

# 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 (zoothecnicns, 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: Dry air must be used for application below 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

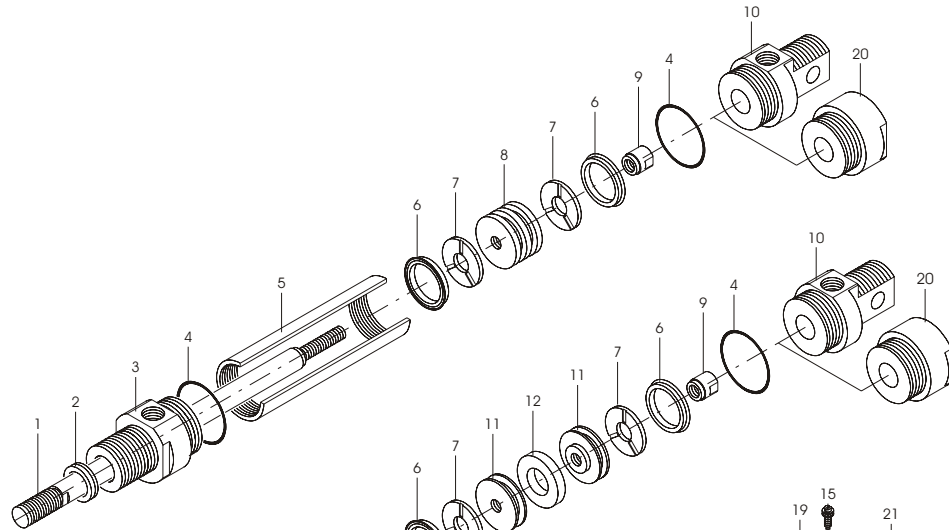
15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 - 320 - 350 - 400 mm

#### ø 32, ø 40 and ø 50

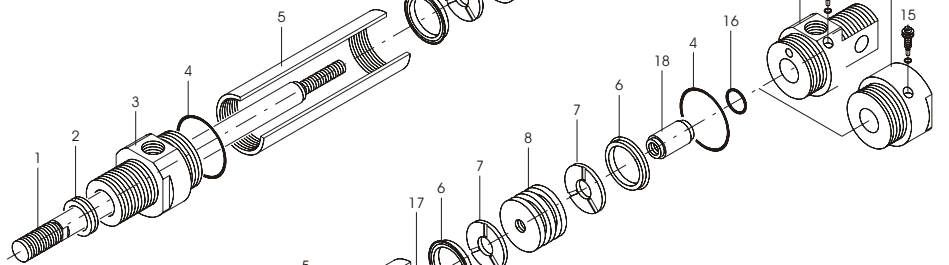
15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 - 320 - 350 - 400 - 450 - 500 mm

**Drawing**

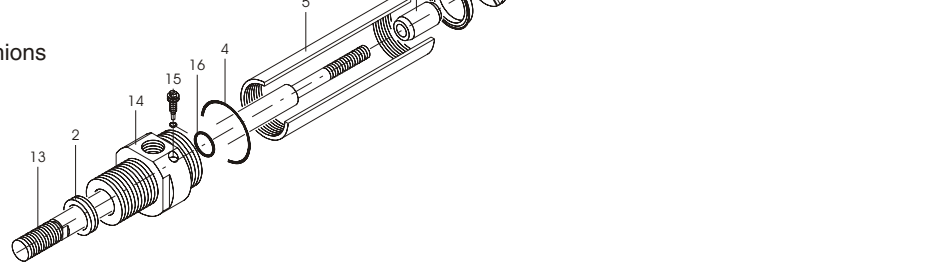
Basic version



Magnetic basic version

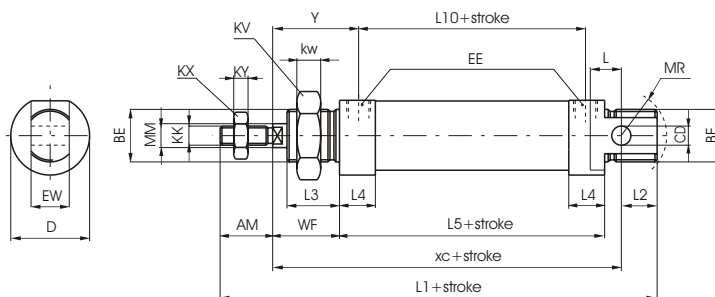


Basic version with cushions



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

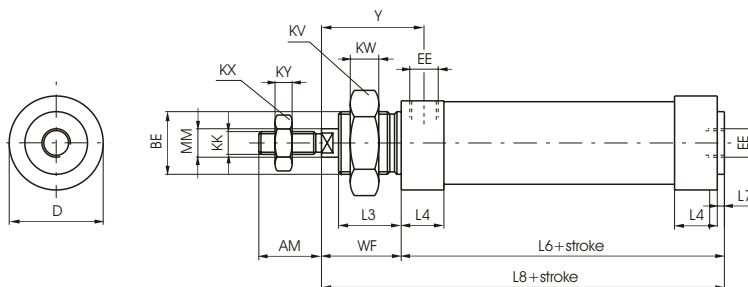
**Basic version**



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

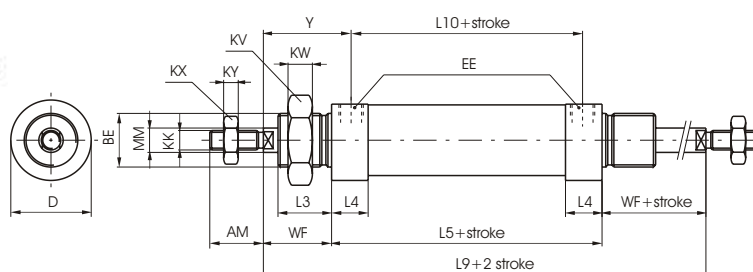
**Without rear eye version**



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

**Push/Pull rod version**

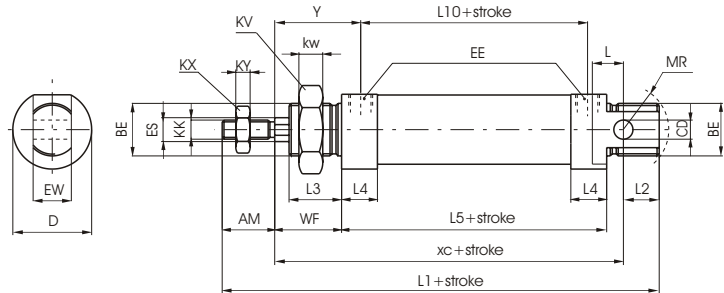


Execution by rod coming out from both end plates, with overall dimensions, except for the rod, equal to 1260 version. Not available with  $\varnothing 8$  and 10).

