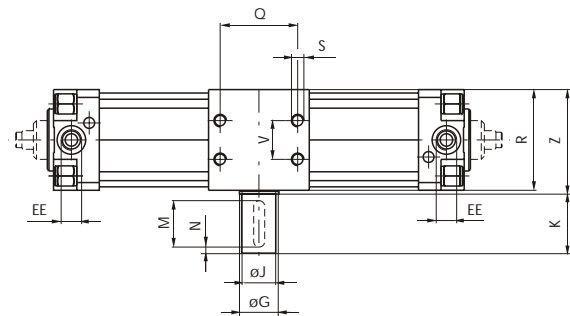
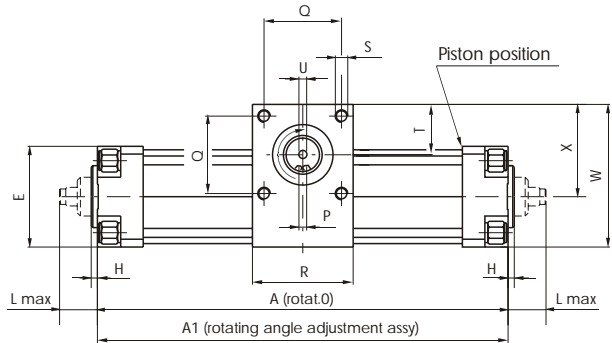
Pos.	Description	N. Pieces
1	Tie rod nut	8
2	End cover	2
3	Cushioning adjustment screw	2
4	Seal cover	2
5	Cushion seal	2
6	Cushion bearing	2
7	Barrel	2
8	Piston	2
9	Tie rod	8
10	Seal	2
11	Body	1
12	Screw plug + Gasket	1
13	Rack	1
14	Sliding shoe	1
15	Adjustment angle	2
16	Female pinion	1
17	Male pinion	1
18	Ball bearing	2
19	Lock nut	1

Female pinion version



Ordering code
1330.Ø.*.01 magnetic
1331.Ø.*.01 non magnetic
1330.Ø.*.01R magnetic with rotating adjustment angle
1331.Ø.*.01R non magnetic with rotating adjustment angle
* = rotating angle

Male pinion version



Ordering code
1332.Ø.*.01 magnetic
1333.Ø.*.01 non magnetic
1332.Ø.*.01R magnetic with rotating adjustment angle
1333.Ø.*.01R non magnetic with rotating adjustment angle
* = rotating angle



Dimensions

Bore	32	40	50	63	80	100	
A rot. 0°	171	195	202	233	268	300	
A rot. 90°	218	252	265	308	378	427	
A rot. 180°	265	308	328	382	488	555	
A rot. 270°	312	364	390	457	598	682	
A rot. 360°	359	421	453	531	708	809	
A1 rot. 0°	174	198	206	237	274	307	
A1 rot. 90°	221	255	269	312	384	434	
A1 rot. 180°	268	311	332	386	494	562	
A1 rot. 270°	315	367	394	461	604	689	
A1 rot. 360°	362	424	457	535	714	816	
B	5	5	5	6	6	8	
C	1	1	1	1	1	1	
D	17,3	17,3	17,3	20,8	22,8	28,3	
E	46	52	65	75	95	115	
Ø F (H 7)	15	15	15	18	20	25	
Ø G	25	25	25	30	40	55	
H	4	4	4	4	4	4	
Ø J (h 7)	14	14	22	25	30	35	
K	30	30	40	40	50	50	
L max.	23	23	28,5	28,5	34,5	34,5	
M	25	25	35	35	45	45	
N	2,5	2,5	2,5	2,5	2,5	2,5	
P	5	5	6	8	8	10	
Q	33	40	50	60	80	80	
R	50	60	65	75	100	115	
S	M6	M6	M8	M8	M10	M10	
T	27,5	35	32,5	35,5	50	54,5	
U	M5	M5	M6	M8	M8	M10	
V	18	22	25	35	50	60	
W	71	85	92	105	141	162	
X	48	59	59,5	67,5	93,5	104,5	
Z	51	61	66	76	101	116	
EE	G 1/8"	G 1/4"	G 1/4"	G 3/8"	G 3/8"	G 1/2"	
Piston stroke every 10 °of rotation	2,61	3,14	3,49	4,14	6,11	7,07	
Female Pinion weight gr.	rot. 90°	1450	2020	3050	4850	10000	14900
	rot. 180°	1600	2240	3350	5350	11000	16350
	rot. 270°	1750	2460	3650	5850	12000	17800
	rot. 360°	1900	2680	3950	6350	13000	19250
Male Pinion weight gr.	rot. 90°	1550	2150	3280	5150	10500	15700
	rot. 180°	1700	2370	3580	5650	11500	17150
	rot. 270°	1850	2590	3880	6150	12500	18600
	rot. 360°	2000	2810	4180	6650	13500	20050

4

Magnetic sensors

Types and codes of the 1320 series.

Mounting

Types and codes of the 1320 series



General

It is sometimes required that the rod of a cylinder should not turn, in order to be able to keep the load or equipment connected to it in the required position.

We have therefore designed a cylinder that fulfils this purpose through its structural characteristics, namely, by using a barrel and piston with a square section. The rod is of course rigidly connected to the piston, offering good resistance and torsion, while the fit between piston and barrel is very tight. This ensures a rod position accuracy of a few seconds of a degree.

The material used, the accurate machining and careful assembly assure product suitability for exacting applications, replacing costly guide system.

The general characteristics are the same as those of the 1320 series cylinders, according to ISO 6431 standards. Thus, same accessories, mountings and magnetic sensors can be used.

In addition, the high-quality hard anodized aluminium barrel allows the cylinder to operate even without lubrication.

Construction characteristics

End plates	UNI 5079 aluminium alloy casting painted black by cataphoresis
Rods	C43 chromed steel Ra = 0,2
Barrel	UNI 9006/1 aluminium alloy square section, hardened 30 micron oxidate
Cushion bushings	2011 UNI 9002/5 hardened alloy aluminium
Piston	polyacetal resin, self-lubricated and anti-wear, with plastroferrite rings in magnetic version
Piston seals	80 shore nitril mixture, wear resistant
Rod and cushion seals	90 shore self-lubricating polyurethane mixture
Other seals	in rubber NBR 80 shore
Cushion adjustment screws	in nickel-plated steel

Technical characteristics

Fluid	filtered and preferably lubricated air
Pressure	10 bar
Operating temperature	-5°C + 70°C

Attention: We recommend using dry air if the working temperature is lower than 0°C.

Bore	Usable surface (square profile) cm ²	Max couple on the rod (max torque) Nm	Grade precision (rest rod, without load) anti-rotation	Cushion length mm.
32	8,31	0,5	12'	22
40	12,41	0,8	12'	27
50	18,41	1,1	12'	27
63	29,67	1,5	12'	32

Standard strokes (for all diameters)

from 0 to 150, every 25 mm

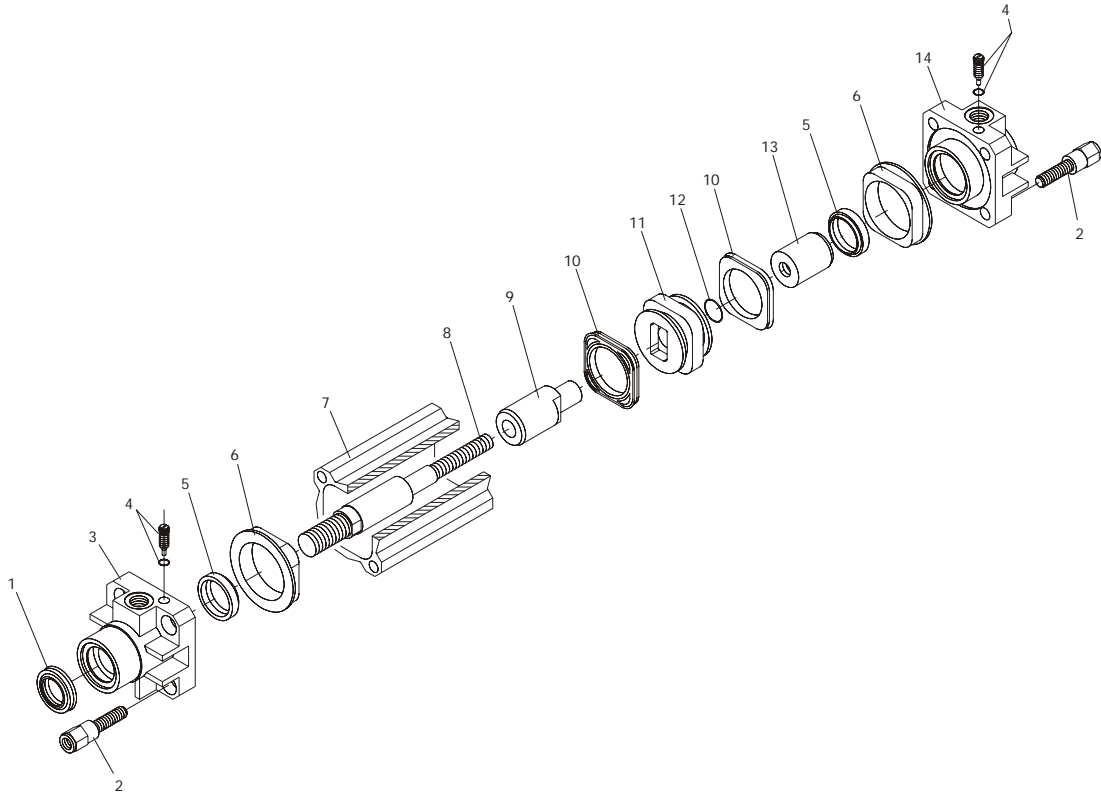
Other stroke for these following bores:

Ø 32 80 mm
Ø 40 80 - 160 mm
Ø 50 80 - 160 - 200 - 250 mm
Ø 63 80 - 160 - 200 - 300 - 320 mm

Stroke Tolerances (ISO 6431)

Bore	Stroke	Tolerance
32 - 40 - 50 - 63	fino a 500	+2 0

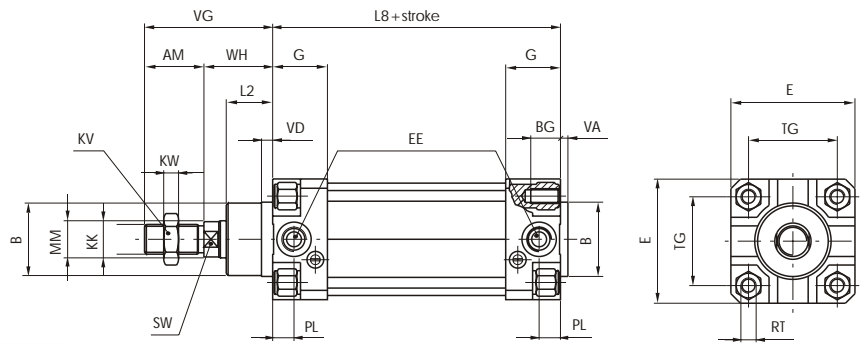
Drawing



Pos.	Description	N. Pieces
1	Rod seal	1
2	Tie rod nut	8
3	Front cover	1
4	Cushioning adjustment screw	2
5	Cushion seal	2
6	Cover seal	2
7	Barrel	1
8	Rod	1
9	Front bushing cushion	1
10	Piston seal	2
11	Piston	1
12	Bushing-Piston seal	1
13	Rear cushion bushing	1
14	Rear cover	1



Basic version

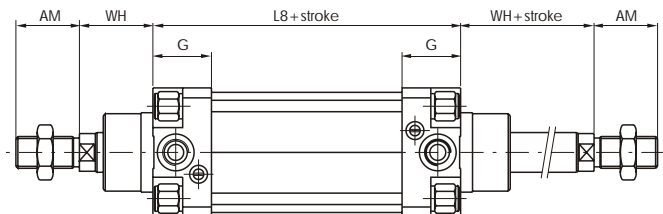


This is the configuration that represents the basic cylinder according to ISO-VDMA standards. It can be directly anchored on machine parts using the four threads on the end cover. For other applications see the following pages where different types of attachments shown.

Bore	32	40	50	63	
AM	22	24	32	32	
B (e 11)	30	35	40	45	
BG	12	12	16	16	
E	46	52	65	75	
EE	G 1/8"	G 1/4"	G 1/4"	G 3/8"	
G	25	29	29,5	36	
KK	M10x1,25	M12x1,25	M16x1,5	M16x1,5	
KV	17	19	24	24	
KW	6	7	8	8	
L 2	18,5	21	26,5	26,5	
L 8	94	105	106	121	
MM	12	16	20	20	
PL	9	11,5	11,5	14	
RT	M6	M6	M8	M8	
SW	10	13	17	17	
TG	32,5	38	46,5	56,5	
VA	4	4	4	4	
VD	5	6	6	6	
VG	48	54	69	69	
WH	26	30	37	37	
Weight gr.	stroke 0	505	705	1320	1710
	every 10 mm	24	33	53	58

Ordering code	
1348.Ø.stroke.01	magnetic chromed rod
1349.Ø.stroke.01	magnetic stainless steel chromed rod
1350.Ø.stroke.01	non-magnetic chromed rod

Push/pull version



Ordering code	
1348.Ø.stroke.02	magnetic chromed rod
1349.Ø.stroke.02	magnetic stainless steel chromed rod
1350.Ø.stroke.02	non-magnetic chromed rod



General

Our new clean profile cylinder is an updated version of the existing 1319-20-21 series, built in accordance with ISO15552 - VDMA24562 standards.

The name of this range gives an indication to it's most important characteristic. The square profile barrel with rounded edges, and "T" slots for sensors on three sides, is completely flat over it's entire length, such that the end covers have the same profile as the barrel.

To compliment this design, we also have a profiled rubber strip that, when cut to the correct length, covers the sensor slot, resulting in a completely closed, smooth finish cylinder.

We thereby have a clean square line design, eliminating the collection of dust, dirt, and grime; ideal where hygiene and ease of cleaning are important.

At first glance, you may overlook the innovative material from which the end covers are moulded. This highly resistant thermoplastic material is the real innovation of this cylinder.

The piston is made from two halves in acetal resin, which are designed to provide superior rod guidance with integral cushion bushes. The magnet is positioned between the semi-pistons, to comprise the complete piston assembly.

The nose and cushioning seals are produced in polyurethan permitting use either with or without lubrication.

The "T" slots on the cylinder sides can accommodate both the classic Pneumax 1500 series, and the miniature 1580 series sensors.

Cylinders can be mounted using the threaded holes in the end covers, or alternatively using the 1320 series of mounting brackets.

This range is the product of extensive research and material tests. All components, from end caps to seals are scrutinised to grant optimum performance.

The result is a range of cylinders with a really clean profile and an aesthetically pleasing, unique shape; ideally suited to applications requiring smoothness, precision and long life.

Construction characteristics

End plates	higt resistant thermoplastic material
Rod	AISI 303 chromed stainless steel or C43 chromed steel
Barrel	aluminium alloy anodised
Rod bushings	self-lubricating sintered bronze
Half-piston	polyacetal resin
Rod, piston and cushioning seals	polyurethan
Other seals	in rubber NBR
Cushion adjustment assy	in nickel plated steel

Technical characteristics

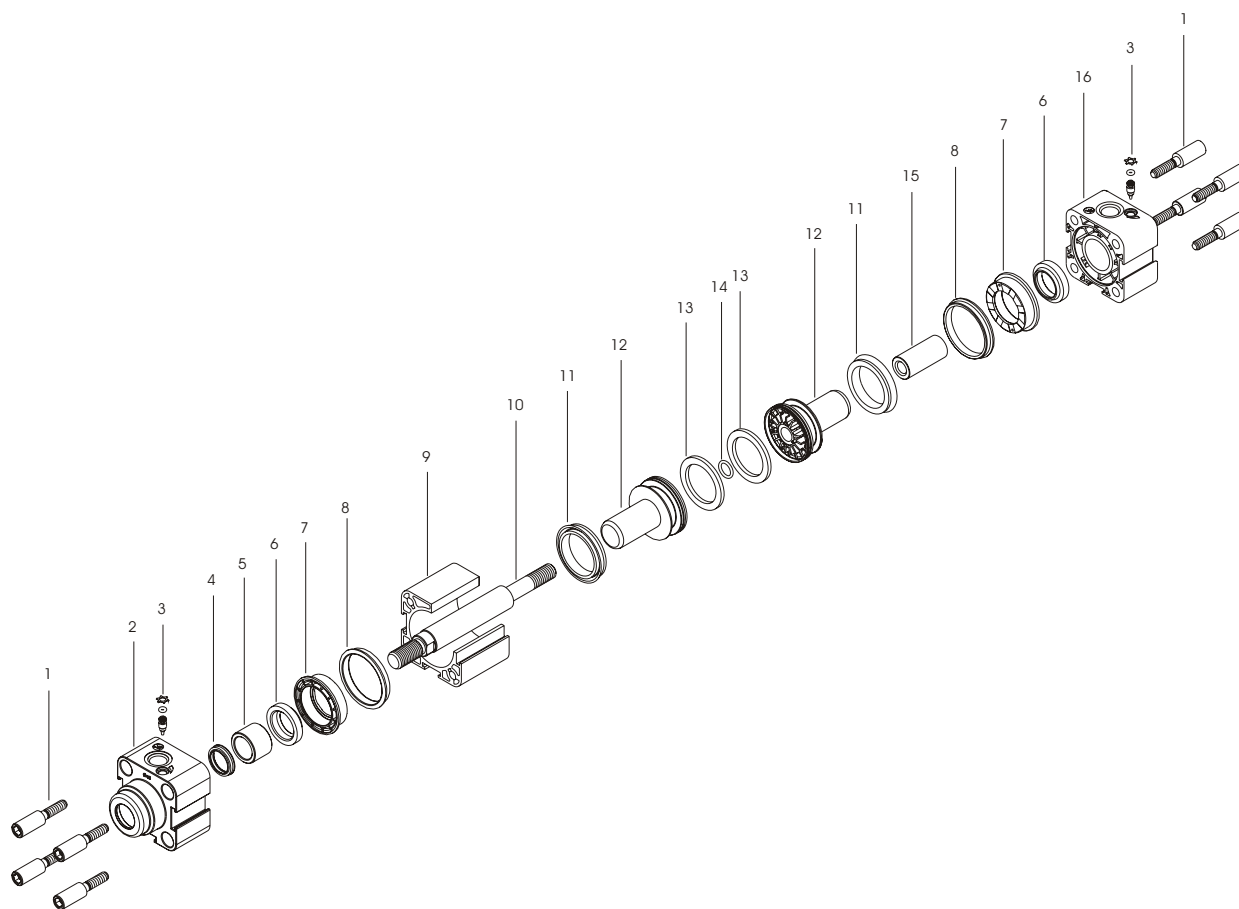
Fluid	filtered and lubricated air or non (when required lubrication must be continuative)
Max pressure	10 bar
Operating temperature	-5°C ÷ +70°C
Bore	Ø 32 - 40 - 50 - 63 - 80 - 100
Cushioning lengths	mm 27 - 31 - 31 - 37 - 40 - 44

Attention: We recommend using dry air if the working temperature is lower than 0°C.

Stroke tolerance (ISO 6431)

Standard strokes (for all bores)	Bore	Stroke	Tolerance
from 0 to 150, every 25 mm	32 - 40 - 50	up to 500	+2 0
		over 500 up to 1000	+3.2 0
from 150 to 500, every 50 mm	63 - 80 - 100	up to 500	+2.5 0
		over 500 up to 1000	+4 0
from 500 to 1000, every 100 mm			

Drawing



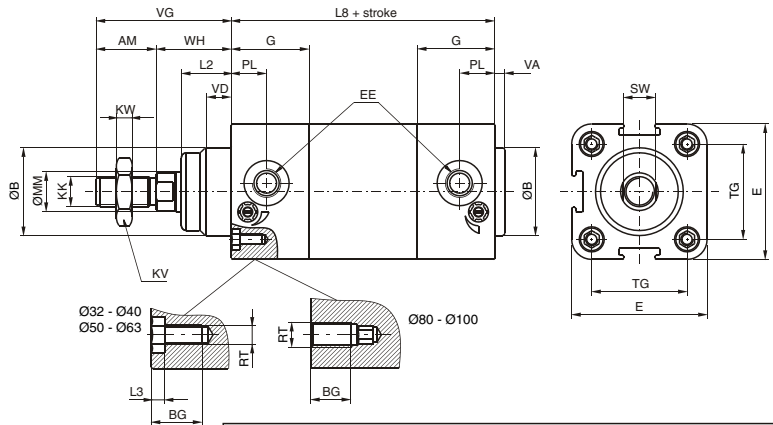
3

Pos.	Description	N. Pieces
1	Tie rod nut	8
2	Front end cover	1
3	Cushion adjustment pin	2
4	Rod seal	1
5	Rod-guide bushing	1
6	Cushion seal	2
7	Cushion seal cup	2
8	Cover seal	2
9	Barrel	1
10	Rod	1
11	Piston seal	2
12	Half piston	2
13	Magnet	*
14	Seal	1
15	Piston rod nut	1
16	Rear end cover	1

* N. 1 for $\varnothing 32$, n. 2 for other bores



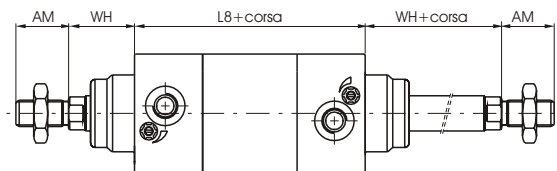
Basic version "01"



This is the configuration representing the basic cylinder according to ISO-VDMA standards. It can be directly anchored on machine parts using the 4 threads on the end cover screws. For other applications see the following pages where different types of attachments are shown.

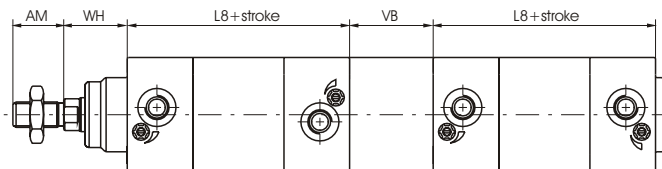
Ordering code
1380.Ø.stroke.01 Magnetic chromed rod
1381.Ø.stroke.01 Magnetic chromed stainless steel rod
1382.Ø.stroke.01 Non magnetic

Push/pull version "02"



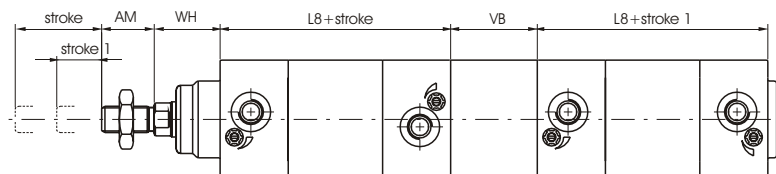
Ordering code
1380.Ø.stroke.02 Magnetic chromed rod
1381.Ø.stroke.02 Magnetic chromed stainless steel rod
1382.Ø.stroke.02 Non magnetic

Tandem push with common rod - "G"



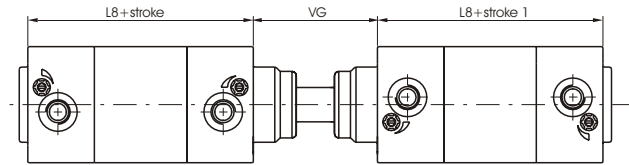
Ordering code
1380.Ø.stroke.G Magnetic chromed rod
1381.Ø.stroke.G Magnetic chromed stainless steel rod
1382.Ø.stroke.G Non magnetic

Tandem push with independent rods - "F"



Ordering code
1380.Ø.stroke.stroke1.F Magnetic chromed rod
1381.Ø.stroke.stroke1.F Magnetic chromed stainless steel rod
1382.Ø.stroke.stroke1.F Non magnetic

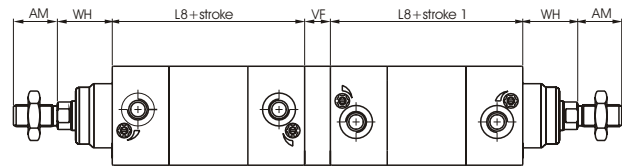
Opposed tandem with common rods - "D"



Ordering code

1380.Ø.stroke.stroke1.D Magnetic chromed rod
1381.Ø.stroke.stroke1.D Magnetic chromed stainless steel rod
1382.Ø.stroke.stroke1.D Non magnetic

Tandem with opposed rods - "E"



Ordering code

1380.Ø.stroke.stroke1.E Magnetic chromed rod
1381.Ø.stroke.stroke1.E Magnetic chromed stainless steel rod
1382.Ø.stroke.stroke1.E Non magnetic

Ribbon for slot hold sensor



Ordering code

1380.02F (code for 1m of product)

Table of dimensions

Bore	32	40	50	63	80	100	
AM	22	24	32	32	40	40	
B (d 11)	30	35	40	45	45	55	
BG	16	16	18	18	16	16	
E	46	54	65	77,5	95,5	115,5	
EE	G 1/8"	G 1/4"	G 1/4"	G 3/8"	G 3/8"	G 1/2"	
G	29	31	33	36	40	44	
KK	M10X1,25	M12X1,25	M16x1,5	M16x1,5	M20x1,5	M20x1,5	
KV	17	19	24	24	30	30	
KW	6	7	8	8	9	9	
L2	16	20	25	25	32	35	
L3	4	4	5	5	/	/	
L8	94	105	106	121	128	138	
MM	12	16	20	20	25	25	
PL	13	14	14	16	16	18	
RT	M6	M6	M8	M8	M10	M10	
SW	10	13	17	17	22	22	
TG	32,5	38	46,5	56,5	72	89	
VA	4	4	4	4	4	4	
VB	33	41	51	51	65	71	
VD	8	10	12	12	15	16	
VF	12	12	16	16	20	20	
VG	48	54	69	69	86	91	
WH	26	30	37	37	46	51	
Weight gr.	stroke 0	480	590	1020	1320	2100	3000
	every 10 mm	33	41	58	67	99	110

HYDRAULIC SPEED CONTROL CHECK CYLINDERS Series 1400



General

The hydraulic speed control check normally couples with a pneumatic cylinder to provide uniform speed control. It is well known that a pneumatic cylinder by its nature cannot assure a constant speed during a cycle or a consistent repetition of speed during successive cycles. In the hydraulic speed control check takes advantage of the incompressibility of oil which, going from the front chamber to the rear one (or viceversa) through a flow regulator, absorbs and neutralizes the speed variation of the air cylinder. Such variations are proportional to the applicable loading. For example in the case of a cylinder that moves a milling mandril on a wooden board, the speed in the initial phase (at almost zero load) would be very high and consequently have a violent impact on the piece of wood. The successive phase would be slower and inconsistent, resulting in sloppy work. The hydraulic speed control check cylinder permits to separate the different phases of the working process by approaching speed working phases to slow ones and eventually accelerated phases (with by pass valves called skip valves. It can be equipped with stopvalves which allow the blockage of the element to which it is connected. The skip and stop valves are actually 2 way poppet valves pneumatically actuated. Both are normally open and therefore must be activated in order to have the skip excluded and the stop inserted. The skip valve has a supplementary regulator for maximum speed control. The rods of all regulators have female 10x1,5 threaded for anchoring. To mount the speed regulator to the cylinder or to the machine it is possible to use the mountings of the 1303 cylinder series which have a 1-5/8" diameter bore. All speed control regulators have a supplemental reserve tank that compensates for the difference in volume between the two chambers due to the presence of the rod in the rear chamber. This supplementary tank compensates for any fluid leakage, even if small, that might occur between the rod and its seal. This reserve tank contains a spring loaded piston which assures a slight over-pressure of the system. A level indicator is included.

The following types of speed regulation are available:

Codes:

- | | |
|---|--|
| 1400.stroke.01.1 and 01.2 extraction regulation | 1400.stroke.02.04 compression regulation + skip |
| 1400.stroke.02.2 compression regulation | 1400.stroke.02.05 compression regulation + stop |
| 1400.stroke.03.2 double regulation (extr. and compr.) | 1400.stroke.02.06 compres. regul. + skip |
| 1400.stroke.01.04 extraction regulation + skip | 1400.stroke.03.04 double regulation + skip+ stop |
| 1400.stroke.01.05 extraction regulation + stop | 1400.stroke.03.05 double regulation + stop |
| 1400.stroke.01.06 extraction regulation + skip + stop | 1400.stroke.03.06 double regulation + skip + stop |

Construction characteristics

Covers	black anodized aluminium
Barrels	cold-drawn steel
Rod	C43 chromed steel
Tie rods	plated zinc steel
Piston	aluminium
Waterproof seals	NBR rubber
Piston seal	Viton
Rod seal	polyurethane
Regulators group	brass
Skip and stop valves	black anodized aluminium
Circuit oil	hydraulic with viscosity 2,9° E at 50°C (viscosity index minimum 118)
Bore	40 mm diameter

Technical characteristics

Max connecting load	600 kg.
Min. and max. speed	60 ÷ 10000 mm/min.
Working temperature	-5°C ÷ +70°C
Minimum pressure for the actuation of skip and stop valves	4 bar

Standard strokes

50 - 100 - 150 - 200 - 250 - 300 - 350 - 400 - 450 - 500 mm
 minimum stroke for type 1400.stroke.03.05. e 1400.stroke.03.06, 150 mm.

Important: For heavier load we have available the hydraulic speed control check cylinders of 63 mm diameter suitable to stand load up to 1200 kg. For more information please contact our technical department.



Variant of rod Ø 10 mm.

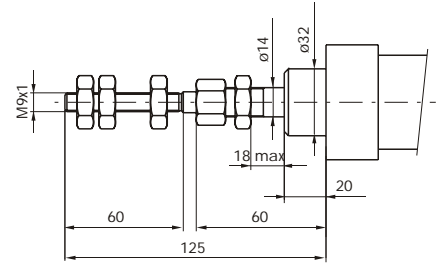
All types of speed regulators can be ordered with a 10 mm. rod and with a 14 mm. guide bushing (as indicated in drawing).

In this case the ordering code changes from 1400 -- to 1401 -- example:

1400.200.01.2 (rod Ø 18)

1401.200.01.2 (rod Ø 10)

The threaded protruding bushing is equipped with a lock nut allowing to anchor a flanged regulator with a Ø 14 mm hole.



Maintenance

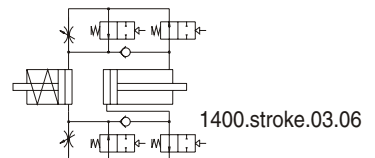
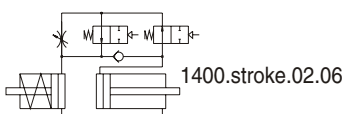
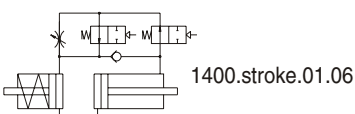
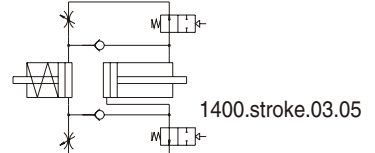
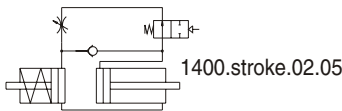
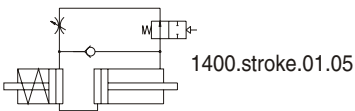
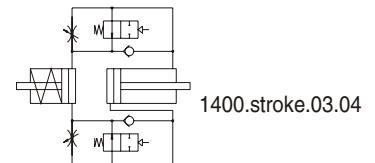
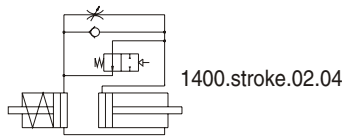
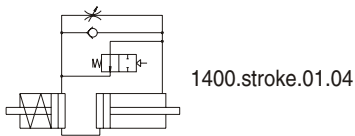
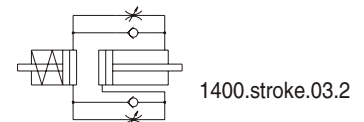
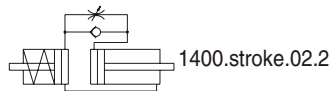
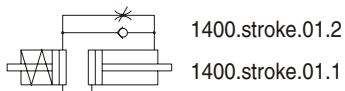
The speed control check is a closed system and there are no external factors that can adversely affect its function. Care however, has to be exercised not to allow the hydraulic fluid level to drop below the minimum indicated on the auxiliary tank. Should this occur, cavitation, or worse, an air pocket would result causing erratic control. Additional fluid should be put in exclusively through a unidirectional valve by means of an appropriate syringe (such as our code number 1400.99.01). Excess fluid will be expelled through a vent into an appropriate container. It is necessary to completely disassemble the regulator and be sure to bleed the system to eliminate air pockets. We suggest that you create a vacuum before beginning to refill. This can be done with a small unidirectional valve turned up and repeatedly loaded with a syringe. The rod must be manually actuated successively releasing air through the valve using a small and pointed instrument.

Functional schematics

Extraction

Compression

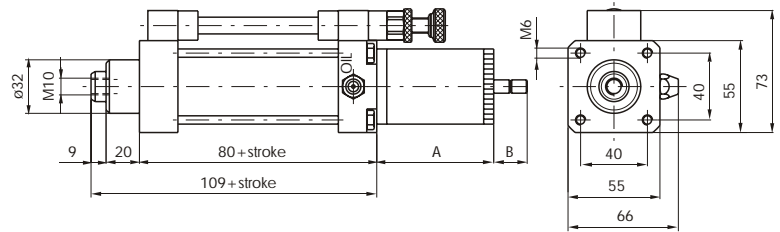
Double regulation



Extraction control: it happens when the pneumatic cylinder (connected to speed control) is moving out speed control piston rod

Compression control: it happens when the pneumatic cylinder (connected to speed control) is moving in speed control piston rod

Extraction regulation- tank in line

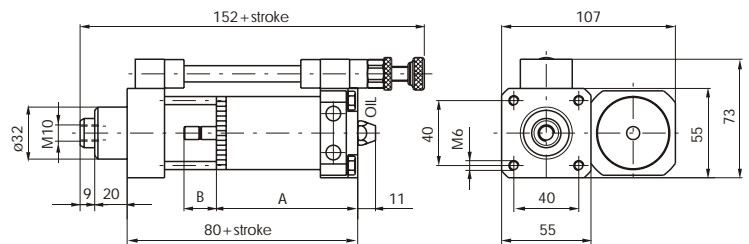


Weight gr.1450 + gr. 300 every 50 mm. stroke

Strokes	A	B max.
< 75	78	30
75 ÷ < 150	102	45
150 ÷ < 250	127	60
250 ÷ < 350	187	90
350 ÷ < 500	202	120

Ordering code	
1400.stroke.01.1	

Extraction regulation - lateral tank

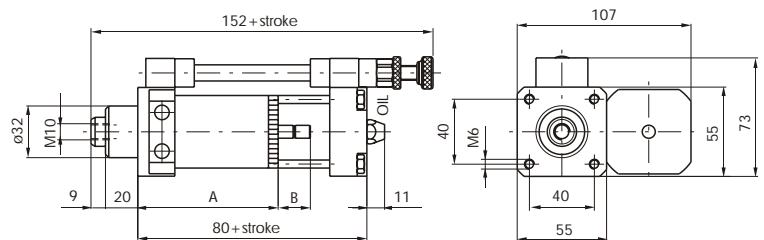


Weight gr. 1530 + gr. 300 every 50 mm. stroke

Strokes	A	B max.
< 75	93	30
75 ÷ < 150	118	45
150 ÷ < 250	143	60
250 ÷ < 350	183	90
350 ÷ < 500	218	120

Ordering code	
1400.stroke.01.2	

Compression regulation



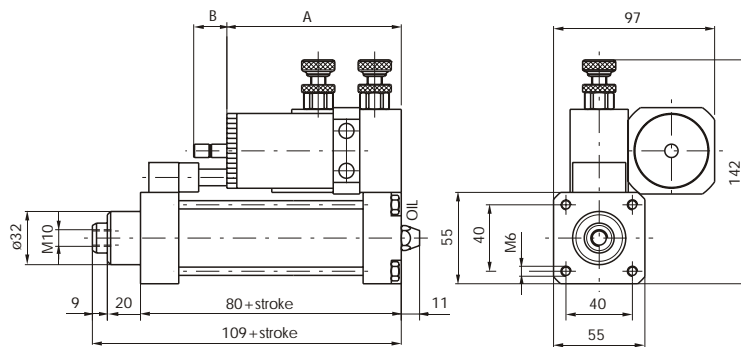
Weight gr. 1530 + gr. 300 every 50 mm. stroke

Strokes	A	B max.
< 75	93	30
75 ÷ < 150	118	45
150 ÷ < 250	143	60
250 ÷ < 350	183	90
350 ÷ < 500	218	120

Ordering code	
1400.stroke.02.2	



Double regulation
(extraction and compression)



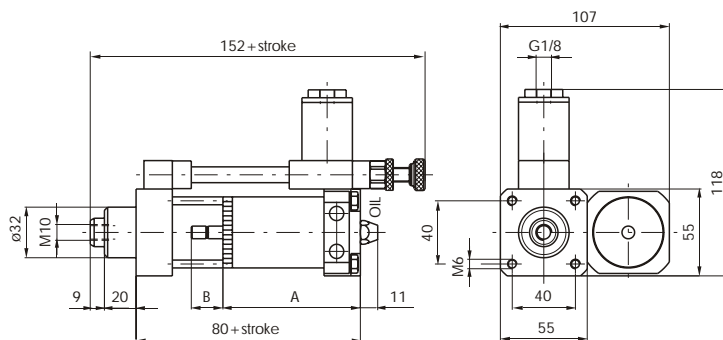
Attenzione: per accoppiamenti in linea o parallelo con cilindri ø80 e ø100 serie 1319-1320-1321, corsa minima 150mm.

Weight gr. 1870 + gr. 300 every 50 mm. stroke

Strokes	A	B max.
< 75	110	30
75 ÷ < 150	135	45
150 ÷ < 250	160	60
250 ÷ < 350	200	90
350 ÷ < 500	235	120

Ordering code
1400.stroke.03.2

Extraction control with skip
(acceleration valve)

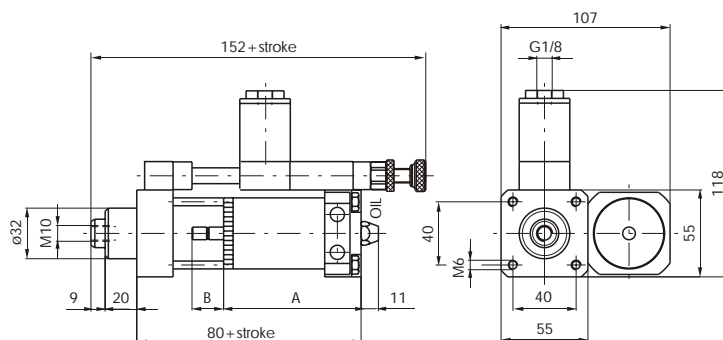


Weight gr. 1670 + gr. 300 every 50 mm. stroke

Strokes	A	B max.
< 75	93	30
75 ÷ < 150	118	45
150 ÷ < 250	143	60
250 ÷ < 350	183	90
350 ÷ < 500	218	120

Ordering code
1400.stroke.01.04

Extraction control with stop
(stop valve)

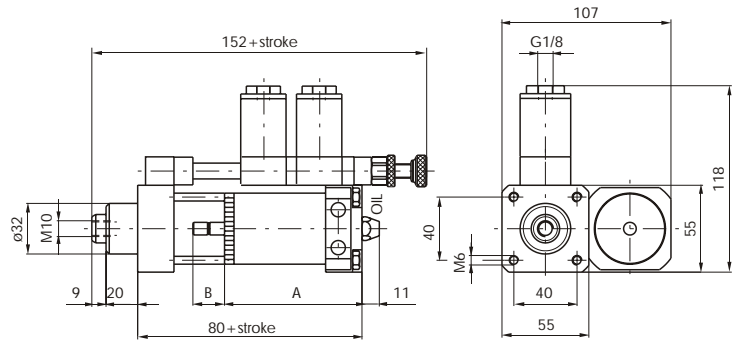


Weight gr. 1710 + gr. 300 every 50 mm. stroke

Strokes	A	B max.
< 75	93	30
75 ÷ < 150	118	45
150 ÷ < 250	143	60
250 ÷ < 350	183	90
350 ÷ < 500	218	120

Ordering code
1400.stroke.01.05

Extraction control with skip and stop
(acceleration and stop valves)

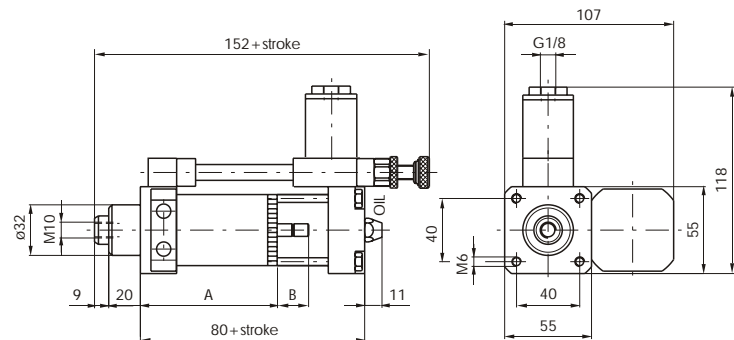


Strokes	A	B max.
< 75	93	30
75 ÷ < 150	118	45
150 ÷ < 250	143	60
250 ÷ < 350	183	90
350 ÷ < 500	218	120

Weight gr. 1830 + gr. 300 every 50 mm. stroke

Ordering code	1400.stroke.01.06
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Compression control with skip
(acceleration valve)

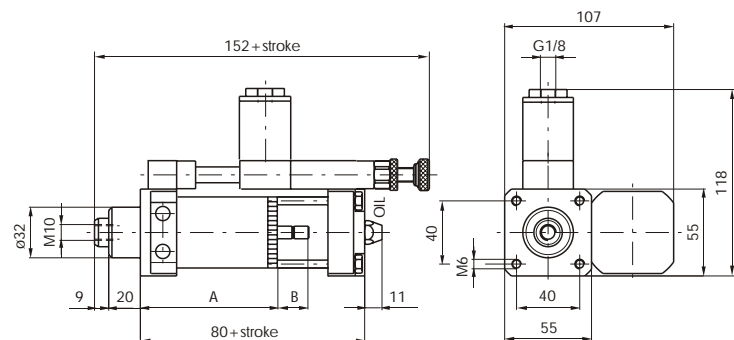


Strokes	A	B max.
< 75	93	30
75 ÷ < 150	118	45
150 ÷ < 250	143	60
250 ÷ < 350	183	90
350 ÷ < 500	218	120

Weight gr. 1670 + gr. 300 every 50 mm. stroke

Ordering code	1400.stroke.02.04
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Compression control with stop
(stop valve)



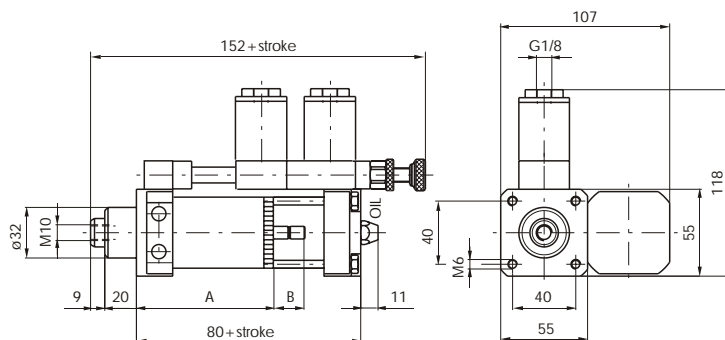
Strokes	A	B max.
< 75	93	30
75 ÷ < 150	118	45
150 ÷ < 250	143	60
250 ÷ < 350	183	90
350 ÷ < 500	218	120

Weight gr. 1710 + gr. 300 every 50 mm. stroke

Ordering code	1400.stroke.02.05
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Compression control with skip and stop
(acceleration and stop valves)

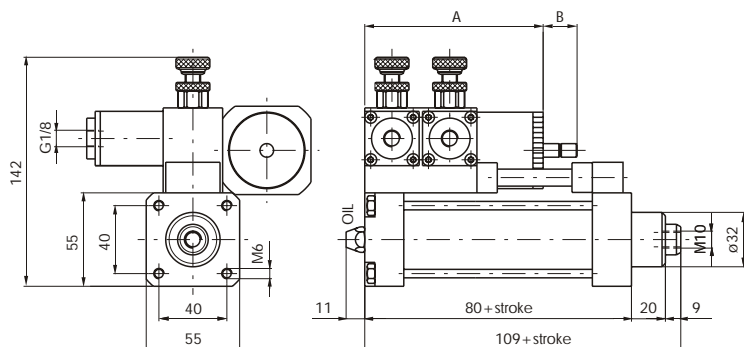


Strokes	A	B max.
< 75	93	30
75 ÷ < 150	118	45
150 ÷ < 250	143	60
250 ÷ < 350	183	90
350 ÷ < 500	218	120

Weight gr. 1830 + gr. 300 every 50 mm. stroke

Ordering code	1400.stroke.02.06
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Double control with skip
(acceleration valves in two directions)

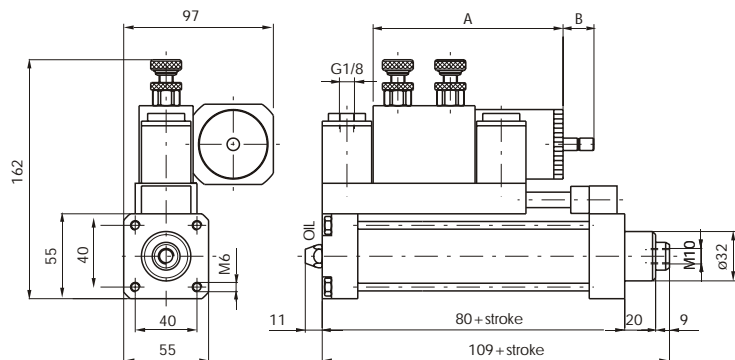
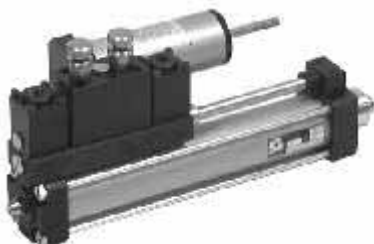


Strokes	A	B max.
< 75	110	30
75 ÷ < 150	135	45
150 ÷ < 250	160	60
250 ÷ < 350	200	90
350 ÷ < 500	235	120

Weight gr. 2110 + gr. 300 every 50 mm. stroke

Ordering code	1400.stroke.03.04
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Double control with stop
(stop valves in two directions)

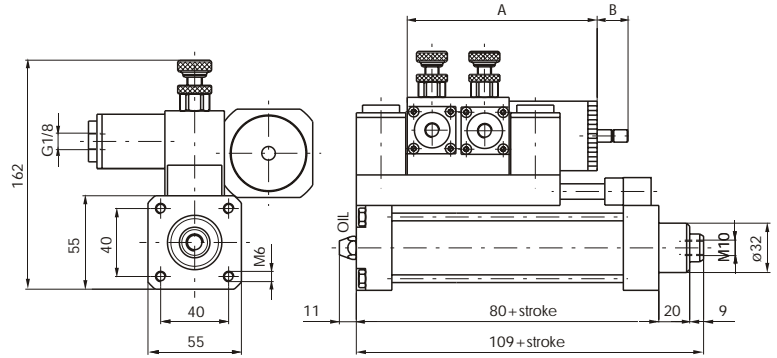
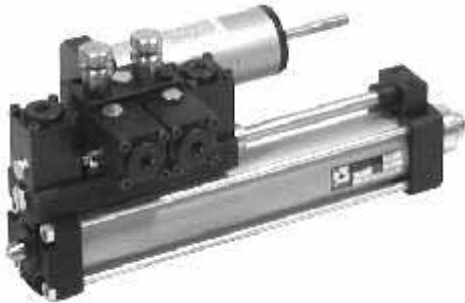


Strokes	A	B max.
150 ÷ < 250	197	60
250 ÷ < 350	237	90
350 ÷ < 500	272	120

Min. stroke 150 mm
Weight gr. 2390 + gr. 300 every 50 mm. stroke

Ordering code	1400.stroke.03.05
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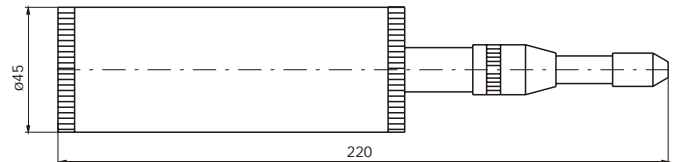
Double control with skip and stop
(acceleration and stop valves in two directions)



Min. stroke 150 mm
Weight gr. 2630 + gr. 300 every 50 mm. stroke

Ordering code	Strokes	A	B max.
1400.stroke.03.06	150 ÷ < 250	197	60
	250 ÷ < 350	237	90
	350 ÷ < 500	272	120

Hydraulic fluid refill syringe



Weight gr. 630

Ordering code
1400.stroke.99.01

Oil for hydraulic and pneumatic circuits

This oil is suitable to lubricate pneumatic circuits and also to refill hydraulic speed control tanks. It is completely compatible with our seals.

Ordering code
PNEUMOIL 01

(1 litre cans)

COMPACT CYLINDERS

Short stroke compact cylinders	6.0÷6.6
Cylinders with non - rotating device	6.7
Accessories	6.8-6.9
Short stroke compact cylinders with special performance	6.10
<hr/>	
Europe compact cylinders	6.12÷6.15
Variants	6.16
Accessories	6.17÷6.20



General

Compact or short stroke cylinders meet the need to make clamps that are quite small. In fact, their main characteristic is that their overall dimensions at stroke 0 are very small compared to normal cylinders and therefore can lock or move short distances even in limited spaces.

All this is obtained rationalizing component construction, considering also that the rod guide can be shorter than that of a normal cylinder.

There are various versions: double and single acting, with magnetic piston push-pull rod and as usual they can be easily modified to suit any applications, for example push-pull rod, tandem with opposed rod, tandem push, etc.

They are built so that the cylinder works perfectly, even with non-lubricated air, due to the fact that the seals are self-lubricating and the body is made from anodized shaped aluminium.

On the cylinder body there are cavities where the magnetic sensors are placed.

A complete range of clamps makes them easy to install under any conditions.

It is interesting to note that as these cylinders (from Ø 32 to Ø 100) have anchoring holes with the same lead and thread as those of series 1320 ISO 6431, they accept all mountings except for the intermediate trunnion.

Construction characteristics

Body	25 micron anodized aluminium alloy
Rod	C43 chromed steel (stainless steel for magnetic cylinders Ø20 and 25)
Piston	aluminium
Rod bushing	anodized aluminium
End plate	anodized aluminium
Piston seal	special NBR 80 shore self-lubricating
Rod seal	self-lubricating polyurethane or VITON®

Technical characteristics

Fluid	filtered and preferably lubricated air
Max pressure	10 bar
Working temperature	-5°C ÷ +70°C (120° C TEHERBAN® seals)

“Attention : We recommend using dry air if the working temperature is lower than 0°C”

Standard strokes

Type 1501, 1504, 1511, 1514, 1515, 1516, 1517 and 1518:
for all bores from 5 to 50 mm. every 5 mm.

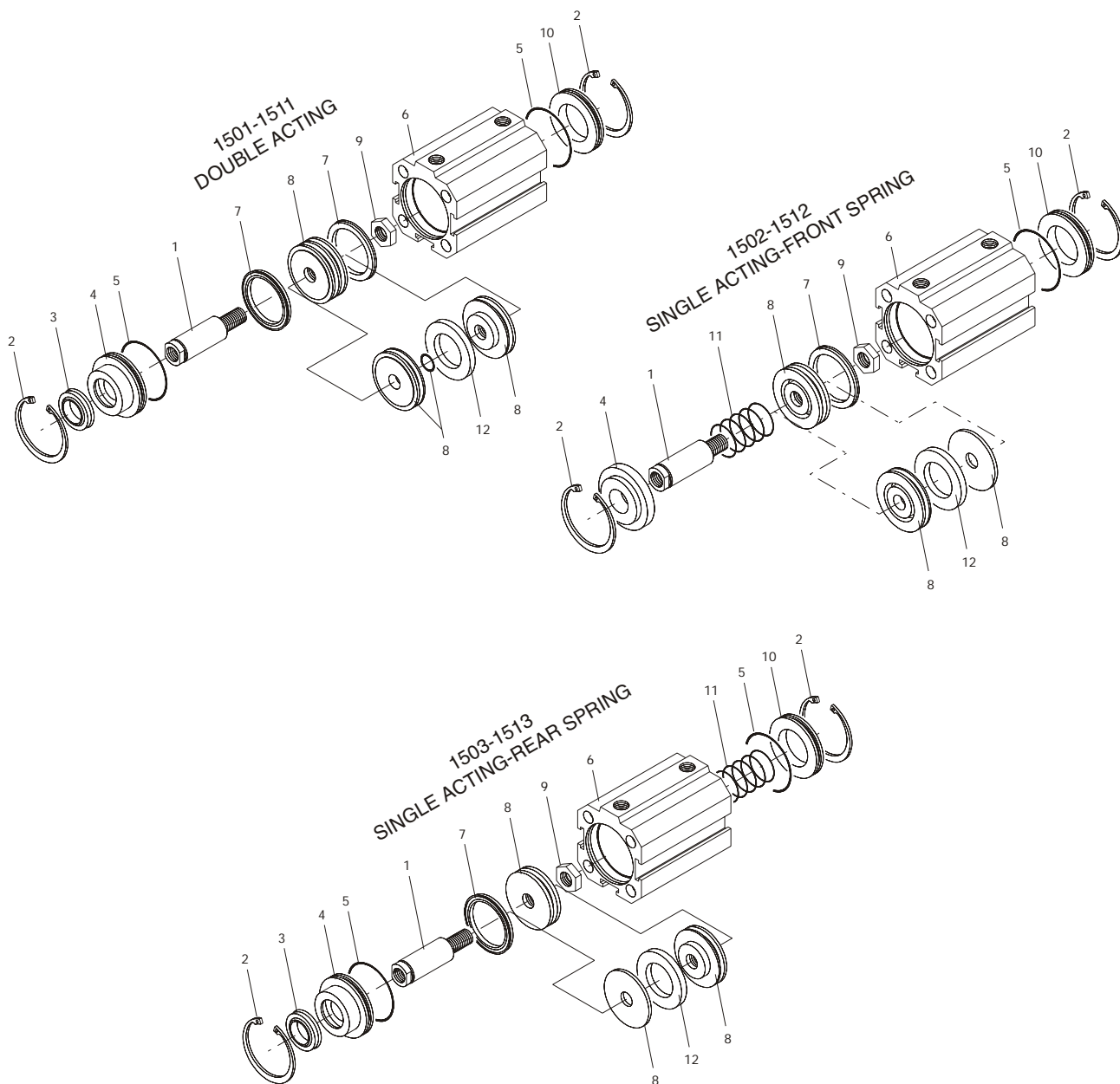
Type 1502, 1503, 1512 and 1513:
for all bores from 5 to 10 mm.

Type with non-rotating device:

Ø 20 and Ø 25	from 5 to 40 mm every 5 mm.
Ø 32 and Ø 40	from 5 to 50 mm every 5 mm.
Ø 50 and Ø 63	from 5 to 60 mm every 5 mm.
Ø 80 and Ø 100	from 5 to 80 mm every 5 mm.



Drawing



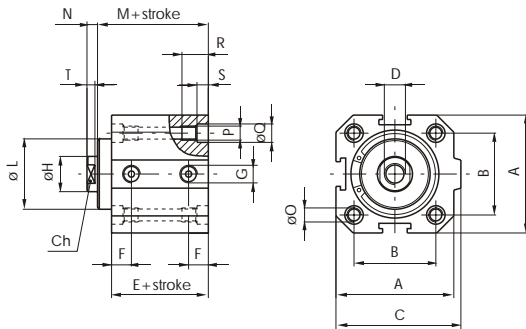
Pos.	Description	N. Pieces
1	Piston rod	1
2	Circlip	2
3	Piston rod seal	1
4	Rod bushing	1
5	Seal	2
6	Cylinder body	1
7	Piston seal	2
8	Piston	1
9	Piston nut	1
10	End plate	1
11	Spring	1
12	Magnet	1

Double acting version



Ordering code

1501.Ø.stroke

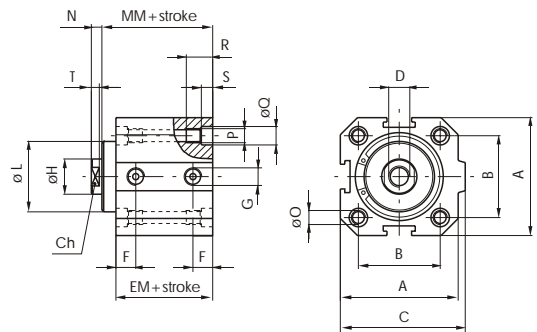


Double acting version with magnetic piston



Ordering code

1511.Ø.stroke



Bore	20	25	32	40	50	63	80	100
A	35	41	48	57	67	80	100	120
B	26	28	32,5	38	46,5	56,5	72	89
C	39,5	44,5	52	61	71	84	106	126
D	M4x8	M5x10	M6x12	M10x15	M12x18	M12x18	M16x20	M16x20
E	29	30,5	32	33,5	35	38	44	47
EM	34	35,5	37	38,5	40	43	49	52
F	9	9,15	9,75	10,5	11	11,25	13,75	15,25
G	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 3/8"	G 3/8"
Ø H	8	10	12	16	20	20	25	25
Ø L $\pm 0,05$ ($\begin{smallmatrix} 0 \\ -0,1 \end{smallmatrix}$ for Ø80 and Ø 100)	17	20,5	26	31	39	40	55	55
M	32	33	35,5	39,5	43	46	51,5	54,5
MM	37	38	40,5	44,5	48	51	56,5	59,5
N	4	4	4	5	6	6	8	8
Ø O	4,3	5,3	5,3	5,3	7	7	9	9
P	M5	M6	M6	M6	M8	M8	M10	M10
Ø Q	7,5	8,5	8,5	8,5	10,5	10,5	13,5	13,5
R	15	18	18	18	22	22	30	30
S	4,5	5,5	5,5	5,5	6,5	6,5	8,5	8,5
T	3	3	3	4	4,5	4,5	5,5	5,5
Ch	6	8	10	13	17	17	22	22

Non magnetic

Weight gr.	stroke 0	75	110	170	260	400	600	800	1500
	every 10 mm.	20	30	40	60	80	100	120	145

Magnetic

Weight gr.	stroke 0	90	130	200	310	460	700	910	1620
	every 10 mm.	20	30	40	60	80	100	120	145



Single acting version with front spring



Ordering code

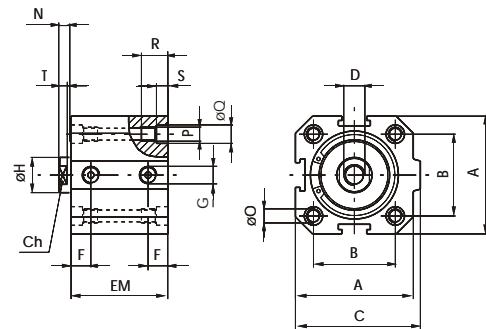
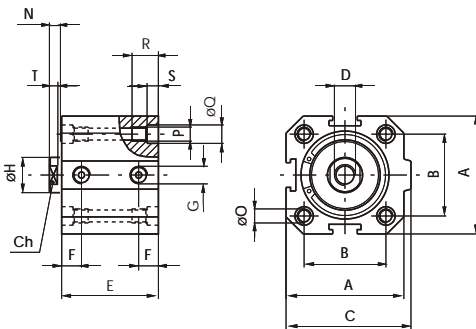
1502.Ø.stroke

Single acting version front spring with magnetic piston



Ordering code

1512.Ø.stroke



Bore		20	25	32	40	50	63	80	100
A		35	41	48	57	67	80	100	120
B		26	28	32,5	38	46,5	56,5	72	89
C		39,5	44,5	52	61	71	84	106	126
D		M4X8	M5X10	M6X12	M10X15	M12X18	M12X18	M16X20	M16X20
E	stroke 5	29	30,5	32	33,5	35	38	44	47
	stroke 10	34	35,5	37	38,5	40	43	49	52
EM	stroke 5	34	35,5	37	38,5	40	43	49	52
	stroke 10	39	40,5	42	43,5	45	48	54	57
F		9	9,15	9,75	10,5	11	11,25	13,75	15,25
G		G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 3/8"	G 3/8"
Ø H		8	10	12	16	20	20	25	25
N		4	4	4	5	6	6	8	8
Ø O		4,3	5,3	5,3	5,3	7	7	9	9
P		M5	M6	M6	M6	M8	M8	M10	M10
Ø Q		7,5	8,5	8,5	8,5	10,5	10,5	13,5	13,5
R		15	18	18	18	22	22	30	30
S		4,5	5,5	5,5	5,5	6,5	6,5	8,5	8,5
T		3	3	3	4	4,5	4,5	5,5	5,5
Ch		6	8	10	13	17	17	22	22

Non magnetic

Weight gr.	stroke 0	70	105	160	250	370	550	750	1440
	stroke 10	80	120	180	280	410	600	810	1500

Magnetic

Weight gr.	stroke 0	85	125	190	300	430	650	860	1560
	stroke 10	95	140	210	330	470	700	920	1620

Single acting version with rear spring



Ordering code

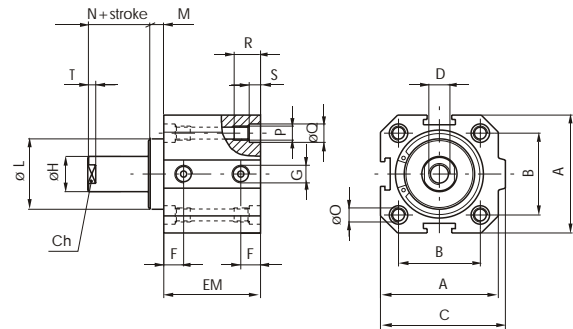
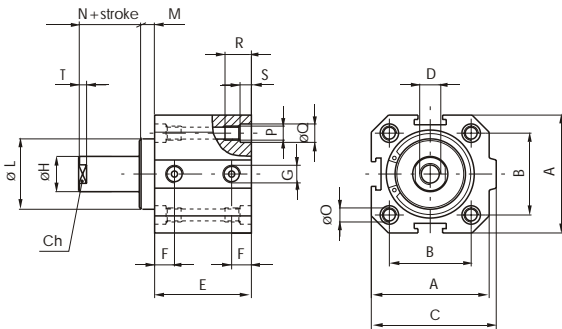
1503.Ø.stroke

Single acting version rear spring with magnetic piston



Ordering code

1513.Ø.stroke



Bore		20	25	32	40	50	63	80	100
A		35	41	48	57	67	80	100	120
B		26	28	32,5	38	46,5	56,5	72	89
C		39,5	44,5	52	61	71	84	106	126
D		M4X8	M5X10	M6X12	M10X15	M12X18	M12X18	M16X20	M16X20
E	stroke 5	29	30,5	32	33,5	35	38	44	47
	stroke 10	34	35,5	37	38,5	40	43	49	52
EM	stroke 5	34	35,5	37	38,5	40	43	49	52
	stroke 10	39	40,5	42	43,5	45	48	54	57
F		9	9,15	9,75	10,5	11	11,25	13,75	15,25
G		G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 3/8"	G 3/8"
Ø H		8	10	12	16	20	20	25	25
Ø L $\pm 0,05$ ($\begin{smallmatrix} 0 \\ -0,1 \end{smallmatrix}$ for Ø80 and Ø 100)		17	20,5	26	31	39	40	55	55
M		3	2,5	3,5	6	8	8	7,5	7,5
N		4	4	4	5	6	6	8	8
Ø O		4,3	5,3	5,3	5,3	7	7	9	9
P		M5	M6	M6	M6	M8	M8	M10	M10
Ø Q		7,5	8,5	8,5	8,5	10,5	10,5	13,5	13,5
R		15	18	18	18	22	22	30	30
S		4,5	5,5	5,5	5,5	6,5	6,5	8,5	8,5
T		3	3	3	4	4,5	4,5	5,5	5,5
Ch		6	8	10	13	17	17	22	22

Non magnetic

Weight gr.	stroke 5	70	105	160	250	370	550	750	1440
	stroke 10	80	120	180	280	410	600	810	1500

Magnetic

Weight gr.	stroke 5	85	125	190	300	430	650	860	1560
	stroke 10	95	140	210	330	470	700	920	1620

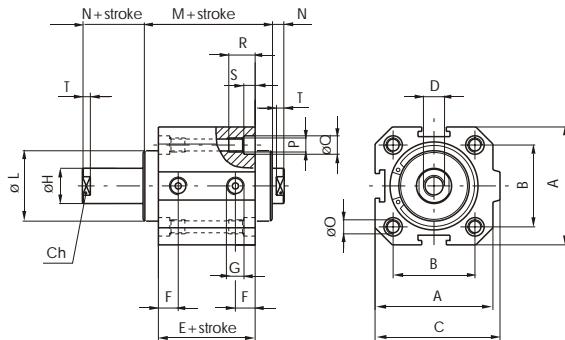


Double acting push-pull rod version



Ordering code

1504.Ø.stroke

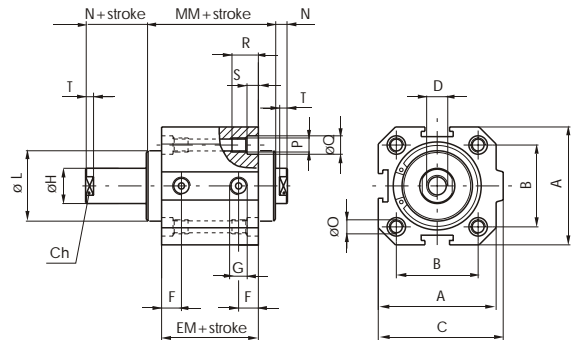


Double acting push-pull rod version with magnetic piston



Ordering code

1514.Ø.stroke



Bore	20	25	32	40	50	63	80	100
A	35	41	48	57	67	80	100	120
B	26	28	32,5	38	46,5	56,5	72	89
C	39,5	44,5	52	61	71	84	106	126
D	M4X8	M5X10	M6X12	M10X15	M12X18	M12X18	M16X20	M16X20
E	29	30,5	32	33,5	35	38	44	47
EM	34	35,5	37	38,5	40	43	49	52
F	9	9,15	9,75	10,5	11	11,25	13,75	15,25
G	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 3/8"	G 3/8"
Ø H	8	10	12	16	20	20	25	25
Ø L $\pm 0,05$ ($^0_{-0,1}$ for Ø80 and Ø 100)	17	20,5	26	31	39	40	55	55
M	35	35,5	39	45,5	51	54	59	62
MM	40	40,5	44	50,5	56	59	64	67
N	4	4	4	5	6	6	8	8
Ø O	4,3	5,3	5,3	5,3	7	7	9	9
P	M5	M6	M6	M6	M8	M8	M10	M10
Ø Q	7,5	8,5	8,5	8,5	10,5	10,5	13,5	13,5
R	15	18	18	18	22	22	30	30
S	4,5	5,5	5,5	5,5	6,5	6,5	8,5	8,5
T	3	3	3	4	4,5	4,5	5,5	5,5
Ch	6	8	10	13	17	17	22	22

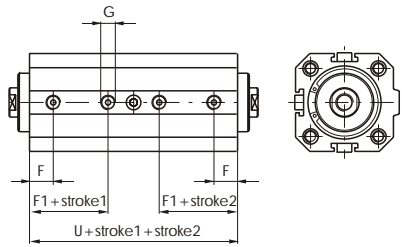
Non magnetic

Weight	stroke 0	90	130	200	320	460	670	1100	1680
gr.	stroke 10	20	35	50	70	90	110	155	185

Magnetic

Weight	stroke 0	105	160	240	380	530	740	1210	1820
gr.	stroke 10	20	35	50	70	90	110	155	185

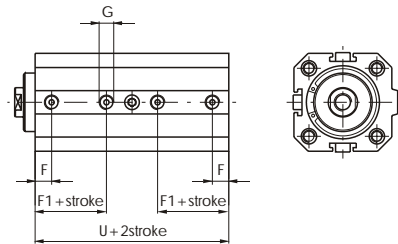
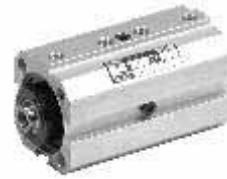
Tandem with opposed rods



Ordering code

1515.Ø.stroke 1.stroke 2
1515.Ø.stroke 1.stroke 2.M (magnetic)

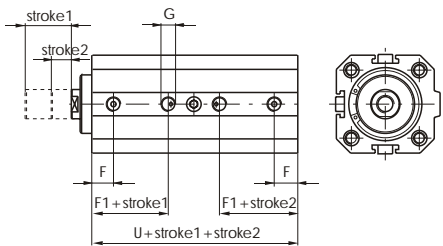
Tandem push with common rods



Ordering code

1516.Ø.stroke
1516.Ø.stroke .M (magnetic)

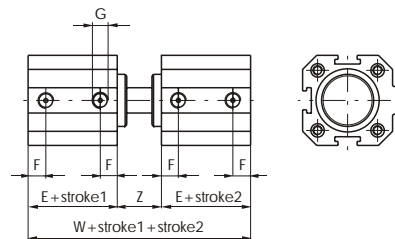
Tandem push with independent rods



Ordering code

1517.Ø.stroke 1.stroke 2
1517.Ø.stroke 1.stroke 2.M (magnetic)

Opposed tandem with common rods



Ordering code

1518.Ø.stroke 1.stroke 2
1518.Ø.stroke 1.stroke 2.M (magnetic)

Bore	20	25	32	40	50	63	80	100
E	29	30,5	32	33,5	35	38	44	47
F	9	9,15	9,75	10,5	11	11,25	13,75	15,25
F1	17,5	18,35	19,75	20,5	21,5	24,25	24,75	26,25
G	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 3/8"	G 3/8"
U	59	60,5	67	68,5	70	78	89	97
W	72	74	79	89	98	104	119	125
Z	14	13	15	22	28	28	31	31

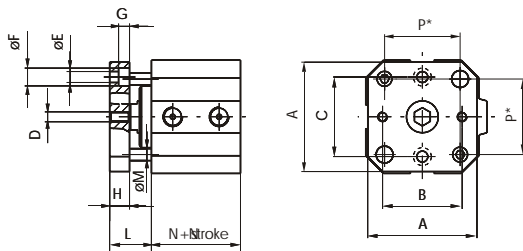
Variations with magnetic piston

E	34	35,5	37	38,5	40	43	49	52
F1	22,5	23,35	24,75	25,5	26,5	29,25	29,75	31,25
U	69	70,5	77	78,5	80	88	99	107
W	82	84	89	99	108	114	129	135



Cylinders with non-rotating device

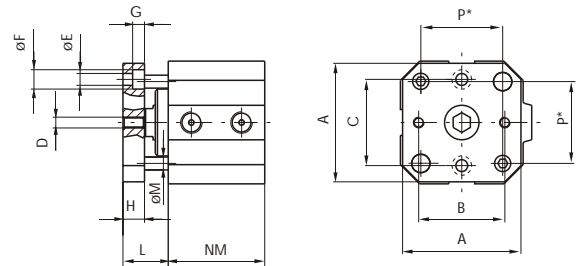
Double acting version



* = Distance between rods centres

Ordering code
1501.Ø.stroke.AR

Double version with magnetic piston

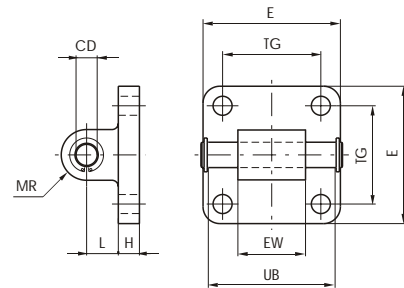
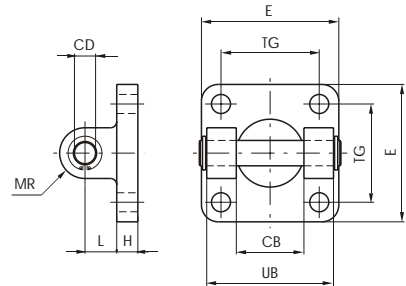


* = Distance between rods centres

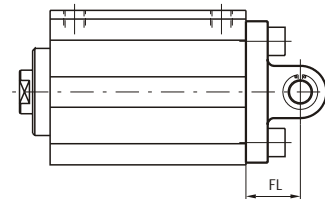
Ordering code
1511.Ø.stroke.AR

Bore	20	25	32	40	50	63	80	100	
A	35	40	45	55	65	80	100	120	
B	22	26	32	40	50	62	82	103	
C	22	28	34	40	50	62	82	103	
D	M 4	M 5	M 5	M 5	M 6	M 6	M 6	M 8	
Ø E	4,5	5,5	5,5	5,5	6,5	8,5	8,5	8,5	
Ø F	7,5	9	9	9	10,5	13,5	13,5	13,5	
G	4,5	5,5	5,5	5,5	6,5	8,5	8,5	8,5	
H	8	8	10	10	12	12	15	15	
L	15	14,5	17,5	21	26	26	30,5	30,5	
Ø M	6	6	6	6	8	8	10	10	
N	29	30,5	32	33,5	35	38	44	47	
NM	34	35,5	37	38,5	40	43	49	52	
P	26	28	32,5	38	46,5	56,5	72	89	
Max. suggestion stroke	40	40	50	50	60	60	80	80	
Weight gr.	Stroke 0	40	50	70	90	200	250	490	650
	ogni 10 mm	5	5	5	5	10	10	20	20

Rear clevis and rear clevis male



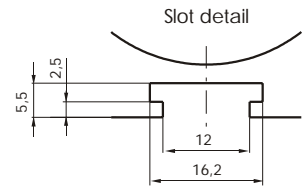
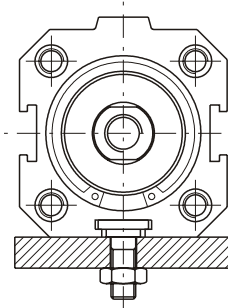
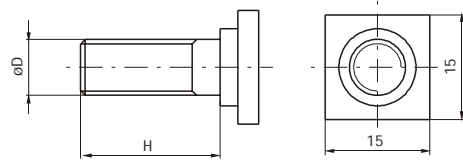
This allows anchorage of the cylinder both parallel and at a right angle to the plane; the cylinder rod can oscillate and self-align as necessary. It is made of aluminium alloy and painted black.



Ordering code <i>Female</i> 1500.Ø.09F <i>Male</i> 1500.Ø.09/1F	Bore	20	25	32	40	50	63	80	100	
	CB (H 14)	16	20	26	28	32	40	50	60	
	Ø CD (h 9)	8	10	10	12	12	16	16	20	
	E	35	40	45	52	65	75	95	115	
	EW $(\begin{smallmatrix} +0.2 \\ -0.6 \end{smallmatrix})$	16	20	26	28	32	40	50	60	
	FL	18	20	22	25	27	32	36	41	
	H	6	8	10	10	12	12	16	16	
	L	12	12	12	15	15	20	20	25	
	MR	8	9	10	12	12	16	16	20	
	TG	26	28	32,5	38	46,5	56,5	72	89	
	UB	35	40	45	52	60	70	90	110	
	Weight gr.	09/F	45	75	80	120	180	300	500	860
		09/1F	53	85	100	160	190	370	560	950



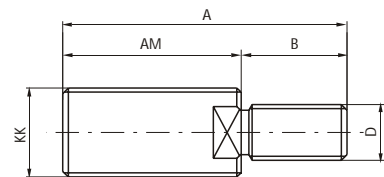
Slot fixing screws



Example mounted with square headed screws on the plane.

Bore	20	25	32	40	50	63	80	100
Ø D	M6	M6	M6	M8	M8	M8	M10	M10
H	15	15	15	20	20	20	25	25
Weight gr.	10			18			25	
Ordering code	1500.15F			1500.16F			1500.18F	

Nipple with ISO standard thread



Fitted on the female thread of the compact cylinders, restore the ISO configuration's rod (ISO 6432 for cylinders Ø20 and Ø25; ISO 6431 for cylinders from Ø32 to Ø100).

Bore	20	25	32	40	50	63	80	100
KK	M8x1,25	M10x1,25	M10x1,25	M12x1,25	M16x1,5	M16x1,5	M20x1,5	M20x1,5
AM	20	22	22	24	32	32	40	40
A	26	30	32	36	47	47	58	58
B	6	8	10	12	15	15	18	18
D	M4	M5	M6	M10	M12	M12	M16	M16
Ordering code	1500.Ø.17F							
Weight gr.	8	15	16	27	65	65	110	110



General

Besides the standard compact cylinder series, to complete the range, there are also available special versions with smaller diameters. These are used where reduced dimensions and low power are needed. They are manufactured only in a single acting version and the available strokes are those listed under the tables.

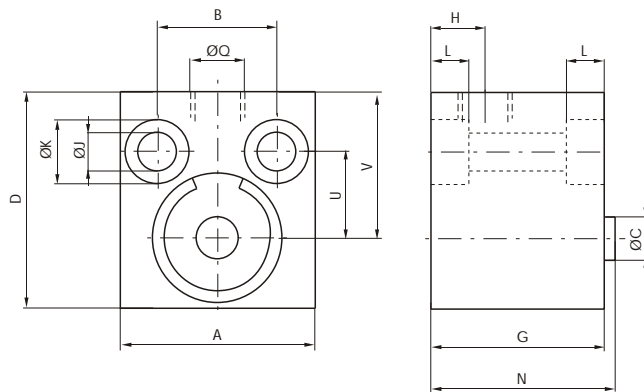
Construction characteristics

Body	anodized aluminium alloy 20011
Rods/Piston	AISI 303 stainless steel chromed rod
Spring	AISI 302 stainless steel
Seals	NBR 80 Shore (lip type)
Bushing guide	brass

Technical characteristics

Fluid	filtered and lubricated air
Max Pressure	10 bar
Working temperature	-5°C ÷ +70°C

“Attention : We recommend using dry air if the working temperature is lower than 0°C”



Ordering code
1502.Ø.stroke

Bore	Stroke	A	B	C	D	G	H	Ø J	Ø K	L	N	Q	U	V	Weight gr.
8	4	18	11	4	20	16	5,5	3,2	5,7	3	17	M5	8	13,5	16
12	4	20	13	5	25	16	5	3,2	5,7	3	17	M5	9	16	24
12	10	20	13	5	25	26	5	3,2	5,7	3	27	M5	9	16	35
16	4	22	13	6	30	18	5	4,2	7,2	4,5	19	M5	12	20	37
16	8	22	13	6	30	25	5	4,2	7,2	4,5	26	M5	12	20	51



General

This series of cylinders are available in two versions with different threaded fixing holes. The first one includes cylinders from Ø 32 to Ø 100 called "ISO" with fixing holes same as cylinders ISO 6431 - VDMA 24562. Cylinders from Ø 20 to Ø 100 called "UNITOP", parts of second series, are mainly according to standard UNITOP RU - P/6 - P/7. Cylinders Ø 12 and Ø 16 non standard, are interchangeable with similar products available in the market. The ISO version uses every fixing devices of series 1320 with exception of intermediate trunnion, while for cylinders Ø 12, Ø 16 and for "UNITOP" version are available fixing devices as flanges, foot, male and female clevis made with aluminum or steel. Every cylinder has the magnetic piston and are available in the most common utilized version such as single and double action, push / pull, male and female piston rod, bored piston rod, non-rotating and tandem versions. Three slots have been realized on three sides of the extruded barrel purposely for the use of magnetic sensors. Standard PNEUMAX sensor can be installed on two out of three slots from Ø 32 to Ø 50 or the miniature sensor with proper adapter on remaining slot. For Ø 63 to Ø 100 the three slots can use standard PNEUMAX sensor. The particular design of the piston allows the use of fixed elastic cushion. Bolted heads so that it is possible to realize cylinders strokes longer than traditional compact cylinders.

Construction characteristics

Body	aluminum alloy UNI 9006/1 25 micron anodization
Heads	from Ø 12 to Ø 25 aluminum alloy UNI 9006/1 anodized from Ø 32 to Ø 100 UNI 5076 aluminium die-casting and painted (cataphoresys)
Piston rod bushing	sintered bronze
Piston rod	from Ø 12 to Ø 25 steel AISI 303 chromed, from Ø 32 to Ø 100 C43 chromed (On request stainless steel AISI 303)
Piston	from Ø 12 to Ø 25 plated zinc steel from Ø 32 to Ø 100 aluminum alloy 2011 UNI 9002/5
Piston seals	polyurethane U90E. On request TEHERBAN®
Piston rod seal	polyurethane U90E. On request TEHERBAN®
Spring	zinc plated steel for springs
Fixing screws	zinc plated steel

Technical characteristics

Fluid	filtered and lubricated air or non
Maximum working pressure	10 bar
Working temperature	-30°C +80°C with polyurethane seals -5°C +120°C with TEHERBAN® seals

"Attention : We recommend using dry air if the working temperature is lower than 0°C"

Standard strokes for single acting cylinders

Ø12	10mm max.
from Ø16 to Ø100	25mm max.

Standard strokes for double acting cylinders

Ø12 and Ø16	from 5 to 40mm every 5mm
Ø20 and Ø25	from 5 to 50mm every 5mm
Ø32 to Ø100	from 5 to 80mm every 5mm

Maximum suggested strokes

Ø12 and Ø16	100mm
Ø20 and Ø25	200mm
Ø32 and Ø40	300mm
Ø50 and Ø63	400mm
Ø80 and Ø100	500mm

Maximum suggested strokes with non-rotating device

from Ø12 to Ø25	40mm
from Ø32 to Ø100	80mm

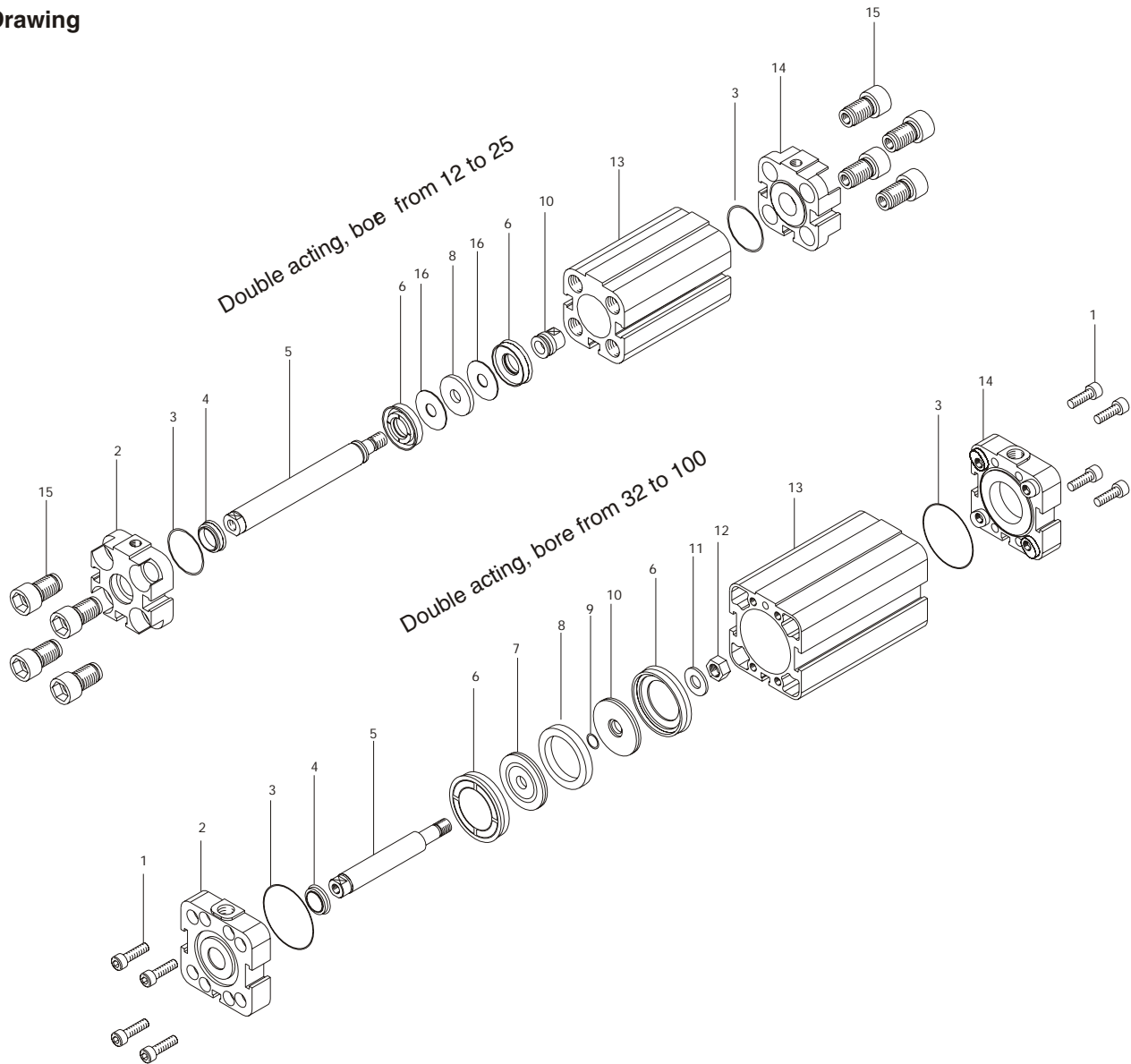
Minimum and maximum springs load

Bore	12	16	20	25	32	40	50	63	80	100
Min. load (N)	3,9	4,4	4,9	9,8	12,3	16,7	27,5	37,3	59,4	101,3
Max load (N)	9,3	17,7	18,1	25,5	34,3	44,1	51,0	63,8	99,4	141,9

Longer strokes may be utilized if there is no radial loads on piston rod considering there isn't adjustable cushioning system.



Drawing



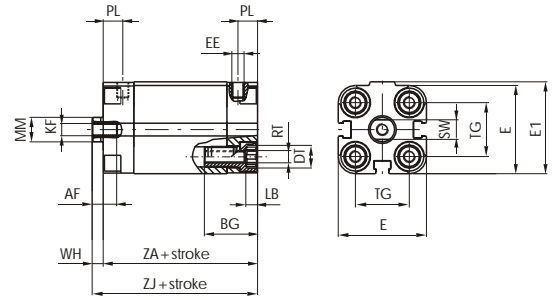
Pos.	Description	N. pieces
1	Screw	*
2	Front cover assy	1
3	Cover seal	2
4	Piston rod seal	1
5	Piston rod	1
6	Piston seal	2
7	Front half piston	1
8	Magnet	**
9	Half piston seal	1
10	Rear half piston	1
11	Washer	1
12	Nut	1
13	Barrel	1
14	Rear cover assy	1
15	Tie rod nut	8
16	Piston washer	2

*Ø 32 ÷ 50 n° 8 - Ø 63 ÷ 100 n° 16 **Ø 12 ÷ 32 n° 1 - Ø 40 ÷ 100 n° 2

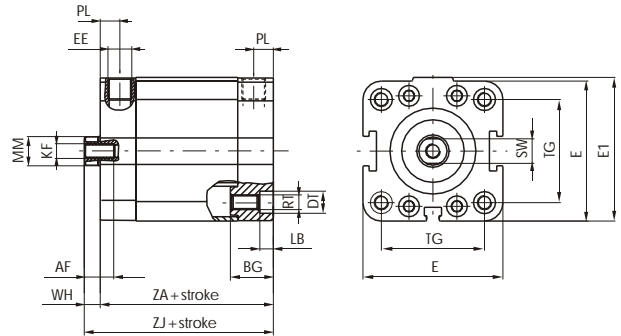
Basic version
Basic version single acting



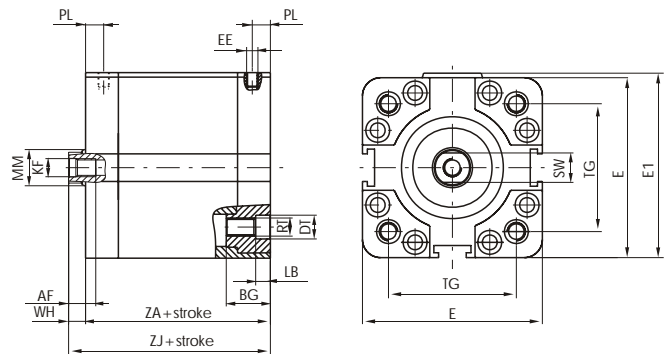
for bore from $\varnothing 12$ to $\varnothing 25$
use sensors series 1580 only



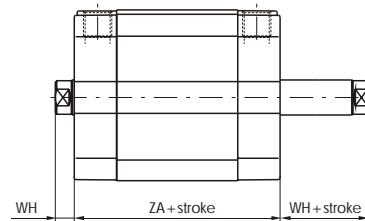
for bore from $\varnothing 32$ to $\varnothing 50$
use sensors series 1500 and 1580 only



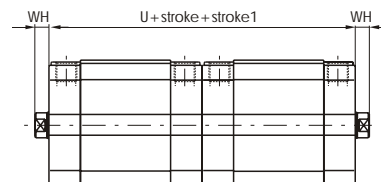
for bore from $\varnothing 63$ to $\varnothing 100$
use sensors series 1500 only
for sensors series 1580 it is required
the adapter code 1580.01.F



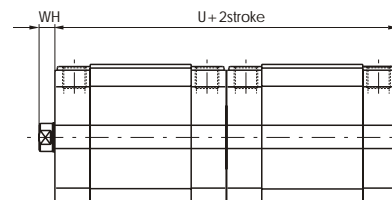
Push/pull version
Push/pull version single acting



Tandem with opposite rods

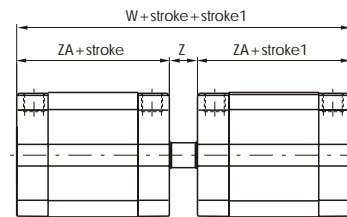


Tandem push with common rods

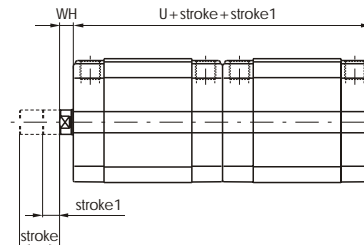




Opposed tandem with common rod



Tandem push with independent rods



Ordering code

Basic version push/pull

- 15 . Ø . stroke
- 1 = Double acting
 - 2 = Front spring
 - 3 = Rear spring
 - 01 = Basic version - female piston rod
 - 02 = Basic version - male piston rod
 - 03 = Push / pull version - female piston rod
 - 04 = Push / pull version - male piston rod
 - 05 = Push / pull version - bored male piston rod
 - 06 = Push / pull version - bored female piston rod
 - 07 = Non - rotating version
 - 08 = Push / pull version with non rotating device on one side - female piston rod
 - 09 = Push / pull version with non rotating device on one side - male piston rod
 - 1 = Chromed rod C43
 - 2 = AISI 303 chromed stainless steel rod
 - 6 = ISO (Ø 32 to 100)
 - 7 = ISO THERBAN® (Ø 32 to 100)
 - 8 = UNITOP (Ø 12 to 100)
 - 9 = UNITOP THERBAN® (Ø 12 to 100)

Tandem version

- 15 . Ø . stroke . (stroke1)
- A = Tandem with opposite rods female thread
 - E = Tandem with opposite rods male thread
 - L = Tandem opposite rods with non rotating device on both sides
 - C = Tandem push with common rods female thread
 - G = Tandem push with common rods male thread
 - H = Tandem push with common rods, push-pull version rod female threads
 - N = Tandem push with common rods with non rotating device
 - D = Opposed tandem with common rod
 - B = Tandem push with independent rods female thread
 - F = Tandem push with independent rods male thread
 - M = Tandem push with independent rods with non rotating device
 - P = Tandem push/pull with independent rods - female thread
 - Q = Tandem push/pull with independent rods - male thread
 - 1 = Chromed rod C43
 - 2 = AISI 303 chromed stainless steel rod
 - 6 = ISO (Ø 32 to 100)
 - 7 = ISO THERBAN® (Ø 32 to 100)
 - 8 = UNITOP (Ø 12 to 100)
 - 9 = UNITOP THERBAN® (Ø 12 to 100)

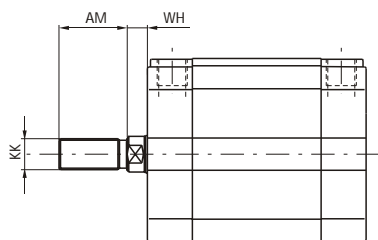
Table of dimensions

Bore	12	16	20	25	32	40	50	63	80	100	
AF	6	8	10	10	12	12	12	12	16	20	
BG	19	19	20	20	17,5	17,5	19,5	19,5	23,5	24,5	
DT	6	6	8	8	10	9	10,5	10,5	14	14	
E	29	29	36	40	48	57	67	80	102	122	
E1	30	30	37,5	41,5	49,5	58,5	69	82	105	125	
EE	M 5	M 5	M 5	M 5	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/4"	
KF	M 3	M 4	M 5	M 5	M 6	M 6	M 8	M 8	M 10	M 12	
LB	3,5	3,5	4,8	4,8	5,5	5,5	6,5	6,5	8,5	8,5	
MM	6	8	10	10	12	12	16	16	20	25	
PL	8	8	8	8	8	8	8	8	8,5	10,5	
RT	M 4	M 4	M 5	M 5	M 6	M 6	M 8	M 8	M 10	M 10	
SW	5	7	8	8	10	10	13	13	17	22	
TG ISO	/	/	/	/	32,5	38	46,5	56,5	72	89	
TG UNITOP	18	18	22	26	32	42	50	62	82	103	
U	76	76	76	79	89	91	91	100	112	133	
W	85	85	85	90	101	104	106	115	128	153	
WH	4,5	4,5	4,5	5,5	6	6,5	7,5	7,5	8	10	
Z	9	9	9	11	12	13	15	15	16	20	
ZA *	38	38	38	39,5	44,5	45,5	45,5	50	56	66,5	
ZJ *	42,5	42,5	42,5	45	50,5	52	53	57,5	64	76,5	
Weight gr.	Stroke 0	88	90	140	170	210	320	460	690	1390	2290
	every 5 mm	8	8	12	13	15	19	25	31	50	66

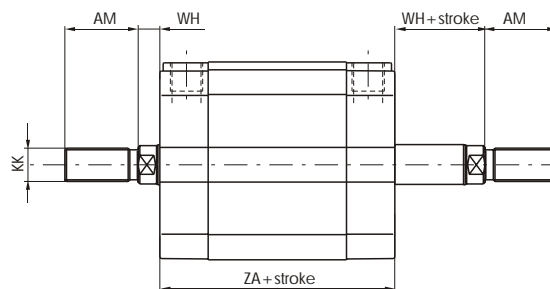
* These dimensions increase of 10 mm for cylinders ø 12 front spring version.

Tabular weights above refer to Basic Versions. The weights of Tandem versions are approximately double those shown.

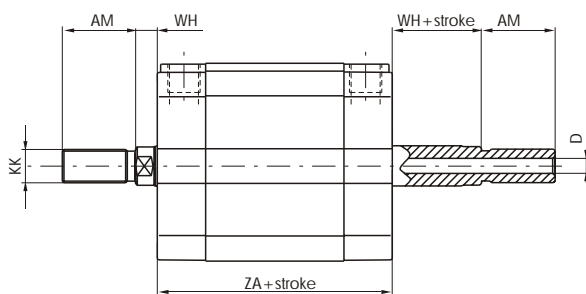
Basic version male piston rod



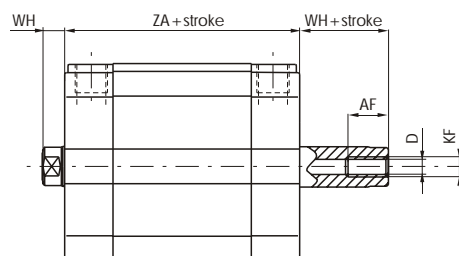
Push - pull version male rod



Push - pull version bored male piston rod

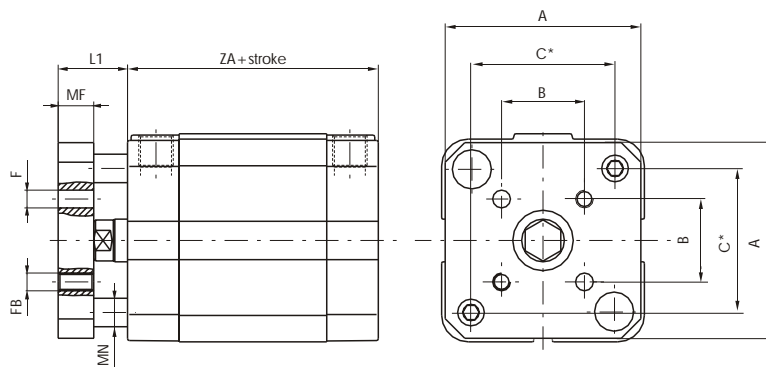


Push - pull version bored female piston rod



Maximum allowed stroke = ZB (see table)

Non-rotating version



* = Distance between rods centres

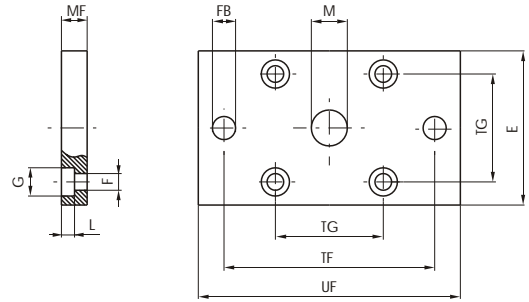
Bore	12	16	20	25	32	40	50	63	80	100
A	28,5	28,5	35,5	39,5	45	55	65	80	100	120
AF	6	8	10	10	12	12	12	12	16	20
AM	16	20	22	22	22	22	24	24	32	40
B	9,9	9,9	12	15,6	19,8	23,3	29,7	35,4	46	56,6
C	18	18	22	26	34	40	49	59,5	77	94
D	2,3	3,2	3,8	3,8	4,5	4,5	6	6	8	10
F	3	3	4	5	5	5	6	6	8	10
FB	M 3	M 3	M 4	M 5	M 5	M 5	M 6	M 6	M 8	M 10
KF	M 3	M 4	M 5	M 5	M 6	M 6	M 8	M 8	M 10	M 12
KK	M6X1	M8X1,25	M10X1,25	M10X1,25	M10X1,25	M10X1,25	M12X1,25	M12X1,25	M16X1,5	M20X1,5
L1	10,5	10,5	12,5	13,5	16	16,5	19,5	19,5	22	24
MF	6	6	8	8	10	10	12	12	14	14
MN	5	5	6	6	8	8	10	10	12	12
WH	4,5	4,5	4,5	5,5	6	6,5	7,5	7,5	8	10
ZA	38	38	38	39,5	44,5	45,5	45,5	50	56	66,5
ZB	20	25	50	50	50	50	75	75	80	80



Front and rear flanges



For bores from 12 to 25



For bores from 32 to 100

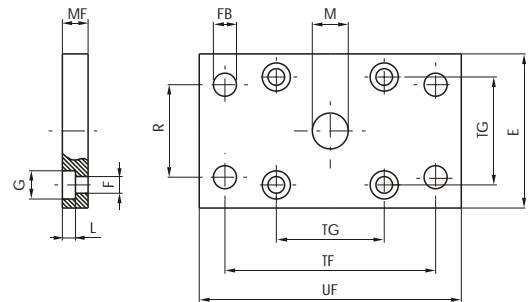
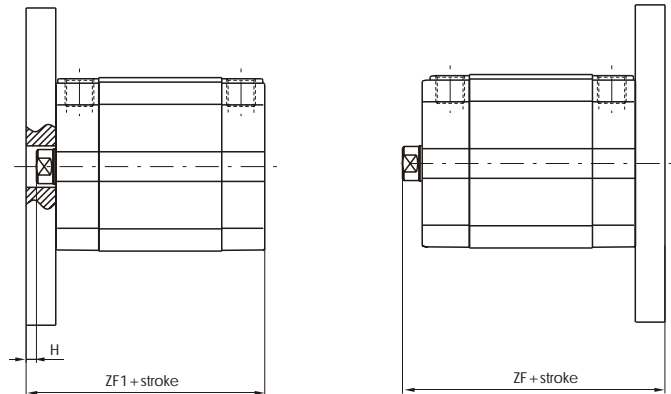


Plate which allows anchorage of the cylinder at a right angle to the plane. It is made with zinc-plated extruded steel or with aluminium.



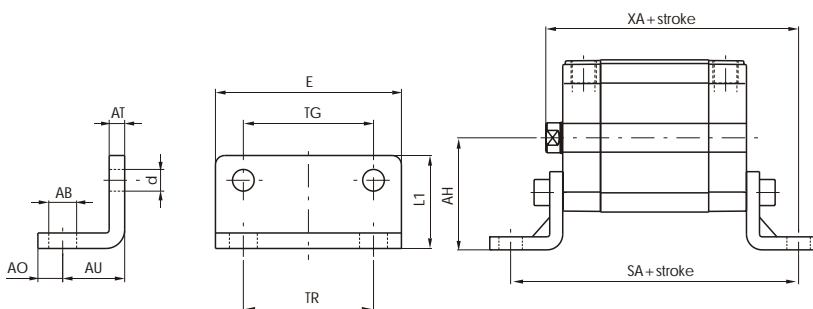
Front

Rear

	ISO Dimensions						UNITOP Dimensions									
	32	40	50	63	80	100	12-16	20	25	32	40	50	63	80	100	
Bore	32	40	50	63	80	100	12-16	20	25	32	40	50	63	80	100	
E	45	52	65	75	95	115	29	36	40	50	60	68	87	107	128	
F	6,5	6,5	8,5	8,5	10,5	10,5	4,5	5,5	5,5	6,6	6,6	9	9	11	11	
FB(H13)	7	9	9	9	12	14	5,5	6,6	6,6	7	9	9	9	12	14	
G	10,5	10,5	13,5	13,5	16,5	16,5	9	10	10	11	11	15	15	18	18	
H	4	3,5	4,5	4,5	8	6	5,5	5,5	4,5	4	3,5	4,5	7,5	7	5	
L	6,5	6,5	8,5	8,5	10,5	10,5	5,4	5,4	5,4	6,4	6,4	8,6	8,6	10,6	10,6	
Ordering code																
<i>ISO</i> 1500.Ø.03F <i>steel</i>	M(H11)	30	35	40	45	45	55	10	12	12	14	14	18	18	23	28
	MF(JS14)	10	10	12	12	16	16	10	10	10	10	10	12	15	15	15
	R(JS14)	32	36	45	50	63	75	/	/	/	32	36	45	50	63	75
	TF(JS14)	64	72	90	100	126	150	43	55	60	65	82	90	110	135	163
<i>UNITOP</i> 1580.Ø.03F <i>steel</i>	TG	32,5	38	46,5	56,5	72	89	18	22	26	32	42	50	62	82	103
	UF	80	90	110	120	150	170	55	70	76	80	102	110	130	160	190
	ZF	60,5	62	65	69,5	80	92,5	52,5	52,5	55	60,5	62	65	72,5	79	91,5
	ZF1	54,5	55,5	57,5	62	72	82,5	48	48	49,5	54,5	55,5	57,5	65	71	81,5
Weight gr.	Steel	160	250	480	620	1430	1970	100	170	210	270	430	600	1210	1810	2610
	Aluminun	/	/	/	/	/	/	35	60	70	90	150	210	420	630	900



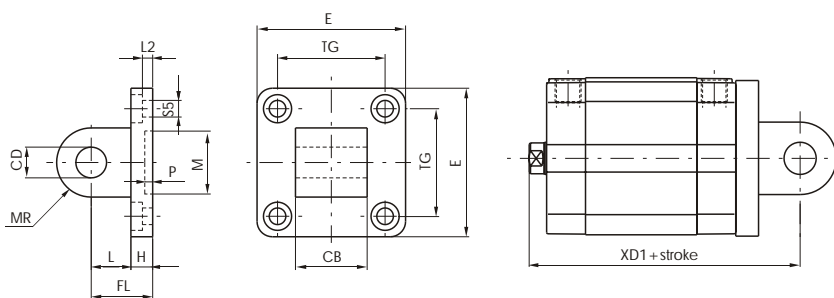
Feet



Element used to anchor the cylinder parallel to the mounting plane. They are made with stamped and pierced sheet metal black painted.

	ISO Dimensions						UNITOP Dimensions									
	32	40	50	63	80	100	12-16	20	25	32	40	50	63	80	100	
Bore	32	40	50	63	80	100	12-16	20	25	32	40	50	63	80	100	
AB (H14)	7	9	9	9	12	14	5,5	6,6	6,6	6,6	9	9	11	11	13,5	
AH (JS15)	32	36	45	50	63	71	22	27	30	32	42,5	47	59,5	65,5	78	
AO ($\pm 0,2$)	11	8	15	13	14	16	4,5	6	6	8	8	8	12	12	12	
AT	4	4	5	5	6	6	3	4	4	5	5	6	6	8	8	
AU ($\pm 0,2$)	24	28	32	32	41	41	13	16	16	18	20	24	27	30	33	
Ordering code	d	7	7	9	9	11	11	4,4	5,4	5,4	6,6	6,6	9	9	11	11
ISO 1500.Ø.05/1F (1 pieces)	E	45	52	65	75	95	115	30	36	40	50	60	68	84	102	123
	L1	30	30	36	35	47	53	17,5	22	23	24	29,5	30	39	36,5	38,5
UNITOP 1580.Ø.05/1F (1 pieces)	SA	92,5	101,5	109,5	114	138	148,5	64	70	71,5	80,5	85,5	93,5	104	116	132,5
	TG	32,5	38	46,5	56,5	72	89	18	22	26	32	42	50	62	82	103
	TR	32	36	45	50	63	75	18	22	26	32	42	50	62	82	103
	XA	74,5	80	85	89,5	105	117,5	55,5	58,5	61	68,5	72	77	84,5	94	109,5
	Weight gr.	50	70	120	180	320	400	20	35	45	75	100	150	250	390	500

UNITOP rear male clevis for bores from 12 to 25



This type of mounting allows anchorage of the cylinder both parallel and at the right angle to the plane. The cylinder rod can oscillate and self-align to the connected load. It's made with aluminium alloy black painted or with zinc plated steel (from Ø 20).

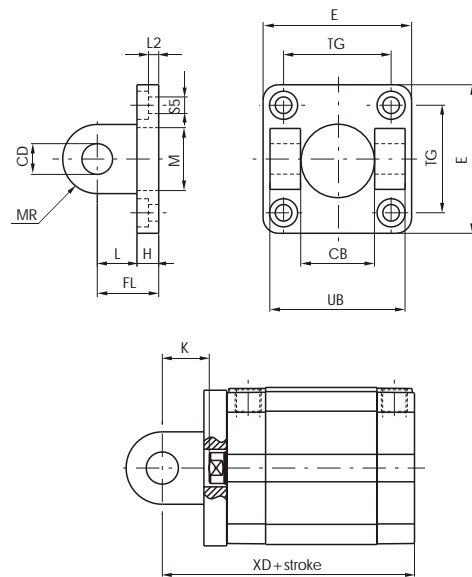
Ordering code	12-16	20	25
Bore	12-16	20	25
CB(h14)	12	16	16
CD (H9)	6	8	8
E ($\pm 0,5$)	27	34	38
FL	16	20	20
H	6	6	6
L	10	14	14
L2 ($\pm 0,5$)	2,6	2,6	2,6
M (H11)	10	12	12
MR	6	8	8
P (+0,3)	3	3	3
S5 (H13)	4,5	5,5	5,5
TG ($\pm 0,2$)	18	22	26
XD1	58,5	62,5	65
Weight gr.	Steel	/	70
	Aluminium	13	25



Front female clevis for bores from 32 to 100



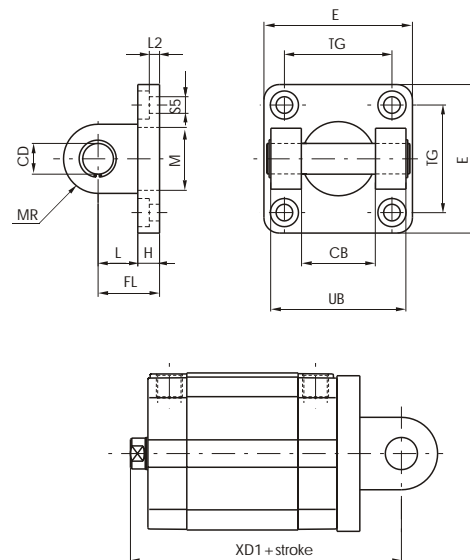
This type of mounting allows anchorage of the cylinder both parallel and at the right angle to the plane. The cylinder rod can oscillate and self-align to the connected load. It's made with aluminium alloy black painted or with zinc plated steel.



Rear female clevis for bores from 32 to 100



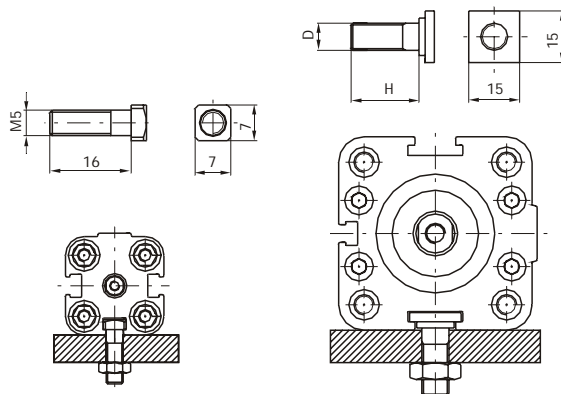
This type of mounting allows anchorage of the cylinder both parallel and at the right angle to the plane. The cylinder rod can oscillate and self-align to the connected load. It's made with aluminium alloy black painted or with zinc plated steel.



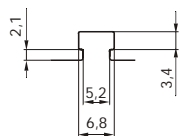
		ISO Dimensions						UNITOP Dimensions						
		32	40	50	63	80	100	32	40	50	63	80	100	
Bore		32	40	50	63	80	100	32	40	50	63	80	100	
CB (H14)		26	28	32	40	50	60	26	28	32	40	50	60	
CD (H9)		10	12	12	16	16	20	10	12	12	16	16	20	
E		45	52	65	75	95	115	48	58	66	83	102	123	
FL		22	25	27	32	36	41	22	25	27	32	36	41	
H		9	9	11	11	14	14	9	9	11	11	13	15	
K		16	18,5	19,5	24,5	28	31	16	18,5	19,5	24,5	28	31	
L		13	16	16	21	22	27	13	16	16	21	23	26	
L2		5,5	5,5	6,5	6,5	10	10	5,5	5,5	6,5	6,5	10	10	
M		30	35	40	45	45	55	14	14	18	18	23	28	
MR		10	12	12	16	16	20	10	12,5	12,5	15	15	20	
S5		6,6	6,6	9	9	11	11	6,6	6,6	9	9	11	11	
TG		32,5	38	46,5	56,5	72	89	32	42	50	62	82	103	
UB		45	52	60	70	90	110	45	52	60	70	90	110	
XD		66,5	70,5	72,5	82	92	107,5	66,5	70,5	72,5	82	92	107,5	
XD1		72,5	77	80	89,5	100	117,5	72,5	77	80	89,5	100	117,5	
Ordering code	Aluminium													
	Steel													
ISO steel														
1500.Ø.08F														
front														
1500.Ø.09F														
rear														
UNITOP														
Weight gr.	Alum. Steel	Front	/	/	/	/	/	/	180	310	420	700	1240	2210
		Rear	/	/	/	/	/	/	220	360	480	830	1390	2500
	Alum.	Front	40	70	120	170	360	570	65	110	145	240	430	770
		Rear	80	120	180	300	500	860	80	125	170	290	480	865



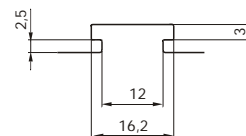
Slot fixing screws



Example of mounting with square head screws



Small slot detail



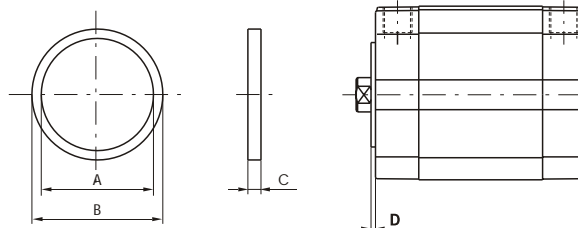
Large slot detail

	Small slot	Large slot		
Code	1500.17F	1500.15F	1500.16F	1500.18F
Bore	12÷25	32	40÷63	80÷100
D	/	M6	M8	M10
H	/	15	20	25
Weight gr.	8	10	18	25

Centering rings



This aluminium ring allows the center assembling of the cylinder.



	32	40	50	63	80	100
Bore	32	40	50	63	80	100
A	25	30	35	40	40	50
B (e11)	30	35	40	45	45	55
C	3,5	3,5	3,5	4,5	5,5	5,5
D	1,5	1,5	1,5	2	2,5	2,5
Weight gr.	2	2	3	4	5	6

Ordering code

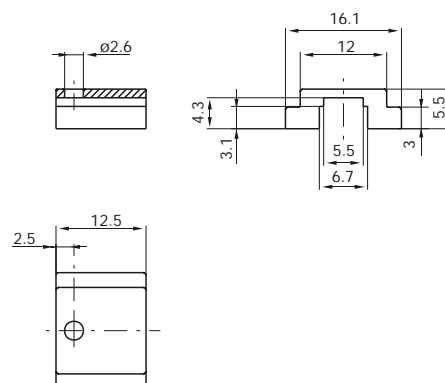
1580.0.02F

Sensor adapter



Weight gr. 3

This nylon adapter allows the miniature sensor assembly on large slot.



Ordering code

1580.01F

RODLESS CYLINDERS

Series 1600

General	6.0
Rodless cylinders	6.1÷7.5
Accessories	6.6÷6.9
Cable cylinders	6.10



General

The purpose of producing a rodless cylinder is to provide space saving over conventional cylinders. On a traditional rod type cylinder, the total space occupied with rod out is more than double the length of the cylinder, while with rodless cylinder it's little more than its stroke.

The barrel, made with extruded anodized aluminium, is formed with a longitudinal slot allowing the connection between piston and mounting carriage.

The pneumatic seal is obtained with the use of a hardened stainless steel band, located and retained along the slot with a magnetic field generated by two bands of **plastoferrite**.

Another stainless steel band is positioned outside, closing the slot avoiding contamination to the inner part of the cylinder.

A slide rail system separates the two bands, in the pressure free area between the two piston seals, allowing the movement of the mounting carriage.

The main feature of this cylinder is the robust piston mounting plate system. Guide blocks are oversized to withstand high stress; furthermore, the steel bands system ensures a long cylinder life even with high temperature and speed.

Other important features include the possibility to feed the two cylinder chambers from a single end cap, installation of magnetic piston for controlling the reed contact sensors, adjustable cushioning and simple maintenance procedure. Standard accessories include foot mounting brackets for installation on cylinder and caps, intermediate mounting brackets to give support to long stroke cylinders under load (over one meter), an oscillating coupling device for installation between the mounting plate and the load and on request, a very precise external movement device.

Construction Characteristics

End covers	anodized aluminium alloy 2011
Barrel	extruded anodized aluminium alloy 6060
Bands	tempered stainless steel
Mounting plate	extruded anodized aluminium alloy 6060
Piston	acetal resin
Guide blocks	acetal resin
Cushion bearings	aluminium alloy 2011
Piston seals	special 80 shore nitril mixture, wear resistant
Other seals	NBR oil-resistant rubber

Technical characteristics

Fluid	filtered and lubricated air
Pressure	0,5 ÷ 8 bar
Working temperature	- 5°C ÷ + 70°C
Max. speed	1,5 m/sec. (normal working conditions)
Bores	Ø 25 - 32 - 40 - 50 - 63
Max. stroke	6 m

"Attention: We recommend using dry air if the working temperature is lower than 0°C"

For applications where a low smooth uniform operations speed is required, your specific request on purchase order is needed so that we can use the proper special grease.

Use and maintenance

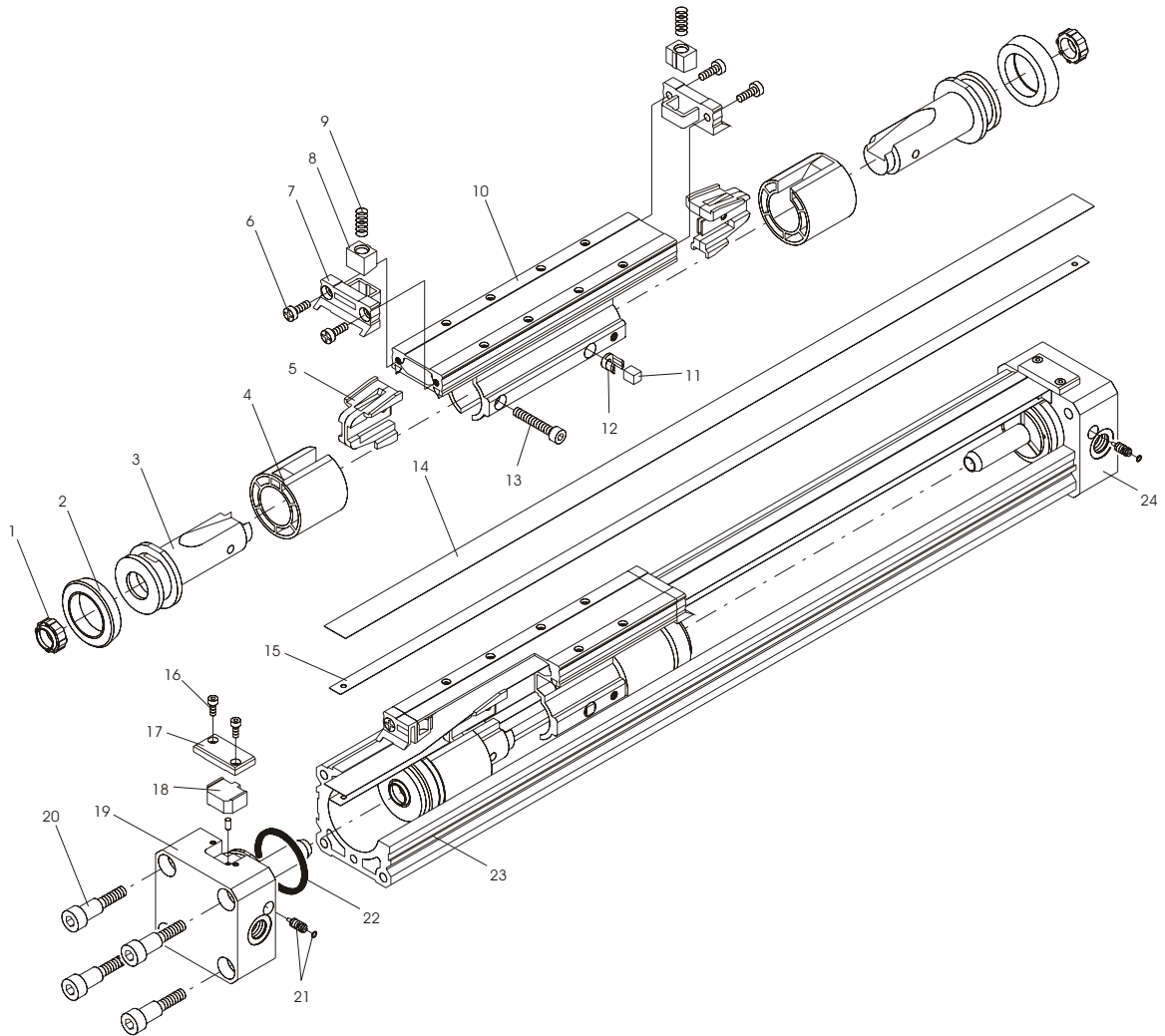
This type of cylinder, due to its characteristics, has to be used within certain criteria. Correct use will give long and troublefree operation. Filtered and lubricated compressed air reduce seal wear. Verify that the load will not produce unforeseen stresses. Never combine high speed with heavy load. Always support the long stroke cylinder with intermediate brackets and never exceed the specified working conditions.

If maintenance is required, follow the instructions supplied with the repair kit.

Lubricate with hydraulic oils of class H, such as CASTROL type MAGNA GC 32.

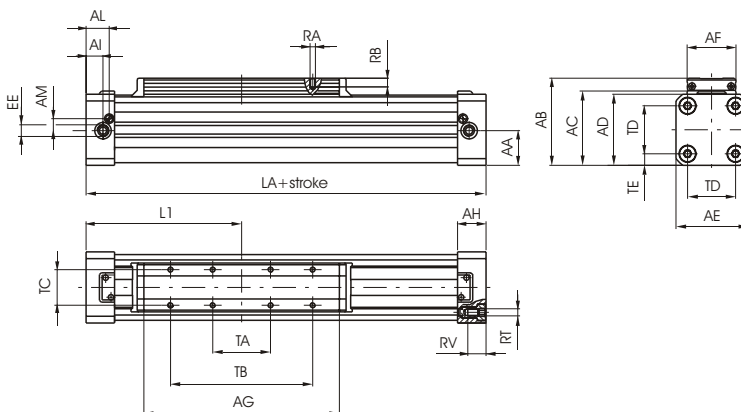


Drawing



Pos.	Description	N. Pieces	Pos.	Description	N. Pieces
1	Cushion seal	2	13	Screw, piston	2
2	Piston seal	2	14	Band, external	1
3	Piston	2	15	Band, internal	1
4	Guide bearing ring	2	16	Screw, plate	4
5	Band guide	2	17	Plate, upper	2
6	Screw, cover	4	18	Plate, lower	2
7	Cover, mounting plate	2	19	Left end cover	1
8	Band stretcher	2	20	Tie rod	8
9	Spring	2	21	Cushion adj. screw	2
10	Mounting plate	1	22	Seal, end cover	2
11	Magnet	2	23	Barrel	1
12	Bushing, magnet	2	24	Right end cover	1

Basic version



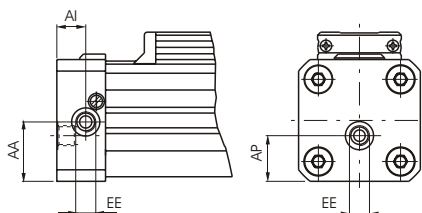
Ordering code

1605.Ø.stroke.01.M

Max. Stroke 6 mt.

Possibility of a single feed cylinder head

Left head

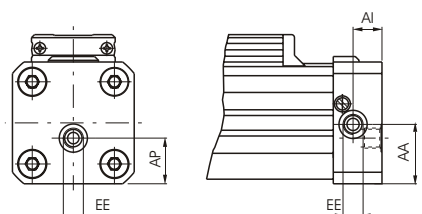


Ordering code

1605.Ø.stroke.02.M

Max. Stroke 6 mt.

Right head



Ordering code

1605.Ø.stroke.03.M

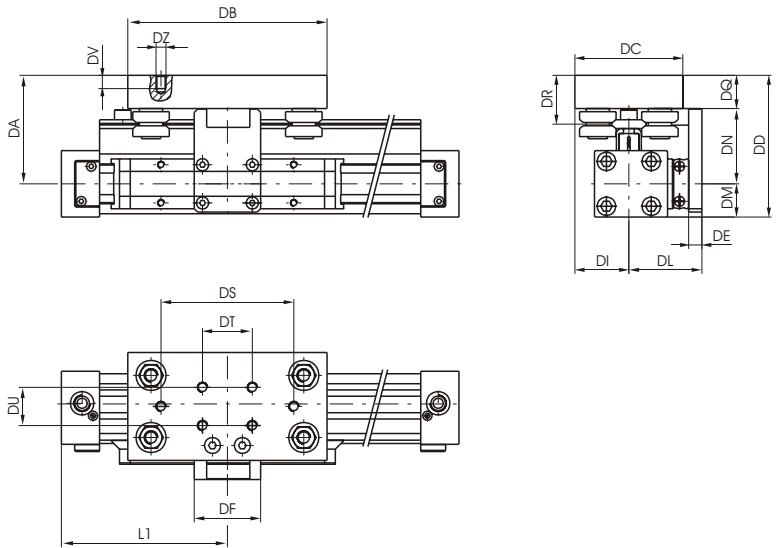
Max. Stroke 6 mt.

Bore	25	32	40	50	63	
AA	19,5	25,5	31	39	46,5	
AB	56	70	80	98	113,5	
AC	48,5	60	70	85	100	
AD	44	55	65	78	95	
AE	40	55	65	78	95	
AF	30	40	40	55	55	
AG	117	146	186	220	255	
AH	23	27	30	32	36	
AI	12,5	14,5	17,5	19	23	
AL	19	22,5	24,5	26	30	
AM	7,5	10,5	11,5	13,5	16	
AP	13	15,2	23	30	35,5	
EE	G 1/8"	G 1/4"	G 1/4"	G 1/4"	G 3/8"	
L1	100	125	150	175	215	
LA	200	250	300	350	430	
RA	M 4	M 5	M 5	M 6	M 6	
RB	7,5	9,5	9,5	11,5	11,5	
RT	M 5	M 6	M 6	M 8	M 8	
RV	13,5	16,5	16,5	20,5	20,5	
TA	30	40	40	65	65	
TB	80	110	110	160	160	
TC	23	30	30	40	40	
TD	27	36	47	54	68	
TE	6,5	9,5	9	12	13,5	
Weight gr.	Stroke 0	900	1650	2650	4330	8010
	every 100 mm.	225	340	490	725	1070
STROKE TOLLERANCE: + 2 mm.						



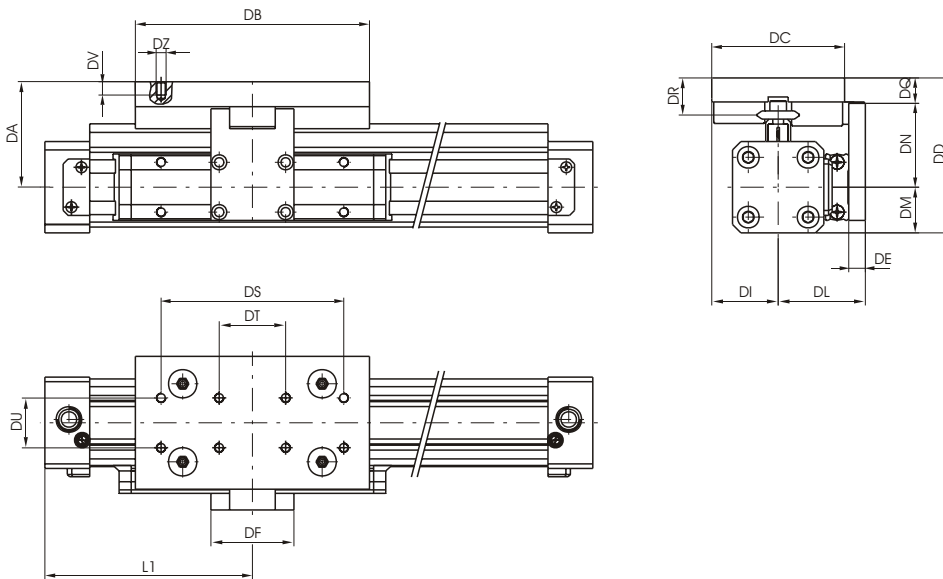
Cylinder with linear control unit
(Ø 25, Ø32 and Ø40)

Cylinder Ø 25



Ordering code
1605.Ø.stroke.01.MG (max. stroke 3 m.)

Cylinder Ø 32, Ø 40



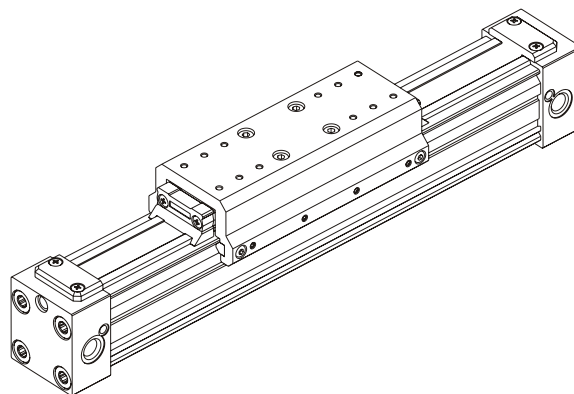
Bore	DA	DB	DC	DD	DE	DF	DI	DL	DM	DN	DQ	DR	DS	DT	DU	DV	DZ	L1	Weight guide	every 100 mm
25	65	120	65	85	8	40	32,5	44	20	45,5	19,5	29	80	30	23	8	M6	100	gr. 850	gr. 90
32	63	141	80	90,5	10	50	40	52,5	27,5	48,5	14,5	21,5	110	40	30	8	M5	125	gr. 950	gr. 90
40	68,5	141	80	101	10	50	40	57,5	32,5	54	14,5	21,5	110	40	30	8	M5	150	gr. 950	gr. 90

For cylinder weight refer to base version

Construction characteristics of linear control unit

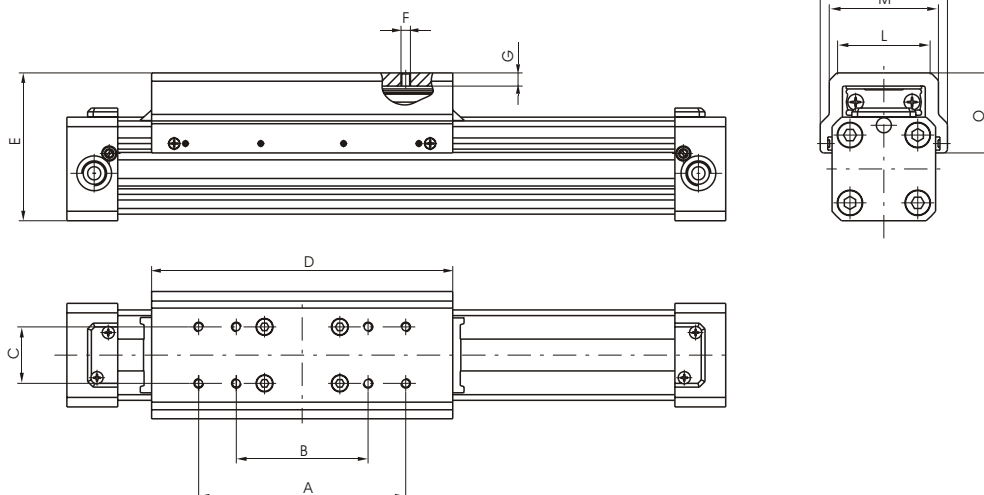
Rod	carbon steel with hardness higher than 55-60 HRC
Bearing with shaft	shielded bearing with shaped ring
Carriage plate	anodized aluminium
Cover	acetal resin

Cylinder with sliding shoes guide
 (Ø 25 (1"), Ø 32 (1-1/4") and Ø 40 (1-5/8"))



Ordering code

1605.Ø.corsa.01.MH Cylinder with sliding shoes guide

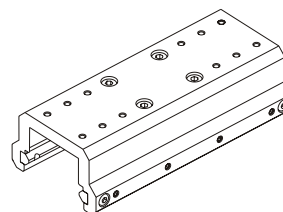


CYLINDER BORE	A	B	C	D	E	F	G	H	L	M	O	Weight gr.
Ø 25	80	55	23	130	64 ^{±1}	M4	6.5	57	36	42	32	235
Ø 32	110	70	30	160	78.5 ^{±1}	M5	7	68	50	58	42.5	445
Ø 40	110	70	30	202	88.5 ^{±1}	M5	7	77	52	60	45.5	595

For cylinders weight refer to base version

Ordering code

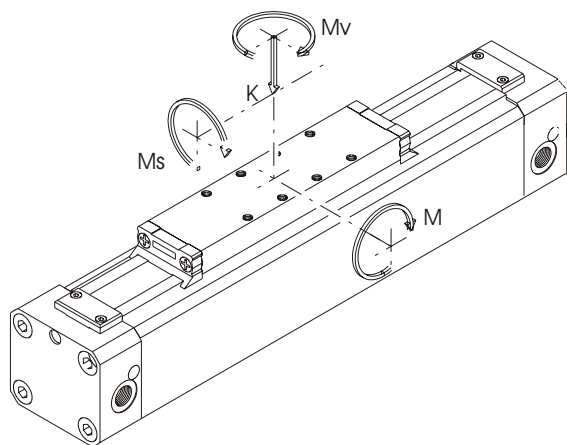
1600.Ø.05F Complete sliding shoes guide



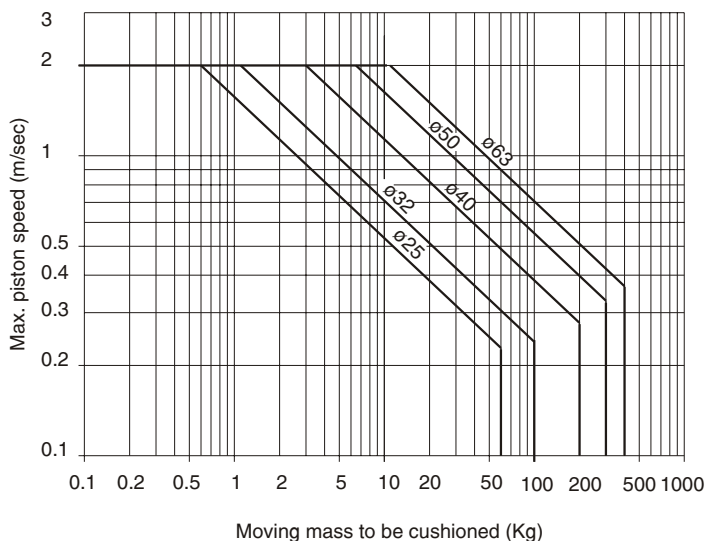
Construction Characteristics of Guide

Sliding shoes guide	reinforced carbon fiber nylon
Mounting plate	extruded anodized aluminium

Basic version cylinder



Operating end stroke decelerator diagram

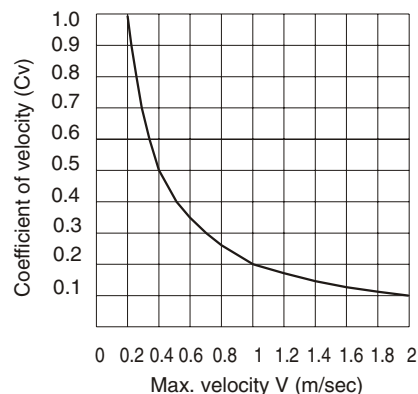


Recommended loads and moments in static conditions

CYLINDER BORE	DECELERATING STROKE (mm)	MAX. RECOMMENDED LOAD K (N)	MAX. RECOMMENDED BENDING MOMENT M (Nm)	MAX. RECOMMENDED CROSS MOMENT Ms (Nm)	MAX. RECOMMENDED TWISTING MOMENT Mv (Nm)
25	20	300	15	0,8	3
32	25	450	30	2,5	5
40	31	750	60	4,5	8
50	38	1200	115	7,5	15
63	49	1600	150	8,5	24

Calculation of permissible load (Kd) in dynamic conditions $K_d = K \cdot C_v$

Coefficient of velocity diagram



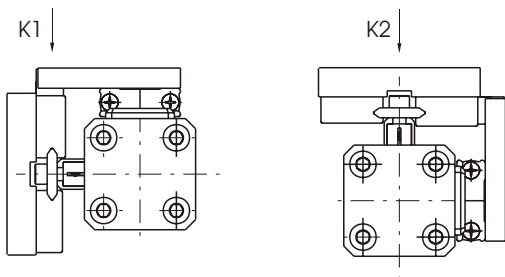
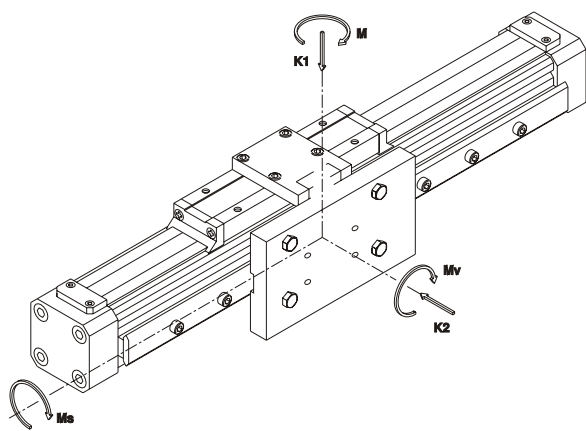
Loads under combined stressing conditions

It is important to take into consideration the following formula when there are a combination of forces with torque:

$$\left[\left(2 \times \frac{M_s}{M_{s \max}} \right) + \left(1.5 \times \frac{M_v}{M_{v \max}} \right) + \frac{M}{M_{\max}} + \frac{K}{K_{\max}} \right] \times \frac{100}{C_v} \leq 100$$

Cylinders with linear control unit Ø32 and Ø40

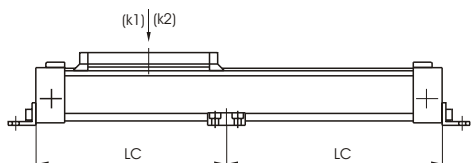
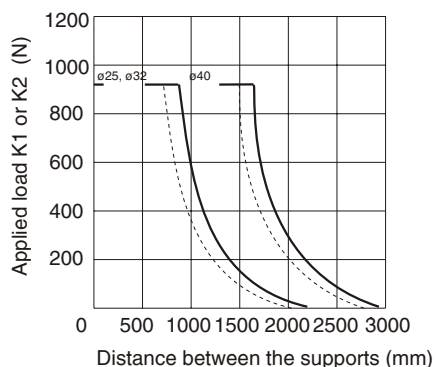
Max. suggested loads and moments



K1 (N)	K2 (N)	M (Nm)	Ms (Nm)	Mv (Nm)
960	960	40	12	40

Max. load (K1 or K2) depending on the distance LC between the supports

K1 K2

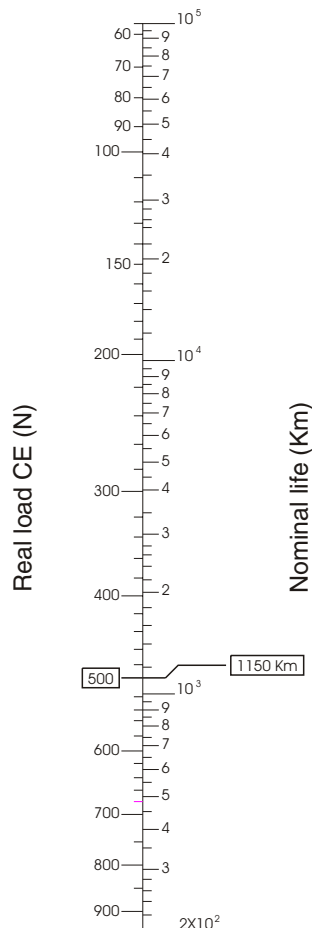


Real load (CE) under combined stressing conditions

It is important to take into consideration the following formula when there are a combination of forces with torque :

$$CE = [K1 + K2 + (24 \times M) + (80 \times Ms) + (24 \times Mv)] \leq 960$$

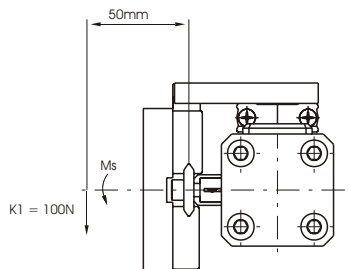
Nomograph load / life



All data refers to a linear control unit properly lubricated with linear speed < di 1,5 m/s

Example to compute the life

Compute the linear control unit life with a load of 100 N applied 50 mm off its axle.



$$Ms = 0,05 \times 100 = 5 \text{ Nm}$$

$$K1 = 100 \text{ N}$$

How to compute the real load using the formula:

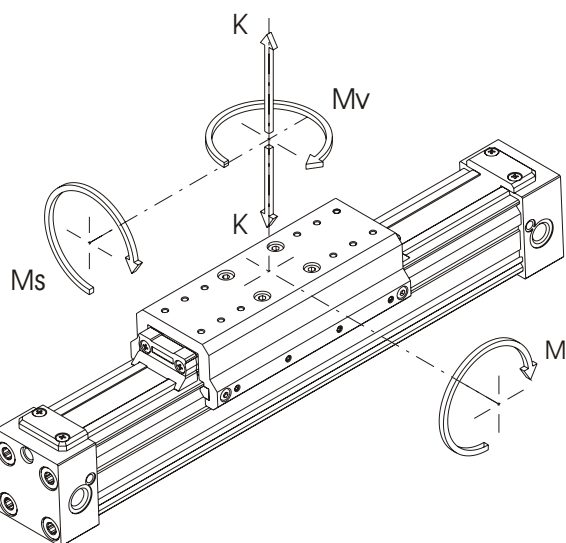
$$CE = [K1 + K2 + (24 \times M) + (80 \times Ms) + (24 \times Mv)]$$

$$CE = [100 + 0 + (24 \times 0) + (80 \times 5) + (24 \times 0)] = 500 \text{ N}$$

After having verified that the CE is lower than 960 N we realize that the life is 1150 Km from the nomograph.

