Section 03

Pneumatic actuation

Pneumatic cylinders, handling and magnetic sensors

Cylinders with piston rod according to standard

ISO 6432 Microbore cylinders

Versions available: with threaded end caps, rolled end caps, aluminium, stainless steel and technopolymer versions

CNOMO-CETOP-ISO cylinders

Cylinders manufactured according to standards CNOMO, CETOP and ISO: standard versions, through rod versions, tandem push with common rod, tandem push with independent rods or opposed tandem with common rod

ISO 15552 cylinders

Cylinders according to ISO 15552 with bores from Ø32 to Ø200 mm and strokes up to 1250 mm.
Available versions: ECOPLUS with aluminium or technopolymer end plates, ECOLIGHT optmized in weight and dimensions, Steel line completely in stainless steel, round tube versions tie rod (Ø250-Ø320 mm)

ISO 15552 Hydro-pneumatic speed control cylinders

ISO 15552 Hydro-pneumatic speed control cylinders with internal hydraulic circuit for movement control

ISO 21287 Compact cylinders

Compact cylinders according to standard ISO with integrated slots suitable for sensors mounting without adaptors. Bores from Ø20 to Ø100 mm. Versions with end stroke adjustable pneumatic cushioning are also available according to ISO 21287

Series Ecompact **3**.87

Cylinders with piston rod not according to standard

Threaded body microbore cylinders

Special performance microbore cylinders with hexagonal or round bodied and either fully threaded or threaded with a plain rod ending

Series 1200
Special performance (1213-1273) **3**.103

Non rotating cylinders

Non rotating cylinders twin rod version, available with bores from Ø32 to Ø100 mm, and strokes up to 500 mm

Series 1325-1326-1345-1347 **3**.105

Flat cylinders

ECOFLAT cylinders available with sizes from Ø25 to Ø63 mm and strokes up to 300 mm. Profiled tube has two “T” slots on the side hosting sensors 1580._, MRS._, MHS._. without adaptors. Two additional connections are also available on rear cover for cylinder feeding

Series ECOFLAT **3**.108

Hydraulic speed control cylinders

Hydraulic speed control cylinders with outward, inward and outward/inward control, with lateral or in-line tank. Available with SKIP valve (accelerating device) and blocking valve (STOP).

Series 1400 **3**.115

Short stroke & compact cylinders

Short stroke & compact cylinders with bores from Ø20 to Ø100 mm, available in single and double acting versions, tandem and through rod with magnetic piston versions. The Europe versions are mainly compliant with the ISO or UNITOP standard (relating to holes), while the Ecompact-S versions are based on connecting rods and centering diameters according to the ISO 15552 standard

Series 1500 **3**.127

Series Europe **3**.136

Series Ecompact-S **3**.144

Cylinders with Piston rod not according to standard (following)

Multimount cylinders

Multimount cylinders available with bores from Ø10 to Ø25 mm, with strokes up to 50 mm and with magnetic piston versions

Guided compact cylinders

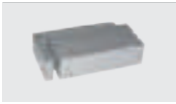
These cylinders are available in sizes Ø32 to Ø63 mm, and comprise a single compact cylinder with integral guide rods, The rod guide is available in two styles: self-lubricating bronze bushes and bearing bushes

Slide cylinders

Slide cylinders manufactured with bores from Ø8 to Ø25 mm, with strokes up to 150 mm. Available with simple and double regulation end stroke and also with front and rear shock absorber

Slide units

Twin-rod linear guide units with bores from Ø10 to Ø32 mm, and with control unit with bronze bush versions, with control unit with bearing bush versions. Are also available the through twin-rod slide units and the compact slide units



Rodless cylinders

Mechanically coupled

Mechanically coupled cylinders with bore from Ø16 to Ø63 mm, and strokes up to 6000 mm, available also with linear control unit

Cable driven

Cable driven cylinders work in a linear translation systems

Rotary actuators

Rack & pinion rotary actuators

Double or single rack & pinion rotary actuators

Vane type rotary actuators

Vane type rotary actuator with the shaft that runs into ball bearings, available with sizes from Ø10 to Ø100 mm

Handling

Pneumatic grippers

Pneumatic grippers manufactured with 2 angular fingers (from -10° to +30°), wide opening 180° or 3 finger parallel style

Magnetic sensors

Standard series

Magnetic sensors with Reed type or Hall effect

Miniaturized series

Miniaturized series with Reed and Hall style versions, available with rectangular, square, square section CURS approved, and round section versions

Accessories and fixing devices

Piston rod lock

Piston rod lock for cylinders with bores from da Ø12 to Ø125 mm

Series 1260 - 1320 **3**.269

Linear guides

Linear control units Series 1200 (Ø20-25 mm) and Series 1320 (from Ø32 to Ø80 mm)

Series 1260 - 1320 **3**.271

Shock absorbers

Shock absorbers with M8x1 - M10x1 - M14x1,5 - M20x1,5 - M27x1,5 threads

Series 6900 **3**.273

Series 1200, Threaded end caps

Construction characteristics

End caps	hard anodised aluminum
Barrel	anodised aluminium (brass for Ø8 and Ø10)
Piston rod	non magnetic piston : Ø8 - Ø10: stainless steel / Ø12 - Ø50: C43 chromed magnetic piston: Ø10 - 20: stainless steel / Ø25 - 50: C43 chromed
Piston	aluminium
Seals	Standard: NBR Oil resistant rubber, PUR Piston rod seals (HNBR or FPM seals available upon request)
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. No lubrication needed, if applied it shall be continuous.
Max. pressure	10 bar
Working temperature	-5°C - +70°C with standard seals magnetic or non magnetic piston -5°C - +80°C with FPM seals magnetic piston -5°C - +80°C with HNBR seals magnetic piston -5°C - +120°C with HNBR seals non magnetic piston -5°C - +150°C with FPM seals non magnetic piston

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device)
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

Please note: air must be dried for applications with lower temperature.
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.
Our Technical Department will be glad to help.

Standard strokes
Double acting version
Ø8 - Ø10 : 15 - 25 - 50 - 75 - 80 - 100 mm
Ø12 - Ø16 : 15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 mm
Ø20 - Ø25 : 15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 - 320 - 350 - 400 mm
Ø32 - Ø50 : 15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 - 320 - 350 - 400 - 450 - 500 mm
On request are available strokes up to:
Ø8 - Ø10 : 250 mm
Ø12 - Ø16 : 700 mm
Ø20 - Ø50 : 1000 mm

Single acting version
Ø12 - Ø50 : up to stroke 40 mm
On request are available strokes up to 200 mm

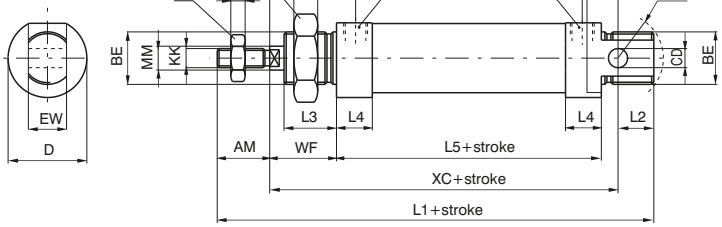
Minimum and maximum springs load for single acting version

Bore	Ø12 - Ø20	Ø25	Ø32	Ø40 - Ø50
Min. load (N)	10	10	20	40
Max. load (N)	25	50	55	110

Basic version

Ordering code	Description
1260.Ø.stroke	Basic version
1271.Ø.stroke	Basic version front spring from Ø12 (max stroke 40 mm)
1272.Ø.stroke	Basic version rear spring from Ø12 (max stroke 40 mm)
12– –.Ø.stroke.A	Adjustable cushioning (from Ø16)
12– –.Ø.stroke.M	Magnetic piston (from Ø10)
12– –.Ø.stroke.X	Stainless steel rod
12– –.Ø.stroke.M.A	Cushioning with magnetic piston
12– –.Ø.stroke.M.A.X	Cushioning, magnetic piston and stainless steel piston rod
12– –.Ø.stroke. . . .T	HNBR seals version
12– –.Ø.stroke. . . .V	FPM seals version

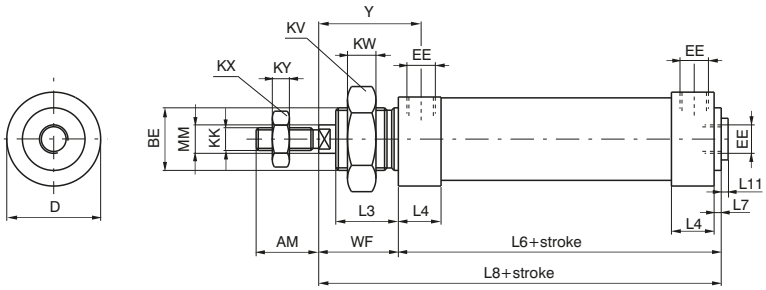
Standard execution, fully complying with ISO standards from ø 8 to ø 25. BOREs 32, 40 and 50 not included in the standard, comply with our own specifications. Can use all available mountings. For single acting type, the maximum stroke is 40 mm., after which overall dimensions increase in length to an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



Without rear eye version

Ordering code	Description
1261.Ø.stroke	Without rear eye
1273.Ø.stroke	Without rear eye front spring from Ø12 (max stroke 40 mm)
1274.Ø.stroke	Without rear eye rear spring from Ø12 (max stroke 40 mm)
12– –.Ø.stroke.A	Adjustable cushioning (from Ø16)
12– –.Ø.stroke.M	Magnetic piston (from Ø10)
12– –.Ø.stroke.X	Stainless steel rod
12– –.Ø.stroke.M.A	Cushioning with magnetic piston
12– –.Ø.stroke.M.A.X	Cushioning, magnetic piston and stainless steel piston rod
12– –.Ø.stroke. . . .T	HNBR seals version
12– –.Ø.stroke. . . .V	FPM seals
12– –.Ø.stroke. . . .L	Air inlet at 90° 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.

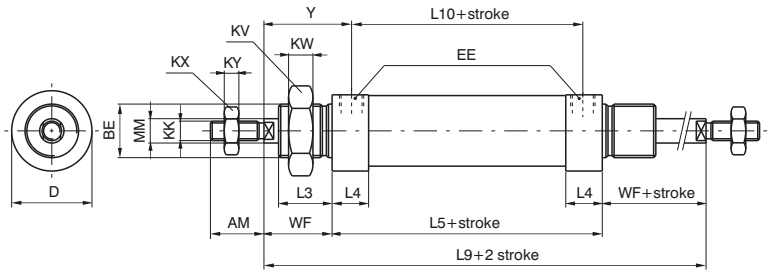


Through rod cylinder version

Ordering code	Description
1262.Ø.stroke	Through rod cylinder rod
1262.Ø.stroke.A	Adjustable cushioning (from Ø16)
1262.Ø.stroke.M	Magnetic piston (from Ø10)
1262.Ø.stroke.X	Stainless steel rod
1262.Ø.stroke.E	Hexagonal piston rod (from Ø12)
1262.Ø.stroke.M.A	Cushioning with magnetic piston
1262.Ø.stroke.M.A.X	Cushioning, magnetic piston and stainless steel piston rod
1262.Ø.stroke. . . .T	HNBR* seals version
1262.Ø.stroke. . . .V	FPM* seals version

★ Excludes hexagonal rod version

Execution by rod coming out from both end caps, with overall dimensions. except for the rod, equal to 1260 version. Not available with Ø8 and 10.



Non rotating piston rod version

Ordering code	Description
1260.Ø.stroke.E	Hexagonal piston rod (from Ø12)
1271.Ø.stroke.E	Hexagonal piston rod with front spring from Ø12 (max stroke 40 mm.)
1272.Ø.stroke.E	Hexagonal piston rod with rear spring from Ø12 (max stroke 40 mm.)
12– –.Ø.stroke.M.E	Hexagonal piston rod with magnetic piston (from Ø12)

Similar overall dimensions as 1260 basic type, it differs because of the hexagonal rod (instead of circular) to avoid the rotation. It is particularly suitable 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.

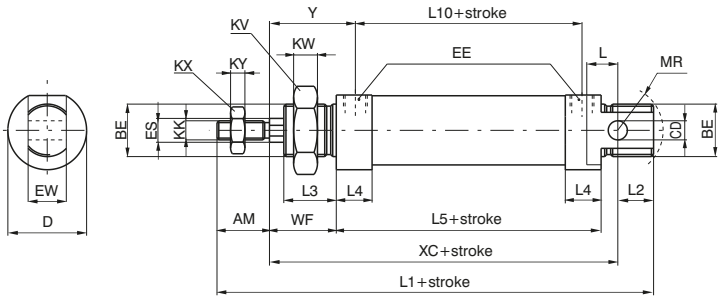


Table of dimensions

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	G1/8"	G1/8"	G1/8"	G1/4"	G1/4"
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
L11		-	-	-	1,5	2	2	2	2	2
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
g	every 10mm	6	7	5	5	8	11	15	19	21

Without rear eye version

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

Through rod cylinder version

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

Hexagonal rod version

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

(*) These dimensions increase of 10 mm for microbore cylinders equipped with magnetic piston and spring return, and of 9 mm for microbore cylinders with 10 mm BORE magnetic piston

Series 1200, Rolled end covers “MIR”

Construction characteristics

End caps	hard anodised aluminium
Barrel	stainless steel AISI 304
Piston rod	stainless steel
Piston	brass (ø8-10-12) aluminium (ø16-20-25)
Seals	Standard: NBR Oil resistant rubber, PUR Piston rod seals (HNBR or FPM seals available upon request)
Mounting	steel painted in cataphoresis
Forks	zinc plated steel
Single-acting springs	C98 zinc plated steel for springs
Cushioning length	ø 16 - 20 - 25 - 32 mm 15 - 18 - 18 - 18

Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Maximum working pressure	10 bar
Working temperature	-5°C - +70°C with standard seals magnetic or non magnetic piston
	-5°C - +80°C with FPM seals magnetic piston
	-5°C - +80°C with HNBR seals magnetic piston
	-5°C - +120°C with HNBR seals non magnetic piston
	-5°C - +150°C with FPM seals non magnetic piston

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device)
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

Please note: air must be dried for applications with lower temperature.
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.
Our Technical Department will be glad to help.

Standard strokes

Double acting version
Ø8 - Ø10 : 15 - 25 - 50 - 75 - 80 - 100 mm
Ø12 - Ø16 : 15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 mm
Ø20 - Ø25 : 15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 - 320 - 350 - 400 mm
Ø32 : 15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 - 320 - 350 - 400 - 450 - 500 mm
On request are available strokes up to:
Ø8 - Ø10 : 250 mm
Ø12 - Ø16 : 700 mm
Ø20 - Ø32 : 1000 mm

Single acting version
Front spring **Ø8 - Ø32 :** up to stroke 50 mm
Rear spring **Ø16 - Ø32 :** up to stroke 50 mm

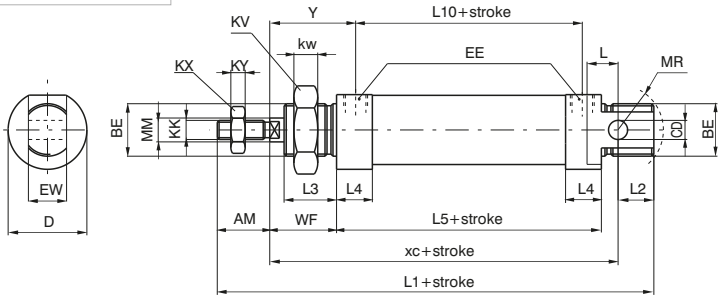
Minimum and maximum springs load for single acting version

Bore	Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
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

Basic version

Ordering code	Description
1280.Ø.stroke	Basic version
1291.Ø.stroke	Basic version front spring (max stroke 50 mm)
1292.Ø.stroke	Basic version rear spring from Ø16 (max stroke 50 mm)
12– –.Ø.stroke.A	Adjustable cushioning (from Ø16)
12– –.Ø.stroke.M	Magnetic piston
12– –.Ø.stroke.A.M	Cushioning with magnetic piston (from Ø16)
12– –.Ø.stroke. . . .T	HNBR seals version
12– –.Ø.stroke. . . .V	FPM seals version

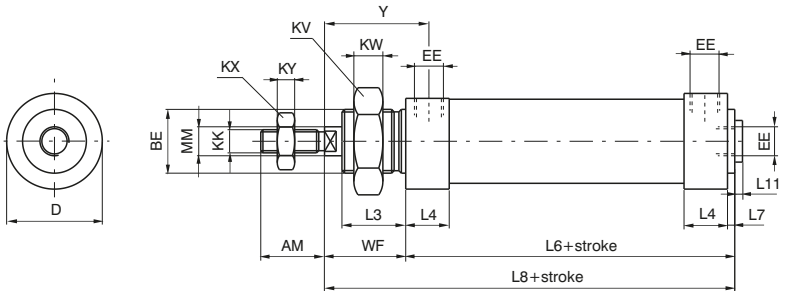
Standard version, fully compliant with ISO standards. Can use all available mountings. For single acting type, the maximum stroke is 50 mm., after which overall dimensions increase in length to an extent not proportional to the stroke (and in any case not longer than stroke 100).



Without rear eye version

Ordering code	Description
1281.Ø.stroke	Without rear eye
1293.Ø.stroke	Without rear eye front spring (max stroke 50 mm)
1294.Ø.stroke	Without rear eye rear spring from Ø16 (max stroke 50 mm)
12– –.Ø.stroke.A	Adjustable cushioning (from Ø16)
12– –.Ø.stroke.M	Magnetic piston
12– –.Ø.stroke.A.M	Cushioning with magnetic piston (from Ø16)
12– –.Ø.stroke. . . .T	HNBR seals version
12– –.Ø.stroke. . . .V	FPM seals version

Version derived from standard version 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.



Through rod cylinder version

Ordering code	Description
1282.Ø.stroke	Through rod cylinder version
1282.Ø.stroke.M	Magnetic piston
1282.Ø.stroke.A	Adjustable cushioning (from Ø16)
1282.Ø.stroke.A.M	Cushioning with magnetic piston (from Ø16)
1282.Ø.stroke. . . .T	HNBR seals version
1282.Ø.stroke. . . .V	FPM seals version

This version having rods coming out from both end caps with overall dimensions, except for the rod, equal to 1280 version. This version is not suitable for Ø8 and Ø10 due to difficulty in anchoring the pistons to rods.

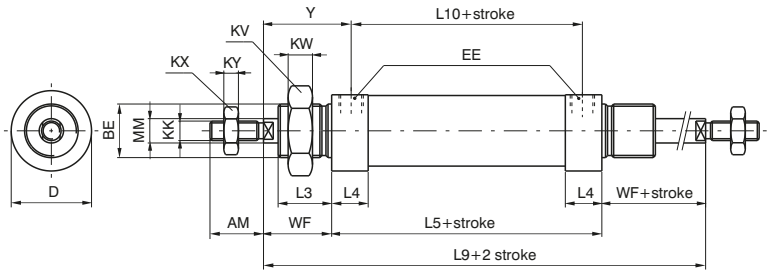


Table of dimensions

		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	13	13
L1 (±1)	*	86	86	105	111	130	141	139
L2		10	10	14	13	15	15	14
L3		12	12	17	17	18	22	22
L4		9	9	9	11	15,5	15	14,5
L5 (±1)	*	46	46	50	56	68	69	69
L6	*	48	48	52	58	70,5	71,5	71,5
L7		2	2	2	2	2,5	2,5	2,5
L8	*	64	64	74	80	94,5	99,5	99,5
L9 (±1,2)	*	78	78	94	100	116	125	125
L10 (±1)	*	37	37	41	45	52,5	53	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	19	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
g	every 10mm	2	2,5	4	5	7,5	11,5	18
Variations of the versions: *without rear eye version*								
Weight	stroke 0	25	30	60	75	150	185	290
g	every 10mm	2	2,5	4	5	7,5	11,5	18
Through rod cylinder version								
Weight	stroke 0	35	40	75	95	200	250	370
g	every 10mm	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).

Series 1200, Rolled end caps “MIR-INOX”

Construction characteristics

End caps	stainless steel AISI 316
Barrel	stainless steel AISI 304
Piston rod	stainless steel
Piston	aluminium
Piston seals	Standard: NBR oil resistant rubber, PUR piston rod seals (FPM seals available upon request)
Mounting	stainless steel AISI 304
Forks	stainless steel AISI 304

Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Maximum working pressure	10 bar
Working temperature	-5°C - +70°C with standard seals magnetic or non magnetic piston
	-5°C - +80°C with FPM seals magnetic piston
	-5°C - +150°C with FPM seals non magnetic piston

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device)
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

Please note: air must be dried for applications with lower temperature.
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.
Our Technical Department will be glad to help.

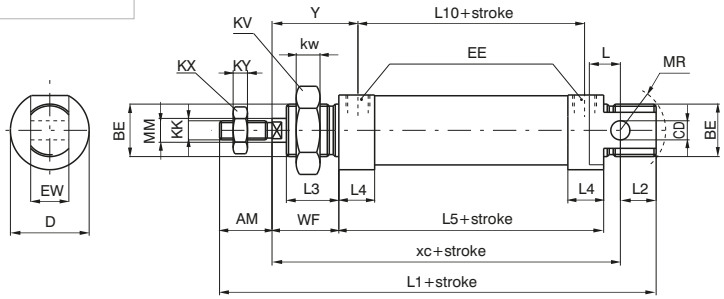
Standard strokes
Double acting version
Ø16 : 15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 mm
Ø20 - Ø25 : 15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 - 320 - 350 - 400 mm
Ø32 : 15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 - 320 - 350 - 400 - 450 - 500 mm
On request are available strokes up to:
Ø16 : 700 mm
Ø20 - Ø32: 1000 mm

Basic version

Ordering code	Description
1280.Ø.stroke.X	Inox non-magnetic version, NBR seals
1280.Ø.stroke.XV	Inox non-magnetic, FPM seals
1280.Ø.stroke.AX	Inox non-magnetic version with cushions*, NBR seals
1280.Ø.stroke.AXV	Inox non-magnetic version with cushions*, FPM seals
1280.Ø.stroke.MX	Inox magnetic version, NBR seals
1280.Ø.stroke.MXV	Inox magnetic version, FPM seals
1280.Ø.stroke.AMX	Inox magnetic version with cushions*, NBR seals
1280.Ø.stroke.AMXV	Inox magnetic version with cushions*, FPM seals

* no adjustable cushioning

Standard version, fully complying with ISO standards.



Through rod cylinder version

Ordering code	Description
1282.Ø.stroke.X	Inox non-magnetic version, NBR seals
1282.Ø.stroke.XV	Inox non-magnetic, FPM seals
1282.Ø.stroke.AX	Inox non-magnetic version with cushions*, NBR seals
1282.Ø.stroke.AXV	Inox non-magnetic version with cushions*, FPM seals
1282.Ø.stroke.MX	Inox magnetic version, NBR seals
1282.Ø.stroke.MXV	Inox magnetic version, FPM seals
1282.Ø.stroke.AMX	Inox magnetic version with cushions*, NBR seals
1282.Ø.stroke.AMXV	Inox magnetic version with cushions*, FPM seals

* no adjustable cushioning

This version having rods coming out from both end caps, with overall dimensions, except for the rod, equal to 1280 version.

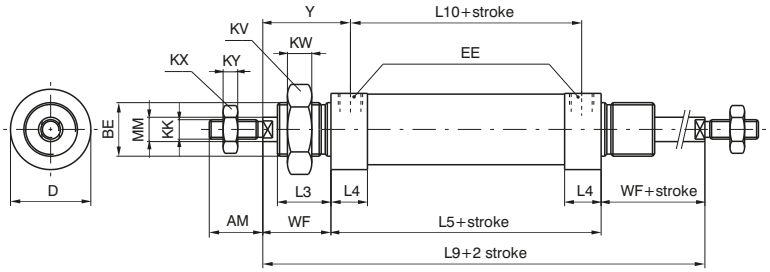


Table of dimensions

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

	Standard weight (g)		Weight through rod version (g)	
Bore	**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

Series 1200, TECNO-MIR

Construction characteristic

End caps	nylon 66 reinforced with glass fibres
Barrel	nylon 66 reinforced with glass fibres
Piston rod	C43 Chromed (non magnetic piston version) stainless steel (magnetic piston version)
Piston	aluminium
Seal	NBR oil-resistant rubber seal
Piston rod seal	PUR
Mounting	steel painted / stainless steel AISI 304
Forks	zinc plated steel / stainless steel AISI 304

Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Maximum working pressure	8 bar
Working temperature	-5°C - +50°C

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device)
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

Please note: air must be dried for applications with lower temperature.
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.
Our Technical Department will be glad to help.

Standard strokes

Double acting version

Ø12 : 15 - 25 - 50 - 75 - 80 - 100 - 125 - 150 - 160 - 200 mm
Ø16 : 15 - 25 - 50 - 75 - 80 - 100 - 125 - 150 - 160 - 200 - 250 mm
Ø20 - Ø25 : 15 - 25 - 50 - 75 - 80 - 100 - 125 - 150 - 160 - 200 - 250 - 300 mm
On request are available strokes up to:
Ø12 : 200 mm
Ø16 : 250 mm
Ø20 - Ø25: 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

WEIGHT TABLE SERIES TECNO MIR 1230 - 1231

WEIGHT g	Bore	Ø12	Ø16	Ø20	Ø25
	storke 0	50 gr.	65 gr.	120 gr.	160 gr.
	every 10mm	3,75 gr.	4 gr.	6,5 gr.	9 gr.

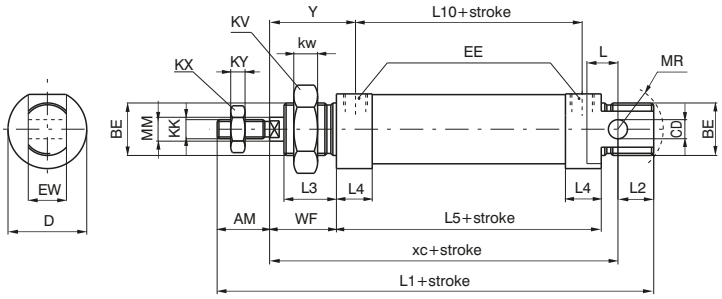
WEIGHT TABLE SERIES TECNO MIR 1232

WEIGHT g	Bore	Ø12	Ø16	Ø20	Ø25
	stroke 0	60 gr.	75 gr.	180 gr.	200 gr.
	every 10mm	7 gr.	8,5 gr.	10 gr.	20 gr.

Basic version

Ordering code	Description
1230.Ø.stroke	Basic version
1230.Ø.stroke.M	Basic version magnetic piston

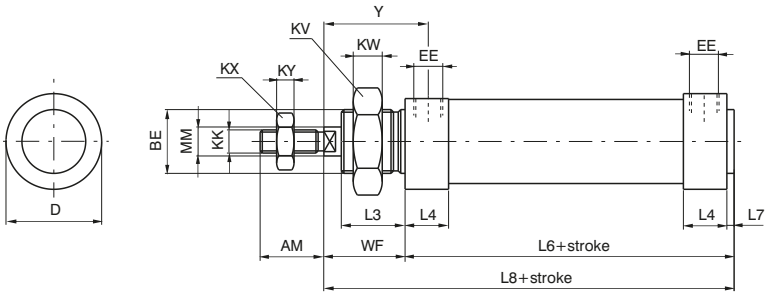
Standard version, fully complying with ISO standards. Can use all available mountings.



Without rear eye version

Ordering code	Description
1231.Ø.stroke	Without rear eye version
1231.Ø.stroke.M	Without rear eye version magnetic piston

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



Through rod cylinder version

Ordering code	Description
1232.Ø.stroke	Through rod cylinder version
1232.Ø.stroke.M	Through rod cylinder version magnetic piston

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

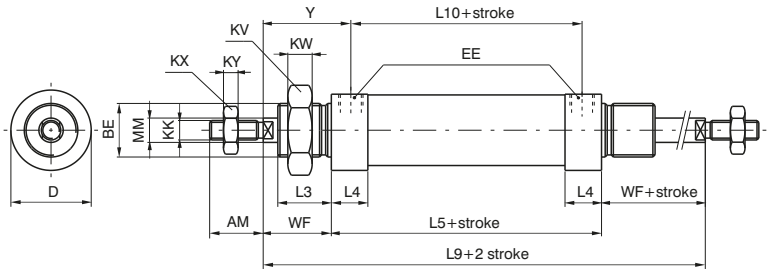


Table of dimensions

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

Series 1200 Steel line

General

The 12X stainless steel ISO 6432 microbore cylinders series are designed for corrosion resistance application such as marine, pharmaceutical and food ambiences.
The pre lubrication grease used is NSF H1 certified for food application.
Specific care has been taken during the design stages and the result is a clean profile cylinder easy to clean and free from possible residue build-up areas. All parts in contact with the external environment are in Stainless steel 316L and the seals are available in three different compounds for different temperature applications:
PUR -30C° - +80C°, FPM -5°C - +150°C and NBR -5°C - +70°C.
The range starts from 16 bore up to 63 bore, double acting version standard or with through rod, magnetic or not magnetic piston available.
The end caps are crimped onto the barrel for bore sizes 16 to 25 and screwed on the barrel from 32 to 63 bore.
Depending on the type of mounting required it is possible to choose different end caps style.
The piston is aluminium and the sensor bracket, when required is in stainless steel 316 with plastic adaptor or in plastic material. The cylinder can be fixed with the wide range of stainless steel accessories.

Construction characteristics

End caps, barrel, piston rod	Stainless steel AISI 316
Piston	Aluminium
Seals	NBR (PUR piston rod seals) FPM PUR
Fixing / Accessories	AISI 316 / 304

Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Max. pressure	10 bar
Bore Cushioning lenght	Ø 16 - 20 - 25 - 32 - 40 - 50 - 63 mm 15 - 18 - 18 - 18 - 22 - 22 - 25

Operating temperature

Seals material	Operating temperature	Piston		Cushioning		Bores
		Magnetic	Non magnetic	Pneumatic adjustable	Pneumatic fix	
NBR	-5°C - +70°C	●	●	●	●	Ø16-Ø20-Ø25-Ø32-Ø40-Ø50-Ø63
FPM	-5°C - +80°C	●		●	●	Ø16-Ø20-Ø25-Ø32-Ø40-Ø50-Ø63
	-5°C - +150°C		●	●	●	Ø16-Ø20-Ø25-Ø32-Ø40-Ø50-Ø63
PUR	-5°C - +70°C	●	●	●		Ø16-Ø20-Ø25-Ø32
	-30°C - +80°C	●	●		●	Ø16-Ø20-Ø25-Ø32
		●	●	●	●	Ø40-Ø50-Ø63

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device)
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

Please note: air must be dried for applications with lower temperature.
Our Technical Department will be glad to help.

Standard strokes

Ø16 :

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

Ø20 - Ø25 :

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

Ø32 - Ø63 :

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

Coding key

12X _ _ . _ _ _ . _ _ _ _ . _ . _

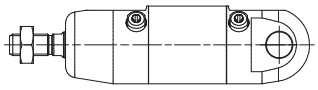
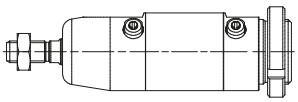
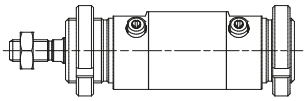
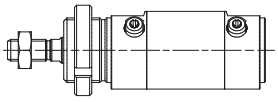
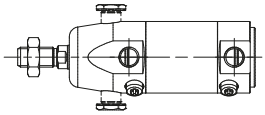
FUNCTION	
A	Double acting
B	Double acting cushioned
C	Double acting through rod
D	Double acting cushioned through rod

BORE
016
020
025
032
040
050
063

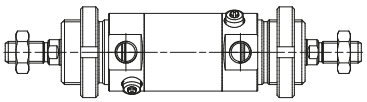
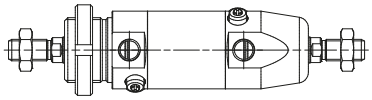
STROKE

MAGNETIC PISTON VARIANTS	
M	Magnetic piston max. temperature +80°C
N	Non magnetic piston

SEALS	
N	NBR
V	FPM
P	PUR

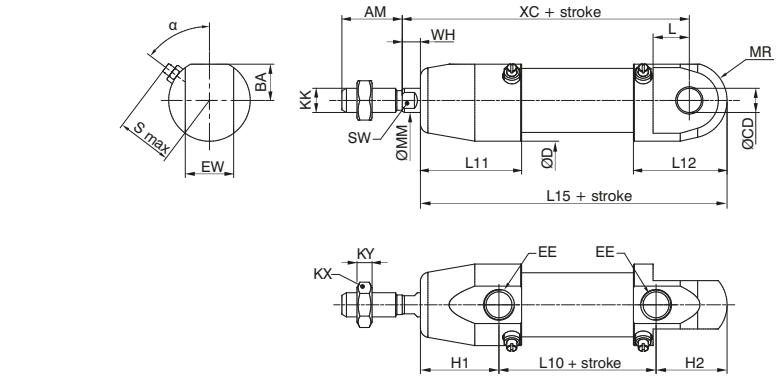
	TYPE		
	FRONT END CAP	BASIC VERSION	REAR END CAP
A	CLEAN PROFILE		WITH INTEGRATED TRUNNION
B	CLEAN PROFILE		THREADED
C	THREADED		THREADED
D	THREADED		SHORT END CAP
E*	FOR PIN		SHORT END CAP

* Available only for Ø32 - Ø40 - Ø50 - Ø63

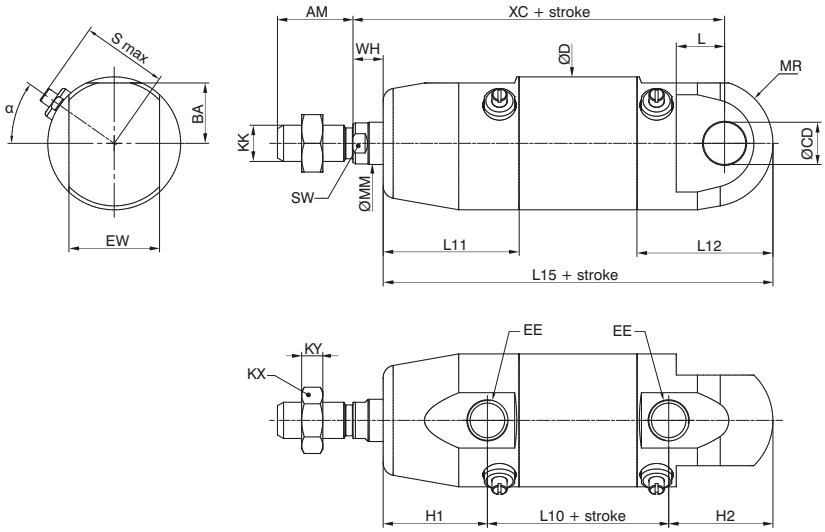
	END CAP	THROUGH ROD CYLINDER VERSION	END CAP
S	THREADED		THREADED
T	THREADED		CLEAN PROFILE

Cylinder type "A"

from Ø16 to Ø25

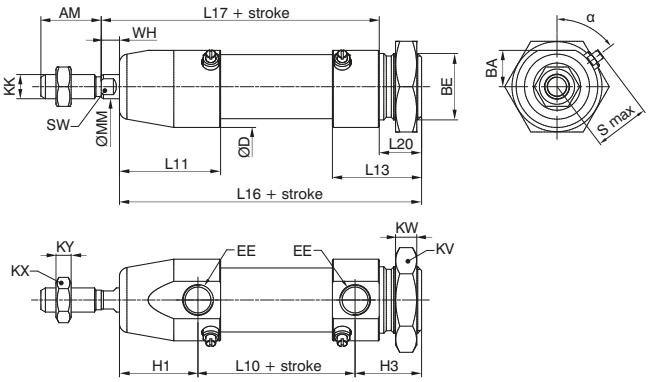


from Ø32 to Ø63

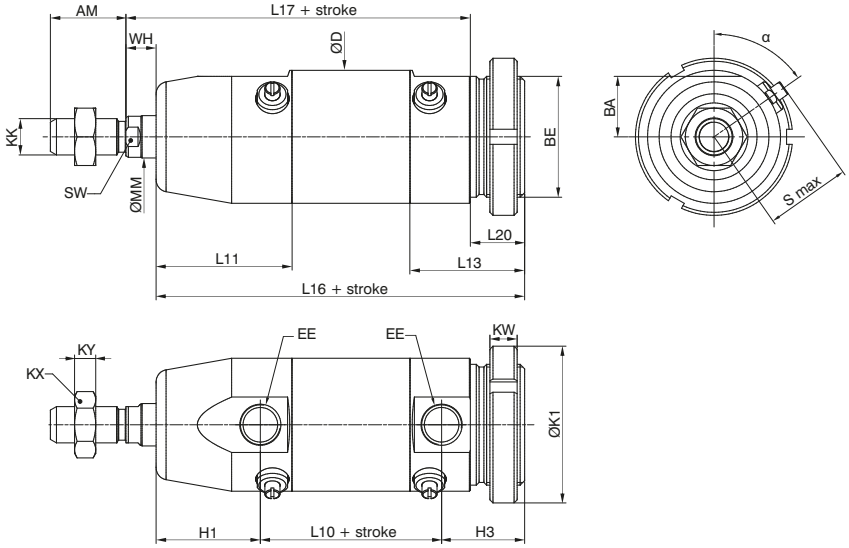


Cylinder type "B"

from Ø16 to Ø25

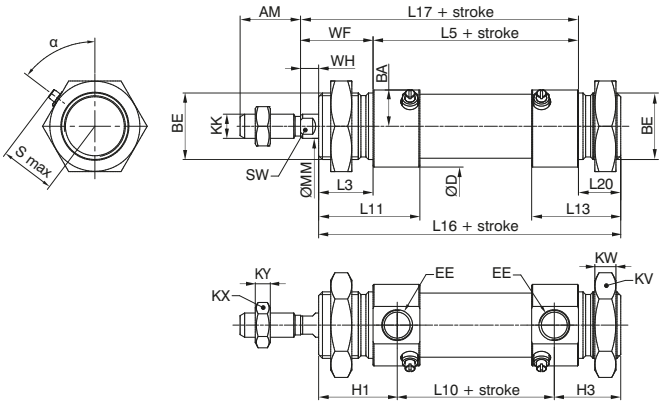


from Ø32 to Ø63

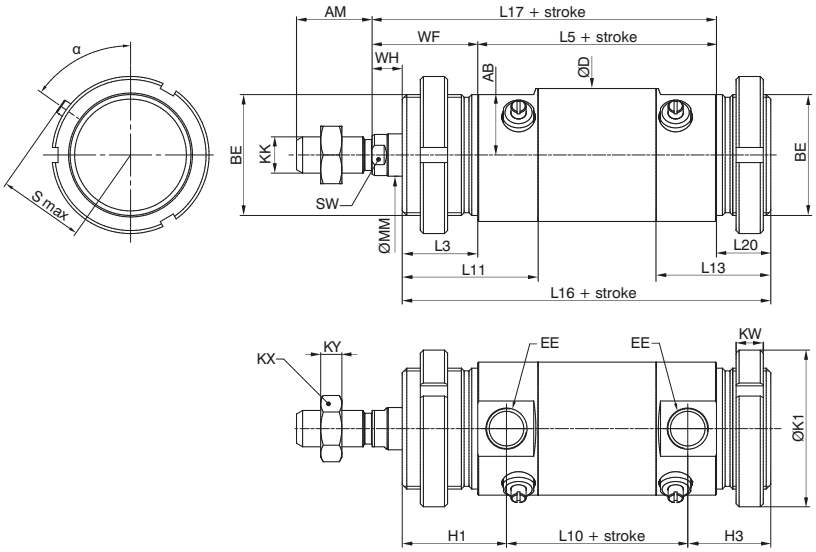


Cylinder type "C"

from Ø16 to Ø25

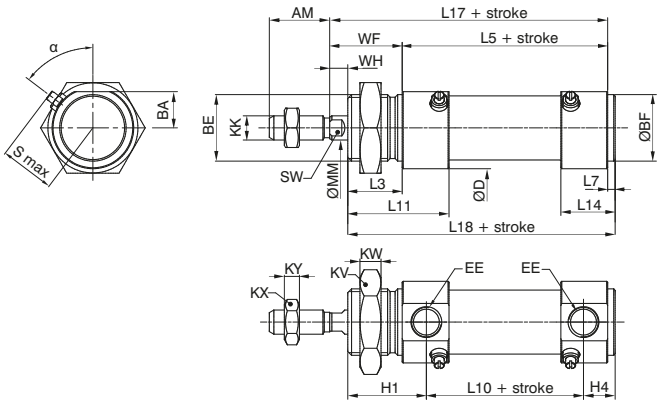


from Ø32 to Ø63

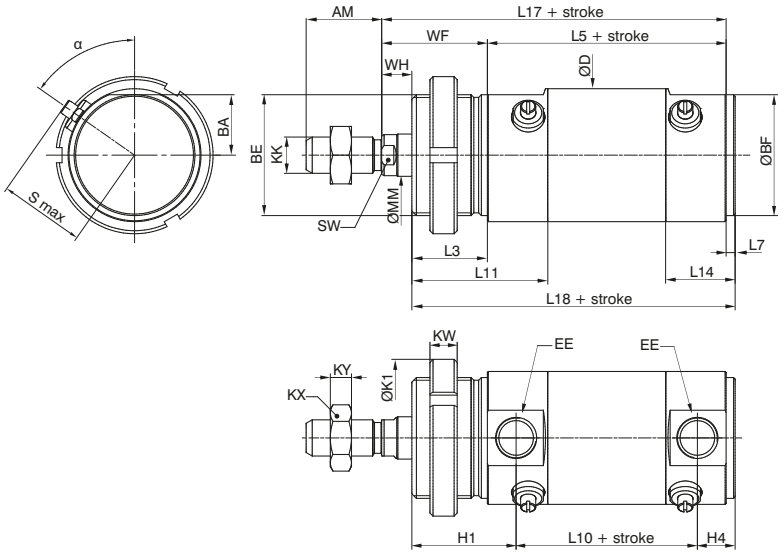


Cylinder type "D"

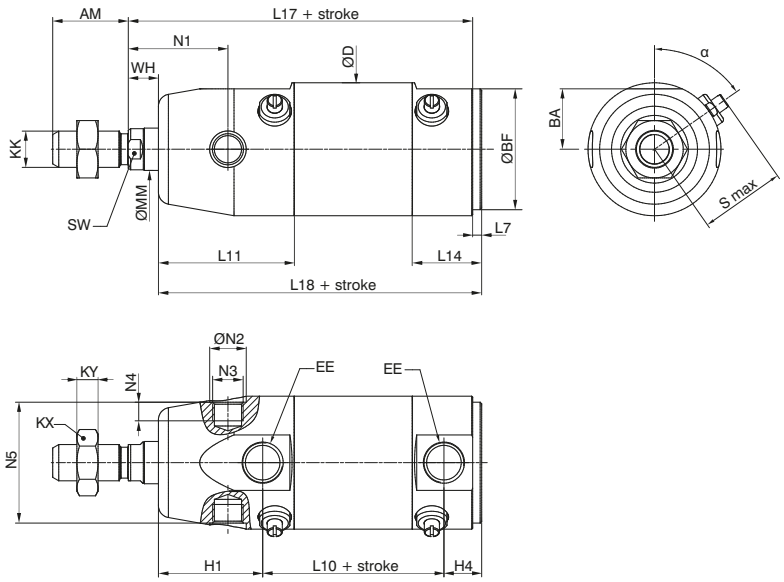
from Ø16 to Ø25



from Ø32 to Ø63

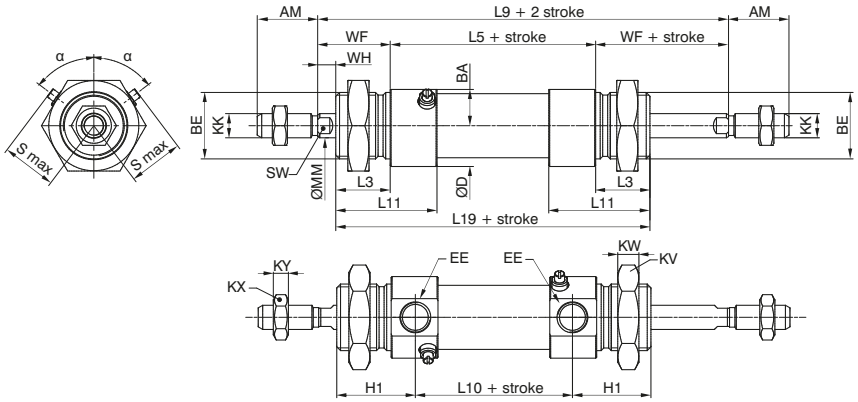


Cylinder type "E"

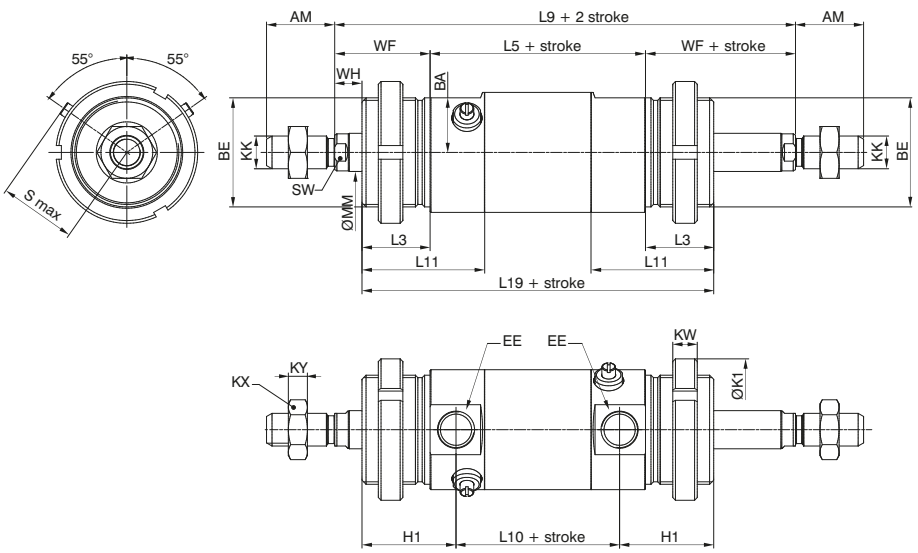


from Ø32 to Ø63

Cylinder type "S"

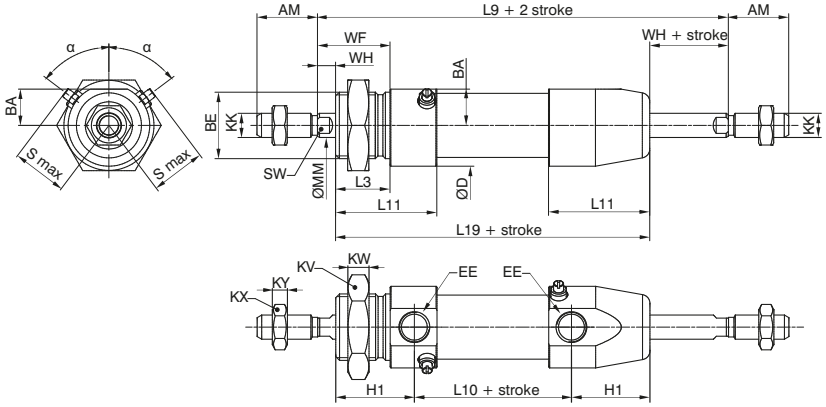


from Ø16 to Ø25

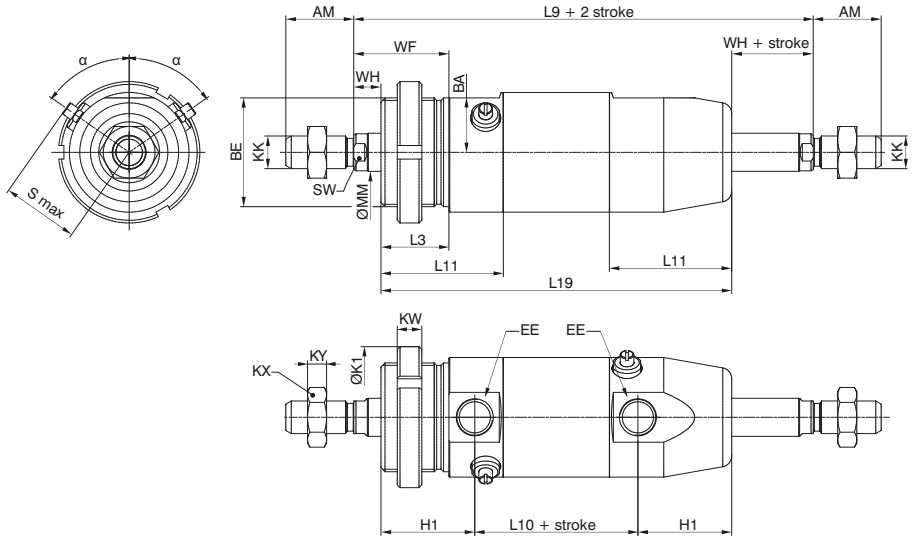


from Ø32 to Ø63

Cylinder type "T"

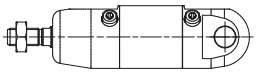
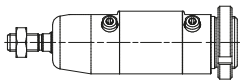
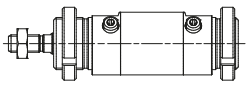
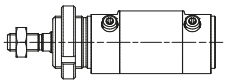
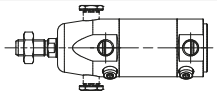


from Ø16 to Ø25



from Ø32 to Ø63

Weight charts

	BASIC VERSION		WEIGHT (g)						
			Ø16	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63
A		Stroke 0	131	264	371	621	1060	1600	3150
		every each 10mm	5	7	11	26	33	42	65
B		Stroke 0	150	310	410	666	1160	1700	3230
		every each 10mm	5	7	11	26	33	42	65
C		Stroke 0	153	323	411	688	1200	1660	3060
		every each 10mm	5	7	11	26	33	42	65
D		Stroke 0	129	267	359	580	1020	1460	2800
		every each 10mm	5	7	11	26	33	42	65
E*		Stroke 0	/	/	/	558	960	1480	2930
		every each 10mm	/	/	/	26	33	42	65

* Available only for Ø32 - Ø40 - Ø50 - Ø63

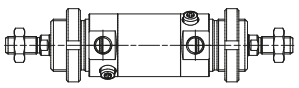
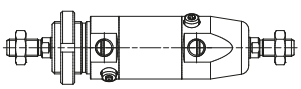
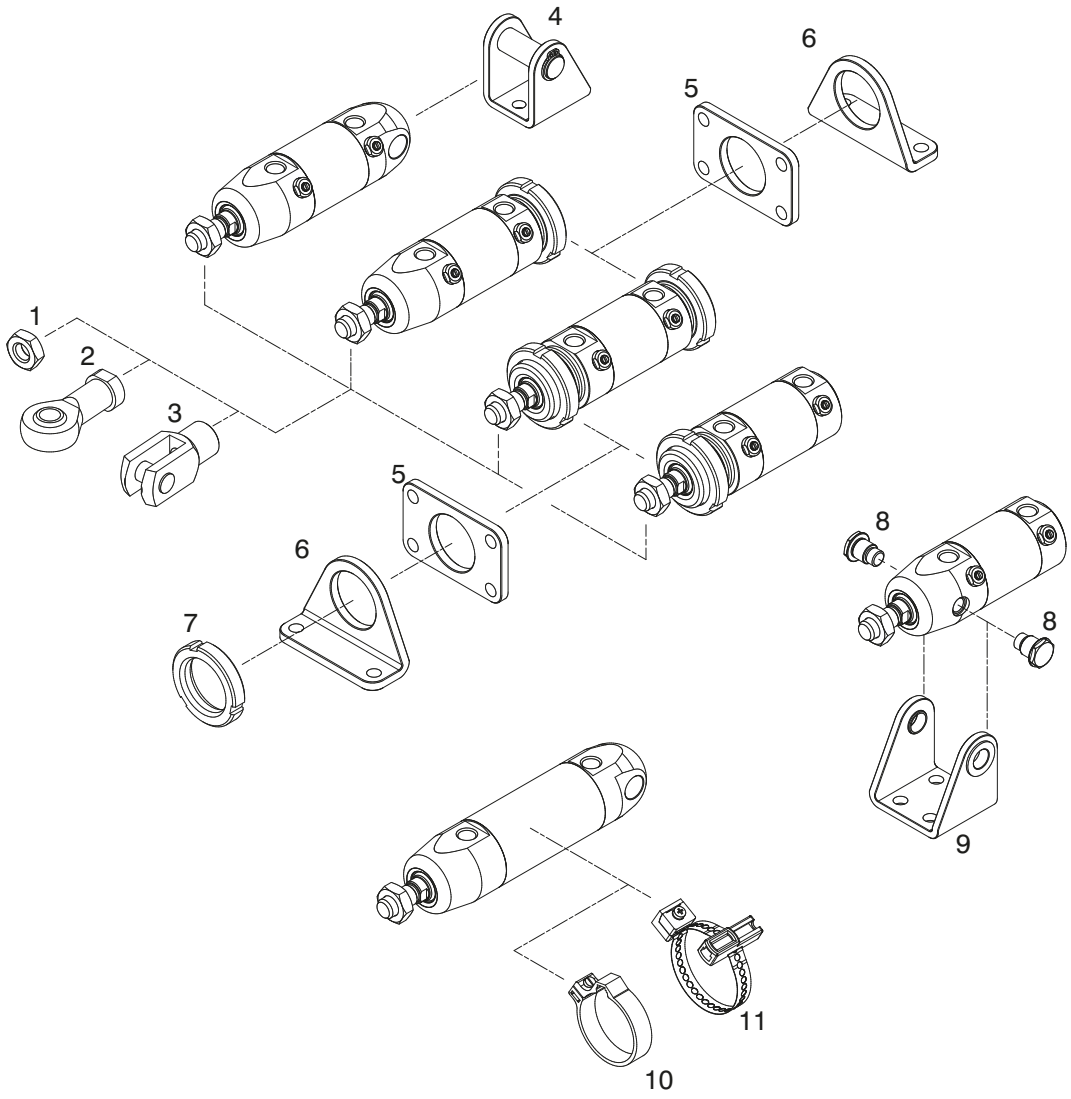
	THROUGH ROD CYLINDER VERSION		Ø16	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63
S		Stroke 0	172	350	465	745	1364	1793	3318
		every each 10mm	7	11	18	35	48	58	90
T		Stroke 0	181	336	470	723	1299	1832	3483
		every each 10mm	7	11	18	35	48	58	90

Table of dimensions

Bore	Ø16	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63
α	53°	53°	53°	55°	55°	55°	55°
AM	16	20	22	20	25	25	32
BA	9	12	13,5	16	20	25	31
BE	M16x1,5	M22x1,5	M22x1,5	M30x1,5	M40x1,5	M40x1,5	M45x1,5
ØBF	16	22	22	30	40	40	45
EE	M5	G1/8	G1/8	G1/8	G1/4	G1/4	G3/8
EW	12	16	16	26	30	30	40
ØCD ^{H9}	6	8	8	12	14	14	16
ØD	21	27	30	36	44	54	68
H1	22,5	26	30	30	34,5	34,5	40
H2	17,5	23,5	27,5	30	34,5	34,5	40
H3	16,5	22	22	23	27,5	27,5	30
H4	7,5	10,5	10,5	10,5	12,5	12,5	16
ØK1	/	/	/	/	52	52	60
KK	M6x1	M8x1,25	M10x1,25	M10x1,25	M12x1,75	M12x1,75	M16x1,5
KX	10	13	17	17	19	19	24
KY	4	5	6	6	7	7	8
KV	22	30	30	42	/	/	/
KW	6	7	7	8	9	9	10
L	9	12	14	13	16	16	22
L3	17	18	22	22	25	25	28
L5	56	68	69	69	79	82	106
L7	2	2,5	2,5	2,5	3	3	4
L9	100	116	125	125	149	152	180
L10	45	52	53	53	60	63	82
L11	28	33,5	37	38,5	45	45	54
L12	23	31	34,5	38,5	45	45	54
L13	22	29,5	29	31,5	38	38	44
L14	12,8	18	17,5	19	23	23	30
L15	85	101,5	110,5	113	129	132	162
L16	84	100	105	106	122	125	152
L17	78	92	97	97	114	117	143
L18	75	88,5	93,5	93,5	107	110	138
L19	90	104	113	113	129	132	162
L20	11	14	14	15	18	18	18
ØMM	6	8	10	12	14	16	20
MR	8	12,5	12,5	17	21	26	34,5
N1	/	/	/	27	33	40	45
ØN2 $^{+0/-0,05}$	/	/	/	10,1	12,1	14,1	16,1
N3	/	/	/	M8x0,75	M10x1	M12x1	M14x1
N4	/	/	/	5,5	6	8,7	11,7
N5 $^{+0,1/-0}$	/	/	/	32	40	50	64
Smax	15,5	18,5	19,5	25	28,5	33,5	40
SW	5	6	8	10	12	12	17
WF	22	24	28	28	35	35	37
WH	5	6	6	6	10	10	9
XC	82	95	104	105	123	126	154

Accessories and fixing devices

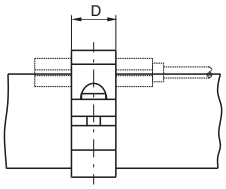


Position	Description	Ordering code	Materials
1	Rod lock nut	12X.Ø.11	Stainless steel AISI 316
2	Ball joint	12X.Ø.10	Stainless steel
3	Fork	12X.Ø.04	Stainless steel
4	Rear clevis	12X.Ø.03	Stainless steel
5	Flange	12X.Ø.02	Stainless steel AISI 316
6	Foot	12X.Ø.01	Stainless steel AISI 316
7	Nut or lock nut for the endcaps	12X.Ø.05	Stainless steel AISI 316
8	Pin for front clevis (Ø32 - Ø63)	12X.Ø.09	Stainless steel AISI 316
9	Front clevis (Ø32 - Ø63)	12X.Ø.08	Stainless steel AISI 316
10	Sensor clamp (Ø16 - Ø50)	12X.Ø.FS	Technopolymer
11	Sensor clamp (Ø16 - Ø63)	12X.Ø.FSX	Stainless steel Technopolymer

Sensor clamps cod. 1580._, MRS._, MHS._

Ordering code
12X.Ø.FS

The kit comprises:
n° 1 clamp (Technopolymer)
n° 1 screw (AISI 304)
n° 1 nut (AISI 304)



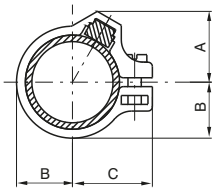


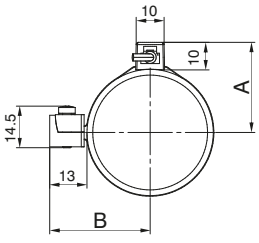
Table of dimensions

Bore	Ø16	Ø20	Ø25	Ø32	Ø40	Ø50
A	14,5	16	17,5	20,5	22	29
B	10,5	12,5	15,3	20	24	29
C	16	18	20,5	26	30	35
D	10	10	10	10	10	10
Weight (g)	3	5	7	8	10	11

Sensor clamps cod. 1580._, MRS._, MHS._

Ordering code
12X.Ø.FSX

The kit comprises:
n° 1 clamp (AISI 304)
n° 1 switch bracket + support (Technopolymer)
n° 1 screw (AISI 304)
n° 1 nut (AISI 304)



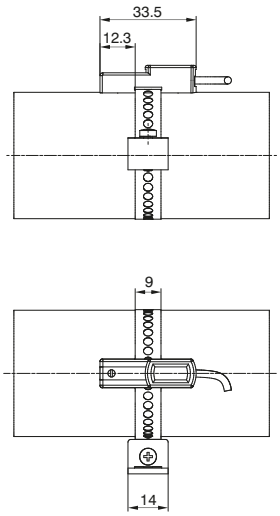


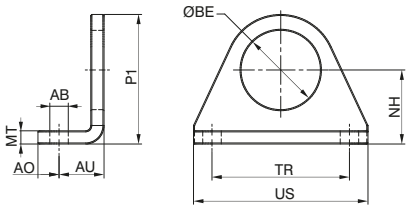
Table of dimensions

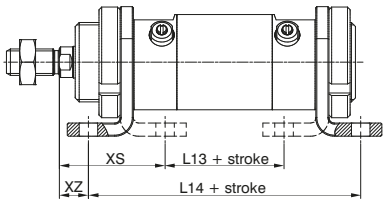
Bore	Ø16	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63
A	19	21	23	28	32	37	44
B	22	24	26	31	35	40	47

Foot

Ordering code
12X.Ø.01

The kit comprises:
n° 1 foot (AISI 316)





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 316.