Ordering code	Description
<b>1262.Ø.stroke</b>	Push/pull rod
<b>1262.Ø.stroke.A</b>	Adjustable cushions (from $\varnothing 16$ )
<b>1262.Ø.stroke.M</b>	Magnetic piston (from $\varnothing 10$ )
<b>1262.Ø.stroke.X</b>	Stainless steel chromed rod
<b>1262.Ø.stroke.E</b>	Hexagon rod (from $\varnothing 12$ )
<b>1262.Ø.stroke.A.M</b>	Cushioned with magnetic piston
<b>1262.Ø.stroke.A.M.X</b>	Cushioned, magnetic piston and stainless steel chromed rod
<b>1262.Ø.stroke. . . T</b>	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
<b>1260.Ø.stroke.E</b>	Non rotating hexagonal rod from ø 12
<b>1271.Ø.stroke.E</b>	Non rotating hexagonal rod front spring from ø 12 (max stroke 40 mm.)
<b>1272.Ø.stroke.E</b>	Non rotating hexagonal rod rear spring from ø 12 (max stroke 40 mm.)
<b>12--Ø.stroke.E.M</b>	Non rotating hexagonal rod magnetic piston (from ø 12)
<b>12--Ø.stroke.E.X</b>	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 length	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 polyurethane seals -5°C ÷ +120° C with THERBAN® seals

"Attention: Dry air must be used for application below 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

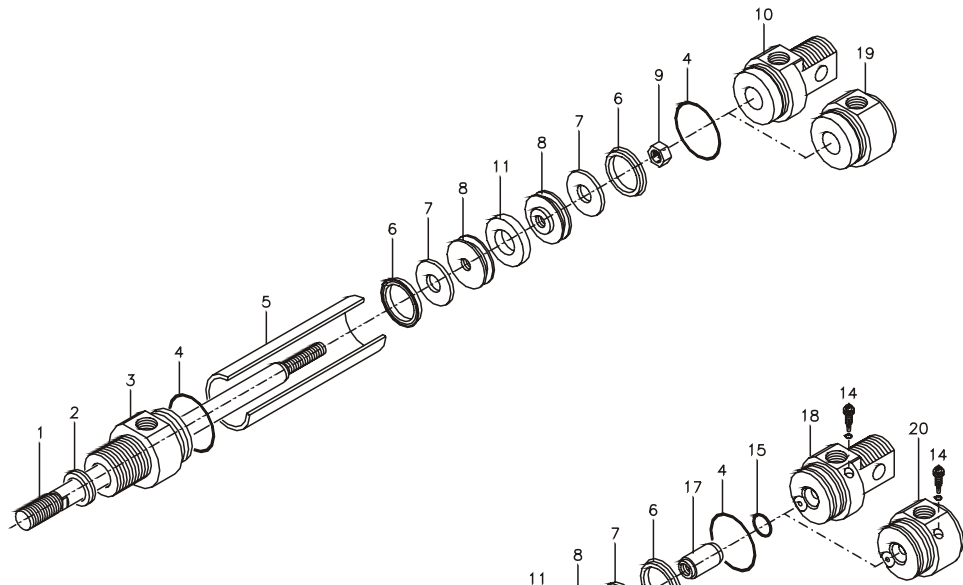
#### ø 32

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

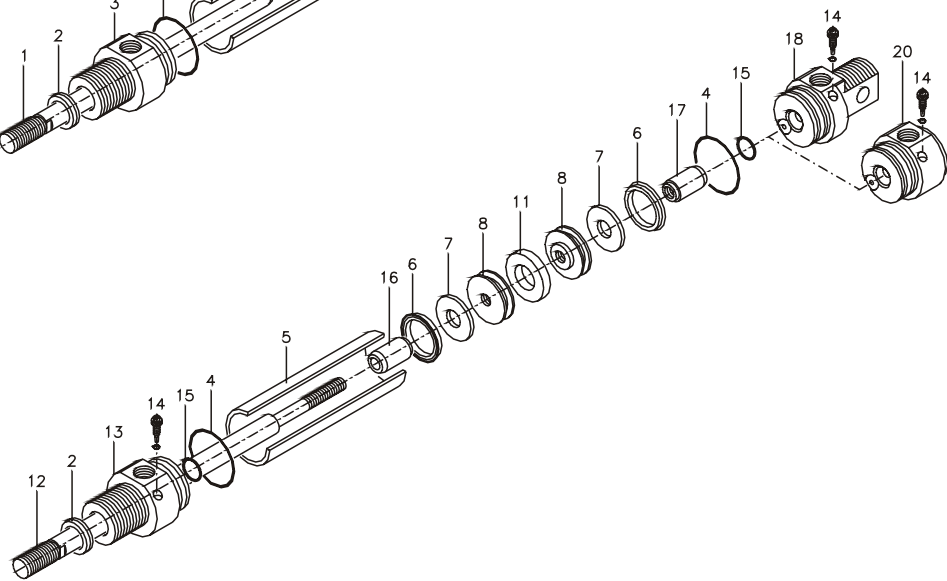
For single acting front spring version, max stroke is 50 mm, while single acting rear spring version is available from ø 16, max stroke 50 mm.