Cylinder with sliding shoes guide $\varnothing 25$, $\varnothing 32$ and $\varnothing 40$

Max. suggested loads and moments



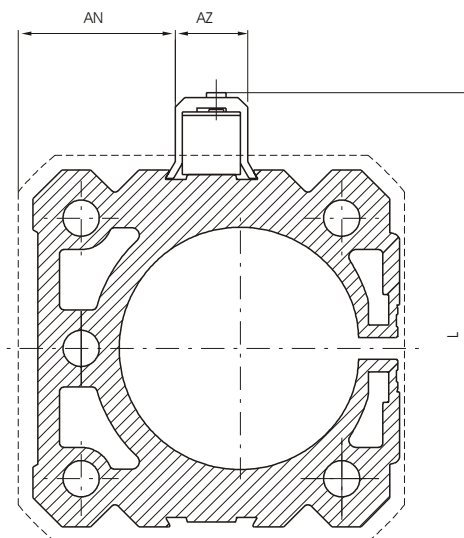
Recommended loads and moments in static conditions

CYLINDER BORE	MAX RECOMMENDED LOAD K (N)	MAX RECOMMENDED BENDING MOMENT M (Nm)	MAX RECOMMENDED CROSS MOMENT M_s (Nm)	MAX RECOMMENDED TWISTING MOMENT M_v (Nm)
$\varnothing 25$	300	20	1	4
$\varnothing 32$	450	35	3	6
$\varnothing 40$	750	70	5	9

Sensor brackets

Ordering code

1600.A



Bore	25	32	40	50	63
AN	12,5	20	25	32,5	40
AZ	15	15	15	15	15
L	55	68	79	94	110
Weight gr.	6	6	6	6	6

Sensors

For technical characteristics and ordering codes see page 8.0 and following.

Instruction on how to use the sensors propely

Particular attention must be paid not to exceed the working limits listed in the tables and that the sensor is never connected to the mains without a load connected in series; these are the only measures that if not observed can put the circuits out of order. In the case of direct current (D.C.) connection polarities must be respected, that is the brown wire to the positive load (+) and the blue to the negative (-). If these are inverted the sensor remains switched, the load connected and the led turned off. However, this would not damage the circuit.

For the "U" type sensors attention must be paid that the length of the cable doesn't exceed 8 meters, with tension above 100 V. In this case a serial resistance is addad to reduce the capacitive effects of the line.

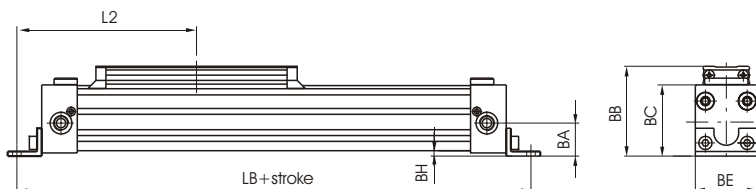
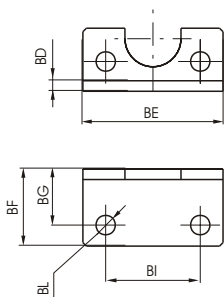
As an example 1000 Ω per 100-130 V e 2000 Ω per 200-240 V.



Mounting foot brackets

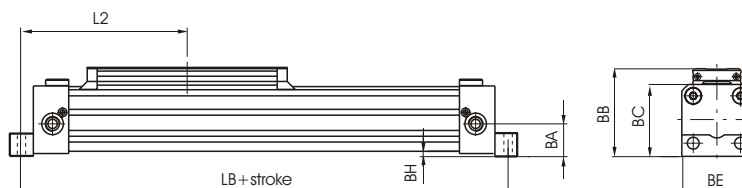
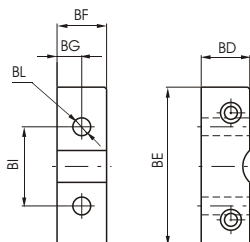
Ordering code

1600.Ø.01F (1 piece)



**Bore
25 - 32**

Bore	25	32	40	50	63
BA	21,5	28	32,5	41	49
BB	58	72,5	81,5	100	116
BC	46	57,5	66,5	82	97,5
BD	3	3	20	25	30
BE	40	55	65	80	95
BF	22	25	25	25	30
BG	16	18	12,5	12,5	15
BH	3,5	6	4,5	5	5
BI	27	36	30	40	48
BL	5,5	6,6	9	9	11
L2	116	143	162,5	187,5	230
LB	232	286	325	375	460
Weight gr.	30	45	65	110	190

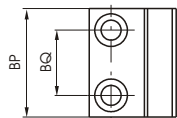
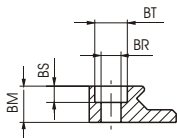


**Bore
40 - 50 - 63**

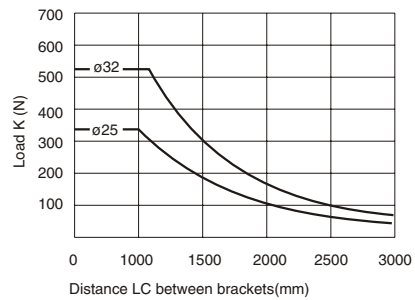
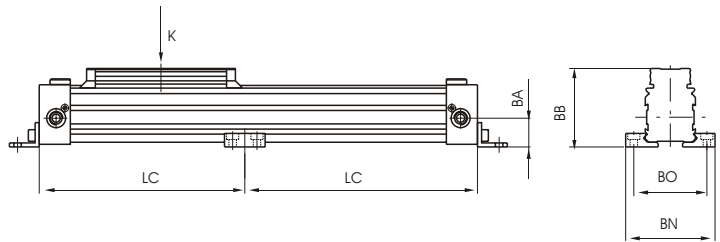
Intermediate support

Ordering code

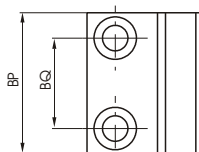
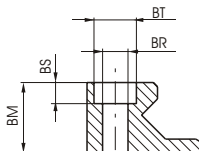
1600.Ø.02F (1 piece)



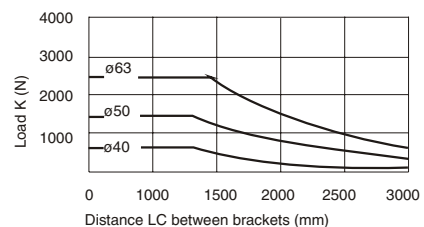
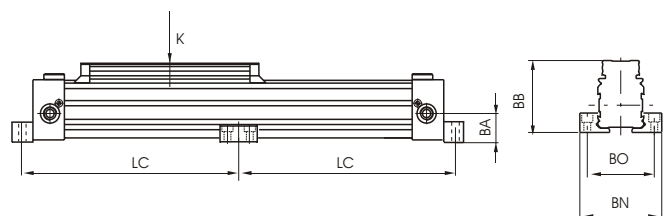
**Bore
25 - 32**



Bore	25	32	40	50	63
BA	21,5	28	32,5	41	49
BB	58	72,5	81,5	100	116
BM	10	18	18	25	30
BN	66	86	96	120	140
BO	54	70	80	100	120
BP	30	40	40	50	50
BQ	18	25	25	32	32
BR	5,5	6,6	6,6	9	9
BS	4,5	5,5	5,5	7,5	7,5
BT	9	11	11	15	15
Weight gr.	25	80	80	160	215



**Bore
40 - 50 - 63**



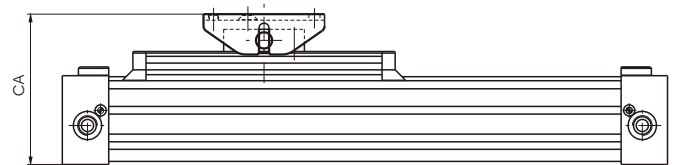
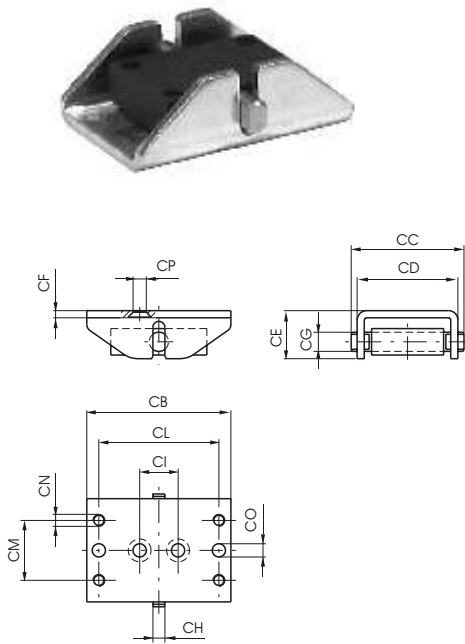


Oscillating hinge

Ordering code

1600.Ø.03F

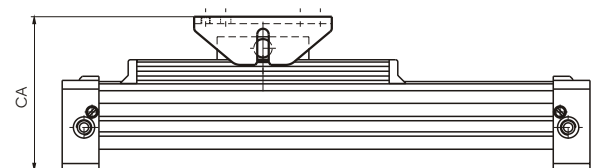
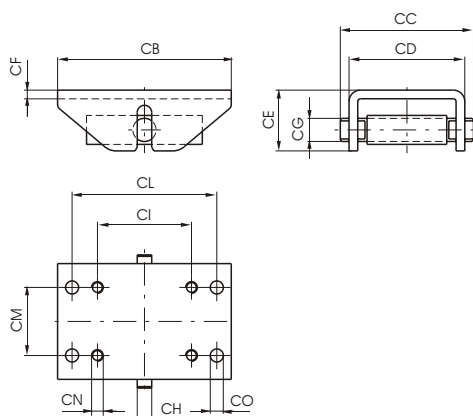
**Bore
25 - 32 - 40**



Bore	25	32	40	50	63
CA (± 5.5)	76	99,5	108,5	135,5	151
CB	60	100	100	120	120
CC	47	64	64	92	92
CD (± 5)	42	56	56	80	80
CE	20	30	30	42	42
CF	3	4	4	6	6
CG	8	12	12	16	16
CH	5	8	8	10	10
CI	16	40	40	65	65
CL	50	80	80	100	100
CM	25	30	30	47	47
CN	M 5	M 6	M 6	M 8	M 8
CO	5,5	6,5	6,5	9	9
CP	5,5	7	7	-	-
Weight gr.	130	380	380	990	990



**Bore
50 - 63**



General

The cable cylinders work in a linear translation systems, they are very compact and are to be used where a normal cylinder with a rigid rod is too cumbersome. The main characteristic of the cable cylinders is the absence of the rod which, in coming out of the end plate at the end of the stroke, doubles the total overall dimension of the cylinder. In the case of the cable cylinder, the rod is replaced by a metal rilsan-coated cable. It is connected to the piston and coming at the maximum point of stroke never exceeds the overall dimensions of the cylinder.

The cable are connected to the bracket with clamps which serve also to regulate the tension. Because of the construction characteristics of this type of cylinder it must be used with much attention. The cable is capable of supporting large stress due to heavy load and high speed. Unfortunately, we cannot give definitive limits of use if not in presence of masses of a few kilograms to be translated (7 ÷ 10 for 16 and 20 ÷ 25 for Ø 25) with speed inversely proportional to the entity of the same load (max 0,5 m/sec). This is done in a way that the load always has a mechanical stop at the end of the stroke. The magnetic piston version legthens the overall dimensions by 50 mm; the serie 1200 microcylinders sensors are used along with the clips of that series.

Construction characteristic

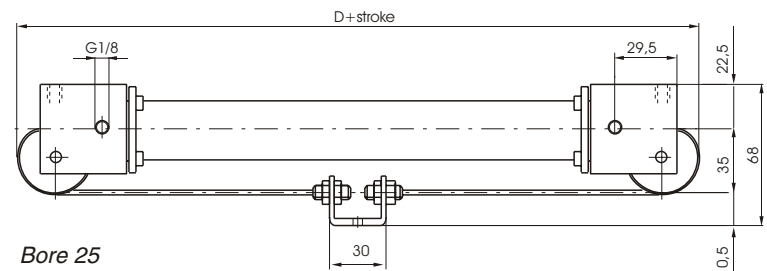
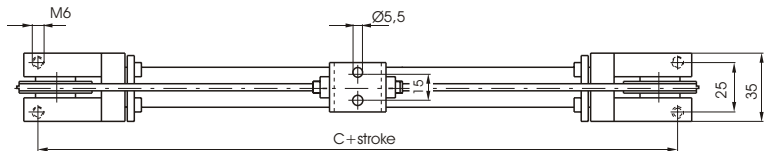
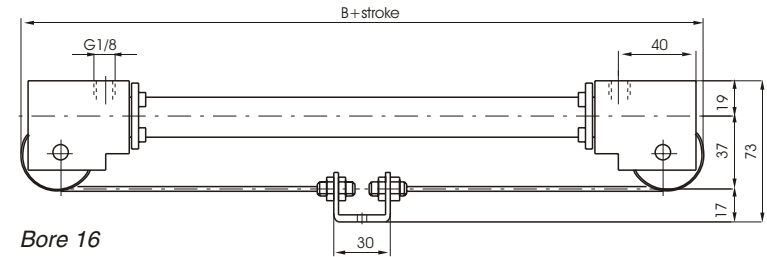
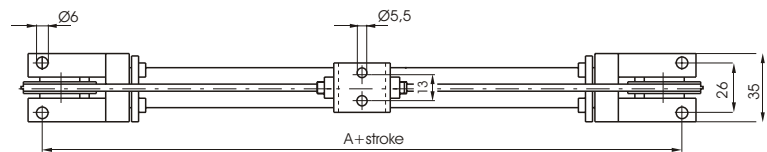
End plates	anodized black aluminium	Piston seal	NBR 80 Shore (at lip)
Barrel	anodized aluminium	Cable seal	polyurethane mixture
Piston	aluminium	Bracket	steel
Cable	steel	Cable clamps	brass
Cable covering	rilsan	Pulleys	aluminium with ball bearing

Technical characteristics

Fluid: filtered and lubricating air | Max. pressure: 6 bar | Min. and max. temperature: -5°C ÷ +70°C | Max speed: 0,5 m/sec.

"Attention: We recommend using dry air if the working temperature is lower than 0°C"

	A	B	C	D
Standard	111	132	86	124
Magnetic	161	182	136	174



Ordering code
1601.Ø.stroke
1601.Ø.stroke.M
Version with magnetic piston

Maintenance

The cable is obviously the part most subject to breakage. The cylinder can be disassembled for replacement of the cable which is supplied already complete with threaded bushings to be screwed on to the piston. Once the wear of the barrel and seals has been checked, the cylinders can be reassembled by screwing on the end plates. Next, the ends of the cable are attached to the bracket by way of clamps and the tension regulated. The tension is correct when the cable is not cambered.

MAGNETIC SENSORS FOR CYLINDERS

General	8.0
Magnetic sensors REED type series 1500	8.1-8.3
Magnetic sensors HALL effect series 1500	8.4-8.5
Miniaturized magnetic sensors REED and HALL type series 1580	8.6



Magnetic sensors for cylinders

General

The limit switches, or magnetic sensors, have to be mounted on cylinders with magnetic piston. These, when hit by the magnetic field generated by the piston as it approaches, close the circuit sending an electrical signal by relè solenoid valve control, etc. or converse with the controlling electronic system situated on the machine. There are available magnetic sensor with ampulla Reed type and with Hall effect. The sensors are attached to the cylinder by a proper clamp and have a Led insertion indicator.

The magnetic sensors with ampulla are made in 3 versions:

- U (universal) functioning with continuous or alternate current, protected by varistor Led indicator.
- U/1 (universal) functioning with continuous or alternate current, with contact Reed only to avoid 3 volt tension drop caused by led.
- D.C. for functioning with continuous current only, utilized for switching heavy loads since the contact Reed become the pilot of a semi-conductor power circuit.

Note: The magnetic sensors are according to the Directive **EMC 89/336/CEE** and following amendments.

Instruction on how to use the sensors properly

Particular attention should be paid not to exceed the wide operating limits showed in the specification table.

Besides the sensor has never to be connected to the mains if a load has not been yet connected in series. These are the only cares that, if not followed, may cause damages to the sensor.

Furthermore it has to be considered that, while loading, the current absorbed by the sensor might be 50% higher that the rated one. Therefore, specially while using alternate current (AC) there is the need to observe the appropriate safety margins.

In the case of direct current (DC) sensors (see code numbers 1500.DC and 1600.DC), the polarity of the connection has to be observed: the brown cable must be connected to the plus (+) and the blue one to the minus (-). Attention has also to be paid to the orientation of the connector, cause by inverting the connection the circuit will be not damaged, but the sensors will remain switched, the load connected and the led turned off.

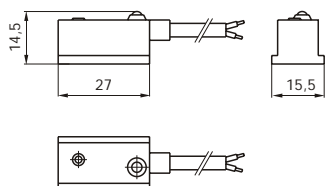
Due to the particular structure of the switching circuit of these sensors, which is made of semiconductors, there are no particular contra-indications related to its use: the supported load may therefore be indifferently of inductive, capacitive or resistive type, and similarly the length of the connecting wire is not of importance.

On the contrary, in case of use universal (U) sensors with direct current (DC), attention has to be paid to the length of the cable, which has to be no longer than 10m with 48V voltage.

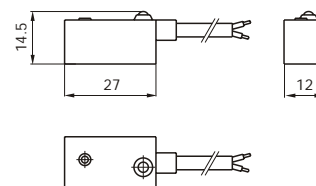
Besides, there are some other external factors to be taken into consideration, such as proximity of powered cable, magnetic fields produced by electric motors, mass of iron too close to the sensor, and so on: these factors have to be therefore carefully avoided, being able to influence the sensors and accordingly to cause irregularity of operation.



Sensors with 2 m. cable (REED type)



for cylinders and microcylinders



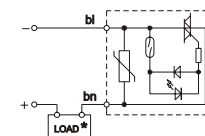
for rodless cylinders

Ordering code

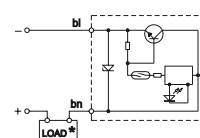
Cylinders and microcylinders	1500.A.C. 1500.D.C. 1500.U 1500.U/1	sensor for alternating current with led sensor for continuous current with led universal sensor with led universal sensor without led (REED ampulla only)
Rodless cylinders	1600.A.C. 1600.D.C. 1600.U 1600.U/1	sensor for alternating current with led sensor for continuous current with led universal sensor with led universal sensor without led (REED ampulla only)

Diagrams and connections

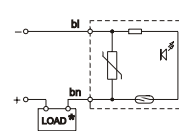
Type - a.c.



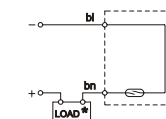
Type - d.c.



Type - U



Type U/1



Technical characteristics

	a.c.	d.c.	U		U/1	
			a.c.	d.c.	a.c.	d.c.
Maximum permanent current	1,5A	1,2A	0,5A		0,3A	
Maximum current (pulses of 0,5 sec.)	6A	1,5A	1A		0,8A	
Voltage range	12 ÷ 250V	12 ÷ 30V	3 ÷ 250V	12 ÷ 48V	0 ÷ 250V	0 ÷ 48V
Maximum permanent power	375VA	32W	20VA	15W	10VA	8W
Working temperature	-20°C ÷ 50°C		-20° C ÷ 70°C			
Maximum voltage drop	<3V	2V	<3V		0V	
Cable section	2x0,35 mm ²					
Degree of protection	IP 65					
Connecting time	2 ms					
Disconnecting time	1 ms					
Average working period	10 cycles					
Repetition of intervention point	± 0,1 mm					
Type of contact	N. O.					

★ Connection can be done either to negative or positive pole.

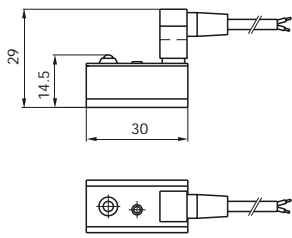
These sensors can be used on cylinders series:

- | | |
|---|---|
| <p>1200 for microcylind. with threaded end covers, with clamps code
for microcylind. "MIR" with rolled end covers, with clamps code
for microcylind. "MIR-INOX" with rolled end covers, with clamps code</p> <p>1306 - 1307 - 1308 brackets code</p> <p>1319 - 1320 brackets code</p> <p>1500 directly on groove</p> <p>1600 brackets code</p> | <p>1260.Ø.F
1280.Ø.F from Ø16 to Ø32
1280.Ø.FX from Ø16 to Ø32</p> <p>1306.A for cylind. from Ø 32 to Ø 63
1306.B for cylind. from Ø 80 to Ø 125
1306.C for cylind. from Ø 160 and Ø 200</p> <p>1320.A for cylinders Ø 32 and Ø 40
1320.B for cylinders Ø 50 and Ø 63
1320.C for cylinders Ø 80 and Ø 100
1320.D for cylinders Ø 125
1320.E for cylinders Ø 160
1320.F for cylinders Ø 200</p> <p>1600.A</p> |
|---|---|

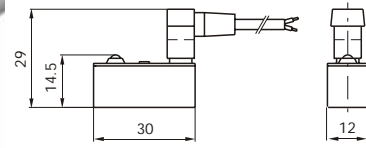


Magnetic sensors for cylinders

Sensors with connector (REED type)



for cylinders and microcylinders



for rodless cylinders

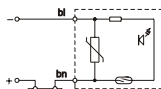
Ordering code

<p>Cylinders and Microcylinders</p>	<p>RS.UA RS.UANO RS.UA/1 RS.UA/1L RS.UC RS.DC RS.DCNO RS.UAC1 RS.UAC1/1 RS.UACH1/1L** RS.UCC1</p>	<p>universal sensor with led normally open N.O. universal sensor with led normally open N.O, according to standard IEC 947 universal sensor without led N.O. (REED ampulla only) universal sensor with led normally open N.O., for series assembly (3 wires) universal sensor with led normally closed N.C. sensor for continuous current with led normally open N.O. sensor for continuous current with led normally open N.O., according to standard IEC 947 universal sensor with led N.O. with connector and 2,5 m. Cable universal sensor without led N.O. with connector and 2,5 m. cable (REED ampulla only) universal sensor with led N.O. with connector and 2,5 m. cable, for series mounting (3 wires) universal sensor with led N.C. with connector and 2,5 m. Cable</p>
<p>Rodless cylinders</p>	<p>SRS.UA SRS.UA/1 SRS.UA/1L SRS.UC SRS.DC SRS.UAC1 SRS.UAC1/1 SRS.UACH1/1L** SRS.UCC1 SRS.DCC1</p> <p>C1 C2 C3 C1NO C2NO C3NO</p>	<p>universal sensor with led N.O. universal sensor without led N.O. universal sensor with led N.O., for series assembly (3 wires) universal sensor with led normally closed N.C. sensor for continuous current with led normally closed N.O. universal sensor with led N.O. with connector and 2,5 m. Cable universal sensor without led N.O. with connector and 2,5 m. cable (REED ampulla only) universal sensor with led N.O. with connector and 2,5 m. cable, for series assembly (3 wires) universal sensor with led N.C. with connector and 2,5 m. cable sensor for continuous current with led normally closed N.O., with connector and 2,5 m. Cable</p> <p>connector with 2,5 m. cable connector with 5 m. cable connector with 10 m. cable connector with 2,5 m. cable, according to standard IEC 947 connector with 5 m. cable, according to standard IEC 947 connector with 10 m. cable, according to standard IEC 947</p>

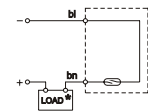
**Utilizzare solo connettori per sensori effetto HALL (vedi pag. 8.5)

Diagrams and connections

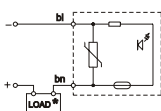
Type - UA



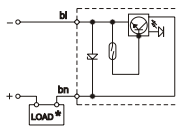
Type UA/1



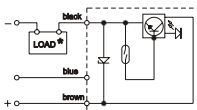
Type - UC



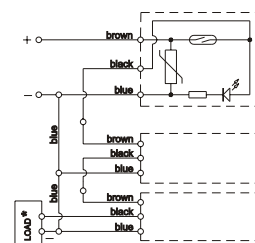
Type - d.c.



Type - DCNO



Type - UA/1L





Technical characteristics

	d.c.	U				U/1L		U/1	
		a.c.		d.c.		a.c.	d.c.	a.c.	d.c.
Type of contact	N.O.	N.O.	N.C.	N.O.	N.C.	N.O.		N.O.	
Maximum permanent current	1,2A	0,5A	0,3A	0,5A	0,3A	0,5A		0,5A	
Maximum current (pulses of 0,5 sec.)	1,5A	1A	0,8A	1A	0,8A	1A		1A	
Voltage range	12 ÷ 30V	3 ÷ 250V	3 ÷ 110V	12 ÷ 48V		24V		0 ÷ 250V	0 ÷ 48V
Maximum permanent power	32W	20VA	10VA	15W	8W	20VA	15W	10VA	8W
Working temperature	-20° C ÷ 70°C								
Maximum voltage drop	2V	<3V				0V			
Cable section	2x0,35 mm ²					3x0,35 mm ²		2x0,35 mm ²	
Degree of protection	IP 65								
Connecting time	2 ms								
Disconnecting time	1 ms								
Average working period	10 cycles								
Repetition of intervention point	± 0,1 mm								

★ Connection can be done either to negative or positive pole.

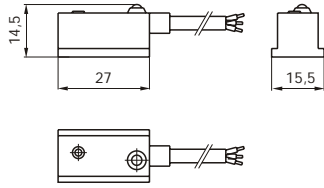
These sensors can be used on cylinders series:

- | | |
|---|--|
| <p>1200 for microcylind. with threaded end covers, with clamps code
for microcylind. "MIR" with rolled end covers, with clamps code
for microcylind. "MIR-INOX" with rolled end covers, with clamps code</p> <p>1306 - 1307 - 1308 brackets code</p> <p>1319 - 1320 brackets code</p> <p>1500 directly on groove</p> <p>1600 brackets code</p> | <p>1260.Ø.F
1280.Ø.F from Ø16 to Ø32
1280.Ø.FX from Ø16 to Ø32</p> <p>1306.A for cylind. from Ø 32 to Ø 63
1306.B for cylind. from Ø 80 to Ø 125
1306.C for cylind. from Ø160 and Ø200
1320.A for cylinders Ø 32 and Ø 40
1320.B for cylinders Ø 50 and Ø 63
1320.C for cylinders Ø 80 and Ø 100
1320.D for cylinders Ø 125
1320.E for cylinders Ø 160
1320.F for cylinders Ø 200</p> <p>1600.A</p> |
|---|--|

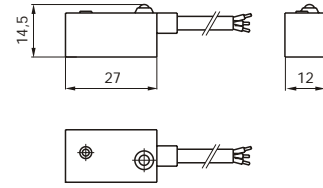


Magnetic sensors for cylinders

Sensors with 3 m. cable (HALL effect)



for cylinders and microcylinders



for rodless cylinders

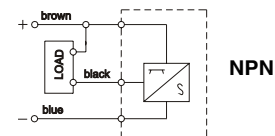
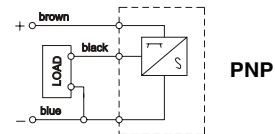
Ordering code

Cylinders and microcylinders	1500.HAP 1500.HAN 1500.HCP 1500.HCN	PNP sensor Hall effect with led, normally open N.O. NPN sensor Hall effect with led, normally open N.O. PNP sensor Hall effect with led, normally closed N.C. NPN sensor Hall effect with led, normally closed N.C.
Rodless cylinders	1600.HAP 1600.HAN 1600.HCP 1600.HCN	PNP sensor Hall effect with led, normally open N.O. NPN sensor Hall effect with led, normally open N.O. PNP sensor Hall effect with led, normally closed N.C. NPN sensor Hall effect with led, normally closed N.C.

Technical characteristics

Maximum permanent current	0,5A
Voltage range	10 ÷ 30V DC
Power (inductive load)	10W
Working temperature	-20° C ÷ 70°C
Cable section	3x0,25 mm ²
Degree of protection	IP 65
Connecting time	0,8 μs
Disconnecting time	0,3 μs
Average working period	10 ⁹ cicles
Repetition of intervention point	± 0,1 mm
Type of contact	N. O. o N.C.

Diagrams and connections

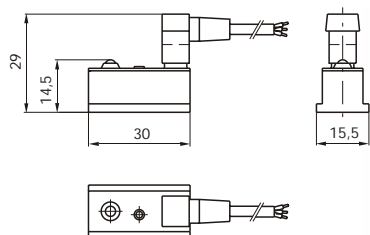


These sensors can be used on cylinders series:

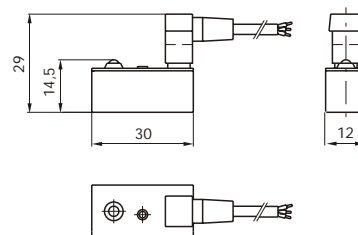
1200	for microcylind. with threaded end covers, with clamps code for microcylind. "MIR" with rolled end covers, with clamps code for microcylind. "MIR-INOX" with rolled end covers, with clamps code	1260.Ø.F 1280.Ø.F from Ø16 to Ø32 1280.Ø.FX from Ø16 to Ø32
1306 - 1307 - 1308	brackets code	1306.A for cylind. from Ø 32 to Ø 63 1306.B for cylind. from Ø 80 to Ø 125 1306.C for cylind. from Ø160 and Ø200
1319 - 1320	brackets code	1320.A for cylinders Ø 32 and Ø 40 1320.B for cylinders Ø 50 and Ø 63 1320.C for cylinders Ø 80 and Ø 100 1320.D for cylinders Ø 125 1320.E for cylinders Ø 160 1320.F for cylinders Ø 200
1500	directly on groove	
1600	brackets code	1600.A



Sensor with connector (Hall effect)



for cylinders and microcylinders



for rodless cylinders

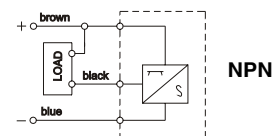
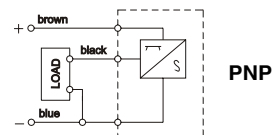
Ordering code

Cylinders and microcylinders	HS.PA HS.NA HS.PAC1 HS.NAC1	PNP sensor Hall effect with led, normally open N.O. NPN sensor Hall effect with led, normally open N.O. PNP sensor Hall effect N.O. with led, with connector and 2,5 m. cable NPN sensor Hall effect N.O. with led, with connector and 2,5 m. cable
Rodless cylinders	SHS.PA SHS.NA SHS.PAC1 SHS.NAC1	PNP sensor Hall effect with led, normally open N.O. NPN sensor Hall effect with led, normally open N.O. PNP sensor Hall effect N.O. with led, with connector and 2,5 m. cable NPN sensor Hall effect N.O. with led, with connector and 2,5 m. cable
	CH1 CH2	connector with 2,5 m. cable (3 wires) connector with 5 m. cable (3 wires)

Technical characteristic

Maximum permanent current	0,25A
Voltage range	6 ÷ 30V DC
Power (inductive load)	6W
Working temperature	-20° C ÷ 70°C
Cable section	3x0,25 mm ²
Degree of protection	IP 65
Connecting time	0,8 μs
Disconnecting time	0,3 μs
Average working period	10 ⁸ cycles
Repetition of intervention point	± 0,1 mm
Contact normally open	N. O.

Diagrams and connections



These sensors can be used on cylinders series:

1200 for microcylind. with threaded end covers, with clamps code
for microcylind. "MIR" with rolled end covers, with clamps code
for microcylind. "MIR-INOX" with rolled end covers, with clamps code

1306 - 1307 - 1308 brackets code

1319 - 1320 brackets code

1500 directly on groove

1600 brackets code

1260.Ø.F
1280.Ø.F from Ø16 to Ø32
1280.Ø.FX from Ø16 to Ø32

1306.A for cylind. from Ø 32 to Ø 63
1306.B for cylind. from Ø 80 to Ø 125
1306.C for cylind. from Ø 160 and Ø 200

1320.A for cylinders Ø 32 and Ø 40
1320.B for cylinders Ø 50 and Ø 63
1320.C for cylinders Ø 80 and Ø 100
1320.D for cylinders Ø 125
1320.E for cylinders Ø 160
1320.F for cylinders Ø 200

1600.A

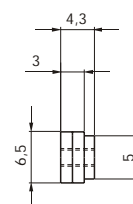
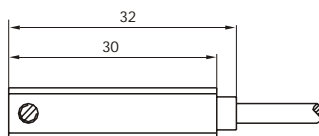


Magnetic sensors for cylinders

Sensor c/w 2.5 m. cable



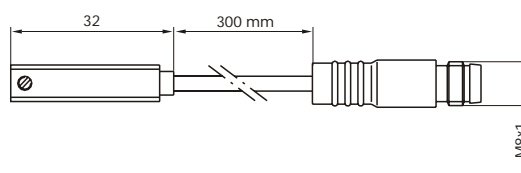
Weight gr. 27



Sensor c/w M8 connector (300 mm cable)



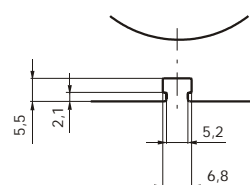
Weight gr. 15



Ordering codes

1580.U	Reed bulb sensor with led and 2.5 m cable
1580.UAP	Reed bulb sensor with led and 2.5 m cable (3 wires)
1580.HAP	PNP sensor Hall effect with led and 2.5 m cable
MRS.U	Reed bulb sensor with led and connector
MRS.UAP	Reed bulb sensor with led and connector (3 wires)
MHS.P	PNP sensor Hall effect with led and connector
MC1	M8 in line connector with 2.5 m cable (2 wires)
MC2	M8 in line connector with 5 m cable (2 wires)
MCH1	M8 in line connector with 2.5 m cable (3 wires)
MCH2	M8 in line connector with 5 m cable (3 wires)

Slot detail

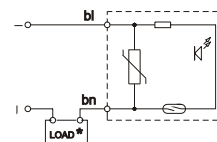


Normal standard "PNEUMAX" sensors suitable for large slot are available for cylinders from Ø 32 to Ø 100 (see catalogue 4 section 8).

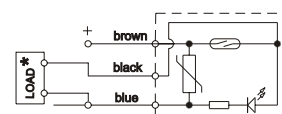
Technical characteristics

	1580.U	1580.UAP	MRS.U	MRS.UAP	1580.HAP	MHS.P
Type of contact	N.O.					
Maximum current (pulses of 0,5 sec.)	0,1A				0,2A	
Maximum permanent current	0,1A				0,2A	
Maximum permanent power	6VA				4W	
Voltage range A. C.	3 ÷ 30V	24V	3 ÷ 30V		/	
Voltage range D. C.	3 ÷ 30V	24V	3 ÷ 30V		12÷30V	
Working temperature	-20° C ÷ 70° C					
Maximum voltage drop	<3V	0V	<3V	0V	<3V	
Cable section	2x0,14	3x0,14	2x0,14			3x0,14
Degree of protection	IP 65					
Connecting time	0,5 ms				0,8 µs	
Disconnecting time	0,1 ms				0,3 µs	
Average working period	10 ⁷				10 ⁹	
Repetition of intervention point	± 0,1					

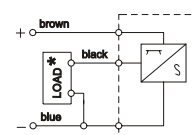
Diagrams and connections



with Reed bulb



with Reed bulb (3 wires)



Hall effect

NOTE : pay attention to the connected loads which should not exceed the recommendation

These sensors can be used on cylinders series:

- 1200** microcylinders "MIR" with rolled end covers, with clamps code **1280.Ø.FS**
microcylinders "MIR-INOX" with rolled end covers, with clamps code **1280.Ø.FSX**
- 1500**
 - Short stroke compact cylinders with sensor adapter code **1580.01F**
 - Europe compact cylinders - directly on groove from Ø 12 to Ø 25
 - directly on groove or with sensor adapter(code **1580.01F**) from Ø 32 to Ø 50
 - with sensor adapter (code **1580.01F**) from Ø 63 to Ø 100.

Direct operated solenoid valves Series 300

Miniature solenoid valves 10 mm

Microsolenoid valves 15 mm

Microsolenoid valves 22 mm

Microsolenoid valves 22 mm
Series Mounting

Microsolenoid valves 22 mm
Bistable

Electric pilot CNOMO 30 mm

Solenoid valves 32 mm




General

The direct operated solenoid valve is the interface between pneumatic and electronic. In fact, it is actuated by an electrical signal and in turn gives a pneumatic signal directly available for small users or for actuating bigger pneumatic distributors.

A wide range of valves are needed for satisfying various applications. For this need we have available miniature components with very low volume and electrical impute as well as solenoid valves with large flow rate and power for heavy duty operations. These solenoid valves are usually 3/2, normally closed or normally open, but there are available the 2/2, closed or open, for vacuum and others.

Note that the direct operated valves can only be used with bases, individual or multiple with M5 or G 1/8" thread or with connections.

PNEUMAX solenoid valves are  homologated valid for USA and Canada (file n. E206325-AIU2, AIU8). As for ordering code please see page 1.26 and 1.27.

Use and maintenance

Maintenance is normally not required for these components therefore the spare parts list is not provided.

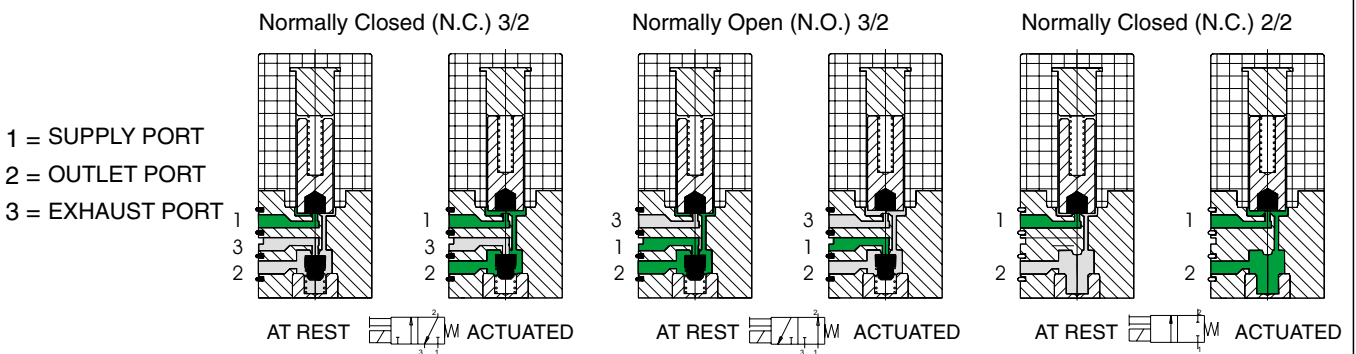
Their construction complexity and low cost do not make repair economically viable. It s easier and more economic to replace the complete valve in case of malfunction.

For proper lubrication use only hydraulic oil class H such as Castrol type MAGNA GC 32.

General

Direct operated solenoid valve differs from other types for its minimum overall dimensions. Its specific design allows single or gang mounting in narrow spaces. Its high switching speed and flow rate make this small valve useful for different applications and suitable also with other fluids than compressed air compatible with constructive material. All versions, equipped with override device, are 3/2 ways N.C. and N.O., 2/2 ways N.C. 12 or 24 olt D.C. with cables or connector also with led. Make sure that the fastening screws are tightened with maximum torque of 0,25 Nm.

Functional schematics



Construction

Electrical part:

Miniature solenoid consisting of a coil made of copper wire of different sizes depending on the voltage. Insulated according to F class standards and injection-moulded nylon-glass application. All parts forming the cladding, the electrical connections and the pole pieces are protected against corrosion. Electrical connection is via connector or directly with flying leads.

Mechanical part:

AISI 430F cores, AISI 302 return springs, NBR seals, thermoplastic polyester body, plug and manual control made of nickel-plated brass. The miniature solenoid valves are mounted on a separate base, multiple base or distributors.

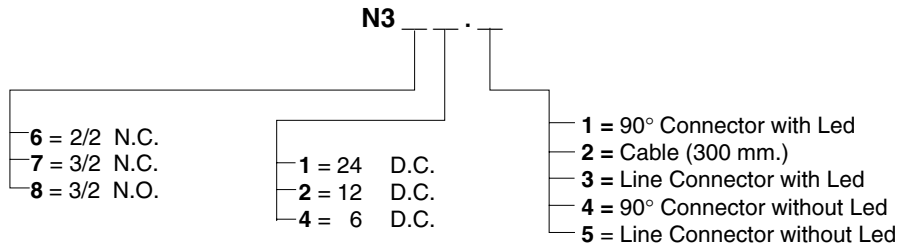
tributeur.

Technical characteristics

Pneumatic:	Working pressure	0 ÷ 7 bar
	Orifice size	0,7 mm
	Fluid/ambient temperature	-5° 50°C
	Maximum flow rate at 6 bar with Δp 1 bar	14 NI/min
	Exhaust flow	22 NI/min
	Max number of cycles per minute	2.700
	Life	50 Million
Electric:	oltages	12 ÷ 24 olt D.C.
	Power	1,3 Watt
	oltage tolerance	-5 10
	Response time when energized	8 ms
	Response time when de-energized	10 ms
	Copper wire isolation class	F (155°C)



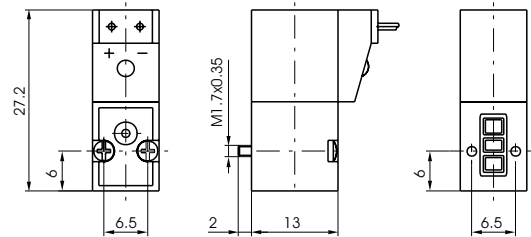
Ordering codes



Miniature solenoid valve with cable



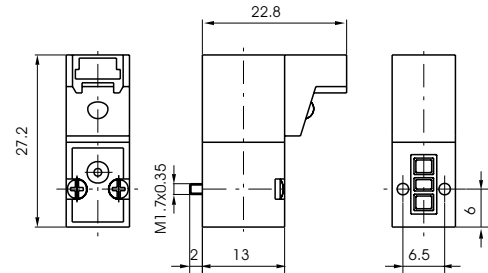
Weight gr. 12



Miniature solenoid valve with 90° connector



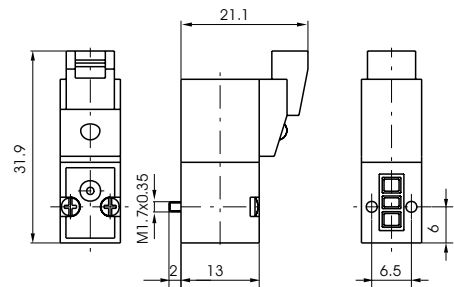
Weight gr. 12



Miniature solenoid valve with line connector



Weight gr. 12



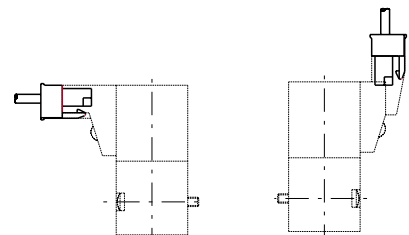
Connector

Ordering codes

- 371 .
- 300 Cable L = 300 mm
 - 600 Cable L = 600 mm
 - 1000 Cable L = 1000 mm



Weight gr. 3

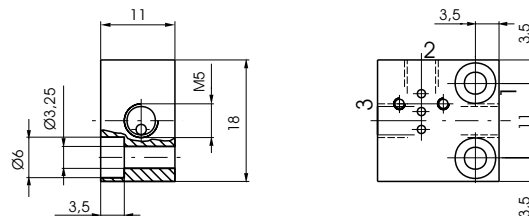




Individual base

Ordering code

395.01



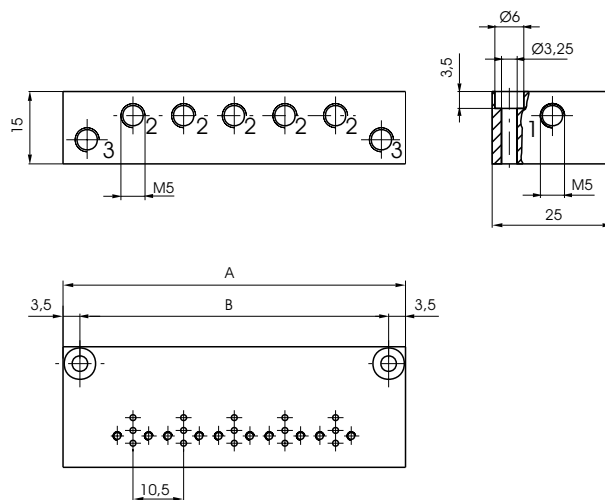
Weight gr. 10

Multiple bases

Ordering code

395 .

N° Places

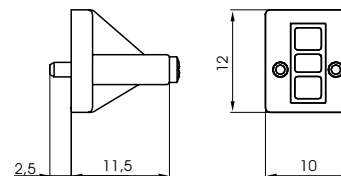


N° Places	02	03	04	05	06	07	08	09	10
A	39.5	50	60.5	71	81.5	92	102.5	113	123.5
B	32.5	43	53.5	64	74.5	85	95.5	106	116.5
Weight (gr.)	43	54	65	76	87	98	109	120	131

Closing plate

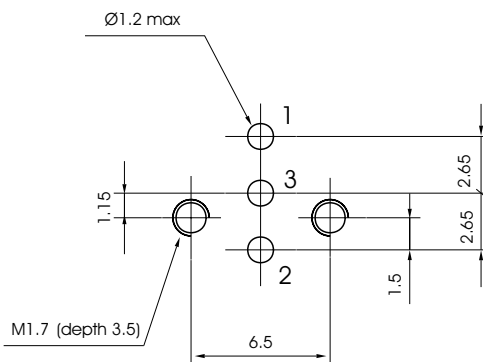
Ordering code

395.00



Weight gr. 5

Interface dimensions

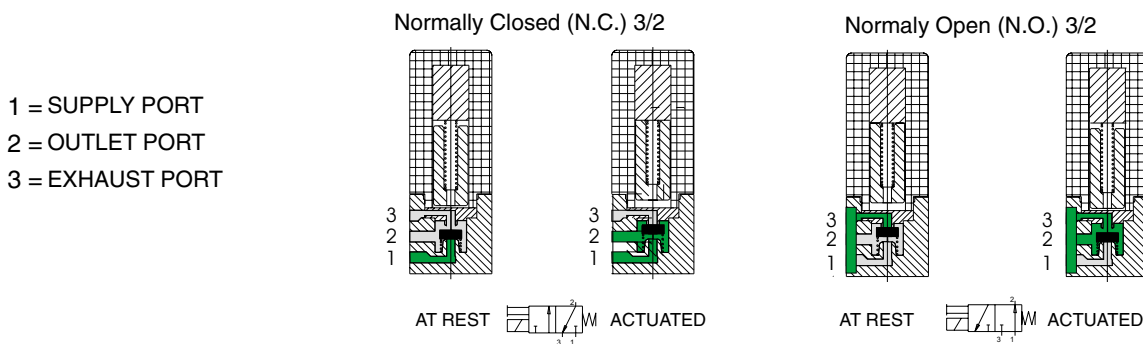




General

This direct operated solenoid valve has minimum overall dimensions (15 mm wide). Its construction method is same as 10 mm valve, of course.
 It is suitable to be single or gang mounted or as electro-operator for larger air flow distributors.
 Can be utilized with compressed air and other fluids compatible with material used to build the solenoid valve.
 The available versions, all equipped with manual override, are 3 ways, normally closed and normally open with DC and AC 50/60 Hz.
 It's possible to install the N.O. valve on N.C. interface by using the registered reverse system included in the valve body.
 The electrical connection is made with cables (300 mm.), FASTON or with connector.
 This type of miniature solenoid valve is interchangeable with most of the same products available on the market.
 Coil can also be positioned at 180° to get the electrical connection located on the opposite side than override.
 Make sure that the fastening screws are tightened with maximum torque of 0,75 Nm.

Functional schematics



Construction characteristics:

Electrical part: Miniature solenoid consisting of a coil made of copper wire of different diameters depending on voltage, isolated according to "F" class standard, with injection-moulded nylon-glass application.
 All parts forming the cladding, the electrical connections and the pole pieces are protected against corrosion.

Mechanical part: AISI 430F cores, AISI 302 return springs, NBR seals, thermoplastic polyester body.

Technical characteristics

Pneumatic

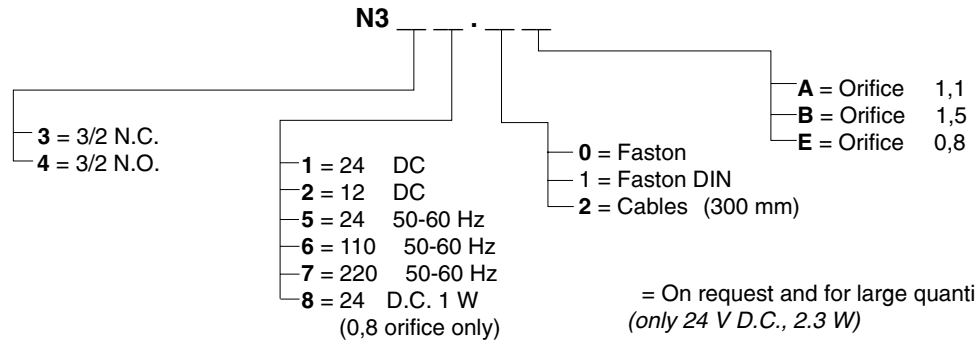
Nominal diameter	0,8 mm	1,1 mm	1,5 mm (only D.C.)
Maximum flow rate at 6 bar with Δp 1 bar	20 NI/min	30 NI/min	50 NI/min
Working pressure for N.C.	0 to 10 bar		0 to 7 bar
Working pressure for N.O.	/	0 to 8 bar	0 to 5 bar
Temperature	-5° 50°C		

Electrical

voltage D.C.	24 DC	12-24 DC	
voltage A.C.	/	24-110-220 vlt 50/60 Hz	/
Power	1 Watt	2,3 Watt	
	/	2,8 A (at starting) 2,5 A (at speed)	/
voltage tolerance	-5 10		
Response time	10÷12 ms		
Isolating class	F (155°C)		
Protection degree	IP65 (with cables) IP65 (with connectors) IP00 (with faston)		
Life expectancy	50 million cycles (with standard working conditions)		



Ordering code

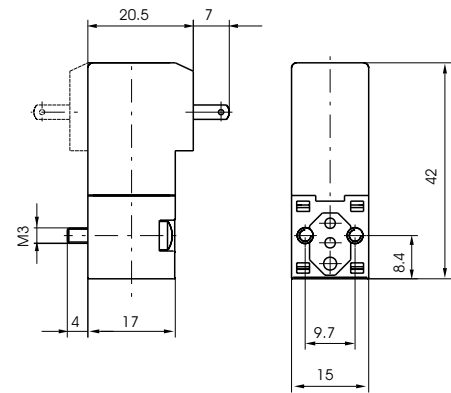


See previous page for available versions

With Faston



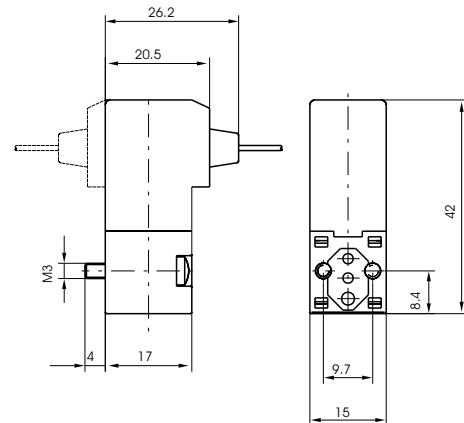
Weight gr. 36



With cables



Weight gr. 38



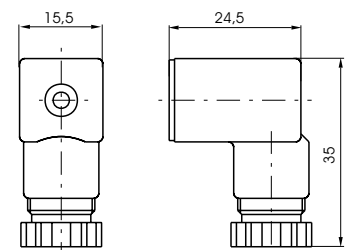
Connector

Ordering code

- 315.11.00 Standard
- 315.11.0 L Led
 - 1 = 24 D.C./A.C.
 - 2 = 110 50/60 Hz
 - 3 = 220 50/60 Hz
- 315.12.00 for faston DIN
- 315.12.0 L for faston DIN with Led
 - 1 = 24 D.C.
 - 2 = 110 50/60 Hz
 - 3 = 220 50/60 Hz



Weight gr. 13





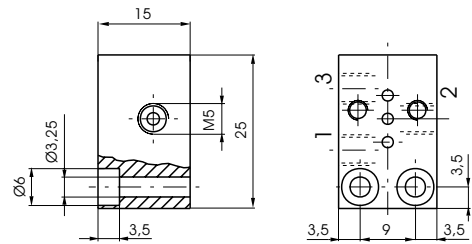
Single use base

Ordering code

355.01



Weight gr. 18



Multiple bases

Ordering code

A = Orifice M5

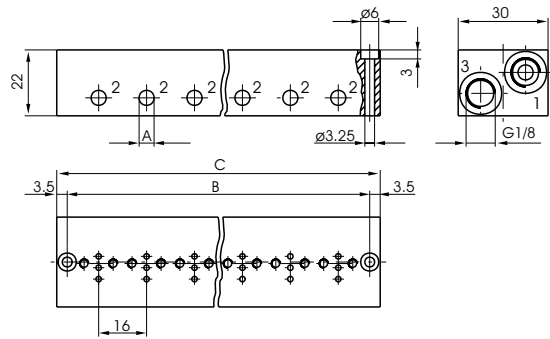
A = Pipe fitting 4

355 .

354 .

N° PLACES

N° PLACES



N° places	02	03	04	05	06	07	08	09	10
B	37	53	69	85	101	117	133	149	165
C	44	60	76	92	108	124	140	156	172
Weight (gr.)	66	92	116	141	165	190	216	242	266

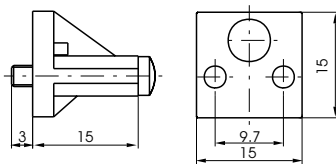
Closing plate

Ordering code

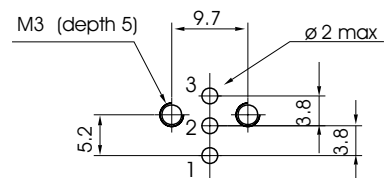
355.00



Weight 6 gr.

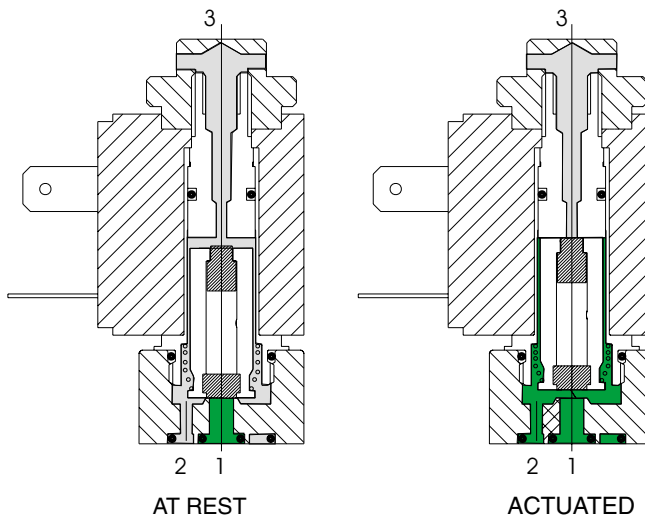
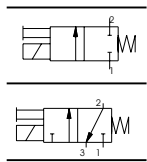


Interface dimensions



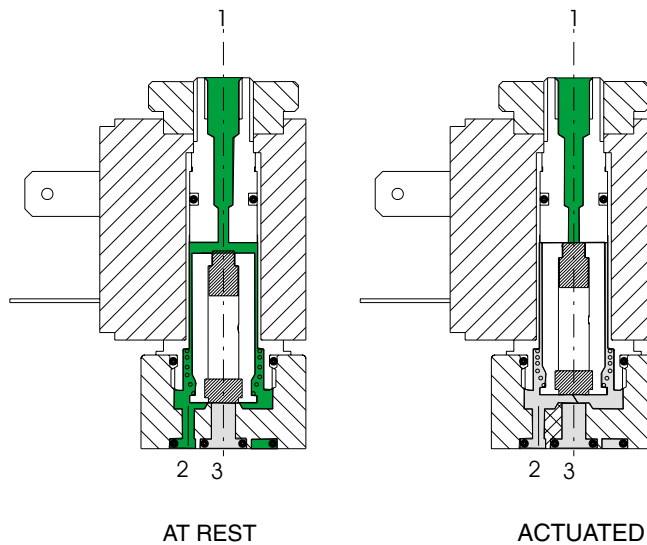
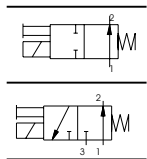
Functional schematics

Normally Closed (N.C.) 3/2 o 2/2



1 = INLET PORT
2 = OUTLET PORT
3 = EXHAUST PORT
(Plugged if 2/2)

Normally Open (N.O.) 3/2 o 2/2



Construction characteristics

Electrical parts: Solenoids: the solenoid consist of coils having different diameter copper wire windings insulated according standards "H"; they are encased in a nylon-glass compound. All parts are corrosion resistant.

Mechanical parts: Nickel plated brass tube nitrile viton seals stainless steel plunger (AISI 430F), stainless steel adjusted springs, viton poppet seals, tropicalized zinc alloy interface plate, nickeled brass manual override, nickel steel coil lock nut, zinc steel mounting screw.

To be usable, the solenoids and microsolenoids have to be attached either to a base or directly to the distributor s operators by means of connectors M5 or G 1/8". These solenoids are available in all voltages and frequencies used in the world. The following are the technical characteristics of the solenoid.



Technical characteristics

Pneumatic	Working pressure	0 ÷ 10 bar	
	Orifice size	1,3 mm	(0,9 mm for 2 W)
	Maximum fluid temperature	50°C	
	Maximum ambient temperature	50°C	
	Maximum flow rate at 6 bar with Δp 1 bar	53 NI/min	(20NI/min. for 2 W)
	Cycles/minute	700	
	Fluids	Air-vacuum-inert gases	
	Lubrication	non required	
	Life	45 to 50 million cycles	
Electrical	Power consumption inrush - D.C.	-	
	Power consumption inrush - A.C	9 A	
	Power consumption holding - D.C	5 W	(2 W)
	Power consumption holding - A.C	6 A	
	Operating voltage tolerance	10	
	Response time opening	40 ms	
	Response time closing	21 ms	
	Insulation of the copper wire	H	
	Insulation of the coil	F	
	Connector protection	IP 65	
	Cable protection	PG 9	

The response time were determined using standard procedure CETOP RP 82 P.

Maintenance and replacement parts

Maintenance practices for these valves are similar to those already detailed for other products- replacement of the plunger or poppet is not advisable since the new replacement would not provide the best fit with the rest of the already used valve.

Special care should be taken that no dirt is accumulated between the working surface of fixed core and the plunger which would result in vibrations and overheating of the solenoid. In the case of microsolenoid it must be assured that the alternate current coil is not charged when the mechanical part is not mounted to avoid destruction of the coil.

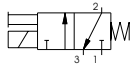
The electrical connections have to be perfect, especially where low currents are used (12-24).

Oxidation of contacts between the connector and the coil can lead to intermittent malfunctions which are difficult to trace. Oxidation of contacts due to humidity or corrosive atmosphere are one of the most common causes of false alarms. Clean the contacts with appropriate spray.

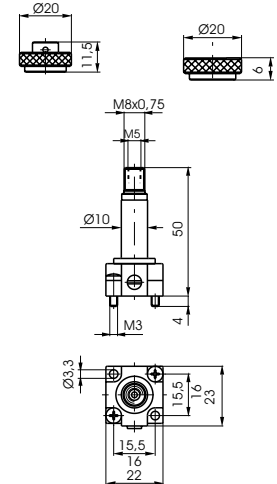
**Mechanical actuator for Normally Closed (N.C.)
miniature solenoid valve**

Ordering code

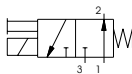
- M 2** Normally Closed (N.C.)
- M 2P** Normally Closed (N.C.) threaded lock nut
- M 2/9** Normally Closed 2 W 24 D.C.



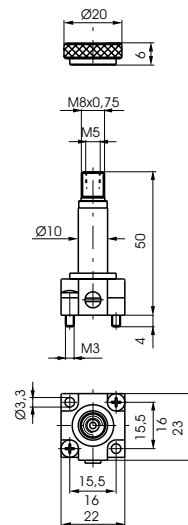
Weight gr. 61



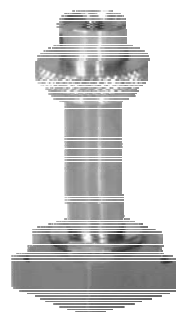
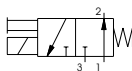
- M 2/1** Normally Open (N.O.) air feeding through fix flunger



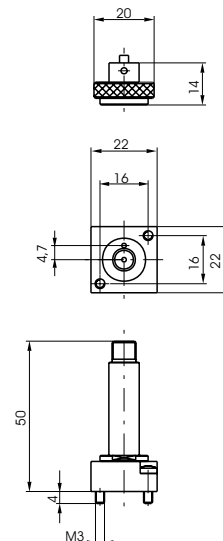
Weight gr. 58



- MM 7** Normally Open (N.O.) air feeding through base



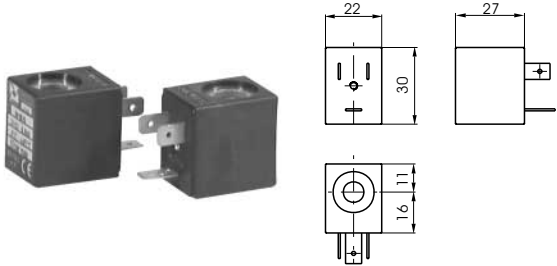
Weight gr. 46



Coil suitable for MM7 are listed on page 1.18



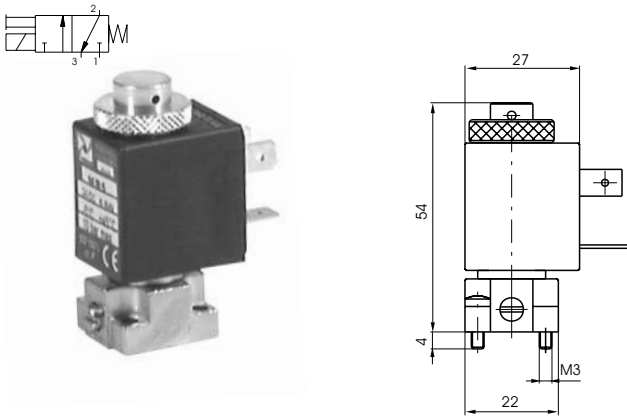
Coil



Use only with M2/9

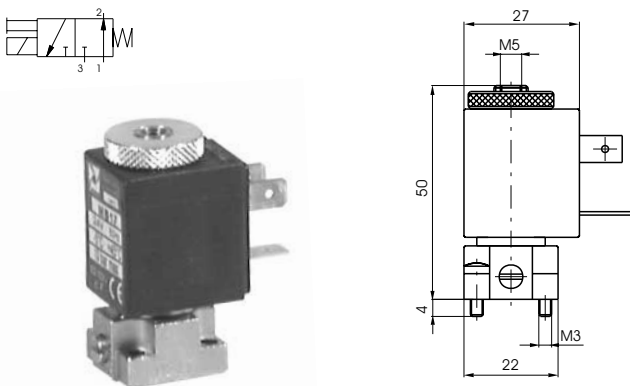
Ordering code	Available voltages	
MB 4 MB 5 MB 6 MB 9	12 D.C. 24 D.C. 48 D.C. 24 D.C. (2 Watt)	Direct current
MB 17 MB 21 MB 22 MB 24	24/50 48/50 110/50 220/50	Alternating current 50 Hz
MB 37 MB 39 MB 41 MB 56 MB 57 MB 58	24/60 110/60 220/60 24/50-60 110/50-60 220/50-60	Alternating current 60 Hz 50/60 Hz

Miniature solenoid valve Normally Closed (N.C.)



Ordering code	Available voltages Miniature solenoid valve N.C.	
M 2.4 M 2.5 M 2.6 M 2.9	12 DC 24 DC 48 DC 24 DC (2 Watt)	Direct current
M 2.17 M 2.21 M 2.22 M 2.24	24/50 48/50 110/50 220/50	Alternating current 50 Hz
M 2.37 M 2.39 M 2.41 M 2.56 M 2.57 M 2.58	24/60 110/60 220/60 24/50-60 110/50-60 220/50-60	Alternating current 60 Hz 50/60 Hz

Miniature solenoid valve Normally Open (N.O.)

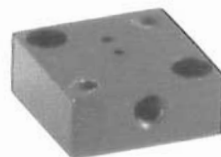


Ordering code	Available voltages Miniature solenoid valve N.O.	
M 2/1.4 M 2/1.5 M 2/1.6 M 2/1.9	12 DC 24 DC 48 DC 24 DC (2 Watt)	Direct current
M 2/1.17 M 2/1.21 M 2/1.22 M 2/1.24	24/50 48/50 110/50 220/50	Alternating current 50 Hz
M 2/1.37 M 2/1.39 M 2/1.41 M 2/1.56 M 2/1.57 M 2/1.58	24/60 110/60 220/60 24/50-60 110/50-60 220/50-60	Alternating current 60 Hz 50/60 Hz

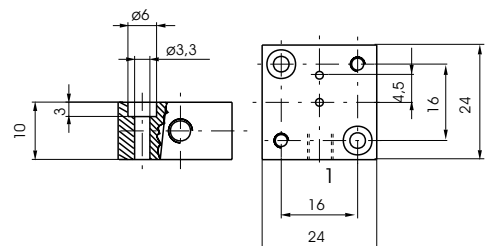
E ternal feeding base

Ordering code

305.10.05



Weight gr.18



Direct operated solenoid valves
22 mm. Miniature solenoid valve

Series 300



1

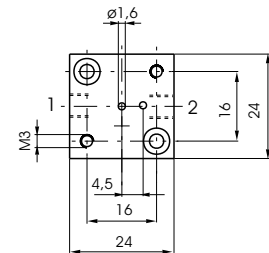
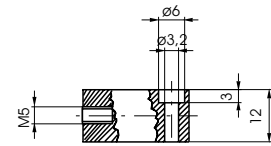
Individual base



In line ports - thread M5

1 = INLET PORT (N.C.)
2 = OUTLET PORT

With a N.O. miniature solenoid valve
1 = EXHAUST
2 = OUTLET PORT



Ordering code

305.00.00

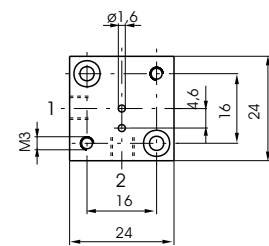
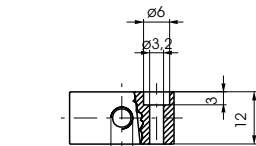
Weight gr. 56



90° Port - thread M5

1 = INLET PORT (N.C.)
2 = OUTLET PORT (N.C.)

With a N.O. miniature solenoid valve
1 = EXHAUST
2 = OUTLET PORT



Ordering code

305.90.00

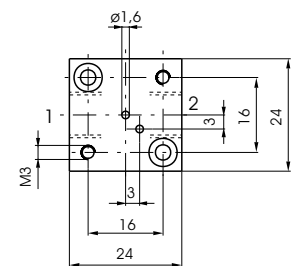
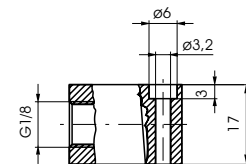
Weight gr. 56



In line ports - thread G 1/8"

1 = INLET PORT (N.C.)
2 = OUTLET PORT (N.C.)

With a N.O. miniature solenoid valve
1 = EXHAUST
2 = OUTLET PORT



Ordering code

305.00.18

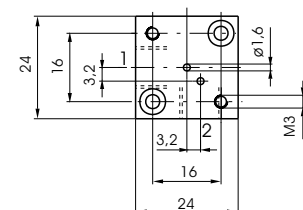
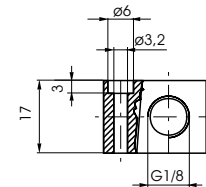
Weight gr. 75



90° Port - thread G 1/8"

1 = INLET PORT (N.C.)
2 = OUTLET PORT (N.C.)

With a N.O. miniature solenoid valve
1 = EXHAUST
2 = OUTLET PORT



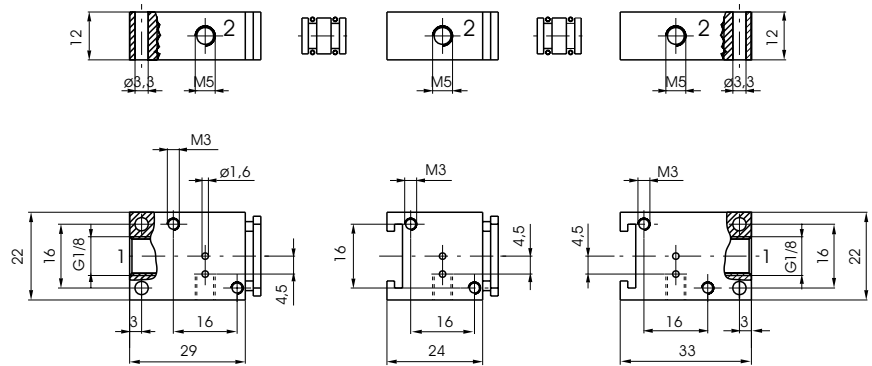
Ordering code

305.90.18

Weight gr. 75



Modular bases for series mounting



Ordering code

nitial ase
305.05.00
Weight gr. 57

nter e iate ase
305.06.00
Weight gr. 44

ast ase
305.07.00
Weight gr. 53

ore spacer
305.05.01
Weight gr. 3

oli spacer
305.05.02
Weight gr. 4

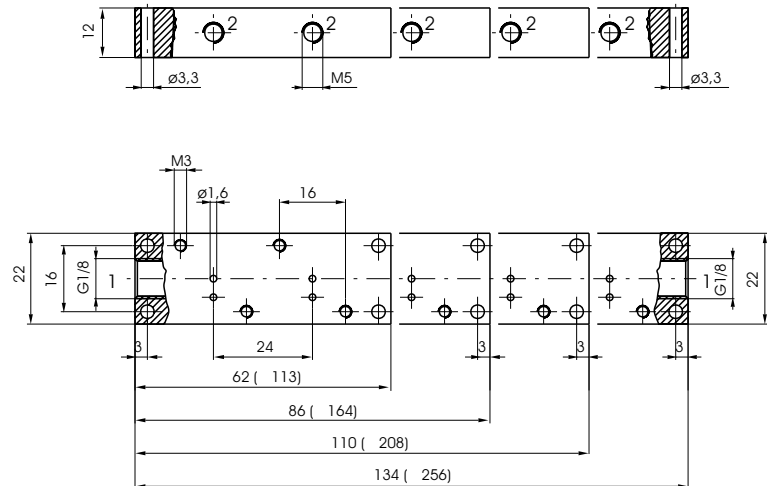
nitial ase

nter e iate ase

ast ase



Multiple integral bases for series mounting

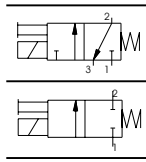


Ordering code

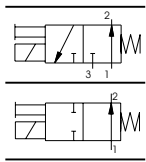
305.08.02 2 positions
305.08.03 3 positions
305.08.04 4 positions
305.08.05 5 positions



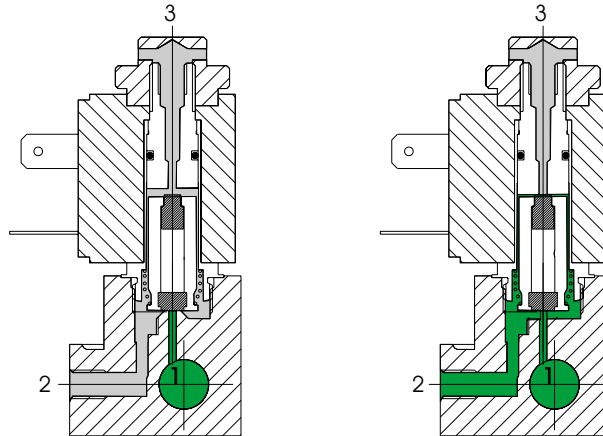
Functional schematic



1 = INLET PORT
2 = OUTLET PORT
3 = EXHAUST PORT
(Plugged if 2/2)



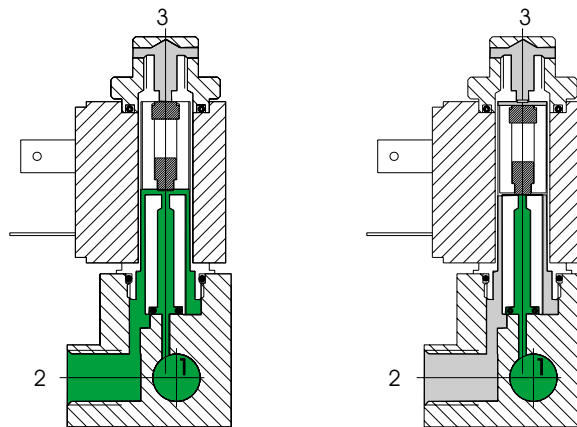
Normally Closed (N.C.) 3/2 or 2/2



AT REST

ACTUATED

Normally Open (N.O.) 3/2 or 2/2



AT REST

ACTUATED

Construction characteristics

Electrical parts: Solenoids: the solenoid consist of coils having different diameter copper wire windings insulated according standards "H"; they are encased in a nylon-glass compount. All parts are corrosion resistant.

Mechanical parts: Nickel plated brass tube nitrile (NBR) stainless steel plunger (AISI 430F), stainless steel adjusted springs, viton poppet seals, tropicalized zinc alloy interface plate, nickered brass manual override, nickel steel coil lock nut, zinc steel mounting screws. Electrical connectors are standard.

1



Technical characteristics

Pneumatic	Working pressure	0 ÷ 10 bar	
	Orifice size	1,3 mm	(1,1 mm for 2 W)
	Maximum fluid temperature	50°C	
	Maximum ambient temperature	50°C	
	Maximum flow rate at 6 bar with $\Delta p = 1$	53 NI/min	(35 NI/min. for 2 W)
	Cycles/minute	700	
	Fluids	Air- acuum-Inert gases	
	Lubrication	Non needed	
	Life	40 ÷ 50 million cycles	
Electrical	Power consumption inrush - D.C	-	
	Power consumption inrush - A.C	9 A	
	Power consumption holding - D.C	5 W	(2 W)
	Power consumption holding - A.C	6 A	
	Operating voltage tolerance	10	
	Response time opening	40 ms	
	Response time closing	21 ms	
	Insulation of the copper wire	H	
	Insulation of the coil	F	
	Connector protection	IP 65	
	Cable protection	PG 9	

The response times were determined using standard procedure CETOP RP 82 P.

Maintenance and replacement parts

Maintenace practices for these valves are similar to those already detailed for other products - replacement of the plunger or poppet is not advisable since the new replacement would not provide the best fit with the rest of the already used valve.

Special care should be taken that no dirt is accumulated between the working surface of fixed core and the plunger which would result in vibrations and overheating of the solenoid. In the case of microsolenoid it must be assured that the alternate current coil is not charged when the machanical part is not mounted to avoid destruction of the coil.

The electrical connections have to be perfect, especially where low currents are used (12-24). Oxidation of contacts between the connector and the coil can lead to intermittent malfunctions which are difficult to trace. Oxidation of contacts due to humidity or corrosive atmosphere are one of the most common causes of false alarms. Clean the contacts with appropriate spray.

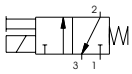
**Mechanical actuator for Normally Closed (N.C.)
Miniature solenoid valve**

Normally Closed (N.C.)

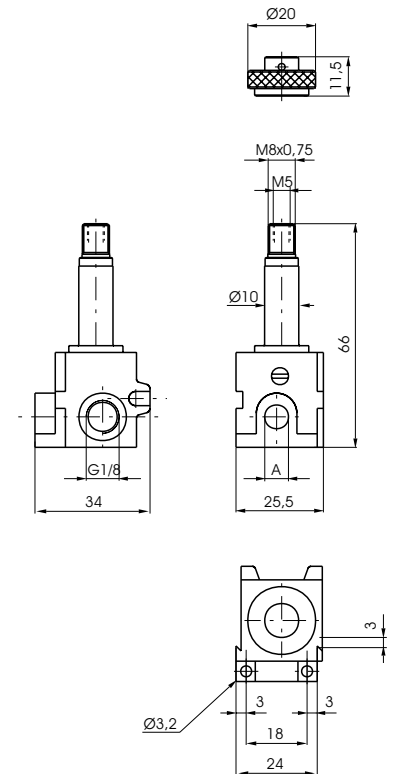
Ordering code

- 305.M1 A = G 1/8
- 355.M1 A = M 5
- 345.M1 A = Push in fitting for 4 mm tube

- 305.M1/9 A = G 1/8
- 355.M1/9 A = M 5
- 345.M1/9 A = Push in fitting for 4 mm tube



2 W
24 C

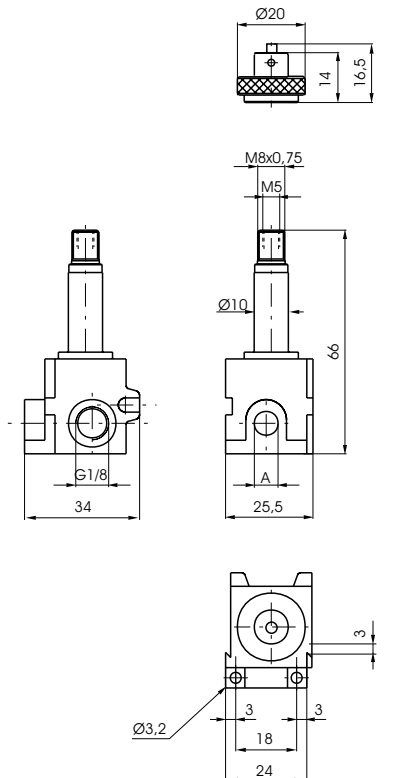
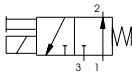


Weight gr. 106

Normally Open (N.O.)

Ordering code

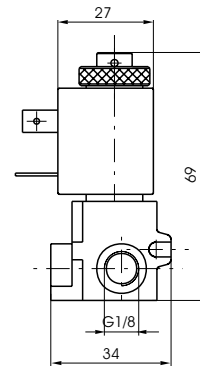
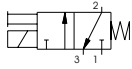
- 305.M1/1 A = G 1/8
- 355.M1/1 A = M 5
- 345.M1/1 A = Push in fitting for 4 mm tube



Weight gr. 106



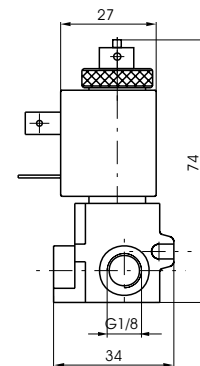
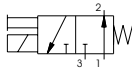
Miniature solenoid valve



Weight gr. 160

Normally Closed (N.C.)

Ordering code			Available voltage	
G 1/8"	M 5	TUBE 4	Miniature solenoid	
305.M4	355.M4	345.M4	12 D.C.	Direct current
305.M5	355.M5	345.M5	24 D.C.	
305.M6	355.M6	345.M6	48 D.C.	
305.M9	355.M9	345.M9	24 D.C. (2 Watt)	
305.M17	355.M17	345.M17	24/50	Alternating current 50 Hz
305.M21	355.M21	345.M21	48/50	
305.M22	355.M22	345.M22	110/50	
305.M24	355.M24	345.M24	220/50	
305.M37	355.M37	345.M37	24/60	Alternating current 60 Hz
305.M39	355.M39	345.M39	110/60	
305.M41	355.M41	345.M41	220/60	
305.M56	355.M56	345.M56	24/50-60	Alternating current 50/60 Hz
305.M57	355.M57	345.M57	110/50-60	
305.M58	355.M58	345.M58	220/50-60	



Weight gr. 165

Normally Open (N.O.)

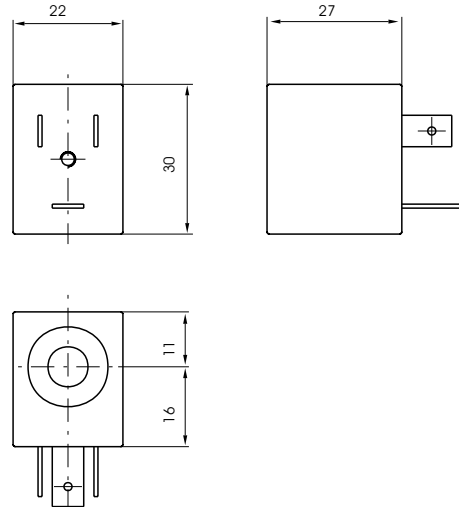
Ordering code			Available voltages	
G 1/8"	M 5	TUBE 4 mm	Miniature solenoid	
305.M10/1	355.M10/1	345.M10/1	24 D.C. (8 Watt)	Direct current
305.M17/1	355.M17/1	345.M17/1	24/50	Alternating current 50 Hz
305.M21/1	355.M21/1	345.M21/1	48/50	
305.M22/1	355.M22/1	345.M22/1	110/50	
305.M24/1	355.M24/1	345.M24/1	220/50	
305.M37/1	355.M37/1	345.M37/1	24/60	Alternating current 60 Hz
305.M39/1	355.M39/1	345.M39/1	110/60	
305.M41/1	355.M41/1	345.M41/1	220/60	
305.M56/1	355.M56/1	345.M56/1	24/50-60	Alternating current 50/60 Hz
305.M57/1	355.M57/1	345.M57/1	110/50-60	
305.M58/1	355.M58/1	345.M58/1	220/50-60	



Coil



Weight gr. 54

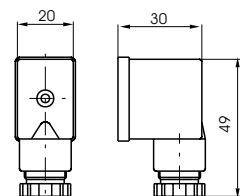


Ordering code		Available voltages	
N.C.	N.O.	Coil	
MB4 MB5 MB6 MB9	MB10/1	12 D.C. 24 D.C. 48 D.C. 24 D.C. (2 Watt) 24 D.C. (8 Watt)	Direct current
MB17 MB21 MB22 MB24	MB17/1 MB21/1 MB22/1 MB24/1	24/50 48/50 110/50 220/50	Alternating current 50 Hz
MB37 MB39 MB41	MB37/1 MB39/1 MB41/1	24/60 110/60 220/60	Alternating current 60 Hz
MB56 MB57 MB58	MB56/1 MB57/1 MB58/1	24/50-60 110/50-60 220/50-60	Alternating current 50/60 Hz

Electrical connector

Ordering code

- 305.11.00 Normal
- 305.11.0 L Led
- 1 = 24 D.C./A.C.
- 2 = 110 50/60Hz
- 3 = 220 50/60Hz



1



General

The most interesting aspects of this bi-stable miniature solenoid valve operating with D.C. only, is that it can be commuted with a simple electric impulse and stay commuted till an inverted polarity impulse deactivates it. It means that the valve is not automatically deactivated if current fail as happens with normal solenoid valves.

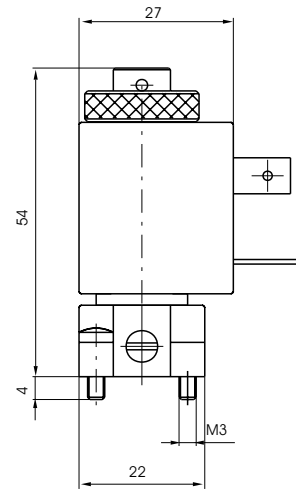
The applications differ but are all based on above mentioned feature.

The internal construction is relatively special. The fix plunger is equipped with a permanent magnet that hold or release the mobile plunger according to the magnetic field generated by the coil.

A specific coil is used for this application and it cannot be replaced by the standard ones.

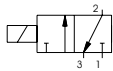
Ordering code is **MBB5**.

Miniature solenoid valve for distributors and bases



Ordering code

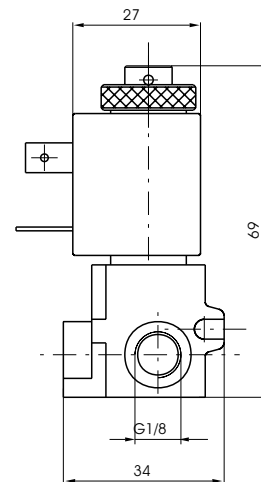
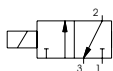
M5/B



Miniature solenoid valve with inseries mounting base

Ordering code

305.M5/B = G 1/8
355.M5/B = M5
345.M5/B = Fitting for 4 mm tube

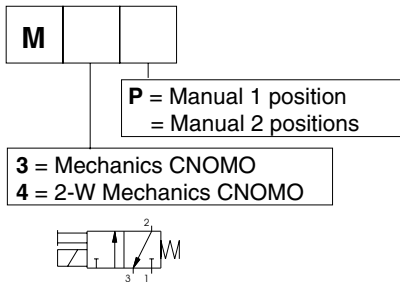




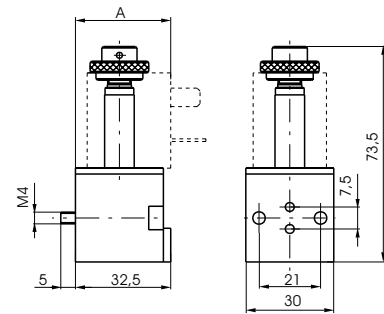
Electric pilot CNOMO (coil not included)

Mechanics with base for solenoid to be used where an electric pilot system is required. May be used on all sizes and is standardized as an interface on the distributor. The base is fitted with a manual control which is pulse actuated, without check, or with two stable positions, actuated by means of a screwdriver (pressing down and turning clockwise by 90°). Two different types of solenoids can be mounted on the stem, one in conformity with ISO standard size 30x38 and ISO 4400 (DIN 43650) electrical connection, and a compact one size 22x27, having the same performance but at lower price. The technical characteristics of the latter are described in the catalogue, series 300, and refer to MB solenoids. The base is fitted with screws (M4x30) for fastening to the distributor.

Ordering code



Weight gr. 60



A = 33 (with MB solenoid)
A = 38 (with MC solenoid)

General characteristics

Structural	Body	Thermoplastic polyester	
	Stem	Nickel-platted brass	
	Cores	AISI 430F stainless steel	
	Springs	AISI 302 stainless steel	
	Shutters	iton	
	Other seals	NBR	
	Manual control	Nickel-platted brass	
	Pneumatic	Fluid	Air, Neutral gases
Working pressure		0 ÷ 10 bar	
Fluid ambient temperature		-5°C 50°C	
Flow rate at 6 bar with Δp 1 bar		53 NI/min	(20 NI/min for 2 W)
Nominal flow cross section		1,3 mm	(0,9 mm for 2 W)
Electric	Power consumption inrush - A.C.	13 A	
	Power consumption holding - D.C.	3,5 W	(2 W)
	Power consumption holding - A.C.	8,5 A	
	Operating voltage tolerance	10	
	Response time opening	40 ms	
	Response time closing	21 ms	
	Insulation of the copper wire	H	
	Insulation of the coil	F	
	Connector protection	IP 65	
	Cable protection	PG 11	

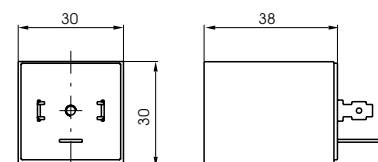
The response times were determined using standard procedure CETO RP 82 P.

Coil

Ordering code	Available voltages
	coil
MC5	24 D.C.
MC9	24 D.C. (2 Watt)
MC56	24/50-60 Hz
MC57	110/50-60 Hz
MC58	230/50-60 Hz



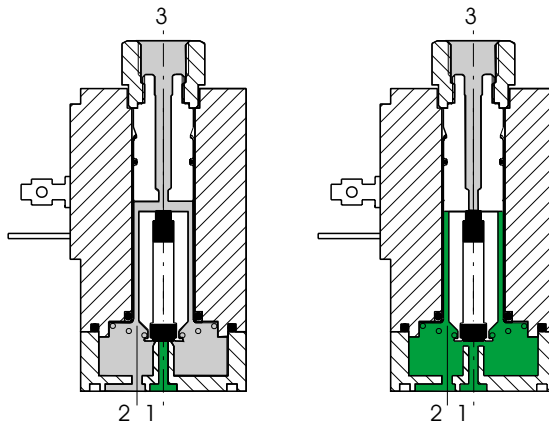
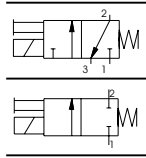
Weight gr. 110





Functional schematic

Normally Closed (N.C.) 3/2 or 2/2

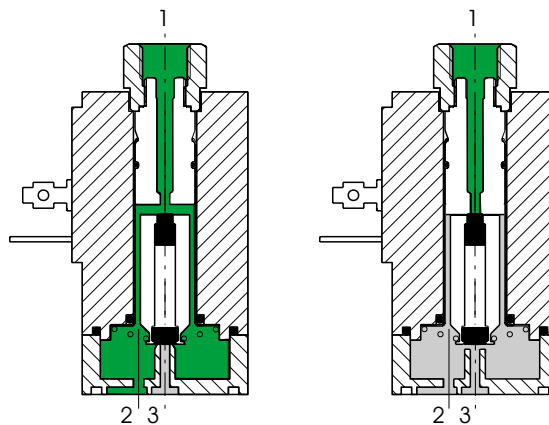
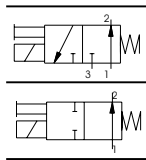


AT REST

ACTUATED

- 1 = INLET PORT
- 2 = OUTLET PORT
- 3 = EXHAUST PORT
(Plugged if 2/2)

Normally Open (N.O.) 3/2 or 2/2



AT REST

ACTUATED

Construction characteristics

Electrical parts: Solenoids: the solenoid consists of coils having different diameter copper wire windings insulated according standards "H"; they are encased in a nylon-glass compound. All parts are corrosion resistant.

Mechanical parts: Stainless steel tube and plunger (AISI 430F), stainless steel adjusted springs, viton poppet seals, tropicalized zinc alloy interface plate, nitrile (NBR) seal nickeled brass manual override, nickel steel coil lock nut, zinc steel mounting screws.
To be usable, the solenoids have to be attached either to a base or directly to the distributor s operators by means of connectors G 1/8".
Electrical connectors are standard. These solenoid are available in all voltages and frequencies used in the world. The following are the technical characteristics of the solenoid.



Technical characteristics

Pneumatic	Working pressure	0 ÷ 10 bar
	Orifice size	1,8 mm
	Maximum fluid temperature	50°C
	Maximum ambient temperature	50°C
	Maximum flow rate at 6 bar with $\Delta p = 1$	80 NI/min
	Cycles/minute	700
	Fluids	Air- acuum-Inert gases
	Lubrication	Not required
	Life	40 to 50 millions
Electric	Power consumption inrush - D.C.	-
	Power consumption inrush - A.C.	19,5 A
	Power consumption holding - D.C.	8,2 W
	Power consumption holding - A.C.	9 A
	Operating voltage tolerance	10
	Response time opening	40 ms
	Response time closing	21 ms
	Insulation of the copper wire	H
	Insulation of the coil	F
	Connector protection	IP 65
	Cable protection	PG 11

The response times were determined using standard procedure CETO RP 82 P. The

Maintenance and replacement parts

Maintenance practices for these valves are similar to those already detailed for other products - replacement of the plunger or poppet is not advisable since the new replacement would not provide the best fit with the rest of the already used valve.

Special care should be taken that no dirt is accumulated between the working surface of fixed cores 3 and the plunger 2 which would result in vibrations and overheating of the solenoid. In the case of microsolenoid it must be assured that the alternate current coil is not charged when the mechanical part is not mounted to avoid destruction of the coil.

The electrical connections have to be perfect, especially where low currents are used (12-24). Oxidation of contacts between the connector and the coil can lead to intermittent malfunctions which are difficult to trace. Oxidation of contacts due to humidity or corrosive atmosphere are one of the most common causes of false alarms. Clean the contacts with appropriate spray.

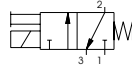


Solenoid valve S and S/1

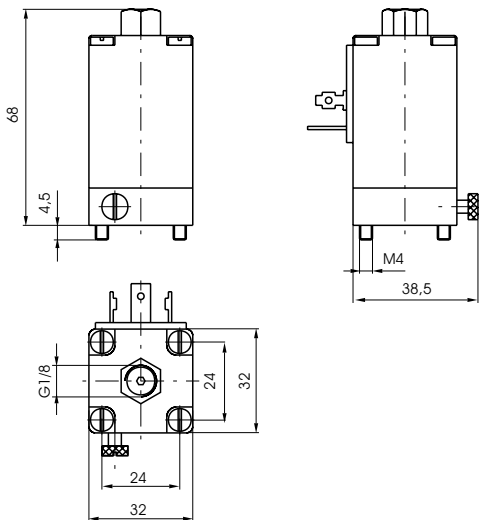
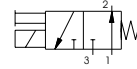


Weight gr. 220

Normally Closed
(N.C.) - **S**



Normally Open
(N.A.) - **S/1**



Ordering code		Available voltages	
		Coil	
S 2	S 2/1	6 D.C.	Direct current
S 4	S 4/1	12 D.C.	
S 5	S 5/1	24 D.C.	
S 6	S 6/1	48 D.C.	
S 16	S 16/1	12/50	Alternating current 50 Hz
S 17	S 17/1	24/50	
S 19	S 19/1	32/50	
S 20	S 20/1	42/50	
S 21	S 21/1	48/50	
S 22	S 22/1	110/50	
S 23	S 23/1	115/50	
S 24	S 24/1	220/50	
S 25	S 25/1	240/50	
S 36	S 36/1	12/60	Alternating current 60 Hz
S 37	S 37/1	24/50	
S 38	S 38/1	48/60	
S 39	S 39/1	110/60	
S 40	S 40/1	115/60	
S 41	S 41/1	220/60	
S 42	S 42/1	240/60	
S 56	S 56/1	24/50-60	Alternating current 50/60 Hz
S 57	S 57/1	110/50-60	
S 58	S 58/1	220/50-60	

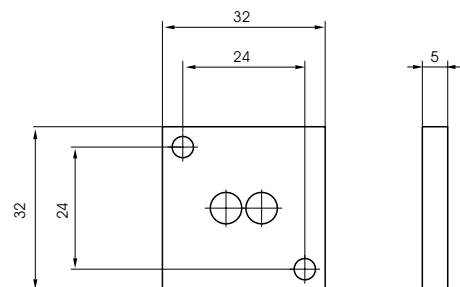
Closing plate

Ordering code

300.12.00



Weight gr. 14



External feeding base

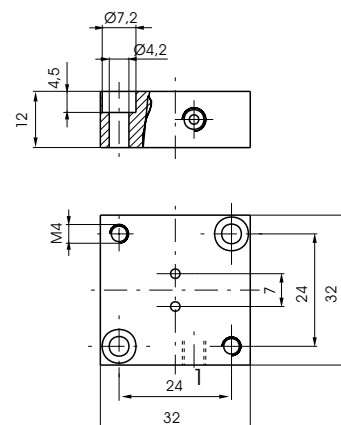
To be used with electrodistributeurs to get a different piloting pressure from the line one.

Ordering code

300.10.5



Weight gr. 35





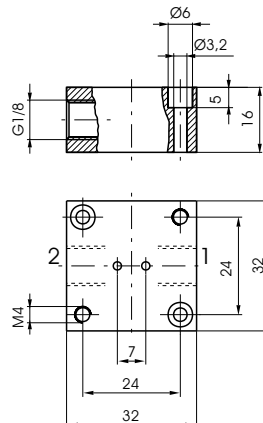
Individual base



In line port - thread G 1/8"

1 = INLET PORT (N.C.)
2 = OUTLET PORT (N.C.)

With solenoid valve N.O.
1 = EXHAUST PORT
2 = OUTLET PORT



Ordering code

300.04.00

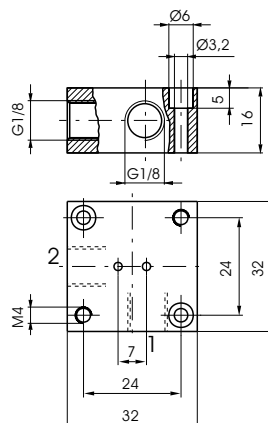
Weight gr. 40



90° Port - thread G 1/8"

1 = INLET PORT (N.C.)
2 = OUTLET PORT (N.C.)

With solenoid valve N.O.
1 = EXHAUST PORT
2 = OUTLET PORT



Ordering code

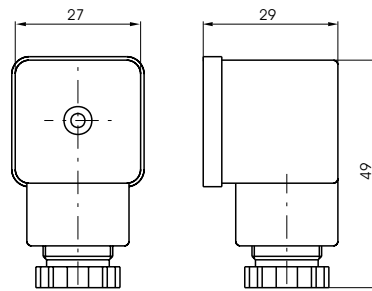
300.04.90

Weight gr. 40

Electrical connector

Ordering code

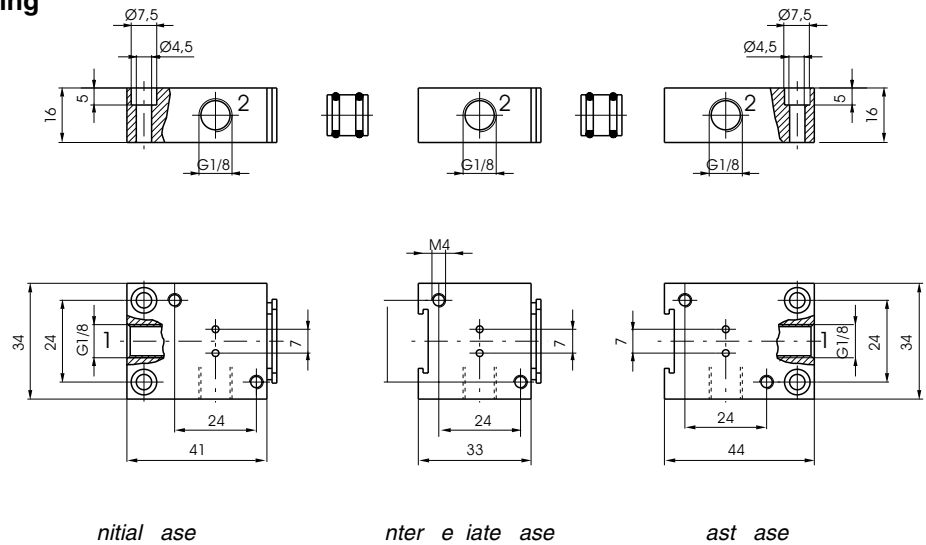
- 300.11.00** Normal
- 300.11.0 L** Led
- 1 = 24 D.C./A.C.
- 2 = 110 50/60Hz
- 3 = 220 50/60Hz



Weight gr. 25



Modular bases for series mounting



Ordering code

nitil ase
300.05.00

nter e iate ase
300.06.00

ast ase
300.07.00

ore spacer
300.05.01
Weight gr. 5

oli space
300.05.02
Weight gr. 6

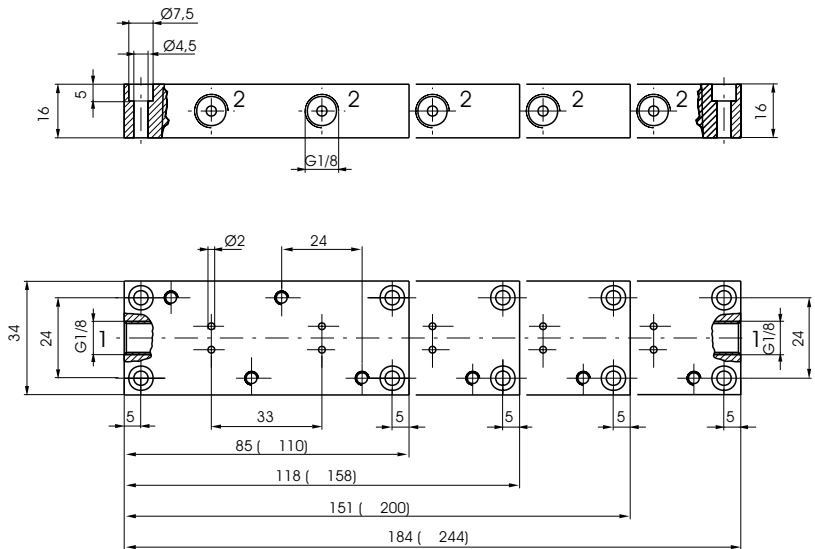


Weight gr. 52

Weight gr. 40

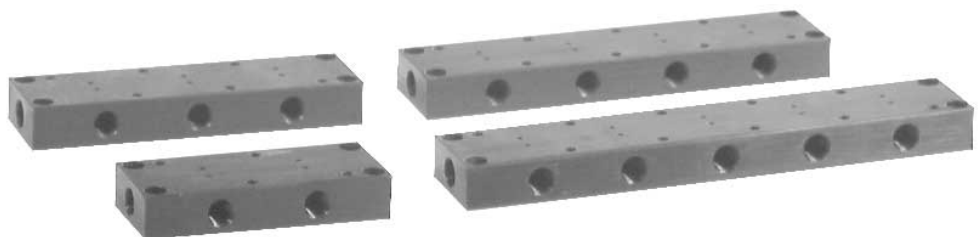
Weight gr. 52

Multiple integral bases for series mounting



Ordering code

- 300.08.02** 2 positions
- 300.08.03** 3 positions
- 300.08.04** 4 positions
- 300.08.05** 5 positions





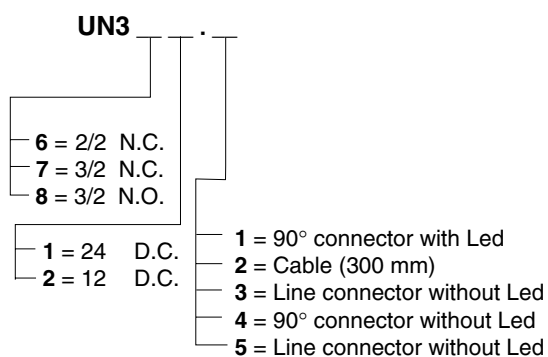
General

The series Curs homologated solenoid valves (valid for USA and Canada file n. E206325- AIU2, AIU8) are different from the standard ones for microsolenoid made with an injected RYNITE[®] embedded copper wire (they are included in class "F" insulation).

Refer to standard versions as for as other details and accessories to be used with solenoid valves.

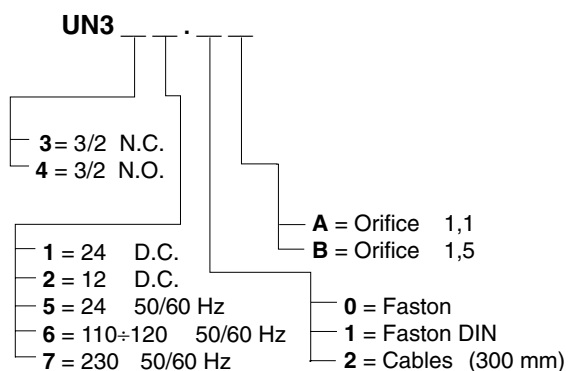
Miniature solenoid valve 10mm

Ordering code



Miniature solenoid valve 15mm

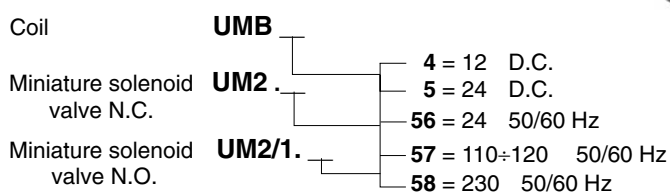
Ordering code



On request and for large quantity only (only 24 D.C. 2,3 W)

Miniature solenoid valve 22mm

Ordering code





Miniature solenoid valve 22mm for series mounting

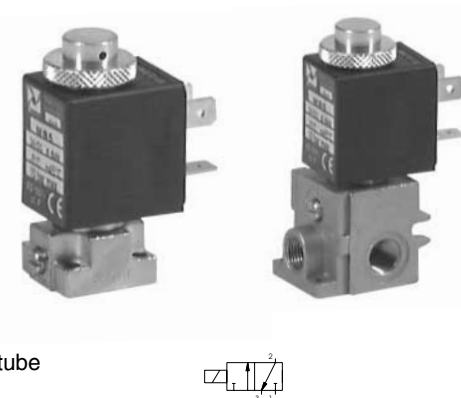
Ordering code

- Coil N.C. **UMB**
 - 4 = 12 D.C.
 - 5 = 24 D.C.
 - 56 = 24 50/60 Hz
 - 57 = 110÷120 50/60 Hz
 - 58 = 230 50/60 Hz
- Coil N.O. **UMB /1**
 - 10 = 24 D.C. 8W
 - 56 = 24 50/60 Hz
 - 57 = 110÷120 50/60 Hz
 - 58 = 230 50/60 Hz
- Solenoid valve N.C. **U3 5.M**
 - 0 = G1/8"
 - 5 = M5
 - 4 = fitting for 4mm tube
 - 4 = 12 D.C.
 - 5 = 24 D.C.
 - 56 = 24 50/60 Hz
 - 57 = 110÷120 50/60 Hz
 - 58 = 230 50/60 Hz
- Solenoid valve N.O. **U3 5.M /1**
 - 0 = G1/8"
 - 5 = M5
 - 4 = fitting for 4mm tube
 - 10 = 24 D.C. 8W
 - 56 = 24 50/60 Hz
 - 57 = 110÷120 50/60 Hz
 - 58 = 230 50/60 Hz



Bi stable miniature solenoid valve 22mm

- Coil **UMBB5**
- Miniature solenoid valve for distributors and bases (N.C.) **UM5/B**
- Miniature solenoid valve with inseries mounting base (N.C.) **U3 5.M5/B**
 - 0 = G1/8"
 - 5 = M5
 - 4 = fitting for 4mm tube



Solenoid valve 30 mm (for mechanics M3 and M4 pag. 1.20)

Ordering code

- UMC5** = 24 D.C.
- UMC56** = 24 50/60 Hz
- UMC57** = 110÷120 50/60 Hz
- UMC58** = 230 50/60 Hz



Solenoid valve 32 mm

Ordering code

- Solenoid valve N.C. **US**
- Solenoid valve N.O. **US /1**
 - 4 = 12 D.C.
 - 5 = 24 D.C.
 - 56 = 24 50/60 Hz
 - 57 = 110÷120 50/60 Hz
 - 58 = 230 50/60 Hz





General

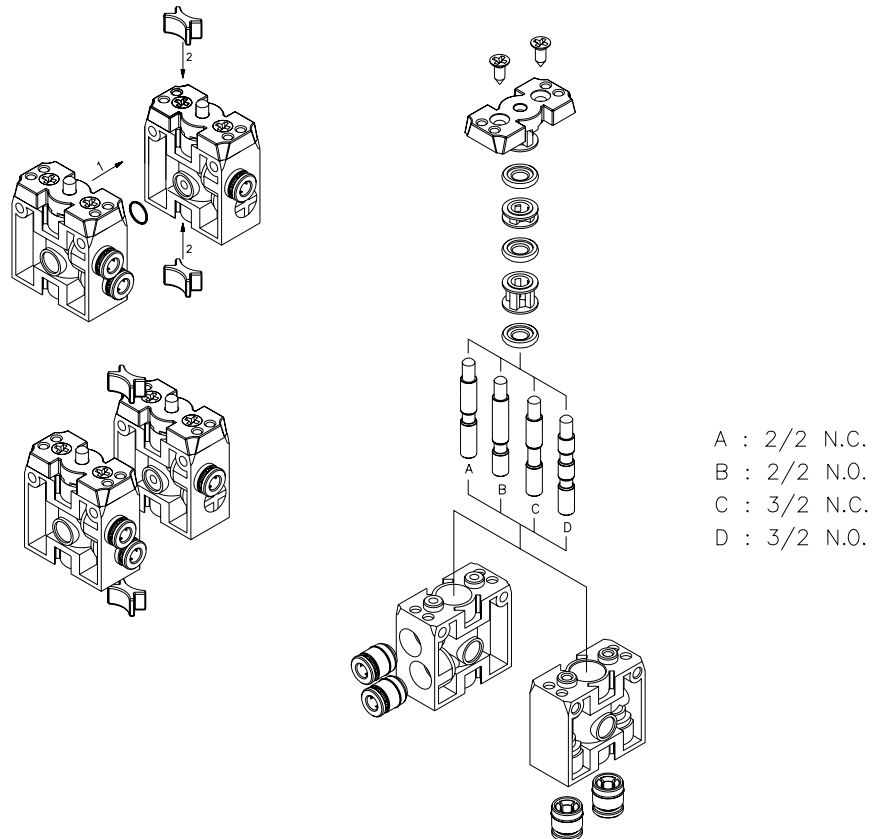
New 104 micro valves series have been realized as an economic version to complete the range of 105 valves version. With their small overall dimensions it makes easy installation and operation. Their main characteristic is the possibility to choose between the version with lateral or rear pneumatic connections realized with quick fitting for Ø 4 mm. tube included.

The valves are available with 2 or 3 ways versions, normally closed or open, 5 ways and 5 ways 3 positions open centers and pressured centres.

The 5 ways version is made with two 3 ways valves placed side by side with common inlet.

The operators available for this valve are push button (different versions) and selector (key, short and long lever) and pneumatic.

It is also possible to combine the 2 and 3 ways valves with electrical switches, normally closed or open.



Construction characteristics

Body and cover	Reinforced technopolymer
Actuators	Plastic material for buttons and switches
Seals	Oil proof rubber NBR
Spacer	Acetal resin
Spool	Nickel-plated steel
Spring	Spring steel AISI 302

Use and maintenance

These valves have a mean life of 10 to 15 millions of cycles depending on application. Proper lubrication with specified oil may reduce the wear of the seals and good filtration insures long and trouble free operation. Check that the operating conditions are in accordance with the suggested pressure, temperature and so on.

ATTENTION: use hydraulic oil class H for lubrication such as MAGNA GC 32 (Castrol).



2/2 - 3/2

Tappet - spring

Lateral connections

Rear connections

Weight gr. 20
 Operating force 13 N

Ordering code

104. .0.1.

TYPE:
 22 = 2 way
 32 = 3 way

CONNECTION TYPE:
 L = Lateral
 P = Rear

FUNCTION:
 C = Norm. closed N.C.
 A = Norm. open N.O.

2/2 - 3/2

Pneumatic - spring

Lateral connections

Rear connections

Weight gr. 25
 Minimum operating pressure 2,5 bar

Ordering code

104. .11.1.

TYPE:
 22 = 2 way
 32 = 3 way

CONNECTION TYPE:
 L = Lateral
 P = Rear

FUNCTION:
 C = Norm. closed N.C.
 A = Norm. open N.O.

2/2 - 3/2

Push button - spring

Lateral connections

Rear connections

Weight gr. 50
 Operating force 18 N

Ordering code

104. .6.22/ .

TYPE:
 22 = 2 ways
 32 = 3 ways

BUTTON COLOR:
 1 = Red
 2 = Black
 3 = Green
 4 = Yellow

CONNECTION TYPE:
 L = Lateral
 P = Rear

FUNCTION:
 C = Norm. closed N.C.
 A = Norm. open N.O.

5/2

Lateral connections

Rear connections

Weight gr. 105
 Operating force 30 N

Ordering code

104. 52.6.22/ .

BUTTON COLOR:
 1 = Red
 2 = Black
 3 = Green
 4 = Yellow

CONNECTION TYPE:
 L = Lateral
 P = Rear

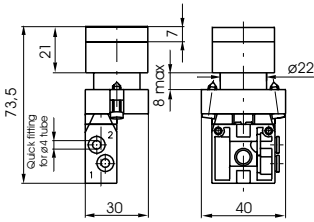
Operational Characteristics	Fluid	Max working pressure	Operating Temperature		Flow rate 6 bar at $\Delta p = 1$	Orifice size	Working port size
	Filtered and lubricated air	10 bar	min. -5° C	max. +50° C	90 NI/min	mm 2,5	tube Ø4

1

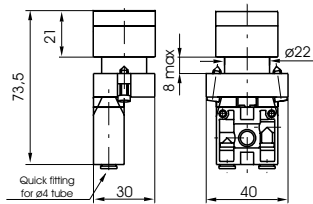


2/2 - 3/2

Lateral connections



Push button 2 positions
(step - step)
Rear connections



Ordering code

104. .6.31.

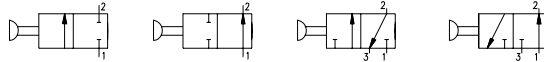
TYPE:
22 = 2 way
32 = 3 way

CONNECTION TYPE:
L = Lateral
P = Rear

FUNCTION:
C = Norm. closed N.C.
A = Norm. open N.O.

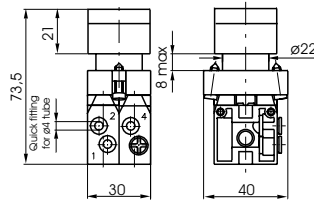
Weight gr. 60

Operating force 18 N

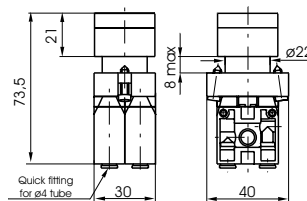


5/2

Lateral connections



Rear connections



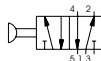
Ordering code

104. 52.6.31.

CONNECTION TYPE:
L = Lateral
P = Rear

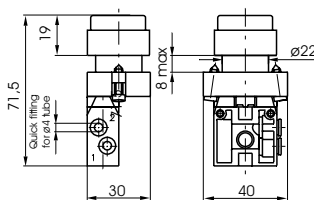
Weight gr. 110

Operating force 30 N



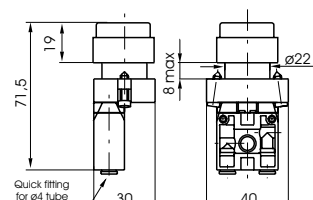
2/2 - 3/2

Lateral connections



Raised Push button - spring

Rear connections



Ordering code

104. .6.23/ .

TYPE:
22 = 2 ways
32 = 3 ways

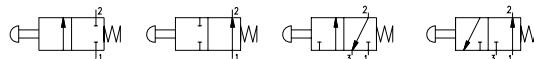
BUTTON COLOR:
1 = Red
2 = Black
3 = Green
4 = Yellow

CONNECTION TYPE:
L = Lateral
P = Rear

FUNCTION:
C = Norm. closed N.C.
A = Norm. open N.O.

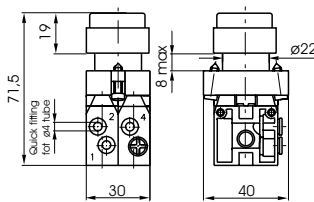
Weight gr. 50

Operating force 18 N

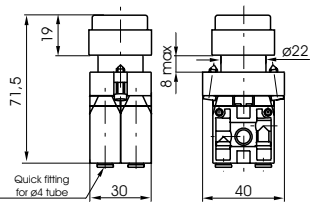


5/2

Lateral connections



Rear connections



Ordering code

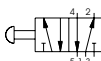
104. 52.6.23/ .

BUTTON COLOR:
1 = Red
2 = Black
3 = Green
4 = Yellow

CONNECTION TYPE:
L = Lateral
P = Rear

Weight gr. 105

Operating force 30 N



Operational Characteristics	Fluid	Max working pressure	Operating Temperature		Flow rate 6 bar at $\Delta p = 1$	Orifice size	Working port size
	Filtered and lubricated air	10 bar	min. -5° C	max. +50° C	90 NI/min	mm 2,5	tube ø4



2/2 - 3/2

Palm button 2 position (emergency)

Lateral connections

Rear connections

Ordering code

104. .6.25.

TYPE:
 22 = 2 way
 32 = 3 way

CONNECTION TYPE:
 L = Lateral
 P = Rear

FUNCTION:
 C = Norm. closed N.C.
 A = Norm. open N.O.

Weight gr. 65
 Operating force 19 N

5/2

Lateral connections

Rear connections

Ordering code

104. 52.6.25.

CONNECTION TYPE:
 L = Lateral
 P = Rear

Weight gr. 120
 Operating force 32 N

2/2 - 3/2

Switch - short lever

Lateral connections

Rear connections

Ordering code

104. .6.30.

TYPE:
 22 = 2 ways
 32 = 3 ways

CONNECTION TYPE:
 L = Lateral
 P = Rear

FUNCTION:
 C = Norm. closed N.C.
 A = Norm. open N.O.

Switch 2 positions stable

Weight gr. 65

5/2 - 5/3

Lateral connections

Rear connections

Ordering code

104. 52.6.30.

CONNECTION TYPE:
 L = Lateral
 P = Rear

Switch 2 positions stable

104.53. .6.30.

FUNCTION:
 32 = Open centres
 33 = Pressured centres

SWITCH POSITIONS:
 0 = 3 pos. instable
 1 = 3 pos. stable

CONNECTION TYPE:
 L = Lateral
 P = Rear

Weight gr. 120

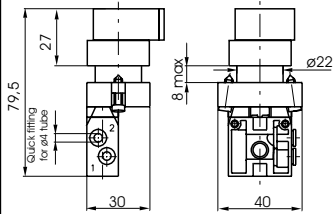
Operational Characteristics	Fluid	Max working pressure	Operating Temperature		Flow rate 6 bar at Δp = 1	Orifice size	Working port size
	Filtered and lubricated air	10 bar	min. -5° C	max. +50° C	90 NI/min	mm 2,5	tube Ø4



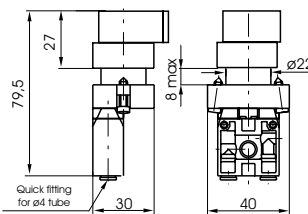
2/2 - 3/2

Switch - long lever

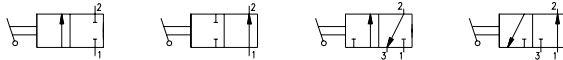
Lateral connections



Rear connections



Weight gr. 65



Ordering code

104. .6.27.

TYPE:
22 = 2 way
32 = 3 way

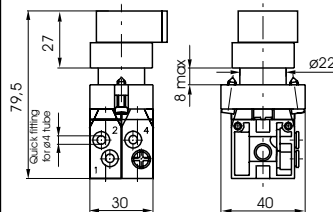
CONNECTION TYPE:
L = Lateral
P = Rear

FUNCTION:
C = Norm. closed N.C.
A = Norm. open N.O.

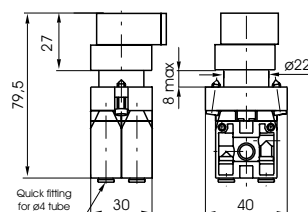
Switch 2 positions stable

5/2 - 5/3

Lateral connections



Rear connections



Weight gr. 120



Ordering code

104. 52.6.27.

CONNECTION TYPE:
L = Lateral
P = Rear

Switch 2 positions stable

104. 53. .6.27.

FUNCTION:
32 = Open centres
33 = Pressured centres

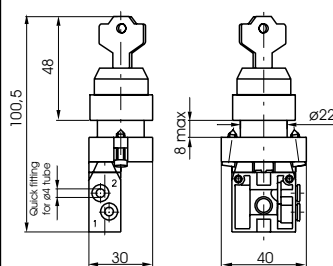
SWITCH POSITIONS:
0 = 3 pos. instable
1 = 3 pos. stable

CONNECTION TYPE:
L = Lateral
P = Rear

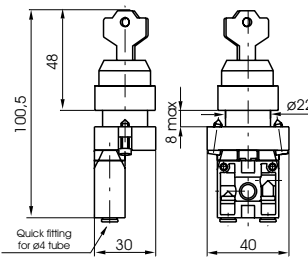
2/2 - 3/2

Kej switch

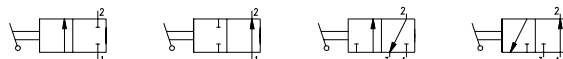
Lateral connections



Rear connections



Weight gr. 100



Ordering code

104. .6.28.

TYPE:
22 = 2 way
32 = 3 way

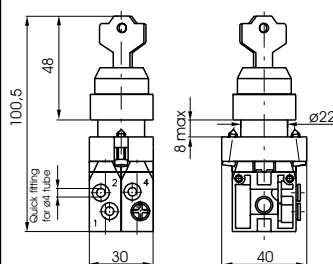
CONNECTION TYPE:
L = Lateral
P = Rear

FUNCTION:
C = Norm. closed N.C.
A = Norm. open N.O.

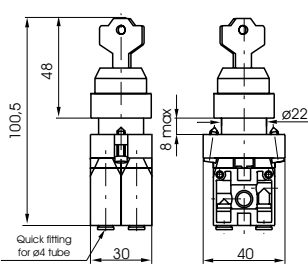
Switch 2 positions stable

5/2 - 5/3

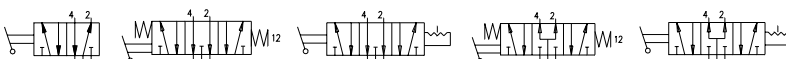
Lateral connections



Rear connections



Weight gr. 155



Ordering code

104. 52.6.28.

CONNECTION TYPE:
L = Lateral
P = Rear

Switch 2 positions stable

104. 53. .6.28.











FUNCTION:
32 = Open centres
33 = Pressured centres

SWITCH POSITIONS:
0 = 3 pos. instable
1 = 3 pos. stable

CONNECTION TYPE:
L = Lateral
P = Rear

Operational Characteristics	Fluid	Max working pressure	Operating Temperature		Flow rate 6 bar at $\Delta p = 1$	Orifice size	Working port size
	Filtered and lubricated air	10 bar	min. -5° C	max. +50° C	90 NI/min	mm 2,5	tube Ø4



<p style="text-align: center;">Push button</p> <hr/> <p style="text-align: center;">Ordering code</p> <hr/> <p>104.6.22/</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>BUTTON COLOR: 1 = Red 2 = Black 3 = Green 4 = Yellow</p> </div> 	<p style="text-align: center;">Raised push button</p> <hr/> <p style="text-align: center;">Ordering code</p> <hr/> <p>104.6.23/</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>BUTTON COLOR: 1 = Red 2 = Black 3 = Green 4 = Yellow</p> </div> 
<p style="text-align: center;">Push button 2 positions (step - step)</p> <hr/> <p style="text-align: center;">Ordering code</p> <hr/> <p>104.6.31</p> 	<p style="text-align: center;">Palm button 2 positions</p> <hr/> <p style="text-align: center;">Ordering code</p> <hr/> <p>104.6.25</p> 
<p style="text-align: center;">Switch short lever</p> <hr/> <p style="text-align: center;">Ordering code</p> <hr/> <p>104.6.30 Switch 2 positions stable</p> <p>104.6.30.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>0 = Switch 3 pos. instable 1 = Switch 3 pos. stable</p> </div> 	<p style="text-align: center;">Switch long lever</p> <hr/> <p style="text-align: center;">Ordering code</p> <hr/> <p>104.6.27 Switch 2 positions stable</p> <p>104.6.27.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>0 = Switch 3 pos. instable 1 = Switch 3 pos. stable</p> </div> 
<p style="text-align: center;">Kej switch</p> <hr/> <p style="text-align: center;">Ordering code</p> <hr/> <p>104.6.28 Switch 2 positions stable</p> <p>104.6.28.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>0 = Switch 3 pos. instable 1 = Switch 3 pos. stable</p> </div> 	<p style="text-align: center;">Fixing plate (completwith fixing screws)</p> <hr/> <p style="text-align: center;">Ordering code</p> <hr/> <p>104.00</p> 
<p style="text-align: center;">Complet pneumatic operator</p> <hr/> <p style="text-align: center;">Ordering code</p> <hr/> <p>104.11</p> 	<p style="text-align: center;">Contact electric element</p> <hr/> <p style="text-align: center;">Ordering code</p> <hr/> <p>104.NC Normally closed 104.NA Normally open</p> 

1



General

The series 105 and 200 consist of a broad range of miniature valves and valves with various type of actuation. The connections are M5 for the microvalve series 105 and G 1/8" to G 1" for valve series 200. Due to their special construction with a balanced spool, these valves can be used interchangeably as 3 ways or 5 ways as can be seen in the functional schematics in section 0. This is important because, for example, the 3 ways can be used normally closed or normally open and the 5 ways can be fed through the exhausts 3 and 5 with different pressures according to the need. The spool, as it is moving, isolates the connections without being effected by the inlet pressure.

The polyurethane seals are available for oil free operation. In this case, the ordering code becomes:

238... for G 1/8" - **234...** for G 1/4" - **232...** for G 1/2"

Important: on this type of valves a temperature higher then 40°C along with water or high humidity are causing a progressive reduction of mechanical characteristics of the seals. This chemical reaction (hydrolysis) duration depends by the ambient temperature and in some cases the seal becomes brittle and falls to pieces.

The valves equipped with polyurethane seals are not suitable for tropical climate.

Construction characteristics

	M5	G 1/8" - G 1/4" - G 1/2" - G 1"
Body	Nickel plated brass	Anodized aluminium
Actuators	Nickel plated brass Stainless steel for roller levers and button levers Zinc plated steel for side levers Plastic material for handles, buttons, switches	Anodized aluminium
Seals	Oilproof rubber NBR	Oilproof rubber NBR
Spacer	Acetal resin	Acetal resin (aluminium for G1")
Spool	Nickel plated steel (Kanigen)	Nickel plated steel (Kanigen)
Bottom plates		Acetal resin
Spring	Spring steel	Spring steel

Use and maintenance

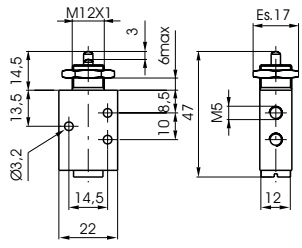

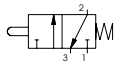
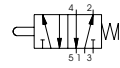
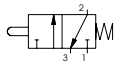
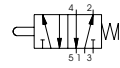
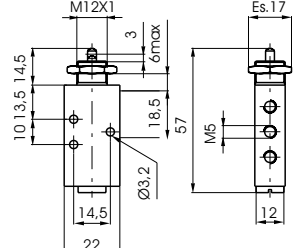

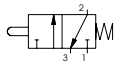
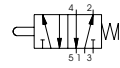
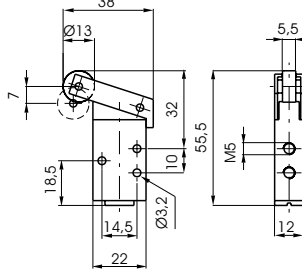

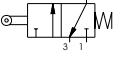

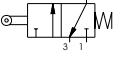

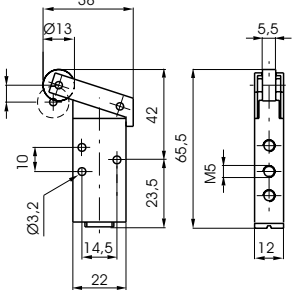

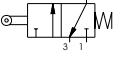

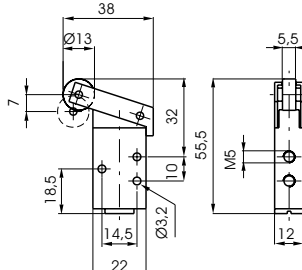

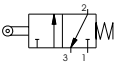
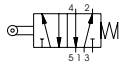
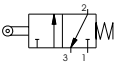
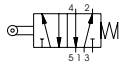
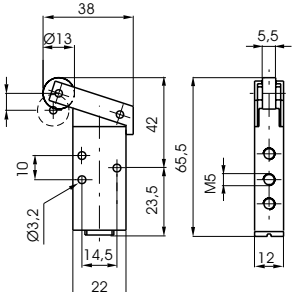

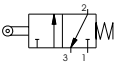
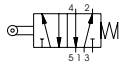
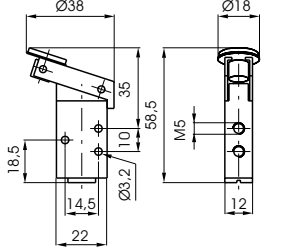





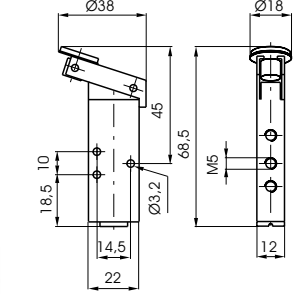



These valves have a mean life of 10 to 15 millions of cycles depending on application. Proper lubrication with specified oil reduces dramatically the wear of the seals and good filtration insures long and trouble free operation. Check that the operating conditions are in accordance with the suggested pressure, temperature and so on.

The exhaust ports of the distributor should be protected in a dusty and dirty environment.

A spare parts kit including the spool complete of wearing seals and actuators is available for overhauling the valve. This simple operation does not require a skilled worker. Although particular care is needed for assembling the valve.

ATTENTION: use hydraulic oil class H for lubrication such as MAGNA GC 32 (Castrol).