Bore	16	20	25	32	40	50	63
AB (H13)	5,5	6,5	6,5	6,5	9	9	9
AO	6	8	8	8	10	10	10
AU	14	17	17	17	20	20	20
ØBE	16	22	22	30	40	40	45
L13 (±1)	36	44	44	45	49	52	78
L14 (±1)	84	102	102	103	119	122	146
MT	4	5	5	5	5	5	6
NH (±0.3)	20	25	25	28	40	40	50
P1	33	45	45	50	66,5	66,5	80
TR (Js14)	32	40	40	52	70	70	70
US	42	54	54	66	90	90	90
XS (±1.4)	32	36	40	40	50	50	51
XZ (±1.4)	8	7	11	11	15	15	17
Weight g.	45	90	90	110	210	210	262

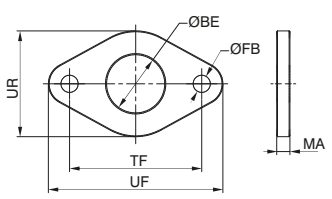
Flange

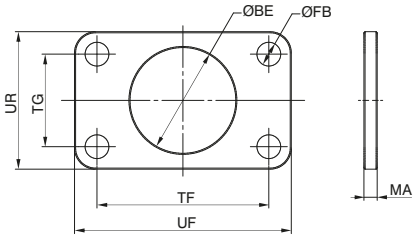
Ordering code
12X.Ø.02

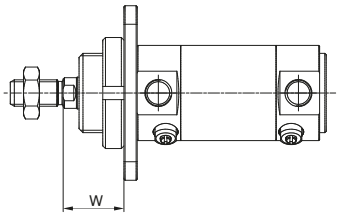
The kit comprises:
n° 1 flange (AISI 316)

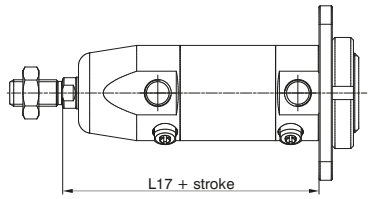
(For Ø16 - Ø20 - Ø25)

(For Ø32 - Ø40 - Ø50 - Ø63)









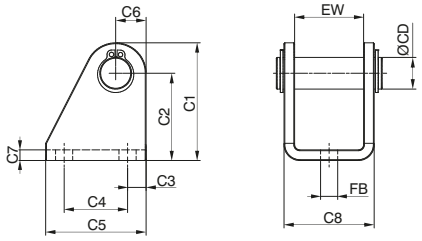
Use to mount the microcylinder at a right angle to the mounting plane.
Made of stainless steel AISI 316.

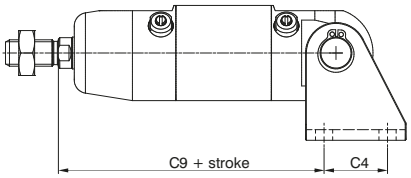
Bore	16	20	25	32	40	50	63
ØBE	16	22	22	30	40	40	45
ØFB (H13)	5,5	6,5	6,5	6,5	9	9	9
UF	53	66	66	68	82	82	96
UR	30	40	40	50	52	52	70
MA	4	5	5	5	5	5	6
TF (JS14)	40	50	50	52	65	65	76
TG	/	/	/	/	35	35	50
W (±1.4)	18	19	23	23	30	30	31
L17	78	92	97	97	114	117	143
Weight g.	40	85	85	100	105	105	225

Rear clevis

Ordering code
12X.Ø.03

The kit comprises:
n° 1 clevis (AISI 316)
n° 1 pin (AISI 316)
n° 2 circlips (AISI 420)





Used to mount by using the rear end 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.

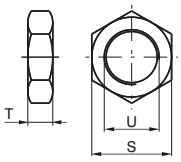
Bore	16	20	25	32	40	50	63
ØCD	6	8	8	12	14	14	16
C1	33,5	39,5	39,5	44,5	53,5	53,5	64
C2 (±0.3)	27	30	30	33	40	40	50
C3	5	6	6	7	10	10	8
C4	15	20	20	24	28	28	34
C5	25	32	32	38	45	45	50
C6	6,5	9,5	9,5	11,5	13,5	13,5	14
C7	3	4	4	4	4	4	6
C8	18	24	24	34	38	38	52
C9 (±0.4)	80,5	91,5	100,5	100,5	119,5	122,5	148
EW	12,1	16,1	16,1	26,1	30,5	30,5	40,5
FB (H13)	5,5	6,5	6,5	6,5	8,5	8,5	9
Weight (g)	35	75	75	135	138	138	284

Rod lock nut / Nut or lock nut for the end cap

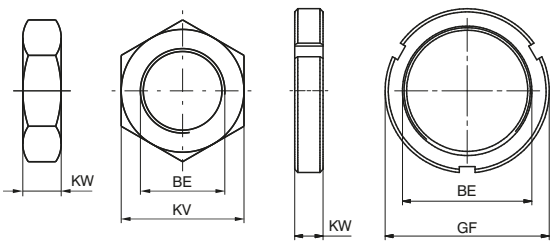
Ordering code
Rod lock nut **12X.Ø.11**
Nut / Lock nut for the end cap **12X.Ø.05**

The kit comprises:
n° 1 rod lock nut (AISI 316)

The kit comprises:
n° 1 nut / lock nut
for the end cap (AISI 316)



Rod lock nut:
Mounted on the rod thread.
Made of stainless steel AISI 316.
Nut / Lock nut for the end cap:
Used to fasten flanges or feet to the endcaps of the microcylinder. The nuts are mounted on diameters that go from Ø16 to Ø25 mm, the lock nuts from Ø32 to Ø63 mm. Both are supplied with the microbore cylinders.



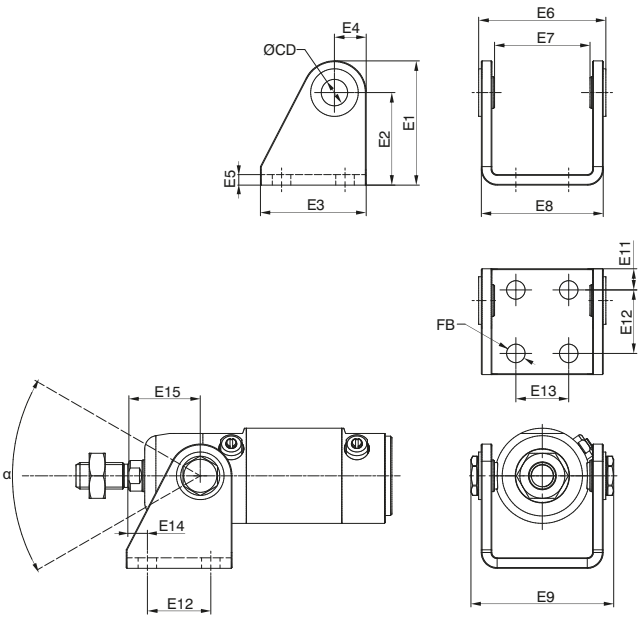
Bore	S	T	U	Dado stelo Weight (g)	BE	KV	GF	KW	Nut / Lock nut for the end caps weight (g)
16	10	4	M6X1	3	M16X1,5	22	-	6	16
20	13	5	M8X1,25	4	M22X1,5	30	-	7	25
25	17	6	M10X1,25	9	M22X1,5	30	-	7	25
32	17	6	M10X1,25	9	M30X1,5	-	42	8	42
40	19	7	M12X1,75	12	M40X1,5	-	52	9	62
50	19	7	M12X1,75	12	M40X1,5	-	52	9	62
63	24	8	M16X1,5	21	M45X1,5	-	60	10	100

Front clevis

Ordering code
12X.Ø.08

The kit comprises:
n° 1 clevis (AISI 316)
n° 2 bushings (Technopolymer)

Used to mount by using the front end cap to mount parallel 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 316.

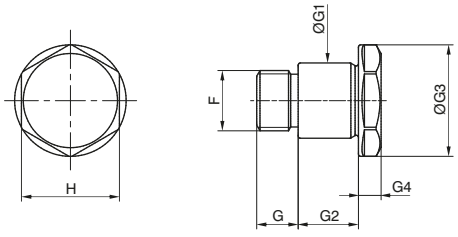


Bore	E1	E2 (±0,2)	E3	E4	E5	E6	E7	E8	E9	E11	E12	E13	E14	E15	FB (H13)	ØCD	α	Weight (g)
32	47	35	40	12	4	48	36	46	54	8	24	20	7	27	7	10	50°	121
40	53	40	50	13	4	60	49	58	68	10	30	28	6	33	9	12	50°	175
50	59	45	54	14	6	74	54	72	84	10	34	36	10	40	9	14	50°	330
63	65	50	65	16	6	88	72	86	98	15	35	42	11	45	9	16	40°	458

Pin for front clevis

Ordering code
12X.Ø.09

The kit comprises:
n° 1 pin (AISI 316)

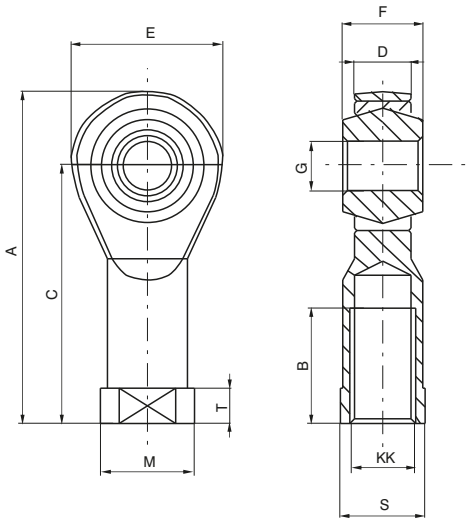


Bore	32	40	50	63
G	5,5	6	8,5	11
G1 (h7)	10	12	14	16
G2	8	10	12	12
G3	15	17	19	24
G4	3	4	5	5
F	M8X0,75	M10X1	M12X1	M14X1
H	13	15	17	21

Ball joint

Ordering code
12X.Ø.10

The kit comprises:
n° 1 ball joint (AISI 304 and 420)



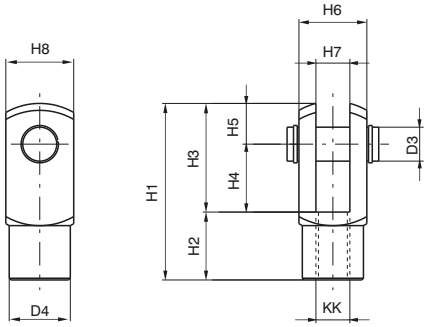
Mounted on the rod thread, assures a regular operation even in the presence of significant forces to the linked element.
Made of stainless steel AISI 304 and 420.

Bore	16	20	25	32	40	50	63
A	40	48	57	57	66	66	85
B	12	16	20	20	22	22	28
C	30	36	43	43	50	50	64
D	6,75	9	10,5	10,5	12	12	15
E	20	24	28	28	32	32	42
F	9	12	14	14	16	16	21
G (H 7)	6	8	10	10	12	12	16
KK	M6	M8	M10X1,25	M10X1,25	M12X1,75	M12X1,75	M16X1,5
M	13	16	19	19	22	22	27
S	11	14	17	17	19	19	22
T	5	5	6,5	6,5	6,5	6,5	8
Weight (g)	25	25	75	75	112	112	222

Cylinder rod fork

Ordering code
12X.Ø.04

The kit comprises:
n° 1 fork (AISI 303)
n° 1 pin (AISI 303)
n° 2 circlips (AISI 420)

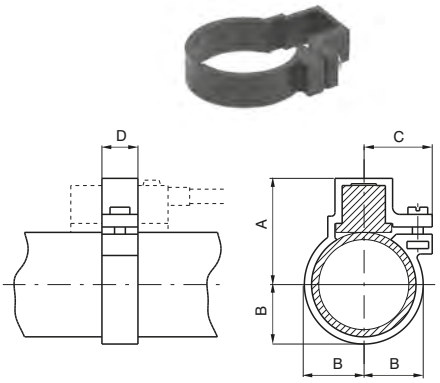


Mounted on the rod thread, assures a regular operation even in the presence of significant forces to the linked element. Made of stainless steel.

Bore	D3	D4	H1	H2	H3	H4	H5	H6	H7 (B12)	H8	KK	Weight (g)
16	6	10	31	12	19	12	7	12	6	12	M6X1	20
20	8	14	42	16	26	16	10	16	8	16	M8X1.25	45
25	10	18	52	20	32	20	12	20	10	20	M10X1.25	90
32	10	18	52	20	32	20	12	20	10	20	M10X1.25	90
40	12	20	62	18	38	24	14	24	12	24	M12X1.75	121
50	12	20	62	18	38	24	14	24	12	24	M12X1.75	121
63	16	26	83	32	51	32	19	32	16	32	M16X1.5	340

Sensor clamps for microbore cylinders with threaded end covers and Technopolymer

Sensor clamps - codes 1500._, RS._, HS._	Sensor clamps - codes 1580._, MRS._, MHS._
Ordering code	Ordering code
1260.Ø.F	**1260.Ø.FS**



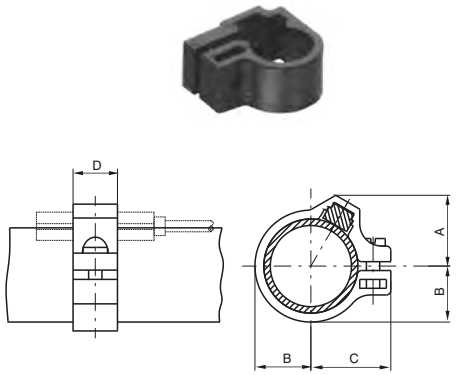


Table of dimensions

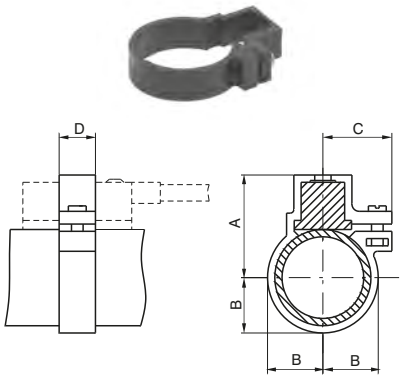
Bore	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32	Ø40	Ø50
A	23	23	25	27	29,5	33	37	42
B	10	10	12	14	16,5	20	24	29
C	15	15	16,5	17,5	19	20	22	24
D	10	10	10	10	10	10	10	10
Weight (gr)	2	2	3	5	7	10	14	16

Table of dimensions

Bore	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32	Ø40	Ø50
A	13	14	15,4	17,2	19,3	20,5	22	29
B	9	10	12	14	16,5	20	24	29
C	16	16	18	19,5	22	26	30	35
D	10	10	10	10	10	10	10	10
Weight (gr)	2	2	3	5	7	8	10	11

Sensor clamps for microbore cylinders with rolled end covers "MIR" and "MIR-INOX"

Sensor clamps - codes 1500._, RS._, HS._	Sensor clamps - codes 1580._, MRS._, MHS._
Ordering code	Ordering code
1280.Ø.F - cylinders MIR 1280.Ø.FX - cylinders MIR-INOX	**1280.Ø.FS - cylinders MIR 1280.Ø.FSX - cylinders MIR-INOX**



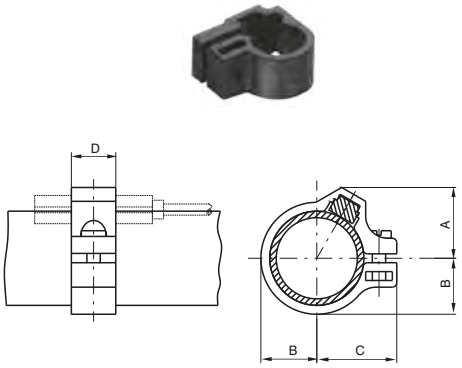


Table of dimensions

Bore	Ø16	Ø20	Ø25	Ø32
A	24	25,5	28,5	31,8
B	10,5	12,5	15,5	18,8
C	16,5	17,5	19	20
D	10	10	10	10
Weight (gr)	3	5	7	10

Table of dimensions

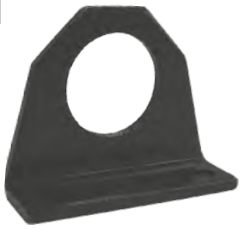
Bore	Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
A	11	12	13	14,5	16	17,5	19,5
B	6,5	7,5	8,5	10,5	12,5	15,3	18,8
C	12,5	13,5	15	16	18	20,5	24
D	10	10	10	10	10	10	10
Weight (gr)	2	2	2	3	5	7	10

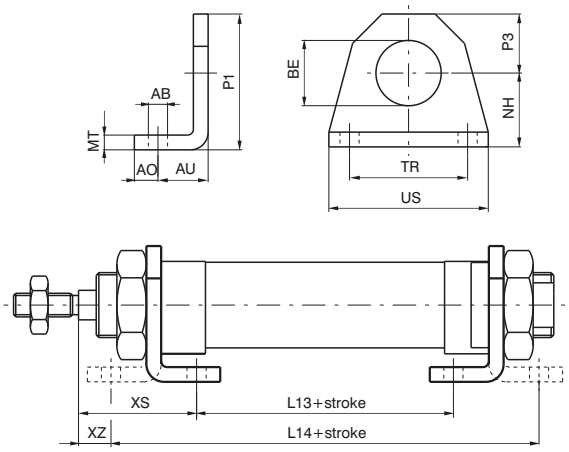
Sensor for microbore cylinders

For technical characteristics and ordering codes see the magnetic sensors sections

Foot

Ordering code
1200.Ø.01 (1 piece)





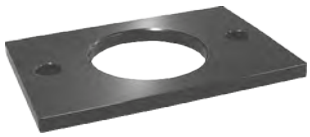
Used to mount the cylinder on the mounting plane with the rod parallel to said plane. Use one for short strokes and two for long strokes. It is made of stamped steel, made corrosion resistant by cataphoreses treatment. Attached to the end caps by means of nuts (or lock nuts) 05.

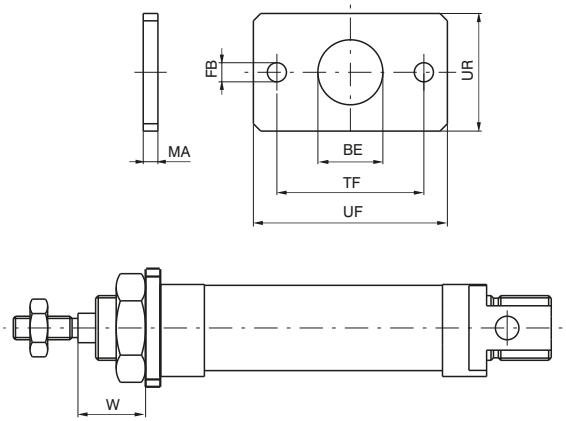
Attention: the dimensions of microbore cylinders with threaded end covers (*) increase of 10 mm. for microbore cylinders equipped with magnetic piston and spring return, and of 9 mm. for microbore cylinders with 10 mm. BORE magnetic piston.

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 g.	22	22	45	45	90	90	110	210	210

Flange

Ordering code
1200.Ø.02 (1 piece)



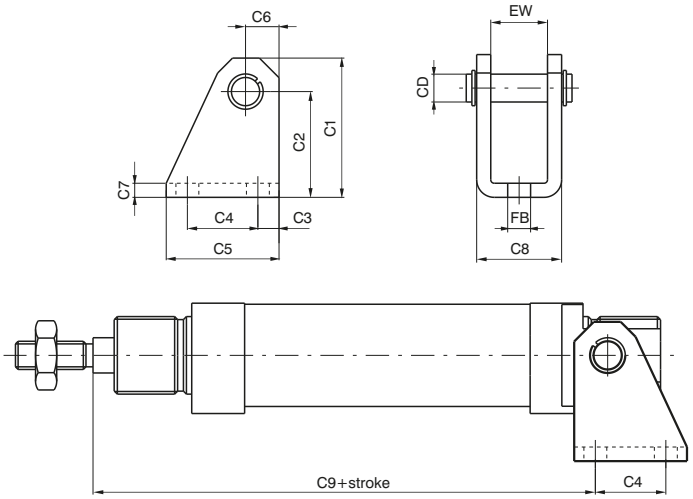


Used to mount the microcylinder at a right angle to the mounting plane. Attached to the front (or rear) end cap by a nut (or lock nut) 05. Made of extruded steel, made corrosion resistant by cataphoresis.

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 g.	20	20	40	40	85	85	100	150	150

Rear eye

Ordering code
1200.Ø.03 (1 piece)



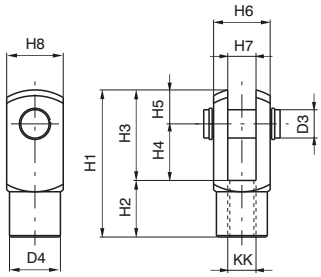
Use with the rear end cover to mount the cylinder either parallel or at a right-angle to the mounting plane. This allows the cylinder to oscillate and self-align with the linked element to the rod. This is necessary when the rod may be subject to lateral during travel.

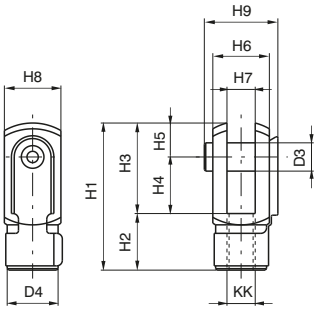
Attention: the dimensions of microbore cylinders with threaded end covers (*) increase by 10mm for equipped with magnetic piston and spring return, and by 9mm for microbore cylinders with 10mm BORE magnetic piston.

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 g.	20	20	35	35	75	75	135	180	180

Cylinder rod forks

Ordering code
1200.Ø.04 * (with pin) **1200.Ø.04/1** (with pin) *Available from bore Ø12

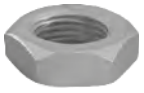


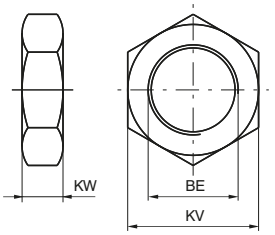


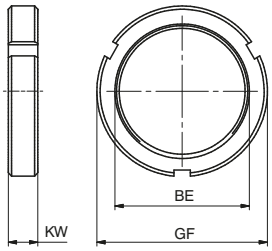
Forks:
Similar to hinge 03, mounted on the rod thread, assures a regular operation even in the presence of significant forces to the linked element. Made of zinc plated steel.
Nut:
Used to fasten flanges or feet to the endcaps of the microcylinder. The nuts are mounted on BORE that go from 8 to 25, the lock nuts on 32, 40 and 50. Both are supplied (one piece) with the microbore cylinders.

Nut or lock nut for the endcaps

Ordering code
1200.Ø.05



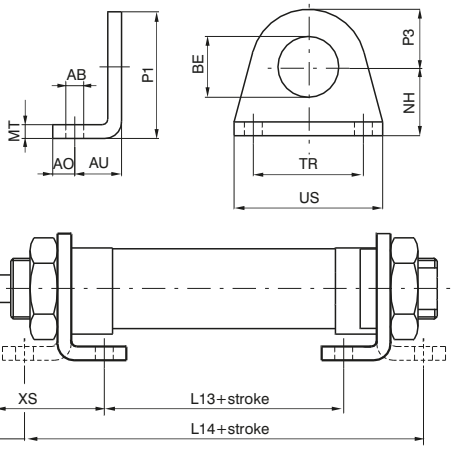




Bore	D3	D4	H1	H2	H3	H4	H5	H6	H7 (B12)	H8	H9	KK	BE	KV	GF	KW	Forks weight g.	Nuts weight g.
8	4	8	21	8	13	8	5	8	4	10	11	M4x0,7	M12x1,25	17	-	5,5	12	7
10	4	8	21	8	13	8	5	8	4	10	11	M4x0,7	M12x1,25	17	-	5,5	12	7
12	6	10	31	12	19	12	7	12	6	12	18	M6x1	M16x1,5	22	-	6	20	16
16	6	10	31	12	19	12	7	12	6	12	18	M6x1	M16x1,5	22	-	6	20	16
20	8	14	42	16	26	16	10	16	8	16	23	M8x1,25	M22x1,5	30	-	7	45	25
25	10	18	52	20	32	20	12	20	10	20	27	M10x1,25	M22x1,5	30	-	7	90	25
32	10	18	52	20	32	20	12	20	10	20	27	M10x1,25	M30x1,5	-	42	8	90	42
40	12	20	62	24	38	24	14	24	12	24	32	M12x1,75	M40x1,5	-	52	9	145	60
50	12	20	62	24	38	24	14	24	12	24	32	M12x1,75	M40x1,5	-	52	9	145	60

Foot

Ordering code
1200.Ø.01X (1 piece)

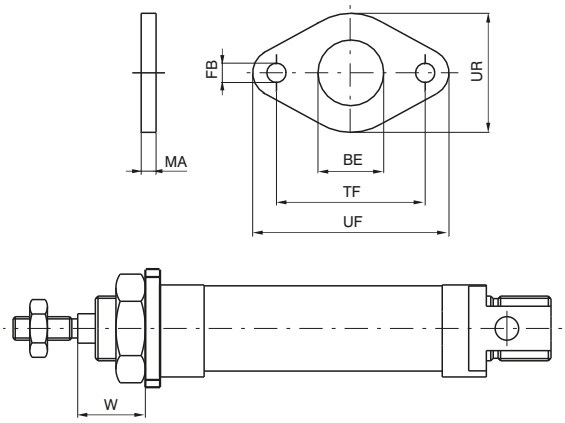


Used to mount the cylinder on the mounting plane with the rod parallel to said plane. Use one for short strokes and two for long strokes.
It is made stamped stainless steel AISI 304. Attached to the end caps by means of nuts (or lock nuts) 05X.

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 g	45	90	90	110

Flange

Ordering code
1200.Ø.02X

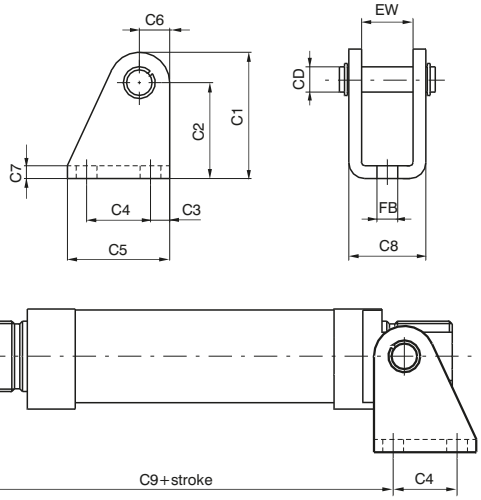


Use to mount the microbore cylinder at a right angle to the mounting plane. Attached to the front (or rear) endcap by a nut (or lock nut)05X. Made of stainless steel AISI 304.

Bore	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 g	40	85	85	100

Rear eye

Ordering code
1200.Ø.03X (1 piece)

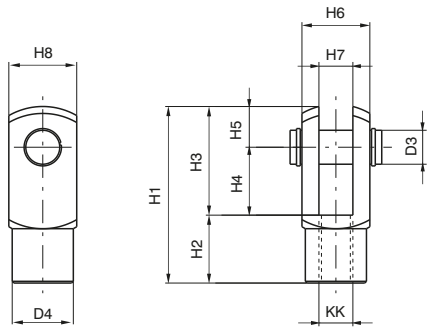


Used to mount by using the rear end cover to mount either parallel or at a right angle to the mounting plane. Allows the cylinder to oscillate and self-align with the linked element to the rod. Necessary to use when the rod may be subject to lateral forces during travel.
Made of stamped stainless steel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

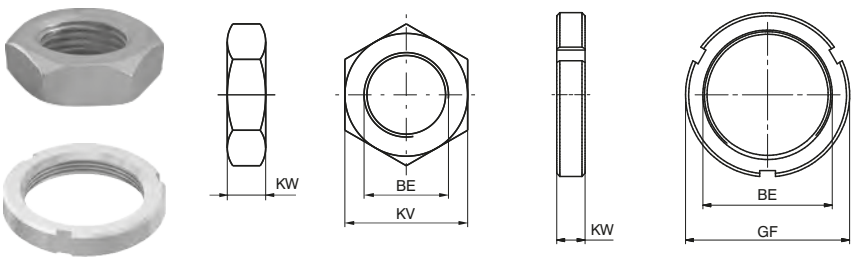
Bore	16	20	25	32
CD	6	8	8	12
C1	33,5	39,5	39,5	44,5
C2 (±0,3)	27	30	30	33
C3	5	6	6	7
C4	15	20	20	24
C5	25	32	32	38
C6	6,5	9,5	9,5	11,5
C7	3	4	4	4
C8	18	24	24	34
C9 (±0,4)	80,5	91,5	100,5	100,5
EW	12,1	16,1	16,1	26,1
FB (H13)	5,5	6,5	6,5	6,5
Weight g.	35	75	75	135

Cylinder rod fork / Nut or lock nut for the endcaps

Ordering code
1200.Ø.04X (with pin)
1200.Ø.05X (1 piece)



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.
Nut:
Used to fasten flanges or feet to the endcaps of the microbore cylinder. The nuts are mounted on bores that go from 16 to 25, the lock nuts on 32. Both are supplied (one piece) with the microbore cylinders.



Bore	Weight g fork	Weight g nut	D3	D4	H1	H2	H3	H4	H5	H6	H7 (B12)	H8	KK	BE	KV	GF	KW
16	20	16	6	10	31	12	19	12	7	12	6	12	M6X1	M16X1,5	22	-	6
20	45	25	8	14	42	16	26	16	10	16	8	16	M8X1,25	M22X1,5	30	-	7
25	90	25	10	18	52	20	32	20	12	20	10	20	M10X1,25	M22X1,5	30	-	7
32	90	42	10	18	52	20	32	20	12	20	10	20	M10X1,25	M30X1,5	-	42	8

Series 1303-1304-1305-1306-1307-1308

General

They conform to CNOMO standards, fully complying with CETOP and ISO standards, with mounted fixing devices 32 to 100.

Construction characteristic

End caps	solid aluminium bar up to Ø100, alloy aluminium from Ø125 to Ø200
Rod	C43 chromed steel, by thickness or stainless steel
Barrel	oxidised aluminium
Tie rods	steel with rolled threads
Cushion bearings	aluminium
Rod-guide bushing	brass (Ø32, 40, 50) in aluminium with self-lubricating bearings in sinterized bronze for the remaining BOREs
Piston	aluminium lathed from bar
Seals	Standard: NBR Oil resistant rubber, PUR Piston rod seals (FPM seals available upon request)

Operational characteristics

Fluid	filtered and lubricated air - hydraulic oil (with special bushing)
Pressure	max. 12 bar (air) - 20 bar (oil)
Operating temperature	-5 °C - +70 °C with 1303-1308 standard seals -5 °C - +80 °C with FPM seals for 1306-1308 series (magnetic piston) -5 °C - +150 °C with FPM seals for 1303-1305 series (non magnetic piston)
Cushioning length	Ø 32 - 40 - 50 - 63 - 80 - 100 - 125 - 160 - 200 mm 20 - 20 - 22 - 24 - 24 - 25 - 27 - 35 - 35

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device)
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

Please note: air must be dried for applications with lower temperature.
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.
Our Technical Department will be glad to help.

Standard strokes

Double acting version
From 0 to 150 every 25 mm; from 150 to 500 every 50 mm; from 500 to 1000 every 100 mm (for all bores)
On request are available strokes up to 2800 mm

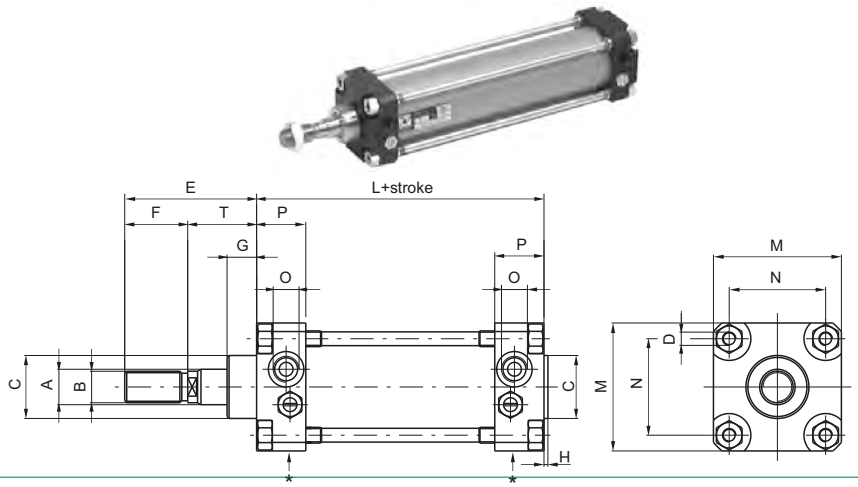
Single acting version
up to stroke 50 mm

Minimum and maximum springs load for single acting version

Bore	Ø32	Ø40 - Ø50	Ø63	Ø80 - Ø100
Min. load (N)	20	25	50	100
Max. load (N)	55	80	115	200

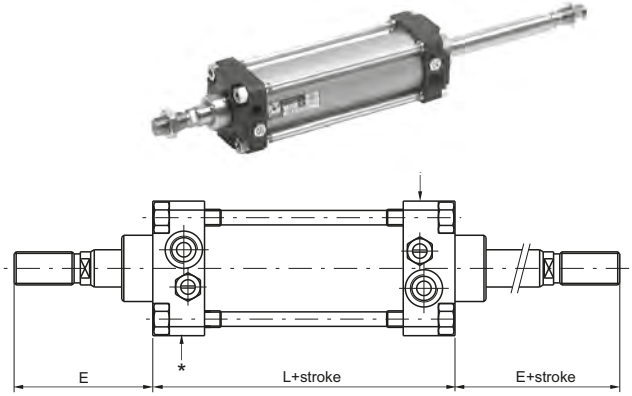
Basic version

Ordering code
Non magnetic piston
1303.Ø.stroke.01A (CNOMO) **1304.Ø.stroke.01A** (CETOP) **1305.Ø.stroke.01A** (ISO)
Magnetic piston
1306.Ø.stroke.01A (CNOMO) **1307.Ø.stroke.01A** (CETOP) **1308.Ø.stroke.01A** (ISO)



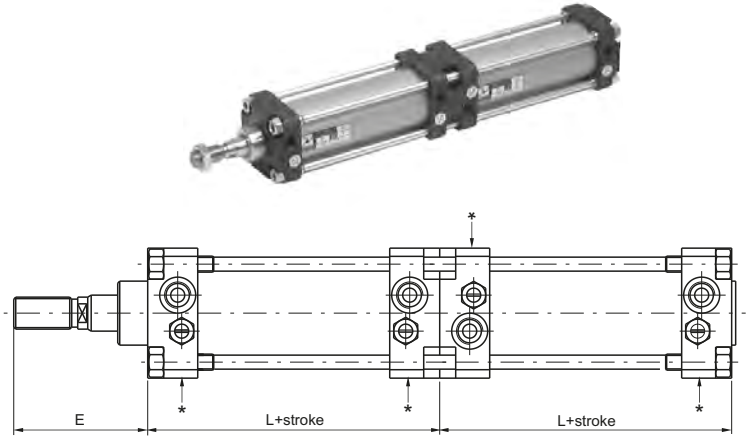
Through rod cylinder version

Ordering code
Non magnetic piston
1303.Ø.stroke.02A (CNOMO) **1304.Ø.stroke.02A** (CETOP) **1305.Ø.stroke.02A** (ISO)
Magnetic piston
1306.Ø.stroke.02A (CNOMO) **1307.Ø.stroke.02A** (CETOP) **1308.Ø.stroke.02A** (ISO)



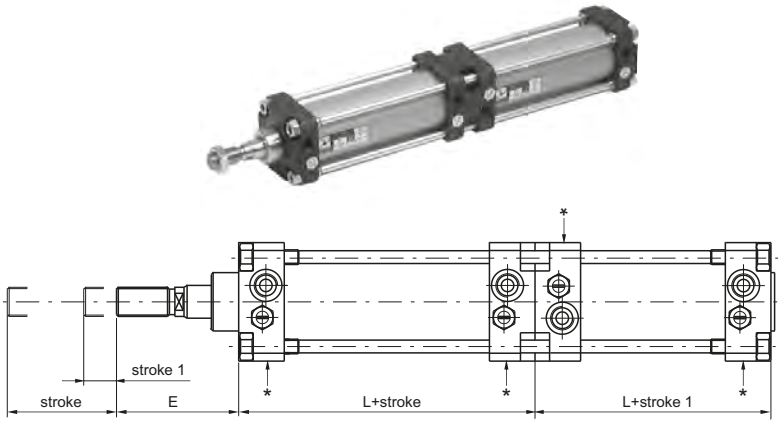
Tandem push with a common rod

Ordering code
Non magnetic piston
1303.Ø.stroke.H (CNOMO) **1304.Ø.stroke.H** (CETOP) **1305.Ø.stroke.H** (ISO)
Magnetic piston
1306.Ø.stroke.H (CNOMO) **1307.Ø.stroke.H** (CETOP) **1308.Ø.stroke.H** (ISO)



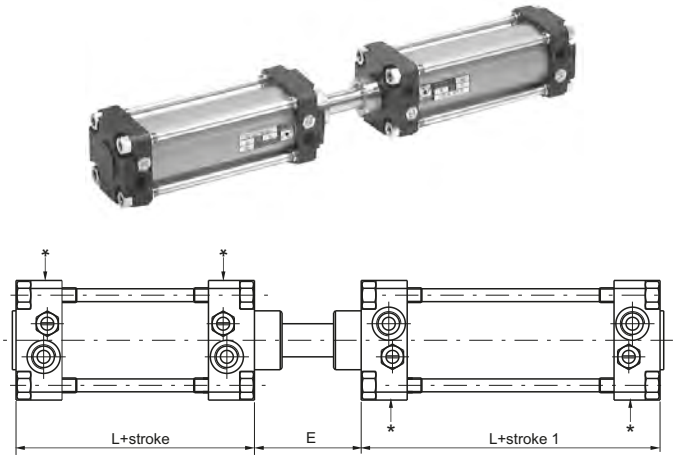
Tandem push with independent rods

Ordering code
Non magnetic piston
1303.Ø.stroke.stroke1.N (CNOMO) **1304.Ø.stroke.stroke1.N** (CETOP) **1305.Ø.stroke.stroke1.N** (ISO)
Magnetic piston
1306.Ø.stroke.stroke1.N (CNOMO) **1307.Ø.stroke.stroke1.N** (CETOP) **1308.Ø.stroke.stroke1.N** (ISO)



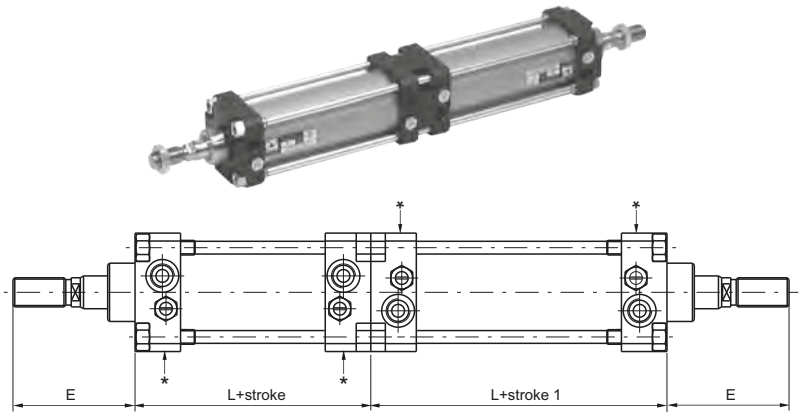
Opposed tandem with common rods

Ordering code
Non magnetic piston
1303.Ø.stroke.stroke1.R (CNOMO) **1304.Ø.stroke.stroke1.R** (CETOP) **1305.Ø.stroke.stroke1.R** (ISO)
Magnetic piston
1306.Ø.stroke.stroke1.R (CNOMO) **1307.Ø.stroke.stroke1.R** (CETOP) **1308.Ø.stroke.stroke1.R** (ISO)



Tandem with opposed rods

Ordering code
Non magnetic piston
1303.Ø.stroke.stroke1.U (CNOMO) **1304.Ø.stroke.stroke1.U** (CETOP) **1305.Ø.stroke.stroke1.U** (ISO)
Magnetic piston
1306.Ø.stroke.stroke1.U (CNOMO) **1307.Ø.stroke.stroke1.U** (CETOP) **1308.Ø.stroke.stroke1.U** (ISO)



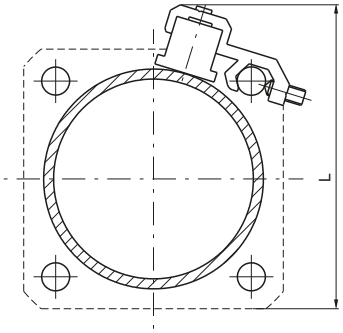
Variants
Add "X" to the cylinder code to order cylinders with STAINLESS STEEL rods. Example:**1303.32.250.01AX.**
Add "V" to the cylinder code to order cylinders with FPM seals. Example:**1303.32.250.01AV.**
Add "MA" to the cylinder code to order cylinders single acting front spring, with strokes not superior to 50. Example:**1303.32.50.01AMA.**
Add "MP" to the cylinder code to order cylinders single acting rear spring, with strokes not superior to 50. Example:**1303.50.25.01AMP.**
Note: 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
H		2,5	2	2	2	2	2	3	3	3
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 TOLERANCE: + 2 mm.										
WEIGHT IN g 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
FOR CYLINDERS IN TANDEM THE WEIGHT IS APPROXIMATELY DOUBLE										

Sensor brackets codes - 1500._, RS._, HS._

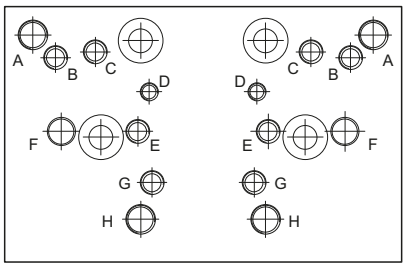
Ordering code	1306.A				1306.B			1306.C	
Bore	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100	Ø125	Ø160	Ø200
L	59	65	76	87	103	121	144	179	215



Sensor for microbore cylinders

For technical characteristics and ordering codes see Chapter 6 (magnetic sensors)

This accessory allows valves or solenoid valves to mount on the side of the cylinder. Support should be anchored to the tie rods and on it either a threaded distributor can be mounted or a base upon which an ISO distributor can be mounted. Once installed the connections must be done with fittings and pipes. All of the threaded holes on the support plate are dedicated to different valves series as per attached drawing.

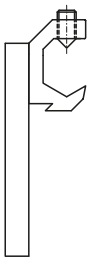


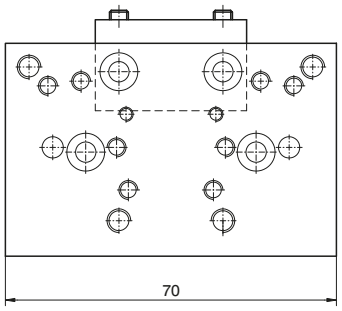
Fixing holes for valves series:

A = 414/2
B = 824
C = 828, T488, 488, 484
D = 2400
E = 2600
F = Bases for ISO distributors
G = 858/2
H = T424

Support

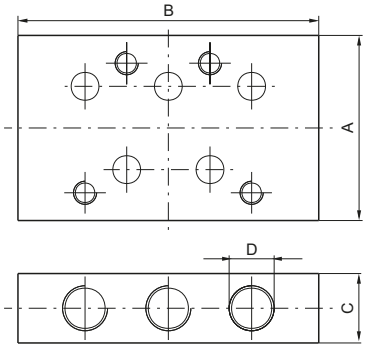
Ordering code
1306.15 (Ø32 ... Ø100)





Bases for ISO solenoid valves

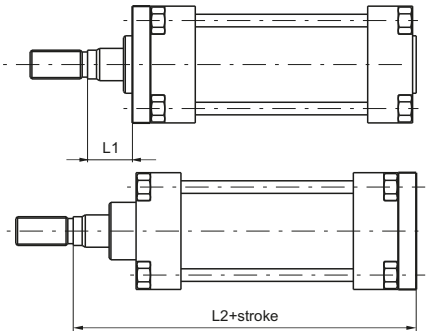
Ordering code	
1320.21	bases for ISO 1 solenoid valves
1320.22	bases for ISO 2 solenoid valves



	Dimensions			
	A	B	C	D
bases for ISO 1 solenoid valves	40	75	15	G 1/8"
bases for ISO 2 solenoid valves	50	95	20	G 1/4"

Front and rear flanges

Ordering code
1303.Ø.03F (CNOMO) **1304.Ø.03F** (CETOP - ISO)



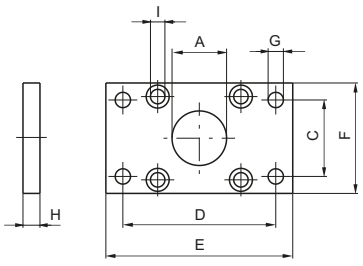
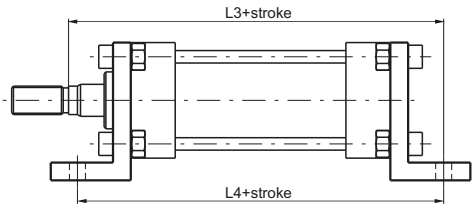


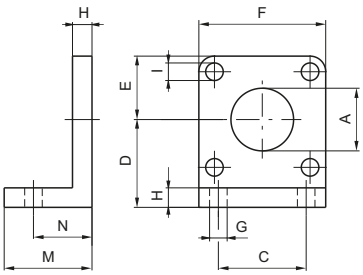
Plate which allows anchorage of the cylinder at a right angle to the plane. It is made of zinc-plated extruded steel.

Bore	32	40	50	63	80	100	125	160	200
A (H11)	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 (H13)	9	9	11	11	14	14	18	22	22
G - CETOP - ISO (H13)	7	9	9	9	12	14	16	18	22
H (JS 14)	8	8	10	10	12	12	16	20	20
I	6,5	6,5	9	9	10,5	10,5	13,5	16,5	16,5
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 g	165	200	540	1060	1460	1510	3100	6400	9500

Standard feet

Ordering code
1303.Ø.05F (CNOMO) (1 piece) **1304.Ø.05F** (CETOP - ISO) (1 piece)



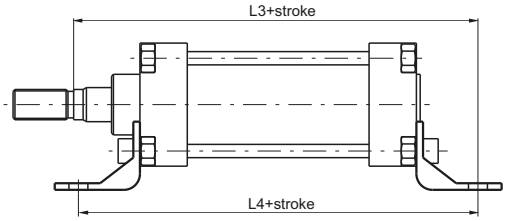


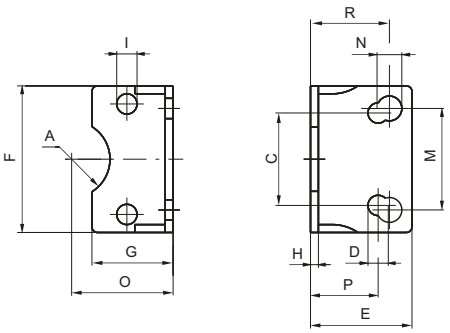
Elements used to anchor the cylinder parallel to the mounting plane. They are made of cast aluminium, painted black.

Bore	32	40	50	63	80	100	125	160	200
A (H11)	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 (H14)	9	9	11	11	14	14	18	22	22
G - CETOP (H14)	7	9	9	9	12	14	16	18	22
G - ISO (H14)	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 g	55	70	150	175	260	550	920	2200	3200

Short sheet metal feet

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



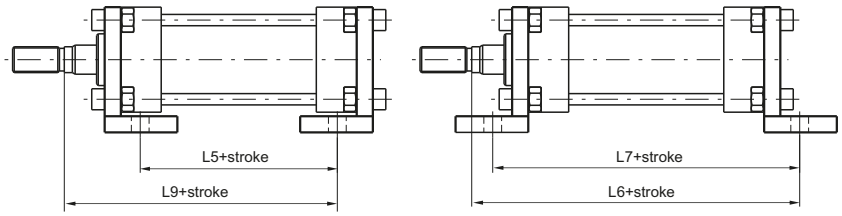


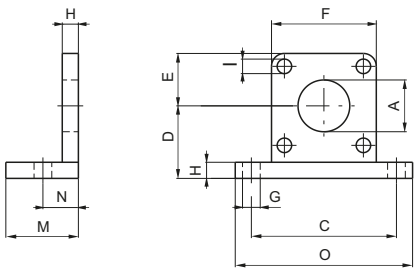
Elements used to anchor the cylinder parallel to the mounting plane. They are made of stamped and pierced sheet metal and painted in black. The mounting holes allow use with CNOMO, CETOP and ISO. Available up to 100 mm bore

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 g	58	70	118	184	305	385

Large internal and external feet

Ordering code
Internal **1303.Ø.06F** (CNOMO) (1 piece) (May be used with CETOP-ISO cylinders but are not specified in the standards) *External* **1303.Ø.07F** (CNOMO) (1 piece)



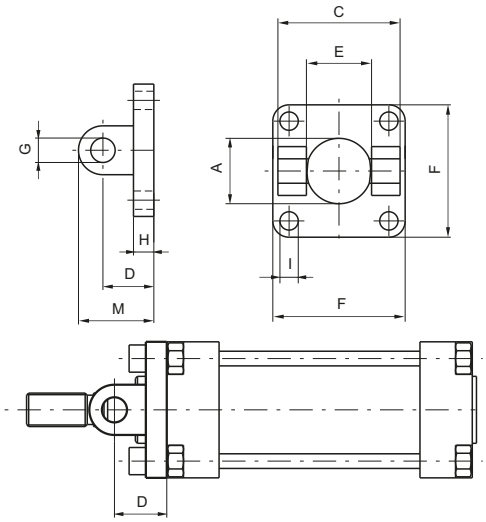


Elements used to anchor the cylinder parallel to the mounting plane. They are made of aluminium alloy and painted black.

Bore	32	40	50	63	80	100	125	160	200
A (H11)	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 (H14)	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 g	80	90	190	210	460	600	1080	2400	3100

Front clevis

Ordering code
Front **1303.Ø.08F** (CNOMO) **1304.Ø.08F** (CETOP - ISO)

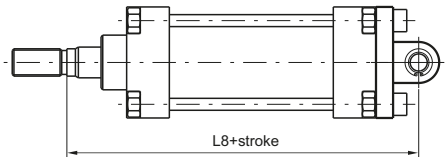


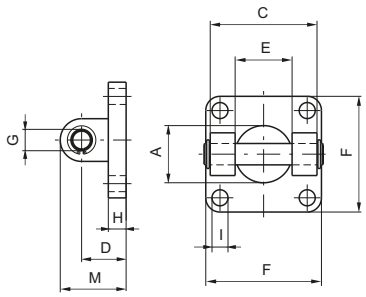
This type of mounting allows anchorage of the cylinder both parallel and at a right angle to the plane; the cylinder rod can oscillate and self-align as necessary. It is made of aluminium alloy and painted black.

Bore	32	40	50	63	80	100	125	160	200
A	25	32	32	45	45	55	55	65	65
C - CNOMO (H1)	45	52	65	75	95	115	140	180	220
C - CETOP - ISO (H14)	45	52	60	70	90	110	130	170	170
D - CNOMO (±0,2)	18	24	26	30	32	37	41	55	55
D - CETOP (±0,2)	20	22	25	30	32	37	46	55	55
E - CNOMO (H14)	26	33	33	47	47	57	57	72	72
E - CETOP (H14)	26	28	32	40	50	60	70	90	90
F	45	52	65	75	95	115	140	180	220
G - CNOMO (H9)	8	12	12	16	16	20	20	25	25
G - CETOP - ISO (H9)	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
Weight g	55	60	120	145	325	510	900	2080	3100

Rear clevis complete with pin

Ordering code
Rear **1303.Ø.09F** (CNOMO) **1304.Ø.09F** (CETOP - ISO)



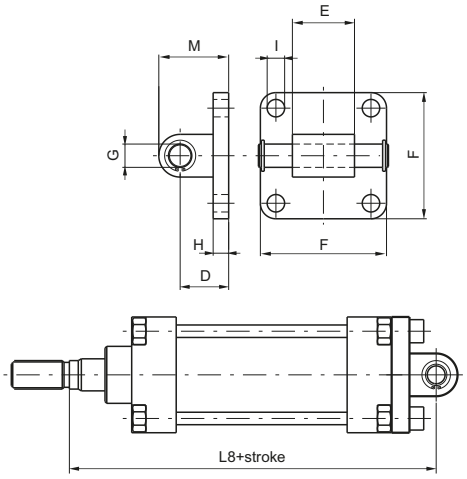


This type of mounting allows anchorage of the cylinder both parallel and at a right angle to the plane; the cylinder rod can oscillate and self-align as necessary. It is made of aluminium alloy and painted black.