**Drawing**

Basic version



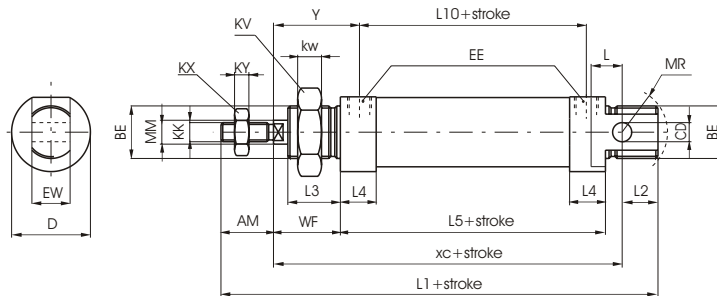
Basic version with cushions



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



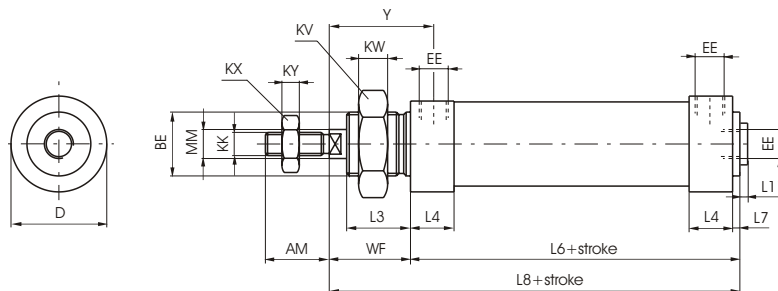
**Basic version**



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

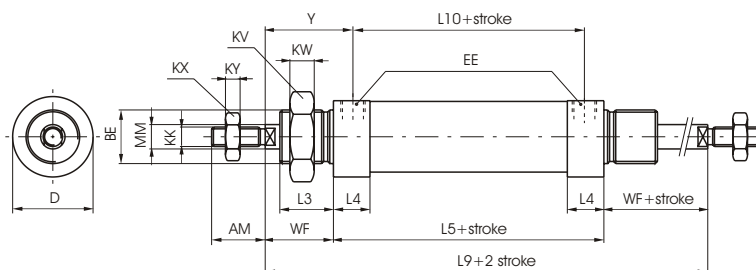
**Without rear eye version**



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
<b>1281.Ø.stroke.M</b>	Basic magnetic version
<b>1293.Ø.stroke.M</b>	Basic magnetic front spring (max stroke 50 mm)
<b>1294.Ø.stroke.M</b>	Basic magnetic rear spring from ø16(max stroke 50 mm)
<b>12--.Ø.stroke.A.M</b>	Cushioned with magnetic piston (from ø16)
<b>12--.Ø.stroke..T</b>	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
<b>1282.Ø.stroke.M</b>	Magnetic push/pull rod
<b>1282.Ø.stroke.A.M</b>	Magnetic adjustable cushions (from ø16)
<b>1282.Ø.stroke..T</b>	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
<b>Variations of the versions</b>								
<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: Dry air must be used for application below 0°C"