<p>3/2</p>  	<p>Tappet spring</p> <hr/> <p>Ordering code</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;"> <p>105.32.0.1</p>  <p>Weight gr. 70</p> </td> <td style="width: 50%; text-align: center;"> <p>105.52.0.1</p>  <p>Weight gr. 87</p> </td> </tr> </table> <p>Operating force 14 N</p>		<p>105.32.0.1</p>  <p>Weight gr. 70</p>	<p>105.52.0.1</p>  <p>Weight gr. 87</p>	<p>5/2</p>  	
<p>105.32.0.1</p>  <p>Weight gr. 70</p>	<p>105.52.0.1</p>  <p>Weight gr. 87</p>					
<p>3/2</p>  	<p>Lever roller spring</p> <hr/> <p>Ordering code</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;"> <p>105.32.2.1</p>  <p>Weight gr. 85</p> </td> <td style="width: 50%; text-align: center;"> <p>105.52.2.1</p>  <p>Weight gr. 102</p> </td> </tr> </table> <p>Operating force 6 N</p>		<p>105.32.2.1</p>  <p>Weight gr. 85</p>	<p>105.52.2.1</p>  <p>Weight gr. 102</p>	<p>5/2</p>  	
<p>105.32.2.1</p>  <p>Weight gr. 85</p>	<p>105.52.2.1</p>  <p>Weight gr. 102</p>					
<p>3/2</p>  	<p>Lever roller ball bearing spring</p> <hr/> <p>Ordering code</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;"> <p>105.32.2.1/1</p>  <p>Weight gr. 100</p> </td> <td style="width: 50%; text-align: center;"> <p>105.52.2.1/1</p>  <p>Weight gr. 117</p> </td> </tr> </table> <p>Operating force 6 N</p>		<p>105.32.2.1/1</p>  <p>Weight gr. 100</p>	<p>105.52.2.1/1</p>  <p>Weight gr. 117</p>	<p>5/2</p>  	
<p>105.32.2.1/1</p>  <p>Weight gr. 100</p>	<p>105.52.2.1/1</p>  <p>Weight gr. 117</p>					
<p>3/2</p>  	<p>Lever button spring</p> <hr/> <p>Ordering code</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;"> <p>105.32.2.6/1 <i>Red</i></p> <p>105.32.2.6/2 <i>Black</i></p> <p>105.32.2.6/3 <i>Green</i></p>  <p>Weight gr. 85</p> </td> <td style="width: 50%; text-align: center;"> <p>105.52.2.6/1 <i>Red</i></p> <p>105.52.2.6/2 <i>Black</i></p> <p>105.52.2.6/3 <i>Green</i></p>  <p>Weight gr. 102</p> </td> </tr> </table> <p>Operating force 6 N</p>		<p>105.32.2.6/1 <i>Red</i></p> <p>105.32.2.6/2 <i>Black</i></p> <p>105.32.2.6/3 <i>Green</i></p>  <p>Weight gr. 85</p>	<p>105.52.2.6/1 <i>Red</i></p> <p>105.52.2.6/2 <i>Black</i></p> <p>105.52.2.6/3 <i>Green</i></p>  <p>Weight gr. 102</p>	<p>5/2</p>  	
<p>105.32.2.6/1 <i>Red</i></p> <p>105.32.2.6/2 <i>Black</i></p> <p>105.32.2.6/3 <i>Green</i></p>  <p>Weight gr. 85</p>	<p>105.52.2.6/1 <i>Red</i></p> <p>105.52.2.6/2 <i>Black</i></p> <p>105.52.2.6/3 <i>Green</i></p>  <p>Weight gr. 102</p>					
<p>Operational characteristics</p>	<p>Fluid</p> <p>Filtered and lubricated air</p>	<p>Max working pressure</p> <p>10 bar</p>	<p>Operating temperature</p> <p>min. -5°C</p> <p>max. +70°C</p>	<p>Flow rate at 6 bar with $\Delta p = 1$</p> <p>120 NI/min</p>	<p>Ø Orifice size</p> <p>mm 2,5</p>	<p>Working port size</p> <p>M5</p>

3/2 **5/2**

Lever roller, unidirectional spring

Ordering code

105.32.3.1	105.52.3.1
Weight gr. 85	Weight gr. 102

Operating force 6 N

3/2 **5/2**

**Lever panel Ø 22
2-positions**

Ordering code

105.32.4/1 <i>Red</i>	105.52.4/1 <i>Red</i>
105.32.4/2 <i>Black</i>	105.52.4/2 <i>Black</i>
105.32.4/3 <i>Green</i>	105.52.4/3 <i>Green</i>
Weight gr. 125	Weight gr. 142

3/2 **5/2**

**Lever panel Ø 30
2-positions**

Ordering code

105.32.5/1 <i>Red</i>	105.52.5/1 <i>Red</i>
105.32.5/2 <i>Black</i>	105.52.5/2 <i>Black</i>
105.32.5/3 <i>Green</i>	105.52.5/3 <i>Green</i>
Weight gr. 165	Weight gr. 182

3/2 **5/2**

**Push button Ø 30
spring**

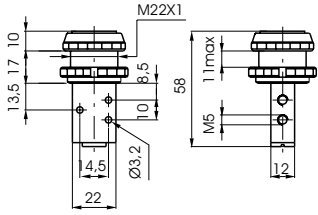





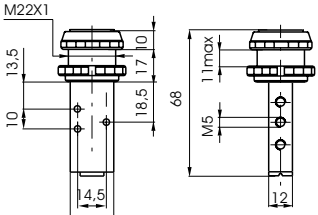



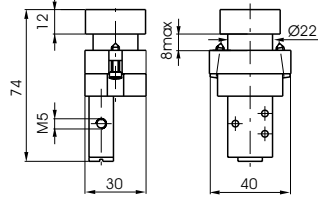

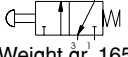

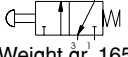

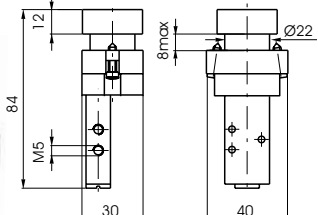

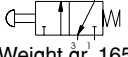

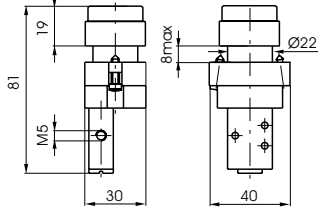

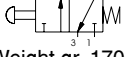

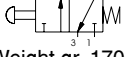

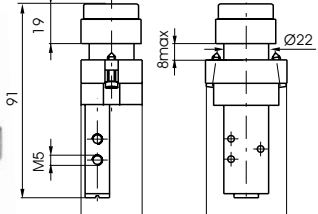

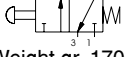

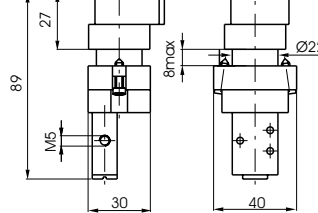

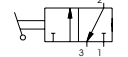
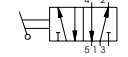
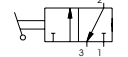
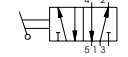
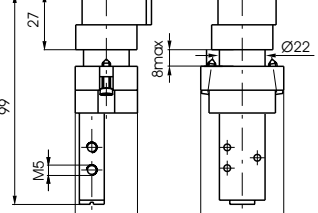

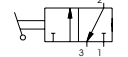
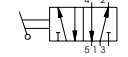
Ordering code

105.32.6.1/1 <i>Red</i>	105.52.6.1/1 <i>Red</i>
105.32.6.1/2 <i>Black</i>	105.52.6.1/2 <i>Black</i>
105.32.6.1/3 <i>Green</i>	105.52.6.1/3 <i>Green</i>
Weight gr. 123	Weight gr. 140

Operating force 14 N

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with Δ p = 1	Ø Orefice size	Working port size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	120 NI/min	mm 2,5	M5



<p>3/2</p>  	<p style="text-align: center;">Push button Ø 22 spring</p> <hr/> <p style="text-align: center;">Ordering code</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"> <p>105.32.6.2/1 <i>Red</i></p> <p>105.32.6.2/2 <i>Black</i></p> <p>105.32.6.2/3 <i>Green</i></p>  <p>Weight gr. 102</p> </td> <td style="width: 50%; padding: 5px;"> <p>105.52.6.2/1 <i>Red</i></p> <p>105.52.6.2/2 <i>Black</i></p> <p>105.52.6.2/3 <i>Green</i></p>  <p>Weight gr. 119</p> </td> </tr> </table> <p style="text-align: center;">Operating force 14 N</p>		<p>105.32.6.2/1 <i>Red</i></p> <p>105.32.6.2/2 <i>Black</i></p> <p>105.32.6.2/3 <i>Green</i></p>  <p>Weight gr. 102</p>	<p>105.52.6.2/1 <i>Red</i></p> <p>105.52.6.2/2 <i>Black</i></p> <p>105.52.6.2/3 <i>Green</i></p>  <p>Weight gr. 119</p>	<p>5/2</p>  	
<p>105.32.6.2/1 <i>Red</i></p> <p>105.32.6.2/2 <i>Black</i></p> <p>105.32.6.2/3 <i>Green</i></p>  <p>Weight gr. 102</p>	<p>105.52.6.2/1 <i>Red</i></p> <p>105.52.6.2/2 <i>Black</i></p> <p>105.52.6.2/3 <i>Green</i></p>  <p>Weight gr. 119</p>					
<p>3/2</p>  	<p style="text-align: center;">Push button spring</p> <hr/> <p style="text-align: center;">Ordering code</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"> <p>105.32.6.22/1 <i>Red</i></p> <p>105.32.6.22/2 <i>Black</i></p> <p>105.32.6.22/3 <i>Green</i></p> <p>105.32.6.22/4 <i>Yellow</i></p>  <p>Weight gr. 165</p> </td> <td style="width: 50%; padding: 5px;"> <p>105.52.6.22/1 <i>Red</i></p> <p>105.52.6.22/2 <i>Black</i></p> <p>105.52.6.22/3 <i>Green</i></p> <p>105.52.6.22/4 <i>Yellow</i></p>  <p>Weight gr. 182</p> </td> </tr> </table> <p style="text-align: center;">Operating force 14 N</p>		<p>105.32.6.22/1 <i>Red</i></p> <p>105.32.6.22/2 <i>Black</i></p> <p>105.32.6.22/3 <i>Green</i></p> <p>105.32.6.22/4 <i>Yellow</i></p>  <p>Weight gr. 165</p>	<p>105.52.6.22/1 <i>Red</i></p> <p>105.52.6.22/2 <i>Black</i></p> <p>105.52.6.22/3 <i>Green</i></p> <p>105.52.6.22/4 <i>Yellow</i></p>  <p>Weight gr. 182</p>	<p>5/2</p>  	
<p>105.32.6.22/1 <i>Red</i></p> <p>105.32.6.22/2 <i>Black</i></p> <p>105.32.6.22/3 <i>Green</i></p> <p>105.32.6.22/4 <i>Yellow</i></p>  <p>Weight gr. 165</p>	<p>105.52.6.22/1 <i>Red</i></p> <p>105.52.6.22/2 <i>Black</i></p> <p>105.52.6.22/3 <i>Green</i></p> <p>105.52.6.22/4 <i>Yellow</i></p>  <p>Weight gr. 182</p>					
<p>3/2</p>  	<p style="text-align: center;">Raised push button spring</p> <hr/> <p style="text-align: center;">Ordering code</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"> <p>105.32.6.23/1 <i>Red</i></p> <p>105.32.6.23/2 <i>Black</i></p> <p>105.32.6.23/3 <i>Green</i></p> <p>105.32.6.23/4 <i>Yellow</i></p>  <p>Weight gr. 170</p> </td> <td style="width: 50%; padding: 5px;"> <p>105.52.6.23/1 <i>Red</i></p> <p>105.52.6.23/2 <i>Black</i></p> <p>105.52.6.23/3 <i>Green</i></p> <p>105.52.6.23/4 <i>Yellow</i></p>  <p>Weight gr. 187</p> </td> </tr> </table> <p style="text-align: center;">Operating force 14 N</p>		<p>105.32.6.23/1 <i>Red</i></p> <p>105.32.6.23/2 <i>Black</i></p> <p>105.32.6.23/3 <i>Green</i></p> <p>105.32.6.23/4 <i>Yellow</i></p>  <p>Weight gr. 170</p>	<p>105.52.6.23/1 <i>Red</i></p> <p>105.52.6.23/2 <i>Black</i></p> <p>105.52.6.23/3 <i>Green</i></p> <p>105.52.6.23/4 <i>Yellow</i></p>  <p>Weight gr. 187</p>	<p>5/2</p>  	
<p>105.32.6.23/1 <i>Red</i></p> <p>105.32.6.23/2 <i>Black</i></p> <p>105.32.6.23/3 <i>Green</i></p> <p>105.32.6.23/4 <i>Yellow</i></p>  <p>Weight gr. 170</p>	<p>105.52.6.23/1 <i>Red</i></p> <p>105.52.6.23/2 <i>Black</i></p> <p>105.52.6.23/3 <i>Green</i></p> <p>105.52.6.23/4 <i>Yellow</i></p>  <p>Weight gr. 187</p>					
<p>3/2</p>  	<p style="text-align: center;">Switch 2-positions</p> <hr/> <p style="text-align: center;">Ordering code</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"> <p>105.32.6.27</p>  <p>Weight gr. 185</p> </td> <td style="width: 50%; padding: 5px;"> <p>105.52.6.27</p>  <p>Weight gr. 202</p> </td> </tr> </table>		<p>105.32.6.27</p>  <p>Weight gr. 185</p>	<p>105.52.6.27</p>  <p>Weight gr. 202</p>	<p>5/2</p>  	
<p>105.32.6.27</p>  <p>Weight gr. 185</p>	<p>105.52.6.27</p>  <p>Weight gr. 202</p>					
<p>Operational characteristics</p>	<p>Fluid</p> <p>Filtered and lubricated air</p>	<p>Max working pressure</p> <p>10 bar</p>	<p>Operating temperature</p> <p>min. -5°C</p> <p>max. +70°C</p>	<p>Flow rate at 6 bar with Δ p = 1</p> <p>120 NI/min</p>	<p>Ø Orifice size</p> <p>mm 2,5</p>	<p>Working port size</p> <p>M5</p>

3/2 **5/2**

**Key switch
2-positions**

Ordering code

105.32.6.28	105.52.6.28
Weight gr. 215	Weight gr. 232

3/2 **5/2**

**Palm pushbutton Ø 30
spring**

Ordering code

105.32.7.1/1 <i>Red</i>	105.52.7.1/1 <i>Red</i>
105.32.7.1/22 <i>Black</i>	105.52.7.1/22 <i>Black</i>
105.32.7.1/3 <i>Green</i>	105.52.7.1/3 <i>Green</i>
Weight gr. 126	Weight gr. 143

Operating force 14 N

3/2 **5/2**

**Palm pushbutton Ø 22
spring**

Ordering code

105.32.7.2/1 <i>Red</i>	105.52.7.2/1 <i>Red</i>
105.32.7.2/2 <i>Black</i>	105.52.7.2/2 <i>Black</i>
105.32.7.2/3 <i>Green</i>	105.52.7.2/3 <i>Green</i>
Weight gr. 103	Weight gr. 120

Operating force 14 N

3/2 **5/2**

**Push button
spring**

Ordering code

105.32.8.1/1 <i>Red</i>	105.52.8.1/1 <i>Red</i>
105.32.8.1/2 <i>Black</i>	105.52.8.1/2 <i>Black</i>
105.32.8.1/3 <i>Green</i>	105.52.8.1/3 <i>Green</i>
Weight gr. 75	Weight gr. 92

Operating force 14 N

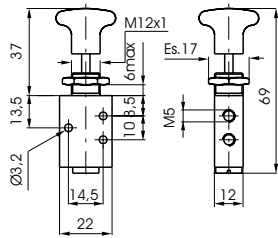
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	\varnothing Orefice size	Working port size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	120 NI/min	mm 2,5	M5



3/2

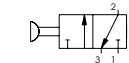
**Push button
2-positions**

5/2



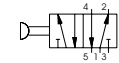
Ordering code

105.32.8/1
Red
105.32.8/2
Black
105.32.8/3
Green

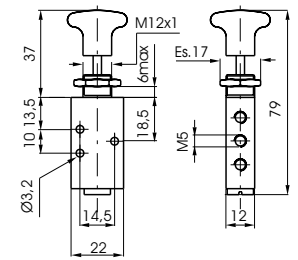


Weight gr. 75

105.52.8/1
Red
105.52.8/2
Black
105.52.8/3
Green



Weight gr. 92

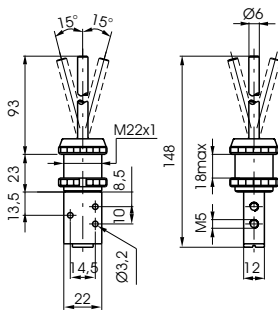


Operating force 3 N

3/2

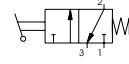
**Whisker
spring**

5/2



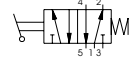
Ordering code

105.32.9.1

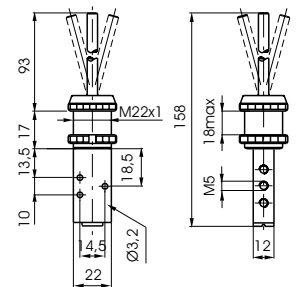


Weight gr. 136

105.52.9.1



Weight gr. 153



3/2

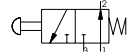
**Handle
with valve 3/2**

5/2

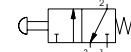


Ordering code

105.32.6.40A N.O.

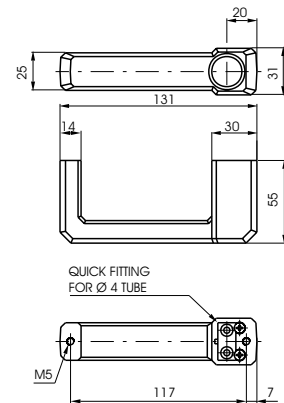


105.32.6.40C N.C.



Weight gr. 165

Operating force 14 N



Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	\varnothing Orifice size	Working port size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	120 NI/min	mm 2,5	M5 - 4 mm push in fitting

Valves G 1/8" - G 1" Series 200

Tappet

Lever roller

Lever button

Lever sensitive

Lever panel

Lever front

Push button

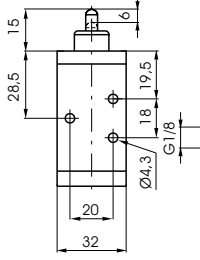
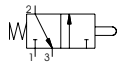
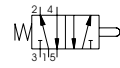
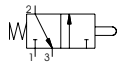
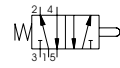
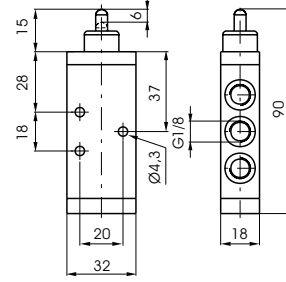
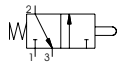
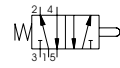
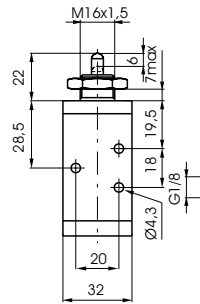
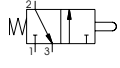

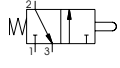

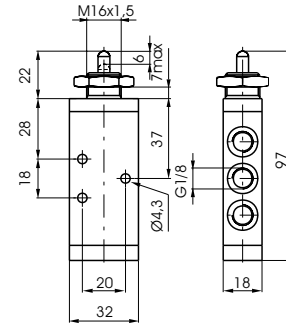
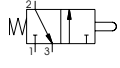

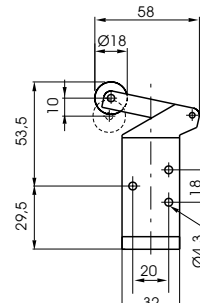
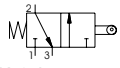
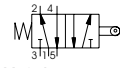
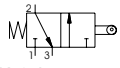
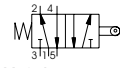
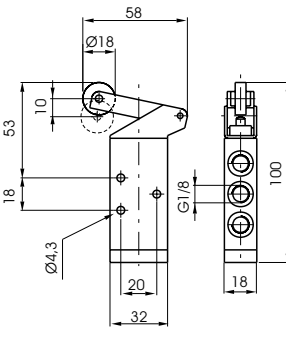
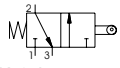
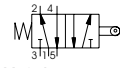
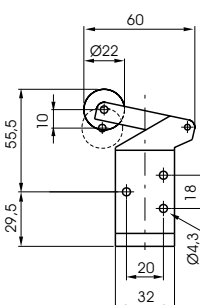
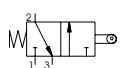

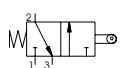

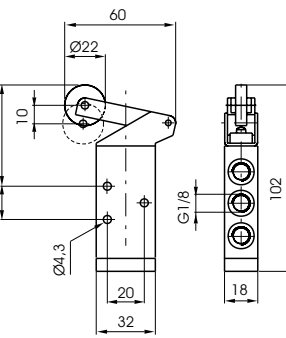
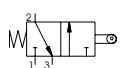

Switch

Lever lateral

Pedal

Pedal ?????????



3/2	Tappet spring		5/2								
	<p style="text-align: center;">Ordering code</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">228.32.0.1</td> <td style="width: 50%; text-align: center;">228.52.0.1</td> </tr> <tr> <td style="text-align: center;">  </td> <td style="text-align: center;">  </td> </tr> <tr> <td style="text-align: center;">Weight gr. 85</td> <td style="text-align: center;">Weight gr. 105</td> </tr> </table> <p style="text-align: center;">Operating force 33 N</p>		228.32.0.1	228.52.0.1			Weight gr. 85	Weight gr. 105			
228.32.0.1	228.52.0.1										
											
Weight gr. 85	Weight gr. 105										
	<p style="text-align: center;">Ordering code</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">228.32.1.1</td> <td style="width: 50%; text-align: center;">228.52.1.1</td> </tr> <tr> <td style="text-align: center;">  </td> <td style="text-align: center;">  </td> </tr> <tr> <td style="text-align: center;">Weight gr. 102</td> <td style="text-align: center;">Weight gr. 122</td> </tr> </table> <p style="text-align: center;">Operating force 33 N</p>		228.32.1.1	228.52.1.1			Weight gr. 102	Weight gr. 122			
228.32.1.1	228.52.1.1										
											
Weight gr. 102	Weight gr. 122										
	<p style="text-align: center;">Ordering code</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">228.32.2.1 <i>Plastic roller</i></td> <td style="width: 50%; text-align: center;">228.32.2.1 <i>Plastic roller</i></td> </tr> <tr> <td style="width: 50%; text-align: center;">228.32.2.1/2 <i>Metal roller</i></td> <td style="width: 50%; text-align: center;">228.32.2.1/2 <i>Metal roller</i></td> </tr> <tr> <td style="text-align: center;">  </td> <td style="text-align: center;">  </td> </tr> <tr> <td style="text-align: center;">Weight gr. 115</td> <td style="text-align: center;">Weight gr. 135</td> </tr> </table> <p style="text-align: center;">Operating force 15 N</p>		228.32.2.1 <i>Plastic roller</i>	228.32.2.1 <i>Plastic roller</i>	228.32.2.1/2 <i>Metal roller</i>	228.32.2.1/2 <i>Metal roller</i>			Weight gr. 115	Weight gr. 135	
228.32.2.1 <i>Plastic roller</i>	228.32.2.1 <i>Plastic roller</i>										
228.32.2.1/2 <i>Metal roller</i>	228.32.2.1/2 <i>Metal roller</i>										
											
Weight gr. 115	Weight gr. 135										
	<p style="text-align: center;">Ordering code</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">228.32.2.1/1</td> <td style="width: 50%; text-align: center;">228.52.2.1/1</td> </tr> <tr> <td style="text-align: center;">  </td> <td style="text-align: center;">  </td> </tr> <tr> <td style="text-align: center;">Weight gr. 130</td> <td style="text-align: center;">Weight gr. 150</td> </tr> </table> <p style="text-align: center;">Operating force 15 N</p>		228.32.2.1/1	228.52.2.1/1			Weight gr. 130	Weight gr. 150			
228.32.2.1/1	228.52.2.1/1										
											
Weight gr. 130	Weight gr. 150										
<p>Operational characteristics</p>	<p>Fluid</p> <p>Filtered and lubricated air</p>	<p>Max working pressure</p> <p>10 bar</p>	<p>Operating temperature</p> <p>min. -5°C</p> <p>max. +70°C</p>	<p>Flow rate at 6 bar with Δ p = 1</p> <p>540 NI/min</p>	<p>Ø Orifice size</p> <p>mm 6</p>	<p>Working port size</p> <p>G 1/8"</p>					



3/2 **5/2**

Lever button spring

Ordering code

228.32.2.6/1 <i>Red</i>	228.52.2.6/1 <i>Red</i>
228.32.2.6/2 <i>Black</i>	228.52.2.6/2 <i>Black</i>
228.32.2.6/3 <i>Green</i>	228.52.2.6/3 <i>Green</i>

Weight gr. 120 Weight gr. 140

Operating force 15 N

3/2 **5/2**

Switch lateral 2-positions

Ordering code

228.32.27	228.52.27
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Weight gr. 190 Weight gr. 210

3/2 **5/2**

Lever roller unidirectional spring

Ordering code

228.32.3.1 <i>Plastic roller</i>	228.52.3.1 <i>Plastic roller</i>
228.32.3.1/2 <i>Metal roller</i>	228.52.3.1/2 <i>Metal roller</i>

Weight gr. 110 Weight gr. 130

Operating force 15 N

3/2 **5/2**

Lever roller lateral bidirectional spring

Ordering code

228.32.4.1	228.52.4.1
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Weight gr. 180 Weight gr. 200

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with Δ p = 1	Ø Orefice size	Working port size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	540 NI/min	mm 6	G 1/8"

3/2	Lever sensitive differential	5/2
Ordering code		
228.32.4.13 		228.52.4.13
Weight gr. 200 Minimum working pressure 2,5 bar		Weight gr. 220

3/2	Lever panel Ø 30 2-positions	5/2
Ordering code		
228.32.5/1 <i>Red</i> 228.32.5/2 <i>Black</i> 228.32.5/3 <i>Green</i> 		228.52.5/1 <i>Red</i> 228.52.5/2 <i>Black</i> 228.52.5/3 <i>Green</i>
Weight gr. 198		Weight gr. 218

3/2	Lever front 2-positions	5/2
Ordering code		
228.32.55/1 <i>Red</i> 228.32.55/2 <i>Black</i> 228.32.55/3 <i>Green</i> 		228.52.55/1 <i>Red</i> 228.52.55/2 <i>Black</i> 228.52.55/3 <i>Green</i>
Weight gr. 115		Weight gr. 135

3/2	Pushbutton Ø 30 spring	5/2
Ordering code		
228.32.6.1/1 <i>Red</i> 228.32.6.1/2 <i>Black</i> 228.32.6.1/3 <i>Green</i> 		228.52.6.1/1 <i>Red</i> 228.52.6.1/2 <i>Black</i> 228.52.6.1/3 <i>Green</i>
Weight gr. 155		Weight gr. 175
Operating force 33 N		

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	\varnothing Orifice size	Working port size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	540 NI/min	mm 6	G 1/8"



3/2 Sensitive pushbutton Ø 30 differential 5/2

Ordering code

228.32.6.13/1 Red	228.52.6.13/1 Red
228.32.6.13/2 Black	228.52.6.13/2 Black
228.32.6.13/3 Green	228.52.6.13/3 Green

Weight gr. 197 Weight gr. 217
Operating force 18,5 N (at 6 bar)

3/2 Push button spring 5/2

Ordering code

228.32.6.22/1 Red	228.52.6.22/1 Red
228.32.6.22/2 Black	228.52.6.22/2 Black
228.32.6.22/3 Green	228.52.6.22/3 Green
228.32.6.22/4 Yellow	228.52.6.22/4 Yellow

Weight gr. 225 Weight gr. 245
Operating force 33 N

3/2 Raised pushbutton spring 5/2

Ordering code

228.32.6.23/1 Red	228.52.6.23/1 Red
228.32.6.23/2 Black	228.52.6.23/2 Black
228.32.6.23/3 Green	228.52.6.23/3 Green
228.32.6.23/4 Yellow	228.52.6.23/4 Yellow

Weight gr. 230 Weight gr. 250
Operating force 33 N

3/2 Palm button 2-positions 5/2

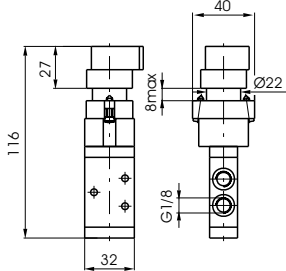

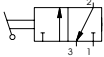
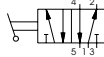

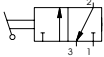
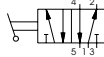
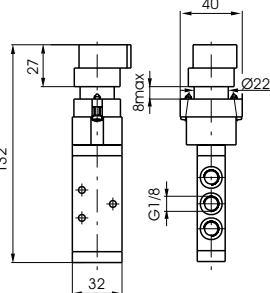
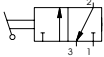
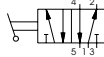
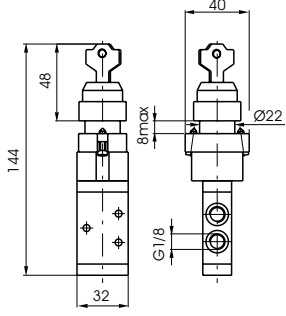

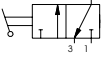
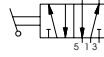

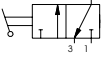
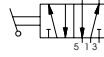
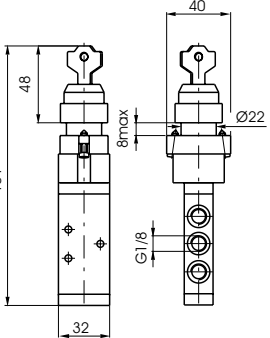
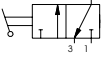
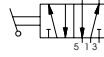
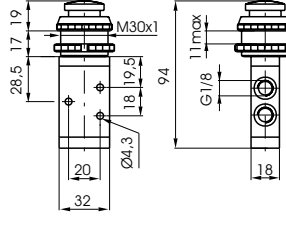


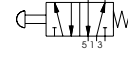


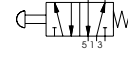
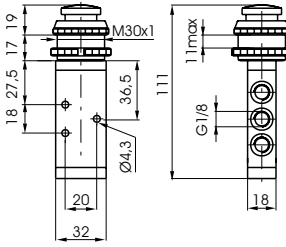

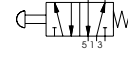
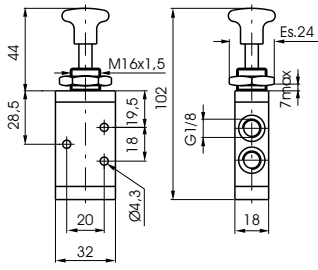

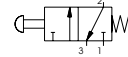


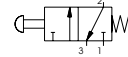

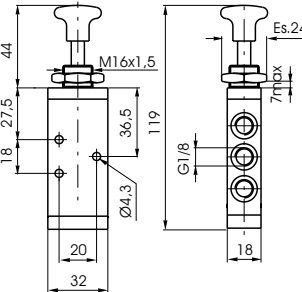
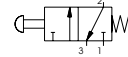

Ordering code

228.32.6.25	228.52.6.25
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Weight gr. 235 Weight gr. 255
Operating force 33 N

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Ø Orefice size	Working port size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	540 NI/min	mm 6	G 1/8"



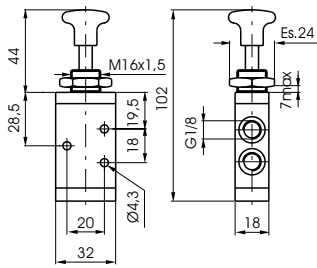
<p>3/2</p>  	<p style="text-align: center;">Switch 2-positions</p> <hr/> <p style="text-align: center;">Ordering code</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center; vertical-align: top;"> <p>228.32.6.27</p>  </td> <td style="width: 50%; text-align: center; vertical-align: top;"> <p>228.52.6.27</p>  </td> </tr> <tr> <td style="text-align: center;">Weight gr. 230</td> <td style="text-align: center;">Weight gr. 250</td> </tr> </table> 		<p>228.32.6.27</p> 	<p>228.52.6.27</p> 	Weight gr. 230	Weight gr. 250	<p>5/2</p> 		
<p>228.32.6.27</p> 	<p>228.52.6.27</p> 								
Weight gr. 230	Weight gr. 250								
<p>3/2</p>  	<p style="text-align: center;">Key switch 2-positions</p> <hr/> <p style="text-align: center;">Ordering code</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center; vertical-align: top;"> <p>228.32.6.28</p>  </td> <td style="width: 50%; text-align: center; vertical-align: top;"> <p>228.52.6.28</p>  </td> </tr> <tr> <td style="text-align: center;">Weight gr. 230</td> <td style="text-align: center;">Weight gr. 250</td> </tr> </table> 		<p>228.32.6.28</p> 	<p>228.52.6.28</p> 	Weight gr. 230	Weight gr. 250	<p>5/2</p> 		
<p>228.32.6.28</p> 	<p>228.52.6.28</p> 								
Weight gr. 230	Weight gr. 250								
<p>3/2</p>  	<p style="text-align: center;">Palm push button Ø 30 spring</p> <hr/> <p style="text-align: center;">Ordering code</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center; vertical-align: top;"> <p>228.32.7.1/1 <i>Red</i></p> <p>228.32.7.1/2 <i>Black</i></p> <p>228.32.7.1/3 <i>Green</i></p>  </td> <td style="width: 50%; text-align: center; vertical-align: top;"> <p>228.52.7.1/1 <i>Red</i></p> <p>228.52.7.1/2 <i>Black</i></p> <p>228.52.7.1/3 <i>Green</i></p>  </td> </tr> <tr> <td style="text-align: center;">Weight gr. 148</td> <td style="text-align: center;">Weight gr. 168</td> </tr> <tr> <td colspan="2" style="text-align: center;">Operating force 33 N</td> </tr> </table> 		<p>228.32.7.1/1 <i>Red</i></p> <p>228.32.7.1/2 <i>Black</i></p> <p>228.32.7.1/3 <i>Green</i></p> 	<p>228.52.7.1/1 <i>Red</i></p> <p>228.52.7.1/2 <i>Black</i></p> <p>228.52.7.1/3 <i>Green</i></p> 	Weight gr. 148	Weight gr. 168	Operating force 33 N		<p>5/2</p> 
<p>228.32.7.1/1 <i>Red</i></p> <p>228.32.7.1/2 <i>Black</i></p> <p>228.32.7.1/3 <i>Green</i></p> 	<p>228.52.7.1/1 <i>Red</i></p> <p>228.52.7.1/2 <i>Black</i></p> <p>228.52.7.1/3 <i>Green</i></p> 								
Weight gr. 148	Weight gr. 168								
Operating force 33 N									
<p>3/2</p>  	<p style="text-align: center;">Push button spring</p> <hr/> <p style="text-align: center;">Ordering code</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center; vertical-align: top;"> <p>228.32.8.1/1 <i>Red</i></p> <p>228.32.8.1/2 <i>Black</i></p> <p>228.32.8.1/3 <i>Green</i></p>  </td> <td style="width: 50%; text-align: center; vertical-align: top;"> <p>228.52.8.1/1 <i>Red</i></p> <p>228.52.8.1/2 <i>Black</i></p> <p>228.52.8.1/3 <i>Green</i></p>  </td> </tr> <tr> <td style="text-align: center;">Weight gr. 120</td> <td style="text-align: center;">Weight gr. 140</td> </tr> <tr> <td colspan="2" style="text-align: center;">Operating force 33 N</td> </tr> </table> 		<p>228.32.8.1/1 <i>Red</i></p> <p>228.32.8.1/2 <i>Black</i></p> <p>228.32.8.1/3 <i>Green</i></p> 	<p>228.52.8.1/1 <i>Red</i></p> <p>228.52.8.1/2 <i>Black</i></p> <p>228.52.8.1/3 <i>Green</i></p> 	Weight gr. 120	Weight gr. 140	Operating force 33 N		<p>5/2</p> 
<p>228.32.8.1/1 <i>Red</i></p> <p>228.32.8.1/2 <i>Black</i></p> <p>228.32.8.1/3 <i>Green</i></p> 	<p>228.52.8.1/1 <i>Red</i></p> <p>228.52.8.1/2 <i>Black</i></p> <p>228.52.8.1/3 <i>Green</i></p> 								
Weight gr. 120	Weight gr. 140								
Operating force 33 N									
<p>Operational characteristics</p>	<p>Fluid</p> <p>Filtered and lubricated air</p>	<p>Max working pressure</p> <p>10 bar</p>	<p>Operating temperature</p> <p>min. -5°C</p> <p>max. +70°C</p>	<p>Flow rate at 6 bar with $\Delta p = 1$</p> <p>540 NI/min</p>	<p>Ø Orifice size</p> <p>mm 6</p>	<p>Working port size</p> <p>G 1/8"</p>			



3/2

**Push button
2-positions**

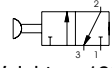
5/2



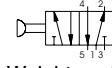
Ordering code

228.32.8/1
Red
228.32.8/2
Black
228.32.8/3
Green

228.52.8/1
Red
228.52.8/2
Black
228.52.8/3
Green

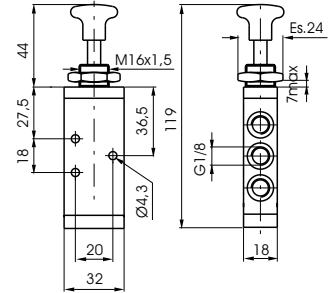


Weight gr. 120



Weight gr. 140

Operating force 10 N



**Lever lateral
spring**

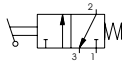
3/2

5/2

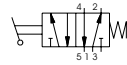
Ordering code

3/2
228.32. .1/1
Red
228.32. .1/2
Black
228.32. .1/3
Green

5/2
228.52. .1/1
Red
228.52. .1/2
Black
228.52. .1/3
Green



Weight gr. 140



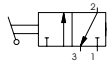
Weight gr. 160

**Lever lateral
2-positions**

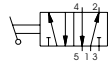
Ordering code

228.32. /1
Red
228.32. /2
Black
228.32. /3
Green

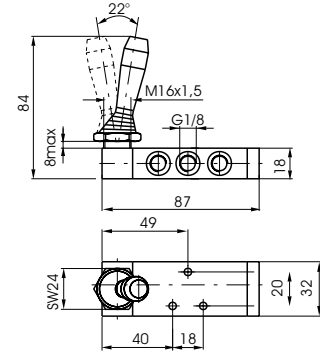
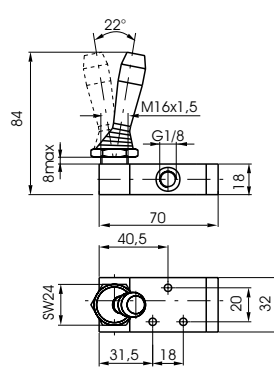
228.52. /1
Red
228.52. /2
Black
228.52. /3
Green



Weight gr. 140



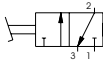
Weight gr. 160




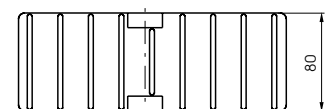
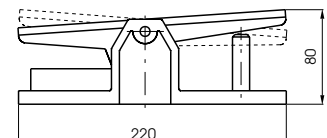
**Pedal aluminium
2-positions**

3/2 - 5/2

Ordering code

3/2
228.32.10

Weight gr. 790

5/2
228.52.10

Weight gr. 810



Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	\varnothing Orefice size	Working port size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	540 NI/min	mm 6	G 1/8"

<p>Pedal aluminium spring</p> <p>Ordering code</p> <p>3/2 228.32.10.1</p> <p>Weight gr. 790</p> <p>5/2 228.52.10.1</p> <p>Weight gr. 810</p>		<p>3/2 - 5/2</p>				
<p>Pedal protected spring</p> <p>Ordering code</p> <p>3/2 228.32.10.1/1 228.32.10.2/1 without safet device</p> <p>5/2 228.52.10.1/1 228.52.10.2/1 without safet device</p> <p>Weight gr. 1.120</p>		<p>3/2 - 5/2</p>				
<p>Pedal protected 2-positions</p> <p>Ordering code</p> <p>3/2 228.32.10/1</p> <p>5/2 228.52.10/1</p> <p>Weight gr. 1.120</p>		<p>3/2 - 5/2</p>				
<p>Pedal plastic miniaturi ed spring</p> <p>Ordering code</p> <p>228.52.10.1P 228.52.10.1P (Stainless steel spool)</p> <p>Weight gr. 230</p>		<p>5/2</p>				
<p>Operational characteristics</p>	<p>Fluid</p> <p>Filtered and lubricated air</p>	<p>Max working pressure</p> <p>10 bar</p>	<p>Operating temperature</p> <p>min. -5°C max. +70°C</p>	<p>Flow rate at 6 bar with $\Delta p = 1$</p> <p>540 NI/min</p>	<p>Ø Orefice size</p> <p>mm 6</p>	<p>Working port size</p> <p>G 1/8"</p>

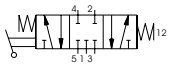


**Lever lateral
spring centre - 3-positions**

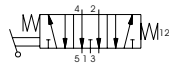
5/3

Ordering code

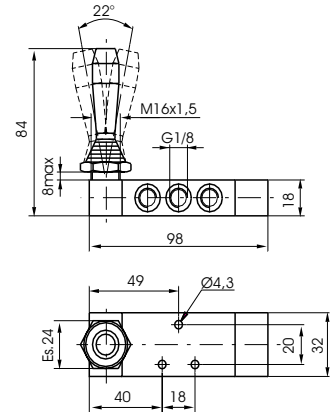
losed centres
228.53.31. .1/1 Red
228.53.31. .1/2 Black
228.53.31. .1/3 Green



en centres
228.53.32. .1/1 Red
228.53.32. .1/2 Black
228.53.32. .1/3 Green



Weight gr. 190

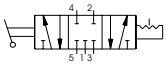


**Lever lateral
3-position detent**

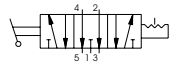
5/3

Ordering code

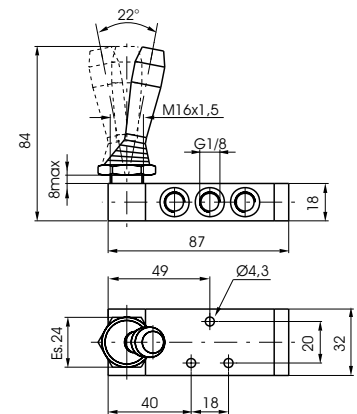
losed centres
228.53.31. /1 Red
228.53.31. /2 Black
228.53.31. /3 Green



en centres
228.53.32. /1 Red
228.53.32. /2 Black
228.53.32. /3 Green



Weight gr. 160

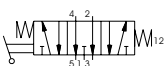


Lever central

5/3

Ordering code

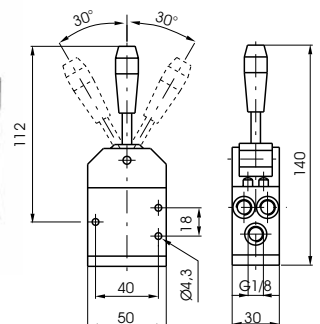
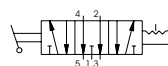
*en centres
s rin ositions*
228.53.32. /1 Red
228.53.32. /2 Black



*en centres
ositions*
228.53.32. .2/1 Red
228.53.32. .2/2 Black



*en centres
ositions*
228.53.32. .3/1 Red
228.53.32. .3/2 Black



Weight gr. 140

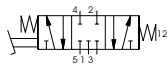
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Ø Orefice size	Working port size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	410 NI/min	mm 6	G 1/8"

**Pedal spring
3-positions**

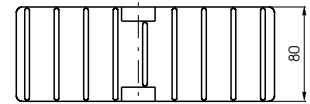
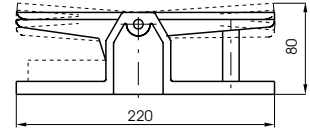
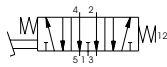
5/3

Ordering code

losed centres
228.53.31.10.1



en centres
228.53.32.10.1



Weight gr. 810

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	\varnothing Orefice size	Working port size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	410 NI/min	mm 6	G 1/8"



3/2 **5/2**

Tappet spring

Ordering code

224.32.1.1	224.52.1.1
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Weight gr. 370 Weight gr. 455
Operating force 71,5 N

3/2 **5/2**

Lever roller spring

Ordering code

224.32.2.1	224.52.2.1
-------------------	-------------------

Weight gr. 510 Weight gr. 595
Operating force 35 N

3/2 **5/2**

Lever roller unidirectional spring

Ordering code

224.32.3.1	224.52.3.1
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Weight gr. 525 Weight gr. 610
Operating force 35 N

3/2 **5/2**

Pushbutton spring

Ordering code

224.32.8.1	224.52.8.1
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Weight gr. 395 Weight gr. 480
Operating force 71,5 N

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	\varnothing Orefice size	Working port size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	1360 NI/min	mm 8	G 1/4"



3/2 **5/2**

**Pushbutton
2-positions**

Ordering code

<p>224.32.8</p> <p>Weight gr. 385</p>	<p>224.52.8</p> <p>Weight gr. 470</p>
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Operating force 10 N

Lever lateral spring

Ordering code

<p>3/2</p> <p>224.32. .1/1 <i>Red</i></p> <p>224.32. .1/2 <i>Black</i></p> <p>224.32. .1/3 <i>Green</i></p> <p>Weight gr. 520</p>	<p>5/2</p> <p>224.52. .1/1 <i>Red</i></p> <p>224.52. .1/2 <i>Black</i></p> <p>224.52. .1/3 <i>Green</i></p> <p>Weight gr. 605</p>
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**Lever lateral
2-positions**

Ordering code

<p>224.32. /1 <i>Red</i></p> <p>224.32. /2 <i>Black</i></p> <p>224.32. /3 <i>Green</i></p> <p>Weight gr. 510</p>	<p>224.52. /1 <i>Red</i></p> <p>224.52. /2 <i>Black</i></p> <p>224.52. /3 <i>Green</i></p> <p>Weight gr. 595</p>
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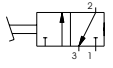

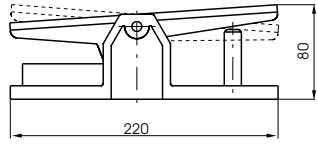
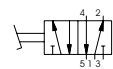
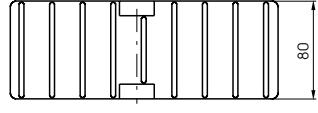
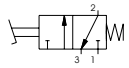

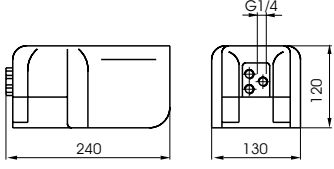
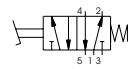
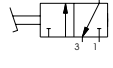

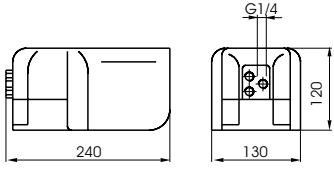
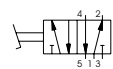
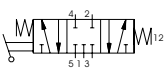
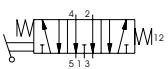

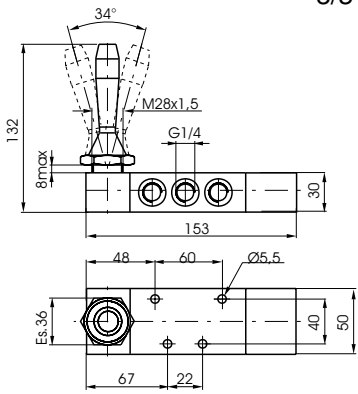
Pedal aluminium spring

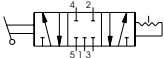


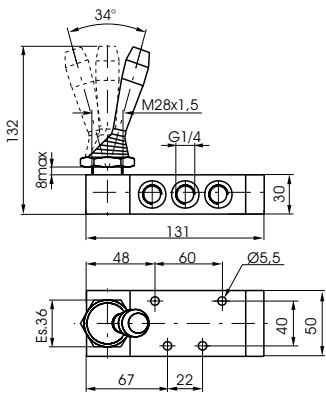
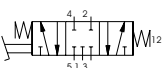


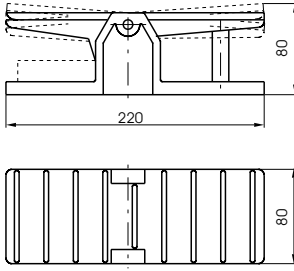
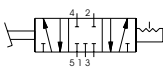
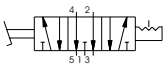

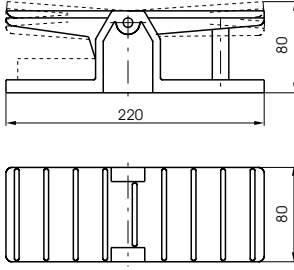
Ordering code

<p>3/2</p> <p>224.32.10.1</p> <p>Weight gr. 1.070</p>	<p>5/2</p> <p>224.52.10.1</p> <p>Weight gr. 1.155</p>
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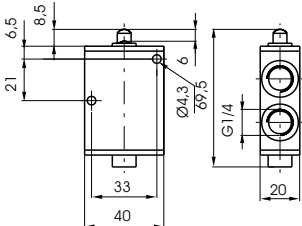

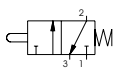

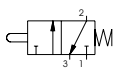

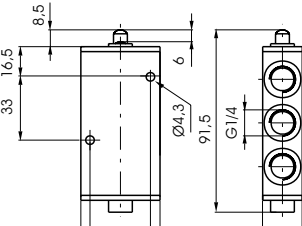

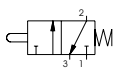

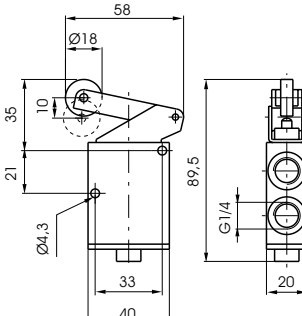

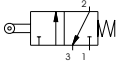

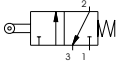

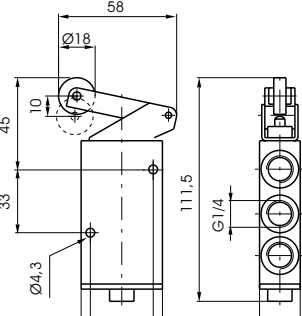

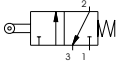

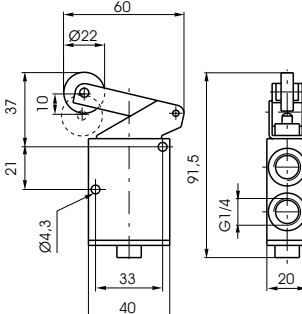

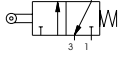

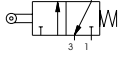

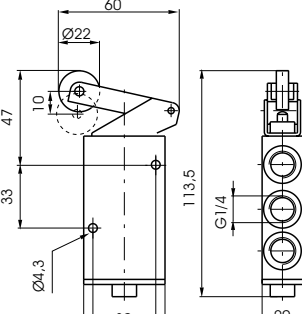

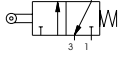

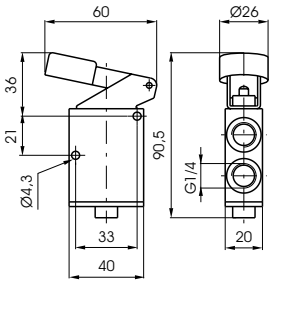

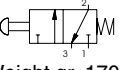

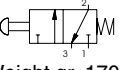

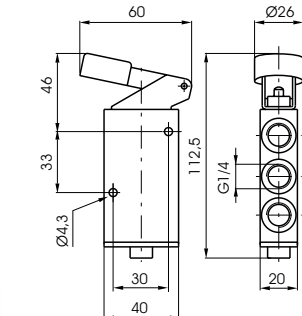

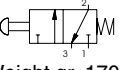

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Ø Orifice size	Working port size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	1360 NI/min	mm 8	G 1/4"



<p>Pedal aluminium 2-positions</p>				3/2 - 5/2			
Ordering code							
3/2	<p>224.32.10</p>  <p>Weight gr. 1.060</p>						
5/2	<p>224.52.10</p>  <p>Weight gr. 1.145</p>						
<p>Pedal protected spring</p>				3/2 - 5/2			
Ordering code							
3/2	<p>214.32.10.1/1 214.32.10.2/1 without safet device</p> 						
5/2	<p>214.52.10.1/1 214.52.10.2/1 without safet device</p>  <p>Weight gr. 1.730</p>						
<p>Pedal protected 2-positions</p>				3/2 - 5/2			
Ordering code							
3/2	<p>214.32.10/1</p> 						
5/2	<p>214.52.10/1</p>  <p>Weight gr. 1.730</p>						
<p>Lever lateral spring - 3-positions</p>				5/3			
Ordering code							
<p><i>losed centres</i></p> <p>224.53.31. .1/1 Red 224.53.31. .1/2 Black 224.53.31. .1/3 Green</p> 		<p><i>en centres</i></p> <p>224.53.32. .1/1 Red 224.53.32. .1/2 Black 224.53.32. .1/3 Green</p> 		 <p>Weight gr. 745</p>			
							
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	\varnothing Orefice size	Working port size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	1360 NI/min (3/2-5/2) 1280 NI/min (5/3)	mm 8	G 1/4"

<p>Lever lateral 3-positions</p>		5/3					
Ordering code							
<p><i>losed centres</i> 224.53.31. /1 Red 224.53.31. /2 Black 228.53.31. /3 Green</p> 		<p><i>en centres</i> 224.53.32. /1 Red 224.53.32. /2 Black 224.53.32. /3 Green</p> 		 <p>Weight gr. 605</p>			
Pedal spring - 3-positions							
Ordering code							
<p><i>losed centres</i> 224.53.31.10.1</p> 		<p><i>en centres</i> 224.53.32.10.1</p> 		 <p>Weight gr. 1.285</p>			
Pedal 3-positions							
Ordering code							
<p><i>losed centres</i> 224.53.31.10</p> 		<p><i>en centres</i> 224.53.32.10</p> 		 <p>Weight gr. 1.145</p>			
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	\varnothing Orifice size	Working port size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	1280 NI/min	mm 8	G 1/4"



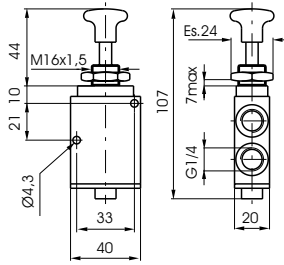
<p>3/2</p>  	<p style="text-align: center;">Tappet spring</p> <hr/> <p style="text-align: center;">Ordering code</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center; vertical-align: top;"> <p>214/2.32.0.1</p>  </td> <td style="width: 50%; text-align: center; vertical-align: top;"> <p>214/2.52.0.1</p>  </td> </tr> </table> <p style="text-align: center;">Weight gr. 145 Weight gr. 185 Operating force 51 N</p>		<p>214/2.32.0.1</p> 	<p>214/2.52.0.1</p> 	<p>5/2</p>  	
<p>214/2.32.0.1</p> 	<p>214/2.52.0.1</p> 					
<p>3/2</p>  	<p style="text-align: center;">Lever roller spring</p> <hr/> <p style="text-align: center;">Ordering code</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center; vertical-align: top;"> <p>214/2.32.2.1 <i>Plastic roller</i></p> <p>214/2.32.2.1/2 <i>Metal roller</i></p>  </td> <td style="width: 50%; text-align: center; vertical-align: top;"> <p>214/2.52.2.1 <i>Plastic roller</i></p> <p>214/2.52.2.1/2 <i>Metal roller</i></p>  </td> </tr> </table> <p style="text-align: center;">Weight gr. 170 Weight gr. 210 Operating force 24 N</p>		<p>214/2.32.2.1 <i>Plastic roller</i></p> <p>214/2.32.2.1/2 <i>Metal roller</i></p> 	<p>214/2.52.2.1 <i>Plastic roller</i></p> <p>214/2.52.2.1/2 <i>Metal roller</i></p> 	<p>5/2</p>  	
<p>214/2.32.2.1 <i>Plastic roller</i></p> <p>214/2.32.2.1/2 <i>Metal roller</i></p> 	<p>214/2.52.2.1 <i>Plastic roller</i></p> <p>214/2.52.2.1/2 <i>Metal roller</i></p> 					
<p>3/2</p>  	<p style="text-align: center;">Lever roller ball bearing spring</p> <hr/> <p style="text-align: center;">Ordering code</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center; vertical-align: top;"> <p>214/2.32.2.1/1</p>  </td> <td style="width: 50%; text-align: center; vertical-align: top;"> <p>214/2.52.2.1/1</p>  </td> </tr> </table> <p style="text-align: center;">Weight gr. 180 Weight gr. 220 Operating force 24 N</p>		<p>214/2.32.2.1/1</p> 	<p>214/2.52.2.1/1</p> 	<p>5/2</p>  	
<p>214/2.32.2.1/1</p> 	<p>214/2.52.2.1/1</p> 					
<p>3/2</p>  	<p style="text-align: center;">Lever button spring</p> <hr/> <p style="text-align: center;">Ordering code</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center; vertical-align: top;"> <p>214/2.32.2.6/1 <i>Red</i></p> <p>214/2.32.2.6/2 <i>Black</i></p> <p>214/2.32.2.6/3 <i>Green</i></p>  </td> <td style="width: 50%; text-align: center; vertical-align: top;"> <p>214/2.52.2.6/1 <i>Red</i></p> <p>214/2.52.2.6/2 <i>Black</i></p> <p>214/2.52.2.6/3 <i>Green</i></p>  </td> </tr> </table> <p style="text-align: center;">Weight gr. 170 Weight gr. 210 Operating force 24 N</p>		<p>214/2.32.2.6/1 <i>Red</i></p> <p>214/2.32.2.6/2 <i>Black</i></p> <p>214/2.32.2.6/3 <i>Green</i></p> 	<p>214/2.52.2.6/1 <i>Red</i></p> <p>214/2.52.2.6/2 <i>Black</i></p> <p>214/2.52.2.6/3 <i>Green</i></p> 	<p>5/2</p>  	
<p>214/2.32.2.6/1 <i>Red</i></p> <p>214/2.32.2.6/2 <i>Black</i></p> <p>214/2.32.2.6/3 <i>Green</i></p> 	<p>214/2.52.2.6/1 <i>Red</i></p> <p>214/2.52.2.6/2 <i>Black</i></p> <p>214/2.52.2.6/3 <i>Green</i></p> 					
<p>Operational characteristics</p>	<p>Fluid</p> <p>Filtered and lubricated air</p>	<p>Max working pressure</p> <p>10 bar</p>	<p>Operating temperature</p> <p>min. -5°C max. +70°C</p>	<p>Flow rate at 6 bar with $\Delta p = 1$</p> <p>970 NI/min</p>	<p>Ø Orefice size</p> <p>mm 7</p>	<p>Working port size</p> <p>G 1/4"</p>



<p>3/2</p>	<p style="text-align: center;">Lever roller unidirectional spring</p> <hr/> <p style="text-align: center;">Ordering code</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>214/2.32.3.1 <i>Plastic roller</i></p> <p>214/2.32.3.1/2 <i>Metal roller</i></p> <p>Weight gr. 170</p> </td> <td style="width: 50%; vertical-align: top;"> <p>214/2.52.3.1 <i>Plastic roller</i></p> <p>214/2.52.3.1/2 <i>Metal roller</i></p> <p>Weight gr. 210</p> </td> </tr> </table> <p style="text-align: center;">Operating force 24 N</p>		<p>214/2.32.3.1 <i>Plastic roller</i></p> <p>214/2.32.3.1/2 <i>Metal roller</i></p> <p>Weight gr. 170</p>	<p>214/2.52.3.1 <i>Plastic roller</i></p> <p>214/2.52.3.1/2 <i>Metal roller</i></p> <p>Weight gr. 210</p>	<p>5/2</p>	
<p>214/2.32.3.1 <i>Plastic roller</i></p> <p>214/2.32.3.1/2 <i>Metal roller</i></p> <p>Weight gr. 170</p>	<p>214/2.52.3.1 <i>Plastic roller</i></p> <p>214/2.52.3.1/2 <i>Metal roller</i></p> <p>Weight gr. 210</p>					
<p>3/2</p>	<p style="text-align: center;">Lever rotating 2-positions</p> <hr/> <p style="text-align: center;">Ordering code</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>214/2.32.5</p> <p>Weight gr. 540</p> </td> <td style="width: 50%; vertical-align: top;"> <p>214/2.52.5</p> <p>Weight gr. 600</p> </td> </tr> </table>		<p>214/2.32.5</p> <p>Weight gr. 540</p>	<p>214/2.52.5</p> <p>Weight gr. 600</p>	<p>5/2</p>	
<p>214/2.32.5</p> <p>Weight gr. 540</p>	<p>214/2.52.5</p> <p>Weight gr. 600</p>					
<p>3/2</p>	<p style="text-align: center;">Lever front 2-positions</p> <hr/> <p style="text-align: center;">Ordering code</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>214/2.32.55/1 <i>Red</i></p> <p>214/2.32.55/2 <i>Black</i></p> <p>214/2.32.55/3 <i>Green</i></p> <p>Weight gr. 165</p> </td> <td style="width: 50%; vertical-align: top;"> <p>214/2.52.55/1 <i>Red</i></p> <p>214/2.52.55/2 <i>Black</i></p> <p>214/2.52.55/3 <i>Green</i></p> <p>Weight gr. 205</p> </td> </tr> </table>		<p>214/2.32.55/1 <i>Red</i></p> <p>214/2.32.55/2 <i>Black</i></p> <p>214/2.32.55/3 <i>Green</i></p> <p>Weight gr. 165</p>	<p>214/2.52.55/1 <i>Red</i></p> <p>214/2.52.55/2 <i>Black</i></p> <p>214/2.52.55/3 <i>Green</i></p> <p>Weight gr. 205</p>	<p>5/2</p>	
<p>214/2.32.55/1 <i>Red</i></p> <p>214/2.32.55/2 <i>Black</i></p> <p>214/2.32.55/3 <i>Green</i></p> <p>Weight gr. 165</p>	<p>214/2.52.55/1 <i>Red</i></p> <p>214/2.52.55/2 <i>Black</i></p> <p>214/2.52.55/3 <i>Green</i></p> <p>Weight gr. 205</p>					
<p>3/2</p>	<p style="text-align: center;">Pushbutton spring</p> <hr/> <p style="text-align: center;">Ordering code</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>214/2.32.8.1/1 <i>Red</i></p> <p>214/2.32.8.1/2 <i>Black</i></p> <p>214/2.32.8.1/3 <i>Green</i></p> <p>Weight gr. 165</p> </td> <td style="width: 50%; vertical-align: top;"> <p>214/2.52.8.1/1 <i>Red</i></p> <p>214/2.52.8.1/2 <i>Black</i></p> <p>214/2.52.8.1/3 <i>Green</i></p> <p>Weight gr. 205</p> </td> </tr> </table> <p style="text-align: center;">Operating force 51 N</p>		<p>214/2.32.8.1/1 <i>Red</i></p> <p>214/2.32.8.1/2 <i>Black</i></p> <p>214/2.32.8.1/3 <i>Green</i></p> <p>Weight gr. 165</p>	<p>214/2.52.8.1/1 <i>Red</i></p> <p>214/2.52.8.1/2 <i>Black</i></p> <p>214/2.52.8.1/3 <i>Green</i></p> <p>Weight gr. 205</p>	<p>5/2</p>	
<p>214/2.32.8.1/1 <i>Red</i></p> <p>214/2.32.8.1/2 <i>Black</i></p> <p>214/2.32.8.1/3 <i>Green</i></p> <p>Weight gr. 165</p>	<p>214/2.52.8.1/1 <i>Red</i></p> <p>214/2.52.8.1/2 <i>Black</i></p> <p>214/2.52.8.1/3 <i>Green</i></p> <p>Weight gr. 205</p>					
<p>Operational characteristics</p>	<p>Fluid</p> <p>Filtered and lubricated air</p>	<p>Max working pressure</p> <p>10 bar</p>	<p>Operating temperature</p> <p>min. -5°C</p> <p>max. +70°C</p>	<p>Flow rate at 6 bar with $\Delta p = 1$</p> <p>970 NI/min</p>	<p>Ø Orifice size</p> <p>mm 7</p>	<p>Working port size</p> <p>G 1/4"</p>



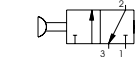
3/2



**Pushbutton
2-positions**

Ordering code

214/2.32.8/1
Red
214/2.32.8/2
Black
214/2.32.8/3
Green



Weight gr. 160

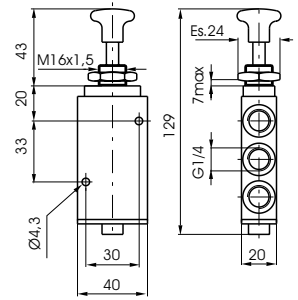
214/2.52.8/1
Red
214/2.52.8/2
Black
214/2.52.8/3
Green



Weight gr. 200

Operating force 10 N

5/2



Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	\varnothing Orifice size	Working port size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	970 NI/min	mm 7	G 1/4"



Lever lateral spring		3/2		5/2			
Ordering code							
3/2 212.32.9.1	5/2 212.52.9.1						
Weight gr. 1.480	Weight gr. 1.765						
Lever lateral 2-positions							
Ordering code							
3/2 212.32.9	5/2 212.52.9						
Weight gr. 1.460	Weight gr. 1.745						
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	\varnothing Orifice size	Working port size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	3500 NI/min (3/2-5/2)	mm 15	G 1/2"
Lever lateral spring - 3-positions							
Ordering code							
Closed centres 212.53.31.9.1	Open centres 212.53.32.9.1						
		Weight gr. 2.100					
Lever lateral 3-positions							
Ordering code							
Closed centres 212.53.31.9	Open centres 212.53.32.9						
		Weight gr. 1.765					
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	\varnothing Orifice size	Working port size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	3000 NI/min	mm 15	G 1/2"



Lever lateral spring		3/2		5/2			
Ordering code							
3/2 211.32.9.1	5/2 211.52.9.1						
Weight gr. 4.300	Weight gr. 4.900						
Lever lateral 2-positions							
Ordering code							
3/2 211.32.9	5/2 211.52.9						
Weight gr. 4.300	Weight gr. 4.900						
Lever lateral spring - 3-positions					5/3		
Ordering code							
<i>Closed centres</i> 211.53.31.9.1	<i>Open centres</i> 211.53.32.9.1						
		Weight gr. 5.000					
Lever lateral 3-positions					5/3		
Ordering code							
<i>Closed centres</i> 211.53.31.9	<i>Open centres</i> 211.53.32.9						
		Weight gr. 5.000					
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Ø Orefice size	Working port size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	6500 NI/min	mm 20	G 1"

Accessories M5 ÷ G 1"

Series 600

Flow control valves

Quick exhaust valves

Exhaust flow control valves

Shuttle valves

Silencers

Check valves

Manifolds

Block valves

Gang mounting manifolds

Economizers



General

These accessories are a range of devices for completing a pneumatic circuit. These valves, with their special functions, are inserted between two valves, between a valve and a cylinder, or following a cylinder.

One of the particular characteristic of these accessories is that they are automatically actuated without the need for external commands. Usually, operation and idle are controlled by the presence or absence of pressure as, for example, in the case of quick exhaust valves which pilots itself as a selector, changing the flow direction as the signal goes off and on.

On the other hand, other components are inert. That is, they do not have any internal variable function which is sensitive to pressure. Among these components are silencers, manifolds and flow regulators.

There are also the flow regulators, which like electronic components, can be defined as variable resistences. They are fundamental in regulating the flow rate, provide precise timings and regulate the cylinders' speed.

The selector valves, with "AND" and "OR" functions, are logic functions components which often are an essential element. Furthermore, they are built to allow high flow rate which cannot be obtained by classic pneumatic logic.

The block valves lock the cylinder in a position, avoiding unexpected depressurization of the cylinder's chamber due to lack of compressed air at the inlet port. Practically, it is a piloted unidirectional valve that blocks the exhaust port when there is no air in the pilot circuit.

Finally the economizer valves are in fact a pressure reducer valves installed between valve and cylinder for reducing the air consumption. For example this is applicable on the cylinder return stroke without penalizing the exhaust as happens with FRL pressure regulator.

Construction characteristics

We have not listed all different materials used for the construction of these components because the list would be too the long. We use corrosion proof material, brass or anodized aluminium and the most appropriate specific mixture for seals. If more information is required please contact our technical department.

Use and maintenance

In operation pay attention to the minimum and maximum criteria for temperature and pressure, and ensure good quality compressed air. In a dirty environment, protect the exhaust ports. In this case, maintenance is minimal and is necessary only if the air is particularly dirty. The components most subject to damage by the accumulation of dirt are flow regulators with fine regulation and silencers. As for regulators, follow the normal procedure for disassembling, washing with non-chemical cleaning agents and remounting. The silencers need only to be rinsed in petrol or solvent and blown dry with compressed air.

The number of requests for spare seals for flow regulators and shuttle valves are statistically irrelevant. More often, it is necessary to replace the lining of the quick exhaust because of the wear it undergoes due to the particular conditions of operating.

ATTENTION: for lubrication use class H hydraulic oils, for example Castrol MAGNA GC 32.

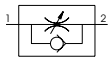


Miniature flow control valve M5 Ø3 tube						
Ordering code						
6.01.305.1.2 <i>Unidirectional</i>						
6.01.305.2.1 <i>Unidirectional</i>						
6.01.305.1.1 <i>Bidirectional</i>		Weight gr. 14	Operational characteristics			
		Fluid	Max working pressure	Operating temperat.		Ø Orifice size
		Filtered air	10 bar	min. -5°C	max. +70°C	mm 2
Miniature flow control valve M5 Ø3 tube, with adjustment knob						
Ordering code						
6.01.305.1.2 P <i>Unidirectional</i>						
6.01.305.2.1P <i>Unidirectional</i>						
6.01.305.1.1P <i>Bidirectional</i>		Weight gr. 16	Operational characteristics			
		Fluid	Max working pressure	Operating temperat.		Ø Orifice size
		Filtered air	10 bar	min. -5°C	max. +70°C	mm 2
Miniature flow control valve M5 Ø3,17						
Ordering code						
6.01.315.1.2 <i>Unidirectional</i>						
6.01.315.2.1 <i>Unidirectional</i>						
6.01.315.1.1 <i>Bidirectional</i>		Weight gr. 14	Operational characteristics			
		Fluid	Max working pressure	Operating temperat.		Ø Orifice size
		Filtered air	10 bar	min. -5°C	max. +70°C	mm 2
Miniature flow control valve M5 Ø3,17 tube, with adjustment knob						
Ordering code						
6.01.315.1.2 P <i>Unidirectional</i>						
6.01.315.2.1P <i>Unidirectional</i>						
6.01.315.1.1P <i>Bidirectional</i>		Weight gr. 16	Operational characteristics			
		Fluid	Max working pressure	Operating temperat.		Ø Orifice size
		Filtered air	10 bar	min. -5°C	max. +70°C	mm 2

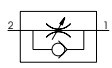
**Miniature flow control valve M5
Ø4 tube**

Ordering code



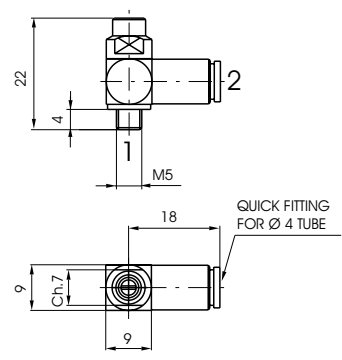
6.01.45.1.2 *Unidirectional*



6.01.45.2.1 *Unidirectional*



6.01.45.1.1 *Bidirectional*

Weight gr. 14

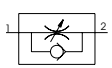
Operational characteristics

Fluid	Max working pressure	Operating temperature min.	Operating temperature max.	Ø Orifice size
Filtered air	10 bar	-5°C	+70°C	mm 1,5

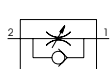
**Miniature flow control valve M5
Ø4 tube with adjustment knob**

Ordering code

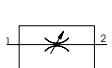

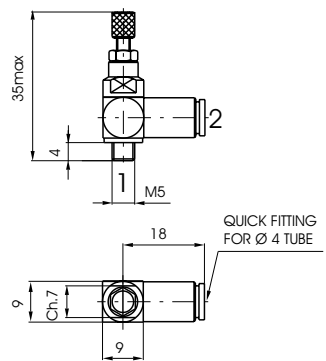
6.01.45.1.2 P *Unidirectional*



6.01.45.2.1 P *Unidirectional*



6.01.45.1.1 P *Bidirectional*

Weight gr. 16

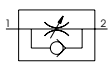
Operational characteristics

Fluid	Max working pressure	Operating temperature min.	Operating temperature max.	Ø Orifice size
Filtered air	10 bar	-5°C	+70°C	mm 1,5

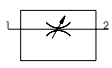

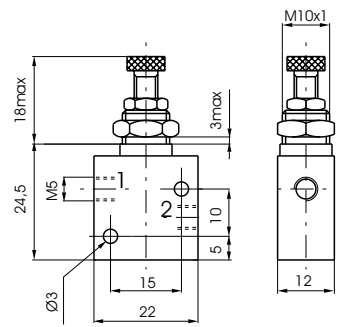
**Flow control valve M5
in line ports**

Ordering code

6.01.05 *Unidirectional*



6.01.05/2 *Bidirectional*

Weight gr. 48

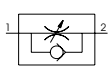
Operational characteristics

Fluid	Max working pressure	Operating temperature min.	Operating temperature max.	Ø Orifice size
Filtered air	10 bar	-5°C	+70°C	mm 2

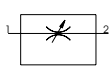

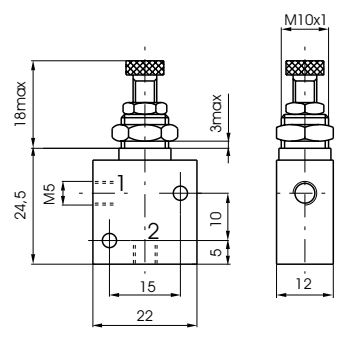
**Flow control valve M5
port at 90°**

Ordering code

6.01.05.90 *Unidirectional*



6.01.05.90/2 *Bidirectional*


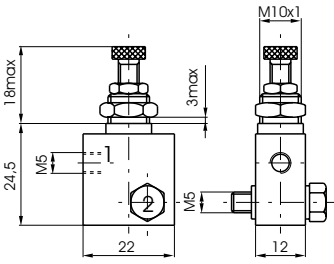
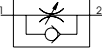
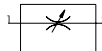





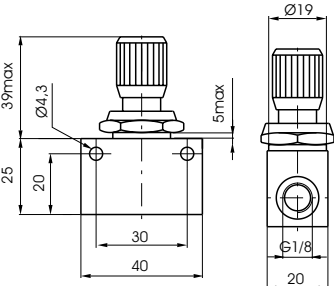
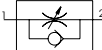
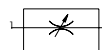
Weight gr. 48


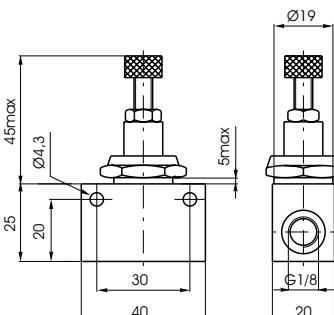
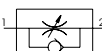
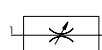
Operational characteristics


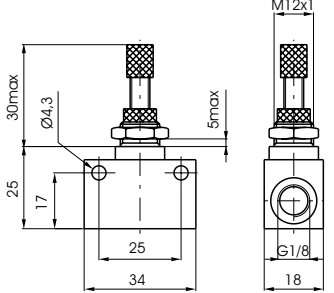
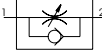
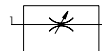
Fluid	Max working pressure	Operating temperature min.	Operating temperature max.	Ø Orifice size
Filtered air	10 bar	-5°C	+70°C	mm 2



Flow control valve M5 with a through bolt						
Ordering code						
6.01.05.180	<i>Unidirectional</i>	Weight gr. 52				
						
6.01.05.180/2	<i>Bidirectional</i>	Weight gr. 52				
						
Operational characteristics						
		Fluid	Max working pressure	Operating temperature		Ø Orifice size
		Filtered air	10 bar	min. -5°C	max. +70°C	mm 2

Flow control valve G 1/8" ultrasensitive						
Ordering code						
6.01.18/4	<i>Unidirectional</i>	Weight gr. 100				
						
6.01.18/5	<i>Bidirectional</i>	Weight gr. 100				
						
Operational characteristics						
		Fluid	Max working pressure	Operating temperature		Ø Orifice size
		Filtered air	10 bar	min. -5°C	max. +70°C	mm 3

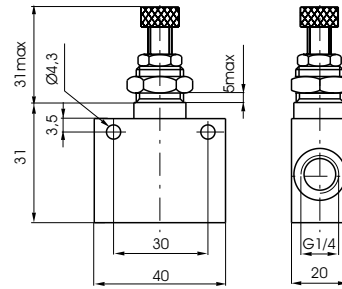
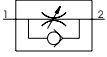
Flow control valve G 1/8" ultrasensitive with lock nut						
Ordering code						
6.01.18/6	<i>Unidirectional</i>	Weight gr. 105				
						
6.01.18/7	<i>Bidirectional</i>	Weight gr. 105				
						
Operational characteristics						
		Fluid	Max working pressure	Operating temperature		Ø Orifice size
		Filtered air	10 bar	min. -5°C	max. +70°C	mm 3

Flow control valve G 1/8"						
Ordering code						
6.01.18N	<i>Unidirectional</i>	Weight gr. 50				
						
6.01.18/1N	<i>Bidirectional</i>	Weight gr. 50				
						
Operational characteristics						
		Fluid	Max working pressure	Operating temperature		Ø Orifice size
		Filtered air	10 bar	min. -5°C	max. +70°C	mm 4

Flow control valve G 1/4" compact type

Ordering code

6.01.14/1 *Unidirectional*



Operational characteristics

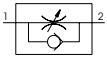
Weight gr. 100

Fluid	Max working pressure	Operating temperature min.	Operating temperature max.	Ø Orifice size
Filtered air	10 bar	-5°C	+70°C	mm 5,5

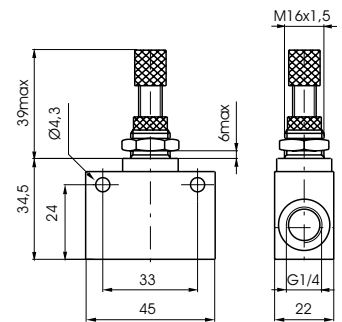
Flow control valve G 1/4"

Ordering code

6.01.14 N *Unidirectional*



6.01.14/1 N *Bidirectional*



Operational characteristics

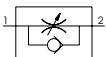
Weight gr. 105

Fluid	Max working pressure	Operating temperature min.	Operating temperature max.	Ø Orifice size
Filtered air	10 bar	-5°C	+70°C	mm 7

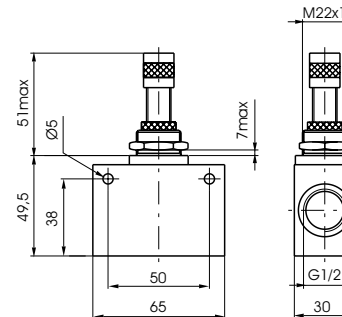
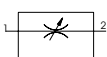
Flow control valve G 1/2"

Ordering code

6.01.12 N *Unidirectional*



6.01.12/1 N *Bidirectional*



Operational characteristics

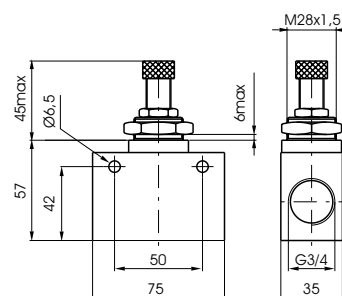
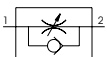
Weight gr. 505

Fluid	Max working pressure	Operating temperature min.	Operating temperature max.	Ø Orifice size
Filtered air	10 bar	-5°C	+70°C	mm 12

Flow control valve G 3/4"

Ordering code

6.01.34 *Unidirectional*



Operational characteristics

Weight gr. 500

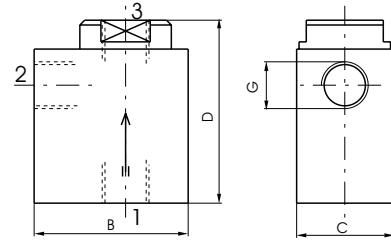
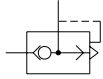
Fluid	Max working pressure	Operating temperature min.	Operating temperature max.	Ø Orifice size
Filtered air	10 bar	-5°C	+70°C	mm 12



Quick exhaust valve
M5 - G 1/8" - G 1/4" - G 1/2"

Ordering code

- 6.02.05 (M5)
- 6.02.18 (G 1/8")
- 6.02.14 (G 1/4")
- 6.02.12 (G 1/2")



G	M5	1/8"	1/4"	1/2"	
B	22	32	35	52	
C	12	20	25	37	
D	28	38	50	62	
Weight gr.	50	62	112	310	
Flow rate NI/min at 6 bar with $\Delta p = 1$	from 1 to 2	120	480	960	3300
Flow rate NI/min at 6 bar on free exhaust	from 2 to 3	220	1100	1930	6500

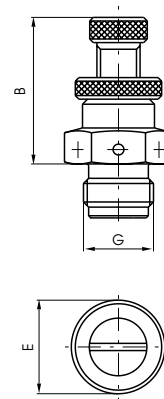
Operational characteristics

Fluid	Max working pressure	Operating temperature	
		min.	max.
Filtered air	10 bar	-5°C	+70°C

Exhaust flow control
M5 - G 1/8" - G 1/4" - G 1/2"

Ordering code

- 6.03.05 (M5)
- 6.03.18 (G 1/8")
- 6.03.14 (G 1/4")
- 6.03.12 (G 1/2")



G	M5	1/8"	1/4"	1/2"
B	21	18	22	39
E	9	13	16	25
Weight gr.	10	18	32	155

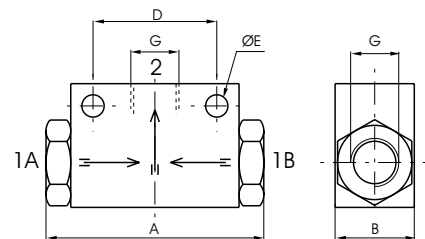
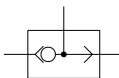
Operational characteristics

Fluid	Max working pressure	Operating temperature	
		min.	max.
Filtered air	10 bar	-5°C	+70°C

Shuttle valve "OR"
M5 - G 1/8" - G 1/4"

Ordering code

- 6.04.05 (M5)
- 6.04.18 (G 1/8")
- 6.04.14 (G 1/4")



G	M5	1/8"	1/4"	
A	27	44	62	
B	12	16	22	
D	15	25	35	
E	3,5	4,5	5,5	
Weight gr.	33	50	110	
Flow rate at 6 bar with $\Delta p = 1$	NI/min.	110	700	2200

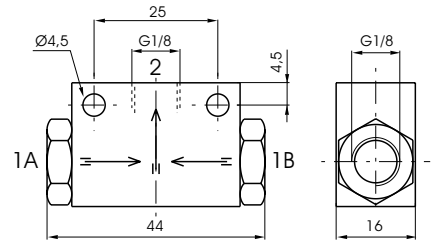
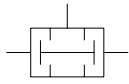
Operational characteristics

Fluid	Max working pressure	Operating temperature	
		min.	max.
Filtered air	10 bar	-5°C	+70°C

**Shuttle valve "AND"
G 1/8"**

Ordering code

6.04.18/1 (G 1/8")



Operational characteristics

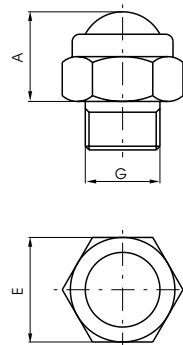
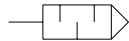
Weight gr.50

Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$
		min.	max.	
Filtered air	10 bar	-5°C	+70°C	480 NI/min.

**Silencers steel wool
G 1/8" - G 1/4" - G 3/8" - G 1/2"**

Ordering code

- 6.05.18** (G 1/8")
- 6.05.14** (G 1/4")
- 6.05.38** (G 3/8")
- 6.05.12** (G 1/2")



Operational characteristics

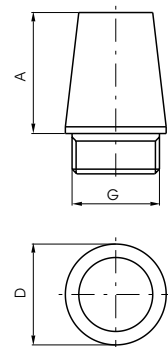
Fluid	Max working pressure	Operating temperature	
		min.	max.
Filtered air	10 bar	-5°C	+70°C

G	1/8"	1/4"	3/8"	1/2"
A	12	13	15	17
E	14	17	22	27
Weight gr.	8	16	32	44

**Silencers brass
M5 - G 1/8" - G 1/4" - G 3/8"
G 1/2" - G 3/4" - G 1"**

Ordering code

- 6.06.05** (M5)
- 6.06.18** (G 1/8")
- 6.06.14** (G 1/4")
- 6.06.38** (G 3/8")
- 6.06.12** (G 1/2")
- 6.06.34** (G 3/4")
- 6.06.01** (G 1")



Operational characteristics

Fluid	Max working pressure	Operating temperature	
		min.	max.
Filtered air	10 bar	-5°C	+70°C

G	M5	1/8"	1/4"	3/8"	1/2"	3/4"	1"
A	17	15	18	28	32	40	50
D	8	12	15	19	23	29	38
Weight gr.	4	8	15	35	50	92	182



Check valves
M5 - G 1/8" - G 1/4" - G 3/8" - G 1/2"

Ordering code

NBR poppet

6.07.05 (M5)

6.07.18 (G 1/8")

6.07.14 (G 1/4")

6.07.38 (G 3/8")

6.07.12 (G 1/2")

VITON poppet

6.07.18V (G 1/8")

6.07.14V (G 1/4")

6.07.38V (G 3/8")

6.07.12V (G 1/2")



Operational characteristics

Fluid	Max working pressure	Operating temperature	
		min.	max.
Filtered air	10 bar	-5°C	+70°C (+ 200°C Viton)

Flow rate at 6 bar with $\Delta p = 1$

G	M5	1/8"	1/4"	3/8"	1/2"
E	10	14	17	21	25
L	21	37	48	50	60
Weight gr.	14	35	60	85	136
NI/min.	160	650	1150	2600	3500

Manifold 4 ports
M5 - G 1/8" - G 1/4"
G 3/8" - G 1/2"

Ordering code

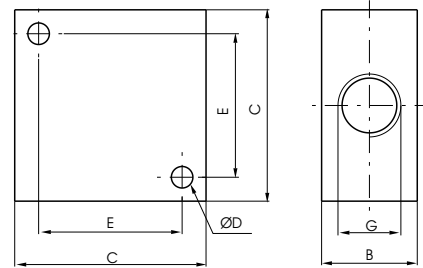
6.08.05/4 (M5)

6.08.18/4 (G 1/8")

6.08.14/4 (G 1/4")

6.08.38/4 (G 3/8")

6.08.12/4 (G 1/2")



Operational characteristics

Fluid	Max working pressure	Operating temperature	
		min.	max.
Filtered air	10 bar	-5°C	+70°C

G	M5	1/8"	1/4"	3/8"	1/2"
B	10	16	20	20	30
C	20	32	40	40	50
D	3,3	4,5	5,5	5,5	6,5
E	14	22	30	30	38
Weight gr.	28	38	68	54	135

Manifold 10 ports
M5 - G 1/8" - G 1/4"
G 3/8" - G 1/2"

Ordering code

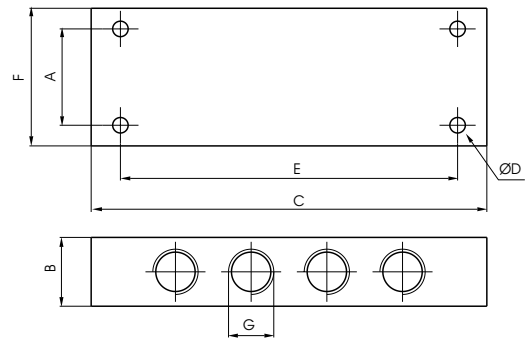
6.08.05/8 (M5)

6.08.18/8 (G 1/8")

6.08.14/8 (G 1/4")

6.08.38/8 (G 3/8")

6.08.12/8 (G 1/2")



Operational characteristics

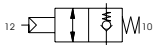
Fluid	Max working pressure	Operating temperature	
		min.	max.
Filtered air	10 bar	-5°C	+70°C

G	M5	1/8"	1/4"	3/8"	1/2"
A	16	20	28	28	36
B	12	18	20	20	30
C	60	90	115	130	170
D	3,3	4,5	4,5	5,5	5,5
E	50	75	98	112	150
F	22	32	40	40	50
Weight gr.	92	110	185	165	460

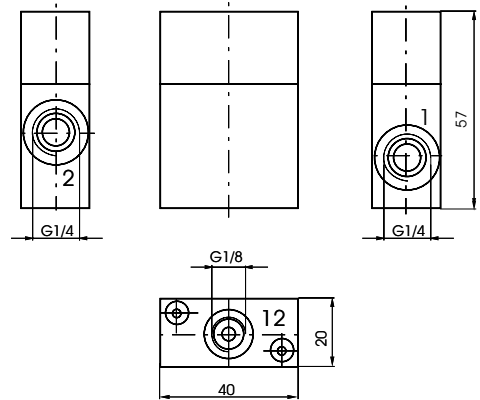
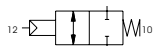
**Block valve
G 1/4"**

Ordering code

6.09.14.UN *Unidirectional*



6.09.14.BN *Bidirectional*



CONNECTIONS

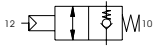
- 1 = VALVE
- 2 = CYLINDER
- 12 = PILOTING

Operational characteristics

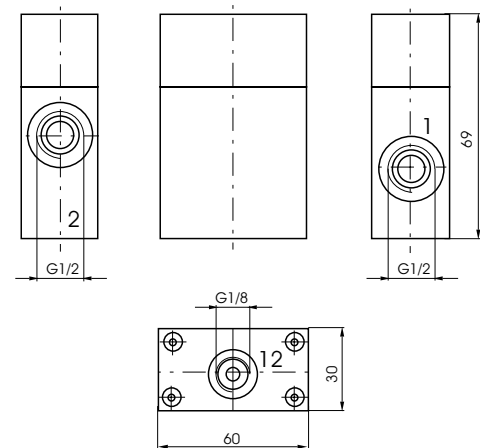
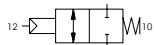
Weight gr. 122	Fluid	Max working pressure	Min. piloting pressure	Temperature		Flow at 6 bar with $\Delta p = 1$ bar	Ø orifice size
	Filtered and lubricated air	10 bar	4 bar	min. -5°C	max. +70°C		
						700 NI/min.	mm 7

**Block valve
G 1/2"**

6.09.12.UN *Unidirectional*



6.09.12.BN *Bidirectional*



CONNECTIONS

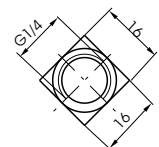
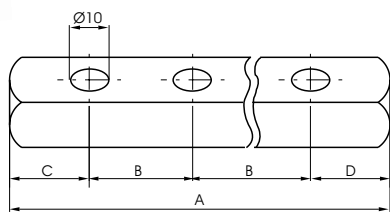
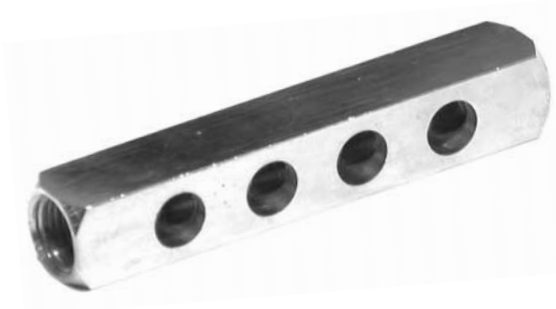
- 1 = VALVE
- 2 = CYLINDER
- 12 = PILOTING

Operational characteristics

Weight gr. 305	Fluid	Max working pressure	Min. piloting pressure	Temperature		Flow at 6 bar with $\Delta p = 1$ bar	Ø orifice size
	Filtered and lubricated air	10 bar	4 bar	min. -5°C	max. +70°C		
						2000 NI/min.	mm 12



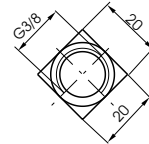
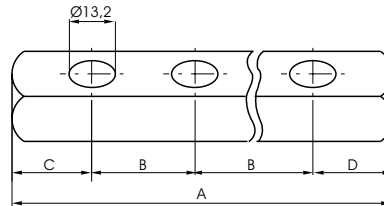
Gang mounting manifold for valves and solenoid valves G 1/8"



Ordering code	* No. OF POSITION									
	2	3	4	5	6	7	8	9	10	
6.10.18.18/*	A	58	76	94	112	130	148	166	184	202
	B	18	18	18	18	18	18	18	18	18
	C	20	20	20	20	20	20	20	20	20
	D	20	20	20	20	20	20	20	20	20
	Weight gr.	55	80	105	130	155	180	205	230	255
6.10.18.25/*	A	70	95	120	145	170	195	220	245	270
	B	25	25	25	25	25	25	25	25	25
	C	20	20	20	20	20	20	20	20	20
	D	25	25	25	25	25	25	25	25	25
	Weight gr.	80	115	150	185	220	255	290	325	360
6.10.18.26/*	A	66	92	118	144	170	196	222	248	274
	B	26	26	26	26	26	26	26	26	26
	C	20	20	20	20	20	20	20	20	20
	D	20	20	20	20	20	20	20	20	20
	Weight gr.	70	110	145	185	220	260	300	340	375
6.10.18.30/*	A	80	110	140	170	200	230	260	290	320
	B	30	30	30	30	30	30	30	30	30
	C	25	25	25	25	25	25	25	25	25
	D	25	25	25	25	25	25	25	25	25
	Weight gr.	100	140	180	220	260	300	340	380	420
6.10.18.32/*	A	82	114	146	178	210	242	274	306	338
	B	32	32	32	32	32	32	32	32	32
	C	25	25	25	25	25	25	25	25	25
	D	25	25	25	25	25	25	25	25	25
	Weight gr.	100	145	190	235	280	325	370	415	460
6.10.18.35/*	A	89	124	159	194	229	264	299	334	369
	B	35	35	35	35	35	35	35	35	35
	C	27	27	27	27	27	27	27	27	27
	D	27	27	27	27	27	27	27	27	27
	Weight gr.	110	160	210	260	310	360	410	460	510

ATTENTION: the number before stroke indicates the max valve thickness

Gang mounting manifold for valves and solenoid valves G 1/4"



Ordering code		* No. OF POSITION								
		2	3	4	5	6	7	8	9	10
6.10.14.20/*	A	65	85	105	125	145	165	185	22,55	225
	B	20	20	20	20	20	20	20	20	20
	C	22,5	22,5	22,5	22,5	22,5	22,5	22,5	22,5	22,5
	D	22,5	22,5	22,5	22,5	22,5	22,5	22,5	22,5	22,5
	Weight gr.	130	150	190	190	210	230	250	270	290
6.10.14.25/*	A	75	100	125	150	175	200	225	250	275
	B	25	25	25	25	25	25	25	25	25
	C	25	25	25	25	25	25	25	25	25
	D	25	25	25	25	25	25	25	25	25
	Weight gr.	140	170	200	230	260	290	320	350	380
6.10.14.30/*	A	80	110	140	170	200	230	260	290	320
	B	30	30	30	30	30	30	30	30	30
	C	25	25	25	25	25	25	25	25	25
	D	25	25	25	25	25	25	25	25	25
	Weight gr.	150	190	230	270	310	350	390	430	470
6.10.14.35/*	A	85	120	155	190	225	260	295	335	365
	B	35	35	35	35	35	35	35	35	35
	C	30	30	30	30	30	30	30	30	30
	D	20	20	20	20	20	20	20	20	20
	Weight gr.	160	210	260	310	360	410	460	510	560
6.10.14.45/*	A	115	160	205	250	295	340	385	430	365
	B	45	45	45	45	45	45	45	45	45
	C	35	35	35	35	35	35	35	35	35
	D	35	35	35	35	35	35	35	35	35
	Weight gr.	200	275	350	425	500	575	650	725	560

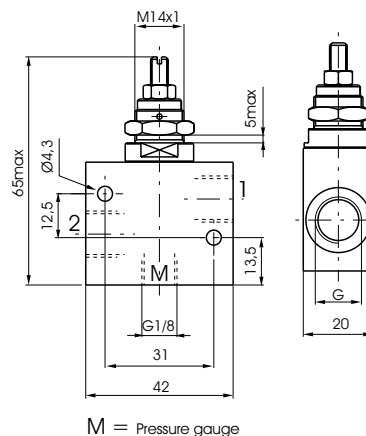
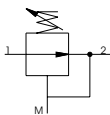
ATTENTION: the number before stroke indicates the max valve thickness



**Economizer
G 1/8" - G 1/4"**

Ordering code

- 6.11.18 Ports G 1/8"
- 6.11.14 Ports G 1/4"



Operational characteristics

Weight gr. 85

Fluid	Max working pressure	Pressure range	Operating temperature		Flow rate from port 2 to 1 with $\Delta p = 1$ bar	Ø Orifice size
			min.	max.		
Filtered air	10 bar	0 - 5,5 bar	-5°C	+70°C	860 NI/min.	mm 6

Poppet valves M5, G 1/8"

Series 700

Tappet

Lever roller

Lever button

Lever panel

Pushbutton

Whisker



General

The main characteristic of these valves is their poppet type construction. This offers superior resistance to adverse operating conditions such as dust particles in the compressed air, insufficient lubrication and so on.

On the other hand the valves operate as 3-ways or 2-ways only, normally closed, and the required operating force increases with increases in line pressure.

Construction characteristics

	M5	G 1/8"
Body	Nickel plated brass	Anodized aluminium
Actuators	Nickel plated brass Stainless steel for roller levers and button levers Plastic material for handles and buttons	Anodized aluminium
Seals	Oilproof rubber NBR	Oilproof rubber NBR
Spacers	Brass (OT 58)	Brass (OT 58)
Spool	Nickel plated steel (Kanigen)	Nickel plated steel (Kanigen)
Bottom plates	-	Plastic material
Spring	Stainless steel	Stainless steel

Use and maintenance

These valves have a mean life of 10 to 15 millions of cycles depending on application.

Proper lubrication with specified oil reduces dramatically the wear of the seals and good filtration insures long and trouble free operation. Check that the operating conditions are in accordance with the suggested pressure, temperature and so on.


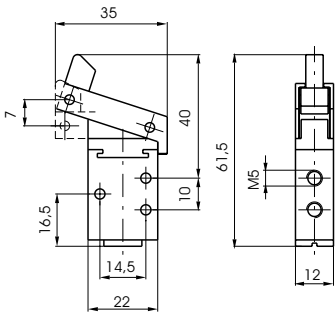

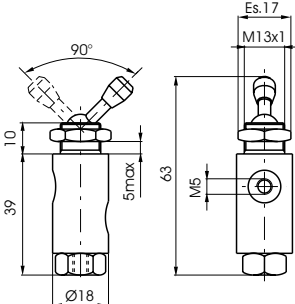

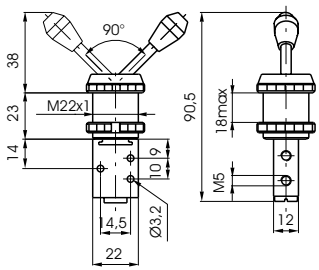

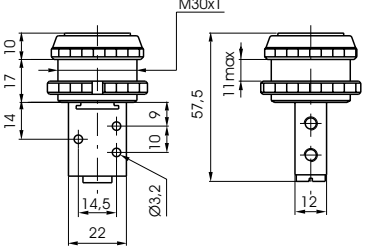
The exhaust ports of the distributor should be protected in a dusty and dirty environment.


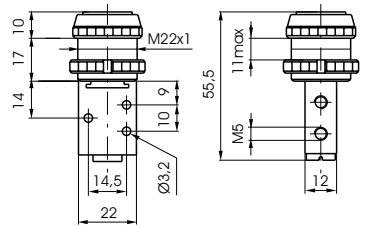
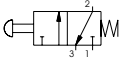

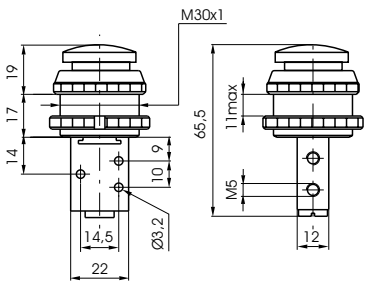
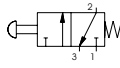

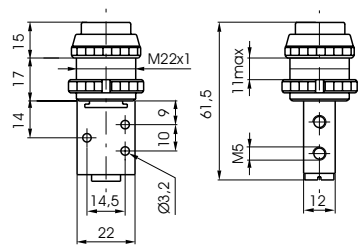
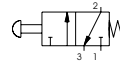

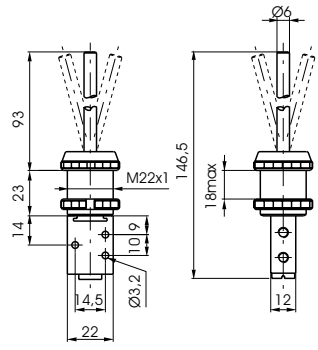
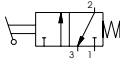
A spare parts kit including the spool complete of wearing seals and actuators is available for overhauling the valve. This simple operation does not require a skilled worker. Although particular care is needed for assembling the valve.

ATTENTION: use hydraulic oil class H for lubrication such as MAGNA GC 32 (Castrol).


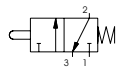
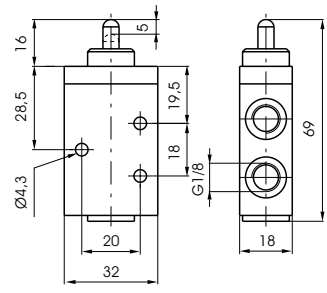

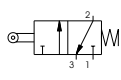
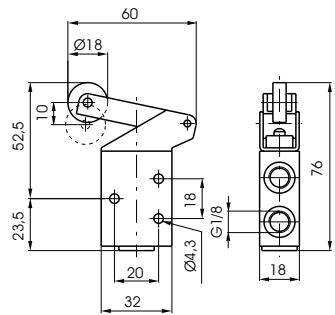

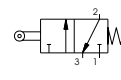
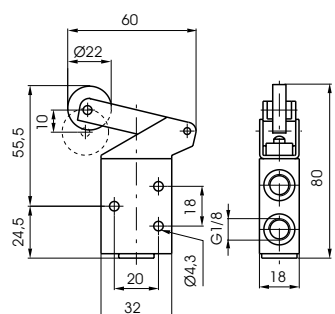

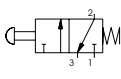
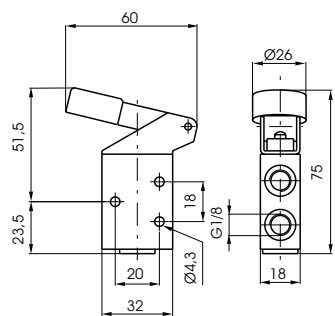
<p>Tappet spring</p>		3/2					
<p>Ordering code</p>							
<p>705.32.0.1</p>							
<p>Weight gr. 64</p>							
<p>Operating force 21,5 N (at 6 bar)</p>							
<p>Lever roller spring</p>		3/2					
<p>Ordering code</p>							
<p>705.32.2.1</p>							
<p>Weight gr. 80</p>							
<p>Operating force 10 N (at 6 bar)</p>							
<p>Lever roller ball bearing spring</p>		3/2					
<p>Ordering code</p>							
<p>705.32.2.1/1</p>							
<p>Weight gr. 95</p>							
<p>Operating force 10 N (at 6 bar)</p>							
<p>Lever button spring</p>		3/2					
<p>Ordering code</p>							
<p>705.32.2.6/1 Red 705.32.3.6/2 Black 705.32.2.6/3 Green</p>							
<p>Weight gr. 80</p>							
<p>Operating force 10 N (at 6 bar)</p>							
<p>Operational characteristics</p>	<p>Fluid</p>	<p>Max working pressure</p>	<p>Operating temperature</p>		<p>Flow rate at 6 bar with $\Delta p = 1$</p>	<p>Ø Orifice size</p>	<p>Working port size</p>
	<p>Filtered and lubricated air</p>	<p>10 bar</p>	<p>min. -5°C</p>	<p>max. +70°C</p>	<p>120 NI/min</p>	<p>mm 2,5</p>	<p>M5</p>



<p>Lever roller unidirectional spring</p>						3/2	
<p>Ordering code</p>							
<p>705.32.3.1</p>							
<p>Weight gr. 80</p>							
		<p>Operating force 10 N (at 6 bar)</p>					
<p>Lever panel Ø 13 2-positions</p>						3/2	
<p>Ordering code</p>							
<p>705.32.5</p>							
<p>Weight gr. 83</p>							
<p>Lever panel Ø 22 2-positions</p>						3/2	
<p>Ordering code</p>							
<p>705.32.55/1 Red</p>							
<p>705.32.55/2 Black</p>							
<p>705.32.55/3 Green</p>							
<p>Weight gr. 120</p>							
<p>Lever button Ø 30 spring</p>						3/2	
<p>Ordering code</p>							
<p>705.32.6.1/1 Red</p>							
<p>705.32.6.1/2 Black</p>							
<p>705.32.6.1/3 Green</p>							
<p>Weight gr. 118</p>							
		<p>Operating force 21,5 N (at 6 bar)</p>					
<p>Operational characteristics</p>	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Ø Orefice size	Working port size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	120 NI/min	mm 2,5	M5

<p>Pushbutton Ø 22 mm spring</p>		3/2					
<p>Ordering code</p>		 					
<p>705.32.6.2/1 Red 705.32.6.2/2 Black 705.32.6.2/3 Green</p>							
 <p>Weight gr. 96</p>							
		Operating force 21,5 N (at 6 bar)					
<p>Palm pushbutton Ø 30 mm spring</p>		3/2					
<p>Ordering code</p>		 					
<p>705.32.7.1/1 Red 705.32.7.1/2 Black 705.32.7.1/3 Green</p>							
 <p>Weight gr. 120</p>							
		Operating force 21,5 N (at 6 bar)					
<p>Palm pushbutton Ø 22 mm spring</p>		3/2					
<p>Ordering code</p>		 					
<p>705.32.7.2/1 Red 705.32.7.2/2 Black 705.32.7.2/3 Green</p>							
 <p>Weight gr. 98</p>							
		Operating force 21,5 N (at 6 bar)					
<p>Whisker spring</p>		3/2					
<p>Ordering code</p>		 					
<p>705.32.9.1</p>							
 <p>Weight gr. 130</p>							
		Operating force 21,5 N (at 6 bar)					
<p>Operational characteristics</p>	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Ø Orifice size	Working port size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	120 NI/min	mm 2,5	M5



<p>Tappet spring</p>		3/2					
<p>Ordering code</p>							
<p>718.32.0.1</p>							
							
<p>Weight gr. 90</p>							
		<p>Operating force 44 N (at 6 bar)</p>					
<p>Lever roller spring</p>		3/2					
<p>Ordering code</p>							
<p>718.32.2.1 Plastic roller 718.32.2.1/2 Metal roller</p>							
							
<p>Weight gr. 115</p>							
		<p>Operating force 20 N (at 6 bar)</p>					
<p>Lever roller ball bearing spring</p>		3/2					
<p>Ordering code</p>							
<p>718.32.2.1/1</p>							
							
<p>Weight gr. 130</p>							
		<p>Operating force 20 N (at 6 bar)</p>					
<p>Lever button spring</p>		3/2					
<p>Ordering code</p>							
<p>718.32.2.6/1 Red 718.32.2.6/2 Black 718.32.2.6/3 Green</p>							
							
<p>Weight gr. 120</p>							
		<p>Operating force 20 N (at 6 bar)</p>					
<p>Operational characteristics</p>	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Ø Orefice size	Working port size
	Filtered and lubricated air	10 bar	max. -5° C	max. +70° C	570 NI/min	mm 5,5	G 1/8"



Lever roller unidirectional spring 3/2

Ordering code

718.32.3.1 Plastic roller
718.32.3.1/2 Metal roller



Weight gr. 110




Operating force 20 N (at 6 bar)

Push button Ø 30 mm spring 3/2

Ordering code

718.32.6.1/1 Red
718.32.6.1/2 Black
718.32.6.1/3 Green



Weight gr. 148




Operating force 44,3 N (at 6 bar)

Palm pushbutton Ø 30 mm spring 3/2

Ordering code

718.32.7.1/1 Red
718.32.7.1/2 Black
718.32.7.1/3 Green



Weight gr. 155




Operating force 44,3 N (at 6 bar)

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Ø Orefice size	Working port size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	570 NI/min	mm 5,5	G 1/8"

Complementary valves Series 900

Pressure switches

Impulse generators

Timers

Two hands safety valve

Valve

Oscillator valve

Signal amplifier

Progressive start up valve



General

When building automated pneumatic circuits, it is sometimes necessary to alter or modify the various signals. There can be, for instance, a permanent signal coming from a limit switch that needs to be terminated, or there may be a need to modify a pneumatic signal into an electric one, etc. While this can be accomplished by using commercially available components, the process is tedious and expensive. We have therefore developed a number of components to facilitate this task resulting in a consistent saving of time, space and money.

The 900 series consist of the following components:

- Pressure switch, which transforms a pneumatic signal into an electric one.
- Impulse generator, which transforms a permanent pneumatic signal into an adjustable impulse from 0 to 10 seconds.
- Pneumatic timer (N.C. or N.O.), which cuts or releases a pneumatic signal within an adjustable time.
- Two hands safety valve, which allows a safety use of two hands pneumatic controls (for example two push-button 3/2 N.C. to a certain distance) excluding false signals in case of push-button or valve malfunction.
- Oscillator valve, 5/2 - G 1/8" with two logic functions "NOT" mounted on board, switches when the pressure in the connected cylinder exhaust chamber is reaching the threshold of "NOT".
- Signal amplifier, 3/2 - G 1/8" N.C. valve actuated by weak signals but higher than 0.05 bar.
- Progressive start-up valve, which is a device that is fitted in between valve or solenoid valve and cylinder allows a gradual filling of the chamber providing a low power cylinder movement. The progressive start-up valve is made of a flow control valve and a 2/2 N.C. valve with 6 mm nominal orifice. The valve is totally open when the pressure in the cylinder reaches 50% of inlet pressure.
- High-low pressure devices, located in the pneumatic circuit between valve and cylinder, allow the function of the cylinder with two different pressures. Example: in case of a locking action, it is possible to approach the required position at a low pressure, then increase to its maximum value in the circuit with the use of an electric signal. They are practically made of a piloted pressure regulator without relieving.

Construction characteristics

We have not listed all different materials used for the construction of these components because the list would be too long. We use corrosion proof material, brass or anodized aluminium and the most appropriate specific mixture for seals. If more information is required please contact our technical department.

Use and maintenance

In use pay attention to the minimum and maximum criteria for temperature and pressure, checking and ensure good quality compressed air. In a dirty environment, protect the exhaust ports. In this case, maintenance is minimal and is necessary only if the air is particularly dirty. The components most subject to damage by the accumulation of dirt are flow regulators with fine regulation and silencers. As for regulators, follow the normal procedure for disassembling, washing with non-chemical cleaning agents and remounting. The silencers need only to be rinsed in petrol or solvent and blown dry with compressed air.

The number of requests for spare seals for flow regulators and shuttle valves are statistically irrelevant. More often, it is necessary to replace the lining of the quick exhaust because of the wear it undergoes due to the particular conditions of operating.

ATTENTION: for lubrication use class H hydraulic oils, for example Castrol MAGNA GC 32.



**Pressure switch
G 1/8" - screw connections**

Ordering code

900.18.1-1 (0,5 ÷ 1 bar)
900.18.1-4 (3,5 ÷ 4 bar)

Weight gr. 75

**Pressure switch
G 1/8" - spade connections**

Ordering code

900.18.1/1-1 (0,5 ÷ 1 bar)
900.18.1/1-4 (3,5 ÷ 4 bar)

Weight gr. 60

Switch protection

Ordering code

900.18.0

Weight gr. 6

Operational characteristics	Fluid	Max working pressure	Operating temperature		Working pilot port size	Flow rate microswitch 900.18.1/1	Flow rate microswitch 900.18.1
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	G 1/8"	13 (3) A - 220 V~	16 (5) A - 220 V~

Impulse generator

Ordering code

900.18.2 N

Weight gr. 235

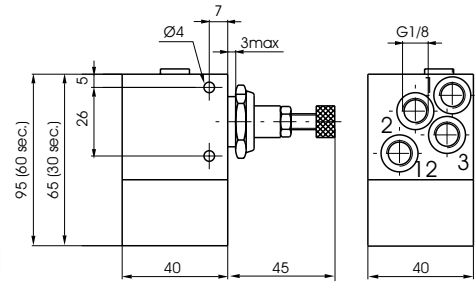
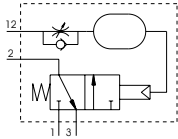
Operational characteristics

Fluid	Max working pressure	Operating temperature		Ø Orifice size
Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	mm 2

Pneumatic timer N.C. G 1/8"

Ordering code

900.18.3 (0 ÷ 30 seconds)
900.18.3-60 (0 ÷ 60 seconds)



Weight gr. 290 (30 sec.)
 Weight gr. 350 (60 sec.)

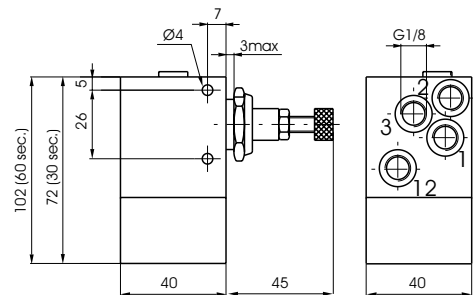
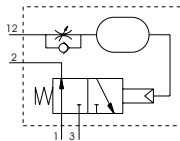
Operational characteristics

Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar $\Delta p = 1$ bar	Ø Orifice size
		min.	max.		
Filtered and lubricated air	3 ÷ 10 bar	-5°C	+70°C	130 NI/min.	mm 2,5

Pneumatic timer N.O. - G 1/8"

Ordering code

900.18.4 (0 ÷ 30 seconds)
900.18.4-60 (0 ÷ 60 seconds)



Weight gr. 320 (30 sec.)
 Weight gr. 380 (60 sec.)

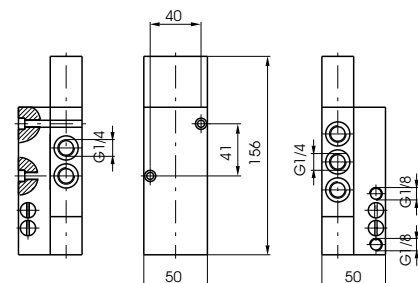
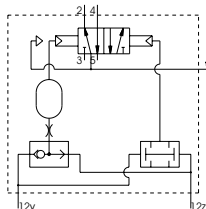
Operational characteristics

Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar $\Delta p = 1$ bar	Ø Orifice size
		min.	max.		
Filtered and lubricated air	4 ÷ 10 bar	-5°C	+70°C	130 NI/min.	mm 2,5

Two hands safety valve G 1/4"

Ordering code

900.52.1.1



Weight gr. 780

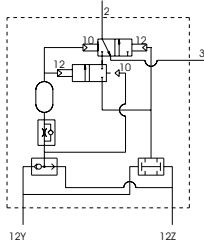
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Ø Orefice size	Working port size	Working pilot port size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	1030 NI/min	mm 7	G 1/4"	G 1/8"



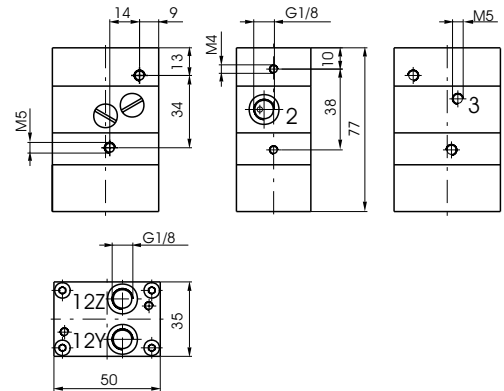
**Two hands safety valve
III A class certification
(according to en 574 standard)**

Ordering code

900.18.9



Weight gr. 340

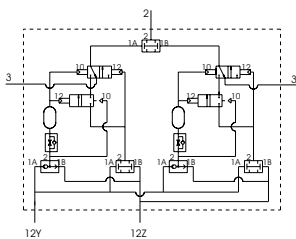


Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	\varnothing Orefice size	Working port size	Working pilot port size
	Filtered and lubricated air	3 ÷ 8 bar	min. -5°C	max. +70°C	40 NI/min	mm 2,5	G 1/8"	G 1/8"

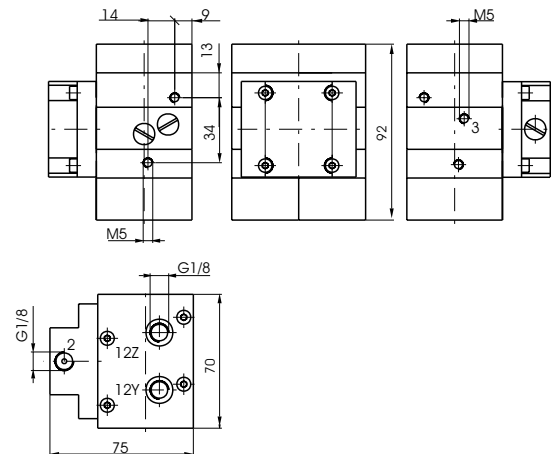
**Two hands safety valve
III B class certification
(according to en 574 standard)**

Ordering code

900.18.10



Weight gr. 980



Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	\varnothing Orefice size	Working port size	Working pilot port size
	Filtered and lubricated air	3 ÷ 8 bar	min. -5°C	max. +70°C	40 NI/min	mm 2,5	G 1/8"	G 1/8"

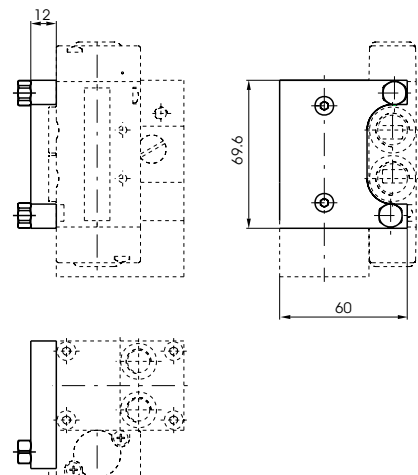
**Power valve adaptor
(Series 2400)**

Ordering code

900.18.11



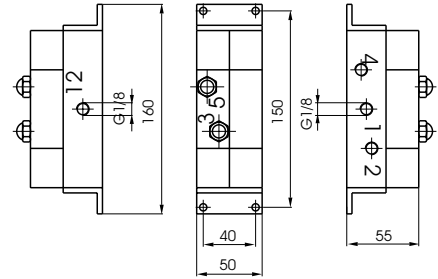
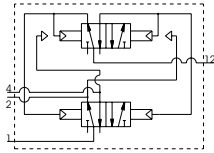
Weight gr. 75



Flip-flop valve G 1/8"

Ordering code

900.52.1.2



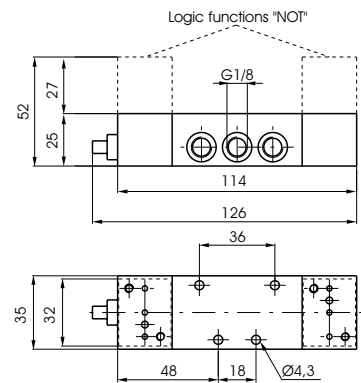
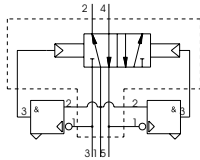
Weight gr. 970

Operational characteristic	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	\varnothing Orefice size	Working port size
	Filtered and lubricated air	10 bar	min. -5 C	max. +70 C	540 NI/min	mm 6	G 1/8"

Oscillator valve G 1/8"

Ordering code

900.52.5
(without logic functions NOT)
900.52.5C
(with logic functions NOT)



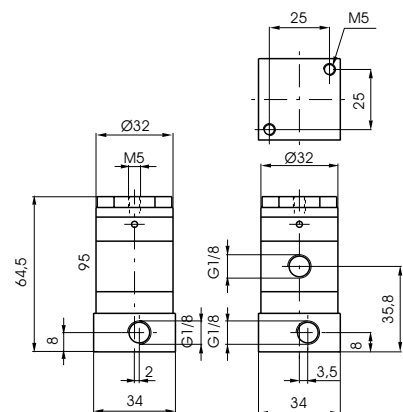
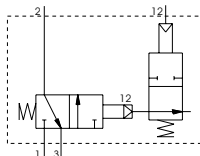
Weight gr. 600

Operational characteristics	Fluid	Max working pressure	Min working pressure	Operating temperature		Flow rate at 6 bar $\Delta p = 1$	\varnothing Orefice size	Working port size
	Filtered and lubricated air	8 bar	2 bar	min. -5 C	max. +45 C	540 NI/min	mm 6	G 1/8"

Signal amplifier G 1/8"

Ordering code

900.32.6



Weight gr. 170

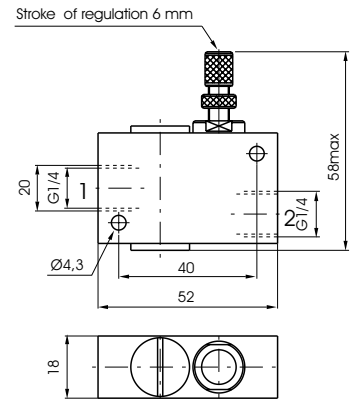
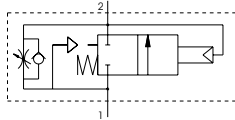
Operational characteristics	Fluid	Max working pressure	Min working pressure	Operating temperature		Flow rate at 6 bar $\Delta p = 1$	\varnothing Orefice size	Working port size
	Filtered and lubricated air	10 bar	0,05 bar	min. -5 C	max. +45°C	130 NI/min	mm 3	G 1/8"



**Progressive start-up valve
G 1/4"**

Ordering code

900.14.7



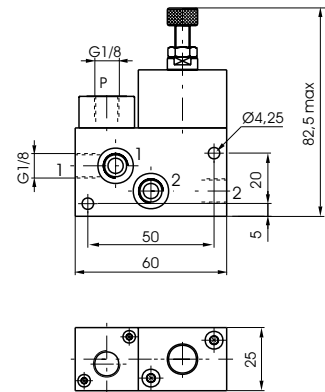
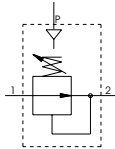
Weight gr. 100

Operational characteristics	Fluid	Min / Max working pressure	Operating temperature		Flow rate from 1 to 2	Flow rate from 2 to 1	Flow rate needle fully open from port 1 to 2	Ø Orifice size	Working port size
		Filtered and lubricated air o non	2,5 / 10 bar	min. -5°C	max. +70°C	760 NI/min	900 NI/min	200 NI/min	mm 6

High-low pressure device

Ordering code

900.18.8P
(with pneumatic pilot)

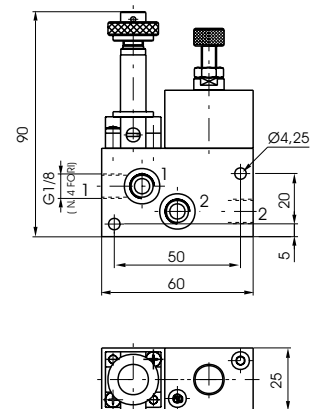
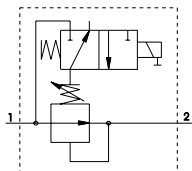


1 = Inlet / pressure gauge
2 = Outlet / pressure gauge
P = Piloting

Weight gr. 240

Ordering code

900.18.8E
(with M2 mechanic)



1 = Inlet / pressure gauge
2 = Outlet / pressure gauge

Weight gr. 280.

Operational characteristic	Fluid	Max working pressure	Pressure range	Temperature		Max flow 6 bar Δ p = 1	Connections
		Filtered and lubricated air	10 bar	1 ÷ 4 bar	min. -5°C	max. +45°C	650 NI/min

Distributors and electrodistributors ISO 5599/1 Series 1000 -1010

Distributors and electro distributors
ISO size 1

Distributors and electro distributors
ISO size 2

Technopolymer Distributors
and electro distributors
ISO size 1

Technopolymer Distributors
and electro distributors
ISO size 2

Distributors and electro distributors
ISO size 3

Modular bases

Inlet blocks

Single use bases



General

5 ways 2 or 3 positions distributors and electric distributors can be used mounted on individual or ganged bases.

A special feature of these devices is that some of their dimensional and functional characteristics comply with international standards, which require that distributors manufactured by different makers be interchangeable. These standards are ISO 5599/1, according to which certain dimensions are mandatory, namely, the mounting surface, the pitch of the fastening screws, the characteristic of the electric pilot, the flow rate, the pneumatic connections, and so on.


The design is based on the balanced spool principle with pneumatic or electropneumatic actuators and resetting by mechanically or pneumatically operated spring.

The 3 position closed centres, are obtained by spring operation.

The feed to the actuators on the distributors can be provided either by pressure intake from inlet 1 (autofeed) or through the base from inlets 12 and 14 (external feed); there are two separate types of these distributors: one is the Series 1000 and the other is the Series 1010.

The Serie 1000 includes size 1 and 2 and are built of die-cast aluminium. The selection is made by turning a seal fitted between body and operator by 180°, so to utilize external-feed pilot or with internal feed.

Ordering codes are referring to distributors with "M2" mechanics or solenoid valves "S" mounted (see Series 300, section 1). (M2 coil are not included and have to be ordering separately).

Coil for M2 and solenoid "S"  homologated are available (see pag. 1.26 - 1.27).

The series 1010 includes 3 sizes: 1, 2 and 3. The body and operators of distributor size 1 and 2 are built of acetal resin protected by an anodized aluminium cap, while size 3 is made of die-cast aluminium with protection cap as well. The selection is made as above. For the electro-distributors it is used the electro-pilots CNOMO Series M with possibility to instal the coils ISO 4400 (DIN 43650) or the coil MB 22x22.

The polyurethane seals are available for oil free operation. In this case, the ordering code becomes:

1001.. becomes 1031 1051.. becomes 1071 1011.. becomes 1021
1002.. becomes 1032 1052.. becomes 1072 1012.. becomes 1022
1013.. becomes 1023

Important: on this type of valves a temperature higher than 40°C along with water or high humidity are causing a progressive reduction of mechanical characteristics of the seals. This chemical reaction (hydrolysis) duration depends by the ambient temperature and in some cases the seal becomes brittle and falls to pieces.

Use and maintenance **The valves equipped with polyurethane seals are not suitable for tropical climate.**

These distributors have an average life span ranging between 10 and 15 million cycles, depending on operating conditions.

Proper lubrication cuts down the wear of the seals drastically, in the same way as proper filtering prevents the build-up of dirt and consequent malfunctioning of the distributors.

Make sure that the conditions of use comply with the pressure, temperature etc. limits indicated and that the fastening screws are tightened with the following maximum torques on distributors Serie 1010.

Size 1 = 4 Nm Size 2 = 5 Nm Size 3 = 8 Nm

Assembly kits, including the spool and seals subject to wear, are available for servicing, which can be carried out by anyone provided proper care is taken when reassembling the distributors.

ATTENTION : use only class H Hydraulic oils for lubrication. e.g. MAGNA GC 32 (CASTROL).