Bore	32	40	50	63	80	100	125	160	200
A	25	32	32	45	45	55	55	65	65
C - CNOMO (H1)	45	52	65	75	95	115	140	180	220
C - CETOP - ISO (H14)	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 (H14)	26	33	33	47	47	57	57	72	72
E - CETOP (H14)	26	28	32	40	50	60	70	90	90
F	45	52	65	75	95	115	140	180	220
G - CNOMO (H9)	8	12	12	16	16	20	20	25	25
G - CETOP - ISO (H9)	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 g	75	110	190	280	490	820	1270	2800	3900

Rear male clevis

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

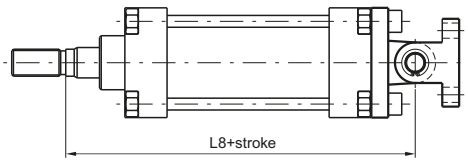


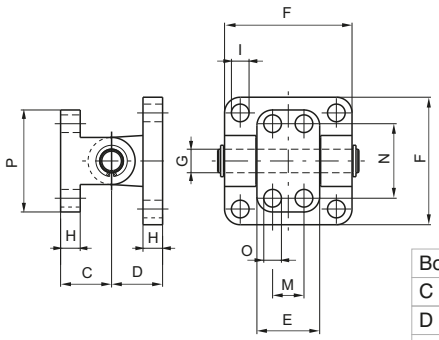
Similar to 09 clevis except for the connection, which is male rather than female. It can also be used as a counter clevis for type 10 (only CETOP - ISO). Allows mounting of cylinder at right angle to the plane of the cylinder rod.

Bore	32	40	50	63	80	100	125	160	200
D (±0,2)	20	22	25	30	32	37	46	55	55
E ($^{-0,2}_{-0,6}$)	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 g	50	80	110	185	325	460	1300	2850	3980

Rear clevis bracket

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



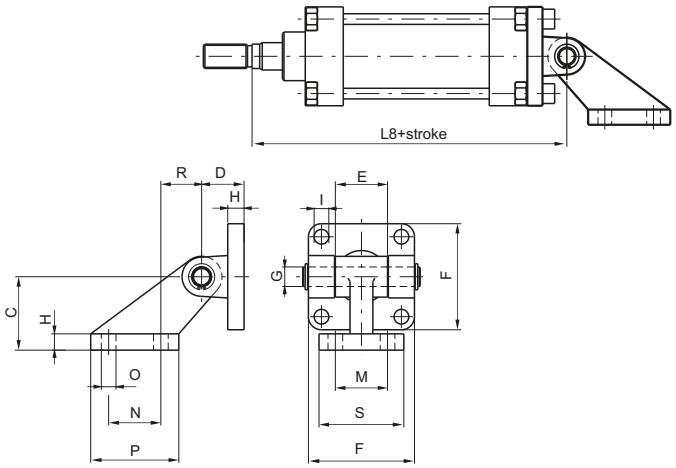


Mounting consists of clevis 09 and counter clevis. Used to mount cylinders at a right angle to the plane to which the counter clevis is attached. Allows self-alignment of the cylinder rod under load with an oscillation of ± 60 degrees.

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 g	90	165	240	470	665	1190	1660	3700	4700

Trunnion with support bracket

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

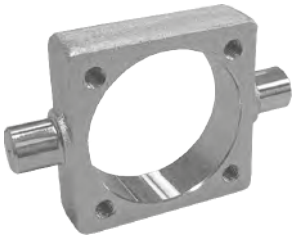


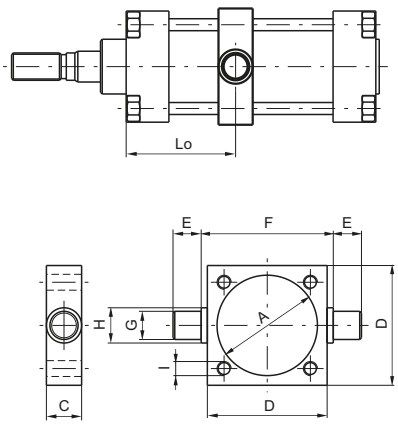
Mounting consists of clevis 09 and right angle counter clevis. Used to mount cylinders parallel to the plane to which the counterclevis is attached. Allows self-alignment of the cylinder rod under load with an oscillation up to 90 degrees from the mounting plane.

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 (H9)	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 (JS14)	25	32	32	40	40	50	50	63	63
N (Js14)	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 g	125	250	325	600	800	1570	2100	4600	5700

Intermediate trunnion

Ordering code
1300.Ø.12F



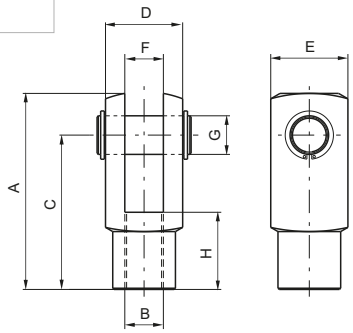


Clevis to be mounted between the endcaps of the cylinder allowing rotation at any point along the barrel. One piece construction from zinc-plated stamped steel. Can be mounted in fixed position or attached to adjustable tie rods.
NOTE: Lo max means at stroke 0.

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 g	130	310	370	700	900	1590	2600	4300	7500

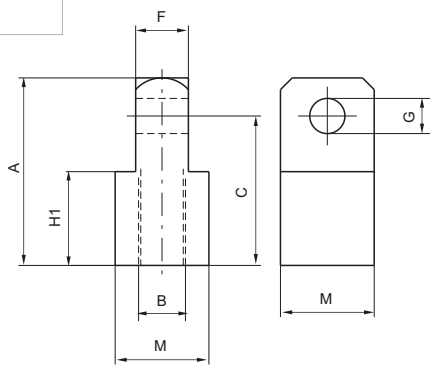
Fork with pin

Ordering code
1300.Ø.13F (CNOMO) **1301.Ø.13F** (CETOP) **1302.Ø.13F** (ISO)



Male fork

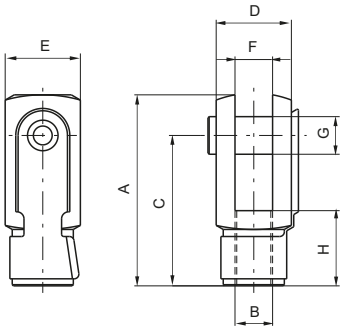
Ordering code
1300.Ø.14F (only for CNOMO cylinders)



Fork with clips

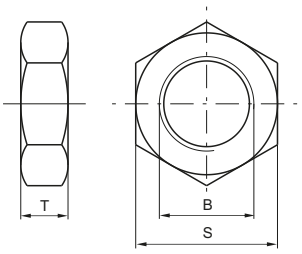
Ordering code
1300.Ø.13/1F (CNOMO) **1301.Ø.13/1F** (CETOP) **1302.Ø.13/1F** (ISO)

from Ø32 to Ø100 mm



Rod lock nut

Ordering code
1300.Ø.18F (CNOMO) **1301.Ø.18F** (CETOP) **1302.Ø.18F** (ISO)



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 (6H)		M10x1,5	M16x1,5	M16x1,5	M20x1,5	M20x1,5	M27x2	M27x2	M36x2	M36x2
B - CETOP (6H)		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	65	80	80	100/100	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
H1 - CNOMO		20	32	32	40	40	55	55	75	75
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 g	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	30	330	500	500	1300	1300	3500	3500

Series 1319-1320-1321

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.

Construction characteristics

End caps	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	stainless steel or C43 chromed steel
Barrel	oxidised aluminium
Cushion bushings	hardened aluminium
Rod-guide bushing	self-lubricating sintered bronze
Piston	vulcanized rubber block on steel core with incorporated plastoferrite permanent magnet, or without magnet for non magnetic version (plus rear spacer).
Seals	standard: NBR Oil resistant rubber, PUR Piston rod and cushion seals (FPM seals available upon request)
Cushion adjustment screws	brass

Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.									
Pressure	max. 10 bar									
Operating temperature	-5 °C - +70 °C with standard seals (magnetic or non magnetic piston) -5 °C - +80 °C with FPM seals for 1319 and 1320 series (magnetic piston) -5 °C - +150 °C with FPM seals for 1321 series (non magnetic piston)									
Cushioning length	Ø	32	40	50	63	80	100	125	160	200
	mm	28	32	32	40	44	50	55	55	55

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device)
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

Please note: air must be dried for applications with lower temperature.
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.
Our Technical Department will be glad to help.

Standard strokes (for all diameters)

Double acting version

from 0 to150, every 25 mm
over 150 up to 500, every 50 mm
over 500 up to 1000, every 100 mm

On request are available strokes up to 2800 mm

Single acting version

From Ø32 to Ø125, up to stroke 50 mm
On request are available strokes up to 200 mm

Stroke tolerance (ISO 15552)

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	$^{+5}_{0}$

Minimum and maximum springs load for single acting version

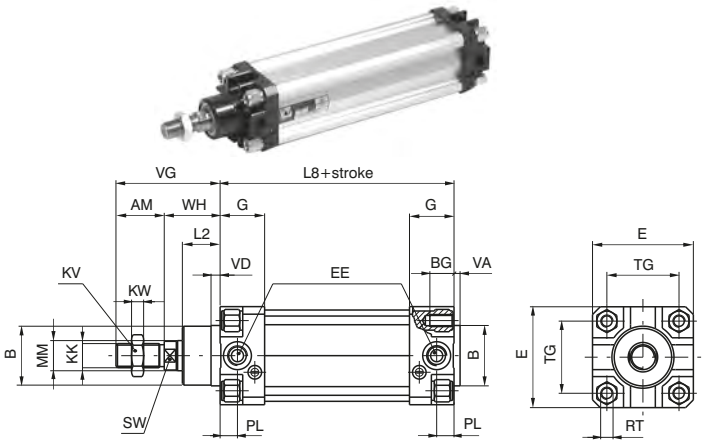
Bore	Ø32	Ø40	Ø50 - Ø63	Ø80 - Ø100	Ø125
Min. load (N)	15	25	50	100	150
Max. load (N)	40	80	115	200	250

Basic version "01"

Ordering code
1319.Ø.stroke.01 magnetic chromed rod **1320.Ø.stroke.01** magnetic stainless steel rod **1321.Ø.stroke.01** non magnetic chromed rod **13– –.Ø.stroke.01V** FPM seals **13– –.Ø.stroke.01MA** Front springs (Ø32-Ø125)* **13– –.Ø.stroke.01MP** Rear springs (Ø32-Ø125)*

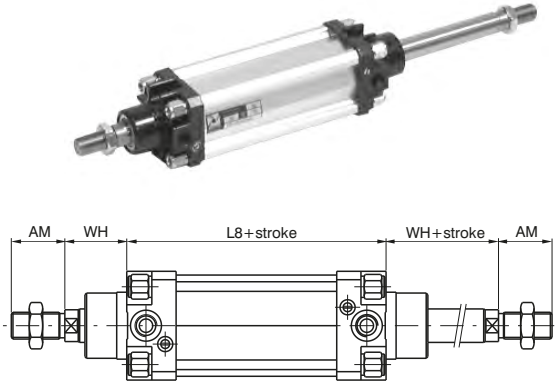
* Max. stroke 50

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 cap. For other applications see the following pages where different types of attachments are shown.



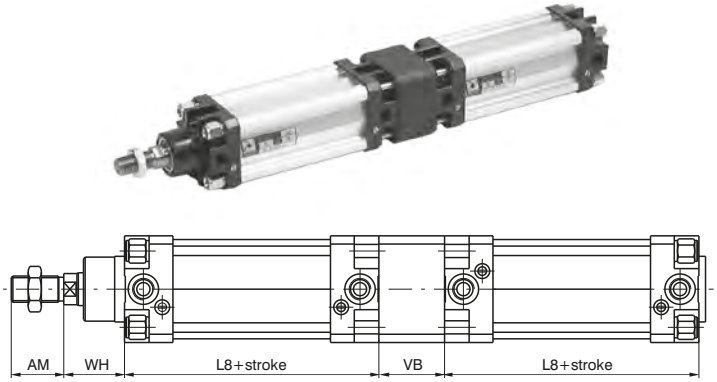
Through rod cylinder version "02"

Ordering code
1319.Ø.stroke.02 magnetic chromed rod **1320.Ø.stroke.02** magnetic stainless steel rod **1321.Ø.stroke.02** non magnetic chromed rod **13– –.Ø.stroke.02V** FPM seals



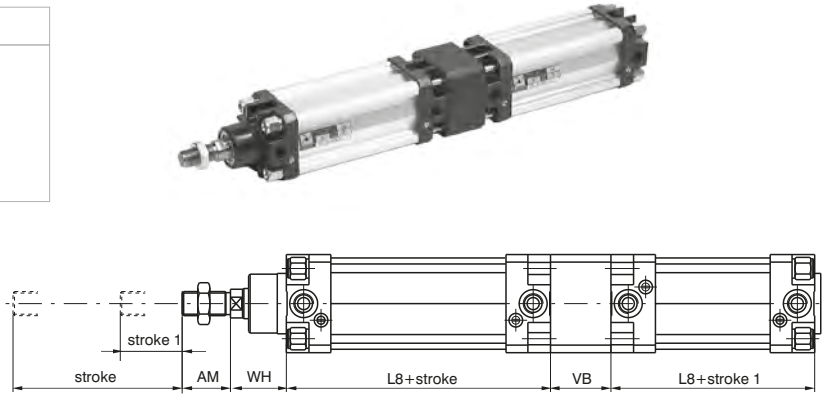
Tandem push with a common rods “G”

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



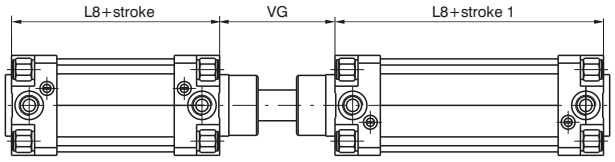
Tandem push with independent rods”F”

Ordering code
1319.Ø.stroke.stroke1.F magnetic chromed rod **1320.Ø.stroke.stroke1.F** magnetic stainless steel rod **1321.Ø.stroke.stroke1.F** non magnetic chromed rod



Opposed tandem with common rod "D"

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



Tandem with opposed rods "E"

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

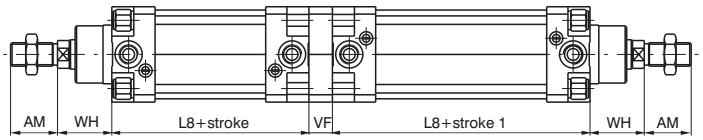


Table of dimensions

Bore		32	40	50	63	80	100	125	160	200
AM		22	24	32	32	40	40	54	72	72
B (d 11)		30	35	40	45	45	55	60	65	75
BG		14	14	16	16	21	21	23	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
L2		16	20	25	25	32	35	45	50	60
L8*		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	25
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	10	10	12	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	Stroke 0	480	730	1150	1600	2800	3600	7800	15000	21500
g	every 10 mm	25	32	56	60	90	100	140	265	325

* For strokes over 50mm, the length does not increase proportionally to the stroke, and allowance must be made for adequate spring allocation (see table of L8 dimensions).

"L8" dimensions for "rear spring" and "front spring"

Bore	32	40	50	63	80	100	125
L8 (Stroke 51 ÷ 100)	134	150	151	166	183	193	230
L8 (Stroke 101 ÷ 150)	174	195	196	211	238	248	300
L8 (Stroke 151 ÷ 200)	214	240	241	256	293	303	370

Series 1348-1349-1350, Non rotating cylinders

Construction characteristics

End caps	UNI 5079 aluminium alloy casting painted black by cataphoresis
Rod	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 plastoferrite rings in magnetic version
Piston seals	NBR oil-resistant rubber, PUR Piston rod and cushion seals
Cushioning adjustement screw	brass

Technical characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Pressure	10 bar
Operating temperature	-5°C - +70°C

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device)
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

Please note: air must be dried for applications with lower temperature.
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.
Our Technical Department will be glad to help.

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

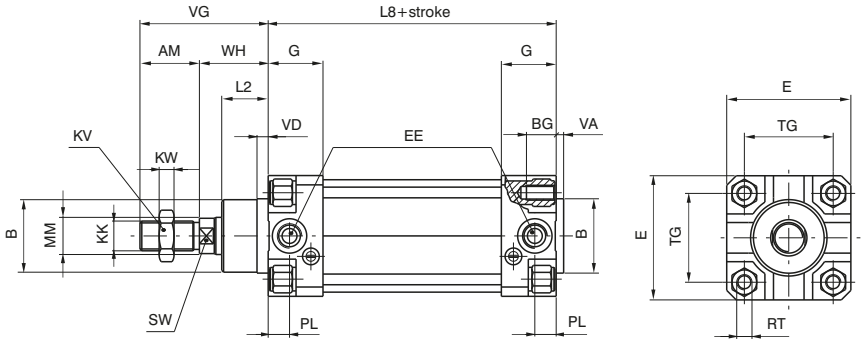
On request are available strokes up to 1000 mm

Stroke Tolerance (ISO 15552)

Bore	Stroke	Tolerance
32 - 40 - 50 - 63	up to 500	$^{+2}_{0}$

Basic version

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

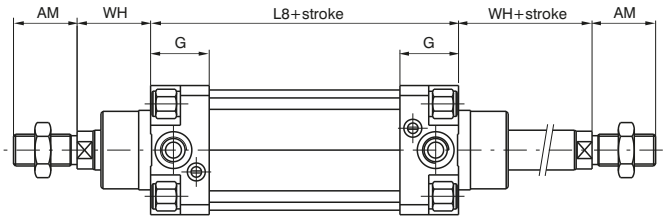


Bore		32	40	50	63
AM		22	24	32	32
B (d 11)		30	35	40	45
BG		12	12	16	16
E		46	52	65	75
EE		G 1/8"	G 1/4"	G 1/4"	G 3/8"
G		25	29	29,5	36
KK		M10x1,25	M12x1,25	M16x1,5	M16x1,5
KV		17	19	24	24
KW		6	7	8	8
L 2		16	20	25	25
L 8		94	105	106	121
MM		12	16	20	20
PL		9	11,5	13	14
RT		M6	M6	M8	M8
SW		10	13	17	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	stroke 0	505	705	1320	1710
g	every 10 mm	24	33	53	58

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

Through rod cylinder version

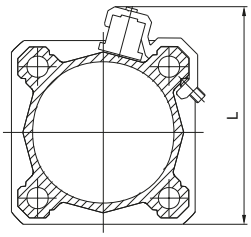
Ordering code
1348.Ø.stroke.02 magnetic chromed rod **1349.Ø.stroke.02** magnetic stainless steel rod **1350.Ø.stroke.02** non-magnetic chromed rod



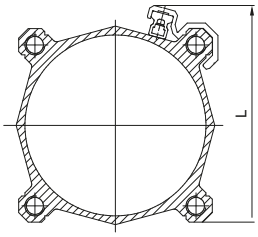
Sensor brackets

Sensor brackets codes 1500._, RS._, HS._	Sensor brackets codes 1595.HAP	Bore	L
Code	Code		
1320.A	1320.ASC	Ø32	60
		Ø40	65
1320.B	1320.BSC	Ø50	77
		Ø63	87
1320.C	1320.CSC	Ø80	105
		Ø100	125
1320.D	1320.DSC	Ø125	145
1320.E	1320.ESC	Ø160	184
1320.F	1320.FSC	Ø200	222

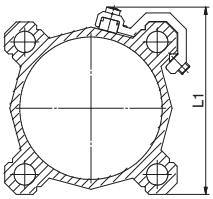
Sensor brackets codes 1580._, MRS._, MHS._		
Code	Bore	L1
1320.AS	Ø32	48
	Ø40	54
1320.BS	Ø50	66
	Ø63	76
1320.CS	Ø80	96
	Ø100	112
1320.DSC	Ø125	145
1320.ESC	Ø160	184
1320.FSC	Ø200	222



Sensors 1500._,RS._,HS._



Sensors 1595.HAP

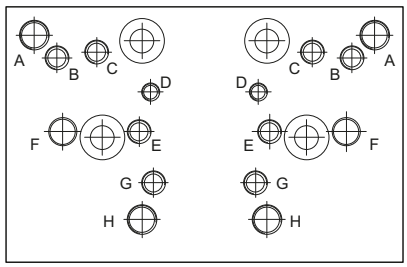


Sensors 1580._, MRS._, MHS._

Sensors for microbore cylinders: for technical characteristics and ordering codes see "Magnetic sensors" section

Solenoid valves supports

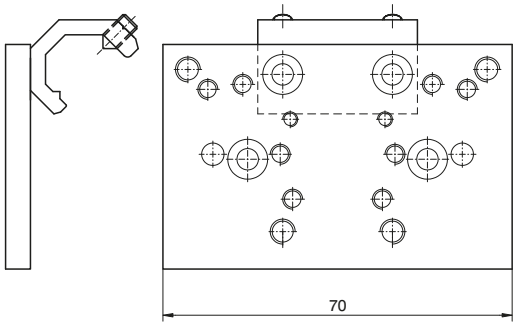
This accessory permits to mount a valve or an electrovalve on a side of the cylinder. The plate can be fitted on the cylinder profiled barrel, and, on it, can be mounted either a threaded distributor or a base on whic can be mounted an ISO distributor. Once installed the connections must be done with fittings and pipes. All of the threaded holes on the support plate are dedicated to different valves series as per attached drawing.



Fixing holes for valves series:

A = 414/2
B = 824
C = 828, T488, 488, 484
D = 2400
E = 2600
F = Bases for ISO distributors
G = 858/2
H = T424

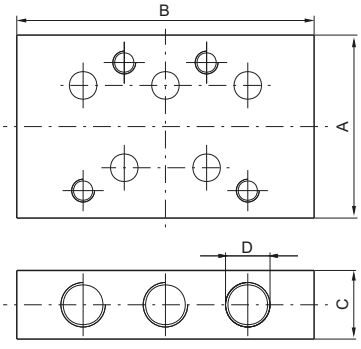
Ordering code
1320.15 (Ø32 - Ø40)
1320.16 (Ø50 - Ø63)
1320.17 (Ø80 - Ø100)
1320.18 (Ø125)
1320.19 (Ø160)
1320.20 (Ø200)



Bases for ISO solenoid valves

Ordering code

1320.21	bases for ISO 1 solenoid valves
1320.22	bases for ISO 2 solenoid valves



		Dimensions			
		A	B	C	D
1320.21	bases for ISO 1 solenoid valves	40	75	15	G 1/8"
1320.22	bases for ISO 2 solenoid valves	50	95	20	G 1/4"

Series 1386-1387-1388/ 1396/1397/1398, ECOPLUS

General

Profiled tube has two "T" slots on the three sides hosting sensors 1580._, MRS._, MHS._. without adaptors.

Construction characteristics

End caps	Series 1386 - 1388: high resistant thermoplastic material	Series 1396 - 1398: Die-casting aluminium
Rod	C43 chromed steel or stainless steel	
Barrel	anodised aluminium alloy	
Rod-guide bushing	self-lubricating sintered bronze	
Piston	acetal resin, aluminium on request	
Seal	standard: NBR Oil resistant rubber, PUR Piston rod seals (PUR seals available upon request)	
Cushion adjusting screws	brass	

Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.							
Max. pressure	10 bar							
Operating temperature	-5°C - +70°C with standard seals -30°C - +80°C with PUR seals							
Bore	Ø	32	40	50	63	80	100	
Cushioning lenght	mm	27	31	31	37	40	44	
Cushioning lenght "K" and "PK" version	mm	20	20	22	22	32	32	

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod;
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device and aluminium piston);
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

Please note: air must be dried for applications with lower temperature.
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.
Our Technical Department will be glad to help.

Standard strokes (for all diameters)

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

On request are available strokes up to 2800 mm

Stroke tolerance (ISO 15552)

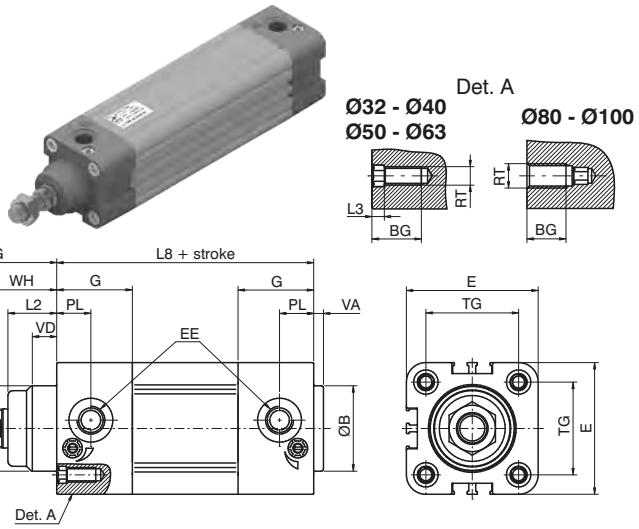
Bore	Stroke	Tolerance
32 - 40 - 50	up to 500	+2 0
	over 500 up to 1000	+3.2 0
63 - 80 - 100	up to 500	+2.5 0
	over 500 up to 1000	+4 0

Basic version “01”

Ordering code

TECHNOPOLYMER COVERS
1386.Ø.stroke.01 Magnetic chromed rod
1387.Ø.stroke.01 Magnetic stainless steel rod
1388.Ø.stroke.01 Non magnetic chromed rod

ALUMINIUM COVERS
1396.Ø.stroke.01 Magnetic chromed rod
1397.Ø.stroke.01 Magnetic stainless steel rod
1398.Ø.stroke.01 Non magnetic chromed rod

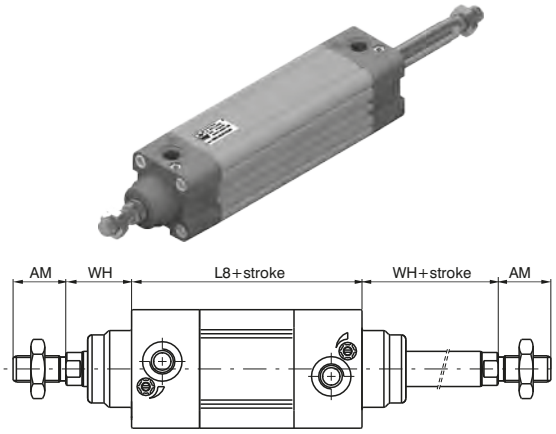


Through rod cylinder version “02”

Ordering code

TECHNOPOLYMER COVERS
1386.Ø.stroke.02 Magnetic chromed rod
1387.Ø.stroke.02 Magnetic stainless steel rod
1388.Ø.stroke.02 Non magnetic chromed rod

ALUMINIUM COVERS
1396.Ø.stroke.02 Magnetic chromed rod
1397.Ø.stroke.02 Magnetic stainless steel rod
1398.Ø.stroke.02 Non magnetic chromed rod

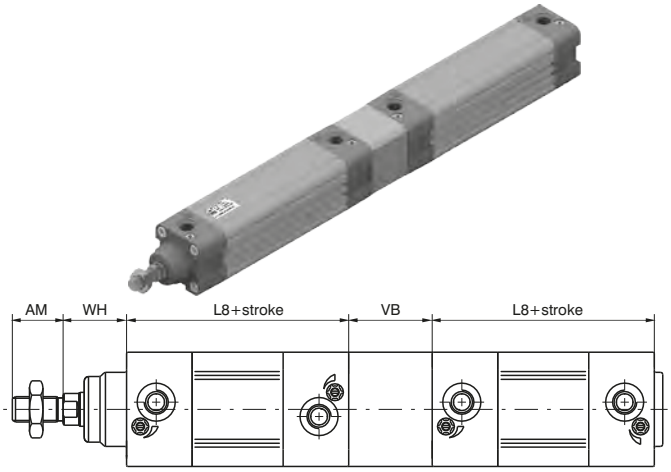


Tandem push with common rods “G”

Ordering code

TECHNOPOLYMER COVERS
1386.Ø.stroke.G Magnetic chromed rod
1387.Ø.stroke.G Magnetic stainless steel rod
1388.Ø.stroke.G Non magnetic chromed rod

ALUMINIUM COVERS
1396.Ø.stroke.G Magnetic chromed rod
1397.Ø.stroke.G Magnetic stainless steel rod
1398.Ø.stroke.G Non magnetic chromed rod

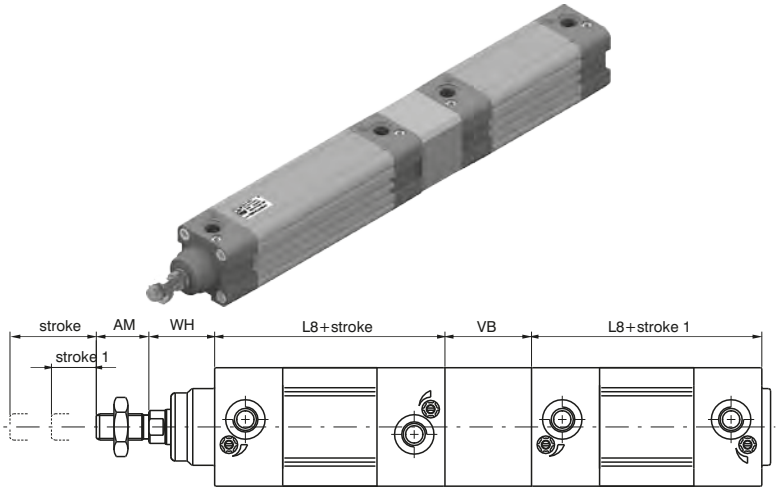


Tandem push with independent rods “F”

Ordering code

TECHNOPOLYMER COVERS
1386.Ø.stroke.stroke1.F Magnetic chromed rod
1387.Ø.stroke.stroke1.F Magnetic stainless steel rod
1388.Ø.stroke.stroke1.F Non magnetic chromed rod

ALUMINIUM COVERS
1396.Ø.stroke.stroke1.F Magnetic chromed rod
1397.Ø.stroke.stroke1.F Magnetic stainless steel rod
1398.Ø.stroke.stroke1.F Non magnetic chromed rod

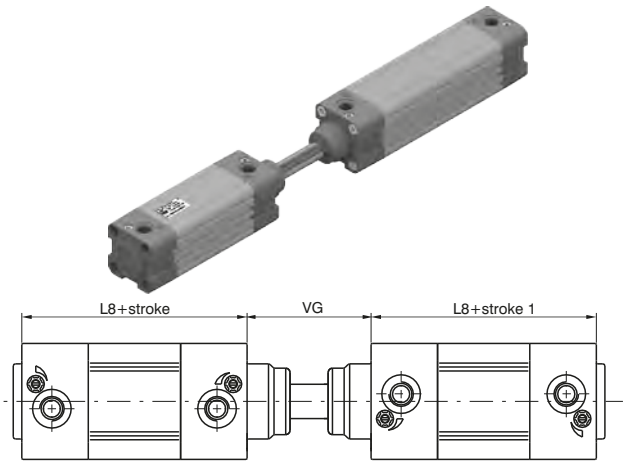


Opposed tandem with common rod "D"

Ordering code

TECHNOPOLYMER COVERS
1386.Ø.stroke.stroke1.D Magnetic chromed rod
1387.Ø.stroke.stroke1.D Magnetic stainless steel rod
1388.Ø.stroke.stroke1.D Non magnetic chromed rod

ALUMINIUM COVERS
1396.Ø.stroke.stroke1.D Magnetic chromed rod
1397.Ø.stroke.stroke1.D Magnetic stainless steel rod
1398.Ø.stroke.stroke1.D Non magnetic chromed rod

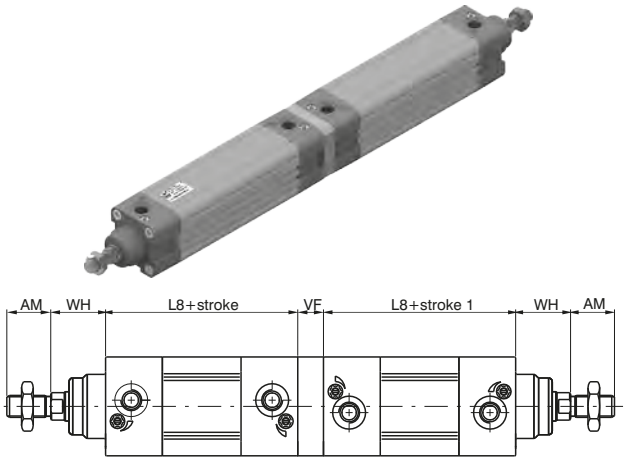


Tandem with opposed rods "E"

Ordering code

TECHNOPOLYMER COVERS
1386.Ø.stroke.stroke1.E Magnetic chromed rod
1387.Ø.stroke.stroke1.E Magnetic stainless steel rod
1388.Ø.stroke.stroke1.E Non magnetic chromed rod

ALUMINIUM COVERS
1396.Ø.stroke.stroke1.E Magnetic chromed rod
1397.Ø.stroke.stroke1.E Magnetic stainless steel rod
1398.Ø.stroke.stroke1.E Non magnetic chromed rod



Variants

Ordering code

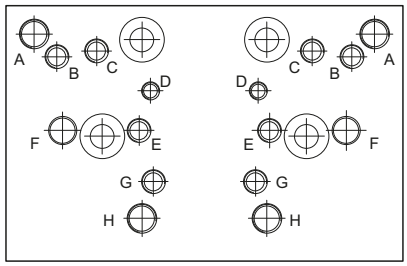
13_ _.Ø.stroke._ _.P = Version with PUR seals
13_ _.Ø.stroke._ _.K = Version with aluminium piston
13_ _.Ø.stroke._ _.PK =Version with PUR seals and aluminium piston

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	Aluminium	stroke 0	550	690	1200	1590	2500	3670
g	covers	every 10 mm	29	40	57	66	96	112
Weight	Technopolymer	stroke 0	470	590	1020	1320	2090	3010
g	covers	every 10 mm	29	40	57	66	96	112

Solenoid valves supports

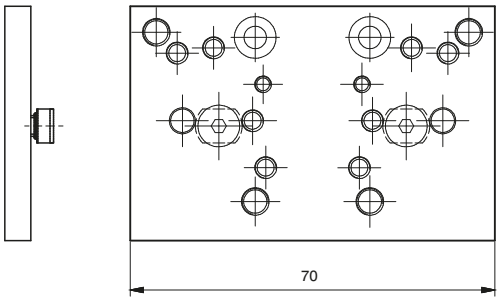
This accessory permits to mount a valve or an electrovalve on a side of the cylinder. The plate can be fitted on the cylinder profiled barrel, and, on it, can be mounted either a threaded distributor or a base on whic can be mounted an ISO distributor. Once installed the connections must be done with fittings and pipes. All of the threaded holes on the support plate are dedicated to different valves series as per attached drawing.



Fixing holes for valves series:

A = 414/2
B = 824
C = 828, T488, 488, 484
D = 2400
E = 2600
G = 858/2
H = T424

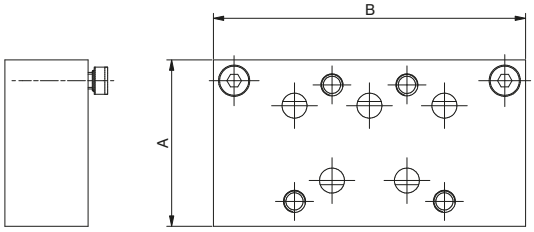
Ordering code
1386.15



Attention: do not use ISO distributor for base mounting

Bases for ISO solenoid valves

Ordering code	
1320.23	bases for ISO 1 solenoid valves
1320.24	bases for ISO 2 solenoid valves



	Dimensions			
	A	B	C	D
bases for ISO 1 solenoid valves	40	75	15	G 1/8"
bases for ISO 2 solenoid valves	50	95	20	G 1/4"

Series 1390-1391-1392, ECOLIGHT

Construction characteristics

End caps	die-casting aluminium
Rod	C43 chromed steel or stainless steel
Barrel	aluminium alloy anodised
Rod-guide bushing	spheroid bronze on steel band with P.T.F.E. coat
Piston	Ø32 - Ø100 acetal resin, aluminium on request Ø125 - Ø200 aluminium **V, Q, R, L** versions (Ø32 - Ø100): aluminium
Seals	standard: NBR oil resistant rubber, PUR piston rod seals **V** version: FPM **P** version: PUR **Q** version: NBR and PUR with plastic rod scraper with a high wear resistance **R** version: PUR with metallic rod scraper **L** version: special PUR
Cushion adjusting screws	brass

Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous. **L version** (for low temperature): dried air, guarantee a dew point lower than the minimum operating temperature
Max. pressure	10 bar
Operating temperature	-5°C - +70°C with standard seals -30°C - +80°C with PUR seals (**P** version) -5°C - +80°C with FPM seals for 1390 and 1391 series (magnetic piston) (**V** version) -5°C - +150°C with FPM seals for 1392 series (no magnetic piston) (**V** version) -20°C - +80°C (**Q** version) -10°C - +80°C (**R** version) -50°C - +80°C (**L** version)

Bore	Ø	32	40	50	63	80	100	125	160	200
Cushioning lenght	mm	27	31	31	37	40	44	44	50	55
Cushion length version with aluminum piston	mm	20	20	22	22	32	32	/	/	/

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod;
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device and the aluminium piston);
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

VERSIONS WITH ADDITIONAL ROD SCRAPER

Version with plastic rod scraper (Q)

The pneumatic seal is manufactured using a special NBR seal material, with the rod scraper that comes in contact with the external environment made of a plastic material with a high wear resistance. The geometric shape with its excellent scraping capacity guarantees additional protection of the piston rod and nose seal against the impurities, liquids, water, and debris.

Version with metallic rod scraper (R)

The pneumatic seal is manufactured using a special FPM seal material with its own scraping lip with the additional rod scraper that comes into contact with the external environment made of metal. This combination of scraping lip and metal rod scraper enable these actuators to be used in particularly extreme environments.

Here are some examples:

Aluminum foundries: To remove the residues of alumina or fluorine compounds that are deposited on the piston rod during the preparation phase of aluminum casting.

Automotive: To prevent debris which has collected on the piston rod damaging the nose seal during operation especially waste produced during the welding process.

Industrial ovens: To eliminate cement powders or those produced during the manufacture of bricks/tiles

Thanks to the high-performance nose seal and scraper protection of the piston rod, the cylinder will be protected against premature wear that you would normally experience using standard cylinders in these harsh environments.

Low temperature version (L): The special seals compound allows the use of the cylinders up to a temperature of -50°C. The rod scraper seal is equipped with a metallic scraper which removes ice crystals which might form at minus temperature

Please note: air must be dry for applications with lower temperature.

Use hydraulic oils H class (ISO VG32) for correct continued lubrication.

Our Technical Department will be glad to help.

Standard strokes (for all diameters)

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

On request are available strokes up to 2800 mm

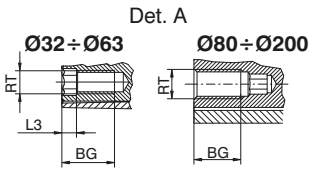
Stroke tolerance (ISO 15552)

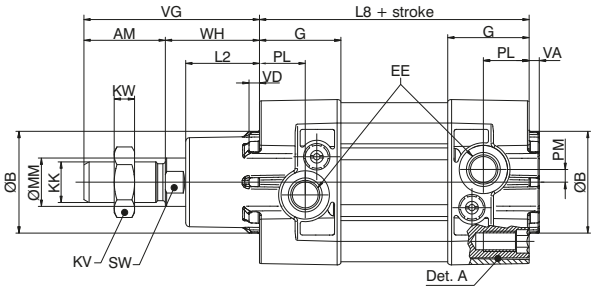
Bore	Stroke	Tolerance
32 - 40 - 50	up to 500	+2 0
	over 500 up to 1250	+3.2 0
63 - 80 - 100	up to 500	+2.5 0
	over 500 up to 1250	+4 0
125 - 160 - 200	up to 500	+4 0
	over 500 up to 1250	+5 0

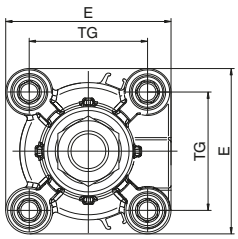
Basic version “01”

Ordering code
1390.Ø.stroke.01 Magnetic chromed rod **1391.Ø.stroke.01** Magnetic stainless steel rod **1392.Ø.stroke.01** Non magnetic chromed rod

This is the configuration representing the basic cylinder according to ISO–VDMA standards. It can be directly anchored on machine parts using the four threads on the end cap screws. For other applications see “Cylinder section” on the General Catalogue, where different types of attachments are shown.

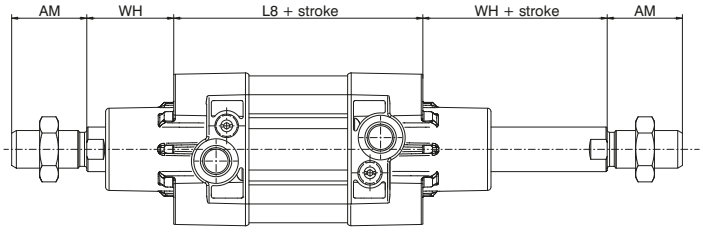






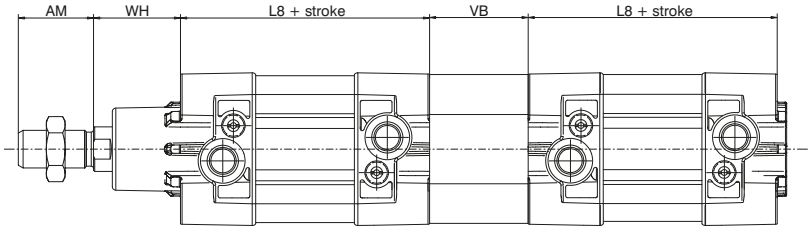
Through rod cylinder version “02”

Ordering code
1390.Ø.stroke.02 Magnetic chromed rod **1391.Ø.stroke.02** Magnetic stainless steel rod **1392.Ø.stroke.02** Non magnetic chromed rod



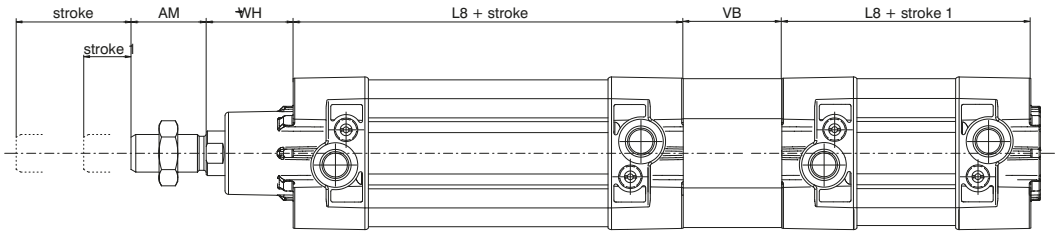
Tandem push with common rods “G”

Ordering code
1390.Ø.stroke.G Magnetic chromed rod **1391.Ø.stroke.G** Magnetic stainless steel rod **1392.Ø.stroke.G** Non magnetic chromed rod



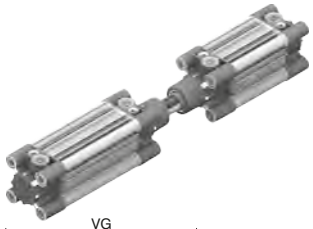
Tandem push with independent rods “F”

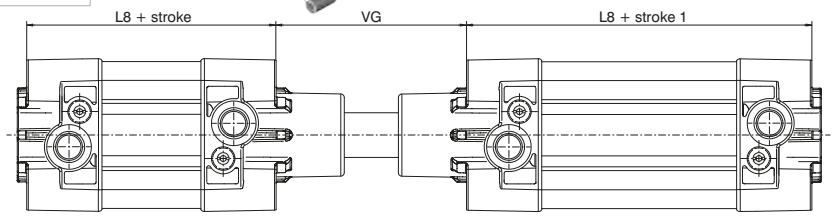
Ordering code
1390.Ø.stroke.stroke1.F Magnetic chromed rod **1391.Ø.stroke.stroke1.F** Magnetic stainless steel rod **1392.Ø.stroke.stroke1.F** Non magnetic chromed rod



Opposed tandem with common rod "D"

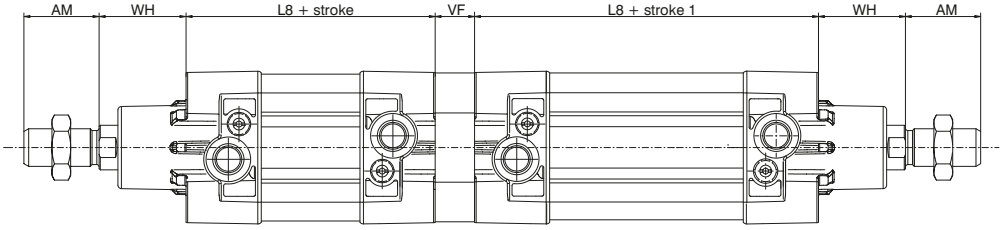
Ordering code
1390.Ø.stroke.stroke1.D Magnetic chromed rod **1391.Ø.stroke.stroke1.D** Magnetic stainless steel rod **1392.Ø.stroke.stroke1.D** Non magnetic chromed rod





Tandem with opposed rods - "E"

Ordering code
1390.Ø.stroke.stroke1.E Magnetic chromed rod **1391.Ø.stroke.stroke1.E** Magnetic stainless steel rod **1392.Ø.stroke.stroke1.E** Non magnetic chromed rod



Variants

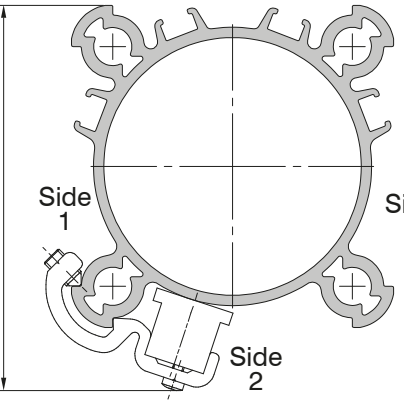
Ordering code
139_.Ø.stroke._ _.P = Version with PUR seals
139_.Ø.stroke._ _.K = Version with aluminium piston (from Ø32 to Ø100)
139_.Ø.stroke._ _.PK =Version with PUR seals and aluminium piston (from Ø32 to Ø100)
139_.Ø.stroke._ _.V =Version with FPM seals and aluminium piston
139_.Ø.corsa._ _.R = Version with metallic rod scraper and aluminium piston (Ø32-Ø100)
139_.Ø.corsa._ _.Q = Version with plastic rod scraper and aluminium piston (Ø32-Ø100)
139_.Ø.stroke._ _.PQ = Version with PUR seals and plastic rod scraper and aluminium piston (Ø32-Ø100)
139_.Ø.corsa._ _.L = Version for low temperature and aluminium piston (-50°C) (Ø32-Ø100)

Table of dimensions

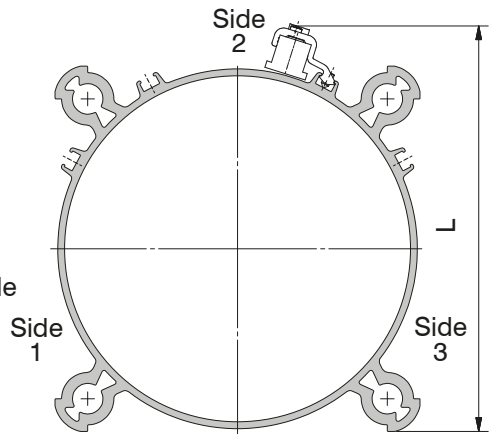
Bore		32	40	50	63	80	100	125	160	200
AM		22	24	32	32	40	40	54	72	72
B (d 11)		30	35	40	45	45	55	60	65	75
BG		16	16	18	18	16	16	21	25	25
E		47	54	65	76	95	113	138	180	216
EE		G 1/8"	G 1/4"	G 1/4"	G 3/8"	G 3/8"	G 1/2"	G 1/2"	G 3/4"	G 3/4"
G		29.5	33	32	36	38.5	41.5	48	49	49
KK		M10X1.25	M12X1.25	M16x1.5	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
L2		19	22	29	29	35	36	45	50	60
L3		4	4	5	5	/	/	/	/	/
L8		94	105	106	121	128	138	160	180	180
MM		12	16	20	20	25	25	32	40	40
PL		13	16	18	18	16	18	25	26	25
PM		3	4	5	4.5	2.5	6	8	11	11
RT		M6	M6	M8	M8	M10	M10	M12	M16	M16
SW		10	13	17	17	22	22	27	36	36
TG		32.5	38	46.5	56,5	72	89	110	140	175
VA		4	4	4	4	4	4	6	6	6
VB		33	41	51	51	65	71	75	70	75
VD		4	4	4	4	4	4	6	6	6
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	stroke 0	460	650	1030	1360	2180	2890	5700	11200	14900
g	every 10 mm	23	32	45	49	75	81	130	195	245

On the ECOLIGHT series it is possible to use three sensor types, according to bore, as indicated below:

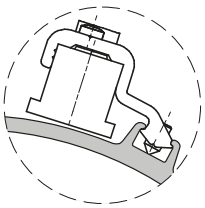
Sensors code **1500._**
RS._
HS._



Ø32 - Ø100: the sensors can be fixed on the three sides as indicated in the drawing, by using suitable brackets (except for Ø32 on side 2)



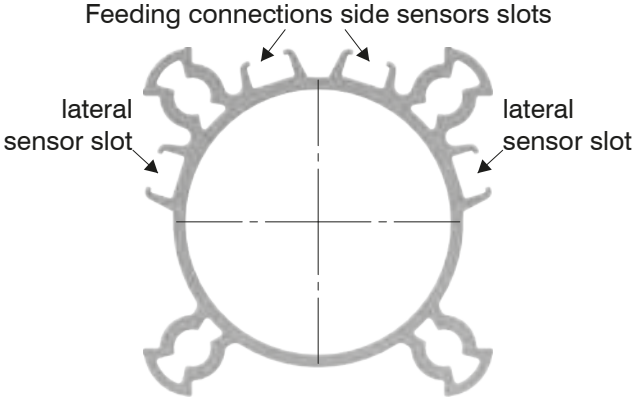
Ø125 - Ø200: the sensors can be fixed on the three sides as indicated in the drawing, by using suitable bracket



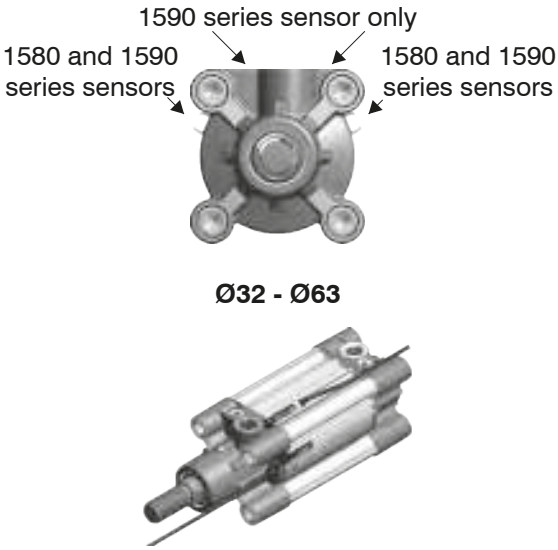
Code	Bore	L
1390.A	Ø32	58
	Ø40	65
1390.B	Ø50	75
	Ø63	86
1390.C	Ø80	105
	Ø100	122
1390.D	Ø125	150
	Ø160	190
	Ø200	225

Sensors code **1580._**
MRS._
MHS._

Feeding connections side sensors slots

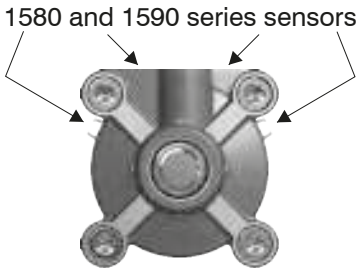


Sensors code **1590._**
LRS._
LHS._

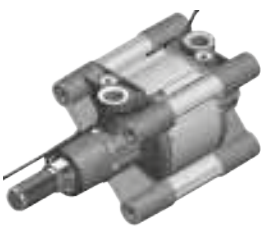


Ø32 - Ø63

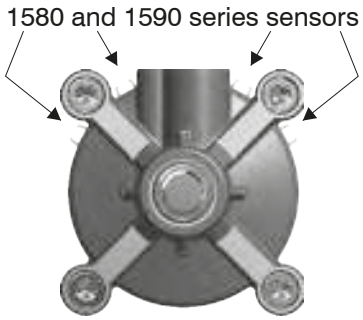
CYLINDERS - BORE SIZES Ø32 to Ø63:
The two slots on connection side are plugged, therefore only sensor 1590 can be used. Suitable for top housing and once placed by means of its screw, it can be fixed in desired position.



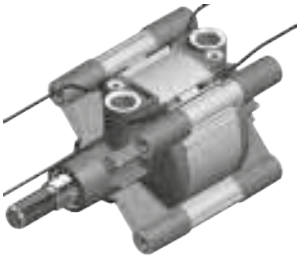
Ø80



CYLINDERS - BORE SIZE Ø80:
The two top housing can be accessed from the front of the unit, one housing can be accessed from the front end cap and the opposite housing from the rear end cap. It is therefore possible to use both type of sensors: 1580 - 1590.



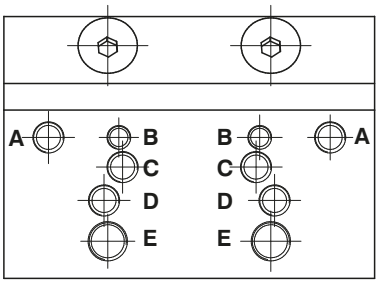
Ø100 - Ø200



CYLINDERS - BORE SIZE Ø100-Ø200:
All four housings can be accessed from the front of the unit. It is therefore possible to use both type of sensors: 1580 - 1590.

Solenoid valves supports

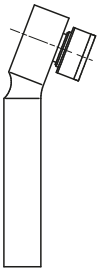
This accessory permits to mount a valve or an electrovalve on a side of the cylinder. The plate can be fitted on the cylinder profiled barrel. Once installed the connections must be done with fittings and pipes. All of the threaded holes on the support plate are dedicated to different valves series as per attached drawing.