### Standards stroke

#### ø 16

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

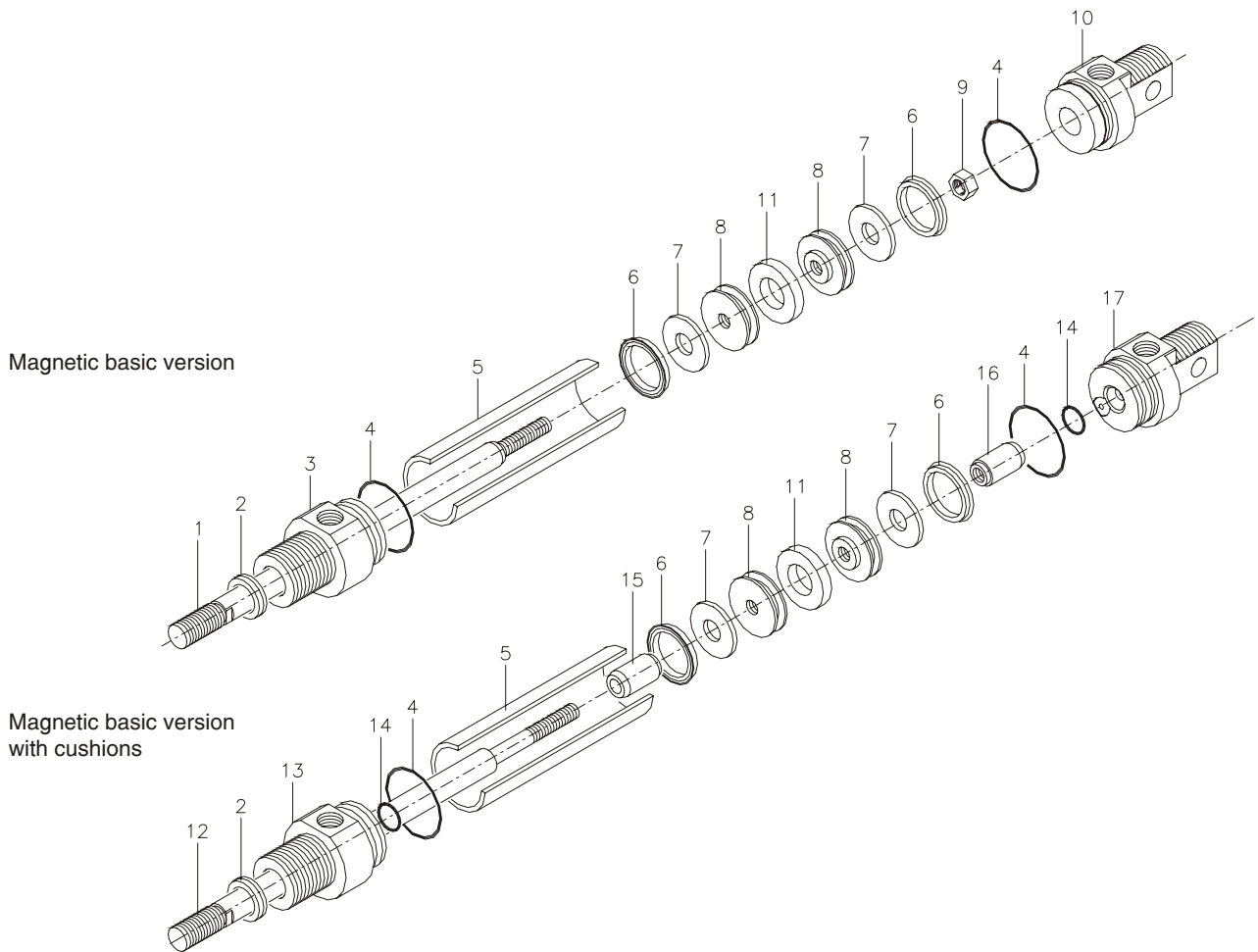
#### ø 20 and ø 25

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

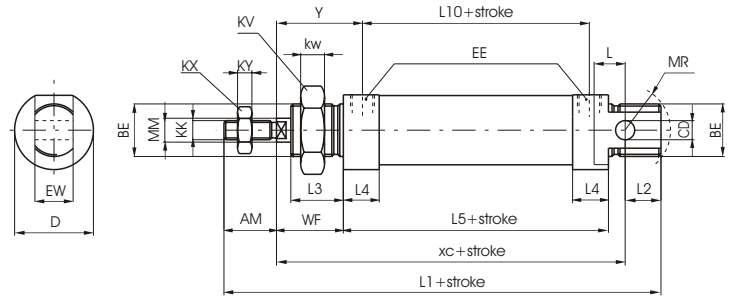
**Drawing**



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

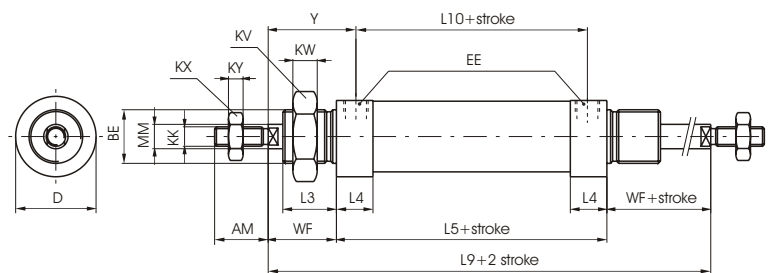


**Magnetic basic version**



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**

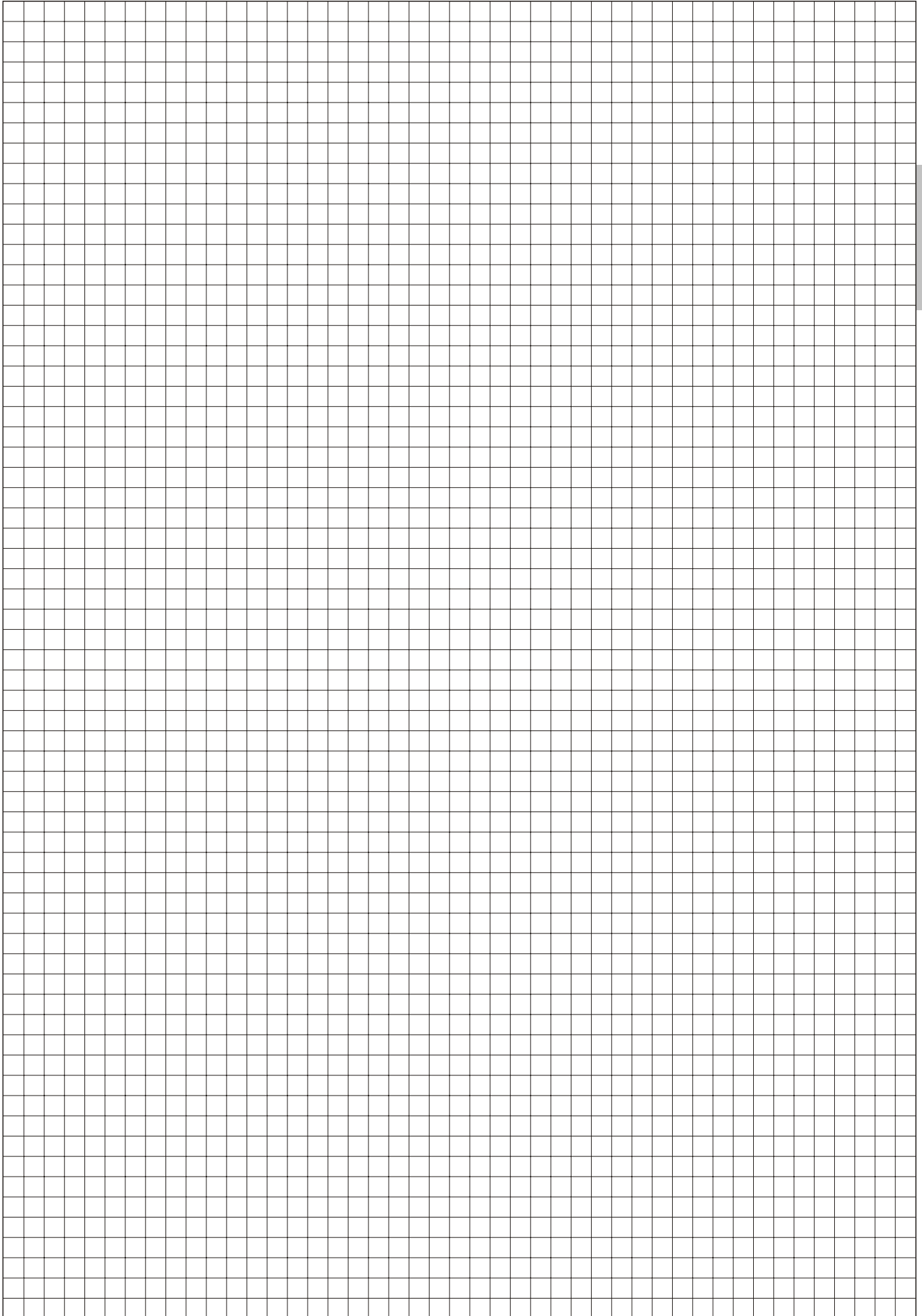
**128 .Ø.stroke.**

- 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





### General

Continuing in our commitment to the development and implementation of technologically advanced, competitive products we have introduced the 1230 series of technopolymer bodied microcylinders. This new cylinder complies with ISO6432 and has operational characteristics similar to the Mir (1280) series cylinder with rolled end covers.

One of the main features of this cylinder is the material of construction.

In fact, the end covers and barrel are made from a technopolymer reinforced with glass fiber, giving mechanical qualities similar to those of aluminium.

The use of technopolymer also allows the use of these cylinders in environments that are incompatible with aluminium.

Bores available : Ø12 - Ø16 - Ø20 - Ø25.