Construction characteristics

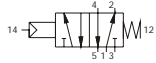
Series 1000	Size 1	Size 2	
Body	Zinc alloy	Die-cast aluminium	
Operators	Zinc alloy	Die-cast aluminium	
Spools	Nickel-plated steel (Kanigen)	Nickel-plated steel (Kanigen)	
Seals	Nitrile rubber (NBR) oil resistant	Nitrile rubber (NBR) oil resistant	
Spacers	Acetal resin	Aluminium	
Springs	Spring steel	Spring steel	
Selectors	Nitrile rubber (NBR) oil resistant	Nitrile rubber (NBR) oil resistant	
Series 1010	Size 1	Size 2	Size 3
Body	Acetal resin	Acetal resin	Die-cast aluminium
Operators	Acetal resin	Acetal resin	Die-cast aluminium
Spools	Nickel-plated steel (Kanigen)	Nickel-plated steel (Kanigen)	Nickel-plated steel (Kanigen)
Seals	Nitrile rubber (NBR) oil resistant	Nitrile rubber (NBR) oil resistant	Nitrile rubber (NBR) oil resist.
Spacers	Acetal resin	Acetal resin	Acetal resin
Control pistons	Aluminium	Aluminium	Aluminium
Springs	Spring steel	Spring steel	Spring steel

5/2

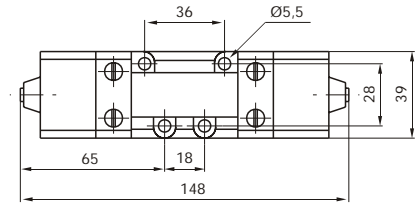
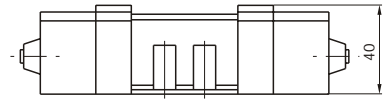
Pneumatic Spring

Ordering code

1001.52.1.9



Weight gr. 780



Minimum working pressure 2,5 bar

5/2

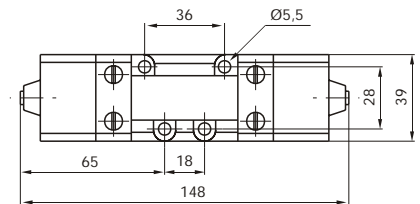
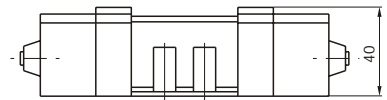
Pneumatic Differential

Ordering code

1001.52.1.6



Weight gr. 790



Minimum working pressure 2 bar

5/2 and 5/3

Pneumatic Pneumatic

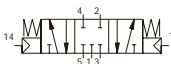
Ordering code

1001.52.1.8

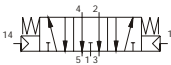


Minimum working pressure 1,5 bar

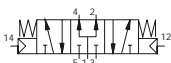
1001.53.31.1.8 *Closed centres*



1001.53.32.1.8 *Open centres*

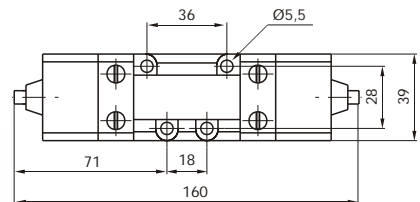
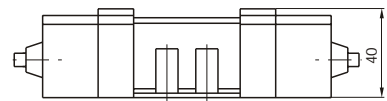


1001.53.33.1.8 *Pressured centres*



Minimum working pressure 3 bar

Weight gr. 800



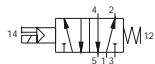
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated	10 bar	min. -5°C	max. +70°C	840 NI/min (5/2) 720 NI/min (5/3)	-----	-----

5/2

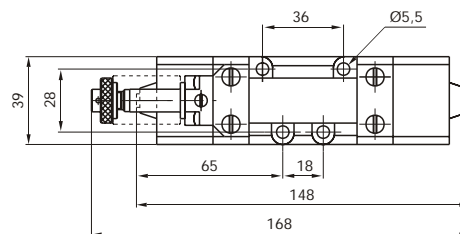
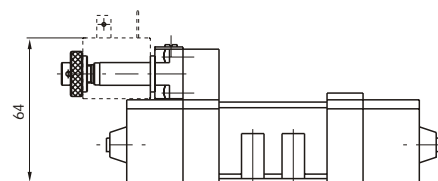
Solenoid Spring

Ordering code

1051.52.3.9.M2



Weight gr. 890



Minimum working pressure 2,5 bar

5/2

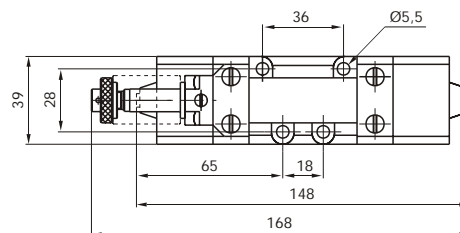
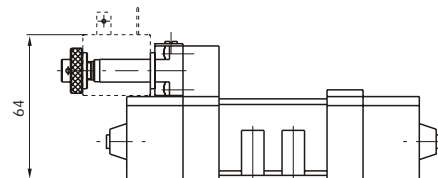
Solenoid Differential

Ordering code

1051.52.3.6.M2



Weight gr. 900



Minimum working pressure 2 bar

5/2 and 5/3

Solenoid Solenoid

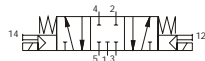
Ordering code

1051.52.3.5.M2



Minimum working pressure 1,5 bar

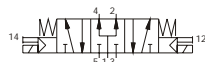
1051.53.31.3.5.M2 *Closed centres*



1051.53.32.3.5.M2 *Open centres*

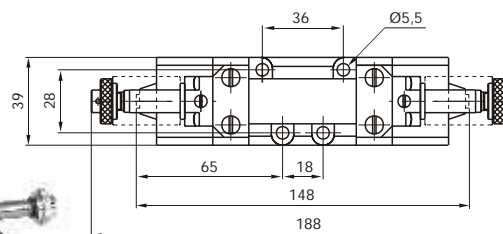
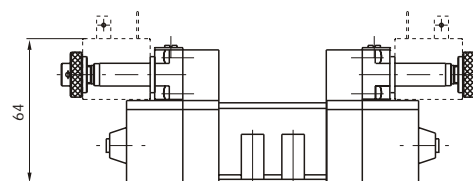


1051.53.33.3.5.M2 *Pressured centres*



Minimum working pressure 3 bar

Weight gr. 1040



6

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated	10 bar	min. -5°C	max. +50°C	840 NI/min (5/2) 720 NI/min (5/3)	-----	-----

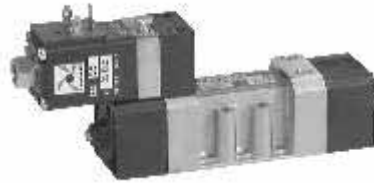
5/2

Solenoid Spring

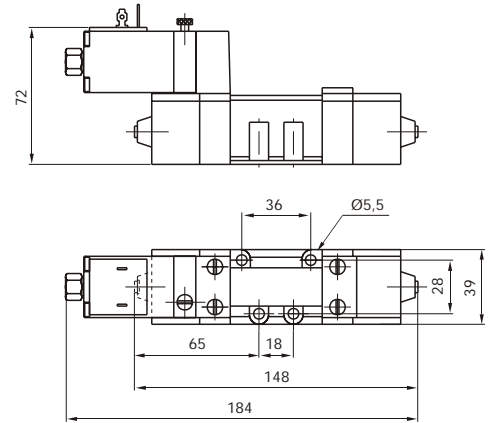
Ordering code

1001.52.3.9.S*

Weight gr. 1100



Minimum working pressure 2,5 bar



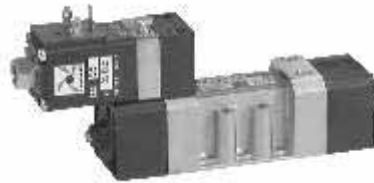
5/2

Solenoid Differential

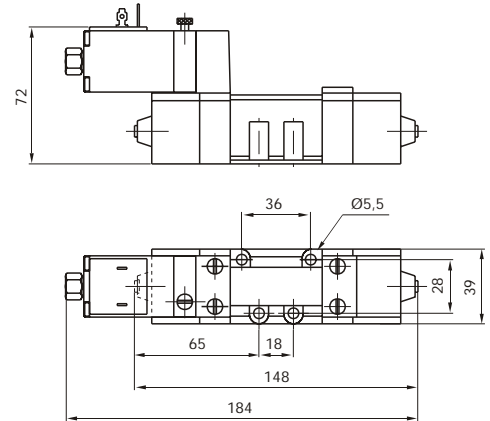
Ordering code

1001.52.3.6.S*

Weight gr. 1110



Minimum working pressure 2 bar



5/2 and 5/3

Solenoid Solenoid

Ordering code

1001.52.3.5.S*

Minimum working pressure 1,5 bar

1001.53.31.3.5.S* Closed centres

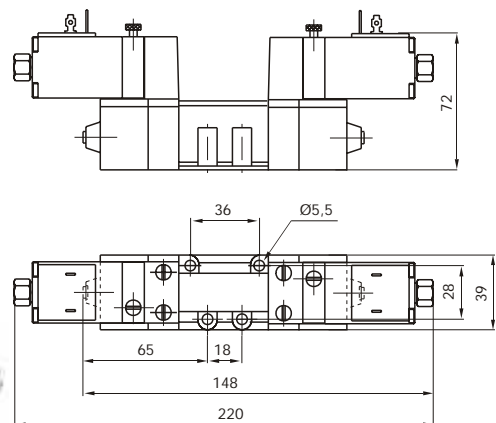
1001.53.32.3.5.S* Open centres

1001.53.33.3.5.S* Pressured centres



Minimum working pressure 3 bar

Weight gr. 1410



Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated	10 bar	min. -5°C	max. +50°C	840 NI/min (5/2) 720 NI/min (5/3)	-----	-----

5/2

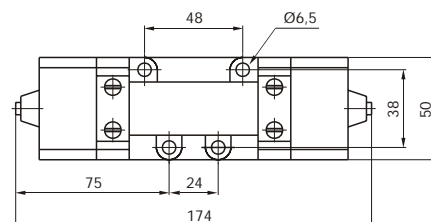
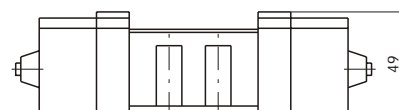
Pneumatic Differential

Ordering code

1002.52.1.6



Weight gr. 730



Minimum working pressure 2,5 bar

5/2

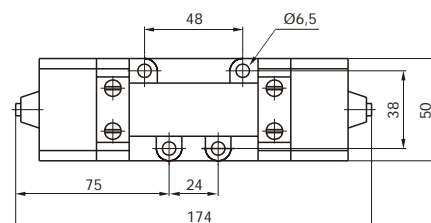
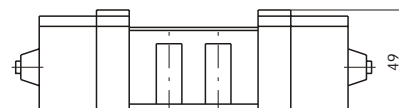
Pneumatic Pneumatic

Ordering code

1002.52.1.8



Weight gr. 740



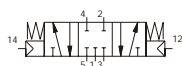
Minimum working pressure 2 bar

5/3

Pneumatic Pneumatic

Ordering code

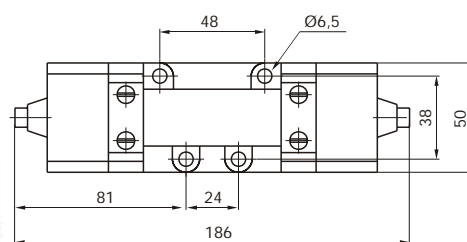
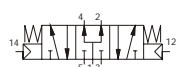
1002.53.31.1.8 *Closed centres*



1002.53.32.1.8 *Open centres*



1002.53.33.1.8 *Pressured centres*



Minimum working pressure 3 bar

Weight gr. 740

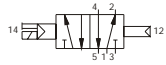
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated	10 bar	min. -5°C	max. +70°C	1700 NI/min	-----	-----

5/2

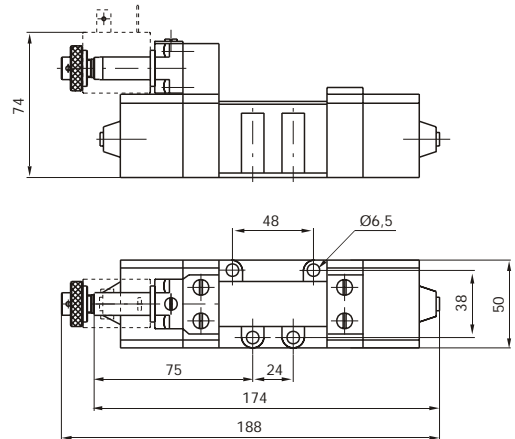
**Solenoid
Differential**

Ordering code

1052.52.3.6.M2



Weight gr. 850



Minimum working pressure 2 bar

5/2

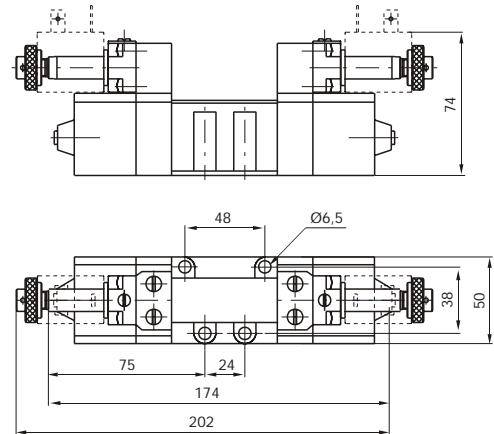
**Solenoid
Solenoid**

Ordering code

1052.52.3.5.M2



Weight gr. 980



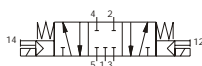
Minimum working pressure 1,5 bar

5/3

**Solenoid
Solenoid**

Ordering code

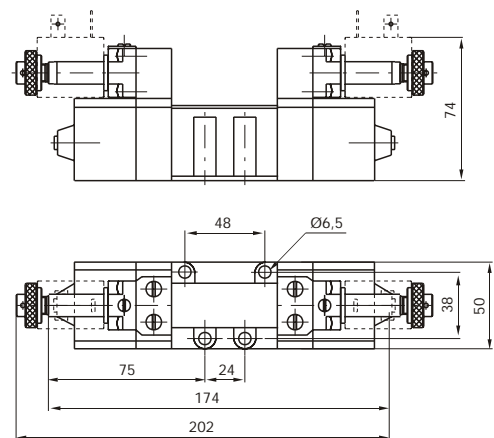
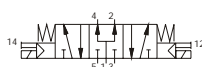
1052.53.31.3.5.M2 *Closed centres*



1052.53.32.3.5.M2 *Open centres*



1052.53.33.3.5.M2 *Pressured centres*



Minimum working pressure 3 bar

Weight gr. 980

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated	10 bar	min. -5°C	max. +50°C	1700 NI/min	-----	-----



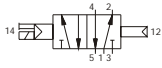
5/2

**Solenoid
Differential**

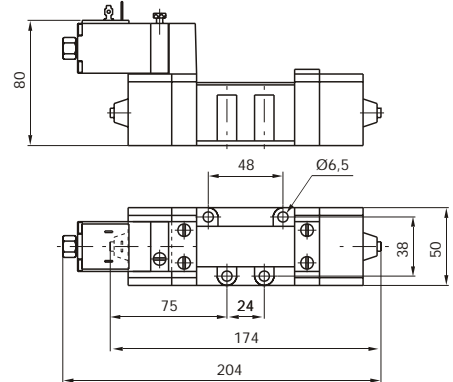
Ordering code

1002.52.3.6.S*

S* = solenoid code
(see page 1.23)



Weight gr. 1050



Minimum working pressure 2 bar

5/2

**Solenoid
Solenoid**

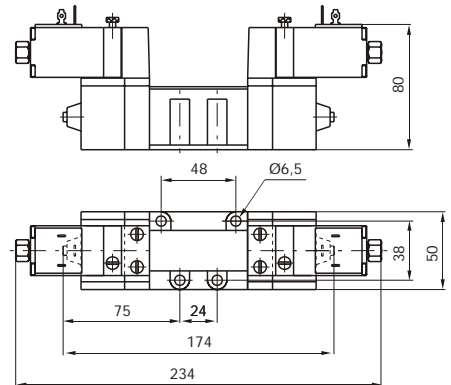
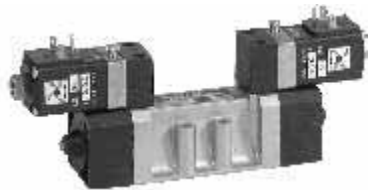
Ordering code

1002.52.3.5.S*

S* = solenoid code
(see page 1.23)



Weight gr. 1350



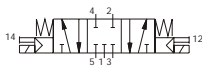
Minimum working pressure 1,5 bar

5/3

**Solenoid
Solenoid**

Ordering code

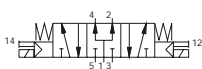
1002.53.31.3.5.S* *Closed centres*



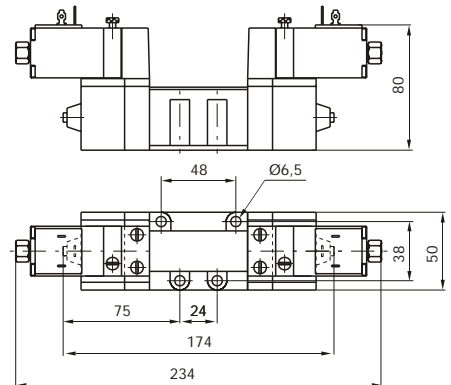
1002.53.32.3.5.S* *Open centres*



1002.53.33.3.5.S* *Pressured centres*



S* = solenoid code
(see page 1.23)



Minimum working pressure 3 bar

Weight gr. 1350

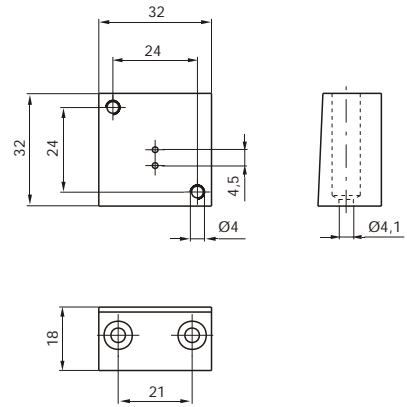
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated	10 bar	min. -5°C	max. +50°C	1700 NI/min	-----	-----



Base CNOMO for 32 mm Solenoid valve

Ordering code

1001.04

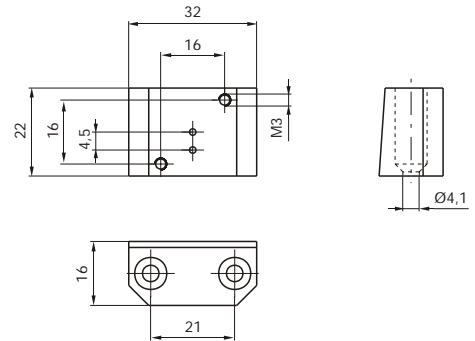


Weight gr. 90

Base for 22 mm solenoid valve

Ordering code

1001.05



Weight gr. 60

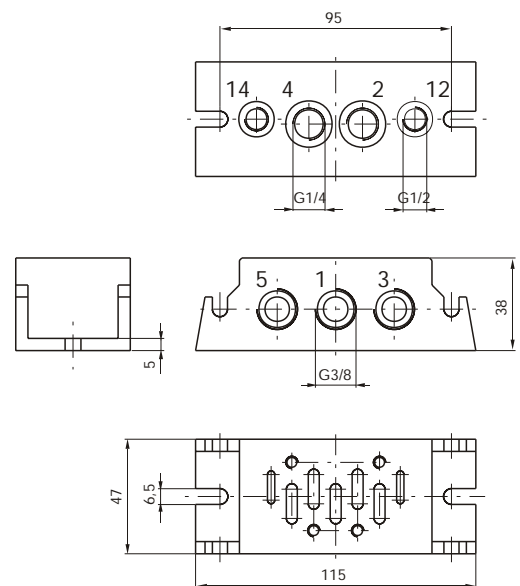
Base with bottom connections size 1

Ordering code

1001.00

- 1** = INLET PORT
- 2-4** = OUTLET PORTS
- 3-5** = EXHAUST PORTS
- 12-14** = PILOT PORTS

Weight gr. 320





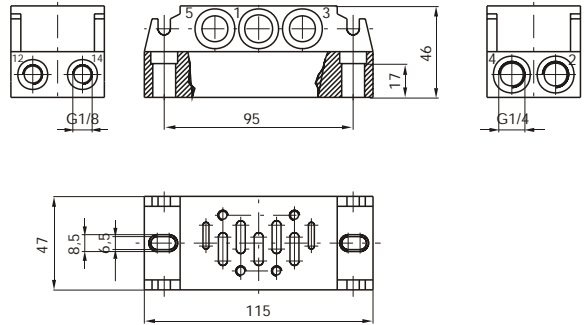
Base with side connections size 1

Ordering code

1001.01

- 1 = INLET PORT
- 2-4 = OUTLET PORTS
- 3-5 = EXHAUST PORTS
- 12-14 = PILOT PORTS

Weight gr. 445



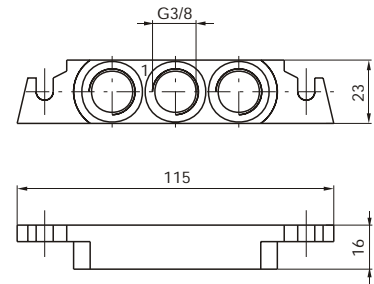
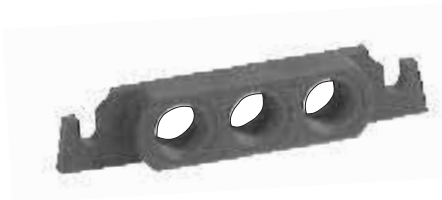
Inlet blocks

Ordering code

1001.02

- 1 = INLET PORT

Weight gr. 55



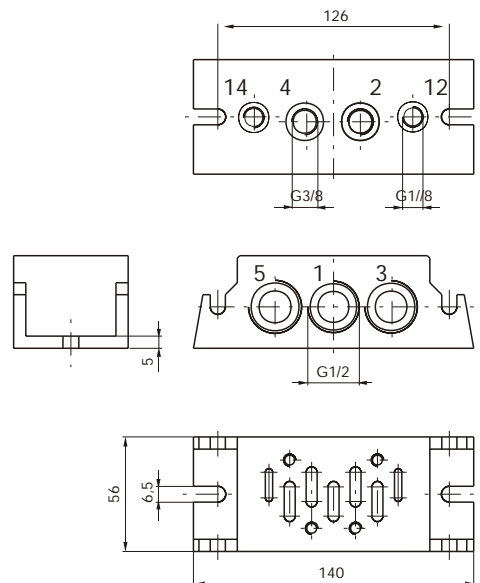
Base with bottom connections size 2

Ordering code

1002.00

- 1 = INLET PORT
- 2-4 = OUTLET PORTS
- 3-5 = EXHAUST PORTS
- 12-14 = PILOT PORTS

Weight gr. 520

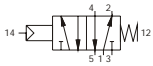


5/2

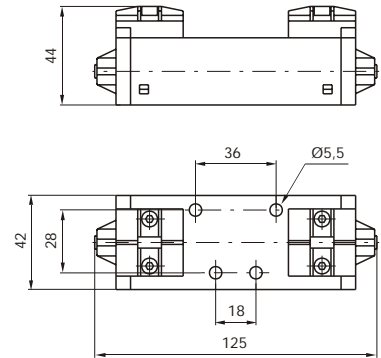
Pneumatic Spring

Ordering code

1011.52.1.9



Weight gr. 230



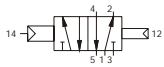
Minimum working pressure 2,5 bar

5/2

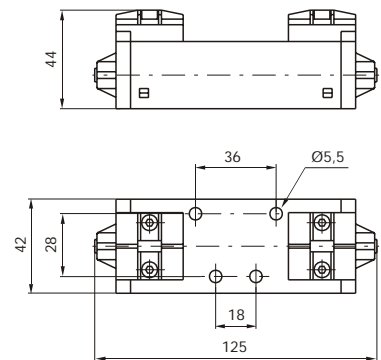
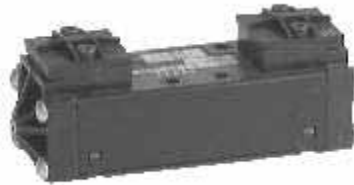
Pneumatic Differential

Ordering code

1011.52.1.6



Weight gr. 240



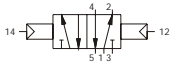
Minimum working pressure 2 bar

5/2 and 5/3

Pneumatic Pneumatic

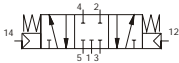
Ordering code

1011.52.1.8

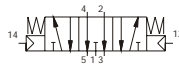


Minimum working pressure 1,5 bar

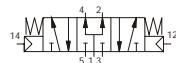
1011.53.31.1.8 *Closed centres*



1011.53.32.1.8 *Open centres*

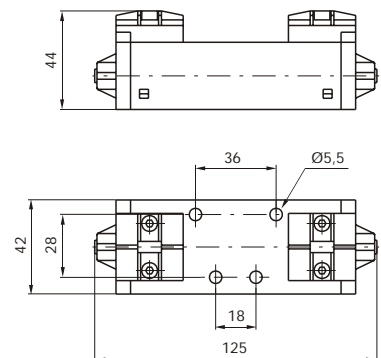


1011.53.33.1.8 *Pressured centres*



Minimum working pressure 3 bar

Weight gr. 240



Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated	10 bar	min. -5°C	max. +50°C	900 NI/min	-----	-----



5/2

Solenoid Spring

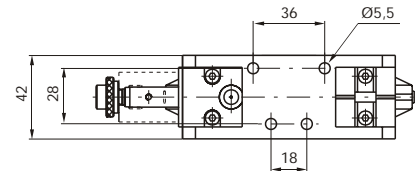
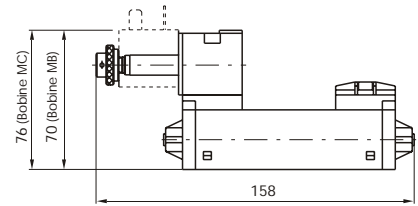
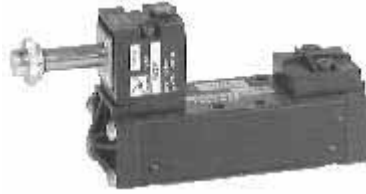
Ordering code

1011.52.3.9.M**

M** = mechanical code (see page 1.20)



Weight gr. 290



Minimum working pressure 2,5 bar

5/2

Solenoid Differential

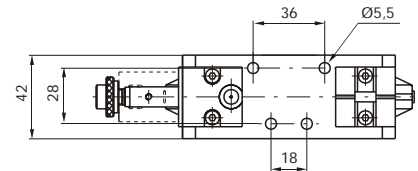
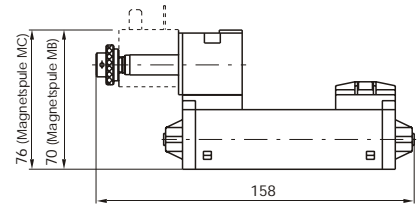
Ordering code

1011.52.3.6.M**

M** = mechanical code (see page 1.20)



Weight gr. 290



Minimum working pressure 2 bar

5/2 and 5/3

Solenoid Solenoid

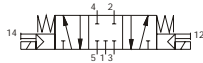
Ordering code

1011.52.3.5.M**

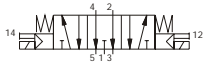


Minimum working pressure 1,5 bar

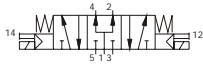
1011.53.31.3.5.M** *Closed centres*



1011.53.32.3.5.M** *Open centres*



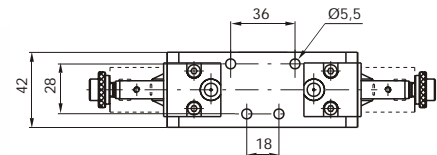
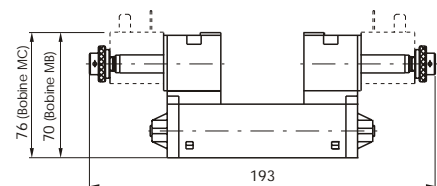
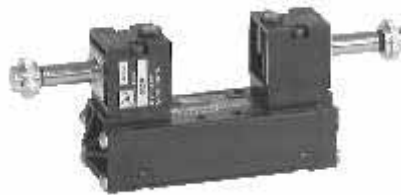
1011.53.33.3.5.M** *Pressured centres*



M** = mechanical code (see page 1.20)

Minimum working pressure 3 bar

Weight gr. 350



6

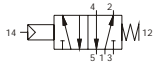
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated	10 bar	min. -5° C	max. +50° C	900 NI/min	-----	-----

5/2

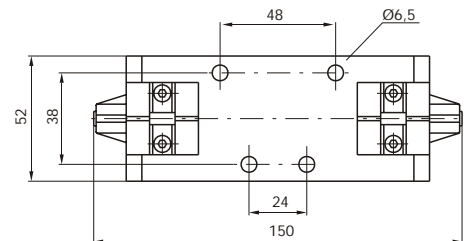
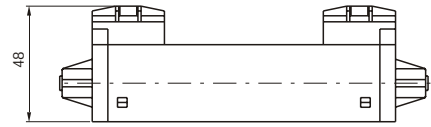
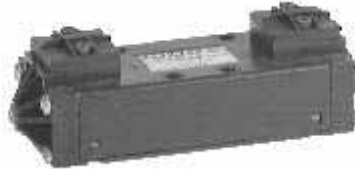
Pneumatic Spring

Ordering code

1012.52.1.9



Weight gr. 300



Minimum working pressure 2,5 bar

5/2

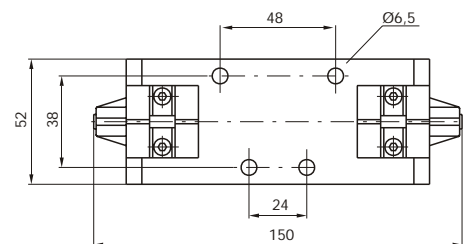
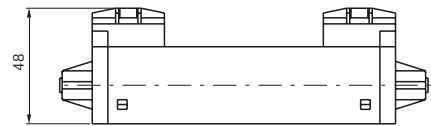
Pneumatic Differential

Ordering code

1012.52.1.6



Weight gr. 310



Minimum working pressure 2 bar

5/2 and 5/3

Pneumatic Pneumatic

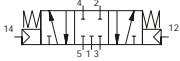
Ordering code

1012.52.1.8

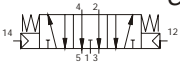


Minimum working pressure 1,5 bar

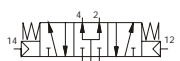
1012.53.31.1.8 *Closed centres*



1012.53.32.1.8 *Open centres*

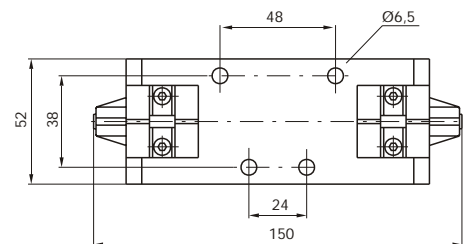
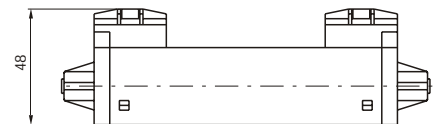


1012.53.33.1.8 *Pressured centres*




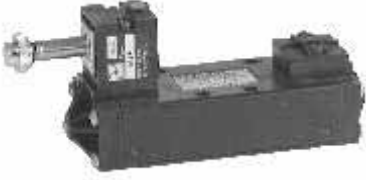
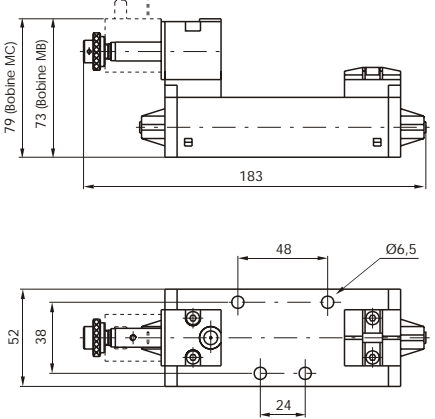

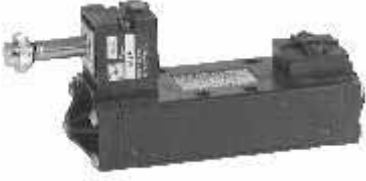
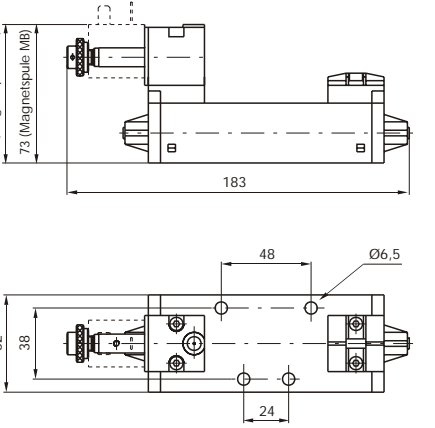
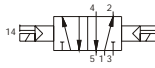


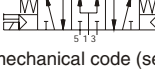

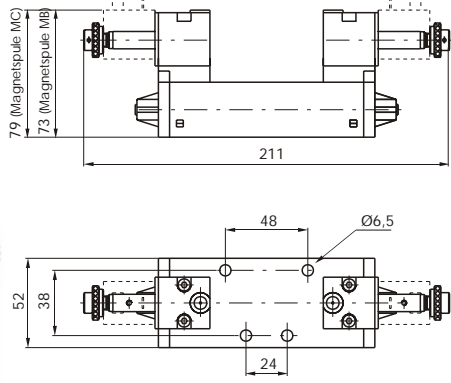
Minimum working pressure 3 bar

Weight gr. 310



Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated	10 bar	min. -5°C	max. +50°C	1600 NI/min	-----	-----



5/2							
Solenoid Spring							
Ordering code							
1012.52.3.9.M** M** = mechanical code (see page 1.20)							
							
Weight gr. 360							
Minimum working pressure 2,5 bar							
							
							
5/2							
Solenoid Differential							
Ordering code							
1012.52.3.6.M** M** = mechanical code (see page 1.20)							
							
Weight gr. 360							
Minimum working pressure 2 bar							
							
							
5/2 and 5/3							
Solenoid Solenoid							
Ordering code							
1012.52.3.5.M**							
							
Minimum working pressure 1,5 bar							
1012.53.31.3.5.M** <i>Closed centres</i>							
							
1012.53.32.3.5.M** <i>Open centres</i>							
							
1012.53.33.3.5.M** <i>Pressured centres</i>							
							
M** = mechanical code (see page 1.20)							
Minimum working pressure 3 bar							
							
							
Weight gr. 420							
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated	10 bar	min. -5°C	max. +50°C	1600 NI/min	-----	-----

5/2

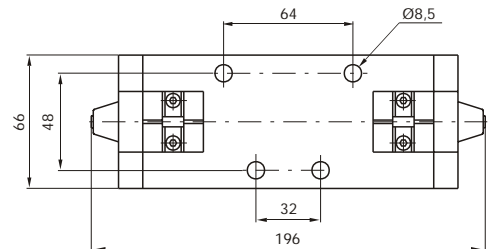
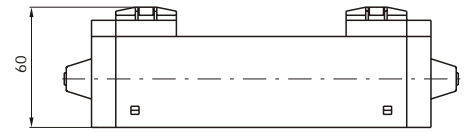
Pneumatic Spring

Ordering code

1013.52.1.9



Weight gr. 1000



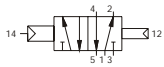
Minimum working pressure 2,5 bar

5/2

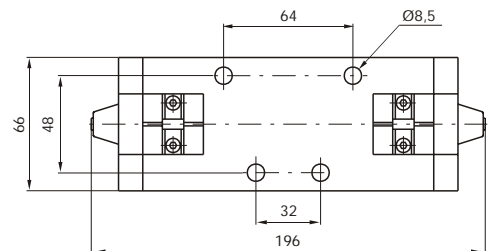
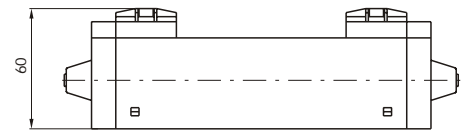
Pneumatic Differential

Ordering code

1013.52.1.6



Weight gr. 1020



Minimum working pressure 2 bar

5/2 and 5/3

Pneumatic Pneumatic

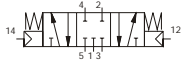
Ordering code

1013.52.1.8



Minimum working pressure 1,5 bar

1013.53.31.1.8 *Closed centres*



1013.53.32.1.8 *Open centres*

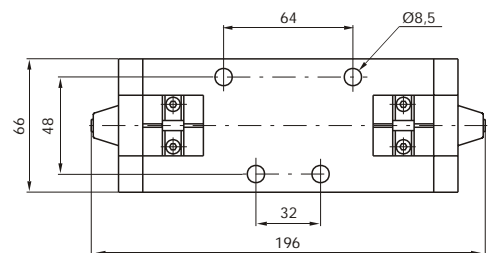
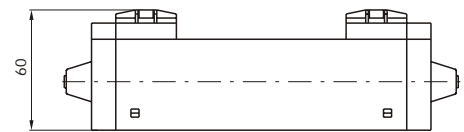


1013.53.33.1.8 *Pressured centres*



Minimum working pressure 3 bar

Weight gr. 1050



Operational characteristics

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated	10 bar	min. -5°C	max. +50°C	3600 NI/min (5/2) 3000 NI/min (5/3)	-----	-----

5/2

Solenoid Spring

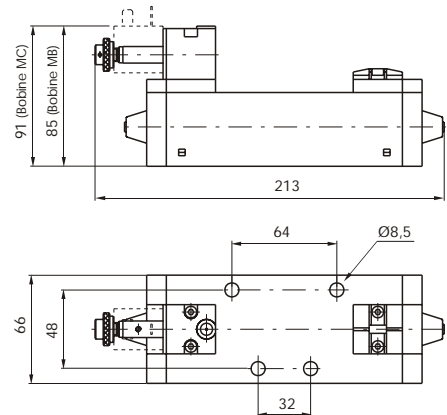
Ordering code

1013.52.3.9.M**

M** = mechanical code (see page 1.20)



Weight gr. 1060



Minimum working pressure 2,5 bar

5/2

Solenoid Differential

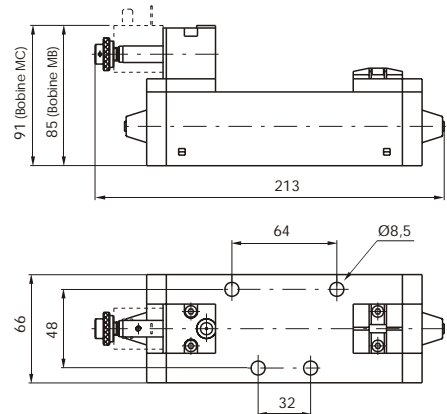
Ordering code

1013.52.3.6.M**

M** = mechanical code (see page 1.20)



Weight gr. 1080



Minimum working pressure 2 bar

5/2 and 5/3

Solenoid Solenoid

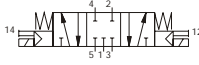
Ordering code

1013.52.3.5.M**

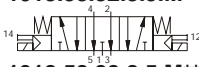


Minimum working pressure 1,5 bar

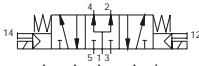
1013.53.31.3.5.M** *Closed centres*



1013.53.32.3.5.M** *Open centres*



1013.53.33.3.5.M** *Pressured centres*

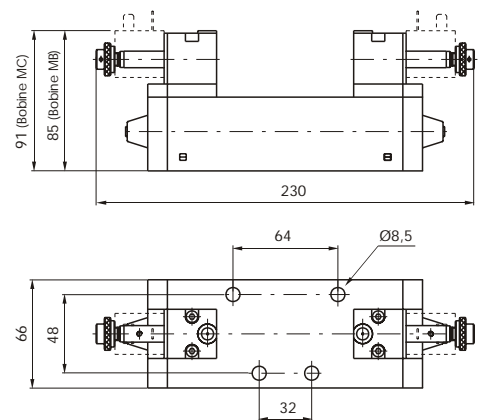


M** = mechanical code (see page 1.20)

Minimum working pressure 3 bar



Weight gr. 1170



Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated	10 bar	min. -5°C	max. +50°C			
					3600 NI/min (5/2) 3000 NI/min (5/3)	-----	-----



These bases are manufactured with the outlet and pilot ports on both the sides and the bottom faces giving the option for use with any application. Unused ports must be blanked off using threaded plugs which are not included in the part number or price. To isolate bases from each other for use with different supply pressures ports 1, 3 & 5 should be plugged underneath the seal.

The codes are:

1101.17 (size 1) - 1102.17 (size 2) - 1103.17 (size 3)

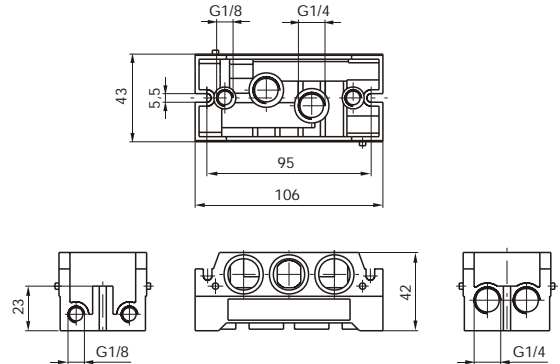
Size 1

Ordering code

1101.00



Weight gr. 240



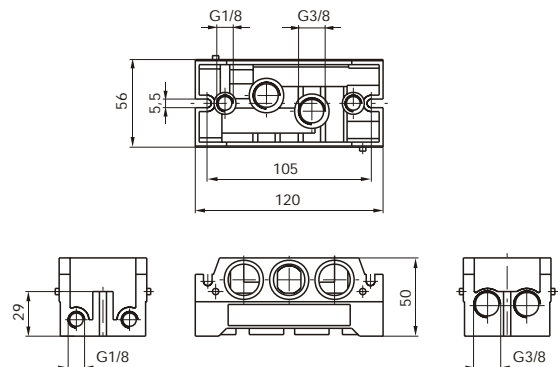
Size 2

Ordering code

1102.00



Weight gr. 340



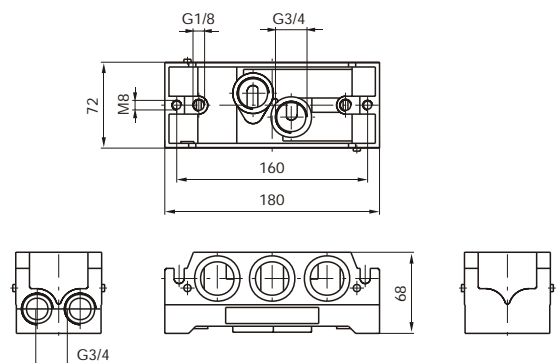
Size 3

Ordering code

1103.00



Weight gr. 950



Size 1

Ordering code

1101.09

Weight gr. 100



Ordering code

Taille 1

1101.10
Universal

1101.11
Aligned connections

1101.12
Top connections

1101.13
Bottom connections

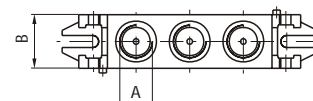
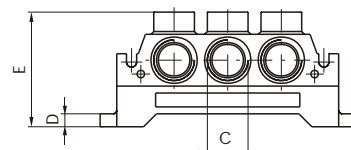
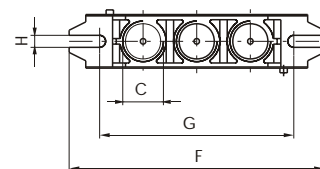
Taille 2

1102.10
Universal

1102.11
Aligned connections

1102.12
Top connections

1102.13
Bottom connections



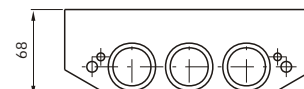
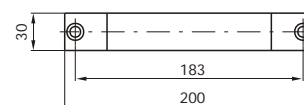
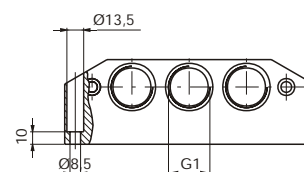
	A	B	C	D	E	F	G	H	Weight gr.
Size 1	G 1/4"	24	G 3/8"	7	52	106	95	5,5	160
Size 2	G 3/8"	29	G 1/2"	7	62	138	105	6,5	230

Size 3

Ordering code

1103.11
Aligned connections

Weight gr. 840



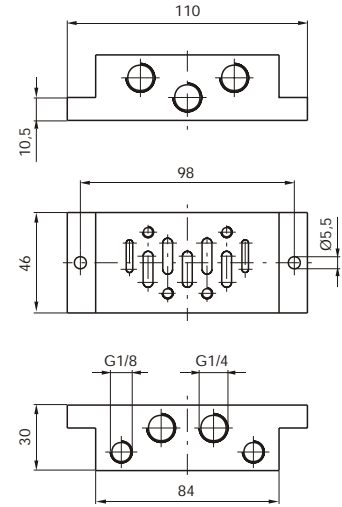
Size 1- Shape "A"

Ordering code

1101.14



Weight gr. 160



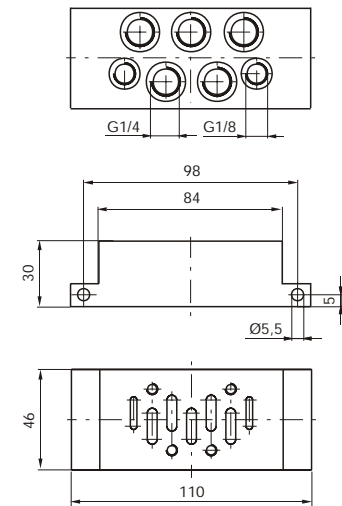
Size 1- Shape "B"

Ordering code

1101.15



Weight gr. 190



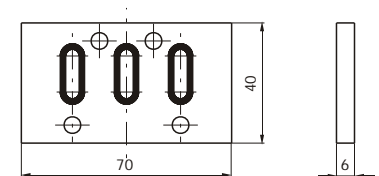
Closing plate

Ordering code

1101.16



Weight gr. 47



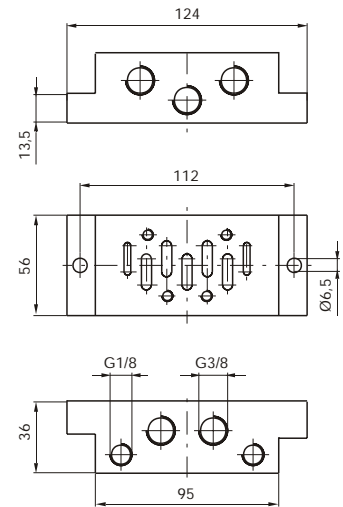
Size 2 - Forme "A"

Ordering code

1102.14



Weight gr. 190



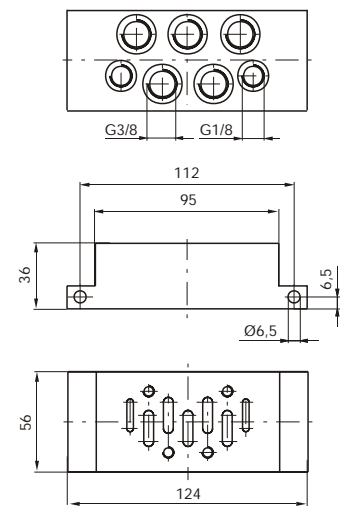
Size 2 - Shape "B"

Ordering code

1102.15



Weight gr. 220



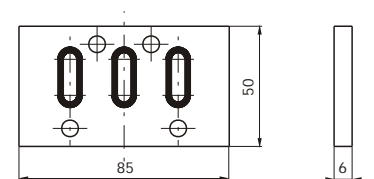
Closing plate

Ordering code

1102.16



Weight gr. 75





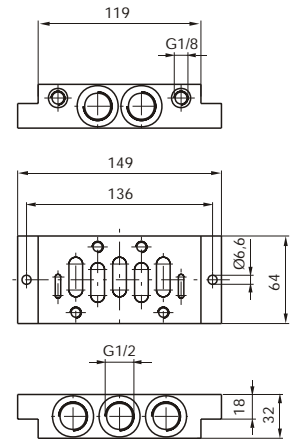
Size 3 - Shape "A"

Ordering code

1103.14



Weight gr. 600



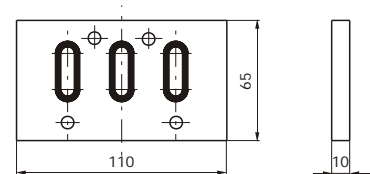
Closing plate

Ordering code

1103.16



Weight gr. 200



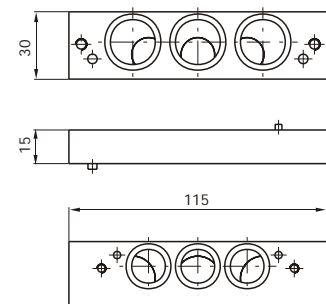
Base adaptor ISO 1 - ISO 2

Ordering code

1100.2-1



Weight gr. 110



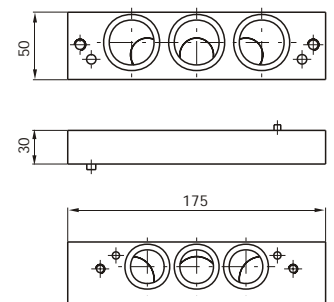
Base adaptor ISO 2 - ISO 3

Ordering code

1100.3-2



Weight gr. 590



Pneumatic actuated valves

Series 104/105/200

Valves \varnothing 4 tube

Valves M 5

Valves G 1/8"

Valves G 1/4" - Compact series

Valves G 1/4"

Valves G 1/2"

Valves G 1"



General

The pneumatic actuated valves are grouped in this part of catalogue because they have similar operating conditions of the solenoid valves. In fact the commutation signal is remote as it is for the manual and mechanical actuated valves.

In the first part of these catalogues are listed the pneumatic actuated valves for single use not suitable to be assembled on bases but eventually on manifold with one inlet port only.

The valves series 800 are suitable for both single and ganged applications.

These valves have a diversified use of 3-ways and 5-ways based on balanced spool as shown on functional symbols.

The repositions are made by spring, differential pneumatic spring or pneumatic for the bistable and centre spring return.

The polyurethane seals are available for oil free operation. In this case, the ordering code becomes:

238... for G 1/8" - **234 ...** for G 1/4" **232...** for G 1/2"

Important: on this type of valves a temperature higher then 40°C along with water or high humidity are causing a progressive reduction of mechanical characteristics of the seals. This chemical reaction (hydrolysis) duration depends by the ambient temperature and in some cases the seal becomes brittle and falls to pieces.

The valves equipped with polyurethane seals are not suitable for tropical climate.

Construction characteristics

	Tube Ø 4	M5	G 1/8" ÷ G 1"
Bodies	Reinforced technopolymer	Nickel plated brass	Anodized aluminium
Actuators	Reinforced technopolymer	Nickel plated brass	Anodized aluminium
Spools	Hardened nickel plated steel		
Seals	Nitrile (NBR) rubber oil resistant		
Spacers	Polyacetal		
Pistons	Acetal resin	Brass	Brass
Springs	Spring steel		
Bottom plates	/	/	Acetal resin Anodized aluminium

Use and maintenance

These valves are a mean life of 10 to 15 millions of cycles depending on application. Proper lubrication with specified oil reduces dramatically the wear of the seals as well as a good filtration insures long and trouble free operation. Check that the operating conditions are according to the suggested pressure, temperature an so on.

The exhaust ports of the distributor have to be protected in a dusty and dirty environment.

A spare parts kit including the spool complete of wearing seals and actuators are available for overhauling the valve. This simple operation does not require a skilled worker. Although a particular care is needed for assembling the valve.

ATTENTION: use hydraulic oil class H for lubrication such as MAGNA GC 32 (Castrol).



2/2 - 3/2 **2/2 - 3/2**

Pneumatic Spring

Ordering code

Lateral connections

Weight gr. 25

104. .11.1.

TYPE:
22 = 2 way
32 = 3 way

CONNECTION TYPE:
L = Lateral
P = Rear

FUNCTION:
C = Norm. closed N.C.
A = Norm. open N.O.

Minimum operating pressure 2,5 bar

Rear connections

Weight gr. 25

3/2 **5/2**

Pneumatic Spring

Ordering code

Weight gr. 90

105.32.11.1 **105.52.11.1**

Weight gr. 100

Minimum operating pressure 2,5 bar

Weight gr. 100

3/2 **5/2**

Pneumatic Differential - External

Ordering code

Weight gr. 110

105.32.11.12 **105.52.11.12**

Weight gr. 120

Minimum operating pressure 2,5 bar

Weight gr. 120

3/2 **5/2**

Pneumatic Pneumatic

Ordering code

Weight gr. 110

105.32.11.11 **105.52.11.11**

Weight gr. 120

Minimum operating pressure 2 bar

Weight gr. 120

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size	Pilot ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	120 NI/min	2,5 mm	M 5	M 5



3/2 **5/2**

Pneumatic Spring

Ordering code

228.32.11.1 	228.52.11.1
Weight gr. 110	Weight gr. 130

Minimum operating pressure 2,5 bar

3/2 **5/2**

Pneumatic Differential - External

Ordering code

228.32.11.12 	228.52.11.12
Weight gr. 140	Weight gr. 160

Minimum operating pressure 2,5 bar

3/2 **5/2**

Pneumatic Differential - Self-aligned

Ordering code

228.32.11.12/1 	228.52.11.12/1
Weight gr. 130	Weight gr. 150

Minimum operating pressure 2,5 bar

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size	Pilot ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	540 NI/min	6 mm	G 1/8"	G 1/8"



3/2 **5/2**

**Pneumatic
Pneumatic**

Ordering code

228.32.11.11	228.52.11.11
Weight gr. 140	Weight gr. 160

Minimum operating pressure 2 bar

3/2 **5/2**

**Amplified Pneumatic
Spring**

Ordering code

228.32.13.1	228.52.13.1
Weight gr. 260	Weight gr. 290

Minimum operating pressure 0,5 bar

5/3

**Pneumatic
Pneumatic**

Weight gr. 180

Ordering code

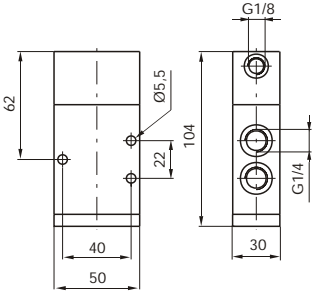
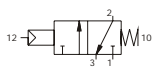

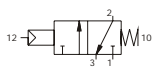


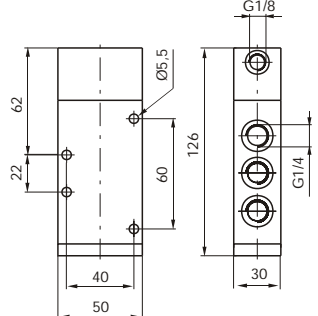
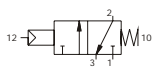

<i>Closed centres</i>	228.53.31.11.11
<i>Open centres</i>	228.53.32.11.11
<i>Pressured centres</i>	228.53.33.11.11

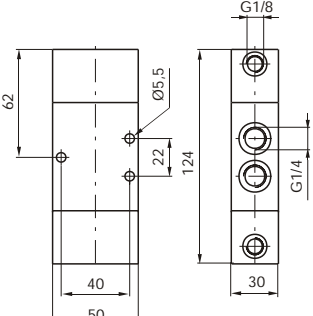
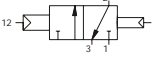

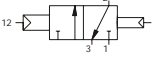


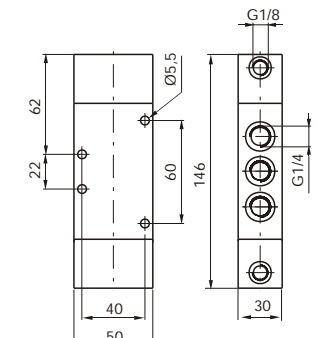
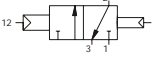

Minimum operating pressure 3 bar

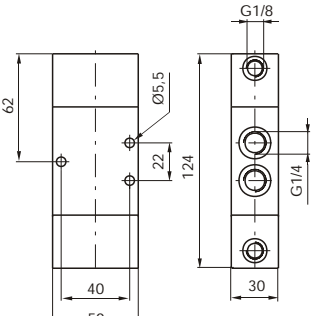
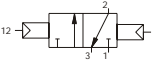
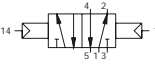
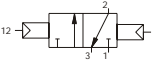
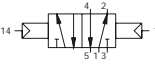

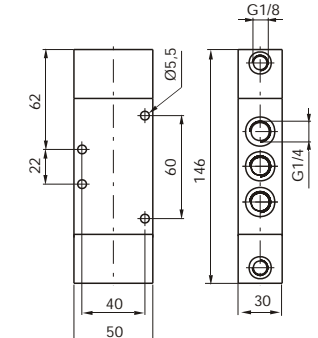
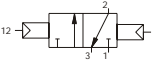
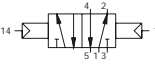
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size	Pilot ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	540 NI/min (3/2-5/2) 410 NI/min (5/3)	6 mm	G 1/8"	G 1/8"


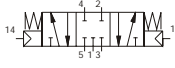

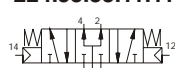
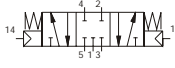

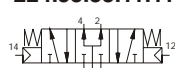
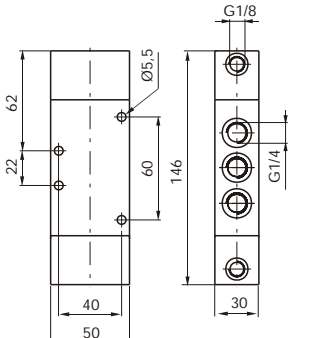
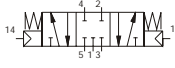

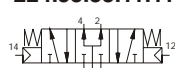


3/2	Pneumatic Spring				5/2			
		Ordering code	214/2.32.11.1	214/2.52.11.1				
			Weight gr. 310	Weight gr. 370				
			Minimum operating pressure 2,5 bar					
3/2	Pneumatic Differential				5/2			
		Ordering code	214/2.32.11.12	214/2.52.11.12				
			Weight gr. 380	Weight gr. 440				
			Minimum operating pressure 2,5 bar					
3/2	Pneumatic Pneumatic				5/2			
		Ordering code	214/2.32.11.11	214/2.52.11.11				
			Weight gr. 400	Weight gr. 460				
			Minimum operating pressure 2 bar					
3/2	Amplified Pneumatic Spring				5/2			
		Ordering code	214/2.32.13.1	214/2.52.13.1				
			Weight gr. 500	Weight gr. 560				
			Minimum operating pressure 0,5 bar					
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size	Pilot ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	1030 NI/min	7 mm	G 1/4"	G 1/8"

<p>3/2</p> 	<p>Pneumatic Spring</p> <hr/> <p>Ordering code</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; text-align: center;"> <p>224.32.11.1</p>  </td> <td style="width:50%; text-align: center;"> <p>224.52.11.1</p>  </td> </tr> <tr> <td style="text-align: center;">Weight gr. 370</td> <td style="text-align: center;">Weight gr. 450</td> </tr> </table> <p>Minimum operating pressure 2,5 bar</p>	<p>224.32.11.1</p> 	<p>224.52.11.1</p> 	Weight gr. 370	Weight gr. 450		<p>5/2</p> 
<p>224.32.11.1</p> 	<p>224.52.11.1</p> 						
Weight gr. 370	Weight gr. 450						

<p>3/2</p> 	<p>Pneumatic Differential</p> <hr/> <p>Ordering code</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; text-align: center;"> <p>224.32.11.12</p>  </td> <td style="width:50%; text-align: center;"> <p>224.52.11.12</p>  </td> </tr> <tr> <td style="text-align: center;">Weight gr. 480</td> <td style="text-align: center;">Weight gr. 550</td> </tr> </table> <p>Minimum operating pressure 2,5 bar</p>	<p>224.32.11.12</p> 	<p>224.52.11.12</p> 	Weight gr. 480	Weight gr. 550		<p>5/2</p> 
<p>224.32.11.12</p> 	<p>224.52.11.12</p> 						
Weight gr. 480	Weight gr. 550						

<p>3/2</p> 	<p>Pneumatic Pneumatic</p> <hr/> <p>Ordering code</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; text-align: center;"> <p>224.32.11.11</p>  </td> <td style="width:50%; text-align: center;"> <p>224.52.11.11</p>  </td> </tr> <tr> <td style="text-align: center;">Weight gr. 470</td> <td style="text-align: center;">Weight gr. 540</td> </tr> </table> <p>Minimum operating pressure 2 bar</p>	<p>224.32.11.11</p> 	<p>224.52.11.11</p> 	Weight gr. 470	Weight gr. 540		<p>5/2</p> 
<p>224.32.11.11</p> 	<p>224.52.11.11</p> 						
Weight gr. 470	Weight gr. 540						

	<p>Pneumatic Pneumatic</p> <hr/> <p>Ordering code</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; text-align: center;"> <p><i>Closed centres</i></p> <p>224.53.31.11.11</p>  </td> <td style="width:50%;"></td> </tr> <tr> <td style="width:50%; text-align: center;"> <p><i>Open centres</i></p> <p>224.53.32.11.11</p>  </td> <td style="width:50%;"></td> </tr> <tr> <td style="width:50%; text-align: center;"> <p><i>Pressured centres</i></p> <p>224.53.33.11.11</p>  </td> <td style="width:50%;"></td> </tr> </table> <p>Weight gr. 550 Minimum operating pressure 3 bar</p>	<p><i>Closed centres</i></p> <p>224.53.31.11.11</p> 		<p><i>Open centres</i></p> <p>224.53.32.11.11</p> 		<p><i>Pressured centres</i></p> <p>224.53.33.11.11</p> 			
<p><i>Closed centres</i></p> <p>224.53.31.11.11</p> 									
<p><i>Open centres</i></p> <p>224.53.32.11.11</p> 									
<p><i>Pressured centres</i></p> <p>224.53.33.11.11</p> 									

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size	Pilot ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	1360 NI/min (3/2-5/2) 1280 NI/min (5/3)	8 mm	G 1/4"	G 1/8"

3/2 **5/2**

Pneumatic Spring

Ordering code

212.32.11.1	212.52.11.1
Weight gr. 1110	Weight gr. 1390

Minimum operating pressure 2,5 bar

3/2 **5/2**

Pneumatic Differential

Ordering code

212.32.11.12	212.52.11.12
Weight gr. 1380	Weight gr. 1660

Minimum operating pressure 2,5 bar

3/2 **5/2**

Pneumatic Pneumatic

Ordering code

212.32.11.11	212.52.11.11
Weight gr. 1350	Weight gr. 1630

Minimum operating pressure 2 bar

5/3

Pneumatic Pneumatic

Ordering code

212.53.31.11.11	<i>Closed centres</i>
212.53.32.11.11	<i>Open centres</i>
212.53.33.11.11	<i>Pressured centres</i>

Weight gr. 1650

Minimum operating pressure 3 bar

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size	Pilot ports size
		Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	3500 NI/min (3/2-5/2) 3000 NI/min (5/3)	15 mm	G 1/2"



<p>3/2</p>	<p>Pneumatic Spring</p> <hr/> <p>Ordering code</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;"> <p>211.32.11.1</p> </td> <td style="width: 50%; text-align: center;"> <p>211.52.11.1</p> </td> </tr> <tr> <td style="text-align: center;">Weight gr. 3300</td> <td style="text-align: center;">Weight gr. 4200</td> </tr> </table> <p>Minimum operating pressure 2,5 bar</p>	<p>211.32.11.1</p>	<p>211.52.11.1</p>	Weight gr. 3300	Weight gr. 4200	<p>5/2</p>
<p>211.32.11.1</p>	<p>211.52.11.1</p>					
Weight gr. 3300	Weight gr. 4200					

<p>3/2</p>	<p>Pneumatic Differential</p> <hr/> <p>Ordering code</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;"> <p>211.32.11.12</p> </td> <td style="width: 50%; text-align: center;"> <p>211.52.11.12</p> </td> </tr> <tr> <td style="text-align: center;">Weight gr. 3300</td> <td style="text-align: center;">Weight gr. 4200</td> </tr> </table> <p>Minimum operating pressure 2,5 bar</p>	<p>211.32.11.12</p>	<p>211.52.11.12</p>	Weight gr. 3300	Weight gr. 4200	<p>5/2</p>
<p>211.32.11.12</p>	<p>211.52.11.12</p>					
Weight gr. 3300	Weight gr. 4200					

<p>3/2</p>	<p>Pneumatic Pneumatic</p> <hr/> <p>Ordering code</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;"> <p>211.32.11.11</p> </td> <td style="width: 50%; text-align: center;"> <p>211.52.11.11</p> </td> </tr> <tr> <td style="text-align: center;">Weight gr. 3300</td> <td style="text-align: center;">Weight gr. 4200</td> </tr> </table> <p>Minimum operating pressure 2 bar</p>	<p>211.32.11.11</p>	<p>211.52.11.11</p>	Weight gr. 3300	Weight gr. 4200	<p>5/2</p>
<p>211.32.11.11</p>	<p>211.52.11.11</p>					
Weight gr. 3300	Weight gr. 4200					

	<p>Pneumatic Pneumatic</p> <hr/> <p>Ordering code</p>	<p>5/3</p>
	<p><i>Closed centres</i></p> <p>211.53.31.11.11</p>	
<p><i>Open closed</i></p> <p>211.53.32.11.11</p>		
<p><i>Pressured centres</i></p> <p>211.53.33.11.11</p>		
	<p>Weight gr. 4200</p> <p>Minimum operating pressure 3 bar</p>	

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size	Pilot port size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	6500 NI/min	20 mm.	G 1"	G 1/8"

Distributors and electro distributors Series 2000

Distributors and electro distributors
size 10 mm LINE

Distributors and electro distributors
size 10 mm FLAT

Distributors and electro distributors
size 10 mm BASE

Integral electrical connections 10,5 pitch

Distributors and electro distributors
size 18 mm LINE

Distributors and electro distributors
size 18 mm FLAT

Distributors and electro distributors
size 18 mm VDMA 24563-02

Integral electrical connections 19mm pitch

Distributors and electro distributors
size 26 mm LINE

Distributors and electro distributors
size 26 mm FLAT

Distributors and electro distributors
size 26 mm VDMA 24563-01



General

The 2000 series solenoid valves have been developed to meet requirements for electronically controlled pneumatic systems and / or serial control systems already used in all manufacturing sectors. They have been designed to be easily assembled into groups or manifolds and include integral electrical connection to facilitate simple and speedy integration into a control system. The series comprises a range of products classified according to type, size and performance. There are three main sizes, 10mm., 18 mm. and 26 mm., with each size further divided into 3 types "LINE", "FLAT" and "VDMA" or "BASE".

The 10mm. and 18 mm. 24 VDC range of valves includes a range of accessories for the production of manifolded valve assemblies with integral electrical connections. Modules are available in two or four station variants for flexibility and are supplied to IP40 or alternatively IP65 environmental protection.

Construction characteristics

	2100	2400	2600
Central body	Extruded aluminium bar with chemical nickel treatment and PTFE (polytetrafluorethylene)		
Connection plates	Technopolymer	Zincalloy	Die-cast aluminium
Operators	Technopolymer		
Spool	Aluminium 2011		
Piston seals	Oil resistant nitrile rubber - NBR		
Spool seals	Oil resistant nitrile rubber - HNBR (Therban)		
Springs	Stainless steel AISI 302		
Piston	Aluminium 2011	Technopolymer	

Use and maintenance

The average life of the valve exceeds 50.000.000 cycles when used under optimum conditions. Adequate lubrication reduces seals wear, just as proper filtering of supply air prevents the build-up of dirt that can cause malfunction. Ensure the valve is used within our recommended criteria for pressure and temperature. In dirty or dusty environments, the exhaust ports should be protected. A seal kit including the spool is available for overhauling the valve. This operation does not require a skilled worker, although a particular care should be taken when reassembling the valve.

Ordering codes for miniature solenoid valves

Series 2100

The 10 mm. miniature solenoid valve with 0,7 mm. orifice has been selected for piloting this series of valves (see Series 300, section 1). This results in low response times and reduced power consumption. The valve can be supplied with the coil upward or downward depending on the application.

Codes are as follows:

Coil upward code

01 = miniature sol. 12 VDC 90°conn. with led
 21 = miniature sol. 12 VDC line conn. with led
 02 = miniature sol. 24 VDC 90°conn. with led
 22 = miniature sol. 24 VDC line conn. with led

Coil downward code

11 = miniature sol. 12 VDC 90° conn. with led
 31 = miniature sol. 12 VDC line conn. with led
 12 = miniature sol. 24 VDC 90°conn. with led
 32 = miniature sol. 24 VDC line conn. with led
 91 = miniature sol. 12 VDC for integral electrical connections
 92 = miniature sol. 24 VDC for integral electrical connections

Series 2400/2600

The 15 mm miniature solenoid valve with 1,1 mm. orifice has been selected for piloting this series of valves (see Series 300, section 1). This results in low response times and reduced power consumption. The valve can be supplied with the coil upward or downward depending on the application.

Codes are as follows :

Coil upward code

01 = miniature sol. 12 VDC
 02 = miniature sol. 24 VDC
 05 = miniature sol. 24 VAC
 06 = miniature sol. 110 VAC
 07 = miniature sol. 220 VAC

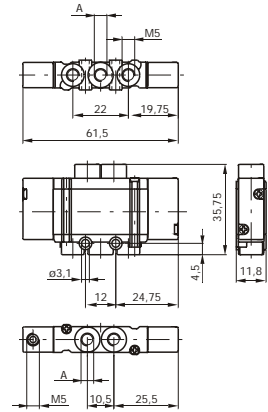
Coil downward code

11 = miniature sol. 12 VDC
 12 = miniature sol. 24 VDC
 15 = miniature sol. 24 VAC
 16 = miniature sol. 110 VAC
 17 = miniature sol. 220 VAC

Miniature solenoid  homologated are available (see page 1.26).

5/2

Pneumatic Spring



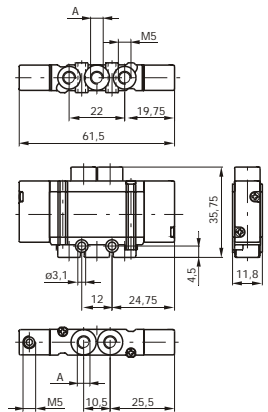
Weight gr. 30

Minimum operating pressure 2 bar

For dimension 'A'
see ordering code

5/2

Pneumatic Differential



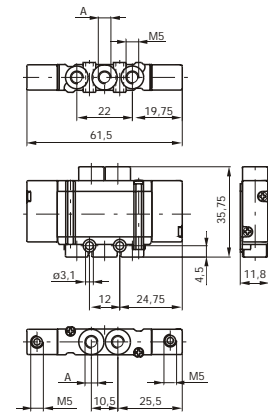
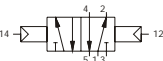
Weight gr. 28

Minimum operating pressure 2 bar

For dimension 'A'
see ordering code

5/2

Pneumatic Pneumatic



Weight gr. 30

Minimum operating pressure 1,5 bar

For dimension 'A'
see ordering code

Ordering codes

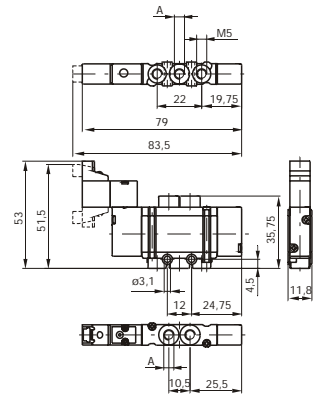
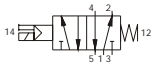
211 . 52 . 00 . _ _

TYPE:
5 = Connection 'A' = M5
7 = Connection 'A' = M7x1

PILOTING:
16 = Pneum. - Diff./al
18 = Pneum. - Pneum.
19 = Pneum. - Spring

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	7 bar	min. -5° C	max. +50° C	250 NI/min	ø 2,5	M5 - M7

5/2
**Miniature solenoid
Spring**

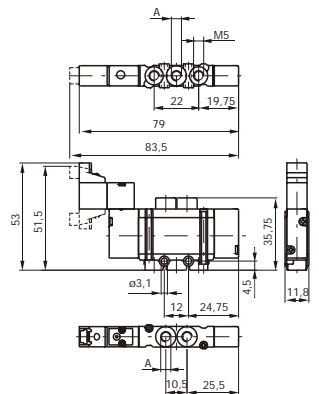
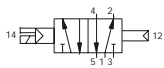


Weight gr. 42

Minimum operating pressure 2 bar

For dimension 'A'
see ordering code

5/2
**Miniature solenoid
Differential**

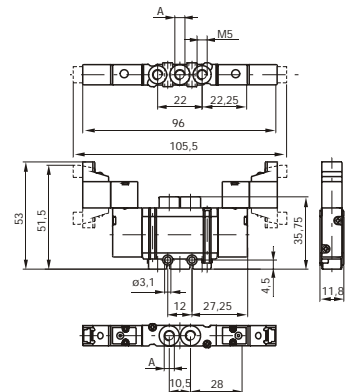


Weight gr. 40

Minimum operating pressure 2 bar

For dimension 'A'
see ordering code

5/2
**Miniature solenoid
Miniature solenoid**



Weight gr. 52

Minimum operating pressure 1,5 bar

For dimension 'A'
see ordering code

Ordering codes

211 . 52 . 00

TYPE:
5 = Connection 'A' = M5
7 = Connection 'A' = M7x1

PILOTING:
35 = Sv. - Sv
36 = Sv. - Diff./al
39 = Sv. - Spring

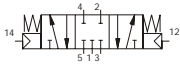
VOLTAGE:
01 = miniature sol. 12 VDC 90°conn. with led
21 = miniature sol. 12 VDC line conn. with led
02 = miniature sol. 24 VDC 90°conn. with led
22 = miniature sol. 24 VDC line conn. with led
11 = miniature sol. 12 VDC 90° conn. with led downward
31 = miniature sol. 12 VDC line conn. with led downward
12 = miniature sol. 24 VDC 90°conn. with led downward
32 = miniature sol. 24 VDC line conn. with led downward

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	7 bar	min. -5° C	max. +50° C	250 NI/min	\varnothing 2,5	M5 - M7

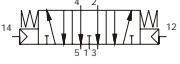
5/3

**Pneumatic
Pneumatic**

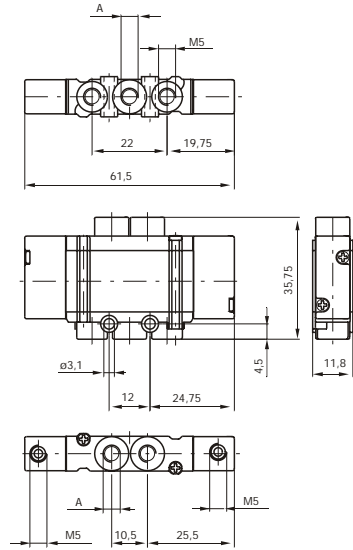
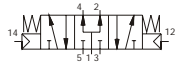
Closed centres



Open centres



Pressure centres



Weight gr. 32

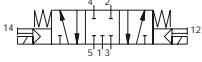
Minimum operating pressure 2,5 bar

For dimension 'A'
see ordering code

5/3

**Miniature solenoid
Miniature solenoid**

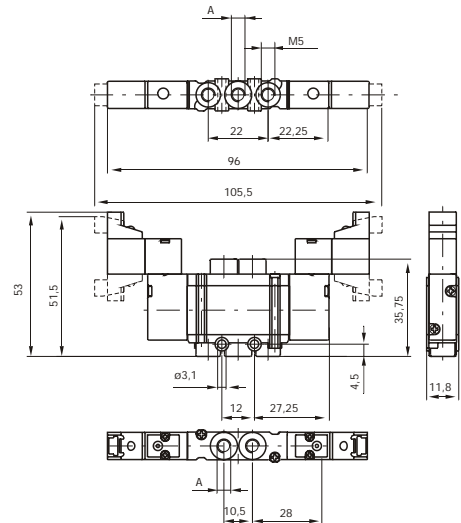
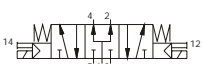
Closed centres



Open centres



Pressure centres



Weight gr. 54

Minimum operating pressure 2,5 bar

For dimension 'A'
see ordering code

Ordering code

211 . 53

TYPE:
5 = Connection 'A' = M5
7 = Connection 'A' = M7x1

FUNCTION:
31 = 3 pos. CC
32 = 3 pos. OC
33 = 3 pos. PC

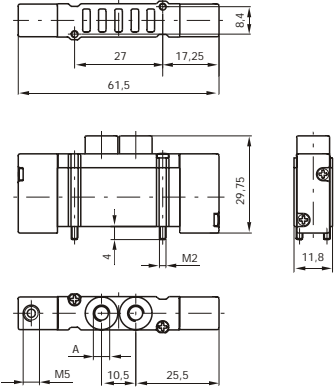
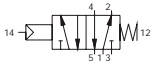
PILOTING:
18 = Pneum. - Pneum.
35 = Sv. - sv.

VOLTAGE:
01 = miniature sol. 12 VDC 90°conn. with led
21 = miniature sol. 12 VDC line conn. with led
02 = miniature sol. 24 VDC 90°conn. with led
22 = miniature sol. 24 VDC line conn. with led
11 = miniature sol. 12 VDC 90° conn. with led downward
31 = miniature sol. 12 VDC line conn. with led downward
12 = miniature sol. 24 VDC 90°conn. with led downward
32 = miniature sol. 24 VDC line conn. with led downward

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	7 bar	min. -5° C	max. +50° C	180 NI/min	ϕ 2,5	M5 - M7

5/2

Pneumatic Spring



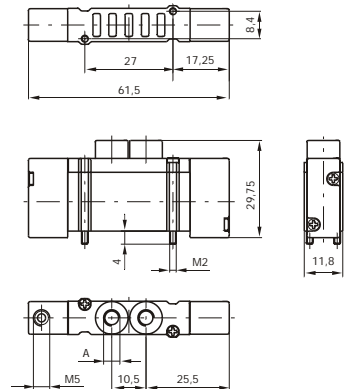
Weight gr. 32

Minimum operating pressure 2 bar

For dimension 'A'
see ordering code

5/2

Pneumatic Differential



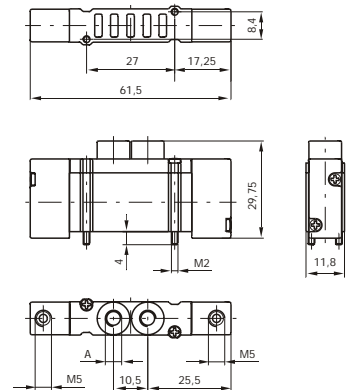
Weight gr. 30

Minimum operating pressure 2 bar

For dimension 'A'
see ordering code

5/2

Pneumatic Pneumatic



Weight gr. 32

Minimum operating pressure 1,5 bar

For dimension 'A'
see ordering code

Ordering codes

213 . 52 . 00 .

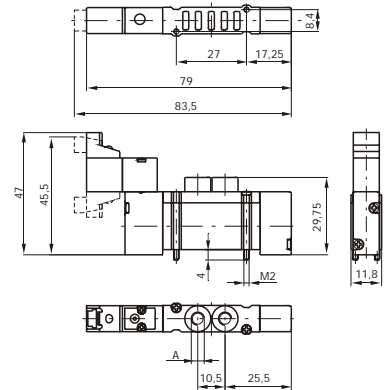
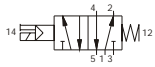
TYPE:
5 = Connection 'A' = M5
7 = Connection 'A' = M7x1

PILOTING:
16 = Pneum. - Diff./al
18 = Pneum. - Pneum.
19 = Pneum. - Spring

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	7 bar	min. -5° C	max. +50° C	250 NI/min	\varnothing 2,5	M5 - M7

5/2

**Miniature solenoid
Spring**



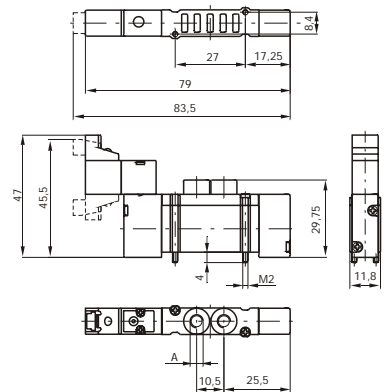
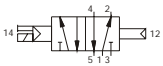
Weight gr. 38

Minimum operating pressure 2 bar

For dimension 'A'
see ordering code

5/2

**Miniature solenoid
Differential**



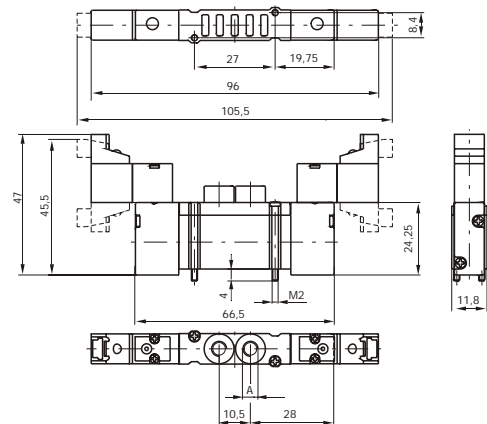
Weight gr. 36

Minimum operating pressure 2 bar

For dimension 'A'
see ordering code

5/2

**Miniature solenoid
Miniature solenoid**



Weight gr. 50

Minimum operating pressure 1,5 bar

For dimension 'A'
see ordering code

Ordering codes

213 . 52 . 00

<p>TYPE: 5 = Connection 'A' = M5 7 = Connection 'A' = M7x1</p>	<p>PILOTING: 35 = Sv. - sv. 36 = Sv. - diff./al 39 = Sv. - spring</p>	<p>VOLTAGE: 01 = miniature sol. 12 VDC 90°conn. with led 21 = miniature sol. 12 VDC line conn. with led 02 = miniature sol. 24 VDC 90°conn. with led 22 = miniature sol. 24 VDC line conn. with led 11 = miniature sol. 12 VDC 90° conn. with led downward 31 = miniature sol. 12 VDC line conn. with led downward 12 = miniature sol. 24 VDC 90°conn. with led downward 32 = miniature sol. 24 VDC line conn. with led downward 91 = miniature sol. 12 VDC for integral electrical connections downward 92 = miniature sol. 24 VDC for integral electrical connections downward</p>
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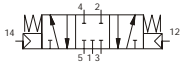
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	7 bar	min. -5° C	max. +50° C	250 NI/min	\varnothing 2,5	M5 - M7



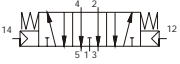
5/3

**Pneumatic
 Pneumatic**

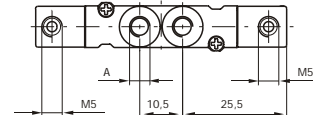
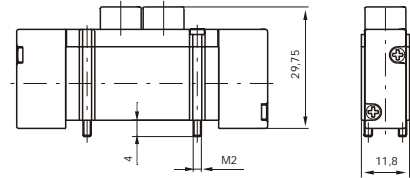
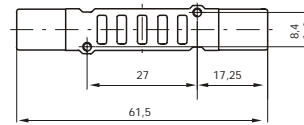
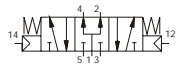
Closed centres



Open centres



Pressure centres



Weight gr. 28

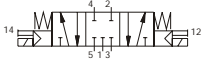
Minimum operating pressure 2,5 bar

For dimension 'A'
 see ordering code

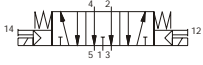
5/3

**Miniature solenoid
 Miniature solenoid**

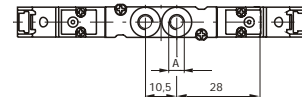
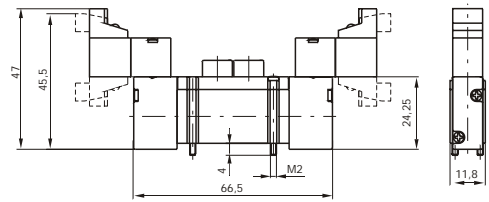
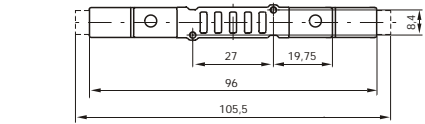
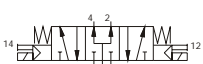
Closed centres



Open centres



Pressure centres



Weight gr. 52

Minimum operating pressure 2,5 bar

For dimension 'A'
 see ordering code

Ordering code

213 . 53

TYPE:
 5 = Connection 'A' = M5
 7 = Connection 'A' = M7x1

FUNCTION:
 31 = 3 pos. CC
 32 = 3 pos. OC
 33 = 3 pos. PC

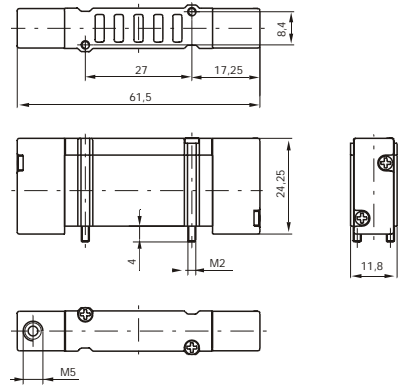
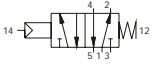
PILOTING:
 18 = Pneum. - Pneum.
 35 = Sv. - sv.

VOLTAGE:
 01 = miniature sol. 12 VDC 90°conn. with led
 21 = miniature sol. 12 VDC line conn. with led
 02 = miniature sol. 24 VDC 90°conn. with led
 22 = miniature sol. 24 VDC line conn. with led
 11 = miniature sol. 12 VDC 90° conn. with led downward
 31 = miniature sol. 12 VDC line conn. with led downward
 12 = miniature sol. 24 VDC 90°conn. with led downward
 32 = miniature sol. 24 VDC line conn. with led downward
 91 = miniature sol. 12 VDC for integral electrical connections downward
 92 = miniature sol. 24 VDC for integral electrical connections downward

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with Δ p = 1	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	7 bar	min. -5° C	max. +50° C	180 NI/min	ø 2,5	M5 - M7

5/2

Pneumatic Spring

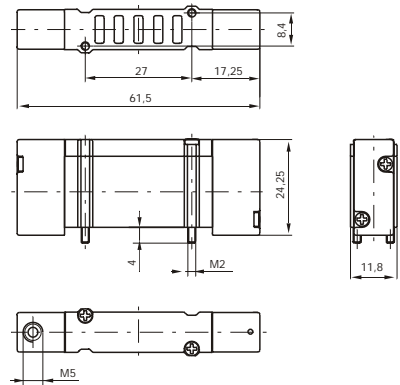


Weight gr. 24

Minimum operating pressure 2 bar

5/2

Pneumatic Differential

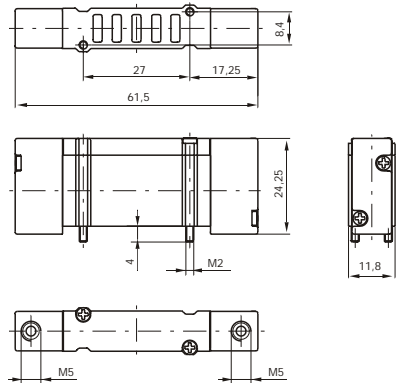
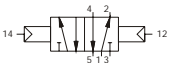


Weight gr. 22

Minimum operating pressure 2 bar

5/2

Pneumatic Pneumatic



Weight gr. 26

Minimum operating pressure 1,5 bar

Ordering codes

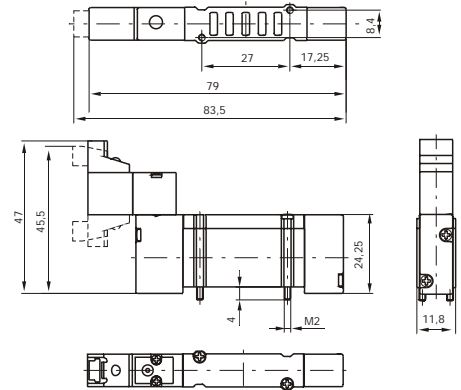
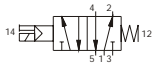
2141 . 52 . 00 .

PILOTING:
16 = Pneum. - diff./al
18 = Pneum. - pneum.
19 = Pneum. - spring

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	7 bar	min. -5° C	max. +50° C	250 NI/min	\varnothing 2,5	/

5/2

**Miniature solenoid
Spring**

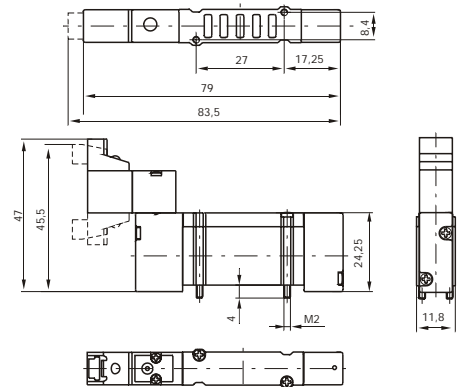
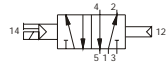


Weight gr. 38

Minimum operating pressure 2 bar

5/2

**Miniature solenoid
Differential**

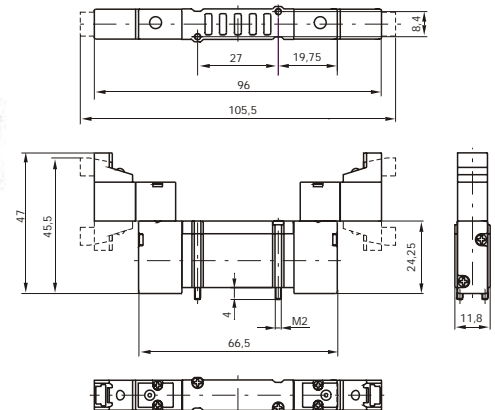
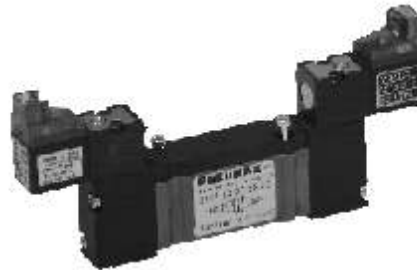


Weight gr. 36

Minimum operating pressure 2 bar

5/2

**Miniature solenoid
Miniature solenoid**



Weight gr. 48

Minimum operating pressure 1,5 bar

Ordering codes

2141 . 52 . 00

PILOTING:
35 = Sv. - sv.
36 = Sv. - diff./al
39 = Sv. - spring

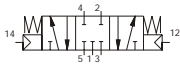
VOLTAGE:
01 = miniature sol. 12 VDC 90°conn. with led
21 = miniature sol. 12 VDC line conn. with led
02 = miniature sol. 24 VDC 90°conn. with led
22 = miniature sol. 24 VDC line conn. with led
11 = miniature sol. 12 VDC 90° conn. with led downward
31 = miniature sol. 12 VDC line conn. with led downward
12 = miniature sol. 24 VDC 90°conn. with led downward
32 = miniature sol. 24 VDC line conn. with led downward
91 = miniature sol. 12 VDC for integral electrical connections downward
92 = miniature sol. 24 VDC for integral electrical connections downward

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	7 bar	min. -5° C	max. +50° C	250 NI/min	\varnothing 2,5	/

5/3

**Pneumatic
Pneumatic**

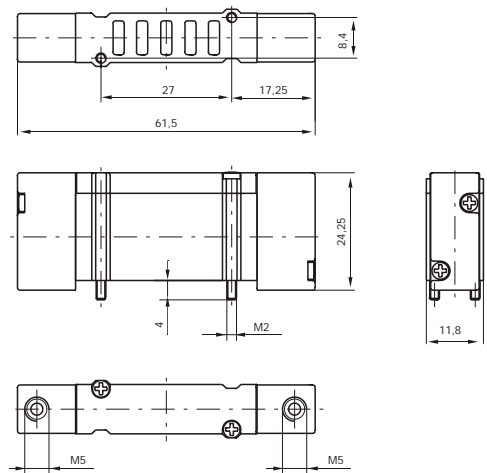
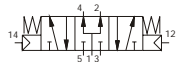
Closed centres



Open centres



Pressure centres



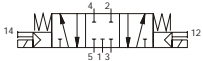
Weight gr. 28

Minimum operating pressure 2,5 bar

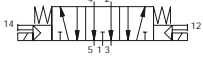
5/3

**Miniature solenoid
Miniature solenoid**

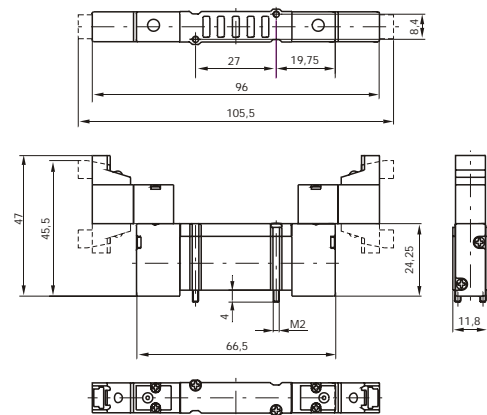
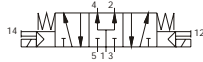
Closed centres



Open centres



Pressure centres



Weight gr. 50

Minimum operating pressure 2,5 bar

Ordering code

2141. 53

FUNCTION:
31 = 3 pos. CC
32 = 3 pos. OC
33 = 3 pos. PC

PILOTING:
18 = Pneum. - Pneum.
35 = Sv. - sv.

VOLTAGE:
01 = miniature sol. 12 VDC 90°conn. with led
21 = miniature sol. 12 VDC line conn. with led
02 = miniature sol. 24 VDC 90°conn. with led
22 = miniature sol. 24 VDC line conn. with led
11 = miniature sol. 12 VDC 90° conn. with led downward
31 = miniature sol. 12 VDC line conn. with led downward
12 = miniature sol. 24 VDC 90°conn. with led downward
32 = miniature sol. 24 VDC line conn. with led downward
91 = miniature sol. 12 VDC for integral electrical connections downward
92 = miniature sol. 24 VDC for integral electrical connections downward

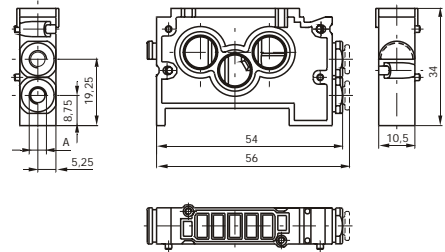
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	7 bar	min. -5° C	max. +50° C	180 NI/min	\varnothing 2,5	/

Modular base for "BASE" version

Ordering code

214 .01

- 0 = modular BASE without cartridges
- 4 = modular BASE c/w with 4 mm tube cartridges
- 5 = modular BASE c/w with M5 cartridges
- 6 = modular BASE c/w with 6mm tube cartridges
- 7 = modular BASE c/w with M7x1 cartridges

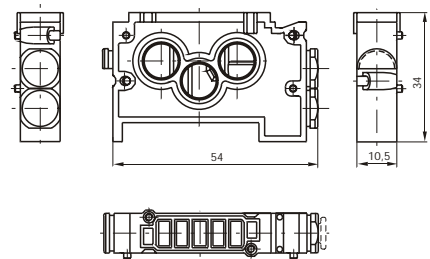


Weight gr. 22

Modular base for "FLAT" version

Ordering code

2130.01

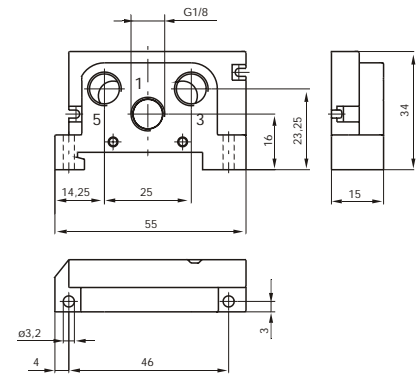


Weight gr. 28

Right inlet base

Ordering code

2140.02

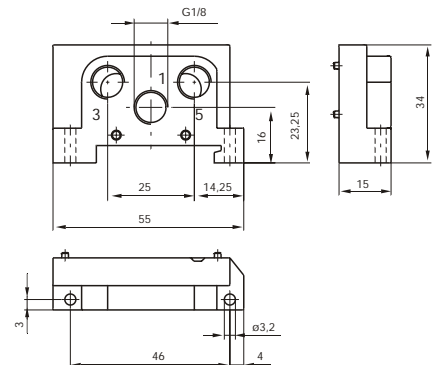


Weight gr. 18

Left inlet base

Ordering code

2140.03



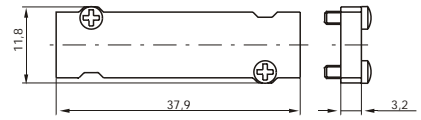
Weight gr. 18



Closing plate

Ordering code

2130.00



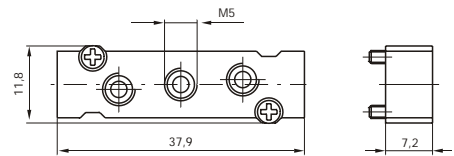
Weight gr. 7

Intermediate air intake

(to be assembled instead of a valve)

Ordering code

2130.10



Weight gr. 12

Modulare base cartridge

Ordering code

2100.

- 031M = 4 mm tube cartridge
- 033M = M5 cartridge
- 034M = M7x1 cartridge
- 035M = lock cartridge
- 036M = 6mm tube cartridge

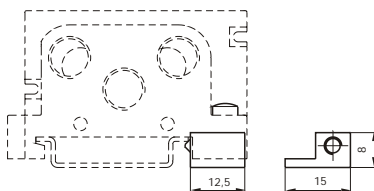


Weight gr. 6

DIN rail adapter

Ordering code

2130.16



Weight gr. 5

Diaphragm plug

Ordering code

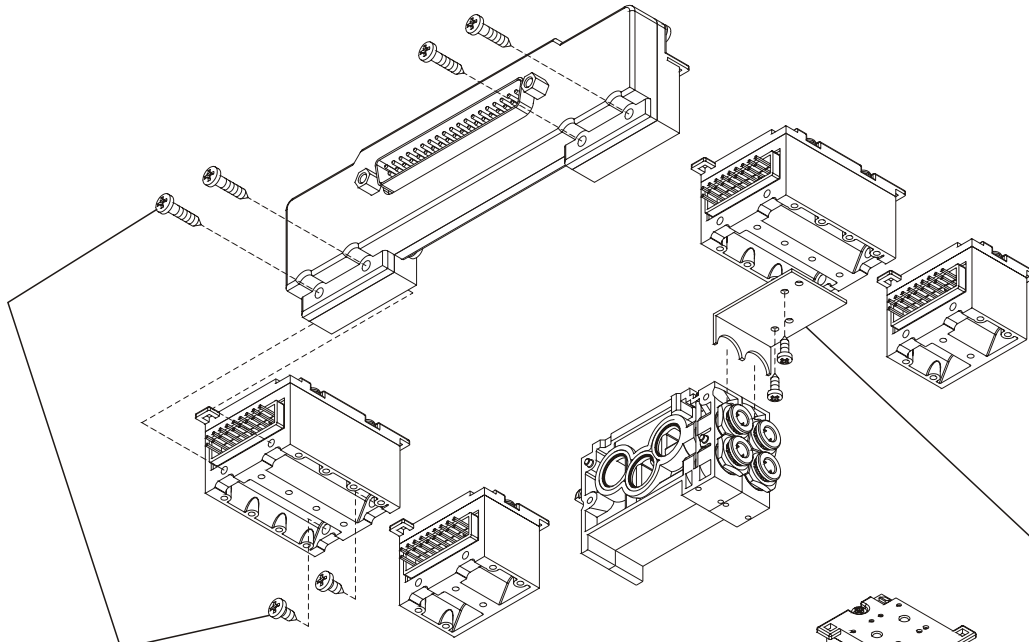
2130.17



Weight gr. 6

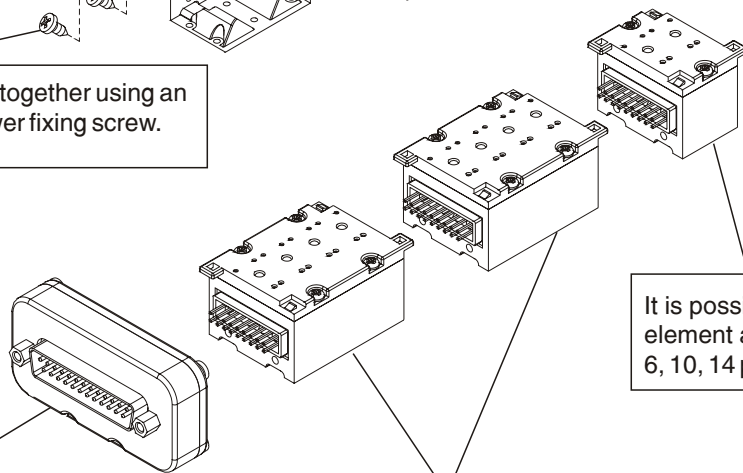
The integral electrical design for the series 2400 valve is extremely flexible, allowing the production of pre-wired solenoid valve manifolds, the configuration of which can be determined at the point of assembly. The 24 VDC, 12 VDC (equivalent PNP) modules are available with 2 or 4 positions. The system assembled is designed for an IP40 - IP65 protection.

Coil type 91 or 92 is required for the multipin electrical connection (see valve ordering codes).



The elements connect together using an upper coupling and lower fixing screw.

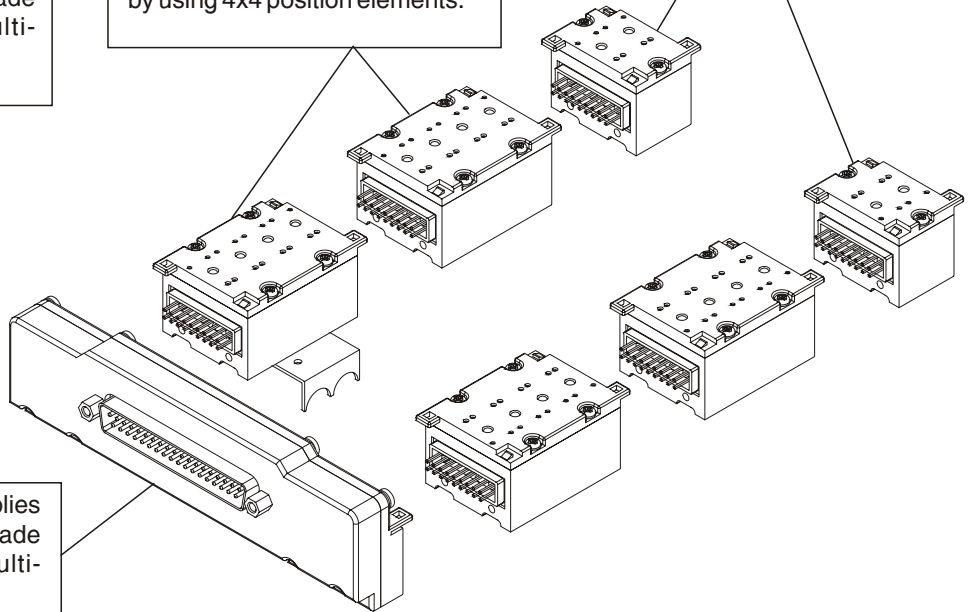
Support plates are supplied to mount the electrical connection elements to the manifold modules. Individual valves can still be removed from the manifold even after assembly is complete. One support plate is required per element.



It is possible to use the 2 position element as the first terminal on 2, 6, 10, 14 position assemblies.







On single solenoid assemblies electrical connection is made using an SUB-D 25 multi-connector.

Up to 16 valves can be operated by using 4x4 position elements.



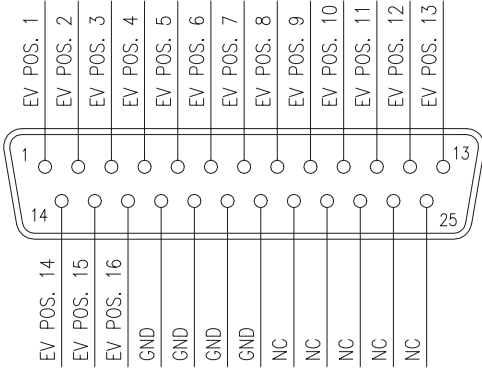
On double solenoid assemblies electrical connection is made using a SUB-D 37 multi-connector.



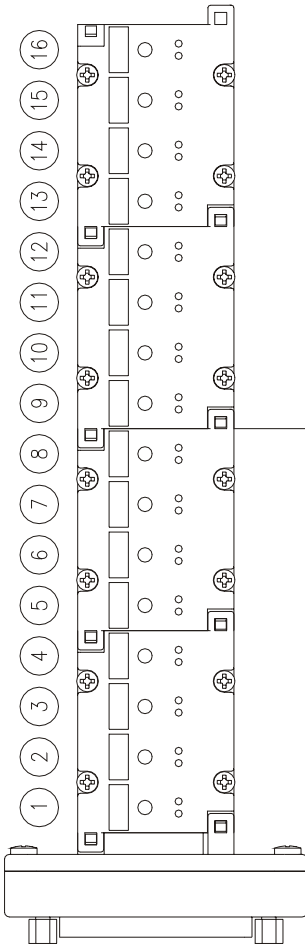
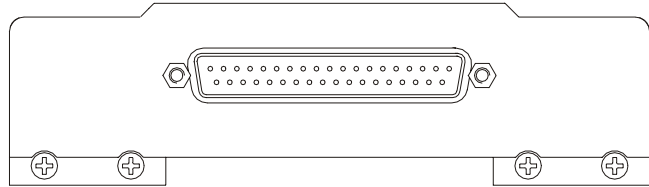
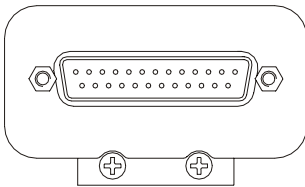
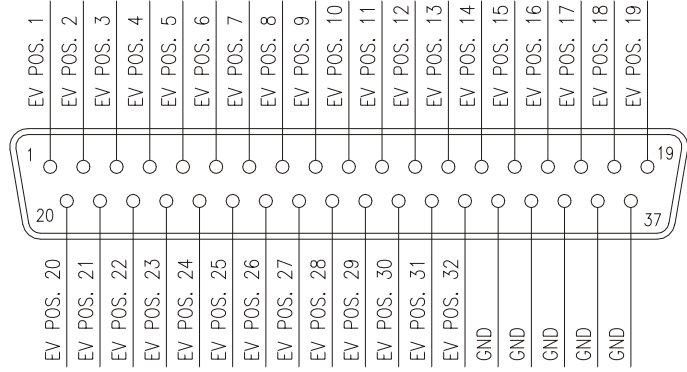
<p>4 positions module</p> <hr/> <p>Ordering code</p> <hr/> <p>2100 . 04 .</p>  <div style="border: 1px solid black; padding: 5px;"> <p>TYPE: 00 = (module 4 pos. Left IP40 - PNP) 01 = (module 4 pos. Right IP40 - PNP) 02 = (module 4 pos. Left IP40 with protection diode - PNP) 03 = (module 4 pos. Right IP40 with protection diode - PNP) 10 = (module 4 pos. Left IP65 - PNP) 11 = (module 4 pos. Right IP65 - PNP) 12 = (module 4 pos. Left IP65 with protection diode - PNP) 13 = (module 4 pos. Right IP65 with protection diode - PNP)</p> </div> <p>Weight gr. 35</p>	<p>2 positions module</p> <hr/> <p>Ordering code</p> <hr/> <p>2100 . 02 .</p>  <div style="border: 1px solid black; padding: 5px;"> <p>TYPE: 00 = (module 2 pos. Left IP40 - PNP) 01 = (module 2 pos. Right IP40 - PNP) 02 = (module 2 pos. Left IP40 with protection diode - PNP) 03 = (module 2 pos. Right IP40 with protection diode - PNP) 10 = (module 2 pos. Left IP65 - PNP) 11 = (module 2 pos. Right IP65 - PNP) 12 = (module 2 pos. Left IP65 with protection diode - PNP) 13 = (module 2 pos. Right IP65 with protection diode - PNP)</p> </div> <p>Weight gr. 20</p>
<p>37 contacts front connector IP65</p> <hr/> <p>Ordering code</p> <hr/> <p>2100 . 37 . 10</p>  <p>Note: The IP65 protection is obtained by IP65 Pneumax cable. Weight gr. 120</p>	<p>25 contacts connector IP65</p> <hr/> <p>Ordering code</p> <hr/> <p>2100 . 25 . 10</p>  <p>Note: The IP65 protection is obtained by IP65 Pneumax cable. Weight gr. 40</p>
<p>Plug</p> <hr/> <p>Ordering code</p> <hr/> <p>2100.00</p>  <p>Weight gr. 4</p>	<p>Cable c/w connector mobile positioning</p> <hr/> <p>Ordering code</p> <hr/> <p>2400</p> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 5px;"> <p>CONNECTOR TYPE 25 = 25 contacts 37 = 37 contacts</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p>CABLE LENGTH 03 = 3 meters 05 = 5 meters 10 = 10 meters</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p>00 = connector IP40 10 = connector IP65 (with protection device)</p> </div> </div>
<p>FLAT support plate</p> <hr/> <p>Ordering code</p> <hr/> <p>2130.50</p>  <p>Weight gr. 5</p>	



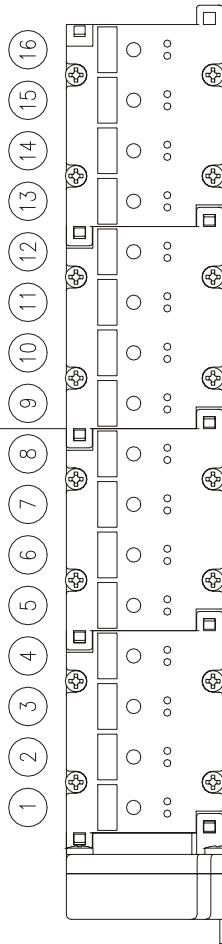
SUB-D 25 CONTACTS CONNECTOR



SUB-D 37 CONTACTS CONNECTOR



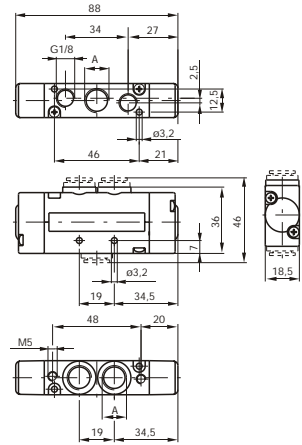
Left modules



Right modules

5/2

Pneumatic Spring



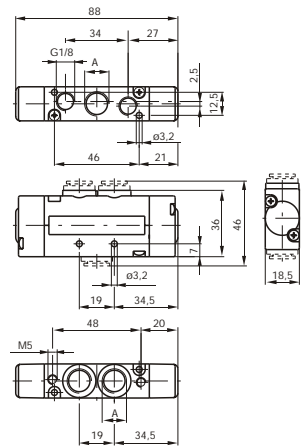
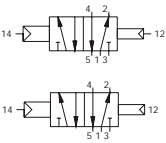
Weight gr. 155

Minimum operating pressure 2 bar

For dimension 'A'
see ordering code

5/2

Pneumatic Differential



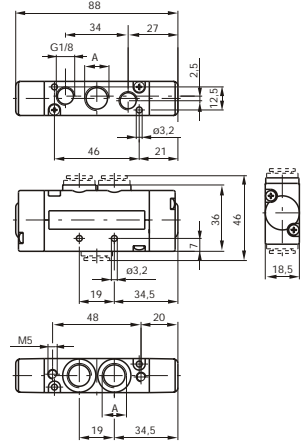
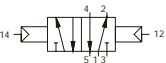
Weight gr. 155

Minimum operating pressure 2 bar

For dimension 'A'
see ordering code

5/2

Pneumatic Pneumatic



Weight gr. 155

Minimum operating pressure 1,5 bar

For dimension 'A'
see ordering code

Ordering codes

241 . 52 . 00 .

TYPE:
1 = Connection 'A' = G 1/4"
5 = Connection 'A' = G 1/8"
6 = Connection 'A' = Quick fitting, tube ø 6
8 = Connection 'A' = Quick fitting, tube ø 8

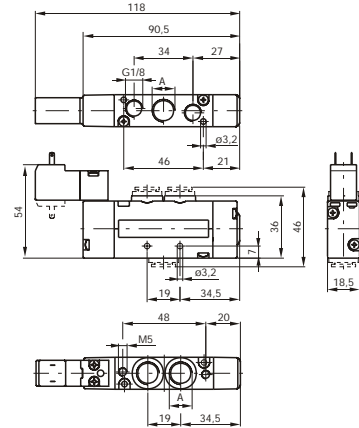
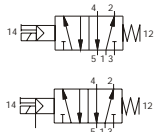
PILOTING:
16 = Pneum. - Diff./al
17 = Pneum. - Diff./al ext.
18 = Pneum. - Pneum.
19 = Pneum. - Spring

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	10 bar	min. -5°C	max. +50°C	800 NI/min	ø 7	G1/8" - G1/4" - T.8



5/2

**Miniature solenoid
Spring**



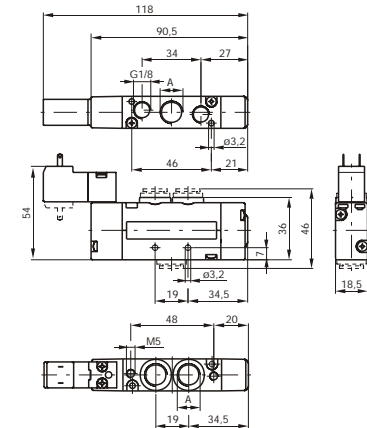
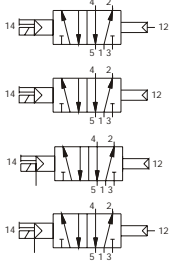
Weight gr. 195

Minimum operating pressure 2 bar

For dimension 'A'
see ordering code

5/2

**Miniature solenoid
Diff./al**



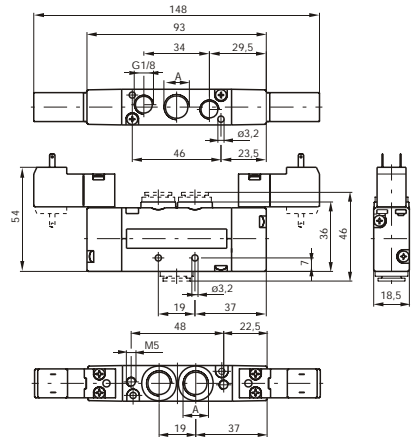
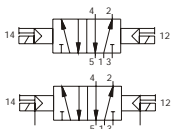
Weight gr. 195

Minimum operating pressure 2 bar

For dimension 'A'
see ordering code

5/2

**Miniature solenoid
Miniature solenoid**



Weight gr. 225

Minimum operating pressure 1,5 bar

For dimension 'A'
see ordering code

Ordering codes

241 . 52 . 00 . . .

TYPE:
1 = Connection 'A' = G 1/4"
5 = Connection 'A' = G 1/8"
6 = Connection 'A' = Quick fitting, tube ø 6
8 = Connection 'A' = Quick fitting, tube ø 8

PILOTING:
24 = Sv. ext. - Sv. ext.
26 = Sv. ext. - Diff./al
27 = Sv. ext. - Diff./al ext.
29 = Sv. ext. - Spring
35 = Sv. - Sv
36 = Sv. - Diff./al
37 = Sv. - Diff./al ext.
39 = Sv. - Spring

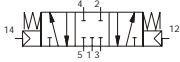
VOLTAGE:
01 = Miniature sol. 12 VDC
02 = Miniature sol. 24 VDC
05 = Miniature sol. 24 VAC
06 = Miniature sol. 110 VAC
07 = Miniature sol. 220 VAC
11 = Miniature sol. 12 VDC Downward
12 = Miniature sol. 24 VDC Downward
15 = Miniature sol. 24 VAC Downward
16 = Miniature sol. 110 VAC Downward
17 = Miniature sol. 220 VAC Downward

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with Δ p = 1	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	10 bar	min. -5°C	max. +50°C	800 NI/min	ø 7	G1/8" - G1/4" - T.8

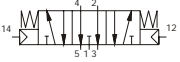
5/3

**Pneumatic
Pneumatic**

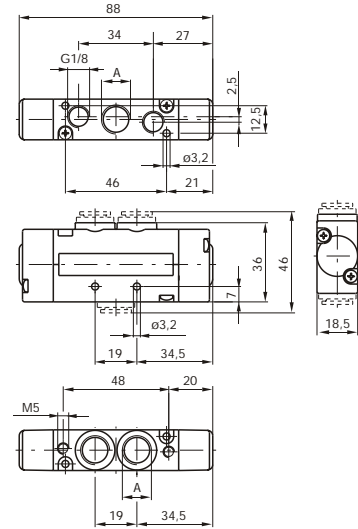
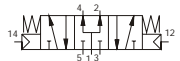
Closed centres



Open centres



Pressure centres



Weight gr. 165

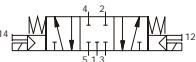
Minimum operating pressure 3 bar

For dimension 'A'
see ordering code

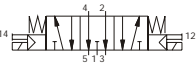
5/3

**Miniature solenoid
Miniature solenoid**

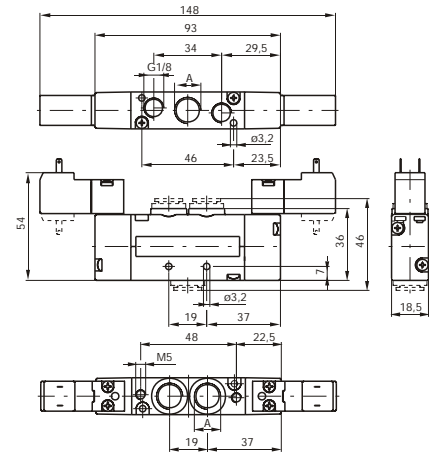
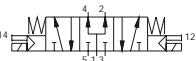
Closed centres



Open centres



Pressure centres



Weight gr. 235

Minimum operating pressure 3 bar

For dimension 'A'
see ordering code

Ordering codes

241 . 53

TYPE:
1 = Connection 'A' = G 1/4"
5 = Connection 'A' = G 1/8"
6 = Connection 'A' = Quick fitting, tube ø 6
8 = Connection 'A' = Quick fitting, tube ø 8

PILOTING:
18 = Pneum. - Pneum.
35 = Sv. - Sv.

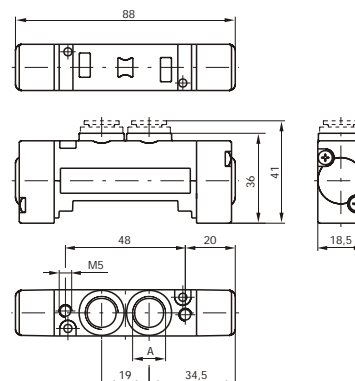
FUNCTION:
31 = 3 pos. CC
32 = 3 pos. OC
33 = 3 pos. PC

VOLTAGE:
01 = Miniature sol. 12 VDC
02 = Miniature sol. 24 VDC
05 = Miniature sol. 24 VAC
06 = Miniature sol. 110 VAC
07 = Miniature sol. 220 VAC
11 = Miniature sol. 12 VDC Downward
12 = Miniature sol. 24 VDC Downward
15 = Miniature sol. 24 VAC Downward
16 = Miniature sol. 110 VAC Downward
17 = Miniature sol. 220 VAC Downward

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	10 bar	min. -5°C	max. +50°C	650 NI/min	ø 7	G1/8" - G1/4" - T.8

5/2

Pneumatic Spring



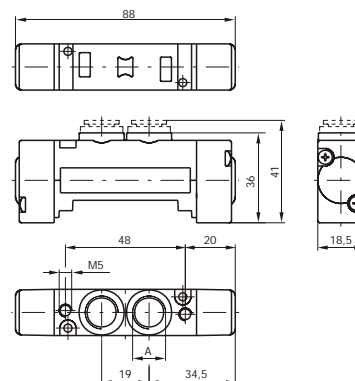
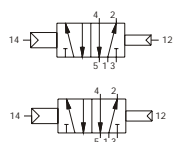
Weight gr. 105

Minimum operating pressure 2 bar

For dimension 'A'
see ordering code

5/2

Pneumatic Differential



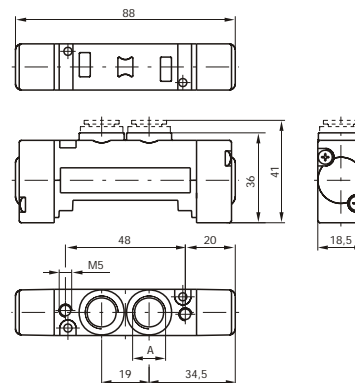
Weight gr. 105

Minimum operating pressure 2 bar

For dimension 'A'
see ordering code

5/2

Pneumatic Pneumatic



Weight gr. 105

Minimum operating pressure 1,5 bar

For dimension 'A'
see ordering code

Ordering codes

243 . 52 . 00 .

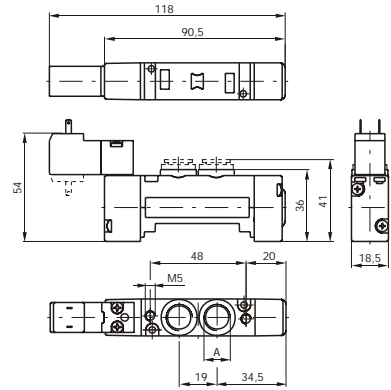
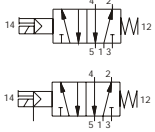
TYPE:
1 = Connection 'A' = G 1/4"
5 = Connection 'A' = G 1/8"
6 = Connection 'A' = Quick fitting, tube ø 6
8 = Connection 'A' = Quick fitting, tube ø 8

PILOTING:
16 = Pneum. - Diff./al
17 = Pneum. - Diff./al ext.
18 = Pneum. - Pneum.
19 = Pneum. - Spring

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air		10 bar	min. -5°C			

5/2

**Miniature solenoid
Spring**



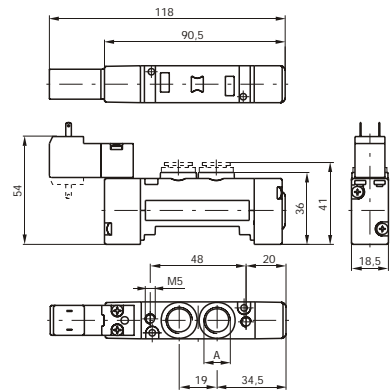
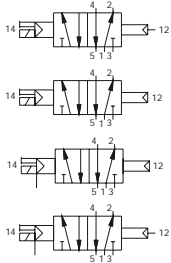
Weight gr. 140

Minimum operating pressure 2 bar

For dimension 'A'
see ordering code

5/2

**Miniature solenoid
Diff./al**



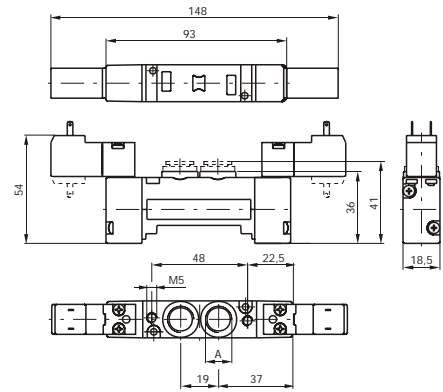
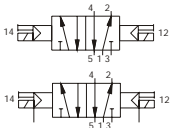
Weight gr. 140

Minimum operating pressure 2 bar

For dimension 'A'
see ordering code

5/2

**Miniature solenoid
Miniature solenoid**



Weight gr. 175

Minimum operating pressure 1,5 bar

For dimension 'A'
see ordering code

Ordering codes

243 . 52 . 00 . .

TYPE:

- 1 = Connection 'A' = G 1/4"
- 5 = Connection 'A' = G 1/8"
- 6 = Connection 'A' = Quick fitting, tube ø 6
- 8 = Connection 'A' = Quick fitting, tube ø 8

PILOTING:

- 24 = Sv. ext. - Sv. ext.
- 26 = Sv. ext. - Diff./al
- 27 = Sv. ext. - Diff./al ext.
- 29 = Sv. ext. - Spring
- 35 = Sv. - Sv.
- 36 = Sv. - Diff./al
- 37 = Sv. - Diff./al ext
- 39 = Sv. - Spring

VOLTAGE:

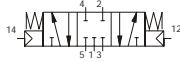
- 01 = Miniature sol. 12 VDC
- 02 = Miniature sol. 24 VDC
- 05 = Miniature sol. 24 VAC
- 06 = Miniature sol. 110 VAC
- 07 = Miniature sol. 220 VAC
- 11 = Miniature sol. 12 VDC Downward
- 12 = Miniature sol. 24 VDC Downward
- 15 = Miniature sol. 24 VAC Downward
- 16 = Miniature sol. 110 VAC Downward
- 17 = Miniature sol. 220 VAC Downward

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	10 bar	min. -5°C	max. +50°C	800 NI/min	ø 7	G1/8" - G1/4" - T.8

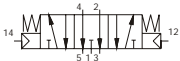
5/3

**Pneumatic
Pneumatic**

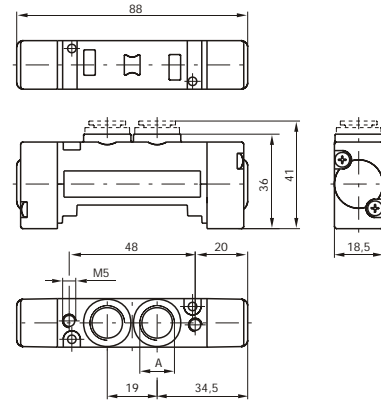
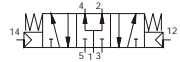
Closed centres



Open centres



Pressure centres



Weight gr. 115

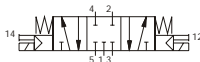
Minimum operating pressure 3 bar

For dimension 'A'
see ordering code

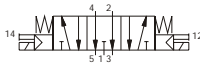
5/3

**Miniature solenoid
Miniature solenoid**

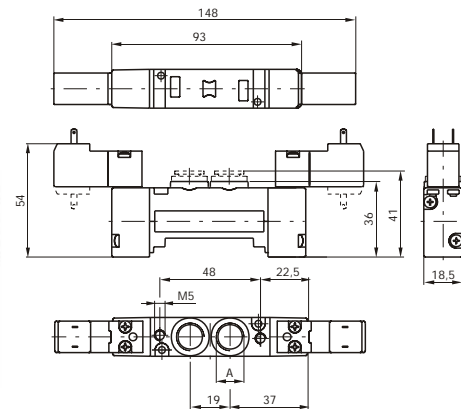
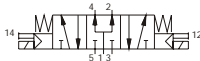
Closed centres



Open centres



Pressure centres



Weight gr. 185

Minimum operating pressure 3 bar

For dimension 'A'
see ordering code

Ordering codes

243 . 53

TYPE:

- 1 = Connection 'A' = G 1/4"
- 5 = Connection 'A' = G 1/8"
- 6 = Connection 'A' = Quick fitting, tube \varnothing 6
- 8 = Connection 'A' = Quick fitting, tube \varnothing 8

PILOTING:

- 18 = Pneum. - Pneum.
- 35 = Sv. - Sv.

VOLTAGE:


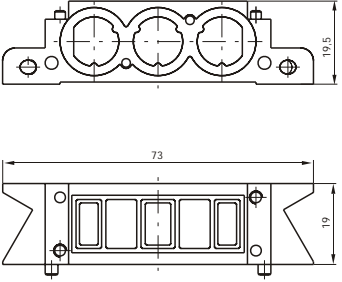

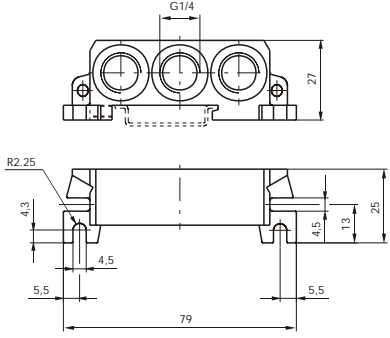

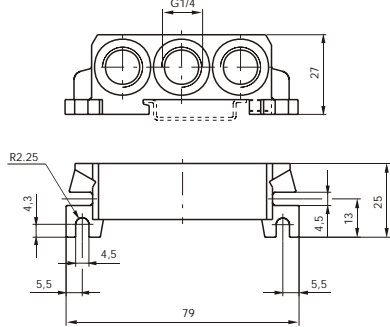

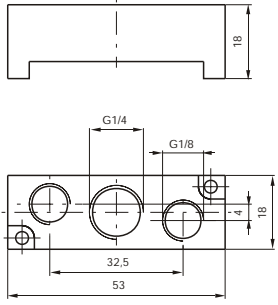

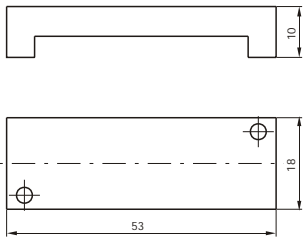

- 01 = Miniature sol. 12 VDC
- 02 = Miniature sol. 24 VDC
- 05 = Miniature sol. 24 VAC
- 06 = Miniature sol. 110 VAC
- 07 = Miniature sol. 220 VAC
- 11 = Miniature sol. 12 VDC Downward
- 12 = Miniature sol. 24 VDC Downward
- 15 = Miniature sol. 24 VAC Downward
- 16 = Miniature sol. 110 VAC Downward
- 17 = Miniature sol. 220 VAC Downward

FUNCTION:

- 31 = 3 pos. CC
- 32 = 3 pos. OC
- 33 = 3 pos. PC

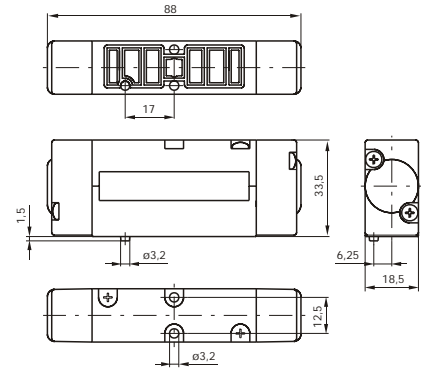
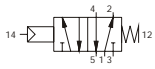
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	10 bar	min. -5°C	max. +50°C	650 NI/min	\varnothing 7	G1/8" - G1/4" - T.8



<p>Modular base</p> <hr/> <p>Ordering code</p> <hr/> <p>2430.01</p>		 
<p>Weight gr. 85</p>		
<p>Right inlet base</p> <hr/> <p>Ordering code</p> <hr/> <p>2430.02</p>		 
<p>Weight gr. 120</p>		
<p>Left inlet base</p> <hr/> <p>Ordering code</p> <hr/> <p>2430.03</p>		 
<p>Weight gr. 125</p>		
<p>Intermediate air intake (to be assembled instead of a valve)</p> <hr/> <p>Ordering code</p> <hr/> <p>2430.10</p>		 
<p>Weight gr. 30</p>		
<p>Closing plate</p> <hr/> <p>Ordering code</p> <hr/> <p>2430.00</p>		 
<p>Weight gr. 20</p>		
		<p>Diaphragm plug</p> <hr/> <p>Ordering code</p> <hr/> <p>2430.17</p>
		
		<p>Weight gr. 5</p>

5/2

Pneumatic Spring

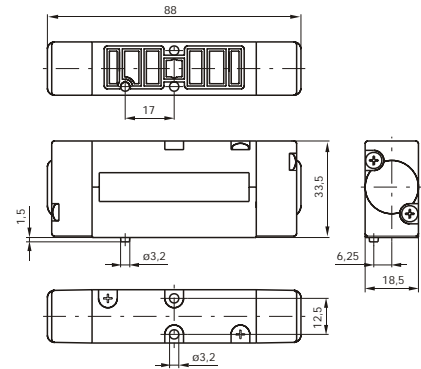
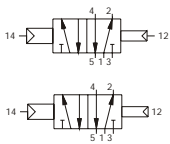


Weight gr. 155

Minimum operating pressure 2 bar

5/2

Pneumatic Differential

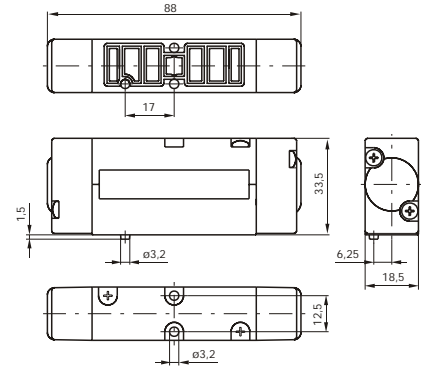


Weight gr. 155

Minimum operating pressure 2 bar

5/2

Pneumatic Pneumatic



Weight gr. 155

Minimum operating pressure 1,5 bar

Ordering codes

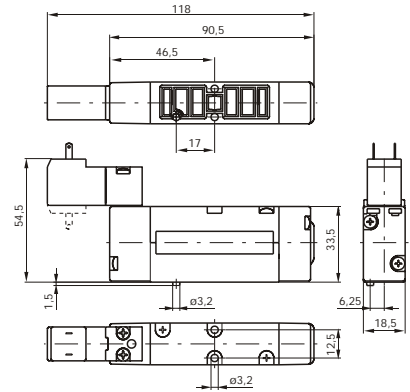
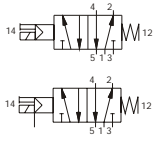
2445 . 52 . 00 .

PILOTING:
16 = Pneum. - Diff./al
17 = Pneum. - Diff./al ext.
18 = Pneum. - Pneum.
19 = Pneum. - Spring

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	10 bar	min. -5°C	max. +50°C	550 NI/min	$\varnothing 5$	/

5/2

**Miniature solenoid
Spring**

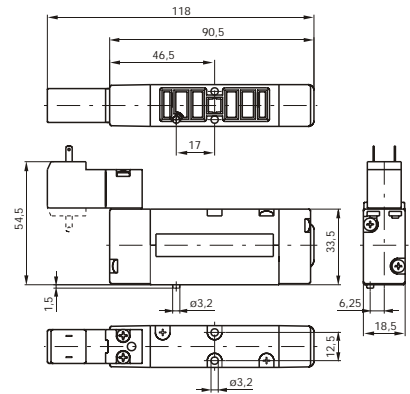
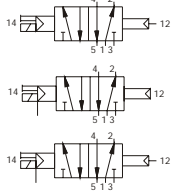


Weight gr. 190

Minimum operating pressure 2 bar

5/2

**Miniature solenoid
Diff./al**

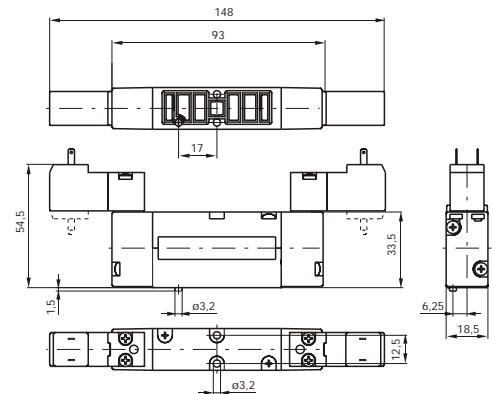
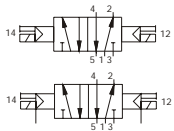


Weight gr. 190

Minimum operating pressure 2 bar

5/2

**Miniature solenoid
Miniature solenoid**



Weight gr. 225

Minimum operating pressure 1,5 bar

Ordering codes

244 . 52 . 00 . .

TYPE:
1 = Electropilot exhaust on base
(only for self feeding valves)
5 = Electropilot exhaust on pilot
(for all versions)

PILOTING:
24 = Sv. ext. - Sv. ext.
26 = Sv. ext. - Diff./al
27 = Sv. ext. - Diff./al ext.
29 = Sv. ext. - Spring
35 = Sv. - Sv.
36 = Sv. - Diff./al
37 = Sv. - Diff./al ext.
39 = Sv. - Spring

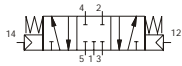
VOLTAGE:
01 = Miniature sol. 12 VDC
02 = Miniature sol. 24 VDC
05 = Miniature sol. 24 VAC
06 = Miniature sol. 110 VAC
07 = Miniature sol. 220 VAC
11 = Miniature sol. 12 VDC Downward
12 = Miniature sol. 24 VDC Downward
15 = Miniature sol. 24 VAC Downward
16 = Miniature sol. 110 VAC Downward
17 = Miniature sol. 220 VAC Downward

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	10 bar	min. -5°C	max. +50°C			

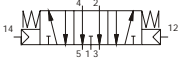
5/3

**Pneumatic
Pneumatic**

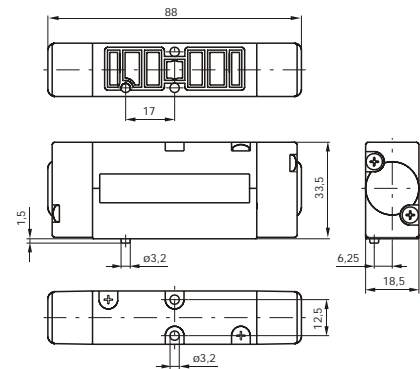
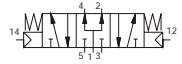
Closed centres



Open centres



Pressure centres



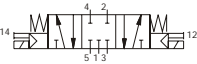
Weight gr. 165

Minimum operating pressure 3 bar

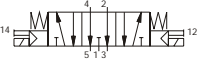
5/3

**Miniature solenoid
Miniature solenoid**

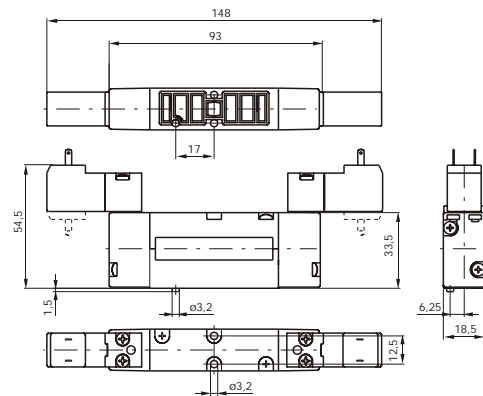
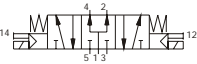
Closed centres



Open centres



Pressure centres



Weight gr. 235

Minimum operating pressure 3 bar

Ordering codes

244 . 53

TYPE:
1 = Electropilot exhaust on base
(only for self feeding valves)
5 = Electropilot exhaust on pilot
(for all versions)

PILOTING:
18 = Pneum. - Pneum.
35 = Sv. - Sv.

FUNCTION:
31 = 3 pos. CC
32 = 3 pos. OC
33 = 3 pos. PC

VOLTAGE:
01 = Miniature sol. 12 VDC
02 = Miniature sol. 24 VDC
05 = Miniature sol. 24 VAC
06 = Miniature sol. 110 VAC
07 = Miniature sol. 220 VAC
11 = Miniature sol. 12 VDC Downward
12 = Miniature sol. 24 VDC Downward
15 = Miniature sol. 24 VAC Downward
16 = Miniature sol. 110 VAC Downward
17 = Miniature sol. 220 VAC Downward

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	10 bar	min. -5°C	max. +50°C	550 NI/min	$\varnothing 5$	/



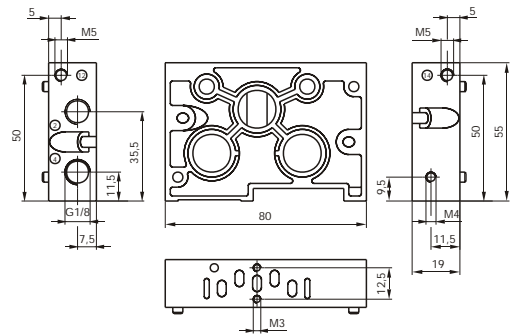
Modular base

Ordering code

2440.01

2440.11

Modular base for
single separate inlet

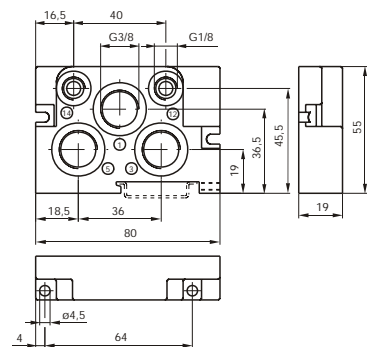


Weight gr. 110

Right inlet base

Ordering code

2440.02

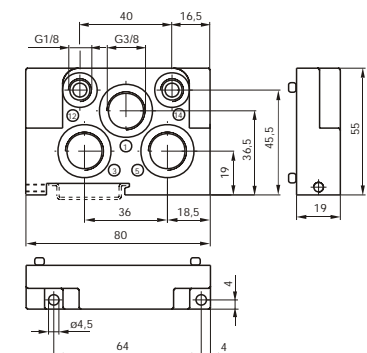


Weight gr. 110

Left inlet base

Ordering code

2440.03

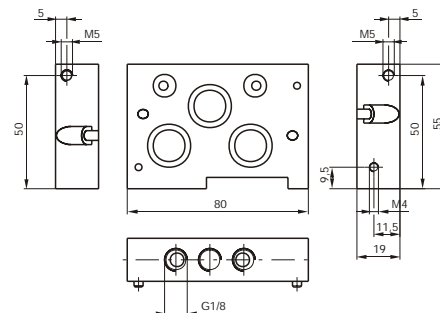


Weight gr. 110

Intermediate air intake

Ordering code

2440.10

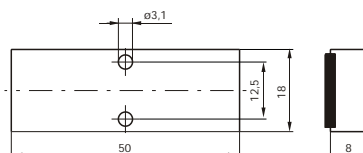


Weight gr. 185

Closing plate

Ordering code

2440.00



Weight gr. 25

Diaphragm plug

Ordering code

2440.17

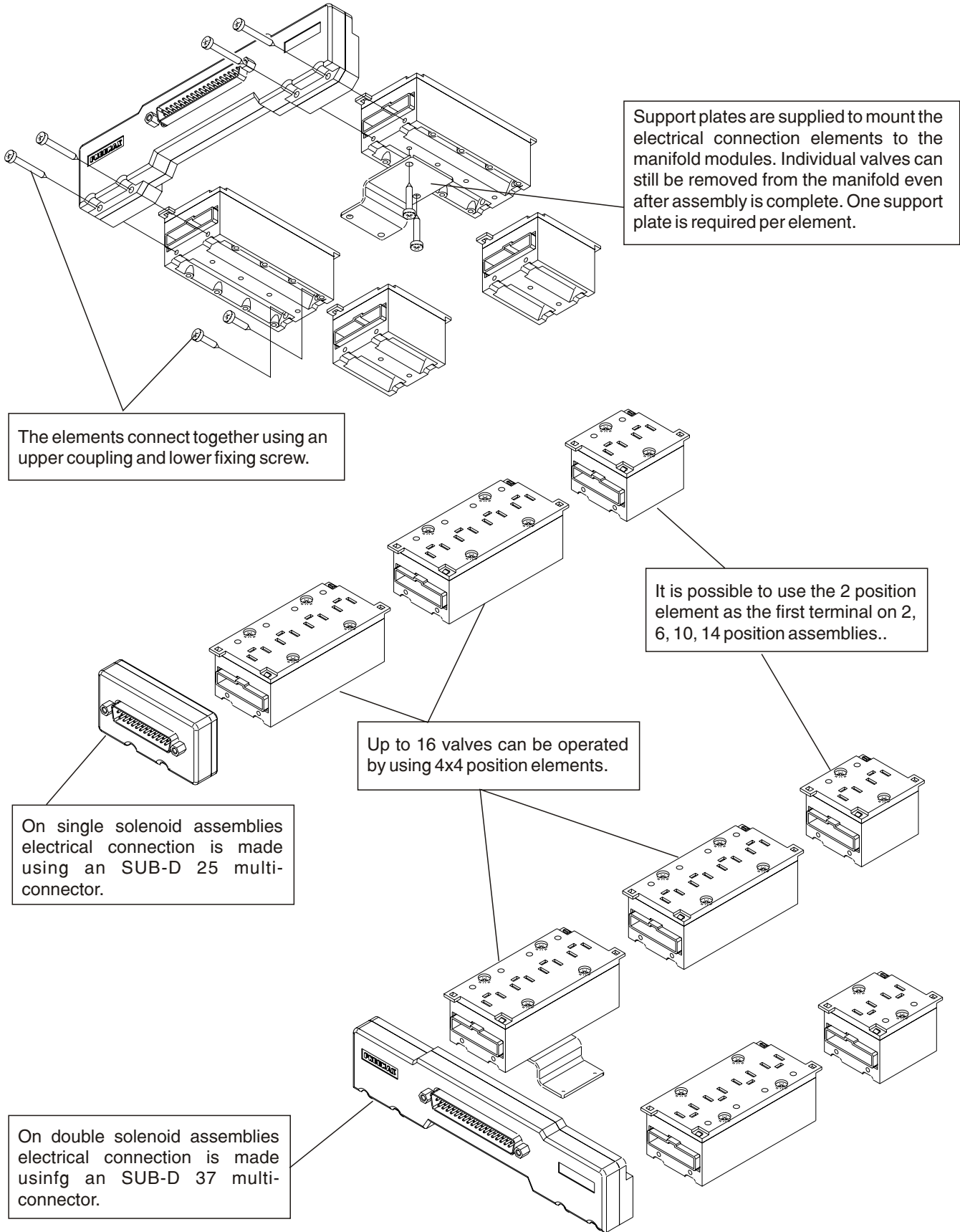


Weight gr. 8



The integral electrical design for the series 2400 valve is extremely flexible, allowing the production of pre-wired solenoid valve manifolds, the configuration of which can be determined at the point of assembly. The 24 VDC, 12 VDC (equivalent PNP) and 24 VAC* modules are available with 2 or 4 positions. The system assembled is designed for an IP40 protection. IP65 is available on request.

* Attention : If the working tension is 24 VAC DO NOT using modules with protection diode



Support plates are supplied to mount the electrical connection elements to the manifold modules. Individual valves can still be removed from the manifold even after assembly is complete. One support plate is required per element.

The elements connect together using an upper coupling and lower fixing screw.











It is possible to use the 2 position element as the first terminal on 2, 6, 10, 14 position assemblies..

Up to 16 valves can be operated by using 4x4 position elements.

On single solenoid assemblies electrical connection is made using an SUB-D 25 multi-connector.

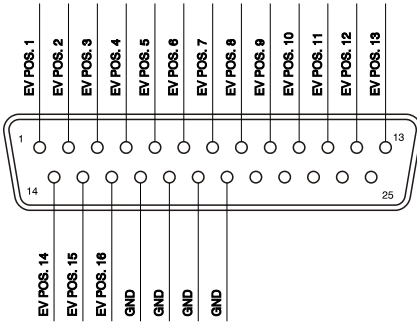
On double solenoid assemblies electrical connection is made using a SUB-D 37 multi-connector.



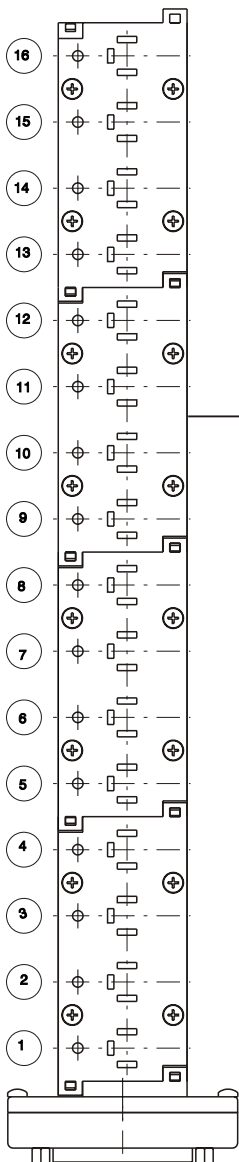
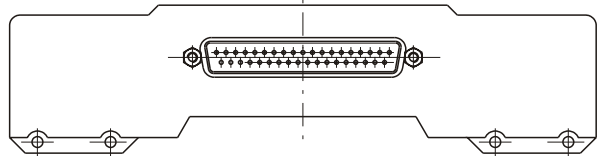
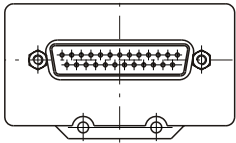
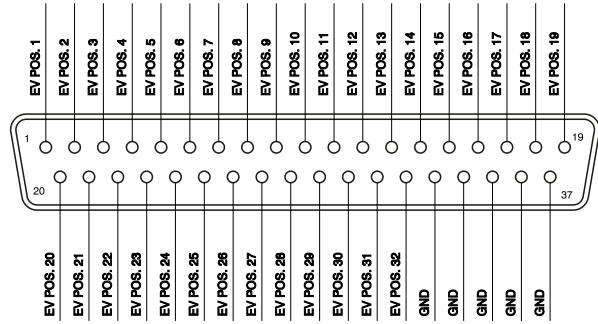
<p>4 positions module</p> <hr/> <p>Ordering code</p> <hr/> <p>2400 . 04 .</p>  <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>TYPE: 00 = (module 4 pos. Left IP40 - PNP) 01 = (module 4 pos. Right IP40 - PNP) 02 = (module 4 pos. Left IP40 with protection diode - PNP) * 03 = (module 4 pos. Right IP40 with protection diode - PNP) * 10 = (module 4 pos. Left IP65 - PNP) 11 = (module 4 pos. Right IP65 - PNP) 12 = (module 4 pos. Left IP65 with protection diode - PNP) * 13 = (module 4 pos. Right IP65 with protection diode - PNP) *</p> <p>* ONLY FOR VDC</p> </div> <p>Weight gr. 50</p>		<p>2 positions module</p> <hr/> <p>Ordering code</p> <hr/> <p>2400 . 02 .</p>  <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>TYPE: 00 = (module 2 pos. Left IP40 - PNP) 01 = (module 2 pos. Right IP40 - PNP) 02 = (module 2 pos. Left IP40 with protection diode - PNP) * 03 = (module 2 pos. Right IP40 with protection diode - PNP) * 10 = (module 2 pos. Left IP65 - PNP) 11 = (module 2 pos. Right IP65 - PNP) 12 = (module 2 pos. Left IP65 with protection diode - PNP) * 13 = (module 2 pos. Right IP65 with protection diode - PNP) *</p> <p>* ONLY FOR VDC</p> </div> <p>Weight gr. 30</p>	
<p>37 contacts front connector IP65</p> <hr/> <p>Ordering code</p> <hr/> <p>2400 . 37 . 10</p>  <p>Weight gr. 120</p>		<p>25 contacts connector IP65</p> <hr/> <p>Ordering code</p> <hr/> <p>2400 . 25 . 10</p>  <p>Weight gr. 40</p>	
<p>Plug</p> <hr/> <p>Ordering code</p> <hr/> <p>2400.00</p>  <p>Weight gr. 5</p>	<p>Closing plate electrical positions</p> <hr/> <p>Ordering code</p> <hr/> <p>2400.15.00</p>  <p>Weight gr. 2</p>	<p>Cable c/w connector mobile positioning</p> <hr/> <p>Ordering code</p> <hr/> <p>2400 .</p> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid black; padding: 5px; font-size: small;"> <p>CONNECTOR TYPE 25 = 25 contacts 37 = 37 contacts</p> </div> <div style="border: 1px solid black; padding: 5px; font-size: small;"> <p>CABLE LENGTH 03 = 3 meters 05 = 5 meters 10 = 10 meters</p> </div> <div style="border: 1px solid black; padding: 5px; font-size: small;"> <p>00 = connector IP40 10 = connector IP65 (with protection device)</p> </div> </div>	
<p>VDMA support plate</p> <hr/> <p>Ordering code</p> <hr/> <p>2440.50</p>  <p>Weight gr. 20</p>		<p>FLAT support plate</p> <hr/> <p>Ordering code</p> <hr/> <p>2430.50</p>  <p>Weight gr. 20</p>	
<p>4 positions box with 25 contacts connector</p> <hr/> <p>Ordering code</p> <hr/> <p>2400.04.25</p>  <p>Weight gr. 65</p>		<p>15 mm male connector with 2 metres cable</p> <hr/> <p>Ordering code</p> <hr/> <p>2400.15.02</p>  <p>Weight gr. 98</p>	



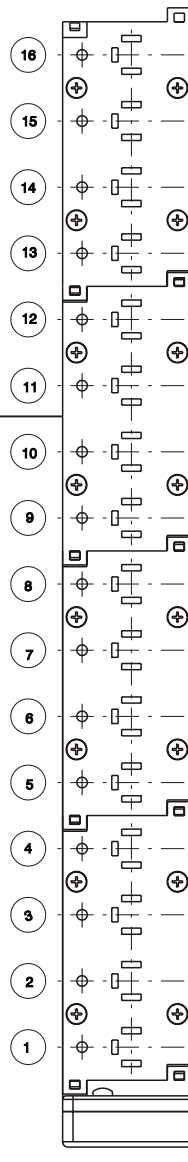
SUB-D 25 CONTACTS CONNECTOR



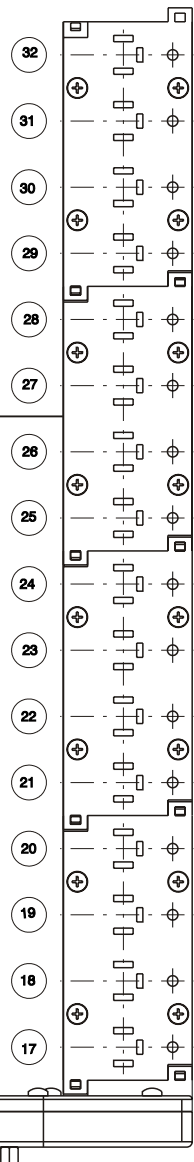
SUB-D 37 CONTACTS CONNECTOR



Left modules

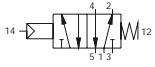


Right modules



5/2

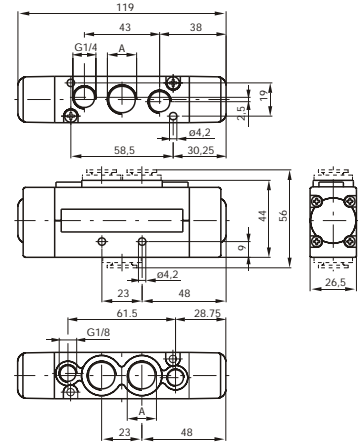
Pneumatic Spring



Weight gr. 235

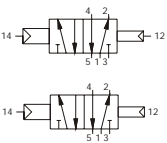
Minimum operating pressure 2 bar

For dimension 'A'
see ordering code



5/2

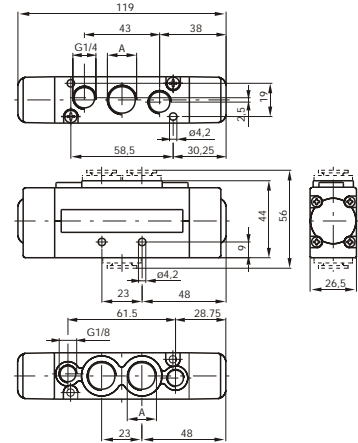
Pneumatic Differential



Weight gr. 235

Minimum operating pressure 2 bar

For dimension 'A'
see ordering code



5/2

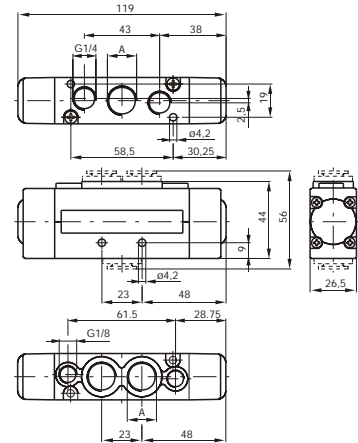
Pneumatic Pneumatic



Weight gr. 235

Minimum operating pressure 1,5 bar

For dimension 'A'
see ordering code



Ordering codes

261 . 52 . 00 .