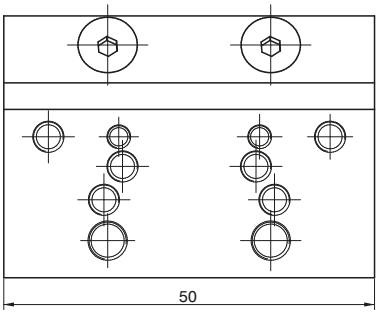


Fixing holes for valves series:

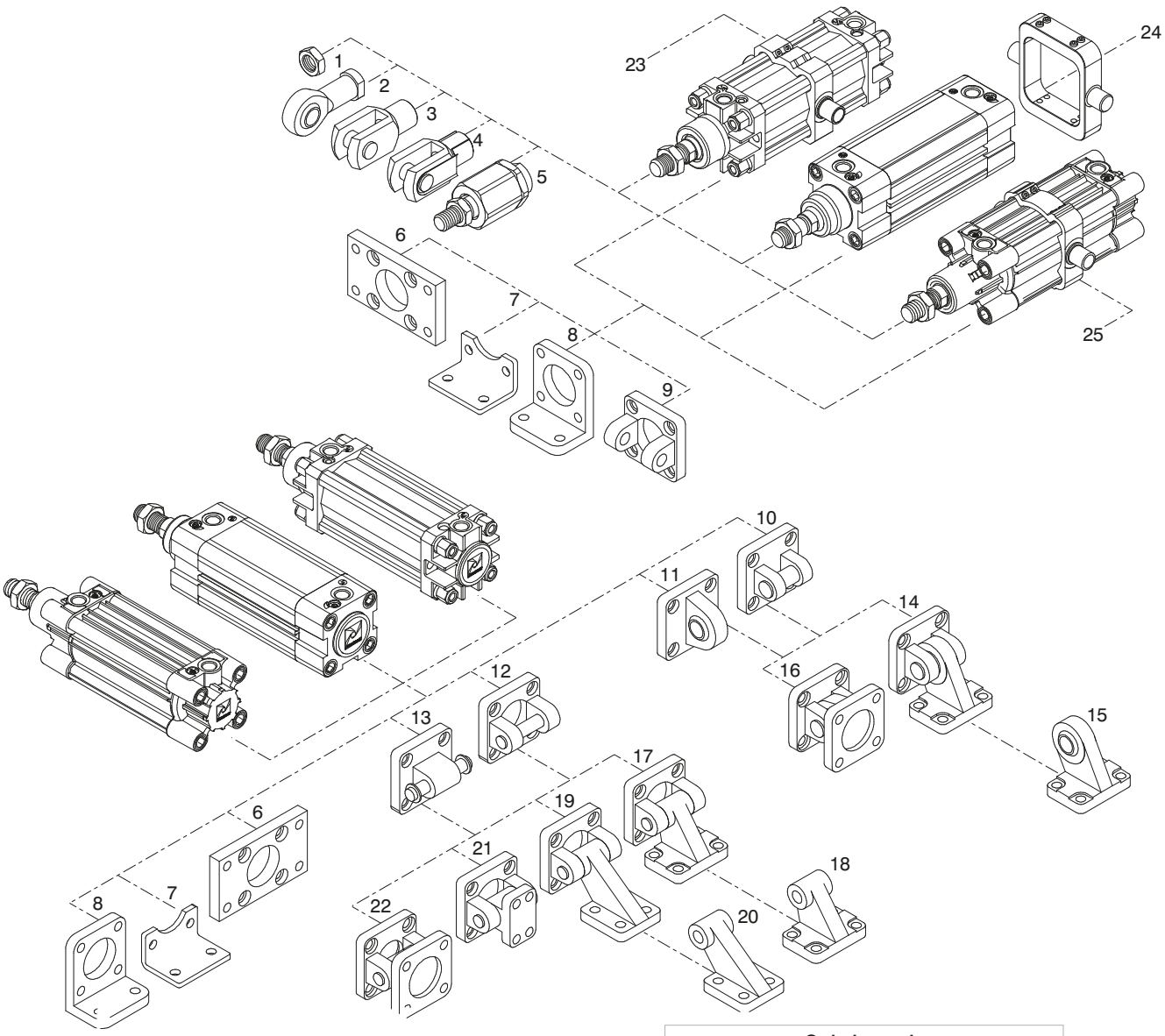
A = 488 / 484
B = 2400
C = T488
D = 2600
E = T424

Ordering code
1390.25 (for Ø32)
1390.26 (for Ø40)
1390.27 (for Ø50)
1390.28 (for Ø63)
1390.29 (for Ø80)
1390.30 (for Ø100)





Attention: do not use ISO distributor for base mounting

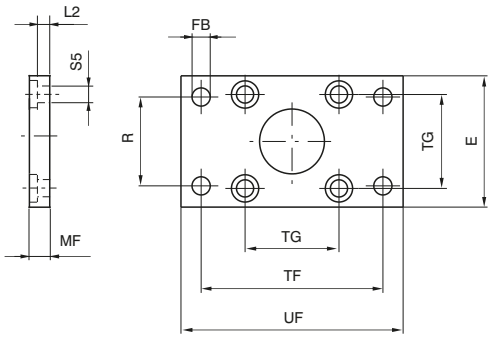


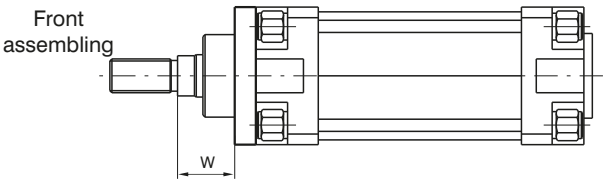
		Ordering code	
Pos.	**Description**	**Aluminium**	**Steel**
1	Rod nut	/	**1320.Ø.18F**
2	Ball joint	/	**1320.Ø.32F**
3	Forks	/	**1320.Ø.13F**
4	Fork with clips	/	**1320.Ø.13/1F**
5	Self-aligning joint	/	**1320.Ø.33F**
6	Flange (MF1-MF2)	**1390.Ø.03F** **1390.Ø.03FP**	**1380.Ø.03F**
7	Short mounting foot brackets (in sheet metal MS1)	/	**1320.Ø.05/1F**
8	Standard mounting foot brackets	**1320.Ø.05F**	/
9	Front clevis	**1380.Ø.08F**	**1320.Ø.19F**
10	Rear narrow clevis (AB6)	**1380.Ø.30F**	**1320.Ø.29F**
11	Rear male clevis (with jointed head according to DIN 648K standard)	**1380.Ø.15F**	**1320.Ø.25F**
12	Rear female clevis (MP2)	**1380.Ø.09F**	**1320.Ø.20F**
13	Rear male clevis (MP4)	**1380.Ø.09/1F**	**1320.Ø.21F**
14	Complete square angle trunnion (pos.10 + pos.15)	/	**1320.Ø.27F**
15	Simple square counter clevis (pos.14)	/	**1320.Ø.28F**
16	Square angle trunnion with joined head (pos.10 + pos.11)	**1380.Ø.36F**	**1320.Ø.26F**
17	Square angle trunnion (AB7) (pos.18 + pos.12)	**1380.Ø.35F**	**1320.Ø.23F**
18	Simple square counter clevis (pos.17)	**1320.Ø.11/2F**	**1320.Ø.24F**
19	Simple rear trunnion with support brackets (pos.20 + pos.12)	**1380.Ø.11F**	/
20	Simple square counter clevis (pos.19)	**1320.Ø.11/1F**	/
21	Standard trunnion	**1380.Ø.10F**	/
22	Standard complete trunnion (pos.12 + pos.13)	**1380.Ø.22F**	**1320.Ø.22F**
23	1319 - 1321 cylinders series Intermediate trunnion	**1320.Ø.12BF**	**1320.Ø.12F**
24	1386 - 1388 / 1396 - 1398 Ecoplus series Intermediate trunnion	/	**1386.Ø.12F**
25	1390 - 1392 Ecolight series Intermediate trunnion	**1390.Ø.12F**	/

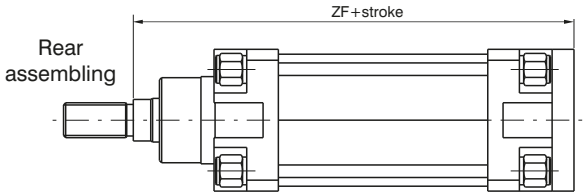
Front and rear flanges (MF1 - Mf2)

Ordering code			
Steel	:	**1380.Ø.03F**	(Ø32 ... Ø200)
Aluminium	:	**1390.Ø.03F**	(Ø32 ... Ø100)
Die-casting aluminium		**1390.Ø.03FP**	(Ø32 ... Ø100)

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



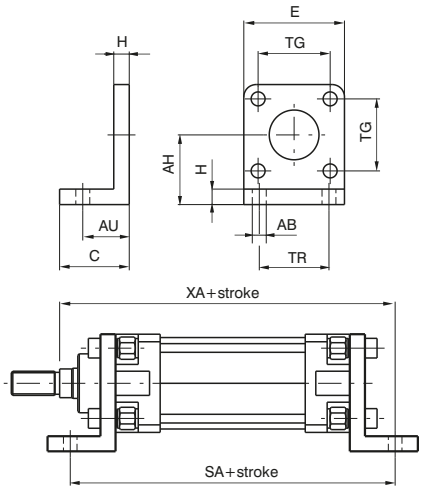




Bore	E	FB (H 13)	MF (JS 14)	R (JS 14)	TF (JS 14)	TG	UF	ZF	W	L2	S5	Weight(g) steel	Weight(g) aluminium	Weight(g) Die-casting aluminium
32	45	7	10	32	64	32,5	80	130	16	5	6,6	190	65	60
40	52	9	10	36	72	38	90	145	20	5	6,6	250	90	69
50	65	9	12	45	90	46,5	110	155	25	6,5	9	480	170	130
63	75	9	12	50	100	56,5	120	170	25	6,5	9	620	220	170
80	95	12	16	63	126	72	150	190	30	8	11	1430	500	345
100	115	14	16	75	150	89	170	205	35	8	11	1990	690	485
125	140	16	20	90	180	110	205	245	45	10,5	14	3750	/	/
160	180	18	20	115	230	140	260	280	60	9,5	18	6350	/	/
200	220	22	25	135	270	175	300	300	70	12,5	18	11350	/	/

Standard mounting foot brackets

Ordering code	
Aluminium:	**1320.Ø.05F** (1 piece)

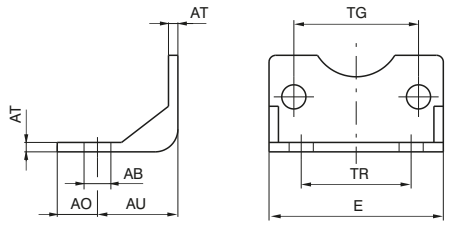


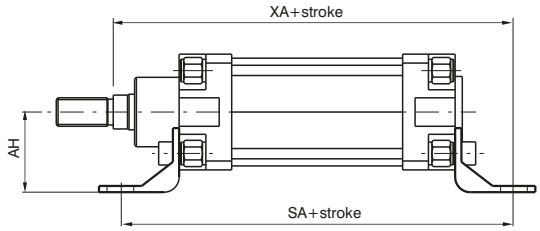
Elements used to anchor the cylinder parallel to the mounting plane. They are made of cast aluminium, painted black.

Bore	32	40	50	63	80	100	125	160	200
AB (H 14)	7	9	9	9	12	14	16	18	22
AH (JS 15)	32	36	45	50	63	71	91	115	135
AU (±0,2)	24	28	32	32	41	41	45	60	70
C	35	35	45	45	55	56	68	82	90
E	45	52	65	75	95	115	140	180	220
H	8	8	10	10	12	12	16	20	20
SA	142	161	170	185	210	220	250	300	320
TG	32,5	38	46,5	56,5	72	89	110	140	175
TR (JS 14)	32	36	45	50	63	75	90	115	135
XA	144	163	175	190	215	230	270	320	345
Weight gr.	45	65	140	175	380	470	920	2300	3200

Short mounting foot brackets (in sheet metal MS1)

Ordering code	
Steel:	**1320.Ø.05/1F** (1 piece)



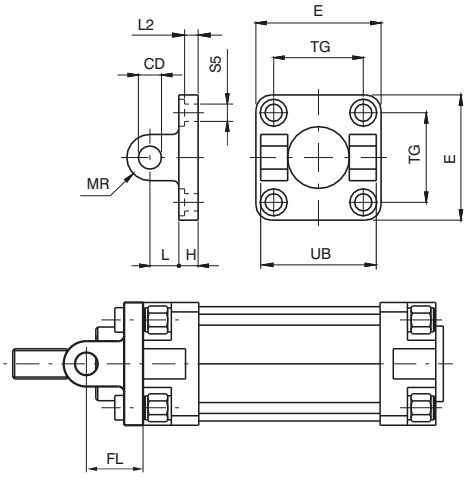


Elements used to anchor the cylinder parallel to the mounting plane. They are made of steel, and painted black.

Bore	32	40	50	63	80	100	125	160	200
AB (H 14)	7	9	9	9	12	14	16	18	22
AH (JS 15)	32	36	45	50	63	71	90	115	135
AU (± 0.2)	24	28	32	32	41	41	45	60	70
AO (± 0.2)	11	8	15	13	14	16	25	15	30
E	45	52	65	75	95	115	140	180	220
AT	4	4	5	5	6	6	8	9	12
SA	142	161	170	185	210	220	250	300	320
TG	32,5	38	46,5	56,5	72	89	110	140	175
TR (JS 14)	32	36	45	50	63	75	90	115	135
XA	144	163	175	190	215	230	270	320	345
Weight g	65	80	170	190	380	452	1090	1190	3450

Front clevis (not specified by ISO-VDMA standards)

Ordering code	
Aluminium:	**1380.Ø.08F**
Steel:	**1320.Ø.19F**

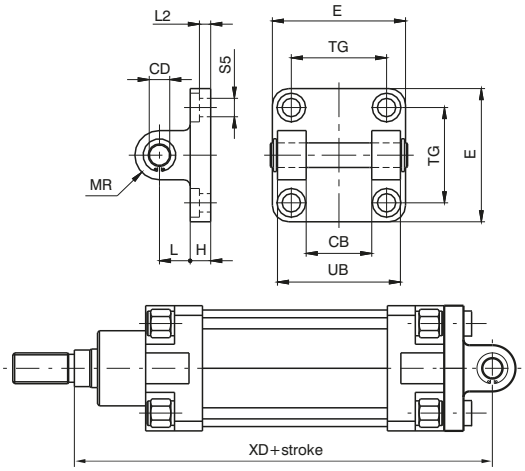


Used to mount the cylinder either parallel or at a right angle to the mounting plane; allows the cylinder to self-align under load. Made of aluminium alloy or steel (see ordering code) and painted black.

Bore		32	40	50	63	80	100	125	160	200
CD (H9)		10	12	12	16	16	20	25	30	30
E	Aluminium	45	52	65	75	95	115	140	180	220
	Steel	45	55	65	75	95	115	140	180	220
FL (±0,2)		22	25	27	32	36	41	50	55	60
H	Aluminium	9	9	11	11	14	14	20	20	25
	Steel	10	10	10	12	14	16	20	20	20
L	Aluminium	13	16	16	21	22	27	30	35	35
	Steel	12	15	17	20	22	25	30	35	40
MR		10	12	12	16	16	20	25	25	25
TG		32,5	38	46,5	56,5	72	89	110	140	175
UB (h14)		45	52	60	70	90	110	130	170	170
L2(±0,5)		5,5	5,5	6,5	6,5	10	10	10	10	11
S5 (H13)		6,6	6,6	9	9	11	11	14	18	18
Weight g	Aluminium	50	75	125	190	380	620	1180	1780	2900
	Steel	150	235	340	550	1010	1710	3360	5750	8960

Rear clevis (MP2)

Ordering code
Aluminium: **1380.Ø.09F** Steel: **1320.Ø.20F**

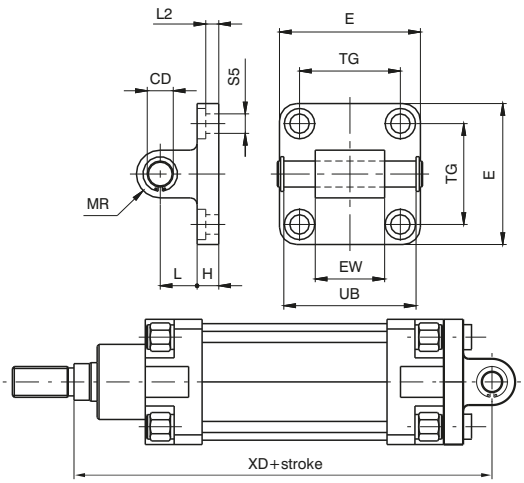


Similar to type 08 but includes a hinge pin. This type of mounting allows anchorage of the cylinder either parallel or right angle to plane; the cylinder rod can oscillate and self-align as necessary when under load. Made of aluminium alloy or steel (see ordering code) and painted black.

Bore		32	40	50	63	80	100	125	160	200
CB (H 14)		26	28	32	40	50	60	70	90	90
CD		10	12	12	16	16	20	25	30	30
E	Aluminium	45	52	65	75	95	115	140	180	220
	Steel	45	55	65	75	95	115	140	180	220
H	Aluminium	9	9	11	11	14	14	20	20	25
	Steel	10	10	10	12	14	16	20	20	20
L	Aluminium	13	16	16	21	22	27	30	35	35
	Steel	12	15	17	20	22	25	30	35	40
MR		10	12	12	16	16	20	25	25	25
TG		32,5	38	46,5	56,5	72	89	110	140	175
UB (h14)		45	52	60	70	90	110	130	170	170
XD		142	160	170	190	210	230	275	315	335
L2(±0,5)		5,5	5,5	6,5	6,5	10	10	10	10	11
S5		6,6	6,6	9	9	11	11	14	18	18
Weight	Aluminium	80	130	185	310	530	910	1710	2760	3820
g	Steel	180	290	400	670	1160	2000	3890	6730	9880

Rear male clevis (MP4)

Ordering code
Aluminium: **1380.Ø.09/1F** Steel: **1320.Ø.21F**

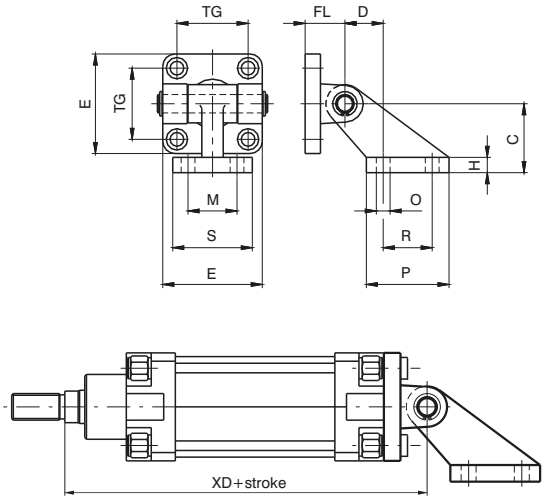


Similar to 09 clevis except for the connection, which is male rather than female. Used to mount the cylinder either parallel or at a right angle to the plane; the cylinder rod can oscillate and self-align as necessary when under load. Made of aluminium alloy or steel (see ordering code) and painted black.

Bore		32	40	50	63	80	100	125	160	200
CD		10	12	12	16	16	20	25	30	30
E	Aluminium	45	52	65	75	95	115	140	180	220
	Steel	45	55	65	75	95	115	140	180	220
EW		26($^{-0,2}_{-0,6}$)	28($^{-0,2}_{-0,6}$)	32($^{-0,2}_{-0,6}$)	40($^{-0,2}_{-0,6}$)	50($^{-0,2}_{-0,6}$)	60($^{-0,2}_{-0,6}$)	70($^{-0,5}_{-1,2}$)	90($^{-0,5}_{-1,2}$)	90($^{-0,5}_{-1,2}$)
H	Aluminium	9	9	11	11	14	14	20	20	25
	Steel	10	10	10	12	14	16	20	20	20
L	Aluminium	13	16	16	21	22	27	30	35	35
	Steel	12	15	17	20	22	25	30	35	40
MR		10	12	12	16	16	20	25	25	25
TG		32,5	38	46,5	56,5	72	89	110	140	175
UB ($^{0,5}_{0}$)		46	53	61	71	91	111	132	171,5	171,5
XD		142	160	170	190	210	230	275	315	335
L2 (±0.5)		5,5	5,5	6,5	6,5	10	10	10	10	11
S5		6,6	6,6	9	9	11	11	14	18	18
Weight	Aluminium	90	130	190	340	580	960	1890	2830	3940
g	Steel	210	330	430	810	1350	2400	4300	6880	8560

Simple rear trunnion with support brackets (not specified by ISO-VDMA standards)

Ordering code
Aluminium: **1380.Ø.11F** Counter clevis can be ordered separately with code1320.Ø.11/1F

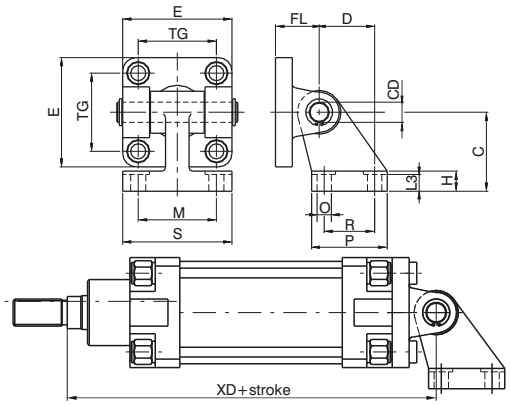


Used to mount cylinders parallel to the plane to which the counter clevis is attached. Allows self-alignment of the cylinder rod under load with an oscillation up to 90 degrees from the mounting plane.

Bore	32	40	50	63	80	100	125	160	200
C (±0,2)	32	45	45	63	63	90	90	140	140
D (±0,5)	18	25	25	32	32	40	40	50	50
E	45	52	65	75	95	115	140	180	220
H	8	10	10	12	12	17	17	20	20
FL	22	25	27	32	36	41	50	55	60
M (JS 14)	25	32	32	40	40	50	50	63	63
TG	32,5	38	46,5	56,5	72	89	110	140	175
O (H 13)	7	9	9	11	14	14	18	18	
P	37	54	54	75	75	103	103	154	154
R (JS 14)	20	32	32	50	50	70	70	110	110
S	41	52	52	63	63	80	80	110	110
XD	142	160	170	190	210	230	275	315	335
Weight g	130	260	330	600	820	1560	2530	4735	5795

Square angle trunnion

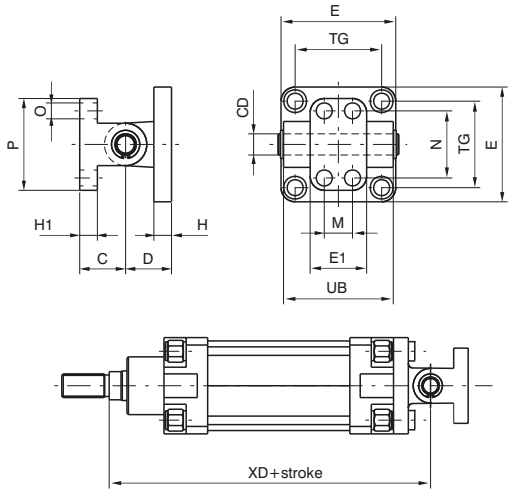
Ordering code
Aluminium: **1380.Ø.35F** Counter clevis can be ordered separately with code1320.Ø.11/2F Steel: **1320.Ø.23F** (Ø32-Ø100) Counter clevis can be ordered separately with code1320.Ø.24F



Bore		32	40	50	63	80	100	125	160	200
E	Aluminium	45	52	65	75	95	115	140	180	220
	Steel	45	55	65	75	95	115	140	180	220
TG		32,5	38	46,5	56,5	72	89	110	140	175
FL		22	25	27	32	36	41	50	55	60
D (JS14)		21	24	33	37	47	55	70	97	105
CD		10	12	12	16	16	20	25	30	30
C (JS15)		32	36	45	50	63	71	90	115	135
H	Aluminium	8	10	12	14	14	17	20	25	30
	Steel	8	10	12	12	14	15	/	/	/
L3	Aluminium	6,4	8,4	10,4	12,4	11,5	14,5	16,8	21	26
	Steel	6,5	8,5	10,5	10,5	11,5	12,5	/	/	/
R (JS14)		18	22	30	35	40	50	60	88	90
P		31	35	45	50	60	70	90	126	130
O (H13)		6,6	6,6	9	9	11	11	14	14	18
S		51	54	65	67	86	96	124	156	162
M (JS14)		38	41	50	52	66	76	94	118	122
XD		142	160	170	190	210	230	275	315	335
Weight g	Aluminium	120	180	225	435	730	1220	2325	3780	4950
	Steel	340	500	640	1250	2100	3500	/	/	/

Standard trunnion (not specified by ISO-VDMA standards)

Ordering code
Aluminium: **1380.Ø.10F**

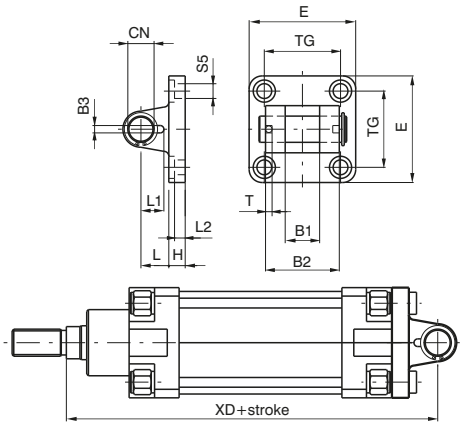


Mounting consists of clevis 09 and counter clevis. Used to mount cylinders at a right angle to the plane to which the counter clevis is attached. Allows self-alignment of the cylinder rod under load with an oscillation of ± 60 degrees.

Bore	32	40	50	63	80	100	125	160	200
C (±0.2)	18	26	26	34	34	41	41	55	55
CD	10	12	12	16	16	20	25	30	30
D	22	25	27	32	36	41	50	55	60
E	45	52	65	75	95	115	140	180	220
E1	25	32	32	46	46	56	56	71	71
H	10	10	12	12	16	16	20	20	25
H1	8	10	10	12	12	16	16	20	20
M (±0.2)	-	16	16	25	25	32	32	43	43
N (±0.2)	28	38	38	54	54	90	90	150	150
O	7	9	9	11	11	14	14	18	18
P	40	52	52	75	75	115	115	180	180
TG	32.5	38	46.5	56.5	72	89	110	140	175
UB	45	52	60	70	90	110	130	170	170
XD	142	160	170	190	210	230	275	315	335
Weight g	110	190	240	490	710	1290	2090	3690	4810

Rear narrow clevis

Ordering code
Aluminium: **1380.Ø.30F** Steel: **1320.Ø.29F** (Ø32 ... Ø125)

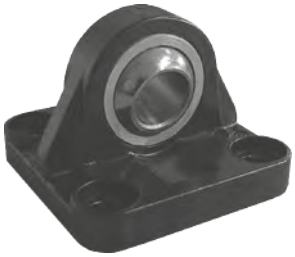


Utilised with clevis 15F allows the cylinder to oscillate in all directions. Made of aluminium alloy or steel (see ordering code) and painted black.

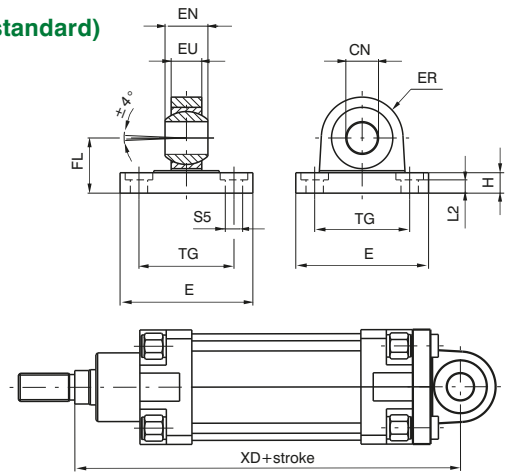
Bore		32	40	50	63	80	100	125	160	200
B1 (H 14)		14	16	21	21	25	25	37	43	43
B2 (d 12)		34	40	45	51	65	75	97	122	122
B3 ($^{+0,2}_{-0}$)		3,3	4,3	4,3	4,3	4,3	6,3	6,3	6,3	6,3
CN		10	12	16	16	20	20	30	35	35
E	Aluminium	45	52	65	75	95	115	140	180	220
	Steel	45	55	65	75	95	115	140	180	220
H	Aluminium	9	9	11	11	14	14	20	20	25
	Steel	10	10	10	12	14	16	20	/	/
L	Aluminium	13	16	16	21	22	27	30	35	35
	Steel	12	15	17	20	22	25	30	/	/
L1		11,5	12	14	14	16	16	24	26,5	26,5
L2 (±0,5)		5,5	5,5	6,5	6,5	10	10	10	10	11
S5		6,6	6,6	9	9	11	11	14	18	18
T		3	4	4	4	4	4	6	6	6
TG		32,5	38	46,5	56,5	72	89	110	140	175
XD		142	160	170	190	210	230	275	315	335
Weight g	Aluminium	70	115	200	290	570	820	1710	3010	4380
	Steel	160	270	370	670	1110	2100	4150	/	/

Rear male clevis (with jointed head according to DIN 648K standard)

Ordering code
Aluminium: **1380.Ø.15F** Steel: **1320.Ø.25F**(Ø32 ... Ø125)



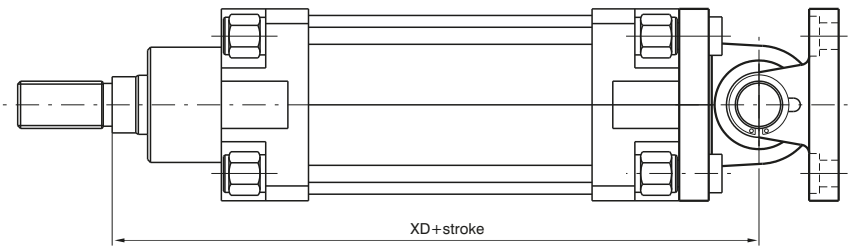
Utilised with clevis 30F allows the cylinder to oscillate in all directions. Made of aluminium alloy or steel (see ordering code) and painted black.

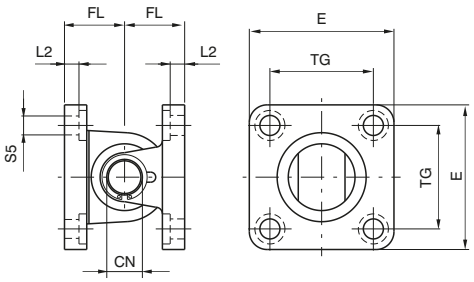


Bore		32	40	50	63	80	100	125	160	200
CN (H 7)		10	12	16	16	20	20	30	35	35
E	Aluminium	45	52	65	75	95	115	140	180	220
	Steel	45	55	65	75	95	115	140	180	220
EN (-0.1)		14	16	21	21	25	25	37	43	43
ER	Aluminium	16	19	21	24	28.5	30	40	45	48
	Steel	15	18	20	23	27	30	40	/	/
EU		10.5	12	15	15	18	18	25	28	28
FL (JS 15)		22	25	27	32	36	41	50	55	60
H	Aluminium	9	9	11	11	14	14	20	20	25
	Steel	10	10	10	12	14	16	20	/	/
L2 (±0.5)		5.5	5.5	6.5	6.5	10	10	10	10	11
S5		6.6	6.6	9	9	11	11	14	18	18
TG		32.5	38	46.5	56.5	72	89	110	140	175
XD		142	160	170	190	210	230	275	315	335
Weight	Aluminium	60	100	180	245	480	650	1410	2420	3840
g	Steel	210	310	400	710	1350	2400	4000	/	/

Complete standard trunnion (with joined head according to DIN 648K standards)

Ordering code
Aluminium: **1380.Ø.36F** Counter clevis can be ordered separately with code 1380.Ø.15F Steel: **1320.Ø.26F** (Ø32-Ø125) Counter clevis can be ordered separately with code 1320.Ø.25F

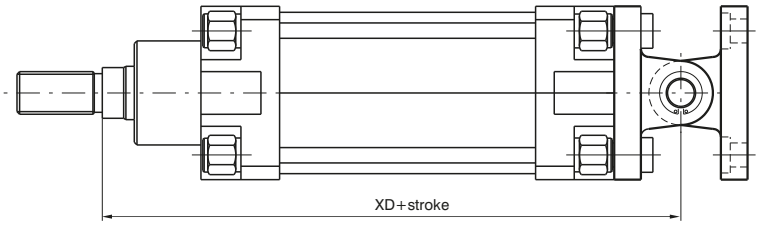


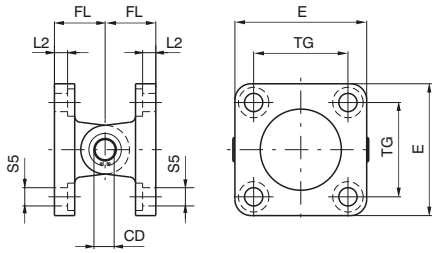


Bore		32	40	50	63	80	100	125	160	200
CN		10	12	16	16	20	20	30	35	35
E	Aluminium	45	52	65	75	95	115	140	180	220
	Steel	45	55	65	75	95	115	140	180	220
FL (JS 15)		22	25	27	32	36	41	50	55	60
L 2 (±0.5)		5.5	5.5	6.5	6.5	10	10	10	10	11
S5		6.6	6.6	9	9	11	11	14	18	18
TG		32.5	38	46.5	56,5	72	89	110	140	175
XD		142	160	170	190	210	230	275	315	335
Weight	Aluminium	130	215	380	535	1050	1470	3120	5430	8220
g	Steel	380	580	770	1380	2460	4500	8150	/	/

Standard complete trunnion

Ordering code
Aluminium: **1380.Ø.22F** Mounting consists of rear clevis code 1380.Ø.09F + rear male clevis code1380.Ø.09/1F (ordering separately) Steel: **1320.Ø.22F** Mounting consists of rear clevis code 1320.Ø.20F + rear male clevis code 1320.Ø.21F (ordering separately)

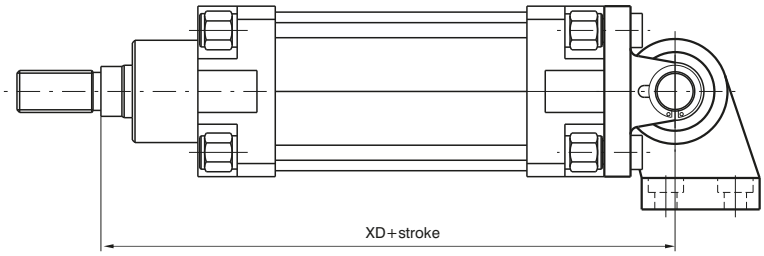


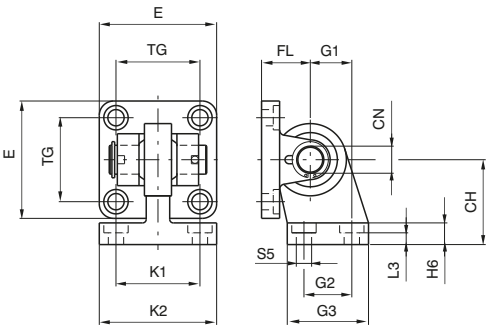


Bore	32	40	50	63	80	100	125	160	200
CD	10	12	12	16	16	20	25	30	30
E	45	55	65	75	95	115	140	180	220
FL	22	25	27	32	36	41	50	55	60
L 2 (±0.5)	5,5	5,5	6,5	6,5	10	10	10	10	11
S 5	6,6	6,6	9	9	11	11	14	18	18
TG	32,5	38	46,5	56,5	72	89	110	140	175
XD	142	160	170	190	210	230	275	315	335
Weight g	360	580	780	1370	2370	4110	7670	12650	17480

Complete square angle trunnion (with joined head according to DIN 648K standards)

Ordering code
Steel: **1320.Ø.27F** Mounting consists of rear clevis narrow code 1320.Ø.29F + simple counter clevis code 1320.Ø.28F (ordering separately)

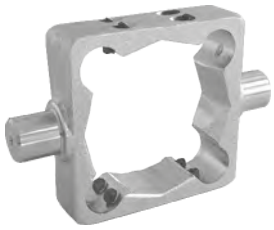


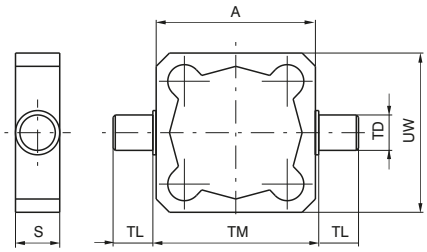


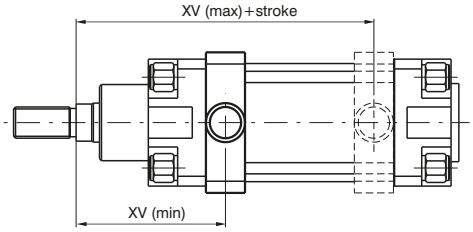
Bore	32	40	50	63	80	100	125
CH (JS 15)	32	36	45	50	63	71	90
CN	10	12	16	16	20	20	30
E	45	55	65	75	95	115	140
FL (JS 15)	22	25	27	32	36	41	50
G1 (JS 15)	21	24	33	37	47	55	70
G2 (JS 14)	18	22	30	35	40	50	60
G3	31	35	45	50	60	70	90
H6	10	10	12	12	14	15	20
K1 (JS 14)	38	41	50	52	66	76	94
K2	51	54	65	67	86	96	124
L3 ($^{+0,5}_{0}$)	8,5	8,5	10,5	10,5	11,5	12,5	17
S5	6,6	6,6	9	9	11	11	14
TG	32,5	38	46,5	56,5	72	89	110
XD	142	160	170	190	210	230	275
Weight g	330	480	830	1220	2100	3580	7000

Intermediate trunnion Series 1319 - 1321

Ordering code
Steel: **1320.Ø.12F**





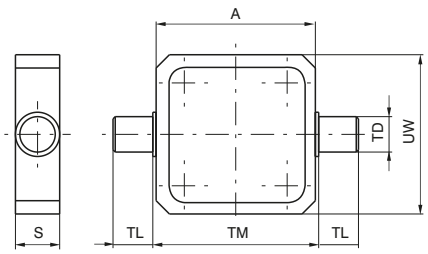


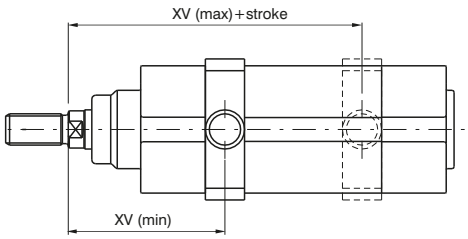
Clevis to be mounted on the barrel to have the centre of rotation of the hinge pin at a point between the end caps of the cylinder. It is attached to the barrel by means of eight pointed grains that block in the "V" groove of the four protruding shapes. In the case of anchorage subject to heavy use, it is recommended to connect the clevis once the right position has been found.
Attention: mounting of the clevis with contact to the end plates does not allow the use of the magnetic sensors as the switch limits.

Bore	32	40	50	63	80	100	125	160	200
A	49	62	73	87	109	130	155	190	240
S	18	21	21	27	27	32	32	40	40
TD (e9)	12	16	16	20	20	25	25	32	32
TL (h14)	12	16	16	20	20	25	25	32	32
TM (h14)	50	63	75	90	110	132	160	200	250
UW	59	62	73	87	109	130	155	190	240
XV (max.)	85	96	102	109	123.5	131.5	162	193	204
XV (min.)	61	69	78	86	96.5	108.5	128	150	168
Weight g	180	270	330	650	890	1550	1950	3580	5850

Intermediate trunnion Series 1386 - 1388 - 1396 - 1398

Ordering code
Steel: **1386.Ø.12F**





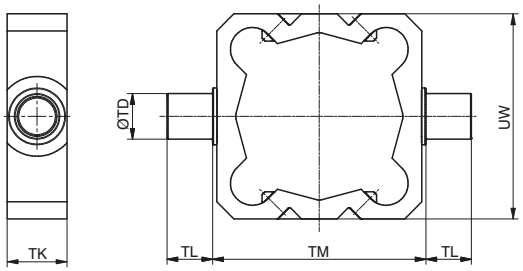
Clevis to be mounted on the barrel to have the centre of rotation of the hinge pin at a point between the end caps of the cylinder. It is attached to the barrel by means of eight pointed grains. In the case of anchorage subject to heavy use, it is recommended to connect the clevis once the right position has been found.

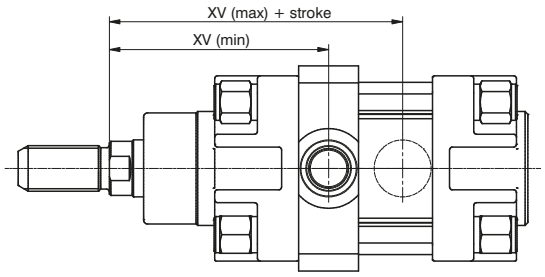
Attention: mounting of the clevis with contact to the end plates does not allow the use of the magnetic sensors as the switch limits.

Bore	32	40	50	63	80	100
A	49.8	62.6	74.1	89.1	109.1	130.1
S	18	21	21	27	27	30
TD (e 9)	12	16	16	20	20	25
TL (h 14)	12	16	16	20	20	25
TM (h 14)	50	63	75	90	110	132
UW	70	78	91	94	130	145
XV (max.)	80	91.5	97.5	106.5	118.5	127
XV (min.)	66	73.5	82.5	88.5	101.5	113
Weight g	195	350	430	565	1035	1450

Intermediate trunnion Series 1319 - 1321

Ordering code
1320.Ø.12BF (Aluminium with steel bushes)



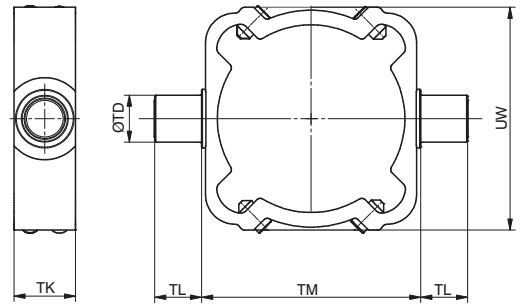


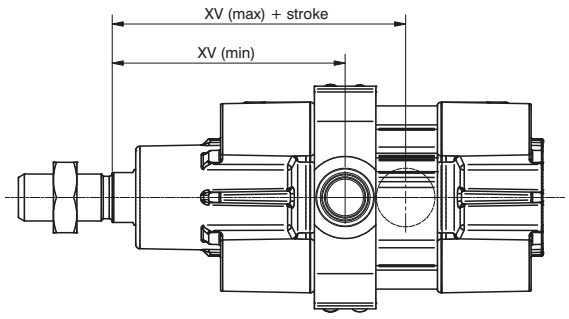
Aluminium Intermediate Trunnion with steel bushes to be mounted on the barrel. This solution allows the cylinder to rotate around the hinge which can be mounted in any position between the end caps. It is attached to the barrel by means of 8 grub screws which secure the Trunnion to the extruded barrel. In the case of heavy duty applications it is recommended that the Trunnion is secured using expansion pins.
In case off applications with high speed, high load and high pressure please contact our technical office.
Please note: If the Trunnion is mounted in direct contact with the cylinder end cap, it will not be possible to fit magnetic sensors at the end of stroke.

Bore	32	40	50	63	80	100
TD	Ø12	Ø16	Ø16	Ø20	Ø20	Ø25
TL	12	16	16	20	20	25
TM	50	63	75	90	110	132
TK	18	21	21	27	27	32
UW	54	60	72	87	109	130
XV min.	61	69	78	86	96.5	108.5
XV max.	85	96	102	109	123.5	131.5
Weight g	70	110	140	280	370	630

Intermediate trunnion Series 1390 - 1392

Ordering code
1390.Ø.12F (Aluminium with steel bushes)





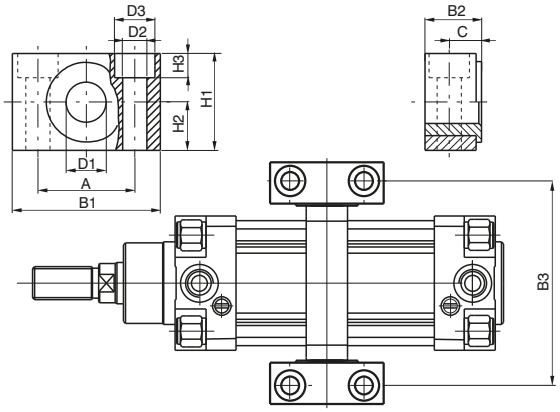
Aluminium Intermediate Trunnion with steel bushes to be mounted on the barrel. This solution allows the cylinder to rotate around the hinge which can be mounted in any position between the end caps. It is attached to the barrel by means of 8 grub screws which secure the Trunnion to the extruded barrel. In the case of heavy duty applications it is recommended that the Trunnion is secured using expansion pins.
In case off applications with high speed, high load and high pressure please contact our technical office.
Please note: If the Trunnion is mounted in direct contact with the cylinder end cap, it will not be possible to fit magnetic sensors at the end of stroke 1500._, RS._, HS._ series.

Bore	32	40	50	63	80	100
TD	Ø12	Ø16	Ø16	Ø20	Ø20	Ø25
TL	12	16	16	20	20	25
TM	53*	63	75	90	110	132
TK	18	21	21	27	27	32
UW	56	64	76	92	112	134
XV min.	65	74	80	87	99	109
XV max.	81	91	100	108	121	130.5
Weight g	60	100	125	240	320	540

* (Ø32, TM: not according to standard ISO 15552

Support for intermediate trunnion

Ordering code
1320.Ø.12/1F (1 piece)

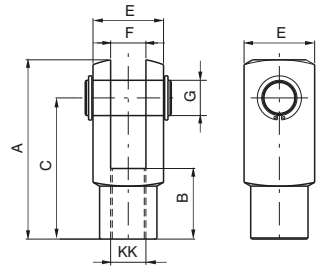


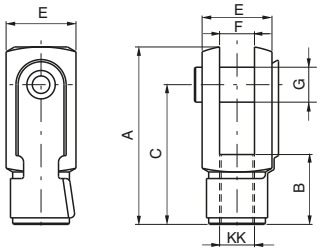
Combining two supports to the intermediate trunnion it is possible to fix the cylinder on plane surface.

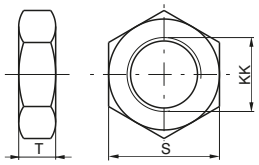
Bore	32	40	50	63	80	100	125	160	200
A (±0.2)	32	36	36	42	42	50	50	60	60
B1	46	55	55	65	65	75	75	92	92
B2	18	21	21	23	23	28.5	28.5	40	40
B3	71	87	99	116	136	164	192	245	295
C	10.5	12	12	13	13	16	16	22.5	22.5
D1 (F7)	12	16	16	20	20	25	25	32	32
D2	6.6	9	9	11	11	14	14	18	18
D3	11	15	15	18	18	20	20	26	26
H1	30	36	36	40	40	50	50	60	60
H2 (±0.1)	15	18	18	20	20	25	25	30	30
H3	7	9	9	11	11	13	13	17	17
Weight g (1 piece)	100	150	150	235	235	435	435	850	850

Rod forks and nuts

Ordering code
1320.Ø.13F **1320.Ø.13/1F** (from ø32 to ø100) **1320.Ø.18F**





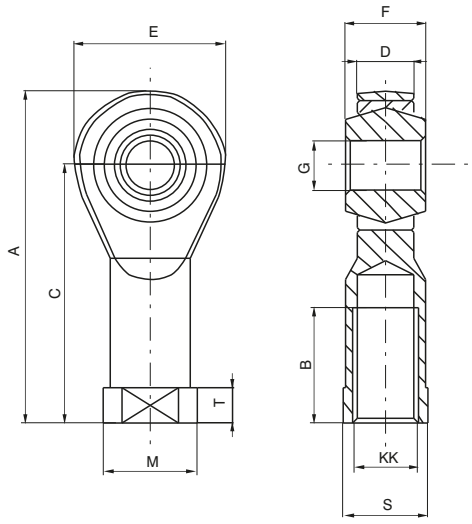


Fork:
Element that when screwed to the rod consents a regular functioning even when there are significant lateral forces as the connection point. Made of zinc-plated steel.
Nut:
Used to block the position of the fork.

Bore		32	40	50	63	80	100	125	160	200
A		52	62	83	83	105	105	148	188	188
B		20	24	32	32	40	40	56	72	72
C		40	48	64	64	80	80	110	144	144
E		20	24	32	32	40	40	55	70	70
F(B12)		10	12	16	16	20	20	30	35	35
G		10	12	16	16	20	20	30	35	35
S		17	19	24	24	30	30	41	55	55
T		6	7	8	8	9	9	12	18	18
KK		M10X1.25	M12X1.25	M16X1.5	M16X1.5	M20X1.5	M20X1.5	M27X2	M36X2	M36X2
Weight	forks	100	140	340	340	680	680	2500	4000	4000
g	nut	15	20	20	20	40	40	100	210	210

Ball joint

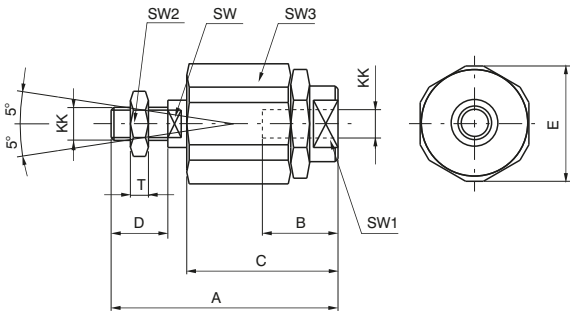
Ordering code
1320.Ø.32F



Bore	32	40	50	63	80	100	125	160	200
A	57	66	85	85	102	102	145	165	165
B	20	22	28	28	33	33	51	56	56
C	43	50	64	64	77	77	110	125	125
D (-0.1)	10.5	12	15	15	18	18	25	28	28
E	28	32	42	42	50	50	70	80	80
F	14	16	21	21	25	25	37	43	43
G (H 7)	10	12	16	16	20	20	30	35	35
KK	M10x1.25	M12x1.25	M16x1.5	M16x1.5	M20x1.5	M20x1.5	M27x2	M36x2	M36x2
M	19	22	27	27	34	34	50	58	58
S	17	19	22	22	30	30	41	50	50
T	6.5	6.5	8	8	10	10	15	17	17
Weight g	76	110	220	220	410	410	1200	1600	1600

Self-aligning joint

Ordering code
1320.Ø.33F



Bore	32	40	50	63	80	100
A	71	75	103	103	119	119
B	20	20	32	32	40	40
C	46	46	63	63	71	71
D	20	24	32	32	40	40
E	32	32	45	45	45	45
KK	M10x1.25	M12x1.25	M16x1.5	M16x1.5	M20x1.5	M20x1.5
SW	12	12	20	20	20	20
SW1	19	19	27	27	27	27
SW2	17	19	24	24	30	30
SW3	30	30	41	41	41	41
T	6	7	8	8	9	9
Weight g	220	230	660	660	700	700

Series 1315, Round tube with tie rod cylinders - Ø250 / Ø320

General

Tie rod cylinders, according to standard ISO15552.

Construction characteristics

End caps	aluminium alloy casting
Rod	C43 chromed steel
Barrel	oxidised aluminium
Tie rod	steel with rolled threads
Cushion bushings	aluminium
Rod-guide bushing	sintered bronze
Piston	aluminium
Seals	Standard: NBR oil resistant rubber, PUR piston rod seals

Operational characteristics

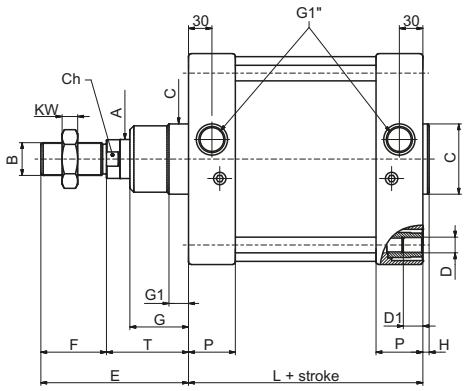
Fluid	filtered and lubricated air - hydraulic oil (with special bushing)
Pressure	max. 12 bar
Operating temperature	-5 °C - +70 °C
Cushioning length	50 mm

Please follow the suggestions below to ensure a long life for these cylinders:
• use clean and lubricated air
• correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
• avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device);
• evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

Please note: air must be dried for applications with lower temperature.
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.
Our Technical Department will be glad to help.

Basic version

Ordering code
1315.Ø.stroke.01A magnetic,aluminium barrel
BORE
Ø 250 = 250 mm
320 = 320 mm



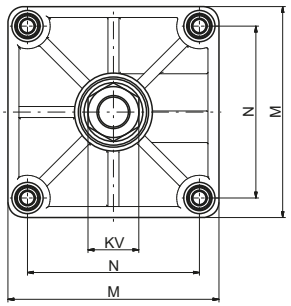


Table of dimensions

BORE	A	B	Ch	C	D	D1	E	F	G	G1	H	KW	KV	L	M	N	P	T	Weight (g)
250	Ø50	M42x2	46	Ø90	M20	25	189	84	75	25	8	21	Es64	200	270	220	60	105	28.170 (increase of 380 g each 10 mm stroke)
320	Ø63	M48x2	55	Ø110	M24	28	216	96	90	25	10	24	Es72	220	350	270	65	120	49.810 (increase of 616 g each 10 mm stroke)

Front and rear flanges

Ordering code
1315.Ø.03F (Steel)
BORE
Ø 250 = 250 mm
320 = 320 mm

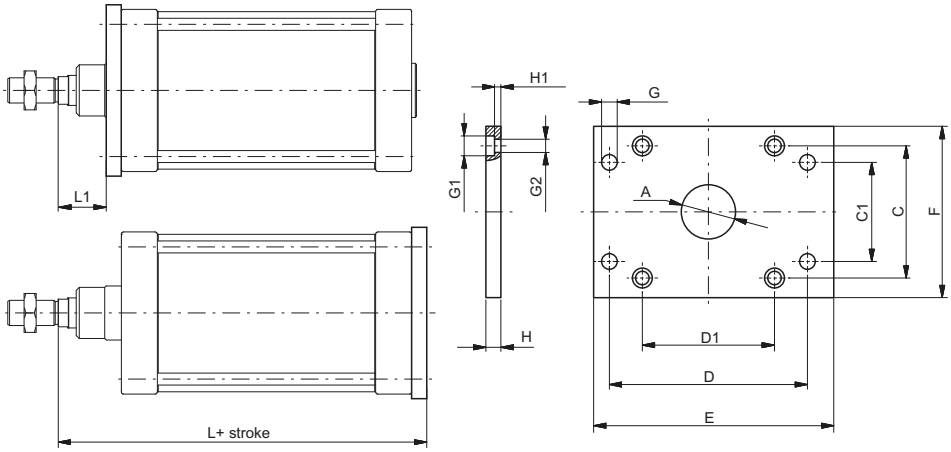


Table of dimensions

BORE	A(H11)	C	C1 (JS14)	D (JS14)	D1	E	F	G (H13)	G1 (H13)	G2 (H13)	H (±0,2)	H1 ($^{+0}_{-0,5}$)	L	L1	Weight (g)
250	90	220	165	330	220	400	285	26	33	22	25	10,5	330	80	20.150
320	110	270	200	400	270	470	350	33	39	26	30	15	370	90	34.000

Rear clevis

Ordering code
1315.Ø.09F
BORE
Ø 250 = 250 mm
320 = 320 mm

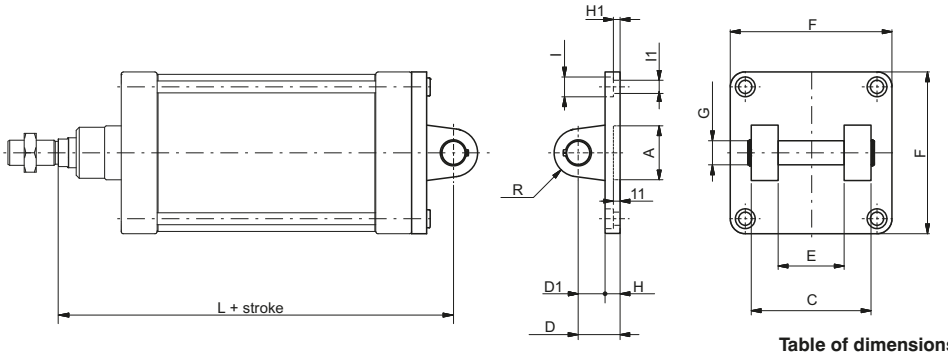


Table of dimensions

BORE	A	C (h14)	D (±0,2)	D1	E (H14)	F	G (H9)	H	H1	I	I1	L	R	Weight (g)
250	Ø90	200	70	45	110	270	40	25	11	33	22	375	40	7.800
320	Ø110	220	80	50	120	350	42,5	30	15	39	26	420	45	13.000

Rear male clevis

Ordering code
1315.Ø.09/1F
BORE
Ø 250 = 250 mm
320 = 320 mm

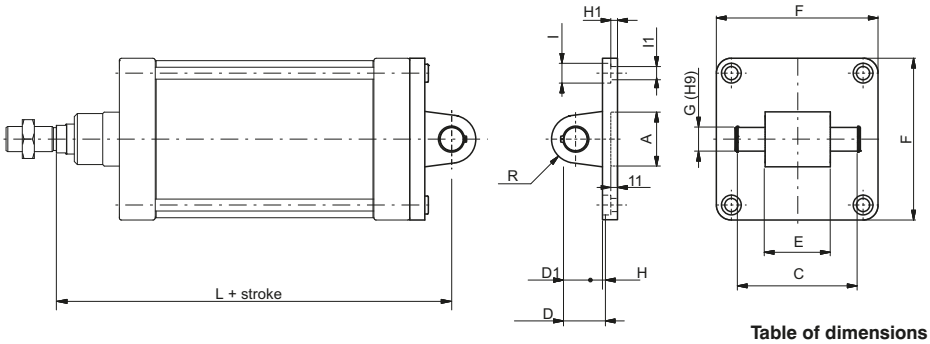


Table of dimensions

BORE	A	C ($^{+0,3}_{0}$)	D (±0,2)	D1	E ($^{-0,5}_{-1,2}$)	F	G (H9)	H	H1	I	I1	L	R	Weight (g)
250	Ø90	202	70	45	110	270	40	25	11	33	22	375	40	8.300
320	Ø110	222	80	50	120	350	42,5	30	15	39	26	420	45	13.060

Intermediate trunnion

Ordering code	
1315.Ø.12F (Steel)	
Ø	**Bore**
	250 = 250 mm
	320 = 320 mm

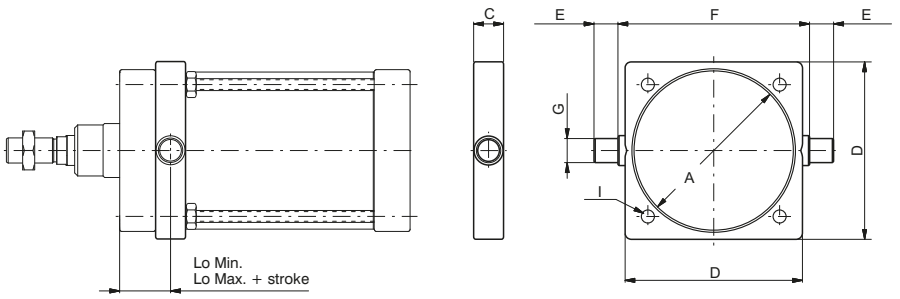


Table of dimensions

BORE	A	C	D	E (h14)	F (h14)	G (e9)	I	Lo Min.	Lo Max.	Weight (g)
250	Ø268	50	295	40	320	Ø40	Ø20,25	85	115 + stroke	10.500
320	Ø343	70	370	50	400	Ø50	Ø24,25	95	125 + stroke	25.300

Fork with pin

Ordering code	
1302.Ø.13F (Steel)	
Ø	**Bore**
	250 = 250 mm
	320 = 320 mm

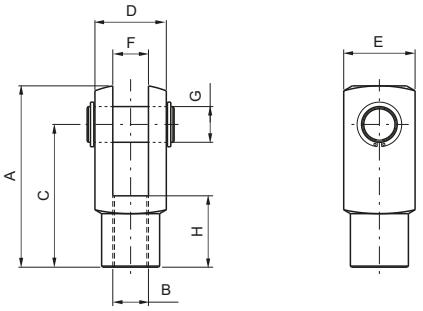


Table of dimensions

BORE	A	B	C	D	E	F	G	H	Weight (g)
250	188	M42x2 (H8)	144	70	70	35 (B12)	Ø35 (H9)	72	3.700
320	265	M48x2	192	96	96	50	Ø50	96	9.700

Rod lock nut

Ordering code	
1302.Ø.18F (Steel)	
Ø	**Bore**
	250 = 250 mm
	320 = 320 mm

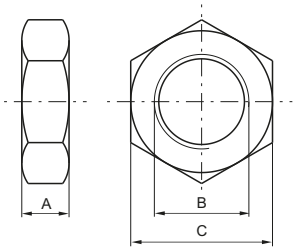


Table of dimensions

BORE	A	B	C	Weight (g)
250	21	M42x2	65	260
320	24	M48x2	72	580

Ball joint

Ordering code	
1302.Ø.32F (Steel)	
Ø	**Bore**
	250 = 250 mm
	320 = 320 mm

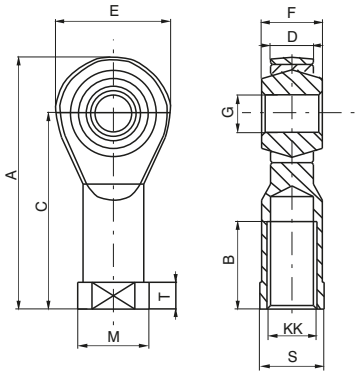


Table of dimensions

BORE	250	320
A	187	218
B	60	65
C	142	162
D (-0.1)	33	45
E	91	117
F	49	60
G (H 7)	40	50
KK	M42x2	M48x2
M	65	75
S	55	65
T	19	23
Weight g.	2.400	5.000

Sensor bracket - codes 1500._,RS._,HS._

Ordering code
1306.D (Ø250)
1306.E (Ø320)

For technical characteristics and Sensors ordering code see "Magnetic sensors" section

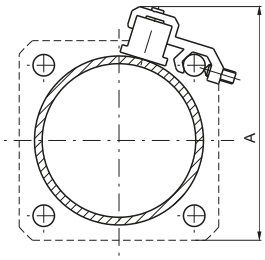


Table of dimensions

BORE	A
250	250
320	365

Series AISI 316 stainless steel - Steel line

General

The 1393-1394 stainless steel ISO 15552 cylinders series are designed for corrosion resistance application such as marine, pharmaceutical and food ambiences.
The pre lubrication grease used is NSF H1 certified for food application.
Specific care has been taken during the design stages and the result is a clean profile cylinder easy to clean and free from possible residue build-up areas.
All parts in contact with the external environment are in Stainless steel 316L and the seals are available in two different compounds for different temperature applications: PUR -30C° - +80 C° and FPM -5°C - +150°C.
The range starts from 32 bore up to 100 bore , round barrel and tie rods design. Double acting version standard or with through rod, magnetic or not magnetic piston available.
The piston is aluminium and the sensor bracket, when required is in stainless steel 316.
The cylinder can be fixed via the threaded holes in the tie rod nuts or with the wide range of stainless steel accessories.