Products types:

- Basic
- Basic with magnetic piston

Options:

- Double acting
- Double acting with flat rear end cover
- Double acting through rod (Push/Pull)

### Construction characteristic

End covers	Nylon 66 reinforced with glass fibres
Barrel	Nylon 66 reinforced with glass fibres
Piston rod	C43 Chromed (non magnetic piston version) Stainless steel AISI 303 chromed (magnetic piston version)
Piston seal	NBR oil-resistant rubber seal
Piston rod seal	Polyurethane self-lubricated mix
Mounting	Steel painted / stainless steel AISI 304
Forks	Zinc plated steel / stainless steel AISI 304

### Technical characteristic

Fluid	Filtered air lubricated or non-lubricated
Maximum working pressure	8 bar
Working temperature	-5°C ÷ +50°C

### Standard stroke

#### Ø 12

15 - 25 - 50 - 75 - 80 - 100 - 125 - 150 - 160 - 200 mm

#### Ø 16

15 - 25 - 50 - 75 - 80 - 100 - 125 - 150 - 160 - 200 - 250 mm

#### Ø 20 and Ø 25

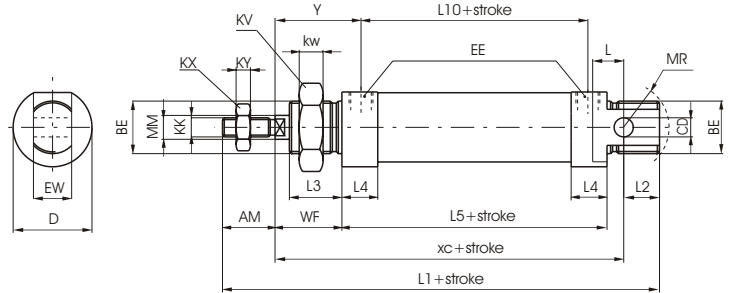
15 - 25 - 50 - 75 - 80 - 100 - 125 - 150 - 160 - 200 - 250 - 300 mm

### Maximum tightening torque for fittings

Bore	Thread	Maximum torque (Nm)
Ø 12	M5	1
Ø 16	M5	1
Ø 20	G 1/8"	4
Ø 25	G 1/8"	4



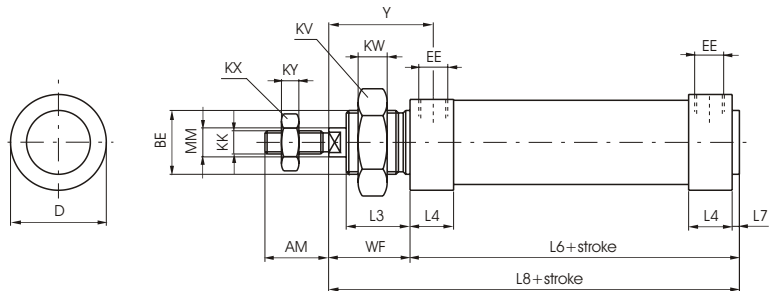
**Basic version**



Standard execution, fully complying with ISO standards. Can use all available mountings.

Ordering code	Description
<b>1230.Ø.stroke</b>	Basic version
<b>1230.Ø.stroke.M</b>	Magnetic basic version

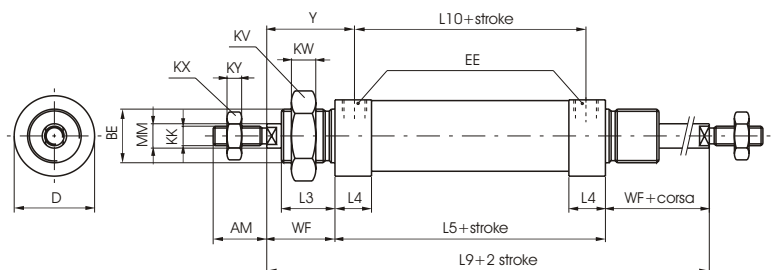
**Without rear eye version**



Version derived from standard execution 1230 and not included in ISO standard. Not having a rear eye it is shorter. The inlet connection is lateral on the rear cover (like on the front cover).

Ordering code	Description
<b>1231.Ø.stroke</b>	Basic version
<b>1231.Ø.stroke.M</b>	Magnetic basic version

**Push/Pull rod version**



Through rod model, dimensions as per the 1230 (except the rod).

Ordering code	Description
<b>1232.Ø.stroke</b>	Basic version
<b>1232.Ø.stroke.M</b>	Magnetic basic version



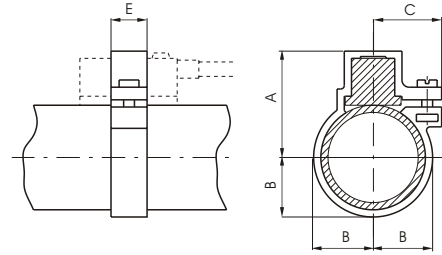


**Table of dimensions**

	Bore			
	12	16	20	25
AM (-0,2)	16	16	20	22
BE	M16X1,5	M16X1,5	M22X1,5	M22X1,5
CD (H9)	6	6	8	8
D (h11)	19	23	28,5	31,5
EE	M5	M5	G1/8"	G1/8"
EW (d13)	12	12	16	16
KK (6g)	M6X1	M6X1	M8X1,25	M10X1,25
KV	22	22	30	30
KW	6	6	7	7
KX	10	10	13	17
KY	4	4	5	6
L	9	9	12	14
L1(±1)	105	111	130	140
L2	14	13	15	14
L3	17	17	18	22
L4	13,5	14,5	20,5	20
L5 (±1)	50	56	68	68
L6	52	58	70,5	70,5
L7	2	2	2,5	2,5
L8	74	80	94,5	98,5
L9 (±1,2)	94	100	116	124
L10 (±1)	41	45	52	52
MM (f7)	6	6	8	10
WF (±1,2)	22	22	24	28
XC (±1)	75	82	95	104
Y (±1)	26,5	27,5	32	36



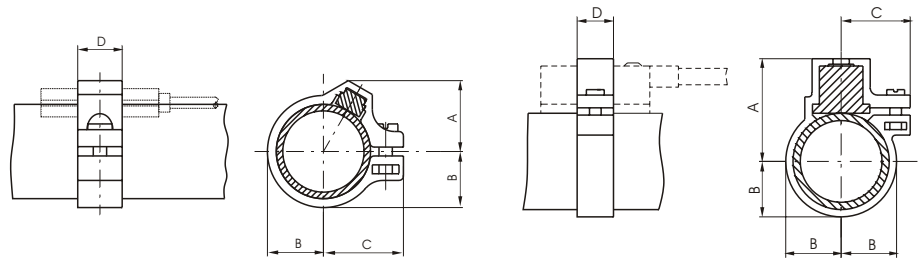
**Sensor clamps for microcylinders with threaded end covers and Technopolymer**