TYPE:
1 = Connection 'A' = G 3/8"
5 = Connection 'A' = G 1/4"
8 = Connection 'A' = Quick fitting, tube ø 10

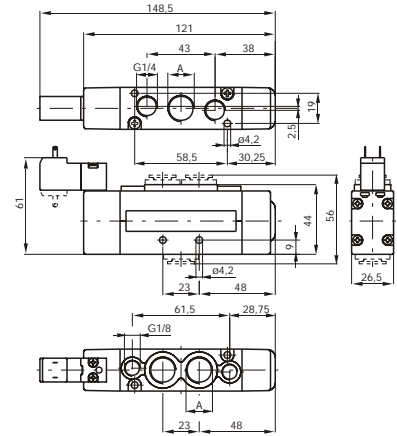
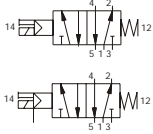
PILOTING:
16 = Pneum. - Diff./al
17 = Pneum. - Diff./al ext.
18 = Pneum. - Pneum.
19 = Pneum. - Spring

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	10 bar	min. -5°C	max. +50°C	1500	ø 9	G1/4" - G3/8" - T.10



5/2

**Miniature solenoid
Spring**



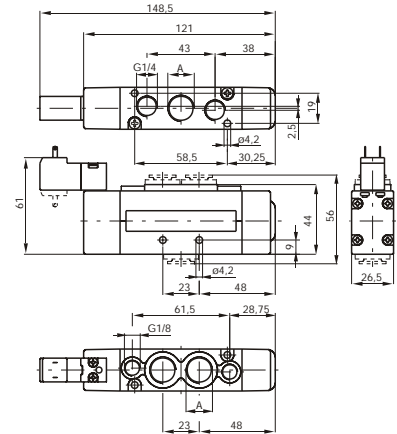
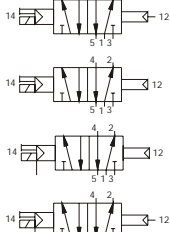
Weight gr. 275

Minimum operating pressure 2 bar

For dimension 'A'
see ordering code

5/2

**Miniature solenoid
Diff./al**



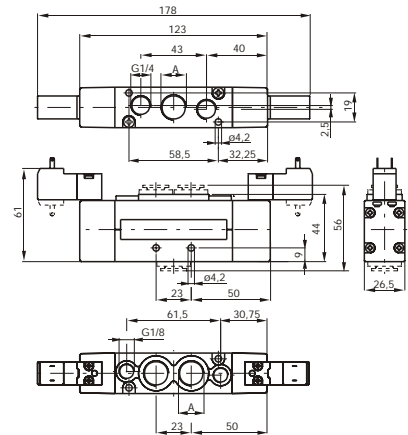
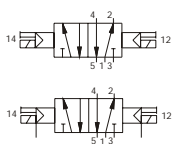
Weight gr. 275

Minimum operating pressure 2 bar

For dimension 'A'
see ordering code

5/2

**Miniature solenoid
Miniature solenoid**



Weight gr. 295

Minimum operating pressure 1,5 bar

For dimension 'A'
see ordering code

Ordering codes

261 . 52 . 00 . .

TYPE:

- 1 = Connection 'A' = G 3/8"
- 5 = Connection 'A' = G 1/4"
- 8 = Connection 'A' = Quick fitting, tube ø 10

PILOTING:

- 24 = Sv. ext. - Sv. ext.
- 26 = Sv. ext. - Diff./al
- 27 = Sv. ext. - Diff./al ext.
- 29 = Sv. ext. - Spring
- 35 = Sv. - Sv.
- 36 = Sv. - Diff./al
- 37 = Sv. - Diff./al ext.
- 39 = Sv. - Spring

VOLTAGE:

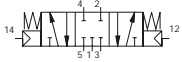
- 01 = Miniature sol. 12 VDC
- 02 = Miniature sol. 24 VDC
- 05 = Miniature sol. 24 VAC
- 06 = Miniature sol. 110 VAC
- 07 = Miniature sol. 220 VAC
- 11 = Miniature sol. 12 VDC Downward
- 12 = Miniature sol. 24 VDC Downward
- 15 = Miniature sol. 24 VAC Downward
- 16 = Miniature sol. 110 VAC Downward
- 17 = Miniature sol. 220 VAC Downward

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	10 bar	min. -5°C	max. +50°C	1500	ø 9	G1/4" - G3/8" - T.10

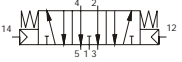
5/3

**Pneumatic
Pneumatic**

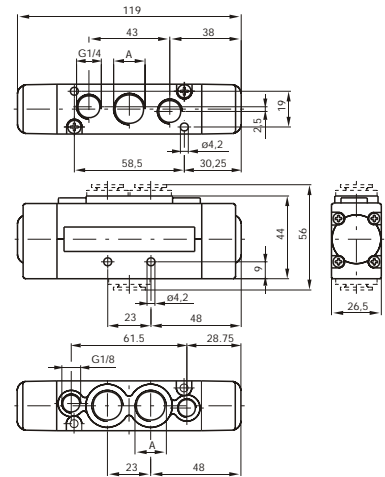
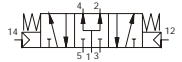
Closed centres



Open centres



Pressure centres



Weight gr. 245

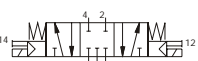
Minimum operating pressure 3 bar

For dimension 'A'
see ordering code

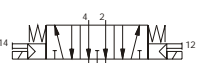
5/3

**Miniature solenoid
Miniature solenoid**

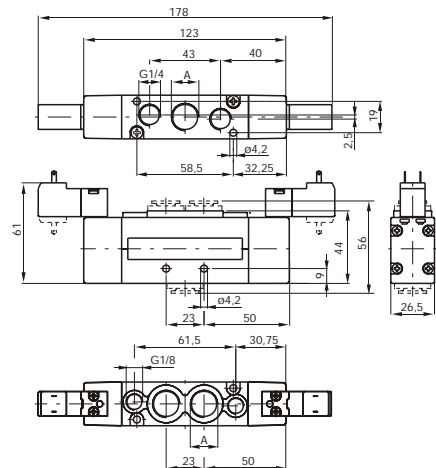
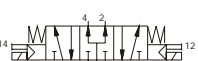
Closed centres



Open centres



Pressure centres



Weight gr. 245

Minimum operating pressure 3 bar

For dimension 'A'
see ordering code

Ordering codes

261 . 53

TYPE:
1 = Connection "A" = G 3/8"
5 = Connection "A" = G 1/4"
8 = Connection "A" = Quick fitting, tube ø 10

PILOTING:
18 = Pneum. - Pneum.
35 = Sv. - Sv.

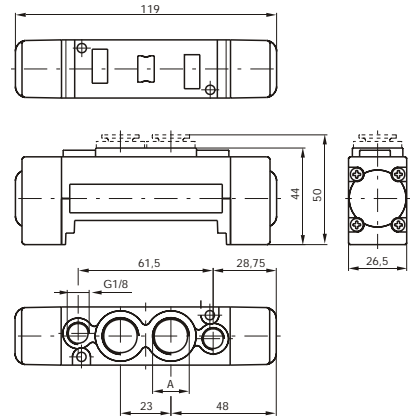
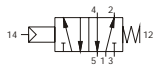
FUNCTION:
31 = 3 pos. CC
32 = 3 pos. OC
33 = 3 pos. PC

VOLTAGE:
01 = Miniature sol. 12 VDC
02 = Miniature sol. 24 VDC
05 = Miniature sol. 24 VAC
06 = Miniature sol. 110 VAC
07 = Miniature sol. 220 VAC
11 = Miniature sol. 12 VDC Downward
12 = Miniature sol. 24 VDC Downward
15 = Miniature sol. 24 VAC Downward
16 = Miniature sol. 110 VAC Downward
17 = Miniature sol. 220 VAC Downward

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with Δ p = 1	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	10 bar	min. -5°C	max. +50°C	1350	ø 9	G1/4" - G3/8" - T.10

5/2

Pneumatic Spring



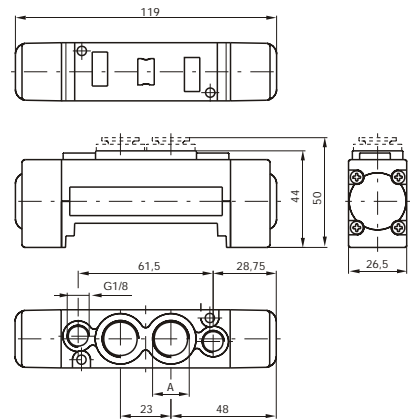
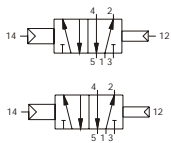
Weight gr. 185

Minimum operating pressure 2 bar

For dimension 'A'
see ordering code

5/2

Pneumatic Differential



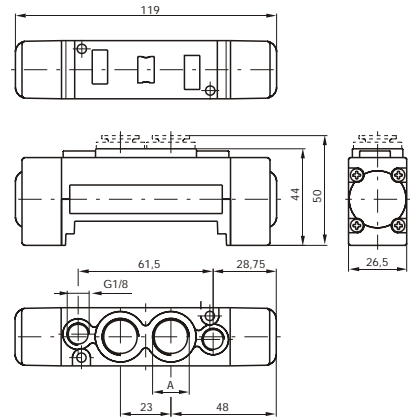
Weight gr. 185

Minimum operating pressure 2 bar

For dimension 'A'
see ordering code

5/2

Pneumatic Pneumatic



Weight gr. 185

Minimum operating pressure 1,5 bar

For dimension 'A'
see ordering code

Ordering codes

263 . 52 . 00 .

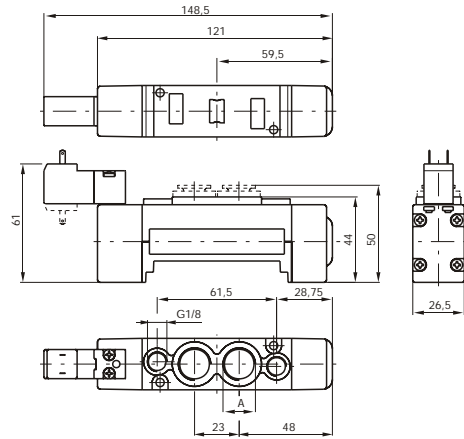
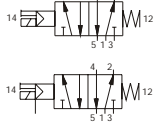
TYPE:
1 = Connection 'A' = G 3/8"
5 = Connection 'A' = G 1/4"
8 = Connection 'A' = Quick fitting, tube ø 10

PILOTING:
16 = Pneum. - Diff./al
17 = Pneum. - Diff./al ext.
18 = Pneum. - Pneum.
19 = Pneum. - Spring

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	10 bar	min. -5°C	max. +50°C	1500	ø 9	G1/4" - G3/8" - T.10

5/2

**Miniature solenoid
Spring**



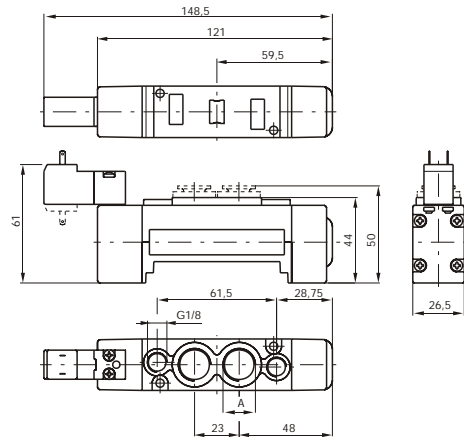
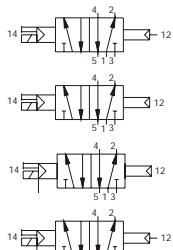
Weight gr. 220

Minimum operating pressure 2 bar

For dimension 'A'
see ordering code

5/2

**Miniature solenoid
Diff./al**



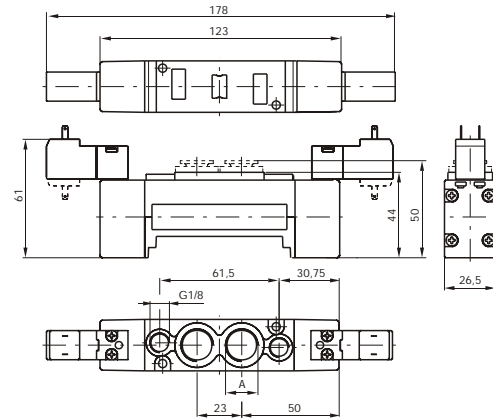
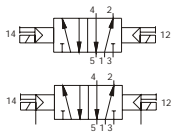
Weight gr. 220

Minimum operating pressure 2 bar

For dimension 'A'
see ordering code

5/2

**Miniature solenoid
Miniature solenoid**



Weight gr. 250

Minimum operating pressure 1,5 bar

For dimension 'A'
see ordering code

Ordering codes

263 . 52 . 00 . .

TYPE:
1 = Connection 'A' = G 3/8"
5 = Connection 'A' = G 1/4"
8 = Connection 'A' = Quick fitting, tube ø 10

PILOTING:
24 = Sv. ext. - Sv. ext.
26 = Sv. ext. - Diff./al
27 = Sv. ext. - Diff./al ext.
29 = Sv. ext. - Spring
35 = Sv. - Sv.
36 = Sv. - Diff./al
37 = Sv. - Diff./al ext.
39 = Sol. - Spring

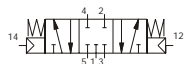
VOLTAGE:
01 = Miniature sol. 12 VDC
02 = Miniature sol. 24 VDC
05 = Miniature sol. 24 VAC
06 = Miniature sol. 110 VAC
07 = Miniature sol. 220 VAC
11 = Miniature sol. 12 VDC Downward
12 = Miniature sol. 24 VDC Downward
15 = Miniature sol. 24 VAC Downward
16 = Miniature sol. 110 VAC Downward
17 = Miniature sol. 220 VAC Downward

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with Δ p = 1	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	10 bar	min. -5°C	max. +50°C	1500	ø 9	G1/4" - G3/8" - T.10

5/3

**Pneumatic
Pneumatic**

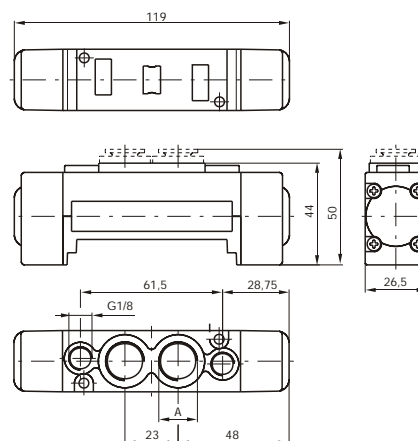
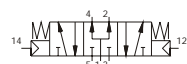
Closed centres



Open centres



Pressure centres



Weight gr. 195

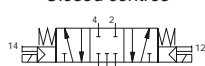
Minimum operating pressure 3 bar

For dimension 'A'
see ordering code

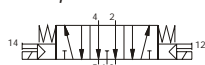
5/3

**Miniature solenoid
Miniature solenoid**

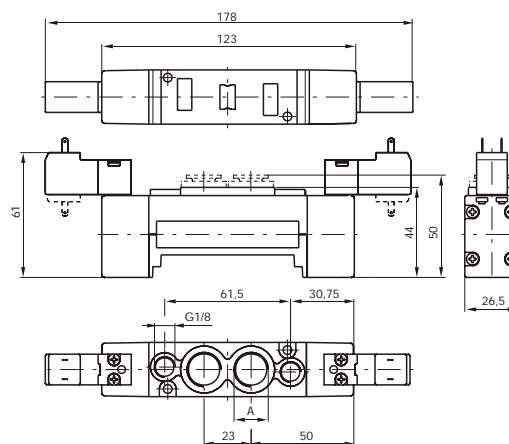
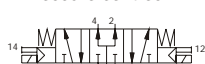
Closed centres



Open centres



Pressure centres



Weight gr. 270

Minimum operating pressure 3 bar

For dimension 'A'
see ordering code

Ordering codes

263 . 53

TYPE:
1 = Connection "A" = G 3/8"
5 = Connection "A" = G 1/4"
8 = Connection "A" = Quick fitting, tube ø 10

PILOTING:
18 = Pneum. - Pneum.
35 = Sv. - Sv.

FUNCTION:
31 = 3 pos. CC
32 = 3 pos. OC
33 = 3 pos. PC

VOLTAGE:
01 = Miniature sol. 12 VDC
02 = Miniature sol. 24 VDC
05 = Miniature sol. 24 VAC
06 = Miniature sol. 110 VAC
07 = Miniature sol. 220 VAC
11 = Miniature sol. 12 VDC Downward
12 = Miniature sol. 24 VDC Downward
15 = Miniature sol. 24 VAC Downward
16 = Miniature sol. 110 VAC Downward
17 = Miniature sol. 220 VAC Downward

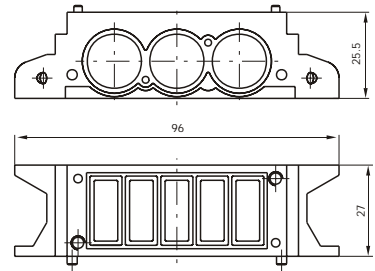
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	10 bar	min. -5°C	max. +50°C	1350	ø 9	G1/4" - G3/8" - T.10



Modular base

Ordering code

2630.01

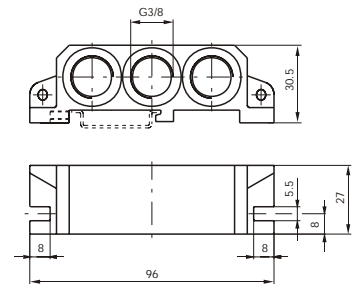


Weight gr. 80

Right inlet base

Ordering code

2630.02

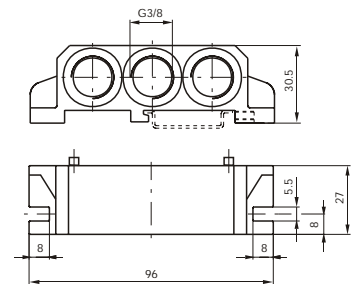


Weight gr. 80

Left inlet base

Ordering code

2630.03

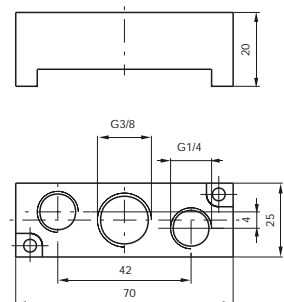


Weight gr. 100

Intermediate air intake
(to be assembled instead of a valve)

Ordering code

2630.10

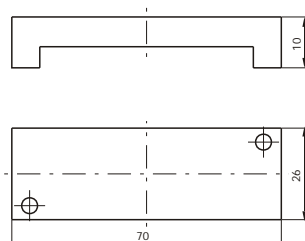


Weight gr. 60

Closing plate

Ordering code

2630.00



Weight gr. 20

Diaphragm plug

Ordering code

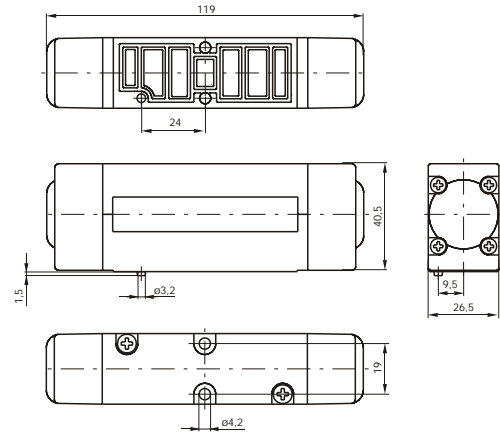
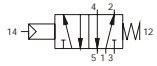
2630.17



Weight gr. 5

5/2

Pneumatic Spring

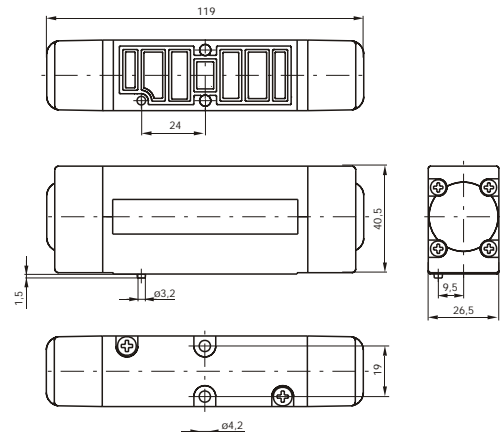
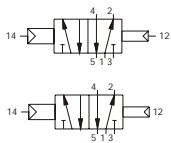


Weight gr. 235

Minimum operating pressure 2 bar

5/2

Pneumatic Differential

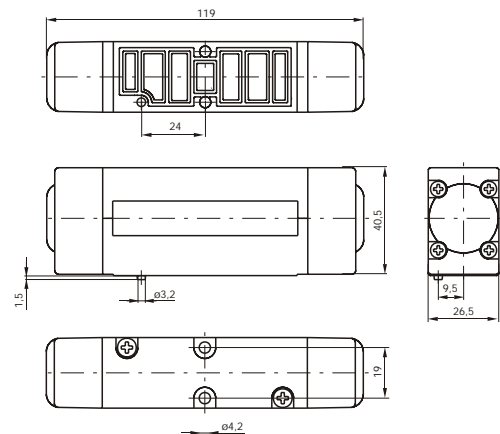


Weight gr. 235

Minimum operating pressure 2 bar

5/2

Pneumatic Pneumatic



Weight gr. 255

Minimum operating pressure 1,5 bar

Ordering codes

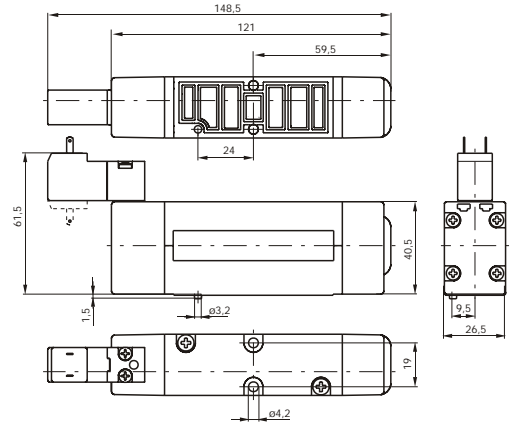
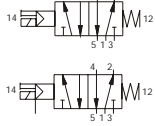
2645 . 52 . 00 .

PILOTING:
16 = Pneum. - Diff./al.
17 = Pneum. - Diff./al ext.
18 = Pneum. - Pneum.
19 = Pneum. - Spring

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	10 bar	min. -5°C	max. +50°C	1100	$\varnothing 7,5$	/

5/2

**Miniature solenoid
Spring**

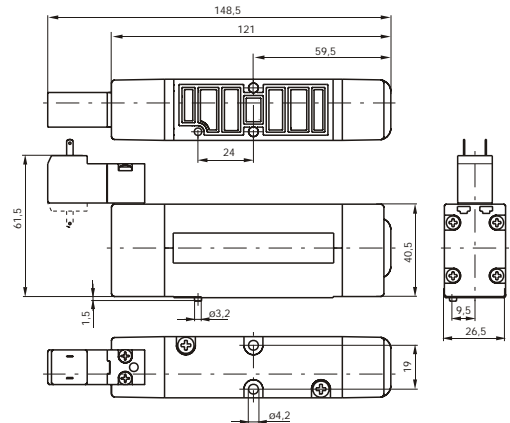
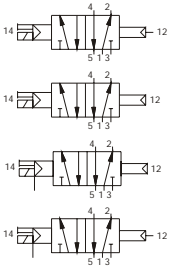


Weight gr. 270

Minimum operating pressure 2 bar

5/2

**Miniature solenoid
Diff./al**

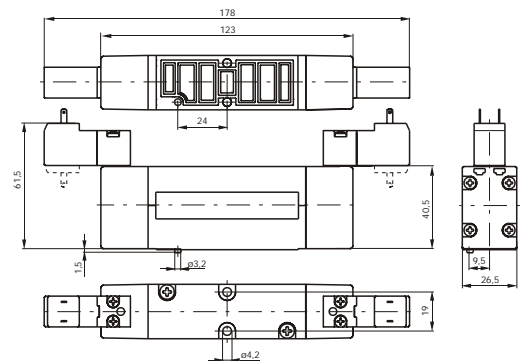
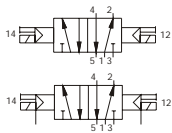


Weight gr. 270

Minimum operating pressure 2 bar

5/2

**Miniature solenoid
Miniature solenoid**



Weight gr. 305

Minimum operating pressure 1,5 bar

Ordering codes

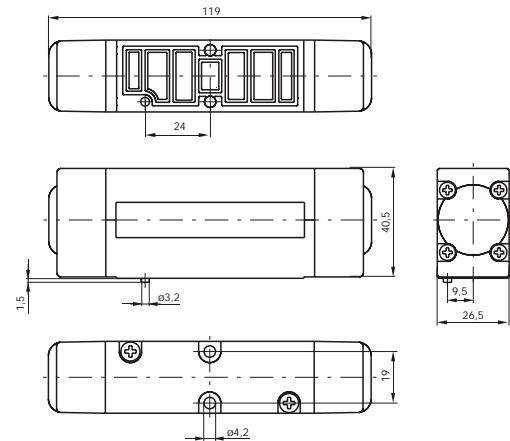
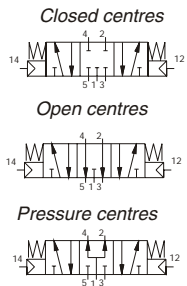
264 . 52 . 00 . .

<p>TYPE: 1 = Electropilot exhaust on base (only for self feeding valves) 5 = Electropilot exhaust on pilot (for all versions)</p>	<p>PILOTING: 24 = Sv. ext. - Sv. ext. 26 = Sv. ext. - Diff./al 27 = Sv. ext. - Diff./al ext. 29 = Sv. ext. - Spring 35 = Sv. - Sv. 36 = Sv. - Diff./al 37 = Sv. - Diff./al ext. 39 = Sv. - Spring</p>	<p>VOLTAGE: 01 = Miniature sol. 12 VDC 02 = Miniature sol. 24 VDC 05 = Miniature sol. 24 VAC 06 = Miniature sol. 110 VAC 07 = Miniature sol. 220 VAC 11 = Miniature sol. 12 VDC Downward 12 = Miniature sol. 24 VDC Downward 15 = Miniature sol. 24 VAC Downward 16 = Miniature sol. 110 VAC Downward 17 = Miniature sol. 220 VAC Downward</p>
--	--	---

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	10 bar	min. -5°C	max. +50°C	1100	$\varnothing 7,5$	/

5/3

**Pneumatic
Pneumatic**

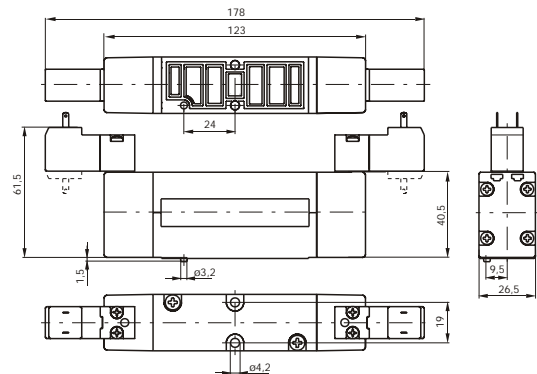
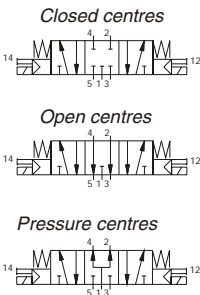


Weight gr. 245

Minimum operating pressure 3 bar

5/3

**Miniature solenoid
Miniature solenoid**



Weight gr. 315

Minimum operating pressure 3 bar

Ordering codes

264 . 53

TYPE:
1 = Electropilot exhaust on base
(only for self feeding valves)
5 = Electropilot exhaust on pilot
(for all versions)

PILOTING:
18 = Pneum. - Pneum.
35 = Sv. - Sv.

FUNCTION:
31 = 3 pos. CC
32 = 3 pos. OC
33 = 3 pos. PC

VOLTAGE:
01 = Miniature sol. 12 VDC
02 = Miniature sol. 24 VDC
05 = Miniature sol. 24 VAC
06 = Miniature sol. 110 VAC
07 = Miniature sol. 220 VAC Downward
12 = Miniature sol. 24 VDC Downward
15 = Miniature sol. 24 VAC Downward
16 = Miniature sol. 110 VAC Downward
17 = Miniature sol. 220 VAC Downward

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	Orifice size	Working ports size
	Filtered and lubricated or not lubricated air	10 bar	min. -5°C	max. +50°C	1000	$\varnothing 7,5$	/

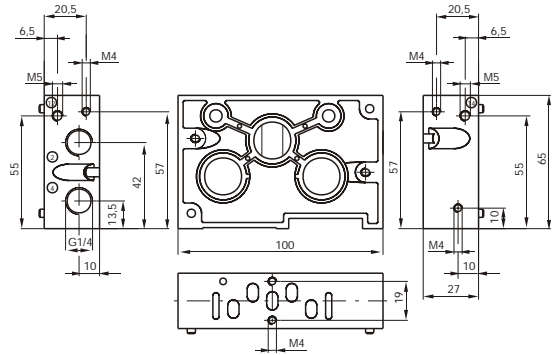


Modular base

Ordering code

2640.01
2640.11

Modular base for
single separate inlet

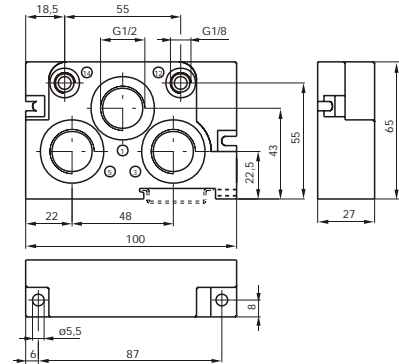


Weight gr. 220

Right inlet base

Ordering code

2640.02

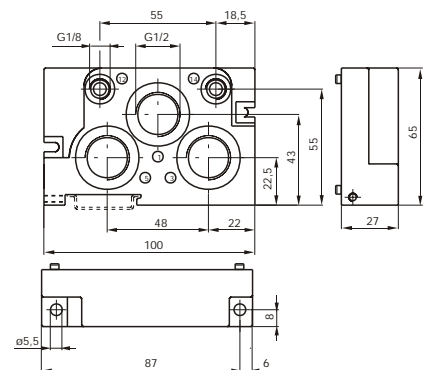


Weight gr. 200

Left inlet base

Ordering code

2640.03

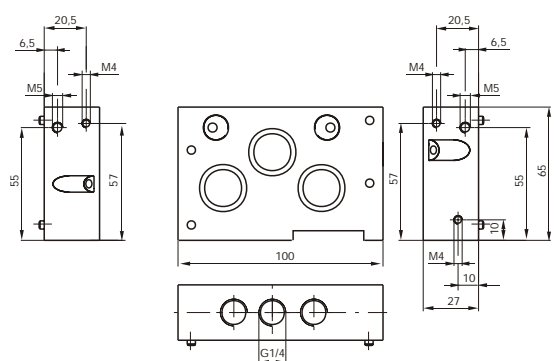


Weight gr. 200

Intermediate air intake

Ordering code

2640.10

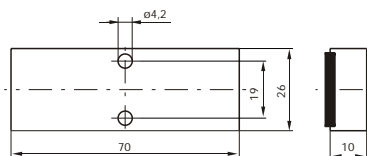


Weight gr. 380

Closing plate

Ordering code

2640.00



Weight gr. 50

Diaphragm plug

Ordering code

2640.17



Weight gr. 10

Direct operated solenoid valves Series 300

Miniature solenoid valves 10 mm

Microsolenoid valves 15 mm

Microsolenoid valves 22 mm

Microsolenoid valves 22 mm
Series Mounting

Microsolenoid valves 22 mm
Bistable

Electric pilot CNOMO 30 mm

Solenoid valves 32 mm




General

The direct operated solenoid valve is the interface between pneumatic and electronic. In fact, it is actuated by an electrical signal and in turn gives a pneumatic signal directly available for small users or for actuating bigger pneumatic distributors.

A wide range of valves are needed for satisfying various applications. For this need we have available miniature components with very low volume and electrical impute as well as solenoid valves with large flow rate and power for heavy duty operations. These solenoid valves are usually 3/2, normally closed or normally open, but there are available the 2/2, closed or open, for vacuum and others.

Note that the direct operated valves can only be used with bases, individual or multiple with M5 or G 1/8" thread or with connections.

PNEUMAX solenoid valves are  homologated valid for USA and Canada (file n. E206325-AIU2, AIU8). As for ordering code please see page 1.26 and 1.27.

Use and maintenance

Maintenance is normally not required for these components therefore the spare parts list is not provided.

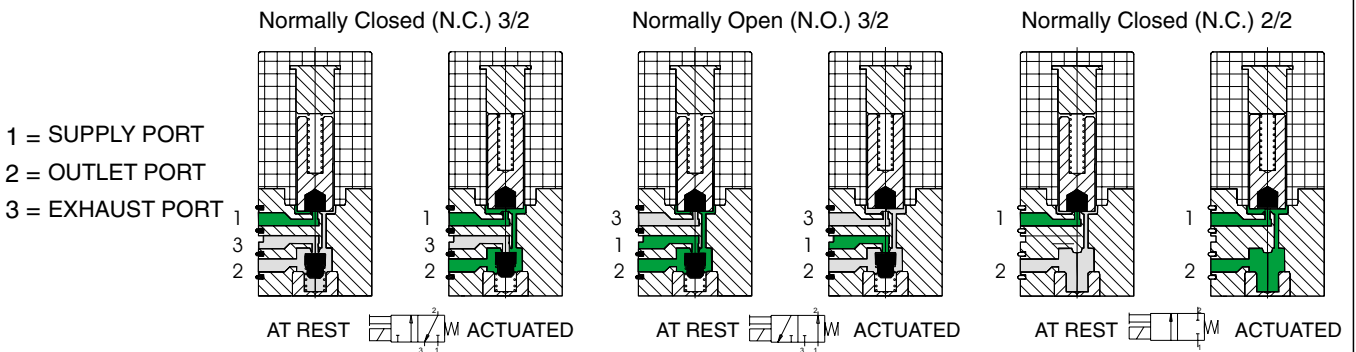
Their construction complexity and low cost do not make repair economically viable. It s easier and more economic to replace the complete valve in case of malfunction.

For proper lubrication use only hydraulic oil class H such as Castrol type MAGNA GC 32.

General

Direct operated solenoid valve differs from other types for its minimum overall dimensions. Its specific design allows single or gang mounting in narrow spaces. Its high switching speed and flow rate make this small valve useful for different applications and suitable also with other fluids than compressed air compatible with constructive material. All versions, equipped with override device, are 3/2 ways N.C. and N.O., 2/2 ways N.C. 12 or 24 olt D.C. with cables or connector also with led. Make sure that the fastening screws are tightened with maximum torque of 0,25 Nm.

Functional schematics



Construction

Electrical part:

Miniature solenoid consisting of a coil made of copper wire of different sizes depending on the voltage. Insulated according to F class standards and injection-moulded nylon-glass application. All parts forming the cladding, the electrical connections and the pole pieces are protected against corrosion. Electrical connection is via connector or directly with flying leads.

Mechanical part:

AISI 430F cores, AISI 302 return springs, NBR seals, thermoplastic polyester body, plug and manual control made of nickel-plated brass. The miniature solenoid valves are mounted on a separate base, multiple base or distributors.

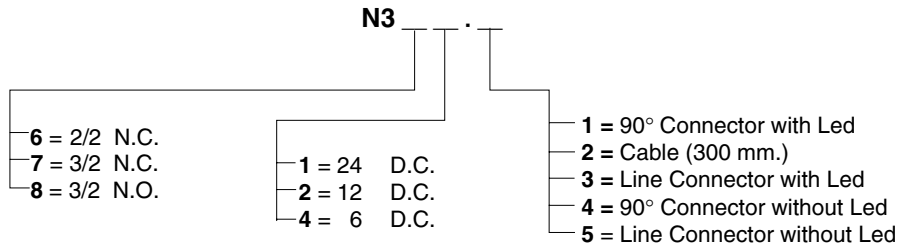
tributeur.

Technical characteristics

Pneumatic:	Working pressure	0 ÷ 7 bar
	Orifice size	0,7 mm
	Fluid/ambient temperature	-5° 50°C
	Maximum flow rate at 6 bar with Δp 1 bar	14 NI/min
	Exhaust flow	22 NI/min
	Max number of cycles per minute	2.700
	Life	50 Million
Electric:	oltages	12 ÷ 24 olt D.C.
	Power	1,3 Watt
	oltage tolerance	-5 10
	Response time when energized	8 ms
	Response time when de-energized	10 ms
	Copper wire isolation class	F (155°C)



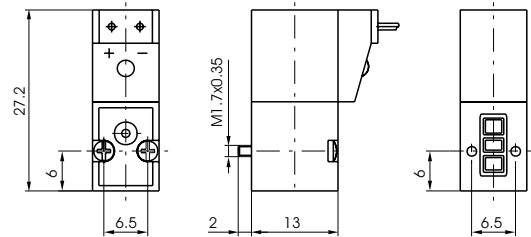
Ordering codes



Miniature solenoid valve with cable



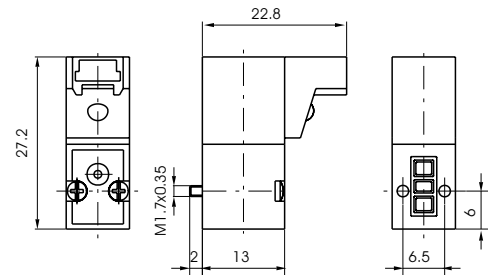
Weight gr. 12



Miniature solenoid valve with 90° connector



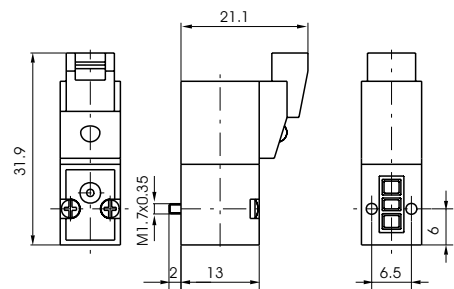
Weight gr. 12



Miniature solenoid valve with line connector



Weight gr. 12



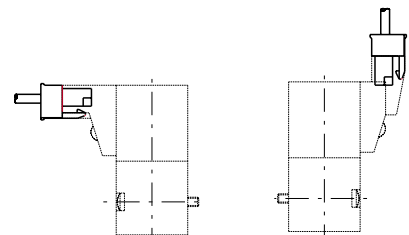
Connector

Ordering codes

- 371 .
- 300 Cable L = 300 mm
 - 600 Cable L = 600 mm
 - 1000 Cable L = 1000 mm



Weight gr. 3

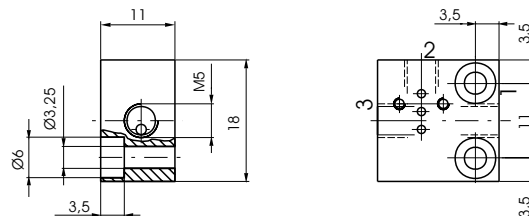




Individual base

Ordering code

395.01



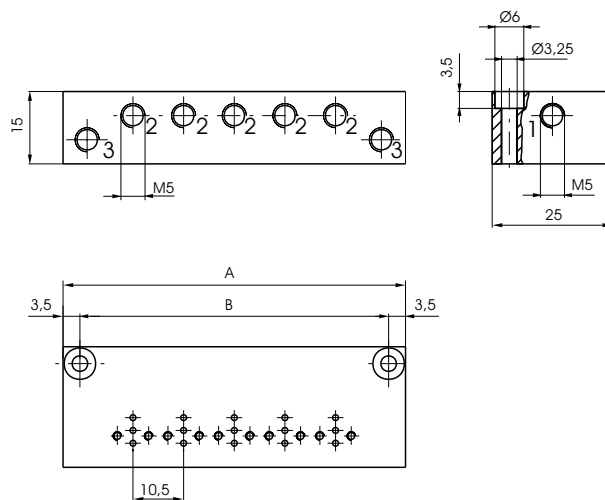
Weight gr. 10

Multiple bases

Ordering code

395 .

N° Places

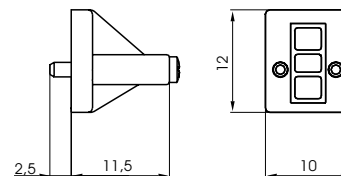


N° Places	02	03	04	05	06	07	08	09	10
A	39.5	50	60.5	71	81.5	92	102.5	113	123.5
B	32.5	43	53.5	64	74.5	85	95.5	106	116.5
Weight (gr.)	43	54	65	76	87	98	109	120	131

Closing plate

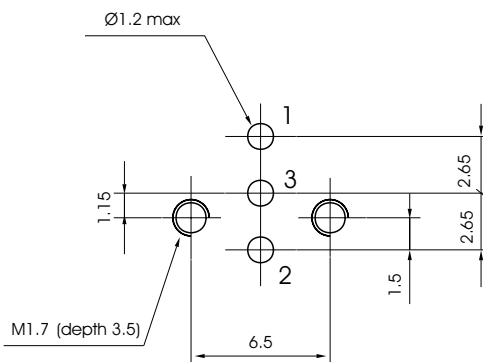
Ordering code

395.00



Weight gr. 5

Interface dimensions

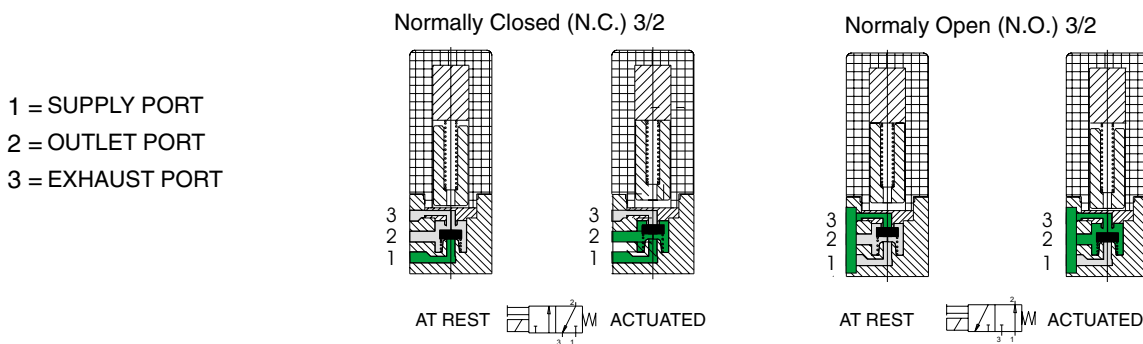




General

This direct operated solenoid valve has minimum overall dimensions (15 mm wide). Its construction method is same as 10 mm valve, of course.
It is suitable to be single or gang mounted or as electro-operator for larger air flow distributors.
Can be utilized with compressed air and other fluids compatible with material used to build the solenoid valve.
The available versions, all equipped with manual override, are 3 ways, normally closed and normally open with DC and AC 50/60 Hz.
It's possible to install the N.O. valve on N.C. interface by using the registered reverse system included in the valve body.
The electrical connection is made with cables (300 mm.), FASTON or with connector.
This type of miniature solenoid valve is interchangeable with most of the same products available on the market.
Coil can also be positioned at 180° to get the electrical connection located on the opposite side than override.
Make sure that the fastening screws are tightened with maximum torque of 0,75 Nm.

Functional schematics



Construction characteristics:

Electrical part: Miniature solenoid consisting of a coil made of copper wire of different diameters depending on voltage, isolated according to "F" class standard, with injection-moulded nylon-glass application.
All parts forming the cladding, the electrical connections and the pole pieces are protected against corrosion.

Mechanical part: AISI 430F cores, AISI 302 return springs, NBR seals, thermoplastic polyester body.

Technical characteristics

Pneumatic

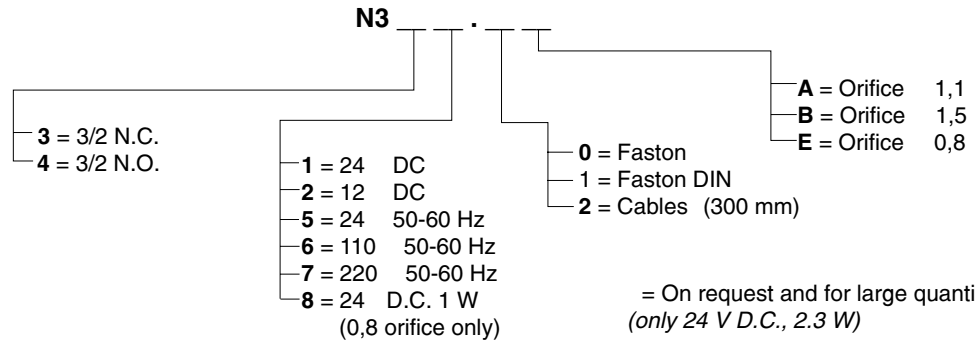
Nominal diameter	0,8 mm	1,1 mm	1,5 mm (only D.C.)
Maximum flow rate at 6 bar with Δp 1 bar	20 NI/min	30 NI/min	50 NI/min
Working pressure for N.C.	0 to 10 bar		0 to 7 bar
Working pressure for N.O.	/	0 to 8 bar	0 to 5 bar
Temperature	-5° 50°C		

Electrical

voltage D.C.	24 DC	12-24 DC	
voltage A.C.	/	24-110-220 vlt 50/60 Hz	/
Power	1 Watt	2,3 Watt	
	/	2,8 A (at starting) 2,5 A (at speed)	/
voltage tolerance	-5 10		
Response time	10÷12 ms		
Isolating class	F (155°C)		
Protection degree	IP65 (with cables) IP65 (with connectors) IP00 (with faston)		
Life expectancy	50 million cycles (with standard working conditions)		



Ordering code

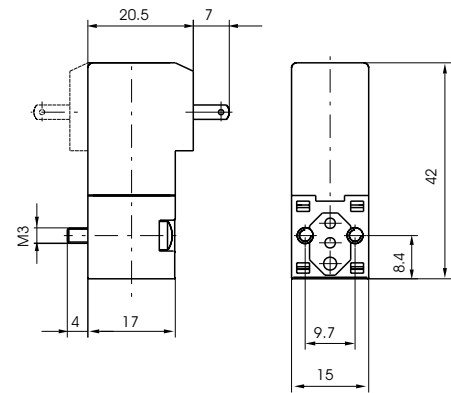


See previous page for available versions

With Faston



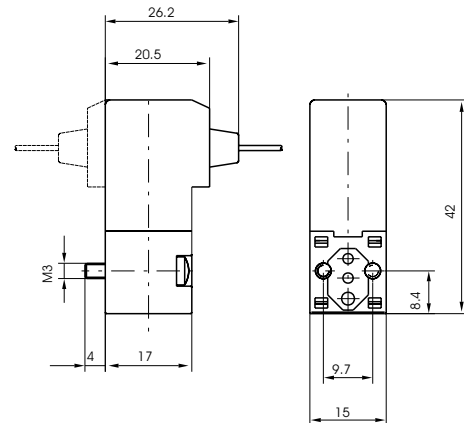
Weight gr. 36



With cables



Weight gr. 38



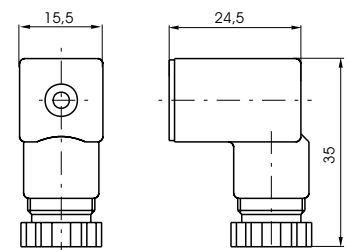
Connector

Ordering code

- 315.11.00 Standard
- 315.11.0 L Led
 - 1 = 24 D.C./A.C.
 - 2 = 110 50/60 Hz
 - 3 = 220 50/60 Hz
- 315.12.00 for faston DIN
- 315.12.0 L for faston DIN with Led
 - 1 = 24 D.C.
 - 2 = 110 50/60 Hz
 - 3 = 220 50/60 Hz



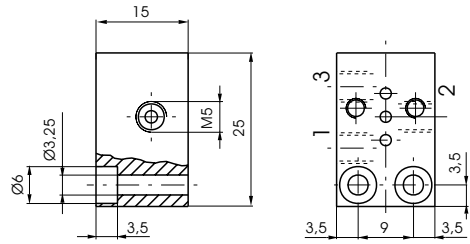
Weight gr. 13



Single use base

Ordering code

355.01



Weight gr. 18

Multiple bases

Ordering code

A = Orifice M5

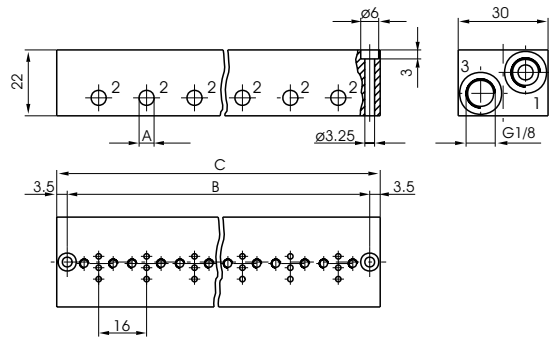
A = Pipe fitting 4

355 .

354 .

N° PLACES

N° PLACES



N° places	02	03	04	05	06	07	08	09	10
B	37	53	69	85	101	117	133	149	165
C	44	60	76	92	108	124	140	156	172
Weight (gr.)	66	92	116	141	165	190	216	242	266

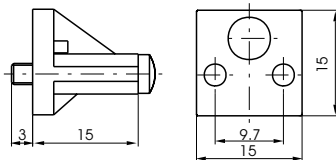
Closing plate

Ordering code

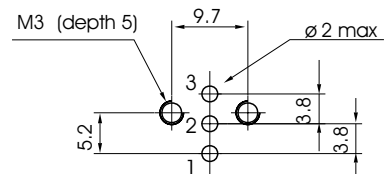
355.00



Weight 6 gr.

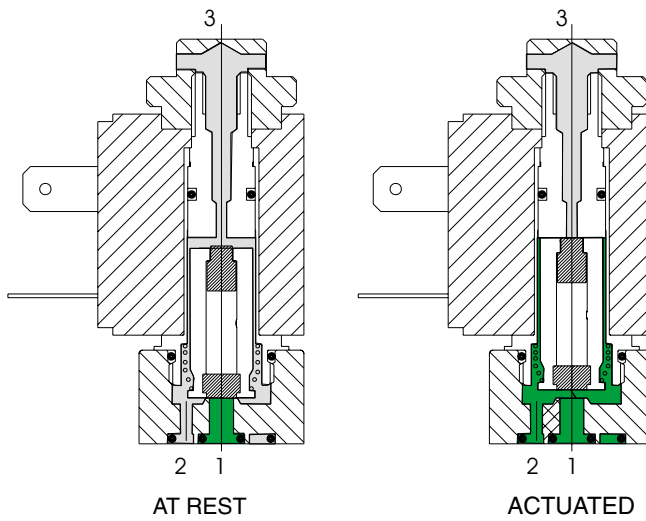
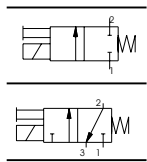


Interface dimensions



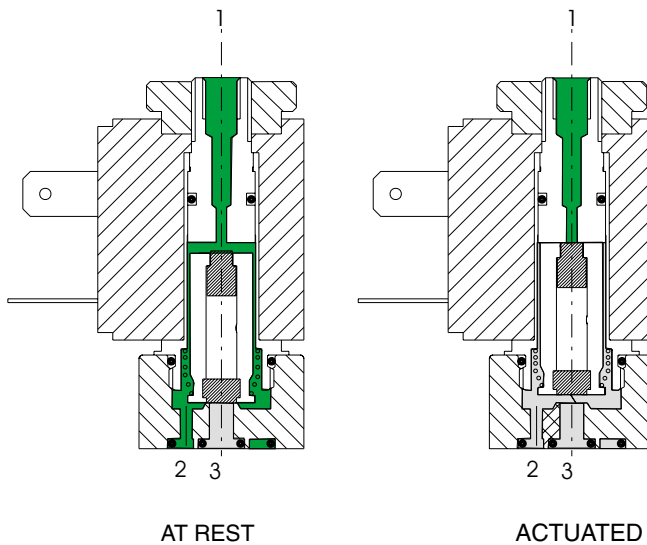
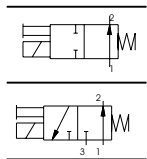
Functional schematics

Normally Closed (N.C.) 3/2 o 2/2



- 1 = INLET PORT
- 2 = OUTLET PORT
- 3 = EXHAUST PORT
(Plugged if 2/2)

Normally Open (N.O.) 3/2 o 2/2



Construction characteristics

Electrical parts: Solenoids: the solenoid consist of coils having different diameter copper wire windings insulated according standards "H"; they are encased in a nylon-glass compound. All parts are corrosion resistant.

Mechanical parts: Nickel plated brass tube nitrile viton seals stainless steel plunger (AISI 430F), stainless steel adjusted springs, viton poppet seals, tropicalized zinc alloy interface plate, nickeled brass manual override, nickel steel coil lock nut, zinc steel mounting screw.

To be usable, the solenoids and microsolenoids have to be attached either to a base or directly to the distributor s operators by means of connectors M5 or G 1/8". These solenoids are available in all voltages and frequencies used in the world. The following are the technical characteristics of the solenoid.



Technical characteristics

Pneumatic	Working pressure	0 ÷ 10 bar	
	Orifice size	1,3 mm	(0,9 mm for 2 W)
	Maximum fluid temperature	50°C	
	Maximum ambient temperature	50°C	
	Maximum flow rate at 6 bar with Δp 1 bar	53 NI/min	(20NI/min. for 2 W)
	Cycles/minute	700	
	Fluids	Air-vacuum-inert gases	
	Lubrication	non required	
	Life	45 to 50 million cycles	
Electrical	Power consumption inrush - D.C.	-	
	Power consumption inrush - A.C	9 A	
	Power consumption holding - D.C	5 W	(2 W)
	Power consumption holding - A.C	6 A	
	Operating voltage tolerance	10	
	Response time opening	40 ms	
	Response time closing	21 ms	
	Insulation of the copper wire	H	
	Insulation of the coil	F	
	Connector protection	IP 65	
	Cable protection	PG 9	

The response time were determined using standard procedure CETOP RP 82 P.

Maintenance and replacement parts

Maintenance practices for these valves are similar to those already detailed for other products-replacement of the plunger or poppet is not advisable since the new replacement would not provide the best fit with the rest of the already used valve.

Special care should be taken that no dirt is accumulated between the working surface of fixed core and the plunger which would result in vibrations and overheating of the solenoid. In the case of microsolenoid it must be assured that the alternate current coil is not charged when the mechanical part is not mounted to avoid destruction of the coil.

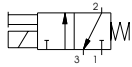
The electrical connections have to be perfect, especially where low currents are used (12-24).

Oxidation of contacts between the connector and the coil can lead to intermittent malfunctions which are difficult to trace. Oxidation of contacts due to humidity or corrosive atmosphere are one of the most common causes of false alarms. Clean the contacts with appropriate spray.

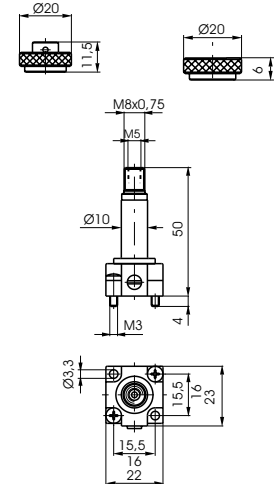
**Mechanical actuator for Normally Closed (N.C.)
miniature solenoid valve**

Ordering code

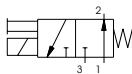
- M 2** Normally Closed (N.C.)
- M 2P** Normally Closed (N.C.) threaded lock nut
- M 2/9** Normally Closed 2 W 24 D.C.



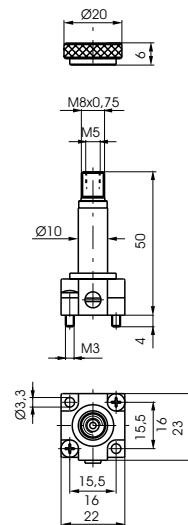
Weight gr. 61



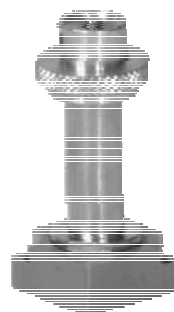
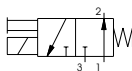
- M 2/1** Normally Open (N.O.) air feeding through fix flunger



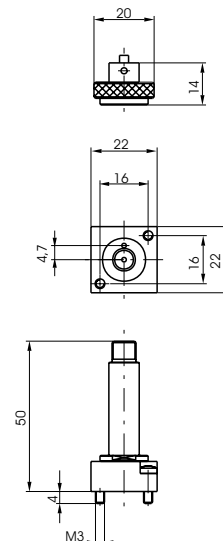
Weight gr. 58



- MM 7** Normally Open (N.O.) air feeding through base



Weight gr. 46

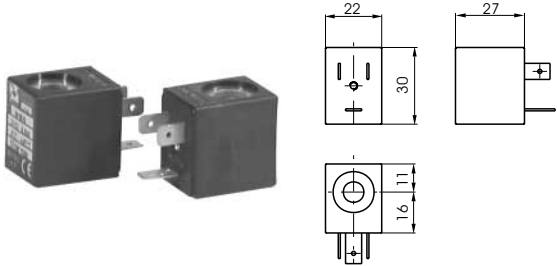


Coil suitable for MM7 are listed on page 1.18

1



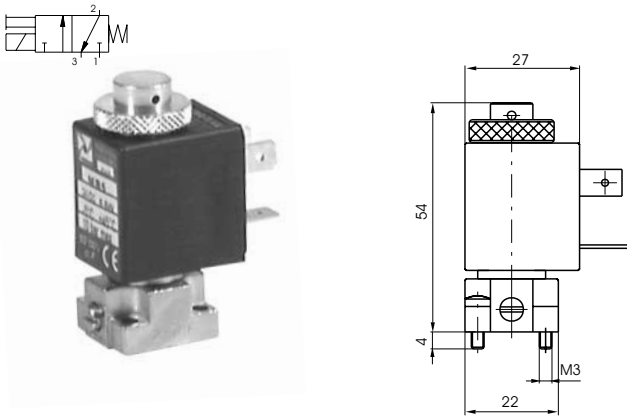
Coil



Use only with M2/9

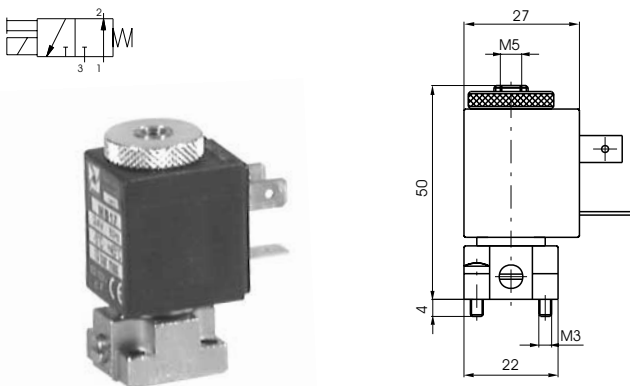
Ordering code	Available voltages	
MB 4 MB 5 MB 6 MB 9	12 D.C. 24 D.C. 48 D.C. 24 D.C. (2 Watt)	Direct current
MB 17 MB 21 MB 22 MB 24	24/50 48/50 110/50 220/50	Alternating current 50 Hz
MB 37 MB 39 MB 41 MB 56 MB 57 MB 58	24/60 110/60 220/60 24/50-60 110/50-60 220/50-60	Alternating current 60 Hz 50/60 Hz

Miniature solenoid valve Normally Closed (N.C.)



Ordering code	Available voltages Miniature solenoid valve N.C.	
M 2.4 M 2.5 M 2.6 M 2.9	12 DC 24 DC 48 DC 24 DC (2 Watt)	Direct current
M 2.17 M 2.21 M 2.22 M 2.24	24/50 48/50 110/50 220/50	Alternating current 50 Hz
M 2.37 M 2.39 M 2.41 M 2.56 M 2.57 M 2.58	24/60 110/60 220/60 24/50-60 110/50-60 220/50-60	Alternating current 60 Hz 50/60 Hz

Miniature solenoid valve Normally Open (N.O.)

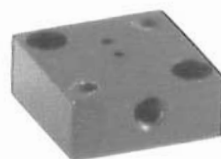


Ordering code	Available voltages Miniature solenoid valve N.O.	
M 2/1.4 M 2/1.5 M 2/1.6 M 2/1.9	12 DC 24 DC 48 DC 24 DC (2 Watt)	Direct current
M 2/1.17 M 2/1.21 M 2/1.22 M 2/1.24	24/50 48/50 110/50 220/50	Alternating current 50 Hz
M 2/1.37 M 2/1.39 M 2/1.41 M 2/1.56 M 2/1.57 M 2/1.58	24/60 110/60 220/60 24/50-60 110/50-60 220/50-60	Alternating current 60 Hz 50/60 Hz

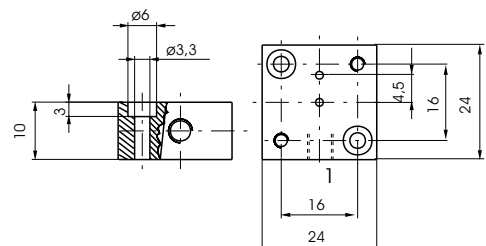
E ternal feeding base

Ordering code

305.10.05



Weight gr.18



Direct operated solenoid valves
22 mm. Miniature solenoid valve

Series 300



1

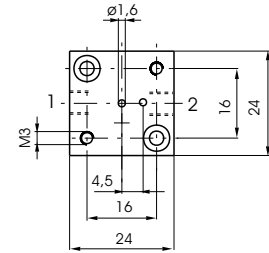
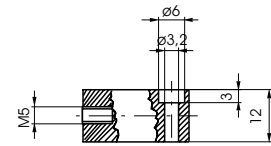
Individual base



In line ports - thread M5

1 = INLET PORT (N.C.)
2 = OUTLET PORT

With a N.O. miniature solenoid valve
1 = EXHAUST
2 = OUTLET PORT



Ordering code

305.00.00

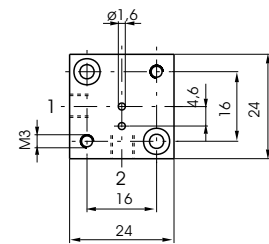
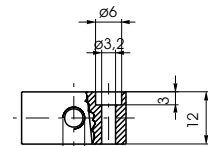
Weight gr. 56



90° Port - thread M5

1 = INLET PORT (N.C.)
2 = OUTLET PORT (N.C.)

With a N.O. miniature solenoid valve
1 = EXHAUST
2 = OUTLET PORT



Ordering code

305.90.00

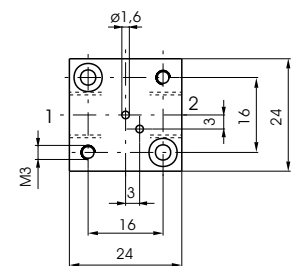
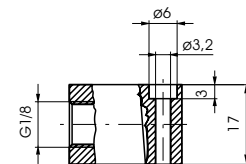
Weight gr. 56



In line ports - thread G 1/8"

1 = INLET PORT (N.C.)
2 = OUTLET PORT (N.C.)

With a N.O. miniature solenoid valve
1 = EXHAUST
2 = OUTLET PORT



Ordering code

305.00.18

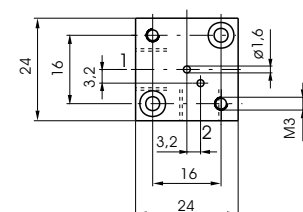
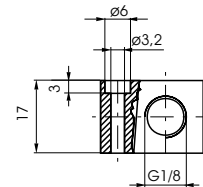
Weight gr. 75



90° Port - thread G 1/8"

1 = INLET PORT (N.C.)
2 = OUTLET PORT (N.C.)

With a N.O. miniature solenoid valve
1 = EXHAUST
2 = OUTLET PORT



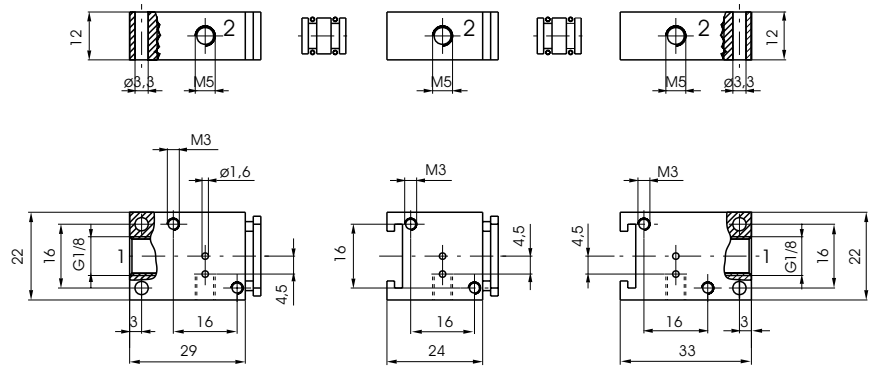
Ordering code

305.90.18

Weight gr. 75



Modular bases for series mounting



Ordering code

nitial ase
305.05.00
Weight gr. 57

nter e iate ase
305.06.00
Weight gr. 44

ast ase
305.07.00
Weight gr. 53

ore spacer
305.05.01
Weight gr. 3

oli spacer
305.05.02
Weight gr. 4

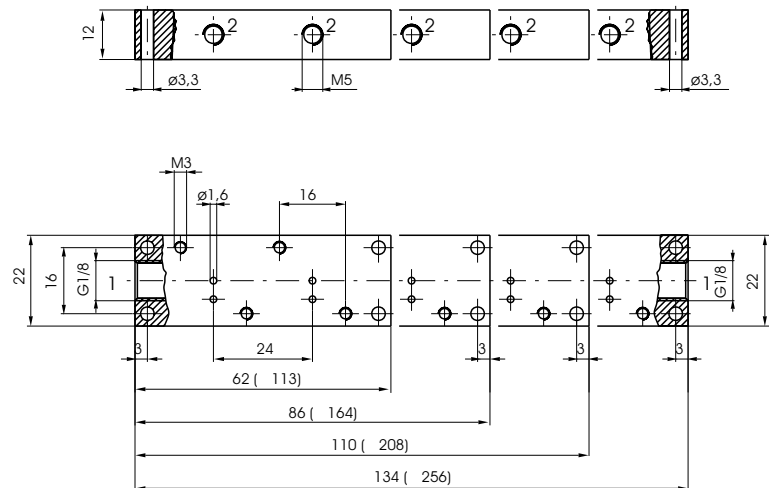
nitial ase

nter e iate ase

ast ase



Multiple integral bases for series mounting

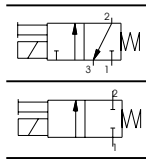


Ordering code

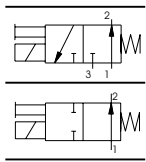
305.08.02 2 positions
305.08.03 3 positions
305.08.04 4 positions
305.08.05 5 positions



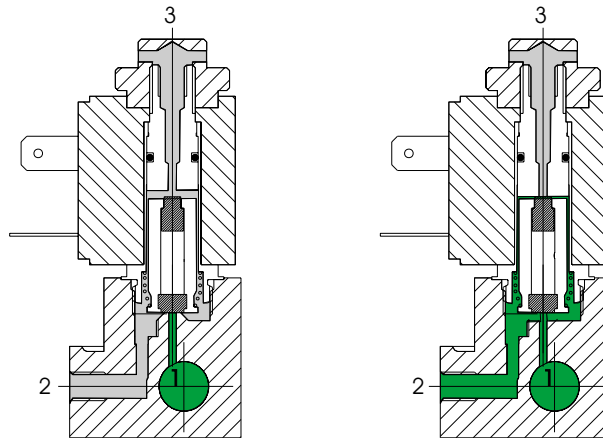
Functional schematic



1 = INLET PORT
2 = OUTLET PORT
3 = EXHAUST PORT
(Plugged if 2/2)



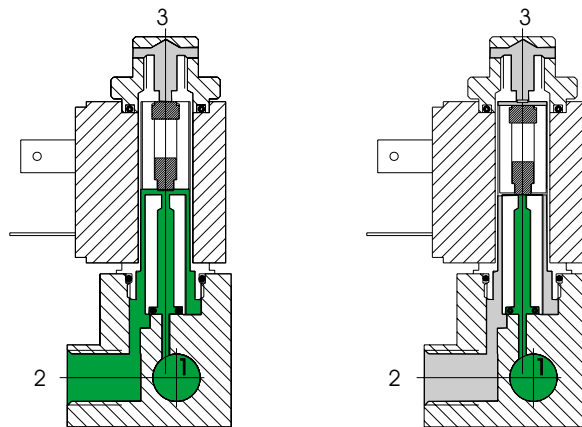
Normally Closed (N.C.) 3/2 or 2/2



AT REST

ACTUATED

Normally Open (N.O.) 3/2 or 2/2



AT REST

ACTUATED

Construction characteristics

Electrical parts: Solenoids: the solenoid consist of coils having different diameter copper wire windings insulated according standards "H"; they are encased in a nylon-glass compount. All parts are corrosion resistant.

Mechanical parts: Nickel plated brass tube nitrile (NBR) stainless steel plunger (AISI 430F), stainless steel adjusted springs, viton poppet seals, tropicalized zinc alloy interface plate, nickered brass manual override, nickel steel coil lock nut, zinc steel mounting screws. Electrical connectors are standard.

1



Technical characteristics

Pneumatic	Working pressure	0 ÷ 10 bar	
	Orifice size	1,3 mm	(1,1 mm for 2 W)
	Maximum fluid temperature	50°C	
	Maximum ambient temperature	50°C	
	Maximum flow rate at 6 bar with $\Delta p = 1$	53 NI/min	(35 NI/min. for 2 W)
	Cycles/minute	700	
	Fluids	Air- acuum-Inert gases	
	Lubrication	Non needed	
	Life	40 ÷ 50 million cycles	
Electrical	Power consumption inrush - D.C	-	
	Power consumption inrush - A.C	9 A	
	Power consumption holding - D.C	5 W	(2 W)
	Power consumption holding - A.C	6 A	
	Operating voltage tolerance	10	
	Response time opening	40 ms	
	Response time closing	21 ms	
	Insulation of the copper wire	H	
	Insulation of the coil	F	
	Connector protection	IP 65	
	Cable protection	PG 9	

The response times were determined using standard procedure CETOP RP 82 P.

Maintenance and replacement parts

Maintenace practices for these valves are similar to those already detailed for other products - replacement of the plunger or poppet is not advisable since the new replacement would not provide the best fit with the rest of the already used valve.

Special care should be taken that no dirt is accumulated between the working surface of fixed core and the plunger which would result in vibrations and overheating of the solenoid. In the case of microsolenoid it must be assured that the alternate current coil is not charged when the machanical part is not mounted to avoid destruction of the coil.

The electrical connections have to be perfect, especially where low currents are used (12-24). Oxidation of contacts between the connector and the coil can lead to intermittent malfunctions which are difficult to trace. Oxidation of contacts due to humidity or corrosive atmosphere are one of the most common causes of false alarms. Clean the contacts with appropriate spray.

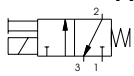
**Mechanical actuator for Normally Closed (N.C.)
Miniature solenoid valve**

Normally Closed (N.C.)

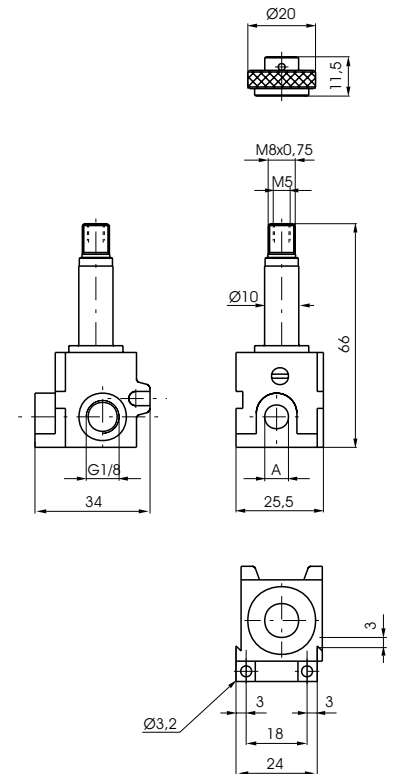
Ordering code

- 305.M1 A = G 1/8
- 355.M1 A = M 5
- 345.M1 A = Push in fitting for 4 mm tube

- 305.M1/9 A = G 1/8
- 355.M1/9 A = M 5
- 345.M1/9 A = Push in fitting for 4 mm tube



2 W
24 C

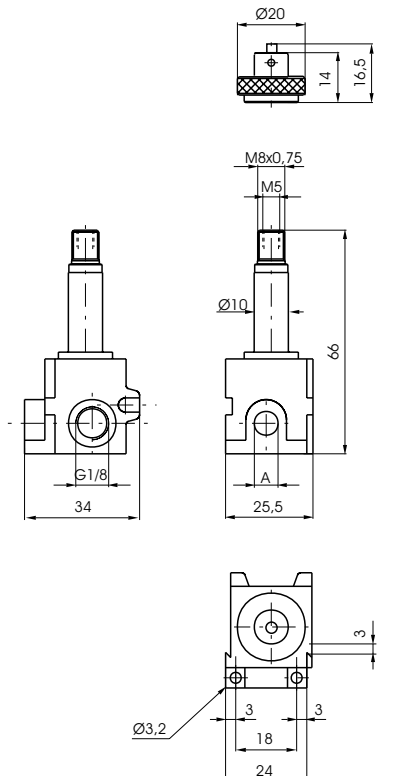
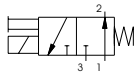


Weight gr. 106

Normally Open (N.O.)

Ordering code

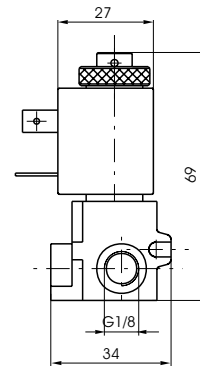
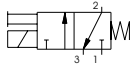
- 305.M1/1 A = G 1/8
- 355.M1/1 A = M 5
- 345.M1/1 A = Push in fitting for 4 mm tube



Weight gr. 106



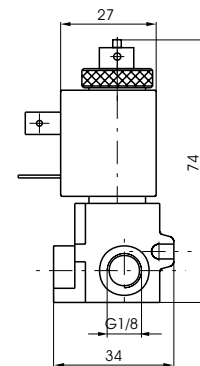
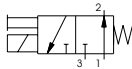
Miniature solenoid valve



Weight gr. 160

Normally Closed (N.C.)

Ordering code			Available voltage	
G 1/8"	M 5	TUBE 4	Miniature solenoid	
305.M4	355.M4	345.M4	12 D.C.	Direct current
305.M5	355.M5	345.M5	24 D.C.	
305.M6	355.M6	345.M6	48 D.C.	
305.M9	355.M9	345.M9	24 D.C. (2 Watt)	
305.M17	355.M17	345.M17	24/50	Alternating current 50 Hz
305.M21	355.M21	345.M21	48/50	
305.M22	355.M22	345.M22	110/50	
305.M24	355.M24	345.M24	220/50	
305.M37	355.M37	345.M37	24/60	Alternating current 60 Hz
305.M39	355.M39	345.M39	110/60	
305.M41	355.M41	345.M41	220/60	
305.M56	355.M56	345.M56	24/50-60	Alternating current 50/60 Hz
305.M57	355.M57	345.M57	110/50-60	
305.M58	355.M58	345.M58	220/50-60	



Weight gr. 165

Normally Open (N.O.)

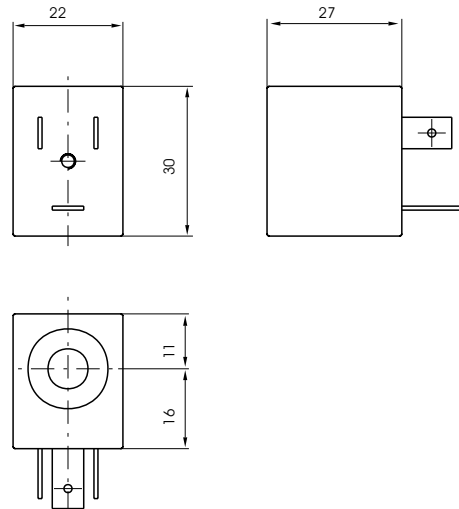
Ordering code			Available voltages	
G 1/8"	M 5	TUBE 4 mm	Miniature solenoid	
305.M10/1	355.M10/1	345.M10/1	24 D.C. (8 Watt)	Direct current
305.M17/1	355.M17/1	345.M17/1	24/50	Alternating current 50 Hz
305.M21/1	355.M21/1	345.M21/1	48/50	
305.M22/1	355.M22/1	345.M22/1	110/50	
305.M24/1	355.M24/1	345.M24/1	220/50	
305.M37/1	355.M37/1	345.M37/1	24/60	Alternating current 60 Hz
305.M39/1	355.M39/1	345.M39/1	110/60	
305.M41/1	355.M41/1	345.M41/1	220/60	
305.M56/1	355.M56/1	345.M56/1	24/50-60	Alternating current 50/60 Hz
305.M57/1	355.M57/1	345.M57/1	110/50-60	
305.M58/1	355.M58/1	345.M58/1	220/50-60	



Coil



Weight gr. 54

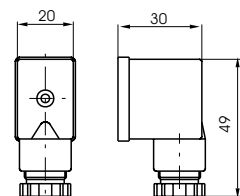


Ordering code		Available voltages	
N.C.	N.O.	Coil	
MB4 MB5 MB6 MB9	MB10/1	12 D.C. 24 D.C. 48 D.C. 24 D.C. (2 Watt) 24 D.C. (8 Watt)	Direct current
MB17 MB21 MB22 MB24	MB17/1 MB21/1 MB22/1 MB24/1	24/50 48/50 110/50 220/50	Alternating current 50 Hz
MB37 MB39 MB41	MB37/1 MB39/1 MB41/1	24/60 110/60 220/60	Alternating current 60 Hz
MB56 MB57 MB58	MB56/1 MB57/1 MB58/1	24/50-60 110/50-60 220/50-60	Alternating current 50/60 Hz

Electrical connector

Ordering code

- 305.11.00 Normal
- 305.11.0 L Led
- 1 = 24 D.C./A.C.
- 2 = 110 50/60Hz
- 3 = 220 50/60Hz



1



General

The most interesting aspects of this bi-stable miniature solenoid valve operating with D.C. only, is that it can be commuted with a simple electric impulse and stay commuted till an inverted polarity impulse deactivates it. It means that the valve is not automatically deactivated if current fail as happens with normal solenoid valves.

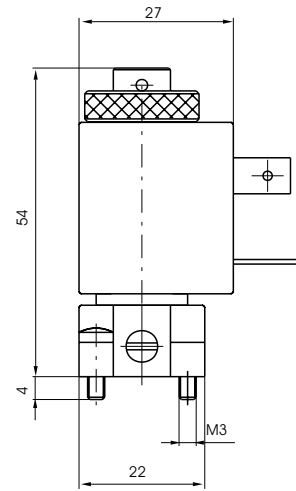
The applications differ but are all based on above mentioned feature.

The internal construction is relatively special. The fix plunger is equipped with a permanent magnet that hold or release the mobile plunger according to the magnetic field generated by the coil.

A specific coil is used for this application and it cannot be replaced by the standard ones.

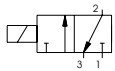
Ordering code is **MBB5**.

Miniature solenoid valve for distributors and bases



Ordering code

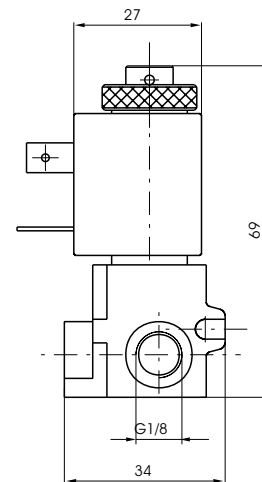
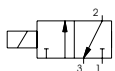
M5/B



Miniature solenoid valve with inseries mounting base

Ordering code

305.M5/B = G 1/8
355.M5/B = M5
345.M5/B = Fitting for 4 mm tube





Electric pilot CNOMO (coil not included)

Mechanics with base for solenoid to be used where an electric pilot system is required.

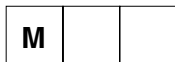
May be used on all sizes and is standardized as an interface on the distributor.

The base is fitted with a manual control which is pulse actuated, without check, or with two stable positions, actuated by means of a screwdriver (pressing down and turning clockwise by 90°).

Two different types of solenoids can be mounted on the stem, one in conformity with ISO standard size 30x38 and ISO 4400 (DIN 43650) electrical connection, and a compact one size 22x27, having the same performance but at lower price. The technical characteristics of the latter are described in the catalogue, series 300, and refer to MB solenoids.

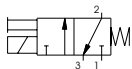
The base is fitted with screws (M4x30) for fastening to the distributor.

Ordering code

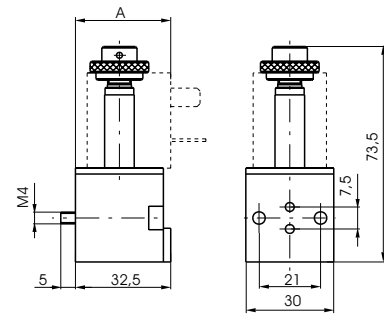


P = Manual 1 position
= Manual 2 positions

3 = Mechanics CNOMO
4 = 2-W Mechanics CNOMO



Weight gr. 60



A = 33 (with MB solenoid)
A = 38 (with MC solenoid)

General characteristics

Structural	Body	Thermoplastic polyester	
	Stem	Nickel-plated brass	
	Cores	AISI 430F stainless steel	
	Springs	AISI 302 stainless steel	
	Shutters	iton	
	Other seals	NBR	
	Manual control	Nickel-plated brass	
	Pneumatic	Fluid	Air, Neutral gases
Working pressure		0 ÷ 10 bar	
Fluid ambient temperature		-5°C 50°C	
Flow rate at 6 bar with Δp 1 bar		53 NI/min	(20 NI/min for 2 W)
Nominal flow cross section		1,3 mm	(0,9 mm for 2 W)
Electric	Power consumption inrush - A.C.	13 A	
	Power consumption holding - D.C.	3,5 W	(2 W)
	Power consumption holding - A.C.	8,5 A	
	Operating voltage tolerance	10	
	Response time opening	40 ms	
	Response time closing	21 ms	
	Insulation of the copper wire	H	
	Insulation of the coil	F	
	Connector protection	IP 65	
	Cable protection	PG 11	

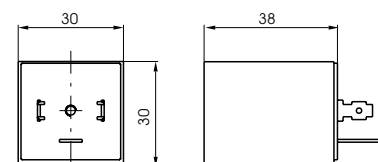
The response times were determined using standard procedure CETO RP 82 P.

Coil

Ordering code	Available voltages
	coil
MC5	24 D.C.
MC9	24 D.C. (2 Watt)
MC56	24/50-60 Hz
MC57	110/50-60 Hz
MC58	230/50-60 Hz



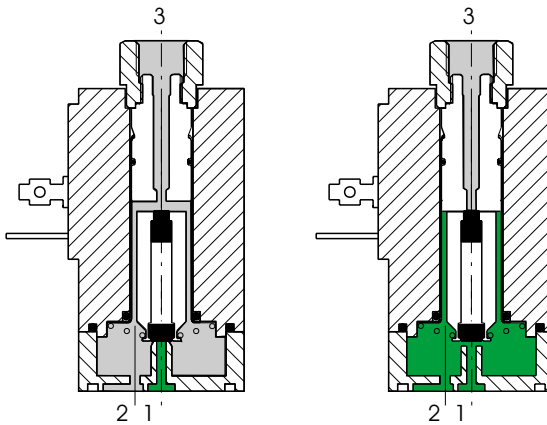
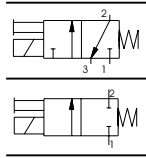
Weight gr. 110





Functional schematic

Normally Closed (N.C.) 3/2 or 2/2

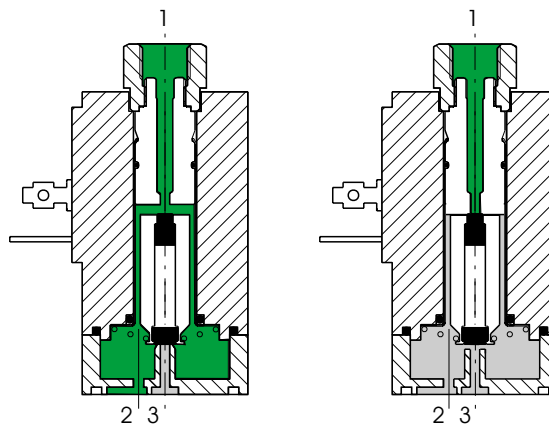
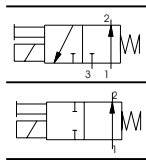


AT REST

ACTUATED

- 1 = INLET PORT
- 2 = OUTLET PORT
- 3 = EXHAUST PORT
(Plugged if 2/2)

Normally Open (N.O.) 3/2 or 2/2



AT REST

ACTUATED

Construction characteristics

Electrical parts: Solenoids: the solenoid consists of coils having different diameter copper wire windings insulated according standards "H"; they are encased in a nylon-glass compound. All parts are corrosion resistant.

Mechanical parts: Stainless steel tube and plunger (AISI 430F), stainless steel adjusted springs, viton poppet seals, tropicalized zinc alloy interface plate, nitrile (NBR) seal nickeled brass manual override, nickel steel coil lock nut, zinc steel mounting screws.
To be usable, the solenoids have to be attached either to a base or directly to the distributor s operators by means of connectors G 1/8".
Electrical connectors are standard. These solenoid are available in all voltages and frequencies used in the world. The following are the technical characteristics of the solenoid.



Technical characteristics

Pneumatic	Working pressure	0 ÷ 10 bar
	Orifice size	1,8 mm
	Maximum fluid temperature	50°C
	Maximum ambient temperature	50°C
	Maximum flow rate at 6 bar with $\Delta p = 1$	80 NI/min
	Cycles/minute	700
	Fluids	Air- acuum-Inert gases
	Lubrication	Not required
	Life	40 to 50 millions
Electric	Power consumption inrush - D.C.	-
	Power consumption inrush - A.C.	19,5 A
	Power consumption holding - D.C.	8,2 W
	Power consumption holding - A.C.	9 A
	Operating voltage tolerance	10
	Response time opening	40 ms
	Response time closing	21 ms
	Insulation of the copper wire	H
	Insulation of the coil	F
	Connector protection	IP 65
	Cable protection	PG 11

The response times were determined using standard procedure CETO RP 82 P. The

Maintenance and replacement parts

Maintenance practices for these valves are similar to those already detailed for other products - replacement of the plunger or poppet is not advisable since the new replacement would not provide the best fit with the rest of the already used valve.

Special care should be taken that no dirt is accumulated between the working surface of fixed cores 3 and the plunger 2 which would result in vibrations and overheating of the solenoid. In the case of microsolenoid it must be assured that the alternate current coil is not charged when the mechanical part is not mounted to avoid destruction of the coil.

The electrical connections have to be perfect, especially where low currents are used (12-24). Oxidation of contacts between the connector and the coil can lead to intermittent malfunctions which are difficult to trace. Oxidation of contacts due to humidity or corrosive atmosphere are one of the most common causes of false alarms. Clean the contacts with appropriate spray.

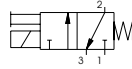


Solenoid valve S and S/1

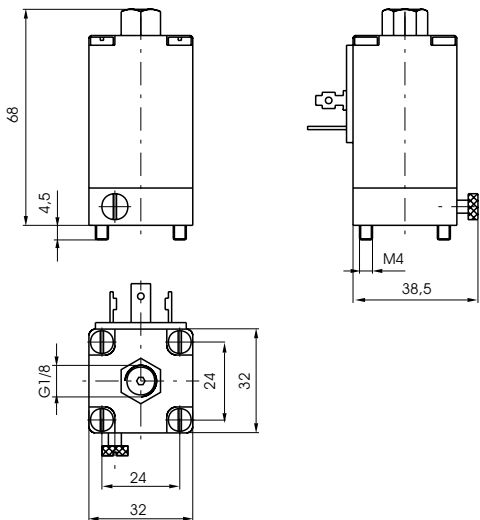
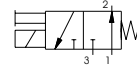


Weight gr. 220

Normally Closed
(N.C.) - **S**



Normally Open
(N.A.) - **S/1**

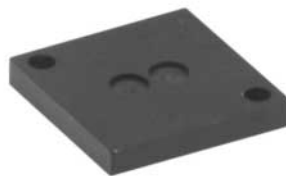


Ordering code		Available voltages	
		Coil	
S 2	S 2/1	6 D.C.	Direct current
S 4	S 4/1	12 D.C.	
S 5	S 5/1	24 D.C.	
S 6	S 6/1	48 D.C.	
S 16	S 16/1	12/50	Alternating current 50 Hz
S 17	S 17/1	24/50	
S 19	S 19/1	32/50	
S 20	S 20/1	42/50	
S 21	S 21/1	48/50	
S 22	S 22/1	110/50	
S 23	S 23/1	115/50	
S 24	S 24/1	220/50	
S 25	S 25/1	240/50	
S 36	S 36/1	12/60	Alternating current 60 Hz
S 37	S 37/1	24/50	
S 38	S 38/1	48/60	
S 39	S 39/1	110/60	
S 40	S 40/1	115/60	
S 41	S 41/1	220/60	
S 42	S 42/1	240/60	
S 56	S 56/1	24/50-60	Alternating current 50/60 Hz
S 57	S 57/1	110/50-60	
S 58	S 58/1	220/50-60	

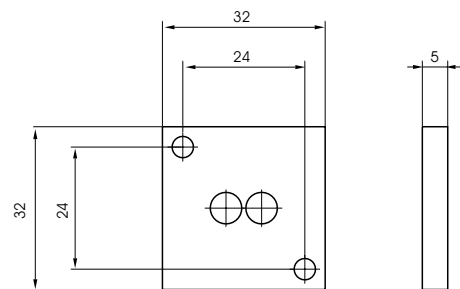
Closing plate

Ordering code

300.12.00



Weight gr. 14



External feeding base

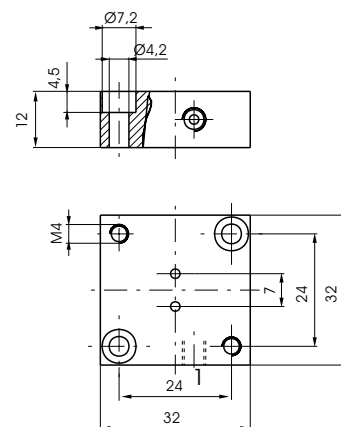
To be used with electrodistributeurs to get a different piloting pressure from the line one.

Ordering code

300.10.5



Weight gr. 35





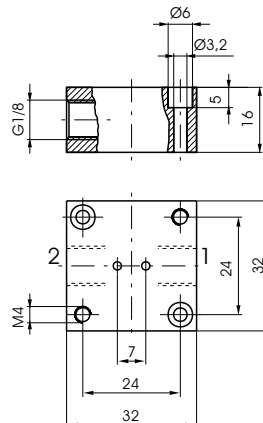
Individual base



In line port - thread G 1/8"

1 = INLET PORT (N.C.)
2 = OUTLET PORT (N.C.)

With solenoid valve N.O.
1 = EXHAUST PORT
2 = OUTLET PORT



Ordering code

300.04.00

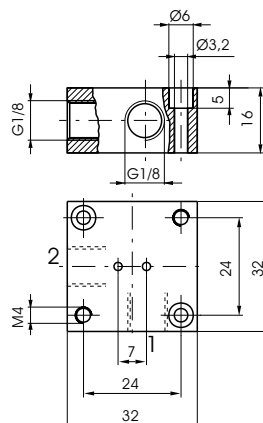
Weight gr. 40



90° Port - thread G 1/8"

1 = INLET PORT (N.C.)
2 = OUTLET PORT (N.C.)

With solenoid valve N.O.
1 = EXHAUST PORT
2 = OUTLET PORT



Ordering code

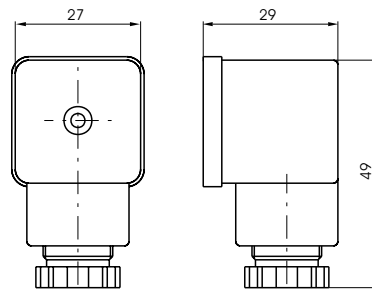
300.04.90

Weight gr. 40

Electrical connector

Ordering code

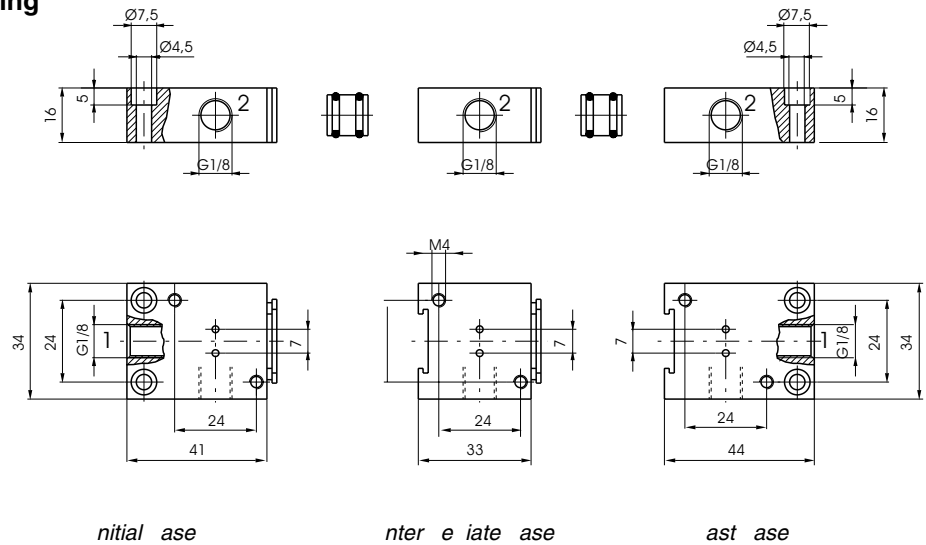
- 300.11.00** Normal
- 300.11.0 L** Led
- 1 = 24 D.C./A.C.
- 2 = 110 50/60Hz
- 3 = 220 50/60Hz



Weight gr. 25



Modular bases for series mounting



Ordering code

nitil ase
300.05.00

nter e iate ase
300.06.00

ast ase
300.07.00

ore spacer
300.05.01
Weight gr. 5

oli space
300.05.02
Weight gr. 6

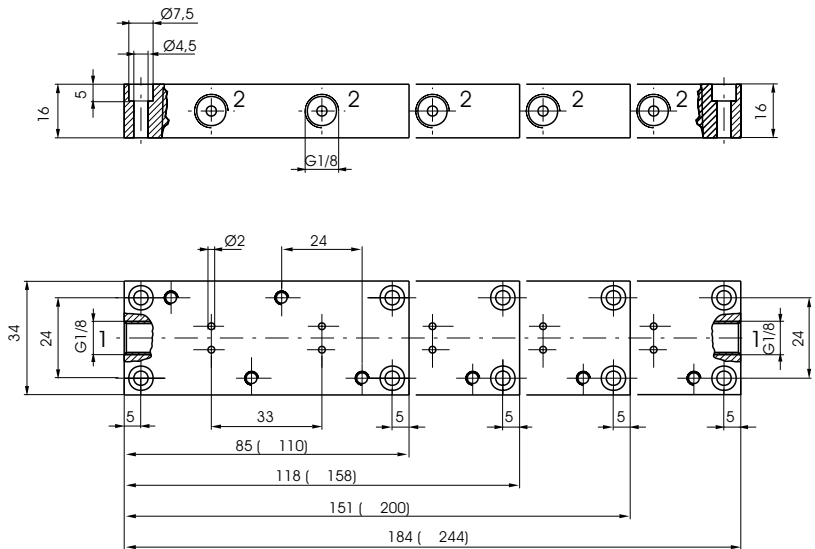


Weight gr. 52

Weight gr. 40

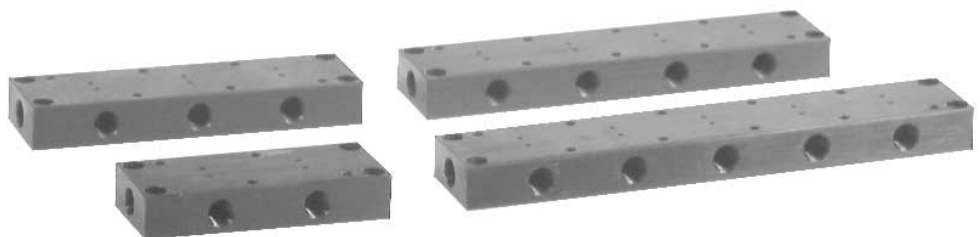
Weight gr. 52

Multiple integral bases for series mounting



Ordering code

- 300.08.02** 2 positions
- 300.08.03** 3 positions
- 300.08.04** 4 positions
- 300.08.05** 5 positions





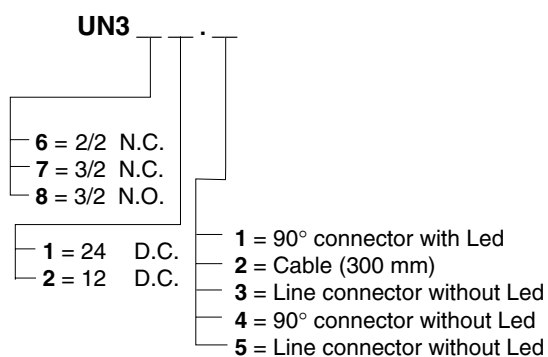
General

The series Curs homologated solenoid valves (valid for USA and Canada file n. E206325- AIU2, AIU8) are different from the standard ones for microsolenoid made with an injected RYNITE[®] embedded copper wire (they are included in class "F" insulation).

Refer to standard versions as for as other details and accessories to be used with solenoid valves.

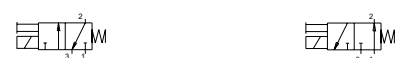
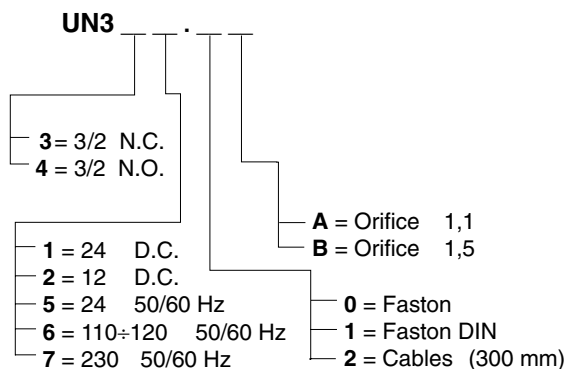
Miniature solenoid valve 10mm

Ordering code



Miniature solenoid valve 15mm

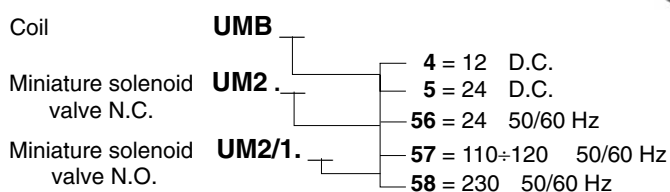
Ordering code



On request and for large quantity only (only 24 D.C. 2,3 W)

Miniature solenoid valve 22mm

Ordering code





Miniature solenoid valve 22mm for series mounting

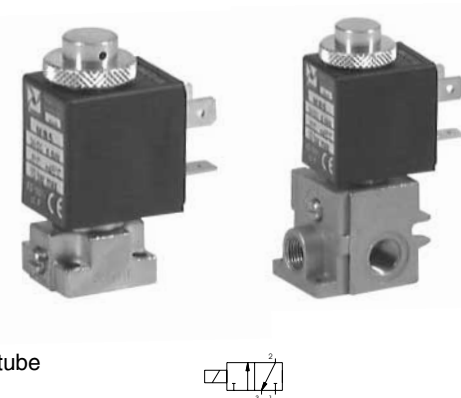
Ordering code

- Coil N.C. **UMB**
 - 4 = 12 D.C.
 - 5 = 24 D.C.
 - 56 = 24 50/60 Hz
 - 57 = 110÷120 50/60 Hz
 - 58 = 230 50/60 Hz
- Coil N.O. **UMB /1**
 - 10 = 24 D.C. 8W
 - 56 = 24 50/60 Hz
 - 57 = 110÷120 50/60 Hz
 - 58 = 230 50/60 Hz
- Solenoid valve N.C. **U3 5.M**
 - 0 = G1/8"
 - 5 = M5
 - 4 = fitting for 4mm tube
 - 4 = 12 D.C.
 - 5 = 24 D.C.
 - 56 = 24 50/60 Hz
 - 57 = 110÷120 50/60 Hz
 - 58 = 230 50/60 Hz
- Solenoid valve N.O. **U3 5.M /1**
 - 0 = G1/8"
 - 5 = M5
 - 4 = fitting for 4mm tube
 - 10 = 24 D.C. 8W
 - 56 = 24 50/60 Hz
 - 57 = 110÷120 50/60 Hz
 - 58 = 230 50/60 Hz



Bi stable miniature solenoid valve 22mm

- Coil **UMBB5**
- Miniature solenoid valve for distributors and bases (N.C.) **UM5/B**
- Miniature solenoid valve with inseries mounting base (N.C.) **U3 5.M5/B**
 - 0 = G1/8"
 - 5 = M5
 - 4 = fitting for 4mm tube



Solenoid valve 30 mm (for mechanics M3 and M4 pag. 1.20)

Ordering code

- UMC5** = 24 D.C.
- UMC56** = 24 50/60 Hz
- UMC57** = 110÷120 50/60 Hz
- UMC58** = 230 50/60 Hz



Solenoid valve 32 mm

Ordering code

- Solenoid valve N.C. **US**
- Solenoid valve N.O. **US /1**
 - 4 = 12 D.C.
 - 5 = 24 D.C.
 - 56 = 24 50/60 Hz
 - 57 = 110÷120 50/60 Hz
 - 58 = 230 50/60 Hz



Solenoid valves

Series 400

Solenoid valves G 1/8"

Solenoid valves G 1/4"

Solenoid valves G 1/4" Compact series

Solenoid valves G 1/4" Compact series
for gang mounting

Solenoid valves G 1/4" sub base "NAMUR"

Solenoid valves G 1/2"

Solenoid valves G 1"

Solenoid valves ECO 2518 G 1/8"
ECO 2514 G 1/4"



General

These are 2 stage valves actuated electro-pneumatically. A serie 300 directly operated solenoid valve actuates pneumatically the principal power distributor. This integrated system allows configurations of systems requiring very little space. The pilot air is normally taken from the inlet port (autofeed) and the only actuating signal is electric.

The range of the solenoid valves, as far as dimensions and mechanical construction, is similar to series 200. We have therefore solenoid valves G 1/8", G 1/4", G 1/2" and G 1" with identical pneumatic characteristics that are, however, actuated electrically. They have a balanced spool, insensitive to presence or absence of pressure. They are constructed in 3 and 5 way with 1 solenoid (monostable) or 2 solenoids (bistable) and also 5 ways 3 positions with closed centres, open centres and pressured centres.

It should be noted that the autofeed of the electric pilot requires always inlet through port 1 and if a 3 ways normally open configuration is desired, it is necessary to switch the operators.

In the tables showing individual valves, the quick reference tables show the output in NI/min at a inlet pressure of 6 bar and a pressure drop of 1 bar. All information was obtained using standards CETOP RP 50P.

Solenoid valves G 1/8" and G 1/4" can be equipped with microsolenoids as well as standard solenoids and they can be mounted in line or in 90 degrees on distributors. Please note that while the microsolenoid can be mounted in any direction, standard solenoid requires mounting as indicated in the photographs and diagrams.

The order codes pertain only to the solenoid valve with mechanical actuator "M2" or solenoid "S*" already assembled (see Series 300, section 1). (M2 coils are not included and have to be ordered separately).

Coils for M2 and solenoids "S"  homologated are available (see page 1.26 - 1.27).

The polyurethane seals are available for oil free operation. In this case, the ordering code becomes :

438...S5 and 478...M2 for G 1/8" - 434...S5 and 474...M2 for G 1/4" 432...S5 for G 1/2"

Important: on this type of valves a temperature higher than 40°C along with water or high humidity are causing a progressive reduction of mechanical characteristics of the seals. This chemical reaction (hydrolysis) duration depends by the ambient temperature and in some cases the seal becomes brittle and falls to pieces.

The valves equipped with polyurethane seals are not suitable for tropical climate.

Construction characteristics

Body	Anodized aluminium alloy
Operators	Anodized aluminium alloy Polyacetal for spring bottom plate G 1/8", G 1/4", G 1/2" and aluminium for G 1"
Spools	Hardened nickel plated steel
Seals	Nitrile rubber (NBR) oil resistant Polyurethane compound for oil free applications G 1/8", G 1/4" and G 1/2"
Spacers	Polyacetal (aluminium for G 1")
Spring	Stainless steel or spring steel

Use and maintenance

These valves are a mean life of 10 to 15 millions of cycles depending on application.

Proper lubrication with specified oil reduces dramatically the wear of the seals as well as a good filtration insures long and trouble free operation. Check that the operating conditions are according to the suggested pressure, temperature and so on.

The exhaust ports of the distributor have to be protected in a dusty and dirty environment.

A spare parts kit including the spool complete with seals and actuators are available for overhauling the valve. This simple operation does not require a skilled worker. Although particular care is needed for assembling the valve.

ATTENTION: use hydraulic oil class H for lubrication such as MAGNA GC 32 (Castrol).



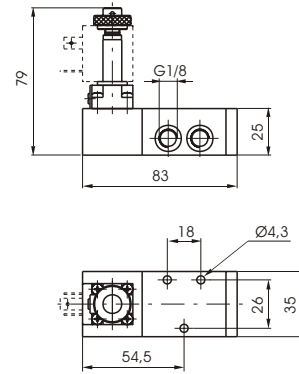
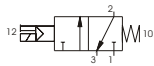
Solenoid Spring

Ordering code

468.32.0.1.M2



Weight gr. 240



3/2

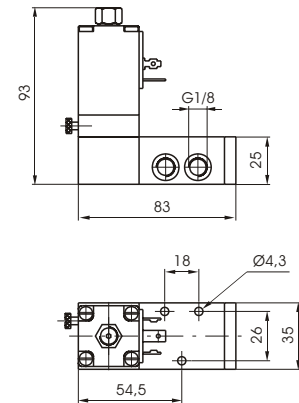
428.32.0.1.S*

S* = solenoid code
(see page 1.23)



Weight gr. 400

Minimum operating pressure 2,5 bar



3/2

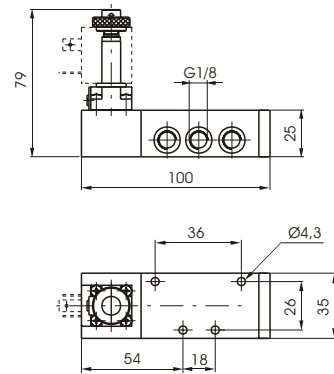
Solenoid Spring

Ordering code

468.52.0.1.M2



Weight gr. 280



5/2

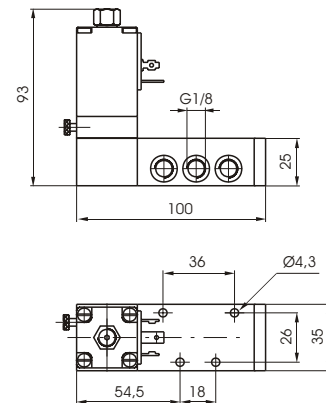
428.52.0.1.S*

S* = solenoid code
(see page 1.23)



Weight gr. 430

Minimum operating pressure 2,5 bar



5/2

Operational characteristics

Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	540 NI/min	6 mm	G 1/8"

<p>Solenoid Differential</p> <hr/> <p>Ordering code</p> <hr/> <p>468.32.0.12.M2</p>						<p>3/2</p>	
		<p>Weight gr. 280</p>		<hr/>			
<p>428.32.0.12.S* S* = solenoid code (see page 1.23)</p>						<p>3/2</p>	
<p>Minimum operating pressure 2,5 bar</p>		<p>Weight gr. 450</p>		<hr/>			
<p>Solenoid Differential</p> <hr/> <p>Ordering code</p> <hr/> <p>468.52.0.12.M2</p>						<p>5/2</p>	
		<p>Weight gr. 320</p>		<hr/>			
<p>428.52.0.12.S* S* = solenoid code (see page 1.23)</p>						<p>5/2</p>	
<p>Minimum operating pressure 2,5 bar</p>		<p>Weight gr. 480</p>		<hr/>			
<p>Operational characteristics</p>	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	540 NI/min	6 mm	G 1/8"



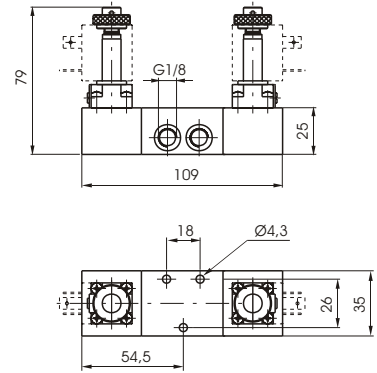
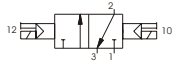
Solenoid Solenoid

Ordering code

468.32.0.0.M2



Weight gr. 370



3/2

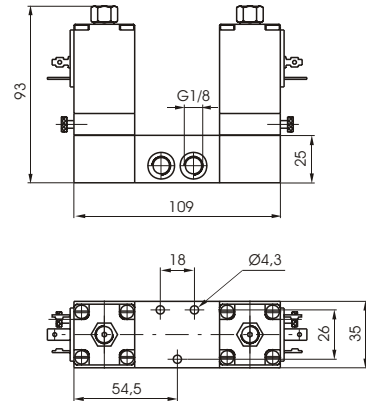
428.32.0.0.S*

S* = solenoid code
(see page 1.23)



Weight gr. 1030

Minimum operating pressure 2 bar

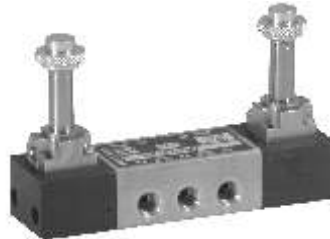


3/2

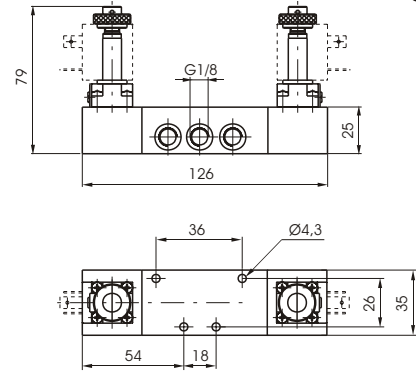
Solenoid Solenoid

Ordering code

468.52.0.0.M2



Weight gr. 410



5/2

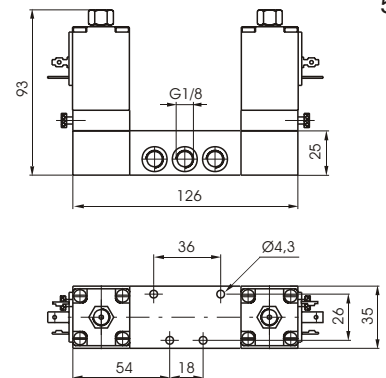
428.52.0.0.S*

S* = solenoid code
(see page 1.23)



Weight gr. 730

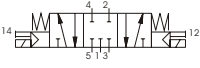

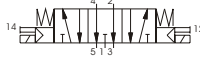
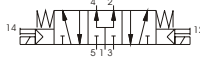
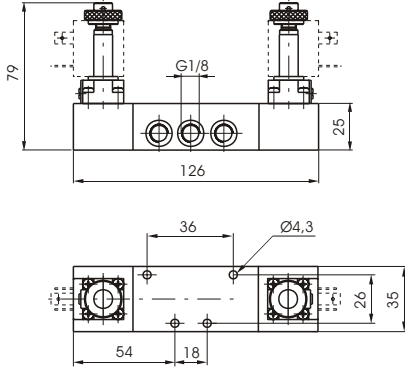
Minimum operating pressure 2 bar



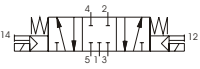

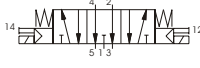
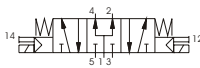
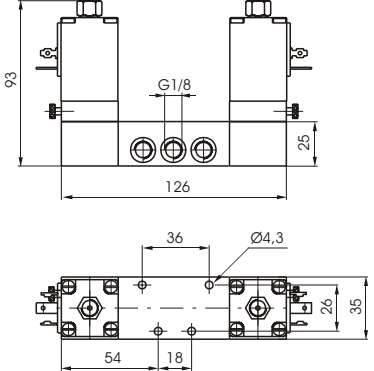
5/2

Operational characteristics

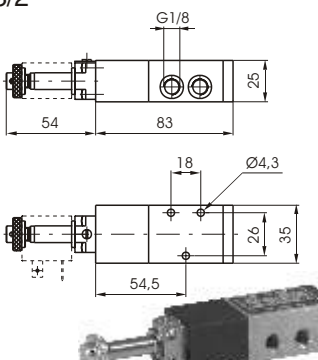
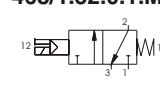
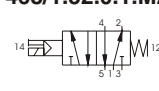
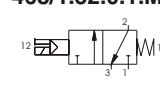
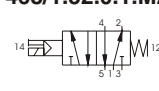
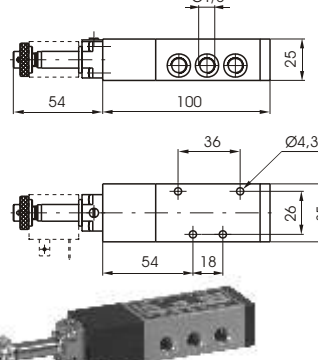
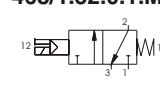
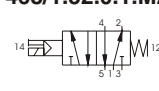
Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	540 NI/min	6 mm.	G 1/8"

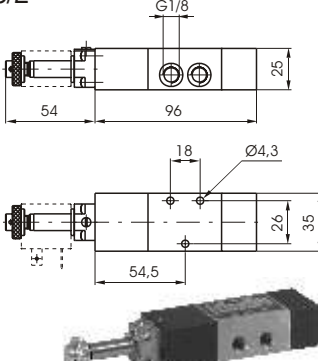
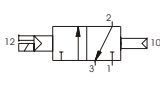
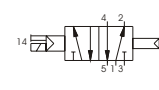
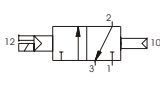
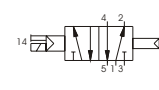
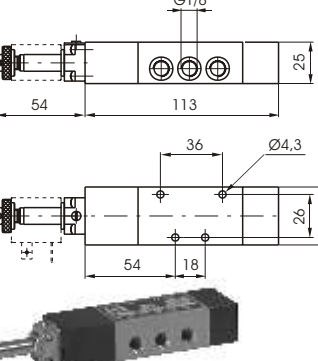
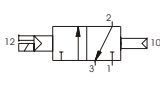
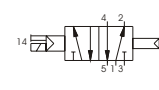
Solenoid Solenoid	5/3
Ordering code	
<p>468.53.31.0.0.M2 <i>Closed centres</i></p> 	
<p>468.53.32.0.0.M2 <i>Open centres</i></p> 	
<p>468.53.33.0.0.M2 <i>Pressured centres</i></p> 	
	
Minimum operating pressure 2,5 bar	Weight gr. 420

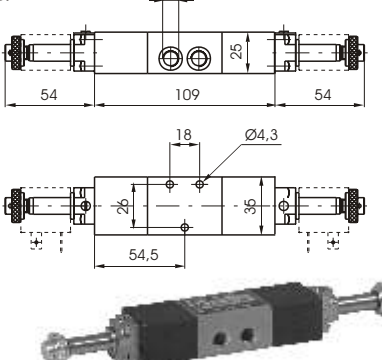
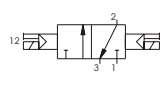
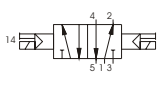
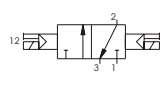
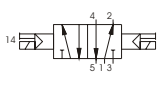
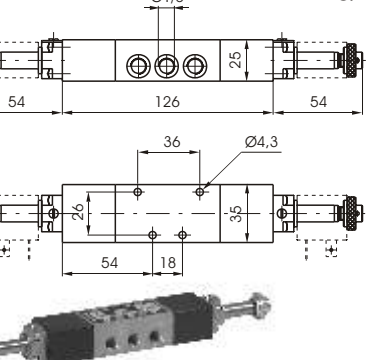
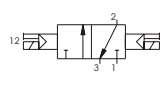
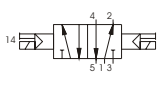
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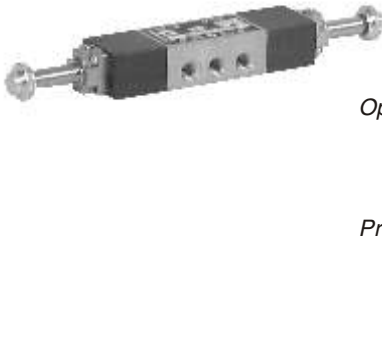
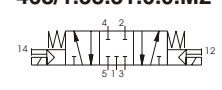
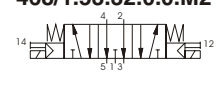

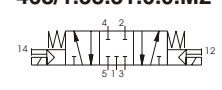
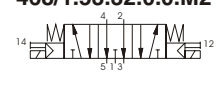

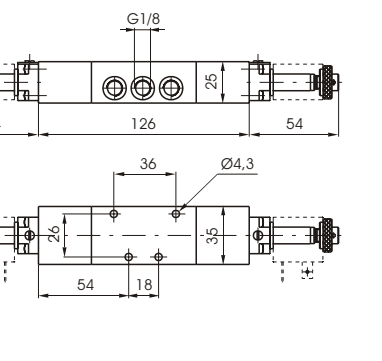
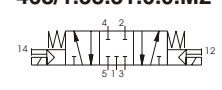
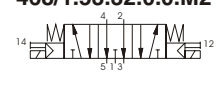

Solenoid Solenoid	5/3
Ordering code	
<p>428.53.31.0.0.S* <i>Closed centres</i></p> 	
<p>428.53.32.0.0.S* <i>Open centres</i></p> 	
<p>428.53.33.0.0.S* <i>Pressured centres</i></p> 	
	
<p>S* = solenoid code (see page 1.23)</p>	
Minimum operating pressure 2,5 bar	Weight gr. 740

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	410 NI/min	6 mm.	G 1/8"

<p>3/2</p> 	<p>Solenoid Spring</p> <hr/> <p>Ordering code</p> <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; border-right: 1px solid black; padding: 5px;">468/1.32.0.1.M2</td> <td style="padding: 5px;">468/1.52.0.1.M2</td> </tr> <tr> <td style="border-right: 1px solid black; text-align: center; padding: 5px;"></td> <td style="text-align: center; padding: 5px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">Weight gr. 240</td> <td style="padding: 5px;">Weight gr. 280</td> </tr> </table> <p>Minimum operating pressure 2,5 bar</p>	468/1.32.0.1.M2	468/1.52.0.1.M2			Weight gr. 240	Weight gr. 280	<p>5/2</p> 
468/1.32.0.1.M2	468/1.52.0.1.M2							
								
Weight gr. 240	Weight gr. 280							

<p>3/2</p> 	<p>Solenoid Differential</p> <hr/> <p>Ordering code</p> <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; border-right: 1px solid black; padding: 5px;">468/1.32.0.12.M2</td> <td style="padding: 5px;">468/1.52.0.12.M2</td> </tr> <tr> <td style="border-right: 1px solid black; text-align: center; padding: 5px;"></td> <td style="text-align: center; padding: 5px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">Weight gr. 280</td> <td style="padding: 5px;">Weight gr. 320</td> </tr> </table> <p>Minimum operating pressure 2,5 bar</p>	468/1.32.0.12.M2	468/1.52.0.12.M2			Weight gr. 280	Weight gr. 320	<p>5/2</p> 
468/1.32.0.12.M2	468/1.52.0.12.M2							
								
Weight gr. 280	Weight gr. 320							

<p>3/2</p> 	<p>Solenoid Solenoid</p> <hr/> <p>Ordering code</p> <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; border-right: 1px solid black; padding: 5px;">468/1.32.0.0.M2</td> <td style="padding: 5px;">468/1.52.0.0.M2</td> </tr> <tr> <td style="border-right: 1px solid black; text-align: center; padding: 5px;"></td> <td style="text-align: center; padding: 5px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">Weight gr. 370</td> <td style="padding: 5px;">Weight gr. 410</td> </tr> </table> <p>Minimum operating pressure 2 bar</p>	468/1.32.0.0.M2	468/1.52.0.0.M2			Weight gr. 370	Weight gr. 410	<p>5/2</p> 
468/1.32.0.0.M2	468/1.52.0.0.M2							
								
Weight gr. 370	Weight gr. 410							

	<p>Solenoid Solenoid</p> <hr/> <p>Ordering code</p> <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; padding: 5px;"><i>Closed centres</i> 468/1.53.31.0.0.M2</td> <td style="padding: 5px;"></td> </tr> <tr> <td style="padding: 5px;"><i>Open centres</i> 468/1.53.32.0.0.M2</td> <td style="padding: 5px;"></td> </tr> <tr> <td style="padding: 5px;"><i>Pressured centres</i> 468/1.53.33.0.0.M2</td> <td style="padding: 5px;"></td> </tr> </table> <p>Weight gr. 420 Minimum operating pressure 3 bar</p>	<i>Closed centres</i> 468/1.53.31.0.0.M2		<i>Open centres</i> 468/1.53.32.0.0.M2		<i>Pressured centres</i> 468/1.53.33.0.0.M2		<p>5/3</p> 
<i>Closed centres</i> 468/1.53.31.0.0.M2								
<i>Open centres</i> 468/1.53.32.0.0.M2								
<i>Pressured centres</i> 468/1.53.33.0.0.M2								

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	540 NI/min (3/2-5/2) 410 NI/(5/3)	6 mm	G 1/8"

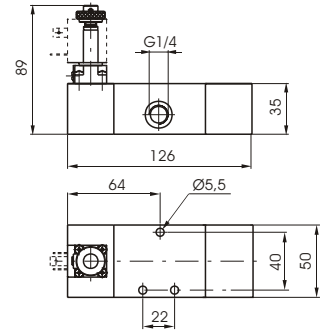
Solenoid Spring							3/2
Ordering code							
464.32.0.1.M2							
Weight gr. 530							
Solenoid Spring							3/2
Ordering code							
424.32.0.1.S*							
S* = solenoid code (see page 1.23)							
Minimum operating pressure 2,5 bar		Weight gr. 680					
Solenoid Spring							5/2
Ordering code							
464.52.0.1.M2							
Weight gr. 625							
Solenoid Spring							5/2
Ordering code							
424.52.0.1.S*							
S* = solenoid code (see page 1.23)							
Minimum operating pressure 2,5 bar		Weight gr. 770					
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	1360 NI/min	6 mm	G 1/4"

**Solenoid
Differential**

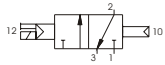
3/2

Ordering code

464.32.0.12.M2

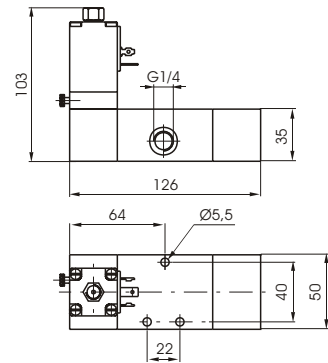
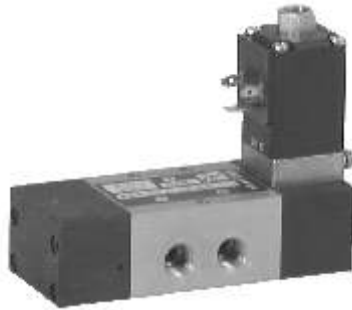


Weight gr. 650



424.32.0.12.S*

S* = solenoid code
(see page 1.23)



Weight gr. 800

Minimum operating pressure 2,5 bar

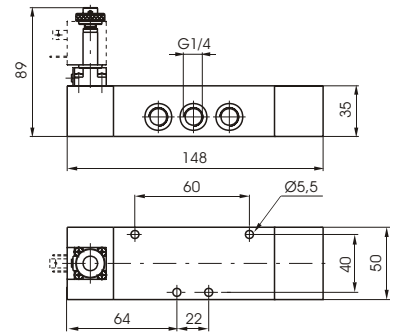
3/2

**Solenoid
Differential**

5/2

Ordering code

464.52.0.12.M2

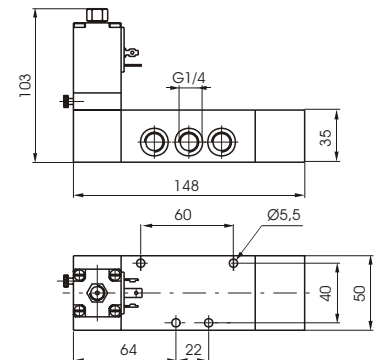


Weight gr. 740



424.52.0.12.S*

S* = solenoid code
(see page 1.23)



Weight gr. 890

Minimum operating pressure 2,5 bar

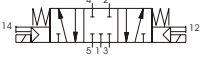

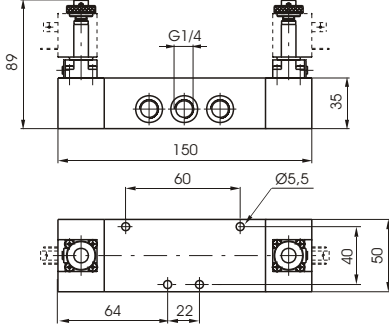
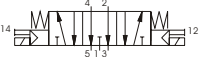
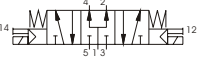
5/2

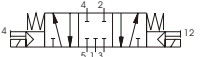

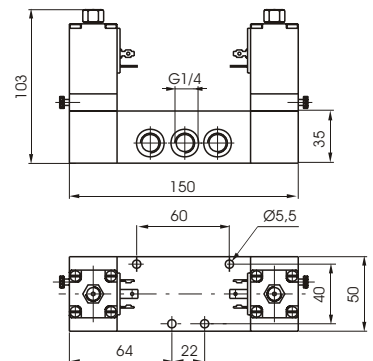
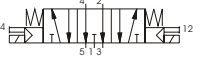
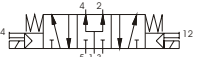
**Operational
characteristics**

Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
		min. -5°C	max. +50°C			
Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	1360 NI/min	8 mm.	G 1/4"

<p>Solenoid Solenoid</p> <hr/> <p>Ordering code</p> <p>464.32.0.0.M2</p>				<p>3/2</p>			
		<p>Weight gr. 730</p>					
<p>424.32.0.0.S*</p> <p>S* = solenoid code (see page 1.23)</p>				<p>3/2</p>			
<p>Minimum operating pressure 2 bar</p>		<p>Weight gr. 1030</p>					
<p>Solenoid Solenoid</p> <hr/> <p>Ordering code</p> <p>464.52.0.0.M2</p>				<p>5/2</p>			
		<p>Weight gr. 820</p>					
<p>424.52.0.0.S*</p> <p>S* = solenoid code (see page 1.23)</p>				<p>5/2</p>			
<p>Minimum operating pressure 2 bar</p>		<p>Weight gr. 1140</p>					
<p>Operational characteristics</p>	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	1360 NI/min	8 mm	G 1/4"



Solenoid Solenoid		5/3
Ordering code		
<p>464.53.31.0.0.M2 <i>Closed centres</i></p> 		
<p>464.53.32.0.0.M2 <i>Open centres</i></p> 		
<p>464.53.33.0.0.M2 <i>Pressured centres</i></p> 		
Minimum operating pressure 3 bar	Weight gr. 820	

Solenoid Solenoid		5/3
Ordering code		
<p>424.53.31.0.0.S* <i>Closed centres</i></p> 		
<p>424.53.32.0.0.S* <i>Open centres</i></p> 		
<p>424.53.33.0.0.S* <i>Pressured centres</i></p> 		
S* = solenoid code (see page 1.23)		
Minimum operating pressure 3 bar	Weight gr. 1140	

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	1280 NI/min	8 mm	G 1/4"

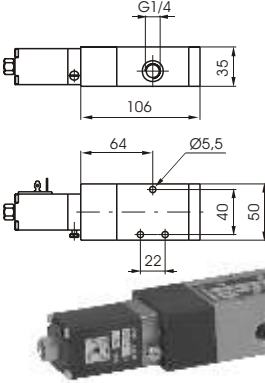
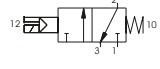

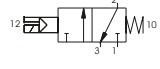

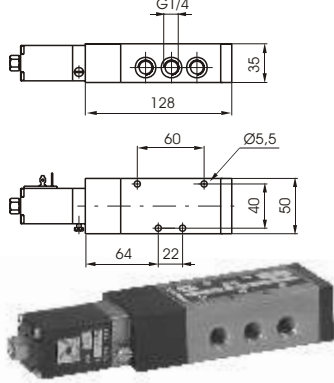
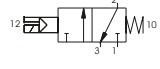

<p>3/2</p>	<p>Solenoid Spring</p> <hr/> <p>Ordering code</p> <hr/> <p>464/1.32.0.1.M2 464/1.52.0.1.M2</p> <p>Weight gr. 530 Weight gr. 625</p> <p>Minimum operating pressure 2,5 bar</p>	<p>5/2</p>
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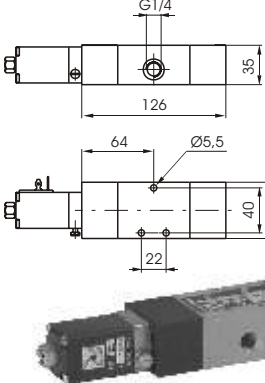




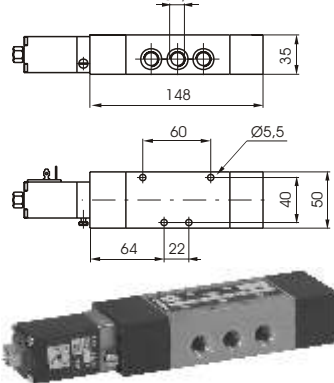


<p>3/2</p>	<p>Solenoid Differential</p> <hr/> <p>Ordering code</p> <hr/> <p>464/1.32.0.12.M2 464/1.52.0.12.M2</p> <p>Weight gr. 650 Weight gr. 740</p> <p>Minimum operating pressure 2,5 bar</p>	<p>5/2</p>
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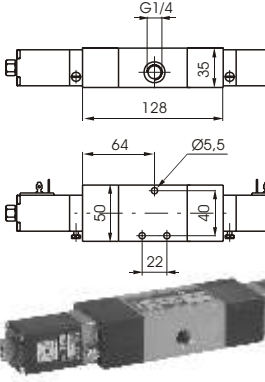
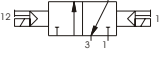

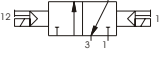

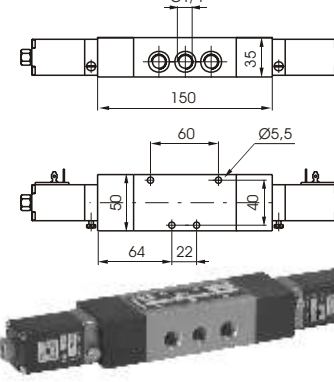
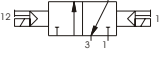

<p>3/2</p>	<p>Solenoid Solenoid</p> <hr/> <p>Ordering code</p> <hr/> <p>464/1.32.0.0.M2 464/1.52.0.0.M2</p> <p>Weight gr. 730 Weight gr. 820</p> <p>Minimum operating pressure 2 bar</p>	<p>5/2</p>
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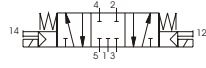
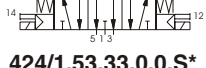
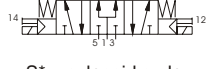
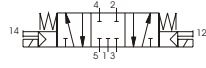
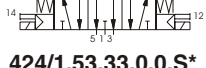
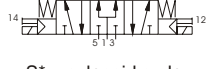
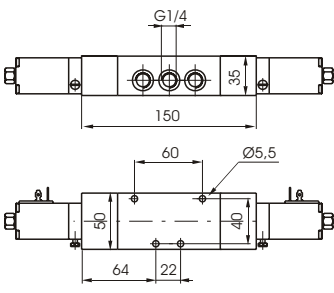
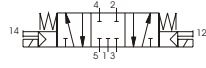
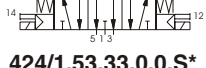
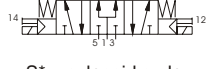
	<p>Microsolenoid Microsolenoid</p> <hr/> <p>Ordering code</p> <hr/> <p><i>Closed centres</i> 464/1.53.31.0.0.M2</p> <p><i>Open centres</i> 464/1.53.32.0.0.M2</p> <p><i>Pressured centres</i> 464/1.53.33.0.0.M2</p> <p>Weight gr. 820</p> <p>Minimum operating pressure 3 bar</p>	<p>5/3</p>
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Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with Δp = 1 bar	Orifice size	Working ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	1360 NI/min (3/2-5/2) 1280 NI/min (5/3)	8 mm	G 1/4"

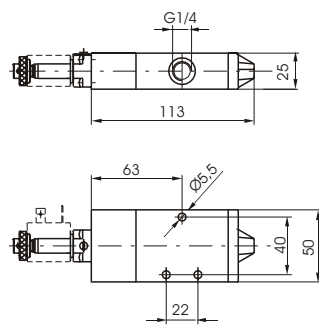

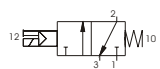
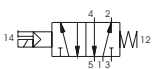
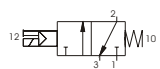
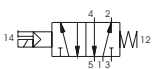
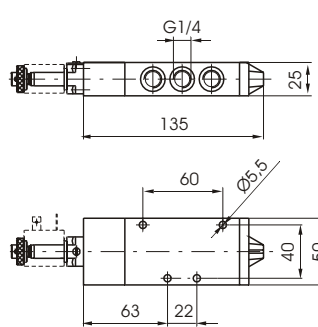

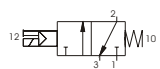
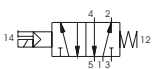
<p>3/2</p> 	<p>Solenoid Spring</p> <hr/> <p>Ordering code</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>424/1.32.0.1.S* S* = solenoid code (see page 1.23)</p>  <p>Weight gr. 680</p> </td> <td style="width: 50%; vertical-align: top;"> <p>424/1.52.0.1.S* S* = solenoid code (see page 1.23)</p>  <p>Weight gr. 770</p> </td> </tr> </table> <p>Minimum operating pressure 2,5 bar</p>	<p>424/1.32.0.1.S* S* = solenoid code (see page 1.23)</p>  <p>Weight gr. 680</p>	<p>424/1.52.0.1.S* S* = solenoid code (see page 1.23)</p>  <p>Weight gr. 770</p>	<p>5/2</p> 
<p>424/1.32.0.1.S* S* = solenoid code (see page 1.23)</p>  <p>Weight gr. 680</p>	<p>424/1.52.0.1.S* S* = solenoid code (see page 1.23)</p>  <p>Weight gr. 770</p>			

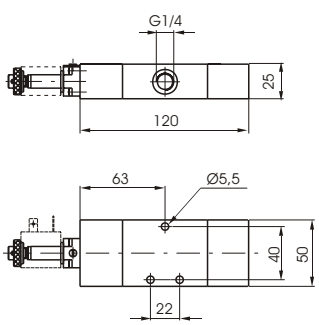

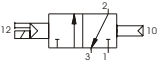
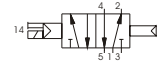
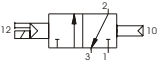
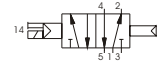
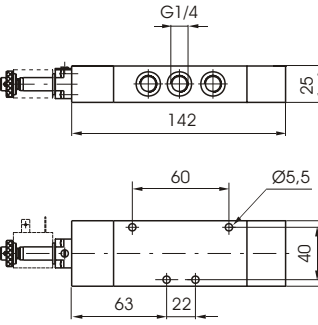

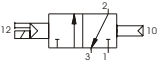
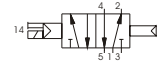
<p>3/2</p> 	<p>Solenoid Differential</p> <hr/> <p>Ordering code</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>424/1.32.0.12.S* S* = solenoid code (see page 1.23)</p>  <p>Weight gr. 800</p> </td> <td style="width: 50%; vertical-align: top;"> <p>424/1.52.0.12.S* S* = solenoid code (see page 1.23)</p>  <p>Weight gr. 890</p> </td> </tr> </table> <p>Minimum operating pressure 2,5 bar</p>	<p>424/1.32.0.12.S* S* = solenoid code (see page 1.23)</p>  <p>Weight gr. 800</p>	<p>424/1.52.0.12.S* S* = solenoid code (see page 1.23)</p>  <p>Weight gr. 890</p>	<p>5/2</p> 
<p>424/1.32.0.12.S* S* = solenoid code (see page 1.23)</p>  <p>Weight gr. 800</p>	<p>424/1.52.0.12.S* S* = solenoid code (see page 1.23)</p>  <p>Weight gr. 890</p>			

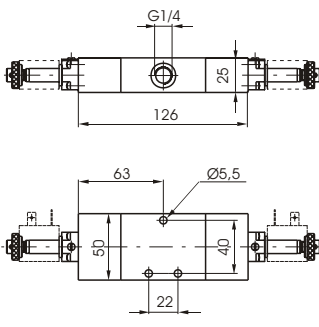

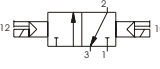

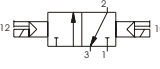

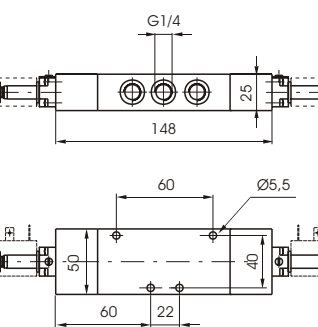

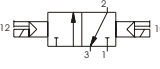

<p>3/2</p> 	<p>Solenoid Solenoid</p> <hr/> <p>Ordering code</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>424/1.32.0.0.S* S* = solenoid code (see page 1.23)</p>  <p>Weight gr. 1030</p> </td> <td style="width: 50%; vertical-align: top;"> <p>424/1.52.0.0.S* S* = solenoid code (see page 1.23)</p>  <p>Weight gr. 1140</p> </td> </tr> </table> <p>Minimum operating pressure 2 bar</p>	<p>424/1.32.0.0.S* S* = solenoid code (see page 1.23)</p>  <p>Weight gr. 1030</p>	<p>424/1.52.0.0.S* S* = solenoid code (see page 1.23)</p>  <p>Weight gr. 1140</p>	<p>5/2</p> 
<p>424/1.32.0.0.S* S* = solenoid code (see page 1.23)</p>  <p>Weight gr. 1030</p>	<p>424/1.52.0.0.S* S* = solenoid code (see page 1.23)</p>  <p>Weight gr. 1140</p>			