Construction characteristics

End caps, piston rod, barrel, cushion screws	Stainless steel AISI 316
Rod-guide bushings	Stainless steel AISI 316 with P.T.F.E. coat
Half-pistons	Aluminium
Seals	PUR or FPM on request
Lubricating grease	NSF-H1 certified grease for incidental contact with food

Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Max. pressure	10 bar
Operating temperature	-30° C - +80°C with PUR seals -5° C - +150°C with FPM seals and non magnetic piston -5° C - +80°C with FPM seals and magnetic piston
Bore	Ø 32 - 40 - 50 - 63 - 80 - 100
Cushioning lenght	mm 20 - 20 - 22 - 22 - 32 - 32

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device)
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

Please note: air must be dried for applications with lower temperature.
Our Technical Department will be glad to help.

Standard strokes (for all diameters)

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

On request are available strokes up to 2800 mm

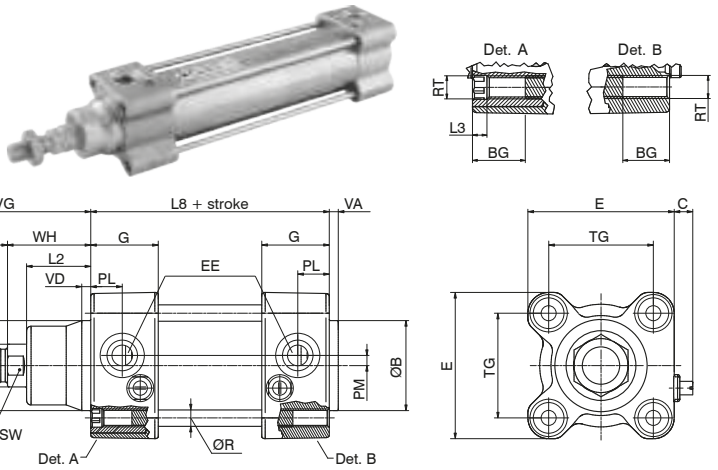
Stroke tolerance (ISO 15552)

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	$^{+4}_{0}$

Basic version “01”

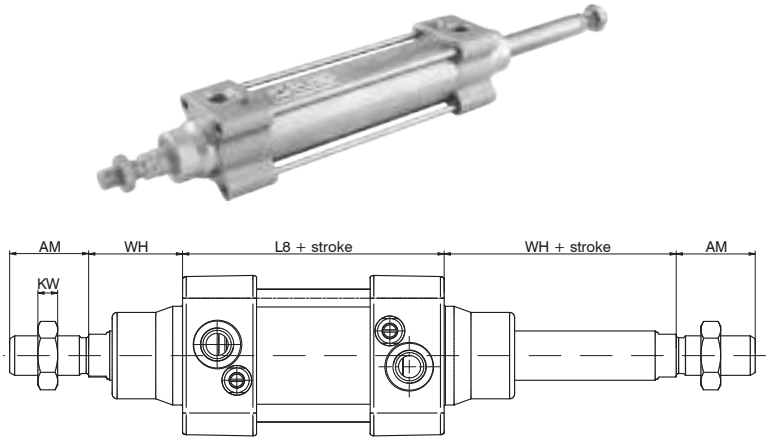
Ordering code
1393.Ø.stroke.01 Magnetic **1394.Ø.stroke.01** Non magnetic

This is the configuration representing the basic cylinder according to ISO standards. It can be directly anchored on machine parts using the four threads on the end cap screws. For other applications see the pages about different types of stainless steel fixings.



Through rod cylinder version - “02”

Ordering code
1393.Ø.stroke.02 Magnetic **1394.Ø.stroke.02** Non magnetic



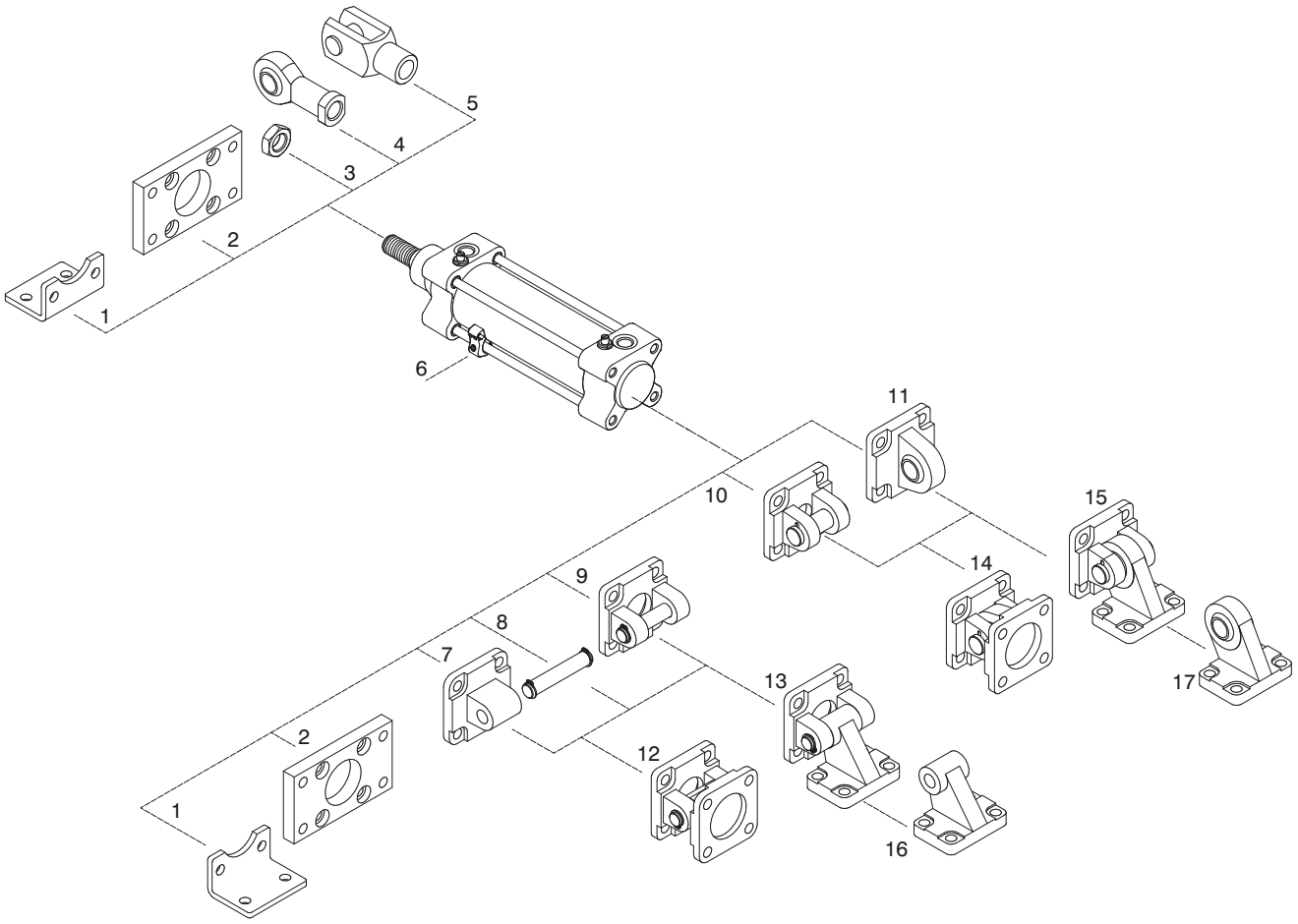
Variants

Version with FPM seals

Ordering code
139_.(93.94) Ø.stroke._ _ V

Table of dimensions

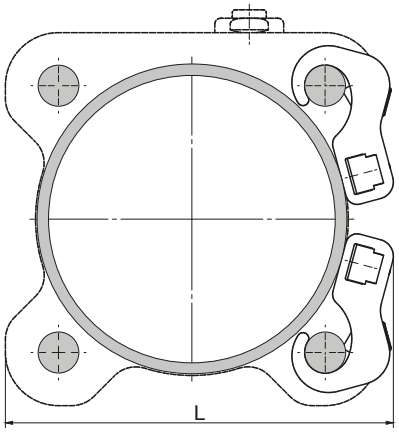
Bore		32	40	50	63	80	100
AM		22	24	32	32	40	40
ØB (d 11)		30	35	40	45	45	55
BG min.		16	16	16	16	18	17
C	min.	4	4	4	4	3,5	3,5
	max.	7.5	7,5	8,5	8,5	9	9
E		47	52	65	76	95	113
EE		G1/8"	G1/4"	G1/4"	G3/8"	G3/8"	G1/2"
G		29	31	30	34	36	40,5
KK		M10X1,25	M12X1,25	M16X1,5	M16X1,5	M20x1,5	M20X1,5
KV		17	19	24	24	30	30
KW		16	7	8	8	9	9
L2		20	22	28,5	29	35	36
L3		4,5	4,5	5	5	6	6
L8		94	105	106	121	128	138
ØMM		12	16	20	20	25	25
PL		13	14	14	16	16	18
PM		3	3,5	4,5	7	8	8
ØR		Ø5,2	Ø5,2	Ø7,1	Ø7,1	Ø8,9	Ø8,9
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
VD		4	4	4	4	4	4
VG		48	54	69	69	86	91
WH		26	30	37	37	46	51
Weight	stroke 0	1000	1430	2150	3000	4400	6400
g	every 10 mm	35	45	63	80	120	135



Position	Description	Ordering code	Materials
1	Short mounting foot brackets (MS1)	1393.Ø.05/1F	Stainless steel AISI 316
2	Flange (MF1-MF2)	1393.Ø.03F	Stainless steel AISI 316
3	Rod nut	1393.Ø.18F	Stainless steel AISI 316
4	Ball joint	1393.Ø.32F	Stainless steel
5	Fork	1393.Ø.13F	Stainless steel
6	Sensor bracket	1393._	Stainless steel AISI 316
7	Rear male clevis (MP4)	1393.Ø.09/1F	Stainless steel AISI 316
8	Pin (AA4) with circlips for rear clevis (MP2) (pos. 9)	1393.Ø.37F	Stainless steel AISI 316
9	Rear female clevis (MP2)	1393.Ø.09F	Stainless steel AISI 316
10	Rear narrow clevis (AB6)	1393.Ø.30F	Stainless steel AISI 316
11	Rear male clevis (with jointed head - MP6)	1393.Ø.15F	Stainless steel AISI 316
12	Standard complete trunnion (pos. 7 + pos. 9)	1393.Ø.22F	Stainless steel AISI 316
13	Square angle trunnion (pos. 9 + pos. 16)	1393.Ø.35F	Stainless steel AISI 316
14	Standard complete trunnion with jointed head (pos. 10 + pos.11)	1393.Ø.36F	Stainless steel AISI 316
15	Complete square angle trunnion (pos. 10 + pos.17)	1393.Ø.27F	Stainless steel AISI 316
16	Simple square counter clevis (AB7) (pos. 13)	1393.Ø.11/2F	Stainless steel AISI 316
17	Simple square counter clevis (pos. 15)	1393.Ø.28F	Stainless steel AISI 316

Sensor bracket

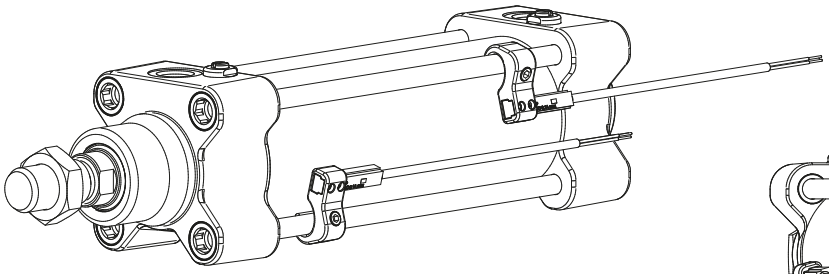
Ordering code
1393.A (Ø32 ... Ø40) **1393.B** (Ø50 ... Ø63) **1393.C** (Ø80 ... Ø100)

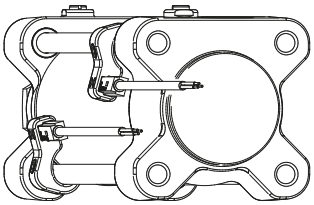


Fixing bracket made of stainless steel AISI 316 for sensor mounting on cylinders.

Sensors cod. **1580._**
MRS._
MHS._

Bore	L
Ø32	51
Ø40	57
Ø50	67
Ø63	79
Ø80	98
Ø100	115



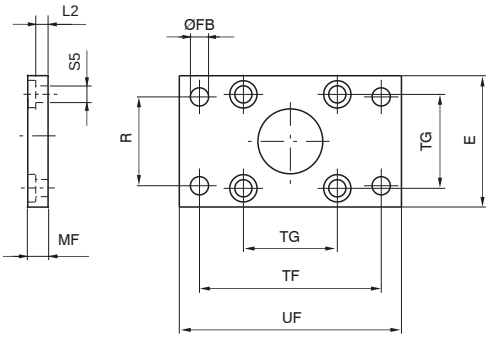


To mount the brackets on the tie rods use the dedicated stainless steel grub screw.

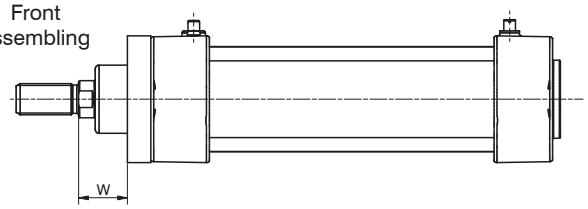
Front and rear flanges (MF1 - MF2)

Ordering code
1393.Ø.03F

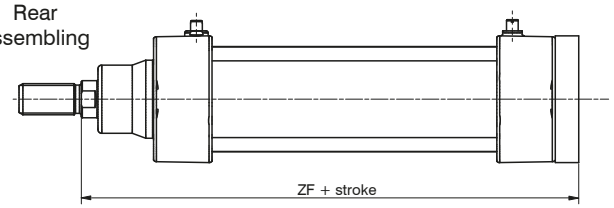
Plate in stainless steel AISI 316 which allows anchorage of the cylinder at a right angle to the plane.



Front assembling



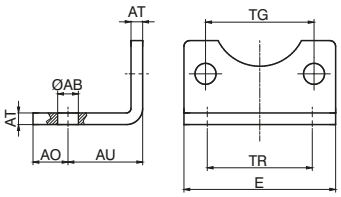
Rear assembling

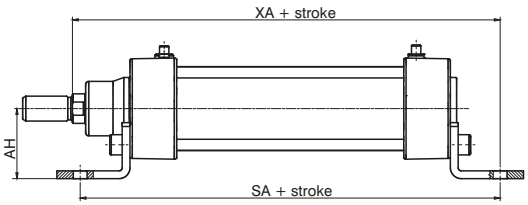


Bore	E	ØFB (H 13)	MF (JS 14)	R (JS 14)	TF (JS 14)	TG	UF	ZF	W	L2	ØS5	Weight (g)
32	45	7	10	32	64	32,5	80	130	16	5	6,6	190
40	52	9	10	36	72	38	90	145	20	5	6,6	250
50	65	9	12	45	90	46,5	110	155	25	6,5	9	480
63	75	9	12	50	100	56,5	120	170	25	6,5	9	620
80	95	12	15	63	126	72	150	189	31	7	11	1430
100	115	14	15	75	150	89	170	204	36	7	11	1990

Short mounting foot brackets (MS1)

Ordering code
1393.Ø.05/1F



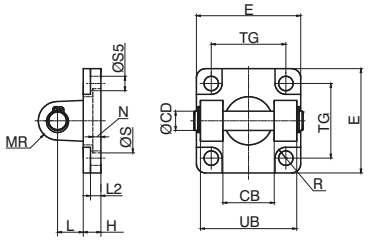


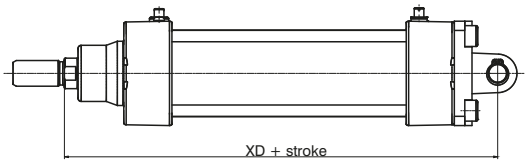
Elements used to anchor the cylinder parallel to the mounting plane. They are made of stainless steel AISI 316.

Bore	32	40	50	63	80	100
ØAB (H 14)	7	9	9	9	12	14
AH	32	36	45	50	63	71
AU (± 0.2)	24	28	32	32	41	41
AO	11	8	15	13	14	16
E	45	52	65	75	95	115
AT	4	4	5	5	6	6
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
Weight g	60	70	160	180	370	430

Rear clevis (MP2)

Ordering code
1393.Ø.09F



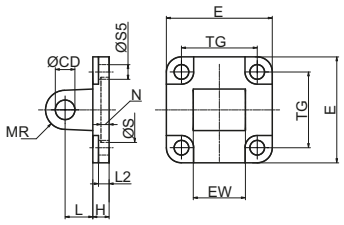


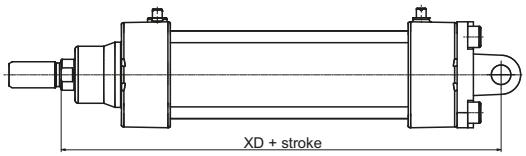
This type of mounting allows anchorage of the cylinder either parallel or right angle to plane; the cylinder rod can oscillate and self-align as necessary when under load. Made of stainless steel AISI 316.

Bore	32	40	50	63	80	100
CB (H 14)	26	28	32	40	50	60
ØCD	10	12	12	16	16	20
E	45	55	65	75	95	115
ØS (H11)	30	35	40	45	45	55
N	5	5	5	5	/	/
R (H13)	5,5	5,5	7,5	7,5	9	9
H	10	10	10	12	14	16
L	12	15	17	20	22	25
MR	10	12	12	16	16	20
TG	32,5	38	46,5	56,5	72	89
UB (h14)	45	52	60	70	90	110
XD	142	160	170	190	210	230
L2 (±0,5)	5,5	5,5	6,5	6,5	10	10
S5 (H13)	6,6	6,6	9	9	11	11
Weight g	140	230	370	540	1000	1700

Rear male clevis (MP4)

Ordering code
1393.Ø.09/1F



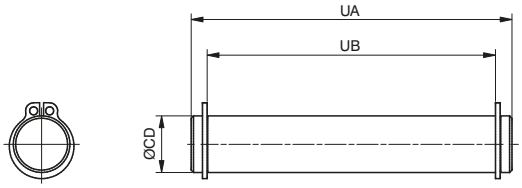


Similar to 09 clevis except for the connection, which is male rather than female. Used to mount the cylinder either parallel or at a right angle to the plane; the cylinder rod can oscillate and self-align as necessary when under load. Made of stainless steel AISI 316.

Bore	32	40	50	63	80	100
CD (H 9)	10	12	12	16	16	20
E	45	55	65	75	95	115
EW ($^{-0,2}_{-0,6}$)	26	28	32	40	50	60
H	10	10	10	12	14	16
L	12	15	17	20	22	25
ØS (H11)	30	35	40	45	45	55
N	5	5	5	5	/	/
R (H13)	5,5	5,5	7,5	7,5	9	9
MR	10	12	12	16	16	20
TG	32,5	38	46,5	56,5	72	89
XD	142	160	170	190	210	230
L2 (±0,5)	5,5	5,5	6,5	6,5	10	10
S5 (H13)	6,6	6,6	9	9	11	11
Weight g	180	280	370	680	1200	2100

Pin with circlips for rear clevis (MP4 and MP2)

Ordering code
1393.Ø.37F

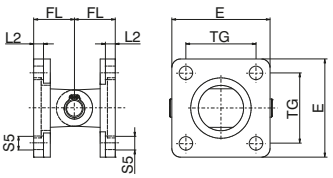


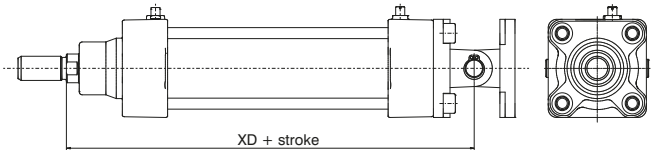
Stainless steel AISI 316 pin, complete with stainless steel circlips, which can be used with clevis code 1393.Ø.09/1F and 1393.Ø.09F

Bore	32	40	50	63	80	100
CD (e8)	10	12	12	16	16	20
UA	53	60	68	78	98	118
UB ($^{-0,5}_{-0}$)	46	53	61	71	91	111
Weight g	35	50	60	120	150	290

Standard complete trunnion

Ordering code
1393.Ø.22F Mounting consists of rear clevis code 1380.Ø09F +rear male clevis code 1380.Ø.09/1F (ordering separately)



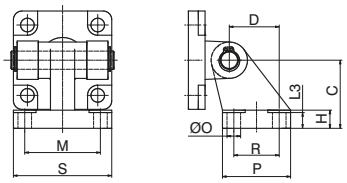


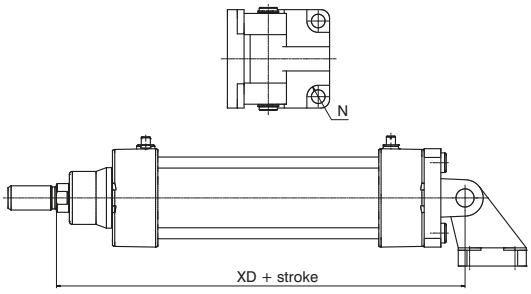
Made of stainless steel AISI 316.

Bore	32	40	50	63	80	100
E	45	55	65	75	95	115
FL	22	25	27	32	36	41
L 2 (±0,5)	5,5	5,5	6,5	6,5	10	10
S 5	6,6	6,6	9	9	11	11
TG	32,5	38	46,5	56,5	72	89
XD	142	160	170	190	210	230
Weight g	360	580	780	1370	2370	4110

Square angle trunnion (AB7)

Ordering code
1393.Ø.35F Counter clevis can be ordered separately with code 1393.Ø.11/2F





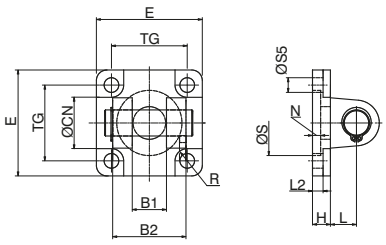
Made of stainless steel AISI 316.

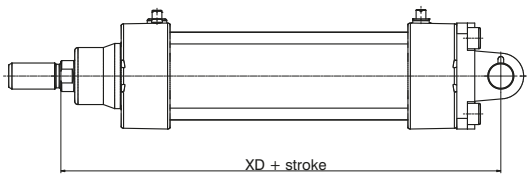
Bore	32	40	50	63	80	100
D (JS 15)	21	24	33	37	47	55
C (JS 15)	32	36	45	50	63	71
H	8	10	12	12	14	15
N (H 13)	5,5	5,5	7,5	7,5	9	9
L3	6,5	8,5	10,5	10,5	11,5	12,5
R (JS 14)	18	22	30	35	40	50
P	31	35	45	50	60	70
O (H 13)	6,6	6,6	9	9	11	11
S	51	54	65	67	86	96
M (JS 14)	38	41	50	52	66	76
XD	142	160	170	190	210	230
Weight g	330	520	810	1200	2200	4710

Rear narrow clevis (AB6)

Ordering code
1393.Ø.30F

Utilised with clevis 1393.Ø.15F allows the cylinder to oscillate in all directions (see standard complete trunnion 1393.Ø.36F)
Made of stainless steel AISI 316.

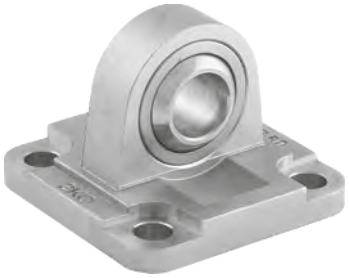




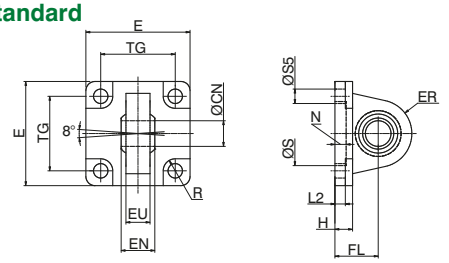
Bore	32	40	50	63	80	100
B1 (H 14)	14	16	21	21	25	25
B2 (h 14)	34	40	45	51	65	75
ØCN	10	12	16	16	20	20
E	45	55	65	75	95	115
H	10	10	10	12	14	16
L	12	15	17	20	22	25
L2 (±0,5)	5,5	5,5	6,5	6,5	10	10
S5 (H 13)	6,6	6,6	9	9	11	11
TG	32,5	38	46,5	56,5	72	89
XD	142	160	170	190	210	230
ØS (H 12)	30	35	40	45	45	55
R (H 13)	5,5	5,5	7,5	7,5	9	9
N	5	5	5	5	5	5
Weight g	170	270	420	650	1380	2050

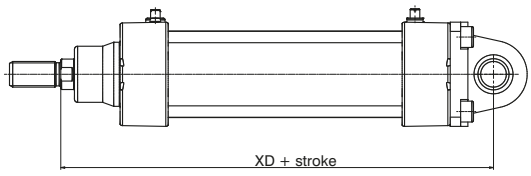
Rear male clevis (MP6) with jointed head according to DIN 648K standard

Ordering code
1393.Ø.15F



Utilised with clevis 1393.Ø.30F allows the cylinder to oscillate in all directions.
Made of stainless steel AISI 316.

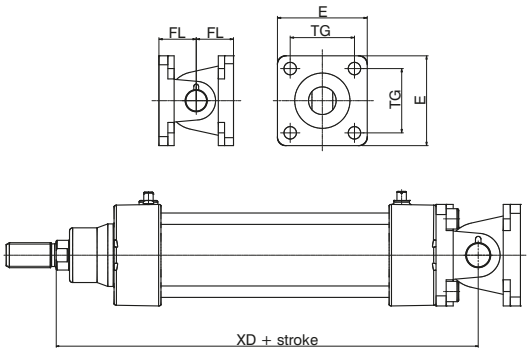




Bore	32	40	50	63	80	100
ØCN (H 7)	10	12	16	16	20	20
E	45	55	65	75	95	115
EN (-0.1)	14	16	21	21	25	25
ER	15	18	20	23	27	30
EU	10,5	12	15	15	18	18
FL (JS 15)	22	25	27	32	36	41
H	10	10	10	12	14	16
L2	5,5	5,5	6,5	6,5	10	10
S5 (H 13)	6,6	6,6	9	9	11	11
TG	32,5	38	46,5	56,5	72	89
XD	142	160	170	190	210	230
ØS (H 11)	30	35	40	45	45	55
R (H 13)	5,5	5,5	7,5	7,5	9	9
N	5	5	5	5	5	5
Weight g	150	260	370	600	1130	1800

Standard complete trunnion with jointed head according to DIN 648K standard

Ordering code
1393.Ø.36F Mounting consists of rear narrow clevis code 1393.Ø.30F with rear male clevis code 1393.Ø.15F

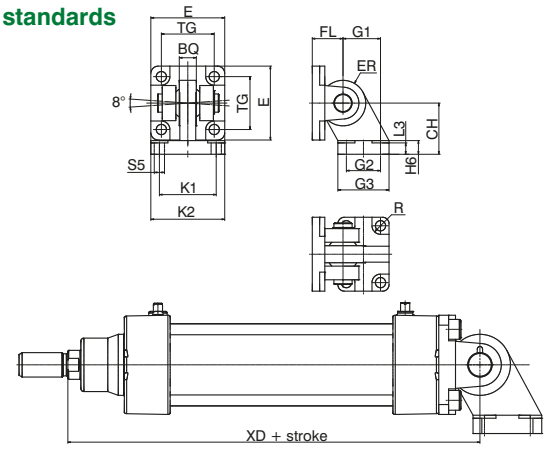


Made of stainless steel AISI 316.

Bore	32	40	50	63	80	100
E	45	55	65	75	95	115
FL (JS 15)	22	25	27	32	36	41
TG	32,5	38	46,5	56,5	72	89
XD	142	160	170	190	210	230
Weight g	320	530	790	1250	2510	3850

Complete square angle trunnion with joined head acc. to DIN 648K standards

Ordering code
1393.Ø.27F Mounting consist of rear narrow clevis cod. 1393.Ø.30F with Simple square counter clevis cod. 1393.Ø.28F (ordering separately)

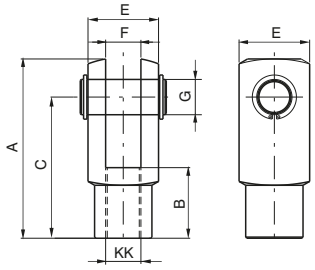


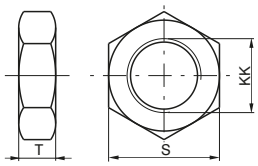
Made of stainless steel AISI 316.

Bore	32	40	50	63	80	100
CH (JS 15)	32	36	45	50	63	71
E	45	55	65	75	95	115
FL	22	25	27	32	36	41
G1 (JS 15)	21	24	33	37	47	55
G2 (JS 14)	18	22	30	35	40	50
G3	31	35	45	50	60	70
H6	10	10	12	12	14	15
K1 (JS 14)	38	41	50	52	66	76
K2	51	54	65	67	86	96
L3 ($^{+0,5}_{0}$)	8,5	8,5	10,5	10,5	11,5	12,5
S5 (H13)	6,6	6,6	9	9	11	11
TG	32,5	38	46,5	56,5	72	89
XD	142	160	170	190	210	230
BQ	10,5	12	15	15	18	18
ER	15	18	20	23	27	30
R (H 13)	5,5	5,5	7,5	7,5	9	9
Weight g	350	540	880	1200	2350	3380

Rod fork and nuts

Ordering code
1393.Ø.13F
1393.Ø.18F



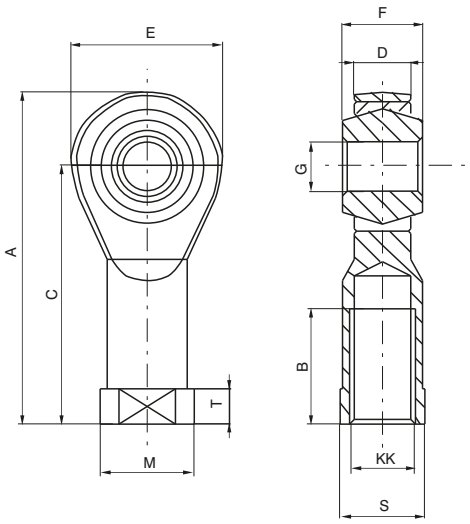


Fork:
Element that when screwed to the rod consents a regular functioning even when there are significant lateral forces as the connection point.
Made of stainless steel AISI 303.
Nut:
Used to block the position of the fork.
Made of stainless steel AISI 316.

Bore		32	40	50	63	80	100
A		52	62	83	83	105	105
B		20	24	32	32	40	40
C		40	48	64	64	80	80
E		20	24	32	32	40	40
F(B13)		10	12	16	16	20	20
G		10	12	16	16	20	20
S		17	19	24	24	30	30
T		6	7	8	8	9	9
KK		M10X1,25	M12X1,25	M16X1,5	M16X1,5	M20X1,5	M20X1,5
Weight g	fork	100	140	340	340	680	680
	Nut	15	20	20	20	40	40

Ball joint

Ordering code
1393.Ø.32F



Ball joint:
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 and 420.

Bore	32	40	50	63	80	100
A	57	66	85	85	102	102
B	20	22	28	28	33	33
C	43	50	64	64	77	77
D	10,5	12	15	15	18	18
E	28	32	42	42	50	50
F	14	16	21	21	25	25
G (H 7)	10	12	16	16	20	20
KK	M10x1,25	M12x1,25	M16x1,5	M16x1,5	M20x1,5	M20x1,5
M	19	22	27	27	34	34
S	17	19	22	22	30	30
T	6,5	6,5	8	8	10	10
Weight g	75	110	220	220	410	410

Series 1450 - 1463 - Hydro-pneumatic speed control cylinders (Ø50 - Ø63)

General

Pneumatic cylinder ISO 15552 handling and controlling movement by means of internal hydraulic circuit.
All ISO fixing devices can be used except for:

- Cylinder Ø63 front clevis code 1463.63.08F
- Cylinder Ø63 front flange code 1463.63.03F
- Cylinder Ø63 foot code 1463.63.05/1F

Ordering key

14_.stroke._._ . _

Ø50 Ø63	Regulation	STOP function	SKIP function
	A = Regulation on extraction	0 = None	0 = None
	B = Regulation on compression	A = Stop N.C. extraction	A = Skip N.C. extraction
	D = Double regulation	B = Stop N.C. compression	B = Skip N.C. compression
		C = Double Stop N.C.	C = Double Skip N.C.
		D = Stop N.O. extraction	D = Skip N.O. extraction
		E = Stop N.O. compression	E = Skip N.O. compression
		F = Double Stop N.O.	F = Double Skip N.O.

Construction characteristics

End cap	aluminium black anodised
Piston Rod	steel tube externally chrome plated
Barrel	aluminium alloy anodised
Magnetic piston	aluminium
Cushion screw	nickel plated steel
Oil tank	aluminium
Pneumatic piston seal (pneumatic side)	oil resitant NBR rubber
Rod and cushion seal	PUR
Hydraulic piston seal (hydraulic side)	PUR

Technical characteristics

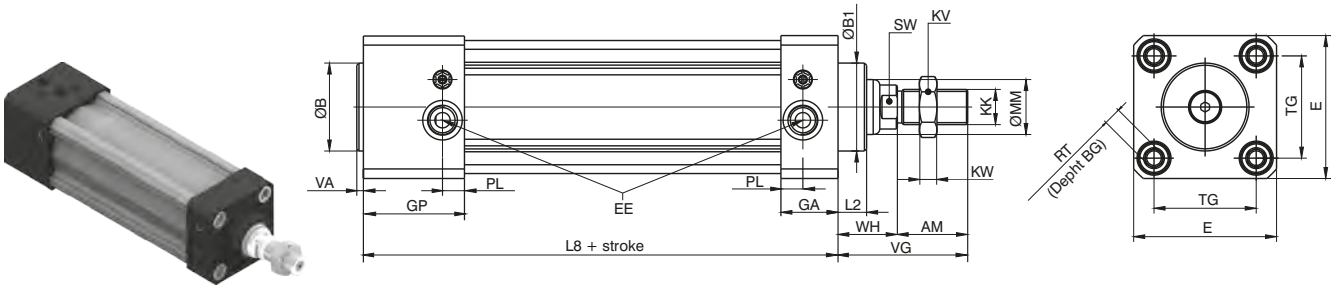
Pneumatic media	filtered and lubricated air
Hydraulic media	filtered 1μ hydraulic oil
Maximum pressure	8 bar
Skip & Stop valve minimum operating pressure	3 bar
Environment temperature	-5°C +70°C
Minimum regulated speed	40 mm/min.
Maximum regulated speed	6000 mm/min. *
Speed with SKIP	150 mm/sec. *
Free speed (without regulation)	300 mm/sec. *
Cushion speed	20 mm *
Standard stroke	from 50 to 450 steps 50 mm
Possibility of rear regulation (on request)	

*** Attenction:** speed recorded with cylinder on horizontal position fed at 8 bar without load on piston rod.

Force (N)

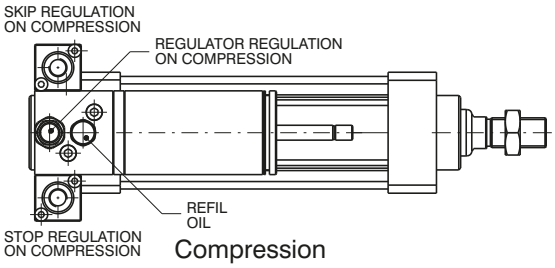
BORE	FORCE	PRESSURE (bar)									
		1	2	3	4	5	6	7	8	9	10
50	Extraction	181.4	362.9	544.3	725.7	907.2	1088.6	1270	1451.5	1632.9	1814.3
	Compression	144.4	288.8	433.2	577.6	722	866.3	1010.7	1155.1	1299.5	1443.9
63	Extraction	294.6	589.1	883.7	1178.2	1472.8	1767.3	2061.9	2356.5	2651	2945.6
	Compression	211.3	422.6	633.9	845.2	1056.6	1267.9	1479.2	1690.5	1901.8	2113.1

Base cylinder dimensions

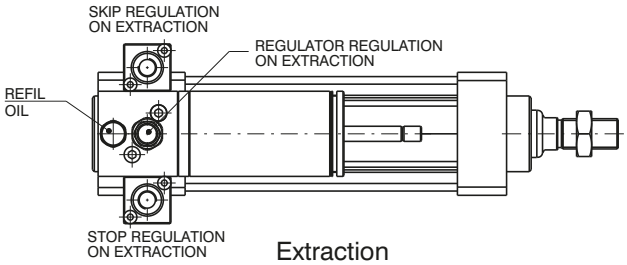


Bore	AM	B (d11)	B1 (d11)	BG	E	EE	GA	GP	KK	KV	KW	L2	L8	MM	PL	RT	SW	TG	VA	VG	WH
50	32	40	40	16	65	G1/4"	26	46	M16x1,5	24	8	13	116	25	10	M8	17	46,5	3	59	27
63		45	50		75	G3/8"			M16x1,5			20	121	35	12			56,5	4	69	37

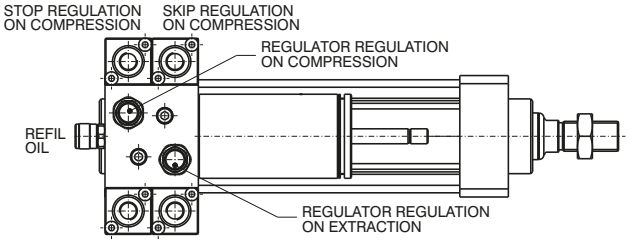
Function valves and regulators position for the different versions



Compression

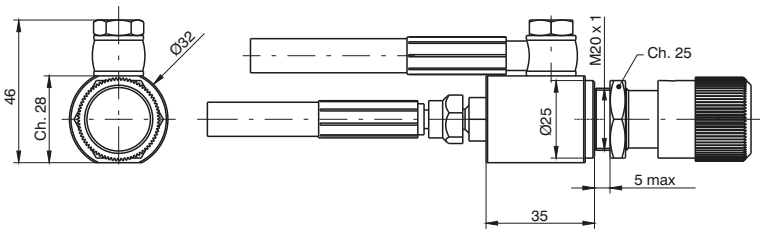


Extraction

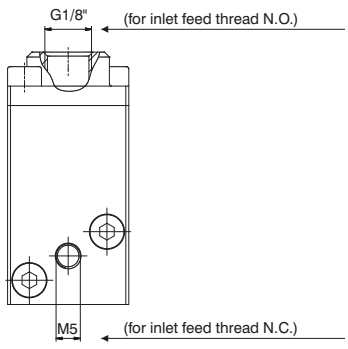


Double regulation

Rear regulator dimensions



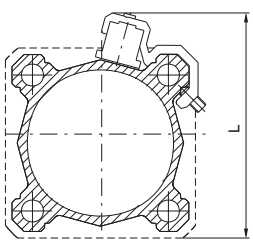
SKIP and STOP valves inlet feed position



Sensor brackets codes 1500._, RS._, HS._

Dimensions

Bore	L
Ø50	77
Ø63	87

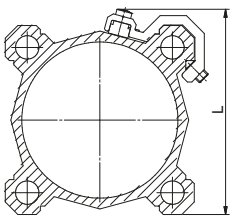


Ordering code	
1320.B	Brackets for cylinder sensors Ø50 - Ø63

Sensor brackets codes 1580._, MRS._, MHS._

Dimensions

Bore	L
Ø50	66
Ø63	76

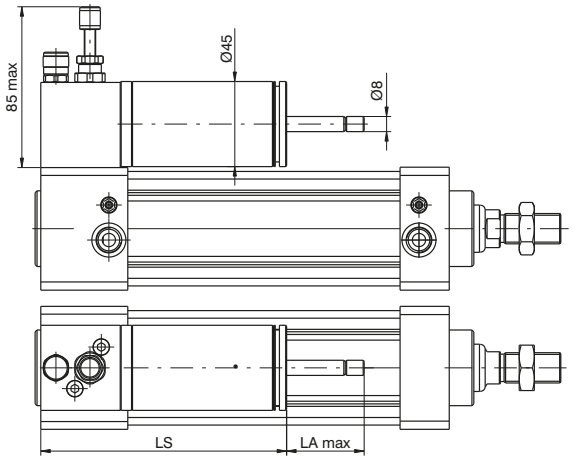


Ordering code	
1320.BS	Brackets for cylinder sensors Ø50 - Ø63

Sensor for cylinder
For technical characteristics and code see “Magnetic sensor” section

Regulation on the outward stroke

Ordering code
14Ø.stroke.A.0.0

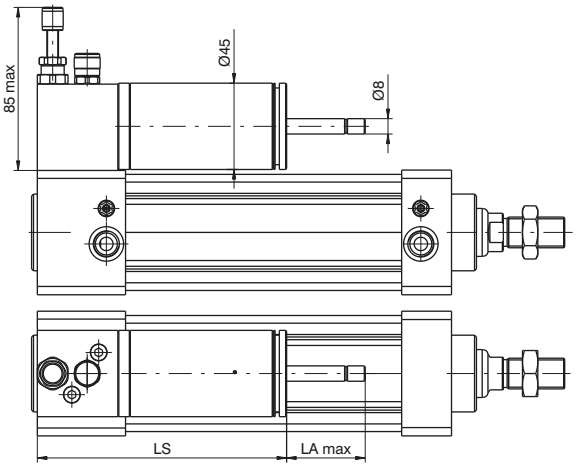


Ø50 Weight g 1970 + g 200 every 50 mm. stroke
Ø63 Weight g 2591 + g 280 every 50 mm. stroke

Strokes	LS	LA max
0 ... 150	130	41
151 ... 350	185	66
351 ... 450	255	106

Regulation on the inward stroke

Ordering code
14Ø.stroke.B.0.0

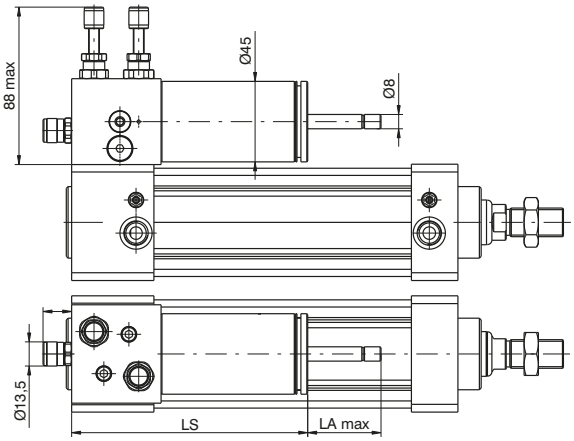


Ø50 Weight g 1970 + g 200 every 50 mm. stroke
Ø63 Weight g 2591 + g 280 every 50 mm. stroke

Strokes	LS	LA max
0 ... 150	130	41
151 ... 350	185	66
351 ... 450	255	106

Regulation in both directions

Ordering code
14Ø.stroke.D.0.0

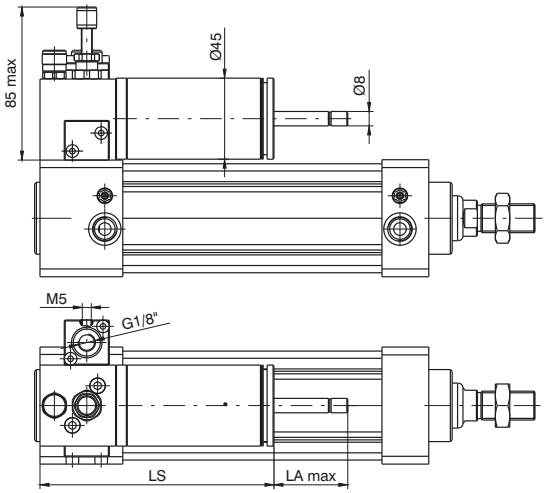


Ø50 Weight g 2128 + g 200 every 50 mm. stroke
Ø63 Weight g 2749 + g 280 every 50 mm. stroke

Strokes	LS	LA max
0 ... 150	132	41
151 ... 350	187	66
351 ... 450	257	106

Regulation on the outward stroke with Skip N.O.

Ordering code
14Ø.stroke.A.0.D

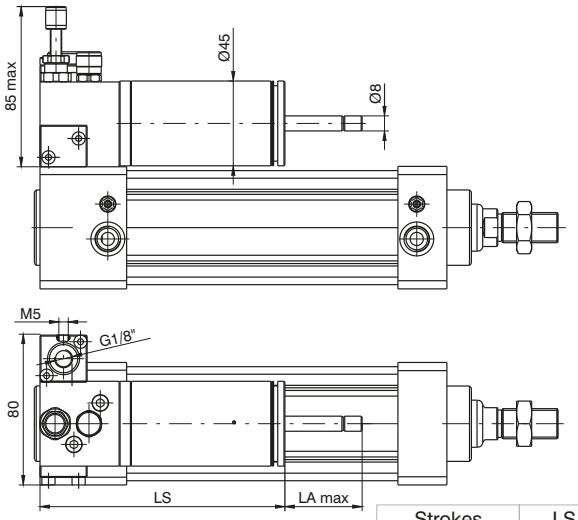


Ø50 Weight g 2059 + g 200 every 50 mm. stroke
Ø63 Weight g 2928 + g 280 every 50 mm. stroke

Strokes	LS	LA max
0 ... 150	130	41
151 ... 350	185	66
351 ... 450	255	106

Regulation on the inward stroke with Skip N.O.

Ordering code
14Ø.stroke.B.0.E

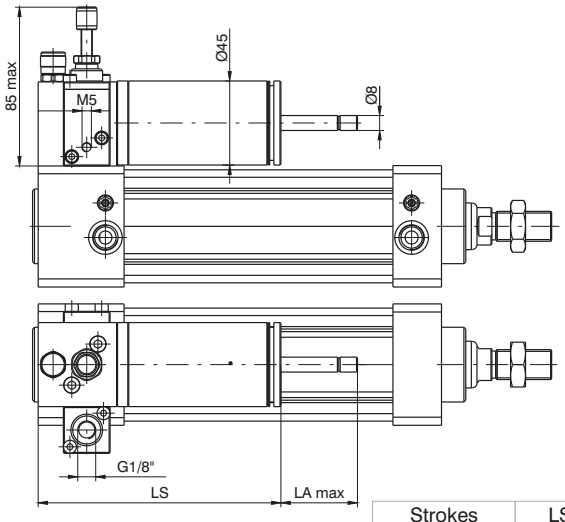


Ø50 Weight g 2059 + g 200 every 50 mm. stroke
Ø63 Weight g 2928 + g 280 every 50 mm. stroke

Strokes	LS	LA max
0 ... 150	130	41
151 ... 350	185	66
351 ... 450	255	106

Regulation on the outward stroke with Stop N.O.

Ordering code
14Ø.stroke.A.D.0

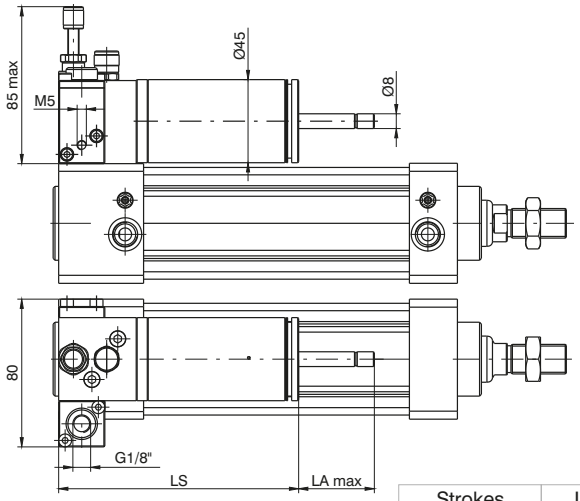


Ø50 Weight g 2059 + g 200 every 50 mm. stroke
Ø63 Weight g 2928 + g 280 every 50 mm. stroke

Strokes	LS	LA max
0 ... 150	130	41
151 ... 350	185	66
351 ... 450	255	106

Regulation on the inward stroke with Stop N.O.

Ordering code
14Ø.stroke.B.E.0

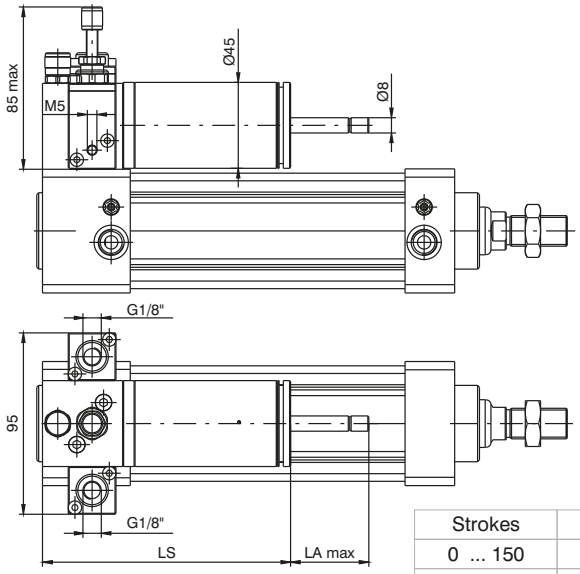


Ø50 Weight g 2059 + g 200 every 50 mm. stroke
Ø63 Weight g 2928 + g 280 every 50 mm. stroke

Strokes	LS	LA max
0 ... 150	130	41
151 ... 350	185	66
351 ... 450	255	106

Regulation on the outward stroke with Skip N.O. - Stop N.O.

Ordering code
14Ø.stroke.A.D.D

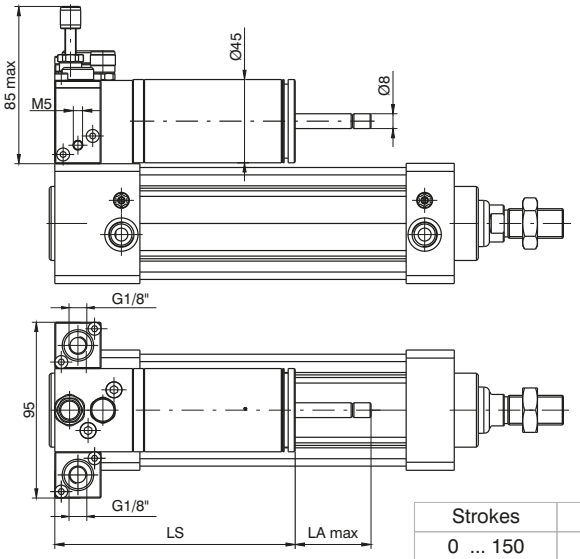


Ø50 Weight g 2140 + g 200 every 50 mm. stroke
Ø63 Weight g 2761 + g 280 every 50 mm. stroke

Strokes	LS	LA max
0 ... 150	130	41
151 ... 350	185	66
351 ... 450	255	106

Regulation on the inward stroke with Skip N.O. - Stop N.O.