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	<b>1260.Ø.F</b>						
Weight gr.	2	3	5	7	10	14	16

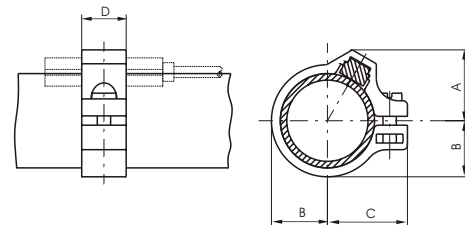
**Sensor clamps for microcylinders with rolled end covers**

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 clamps for miniaturized sensors**



Bore	12	16	20	25
A	14	15,4	17,2	19,3
B	10	12	14	16,5
C	16	18	19,5	22
D	10	10	10	10
Ordering code	<b>1260.Ø.FS</b>			
Weight gr.	-	-	-	-

**Sensor for microcylinders**

For technical characteristics and ordering codes see page 7.0



### 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

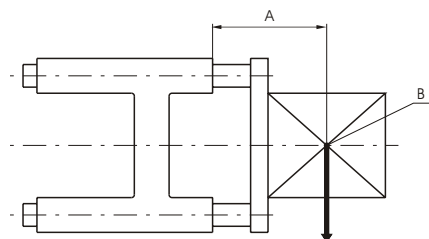
Body	extruded shape anodized aluminium alloy 6060
Bushings	sintered bronze
Wiper	oil resistant NBR rubber
Rods	chromed C43 steel
Plate	plated zinc steel
Mounting block	plated zinc steel

### Technical characteristics

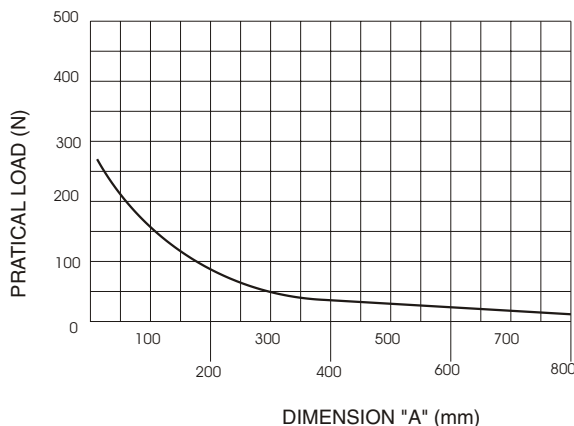
Max. suggested strokes:

Diameter	20	25
Stroke mm.	200	250

Loading diagram based on dimension "A"

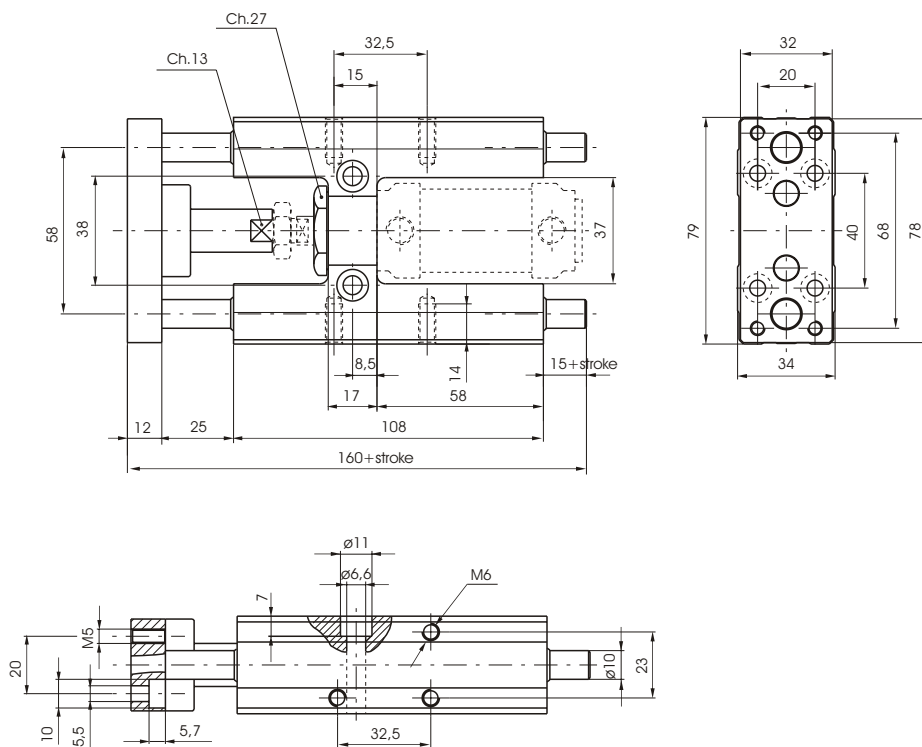


A = Protusion  
B = Load centre of Gravity



### 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
<b>1260.Ø.stroke.GLB</b> (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><td>Ø 12</td><td>Ø 16</td><td>Ø 20</td><td>Ø 25</td></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: Dry air must be used for application below 0°C"

### Use and maintenance

Do not exceed the above technical data.

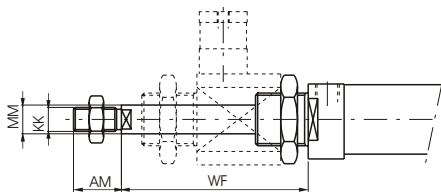
The piston rod lock does not require maintenance if properly utilized. However, it can be disassembled if needed.

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.

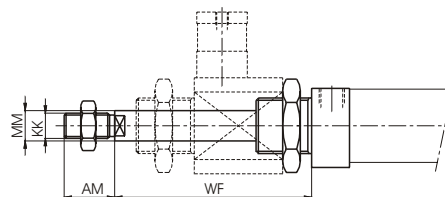


**Microcylinders for piston rod lock**

Threaded end covers version



Rolled end covers version (only "MIR" version)

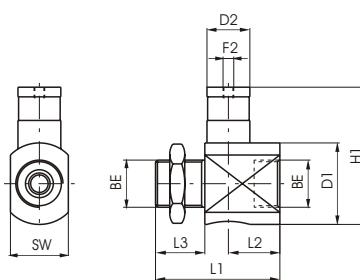


Order piston rod lock separately.  
Do not use with stainless steel or hexagonal piston rod.