	<p>Solenoid Solenoid</p> <hr/> <p>Ordering code</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><i>Closed centres</i> 424/1.53.31.0.0.S*</p>  </td> <td style="width: 50%; vertical-align: top;"> <p><i>Open centres</i> 424/1.53.32.0.0.S*</p>  </td> </tr> <tr> <td style="width: 50%; vertical-align: top;"> <p><i>Pressured centres</i> 424/1.53.33.0.0.S*</p>  </td> <td style="width: 50%; vertical-align: top;"> <p>S* = solenoid code (see page 1.23)</p> <p>Weight gr. 1140 Minimum operating pressure 3 bar</p> </td> </tr> </table>	<p><i>Closed centres</i> 424/1.53.31.0.0.S*</p> 	<p><i>Open centres</i> 424/1.53.32.0.0.S*</p> 	<p><i>Pressured centres</i> 424/1.53.33.0.0.S*</p> 	<p>S* = solenoid code (see page 1.23)</p> <p>Weight gr. 1140 Minimum operating pressure 3 bar</p>	<p>5/3</p> 
<p><i>Closed centres</i> 424/1.53.31.0.0.S*</p> 	<p><i>Open centres</i> 424/1.53.32.0.0.S*</p> 					
<p><i>Pressured centres</i> 424/1.53.33.0.0.S*</p> 	<p>S* = solenoid code (see page 1.23)</p> <p>Weight gr. 1140 Minimum operating pressure 3 bar</p>					

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	1350 NI/min (3/2-5/2) 1280 NI/min (5/3)	8 mm	G 1/4"

<p>3/2</p>  	<p>Solenoid Spring</p> <hr/> <p>Ordering code</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border-right: 1px solid black; padding-right: 10px;"> <p>414/2.32.0.1.M2</p>  <p>Weight gr. 380</p> </td> <td style="width: 50%; padding-left: 10px;"> <p>414/2.52.0.1.M2</p>  <p>Weight gr. 440</p> </td> </tr> </table> <hr/> <p>Minimum operating pressure 2,5 bar</p>	<p>414/2.32.0.1.M2</p>  <p>Weight gr. 380</p>	<p>414/2.52.0.1.M2</p>  <p>Weight gr. 440</p>	<p>5/2</p>  
<p>414/2.32.0.1.M2</p>  <p>Weight gr. 380</p>	<p>414/2.52.0.1.M2</p>  <p>Weight gr. 440</p>			

<p>3/2</p>  	<p>Solenoid Differential</p> <hr/> <p>Ordering code</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border-right: 1px solid black; padding-right: 10px;"> <p>414/2.32.0.12.M2</p>  <p>Weight gr.450</p> </td> <td style="width: 50%; padding-left: 10px;"> <p>414/2.52.0.12.M2</p>  <p>Weight gr. 510</p> </td> </tr> </table> <hr/> <p>Minimum operating pressure 2,5 bar</p>	<p>414/2.32.0.12.M2</p>  <p>Weight gr.450</p>	<p>414/2.52.0.12.M2</p>  <p>Weight gr. 510</p>	<p>5/2</p>  
<p>414/2.32.0.12.M2</p>  <p>Weight gr.450</p>	<p>414/2.52.0.12.M2</p>  <p>Weight gr. 510</p>			

<p>3/2</p>  	<p>Solenoid Solenoid</p> <hr/> <p>Ordering code</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border-right: 1px solid black; padding-right: 10px;"> <p>414/2.32.0.0.M2</p>  <p>Weight gr. 530</p> </td> <td style="width: 50%; padding-left: 10px;"> <p>414/2.52.0.0.M2</p>  <p>Weight gr. 590</p> </td> </tr> </table> <hr/> <p>Minimum operating pressure 2 bar</p>	<p>414/2.32.0.0.M2</p>  <p>Weight gr. 530</p>	<p>414/2.52.0.0.M2</p>  <p>Weight gr. 590</p>	<p>5/2</p>  
<p>414/2.32.0.0.M2</p>  <p>Weight gr. 530</p>	<p>414/2.52.0.0.M2</p>  <p>Weight gr. 590</p>			

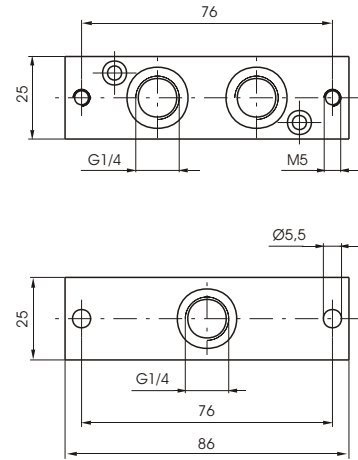
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	1030 NI/min	7 mm	G 1/4"



Modular base for gang mounting

Ordering code

414.00

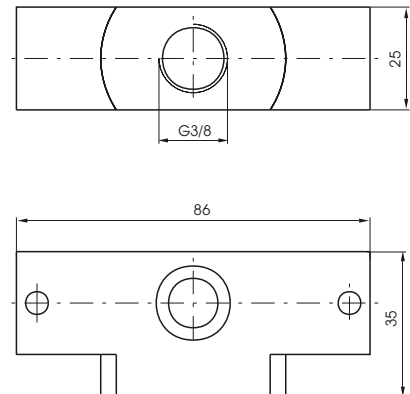


Weight gr. 120

Base for supplementary feed

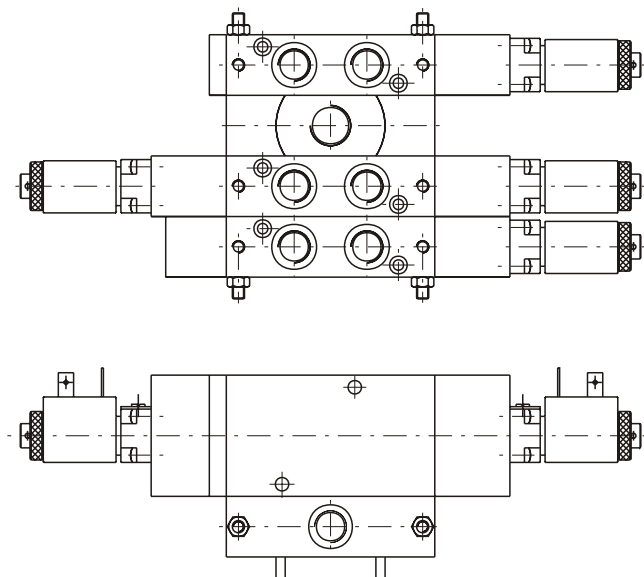
Ordering code

414.01



Weight gr. 160

Example for an arrangement using a supplementary feed base



<p>5/2</p> <p>Solenoid Spring</p> <hr/> <p>Ordering code</p> <hr/> <p>414/3.52.0.1.M2</p>			
<p>Minimum operating pressure 2,5 bar</p> <p style="text-align: right;">Weight gr. 440</p>			
<p>5/2</p> <p>Solenoid Differential</p> <hr/> <p>Ordering code</p> <hr/> <p>414/3.52.0.12.M2</p>			
<p>Minimum operating pressure 2,5 bar</p> <p style="text-align: right;">Weight gr. 510</p>			
<p>5/2</p> <p>Solenoid Spring</p> <hr/> <p>Ordering code</p> <hr/> <p>414/3.52.0.0.M2</p>			
<p>Minimum operating pressure 2 bar</p> <p style="text-align: right;">Weight gr. 590</p>			

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	1030 NI/min	7 mm	G 1/4"



3/2	Solenoid Spring	5/2
	Ordering code 514/N.32.0.1.M2	
	Weight gr. 390	
Weight gr. 450		
Minimum operating pressure 2,5 bar		

3/2	Solenoid Differential	5/2
	Ordering code 514/N.32.0.12.M2	
	Weight gr. 460	
Weight gr. 520		
Minimum operating pressure 2,5 bar		

3/2	Solenoid Solenoid	5/2
	Ordering code 514/N.32.0.0.M2	
	Weight gr. 540	
Weight gr. 600		
Minimum operating pressure 2 bar		

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	1030 NI/min	7 mm	G 1/4"

3/2	Solenoid Spring	5/2
	<p>Ordering code</p> <div style="display: flex; justify-content: space-around;"> <div style="width: 45%;"> <p>412.32.0.1.S* S* = solenoid code (see page 1.23)</p> <p>Weight gr. 1330</p> </div> <div style="width: 45%;"> <p>412.52.0.1.S* S* = solenoid code (see page 1.23)</p> <p>Weight gr. 1600</p> </div> </div>	
<p>Minimum operating pressure 2,5 bar</p>		

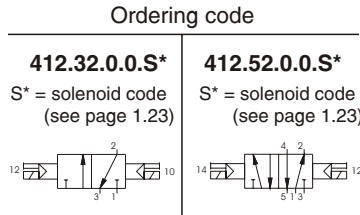
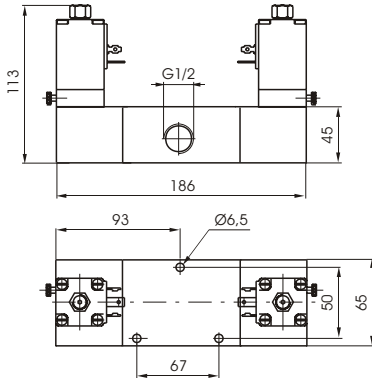
3/2	Solenoid Differential	5/2
	<p>Ordering code</p> <div style="display: flex; justify-content: space-around;"> <div style="width: 45%;"> <p>412.32.0.12.S* S* = solenoid code (see page 1.23)</p> <p>Weight gr. 1600</p> </div> <div style="width: 45%;"> <p>412.52.0.12.S* S* = solenoid code (see page 1.23)</p> <p>Weight gr. 1870</p> </div> </div>	
<p>Minimum operating pressure 2,5 bar</p>		

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
		Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	3500 NI/min	15 mm

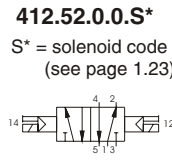
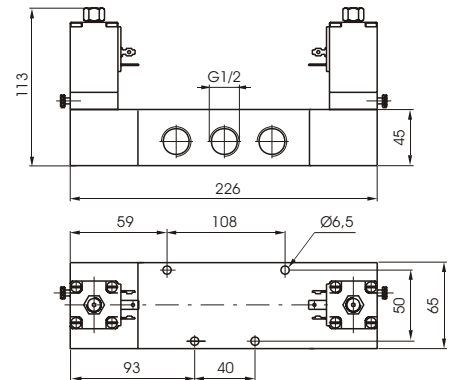
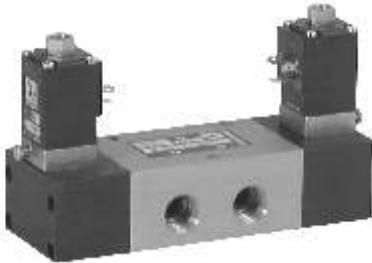
3/2

**Solenoid
Solenoid**

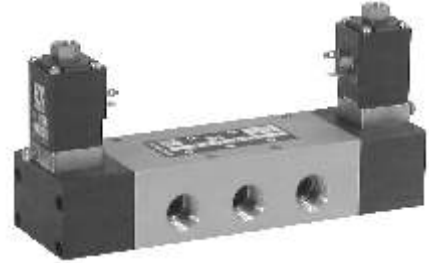
5/2



Weight gr. 1830



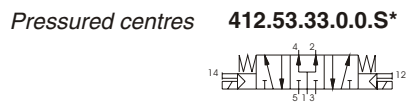
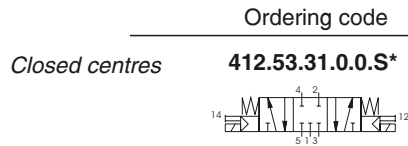
Weight gr. 2100



Minimum operating pressure 2 bar

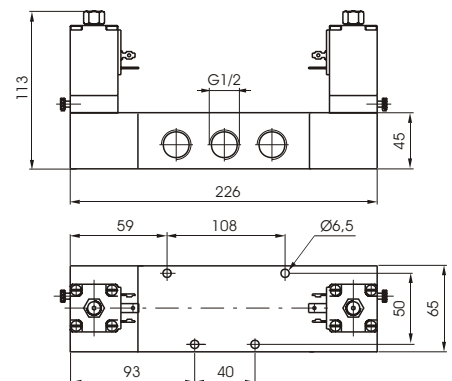
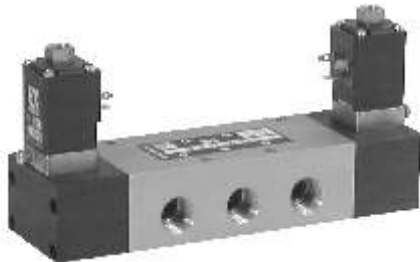
**Solenoid
Solenoid**

5/3



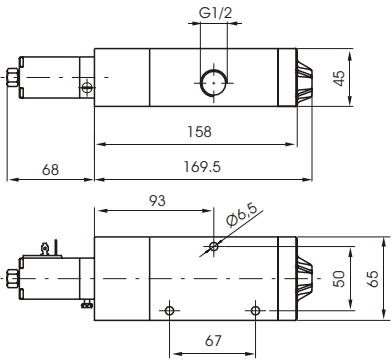
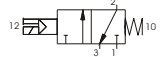

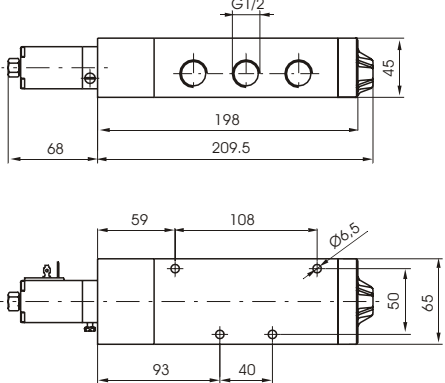


S* = solenoid code (see page 1.23)

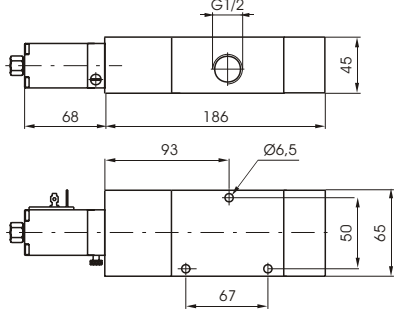
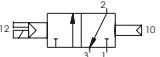

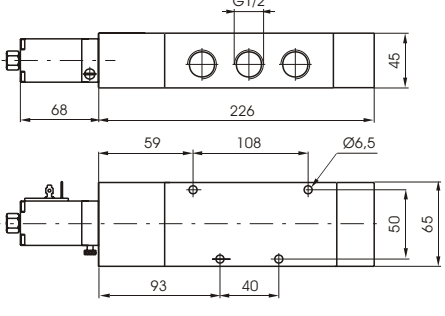


Weight gr. 2100



Minimum operating pressure 3 bar

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	3500 NI/min (3/2-5/2) 3000 NI/min (5/3)	15 mm	G 1/2"

3/2	Solenoid Spring	5/2
Ordering code		
 <p style="text-align: center;">Weight gr. 1330</p>	<p>412/1.32.0.1.S* S* = solenoid code (see page 1.23)</p>  <p>412/1.52.0.1.S* S* = solenoid code (see page 1.23)</p>  <p style="text-align: center;">Weight gr. 1600</p>	 <p style="text-align: center;">Weight gr. 1600</p>
 		
Minimum operating pressure 2,5 bar		

3/2	Solenoid Differential	5/2
Ordering code		
 <p style="text-align: center;">Weight gr. 1600</p>	<p>412/1.32.0.12.S* S* = solenoid code (see page 1.23)</p>  <p>412/1.52.0.12.S* S* = solenoid code (see page 1.23)</p>  <p style="text-align: center;">Weight gr. 1870</p>	 <p style="text-align: center;">Weight gr. 1870</p>
 		
Minimum operating pressure 2,5 bar		

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	3500 NI/min	15 mm	G 1/2"

3/2

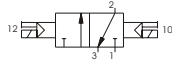
**Solenoid
Solenoid**

5/2

Ordering code

412/1.32.0.0.S*

S* = solenoid code
(see page 1.23)



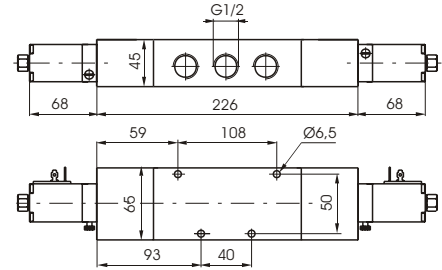
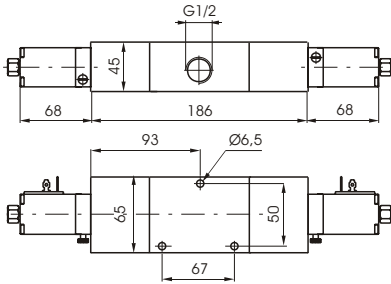
Weight gr. 1830

412/1.52.0.0.S*

S* = solenoid code
(see page 1.23)



Weight gr. 2100



Minimum operating pressure 2 bar

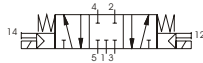
**Solenoid
Solenoid**

5/3

Ordering code

Closed centres

412/1.53.31.0.0.S*



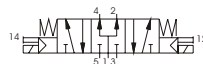
Open centres

412/1.53.32.0.0.S*



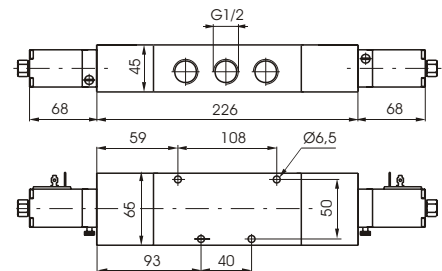
Pressured centres

412/1.53.33.0.0.S*



S* = solenoid code
(see page 1.23)

Weight gr. 2100



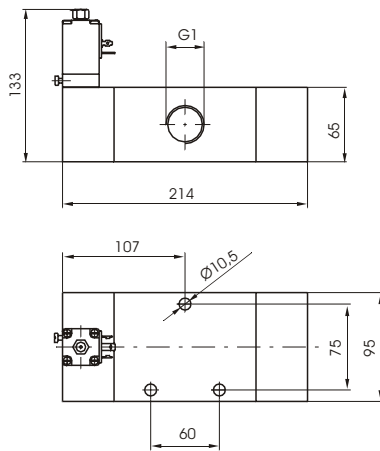
Minimum operating pressure 3 bar

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	3500 NI/min (3/2-5/2) 3000 NI/min (5/3)	15 mm	G 1/2"

3/2

Solenoid Spring

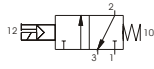
5/2



Ordering code

411.32.0.1.S*

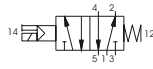
S* = solenoid code
(see page 1.23)



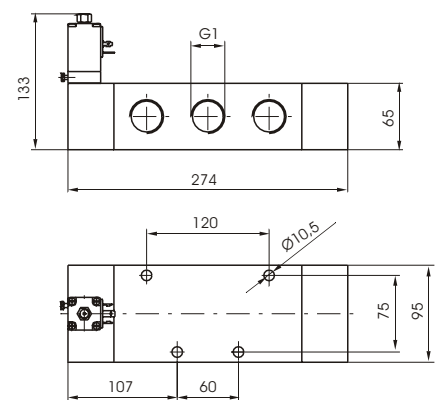
Weight gr. 3400

411.52.0.1.S*

S* = solenoid code
(see page 1.23)



Weight gr. 4300

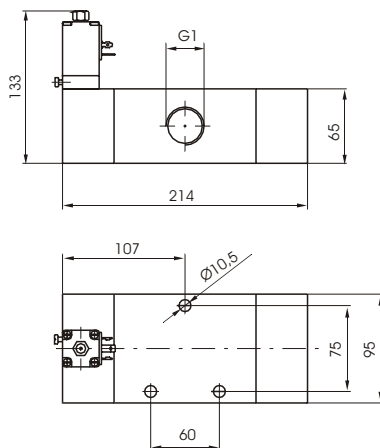


Minimum operating pressure 2,5 bar

3/2

Solenoid Differential

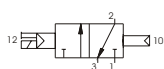
5/2



Ordering code

411.32.0.12.S*

S* = solenoid code
(see page 1.23)



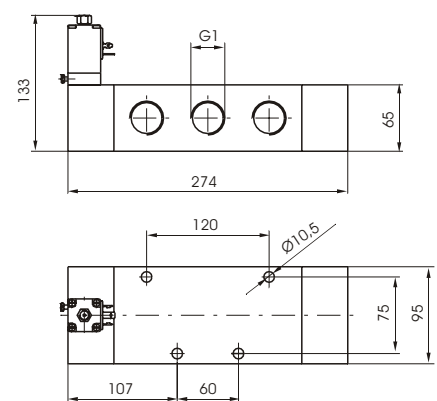
Weight gr. 3400

411.52.0.12.S*

S* = solenoid code
(see page 1.23)



Weight gr. 4300



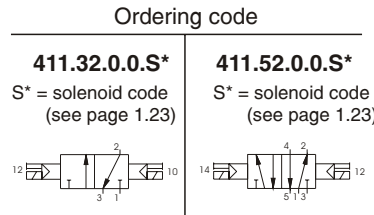
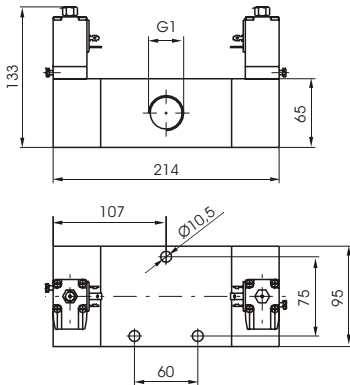
Minimum operating pressure 2,5 bar

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	6500 NI/min	20 mm	G 1"

3/2

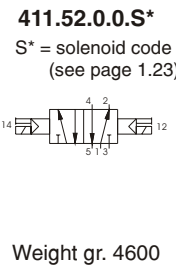
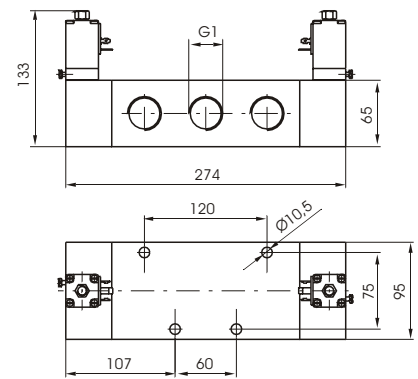
Solenoid
Solenoid

5/2



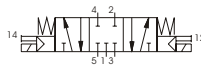
Weight gr. 3700

Minimum operating pressure 2 bar



Closed centres

411.53.31.0.0.S*



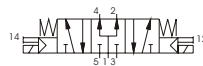
Open centres

411.53.32.0.0.S*



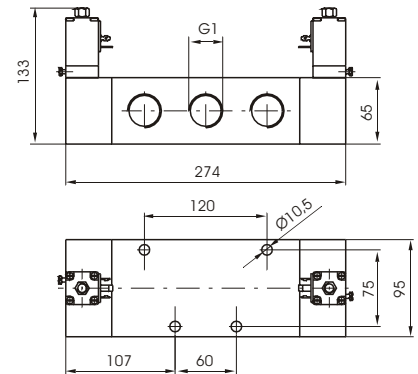
Pressured centres

411.53.33.0.0.S*



S* = solenoid code
(see page 1.23)

Weight gr. 4700



Minimum operating pressure 3 bar

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	6500 NI/min	20 mm	G 1"



General

These solenoid valves are supplied in two series with G 1/8" and G 1/4" connections (both with G 1/8" exhaust connections). Each series is available in 3 or 5 ways version with 1 coil (monostable), spring or pneumatic return, with 2 coils (bistable) and in 5 ways 3 positions version with closed, open and pressured centres.

The gang mounted solenoid valves are available with the traditional manifold obtained from bored square bar of series 600 and with the extruded aluminium base allowing a unic inlet port conveying the exhausts. The base is also prearranged to be fixed on DIN 46277/3 guide.

The solenoid valves are supplied complete with coil (see Series 300, section 1) so that the tension has to be added to the solenoid valve code:

- M11** = Coil 24 V D.C. (rating power 3.8 watt)
- M56** = Coil 24 V 50/60 HZ (starting power 9 VA, rating power 6 VA)
- M57** = Coil 110 V 50/60 HZ (starting power 9 VA, rating power 6 VA)
- M58** = Coil 220 V 50/60 HZ (starting power 9 VA, rating power 6 VA)

The polyurethane seals are available for oil free operation. In this case, the ordering code becomes:
488... becomes **488...P** for G 1/8" and **484...** becomes **484...P** for G 1/4"

Important: on this type of valves a temperature higher then 40°C along with water or high humidity are causing a progressive reduction of mechanical characteristics of the seals. This chemical reaction (hydrolysis) duration depends by the ambient temperature and in some cases the seal becomes brittle and falls to pieces.

The valves equipped with polyurethane seals are not suitable for tropical climate.

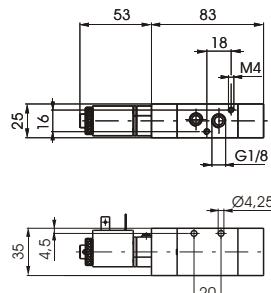

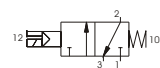
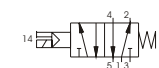
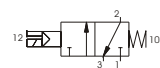
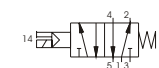
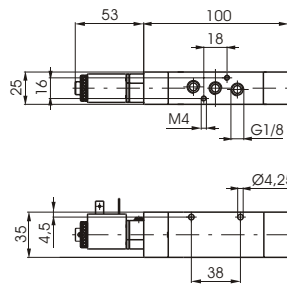

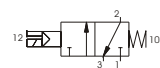
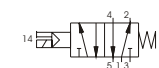
Construction characteristics

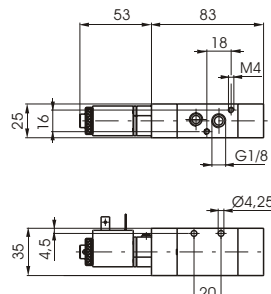

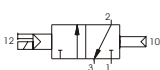
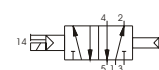
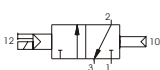
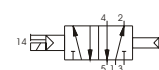
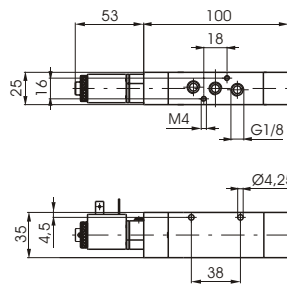

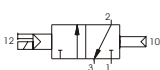
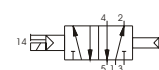
Body	Aluminium alloy 2011
Actuators	Technopolymer
Spool	Nickel plated steel
Piston seals	Nitrile rubber (NBR) oil resistant
Seals	Nitrile rubber (NBR) oil resistant or in alternative Polyurethane compound for oil free application
Spacers	Technopolymer
Springs	Stainless steel AISI 302
Pistons	Technopolymer

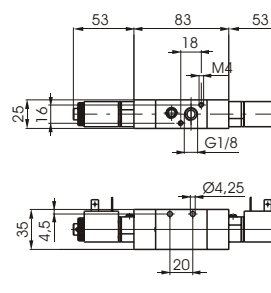

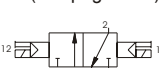

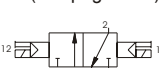

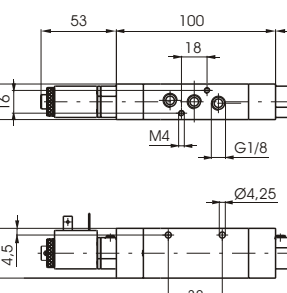

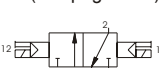

Use and maintenance




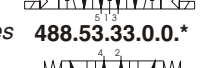
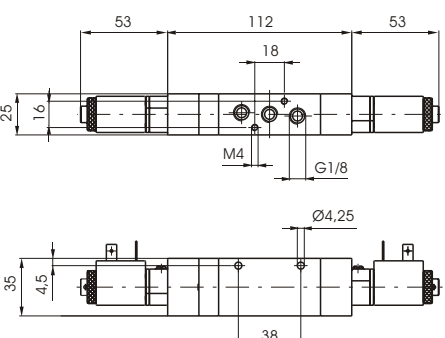
These solenoid valves have a mean life of 15 millions of cycles if utilized in standard conditions. Proper lubrication reduces dramatically the wear of the seals and a good filtration prevents the build-up of dirt and consequent malfunctioning of the solenoid valve. Make sure that the conditions of use comply with the pressure and temperature suggested. The exhaust port 3 and 5 have to be protected in a dusty and dirty environment. A spare parts kit including the spool and seals is available for overhauling the valve. This simple operation does not require a skilled worker.

ATTENTION: use hydraulic oil class H such as MAGNAGC 32 (CASTROL).

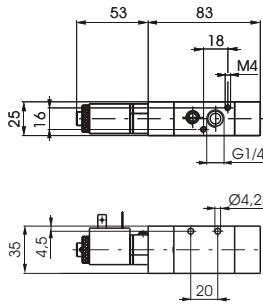

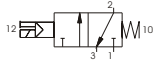
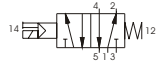
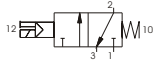
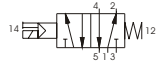
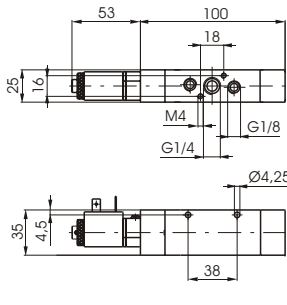

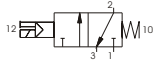
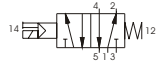
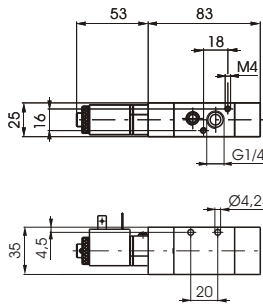

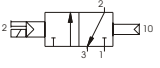
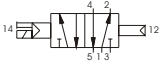
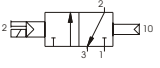
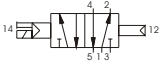
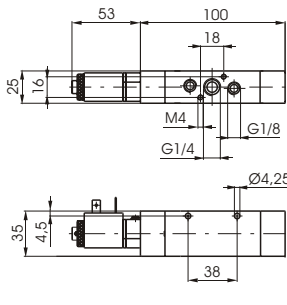

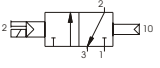
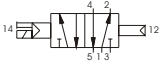
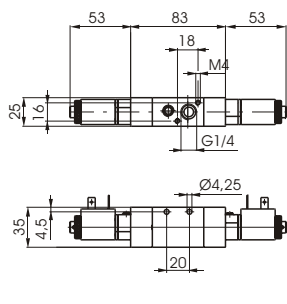

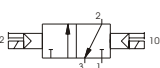
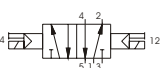
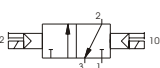
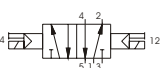
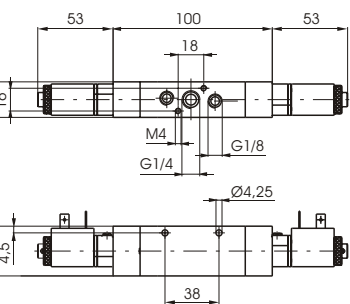

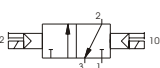
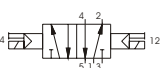

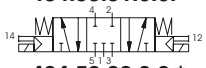
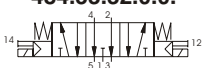
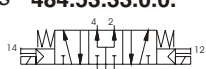
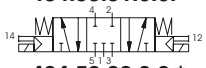
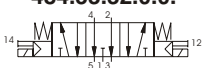
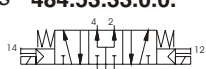
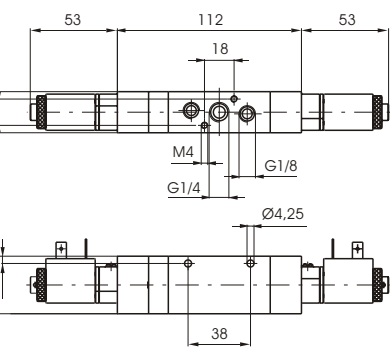
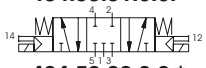
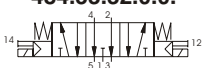
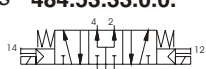
<p>3/2</p>  	<p>Solenoid spring</p> <hr/> <p>Ordering code</p> <table style="width:100%;"> <tr> <td style="width:50%; vertical-align: top;"> <p>488.32.0.1.*</p> <p>*=Tension code (see page 3.23)</p>  <p>Weight gr. 220</p> </td> <td style="width:50%; vertical-align: top;"> <p>488.52.0.1.*</p> <p>*=Tension code (see page 3.23)</p>  <p>Weight gr. 260</p> </td> </tr> </table> <p>Minimum working pressure 2,5 bar</p>	<p>488.32.0.1.*</p> <p>*=Tension code (see page 3.23)</p>  <p>Weight gr. 220</p>	<p>488.52.0.1.*</p> <p>*=Tension code (see page 3.23)</p>  <p>Weight gr. 260</p>	<p>5/2</p>  
<p>488.32.0.1.*</p> <p>*=Tension code (see page 3.23)</p>  <p>Weight gr. 220</p>	<p>488.52.0.1.*</p> <p>*=Tension code (see page 3.23)</p>  <p>Weight gr. 260</p>			

<p>3/2</p>  	<p>Solenoid differential</p> <hr/> <p>Ordering code</p> <table style="width:100%;"> <tr> <td style="width:50%; vertical-align: top;"> <p>488.32.0.12.*</p> <p>*=Tension code (see page 3.23)</p>  <p>Weight gr. 220</p> </td> <td style="width:50%; vertical-align: top;"> <p>488.52.0.12.*</p> <p>*=Tension code (see page 3.23)</p>  <p>Weight gr. 260</p> </td> </tr> </table> <p>Minimum working pressure 2,5 bar</p>	<p>488.32.0.12.*</p> <p>*=Tension code (see page 3.23)</p>  <p>Weight gr. 220</p>	<p>488.52.0.12.*</p> <p>*=Tension code (see page 3.23)</p>  <p>Weight gr. 260</p>	<p>5/2</p>  
<p>488.32.0.12.*</p> <p>*=Tension code (see page 3.23)</p>  <p>Weight gr. 220</p>	<p>488.52.0.12.*</p> <p>*=Tension code (see page 3.23)</p>  <p>Weight gr. 260</p>			

<p>3/2</p>  	<p>Solenoid Solenoid</p> <hr/> <p>Ordering code</p> <table style="width:100%;"> <tr> <td style="width:50%; vertical-align: top;"> <p>488.32.0.0.*</p> <p>*=Tension code (see page 3.23)</p>  <p>Weight gr. 320</p> </td> <td style="width:50%; vertical-align: top;"> <p>488.52.0.0.*</p> <p>*=Tension code (see page 3.23)</p>  <p>Weight gr. 360</p> </td> </tr> </table> <p>Minimum working pressure 2 bar</p>	<p>488.32.0.0.*</p> <p>*=Tension code (see page 3.23)</p>  <p>Weight gr. 320</p>	<p>488.52.0.0.*</p> <p>*=Tension code (see page 3.23)</p>  <p>Weight gr. 360</p>	<p>5/2</p>  
<p>488.32.0.0.*</p> <p>*=Tension code (see page 3.23)</p>  <p>Weight gr. 320</p>	<p>488.52.0.0.*</p> <p>*=Tension code (see page 3.23)</p>  <p>Weight gr. 360</p>			

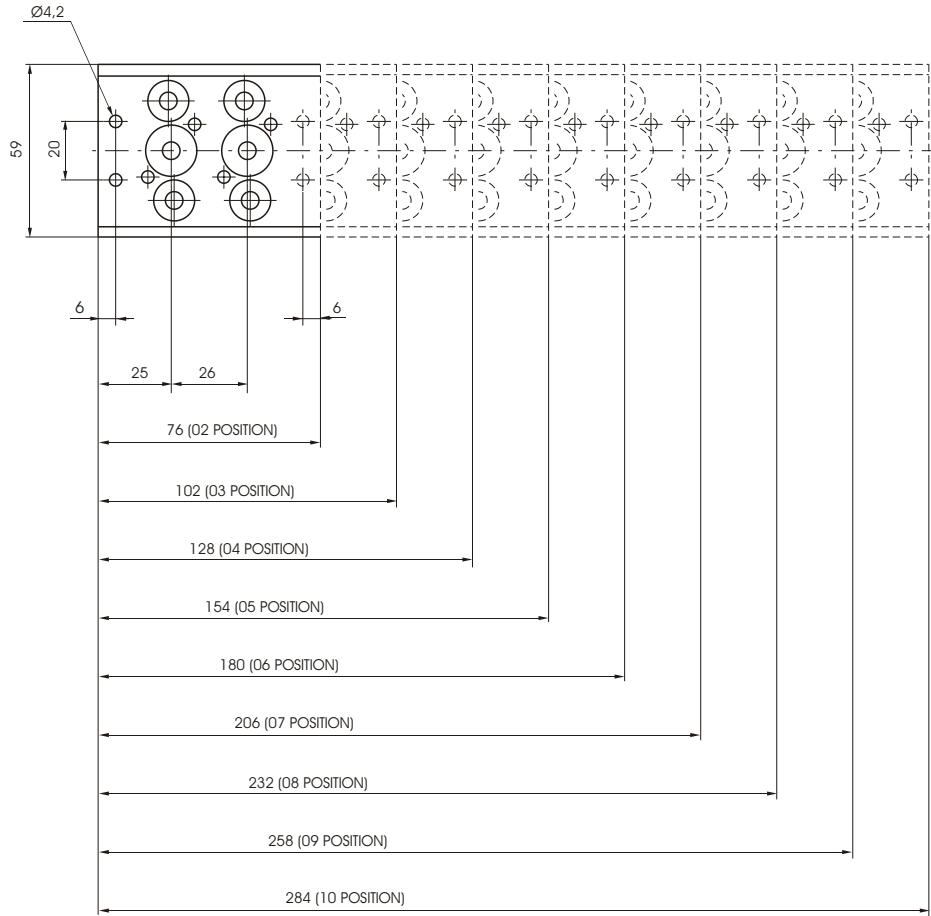
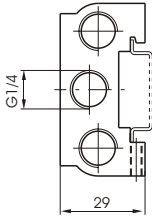
 <p>Weight gr. 400</p>	<p>Solenoid Solenoid</p> <hr/> <p>Ordering code</p> <p><i>Closed centres</i> 488.53.31.0.0.*</p>  <p><i>Open centres</i> 488.53.32.0.0.*</p>  <p><i>Pressured centres</i> 488.53.33.0.0.*</p>  <p>*=Tension code (see page 3.23)</p> <p>Minimum working pressure 3 bar</p>	<p>5/3</p> 
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Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$	\varnothing orifice size	Working ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	620 NI/min (3/2 and 5/2) 410 NI/min (5/3)	6 mm	G 1/8"

<p>3/2</p>  	<p style="text-align: center;">Solenoid spring</p> <hr/> <p style="text-align: center;">Ordering code</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>484.32.0.1.*</p> <p>* =Tension code (see page 3.23)</p>  <p>Weight gr. 220</p> </td> <td style="width: 50%; vertical-align: top;"> <p>484.52.0.1.*</p> <p>* =Tension code (see page 3.23)</p>  <p>Weight gr. 260</p> </td> </tr> </table> <p style="text-align: center;">Minimum working pressure 2,5 bar</p>	<p>484.32.0.1.*</p> <p>* =Tension code (see page 3.23)</p>  <p>Weight gr. 220</p>	<p>484.52.0.1.*</p> <p>* =Tension code (see page 3.23)</p>  <p>Weight gr. 260</p>	<p>5/2</p>  		
<p>484.32.0.1.*</p> <p>* =Tension code (see page 3.23)</p>  <p>Weight gr. 220</p>	<p>484.52.0.1.*</p> <p>* =Tension code (see page 3.23)</p>  <p>Weight gr. 260</p>					
<p>3/2</p>  	<p style="text-align: center;">Solenoid differential</p> <hr/> <p style="text-align: center;">Ordering code</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>484.32.0.12.*</p> <p>* =Tension code (see page 3.23)</p>  <p>Weight gr. 220</p> </td> <td style="width: 50%; vertical-align: top;"> <p>484.52.0.12.*</p> <p>* =Tension code (see page 3.23)</p>  <p>Weight gr. 260</p> </td> </tr> </table> <p style="text-align: center;">Minimum working pressure 2,5 bar</p>	<p>484.32.0.12.*</p> <p>* =Tension code (see page 3.23)</p>  <p>Weight gr. 220</p>	<p>484.52.0.12.*</p> <p>* =Tension code (see page 3.23)</p>  <p>Weight gr. 260</p>	<p>5/2</p>  		
<p>484.32.0.12.*</p> <p>* =Tension code (see page 3.23)</p>  <p>Weight gr. 220</p>	<p>484.52.0.12.*</p> <p>* =Tension code (see page 3.23)</p>  <p>Weight gr. 260</p>					
<p>3/2</p>  	<p style="text-align: center;">Solenoid Solenoid</p> <hr/> <p style="text-align: center;">Ordering code</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>484.32.0.0.*</p> <p>* =Tension code (see page 3.23)</p>  <p>Weight gr. 320</p> </td> <td style="width: 50%; vertical-align: top;"> <p>484.52.0.0.*</p> <p>* =Tension code (see page 3.23)</p>  <p>Weight gr. 360</p> </td> </tr> </table> <p style="text-align: center;">Minimum working pressure 2 bar</p>	<p>484.32.0.0.*</p> <p>* =Tension code (see page 3.23)</p>  <p>Weight gr. 320</p>	<p>484.52.0.0.*</p> <p>* =Tension code (see page 3.23)</p>  <p>Weight gr. 360</p>	<p>5/2</p>  		
<p>484.32.0.0.*</p> <p>* =Tension code (see page 3.23)</p>  <p>Weight gr. 320</p>	<p>484.52.0.0.*</p> <p>* =Tension code (see page 3.23)</p>  <p>Weight gr. 360</p>					
 <p style="text-align: center;">Weight gr. 400</p>	<p style="text-align: center;">Solenoid Solenoid</p> <hr/> <p style="text-align: center;">Ordering code</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><i>Closed centres</i> 484.53.31.0.0.*</p>  </td> <td style="width: 50%; vertical-align: top;"> <p><i>Open centres</i> 484.53.32.0.0.*</p>  </td> </tr> <tr> <td style="width: 50%; vertical-align: top;"> <p><i>Pressured centres</i> 484.53.33.0.0.*</p>  </td> <td style="width: 50%; vertical-align: top;"> <p>* =Tension code (see page 3.23)</p> <p>Minimum working pressure 3 bar</p> </td> </tr> </table>	<p><i>Closed centres</i> 484.53.31.0.0.*</p> 	<p><i>Open centres</i> 484.53.32.0.0.*</p> 	<p><i>Pressured centres</i> 484.53.33.0.0.*</p> 	<p>* =Tension code (see page 3.23)</p> <p>Minimum working pressure 3 bar</p>	<p>5/3</p> 
<p><i>Closed centres</i> 484.53.31.0.0.*</p> 	<p><i>Open centres</i> 484.53.32.0.0.*</p> 					
<p><i>Pressured centres</i> 484.53.33.0.0.*</p> 	<p>* =Tension code (see page 3.23)</p> <p>Minimum working pressure 3 bar</p>					
<p>Operational characteristics</p>	<p>Fluid</p> <p>Filtered and lubricated air</p>	<p>Max working pressure</p> <p>10 bar</p>	<p>Operating temperature</p> <p>min. -5°C max. +50°C</p>	<p>Flow rate at 6 bar with $\Delta p = 1$</p> <p>620 NI/min (3/2 and 5/2) 410 NI/min (5/3)</p>	<p>\varnothing orificie size</p> <p>6 mm.</p>	<p>Working ports size</p> <p>G 1/8" - G 1/4"</p>



Manifolds



Ordering code

488 .
n. pos.

n. position	weight gr.
02	220
03	290
04	360
05	430
06	500
07	570
08	640
09	710
10	780

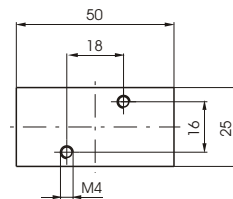


Closing plate

Ordering code

488.00

Weight gr. 25



Distributors and electrodistributors Series 800

Compact distributors and electro distributors
M5 individual, for manifold and
for base mounting

Compact distributors and electro distributors
G 1/8" individual, for manifold and for base

Distributors and electro distributors G 1/8"
individual and for technopolymer manifold

Distributors and electro distributors G 1/4"
individual and for technopolymer manifold

Distributors and electro distributors G 1/8"
individual, for modular base and ISO 1 base



General

The trend towards the miniaturization of components has been consolidated. The use of new technologies makes it possible to manufacture components with high flow rates but extremely compact sizes.

Electric piloting is by means of low-absorption miniature solenoids which are easily connected to the electronic control systems of machines (PLC). Another object of study have been manifolds and multiple bases for ganged assembly of valves or solenoid valves with option for having outlets 2 and 4 either on the valve body or on the base through threaded holes or integrated quick connections provided.

Versions 3/2 and 5/2 are fitted with pneumatic and electropneumatic controls with resetting by mechanically or pneumatically operated spring, or by pneumatic or electropneumatic operation on the bistable versions.

The basic difference between this type of distributors and the others we produce, based on the spool system, lies in the fact that the seals rest on the spool and are dynamic, instead of being locked into spool the valve body by means of spacers. By this means a compact size is obtained and the distributors can be slotted into bases and manifolds by means of two screws.

Structural characteristics

Body	Anodized aluminium
Operators	Anodized aluminium
Spool	Aluminium alloy 2011
Pistons	Aluminium alloy 2011
Seals	Oilproff rubber (HNBR) Therban
Spring	AISI 302 stainless steel

Use and maintenance

These distributors have a medium life of 10 to 15 millions of cycles depending on application. Proper lubrication with specified oil reduces dramatically the wear of the seals as well as a good filtration ensures long and trouble free operation. Check that the operating conditions are according to the suggested pressure, temperature and so on.

The exhaust ports of the distributor have to be preprotected in a dusty and dirty environment.

A spare parts kit including the spool complete with seals is available for overhauling the distributors. This simple operation does not require a skilled worker. Although particular care is needed for assembling the distributor.

ATTENTION: use hydraulic oil class H for lubrication such as MAGNA GC 32 (Castrol).

How to order the electro distributors

Example:

805.52.0.1.01 Electro distributor with miniature solenoid 12 V D.C.

List of codes for tensions:

01 = miniature solenoid 12 V D.C.

02 = miniature solenoid 24 V D.C.

05 = miniature solenoid 24 V A.C.

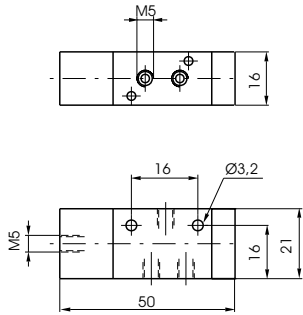

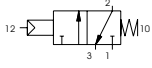
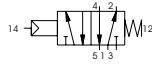
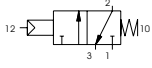
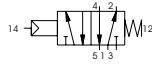
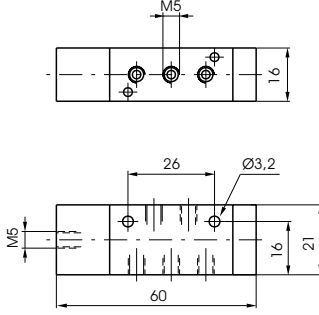

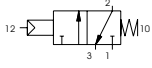
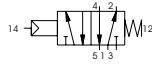
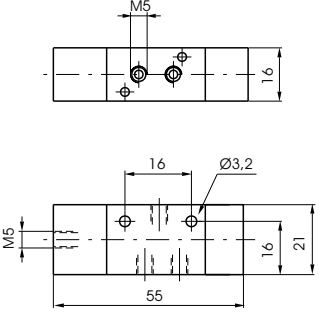

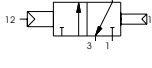
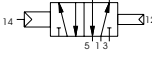
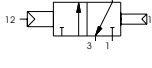
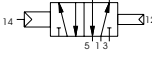
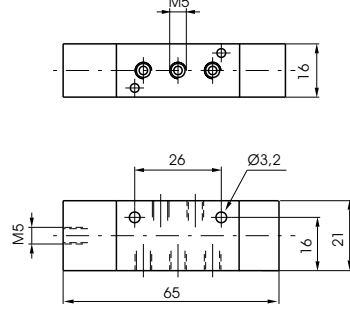

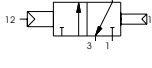
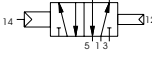
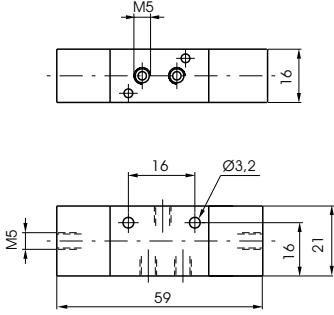





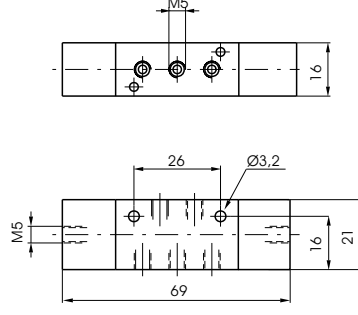



06 = miniature solenoid 110 V A.C.

07 = miniature solenoid 220 V A.C.

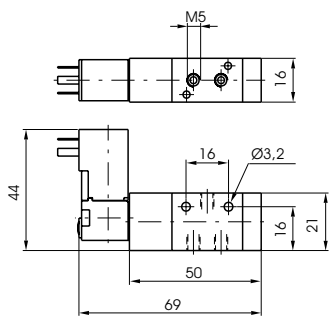

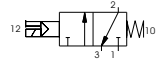
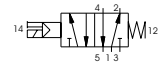
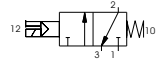
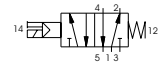
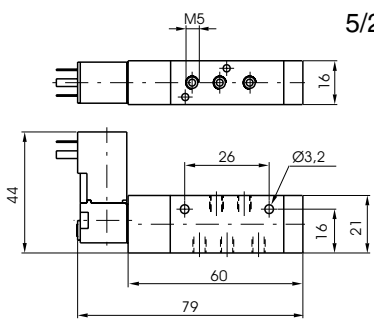

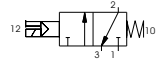
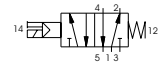
The electropilot utilized is a 15 mm 3/2 N.C. miniature solenoid with faston and 1.1 mm orifice (see Series 300, section 1).

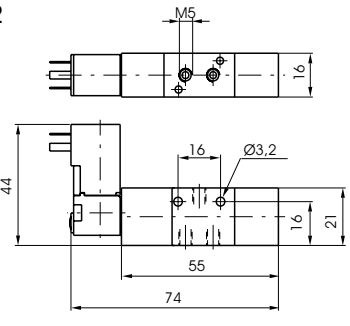

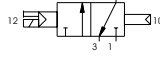
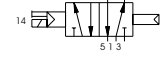
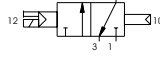
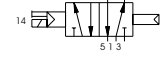
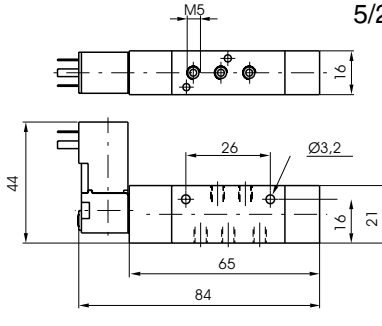

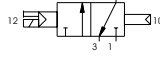
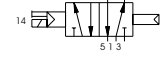
Miniature solenoid  homologated are available (see page 1.26)

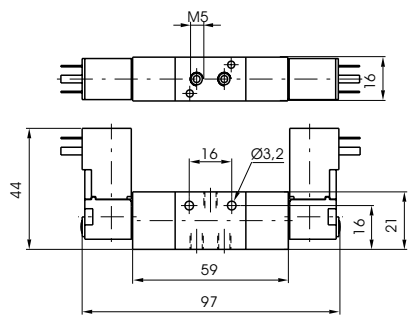

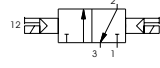

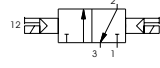

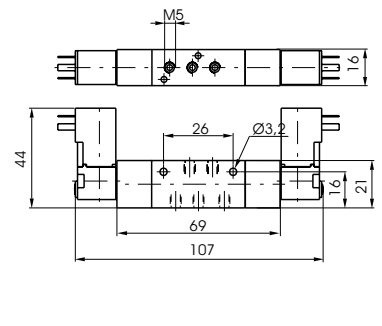

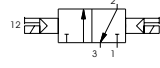



<p>3/2</p>  	<p>Pneumatic Spring</p> <hr/> <p>Ordering code</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border-right: 1px solid black; padding: 5px;"> <p>805.32.11.1</p>  <p>Weight gr. 45</p> </td> <td style="width: 50%; padding: 5px;"> <p>805.52.11.1</p>  <p>Weight gr. 50</p> </td> </tr> </table> <p>Minimum working pressure 2 bar</p>	<p>805.32.11.1</p>  <p>Weight gr. 45</p>	<p>805.52.11.1</p>  <p>Weight gr. 50</p>	<p>5/2</p>  
<p>805.32.11.1</p>  <p>Weight gr. 45</p>	<p>805.52.11.1</p>  <p>Weight gr. 50</p>			
<p>3/2</p>  	<p>Pneumatic Differential</p> <hr/> <p>Ordering code</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border-right: 1px solid black; padding: 5px;"> <p>805.32.11.12</p>  <p>Weight gr. 50</p> </td> <td style="width: 50%; padding: 5px;"> <p>805.52.11.12</p>  <p>Weight gr. 55</p> </td> </tr> </table> <p>Minimum working pressure 2 bar</p>	<p>805.32.11.12</p>  <p>Weight gr. 50</p>	<p>805.52.11.12</p>  <p>Weight gr. 55</p>	<p>5/2</p>  
<p>805.32.11.12</p>  <p>Weight gr. 50</p>	<p>805.52.11.12</p>  <p>Weight gr. 55</p>			
<p>3/2</p>  	<p>Pneumatic Pneumatic</p> <hr/> <p>Ordering code</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border-right: 1px solid black; padding: 5px;"> <p>805.32.11.11</p>  <p>Weight gr. 55</p> </td> <td style="width: 50%; padding: 5px;"> <p>805.52.11.11</p>  <p>Weight gr. 60</p> </td> </tr> </table> <p>Minimum working pressure 1,5 bar</p>	<p>805.32.11.11</p>  <p>Weight gr. 55</p>	<p>805.52.11.11</p>  <p>Weight gr. 60</p>	<p>5/2</p>  
<p>805.32.11.11</p>  <p>Weight gr. 55</p>	<p>805.52.11.11</p>  <p>Weight gr. 60</p>			

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size	Pilot ports size
		Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	160 NI/min	2,5 mm.	M5

<p>3/2</p>  	<p>Miniature solenoid Spring</p> <hr/> <p>Ordering code</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border-right: 1px solid black; padding-right: 10px;"> <p>805.32.0.1.* * = Codes for tension (see page 5.1)</p>  <p>Weight gr. 80</p> </td> <td style="width: 50%; padding-left: 10px;"> <p>805.52.0.1.* * = Codes for tension (see page 5.1)</p>  <p>Weight gr. 85</p> </td> </tr> </table> <p style="text-align: center;">Minimum working pressure 2 bar</p>	<p>805.32.0.1.* * = Codes for tension (see page 5.1)</p>  <p>Weight gr. 80</p>	<p>805.52.0.1.* * = Codes for tension (see page 5.1)</p>  <p>Weight gr. 85</p>	<p>5/2</p>  
<p>805.32.0.1.* * = Codes for tension (see page 5.1)</p>  <p>Weight gr. 80</p>	<p>805.52.0.1.* * = Codes for tension (see page 5.1)</p>  <p>Weight gr. 85</p>			

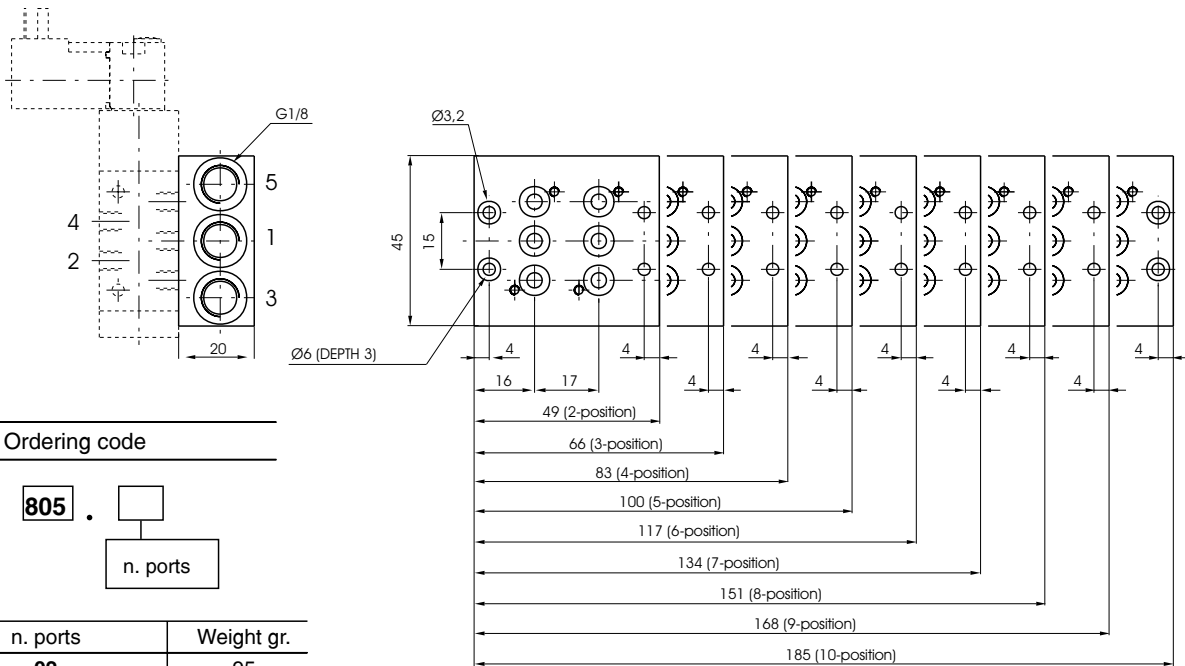
<p>3/2</p>  	<p>Miniature solenoid Differential</p> <hr/> <p>Ordering code</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border-right: 1px solid black; padding-right: 10px;"> <p>805.32.0.12.* * = Codes for tension (see page 5.1)</p>  <p>Weight gr. 85</p> </td> <td style="width: 50%; padding-left: 10px;"> <p>805.52.0.12.* * = Codes for tension (see page 5.1)</p>  <p>Weight gr. 90</p> </td> </tr> </table> <p style="text-align: center;">Minimum working pressure 2 bar</p>	<p>805.32.0.12.* * = Codes for tension (see page 5.1)</p>  <p>Weight gr. 85</p>	<p>805.52.0.12.* * = Codes for tension (see page 5.1)</p>  <p>Weight gr. 90</p>	<p>5/2</p>  
<p>805.32.0.12.* * = Codes for tension (see page 5.1)</p>  <p>Weight gr. 85</p>	<p>805.52.0.12.* * = Codes for tension (see page 5.1)</p>  <p>Weight gr. 90</p>			

<p>3/2</p>  	<p>Miniature solenoid Miniature solenoid</p> <hr/> <p>Ordering code</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border-right: 1px solid black; padding-right: 10px;"> <p>805.32.0.0.* * = Codes for tension (see page 5.1)</p>  <p>Weight gr. 120</p> </td> <td style="width: 50%; padding-left: 10px;"> <p>805.52.0.0.* * = Codes for tension (see page 5.1)</p>  <p>Weight gr. 125</p> </td> </tr> </table> <p style="text-align: center;">Minimum working pressure 1,5 bar</p>	<p>805.32.0.0.* * = Codes for tension (see page 5.1)</p>  <p>Weight gr. 120</p>	<p>805.52.0.0.* * = Codes for tension (see page 5.1)</p>  <p>Weight gr. 125</p>	<p>5/2</p>  
<p>805.32.0.0.* * = Codes for tension (see page 5.1)</p>  <p>Weight gr. 120</p>	<p>805.52.0.0.* * = Codes for tension (see page 5.1)</p>  <p>Weight gr. 125</p>			

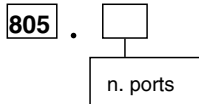
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	160 NI/min	2,5 mm.	M 5



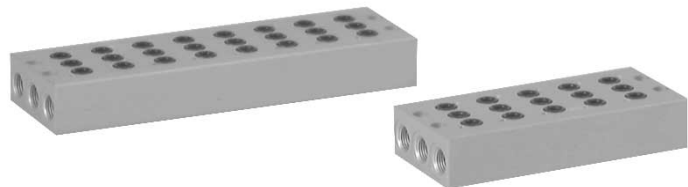
Manifolds



Ordering code



n. ports	Weight gr.
02	95
03	130
04	160
05	190
06	225
07	260
08	290
09	325
10	365



Clip

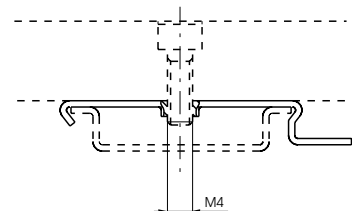
(for mounting the distributors groups on guide DIN 46277/3)

Ordering code

800.00



Weight gr. 5



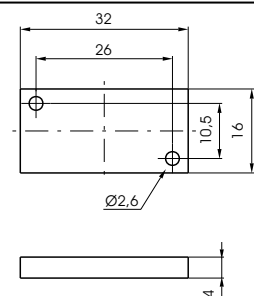
Closing plate

Ordering code

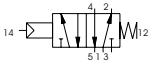

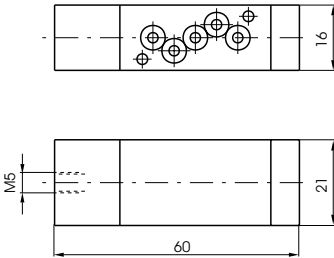
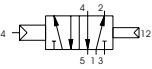

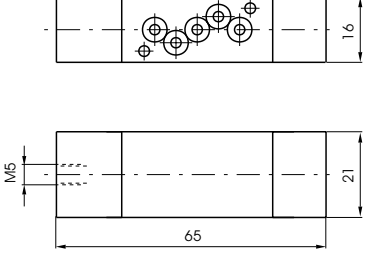
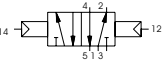

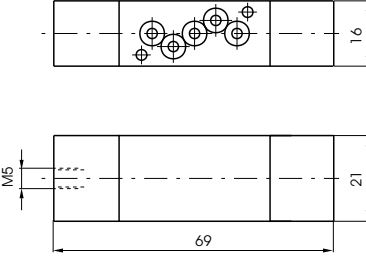
805.00



Weight gr. 15





<p>5/2</p> <p>Pneumatic Spring</p> <hr/> <p>Ordering code</p> <hr/> <p>815.52.11.1</p>  <p>Weight gr. 55</p>   <p>Minimum working pressure 2 bar</p>							
<p>5/2</p> <p>Pneumatic Differential</p> <hr/> <p>Ordering code</p> <hr/> <p>815.52.11.12</p>  <p>Weight gr. 60</p>   <p>Minimum working pressure 2 bar</p>							
<p>5/2</p> <p>Pneumatic Pneumatic</p> <hr/> <p>Ordering code</p> <hr/> <p>815.52.11.11</p>  <p>Weight gr. 65</p>   <p>Minimum working pressure 1,5 bar</p>							

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifize size	Working ports size	Pilot ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	160 NI/min	2,5 mm.	----	M 5

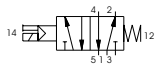
5/2

**Miniature solenoid
Spring**

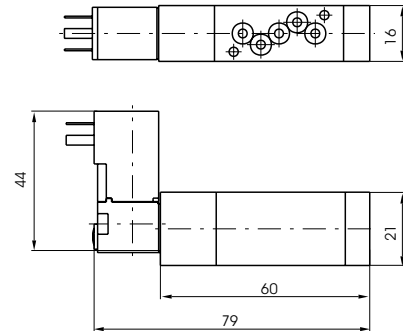
Ordering code

815.52.0.1.*

* = codes for voltage
(see page 5.1)



Weight gr. 90



Minimum working pressure 2 bar

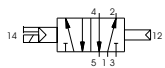
5/2

**Miniature solenoid
Differential**

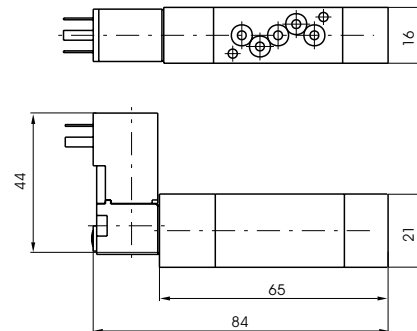
Ordering code

815.52.0.12.*

* = codes for voltage
(see page 5.1)



Weight gr. 95



Minimum working pressure 2 bar

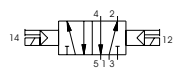
5/2

**Miniature solenoid
Miniature solenoid**

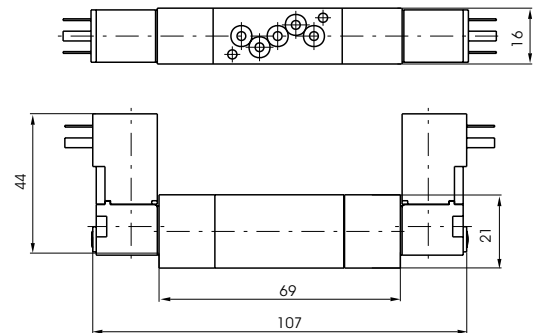
Ordering code

815.52.0.0.*

* = codes for voltage
(see page 5.1)



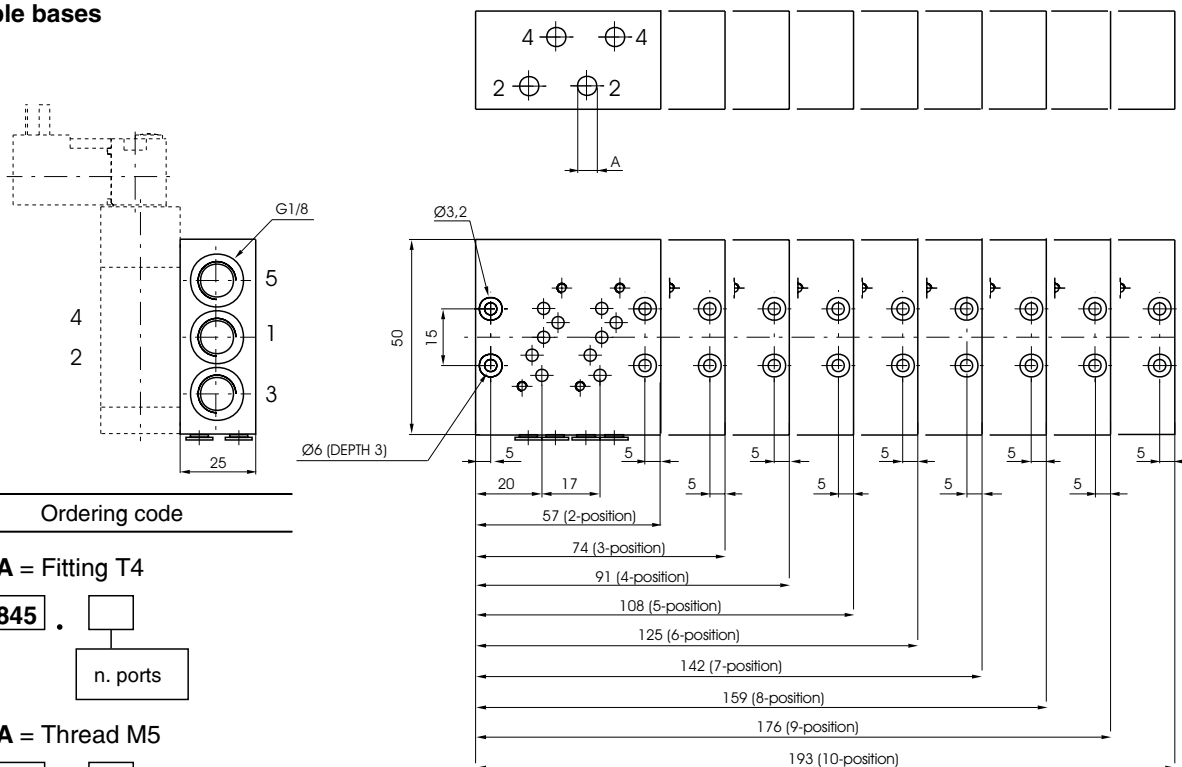
Weight gr. 135



Minimum working pressure 1,5 bar

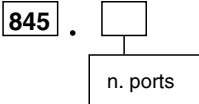
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	160 NI/min	2,5 mm.	-----

Multiple bases

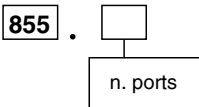


Ordering code

A = Fitting T4



A = Thread M5



n. ports	Weight gr.
02	175
03	230
04	280
05	340
06	390
07	440
08	495
09	545
10	600



5

Clip

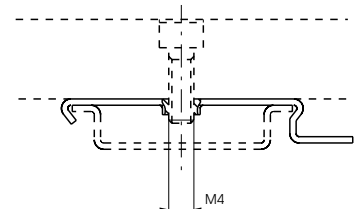
(for mounting the distributors groups on rail DIN 46277/3)

Ordering code

800.00



Weight gr. 5



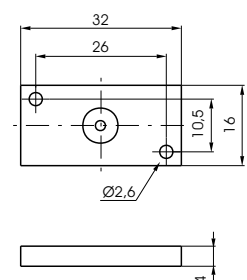
Closing plate

Ordering code

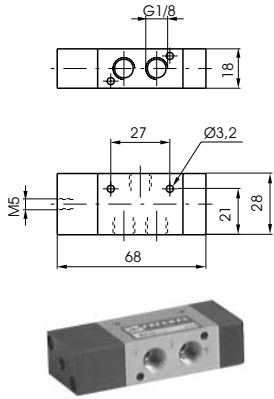
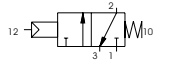
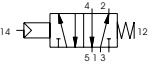
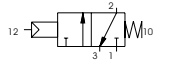
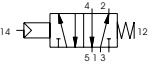
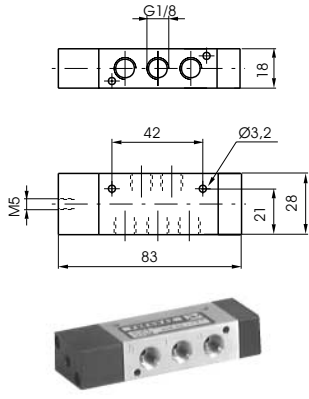
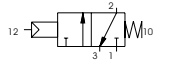
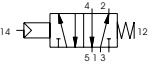
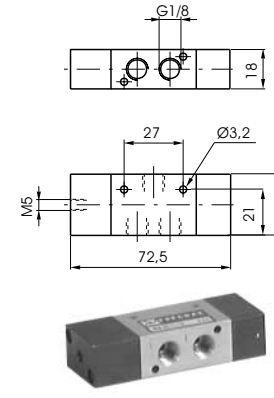
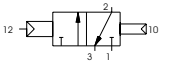
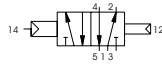
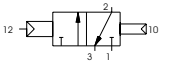
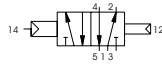
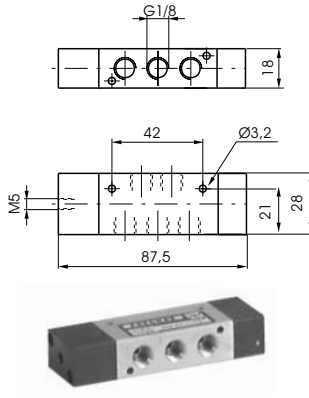
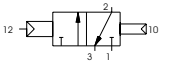
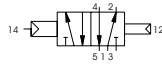
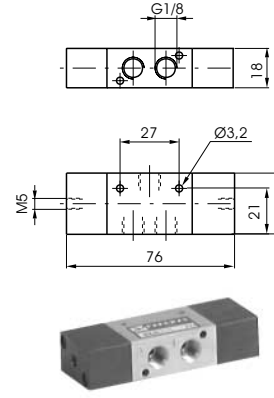
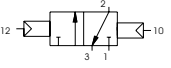

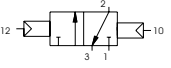

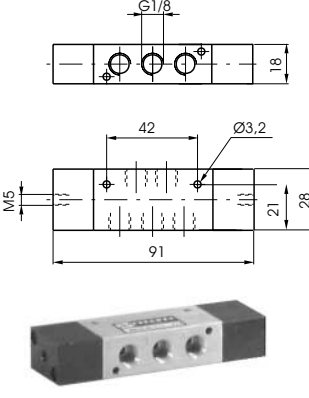
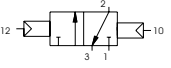


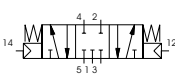
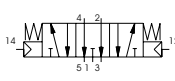
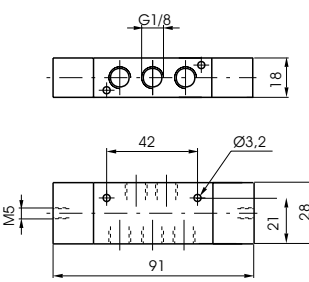
815.00



Weight gr. 15

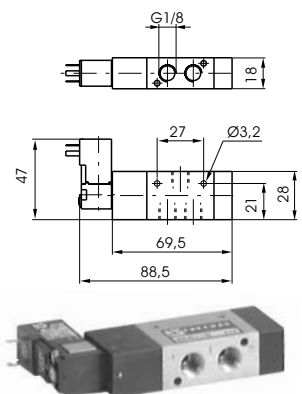
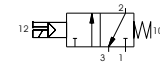
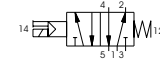
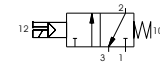
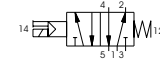
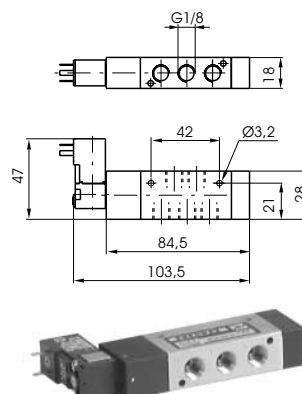
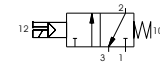
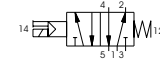
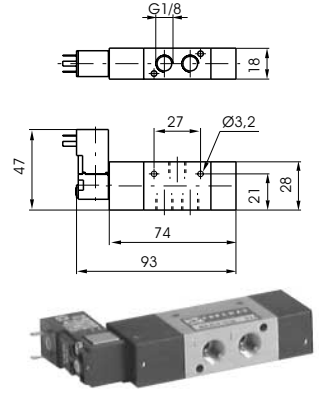
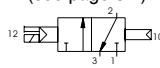
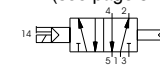
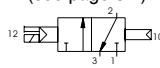
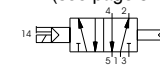
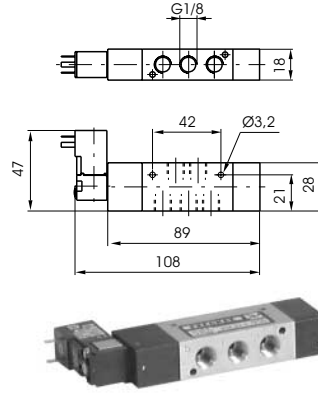
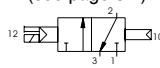
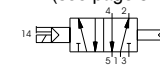
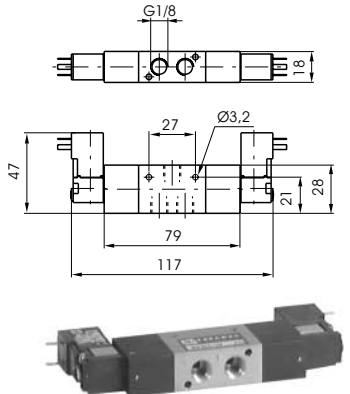
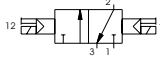
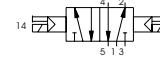
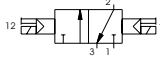
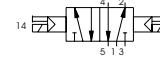
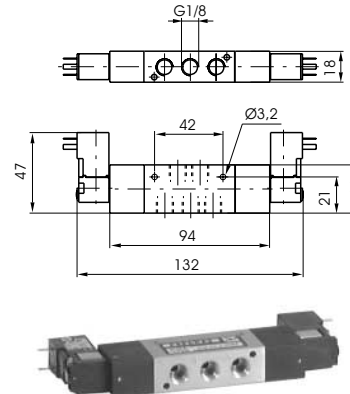
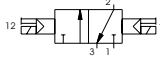
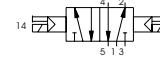
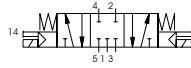

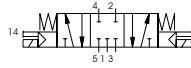

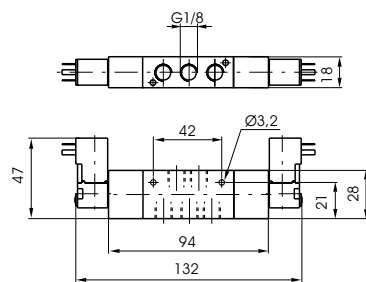
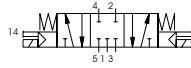





<p>3/2</p> 	<p>Pneumatic Spring</p> <hr/> <p>Ordering code</p> <table border="1"> <tr> <td> <p>808.32.11.1</p>  </td> <td> <p>808.52.11.1</p>  </td> </tr> <tr> <td> <p>Weight gr. 95</p> </td> <td> <p>Weight gr. 100</p> </td> </tr> </table> <p>Minimum working pressure 2 bar</p>	<p>808.32.11.1</p> 	<p>808.52.11.1</p> 	<p>Weight gr. 95</p>	<p>Weight gr. 100</p>	<p>5/2</p> 
<p>808.32.11.1</p> 	<p>808.52.11.1</p> 					
<p>Weight gr. 95</p>	<p>Weight gr. 100</p>					
<p>3/2</p> 	<p>Pneumatic Differential</p> <hr/> <p>Ordering code</p> <table border="1"> <tr> <td> <p>808.32.11.12</p>  </td> <td> <p>808.52.11.12</p>  </td> </tr> <tr> <td> <p>Weight gr. 105</p> </td> <td> <p>Weight gr. 110</p> </td> </tr> </table> <p>Minimum working pressure 2 bar</p>	<p>808.32.11.12</p> 	<p>808.52.11.12</p> 	<p>Weight gr. 105</p>	<p>Weight gr. 110</p>	<p>5/2</p> 
<p>808.32.11.12</p> 	<p>808.52.11.12</p> 					
<p>Weight gr. 105</p>	<p>Weight gr. 110</p>					
<p>3/2</p> 	<p>Pneumatic Pneumatic</p> <hr/> <p>Ordering code</p> <table border="1"> <tr> <td> <p>808.32.11.11</p>  </td> <td> <p>808.52.11.11</p>  </td> </tr> <tr> <td> <p>Weight gr. 115</p> </td> <td> <p>Weight gr. 120</p> </td> </tr> </table> <p>Minimum working pressure 1,5 bar</p>	<p>808.32.11.11</p> 	<p>808.52.11.11</p> 	<p>Weight gr. 115</p>	<p>Weight gr. 120</p>	<p>5/2</p> 
<p>808.32.11.11</p> 	<p>808.52.11.11</p> 					
<p>Weight gr. 115</p>	<p>Weight gr. 120</p>					
	<p>Pneumatic Pneumatic</p> <hr/> <p>Ordering code</p> <p><i>Closed centres</i> 808.53.31.11.11</p>  <p><i>Open centres</i> 808.53.32.11.11</p>  <p>Weight gr. 125</p> <p>Minimum working pressure 3 bar</p>	<p>5/3</p> 				

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size	Pilot ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	520 NI/min	4 mm.	G 1/8"	M 5

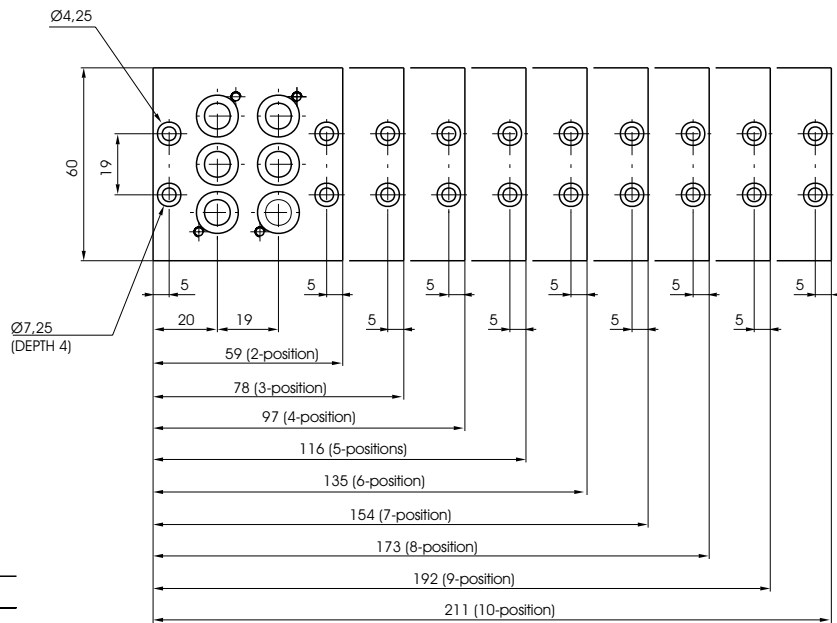
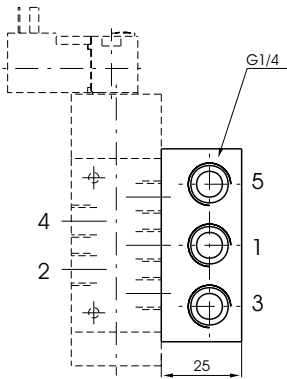


3/2		<p>Miniature solenoid Spring</p> <hr/> <p>Ordering code</p> <table style="width:100%; border: none;"> <tr> <td style="width: 50%; border-right: 1px solid black; padding-right: 10px;"> <p>808.32.0.1.* * = codes for voltage (see page 5.1)</p>  <p>Weight gr. 130</p> </td> <td style="width: 50%; padding-left: 10px;"> <p>808.52.0.1.* * = codes for voltage (see page 5.1)</p>  <p>Weight gr. 135</p> </td> </tr> </table> <p>Minimum working pressure 2 bar</p>	<p>808.32.0.1.* * = codes for voltage (see page 5.1)</p>  <p>Weight gr. 130</p>	<p>808.52.0.1.* * = codes for voltage (see page 5.1)</p>  <p>Weight gr. 135</p>	5/2	
<p>808.32.0.1.* * = codes for voltage (see page 5.1)</p>  <p>Weight gr. 130</p>	<p>808.52.0.1.* * = codes for voltage (see page 5.1)</p>  <p>Weight gr. 135</p>					
3/2		<p>Miniature solenoid Differential</p> <hr/> <p>Ordering code</p> <table style="width:100%; border: none;"> <tr> <td style="width: 50%; border-right: 1px solid black; padding-right: 10px;"> <p>808.32.0.12.* * = codes for voltage (see page 5.1)</p>  <p>Weight gr. 140</p> </td> <td style="width: 50%; padding-left: 10px;"> <p>808.52.0.12.* * = codes for voltage (see page 5.1)</p>  <p>Weight gr. 145</p> </td> </tr> </table> <p>Minimum working pressure 2 bar</p>	<p>808.32.0.12.* * = codes for voltage (see page 5.1)</p>  <p>Weight gr. 140</p>	<p>808.52.0.12.* * = codes for voltage (see page 5.1)</p>  <p>Weight gr. 145</p>	5/2	
<p>808.32.0.12.* * = codes for voltage (see page 5.1)</p>  <p>Weight gr. 140</p>	<p>808.52.0.12.* * = codes for voltage (see page 5.1)</p>  <p>Weight gr. 145</p>					
3/2		<p>Miniature solenoid Miniature solenoid</p> <hr/> <p>Ordering code</p> <table style="width:100%; border: none;"> <tr> <td style="width: 50%; border-right: 1px solid black; padding-right: 10px;"> <p>808.32.0.0.* * = codes for voltage (see page 5.1)</p>  <p>Weight gr. 185</p> </td> <td style="width: 50%; padding-left: 10px;"> <p>808.52.0.0.* * = codes for voltage (see page 5.1)</p>  <p>Weight gr. 190</p> </td> </tr> </table> <p>Minimum working pressure 1,5 bar</p>	<p>808.32.0.0.* * = codes for voltage (see page 5.1)</p>  <p>Weight gr. 185</p>	<p>808.52.0.0.* * = codes for voltage (see page 5.1)</p>  <p>Weight gr. 190</p>	5/2	
<p>808.32.0.0.* * = codes for voltage (see page 5.1)</p>  <p>Weight gr. 185</p>	<p>808.52.0.0.* * = codes for voltage (see page 5.1)</p>  <p>Weight gr. 190</p>					
		<p>Miniature solenoid Miniature solenoid</p> <hr/> <p>Ordering code</p> <table style="width:100%; border: none;"> <tr> <td style="width: 50%; border-right: 1px solid black; padding-right: 10px;"> <p><i>Closed centres</i> 808.53.31.0.0.* * = codes for voltage (see page 5.1)</p>  </td> <td style="width: 50%; padding-left: 10px;"> <p><i>Open centres</i> 808.53.32.0.0.* * = codes for voltage (see page 5.1)</p>  </td> </tr> </table> <p>Weight gr. 190 Minimum working pressure 3 bar</p>	<p><i>Closed centres</i> 808.53.31.0.0.* * = codes for voltage (see page 5.1)</p> 	<p><i>Open centres</i> 808.53.32.0.0.* * = codes for voltage (see page 5.1)</p> 	5/3	
<p><i>Closed centres</i> 808.53.31.0.0.* * = codes for voltage (see page 5.1)</p> 	<p><i>Open centres</i> 808.53.32.0.0.* * = codes for voltage (see page 5.1)</p> 					

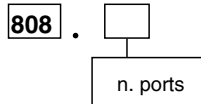
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with Δp = 1 bar	Orifice size	Working ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	520 NI/min	4 mm.	G 1/8"



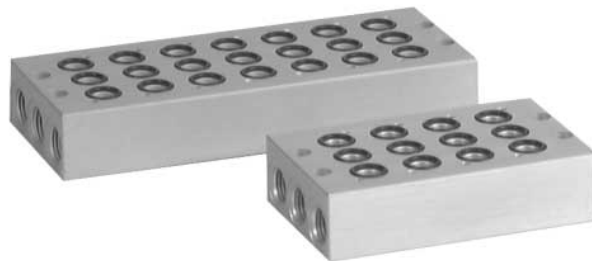
Manifold



Ordering code



n. ports	Weight gr.
02	180
03	245
04	310
05	375
06	440
07	500
08	560
09	620
10	680



Clip

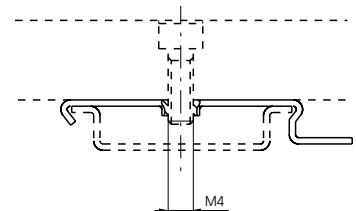
(for mounting the distributors groups on rail DIN 46277/3)

Ordering code

800.00



Weight gr. 5



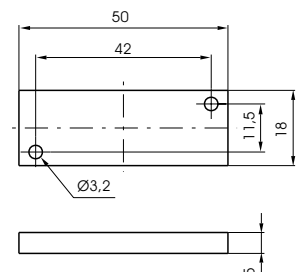
Closing plate

Ordering code

808.00



Weight gr. 65





5/2							
Pneumatic Spring							
Ordering code							
818.52.11.1							
Weight gr. 110							
Minimum working pressure 2 bar							
5/2							
Pneumatic Differential							
Ordering code							
818.52.11.12							
Weight gr. 120							
Minimum working pressure 2 bar							
5/2 et 5/3							
Pneumatic Pneumatic							
Ordering code							
818.52.11.11							
Minimum working pressure 1,5 bar							
818.53.31.11.11 <i>Closed centres</i>							
818.53.32.11.11 <i>Open centres</i>							
Minimum working pressure 3 bar							
Weight gr. 130							

Operational Characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size	Pilot ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +70°C	520 NI/min	4 mm.	-----	M 5



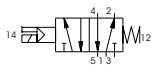
5/2

**Miniature solenoid
Spring**

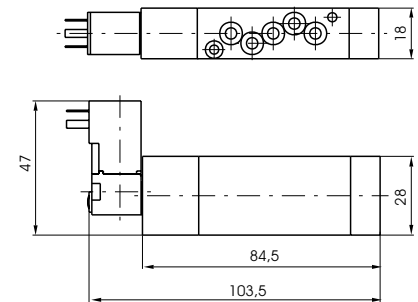
Ordering code

818.52.0.1.*

* = codes for voltage
(see page 5.1)



Weight gr. 145



Minimum working pressure 2 bar

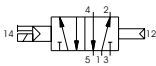
5/2

**Miniature solenoid
Differential**

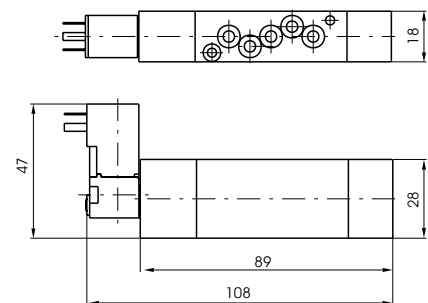
Ordering code

818.52.0.12.*

* = codes for voltage
(see page 5.1)



Weight gr. 155



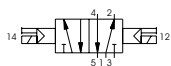
Minimum working pressure 2 bar

5/2 and 5/3

**Microsolenoid
Microsolenoid**

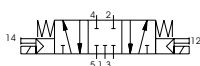
Ordering code

818.52.0.0.*

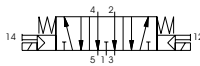


Minimum working pressure 1,5 bar

818.53.31.0.0.* *Closed centres*



818.53.32.0.0.* *Open centres*

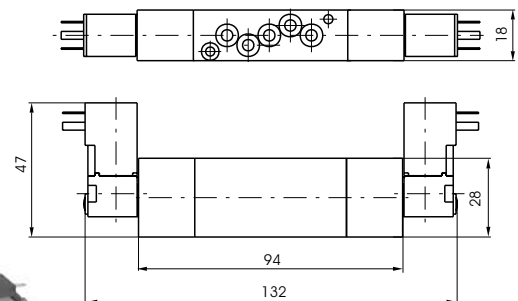


Minimum working pressure 3 bar

* = codes for voltage (see page 5.1)



Weight gr. 200

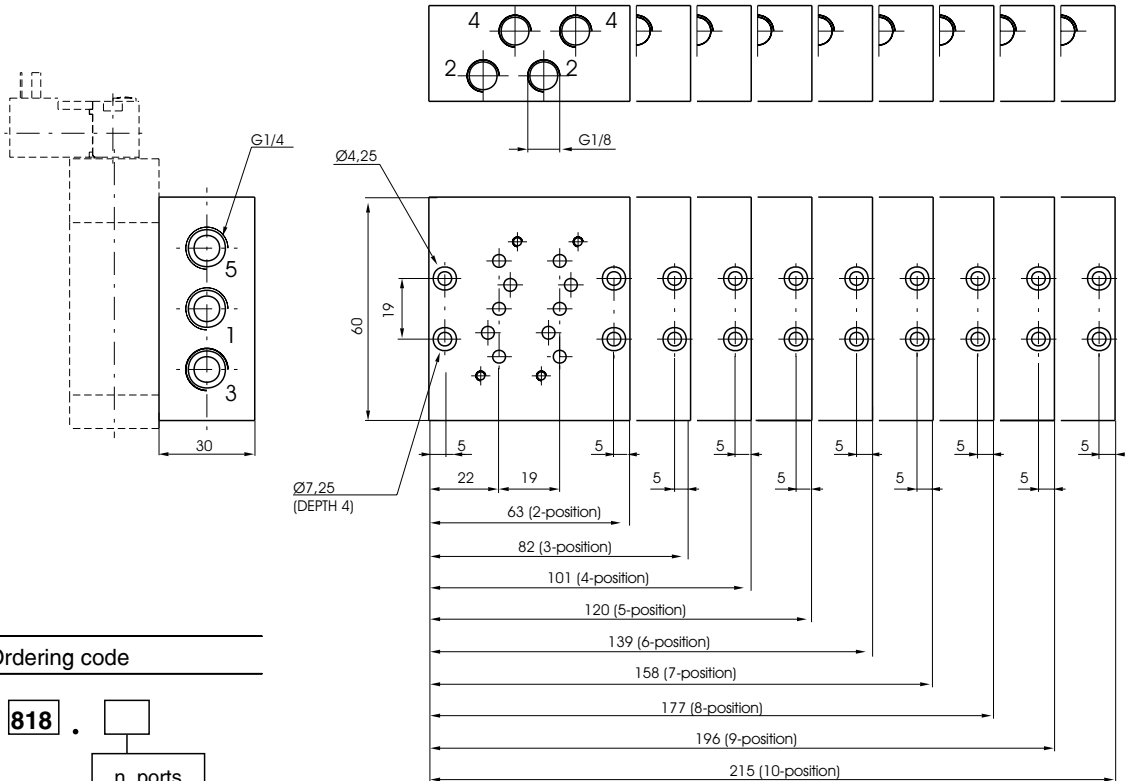


Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	520 NI/min	4 mm.	-----

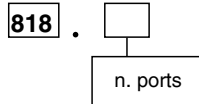


5/2							
Miniature solenoid Spring							
Ordering code							
818/1.52.0.1.*							
* = codes for voltage (see page 5.1)							
Weight gr. 150							
Minimum working pressure 2 bar							
5/2							
Miniature solenoid Differential							
Ordering code							
818/1.52.0.12.*							
* = codes for voltage (see page 5.1)							
Weight gr. 160							
Minimum working pressure 2 bar							
5/2 and 5/3							
Miniature solenoid Miniature solenoid							
Ordering code							
818/1.52.0.0.*							
Minimum working pressure 1,5 bar							
818/1.53.31.0.0.* <i>Closed centres</i>							
818/1.53.32.0.0.* <i>Open centres</i>							
Minimum working pressure 3 bar							
* = codes for voltage (see page 5.1)							
Weight gr. 205							
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	520 NI/min	4 mm.	-----

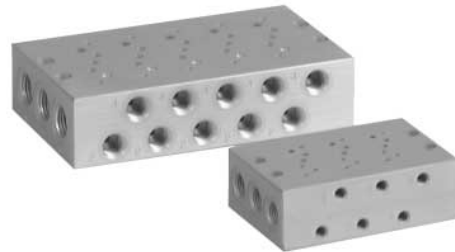
Multiple bases



Ordering code



n. ports	Weight gr.
02	310
03	415
04	510
05	600
06	695
07	790
08	890
09	980
10	1075



Clip

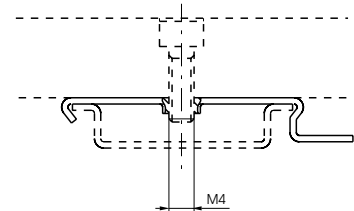
(for mounting the distributors groups on rail DIN 46277/3)

Ordering code

800.00



Weight gr. 5



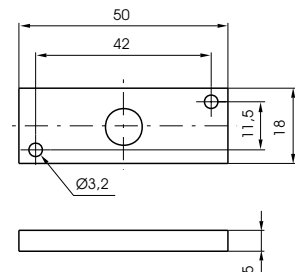
Closing plate

Ordering code

818.00



Weight gr. 65





General description


These are a new concept in distributors and solenoid distributors which were designed to achieve top performance and versatility as well as lightness, compact dimensions and a competitive price. They are made of thermoplastic polyester with threaded brass inserts and operate according to the balanced spool system.

By turning the operators by 180°, the feed to the pilot systems can be changed from internal to external or vice versa.

Available only in the 5-way version, they can be either monostable or bistable with 2 positions and 3 positions with closed or open centres.

Series 300 solenoid valves are used for solenoid pilot systems, "M" and "MB2 coil.

The ordering codes refer to the solenoid distributors with the mechanic "M2" assembled (see Series 300, section 1). (Coil are not included and have to be ordered separately)

Coil  homologated are available. (see page 1.26)

The polyurethane seals are available for oil free operation. In this case, the ordering code becomes:
838 ...for G 1/8" - 834 ...for G 1/4"

Important: on this type of valves a temperature higher than 40°C along with water or high humidity are causing a progressive reduction of mechanical characteristics of the seals. This chemical reaction (hydrolysis) duration depends by the ambient temperature and in some cases the seal becomes brittle

Structural characteristics

Body	Thermoplastic polyester
Operators	Thermoplastic polyester
Spool	Nickel-plated steel (kanigen)
Spacers	Polyacetal (POL)
Pistons	Aluminium alloy 2011
Seals	Oilprof rubber NBR (polyurethane on demand)
Springs	AISI 302 stainless steel - steel for springs

Use and maintenance

These distributors have an average lifespan ranging between 10 and 15 million cycles, depending on operating conditions. Proper lubrication cuts down the wear of the seals drastically, in the same way as proper filtering prevents the build-up of dirt and consequent malfunctioning of the valve.

Make sure that the conditions of use comply with the pressure, temperature, etc. limits indicated and that the fastening screw are tightened with the following maximum torques:

G 1/8" (828) = 4 Nm G 1/4" (824) = 5 Nm

Assembly kits, including the spool and seals subject to wear, are available for servicing, which can be carried out by anyone provided proper care is taken when reassembling the distributor.

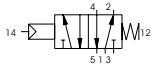
NOTE: use only class H hydraulic oils for lubrication, e.g. MAGNA GC 32 (Castrol).

5/2

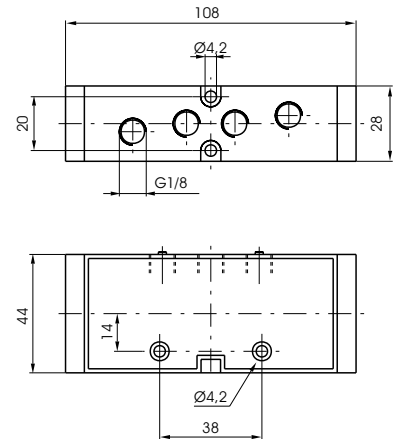
Pneumatic Spring

Ordering code

828.52.1.9



Weight gr. 160



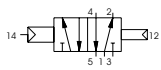
Minimum working pressure 2,5 bar

5/2

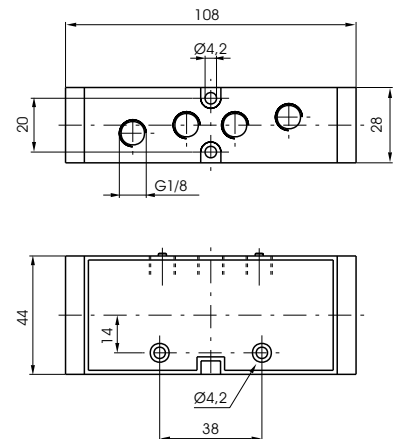
Pneumatic Differential

Ordering code

828.52.1.6



Weight gr. 160



Minimum working pressure 2 bar

5/2 and 5/3

Pneumatic Pneumatic

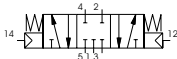
Ordering code

828.52.1.8



Minimum working pressure 1,5 bar

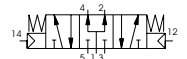
828.53.31.1.8 *Closed centres*



828.53.32.1.8 *Open centres*

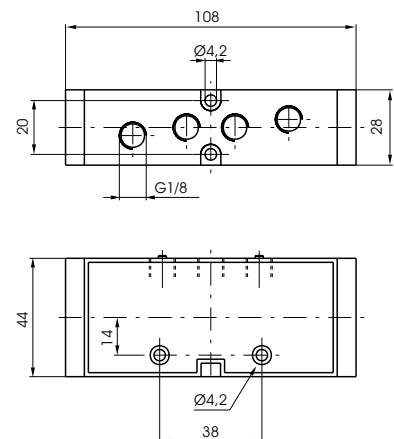


828.53.33.1.8 *Pressured centres*



Minimum working pressure 3 bar

Weight gr. 170

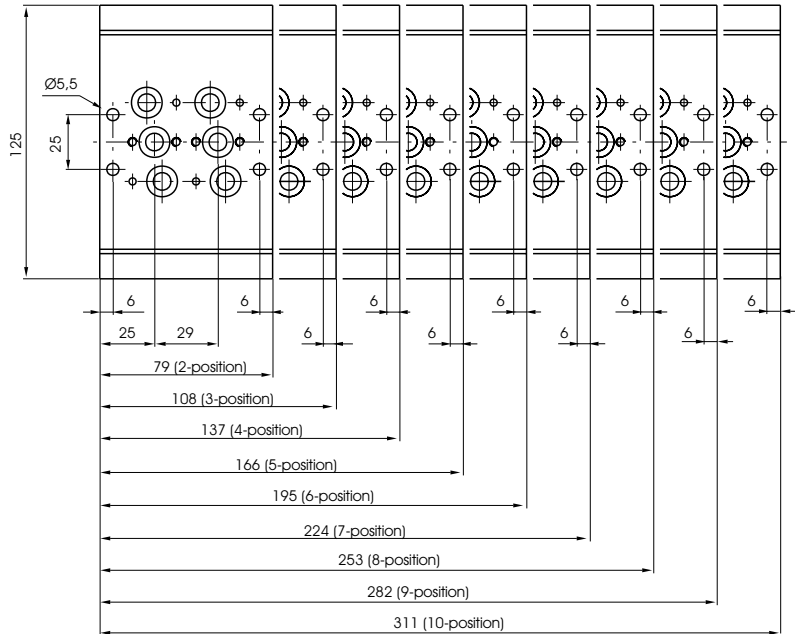
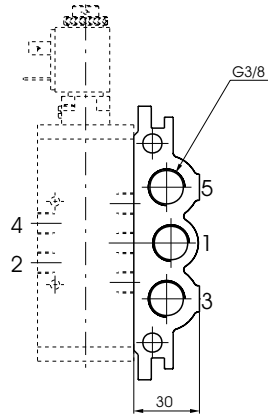


Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size	Pilot ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	800 NI/min (5/2) 710 NI/min (5/3)	7 mm.	G 1/8"	G 1/8"

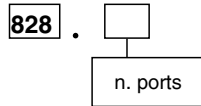
5/2							
Solenoid Spring							
Ordering code							
828.52.3.9.M2							
Weight gr. 210							
Minimum working pressure 2,5 bar							
5/2							
Solenoid Differential							
Ordering code							
828.52.3.6.M2							
Weight gr. 210							
Minimum working pressure 2 bar							
5/2 and 5/3							
Solenoid Solenoid							
Ordering code							
828.52.3.5.M2							
Minimum working pressure 1,5 bar							
828.53.31.3.5.M2 <i>Closed centres</i>							
828.53.32.3.5.M2 <i>Open centres</i>							
828.53.33.3.5.M2 <i>Pressured centres</i>							
Minimum working pressure 3 bar							
Weight gr. 280							
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	800 NI/min (5/2) 710 NI/min (5/3)	7 mm.	G 1/8"



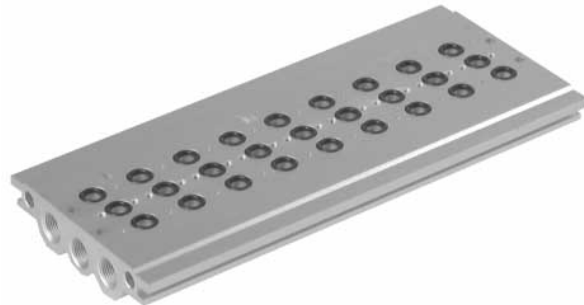
Manifolds



Ordering code



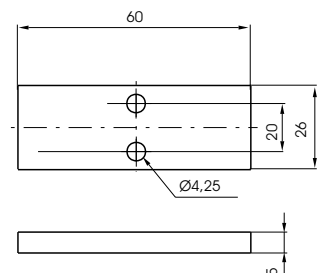
n. ports	Weight gr.
02	425
03	580
04	740
05	890
06	1040
07	1200
08	1360
09	1510
10	1665



Closing plate

Ordering code

828.00



Weight gr. 70

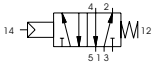


5/2


Pneumatic Spring

Ordering code

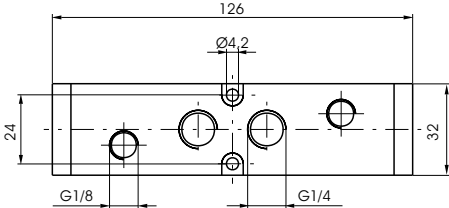
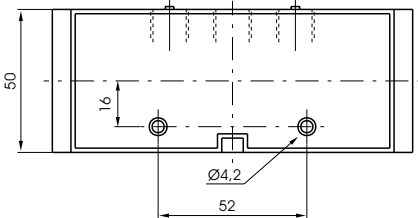
824.52.1.9



Weight gr. 270



Minimum working pressure 2,5 bar

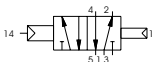



5/2


Pneumatic Differential

Ordering code

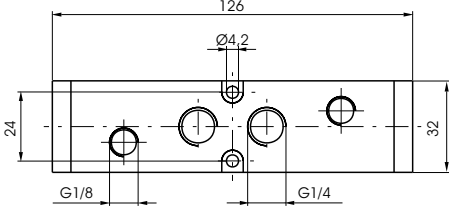
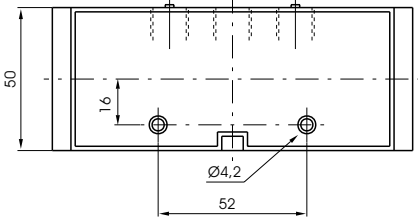
824.52.1.6



Weight gr. 270



Minimum working pressure 2 bar





5/2 and 5/3

Pneumatic Pneumatic

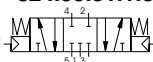
Ordering code

824.52.1.8




Minimum working pressure 1,5 bar

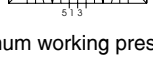

824.53.31.1.8 *Closed centres*



824.53.32.1.8 *Open centres*

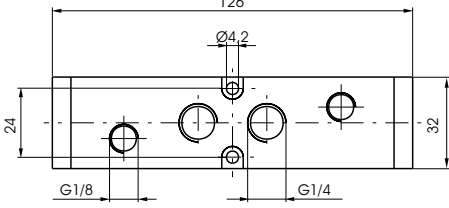
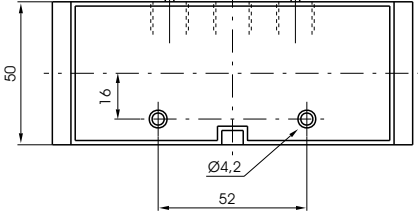


824.53.33.1.8 *Pressured centres*

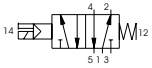

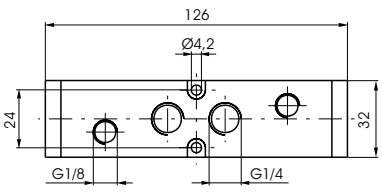
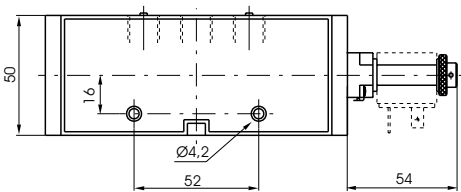
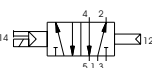

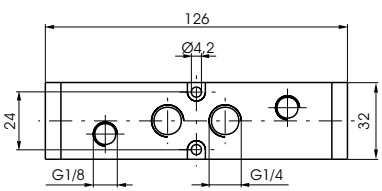
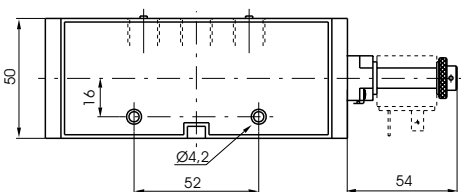

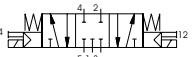

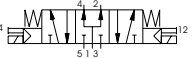

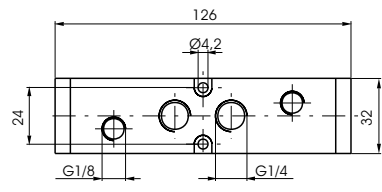
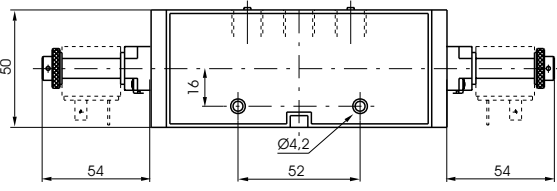
Minimum working pressure 3 bar

Weight gr. 280

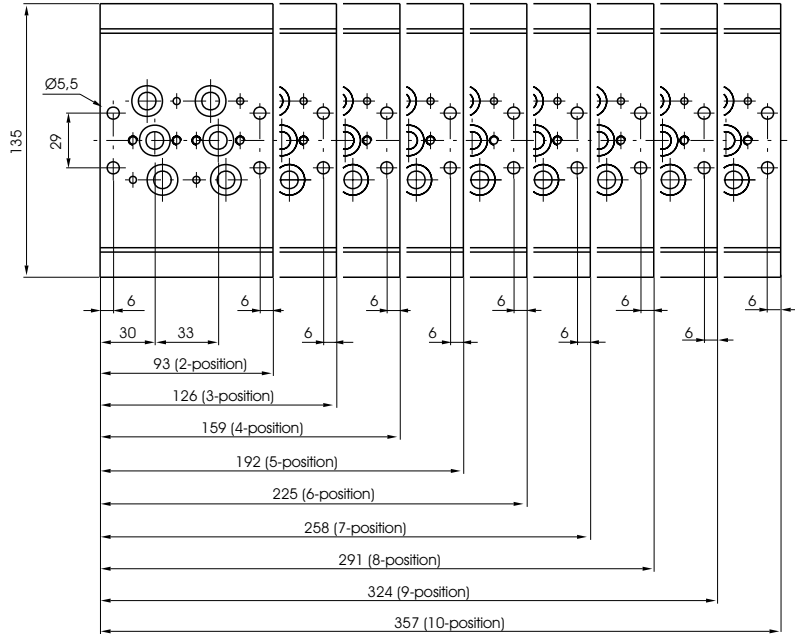
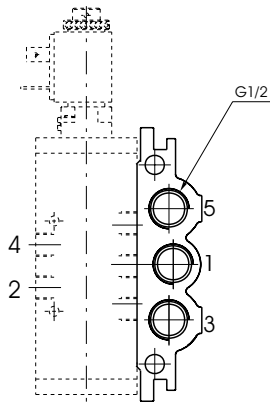



Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size	Pilot ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	1350 NI/min (5/2) 940 NI/min (5/3)	8,5 mm.	G 1/4"	G 1/8"

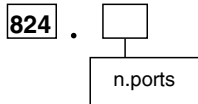


5/2							
Solenoid Spring							
Ordering code							
824.52.3.9.M2							
							
Weight gr. 320							
			 				
Minimum working pressure 2,5 bar							
5/2							
Solenoid Differential							
Ordering code							
824.52.3.6.M2							
							
Weight gr. 320							
			 				
Minimum working pressure 2 bar							
5/2 and 5/3							
Solenoid Solenoid							
Ordering code							
824.52.3.5.M2							
							
Minimum working pressure 1,5 bar							
824.53.31.3.5.M2 <i>Closed centres</i>							
							
824.53.32.3.5.M2 <i>Open centres</i>							
							
824.53.33.3.5.M2 <i>Pressured centres</i>							
							
Minimum working pressure 3 bar			Weight gr. 390				
			 				
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated air	10 bar	min. -5°C	max. +50°C	1350 NI/min (5/2) 940 NI/min (5/3)	8,5 mm.	G 1/4"

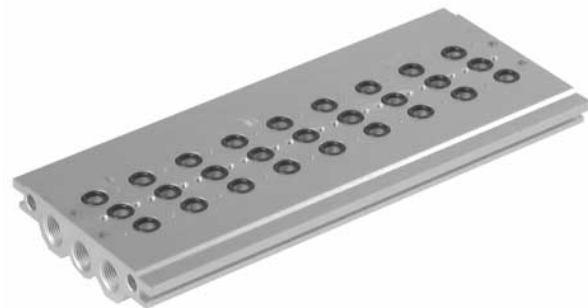
Manifolds



Ordering code



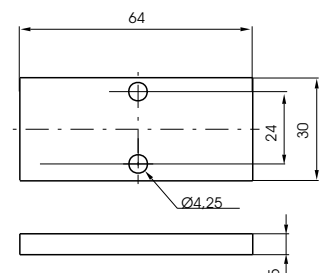
n.ports	Weight gr.
02	560
03	770
04	970
05	1180
06	1385
07	1590
08	1790
09	2000
10	2205



Closing plate

Ordering code

824.00



Weight gr. 80



General

In alternative to the thermoplastic distributors we are producing also a version in zinc alloy for the size G 1/8". This range includes three different types: 858/8 is a distributor or electro distributor for individual use only, 858/3 is mounted on modular base only which includes the inlets and outlets ports and finally the 858/4 which is mounted on ISO base size 1.

The construction method is same and on all 3 distributors is possible to get the feed from the pilot port or internally from port 1 by rotating the actuators of 180°.

These distributors are 5 ways only with options of 2 positions 5/2 and 3 positions 5/3 closed centres, open centres and pressured centres. The mechanic M2 (see Series 300, section 1), with respective coil, are utilized for the electropneumatic pilots.

The ordering codes refer to the distributors with mechanics "M2" mounted. (Coil are not included and homologated are available. (see page 1.26)



Coil homologated are available. (see page 1.26)

The polyurethane seals are available for oil free operation. In this case, the ordering code becomes: 878/.....

Important: on this type of valves a temperature higher than 40°C along with water or high humidity are causing a progressive reduction of mechanical characteristics of the seals. This chemical reaction (hydrolysis) duration depends by the ambient temperature and in some cases the seal becomes brittle and falls to pieces.

The valves equipped with polyurethane seals are not suitable for tropical climate.

Construction characteristic

Body	Zinc alloy
Operators	Zinc alloy
Spool	Nickel plated steel
Seals	Oilproof rubber NBR (polyurethane on demand)
Spacers	Polyacetal (POL)
Pistons	Aluminium
Springs	Spring steel
Bottom plates	Polyacetal (POL)

Use and maintenance

These distributors have a mean life of 10 to 15 millions of cycles, depending on application. Proper lubrication with specified oil reduces dramatically the wear of the seals and a good filtration insures long and trouble free operation. Check that the operation conditions are according to the suggested pressure, temperature and so on. The exhaust ports of the distributor have to be protected in a dusty and dirty environment.

A spare parts kit including the spool and seals is available for overhauling the valve. This simple operation does not require a skilled worker. Although a particular care is needed for assembling the valve.

ATTENTION : use hydraulic oil class H for lubrication such as MAGNA GC 32 (Castrol).

IMPORTANT: the following codes do not include the coil which has to be ordered separately.




5/2								
Pneumatic Spring								
Ordering code								
858/2.52.1.9								
Weight gr. 410								
Minimum working pressure 2,5 bar								
5/2								
Pneumatic Differential								
Ordering code								
858/2.52.1.6								
Weight gr. 410								
Minimum working pressure 2 bar								
5/2 and 5/3								
Pneumatic Pneumatic								
Ordering code								
858/2.52.1.8								
Minimum working pressure 1,5 bar								
858/2.53.31.1.8 <i>Closed centres</i>								
858/2.53.32.1.8 <i>Open centres</i>								
858/2.53.33.1.8 <i>Pressured centres</i>								
Minimum working pressure 3 bar								
Weight gr. 420								
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size	Pilot ports size
	Filtered and lubricated air	10 bar	min. -5° C	max. +70° C	600 NI/min (5/2) 430 NI/min (5/3)	6 mm.	G 1/8"	G 1/8"

5/2


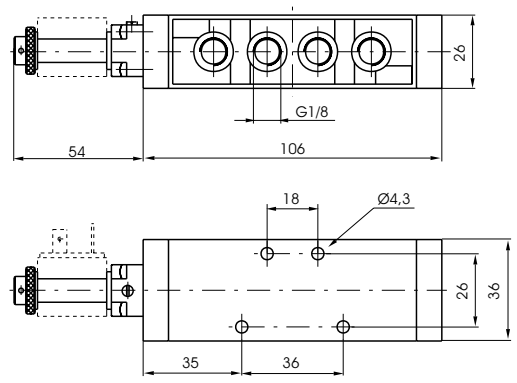
Solenoid Spring

Ordering code

858/2.52.3.9.M2



Weight gr. 480

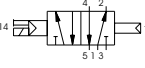
Minimum working pressure 2,5 bar

5/2


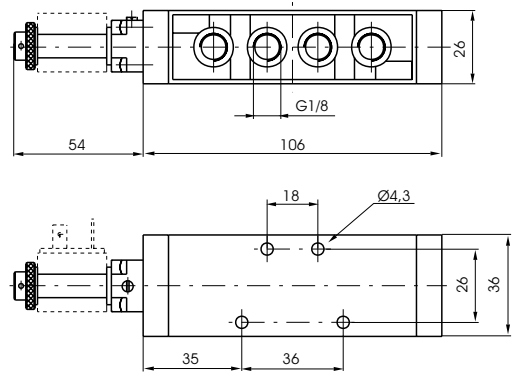
Solenoid Differential

Ordering code

858/2.52.3.6.M2



Weight gr. 480

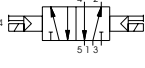
Minimum working pressure 2 bar

5/2 and 5/3

Solenoid Solenoid

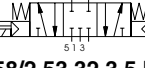
Ordering code

858/2.52.3.5.M2




Minimum working pressure 1,5 bar

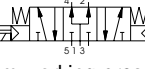
858/2.53.31.3.5.M2 *Closed centres*



858/2.53.32.3.5.M2 *Open centres*


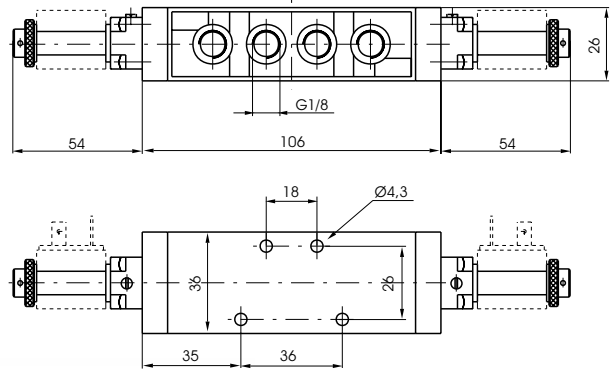


858/2.53.33.3.5.M2 *Pressured centres*



Minimum working pressure 3 bar

Weight gr. 560

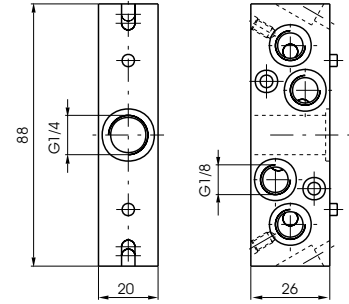
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated	10 bar	min. -5°C	max. +50°C	600 NI/min (5/2) 430 NI/min (5/3)	6,0 mm	G 1/8"

Modular base for series mounting

Ordering code

858/3.00

Weight gr. 220



Brackets

Ordering code

Short bracket

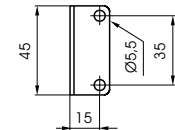
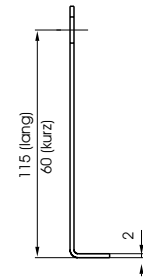
858/3.01

Weight gr. 58

Tall bracket

858/3.02

Weight gr. 96

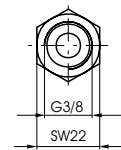
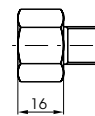


Inlet connector

Ordering code

858/3.03

Weight gr. 40

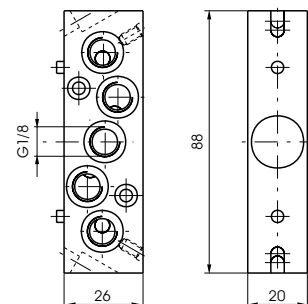


Modular base for series mounting with individual feed

Ordering code

858/3.04

Weight gr. 220



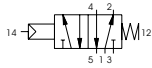


5/2

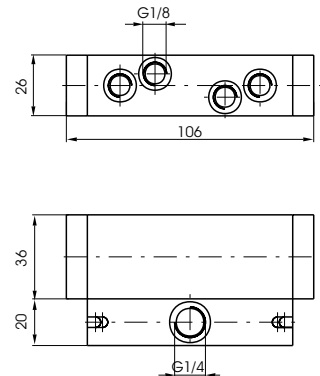
Pneumatic Spring

Ordering code

858/3.52.1.9



Weight gr. 405



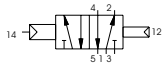
Minimum working pressure 2,5 bar

5/2

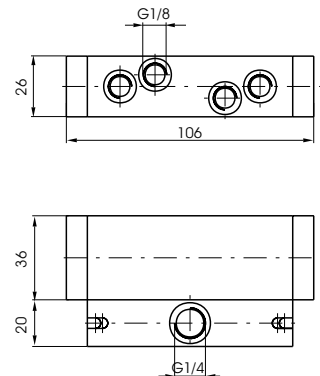
Pneumatic Differential

Ordering code

858/3.52.1.6



Weight gr. 400



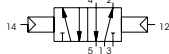
Minimum working pressure 2 bar

5/2 and 5/3

Pneumatic Pneumatic

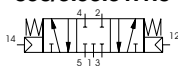
Ordering code

858/3.52.1.8



Minimum working pressure 1,5 bar

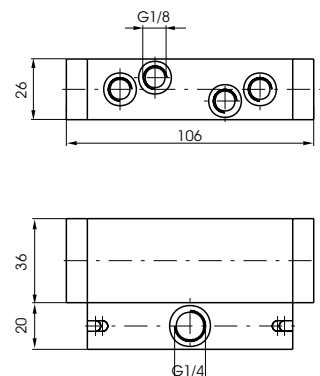
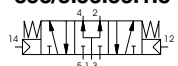
858/3.53.31.1.8 *Closed centres*



858/3.53.32.1.8 *Open centres*



858/3.53.33.1.8 *Pressured centres*

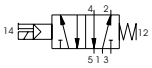

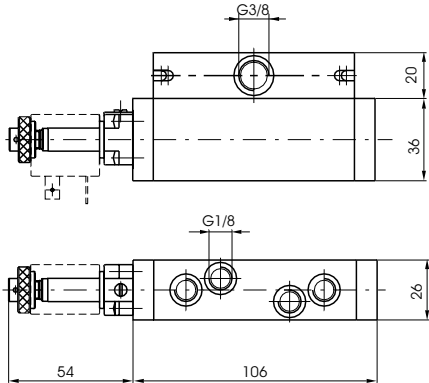


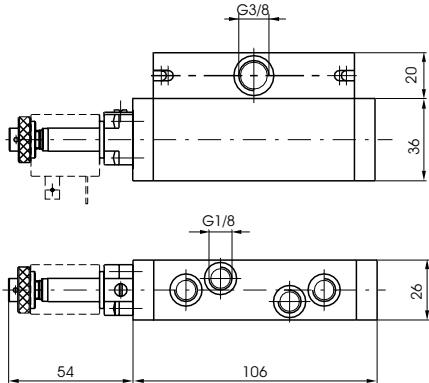

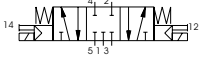
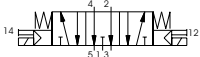
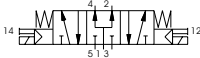

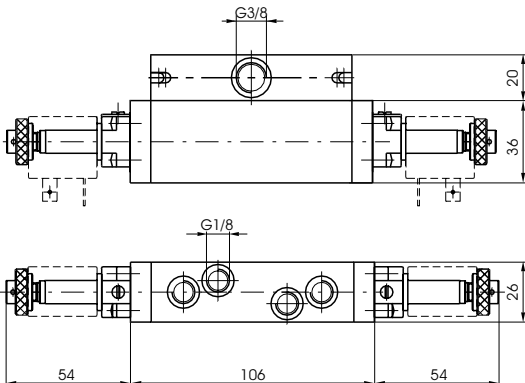


Minimum working pressure 3 bar

Weight gr. 400

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size	Pilot ports size
	Filtered and lubricated	10 bar	min. -5°C	max. +70°C	600 NI/min (5/2) 430 NI/min (5/3)	6,0 mm	G 1/8"	G 1/8"



5/2							
Solenoid Spring							
Ordering code							
858/3.52.3.9.M2							
							
Weight gr. 480							
							
							
Minimum working pressure 2,5 bar							
5/2							
Solenoid Differential							
Ordering code							
858/3.52.3.6.M2							
							
Weight gr. 480							
							
							
Minimum working pressure 2 bar							
5/2 and 5/3							
Solenoid Solenoid							
Ordering code							
858/3.52.3.5.M2							
							
Minimum working pressure 1,5 bar							
858/3.53.31.3.5.M2 <i>Closed centres</i>							
							
858/3.53.32.3.5.M2 <i>Open centres</i>							
							
858/3.53.33.3.5.M2 <i>Pressured centres</i>							
							
Minimum working pressure 3 bar							
Weight gr. 560							
							
							
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated	10 bar	min. -5°C	max. +50°C	600 NI/min (5/2) 430 NI/min (5/3)	6 mm	G 1/8"

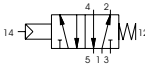


5/2


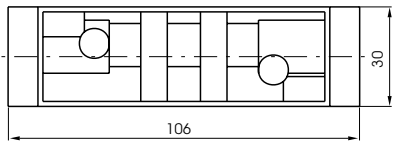
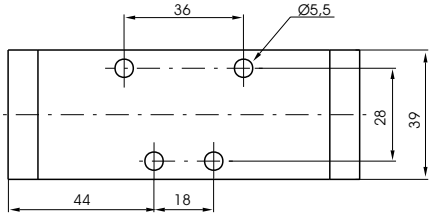
Pneumatic Spring

Ordering code

858/4.52.1.9



Weight gr. 455

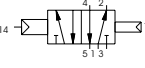
Minimum working pressure 2,5 bar

5/2


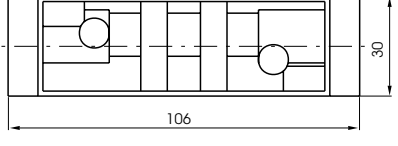
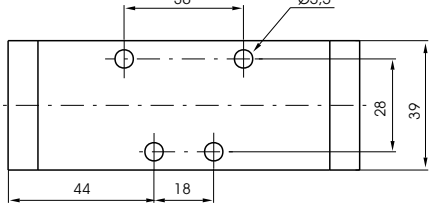
Pneumatic Differential

Ordering code

858/4.52.1.6



Weight gr. 450


Minimum working pressure 2 bar

5/2 and 5/3

Pneumatic Pneumatic


Ordering code

858/4.52.1.8




Minimum working pressure 1,5 bar



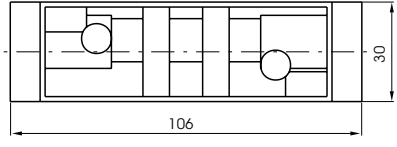
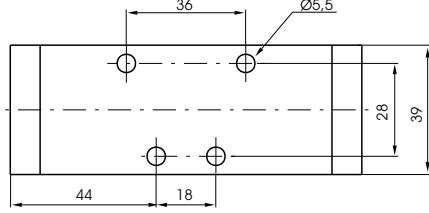
858/4.53.31.1.8 *Closed centres*



858/4.53.32.1.8 *Open centres*



858/4.53.33.1.8 *Pressured centres*

Minimum working pressure 3 bar

Weight gr. 450

Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	\varnothing nominal de passage	Working ports size	Pilot ports size
	Air filtré et lubrifié	10 bar	min. -5°C	max. +70°C	720 NI/min (5/2) 520 NI/min (5/3)	6 mm.	G 1/8"	G 1/8"



5/2							
Solenoid Spring							
Ordering code							
858/4.52.3.9.M2							
Weight gr. 520							
Minimum working pressure 2,5 bar							
5/2							
Solenoid Differential							
Ordering code							
858/4.52.3.6.M2							
Weight gr. 520							
Minimum working pressure 2 bar							
5/2 and 5/3							
Solenoid Solenoid							
Ordering code							
858/4.52.3.5.M2							
Minimum working pressure 1,5 bar							
858/4.53.31.3.5.M2 <i>Closed centres</i>							
858/4.53.32.3.5.M2 <i>Open centres</i>							
858/4.53.33.3.5.M2 <i>Pressured centres</i>							
Minimum working pressure 3 bar							
Weight gr. 600							
Operational characteristics	Fluid	Max working pressure	Operating temperature		Flow rate at 6 bar with $\Delta p = 1$ bar	Orifice size	Working ports size
	Filtered and lubricated	10 bar	min. -5°C	max. +50°C	720 NI/min (5/2) 520 NI/min (5/3)	6 mm.	-----



Size 1

	Page
General	1.0
Assembling	1.1
Filter	1.2
Coalescing filter	1.3
Panel mounting pressure regulator	1.4
Panel mounting pressure regulator including manometer	1.5
Modular pressure regulator	1.6
Modular pressure regulator including manometer	1.7
Manifold pressure regulator	1.8
Manifold pressure regulator	1.9
Lubricator	1.10
Filter - Pressure regulator	1.11
Progressive start-up valve	1.12
Shut-off valve	1.13
Service units combination, 2 components	1.14 - 1.15
Service units combination, 3 components	1.16 - 1.17
High sensitive air pressure regulator with high flow rate relieving	1.18
Accessories	1.19 - 1.20
Spare Parts	1.21 ÷ 1.23



General

The operational safety and durability of a pneumatic circuit depends on the quality of the compressed air. The compressed air and the moisture increase the rate of wear of the surfaces and seals, reducing the efficiency and the life of the pneumatic components. Furthermore the pressure fluctuation due to a discontinuous demand of air, adversely effect the correct operation of the circuit.

To eliminate these disadvantages it is essential to install the service units: filter, pressure regulator and lubricator.

Construction and working characteristics

The great advantage of these Air Service Unit's components is their Modular Design which allows their assembly without the use of additional devices.

Two different version have been designed for this size: one made with zinc alloy body and the other with reinforced technopolymer body and threaded brass connections.

The bowls are made of transparent technopolymer and are also available with shock resistant technopolymer protection on request, always allowing the moisture and oil level control from any angle.

The filter can be equipped with manual or semiautomatic water drain valve; furthermore it's possible to install the automatic draining device inside the bowl.

The pressure regulator handle is lockable in the desired position by simply pressing it downwards.

The lubricator oil flow is adjustable with proper handle and it is visibly checked through the sight dome.

The shut-off valve can be equipped with pad-lock to prevent accidents or damages due to unauthorized operation.

The progressive start-up valve, pneumatically or electropneumatically controlled, allows air supply to the circuit progressively and with adjustable time.

The accessories like the wall fixing brackets, pressure gauges with different scales and diameters and the air intake blocks are completing the range. They are assembled between the elements to get filtered or filtered non-lubricated air in the system.

Instruction for installation and operation

Pay attention to install a group or a single component with air flow direction according to the arrows and to the following sequence: filter, pressure regulator, lubricator and with bowls downwards. The group can be fixed to the wall by removing the covers, which can be installed again after fixing for covering the screws.

Do not exceed the recommended torque while assembling the connectors.

Do not exceed the recommended air pressure and temperature limits.

The moisture should not exceed the level marked on the bowl and it can be drawn off and carried by a flexible tube of Ø 6/4 directly connected to the discharge valve handle.

The pressure should be set from minimum to maximum, rotating the adjusting handle clockwise.

As lubricant, we suggest to use oil class FD22 or HG32. Verify that the lubricator is not fed with a flow lower than the minimum operational.

To set the oil flow rotate the proper adjusting handle in order to get one drop of oil every 300-600 liters of air.

The oil flow will be kept automatically and proportionally to the air flow.

The oil can be refilled by mean of proper plug or directly into the bowl after having de-pressurized the system. Do not exceed the maximum level indicated on the bowl.

Maintenance

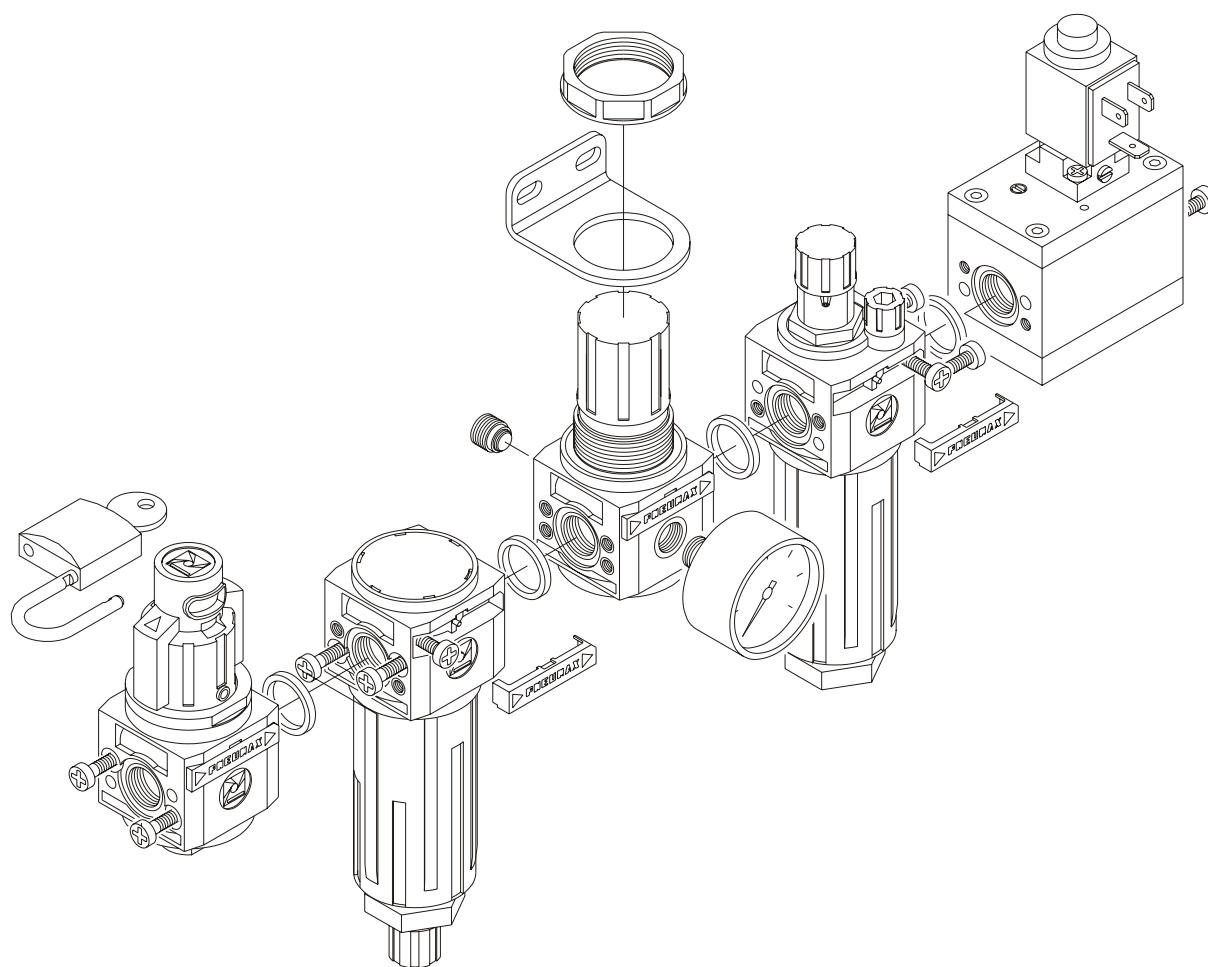
Clean the bowls with water and detergent. Do not use alcohol.

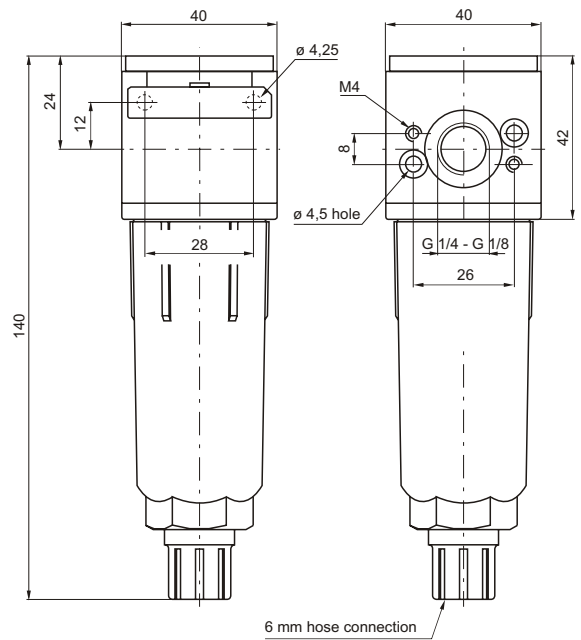
The filter element made with HPDE is reusable by blowing and cleaning it with proper detergent. For replacing or cleaning it, remove the bowl and unscrew the baffle spins.