Ordering code
14Ø.stroke.B.E.E

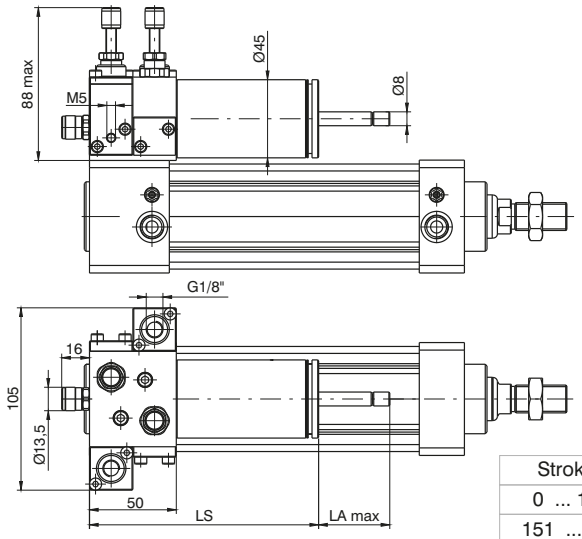


Ø50 Weight g 2140 + g 200 every 50 mm. stroke
Ø63 Weight g 2761 + g 280 every 50 mm. stroke

Strokes	LS	LA max
0 ... 150	130	41
151 ... 350	185	66
351 ... 450	255	106

Regulation and Skip in both directions (N.O. Skip valves in both directions)

Ordering code
14Ø.stroke.D.0.F

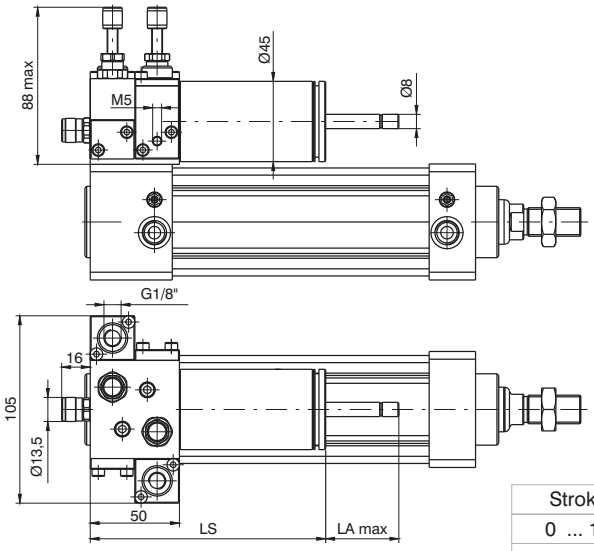


Ø50 Weight g 2311 + g 200 every 50 mm. stroke
Ø63 Weight g 2932 + g 280 every 50 mm. stroke

Strokes	LS	LA max
0 ... 150	132	41
151 ... 350	187	66
351 ... 450	257	106

Regulation and Stop in both directions (N.O. Stop valves in both directions)

Ordering code
14Ø.stroke.D.F.0

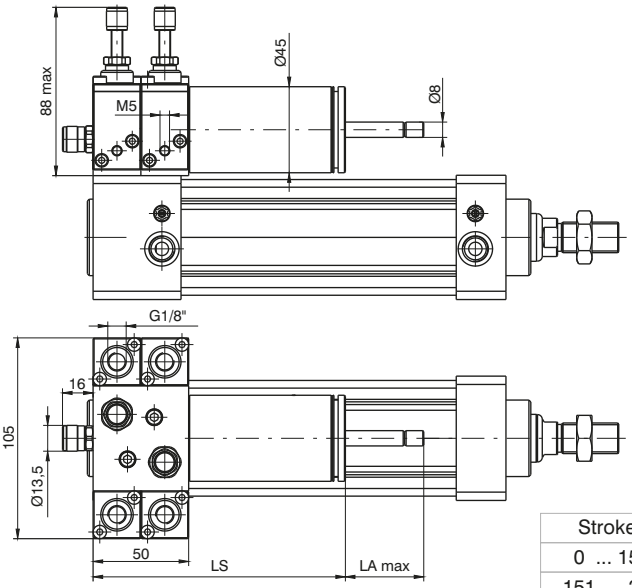


Ø50 Weight g 2311 + g 200 every 50 mm. stroke
Ø63 Weight g 2932 + g 280 every 50 mm. stroke

Strokes	LS	LA max
0 ... 150	132	41
151 ... 350	187	66
351 ... 450	257	106

Regulation with Skip and Stop in both directions (N.O. Skip and Stop valves in both directions)

Ordering code
14Ø.stroke.D.F.F



Ø50 Weight g 2473 + g 200 every 50 mm. stroke
Ø63 Weight g 3094 + g 280 every 50 mm. stroke

Strokes	LS	LA max
0 ... 150	132	41
151 ... 350	187	66
351 ... 450	257	106

Series 1500 - Compact cylinders according to standard ISO 21287 “ECOMPACT”

General

These cylinders are built according to ISO 21287 standards. New barrel profile has two sensor slots on the three sides (Ø20 and Ø25 one slot) suitable for sensors 1580._, MRS._, MHS._ series housing, without need for adaptors.
Versions with end stroke adjustable pneumatic cushioning are also available, allowing adjustments to deceleration and keeping the required overall dimensions according to ISO 21287.
For fixing operation is possible to use the four threaded holes on the end covers, or screws in body holes, alternatively all the fixing devices of UNITOP RU-P/6-P/7 (Ø20 and Ø25) and ISO 15552 (from Ø32 to Ø100) series.

Construction characteristics

Body	anodised aluminium
End cap	aluminium alloy casting painted
Bearing piston rod	sintered bronze
Piston rod	from Ø20 to Ø25 stainless steel from Ø32 to Ø100 C43 chromed (on request stainless steel)
Piston	from Ø20 to Ø40 acetal resin (aluminium on request), Ø50 and Ø100 aluminium (with FPM seals, aluminium piston for all standard diameters)
Seals	Standard: NBR oil resistant rubber, PUR piston rod seals (PUR or FPM seals available upon request)
Spring	stainless steel
Fixing screws	plated zinc steel

Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Max. pressure	10 bar
Operating temperature	-5°C - +70°C with standard seals (magnetic or non magnetic piston) -30°C - +80°C with PUR seals (magnetic or non magnetic piston) -5°C - +80°C with FPM seals (magnetic piston) -5°C - +150°C with FPM seals (non magnetic piston)

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device and aluminium piston)
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

Please note: air must be dried for applications with lower temperature.
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.
Our Technical Department will be glad to help.

Stroke tolerance, minimum and maximum spring loads and cushioning length

Bore	Stroke tolerance	Minimum and maximum springs load		Cushioning length
		(N)		
(mm)	(mm)	min.	max.	(mm)
Ø20	+1.5 / 0 mm	10.8	19.6	/
Ø25		16.7	22.6	5
Ø32	+2 / 0 mm	19.6	25.5	6.5
Ø40		25.5	42.2	8
Ø50		44.1	96.3	7.5
Ø63	+2.5 / 0mm	44.1	96.3	7.5
Ø80		63.8	100.1	8
Ø100		107.9	193.3	12

Standard stroke

DOUBLE ACTING BASIC version and THROUGH ROD CYLINDER version

Bore	Stroke																												
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	100	125	150	160	200	250	300	320	350	400	450	500
	WITHOUT CUSHIONING DEVICE																											
Ø20	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							
Ø25	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							
Ø32	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					
Ø40	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					
Ø50	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Ø63	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Ø80	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ø100	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	WITH CUSHIONING DEVICE																											
Ø20																												
Ø25					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							
Ø32					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					
Ø40					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					
Ø50					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Ø63					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Ø80					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ø100					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

DOUBLE ACTING THROUGH ROD CYLINDER BORED version

Bore	Stroke																												
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	25	30	35	40	45	50	55	60	65	70	75	80
	WITHOUT CUSHIONING DEVICE																WITH CUSHIONING DEVICE											
Ø20	●	●	●	●	●	●	●	●	●	●																		
Ø25	●	●	●	●	●	●	●	●	●	●							●	●	●	●	●	●						
Ø32	●	●	●	●	●	●	●	●	●	●							●	●	●	●	●	●						
Ø40	●	●	●	●	●	●	●	●	●	●							●	●	●	●	●	●						
Ø50	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	
Ø63	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	
Ø80	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ø100	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

DOUBLE ACTING version WITH NON-ROTATING DEVICE

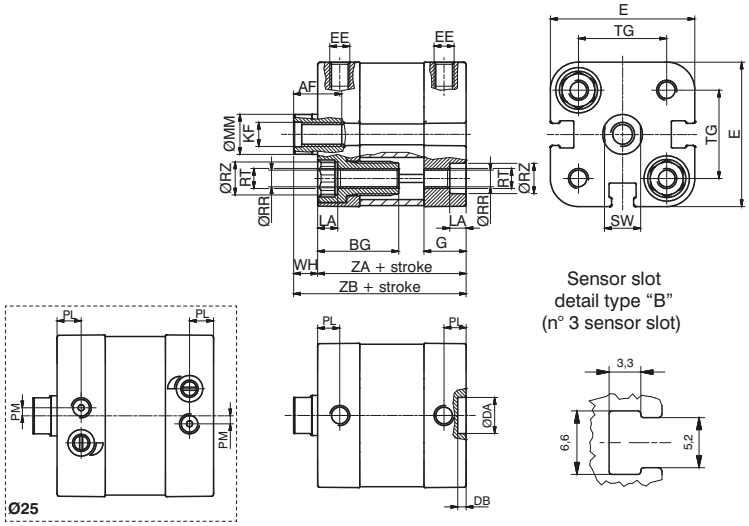
Bore	Stroke																												
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	25	30	35	40	45	50	55	60	65	70	75	80
	WITHOUT CUSHIONING DEVICE																WITH CUSHIONING DEVICE											
Ø20	●	●	●	●	●	●	●	●																				
Ø25	●	●	●	●	●	●	●	●									●	●	●	●								
Ø32	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ø40	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ø50	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ø63	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ø80	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ø100	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

SINGLE ACTING version

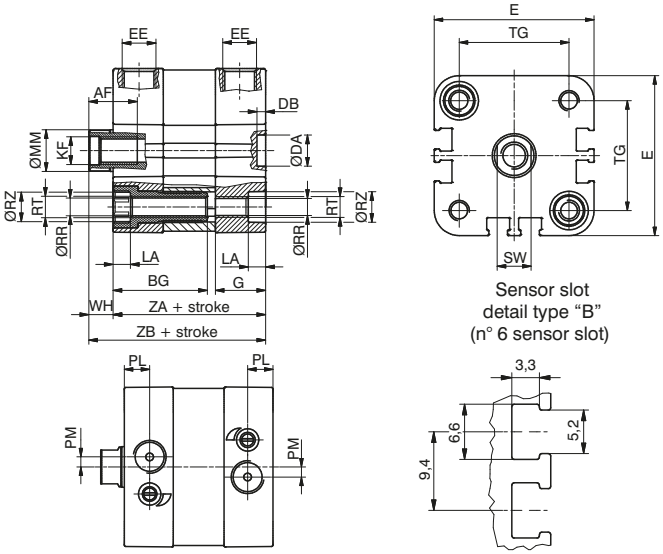
Bore	Stroke				
	5	10	15	20	25
Ø20	●	●	●	●	●
Ø25	●	●	●	●	●
Ø32	●	●	●	●	●
Ø40	●	●	●	●	●
Ø50	●	●	●	●	●
Ø63	●	●	●	●	●
Ø80	●	●	●	●	●
Ø100	●	●	●	●	●

BASIC version
double and single acting

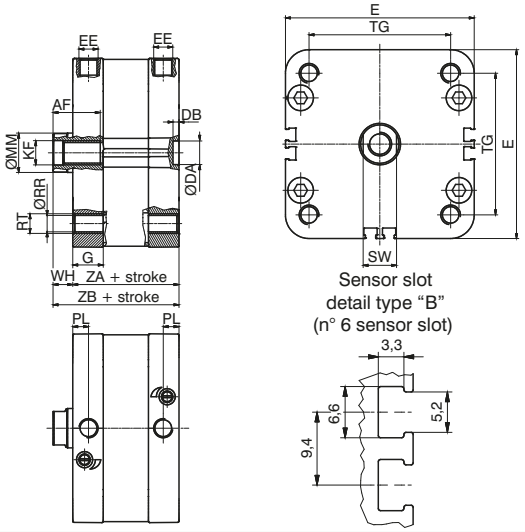
Ø20 and Ø25



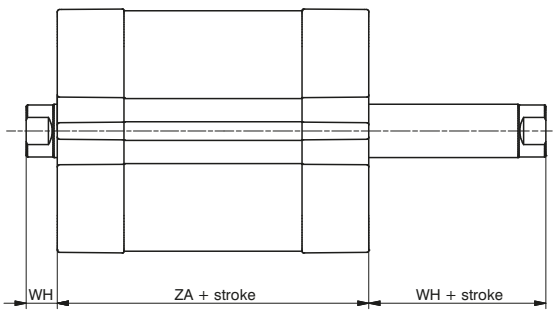
from Ø32 to Ø63



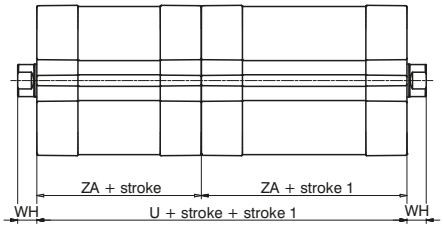
Ø80 and Ø100



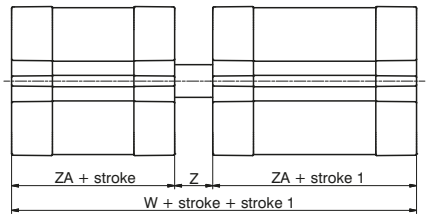
THROUGH ROD CYLINDER version
double and single acting



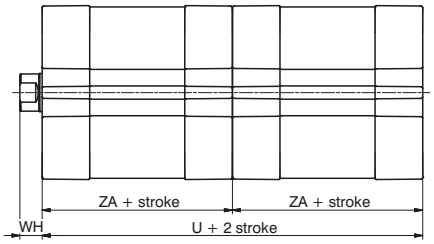
TANDEM version



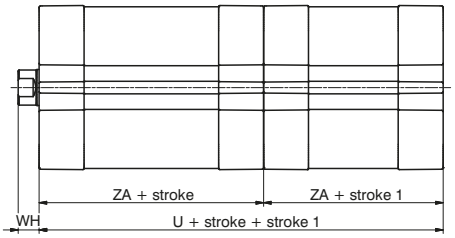
Tandem with opposed rods



Opposed tandem with common rods



Tandem push with common rod



Tandem push with independent rod

Ordering code

Basic and Through rod version

15 _ _.Ø.stroke. _ _ . _

- **1** = magnetic piston, Double acting
- **2** = magnetic piston, Single acting with front spring
- **3** = magnetic piston, Single acting with rear spring
- **4** = non magnetic piston, Double acting
- **5** = non magnetic piston, Single acting with front spring
- **6** = non magnetic piston, Single acting with rear spring

- **01** = Basic, female threaded rod
- **02** = Basic, male threaded rod
- **03** = through rod, female threaded rod
- **04** = through rod, male threaded rod
- ** **05** = through rod, bored female threaded rod
- **06** = through rod, bored male threaded rod
- **07** = with non-rotating device
- **08** = through rod, female threaded rod, with non-rot. device on one side ***
- **09** = through rod, male threaded rod, with non-rot. device on one side ***

- **0** = NBR seals and C43 chromed plated rod *
- **1** = NBR seals and stainless steel rod (starting from bore Ø32)
- **4** = PUR seals and C43 chromed plated rod *
- **5** = PUR seals and stainless steel rod (starting from bore Ø32)
- **6** = FPM seals and C43 chromed plated rod *
- **7** = FPM seals and stainless steel rod (starting from bore Ø32)

* (Ø20 and Ø25 stainless steel)

- **4** = Non-cushioned versions (mechanical cushioning only)
- **5** = Versions with adjustable end of stroke cushioning system (from Ø25)

** It is possible to order the Ø20, Ø25, Ø32 and Ø40 cylinders with an aluminium piston by replacing the '0' with 'K' in the ordering code.
Example: 1540.20.10.01.1 (Acetyl Resin Piston)
1540.20.10.K1.1 (Aluminium Piston version)

*** for single acting version, the spring is on the anti-rotation side

TANDEM version (magnetic pistons)

15 _ _ . Ø .stroke. (stroke 1) . _

Tandem push with common rods
- **C** = female threaded rod
- **G** = male threaded rod
- **H** = with through rod and female threaded rod
- **R** = with through rod and male threaded rod
- **N** = with non-rotating device

Tandem push with independent rods
- **B** = female threaded rod
- **F** = male threaded rod
- **M** = with non-rotating device
- **P** = with through rod and female threaded rod
- **Q** = with through rod and male threaded rod

- **D** = **Opposed tandem with common rod**

Tandem with opposite rods
- **A** = female threaded rod
- **E** = male threaded rod
- **L** = with non-rotating device on both ends

- **0** = NBR seals and C43 chromed plated rod *
- **1** = NBR seals and stainless steel rod (starting from bore Ø32)
- **4** = PUR seals and C43 chromed plated rod *
- **5** = PUR seals and stainless steel rod (starting from bore Ø32)
- **6** = FPM seals and C43 chromed plated rod *
- **7** = FPM seals and stainless steel rod (starting from bore Ø32)

* (Ø20 and Ø25 stainless steel)

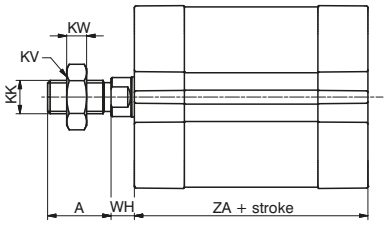
- **4** = Non-cushioned version (mechanical cushioning only)
- **5** = Versions with adjustable end of stroke cushioning system (from Ø25)

Seals compounds scheme: **NBR** oil resistant nitrilic rubber
PUR: polyurethane seals **FPM**: fluoropolymer rubber seals

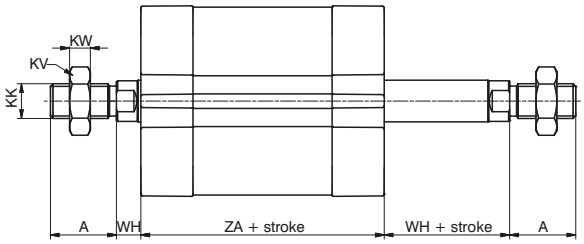
Table of dimensions

Bore		Ø20	Ø25	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
AF (min)		12	12	14	14	18	18	24	24
BG		20	20	16	16	16	16	/	/
DA (H9)	Ø	9	9	9	9	12	12	12	12
DB (+0.1/0)		2.1	2.1	2.5	2.5	2.6	2.6	3	3
E (max)		36	40.5	47.5	55	66	78	96	116
EE		M5	M5	G1/8	G1/8	G1/8	G1/8	G1/8	G1/8
G		10.5	12	14.5	15	15	15	15.5	18.5
KF		M6	M6	M8	M8	M10	M10	M12	M12
LA (0/-0.1)		4.1	4.1	5	5	5	5	/	/
MM (f 7)	Ø	10	10	12	12	16	16	20	25
PL (+0.1/0)		5.5	6	7.5	8	8	8	8	8
PM		/	2	3	/	/	/	/	/
RR (min)	Ø	4.1	4.1	5.1	5.1	6.6	6.6	8.4	8.4
RT		M5	M5	M6	M6	M8	M8	M10	M10
RZ (min)	Ø	7.5	7.5	8.5	8.5	10.5	10.5	/	/
SW (0/-0.1)		9	9	10	10	13	13	17	22
TG (±0.2)		22	26	32.5	38	46.5	56.5	72	89
U		74	78	88	90	90	98	108	134
W		83	89	100	103	105	113	124	154
WH (±1)		6	6	7	7	8	8	10	10
Z		9	11	12	13	15	15	16	20
ZA (±0.5)		37	39	44	45	45	49	54	67
ZB (+1/0)		43	45	51	52	53	57	64	77
Weight	stroke	105	110	200	270	420	550	760	1400
gr.	every 5mm	10	10.5	13	17	23.5	27	37	51

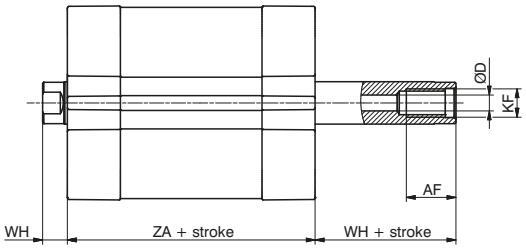
Basic version male piston rod



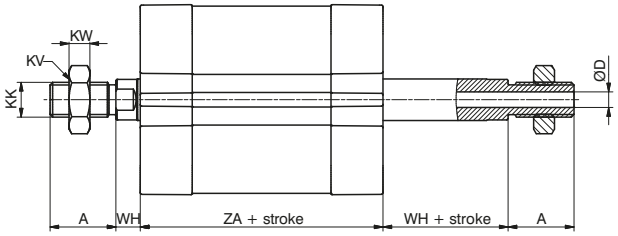
Through rod version male rod



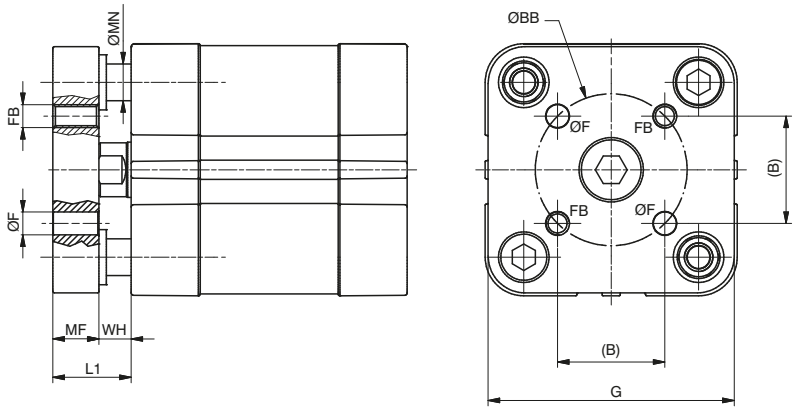
Through rod version bored female piston rod



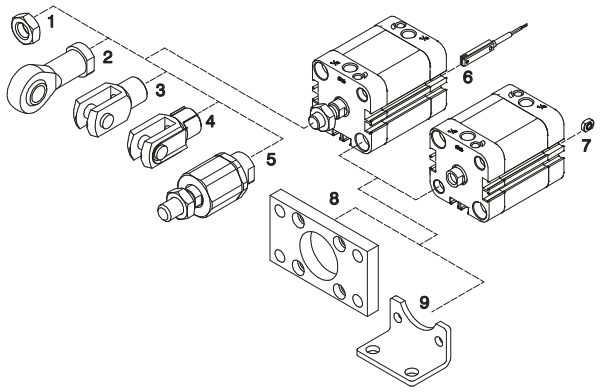
Through rod version bored male piston rod



Non-rotating version

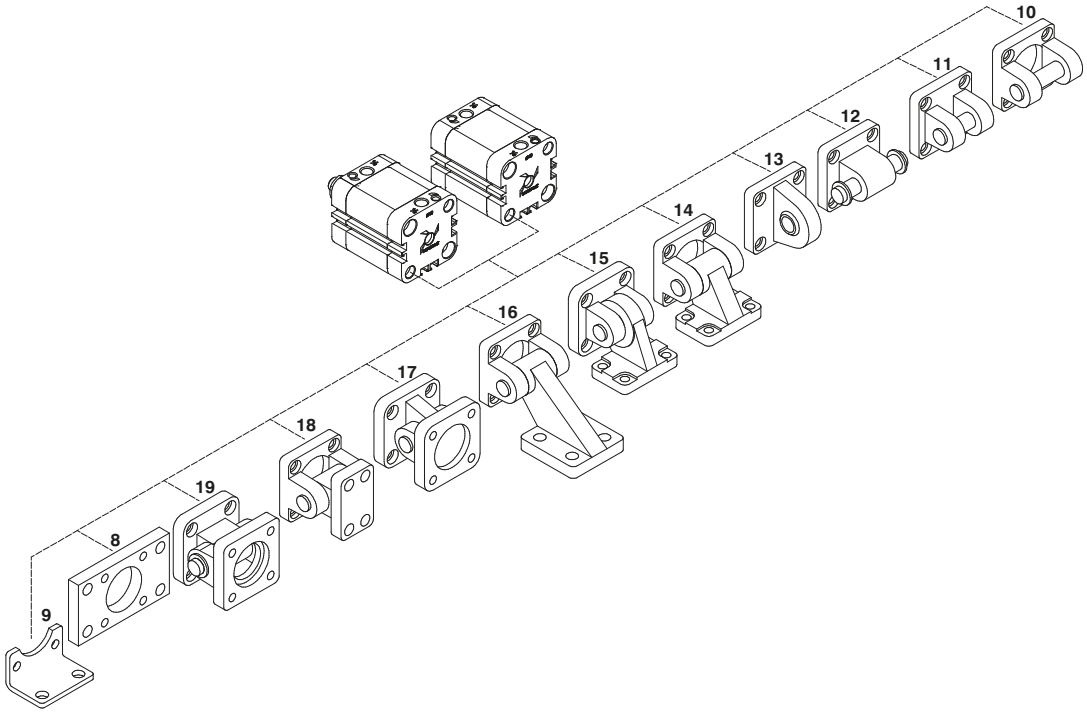


Bore	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
A (0/-0,5)	16	16	19	19	22	22	28	28
AF (min)	12	12	14	14	18	18	24	24
B	12	15,6	19,8	23,3	29,7	35,4	46	56,6
BB (±0,1) Ø	17	22	28	33	42	50	65	80
D Ø	3	3,8	4,5	4,5	6	6	8	10
F (+0,1/0) Ø	4	5	5	5	6	6	8	10
FB	M4	M5	M5	M5	M6	M6	M8	M10
G	35	39,5	45	52	65	75	95	115
KF	M6	M6	M8	M8	M10	M10	M12	M12
KK	M8x1,25	M8x1,25	M10x1,25	M10x1,25	M12x1,25	M12x1,25	M16x1,5	M16x1,5
KV	13	13	17	17	19	19	24	24
KW	5	5	6	6	7	7	8	8
L1	14	14	17	17	20	20	24	24
MF (+0,1/0)	8	8	10	10	12	12	14	14
MN (f 7) Ø	6	6	8	8	10	10	12	12
WH (±1)	6	6	7	7	8	8	10	10
ZA (±0,5)	37	39	44	45	45	49	54	67



Sensor and piston rod accessories

Pos.	Description	Ordering code	
1	Rod lock nut	**1200.20.06** **1320.32.18F** **1320.40.18F** **1320.50.18F**	(Ø20-Ø25) (Ø32-Ø40) (Ø50-Ø63) (Ø80-Ø100)
2	Ball joint	**1200.20.32F** **1320.32.32F** **1320.40.32F** **1320.50.32F**	(Ø20-Ø25) (Ø32-Ø40) (Ø50-Ø63) (Ø80-Ø100)
3	Fork	**1200.20.04** **1320.32.13F** **1320.40.13F** **1320.50.13F**	(Ø20-Ø25) (Ø32-Ø40) (Ø50-Ø63) (Ø80-Ø100)
4	Fork with clips	**1200.20.04/1** **1320.32.13/1F** **1320.40.13/1F** **1320.50.13/1F**	(Ø20-Ø25) (Ø32-Ø40) (Ø50-Ø63) (Ø80-Ø100)
5	Self-aligning joint	**1200.20.33F** **1320.32.33F** **1320.40.33F** **1320.50.33F**	(Ø20-Ø25) (Ø32-Ø40) (Ø50-Ø63) (Ø80-Ø100)
6	Sensors	(See chapter 6 magnetic sensors)	
7	Valves direct mounting bolt	**1500.20F**	(Ø20 - Ø100)

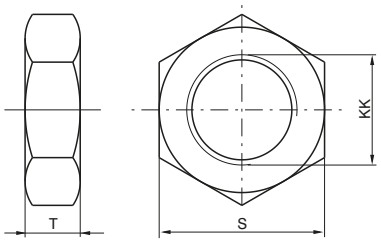


Fixing

Pos.	Description	Ordering code			
		Aluminium		Steel	
8	Flange (MF2)	/		**1540.Ø.03F** **1380.Ø.03F**	(Ø20 - Ø25) (Ø32 - Ø100)
9	Foot (MS1)	/		**1540.Ø.05/1F**	(Ø20 - Ø100)
10	Rear female clevis (MP2)	**1380.Ø.09F**	(Ø32 - Ø100)	**1320.Ø.20F**	(Ø32 - Ø100)
11	Narrow rear female trunnion (AB6)	**1380.Ø.30F**	(Ø32 - Ø100)	**1320.Ø.29F**	(Ø32 - Ø100)
12	Rear male clevis (MP4)	**1580.Ø.09/1F** **1380.Ø.09/1F**	(Ø20 - Ø25) (Ø32 - Ø100)	**1580.Ø.09/2F** **1320.Ø.21F**	(Ø20 - Ø25) (Ø32 - Ø100)
13	Rear male clevis (with jointed head - MP6)	**1380.Ø.15F**	(Ø32 - Ø100)	**1320.Ø.25F**	(Ø32 - Ø100)
14	Square angle trunnion (AB7)	**1380.Ø.35F**	(Ø32 - Ø100)	**1320.Ø.23F**	(Ø32 - Ø100)
15	Square angle trunnion (with joined head)			**1320.Ø.27F**	(Ø32 - Ø100)
16	Square angle trunnion (not specified by ISO 15552)	**1380.Ø.11F**	(Ø32 - Ø100)	/	
17	Standard trunnion (with joined head)	**1380.Ø.36F**	(Ø32 - Ø100)	**1320.Ø.26F**	(Ø32 - Ø100)
18	Standard trunnion (not specified by ISO 15552)	**1380.Ø.10F**	(Ø32 - Ø100)	/	
19	Complete standard trunnion	/		**1320.Ø.22F**	(Ø32 - Ø100)

Rod lock nut

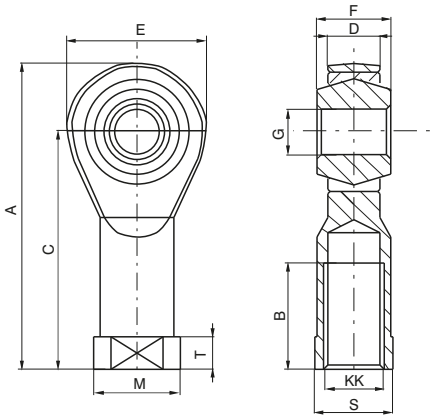
Ordering code	
Ø20-Ø25:	**1200.20.32F**
Ø32-Ø40:	**1320.32.32F**
Ø50-Ø63:	**1320.40.32F**
Ø80-Ø100:	**1320.50.32F**



Bore	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
S	13	13	17	17	19	19	24	24
T	5	5	6	6	7	7	8	8
KK	M8x1.25	M8x1.25	M10x1.25	M10x1.25	M12x1.25	M12x1.25	M16x1.5	M16x1.5
Weight g	12	12	15	15	20	20	20	20

Ball joint

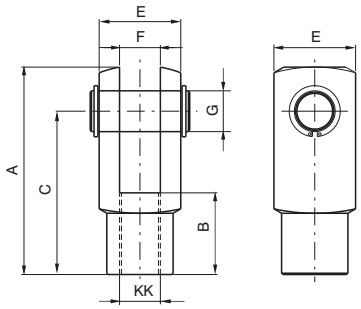
Ordering code	
Ø20-Ø25:	**1200.20.32F**
Ø32-Ø40:	**1320.32.32F**
Ø50-Ø63:	**1320.40.32F**
Ø80-Ø100:	**1320.50.32F**



Bore	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
A	48	48	57	57	66	66	85	85
B	16	16	20	20	22	22	28	28
C	36	36	43	43	50	50	64	64
D (-0,1)	9	9	10,5	10,5	12	12	15	15
E	24	24	28	28	32	32	42	42
F	12	12	14	14	16	16	21	21
G (H7)	8	8	10	10	12	12	16	16
KK	M8x1,25	M8x1,25	M10x1,25	M10x1,25	M12x1,25	M12x1,25	M16x1,5	M16x1,5
M	16	16	19	19	22	22	27	27
S	14	14	17	17	19	19	22	22
T	5	5	6,5	6,5	6,5	6,5	8	8
Weight g	46	46	76	76	110	110	220	220

Fork

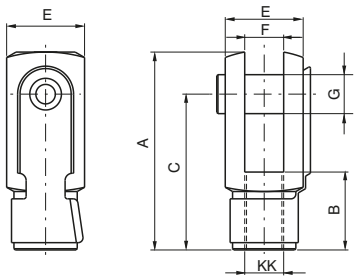
Ordering code	
Ø20-Ø25:	**1200.20.04**
Ø32-Ø40:	**1320.32.13F**
Ø50-Ø63:	**1320.40.13F**
Ø80-Ø100:	**1320.50.13F**



Bore	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
A	42	42	52	52	62	62	83	83
B	16	16	20	20	24	24	32	32
C	32	32	40	40	48	48	64	64
E	16	16	20	20	24	24	32	32
F (B12)	8	8	10	10	12	12	16	16
G	8	8	10	10	12	12	16	16
KK	M8x1,25	M8x1,25	M10x1,25	M10x1,25	M12x1,25	M12x1,25	M16x1,5	M16x1,5
Weight g	45	45	100	100	140	140	340	340

Fork with clips

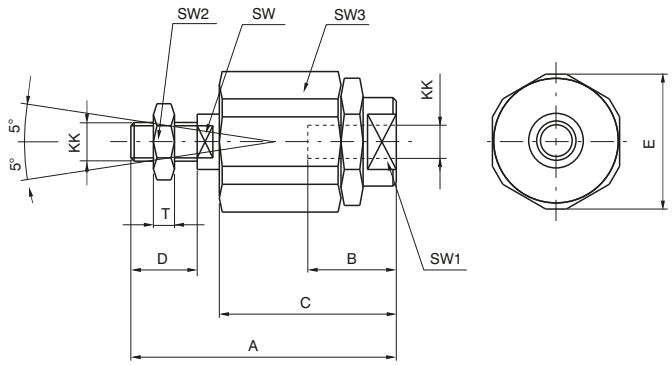
Ordering code	
Ø20-Ø25:	**1200.20.04/1**
Ø32-Ø40:	**1320.32.13/1F**
Ø50-Ø63:	**1320.40.13/1F**
Ø80-Ø100:	**1320.50.13/1F**



Bore	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
A	42	42	52	52	62	62	83	83
B	16	16	20	20	24	24	32	32
C	32	32	40	40	48	48	64	64
E	16	16	20	20	24	24	32	32
F (B12)	8	8	10	10	12	12	16	16
G	8	8	10	10	12	12	16	16
KK	M8x1,25	M8x1,25	M10x1,25	M10x1,25	M12x1,25	M12x1,25	M16x1,5	M16x1,5
Weight g	45	45	100	100	140	140	340	340

Self-aligning joint

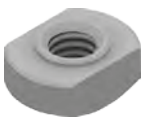
Ordering code	
Ø20-Ø25:	**1200.20.33F**
Ø32-Ø40:	**1320.32.33F**
Ø50-Ø63:	**1320.40.33F**
Ø80-Ø100:	**1320.50.33F**

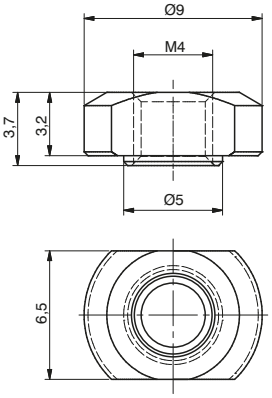


Bore	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
A	57	57	71	71	75	75	103	103
B	20	20	20	20	20	20	32	32
C	33	33	46	46	46	46	63	63
D	20	20	20	20	24	24	32	32
E	19	19	32	32	32	32	45	45
KK	M8x1,25	M8x1,25	M10x1,25	M10x1,25	M12x1,25	M12x1,25	M16x1,5	M16x1,5
SW	7	7	12	12	12	12	20	20
SW1	11	11	19	19	19	19	27	27
SW2	13	13	17	17	19	19	24	24
SW3	17	17	30	30	30	30	41	41
T	5	5	6	6	7	7	8	8
Weight g	60	60	220	220	230	230	660	660

Valves direct mounting nut

Ordering code
1500.20.F

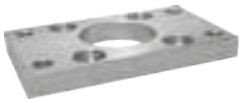


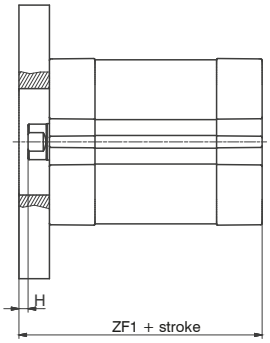


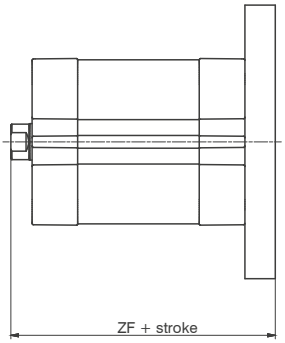
Flange (MF2)

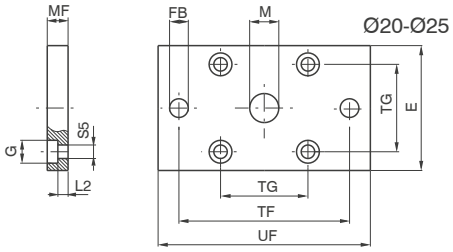
Ordering code
Ø20-Ø25: **1540.Ø.03F**
Ø32-Ø100: **1380.Ø.03F**

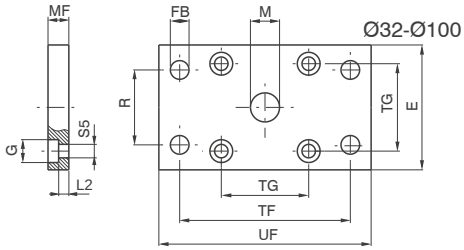
The kit comprises:
n°1 flange (plated zinc steel)
n°4 screws (plated zinc steel)









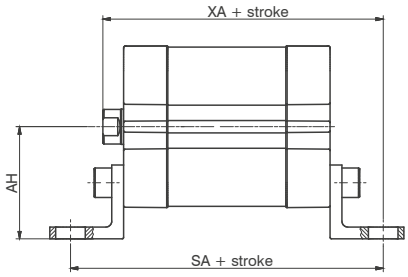


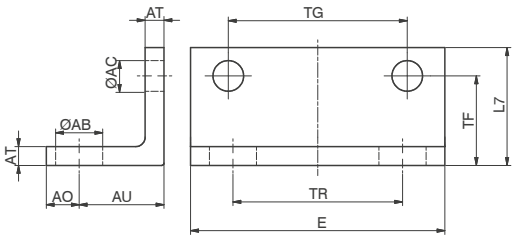
Bore	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
E	35	40	45	52	65	75	95	115
FB (H 13)	6.6	6.6	7	9	9	9	12	14
G	9.5	9.5	10.5	10.5	15	15	18	18
M (H 11)	16	16	30	35	40	45	45	55
MF (JS 14)	8	8	10	10	12	12	16	16
R (JS 14)	/	/	32	36	45	50	63	75
TF (JS 14)	55	60	64	72	90	100	126	150
TG	22	26	32.5	38	46.5	56.5	72	89
UF	70	75	80	90	110	120	150	170
ZF	51	53	130	145	155	170	190	205
ZF1	45	47	54	55	57	61	70	83
H	2	2	3	3	4	4	6	6
L2	3	3	5	5	6.5	6.5	8	8
S5	5.5	5.5	6.6	6.6	9	9	11	11
Weight g	125	160	190	250	480	620	1430	1990

Foot (MS1)

Ordering code
1540.Ø.05/1F

The kit comprises:
n°1 foot (plated zinc steel)
n°2 screws (plated zinc steel)



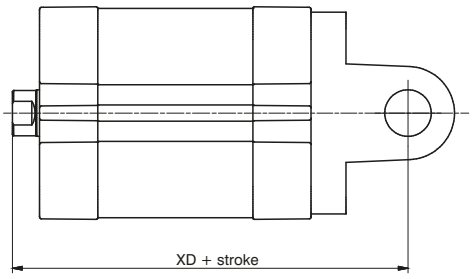


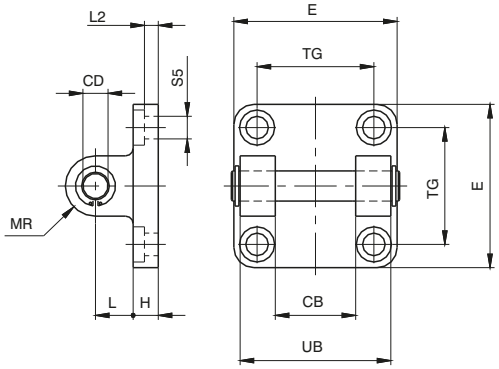
Bore	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
AB (H 14)	7	7	7	10	10	10	12	14.5
AC	5.5	5.5	6.5	6.5	8.5	8.5	10.5	10.5
AH	27	29	33.5	38	45	50	63	74
AO (max)	7	7	7	7	9	9	11	13
AT (±0.5)	4	4	4	4	5	5	6	6
AU (±0.2)	16	16	16	18	21	21	26	27
E (max)	35.5	39.5	46.5	54	65	77	95	115
L7	20	20	25	25	30	30	40	45
TF (±0.1)	16	16	17.25	19	21.75	21.75	27	29.5
TG (±0.2)	22	26	32.5	38	46.5	56.5	72	89
TR (JS 14)	22	26	32	36	45	50	63	75
SA	69	71	76	81	87	91	106	121
XA	59	61	67	70	74	78	90	104
Weight g	40	45	60	70	130	160	300	405

Rear female clevis (MP2)

Ordering code
Aluminium: **1380.Ø.09F**
Steel: **1320.Ø.20F**

The kit comprises:
n°1 clevis (steel or painted aluminium)
n°4 screws (plated zinc steel)
n°1 pin (plated zinc steel)
n°2 circlips (steel)



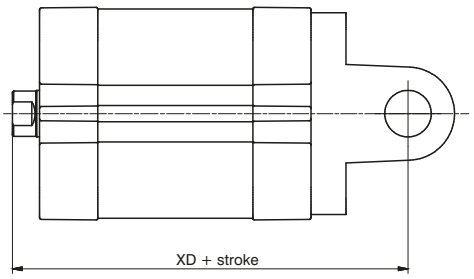


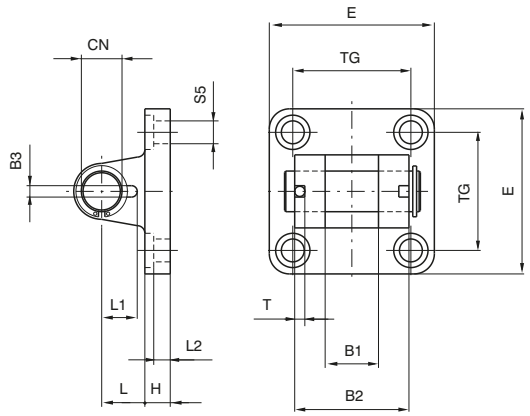
Bore		Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
CB (H 14)		26	28	32	40	50	60
CD		10	12	12	16	16	20
E	Aluminium	45	52	65	75	95	115
	Steel	45	55	65	75	95	115
H	Aluminium	9	9	11	11	14	14
	Steel	10	10	10	12	14	16
L	Aluminium	13	16	16	21	22	27
	Steel	12	15	17	20	22	25
MR		10	12	12	16	16	20
TG		32.5	38	46.5	56.5	72	89
UB (h14)		45	52	60	70	90	110
XD		73	77	80	83	100	118
L2(±0.5)		5.5	5,5	6.5	6.5	10	10
S5		6.6	6.6	9	9	11	11
Weight	Aluminium	80	130	185	310	530	910
g	Steel	180	290	400	670	1160	2000

Narrow rear female trunnion (AB6)

Ordering code
Aluminium: **1380.Ø.30F**
Steel: **1320.Ø.29F**

The kit comprises:
n°1 clevis (plated zinc steel or painted)
n°4 screws (plated zinc steel)
n°1 pin (plated zinc steel) complete with elastic pin and ring





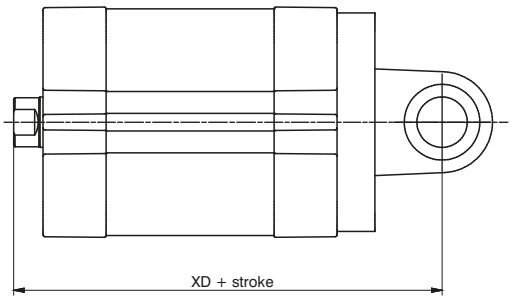
Bore		Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
B1 (H 14)		14	16	21	21	25	25
B2 (d 12)		34	40	45	51	65	75
B3 ($^{+0.2}_{0}$)		3.3	4.3	4.3	4.3	4.3	6.3
CN		10	12	16	16	20	20
E	Aluminium	45	52	65	75	95	115
	Steel	45	55	65	75	95	115
H	Aluminium	9	9	11	11	14	14
	Steel	10	10	10	12	14	16
L	Aluminium	13	16	16	21	22	27
	Steel	12	15	17	20	22	25
L1		11.5	12	14	14	16	16
L2 (±0.5)		5,5	5.5	6.5	6.5	10	10
S5		6,6	6.6	9	9	11	11
T		3	4	4	4	4	4
TG		32.5	38	46.5	56.5	72	89
XD		73	77	80	89	100	118
Weight	Aluminium	70	115	200	290	570	820
g	Steel	160	270	370	670	1110	2100

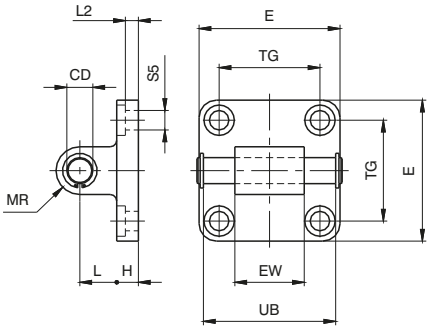
Rear male clevis (MP4)

Ordering code		
Aluminium:	Ø20-Ø25:	**1580.Ø.09/1F**
	Ø32-Ø100:	**1380.Ø.09/1F**
Steel:	Ø20-Ø25:	**1580.Ø.09/2F**
	Ø32-Ø100:	**1320.Ø.21F**

The kit comprises:
n°1 clevis (steel or painted aluminium)
n°4 screws (plated zinc steel)
n°1 pin (plated zinc steel) *
n°2 circlips (steel)

* (from Ø32)



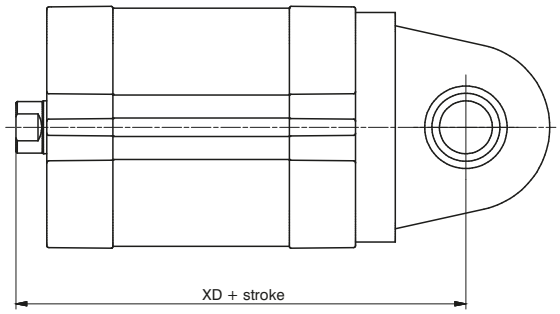


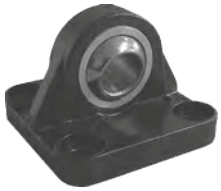
Bore		Ø20	Ø25	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
CD		8(H9)	8(H9)	10	12	12	16	16	20
E	Aluminium	34	38	45	52	65	75	95	115
	Steel	34	38	45	55	65	75	95	115
EW		16(h14)	16(h14)	26($^{-0,2}_{-0,6}$)	28($^{-0,2}_{-0,6}$)	32($^{-0,2}_{-0,6}$)	40($^{-0,2}_{-0,6}$)	50($^{-0,2}_{-0,6}$)	60($^{-0,2}_{-0,6}$)
H	Aluminium	6	6	9	9	11	11	14	14
	Steel	/	/	10	10	10	12	14	16
L	Aluminium	14	14	13	16	16	21	22	27
	Steel	/	/	12	15	17	20	22	25
MR		8	8	10	12	12	16	16	20
TG		22	26	32,5	38	46,5	56,5	72	89
UB ($^{-0,5}_{-0}$)		/	/	46	53	61	71	91	111
XD		63	65	73	77	80	89	100	118
L2 (±0.5)		2,6	2,6	5,5	5,5	6,5	6,5	10	10
S5		5,5	5,5	6,6	6,6	9	9	11	11
Weight	Aluminium	25	28	90	130	190	340	580	960
g	Steel	70	80	210	330	430	810	1350	2400

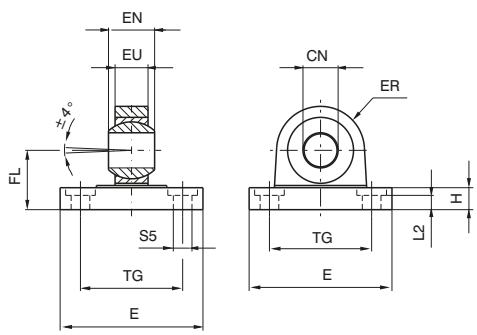
Rear male clevis (with jointed head MP6)

Ordering code	
Aluminium:	**1380.Ø.15F**
Steel:	**1320.Ø.25F**

The kit comprises:
n°1 clevis (steel or painted aluminium)
n°4 screws (plated zinc steel)





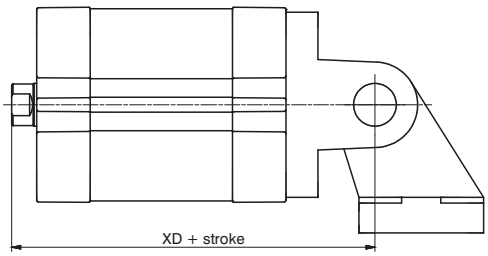


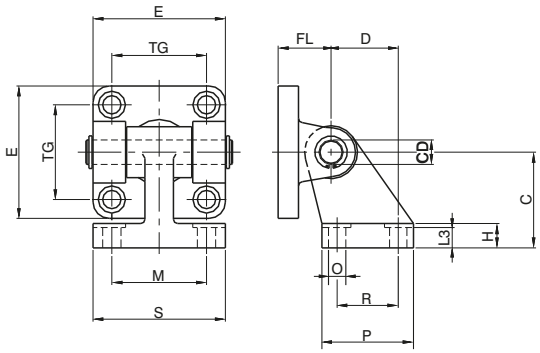
Bore		Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
CN (H 7)		10	12	16	16	20	20
E	Aluminium	45	52	65	75	95	115
	Steel	45	55	65	75	95	115
EN (-0.1)		14	16	21	21	25	25
ER	Aluminium	16	19	21	24	28.5	30
	Steel	15	18	20	23	27	30
EU		10.5	12	15	15	18	18
FL (JS 15)		22	25	27	32	36	41
H	Aluminium	9	9	11	11	14	14
	Steel	10	10	10	12	14	16
L2 (±0.5)		5.5	5.5	6.5	6.5	10	10
S5		6.6	6.6	9	9	11	11
TG		32.5	38	46.5	56.5	72	89
XD		73	77	80	89	100	118
Weight	Aluminium	60	100	180	245	480	650
g	Steel	210	310	400	710	1350	2400

Square angle trunnion (AB7)

Ordering code	
Aluminium:	**1380.Ø.35F**
Steel:	**1320.Ø.23F**

The kit comprises:
n°1 clevis (steel or painted aluminium)
n°1 counter clevis, square
(steel or painted aluminium)
n°4 screws (plated zinc steel)
n°1 pin (plated zinc steel)
n°2 circlips (steel)



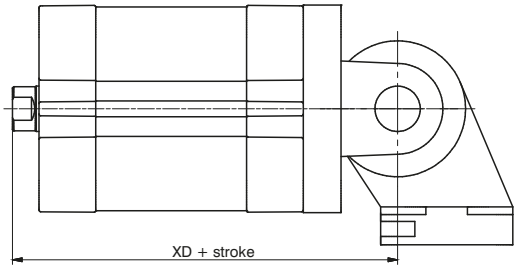


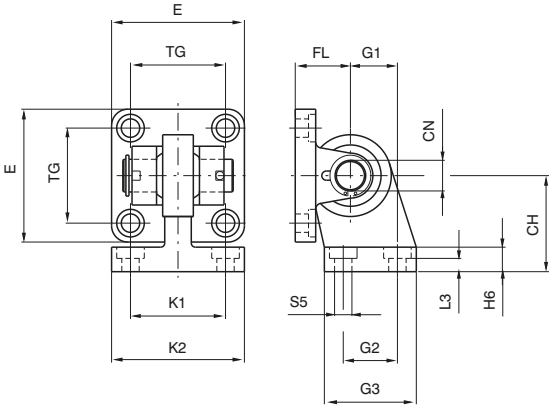
Bore		Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
E	Aluminium	45	52	65	75	95	115
	Steel	45	55	65	75	95	115
TG		32.5	38	46.5	56.5	72	89
FL		22	25	27	32	36	41
D (JS14)		21	24	33	37	47	55
CD		10	12	12	16	16	20
C (JS15)		32	36	45	50	63	71
H	Aluminium	8	10	12	14	14	17
	Steel	8	10	12	12	14	15
L3	Aluminium	6.4	8.4	10.4	12.4	11.5	14.5
	Steel	6.5	8.5	10.5	10.5	11.5	12.5
R (JS14)		18	22	30	35	40	50
P		31	35	45	50	60	70
O (H13)		6.6	6.6	9	9	11	11
S		51	54	65	67	86	96
M (JS14)		38	41	50	52	66	76
XD		73	77	80	89	100	118
Weight	Aluminium	120	180	225	435	730	1220
g	Steel	340	500	640	1250	2100	3500

Square angle trunnion (with joined head)

Ordering code	
Steel:	**1320.Ø.27F**

The kit comprises:
n°1 clevis (painted steel)
n°1 counter clevis square
with joined head (painted steel)
n°4 screws (plated zinc steel)
n°1 pin (plated zinc steel)
n°2 circlips (steel)



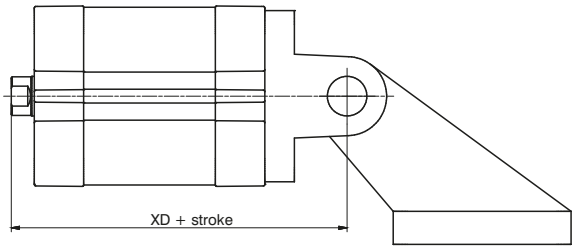


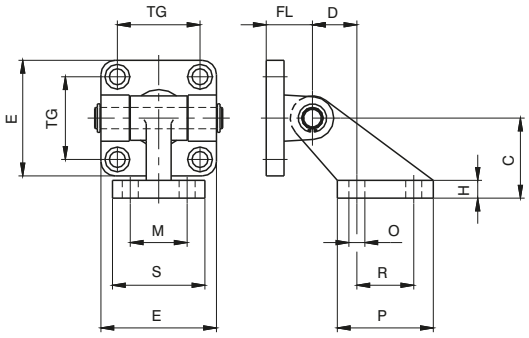
Bore	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
CH (JS 15)	32	36	45	50	63	71
CN	10	12	16	16	20	20
E	45	55	65	75	95	115
FL (JS 15)	22	25	27	32	36	41
G1 (JS 15)	21	24	33	37	47	55
G2 (JS 14)	18	22	30	35	40	50
G3	31	35	45	50	60	70
H6	10	10	12	12	14	15
K1 (JS 14)	38	41	50	52	66	76
K2	51	54	65	67	86	96
L3 ($^{+0.5}_{0}$)	8,5	8,5	10,5	10,5	11,5	12,5
S5	6,6	6,6	9	9	11	11
TG	32,5	38	46,5	56,5	72	89
XD	73	77	80	89	100	118
Weight g	330	480	830	1220	2100	3580

Square angle trunnion (not specified by ISO-VDMA standard)

Ordering code
Aluminium: **1380.Ø.11F**

The kit comprises:
n°1 clevis (painted aluminium)
n°1 counter clevis square (painted aluminium)
n°4 screws (plated zinc steel)
n°1 pin (plated zinc steel)
n°2 circlips (steel)



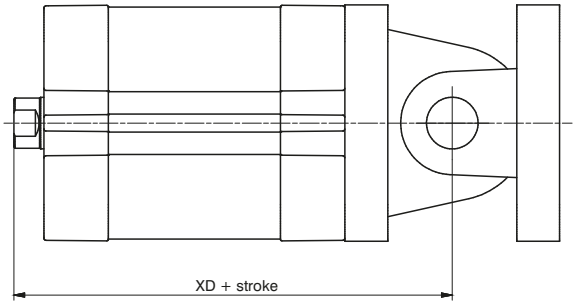


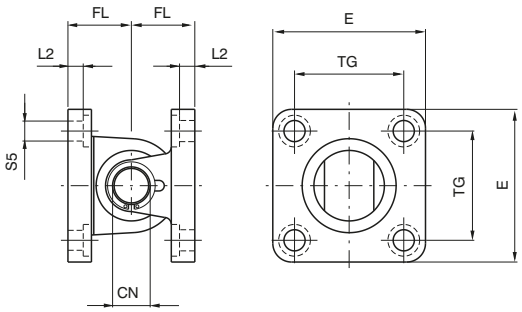
Bore	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
C (±0,2)	32	45	45	63	63	90
D (±0,5)	18	25	25	32	32	40
E	45	52	65	75	95	115
H	8	10	10	12	12	17
FL	22	25	27	32	36	41
M (JS 14)	25	32	32	40	40	50
TG	32,5	38	46,5	56,5	72	89
O (H 13)	7	9	9	11	11	14
P	37	54	54	75	75	103
R (JS 14)	20	32	32	50	50	70
S	41	52	52	63	63	80
XD	73	77	80	89	100	118
Weight g	130	260	330	600	820	1560

Square angle trunnion (with joined head)

Ordering code
Aluminium: **1380.Ø.36F**
Steel: **1320.Ø.26F**

The kit comprises :
n°1 clevis (steel or painted aluminium)
n°1 counter clevis with joined head (steel or painted aluminium)
n°4 screws (plated zinc steel)
n°1 pin (plated zinc steel) complete with elastic pin and ring



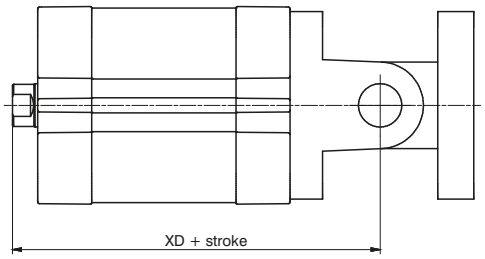


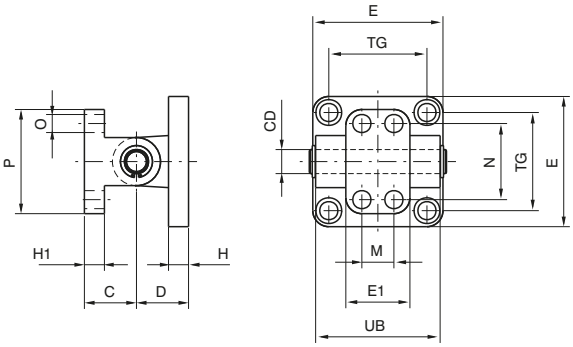
Bore		Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
CN		10	12	16	16	20	20
E	Aluminium	45	52	65	75	95	115
	Steel	45	55	65	75	95	115
FL (JS 15)		22	25	27	32	36	41
L2 (±0.5)		5.5	5.5	6.5	6.5	10	10
S5		6.6	6.6	9	9	11	11
TG		32.5	38	46.5	56.5	72	89
XD		73	77	80	89	100	118
Weight g	Aluminium	130	215	380	535	1050	1470
	Steel	380	580	770	1380	2460	4500