Ordering code
<b>12_ _Ø.stroke.B</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**

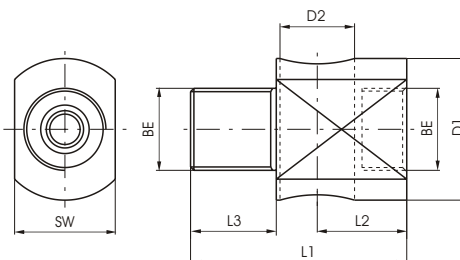


Ordering code
<b>1260.Ø.51BS</b>

Do not use as safety device

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

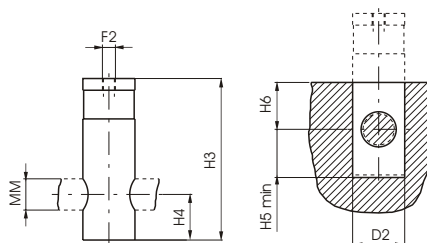
**Piston rod lock bracket**



Ordering code
<b>1260.Ø.51S</b>

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

**Piston rod lock and housing**



Ordering code
<b>1260.Ø.51B</b>

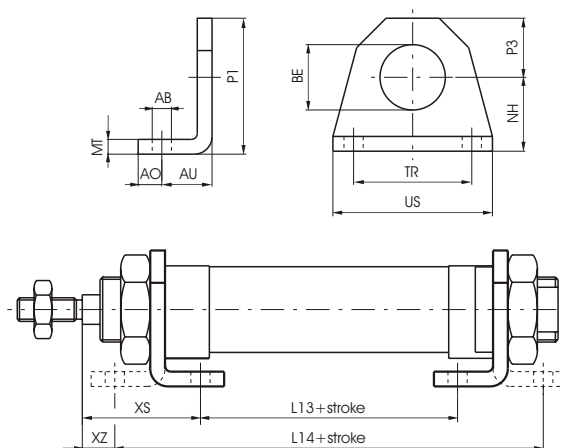
Do not use as safety device

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**



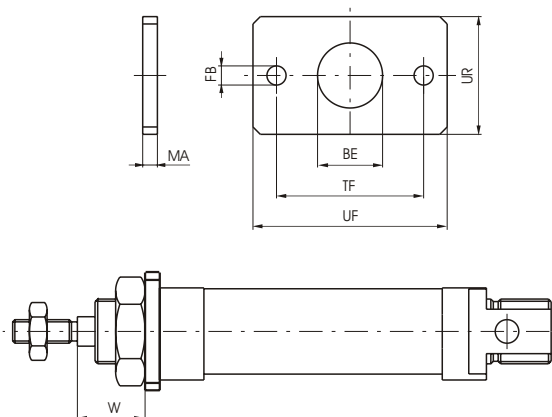
Used to mount the cylinder on the mounting plane with the rod parallel to said plane. Use one for short strokes and two for long strokes. It is made of stamped steel, made corrosion resistant by cathophoresis treatment. Attached to the end plates by means of nuts (or lock nuts) 05.

**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	
<b>1200.Ø.01</b> (1 piece)	

**Flange**



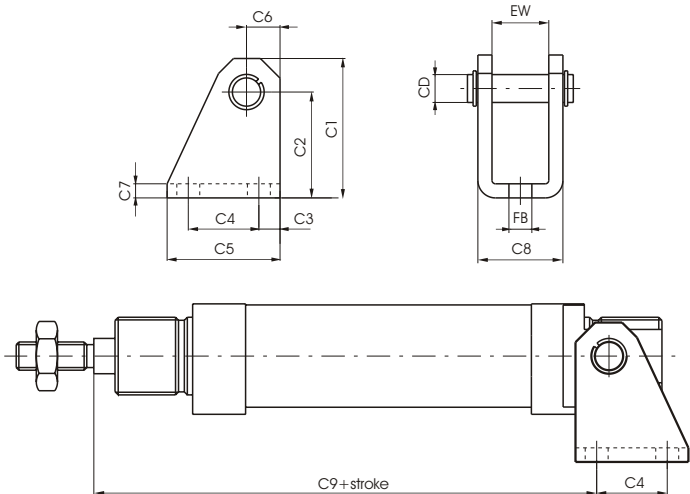
Used to mount the microcylinder at a right angle to the mounting plane. Attached to the front (or rear) endcap by a nut (or lock nut) 05. Made of extruded steel, made corrosion resistant by cathophoresis.

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	
<b>1200.Ø.02</b>	



Rear eye



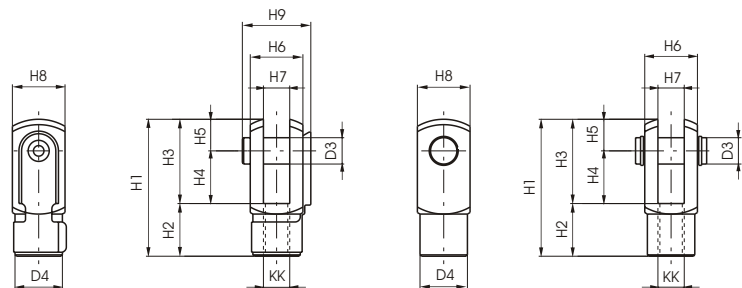
Used to mount by using the rear and cover to mount either parallel or at a right angle to the mounting plane. Allows the cylinder to oscillate and self-align with the linked element to the rod. Necessary to use when the rod may be subject to lateral forces during travel. Made of stamped steel, corrosion resistant by cathoporesis 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	
<b>1200.Ø.03</b>	