Replace the pressure regulator diaphragm whenever the operation is not correct or there is a continuous air leaking through the relieving (over pressure discharge); reinstall the adjusting mechanism support, locking it with about 8 Nm torque. In case it is necessary to replace the lubricator transparent dome, tight it at 5 Nm torque maximum.



Assembling





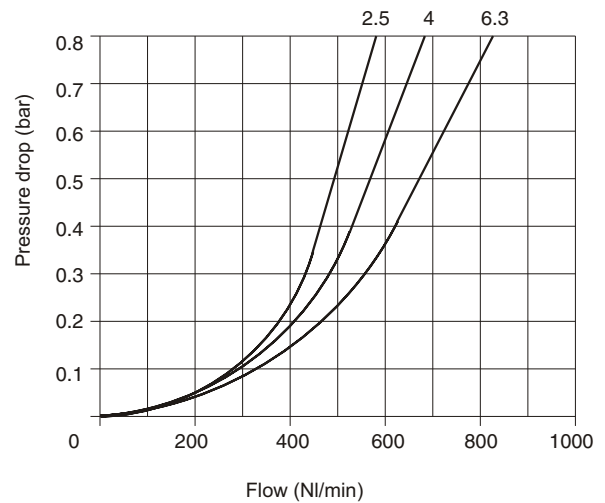
Construction and working characteristics

- Double filtering action: by air centrifuging and by replaceable and reusable HDPE porous filter element.
- Zinc alloy body or reinforced technopolymer body with threaded brass insert connections.
- Wall mounting possibility with M4 screws protected by covers.
- Transparent technopolymer bowl screwed to the body.
- Shock resistant bowl technopolymer protection.
- Manual and semi-automatic water drain valve; in the semi-automatic version the drainage happens when there is no pressure or by pushing the valve up-wards.
- Possibility to see the water level on 360° also with bowl protection assembled.
- Automatic water drainage bowl available on request.

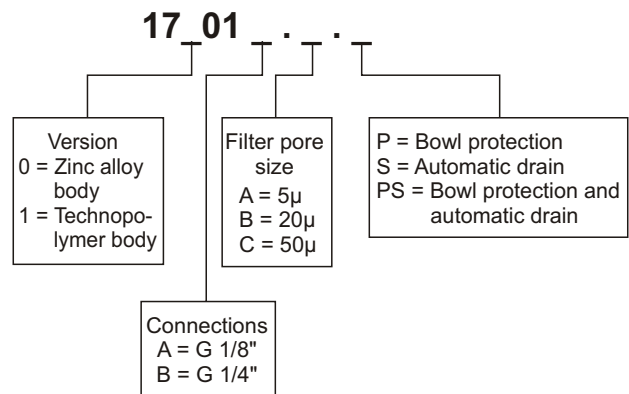
Technical characteristics

Connections	G 1/8" - G 1/4"
Max. Inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature(at 10 bar)	50°C
Weight with technopolymer body	gr. 103
Weight with zinc alloy body	gr. 218
Filter pore size	5µ
	20µ
	50µ
Bowl capacity	17 cm ³
Assembly position	Vertical
Wall fixing screw	M4
Max. fitting torque on zinc alloy body	30 Nm
Max. fitting torque on technopolymer body	15 Nm

Flow rate curves
Inlet pressure (bar)

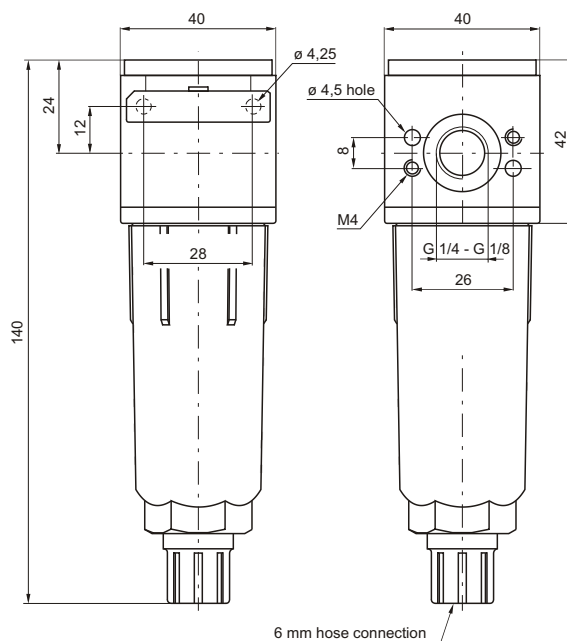


Ordering code



Example: **17101A.B.P**

Filter size 1 with G 1/8" connections, filter pore size 20µ and bowl protection with technopolymer body.



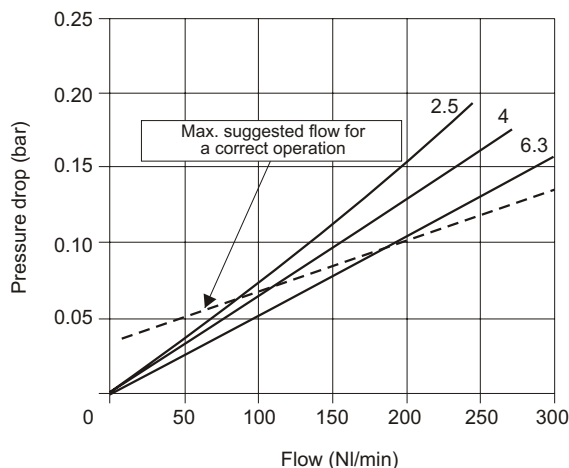
Construction and working characteristics

- Coalescing filter element remove 0,1 μ particle equivalent to 99,97%.
- Zinc alloy body or reinforced technopolymer body with threaded brass insert connections.
- Wall mounting possibility with M4 screws protected by covers.
- Transparent technopolymer bowl screwed to the body.
- Shock resistant bowl technopolymer protection.
- Manual and semi-automatic water drain valve; in the semi-automatic version the drainage happens when there is no pressure or by pushing the valve up-wards.
- Possibility to see the water level on 360° also with bowl protection assembled.
- Automatic water drainage bowl available on request.

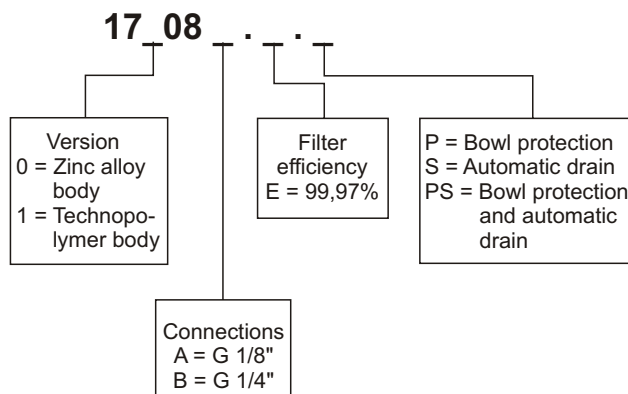
Technical characteristics

Connections	G 1/8" - G 1/4"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature (at 10 bar)	50°C
Weight with technopolymer body	gr. 110
Weight with zinc alloy body	gr. 225
Filter efficiency with 0,1 μ particle	99,97%
Bowl capacity	17 cm ³
Assembly position	Vertical
Wall fixing screws	M4
Max. fitting torque on zinc alloy body	30 Nm
Max. fitting torque on technopolymer body	15 Nm

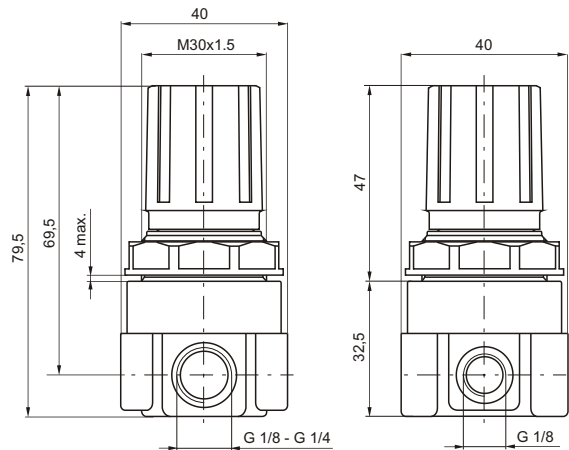
Flow rate curves
Inlet pressure (bar)



Ordering code



Example: **17108A.E.P**
Filter size 1 with G 1/8" connections. Filter efficiency 99,97% and bowl protection with technopolymer body.



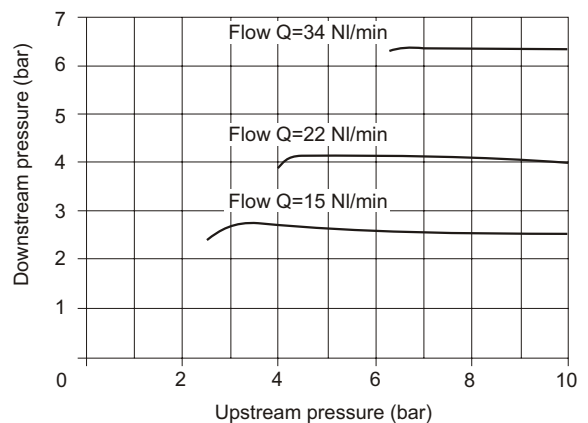
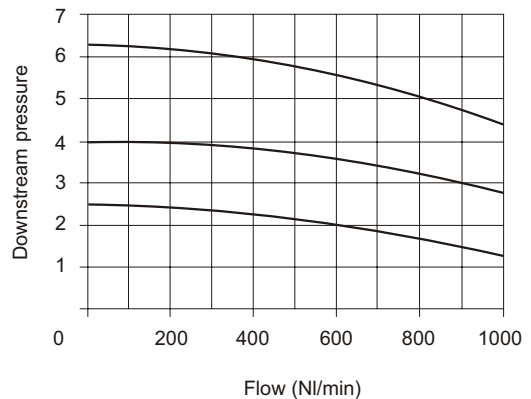
Construction and working characteristics

- Diaphragm pressure regulator with relieving.
- Balanced poppet.
- Technopolymer body with metal reinforced threaded connections.
- Handle lockable in the desired position by simply pressing it downwards.
- Two pressure gauge connections with plug complete of seal.
- Panel mounting bracket.

Technical characteristics

Connections	G 1/8" - G 1/4"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature	50°C
Pressure gauge connections	G 1/8"
Weight	gr. 110
Pressure range	0 - 2 bar 0 - 4 bar 0 - 8 bar 0 - 12 bar
Assembly position	Any
Max. fitting torque	15 Nm

Flow rate curves
Inlet pressure (7 bar)



Ordering code

17109

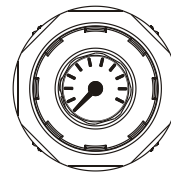
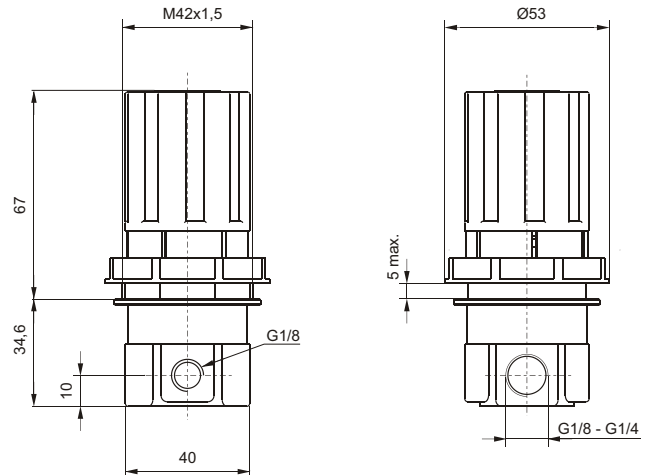
Connections
A = G 1/8"
B = G 1/4"

Adjusting range
A = 0 - 2 bar
B = 0 - 4 bar
C = 0 - 8 bar
D = 0 - 12 bar

L = No relieving
SM = Improved relieving
SR = Unbalanced valve
SRM = Unbalanced valve with improved relieving
SMF = Improved relieving with controlled relief

Example: **17109A.C**

Panel mounting pressure regulator size 1 with G 1/8" connections, 0 - 8 bar adjusting range with relieving.



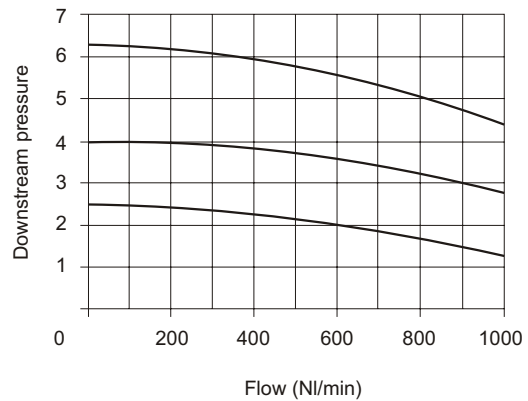
Construction and working characteristics

- Diaphragm pressure regulator with relieving.
- Balanced poppet.
- Technopolymer body with metal reinforced threaded connections.
- Handle lockable in the desired position by simply pressing it downwards.
- Including manometer in the handle upper surface.
- Panel mounting bracket.

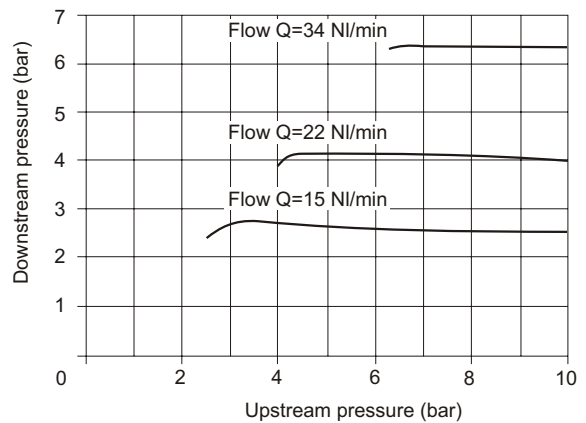
Technical characteristics

Connections	G 1/8" - G 1/4"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature	50°C
Pressure gauge connections	G 1/8"
Weight	gr. 250
Pressure range	0 - 2 bar 0 - 4 bar 0 - 8 bar 0 - 12 bar
Assembly position	Any
Max. fitting torque	15 Nm

Flow rate curves
Inlet pressure (7 bar)

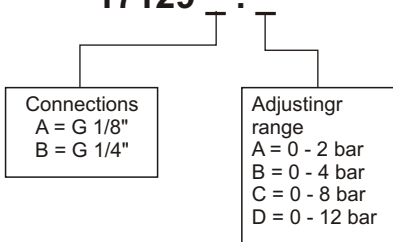


Adjustment characteristics



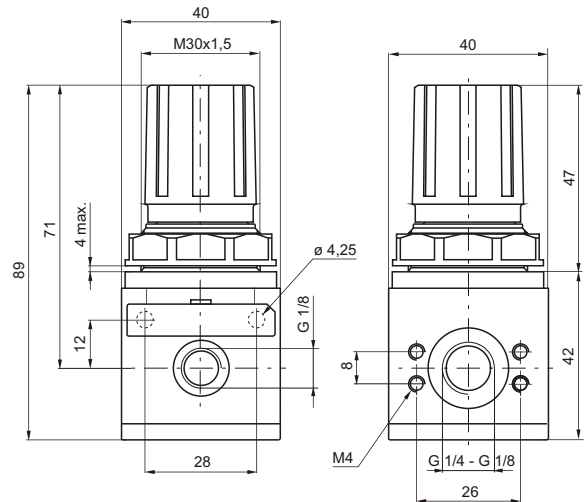
Ordering code

17129



Example: **17129A.C**

Panel mounting pressure regulator size 1 with G 1/8" connections, 0 - 8 bar.



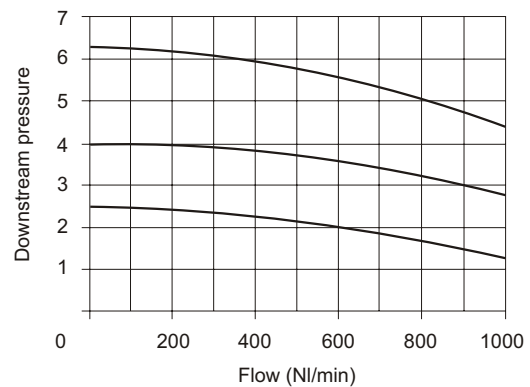
Construction and working characteristics

- Diaphragm pressure regulator with relieving.
- Balanced poppet.
- Zinc alloy body or reinforced technopolymer body with threaded brass insert connections.
- Wall mounting possibility with M4 screws protected by covers.
- Handle lockable in the desired position by simply pressing it downwards.
- Two pressure gauge connections with plug complete of seal.
- Panel mounting bracket.

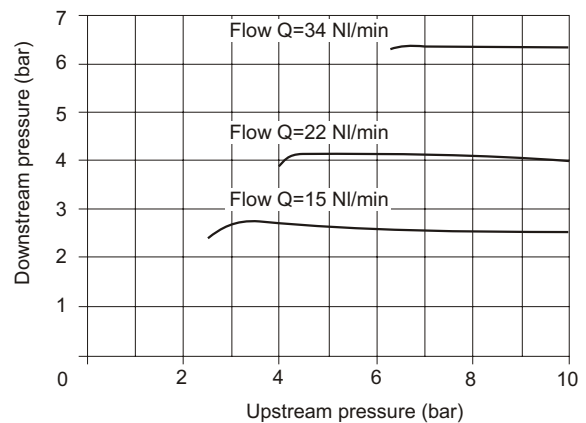
Technical characteristics

Connections	G 1/8" - G 1/4"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature	50°C
Pressure gauge connections	G 1/8"
Weight with technopolymer body	gr. 135
Weight with zinc alloy body	gr. 250
Pressure range	0 - 2 bar 0 - 4 bar 0 - 8 bar 0 - 12 bar
Assembly position	Any
Wall mounting screws	M4
Max. fitting torque on zinc alloy body	25 Nm
Max. fitting torque on technopolymer body	15 Nm

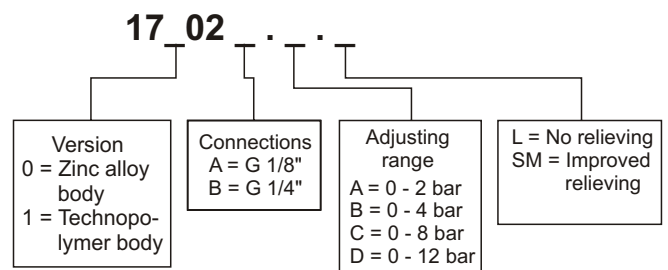
Flow rate curves
Inlet pressure (7 bar)



Adjustment characteristics

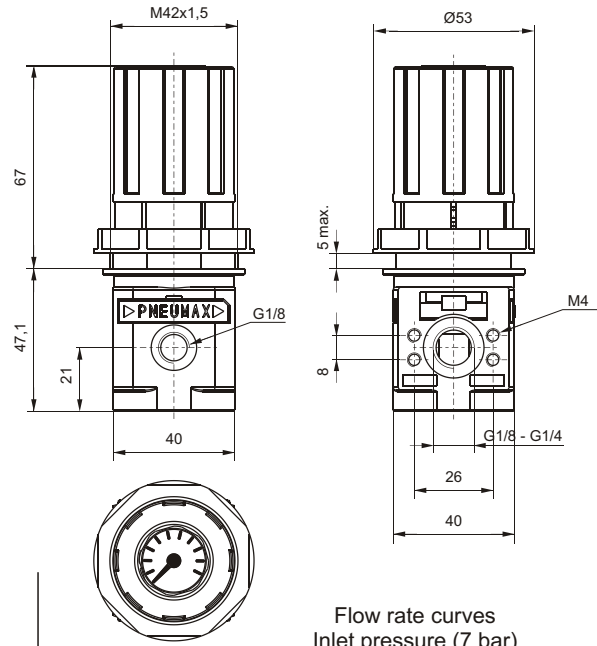


Ordering code



Example: **17102A.C**

Pressure regulator size 1 with G 1/8" connections and 0 - 8 bar adjusting range with relieving with technopolymer body.



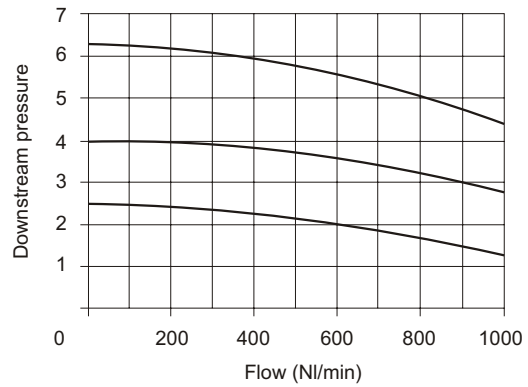
Construction and working characteristics

- Diaphragm pressure regulator with relieving.
- Pressure gauge included on the top of adjusting knob.
- Balanced poppet.
- Zinc alloy body or reinforced technopolymer body with threaded brass insert connections.
- Wall mounting possibility with M4 screws protected by covers.
- Lockable handle by simply pressing it downwards in the desired position.
- Panel mounting bracket.

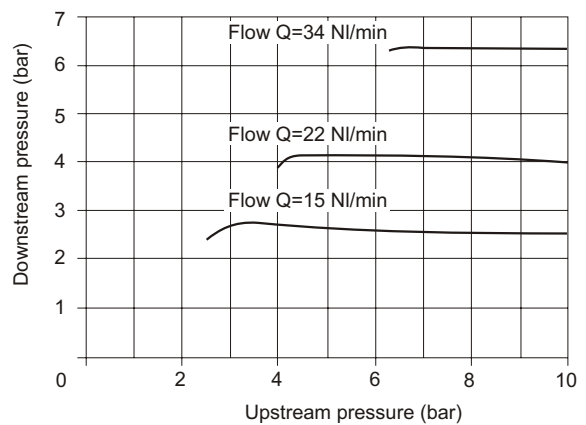
Technical characteristics

Connections	G 1/8" - G 1/4"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature	50°C
Pressure gauge connections	G 1/8"
Weight with technopolymer body	gr. 250
Weight with zinc alloy body	gr. 380
Pressure range	0 - 2 bar 0 - 4 bar 0 - 8 bar 0 - 12 bar
Assembly position	Any
Wall mounting screws	M4
Max. fitting torque on zinc alloy body	25 Nm
Max. fitting torque on technopolymer body	15 Nm

Flow rate curves
Inlet pressure (7 bar)

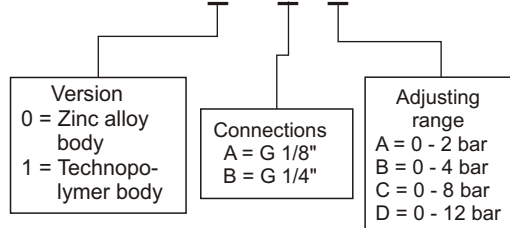


Adjustment characteristics



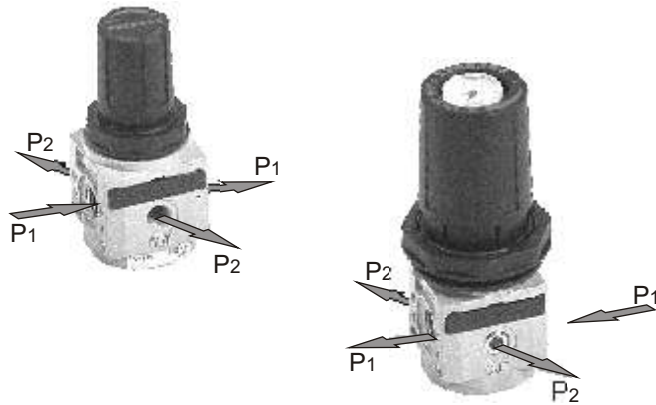
Ordering code

17 22 .



Example: **17022A.C**

Pressure regulator size 1 with G 1/8" connections and 0 - 8 bar adjusting range with relieving with technopolymer body.



P1 = Inlet pressure (IN)
P2 = Adjusted pressure (OUT)

General

Pneumax modular regulators have a common inlet for the whole manifold joined by a bayonet system. Alternatively to standard version it is also possible to use regulators with manometer included. This solution allows space savings on machine and avoids further pneumatic connections among regulators and manometers.

Technical characteristics

Connections	G 1/8" - G 1/4"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature	50°C
Pressure gauge connections	G 1/8"
Weight w/out manometer	gr. 235
Total weight	gr. 380
Pressure range	0 - 2 bar 0 - 4 bar 0 - 8 bar 0 - 12 bar
Assembly position	Any
Wall mounting screws	M4
Max. fitting torque	25 Nm

Ordering code

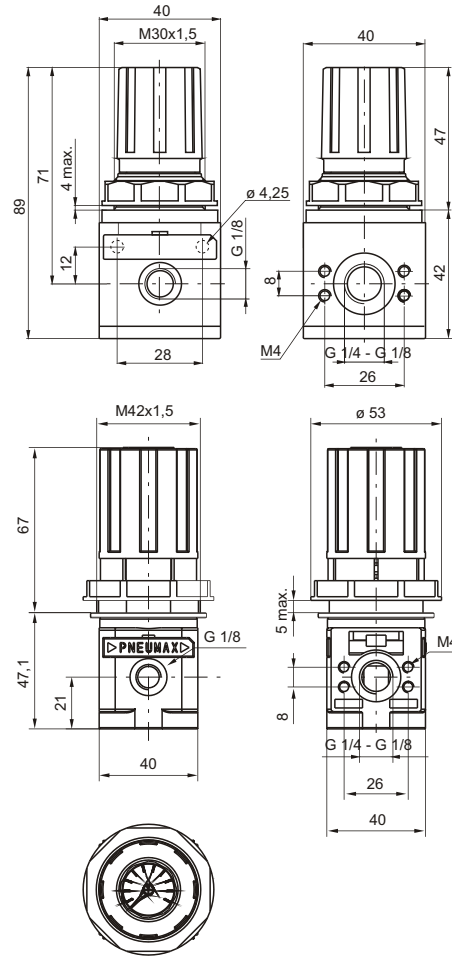
170 2

Available versions:
B = Standard regulator
M = Manifold press.
Reg. c/w manometer

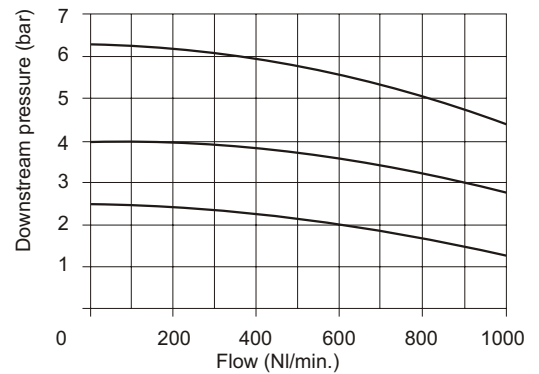
Connections:
A = G 1/8"
B = G 1/4"

Adjusting range
A = 0 - 2 bar
B = 0 - 4 bar
C = 0 - 8 bar
D = 0 - 12 bar

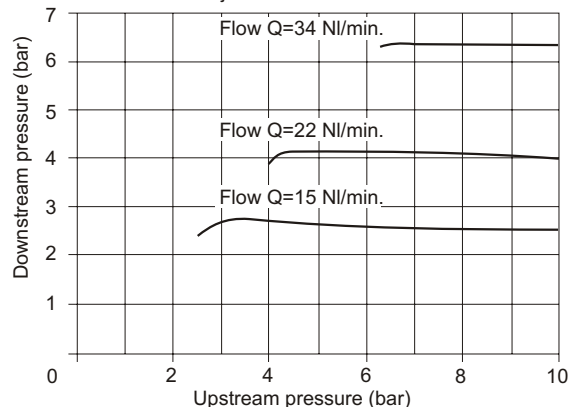
Example: **170B2A.C**
Standard manifold pressure regulator with connections G1/8" and adjusting range 0-8 bar.



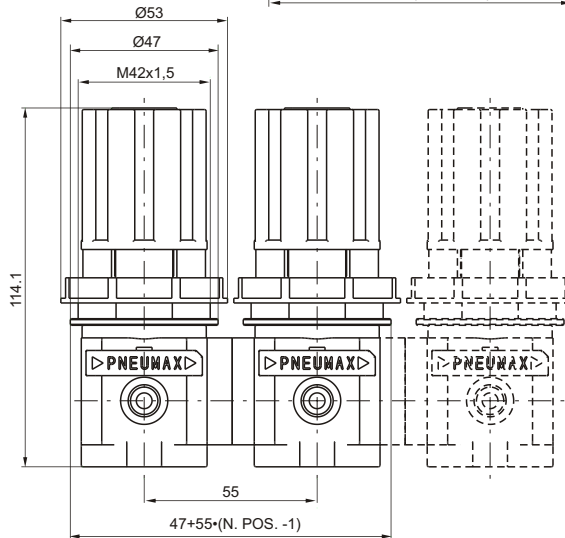
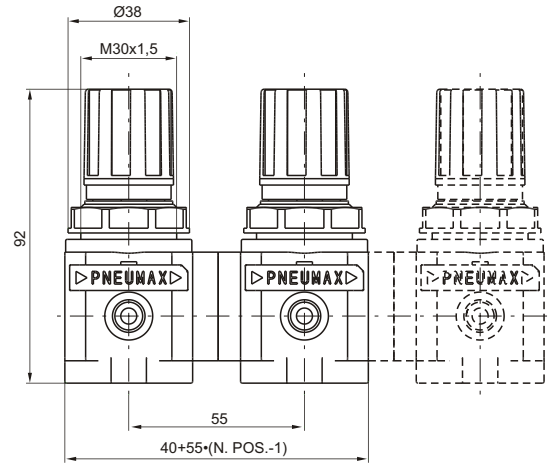
Flow rate curves
Inlet pressure (7 bar)



Adjustment characteristics



Note:
A special kit between pressure regulators is necessary for manifold mounting. Therefore regulators and kits must be ordered in same quantity less one kit. Code 170M6, see next page.



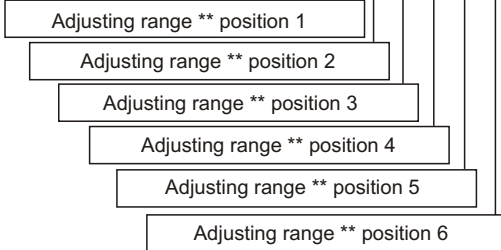
Ordering code

1 7 B 2

Regulators versions:
 B: standard regulator
 M: version manometer included

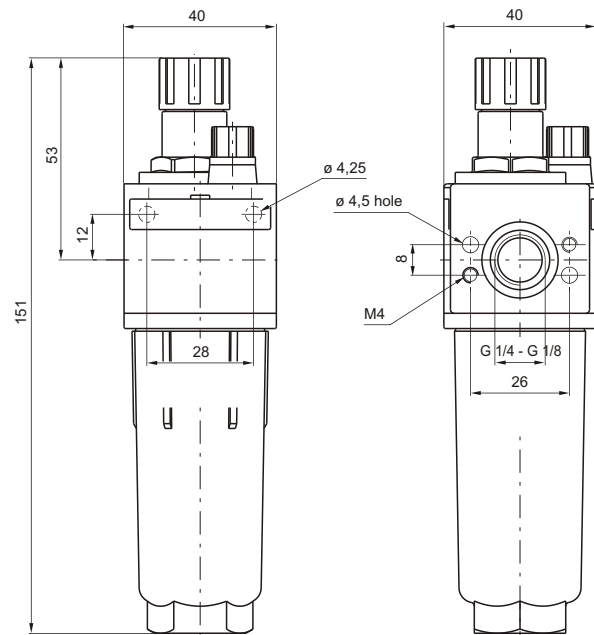
Connections
 A = G 1/8"
 B = G 1/4"

Positions n.:
 2 = 2 regulators
 3 = 3 regulators
 4 = 4 regulators
 5 = 5 regulators
 6 = 6 regulators



Adjusting range
 A = 0 - 2 bar
 B = 0 - 4 bar
 C = 0 - 8 bar
 D = 0 - 12 bar

1



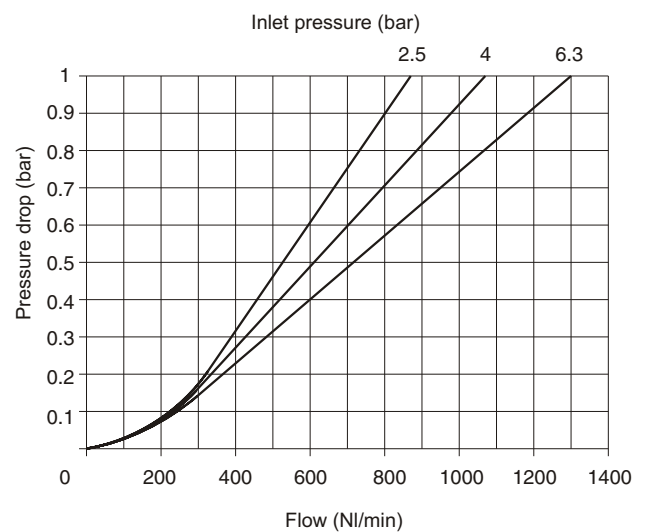
Construction and working characteristics

- Fog type lubrication with variable section orifice according to the flow.
- Zinc alloy body or reinforced technopolymer body with threaded insert connections.
- Wall mounting possibility with M4 screws protected by covers.
- Transparent technopolymer bowl screwed to the body.
- Technopolymer shock resistant bowl protection.
- Possibility to see the min. and max. oil level on 360° also with bowl protection assembled.
- Transparent technopolymer sight dome with adjusting handle.
- Oil filling plug.

Technical characteristics

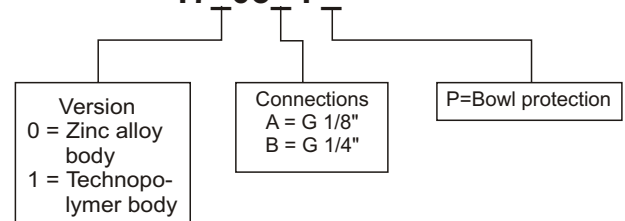
Connections	G 1/8" - G 1/4"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature (at 10 bar)	50°C
Weight with technopolymer body	gr. 108
Weight with zinc alloy body	gr. 258
Indicative oil drip rate	1 drop every 300/600 NI
Oil type	FD22 - HG32
Bowl capacity	32 cm ³
Assembly position	Vertical
Wall mounting screws	M4
Max. fitting torque on zinc alloy body	30 Nm
Max. fitting torque on technopolymer body	15 Nm
Min. operational flow at 6,3 bar	10 NI/min

Flow rate curves



Ordering code

17 03 .

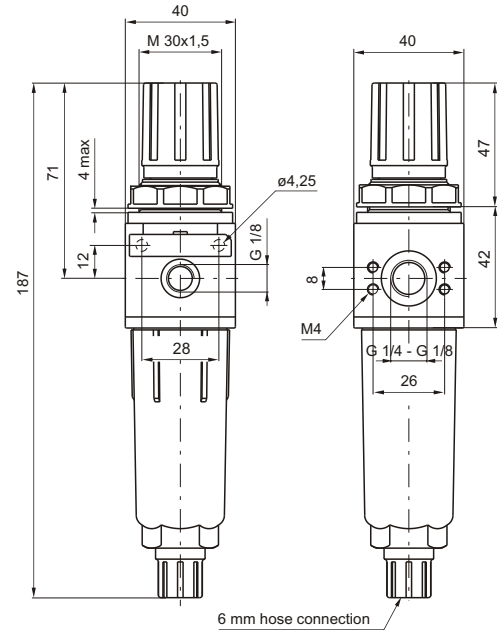


Example: **17103A.P**
Lubricator size 1 with G 1/8" connections and bowl protection with technopolymer body.

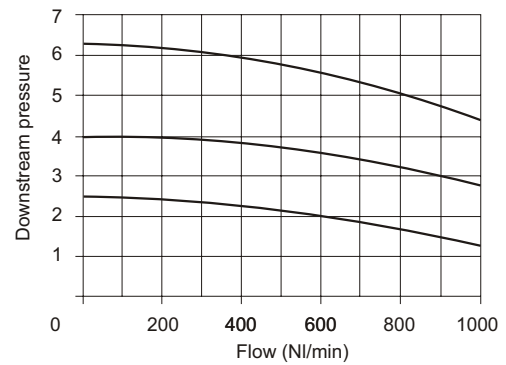


Construction and working characteristics

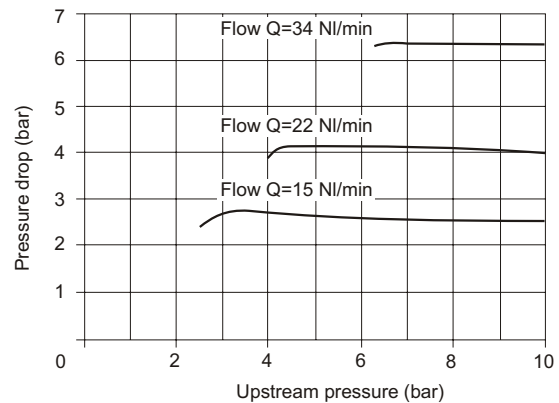
- Filter - diaphragm pressure regulator with relieving.
- Balanced poppet.
- Double filtering action: by air centrifuging and by replaceable and reusable HDPE porous filter element.
- Zinc alloy body or reinforced technopolymer body with threaded brass insert connections.
- Wall mounting possibility with M4 screws protected by covers.
- Handle lockable in the desired position by simply pressing it downwards.
- Transparent technopolymer bowl screwed to the body.
- Technopolymer shock resistant bowl protection.
- Manual and semi-automatic water drain valve; in the semi-automatic version the drainage happens when there is no pressure or by pushing the valve up-wards.
- Possibility to see the water level on 360° also with bowl protection assembled.
- Two pressure gauge connections with plug complete of seal.
- Panel mounting bracket.
- Automatic water drainage bowl available on request.



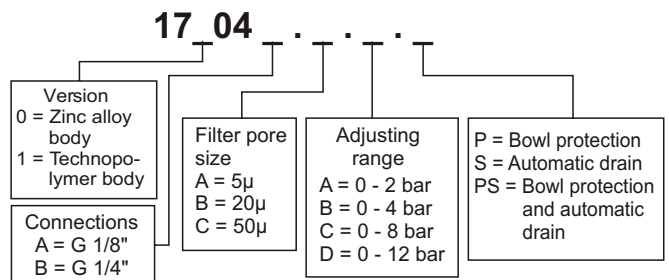
Flow rate curves
Inlet pressure (7 bar)



Adjustment characteristics



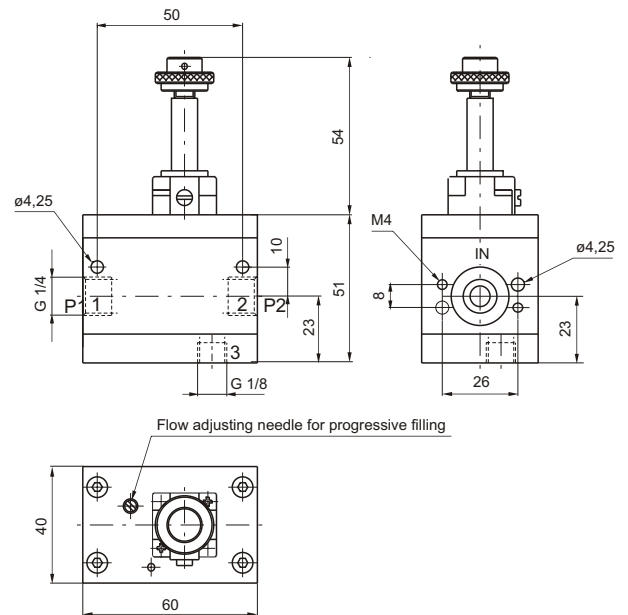
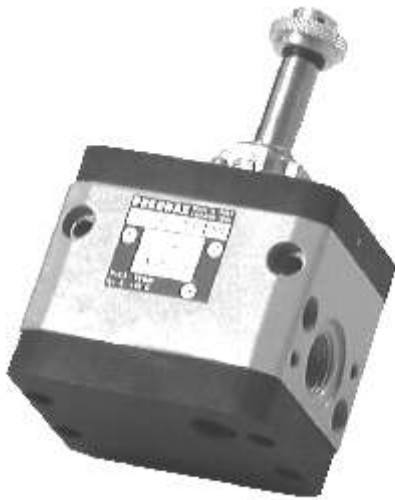
Ordering code



Example: **17104A.B.C.P**
Filter - pressure regulator size 1 with G 1/8" connections, filter pore 20µ adjusting range 0 - 8 bar and bowl protection with technopolymer body.

Technical characteristics

Connections	G 1/8" - G 1/4"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature (at 10 bar)	50°C
Pressure gauge connections	G 1/8"
Weight with technopolymer body	gr. 180
Weight with zinc alloy body	gr. 295
Pressure range	0 - 2 bar
	0 - 4 bar
	0 - 8 bar
	0 - 12 bar
Filter pore size	5µ
	20µ
	50µ
Bowl capacity	17 cm ³
Assembly position	Vertical
Wall mounting screws	M4
Max. fitting torque on zinc alloy body	30 Nm
Max. fitting torque on technopolymer body	15 Nm



Construction and working characteristics

- 3 way valve with double poppet.
- Possibility to adjust the down stream circuit filling time by the enclosed adjustable metering screw.
- Quick down stream circuit discharge.
- Possibility for a pneumatic or electric piloting control.
- Body made with anodized 2011 aluminum alloy.
- Wall mounting possibility with M4 screws.

Technical characteristics

Connections	G 1/4"
Max. inlet pressure	10 bar - 1 MPa
Max. ambient temperature	50°C
Weight	gr. 365
Assembly position	Any
Min. operating pressure	2.5 bar - 0.25 Mpa
Nominal flow at 6 bar with $Dp=1$	1000 NI/min.
Flow with adjustable metering screw fully open	150 NI/min
Wall mounting screws	M4

Important note: the preventive or programmed maintenance of this product is not foreseen considering the elaborated assembling and the specific "PNEUMAX" testing; therefore, call the producer or its representative in case of necessity.

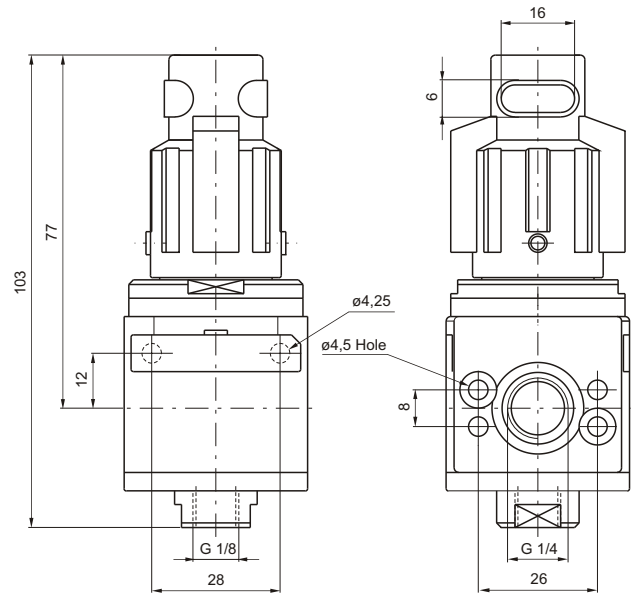
Ordering code

17110.M2

Electrically controlled progressive start-up valve size 1, complete with mechanic for M2 microsolenoid valve.

17120

Progressive start-up valve size 1 with pneumatic control.



1

Construction and working characteristics

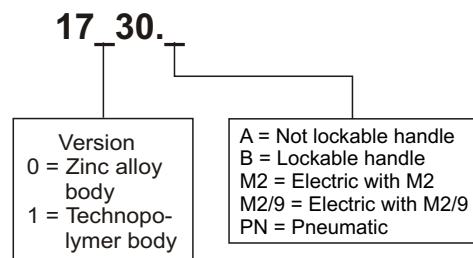
- 3 ways poppet valve.
- Zinc alloy body or reinforced technopolymer body with threaded brass insert connections.
- Double handle action for valve opening: pushing and rotating (clockwise).
- Simply rotate the valve handle counter clockwise for valve closing and down stream circuit discharging.
- Possibility to lock the valve in the discharging position by fitting in a padlock in the proper seat.
- Technopolymer body with metal reinforced threaded connections.

Technical characteristics

Connections	G 1/4"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature	50°C
Weight with technopolymer body	gr. 155
Weight with zinc alloy body	gr. 280
Assembly position	Any
Nominal flow at 6 bar with Dp=1	1000 NI/min
Wall mounting screws	M4
Handle opening and closing angle	90°
Max. fitting torque on zinc alloy body	30 Nm
Max. fitting torque on technopolymer body	15 Nm

Important note: the preventive or programmed maintenance of this product is not foreseen considering the elaborated assembling and the specific "PNEUMAX" testing; therefore, call the producer or its representative in case of necessity.

Ordering code



Example: **17130.B**
Shut-off valve size 1 complete with lockable handle with technopolymer body.

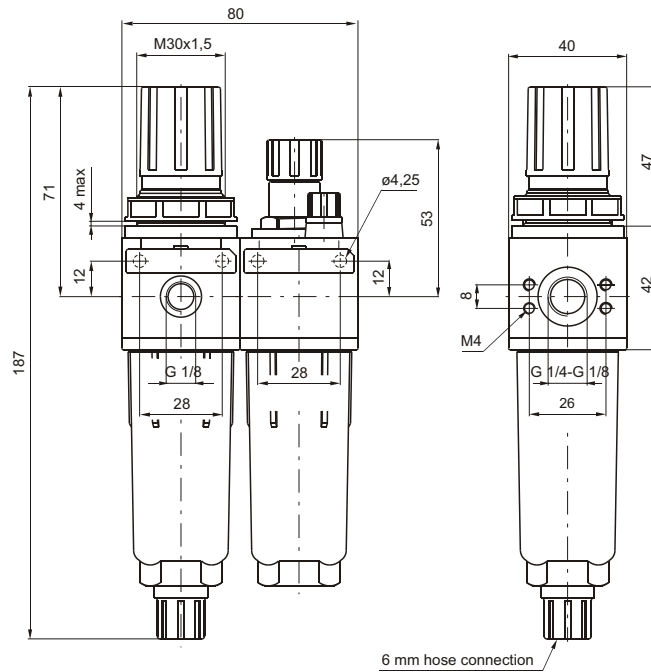


Construction and working characteristics

- Filter - diaphragm pressure regulator with relieving.
- Balanced poppet.
- Double filtering action: by air centrifuging and by replaceable and reusable HDPE porous filter element.
- Zinc alloy body reinforced technopolymer body with threaded brass insert connections
- Wall mounting possibility with M4 screws protected by covers.
- Lockable handle by simply pressing it downwards in the desired position.
- Transparent technopolymer bowls screwed to the body.
- Shock resistant bowl technopolymer protections.
- Manual and semi-automatic water drain valve; in the semi-automatic version the drainage happens when there is no pressure or by pushing the valve up-wards.
- Possibility to see the water level on 360° also with bowl protection assembled.
- Two pressure gauge connections with plug complete of seal.
- Panel mounting bracket.
- Automatic water drainage bowl available on request.
- Fog type lubrication with variable section orifice according to the flow.
- Possibility to see the min. and max. oil level on 360° also with bowl protection assembled.
- Transparent technopolymer sight dome with adjusting handle.
- Oil filling plug.

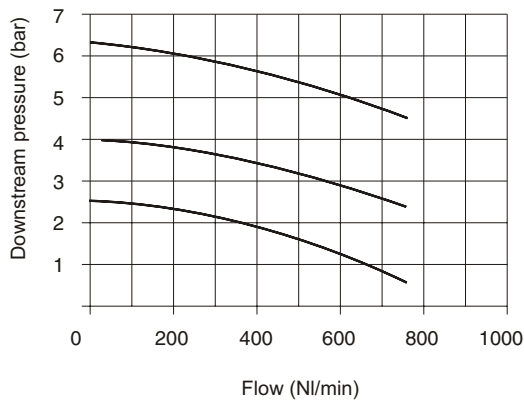
Technical characteristics

Connections	G 1/8" - G 1/4"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature (at 10 bar)	50°C
Pressure gauge connections	G 1/8"
Weight with technopolymer body	gr. 295
Weight with zinc alloy body	gr. 560
Pressure range	0 - 2 bar 0 - 4 bar 0 - 8 bar 0 - 12 bar
Filter pore size	5µ 20µ 50µ
Blow capacity	17 cm ³
Indicative oil drip rate	1 drop every 300/600 NI
Oil type	FD22 - HG32
Bowl capacity	32 cm ³
Assembly position	Vertical
Wall mounting screws	M4
Max. fitting torque on zinc alloy body	30 Nm
Max. fitting torque on technopolymer body	15 Nm
Min. operational flow at 6.3 bar	10 NI/min

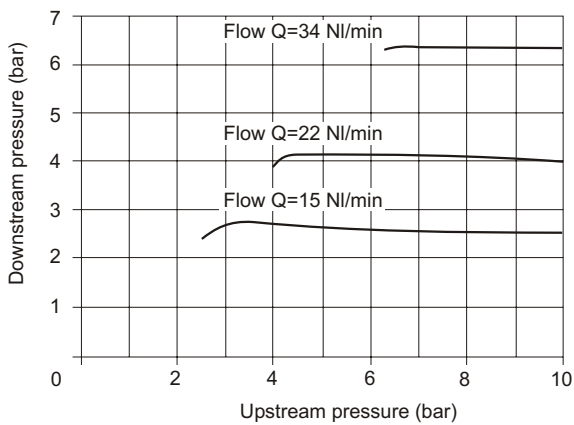


1

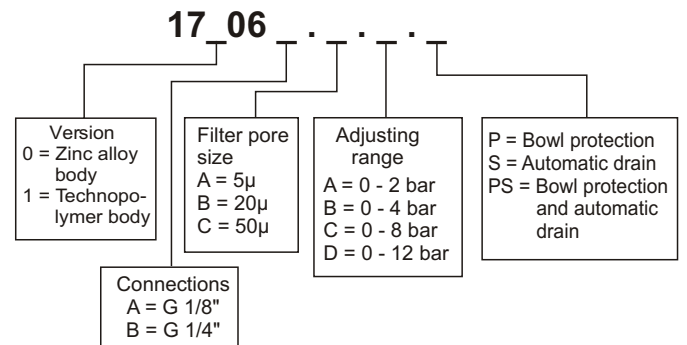
Flow rate curves
 Inlet pressure (7 bar)



Adjustment characteristics



Ordering code



Example: **17106A.B.C.P**

Service unit combination complete with filter - pressure regulator and lubricator size 1 G 1/8" connections, filter pore size 20µ, adjusting range 0-8 bar and bowl protections with technopolymer body.

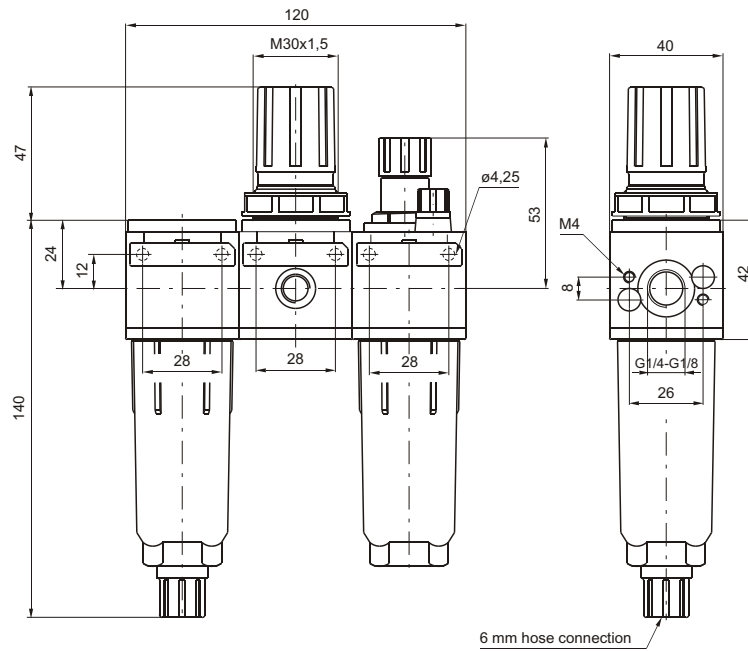


Construction and working characteristics

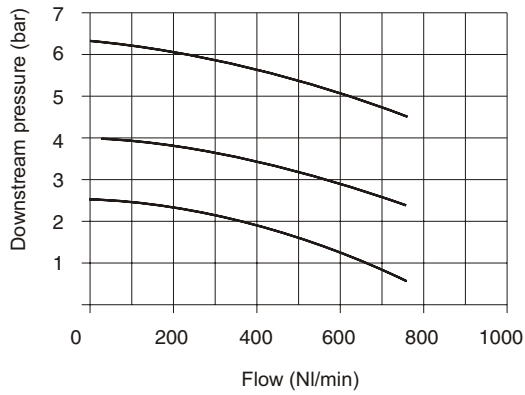
- Zinc alloy body or reinforced technopolymer body with threaded brass insert connections.
- Wall mounting possibility with M4 screws protected by covers.
- Transparent technopolymer bowls screwed to the body.
- Shock resistant bowl technopolymer protections.
- Double filtering action: by air centrifuging and by replaceable and reusable HDPE porous filter element.
- Manual and semi-automatic water drain valve; in the semi-automatic version the drainage happens when there is no pressure or by pushing the valve up-wards.
- Possibility to see the water level on 360° also with bowl protection assembled.
- Diaphragm pressure regulator with relieving and balanced poppet.
- Pressure adjusting lockable handle by simply pressing it downwards in the desired position.
- Two pressure gauge connections with plug complete of seal.
- Panel mounting bracket.
- Automatic water drainage bowl available on request.
- Fog type lubrication with variable section orifice according to the flow.
- Possibility to see the min. and max. oil level on 360° also with bowl protection assembled.
- Transparent technopolymer sight dome with adjusting handle.
- Oil filling plug.

Technical characteristics

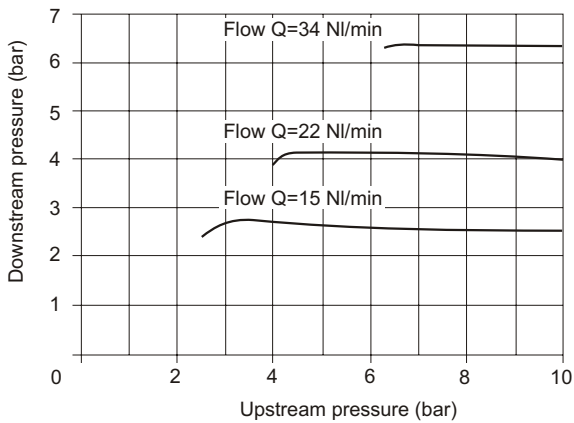
Connections	G 1/8" - G 1/4"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature (at 10 bar)	50°C
Pressure gauge connections	G 1/8"
Weight with technopolymer body	gr. 375
Weight with zinc alloy body	gr. 755
Pressure range	0 - 2 bar 0 - 4 bar 0 - 8 bar 0 - 12 bar
Filter pore size	5µ 20µ 50µ
Bowl capacity	17 cm ³
Indicative oil drip rate	1 drop every 300/600 NI
Oil type	FD22 - HG32
Bowl capacity	32 cm ³
Assembly position	Vertical
Wall mounting screws	M4
Max. fitting torque on zinc alloy body	30 Nm
Max. fitting torque on technopolymer body	15 Nm
Min. operational flow at 6.3 bar	10 NI/min



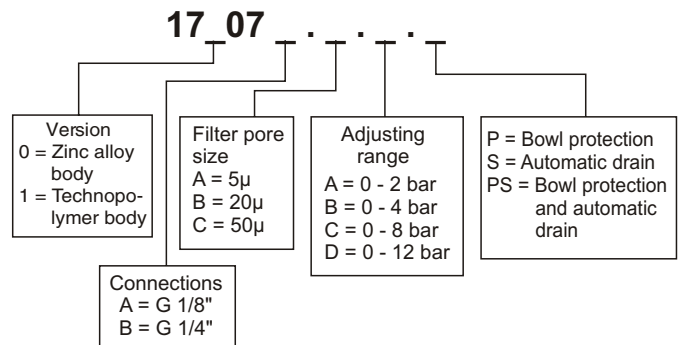
Flow rate curves
 Inlet pressure (7 bar)



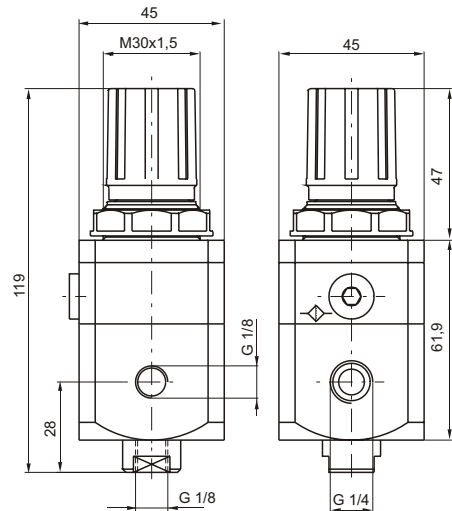
Adjustment characteristics



Ordering code



Example: **17107A.B.C.P**
 Service unit combination complete with filter - pressure regulator and lubricator size 1 G 1/8" connections, filter pore size 20µ, adjusting range 0-8 bar and bowl protections with technopolymer body.



Construction and working characteristics

- Accurate capacity to maintain set pressure.
- Sensitivity combined with high relieving rates.
- High flow rate with extremely low pressure drop.
- Pressure adjusting lockable handle by simply pressing it downwards in the desired position.
- Body made with anodized zoll aluminium alloy
- Two pressure gauge connections with plug complete of seal.
- Ring nut for panel mounting.
- Once set, a constant bleed of air maintains the accuracy of the regulator.
This controlled release is a charasteric, not a fault.

Technical characteristics

Connections	G 1/4"
Max. inlet pressure	10 bar - 1 MPa
Max. ambient temperature	50°C
Pressure gauge connections	G 1/8"
Weight	gr. 350
Pressure range	0,1 - 2 bar 0,1 - 4 bar 0,1 - 7 bar
Assembly position	Any
Air flow (inlet pressure 10 bar)	5 NI/min
Max. fitting torque	40 Nm
Fluid	20µm filtered air and preferably non lubricated

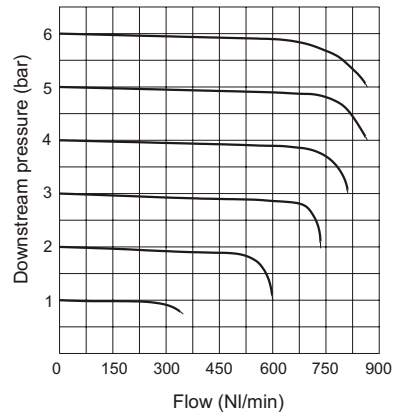
Ordering code

17112B .

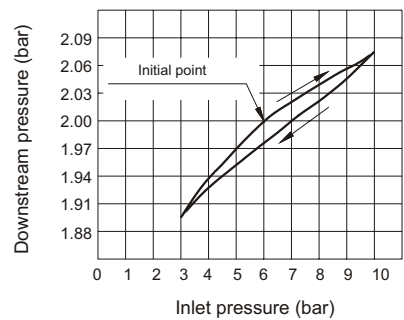
Adjusting range
A = 0,1 - 2 bar
B = 0,1 - 4 bar
C = 0,1 - 7 bar

Example: **17112B.C**
Pressure regulator with G 1/4" 0,1 - 7 bar

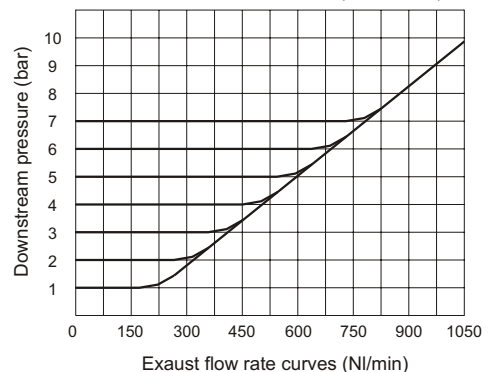
Flow rate curves (17112B.C)
Inlet pressure (7 bar)



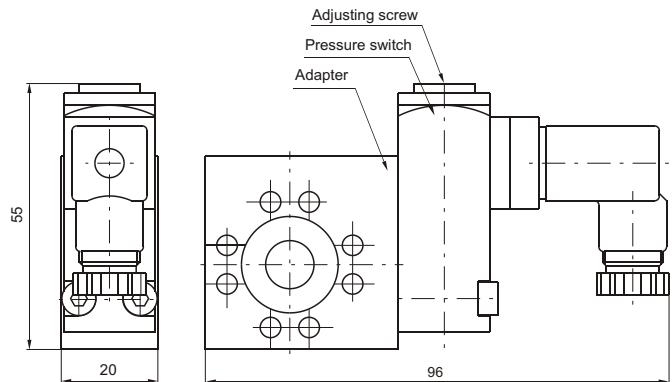
Adjustment characteristics (17112B.C)



Exhaust flow rate curves (17112B.C)



Pressure Switch complete with adapter



Construction and working characteristics

The pressure switch complete with adapter has to be assembled between two elements of the FRL group. It cannot be utilized separately or at the end of the FRL group.

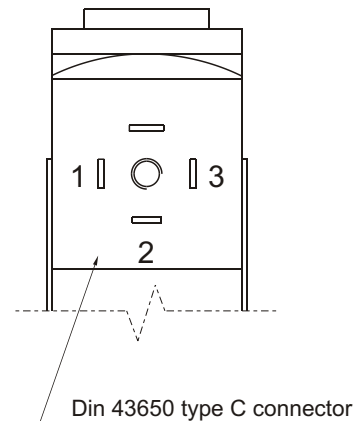
The pressure switch can be set at desired pressure (pressure range from 2 to 10 bar) by rotating the adjusting screw.

The electrical connection is made by mean of a 15 mm connector DIN 43650 type C.

The microswitch contact could be normally closed or open (change over switch).

Connection

- 1 = Neutral
- 2 = N.C. contact
- 3 = N.O. contact



Technical characteristics

Max. inlet pressure	13 bar 1.3 MPa
Max. temperature	50°C
Weight	gr. 160
Microswitch capacity	5A
Grade of protection (with connector assembled)	IP 65
Adjusting range	2 - 10 bar
Assembly position	Any

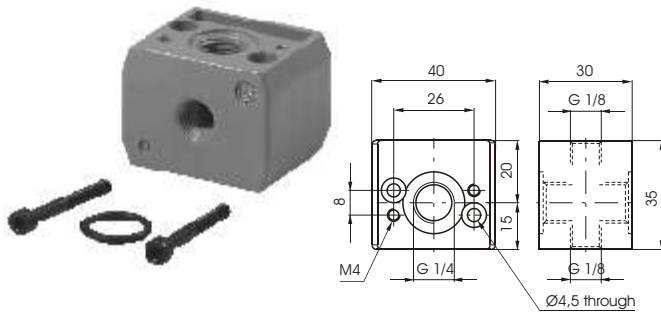
Ordering code

17

- 14A = Pressure switch adapter
- 14B = Pressure switch
- 14C = Pressure switch complete with adapter

Example: **1714C**
Pressure switch complete with adapter.

Air Intake

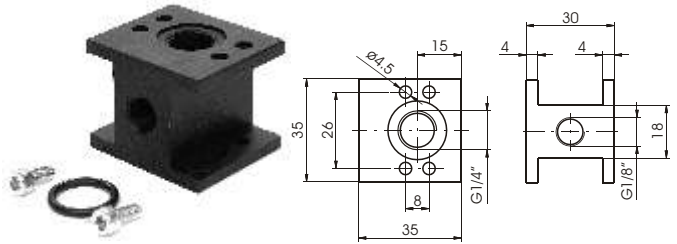


Ordering code

17140

Weight gr. 75

Air Intake - "H" profile

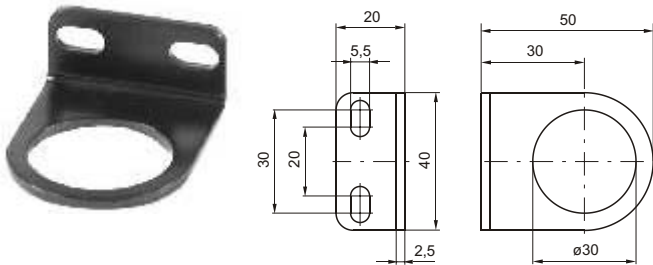


Ordering code

17140H

Weight gr. 50

Fixing bracket



Ordering code

17150

Weight gr. 32

Fixing bracket



Ordering code

170M5

Weight gr. 20

Assembling kit



Ordering code

17160

(standard)

17165

(for progressive start-up valve)

Weight gr. 15

Assembling kit for manifold regulators

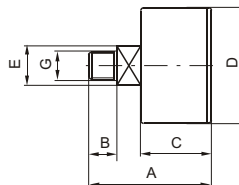


Ordering code

170M6

Weight gr. 20

Pressure gauge



Ordering code

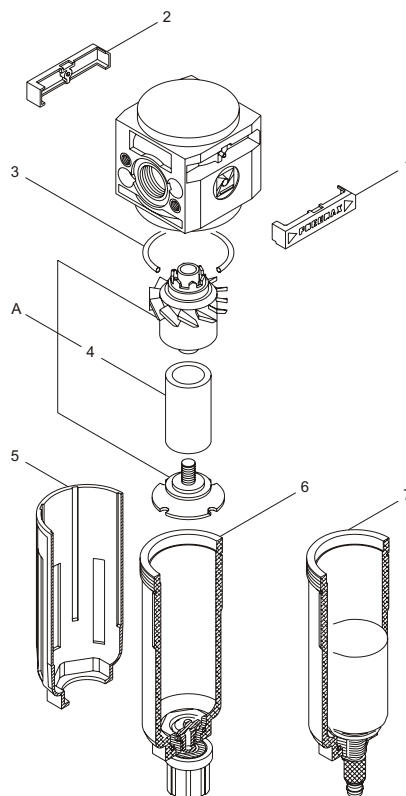
17070

DIMENSIONS							
CODE	A	B	C	D	E	G	Weight gr.
17070A	44	10	26	41	14	G 1/8"	60
17070B	45	10	27	49	14	G 1/8"	80

A = Dial ø40
B = Dial ø50

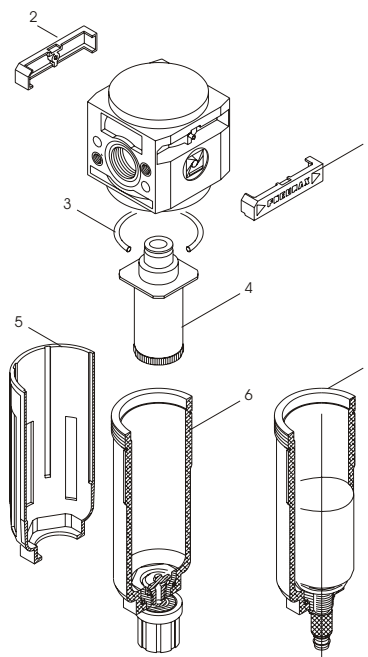
A = Scale 0-4 bar
B = Scale 0-6 bar
C = Scale 0-12 bar

Filter



Pos.	Code	Description
1	RS/1701/10	Front tab
2	RS/1701/11	Rear tab
3	RS/OR 2125	Seal
4	RS/1701/13	Porous filter element 20 μ
4	RS/1701/52	Porous filter element 5 μ
4	RS/1701/53	Porous filter element 50 μ
5	RS/1701/7	Bowl protection
6	RK1701A/013	Filter bowl c/w drain valve
7	RK1701A/018	Filter bowl c/w automatic drain
A	RK1701A/014	Filter group assembly 20 μ
A	RK1701A/021	Filter group assembly 5 μ
A	RK1701A/022	Filter group assembly 50 μ

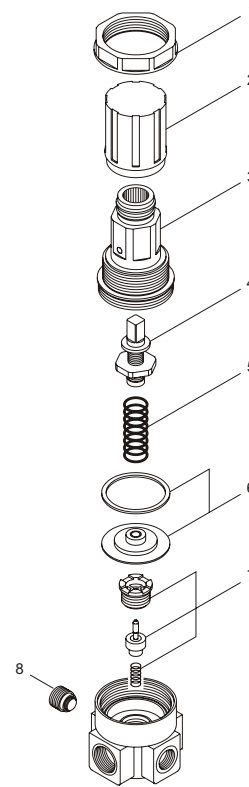
Coalescing filter



Pos.	Code	Description
1	RS/1701/93	Front tab
2	RS/1701/94	Rear tab
3	RS/OR 2125	Seal
4	RK1701A/027	Coalescent group 0.1 μ
5	RS/1701/7	Bowl protection
6	RK1701A/013	Filter bowl c/w drain valve
7	RK1701A/018	Filter bowl c/w automatic drain

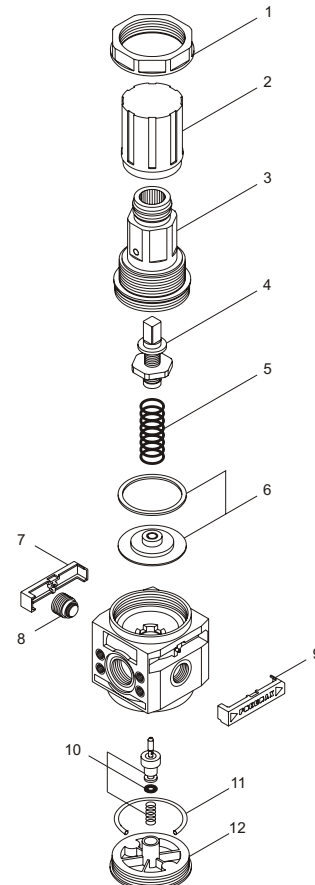
Panel mounting pressure regulator

Pos.	Code	Description
1	RS/1701/12	Lock nut
2	RS/1701/3	Adjusting knob
3	RS/1701/2	Adjusting support
4	RK1701A/016	Adjusting screw assembly
5	RS/1701/30	Spring 0-2 bar range
5	RS/1701/29	Spring 0-4 bar range
5	RS/1701/28	Spring 0-8 bar range
5	RS/1701/31	Spring 0-12 bar range
6	RK1701A/012	Diaphragm assembly
6	RK1701A/024	Diaphragm assembly w/o relieving
7	RK1701A/023	Nozzle c/w poppet
8	RK1701A/020	Plug c/w seal G 1/8

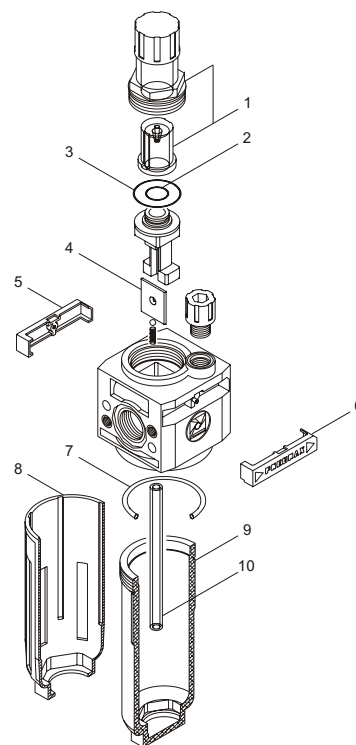


Modular pressure regulator

Pos.	Code	Description
1	RS/1701/12	Lock nut
2	RS/1701/3	Adjusting knob
3	RS/1701/2	Adjusting support
4	RK1701A/016	Adjusting screw assembly
5	RS/1701/30	Spring 0-2 bar range
5	RS/1701/29	Spring 0-4 bar range
5	RS/1701/28	Spring 0-8 bar range
5	RS/1701/31	Spring 0-12 bar range
6	RK1701A/012	Diaphragm assembly
6	RK1701A/024	Diaphragm assembly w/o relieving
7	RS/1701/11	Rear tab
8	RK1701A/020	Plug c/w seal G 1/8
9	RS/1701/10	Front tab
10	RK1701A/025	Poppet c/w spring
11	RS/OR 2125	Seal
12	RS/1701/32	Plug



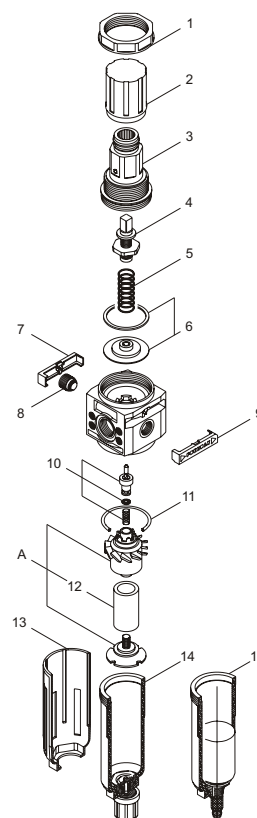
Lubricator



Pos.	Code	Description
1	RK1701A/026	Lubricator sight dome assembly
2	RS/OR 5x1,5	Seal
3	RS/OR 2075	Seal
4	RS/1701/43	Venturi diaphragm
5	RS/1701/11	Rear tab
6	RS/1701/10	Front tab
7	RS/OR 2125	Seal
8	RS/1701/7	Bowl protection
9	RS/1701/41	Lubricator bowl
10	RS/1701/47	Oil tube

Filter - Pressure regulator

Pos.	Code	Description
1	RS/1701/12	Lock nut
2	RS/1701/3	Adjusting knob
3	RS/1701/2	Adjusting support
4	RK1701A/016	Adjusting screw assembly
5	RS/1701/30	Spring 0-2 bar range
5	RS/1701/29	Spring 0-4 bar range
5	RS/1701/28	Spring 0-8 bar range
5	RS/1701/31	Spring 0-12 bar range
6	RK1701A/012	Diaphragm assembly
6	RK1701A/024	Diaphragm assembly w/o rel.
7	RS/1701/11	Rear tab
8	RK1701A/020	Plug c/w seal G 1/8
9	RS/1701/10	Front tab
10	RK1701A/025	Poppet c/w seal and spring
11	RS/OR 2125	Seal
12	RS/1701/13	Porous filter element 20 μ
12	RS/1701/52	Porous filter element 5 μ
12	RS/1701/53	Porous filter element 50 μ
13	RS/1701/7	Bowl protection
14	RK1701A/013	Filter bowl c/w drain valve
15	RK1701A/018	Filter bowl c/w automatic drain
A	RK1701A/014	Filter group assembly 20 μ
A	RK1701A/021	Filter group assembly 5 μ
A	RK1701A/022	Filter group assembly 50 μ





Size 2

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Service units combination, 3 components	2.13 - 2.14
High sensitive air pressure regulator with high flow rate relieving	2.15
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Spare parts	2.18 - 2.19



Construction and working characteristics

The modular air service units groups size 2, as the ones of size 1, allow a wide selection of combinations.

The threaded connections are machined directly on the valve body made with light alloy, so that each components can be used individually.

They can be wall mounted with head-guard screws masked by covers.

The bowls are made of transparent technopolymer, always supplied with shock resistant technopolymer protection, allowing the moisture and oil level control from any angle.

The filter can be equipped with manual or semiautomatic water drain valve; furthermore it's possible to install the automatic draining device inside the bowl.

The pressure regulator handle is lockable in the desired position.

The lubricator oil flow is adjustable with proper handle and it is visibly checked through the sight dome.

The shut-off valve can be equipped with pad-lock to prevent accidents or damages due to unauthorized operation.

The progressive start-up valve, pneumatically or electropneumatically controlled, allows air supply to the circuit progressively and with adjustable time.

Some accessories like the wall fixing bracket, pressure gauges with different scales and diameters, air intake block that assembled between the elements allows to get in the system filtered or filtered non-lubricated air, are completing the range.

Instruction for installation and operation

Pay attention to install a group or a single component with air flow direction according to the arrows and to the following sequence: filter, pressure regulator, lubricator and with bowls downwards. It's possible to fix the group to the wall by removing the covers, which can be installed again for covering the screw after fixing.

Do not exceed the recommended torque while assembling the connectors.

Do not exceed the recommended air pressure and temperature limits.

The moisture should not exceed the level marked on the bowl and it can be drawn off and carried away by a flexible tube of $\varnothing 6/4$ directly connected to the discharge valve handle.

The pressure should be set from minimum to maximum, rotating the adjusting handle clockwise.

As lubricant, we suggest to use oil class FD22 or HG32. Verify that the lubricator is not fed with a flow lower than the minimum operational.

To set the oil flow rotate the proper adjusting handle in order to get one drop of oil every 300-600 liters of air.

The oil flow will be kept automatically and proportionally to the air flow.

The oil can be refilled by mean of proper plug or directly into the bowl after having de-pressurized the system. Do not exceed the maximum level indicated on the bowl.

For opening the shut-off valve push and rotate clockwise the operating handle. For closing it and consequently discharging the down stream line, rotate the handle counter-clockwise.

Maintenance

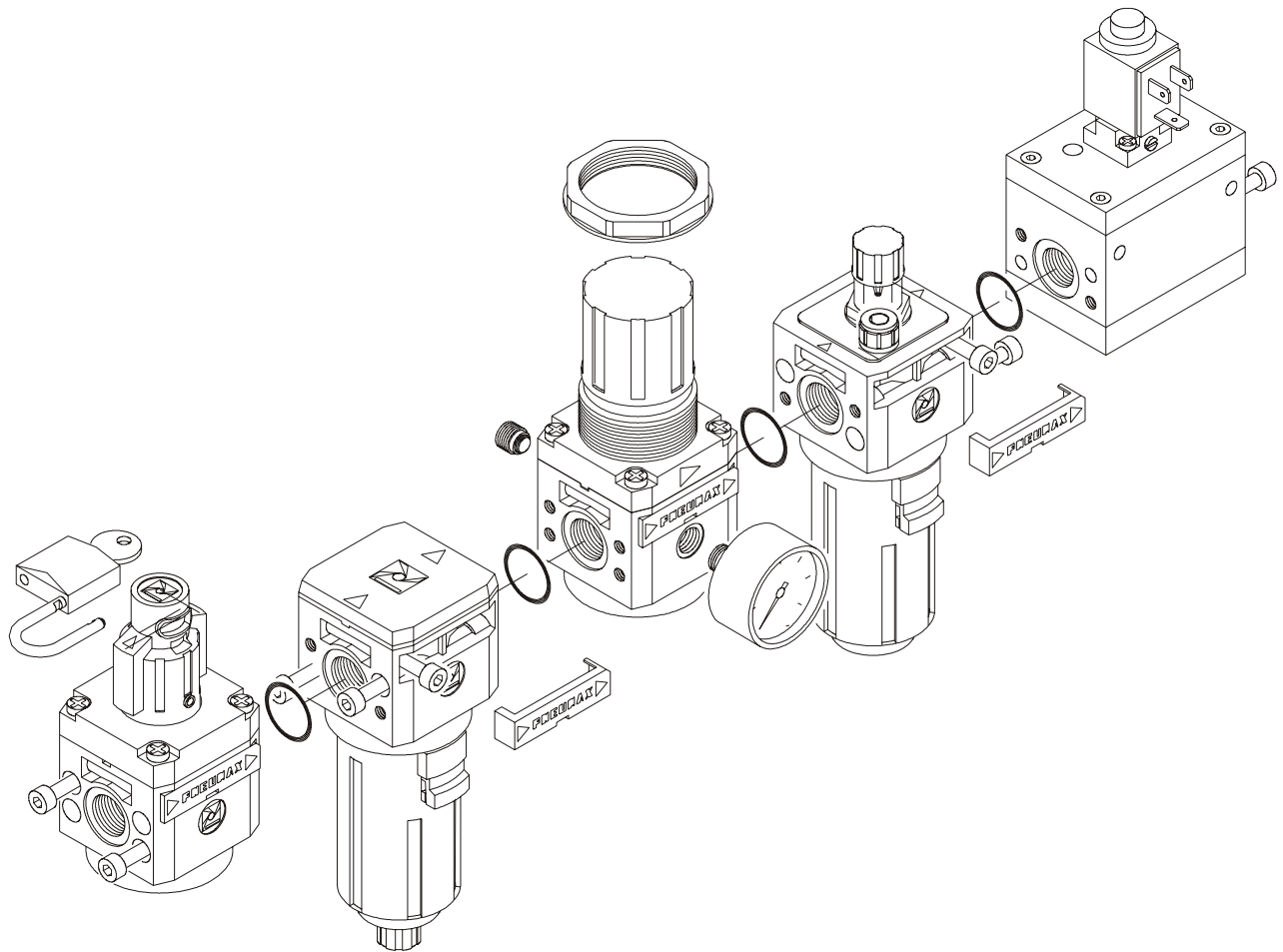
Clean the bowls with water and detergent. Do not use alcohol.

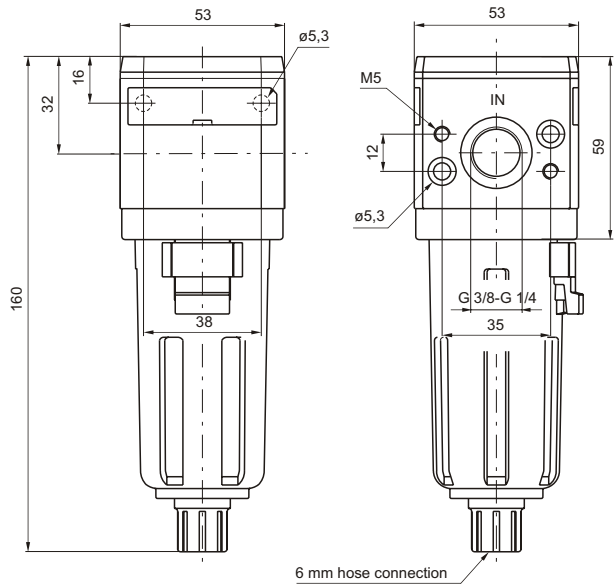
The filter element made with HPDE is reusable by blowing and cleaning it with proper detergent. For replacing or cleaning it, remove the bowl and unscrew the baffle spins.

Replace the pressure regulator diaphragm whenever the operation is not correct or there is a continuous air leaking through the relieving (over pressure discharge); reinstall the adjusting mechanism support locking it with about 8 Nm torque.

In case it is necessary to replace the lubricator transparent dome, tight it at 5 Nm torque maximum.

Assembling





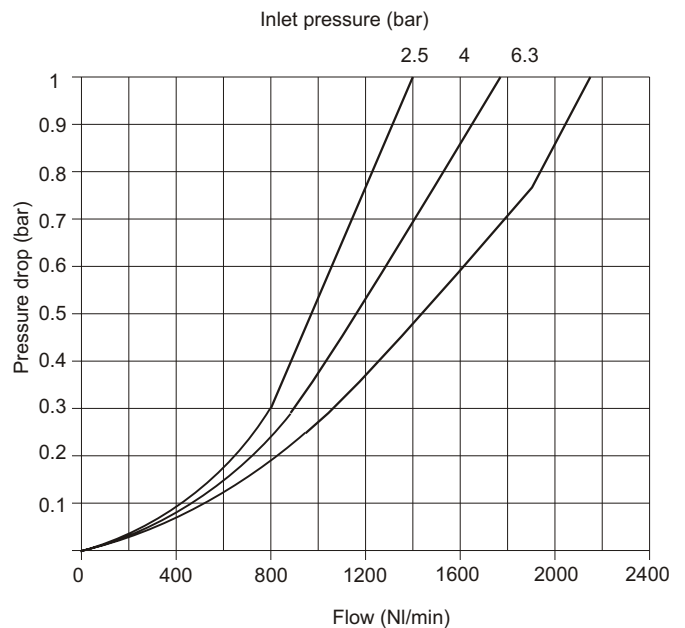
Construction and working characteristics

- Body made with light alloy.
- Wall mounting possibility with M5 screws protected by covers.
- Double filtering action : by air centrifuging and by replaceable and reusable HDPE porous filter element.
- Transparent technopolymer bowl with shock resistant technopolymer protection connected to the body with bayonet cap and safety button.
- Manual and semi-automatic water drain valve; in the semi-automatic version the drainage happens when there is no pressure or by pushing the valve up-wards.
- Possibility to see the water level on 360°.
- Automatic water drainage bowl available on request.

Technical characteristics

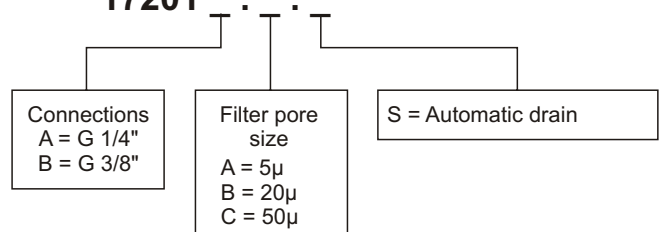
Connections	G 1/4" - G 3/8"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature (at 10 bar)	50°C
Weight	gr. 255
Filter pore size	5µ
	20µ
	50µ
Bowl capacity	28 cm ³
Assembly position	Vertical
Wall fixing screws	M5
Max. fitting torque	25 Nm.

Flow rate curves

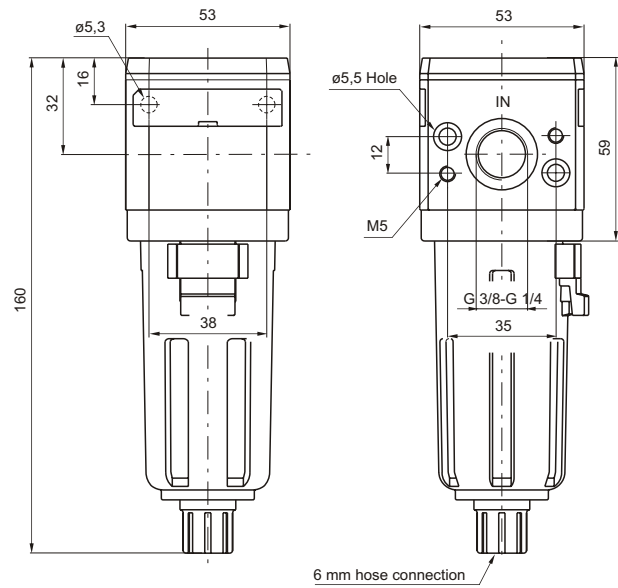


Ordering code

17201



Example: **17201A.B**
Filter size 1 with G 1/8" connections and filter pore size 20µ.



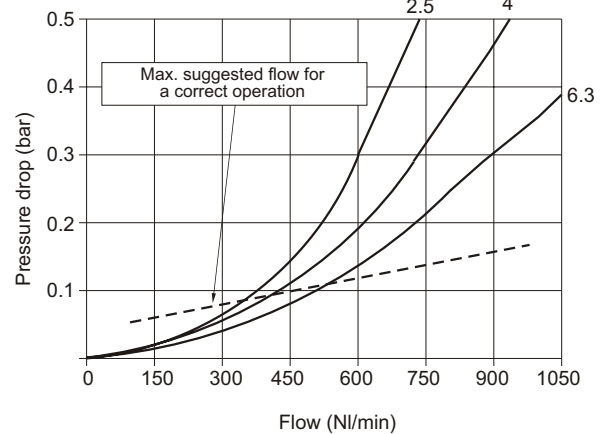
Construction and working characteristics

- Coalescing filter element remove 0,1 μ particles equivalent to 99,97%.
- Body made with light alloy.
- Wall mounting possibility with M5 screw protected by covers.
- Transparent technopolymer bowl with shock resistant technopolymer protection connected to the body with bayonet cap and safety button.
- Manual and semi-automatic water drain valve; in the semi-automatic version the drainage happens when there is no pressure or by pushing the valve up-wards.
- Possibility to see the water level on 360° also with Bowl protection assembled.
- Automatic water drainage bowl available on request.

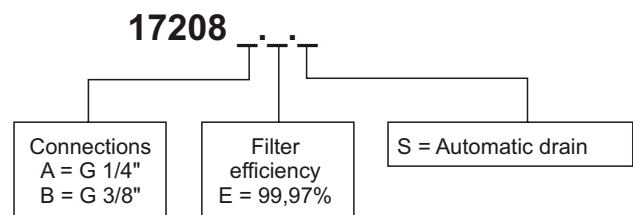
Technical characteristics

Connections	G 1/4" - G 3/8"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature (at 10 bar)	50°C
Weight	gr. 255
Filter efficiency with 0,1 μ particle	99,97%
Bowl capacity	28 cm ³
Assembly position	Vertical
Wall fixing screws	M5
Max. fitting torque	25 Nm

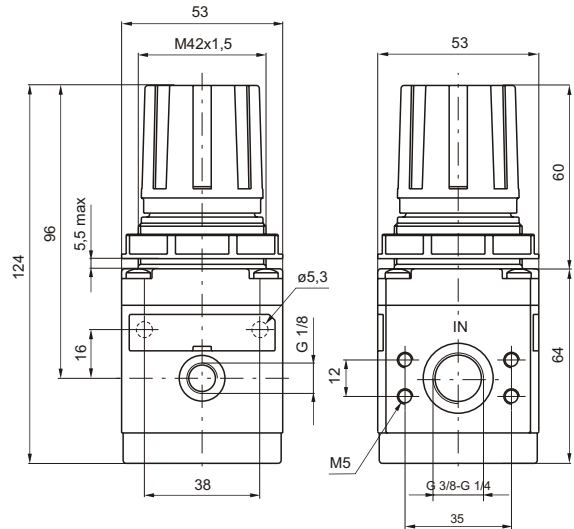
Flow rate curves
Inlet pressure (bar)



Ordering code



Example: **17208A.E**
Coalescing filter size 2 with G 1/4" connections and filter efficiency of 99,97%.



Construction and working characteristics

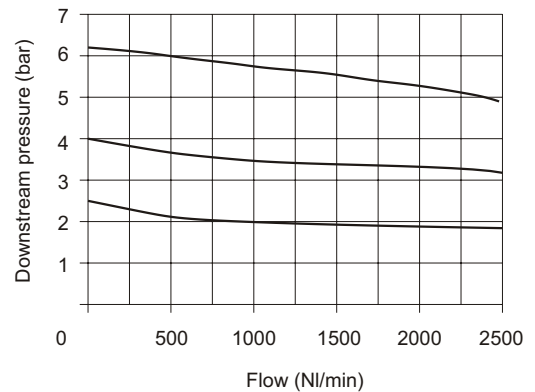
- Diaphragm pressure regulator with relieving.
- Balanced poppet.
- Lockable handle by simply pressing it downwards in the desired position.
- Body made with light alloy.
- Wall mounting possibility with M5 screws protected by covers.
- Two pressure gauge connections with plug complete of seal.
- Panel mounting bracket.

Technical characteristics

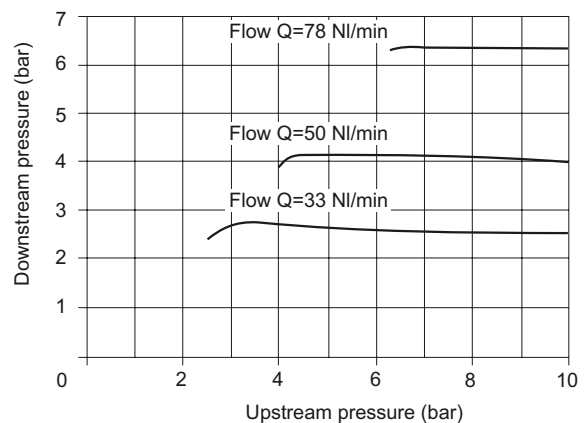
Connections	G 1/4" - G 3/8"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature	50°C
Pressure gauge connections	G 1/8"
Weight	gr. 390
Pressure range	0 - 2 bar
	0 - 4 bar
	0 - 8 bar
	0 - 12 bar
Assembly position	Any
Wall fixing screws	M5
Max. fitting torque	25 Nm

Flow rate curves

Inlet pressure (7 bar)

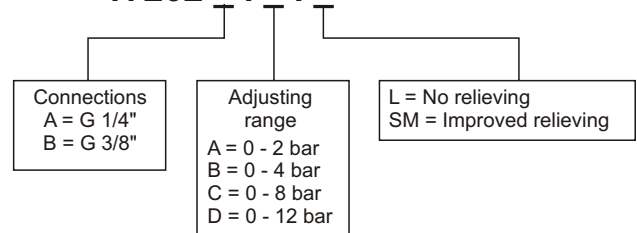


Adjustment characteristics



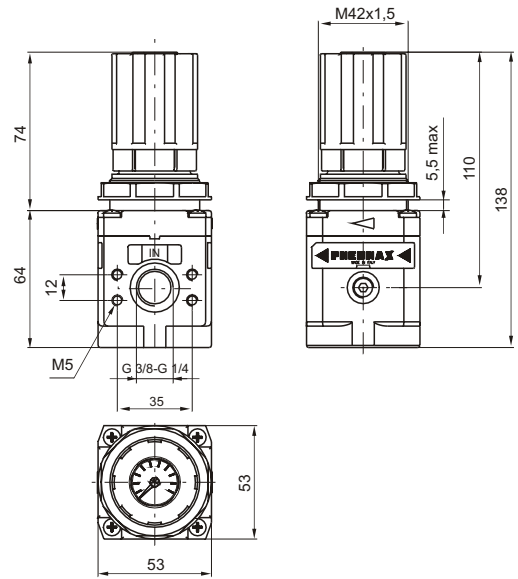
Ordering code

17202



Example: **17202A.C**

Pressure regulator with G 1/4" connections, adjusting range 0 - 8 bar with relieving.



Construction and working characteristics

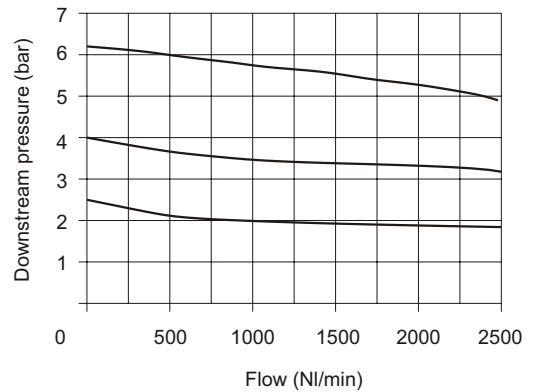
- Diaphragm pressure regulator with relieving.
- Pressure gauge included on the top of adjusting knob.
- Balanced poppet.
- Lockable handle by simply pressing it downwards in the desired position.
- Body made with light alloy.
- Wall mounting possibility with M5 screws protected by covers.
- Panel mounting bracket.

Technical characteristics

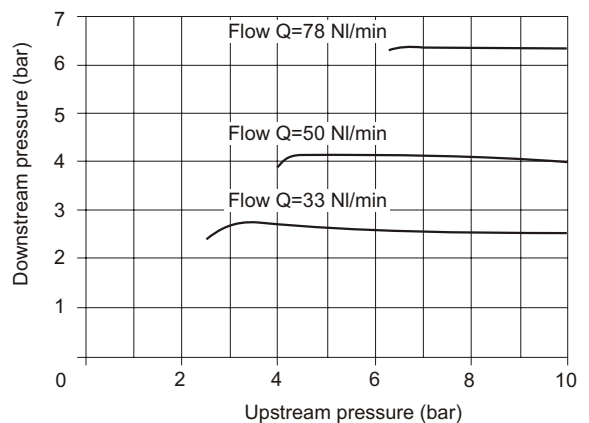
Connections	G 1/4" - G 3/8"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature	50°C
Pressure gauge connections	G 1/8"
Weight	gr. 440
Pressure range	0 - 2 bar
	0 - 4 bar
	0 - 8 bar
	0 - 12 bar
Assembly position	Any
Wall fixing screws	M5
Max. fitting torque	25 Nm

Flow rate curves

Inlet pressure (7 bar)

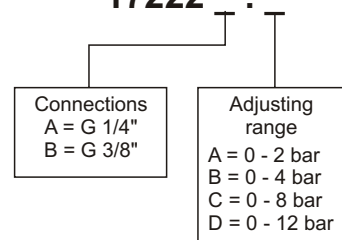


Adjustment characteristics

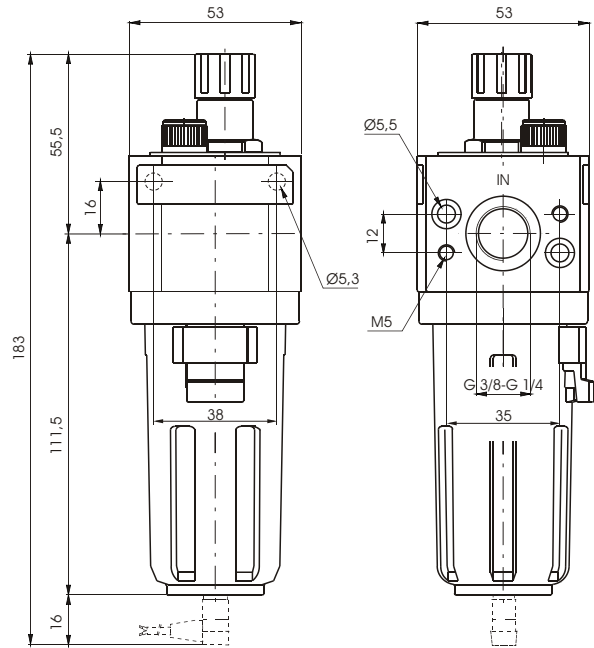


Ordering code

17222



Example: **17222A.C**
 Pressure regulator with G 1/4" connections, adjusting range 0 - 8 bar with relieving.



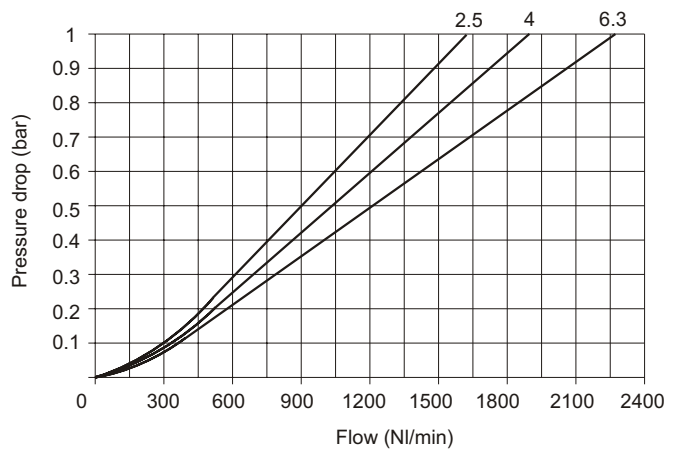
Construction and working characteristics

- Fog type lubrication with variable section orifice according to the flow.
- Body made with light alloy.
- Wall mounting possibility with M5 screws protected by covers.
- Transparent technopolymer bowl with shock resistant technopolymer protection
- Possibility to see the min. and max. level on 360° also with bowl protection assembled.
- Bowl assembled to the body with bayonet cap and safety button.
- Transparent technopolymer sight dome with adjusting handle.
- Oil filling plug.
- Electrical connector for low level indication. Use the C1, C2 or C3 lead for connection (see section 8, catalogue 4 "Cylinders").

Technical characteristics

Connections	G 1/4" - G 3/8"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature (at 10 bar)	50°C
Weight	gr. 280
Indicative oil drip rate	1 drop every 300/600 NI
Oil type	FD22 - HG32
Bowl capacity	50 cm ³
Assembly position	Vertical
Wall mounting screws	M5
Min. operational flow	20 NI/min
Max. fitting torque	25 Nm

Flow rate curves
Inlet pressure (bar)



Ordering code

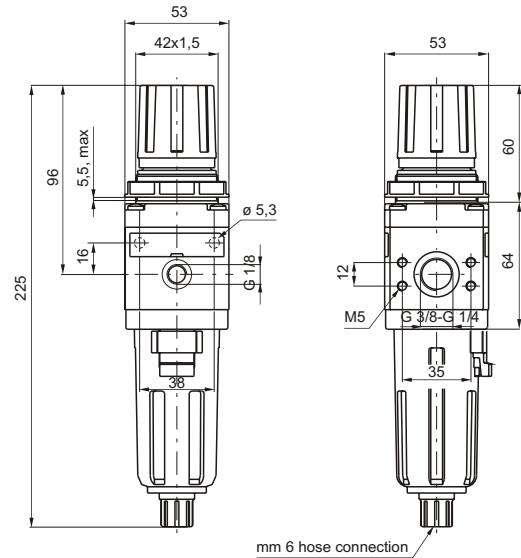
17203

Connections
A = G 1/4"
B = G 3/8"

MA = Minimum oil level indicator N.O.
with plug connector
MC = Minimum oil level indicator N.C.
with plug connector

Note: on MA version the contact is open when the bowl is filled
on MC version the contact is closed when the bowl is filled

Example: **17203A**
Lubricator with G 1/4" connections.



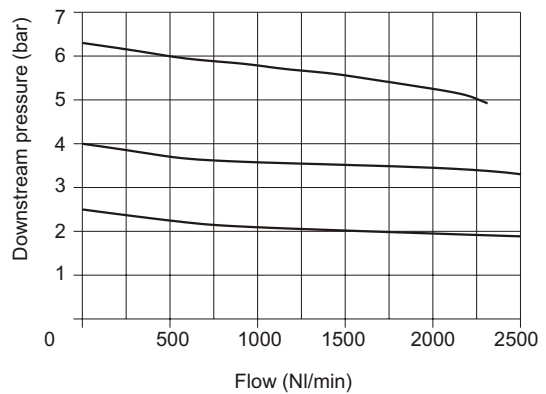
Construction and working characteristics

- Filter - diaphragm pressure regulator with relieving.
- Balanced poppet.
- Lockable handle by simply pressing it downwards in the desired position.
- Body made with light alloy.
- Wall mounting possibility with M5 screws protected by covers.
- Double filtering action: by air centrifuging and by replaceable and reusable HDPE porous filter element.
- Transparent technopolymer bowl with shock resistant technopolymer protection connected to the body with bayonet cap and safety button.
- Manual and semi-automatic water drain valve; in the semi-automatic version the drainage happens when there is no pressure or by pushing the valve up-wards.
- Possibility to see the water level on 360° also with bowl protection assembled.
- Automatic water drainage bowl available on request.
- Two pressure gauge connections with plug complete of seal.

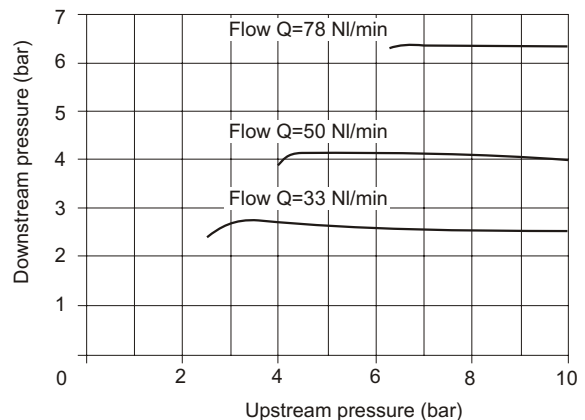
Technical characteristics

Connections	G 1/4" - G 3/8"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature (at 10 bar)	50°C
Pressure gauge connections	G 1/8"
Weight	gr. 450
Pressure range	0 - 2 bar
	0 - 4 bar
	0 - 8 bar
	0 - 12 bar
Filter pore size	5µ
	20µ
	50µ
Bowl capacity	28 cm ³
Assembly position	Vertical
Wall mounting screws	M5
Max. fitting torque	25 Nm

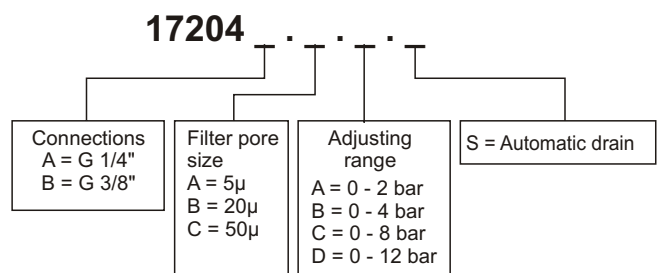
Flow rate curves
Inlet pressure (7 bar)



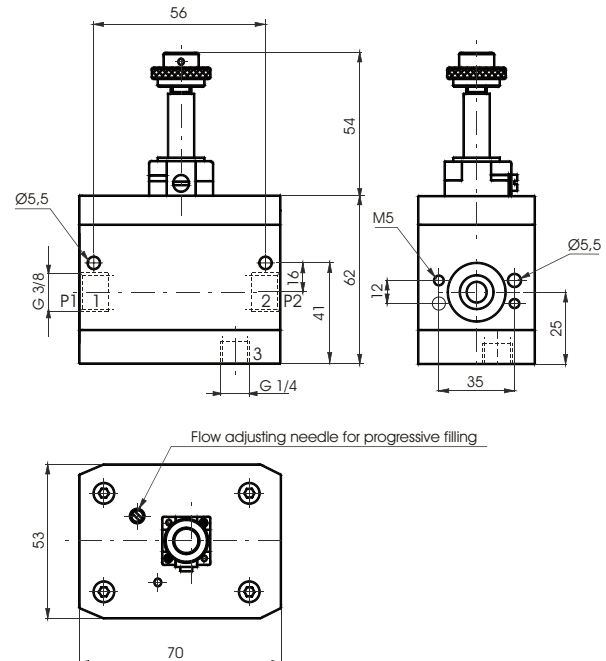
Adjustment characteristics



Ordering code



Example: **17204A.B.C**
Filter - pressure regulator size 2 with G 1/4" connections, filter pore size 20µ and adjusting range 0-8 bar.



Construction and working characteristics

- 3-way valve with double poppet.
- Possibility to adjust the down stream circuit filling time by the enclosed adjustable metering screw.
- Quick down stream circuit discharge.
- Possibility for a pneumatic or electric piloting control.
- Body made with anodized 2011 aluminum alloy.
- Wall mounting possibility with M5 screws.

Technical characteristics

Connections	G 3/8"
Max. inlet pressure	10 bar - 1 MPa
Max. ambient temperature	50°C
Weight	gr. 595
Assembly position	Any
Wall mounting screws	M5
Min. operating pressure	2.5 bar - 0.25 Mpa
Nominal flow at 6 bar with $\Delta p=1$	1700 NI/min.
Flow with adjustable metering screw fully open	340 NI/min

Important note: the preventive or programmed maintenance of this product is not foreseen considering the elaborated assembling and the specific "PNEUMAX" testing; therefore, call the producer or its representative in case of necessity.

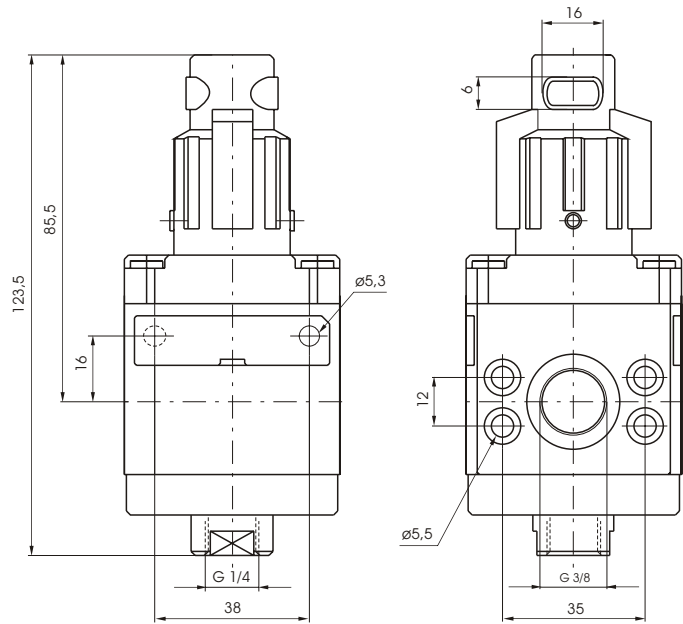
Ordering code

17210.M2

Electrically controlled progressive start-up valve size 2, complete with mechanic for M2 microsolenoid valve.

17220

Progressive start-up valve size 2 with pneumatic control.



2

Construction and working characteristics

- 3 ways poppet valve.
- Body made with anodized aluminum alloy 2011.
- Wall mounting possibility with M5 screws protected by covers.
- Double handle action for valve opening: pushing and rotating (clockwise).
- Simple rotate the valve handle counter clockwise for valve closing and down stream circuit discharging.
- Possibility to lock the valve in the discharging position by fitting in a padlock in the proper seat.

Technical characteristics

Connections	G 3/8"
Max. inlet pressure	13 bar - 1.3 MPa
Max. ambient temperature	50°C
Weight	gr. 380
Assembly position	Any
Nominal flow at 6 bar with Δp=1	2100 NI/min.
Wall mounting screws	M5
Handle opening and closing angle	90°
Max. fitting torque	25 Nm

Important note: the preventive or programmed maintenance of this product is not foreseen considering the elaborated assembling and the specific "PNEUMAX" testing; therefore, call the producer or its representative in case of necessity.

Ordering code

17230 .

- A = Not lockable handle
- B = Lockable handle
- M2 = Electric with M2
- M2/9 = Electric with M2/9
- PN = Pneumatic

Example: **17230.B**
Shut-off valves size 2 complete with lockable handle.

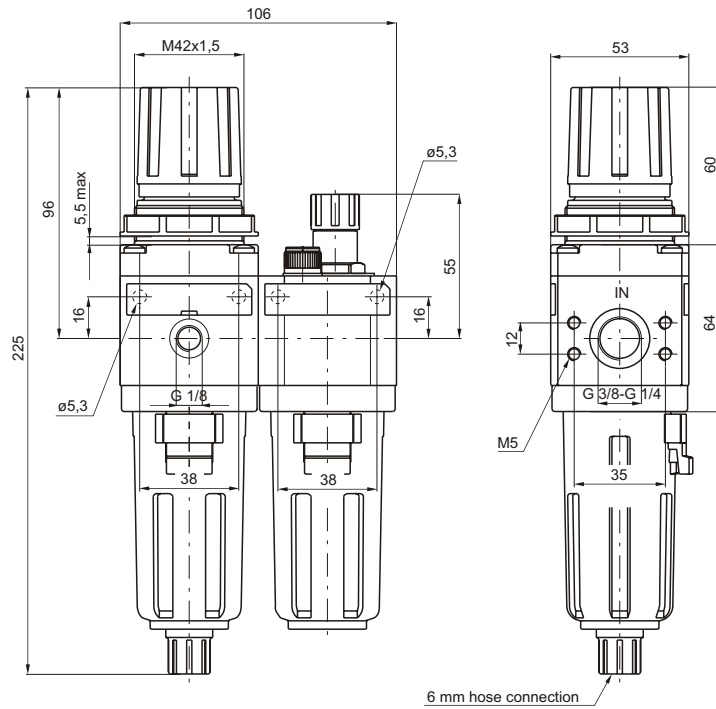


Construction and working characteristics

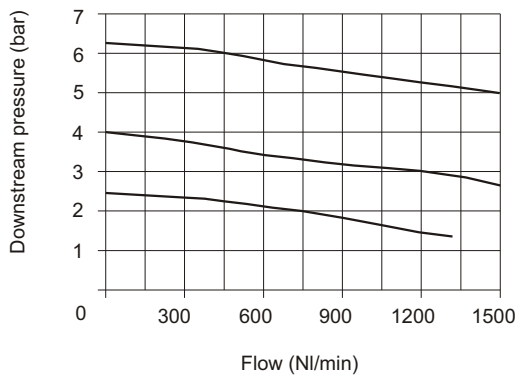
- Filter - diaphragm pressure regulator with relieving.
- Balanced poppet.
- Double filtering action: by air centrifuging and by replaceable and reusable HDPE porous filter element.
- Body made with light alloy.
- Wall mounting possibility with M5 screws protected by covers.
- Lockable handle by simply pressing it downwards in the desired position.
- Transparent technopolymer bowl with shock resistant technopolymer protection connected to the body with bayonet cap and safety button.
- Manual and semi-automatic water drain valve; in the semi-automatic version the drainage happens when there is no pressure or by pushing the valve up-wards.
- Possibility to see the water level on 360° also with bowl protection assembled.
- Automatic water drainage bowl available on request.
- Two pressure gauge connections with plug complete of seal.
- Fog type lubrication with variable section orifice according to the flow.
- Transparent technopolymer sight dome with adjusting handle.
- Oil filling plug.

Technical characteristics

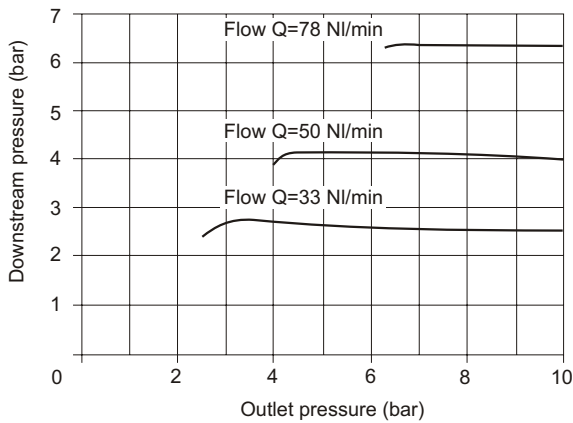
Connections	G 1/4" - G 3/8"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature (at 10 bar)	50°C
Pressure gauge connections	G 1/8"
Weight	gr. 750
Pressure range	0 - 2 bar 0 - 4 bar 0 - 8 bar 0 - 12 bar
Filter pore size	5µ 20µ 50µ
Bowl capacity	28 cm ³
Oil type	FD22 - HG32
Indicative oil drip rate	1 drop every 300/600 NI
Bowl capacity	50 cm ³
Min. operational flow at 6,3 bar	20 NI/min
Assembly position	Vertical
Wall mounting screws	M5
Max. fitting torque	25 Nm



Flow rate curves
 Inlet pressure (7 bar)



Adjustment characteristic



Ordering code

17206

Connections
 A = G 1/4"
 B = G 3/8"

Filter pore size
 A = 5µ
 B = 20µ
 C = 50µ

Adjusting range
 A = 0 - 2 bar
 B = 0 - 4 bar
 C = 0 - 8 bar
 D = 0 - 12 bar

S = Automatic drain

Example: **17206A.B.C.S**

Service unit combination complete with filter - pressure regulator and lubricator size 2, G 1/4" connections, filter pore size 20µ, adjusting range 0-8 bar and automatic drain.

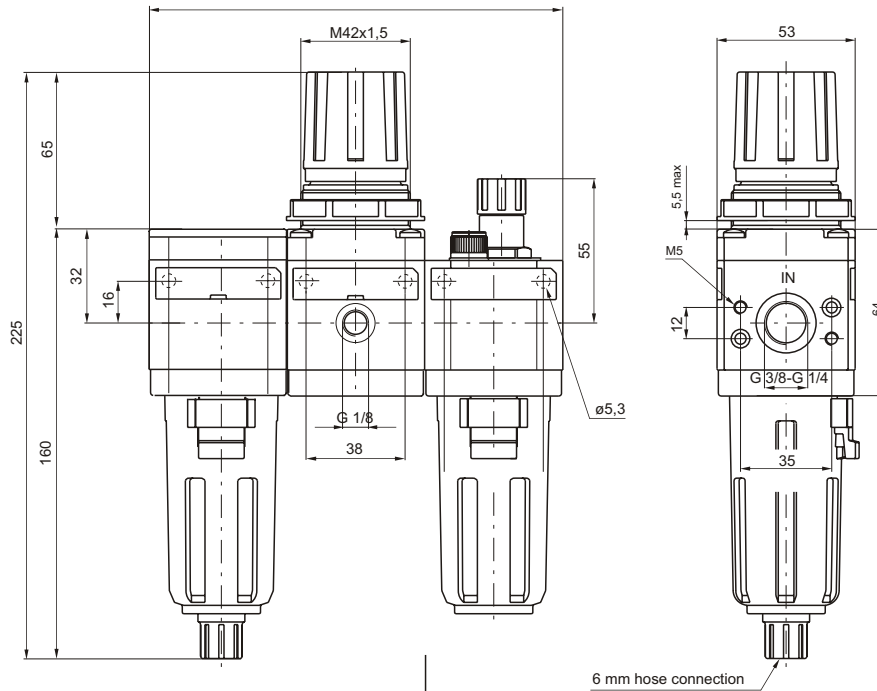


Construction and working characteristics

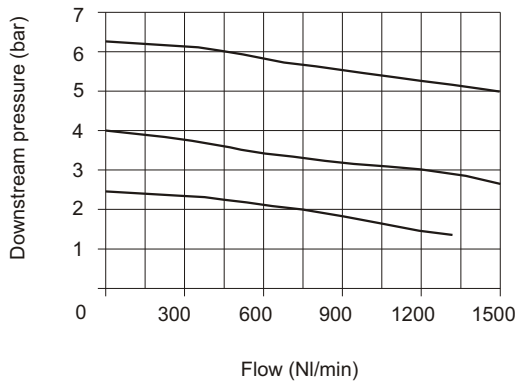
- Filter - diaphragm pressure regulator with relieving.
- Double filtering action: by air centrifuging and by replaceable and reusable HDPE porous filter element.
- Body made with light alloy.
- Wall mounting possibility with M5 screws protected by covers.
- Pressure adjusting lockable handle by simply pressing it downwards in the desired position.
- Transparent technopolymer bowl with shock resistant technopolymer protection connected to the body with bayonet cap and safety button.
- Manual and semi-automatic water drain valve; in the semi-automatic version the drainage happens when there is no pressure or by pushing the valve up-wards.
- Automatic water drainage bowl available on request.
- Possibility to see the water level on 360° also with bowl protection assembled.
- Two pressure gauge connections with plug complete of seal.
- Fog type lubrication with variable section orifice according to the flow.
- Transparent technopolymer sight dome with adjusting handle.
- Oil filling plug.

Technical characteristics

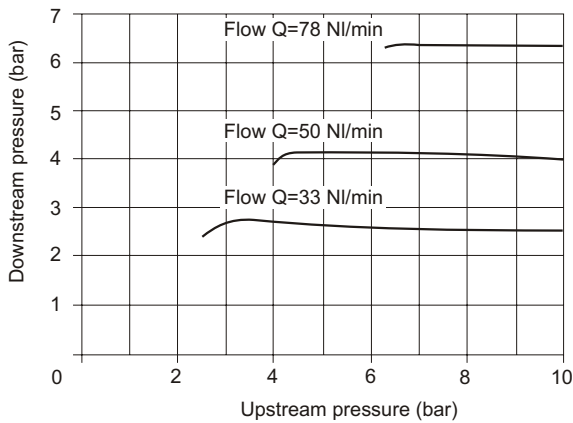
Connections	G 1/4" - G 3/8"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature (at 10 bar)	50°C
Pressure gauge connections	G 1/8"
Weight	gr. 960
Pressure range	0 - 2 bar 0 - 4 bar 0 - 8 bar 0 - 12 bar
Filter pore size	5µ 20µ 50µ
Bowl capacity	28 cm ³
Oil type	FD22 - HG32
Indicative oil drip rate	1 drop every 300/600 NI
Bowl capacity	50 cm ³
Min. operational flow at 6,3 bar	20 NI/min
Assembly position	Vertical
Wall mounting screws	M5
Max. fitting torque	25 Nm



Flow rate curves
 Inlet pressure (7 bar)

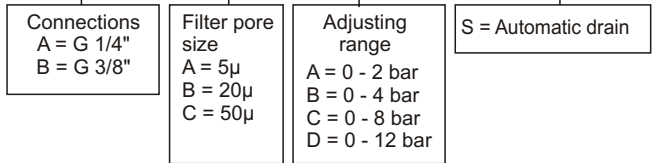


Adjustment characteristics



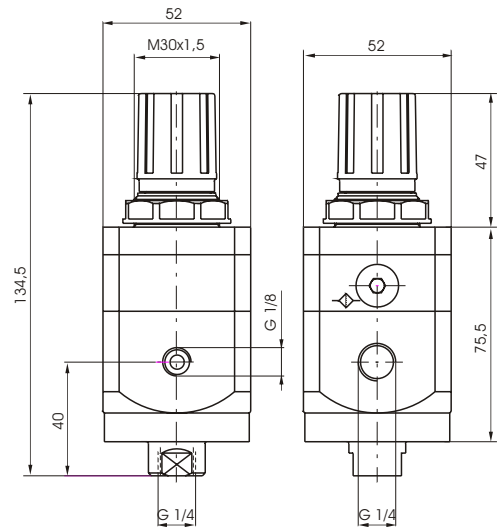
Ordering code

17207



Example: **17207A.B.C.S**

Service unit combination complete with filter - pressure regulator and lubricator size 2, G 1/4" connections, filter pore size 20µ, adjusting range 0-8 bar and automatic drain.



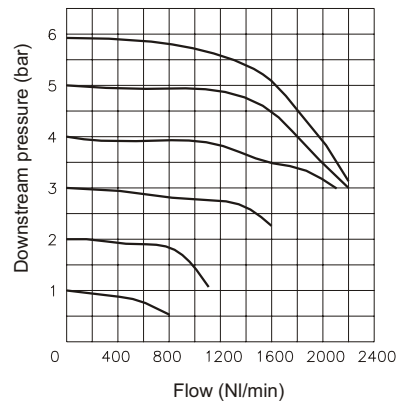
Construction and working characteristics

- Accurate capacity to maintain set pressure.
- Sensitivity combined with high relieving rates.
- High flow rate with extremely low pressure drop.
- Pressure adjusting lockable handle by simply pressing it downwards in the desired position.
- Body made with anodized zoll aluminium alloy
- Two pressure gauge connections with plug complete of seal.
- Ring nut for panel mounting.
- Once set, a constant bleed of air maintains the accuracy of the regulator.
This controlled release is a charasteric, not a fault.

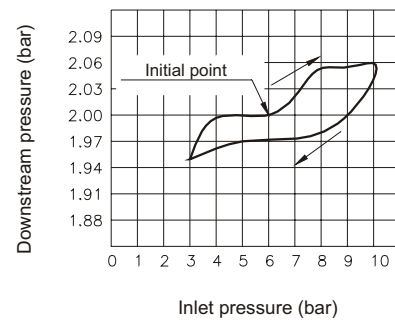
Technical characteristics

Connections	G 1/4"
Max. inlet pressure	10 bar - 1 MPa
Max. ambient temperature	50°C
Pressure gauge connections	G 1/8"
Weight	gr. 520
Pressure range	0,1 - 2 bar
	0,1 - 4 bar
	0,1 - 7 bar
Assembly position	Any
Air flow (inlet pressure 10 bar)	5 NI/min
Max. fitting torque	40 Nm
Fluid	20µm filtered air and preferably non lubricated

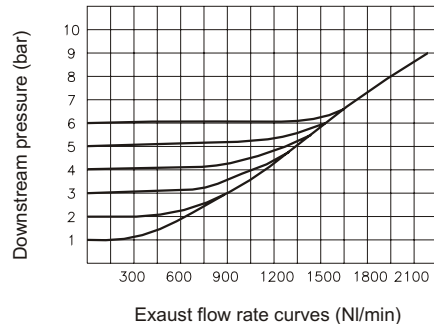
Flow rate curves (17212A.C)
Inlet pressure (7 bar)



Adjustment characteristics (17212A.C)



Exhaust flow rate curves (17212A.C)



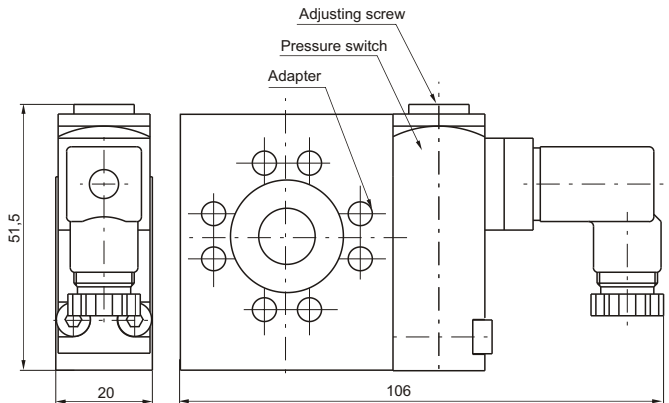
Ordering code

17212A .

Adjusting range
A = 0,1 - 2 bar
B = 0,1 - 4 bar
C = 0,1 - 7 bar

Example: 17212A.C
Pressure regulator with G 1/4" 0,1 - 7 bar

Pressure switch complete with adapter



Construction and working characteristics

The pressure switch complete of adapter has to be assembled between two elements of the FRL group. It cannot be utilized separately or at the end of the FRL group.

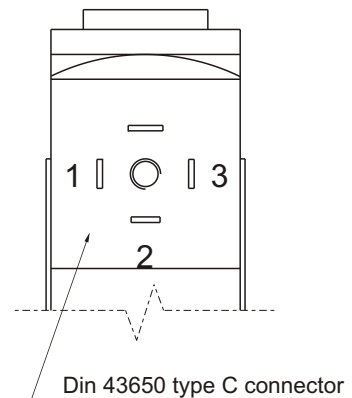
The pressure switch can be set at desired pressure (pressure range from 2 to 10 bar) by rotating the adjusting screw.

The electrical connection is made by mean of a 15 connector DIN 43650 type C.

The microswitch contact could be normally closed or open (change over switch).

Connection

- 1 = Neutral
- 2 = N.C. contact
- 3 = N.O. contact



Technical characteristics

Max. inlet pressure	13 bar 1.3 MPa
Max. temperature	50°C
Weight	gr. 200
Microswitch capacity	5A
Grade of protection (with connector assembled)	IP 65
Adjusting range	2 - 10 bar
Assembly position	Any

Ordering code

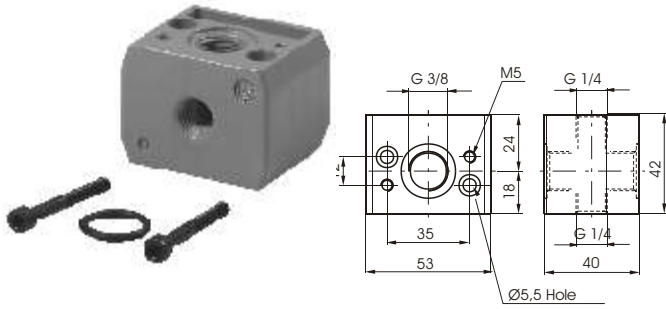
17

- 24A = Pressure switch adapter
- 14B = Pressure switch
- 24C = Pressure switch complete with adapter

Example: **1724C**
Pressure switch complete with adapter.



Air Intake

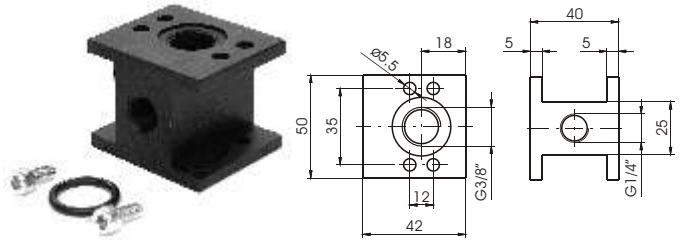


Ordering code

17240

Weight gr. 160

Air Intake - "H" profile

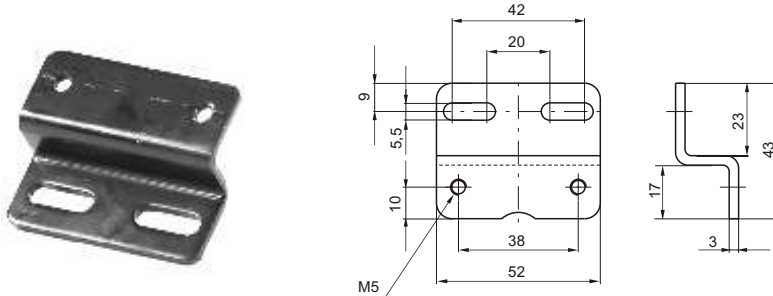


Ordering code

17240H

Weight gr. 116

Fixing bracket



Ordering code

17250

Weight 65 gr.

Pressure gauge



Ordering code

17070

DIMENSIONS							
CODE	A	B	C	D	E	G	Weight gr.
17070A	44	10	26	41	14	G1/8"	60
17070B	45	10	27	49	14	G1/8"	80

Connections
A = Dial ø40
B = Dial ø50

A = Scale 0-4 bar
B = Scale 0-6 bar
C = Scale 0-12 bar

Assembling kit



Ordering code

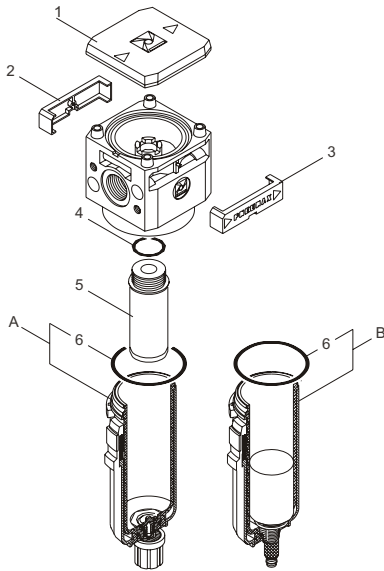
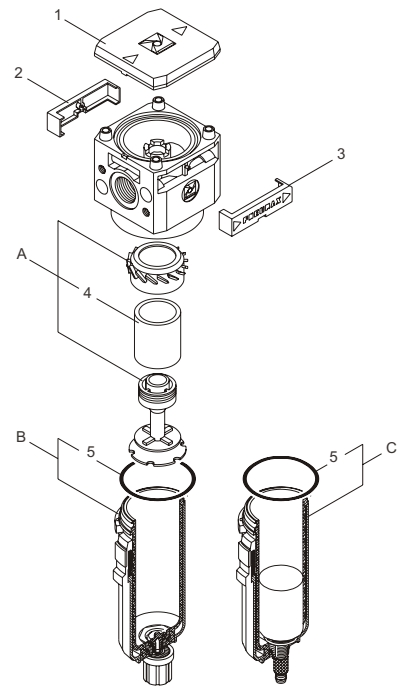
17260
(standard)

17265
(for progressive start-up valve)

Weight 20 gr.

Filtro

Pos.	Code	Description
1	RS/1702/30	Cover
2	RS/1702/11	Rear tab
3	RS/1702/10	Front tab
4	RS/1702/13	Porous filter element 20µ
4	RS/1702/41	Porous filter element 5µ
4	RS/1702/42	Porous filter element 50µ
5	RS/OR 36x2.5	Seal
A	RK1702A/004	Filter group assembly 20µ
A	RK1702A/009	Filter group assembly 5µ
A	RK1702A/010	Filter group assembly 50µ
B	RK1702A/002	Filter bowl c/w drain valve
C	RK1702A/007	Filter bowl c/w automatic drain

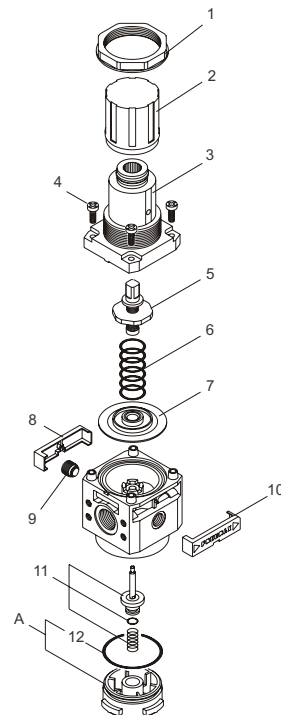


Filtro - depuratore

Pos.	Code	Description
1	RS/1702/30	Cover
2	RS/1702/69	Rear tab
3	RS/1702/68	Front tab
4	RS/OR 3056	Seal
5	RK1702A/017	Coalescent group 0,1µ
6	RS/OR 36x2.5	Seal
A	RK1702A/002	Filter bowl c/w drain valve
B	RK1702A/007	Filter bowl c/w automatic drain

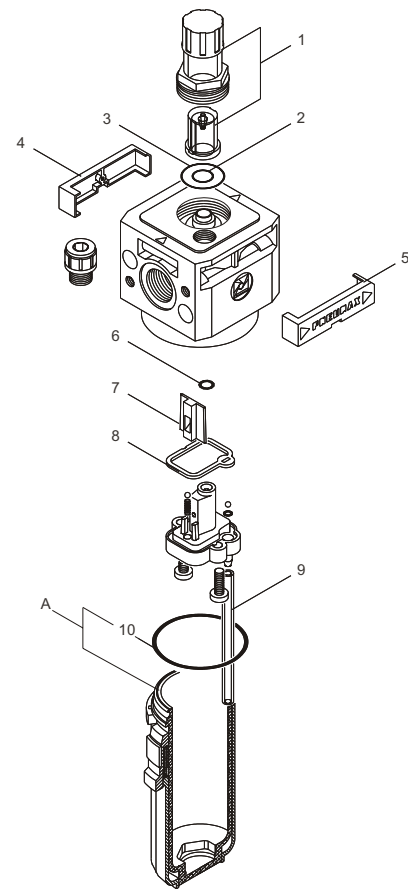
Riduttore

Pos.	Code	Description
1	RS/1702/12	Lock nut
2	RS/1702/3	Adjusting knob
3	RS/1702/2	Adjusting support
4	RS/TCTCR 4x12	Screw
5	RK1702A/005	Adjusting screw assembly
6	RS/1702/38	Spring 0- 2 bar range
6	RS/1702/37	Spring 0- 4 bar range
6	RS/1702/36	Spring 0 - 8 bar range
6	RS/1702/39	Spring 0 - 12 bar range
7	RK1702A/001	Diaphragm assembly
7	RK1702A/011	Diaphragm ass. w/o relieving
8	RS/1702/11	Rear tab
9	RK1701A/020	Plug c/w seal G 1/8"
10	RS/1702/10	Front tab
11	RK1702A/016	Poppet c/w spring
12	RS/OR 36x2.5	Seal
A	RK1702A/014	Plug



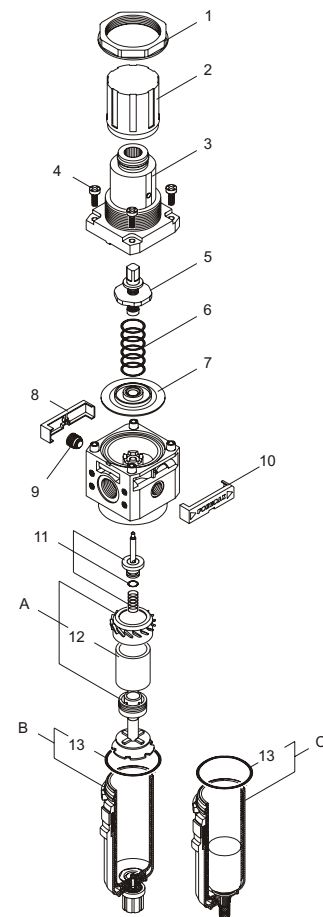
Lubricator

Pos.	Code	Description
1	RK1701A/026	Lubricator sight dome assembly
2	RS/OR 106	Seal
3	RS/OR 2075	Seal
4	RS/1702/11	Rear tab
5	RS/1702/10	Front tab
6	RS/OR 5X1.5	Seal
7	RS/1702/28	Venturi diaphragm
8	RS/1702/31	Seal
9	RS/1702/40	Oil tube
10	RS/OR 36x2.5	Seal
A	RK1702A/003	Lubricator bowl



Filtro - riduttore

Pos.	Code	Description
1	RS/1702/12	Lock nut
2	RS/1702/3	Adjusting knob
3	RS/1702/2	Adjusting support
4	RS/TCTCR 4x12	Screw
5	RK1702A/005	Adjusting screw assembly
6	RS/1702/38	Spring 0 - 2 bar range
6	RS/1702/37	Spring 0 - 4 bar range
6	RS/1702/36	Spring 0 - 8 bar range
6	RS/1702/39	Spring 0 - 12 bar range
7	RK1702A/001	Diaphragm assembly
7	RK1702A/011	Diaphragm ass. w/o relieving
8	RS/1702/11	Rear tab
9	RK1701A/020	Plug c/w seal G 1/8"
10	RS/1702/10	Front tab
11	RK1702A/016	Poppet c/w spring
12	RS/1702/13	Porous filter element 20 μ
12	RS/1702/41	Porous filter element 5 μ
12	RS/1702/42	Porous filter element 50 μ
13	RS/OR 36x2.5	Seal
A	RK1702A/004	Filter group assembly 20 μ
A	RK1702A/009	Filter group assembly 5 μ
A	RK1702A/010	Filter group assembly 50 μ
B	RK1702A/002	Filter bowl c/w drain valve
C	RK1702A/007	Filter bowl c/w automatic drain





Size 3

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Construction and working characteristics

The modular air service units groups of the size 3, as the ones of size 1 and 2, allow a wide selection of combinations.

The threaded connections are machined directly on the valve body made with light alloy, so that each components can be used individually.

They can be wall mounted with head-guard screws masked by covers.

The bowls are made of transparent technopolymer, always supplied with shock resistant technopolymer protection, allowing the moisture and oil level control from any angle.

The filter can be equipped with manual or semiautomatic water drain valve; furthermore it's possible to install the automatic draining device inside the bowl.

The pressure regulator handle is lockable in the desired position.

The lubricator oil flow is adjustable with proper handle and it is visibly checked through the sight dome.

The shut-off valve can be equipped with pad-lock to prevent accidents or damages due to unauthorized operation.

The progressive start-up valve, pneumatically or electropneumatically controlled, allows air supply to the circuit progressively and with adjustable time.

Some accessories like the wall fixing bracket, pressure gauges with different scales and diameters, air intake block that assembled between the elements allows to get in the system filtered or filtered non-lubricated air, are completing the range.

Instruction for installation and operation

Pay attention to install a group or a single component with air flow direction according to the arrows and to the following sequence: filter, pressure regulator, lubricator and with bowls downwards. It's possible to fix the group to the wall by removing the covers, which can be installed again for covering the screw after fixing.

Do not exceed the recommended torque while assembling the connectors.

Do not exceed the recommended air pressure and temperature limits.

The moisture should not exceed the level marked on the bowl and it can be drawn off and carried away by a flexible tube of $\varnothing 6/4$ directly connected to the discharge valve handle.

The pressure should be set from minimum to maximum, rotating the adjusting handle clockwise.

As lubricant, we suggest to use oil class FD22 or HG32. Verify that the lubricator is not fed with a flow lower than the minimum operational.

To set the oil flow rotate the proper adjusting handle in order to get one drop of oil every 300-600 liters of air.

The oil flow will be kept automatically and proportionally to the air flow.

The oil can be refilled by mean of proper plug or directly into the bowl after having de-pressurized the system. Do not exceed the maximum level indicated on the bowl.