Standard trunnion (not specified by ISO-VDMA standard)

Ordering code
Aluminium: **1380.Ø.10F**

The kit comprises:
n°1 clevis (painted aluminium)
n°1 counter clevis (painted aluminium)
n°4 screws (plated zinc steel)
n°1 pin (plated zinc steel)
n°2 circlips (steel)



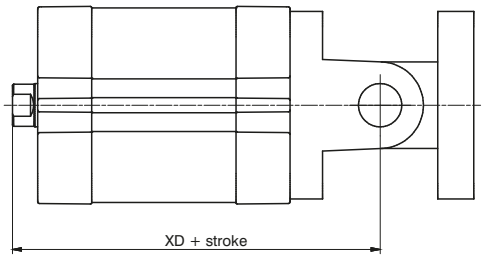


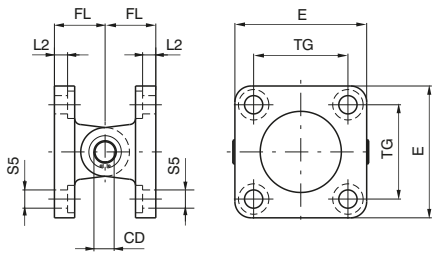
Bore	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
C (±0,2)	18	26	26	34	34	41
CD	10	12	12	16	16	20
D	22	25	27	32	36	41
E	45	52	65	75	95	115
E1	25	32	32	46	46	56
H	10	10	12	12	16	16
H1	8	10	10	12	12	16
M (±0,2)	-	16	16	25	25	32
N (±0,2)	28	38	38	54	54	90
O	7	9	9	11	11	14
P	40	52	52	75	75	115
TG	32,5	38	46,5	56,5	72	89
UB	45	52	60	70	90	110
XD	73	77	80	89	100	118
Weight g	110	190	240	490	710	1290

Complete standard trunnion

Ordering code
Steel: **1320.Ø.22F**

The kit comprises:
n°1 clevis (painted steel)
n°1 counter clevis (painted steel)
n°4 screws (plated zinc steel)
n°1 pin (plated zinc steel)
n°2 circlips (steel)

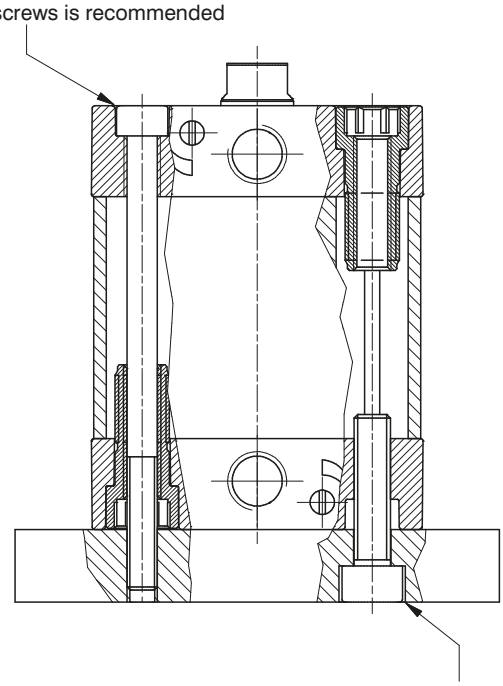




Bore	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
CD	10	12	12	16	16	20
E	45	55	65	75	95	115
FL	22	25	27	32	36	41
L 2 (±0.5)	5,5	5,5	6,5	6,5	10	10
S 5	6,6	6,6	9	9	11	11
TG	32,5	38	46,5	56,5	72	89
XD	73	77	80	89	100	118
Weight g	360	580	780	1370	2370	4110

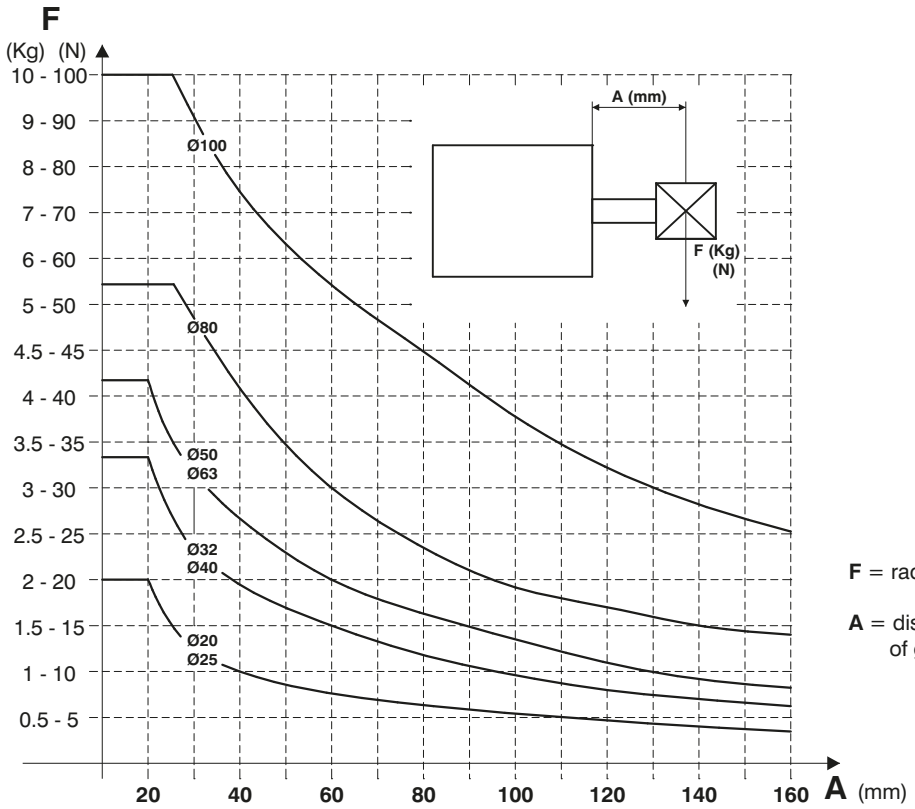
Alternative fixing options

Frontal mounting:
- from Ø20 to Ø40 bolt head
- the use of non-magnetic screws is recommended



Rear mounting

Admissible maximum radial load diagram

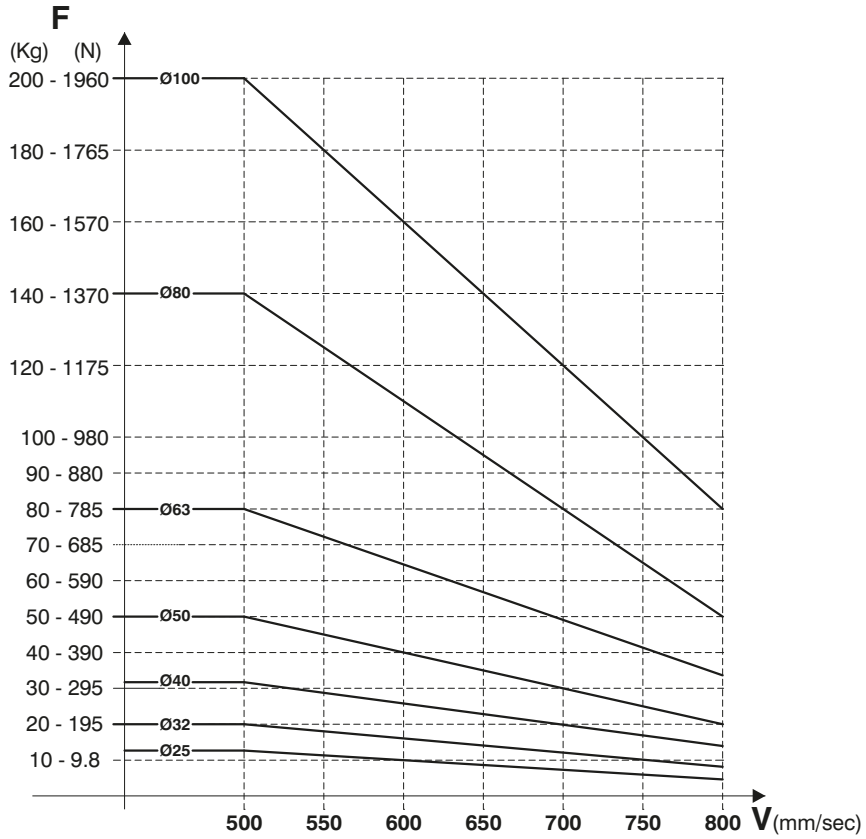


F = radial load (Kg and N)

A = distance between the load (F) centre of gravity and the cylinder front end cap

The diagram shows the maximum Radial load F (in Newtons) that can be applied to the cylinder piston rod as a function of the distance **A** (in mm); based upon the standard version cylinder under static conditions

End of stroke cushioning capacity diagram



F= moved cylinder load (Kg and N)

V= load speed

The diagram shows, for each diameter, the safety curves relative to the maximum loads which can be moved by the cylinder in function of it's speed **V**. The data has been calculated under the following test conditions:
Cylinder mounted vertically with the rod pointing down, air pressure at 5 bar and with a guided load.
Important: Do not exceed the recommended values in the table as reduced life or damage to the cylinder may result.

Series 1200, Special performance microbore cylinders

General

These microbore cylinders are not subject to a standard; they are single acting with a front spring, can be either hexagonal or round bodied and either completely threaded or threaded with a plain rod ending.
They are available with M5 connections or with incorporated quick fittings.

Construction characteristics

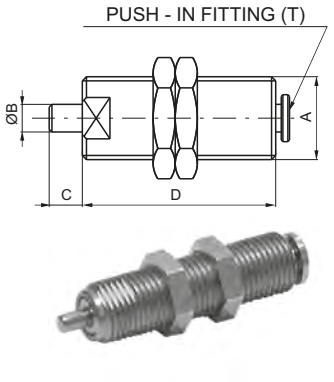
Body	nickel-plated brass
Rod / piston	stainless steel (C43 chromed)
Rod bushing	brass
Spring	stainless steel
Seal	NBR

Technical characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
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

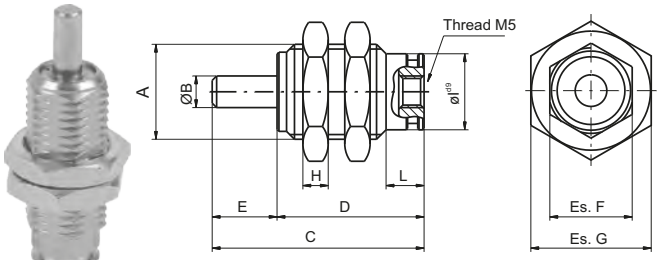
Threaded body, round execution



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

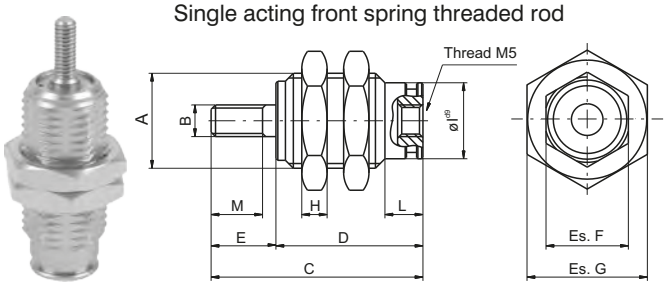
Threaded body, hexagonal execution

Ordering code	Description
1213.Ø.stroke.C	Single acting front spring
1213.Ø.stroke.CF	Single acting front spring threaded body



Single acting front spring

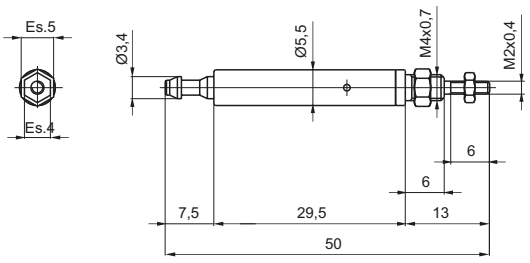
Single acting front spring threaded rod



Ø Cil.	Stroke	A	ØB	B	C	D	E	Es. F	Es. G	H	ØI	L	M
6	5	M10x1	Ø3	M3x0.5	27,5	18,5	9	9	12	3	Ø8,5	6	7
6	10	M10x1	Ø3	M3x0.5	34,5	25,5	9	9	12	3	Ø8,5	6	7
6	15	M10x1	Ø3	M3x0.5	41,5	32,5	9	9	12	3	Ø8,5	6	7
10	5	M15x1.5	Ø5	M4x0.7	32,5	20,5	12	13	19	4	Ø12	6	10
10	10	M15x1.5	Ø5	M4x0.7	39	27	12	13	19	4	Ø12	6	10
10	15	M15x1.5	Ø5	M4x0.7	46	34	12	13	19	4	Ø12	6	10
16	5	M22x1.5	Ø6	M5x0.8	37,5	23,5	14	20	27	5	Ø19	7	12
16	10	M22x1.5	Ø6	M5x0.8	43,5	29,5	14	20	27	5	Ø19	7	12
16	15	M22x1.5	Ø6	M5x0.8	50	36	14	20	27	5	Ø19	7	12

Front fixing microbore cylinders

Ordering code
1273.4.10



Series 1325-1326-1345-1347, twin rod cylinders

Construction characteristics

Front end cap	anodised aluminium
Rear end cap	UNI 5079 aluminium alloy casting
Rod	C43 chromed steel stainless steel
Barrel	RA=0.3-0.5 anodised aluminium
Cushion bushings	hard aluminium
Piston	vulcanized rubber block on steel core with incorporated permanent magnet, or without magnet for non magnetic version (plus spacer).
Flange	zinc plated steel
Rod seal	PUR
Other seals	NBR 80 shore rubbber
Cushioning adjustment screw	nickel-plated steel

Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Max. pressure	10 bar
Working temperature	-5°C - +70°C

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device)
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

Please note: air must be dried for applications with lower temperature.
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.
Our Technical Department will be glad to help.

Cushioning lengths

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

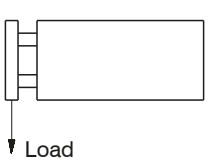
Standard strokes

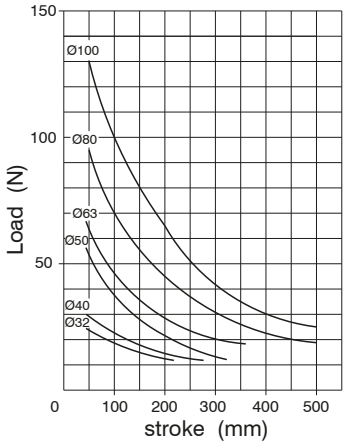
Ø32 25 - 50 - 75 - 100 - 150 - 200 mm
Ø40 25 - 50 - 75 - 100 - 150 - 200 - 250 mm
Ø50 25 - 50 - 75 - 100 - 150 - 200 - 250 - 300 mm
Ø63 25 - 50 - 75 - 100 - 150 - 200 - 250 - 300 - 350 mm
Ø80 25 - 50 - 75 - 100 - 150 - 200 - 250 - 300 - 350 - 400 - 500 mm
Ø100 25 - 50 - 75 - 100 - 150 - 200 - 250 - 300 - 350 - 400 - 500 mm

On request are available strokes up to 1000 mm

Stroke tolerance (ISO 15552)

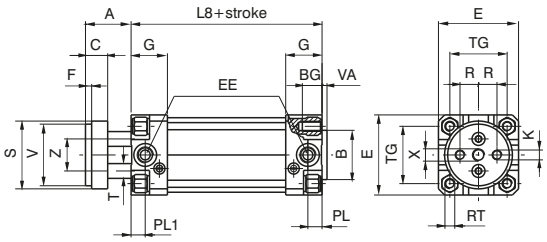
Bore	Stroke	Tolerance
32 - 40 - 50 63 - 80 - 100	up to 500 mm	$^{+2}_{0}$

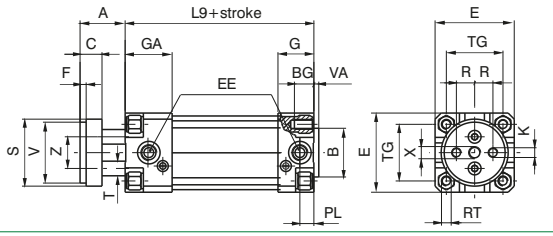




Basic version

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





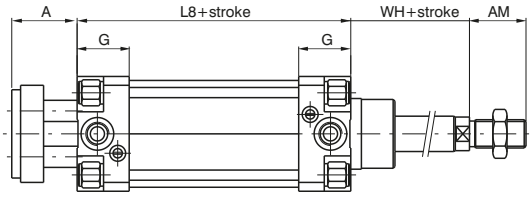
Bore			32	40	50	63	80	100
A			26	30	37	37	46	51
AM			22	24	32	32	40	40
B			30	35	40	45	45	55
BG			12	12	16	16	20	20
C			15	15	18	22	22	22
E			46	52	65	75	95	115
EE			G 1/8"	G 1/4"	G 1/4"	G 3/8"	G 3/8"	G 1/2"
F			4	4	5	5	5	5
G			25	29	29,5	36	36	40
GA			50	54	54,5	61	61	65
K			M6	M8	M8	M10	M12	M12
L8			94	105	106	121	128	138
L9			119	130	131	146	153	163
PL			9	11,5	13	14	16	18
PL1			9,5	11	10,5	14	13	15
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 g	Stroke 0	Basic version	560	810	1380	2300	3680	5740
		Extended ver.	650	950	1500	2500	4100	6300
every 10 mm			20	26	30	40	80	90

Extended front cap

1345.Ø.stroke.01 magnetic **1347.Ø.stroke.01** non magnetic **1345.Ø.stroke.01X** magnetic stainless steel rod **1347.Ø.stroke.01X** non magnetic stainless steel rod

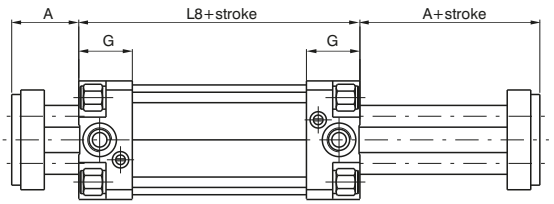
Through rod cylinder version with ISO standard

Ordering code
1325.Ø.stroke.02 magnetic **1326.Ø.stroke.02** non magnetic Rods opions **1325.Ø.stroke.02X** magnetic stainless steel rod **1326.Ø.stroke.02X** non magnetic stainless steel rod



Through rod twin cylinder version

Ordering code
1325.Ø.stroke.06 magnetic **1326.Ø.stroke.06** non magnetic Rods opions **1325.Ø.stroke.06X** magnetic stainless steel rod **1326.Ø.stroke.06X** non magnetic stainless steel rod



Magnetic sensors

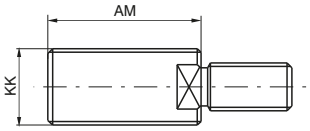
For sensor and sensor support bracket please refer to the 1319 and 1320 series.

Accessories

All of the attachments of the ISO 15552 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

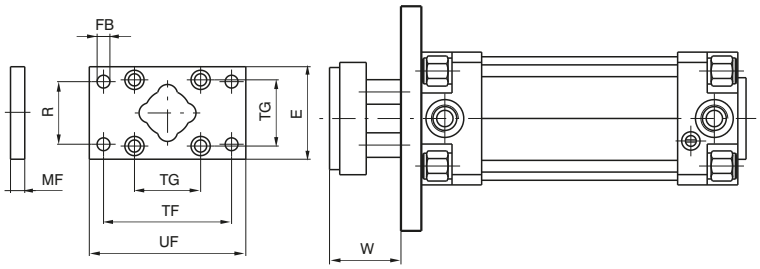
Ordering code
1325.Ø.17F



Bore	32	40	50	63	80	100
AM	22	24	32	35	40	40
KK	M10x1,25	M12x1,25	M16x1,5	M16x1,5	M20x1,5	M20x1,5
Weight g	17	27	63	65	110	110

Front Flange

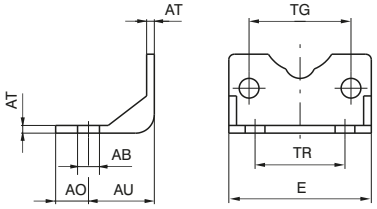
Ordering code
1325.Ø.03F

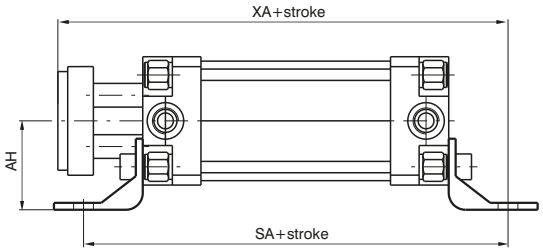


Bore	32	40	50	63	80	100
E	45	52	65	75	95	115
FB (H13)	7	9	9	9	12	14
MF (JS 14)	10	10	12	12	16	16
R (JS 14)	32	36	45	50	63	75
TF (JS 14)	64	72	90	100	126	150
TG	32,5	38	46,5	56,5	72	89
UF	80	90	110	120	150	170
W	16	20	25	25	30	35
Weight g	160	250	480	620	1430	3500

Front foot mounting bracket (short)

Ordering code
1325.Ø.05/1F (1 piece)





Bore	32	40	50	63	80	100
AB (H14)	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
Weight g	50	70	120	180	320	400

Series 1370 - 1371 - 1372 - 1373 - ECOFLAT

General

Profiled tube has two "T" slots on the side hosting sensors 1580._, MRS._, MHS._. without adaptors.
Two additional connections are also available on rear cover for cylinder feeding.

Construction characteristics

End caps	aluminium anodised
Rod	C43 chromed steel or stainless steel
Barrel	aluminium alloy anodised
Piston	acetal resin, aluminium on request
Piston-seal	PUR
Rod-seal	PUR (FPM upon request)
Adjusting screw	zinc plated steel
Shock absorber	NBR

Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Max. pressure	10 bar
Operating temperature	-5°C - +70°C

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod;
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device and aluminium piston);
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

Please note: air must be dried for applications with lower temperature.
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.
Our Technical Department will be glad to help.

Maximum standard strokes

Size 25	200 mm
Size 32 - 63	320 mm

Sections (cm^2)

Size	25	32	40	50	63
Out stroke (cm^2)	5,28	8,09	13,09	20,28	32,68
In stroke (cm^2)	4,49	6,96	11,08	17,14	29,54

In order to calculate the theoretical force generated by the unit, both outstroke and instroke, it is necessary to use the following equation
FORCE(Kg) = Surface (cm^2) x Pressure(bar)
It is also necessary to remember that the theoretical force must be reduced by 10-15% in order to account for the unit internal friction.

Maximum rod radial movement (°)

Size	25	32	40	50	63
Rod radial movement	±0.8	±0.7	±0.6	±0.5	±0.4

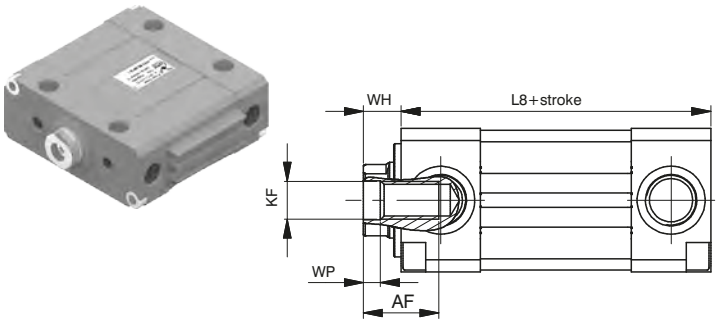
Maximum torque applicable on the piston rod (Nm):

Size	25	32	40	50	63
Maximum torque	0.8	1	1,3	1,8	2,1

The maximum torque values must also be accounted for while mounting accessories on the piston rod.

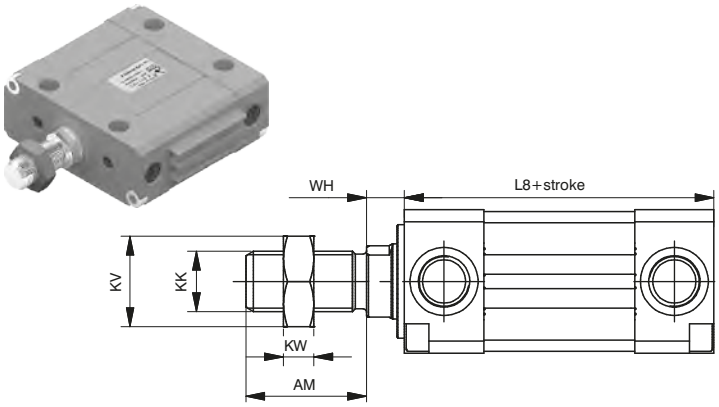
Basic version “1” female rod

Ordering code
SIDE CONNECTION
1370.size.stroke.1 Magnetic chrome plated rod
1371.size.stroke.1 Magnetic stainless steel rod
1372.size.stroke.1 Non magnetic chrome plated rod
1373.size.stroke.1 Non magnetic stainless steel rod
REAR CONNECTION
1370.size.stroke.1.P Magnetic chrome plated rod
1371.size.stroke.1.P Magnetic stainless steel rod
1372.size.stroke.1.P Non magnetic chrome plated rod
1373.size.stroke.1.P Non magnetic stainless steel rod



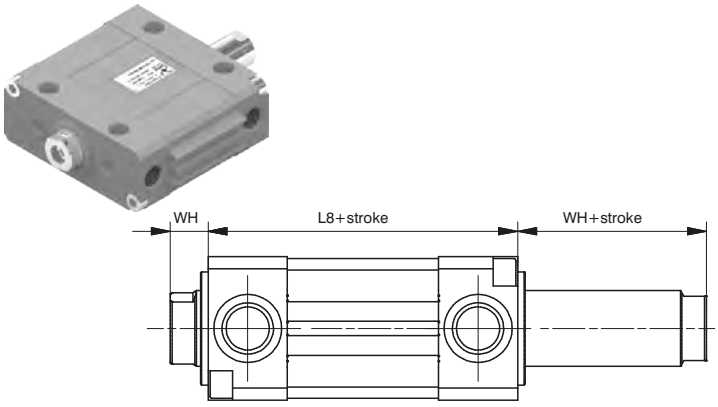
Basic version “2” male rod

Ordering code
SIDE CONNECTION
1370.size.stroke.2 Magnetic chrome plated rod
1371.size.stroke.2 Magnetic stainless steel rod
1372.size.stroke.2 Non magnetic chrome plated rod
1373.size.stroke.2 Non magnetic stainless steel rod
REAR CONNECTION
1370.size.stroke.2.P Magnetic chrome plated rod
1371.size.stroke.2.P Magnetic stainless steel rod
1372.size.stroke.2.P Non magnetic chrome plated rod
1373.size.stroke.2.P Non magnetic stainless steel rod



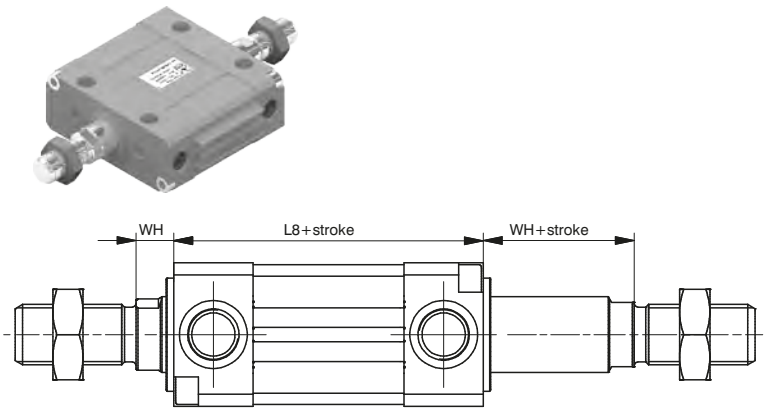
Female through rod cylinder version “3”

Ordering code
1370.size.stroke.3 Magnetic chrome plated rod
1371.size.stroke.3 Magnetic stainless steel rod
1372.size.stroke.3 Non magnetic chrome plated rod
1373.size.stroke.3 Non magnetic stainless steel rod



Male through rod cylinder version “4”

Ordering code
1370.Size.stroke.4 Magnetic stelo cromato
1371.Size.stroke.4 Magnetic stelo inox
1372.Size.stroke.4 Non magnetico stelo cromato
1373.Size.stroke.4 Non magnetico stelo inox



Variants

Ordering code
137_.size.stroke._.K = Version with aluminium piston

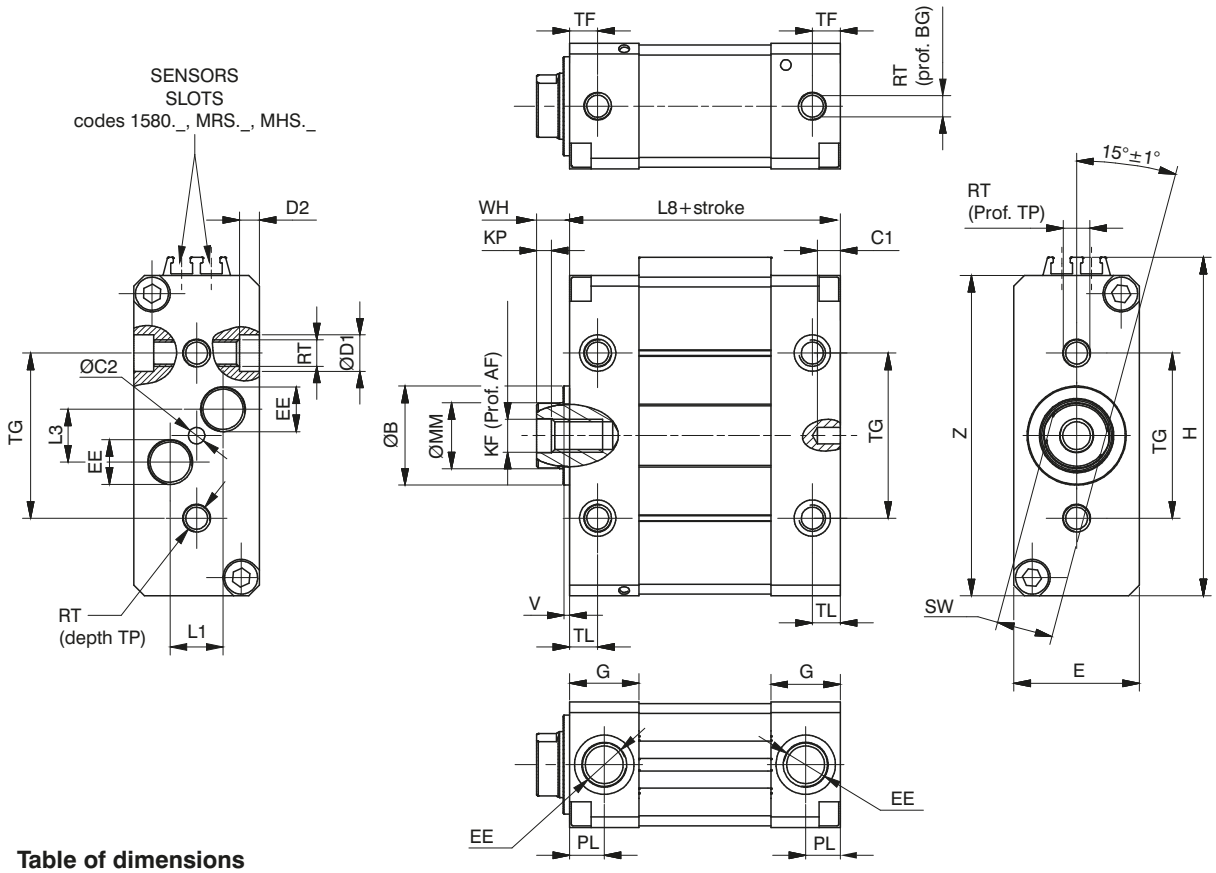


Table of dimensions

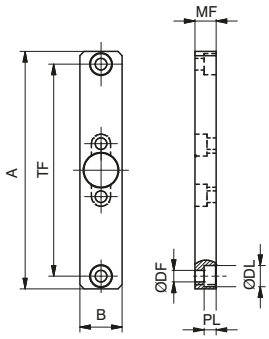
Size				25	32	40	50	63
AM				22	22	24	32	32
AF				12	14	16	20	20
Ø B (h9)				16	20	25	30	30
BG				8	9	9	12	14
C1				7	7	7	7	7
C2 (H9)				4	4	4	5	5
Ø D1				8	10	10	11	15
D2				4	4	5	6	6
E				20	24	30	38	50
EE				M5	G1/8"	G1/8"	G1/4"	G1/4"
G				12	17	17	21	21
H				56,5	65,5	82,5	102,5	127
KF				M5	M6	M8	M10	M10
KK				M10x1,25	M10x1,25	M12x1,25	M16x1,5	M16x1,5
KP				2	2,5	3	4,5	4,5
KV				17	17	19	24	24
KW				6	6	7	8	8
L1				6	7,5	7,5	16	19
L3				10	14,5	14,5	16	21
L8				62	72	76	82	82
Ø MM				10	12	16	20	20
PL				6,5	8,5	8,5	10,5	10,5
RT				M5	M6	M6	M8	M10
SW (H13)				8	10	13	17	17
TF				5	8,5	8,5	8,5	8,5
TG				25	32	40	50	60
TL				5	8,5	8,5	8,5	8,5
TP				8	9	9	12	14
V				2	2	2	2	2
VG				30	30	33	42	42
WH				8	8	9	10	10
Z				51	60	77	97	1215
Weight g	Versions	1	stroke 0	180	285	482	848	1350
		2	stroke 0	203	309	520	929	1431
	every 10 mm			22	29	49	79	118
Weight g	Versions	3	stroke 0	195	314	534	959	1478
		4	stroke 0	242	362	610	1096	1615
	every 10 mm			28	38	65	103	143

Front and rear flange

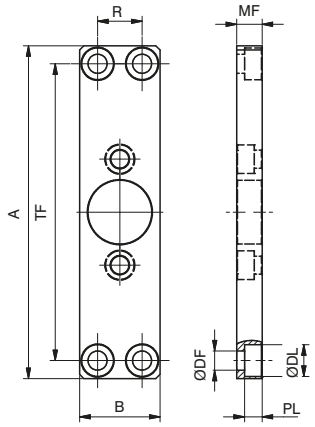
Ordering code
1370.Size.03

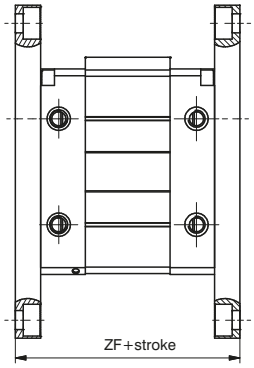
Plate which allows anchorage of the cylinder at a right angle to the plane. Mounted to the cylinder by screws.

Size 25-32-40



Size 50-63



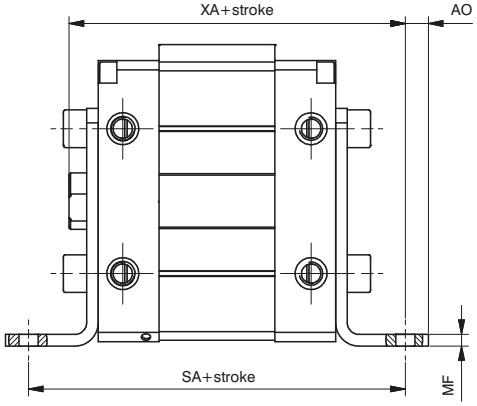


Size	25	32	40	50	63
A	112	130	146	157	157
B	20	24	30	38	50
ØDF	5.5	6.6	6.6	9	9
ØDL	10	11	11	15	15
PL	5.7	6.5	6.3	8.3	8.3
MF	10	10	10	12	15
R	/	/	/	21	33
TF	100	115	132	140	140
ZF	82	92	96	106	112

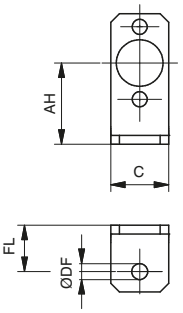
Foot bracket

Ordering code
1370.Size.05/1F (n° 1 piece)

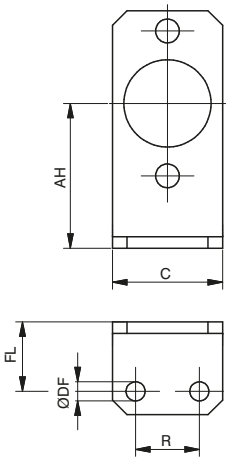
Brackets used to anchor the cylinder parallel to the mounting plane. Manufactured from steel with a rust proof protective treatment. Mounted to the cylinder end caps with bolts.



Size 25



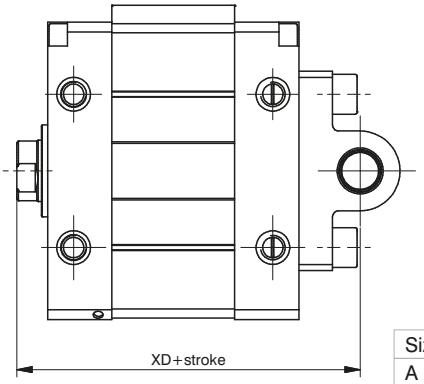
Size 25-40-50-63



Size	25	32	40	50	63
AH	28	32	40	50	63
AO	7	5.5	7	8	10
C	20	24	30	38	50
ØDF	5.5	5.5	5.5	6.6	9
FL	16	18	20	24	27
MF	3	3	4	4	4
R	/	13	16	22	30
SA	94	108	116	130	136
XA	86	98	105	116	119

Rear male clevis

Ordering code
1370.Size.09/1F

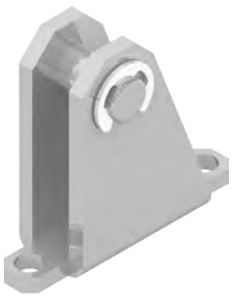


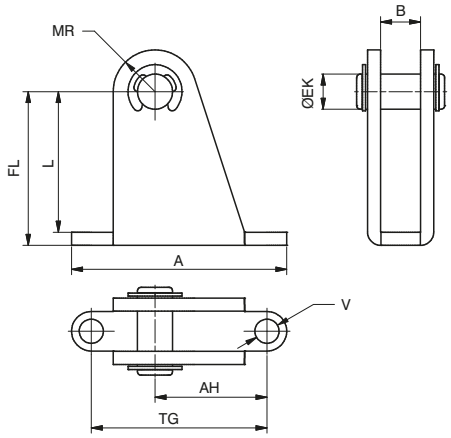
This type of mounting allows anchorage of the cylinder either parallel or right angle to plane; the cylinder rod can oscillate and self-align as necessary when under load.

Size	25	32	40	50	63
A	37	44	52	65	78
B	9	10.5	10.5	20	25
ØCD (H7)	8	10	12	12	16
FL	14	15	18	20	24
H	6	9	9	11	11
L	8	6	9	9	13
MR	7.5	10	13	13	17
XD	84	95	103	112	116

Rear clevis

Ordering code
1370.Size.09F



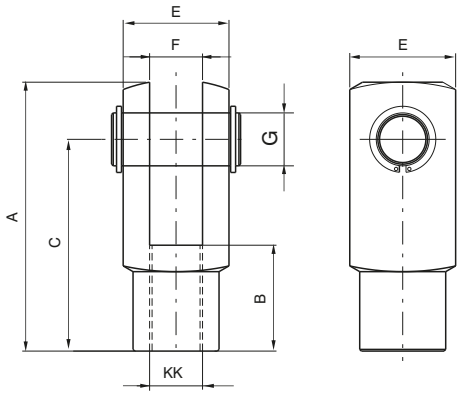


To be used in conjunction with 09/1 clevis.
Similar to type 08 but includes a hinge pin.
This type of mounting allows anchorage of the cylinder either parallel or right angle to plane; the cylinder rod can oscillate and self-align as necessary when under load.
Manufactured from sheet metal with rust proof protective treatment.

Size	25	32	40	50	63
A	49	60	60	46	60
AH	25.5	33	29.5	24	32
B	9.1	10.6	10.6	20.1	25.1
ØEK	8	10	12	12	16
FL	35	42	51	55	68
L	32	38	47	50	63
MR	9.5	11	14	14	18
TG	40	50	50	30	40
ØV	5.5	6.6	6.6	9	11

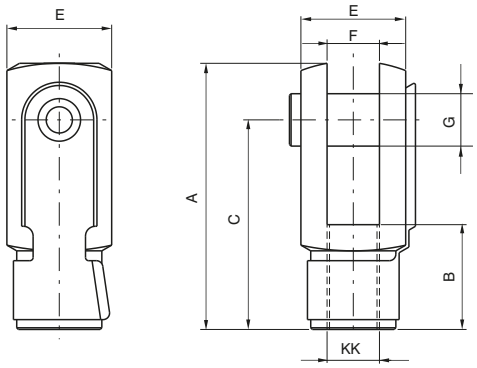
Fork

Ordering code
1320.32.13F (for ø25 and ø32)
1320.40.13F (for ø40)
1320.50.13F (for ø50)
1320.63.13F (for ø63)



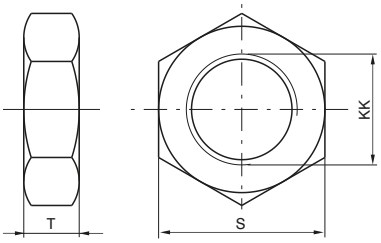
Fork with clips

Ordering code
1320.32.13/1F (for ø25 and ø32)
1320.40.13/1F (for ø40)
1320.50.13/1F (for ø50)
1320.63.13/1F (for ø63)



Nut

Ordering code
1320.32.18F (for ø25 and ø32)
1320.40.18F (for ø40)
1320.50.18F (for ø50)
1320.63.18F (for ø63)

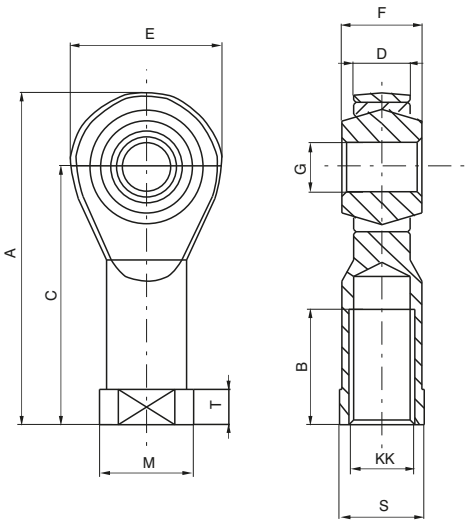


Fork:
Element that when screwed to the rod consents a regular functioning even when there are significant lateral forces as the connection point. Made of zinc-plated steel.
Nut:
Used to block the position of the fork.

Bore		25	32	40	50	63
A		52	52	62	83	83
B		20	20	24	32	32
C		40	40	48	64	64
E		20	20	24	32	32
F(B12)		10	10	12	16	16
G		10	10	12	16	16
S		17	17	19	24	24
T		6	6	7	8	8
KK		M10X1.25	M10X1.25	M12X1.25	M16X1.5	M16X1.5
Weight	fork	100	100	140	340	340
g	nut	15	15	20	20	20

Ball joint

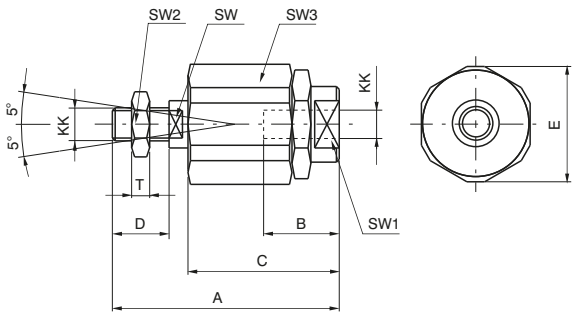
Ordering code
1320.32.32F (for ø25 and ø32)
1320.40.32F (for ø40)
1320.50.32F (for ø50)
1320.63.32F (for ø63)



Bore	25	32	40	50	63
A	57	57	66	85	85
B	20	20	22	28	28
C	43	43	50	64	64
D (-0,1)	10.5	10.5	12	15	15
E	28	28	32	42	42
F	14	14	16	21	21
G (H 7)	10	10	12	16	16
KK	M10x1.25	M10x1.25	M12x1.25	M16x1.5	M16x1.5
M	19	19	22	27	27
S	17	17	19	22	22
T	6.5	6.5	6.5	8	8
Weight g	76	76	110	220	220

Self-aligning joint

Ordering code
1320.32.33F (for ø25 and ø32)
1320.40.33F (for ø40)
1320.50.33F (for ø50)
1320.63.33F (for ø63)



Bore	25	32	40	50	63
A	71	71	75	103	103
B	20	20	20	32	32
C	46	46	46	63	63
D	20	20	24	32	32
E	32	32	32	45	45
KK	M10x1,25	M10x1,25	M12x1,25	M16x1,5	M16x1,5
SW	12	12	12	20	20
SW1	19	19	19	27	27
SW2	17	17	19	24	24
SW3	30	30	30	41	41
T	6	6	7	8	8
Weight g	220	220	230	660	660

Series 1400, Hydraulic speed control cylinders (Ø40 - Ø63)

General

The SKIP and STOP valves are pneumatically actuated 2 ways poppet valves. The SKIP valve (accelerating device) is normally open and is equipped with a supplementary regulator for maximum speed control. It must be activated to obtain speed regulation.
The STOP valve can be normally closed or normally open.

Construction characteristics

End caps	black anodised aluminium
Barrels	bright painted drawn steel
Rod	C43 chromed steel
Tie rods	plated zinc steel
Piston	aluminium
Waterproof seals	NBR rubber
Piston seal	FPM
Rod seal	PUR
Regulators group	brass
Skip and stop valves	black anodised aluminium
Circuit oil	hydraulic with viscosity 2.9° E at 50°C (viscosity index minimum 118)
Bore	40 mm and 63 mm diameter

Technical characteristics

Max connecting load	600 kg (Ø40) -1200 Kg (Ø63)
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

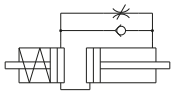
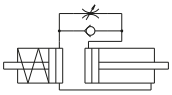
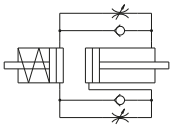
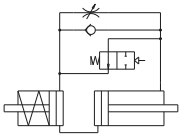
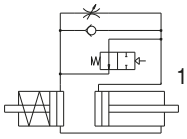
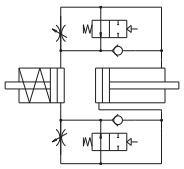
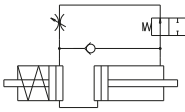
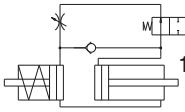
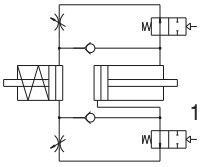
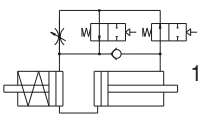
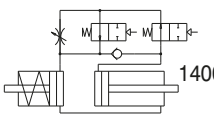
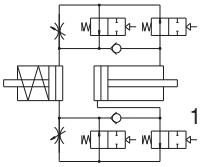
50 - 100 - 150 - 200 - 250 - 300 - 350 - 400 - 450 - 500 mm
minimum stroke for type 1400.stroke.03.05 and 1400.stroke.03.06, 150 mm.

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

Maintenance

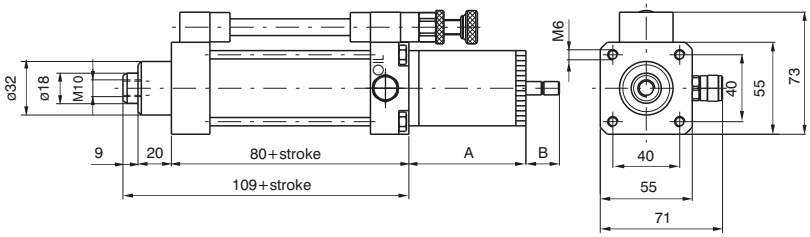
The speed control check is a closed system and there are no external factors that can adversely affect its function. Care however, has to be exercised not to allow the hydraulic fluid level to drop below the minimum indicated on the auxiliary tank. Should this occur, cavitation, or worse, an air pocket 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

Outward stroke Control	Inward stroke Control	Inward & Outward stroke Control
 1400.Ø.stroke.01.2 1400.40.stroke.01.1	 1400.Ø.stroke.02.2	 1400.Ø.stroke.03.2
 1400.Ø.stroke.01.04	 1400.Ø.stroke.02.04	 1400.Ø.stroke.03.04
 1400.Ø.stroke.01.05	 1400.Ø.stroke.02.05	 1400.Ø.stroke.03.05
 1400.Ø.stroke.01.06	 1400.Ø.stroke.02.06	 1400.Ø.stroke.03.06

Regulation on the outward stroke - Tank in line

Ordering code
1400.40.stroke.01.1

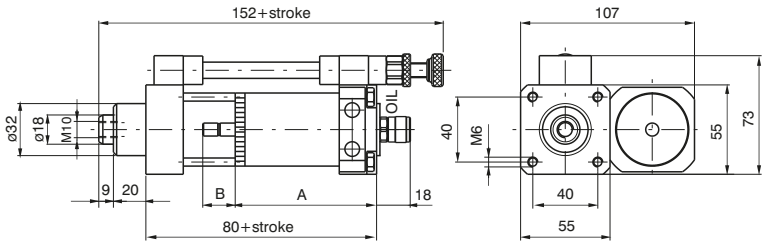


Weight g 1450 + g 300 every 50 mm. stroke

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

Regulation on the outward stroke – Lateral tank

Ordering code
1400.40.stroke.01.2

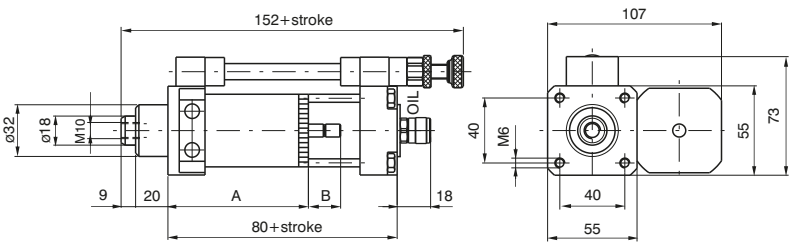


Weight g 1530 + g 300 every 50 mm. di stroke

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

Regulation on the inward stroke

Ordering code
1400.40.stroke.02.2



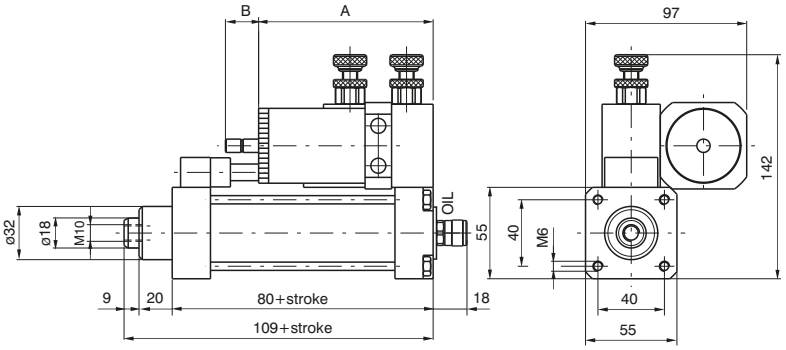
Weight g 1530 + g 300 every 50 mm. di stroke

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

Regulation in both directions

Ordering code
1400.40.stroke.03.2

Weight g 1870 + g 300 every 50 mm. stroke



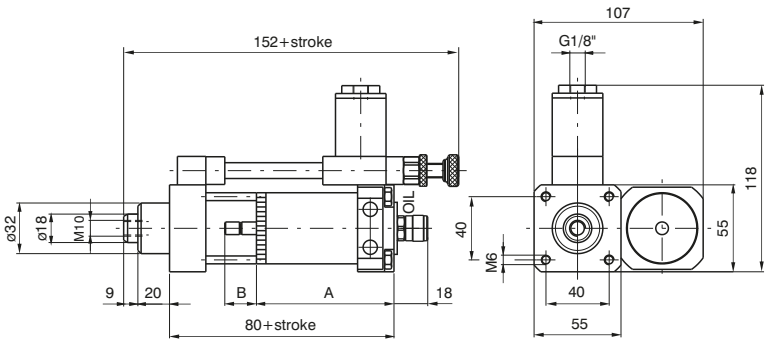
Attention: Minimum stroke=150mm when fitted in tandem (parallel or in-line) with 1319-1320-1321 cylinders series Ø80mm or Ø100mm.

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

Regulation on the outward stroke with skip (Acceleration valve)

Ordering code
1400.40.stroke.01.04

Weight g 1670 + g 300 every 50 mm. stroke

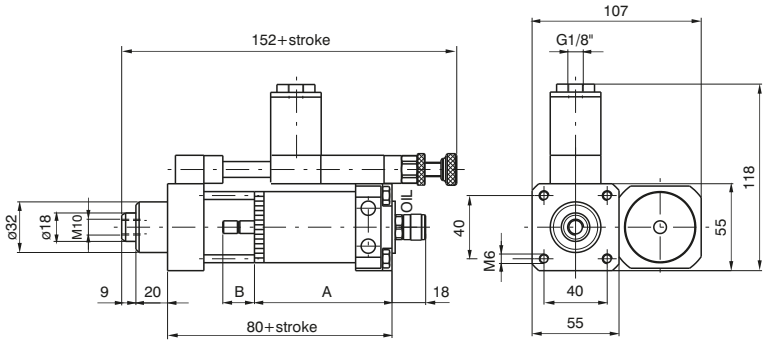


Strokes	A	B max.
< 75	93	30
75...<150	118	45
150...<250	143	60
250...<350	183	90
350...<500	218	120

Regulation on the outward stroke with stop (Stop valve)

Ordering code
1400.40.stroke.01.05

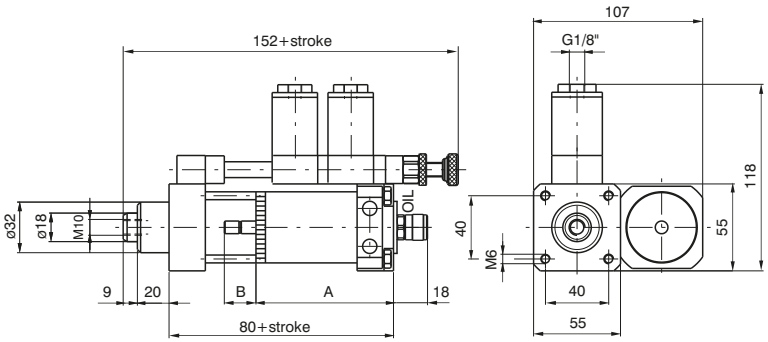
Weight g 1710 + g 300 every 50 mm. stroke



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

Regulation on the outward stroke with skip and stop (Acceleration and stop valves)

Ordering code
1400.40.stroke.01.06

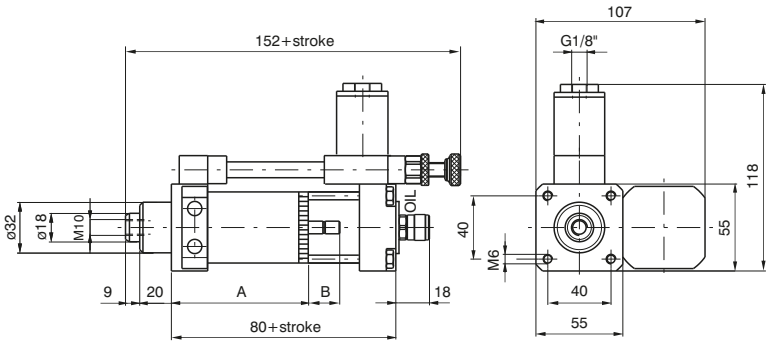


Weight g 1830 + g 300 every 50 mm. stroke

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

Regulation on the inward stroke with skip (Acceleration valve)

Ordering code
1400.40.stroke.02.04

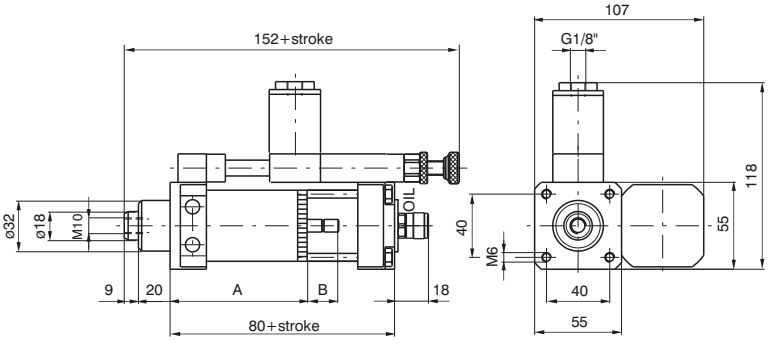


Weight g 1670 + g 300 every 50 mm. stroke

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

Regulation on the inward stroke with stop (Stop valve)

Ordering code
1400.40.stroke.02.05

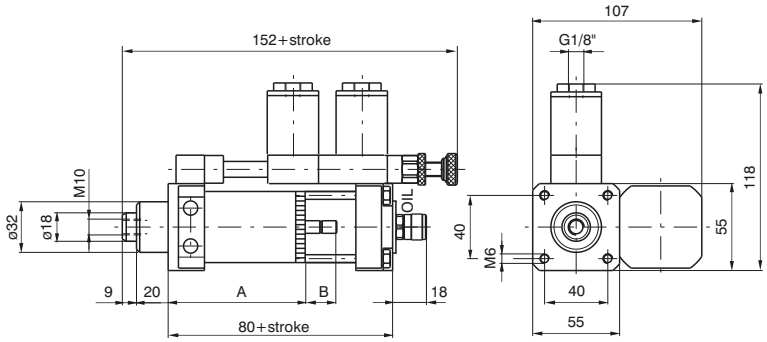


Weight g 1710 + g 300 every 50 mm. stroke

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

Regulation on the inward stroke with skip and stop (Acceleration and stop valves)

Ordering code
1400.40.stroke.02.06

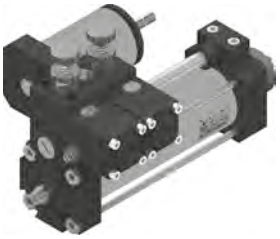


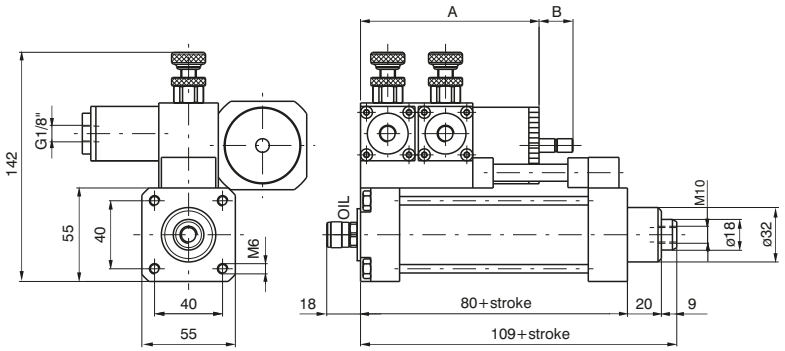
Weight g 1830 + g 300 every 50 mm. stroke

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

Regulation in both directions with skip (Acceleration valves in both directions)

Ordering code
1400.40.stroke.03.04





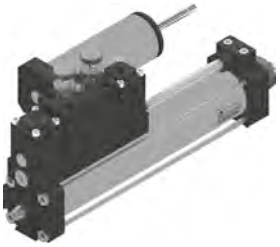
Attention: Minimum stroke=150mm when fitted in tandem (parallel or in-line) with 1319-1320-1321 cylinders series Ø80mm or Ø100mm.