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

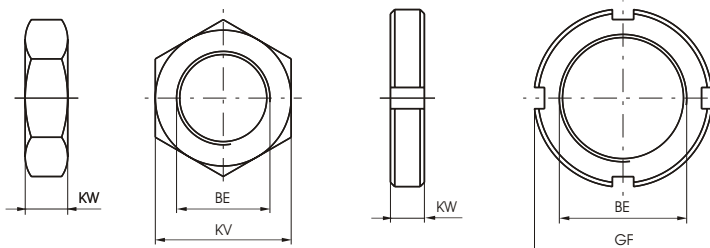
\* Available from Bore Ø12

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





**Nut or lock nut for the endcaps**

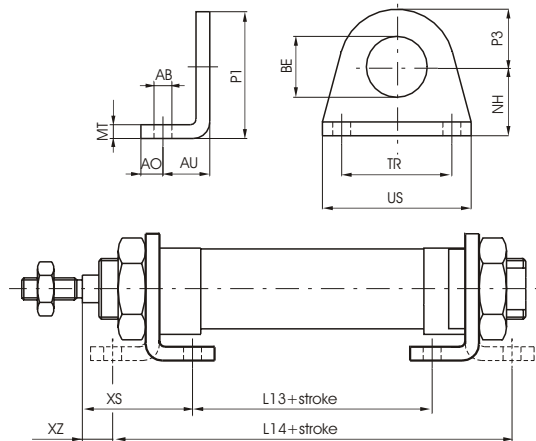


Used to fasten flanges or feet to the endcaps of the microcylinder. The nuts are mounted on diameters that go from 8 to 25, the lock nuts on 32, 40 and 50. Both are supplied (one piece) with the microcylinders.

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									
<b>1200.Ø.05</b>									



**Foot**

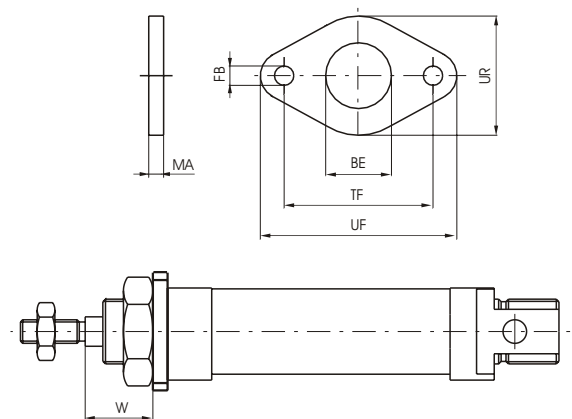


Used to mount the cylinder on the mounting plane with the rod parallel to said plane. Use one for short strokes and two for long strokes. It is made stamped stainless steel AISI 304. Attached to the end plates by means of nuts (or lock nuts) 05X.

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
Weight gr.	45	90	90	110

Ordering code	
<b>1200.Ø.01X</b> (1 piece)	

**Flange**



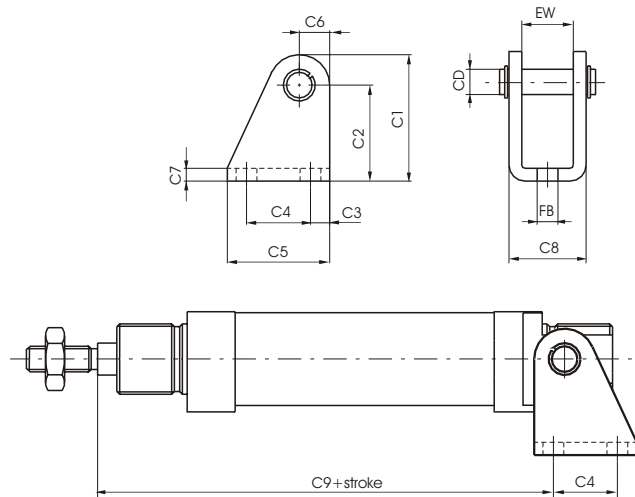
Use to mount the microcylinder at a right angle to the mounting plane. Attached to the front (or rear) endcap by a nut (or lock nut)05X. Made of stainless steel AISI 304.

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
Weight gr.	40	85	85	100

Ordering code	
<b>1200.Ø.02X</b>	



Rear eye

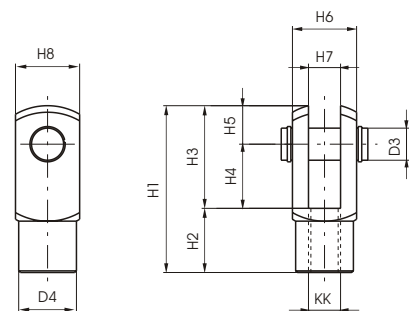


Used to mount by using the rear and cover to mount either parallel or at a right angle to the mounting plane. Allows the cylinder to oscillate and self-align with the linked element to the rod. Necessary to use when the rod may be subject to lateral forces during travel. Made of stamped stainless steel 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	
<b>1200.Ø.03X</b>	

Cylinder rod fork



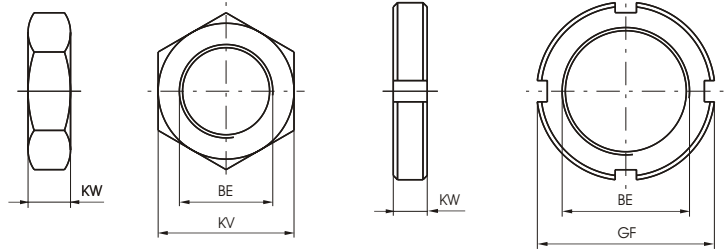
Similar to hinge 03X, mounted on the rod thread, assures a regular operation even in the presence of significant forces to the linked element. Made of stainless steel AISI 304.

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	
<b>1200.Ø.04X</b>	



**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.

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

**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 $\varnothing 10$ )
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: Dry air must be used for application below 0°C"

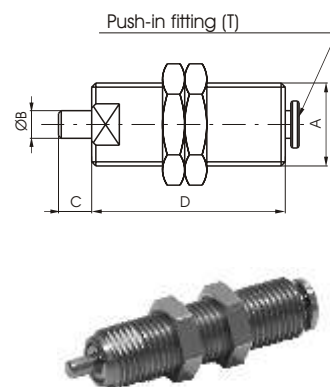
**Maintenance and use**

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).

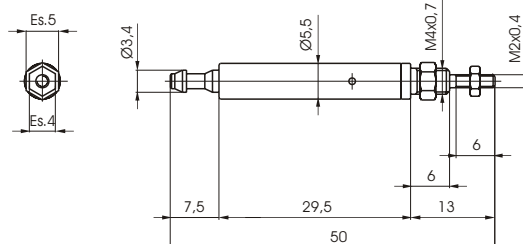
The product cannot be disassembled and it is not possible to carry out maintainance with replacement of seals.

**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  $\varnothing 4$**



Ordering code
<b>1273.4.10</b>