For opening the shut-off valve push and rotate clockwise the operating handle. For closing it and consequently discharging the down stream line, rotate the handle counter-clockwise.

Maintenance

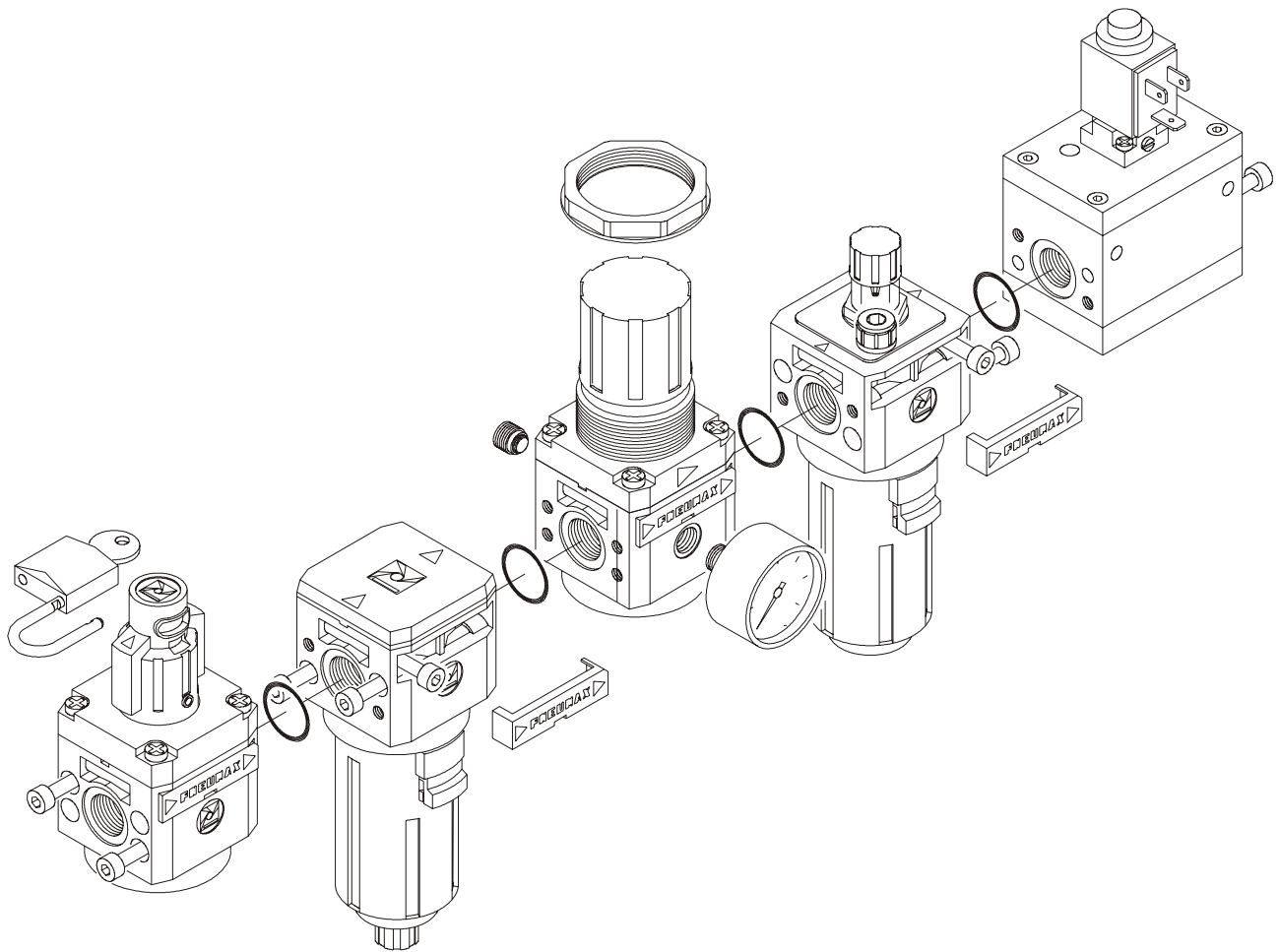
Clean the bowls with water and detergent. Do not use alcohol.

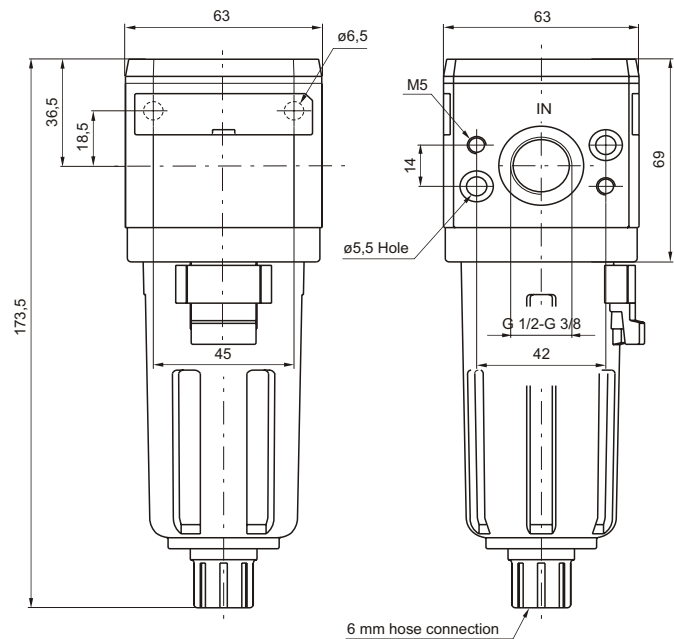
The filter element made with HPDE is reusable by blowing and cleaning it with proper detergent. For replacing or cleaning it, remove the bowl and unscrew the baffle spins.

Replace the pressure regulator diaphragm whenever the operation is not correct or there is a continuous air leaking through the relieving (over pressure discharge); reinstall the adjusting mechanism support locking it with about 8 Nm torque.

In case it is necessary to replace the lubricator transparent dome, tight it at 5 Nm torque

Assembling





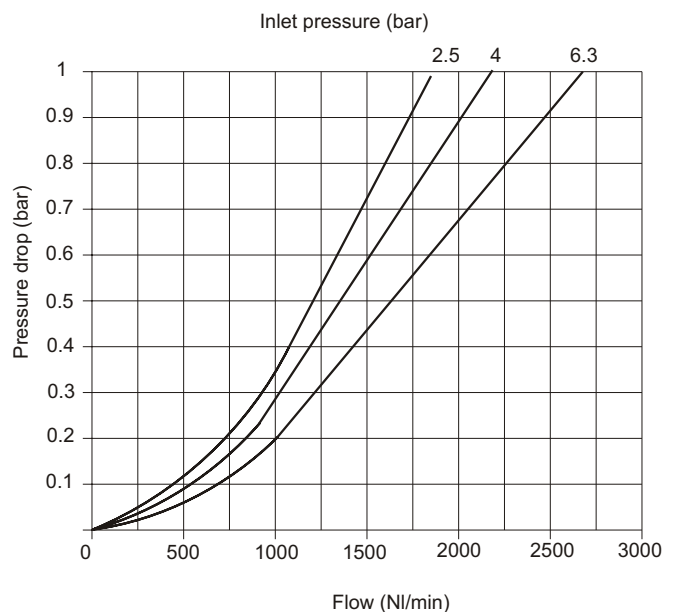
Construction and working characteristics

- Body made with light alloy.
- Wall mounting possibility with M6 screws protected by covers.
- Double filtering action: by air centrifuging and by replaceable and reusable HDPE porous filter element.
- Transparent technopolymer bowl with shock resistant technopolymer protection connected to the body with bayonet cap and safety button.
- Manual and semi-automatic water drain valve; in the semi-automatic version the drainage happens when there is no pressure or by pushing the valve up-wards.
- Possibility to see the water level on 360°.
- Automatic water drainage bowl available on request.

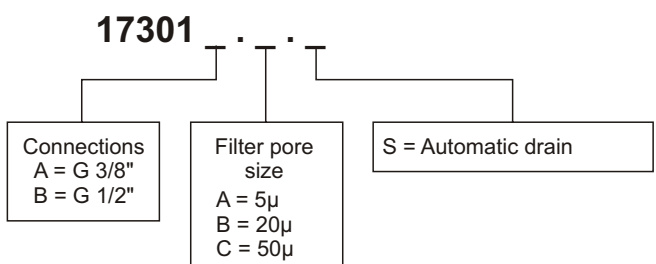
Technical characteristics

Connections	G 3/8" - G 1/2"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature (at 10 bar)	50°C
Weight	gr. 405
Filter pore size	5µ
	20µ
	50µ
Bowl capacity	42 cm ³
Assembly position	Vertical
Wall fixing screws	M6
Max. fitting torque	40 Nm

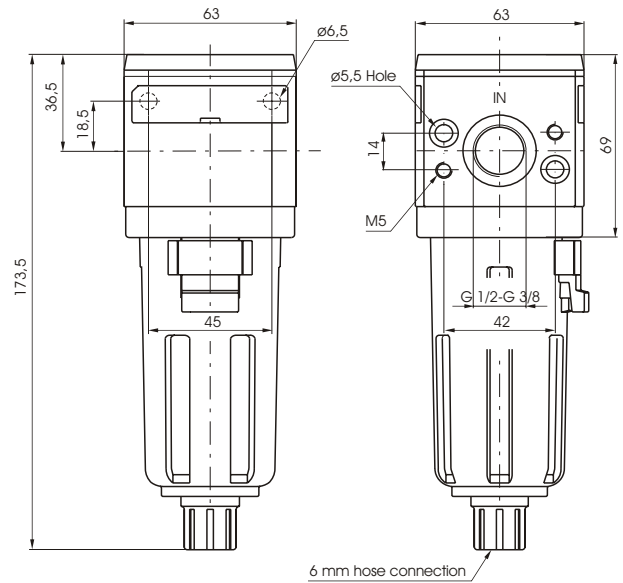
Flow rate curves



Ordering code



Example: **17301A.B**
Filter size 3 with G 3/8" connections and filter pore size 20µ.



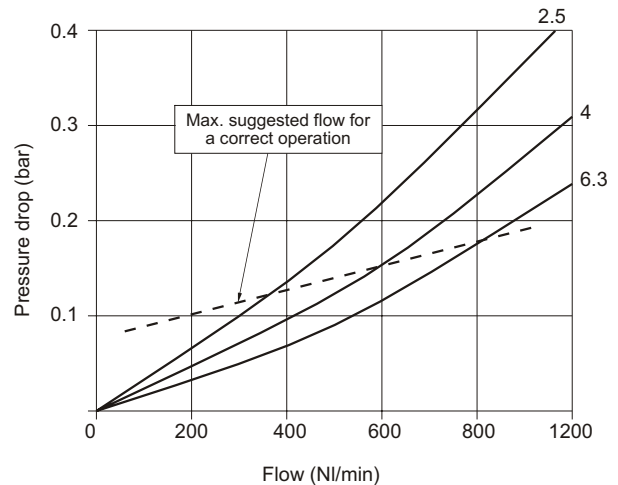
Construction and working characteristics

- Coalescing filter element remove 0,1 μ particles equivalent to 99,97%.
- Body made with light alloy.
- Wall mounting possibility with M6 screws protected by covers.
- Transparent technopolymer bowl with shock resistant technopolymer protection connected to the body with bayonet cap and safety button.
- Manual and semi-automatic water drain valve; in the semi-automatic version the drainage happens when there is no pressure or by pushing the valve up-wards.
- Possibility to see the water level on 360° also with bowl protection assembled.
- Automatic water drainage bowl available on request.

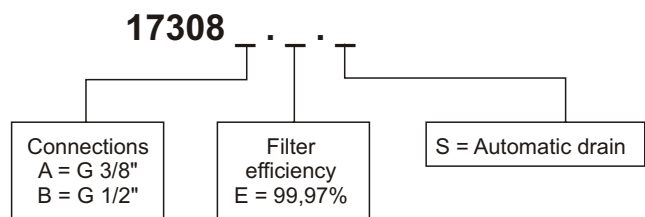
Technical characteristics

Connections	G 3/8" - G 1/2"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature (at 10 bar)	50°C
Weight	gr. 405
Filter efficiency with 0,1 μ particle	99,97%
Bowl capacity	42 cm ³
Assembly position	Vertical
Wall fixing screws	M6
Max. fitting torque	40 Nm

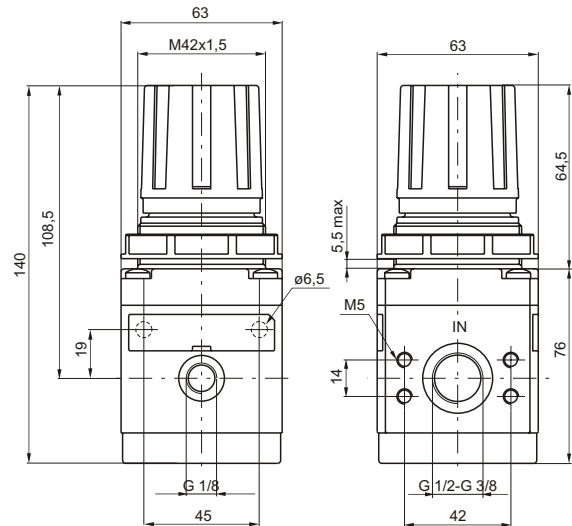
Flow rate curves
Inlet pressure (bar)



Ordering code



Example: **17308A.E**
Coalescing filter size 3 with G 3/8" connections and filter efficiency of 99,97%.



Construction and working characteristics

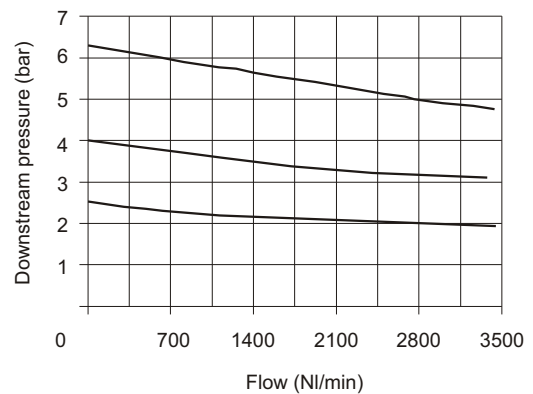
- Diaphragm pressure regulator with relieving.
- Balanced poppet.
- Lockable handle by simply pressing it downwards in the desired position.
- Body made with light alloy.
- Wall mounting possibility with M6 screws protected by covers.
- Two pressure gauge connections with plug complete of seal.
- Panel mounting bracket.

Technical characteristics

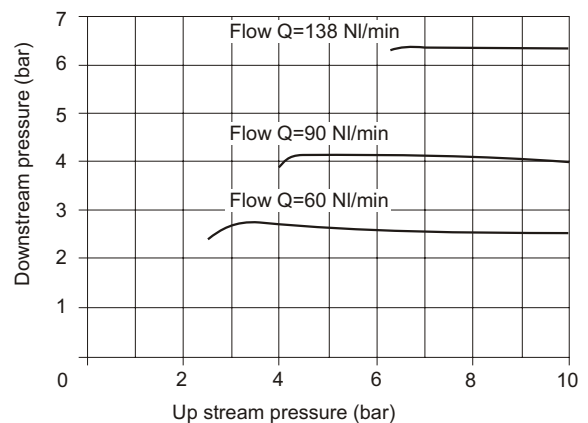
Connections	G 3/8" - G 1/2"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature	50°C
Pressure gauge connections	G 1/8"
Weight	gr. 550
Pressure range	0 - 2 bar
	0 - 4 bar
	0 - 8 bar
	0 - 12 bar
Assembly position	Any
Wall fixing screws	M6
Max. fitting torque	40 Nm

Flow rate curves

Inlet pressure (7 bar)

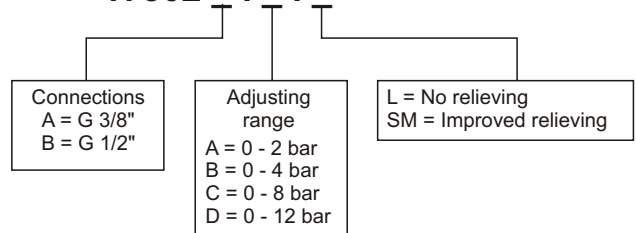


Adjustment characteristics



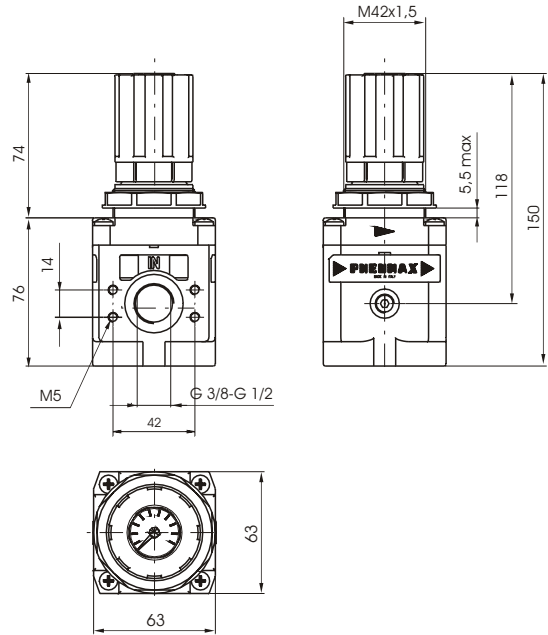
Ordering code

17302



Example: **17302A.C**

Pressure regulator with G 3/8" connections, adjusting range 0 - 8 bar with relieving.



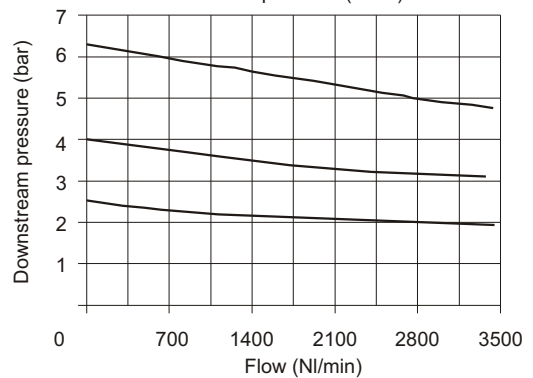
Construction and working characteristics

- Diaphragm pressure regulator with relieving.
- Pressure gauge included on the top of adjusting knob.
- Balanced poppet.
- Lockable handle by simply pressing it downwards in the desired position.
- Body made with light alloy.
- Wall mounting possibility with M5 screws protected by covers.
- Panel mounting bracket.

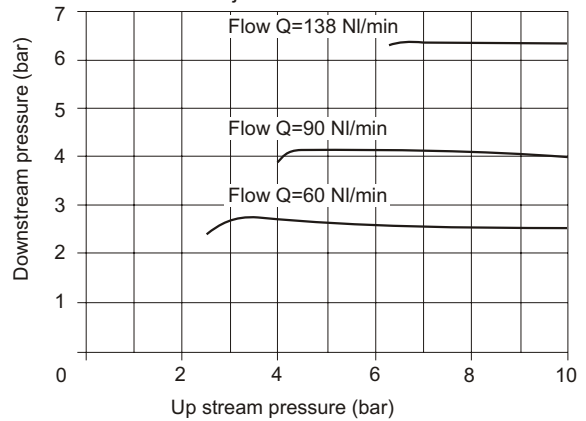
Technical characteristics

Connections	G 3/8" - G 1/2"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature	50°C
Pressure gauge connections	G 1/8"
Weight	gr. 600
Pressure range	0 - 2 bar
	0 - 4 bar
	0 - 8 bar
	0 - 12 bar
Assembly position	Any
Wall fixing screws	M5
Max. fitting torque	40 Nm

Flow rate curves
 Inlet pressure (7 bar)

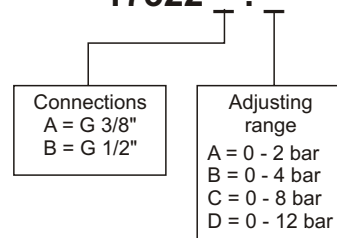


Adjustment characteristics

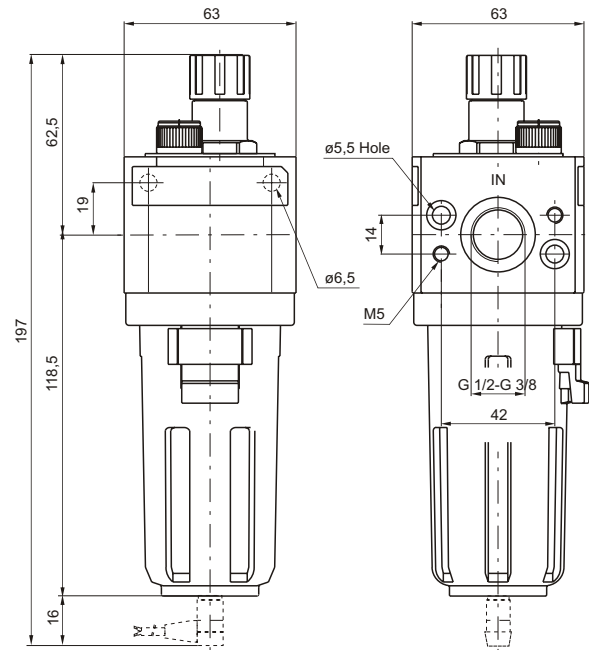


Ordering code

17322



Example: **17322A.C**
 Pressure regulator with G 3/8" connections, adjusting range 0 - 8 bar with relieving.



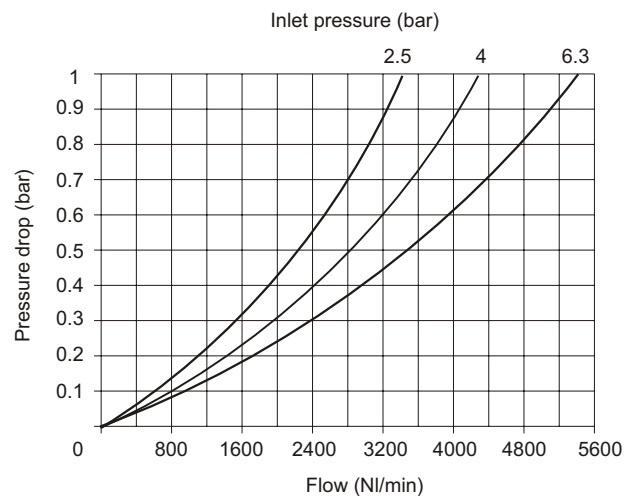
Construction and working characteristics

- Fog type lubrication with variable section orifice according to the flow.
- Body made with light alloy.
- Wall mounting possibility with M5 screws protected by covers.
- Transparent technopolymer bowl with shock resistant technopolymer protection
- Possibility to see the min. and max. level on 360° also with bowl protection assembled.
- Bowl assembled to the body with bayonet cap and safety button.
- Transparent technopolymer sight dome with adjusting handle.
- Oil filling plug.
- Electrical connector for low level indication.
Use the C1, C2 or C3 lead for connection (see section 8, catalogue 4 "Cylinders").

Technical characteristics

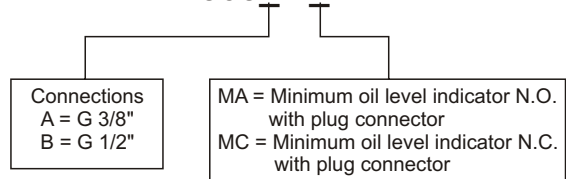
Connections	G 3/8" - G 1/2"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature (at 10 bar)	50°C
Weight	gr. 435
Indicative oil drip rate	1 drop every 300/600 NI
Oil type	FD22 - HG32
Bowl capacity	80 cm ³
Assembly position	Vertical
Wall mounting screws	M6
Min. operational flow	20 NI/min
Max. fitting torque	40 Nm

Flow rate curves



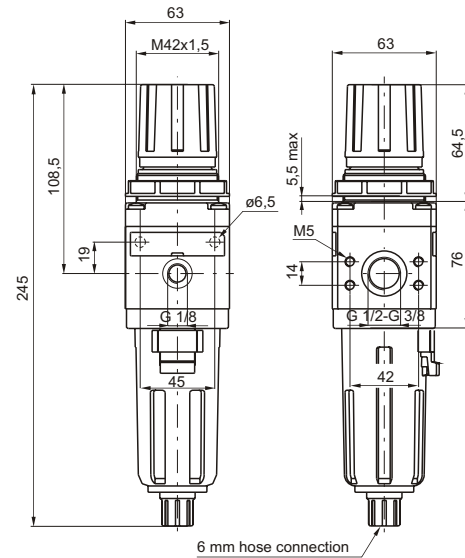
Ordering code

17303



Note: on MA version the contact is open when the bowl is filled
on MC version the contact is closed when the bowl is filled

Example: **17303A**
Lubricator with G 3/8" connections.



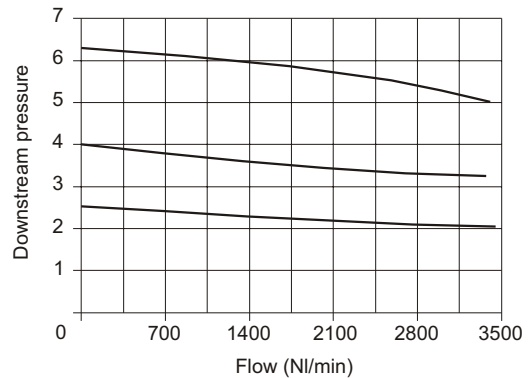
Construction and working characteristics

- Filter - diaphragm pressure regulator with relieving.
- Balanced poppet.
- Lockable handle by simply pressing it downwards in the desired position.
- Body made with light alloy.
- Wall mounting possibility with M6 screws protected by covers.
- Double filtering action: by air centrifuging and by replaceable and reusable HDPE porous filter element.
- Transparent technopolymer bowl with shock resistant technopolymer protection connected to the body with bayonet cap and safety button.
- Manual and semi-automatic water drain valve; in the semiautomatic version the drainage happen when there is no pressure or by pushing the valve up-wards.
- Possibility to see the water level on 360° also with bowl protection assembled.
- Automatic water drainage bowl available on request.
- Two pressure gauge connections with plug complete of seal.

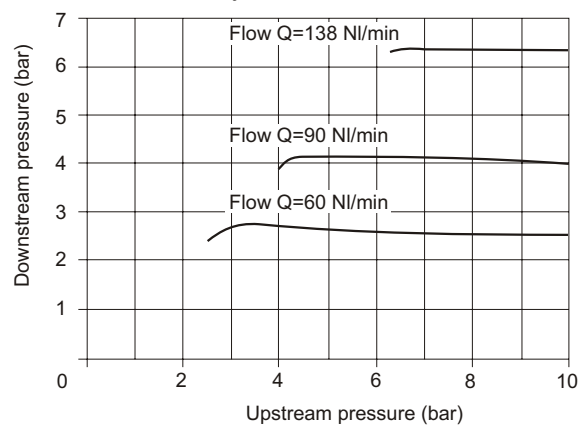
Technical characteristics

Connections	G 3/8" - G 1/2"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature (at 10 bar)	50°C
Pressure gauge connections	G 1/8"
Weight	gr. 645
Pressure range	0 - 2 bar
	0 - 4 bar
	0 - 8 bar
	0 - 12 bar
Filter pore size	5µ
	20µ
	50µ
Blow capacity	42 cm ³
Assembly position	Vertical
Wall mounting screws	M6
Max. fitting torque	40 Nm

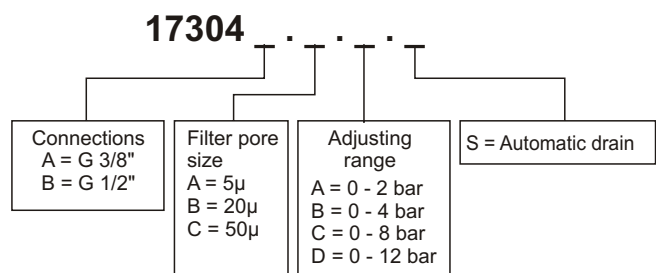
Flow rate curves
Inlet pressure (7 bar)



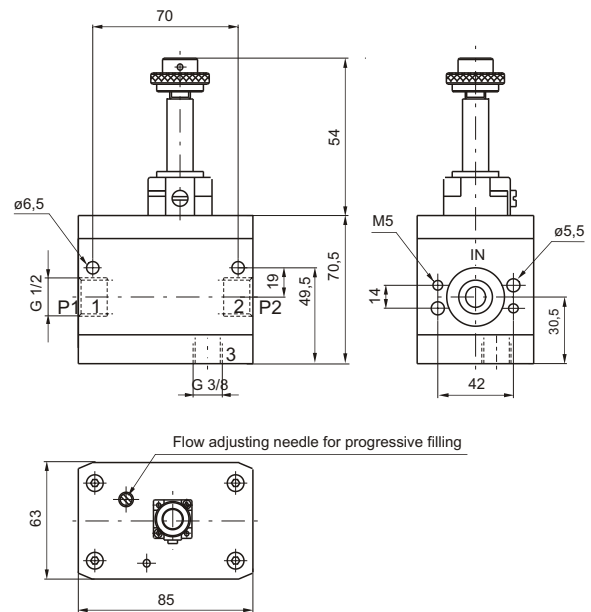
Adjustment characteristics



Ordering code



Example: **17304A.B.C**
Filter - pressure regulator size 3 with G 3/8" connections, filter pore size 20µ and adjusting range 0-8 bar



Construction and working characteristics

- 3 way valve with double poppet.
- Possibility to adjust the down stream circuit filling time by the enclosed adjustable metering screw.
- Quick down stream circuit discharge.
- Possibility for a pneumatic or electric piloting control.
- Body made with anodized 2011 aluminum alloy.
- Wall mounting possibility with M6 screws.

Important note: the preventive or programmed maintenance of this product is not foreseen considering the elaborated assembling and the specific "PNEUMAX" testing; therefore, call the producer or its representative in case of necessity.

Technical characteristics

Connections	G 1/2"
Max. inlet pressure	10 bar - 1 MPa
Max. ambient temperature	50°C
Weight	gr. 1010
Assembly position	Any
Wall mounting screws	M6
Min. operating pressure	2.5 bar - 0.25 Mpa
Nominal flow at 6 bar with $D_p=1$	2500 NI/min
Flow with adjustable metering screw fully open	340 NI/min

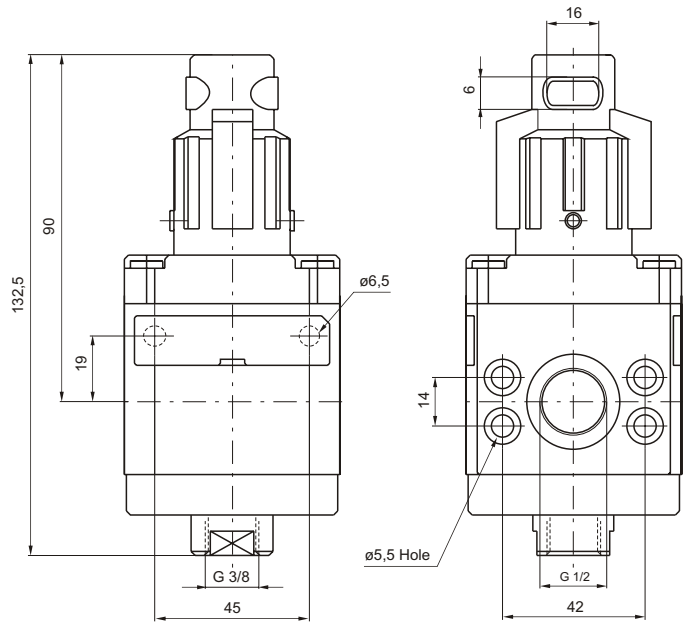
Ordering code

17310.M2

Electrically controlled progressive start-up valve size 3, complete with mechanic for M2 microsolenoid valve.

17320

Progressive start-up valve size 3 with pneumatic control.



Construction and working characteristics

- 3 ways poppet valve.
- Body made with light alloy.
- Wall mounting possibility with M6 screws protected by covers.
- Double action handle for valve opening: pushing and rotating (clockwise).
- Simple rotate the valve handle counter clockwise for valve closing and down stream circuit discharging.
- Possibility to lock the valve in the discharging position by fitting in a padlock in the proper seat.

Technical characteristics

Connections	G 1/2"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature	50°C
Weight	gr. 550
Assembly position	Any
Nominal flow at 6 bar with $D_p=1$	2500 NI/min
Wall mounting screws	M6
Handle opening and closing angle	90°
Max. fitting torque	40 Nm

Important note: the preventive or programmed maintenance of this product is not foreseen considering the elaborated assembling and the specific "PNEUMAX" testing; therefore, call the producer or its representative in case of necessity.

Ordering code

17330 .

A = Not lockable handle
B = Lockable handle
M2 = Electric with M2
M2/9 = Electric with M2/9
PN = Pneumatic

Example: **17330.B**
Shut-off valve size 3 complete with lockable handle.

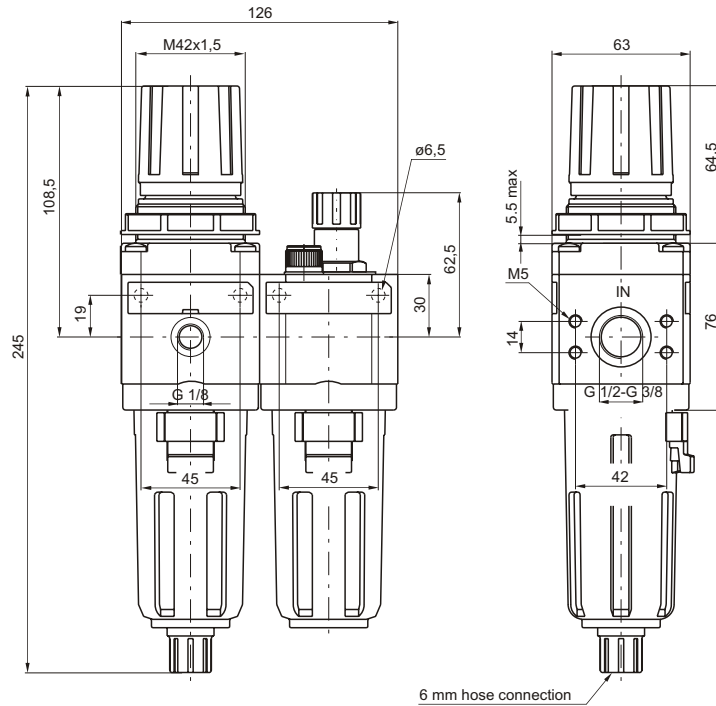


Construction and working characteristics

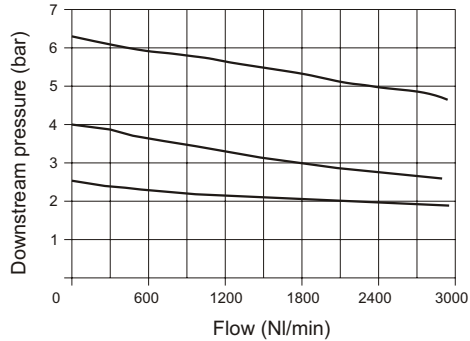
- Filter - diaphragm pressure regulator with relieving.
- Balanced poppet.
- Double filtering action: by air centrifuging and by replaceable and reusable HDPE porous filter element.
- Body made with light alloy.
- Wall mounting possibility with M6 screws protected by covers.
- Lockable handle by simply pressing it downwards in the desired position.
- Transparent technopolymer bowl with shock resistant technopolymer protection connected to the body with bayonet cap and safety button.
- Manual and semi-automatic water drain valve; in the semi-automatic version the drainage happens when there is no pressure or by pushing the valve up-wards.
- Possibility to see the water level on 360° also with bowl protection assembled.
- Automatic water drainage bowl available on request.
- Two pressure gauge connections with plug complete of seal.
- Fog type lubrication with variable section orifice according to the flow.
- Transparent technopolymer sight dome with adjusting handle.
- Oil filling plug.

Technical characteristics

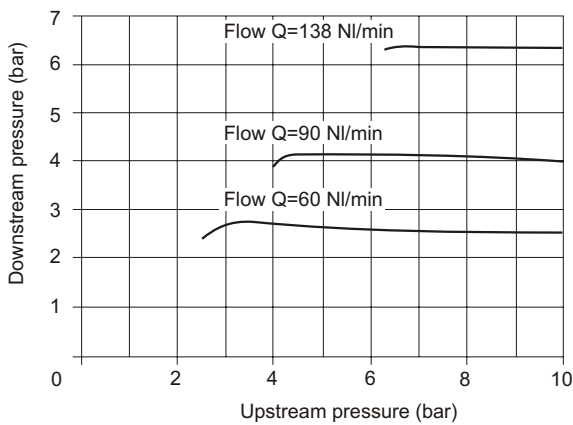
Connections	G 3/8" - G 1/2"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature (at 10 bar)	50°C
Pressure gauge connections	G 1/8"
Weight	gr. 1100
Pressure range	0 - 2 bar 0 - 4 bar 0 - 8 bar 0 - 12 bar
Filter pore size	5µ 20µ 50µ
Bowl capacity	42 cm ³
Oil type	FD22 - HG32
Indicative oil drip rate	1 drop every 300/600 NI
Bowl capacity	80 cm ³
Min. operational flow at 6,3 bar	20 NI/min
Assembly position	Vertical
Wall mounting screws	M6
Max. fitting torque	40 Nm



Flow rate curves
 Inlet pressure (7 bar)



Adjustment characteristics



Ordering code

17306

Connections A = G 3/8" B = G 1/2"	Filter pore size A = 5µ B = 20µ C = 50µ	Adjusting range A = 0 - 2 bar B = 0 - 4 bar C = 0 - 8 bar D = 0 - 12 bar	S = Automatic drain
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Example: **17306A.B.C.S**

Service unit combination complete with filter - pressure regulator + lubricator size 3.

G 3/8" connections, filter pore size 20µ, adjusting range 0-8 bar and automatic drain.

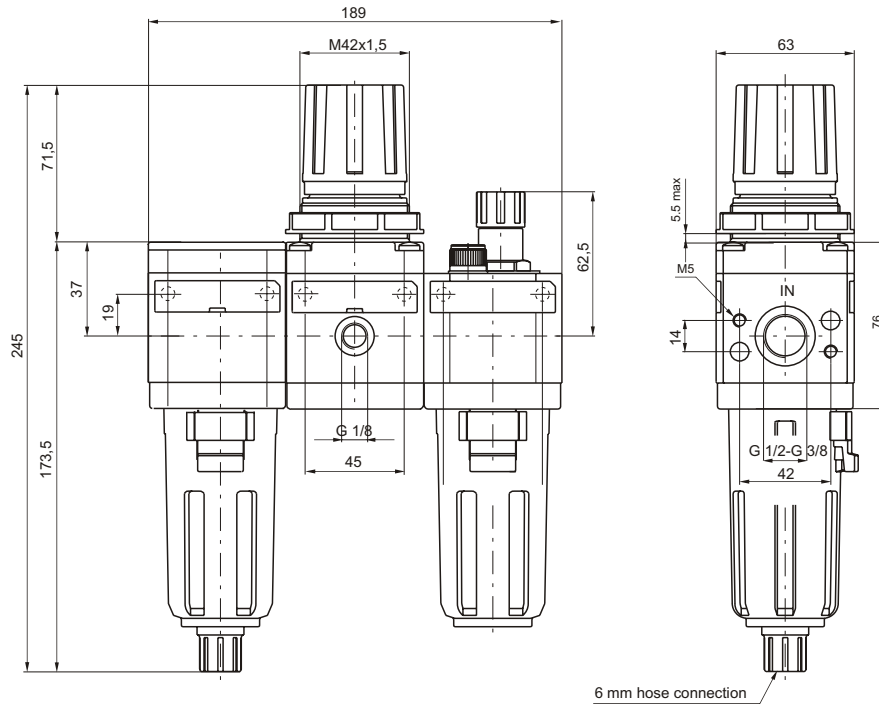


Construction and working characteristics

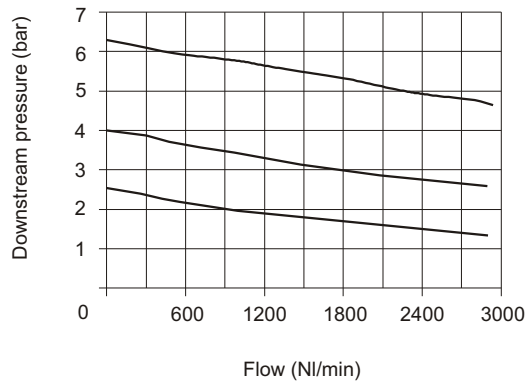
- Filter - diaphragm pressure regulator with relieving.
- Double filtering action: by air centrifuging and by replaceable and reusable HDPE porous filter element.
- Body made with light alloy.
- Wall mounting possibility with M6 screws protected by covers.
- Pressure adjusting lockable handle by simply pressing it downwards in the desired position.
- Transparent technopolymer bowl with shock resistant technopolymer protection connected to the body with bayonet cap and safety button.
- Manual and semi-automatic water drain valve; in the semi-automatic version the drainage happens when there is no pressure or by pushing the valve up-wards.
- Automatic water drainage bowl available on request.
- Possibility to see the water level on 360° also with bowl protection assembled.
- Two pressure gauge connections with plug complete of seal.
- Fog type lubrication with variable section orifice according to the flow.
- Transparent technopolymer sight dome with adjusting handle.
- Oil filling plug.

Technical characteristics

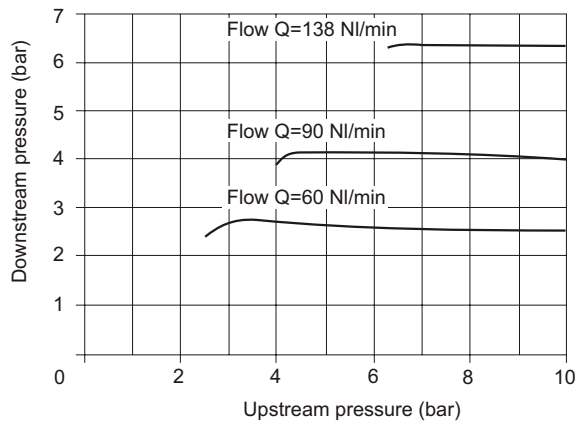
Connections	G 3/8" - G 1/2"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature (at 10 bar)	50°C
Pressure gauge connections	G 1/8"
Weight	gr. 1430
Pressure range	0 - 2 bar 0 - 4 bar 0 - 8 bar 0 - 12 bar
Filter pore size	5µ 20µ 50µ
Bowl capacity	42 cm ³
Oil type	FD22 - HG32
Indicative oil drip rate	1 drop every 300/600 NI
Bowl capacity	80 cm ³
Min. operational flow at 6,3 bar	20 NI/min
Assembly position	Vertical
Wall mounting screws	M6
Max. fitting torque	40 Nm



Flow rate curves
 Inlet pressure (7 bar)



Adjustment characteristics



Ordering code

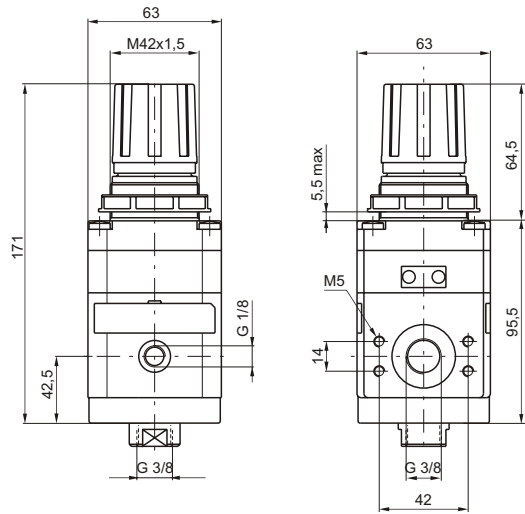
17307

Connections A = G 3/8" B = G 1/2"	Filter pore size A = 5µ B = 20µ C = 50µ	Adjusting range A = 0 - 2 bar B = 0 - 4 bar C = 0 - 8 bar D = 0 - 12 bar	S = Automatic drain
---	--	--	---------------------

Example: **17307A.B.C.S**

Service unit combination complete with filter - pressure regulator and lubricator size 3.

G 3/8" connections, filter pore size 20µ, adjusting range 0-8 bar and automatic drain.



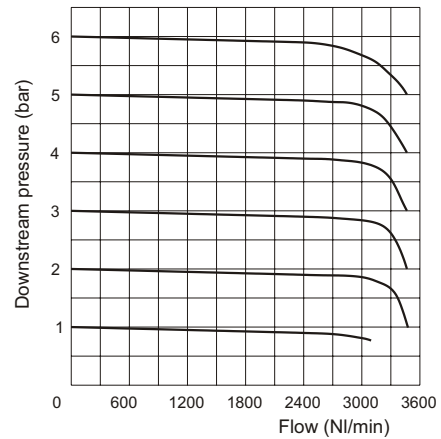
Construction and working characteristics

- Accurate capacity to maintain set pressure.
- Sensitivity combined with high relieving rates.
- High flow rate with extremely low pressure drop.
- Pressure adjusting lockable handle by simply pressing it downwards in the desired position.
- Body made with light alloy.
- Two pressure gauge connections with plug complete of seal.
- Ring nut for panel mounting.
- Once set, a constant bleed of air maintains the accuracy of the regulator.
This controlled release is a characteristic, not a fault.

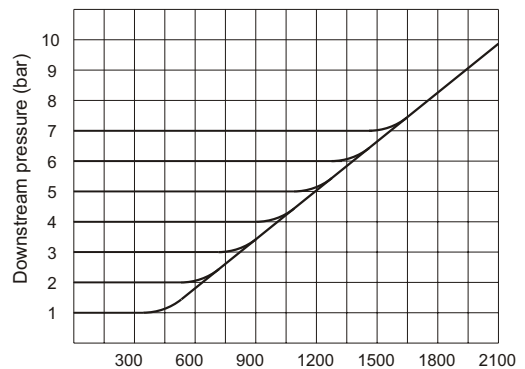
Technical characteristics

Connections	G 3/8"
Max. inlet pressure	10 bar - 1 MPa
Max. ambient temperature	50°C
Pressure gauge connections	G 1/8"
weight	gr. 885
Pressure range	0,1 - 2 bar 0,1 - 4 bar 0,1 - 4 bar
Assembly position	Any
Air flow (inlet pressure 10 bar)	5 NI/min
Max. fitting torque	40 Nm
Fluid	20µm filtered air and preferably non lubricated

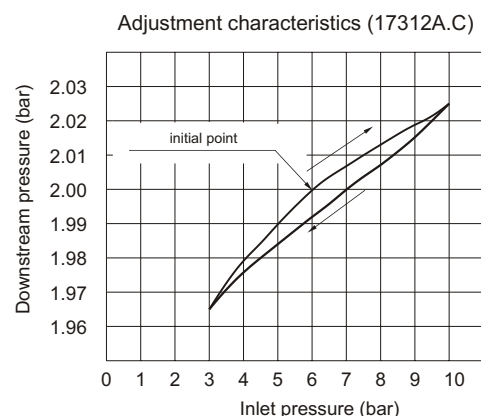
Flow rate curves (17312A.C)
Inlet pressure (7 bar)



Exhaust flow rate curves (17312A.C)



Adjustment characteristics (17312A.C)

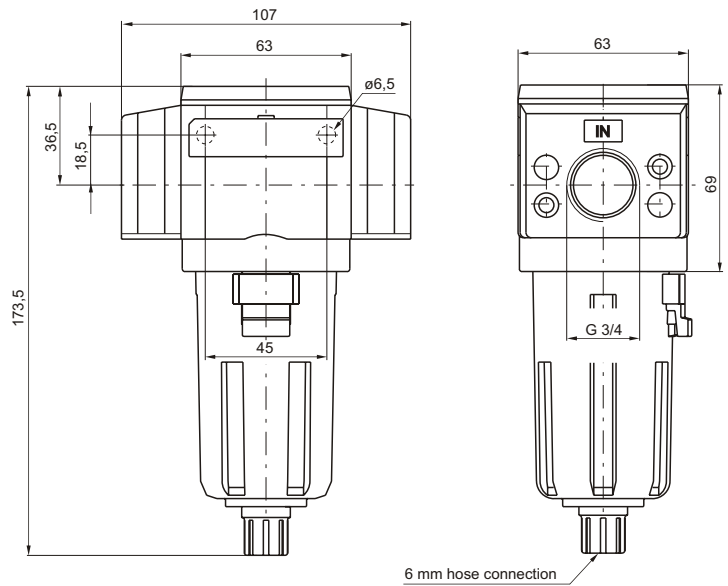


Ordering code

17312A .

Adjusting range
A = 0,1 - 2 bar
B = 0,1 - 4 bar
C = 0,1 - 7 bar

Example: 17312A.C
Pressure regulator with G 3/8" 0 - 7 bar



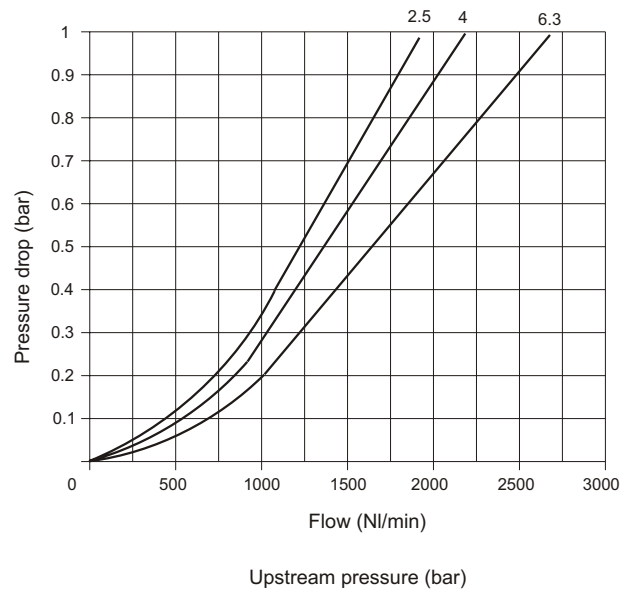
Construction and working characteristics

- Body made with light alloy.
- Flanges made with light alloy.
- Wall mounting possibility with M6 screws protected by covers.
- Double filtering action: by air centrifuging and by replaceable and reusable HDPE porous filter element.
- Transparent technopolymer bowl with shock resistant technopolymer protection connected to the body with bayonet cap and safety button.
- Manual and semi-automatic water drain valve; in the semi-automatic version the drainage happens when there is no pressure or by pushing the valve up-wards.
- Possibility to see the water level on 360°.
- Automatic water drainage bowl available on request.

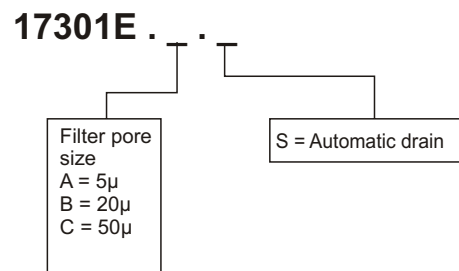
Technical characteristics

Connections	G 3/4"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature (at 10 bar)	50°C
Weight	gr. 405
Filter pore size	5µ
	20µ
	50µ
Bowl capacity	42 cm ²
Assembly position	Vertical
Wall fixing screws	M6
Max. fitting torque	40 Nm

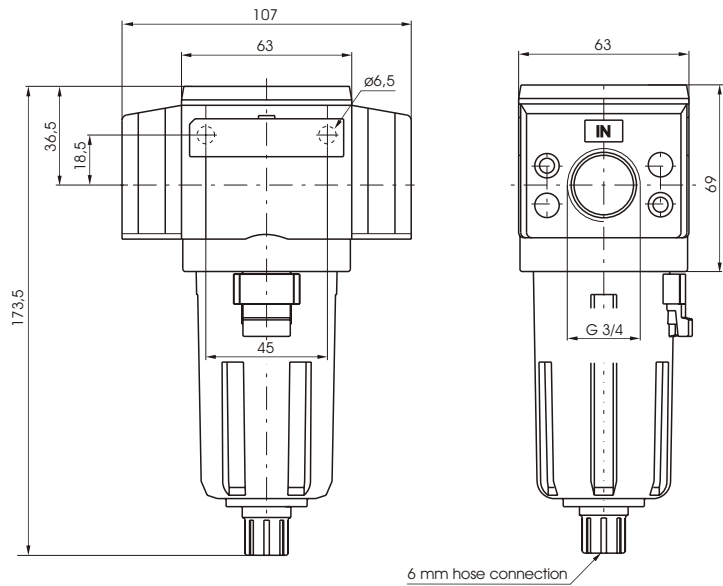
Flow rate curves
Inlet pressure (bar)



Ordering code



Example: **17301E.B**
Filter with G 3/4" connection and filter pore size 20µ



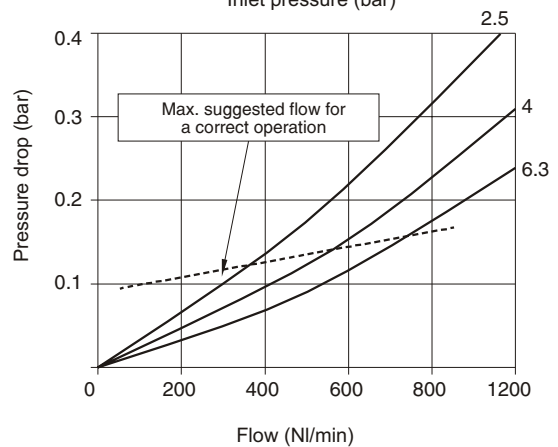
Construction and working characteristics

- Coalescing filter element remove 0,1 μ particles equivalent to 99,97%.
- Body made with light alloy.
- Flanges made with light alloy.
- Wall mounting possibility with M6 screws protected by covers.
- Transparent technopolymer bowl with shock resistant technopolymer protection connected to the body with bayonet cap and safety button.
- Manual and semi-automatic water drain valve; in the semi-automatic version the drainage happens when there is no pressure or by pushing the valve up-wards.
- Possibility to see the water level on 360° also with bowl protection assembled.
- Automatic water drainage bowl available on request.

Technical characteristics

Connections	G 3/4"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature (at 10 bar)	50°C
Weight	gr. 405
Filter efficiency with 0,1 μ particle	99,97%
Bowl capacity	42 cm ³
Assembly position	Vertical
Wall fixing screws	M6
Max. fitting torque	40 Nm

Flow rate curves
Inlet pressure (bar)



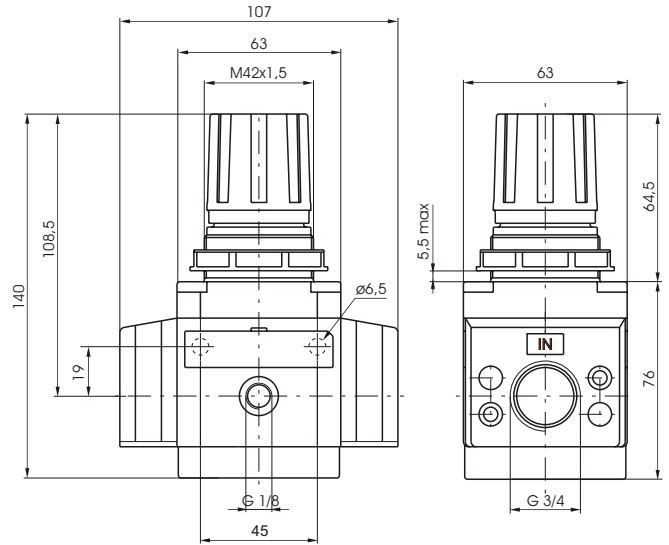
Ordering code

17308E . . .

Filter efficiency
E = 99,97%

S = Automatic drain

Example: **17308E.E**
Coalescing filter size 3 with G 3/4" connections and filter efficiency of 99,97%.



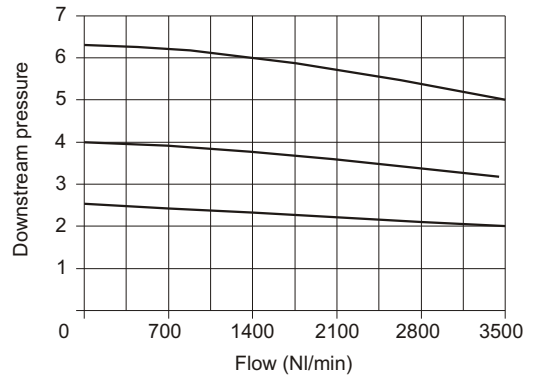
Construction and working characteristics

- Diaphragm pressure regulator with relieving.
- Balanced poppet.
- Lockable handle by simply pressing it downwards in the desired position.
- Body made with light alloy.
- Wall mounting possibility with M6 screws protected by covers.
- Two pressure gauge connections with plug complete of seal.
- Panel mounting bracket.

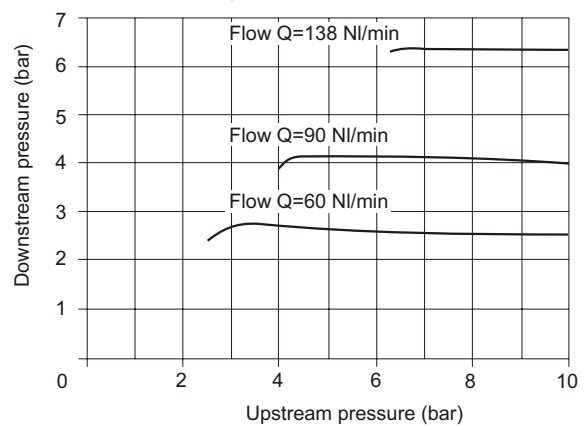
Technical characteristics

Connections	G 3/4"
Max. inlet pressure	13 bar - 1,3 Mpa
Max. ambient temperature	50°C
Pressure gauge connections	G 1/8"
Weight	gr. 550
Pressure range	0 - 2 bar 0 - 4 bar 0 - 8 bar 0 - 12 bar
Assembly position	Any
Wall fixing screws	M6
Max. fitting torque	40 Nm

Flow rate curves
 Inlet pressure (7 bar)

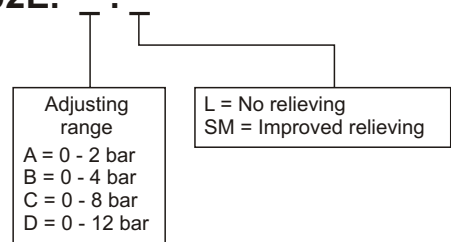


Adjustment characteristics

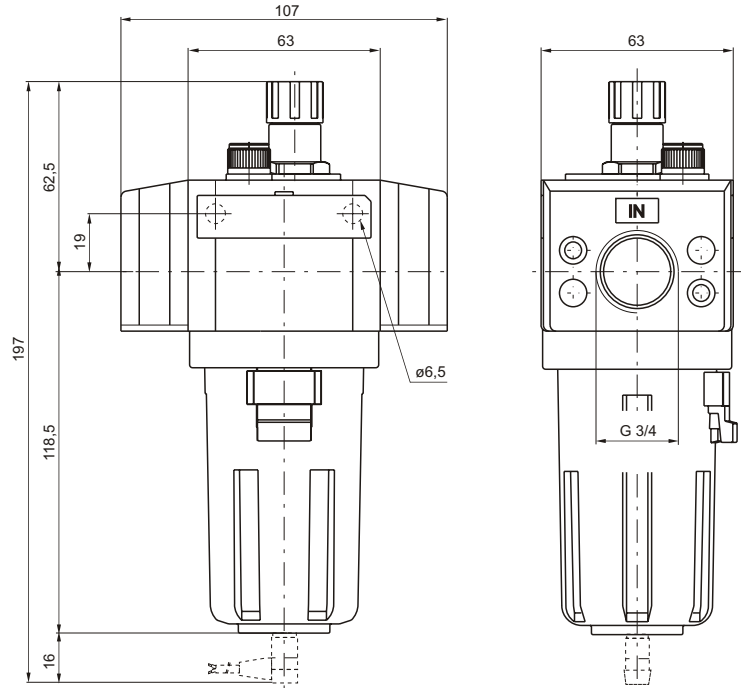


Ordering code

17302E.



Example: **17302E.C**
 Pressure regulator with G 3/4" connections, adjusting range 0 - 8 bar with relieving.



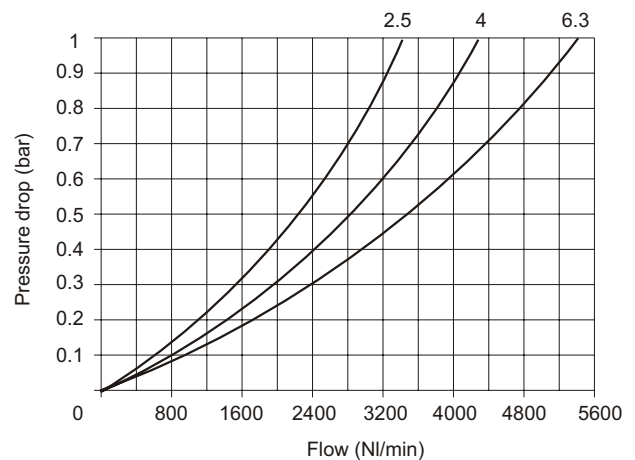
Construction and working characteristics

- Fog type lubrication with variable section orifice according to the flow.
- Body made with light alloy.
- Wall mounting possibility with M6 screws protected by covers.
- Transparent technopolymer bowl with shock resistant technopolymer protection.
- Possibility to see the min. and max. level on 360° also with bowl protection assembled.
- Bowl assembled to the body with bayonet cap and safety button.
- Transparent technopolymer sight dome with adjusting handle.
- Oil filling plug.
- Electrical connector for low level indication. Use the C1, C2 or C3 lead for connection (see section 8, catalogue 4 "Cylinders").

Technical characteristics

Connections	G 3/4"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature (at 10 bar)	50°C
Weight	gr. 435
Indicative oil drip rate	1 drop every 300/600 NI
Oil type	FD22 - Hg32
Bowl capacity	80 cm ³
Assembly position	Vertical
Wall mounting screws	M6
Min. operating flow	20 NI/min
Max. fitting torque	40 Nm

Flow rate curves
Inlet pressure (bar)



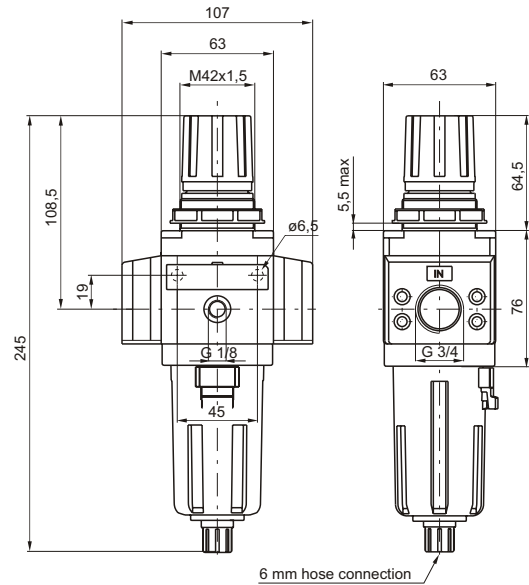
Ordering code

17303E .

MA = Minimum oil level indicator N.O. with plug connector
MC = Minimum oil level indicator N.C. with plug connector

Note: on MA version the contact is open when the bowl is filled
on MC version the contact is closed when the bowl is filled

Example: **17303E**
Lubricator with G 3/4" connections.



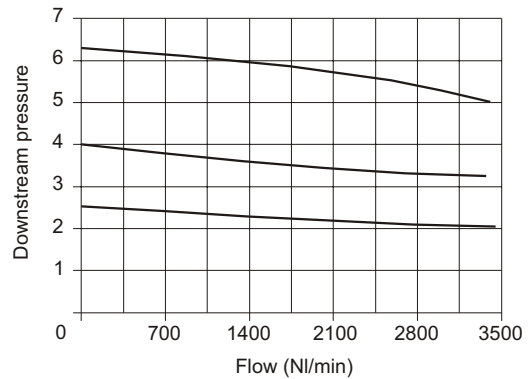
Construction and working characteristics

- Filter - diaphragm pressure regulator with relieving.
- Balanced poppet.
- Lockable handle by simply pressing it downwards in the desired position.
- Body made with light alloy.
- Wall mounting possibility with M6 screws protected by covers.
- Double filtering action: by air centrifuging and by replaceable and reusable HDPE porous filter element.
- Transparent technopolymer bowl with shock resistant technopolymer protection connected to the body with bayonet cap and safety button.
- Manual and semi-automatic water drain valve; in the semiautomatic version the drainage happens when there is no pressure or by pushing the valve up-wards.
- Possibility to see the water level on 360° also with bowl protection assembled.
- Automatic water drainage bowl available on request.
- Two pressure gauge connections with plug complete of seal.

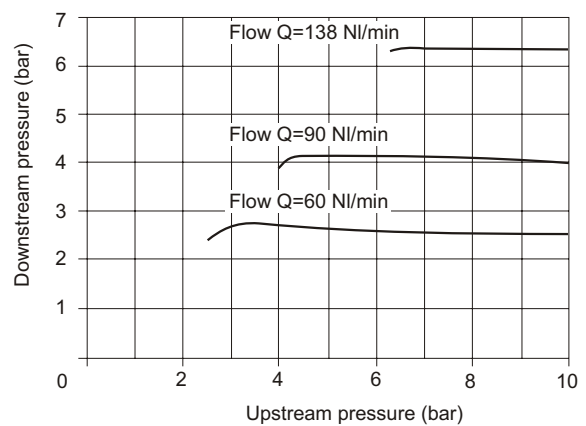
Technical characteristics

Connections	G 3/4"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature (at 10 bar)	50°C
Pressure gauge connections	G 1/8"
Weight	gr. 645
Pressure range	0 - 2 bar
	0 - 4 bar
	0 - 8 bar
	0 - 12 bar
Filter pore size	5µ
	20µ
	50µ
Bowl capacity	42 cm ³
Assembly position	Vertical
Wall mounting screws	M6
Max. fitting torque	40 Nm

Flow rate curves
Inlet pressure (7 bar)

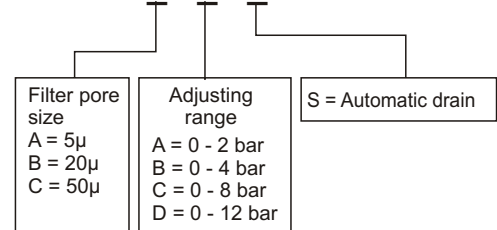


Adjustment characteristic



Ordering code

17304E



Example: **17304E.B.C**
Filter - pressure regulator size 3 with G 3/4" connections, filter pore size 20µ and adjusting range 0-8 bar.

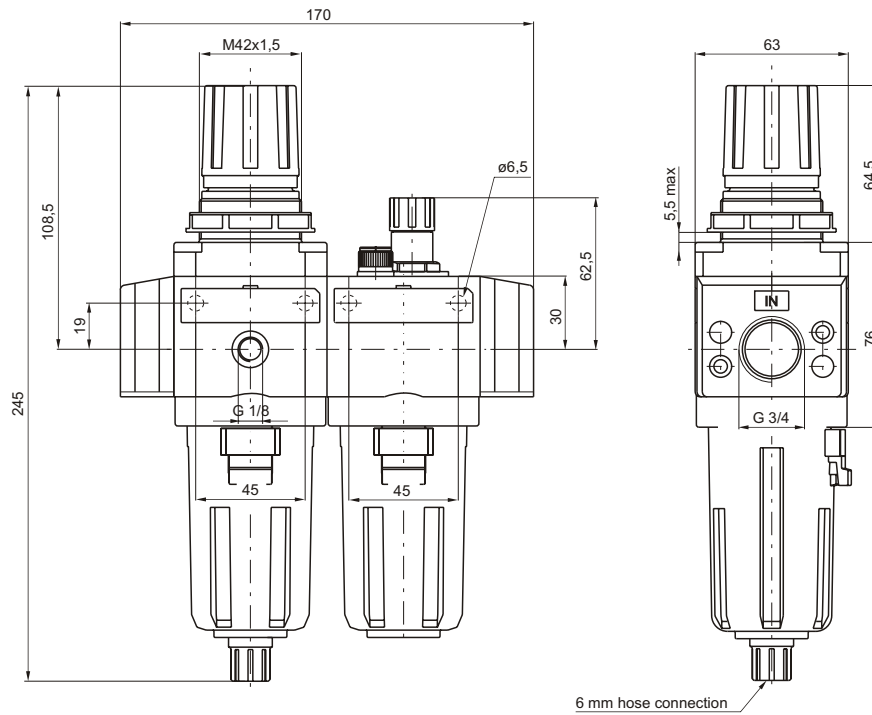


Construction and working characteristics

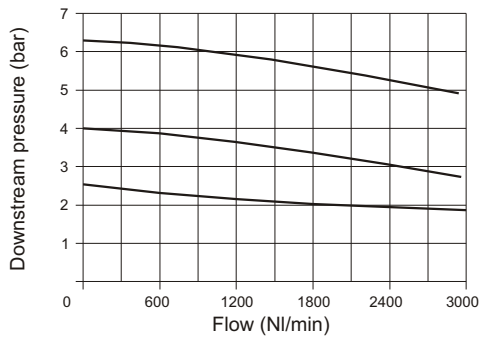
- Filter - diaphragm pressure regulator with relieving.
- Balanced poppet.
- Double filtering action: by air centrifuging and by replaceable and reusable HDPE porous filter element.
- Body made with light alloy.
- Wall mounting possibility with M6 screws protected by covers.
- Lockable handle by simply pressing it downwards in the desired position.
- Transparent technopolymer bowl with shock resistant technopolymer protection connected to the body with bayonet cap and safety button.
- Manual and semi-automatic water drain valve; in the semi-automatic version the drainage happens when there is no pressure or by pushing the valve up-wards.
- Possibility to see the water level on 360° also with bowl protection assembled.
- Automatic water drainage bowl available on request.
- Two pressure gauge connections with plug complete of seal.
- Fog type lubrication with variable section orifice according to the flow.
- Transparent technopolymer sight dome with adjusting handle.
- Oil filling plug.

Technical characteristics

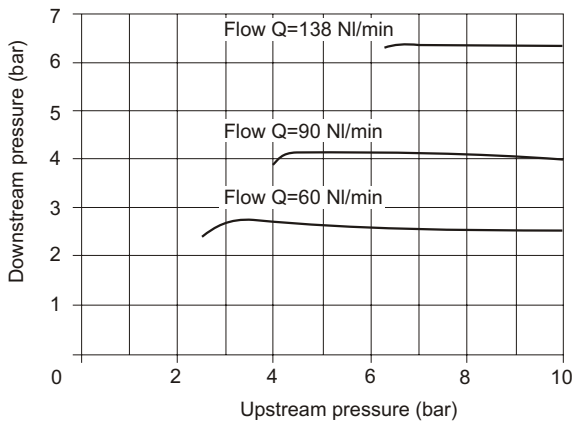
Connections	G 3/4"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature	50°C
Pressure gauge connections	G 1/8"
Weight	gr. 1100
Pressure range	0 - 2 bar 0 - 4 bar 0 - 8 bar 0 - 12 bar
Filter pore size	5µ 20µ 50µ
Bowl capacity	42 cm ³
Oil type	FD22 - HG32
Indicative oil drip rate	1 drop every 300/600 NI
Bowl capacity	80 cm ³
Min. operational flow at 6,3 bar	20 NI/min
Assembly position	Vertical
Wall mounting screws	M6
Max. fitting torque	40 Nm



Flow rate curves
Inlet pressure (7 bar)



Adjustment characteristics



Ordering code

17306E . . .

Filter pore size A = 5µ B = 20µ C = 50µ	Adjusting range A = 0 - 2 bar B = 0 - 4 bar C = 0 - 8 bar D = 0 - 12 bar	S = Automatic drain
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Example: **17306E.B.C.S**
Service unit combination complete with filter - pressure regulator + lubricator size 3 G 3/4".

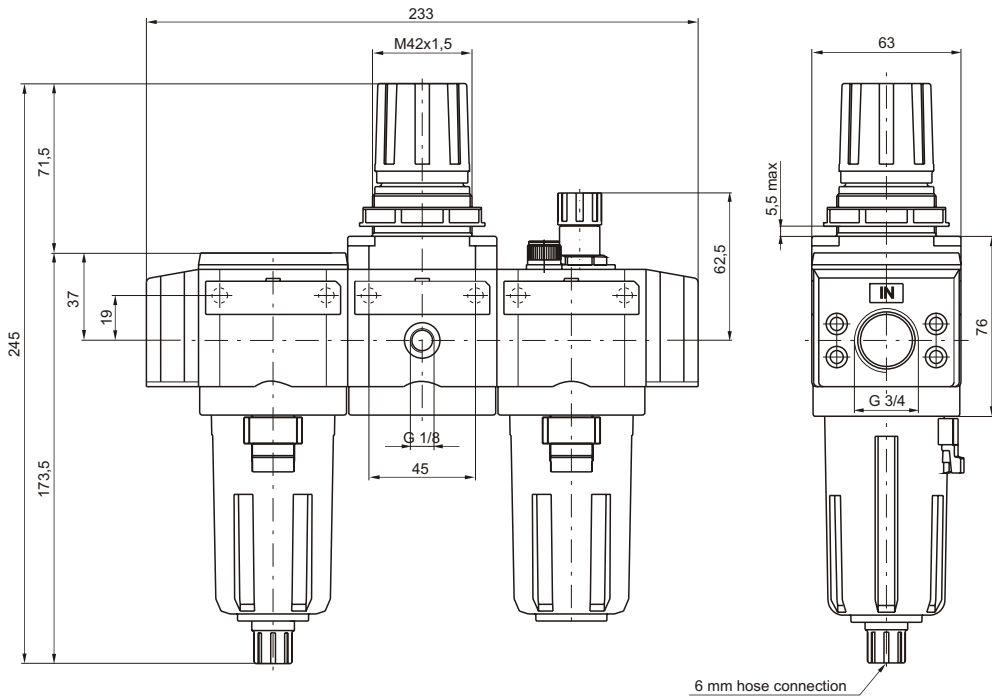


Construction and working characteristics

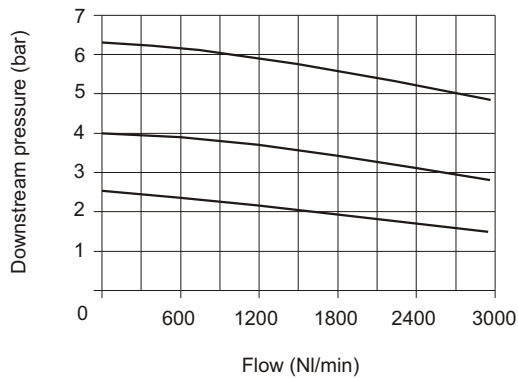
- Filter - diaphragm pressure regulator with relieving.
- Double filtering action: by air centrifuging and by replaceable and reusable HDPE porous filter element.
- Body made with light alloy.
- Wall mounting possibility with M6 screws protected by covers.
- Pressure adjusting lockable handle by simply pressing it downwards in the desired position.
- Transparent technopolymer bowl with shock resistant technopolymer protection connected to the body with bayonet cap and safety button.
- Manual and semi-automatic water drain valve; in the semi-automatic version the drainage happens when there is no pressure or by pushing the valve up-wards.
- Automatic water drainage bowl available on request.
- Possibility to see the water level on 360° also with bowl protection assembled.
- Two pressure gauge connections with plug complete of seal.
- Fog type lubrication with variable section orifice according to the flow.
- Transparent technopolymer sight dome with adjusting handle.
- Oil filling plug.

Technical characteristics

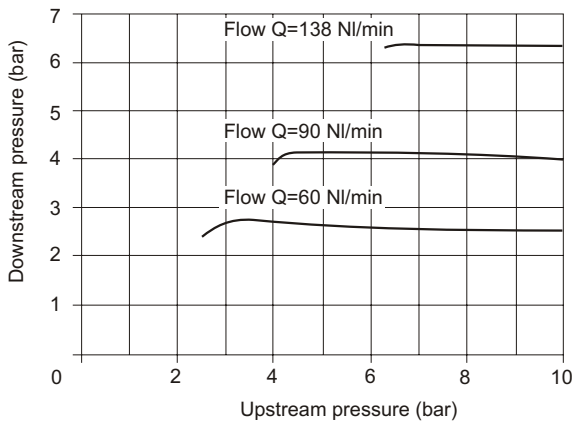
Connections	G 3/4"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature (at 10 bar)	50°C
Pressure gauge connections	G 1/8"
Weight	gr. 1430
Pressure range	0 - 2 bar 0 - 4 bar 0 - 8 bar 0 - 12 bar
Filter pore size	5µ 20µ 50µ
Bowl capacity	42 cm ³
Oil type	FD22 - HG32
Indicative oil drip rate	1 drop every 300/600 NI
Bowl capacity	80 cm ³
Min. operational flow at 6,3 bar	20 NI/min
Assembly position	Vertical
Wall mounting screws	M6
Max. fitting torque	40 Nm



Flow rate curves
 Inlet pressure (7 bar)



Adjustment characteristic



Ordering code

17307E

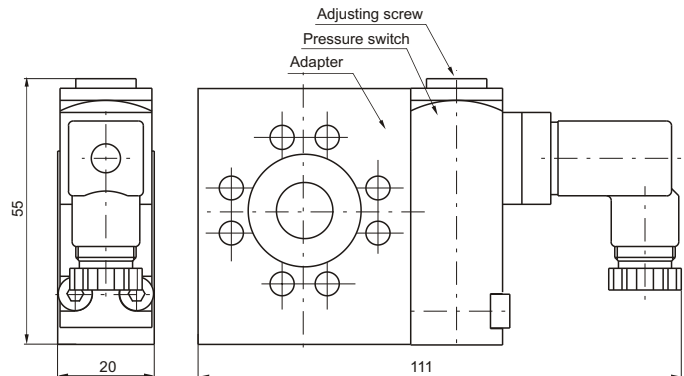
Filter pore size
 A = 5µ
 B = 20µ
 C = 50µ

Adjusting range
 A = 0 - 2 bar
 B = 0 - 4 bar
 C = 0 - 8 bar
 D = 0 - 12 bar

S = Automatic drain

Example: **17307E.B.C.S**
 Service unit combination complete with filter, pressure regulator and lubricator G 3/4" connections, filter pore 20µ, adjusting range 0-8 bar and automatic drain.

Pressure switch complete with adapter



Construction and working characteristics

The pressure switch complete of adapter has to be assembled between two elements of the FRL group. It cannot be utilized separately or at the end of the FRL group.

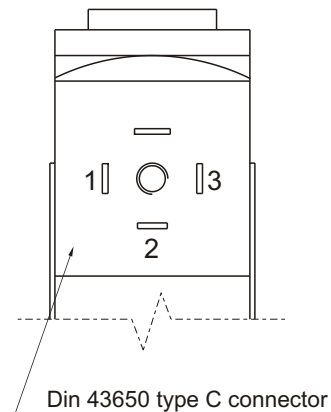
The pressure switch can be set at desired pressure (pressure range from 2 to 10 bar) by rotating the adjusting screw.

The electrical connection is made by mean of a 15 connector DIN 43650 type C.

The microswitch contact could be normally closed or open (change over switch).

Connection

- 1 = Neutral
- 2 = N.C. contact
- 3 = N.O. contact



Technical characteristics

Max. inlet pressure	13 bar 1,3 MPa
Max. temperature	50°C
Weight	gr. 220
Microswitch capacity	5A
Grade of protection (with connector assembled)	IP 65
Adjusting range	2 - 10 bar
Assembly position	Any

Ordering code

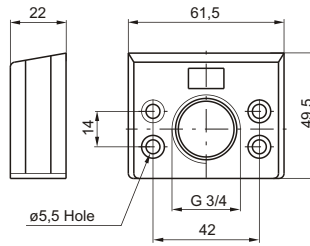
17

34A = Pressure switch adapter
14B = Pressure switch
34C = Pressure switch complete with adapter

Example: **1734C**
Pressure switch complete with adapter.



Flange G 3/4"



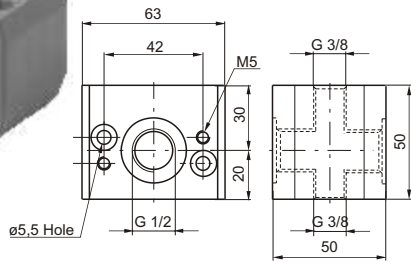
Ordering code

1738

1E = Inlet flange
2E = Outlet flange

Weight gr. 105

Air intake

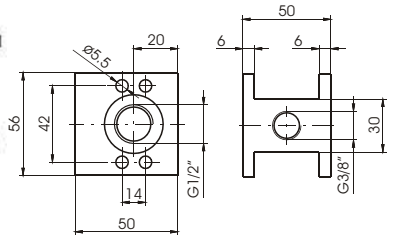


Ordering code

17340

Weight gr. 250

Air intake - "H" profile

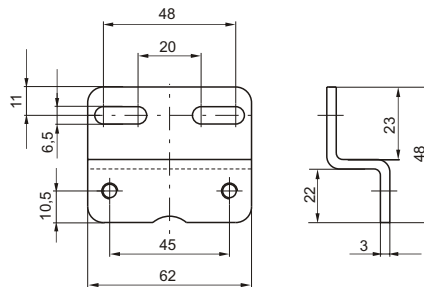


Ordering code

17340H

Weight gr. 192

Fixing bracket



Ordering code

Standard pressure regulator

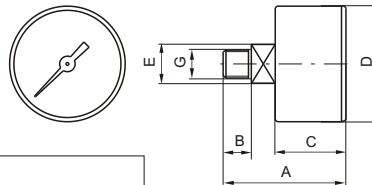
17350

Pressure regulator

17352

Weight gr. 85

Pressure gauge



Ordering code

17070

A = Dial ø40
B = Dial ø50

A = Scale 0-4 bar
B = Scale 0-6 bar
C = Scale 0-12 bar

DIMENSIONS							
CODE	A	B	C	D	E	G	Weight gr.
17070A	44	10	26	41	14	G1/8"	60
17070B	45	10	27	49	14	G1/8"	80

Kit di assemblaggio



Ordering code

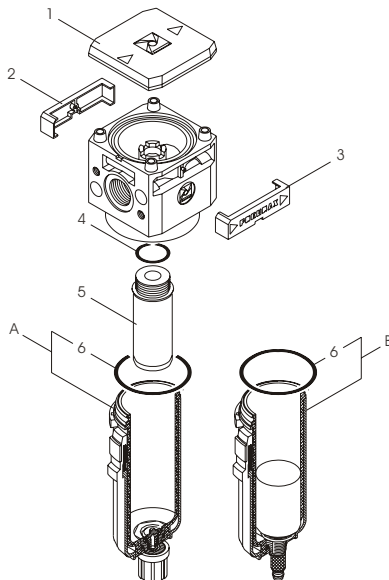
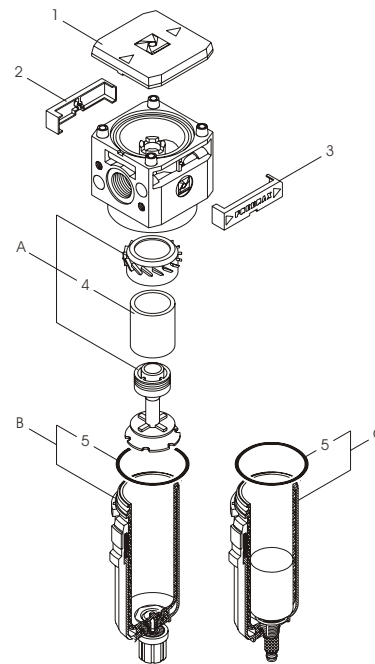
17360
(standard)

17365
(for progressive start-up valve)

Weight gr. 25

Filter

Pos.	Code	Description
1	RS/1703/12	Cover
2	RS/1703/8	Rear tab
3	RS/1703/7	Front tab
4	RS/1703/13	Porous filter element 20 μ
4	RS/1703/26	Porous filter element 5 μ
4	RS/1703/27	Porous filter element 50 μ
5	RS/OR 44x2.5	Seal
A	RK1703A/004	Filter group assembly 20 μ
A	RK1703A/007	Filter group assembly 5 μ
A	RK1703A/008	Filter group assembly 50 μ
B	RK1703A/002	Filter bowl c/w drain valve
C	RK1703A/006	Filter bowl c/w automatic drain

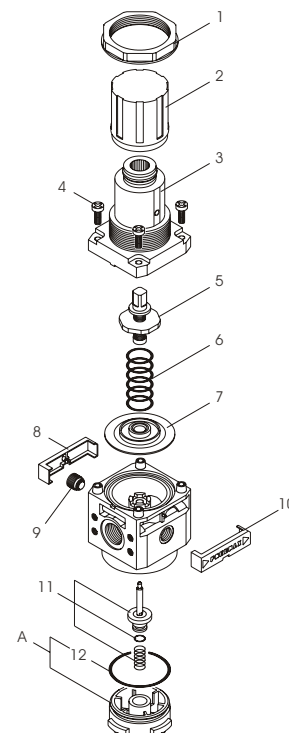


Coalescing Filter

Pos.	Code	Description
1	RS/1703/12	Cover
2	RS/1703/62	Rear tab
3	RS/1703/61	Front tab
4	RS/OR3068	Seal
5	RK1703A/015	Coalescent group 0.1 μ
6	RS/OR 44x2.5	Seal
A	RK1703A/002	Filter bowl c/w drain valve
B	RK1703A/006	Filter bowl c/w automatic drain

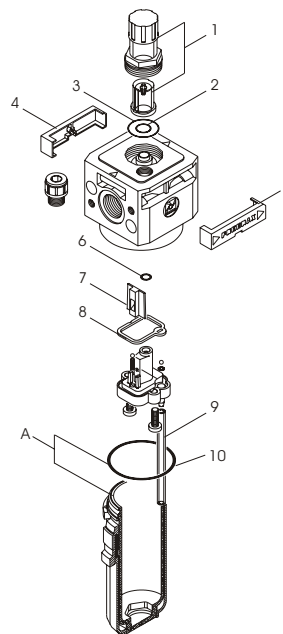
Pressure regulator

Pos.	Code	Description
1	RS/1702/12	Lock nut
2	RS/1702/3	Adjusting knob
3	RS/1703/2	Adjusting support
4	RS/TCTCR 5x14	Screw
5	RK1702A/005	Adjusting screw assembly
6	RS/1703/21	Spring 0- 2 bar range
6	RS/1703/20	Spring 0- 4 bar range
6	RS/1703/19	Spring 0 - 8 bar range
6	RS/1703/22	Spring 0 - 12 bar range
7	RK1703A/001	Diaphragm assembly
7	RK1703A/009	Diaphragm ass. w/o relieving
8	RS/1703/8	Rear tab
9	RK1701A/020	Plug c/w seal G 1/8"
10	RS/1703/7	Front tab
11	RK1703A/014	Poppet c/w spring
12	RS/OR 44x2.5	Seal
A	RK1703A/012	Plug



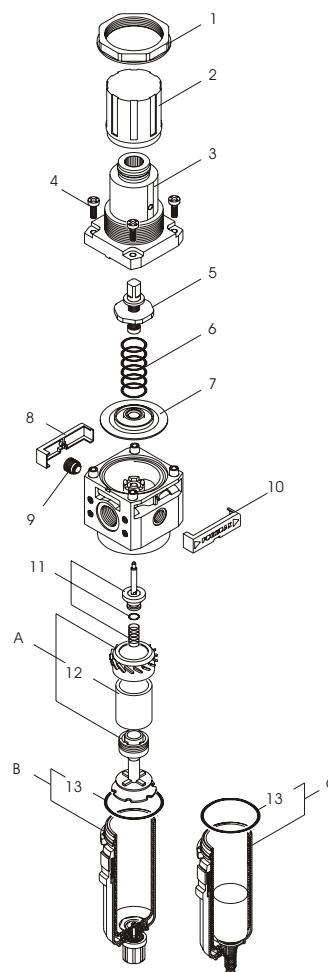
Lubrcator

Pos.	Code	Description
1	RK1701A/026	Lubricator sight dome assembly
2	RS/OR 106	Seal
3	RS/OR 2075	Seal
4	RS/1703/8	Rear tab
5	RS/1703/7	Front tab
6	RS/OR 2037	Seal
7	RS/1703/23	Venturi diaphragm
8	RS/1703/24	Seal
9	RS/1702/40	Oil tube
10	RS/OR 44x2.5	Seal
A	RK1703A/003	Lubricator bowl



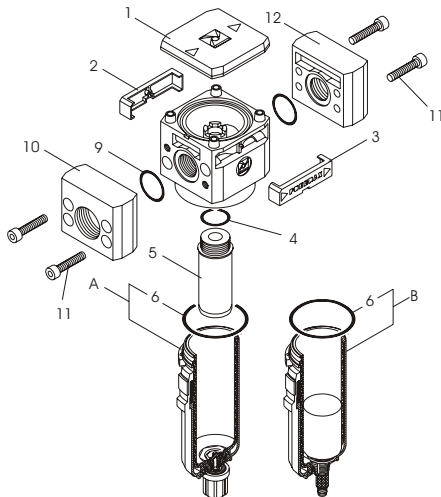
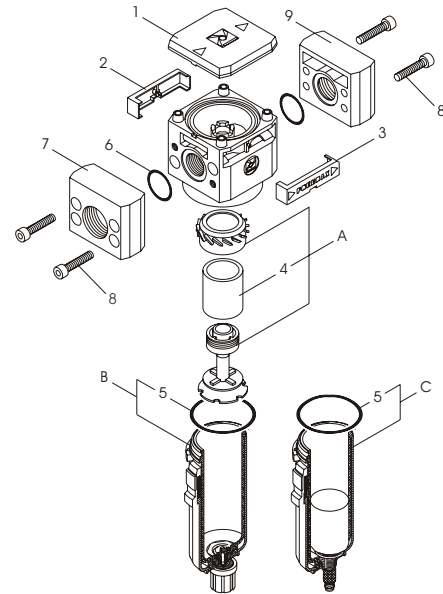
Filter - pressure regulator

Pos.	Codice	Description
1	RS/1702/12	Lock nut
2	RS/1702/3	Adjusting knob
3	RS/1703/2	Adjusting support
4	RS/TCTCR 5x14	Screw
5	RK1702A/005	Adjusting screw assembly
6	RS/1703/21	Spring 0 - 2 bar range
6	RS/1703/20	Spring 0 - 4 bar range
6	RS/1703/19	Spring 0 - 8 bar range
6	RS/1703/22	Spring 0 - 12 bar range
7	RK1703A/001	Diaphragm assembly
7	RK1703A/009	Diaphragm ass. w/o relieving
8	RS/1703/8	Rear tab
9	RK1701A/020	Plug c/w seal G 1/8"
10	RS/1703/7	Front tab
11	RK1703A/014	Poppet c/w spring
12	RS/1703/13	Porous filter element 20µ
12	RS/1703/26	Porous filter element 5µ
12	RS/1703/27	Porous filter element 50µ
13	RS/OR 44x2.5	Seal
A	RK1703A/004	Filter group assembly 20µ
A	RK1703A/007	Filter group assembly 5µ
A	RK1703A/008	Filter group assembly 50µ
B	RK1703A/002	Filter bowlc/w drain valve
C	RK1703A/006	Filter bowl c/w automatic drain



Filter

Pos.	Code	Description
1	RS/1703/12	Cover
2	RS/1703/8	Rear tab
3	RS/1703/7	Front tab
4	RS/1703/13	Porous filter element 20µ
4	RS/1703/26	Porous filter element 5µ
4	RS/1703/27	Porous filter element 50µ
5	RS/OR 44x2.5	Seal
6	RS/OR 24x3	Seal
7	RS/1703/52	Inlet flange
8	RS/TCEI 5x25	Screw
9	RS/1703/53	Outlet flange
A	RK1703A/004	Filter group assembly 20µ
A	RK1703A/007	Filter group assembly 5µ
A	RK1703A/008	Filter group assembly 50µ
B	RK1703A/002	Filter bowl c/w drain valve
C	RK1703A/006	Filter bowl c/w automatic drain

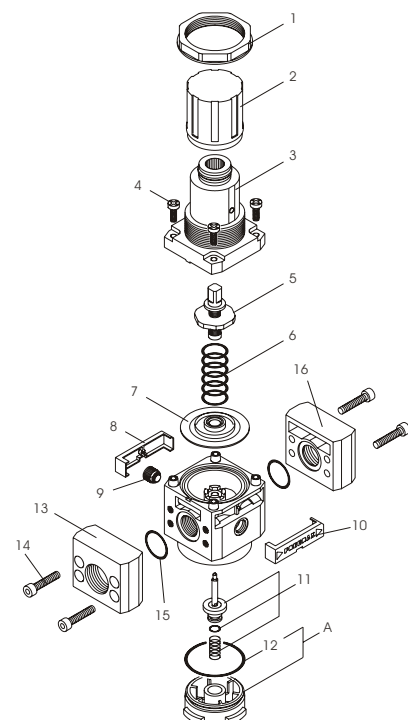


Coalescing Filter

Pos.	Code	Description
1	RS/1703/12	Cover
2	RS/1703/62	Rear tab
3	RS/1703/61	Front tab
4	RS/OR3068	Seal
5	RK1703A/015	Coalescent group 0.1µ
6	RS/OR 44x2.5	Seal
9	RS/OR 24X3	Seal
10	RS/1703/52	Inlet flange
11	RS/TCEI 5X25	Screw
12	RS/1703/53	Outlet flange
A	RK1703A/002	Filter bowl c/w drain valve
B	RK1703A/006	Filter bowl c/w automatic drain

Pressure regulator

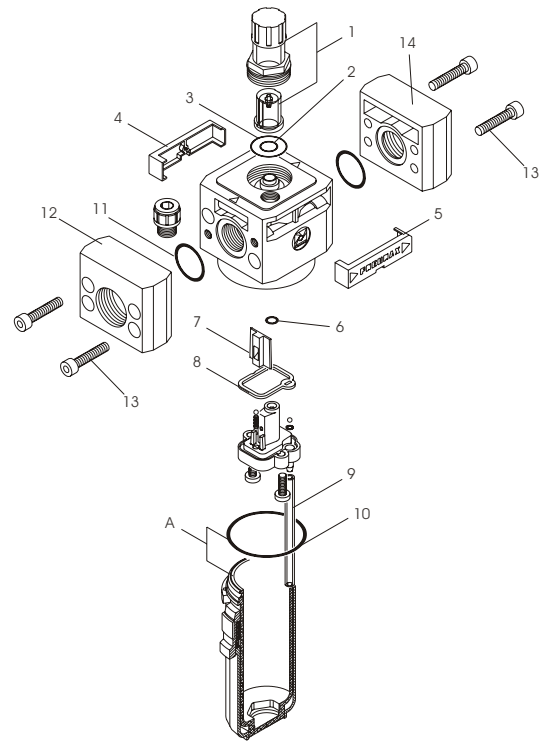
Pos.	Code	Description
1	RS/1702/12	Lock nut
2	RS/1702/3	Adjusting knob
3	RS/1703/2	Adjusting support
4	RS/TCTCR 5x14	Screw
5	RK1702A/005	Adjusting screw assembly
6	RS/1703/21	Spring 0- 2 bar range
6	RS/1703/20	Spring 0- 4 bar range
6	RS/1703/19	Spring 0 - 8 bar range
6	RS/1703/22	Spring 0 - 12 bar range
7	RK1703A/001	Diaphragm assembly
7	RK1703A/009	Diaphragm ass. w/o relieving
8	RS/1703/8	Rear tab
9	RK1701A/020	lug c/w seal G 1/8"
10	RS/1703/7	Front tab
11	RK1703A/014	Poppet c/w spring
12	RS/OR 44x2.5	Seal
13	RS/1703/52	Inlet flange
14	RS/TCEI 5x25	Screw
15	RS/OR 24x3	Seal
16	RS/1703/53	Outlet flange
A	RK1703A/012	Plug





Lubricator

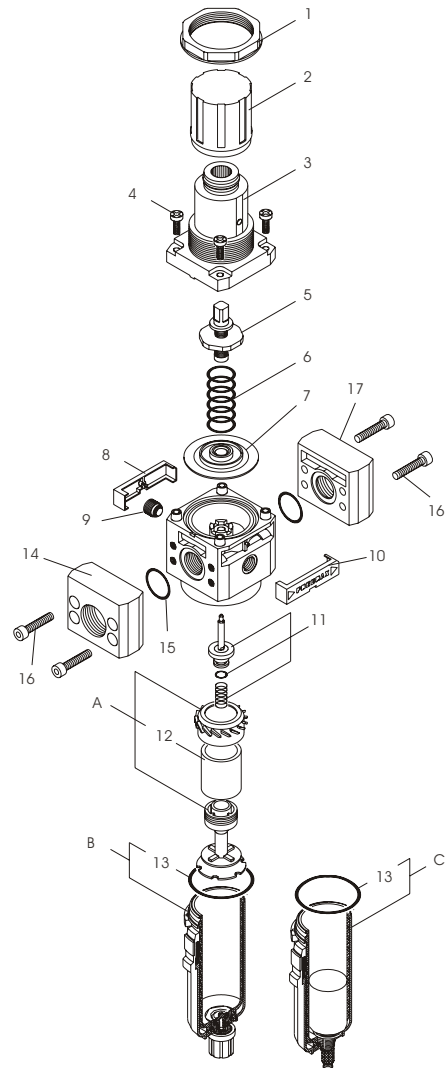
Pos.	Code	Description
1	RK1701A/026	Lubricator sight dome assembly
2	RS/OR 106	Seal
3	RS/OR 2075	Seal
4	RS/1703/8	Rear tab
5	RS/1703/7	Front tab
6	RS/OR 2037	Seal
7	RS/1703/23	Venturi diaphragm
8	RS/1703/24	Seal
9	RS/1702/40	Oil tube
10	RS/OR 44x2.5	Seal
11	RS/OR 24x3	Seal
12	RS/1703/52	Inlet flange
13	RS/TCEI 5x25	Screw
14	RS/1703/53	Outlet flange
A	RK1703A/003	Lubricator bowl



3

Filter - pressure regulator

Pos.	Code	Description
1	RS/1702/12	Lock nut
2	RS/1702/3	Adjusting knob
3	RS/1703/2	Adjusting support
4	RS/TCTCR 5x14	Screw
5	RK1702A/005	Adjusting screw assembly
6	RS/1703/21	Spring 0 - 2 bar range
6	RS/1703/20	Spring 0 - 4 bar range
6	RS/1703/19	Spring 0 - 8 bar range
6	RS/1703/22	Spring 0 - 12 bar range
7	RK1703A/001	Diaphragm assembly
7	RK1703A/009	Diaphragm ass. w/o relieving
8	RS/1703/8	Rear tab
9	RK1701A/020	Plug c/w seal G 1/8"
10	RS/1703/7	Front tab
11	RK1703A/014	Poppet c/w spring
12	RS/1703/13	Porous filter element 20µ
12	RS/1703/26	Porous filter element 5µ
12	RS/1703/27	Porous filter element 50µ
13	RS/OR 44x2.5	Seal
14	RS/OR 24x3	Seal
15	RS/1703/52	Inlet flange
16	RS/TCEI 5x25	Screw
17	RS/1703/53	Outlet flange
A	RK1703A/004	Filter group assembly 20µ
A	RK1703A/007	Filter group assembly 5µ
A	RK1703A/008	Filter group assembly 50µ
B	RK1703A/002	Filter bowl c/w drain valve
C	RK1703A/006	Filter bowl c/w automatic drain





Size 4

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Construction and working characteristics

The modular air service units groups of the size 4, as the other size, allow a wide selection of combinations.

The threaded connections are machined directly on the valve body made with light alloy, so that each components can be used individually.

The wall fixing is done directly with screws through the holes on the body they can be wall mounted.

The bowls are made of transparent technopolymer, always supplied with shock resistant technopolymer protection, allowing the moisture and oil level control from any angle.

The filter can be equipped with manual or semiautomatic water drain valve; furthermore it's possible to install the automatic draining device inside the bowl.

The pressure regulator handle is lockable in the desired position.

The lubricator oil flow is adjustable with proper handle and it is visibly checked through the sight dome.

The shut-off valve can be equipped with pad-lock to prevent accidents or damages due to unauthorized operation.

The progressive start-up valve, pneumatically or electropneumatically controlled, allows air supply to the circuit progressively and with adjustable time.

Instruction for installation and operation

Pay attention to install a group or a single component with air flow direction according to the arrows and to the following sequence: filter, pressure regulator, lubricator and with bowls downwards.

Do not exceed the recommended air pressure and temperature limits.

The moisture should not exceed the level marked on the bowl and it can be drawn off and carried away by a flexible tube of $\varnothing 6/4$ directly connected to the discharge valve handle.

The pressure should be set from minimum to maximum, rotating the adjusting handle clockwise.

As lubricant, we suggest to use oil class FD22 or HG32. Verify that the lubricator is not fed with a flow lower than the minimum operational.

To set the oil flow rotate the proper adjusting handle in order to get one drop of oil every 300-600 liters of air.

The oil flow will be kept automatically and proportionally to the air flow.

The oil can be refilled by mean of proper plug or directly into the bowl after having de-pressurized the system. Do not exceed the maximum level indicated on the bowl.

For opening the shut-off valve push and rotate clockwise the operating handle. For closing it and consequently discharging the down stream line, rotate the handle counter-clockwise.

Maintenance

Clean the bowls with water and detergent. Do not use alcohol.

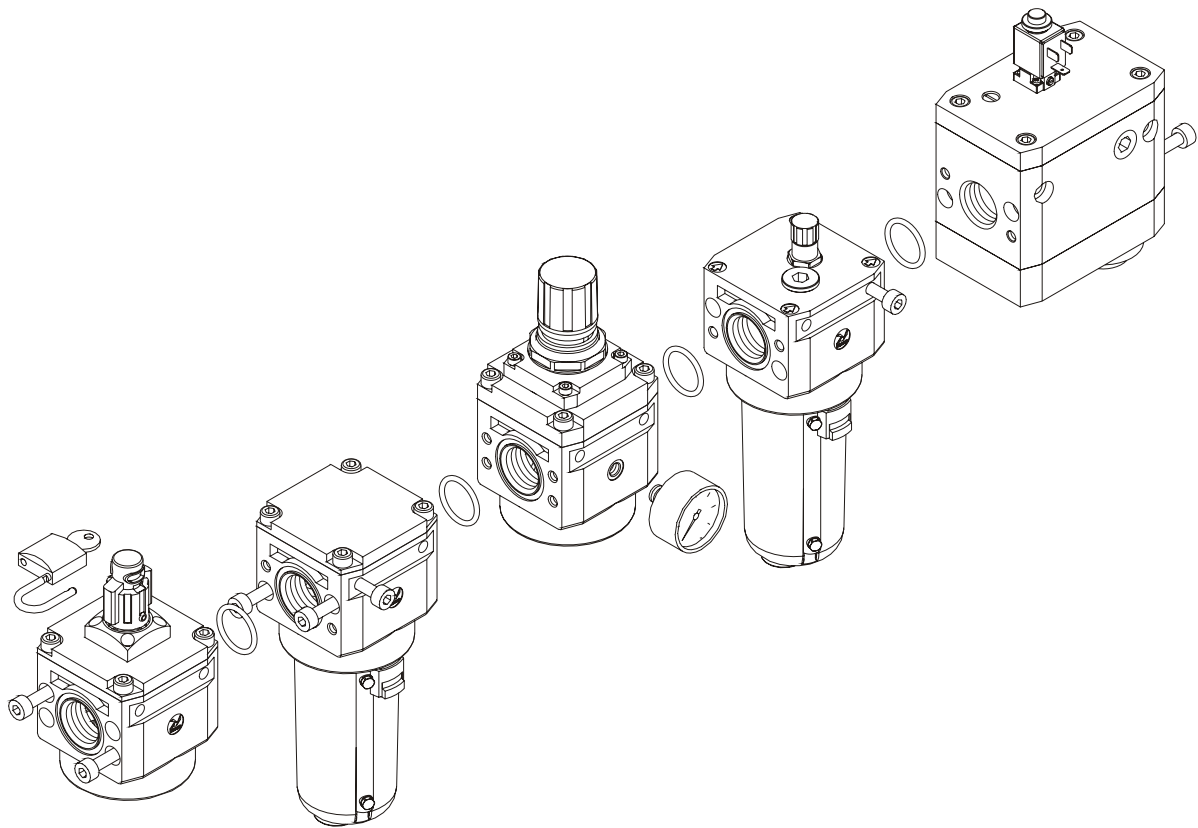
The filter element made with HPDE is reusable by blowing and cleaning it with proper detergent.

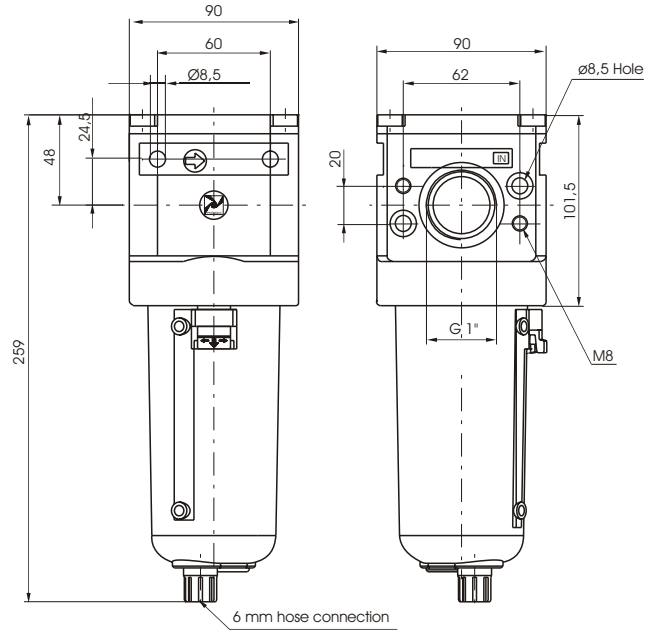
For replacing or cleaning it, remove the bowl and unscrew the baffle spins.

In case it is necessary to replace the lubricator transparent dome, tight it at 5 Nm torque maximum.



Assembling





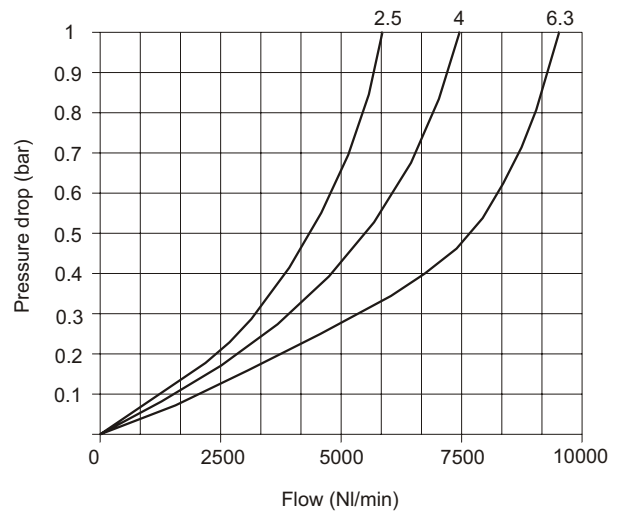
Construction and working characteristics

- Body made with light alloy.
- Wall mounting possibility with M8 screws protected by covers.
- Double filtering action: by air centrifuging and by replaceable and reusable HDPE porous filter element.
- Light alloy bowl c/w level indicator connected to the body with bayonet cap and safety button.
- Manual and semi-automatic water drain valve; in the semi-automatic version the drainage happens when there is no pressure or by pushing the valve up-wards.
- Automatic water drainage bowl available on request.

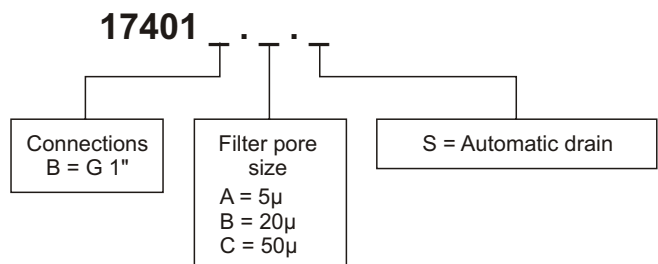
Technical characteristics

Connections	G 1"
Max. Inlet pressure	13 bar - 1,3 Mpa
Max. ambient temperature (at 10bar)	50°C
Weight	gr. 1700
Filter	5 μ
	20 μ
	50 μ
Bowl capacity	160l
Assembly position	Vertical
Wall fixing screw	M8

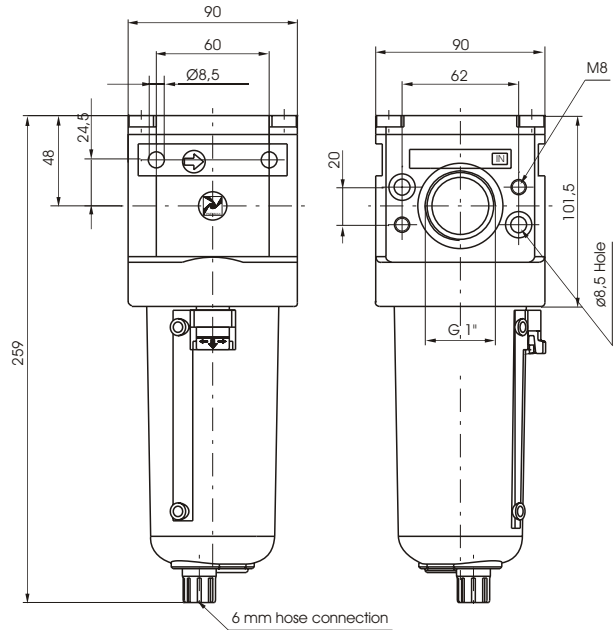
Flow rate curves
Inlet pressure (bar)



Ordering code



Example: **17401B.B**
Filter size 3 with G 1" connections and filter pore size 20μ.



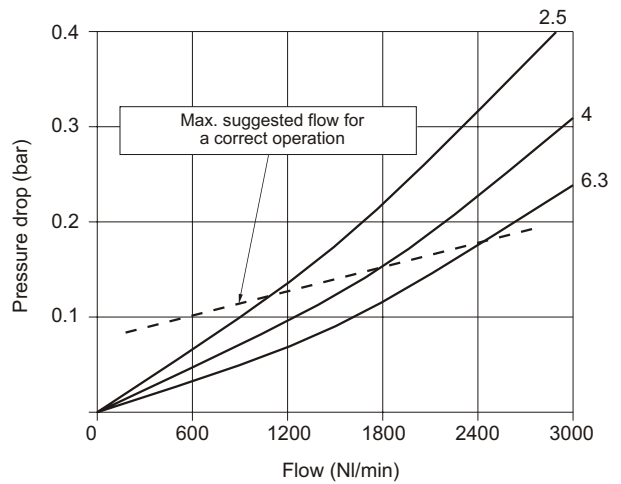
Construction and working characteristics

- Coalescing filter element remove 0,1 μ particles equivalent to 99,97%.
- Body made with light alloy.
- Wall mounting possibility with M8 screws protected by covers.
- Light alloy bowl c/w level indicator connected to the body with bayonet cap and safety button.
- Manual and semi-automatic water drain valve; in the semi-automatic version the drainage happens when there is no pressure or by pushing the valve up-wards.
- Automatic water drainage bowl available on request.

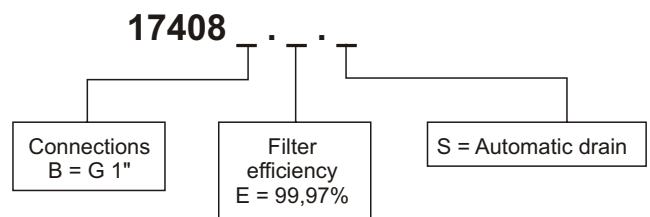
Technical characteristics

Connections	G 1"
Max. inlet pressure	13 bar - 1,3 Mpa
Max. ambient temperature (at 10 bar)	50°C
Weight	gr. 1700
Filter efficiency with 0,1 μ particle	99,97%
Bowl capacity	160 cm ³
Assembly position	Vertical
Wall fixing screw	M8

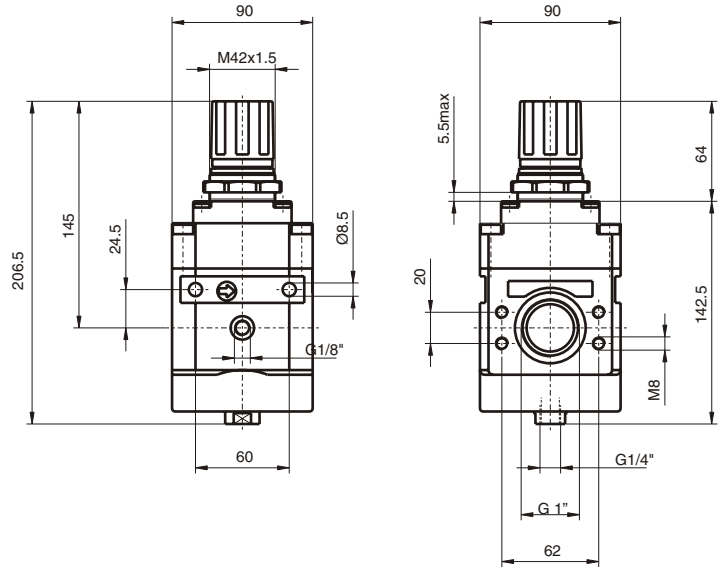
Flow rate curves
Inlet pressure (bar)



Ordering code



Example: **17408B.E**
Coalescing filter size 4 with G 1" connections and filter efficiency of 99,97%.



Construction and working characteristics

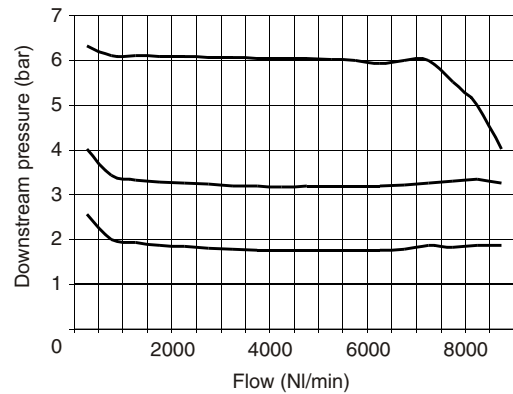
- Sensitivity combined with high relieving rates.
- High flow rate with extremely low pressure drop.
- Pressure adjusting lockable handle by simply pressing it downwards in the desired position.
- Body made with light alloy.
- Two pressure gauge connections with plug complete of seal.
- Ring nut for panel mounting.

Technical characteristics

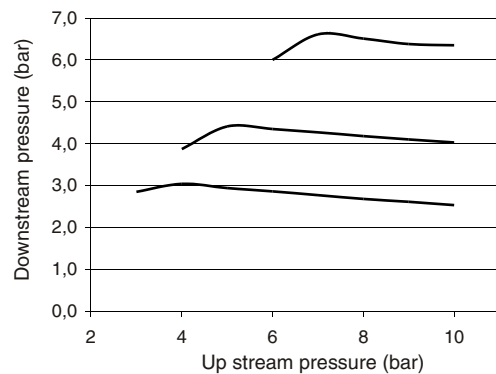
Connections	G 1"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature	50°C
Pressure gauge connections	G1/8"
Weight	gr.1900
Pressure range	0 - 2 bar 0 - 4 bar 0 - 8 bar 0 - 12 bar
Assembly position	Any
Wall fixing screws	M8

Flow rate curves

Inlet pressure (7 bar)



Adjustment characteristics



Ordering code

17402N

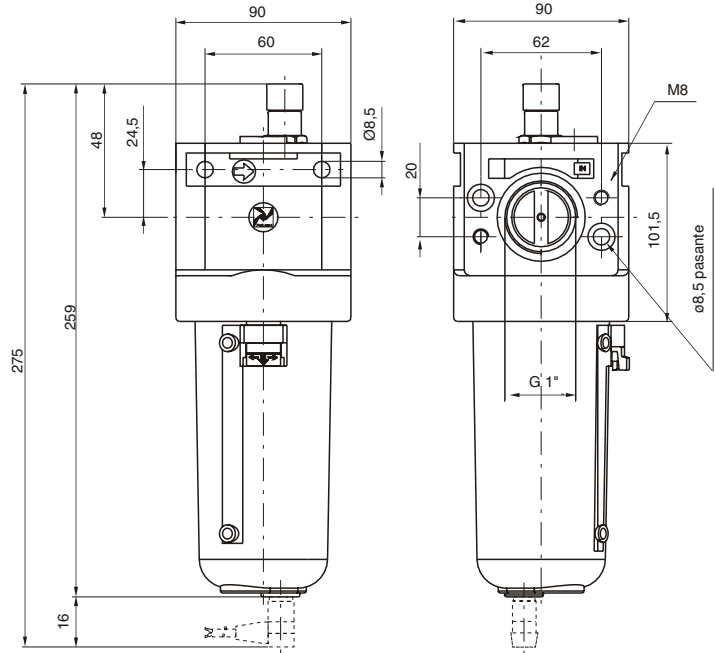
Connections
B = G 1"

Adjusting range

- A = 0 - 2 bar
- B = 0 - 4 bar
- C = 0 - 8 bar
- D = 0 - 12 bar

Example: **17402NB.C**

Pressure regulator with G 1" connections, adjusting range 0 - 8 bar with relieving.



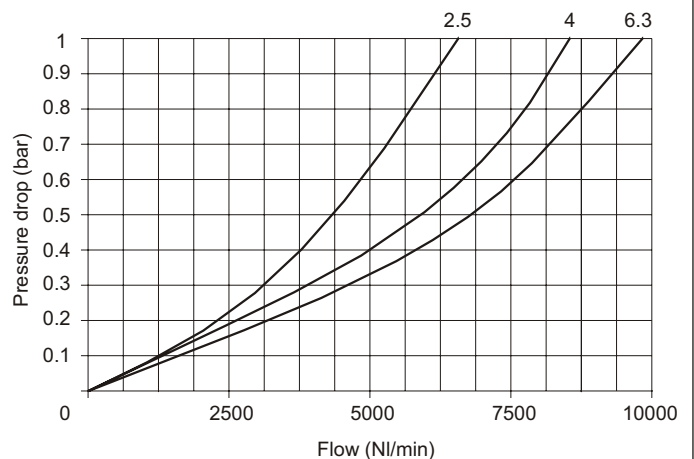
Construction and working characteristics

- Fog type lubrication with variable section orifice according to the flow.
- Body made with light alloy.
- Wall mounting possibility with M8 screws protected by covers.
- Light alloy bowl c/w level indicator connected to the body with bayonet cap and safety button.
- Transparent technopolymer sight dome with adjusting handle.
- Oil filling plug.
- Electrical connector for low level indication. Use the C1, C2 or C3 lead for connection (see section 8, catalogue 4 "Cylinders").

Technical characteristics

Connections	G 1"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature (at 10 bar)	50°C
Weight	gr. 1500
Indicative oil drip rate	1 drop every 300/600 NI
Oil Type	FD22 - Hg32
Bowl capacity	300 cm ³
Assembly position	Vertical
Wall mounting screws	M8
Min. operational flow (at 6,3 bar)	100 NI/min

Flow rate curves
Inlet pressure (bar)



Ordering code

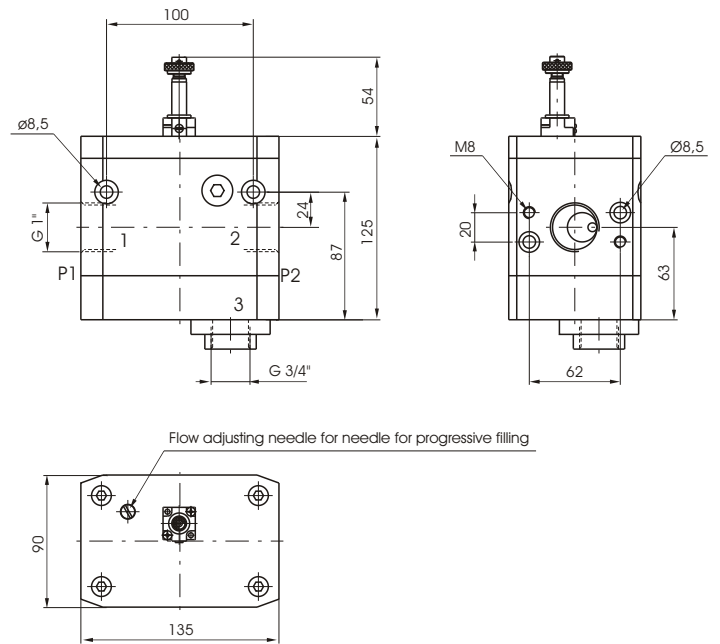
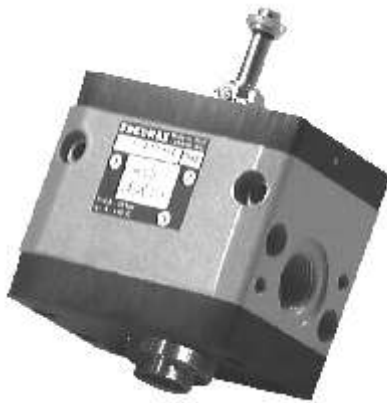
17403

Connections
B = G 1"

MA = Minimum oil level indicator N.O.
with plug connector
MC = Minimum oil level indicator N.C.
with plug connector

Note: on MA version the contact is open when the bowl is filled
on MC version the contact is closed when the bowl is filled

Example: **17403B**
Lubricator with G 1" connections.



Construction and working characteristics

- 3 way valve with double poppet.
- Possibility to adjust the down stream circuit filling time by the enclosed adjustable metering screw.
- Quick down stream circuit discharge.
- Possibility for a pneumatic or electric piloting control.
- Body made with anodized 2011 aluminum alloy.
- Wall mounting possibility with M8 screws.

Technical characteristics

Connections	G 1"
Max. inlet pressure	10 bar - 1 MPa
Max ambient temperature	50°C
Weight	gr. 2300
Assembly position	Any
Wall mounting screws	M8
Min. operating pressure	2.5 bar - 0.25 Mpa
Nominal flow at 6 bar with Dp=1	8000 NI/min
Flow with adjustable metering screw fully open	3000 NI/min

Important note: the preventive or programmed maintenance of this product is not foreseen considering the elaborated assembling and the specific "PNEUMAX" testing; therefore, call the producer or its representative in case of necessity.

Ordering code

17410.M2

Electrically controlled progressive start-up valve size 4, complete with mechanic for M2 microsolenoid valve.

17420

Progressive start-up valve size 4 with pneumatic control.

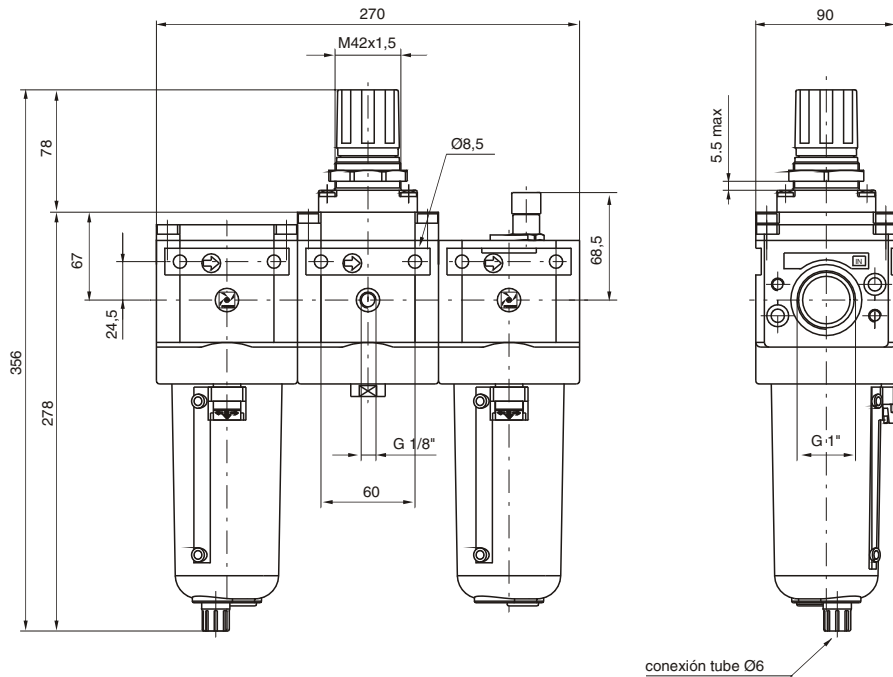


Construction and working characteristics

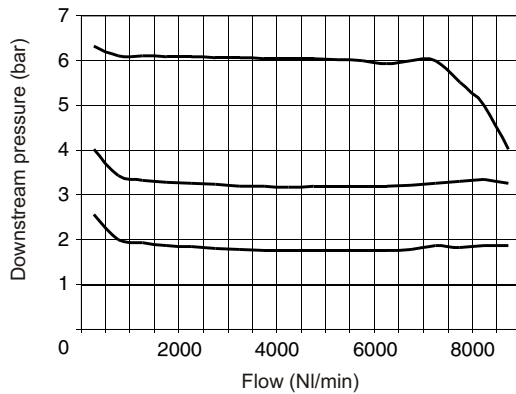
- Filter - diaphragm pressure regulator with relieving.
- Double filtering action: by air centrifuging and by replaceable and reusable HDPE porous filter element.
- Body made with light alloy.
- Wall mounting possibility with M6 screws protected by covers.
- Pressure adjusting lockable handle by simply pressing it downwards in the desired position
- Light alloy bowl c/w level indicator connected to the body with bayonet cap and safety button.
- Manual and semi-automatic water drain valve; in the semi-automatic version the drainage happens when there is no pressure or by pushing the valve up-wards.
- Automatic water drainage bowl available on request.
- Two pressure gauge connections with plug complete of seal.
- Fog type lubrication with variable section orifice according to the flow.
- Transparent technopolymer sight dome with adjusting handle.
- Oil filling plug.

Technical characteristics

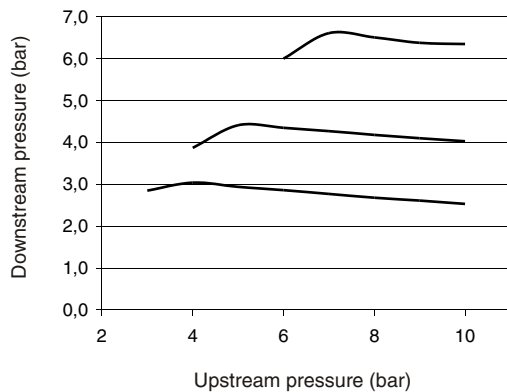
Connections	G 1"
Max inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature (at 10 bar)	50°C
Pressure gauge connections	G 1/8"
Weight	gr. 5300
Pressure range	0 - 2 bar 0 - 4 bar 0 - 8 bar 0 - 12 bar
Filter pore size	5µ 20µ 50µ
Bowl capacity	160 cm ³
Oil type	FD22 - HG32
Indicative oil drip rate	1 drop every 300/600 NI
Bowl capacity	300 cm ³
Min operational flow at 6,3 bar	100 NI/min
Assembly position	Vertical
Wall mounting screws	M8



Flow rate curves
 Inlet Pressure (7 bar)

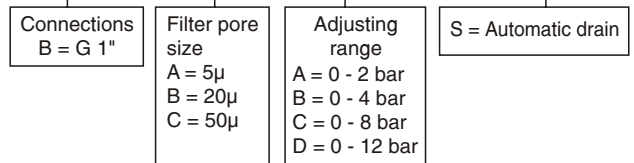


Adjustment characteristics



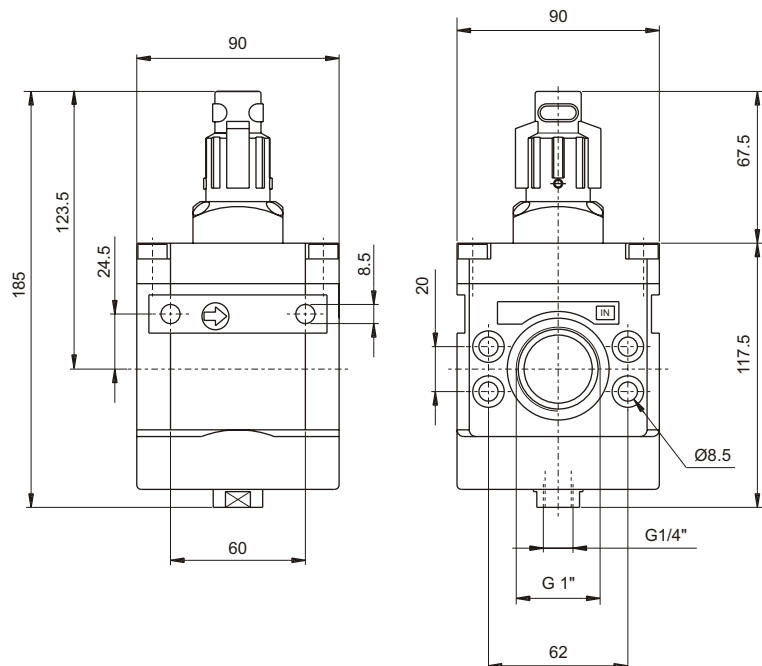
Ordering code

17407N



Example: **17407NB.C.S**

Service unit combination complete with filter - pressure regulator and lubricator size 4. G 1" connections, filter pore size 20µ, adjusting range 0-8 bar and automatic drain.



Construction and working characteristics

- 3 ways poppet valve.
- Body made with light alloy.
- Wall mounting possibility with M8 screws protected by covers.
- Double action handle for valve opening: pushing and rotating (clockwise).
- Simple rotate the valve handle counter clockwise for valve closing and down stream circuit discharging.
- Possibility to lock the valve in the discharging position by fitting in a padlock in the proper seat.

Important note: the preventive or programmed maintenance of this product is not foreseen considering the elaborated assembling and the specific "PNEUMAX" testing; therefore, call the producer or its representative in case of necessity.

Technical characteristics

Connections	G 1"
Max. inlet pressure	13 bar - 1,3 MPa
Max. ambient temperature	50°C
Weight	gr. 1600
Assembly position	Any
Nominal flow at 6 bar with DP=1	8000 NI/min
Wall mounting screws	M8
Handle opening and closing angle	90°
Max. fitting torque	40 Nm

Ordering code

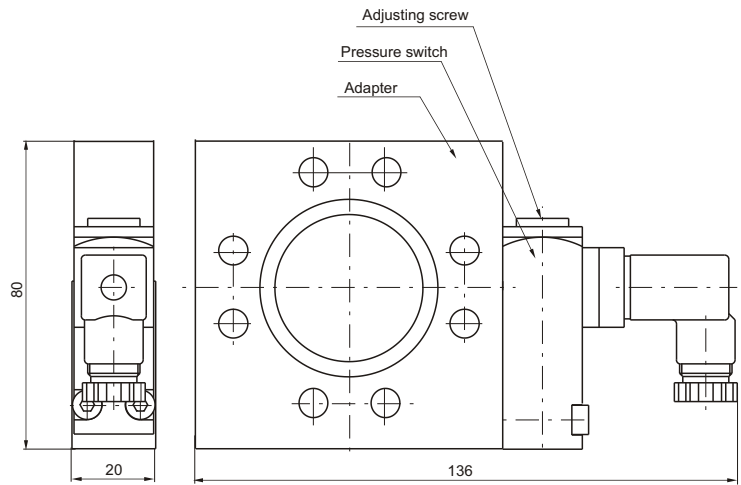
17430 .

A = Not lockable handle
B = Lockable handle

Example: **17430.B**
Shut-off valve size 4 complete with lockable handle.



Pressure switch complete with adapter



Construction and working characteristics

The pressure switch complete of adapter has to be assembled between two elements of the FRL group. It cannot be utilized separately or at the end of the FRL group.

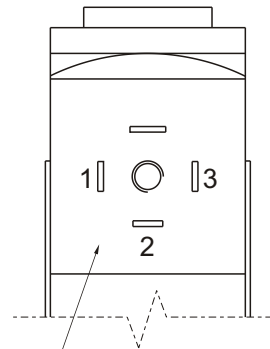
The pressure switch can be set at desired pressure (pressure range from 2 to 10 bar) by rotating the adjusting screw.

The electrical connection is made by mean of a 15 mm connector DIN 43650 type C.

The microswitch contact could be normally closed or open (change over switch).

Connection

- 1 = Neutral
- 2 = N.C. contact
- 3 = N.O. contact



Din 43650 type C connector

Technical characteristics

Max. inlet pressure	13 bar 1,3 MPa
Max. temperature	50°C
Weight	gr. 450
Microswitch capacity	5A
Grade of protection (with connector assembled)	IP65
Adjusting range	2 - 10 bar
assembly position	Any

Ordering code

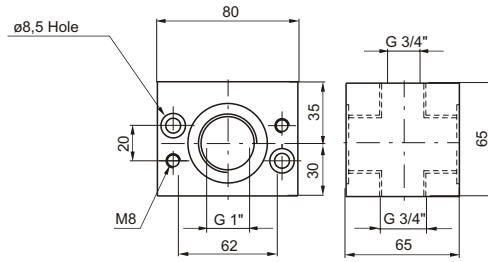
17

- 44A = Pressure switch adapter
- 14B = Pressure switch
- 44C = Pressure switch complete with adapter

Example: **1744C**
Pressure switch complete with adapter.



Air intake

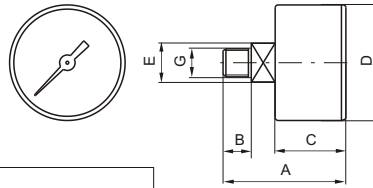


Weight 450 gr.

Ordering code

17440

Pressure gauge



DIMENSIONS							
CODE	A	B	C	D	E	G	Weight gr.
17070A	44	10	26	41	14	G1/8"	60
17070B	45	10	27	49	14	G1/8"	80

Ordering code

17070

A = Dial ø40
B = Dial ø50

A = Scale 0-4 bar
B = Scale 0-6 bar
C = Scale 0-12 bar

Assembling kit



Weight 45 gr.

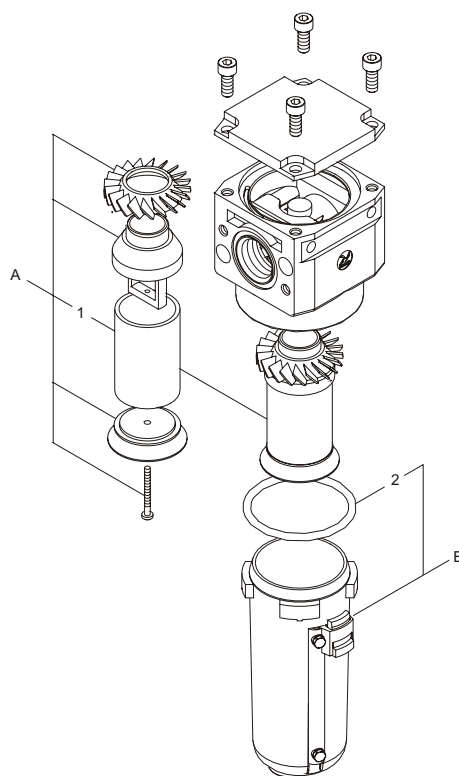
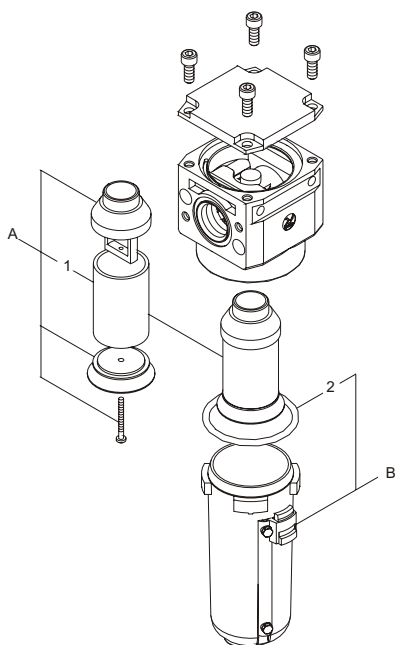
Ordering code

17460
(standard)

17465
(for progressive start-up valve)

Filter

Pos.	Code	Description
1	RS/1704/13	Porous filter elements 20 μ
1	RS/1704/21	Porous filter elements 5 μ
1	RS/1704/22	Porous filter elements 50 μ
2	RS/OR 6275	Seal
A	RK1704A/004	Filter group assembly 20 μ
A	RK1704A/007	Filter group assembly 5 μ
A	RK1704A/008	Filter group assembly 50 μ
B	RK1704A/002	Filter bowl c/w drain valve

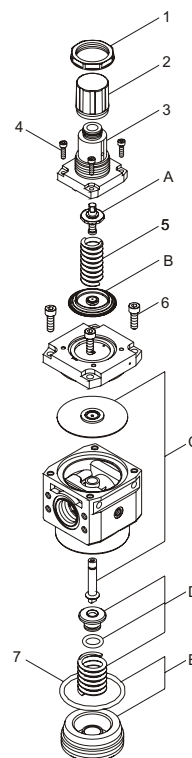


Coalescing Filter

Pos	Code	Description
1	RS/1704/31	Porous filter element 0,1 μ
2	RS/OR6275	Seal
A	RK1704A/015	Coalescent group 0.1 μ
B	RK1704A/002	Filter bowl c/w drain valve

Pressure regular

Pos.	Code	Descrizione
1	RS/1702/12	Lock nut
2	RS/1702/3	Adjusting knob
3	RS/1703/2	Adjusting support
4	RS/TCEI5x18	Screw
5	RS/1703/21	Spring 0 -2 bar range
5	RS/1703/20	Spring 0 -4 bar range
5	RS/1703/19	Spring 0 -8 bar range
5	RS/1703/22	Spring 0 -12 bar range
6	RS/TCIEZ8x25	Central support screws
7	RS/OR 6275	Seal
A	RK1702A/005	Adjusting screw assembly
B	RK1704A/005	Top diaphragm assembly
C	RK1704A/001	Low diaphragm assembly
D	RK1704A/022	Poppet c/w spring
E	RK1704A/023	Plug



Lubricator

Pos	Code	Descrizione
1	RK1701A/026	Lubricator sight dome assembly
2	RS/OR 2075	Seal
3	RS/1704/19	Venturi diaphragm
4	RS/1704/23	Venturi diaphragm screw
5	RS/1704/28	Oil tube
6	RS/OR 6275	Seal
A	RK1704A/003	Lubricator bowl