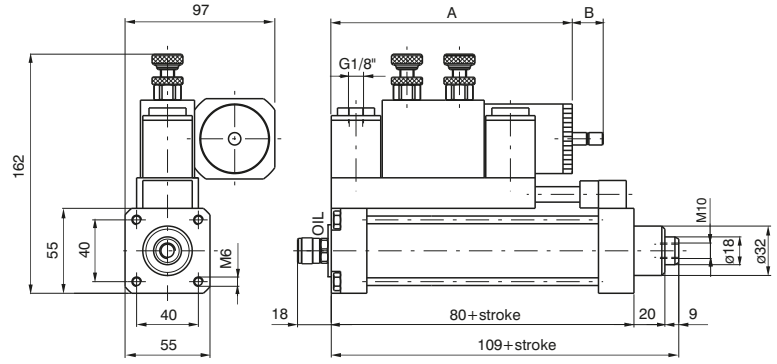
Weight g 2110 + g 300 every 50 mm. stroke

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

Regulation in both directions with stop (Stop valves in both directions)

Ordering code
1400.40.stroke.03.05



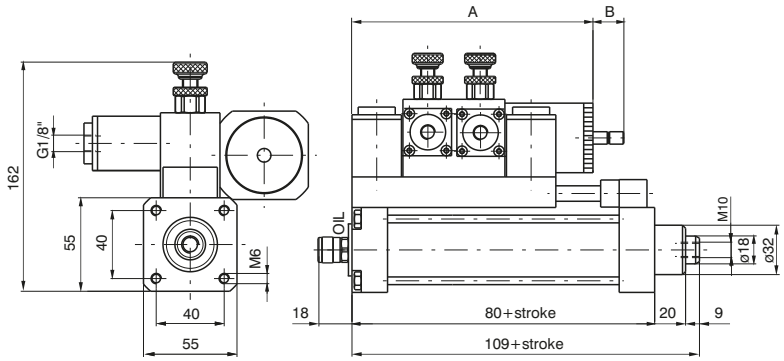


Min. stroke 150 mm
Weight g 2390 + g 300 every 50 mm. stroke

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

Regulation in both directions with skip and stop (Acceleration and stop valves in both

Ordering code
1400.40.stroke.03.06

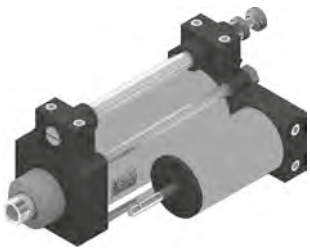


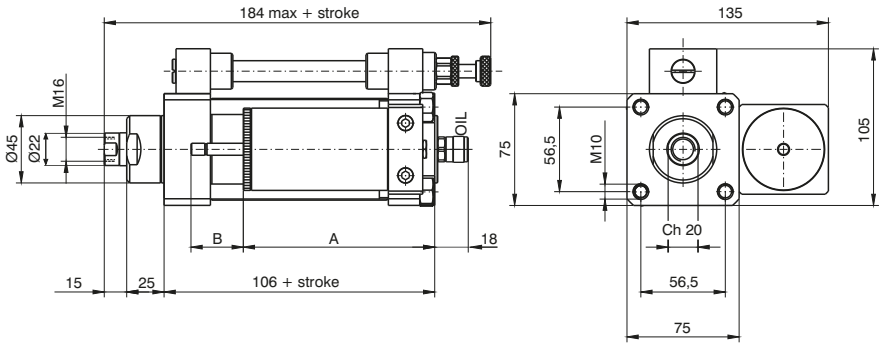
Strokes	A	B max.
150 ... < 250	197	60
250 ... < 350	237	90
350 ... < 500	272	120

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

Regulation on the outward stroke – Lateral tank

Ordering code
1400.63.stroke.01.2



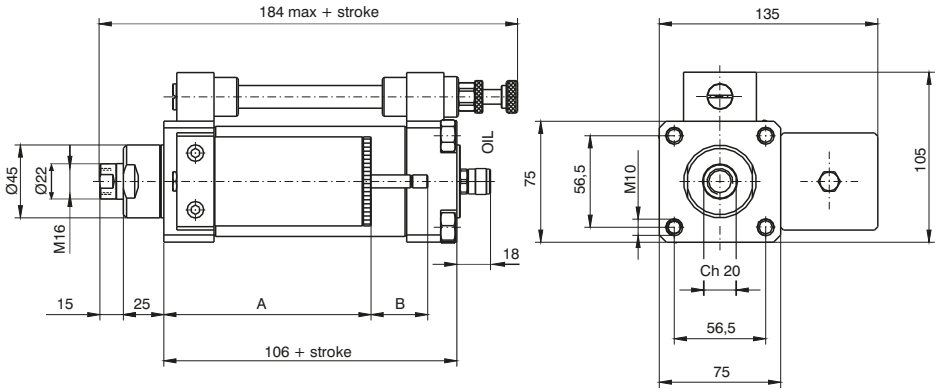


Strokes	A	B max
≥75 ... <150	128	50
≥150 ... <250	188	80
≥250 ... <350	238	100
≥350 ... <450	298	130
≥450 ... ≤600	358	160

Min. stroke 75 mm
Weight g 2950 + g 850 every 50 mm. stroke

Regulation on the inward stroke

Ordering code
1400.63.stroke.02.2

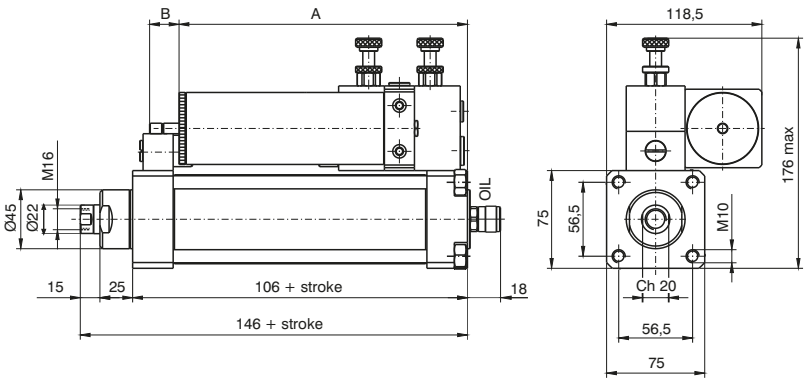


Strokes	A	B max
≥75 ... <150	128	50
≥150 ... <250	188	80
≥250 ... <350	238	100
≥350 ... <450	298	130
≥450 ... ≤600	358	160

Min. stroke 75 mm
Weight g 2950 + g 850 every 50 mm. stroke

Regulation in both directions

Ordering code
1400.63.stroke.03.2

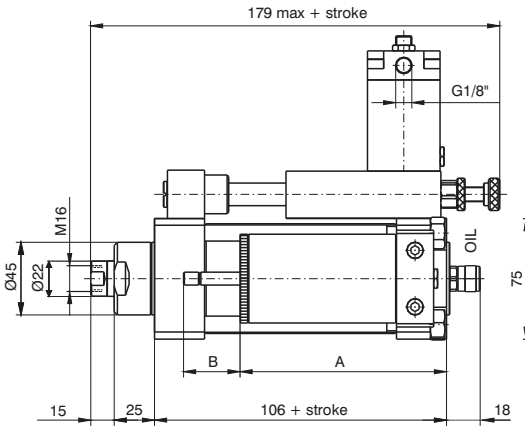


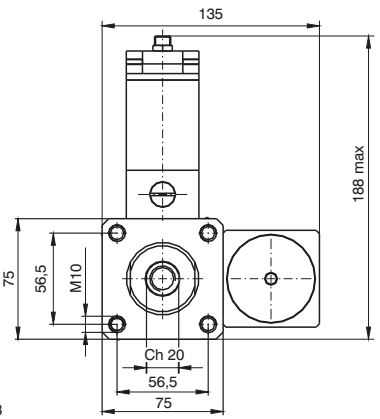
Strokes	A	B max
≥100 ... <150	160	50
≥150 ... <250	220	80
≥250 ... <350	270	100
≥350 ... <450	330	130
≥450 ... ≤600	390	160

Min. stroke 100 mm
Weight g 3600 + g 850 every 50 mm. stroke

Regulation on the outward stroke with skip (Acceleration valve)

Ordering code
1400.63.stroke.01.04



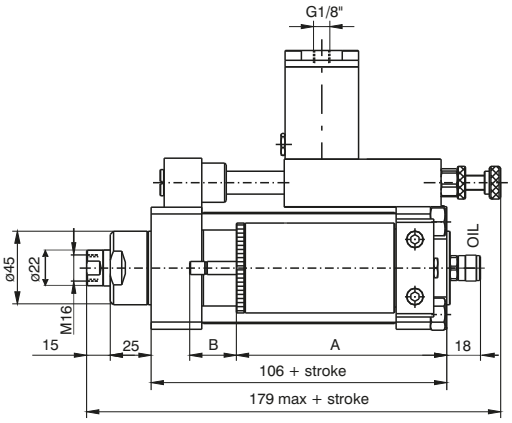


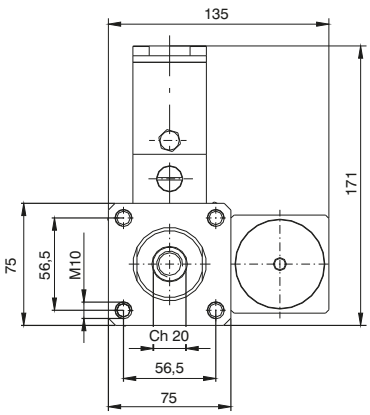
Strokes	A	B max
≥75 ... <150	128	50
≥150 ... <250	188	80
≥250 ... <350	238	100
≥350 ... <450	298	130
≥450 ... ≤600	358	160

Min. stroke 75 mm
Weight g 3450 + g 850 every 50 mm. stroke

Regulation on the outward stroke with stop (Stop valve)

Ordering code
1400.63.stroke.01.05



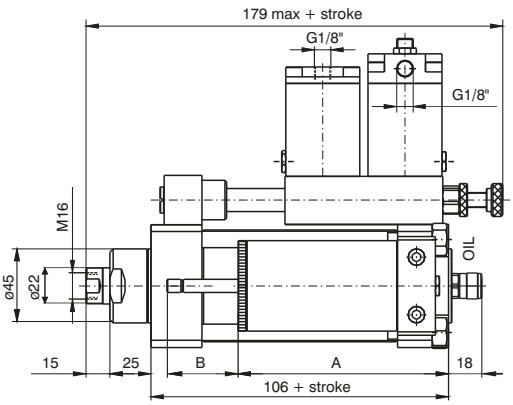


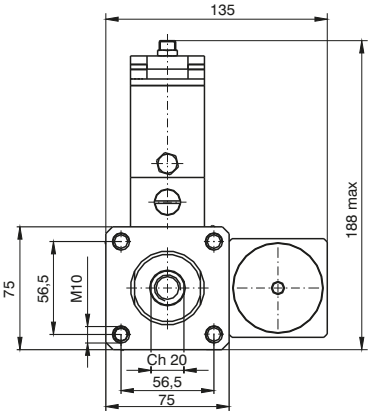
Strokes	A	B max
≥75 ... <150	128	50
≥150 ... <250	188	80
≥250 ... <350	238	100
≥350 ... <450	298	130
≥450 ... ≤600	358	160

Min. stroke 75 mm
Weight g 3450 + g 850 every 50 mm. stroke

Regulation on the outward stroke with skip and stop (Acceleration and stop valves)

Ordering code
1400.63.stroke.01.06



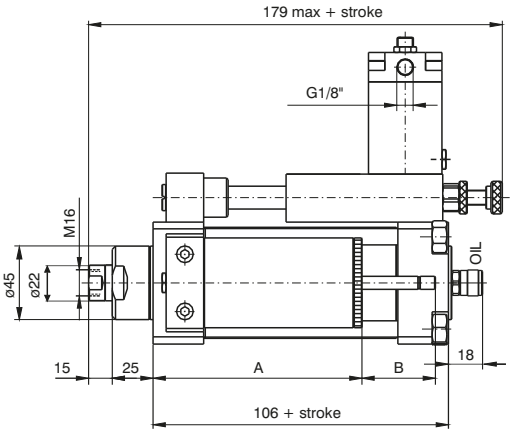


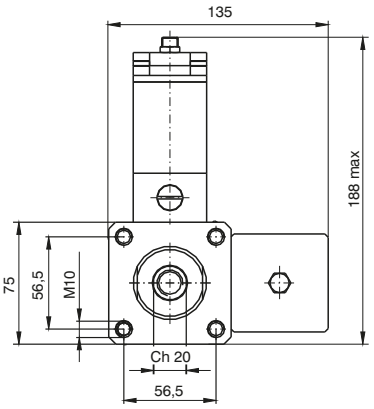
Strokes	A	B max
≥75 ... <150	128	50
≥150 ... <250	188	80
≥250 ... <350	238	100
≥350 ... <450	298	130
≥450 ... ≤600	358	160

Min. stroke 75 mm
Weight g 3700 + g 850 every 50 mm. stroke

Regulation on the inward stroke with skip (Acceleration valve)

Ordering code
1400.63.stroke.02.04



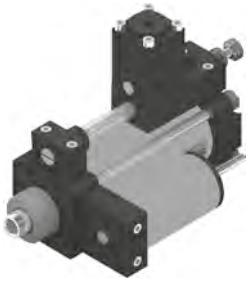


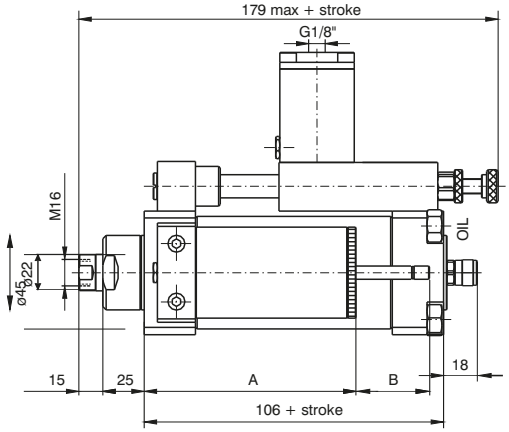
Strokes	A	B max
≥75 ... <150	128	50
≥150 ... <250	188	80
≥250 ... <350	238	100
≥350 ... <450	298	130
≥450 ... ≤600	358	160

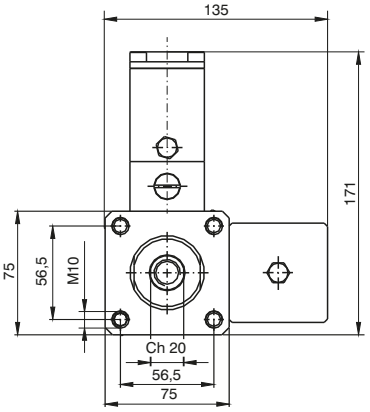
Min. stroke 75 mm
Weight g 3450 + g 850 every 50 mm. stroke

Regulation on the inward stroke with stop (Stop valves)

Ordering code
1400.63.stroke.02.05





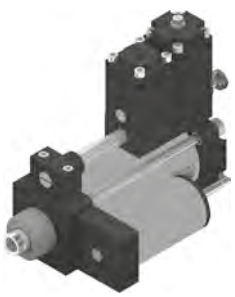


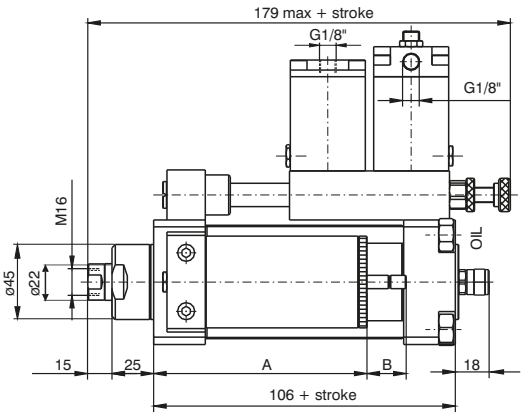
Strokes	A	B max
≥75 ... <150	128	50
≥150 ... <250	188	80
≥250 ... <350	238	100
≥350 ... <450	298	130
≥450 ... ≤600	358	160

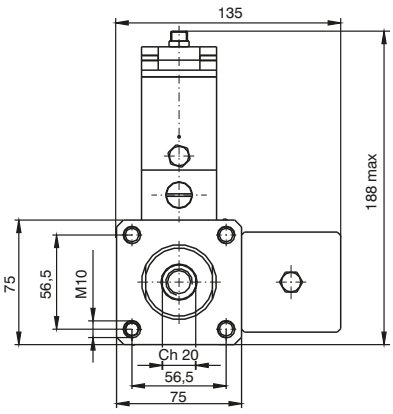
Min. stroke 75 mm
Weight g 3450 + g 850 every 50 mm. stroke

Regulation on the inward stroke with skip and stop (Acceleration and stop valve)

Ordering code
1400.63.stroke.02.06





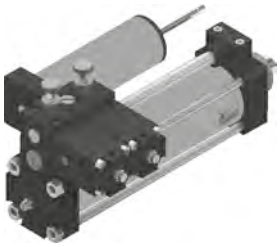


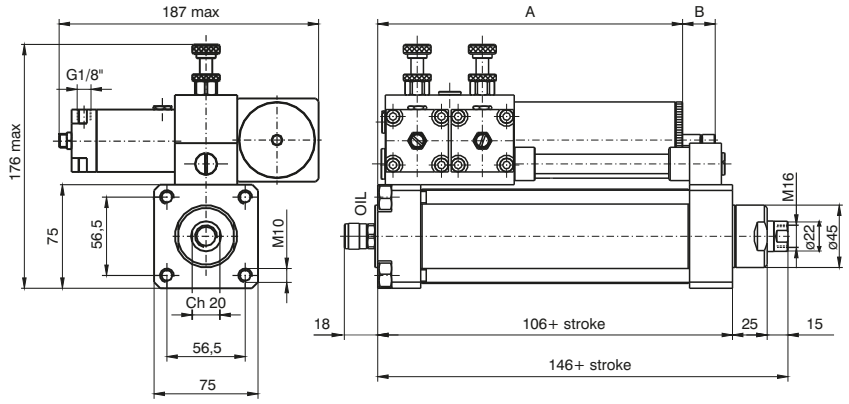
Strokes	A	B max
≥75 ... <150	128	50
≥150 ... <250	188	80
≥250 ... <350	238	100
≥350 ... <450	298	130
≥450 ... ≤600	358	160

Min. stroke 75 mm
Weight g 3700 + g 850 every 50 mm. stroke

Regulation in both direction with skip (Accelerations valve in two directions)

Ordering code
1400.63.stroke.03.04



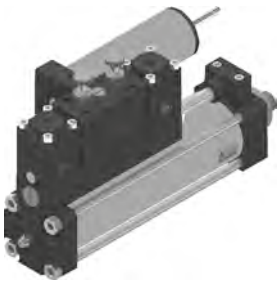


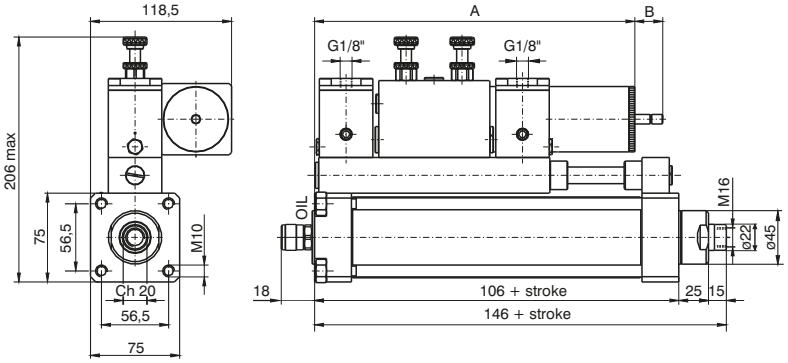
Strokes	A	B max
≥100 ... <150	160	50
≥150 ... <250	220	80
≥250 ... <350	270	100
≥350 ... <450	330	130
≥450 ... ≤600	390	160

Min. stroke 100 mm
Weight g 4100 + g 850 every 50 mm. stroke

Regulation in both direction with stop (Stop valves in two directions)

Ordering code
1400.63.stroke.03.05



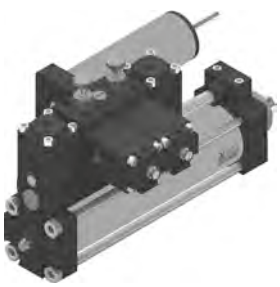


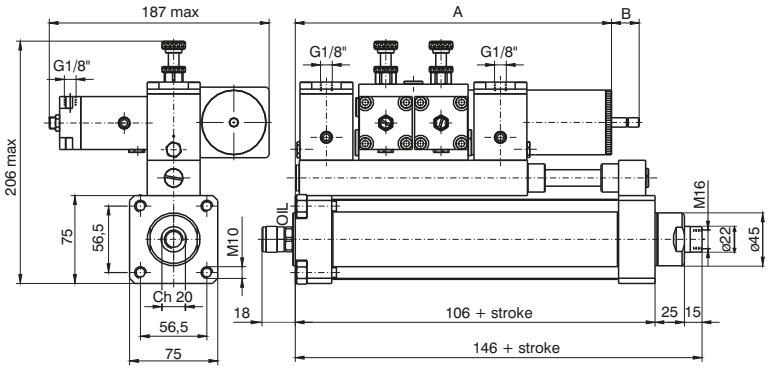
Strokes	A	B max
≥200 ... <250	269	80
≥250 ... <350	319	100
≥350 ... <450	379	130
≥450 ... ≤600	439	160

Min. stroke 200 mm
Weight g 4850 + g 850 every 50 mm. stroke

Regulation in both direction with skip and stop (Acceleration and stop valves in two directions)

Ordering code
1400.63.stroke.03.06



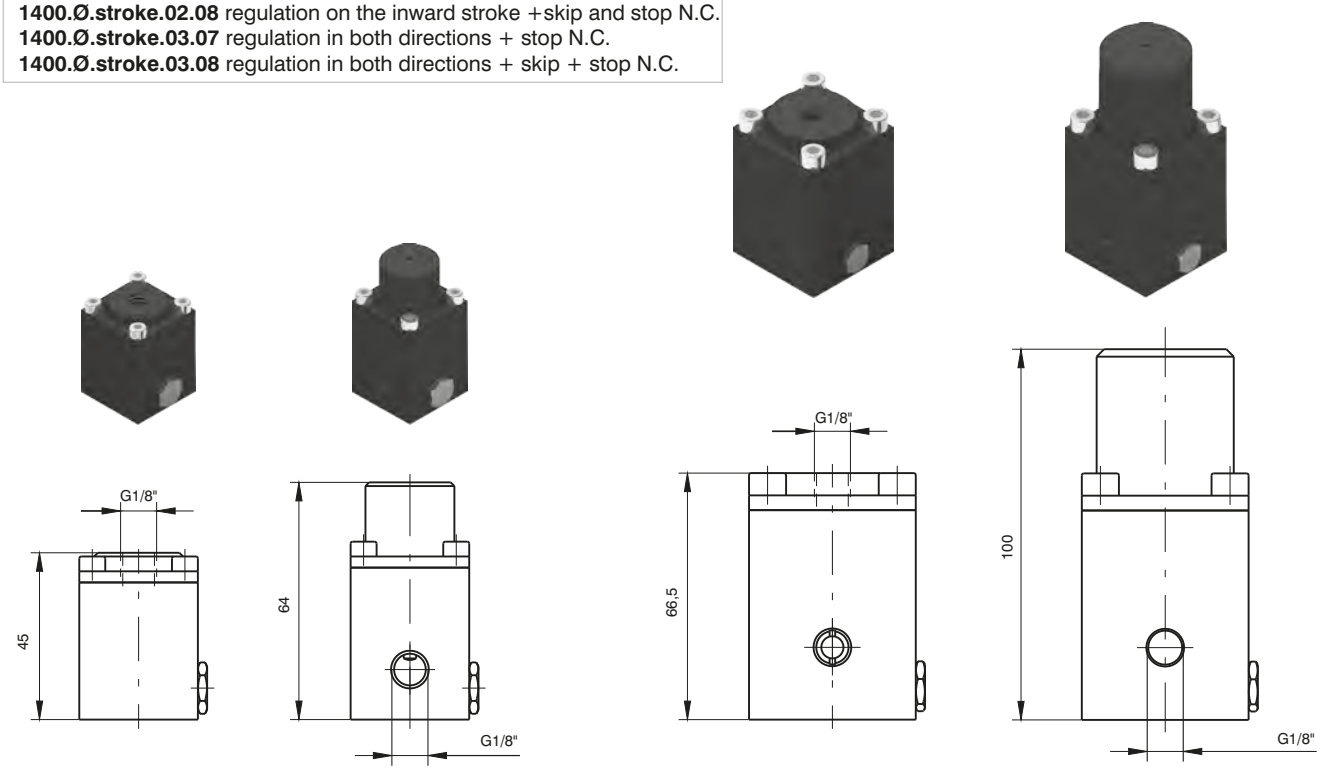


Strokes	A	B max
≥200 ... <250	269	80
≥250 ... <350	319	100
≥350 ... <450	379	130
≥450 ... ≤600	439	160

Min. stroke 200 mm
Weight g 5400 + g 850 every 50 mm. stroke

Dimensional releases and power supply positions with N.C. stop valves

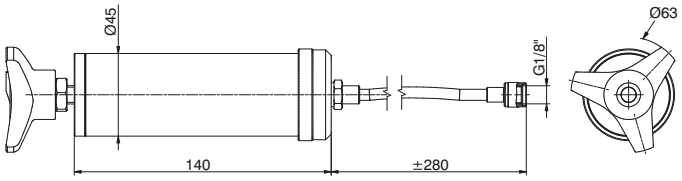
Ordering code
1400.Ø.stroke.01.07 regulation on the outward stroke + stop N.C.
1400.Ø.stroke.01.08 regulation on the outward stroke + skip + stop N.C.
1400.Ø.stroke.02.07 regulation on the inward stroke + stop N.C.
1400.Ø.stroke.02.08 regulation on the inward stroke +skip and stop N.C.
1400.Ø.stroke.03.07 regulation in both directions + stop N.C.
1400.Ø.stroke.03.08 regulation in both directions + skip + stop N.C.



STOP N.A. Ø40 | STOP N.C. Ø40 | STOP N.A. Ø63 | STOP N.C. Ø63

Hydraulic fluid refill syringe

Ordering code
1400.99.02



Weight g 420

Oil for hydraulic and pneumatic circuits

Ordering code
PNEUMOIL 01 (1 litre bottles)

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

Series 1500 - Short stroke compact cylinders

General

Profiled tube has three "T" slots on the three sides hosting sensors 1500._, RS._, HS._.
without adaptors and with adaptor code 1380.01F codes 1580._, MRS._, MHS._.

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	anodised aluminium
Rod	C43 chromed steel (stainless steel for magnetic cylinder Ø20 and Ø25)
Piston	aluminium
Rod bushing	anodised aluminium
End cap	anodised aluminium
Seals	Standard: NBR oil resistant rubber, PUR piston rod seals (HNBR or FPM seals available upon request)

Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Max. pressure	10 bar
Working temperature	-5°C - +70°C with standard seals magnetic or non magnetic piston -5°C - +80°C with FPM seals magnetic piston -5°C - +80°C with HNBR seals magnetic piston -5°C - +120°C with HNBR seals non magnetic piston -5°C - +150°C with FPM seals non magnetic piston

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device)
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

Please note: air must be dried for applications with lower temperature.
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.
Our Technical Department will be glad to help.

Standard strokes

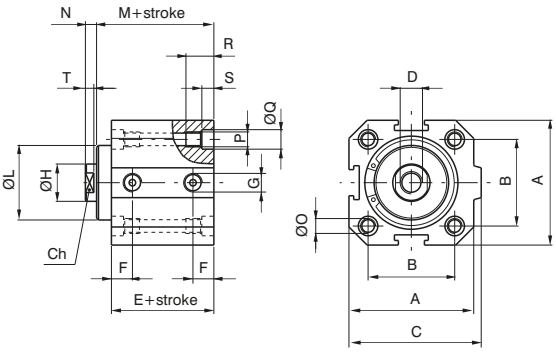
Double acting version
Series 1501, 1504, 1511, 1514, 1515, 1516, 1517 and 1518
for all bores from 5 to 50 mm every 5 mm.
On request are available strokes as follow:
Ø 20 and Ø25 up to stroke 250 mm
Ø 32 e Ø 40 up to stroke 300 mm
Ø 50 e Ø 63 up to stroke 350 mm
Ø 80 e Ø 100 up to stroke 400 mm

Single acting version
Series 1502, 1503, 1512 and 1513:
For all bores from 5 to 10 mm.
On request are available strokes up to 50 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.

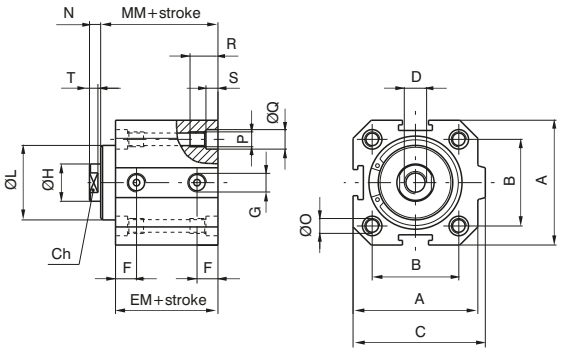
Double acting version

Ordering code
1501.Ø.stroke standard seals **1501.Ø.stroke.V** FPM seals **1501.Ø.stroke.T** HNBR seals



Double acting version with magnetic piston

Ordering code
1511.Ø.stroke standard seals **1511.Ø.stroke.V** FPM seals **1511.Ø.stroke.T** HNBR seals



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 $^{\pm 0,05}_{(-0,1 \text{ per Ø80 e Ø 100})}$	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

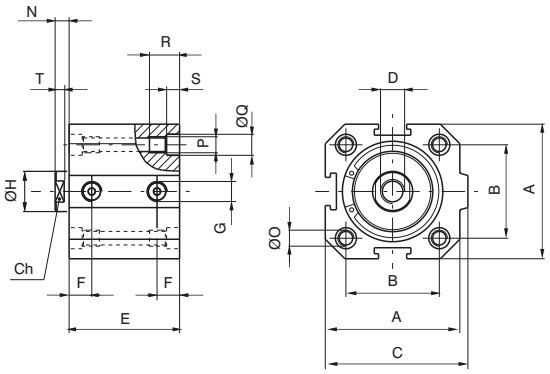
Weight	stroke 0	75	110	170	260	400	600	800	1500
g	every 10 mm.	20	30	40	60	80	100	120	145

Magnetic

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

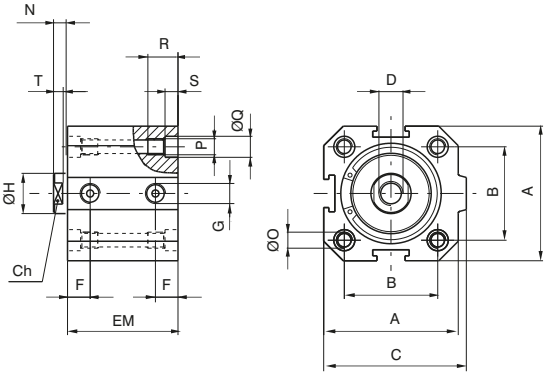
Single acting version with front spring

Ordering code
1502.Ø.stroke standard seals **1502.Ø.stroke.V** FPM seals **1502.Ø.stroke.T** HNBR seals



Single acting version front spring with magnetic piston

Ordering code
1512.Ø.stroke standard seals **1512.Ø.stroke.V** FPM seals **1512.Ø.stroke.T** HNBR seals



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

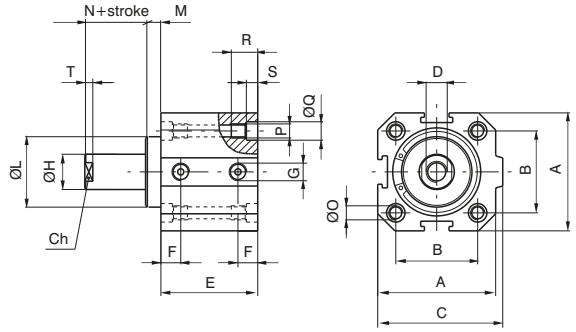
Weight	stroke 5	70	105	160	250	370	550	750	1440
g	stroke 10	80	120	180	280	410	600	810	1500

Magnetic

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

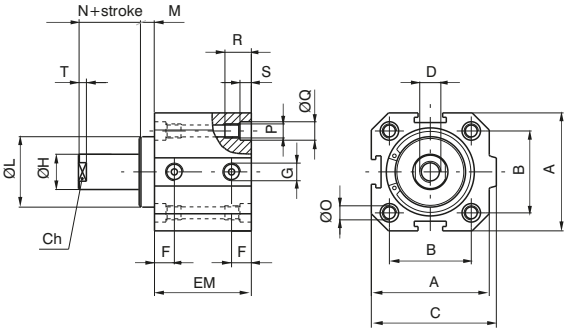
Single acting version with rear spring

Ordering code
1503.Ø.stroke standard seals **1503.Ø.stroke.V** FPM seals **1503.Ø.stroke.T** HNBR seals



Single acting version rear spring with magnetic piston

Ordering code
1513.Ø.stroke standard seals **1513.Ø.stroke.V** FPM seals **1513.Ø.stroke.T** HNBR seals



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 $\pm 0{,}05$ ($^{0}_{-0{,}1}$ per Ø80 e 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

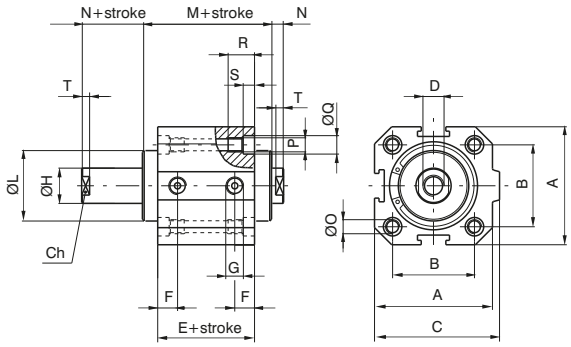
Weight	stroke 5	70	105	160	250	370	550	750	1440
g	stroke 10	80	120	180	280	410	600	810	1500

Magnetic

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

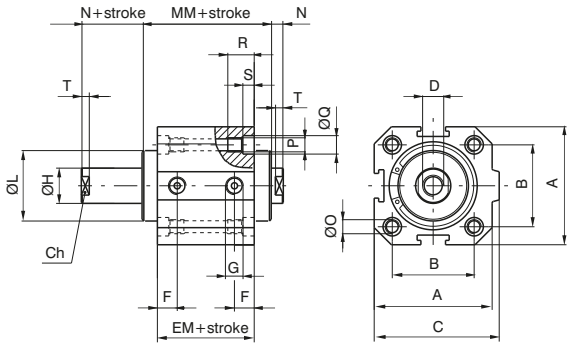
Double acting through rod cylinder version

Ordering code
1504.Ø.stroke standard seals **1504.Ø.stroke.V** FPM seals **1504.Ø.stroke.T** HNBR seals



Double acting through rod cylinder version with magnetic piston

Ordering code
1514.Ø.stroke standard seals **1514.Ø.stroke.V** FPM seals **1514.Ø.stroke.T** HNBR seals



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 $^{\pm 0,05}_{(-0,1 \text{ per Ø80 e Ø 100})}$	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

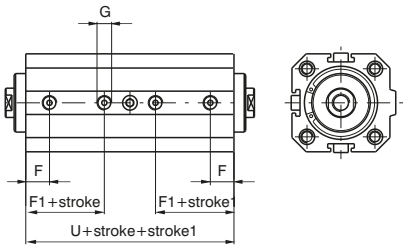
Weight	stroke 0	90	130	200	320	460	670	1100	1680
g	every 10 mm.	20	35	50	70	90	110	155	185

Magnetic

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

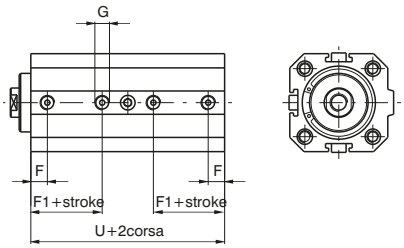
Tandem with opposed rods

Ordering code
1515.Ø.stroke.stroke 1 standard seals **1515.Ø.stroke.stroke 1.V** FPM seals **1515.Ø.stroke.stroke 1.T** HNBR seals **1515.Ø.stroke.stroke 1.M** standard seals, magnetic piston **1515.Ø.stroke.stroke 1.MV** FPM seals, magnetic piston **1515.Ø.stroke.stroke 1.MT** HNBR seals, magnetic piston



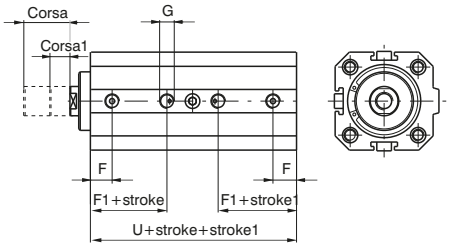
Tandem push with common rods

Ordering code
1516.Ø.stroke standard seals **1516.Ø.stroke.V** FPM seals **1516.Ø.stroke.T** HNBR seals **1516.Ø.stroke.M** standard seals, magnetic piston **1516.Ø.stroke.MV** FPM seals, magnetic piston **1516.Ø.stroke.MT** HNBR seals, magnetic piston



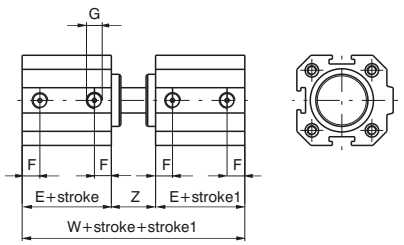
Tandem push with independent rods

Ordering code
1517.Ø.stroke.stroke 1 standard seals **1517.Ø.stroke.stroke 1.V** FPM seals **1517.Ø.stroke.stroke 1.T** HNBR seals **1517.Ø.stroke.stroke 1.M** standard seals, magnetic piston **1517.Ø.stroke.stroke 1.MV** FPM seals, magnetic piston **1517.Ø.stroke.stroke 1.MT** HNBR seals, magnetic piston



Opposed tandem with common rods

Ordering code
1518.Ø.stroke.stroke 1 standard seals **1518.Ø.stroke.stroke 1.V** FPM seals **1518.Ø.stroke.stroke 1.T** HNBR seals **1518.Ø.stroke.stroke 1.M** standard seals, magnetic piston **1518.Ø.stroke.stroke 1.MV** FPM seals, magnetic piston **1518.Ø.stroke.stroke 1.MT** HNBR seals, magnetic piston



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

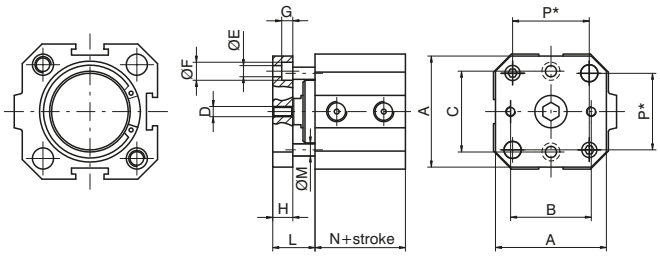
Double acting version

Ordering code
1501.Ø.stroke.AR standard seals **1501.Ø.stroke.AR.V** FPM seals **1501.Ø.stroke.AR.T** HNBR seals

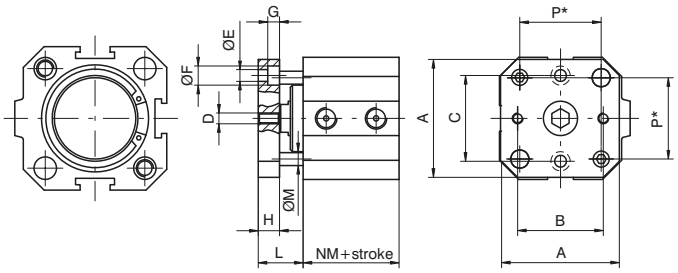
Double version with magnetic piston

Ordering code
1511.Ø.stroke.AR standard seals **1511.Ø.stroke.AR.V** FPM seals **1511.Ø.stroke.AR.T** HNBR seals

Cylinders with non-rotating device



* = Distance between rods centres



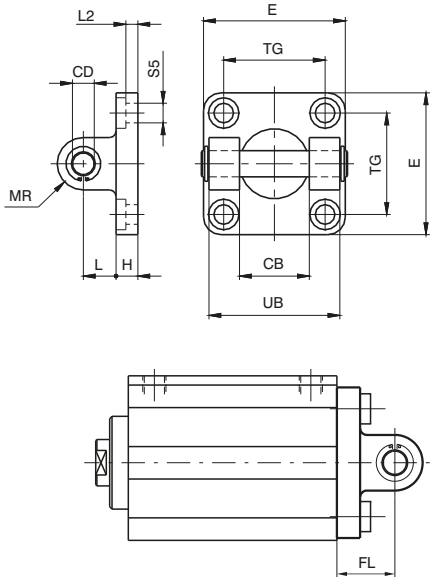
* = Distance between rods centres

It is possible, upon request to have four holes threaded and with counter bores in order to rear mount the cylinder as if it was standard.

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		M4	M5	M5	M5	M6	M6	M8	M8
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	stroke 0	40	50	70	90	200	250	490	650
g		5	5	5	5	10	10	20	20

Rear clevis

Ordering code
1500.Ø.09F

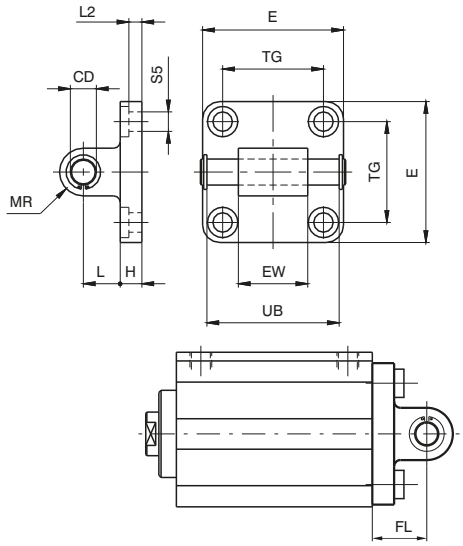


This allows anchorage of the cylinder both parallel and at a right angle to the plane; the cylinder rod can oscillate and self-align as necessary. It is made of aluminium alloy and painted black.

Bore	20	25	32	40	50	63	80	100
CB (h 9)	16	20	26	28	32	40	50	60
CD (H 9)	8	10	10	12	12	16	16	20
E	35	40	45	52	65	75	95	115
H	6	8	9	9	11	11	14	14
L	12	12	13	16	16	21	22	27
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
FL	18	20	22	25	27	32	36	41
L2	/	/	5,5	5,5	6,5	6,5	10	10
S5 (H13)	5,5	6,6	6,6	6,6	9	9	11	11
Weight g	45	75	80	130	185	310	530	910

Rear clevis male

Ordering code
1500.Ø.09/1F

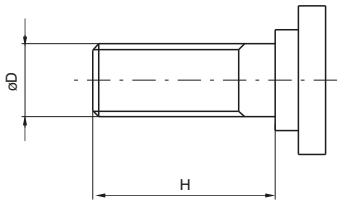


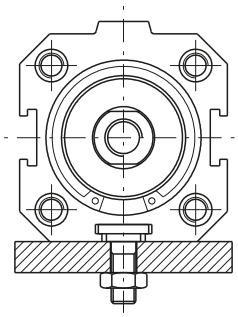
This allows anchorage of the cylinder both parallel and at a right angle to the plane; the cylinder rod can oscillate and self-align as necessary. It is made of aluminium alloy and painted black.

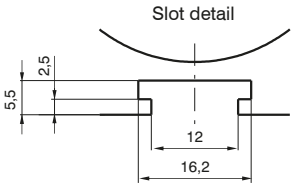
	Bore	20	25	32	40	50	63	80	100
	CD (h 9)	8	10	10	12	12	16	16	20
	E	35	40	45	52	65	75	95	115
	EW	16	20	26	28	32	40	50	60
	H	6	8	9	9	11	11	14	14
	L	12	12	13	16	16	21	22	27
	MR	8	9	10	12	12	16	16	20
	TG	26	28	32,5	38	46,5	56,5	72	89
	UB	35	40	46	53	61	71	91	111
	FL	18	20	22	25	27	32	36	41
	L2	/	/	5,5	5,5	6,5	6,5	10	10
	S5 (H 13)	5,5	6,6	6,6	6,6	9	9	11	11
every 10 mm	Weight g	53	85	90	130	190	340	580	960

Slot fixing screws

Ordering code
1500.15F (from Ø20 to Ø32) **1500.16F** (from Ø40 to Ø63) **1500.18F** (Ø80 and Ø100)





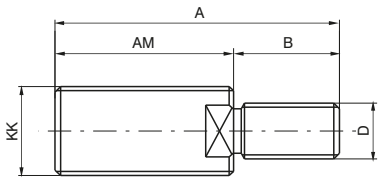


Example mounted with square headed screws on the plane.

Bore	20	25	32	40	50	63	80	100
ØD	M6	M6	M6	M8	M8	M8	M10	M10
H	15	15	15	20	20	20	25	25
Weight g	10			18			25	

Nipple with ISO standard thread

Ordering code
1500.Ø.17F



Fitted on the female thread of the compact cylinders, restore the ISO configurations rod (ISO 6432 for cylinders Ø 20 and Ø 25; ISO 6431 for cylinders from Ø 32 to Ø 100).

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
Weight g	8	15	16	27	65	65	110	110

Series 1500 - "EUROPE" compact cylinders

General

This series of cylinders is 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 on the market.
The ISO version uses all 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 aluminium or steel. For use of magnetic sensors see directions on next page.

Construction characteristics

Body	anodised aluminium
End caps	from Ø12 to Ø25 aluminium alloy UNI 9006/1 anodised from Ø32 to Ø100 UNI 5076 aluminium die-casting and painted (cataphoresis)
Piston rod bushing	sintered bronze
Piston rod	from Ø12 to Ø25 stainless steel froml Ø32 to Ø100 C43 chromed (on request stainless steel for all bores)
Piston	from Ø12 to Ø25 plated zinc steel from Ø32 to Ø100 aluminium alloy 2011 UNI 9002/5
Seals	PUR (on request HNBR)
Spring	zinc plated steel for springs
Fixing screws	zinc plated steel

Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Maximum working pressure	10 bar
Working temperature	-30°C - +80°C with standard seals (magnetic or non magnetic piston)
	-5°C - +80°C with HNBR seals (magnetic piston)
	-5°C - +120°C with HNBR seals (non magnetic piston)

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device)
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

Please note: air must be dried for applications with lower temperature.
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.
Our Technical Department will be glad to help.

Standard strokes for single acting cylinders

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

Maximum suggested strokes

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

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

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 - Ø100	from 5 to 80mm every 5mm

Maximum suggested strokes with non-rotating device

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

Minimum and maximum springs load

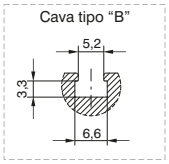
Bore	12	16	20	25	32	40	50	63	80	100
Min. load (N)	3,9	4,4	4,9	9,8	12,3	16,7	27,5	37,3	59,4	101,3
Max. load (N)	9,3	17,7	18,1	25,5	34,3	44,1	51,0	63,8	99,4	141,9

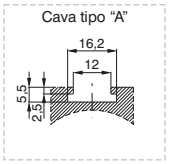
BASIC version double and single acting

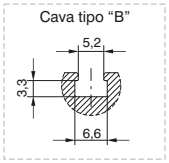
for bores from Ø 12 to Ø 25
use sensors codes
1580._, MHS._, MRS._ only

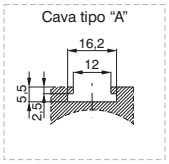
for bores from Ø 32 to Ø 50
use sensors codes
1500._, RS._, HS._ (slot A)
1580._, MHS._, MRS._
(slot B and slot A with adapter code 1380.01F)

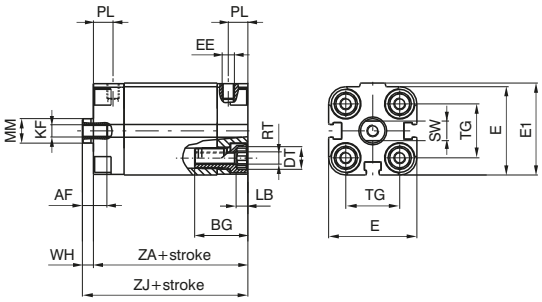
for bores from Ø 63 to Ø 100
use sensors codes
1500._, RS._, HS._ and
1580._, MHS._, MRS._
(with adapter code 1380.01F)

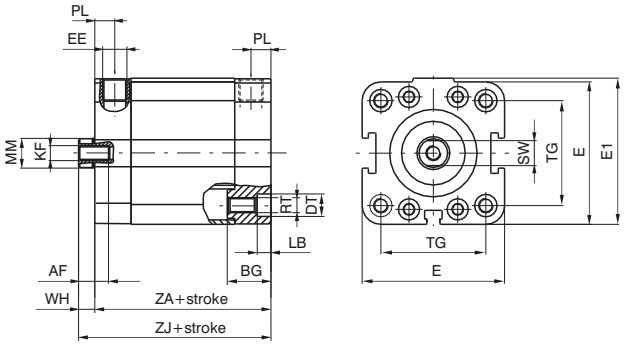


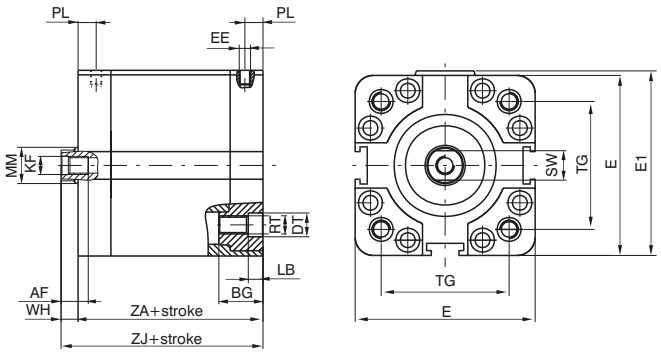




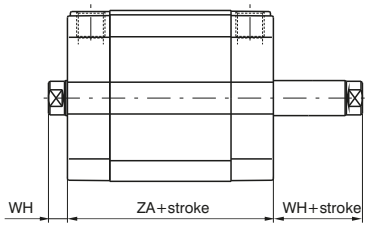




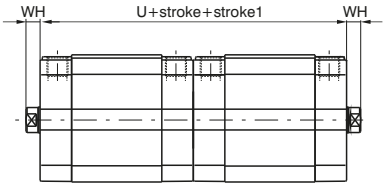




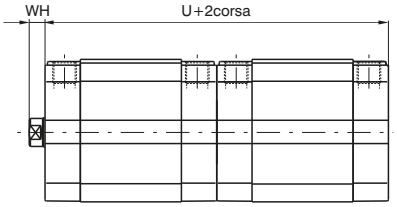
Through rod cylinder version double and single acting



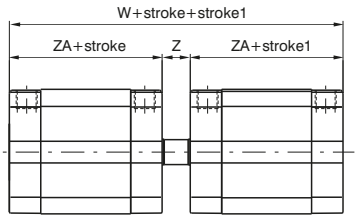
Tandem with opposite rods



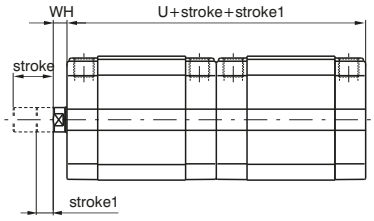
Tandem push with common rods



Opposed tandem with common rod



Tandem push with independent rods



Ordering code

Basic version, through rod cylinder

15_ _. Ø . stroke . _ _ . _

- 1 = Double acting (magnetic)
- 2 = Front spring (magnetic)
- 3 = Rear spring (magnetic)
- 4 = Double acting (non magnetic)
- 5 = Front spring (non magnetic)
- 6 = Rear spring (non magnetic)

- 01 = Basic version - female piston rod
- 02 = Basic version - male piston rod
- 03 = Through rod version - female piston rod
- 04 = Through rod version - male piston rod
- 05 = Through rod version - bored male piston rod
- 06 = Through rod version - bored female piston rod
- 07 = Non - rotating version
- 08 = Through rod version with non rotating device on one side - female piston rod *
- 09 = Through rod version with non rotating device on one side - male piston rod *

- 1 = Chromed rod C43 (from Ø12 to Ø25 stainless steel)
- 2 = Stainless steel rod(from Ø32 to Ø100)

- 6 = ISO (Ø32 - Ø100)
- 7 = ISO HNBR (Ø32 - Ø100)
- 8 = UNITOP (Ø12 - Ø100)
- 9 = UNITOP HNBR (Ø12 - Ø100)

* for single acting version, the spring is on the anti-rotation side

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 through rod with independent rods - female thread
- Q = Tandem through rod with independent rods - male thread

- 1 = Chromed rod C43 (from Ø12 to Ø25 stainless steel)
- 2 = Stainless steel rod(from Ø32 to Ø100)

- 6 = ISO (Ø32 - Ø100)
- 7 = ISO HNBR (Ø32 - Ø100)
- 8 = UNITOP (Ø12 - Ø100)
- 9 = UNITOP HNBR (Ø12 - Ø100)

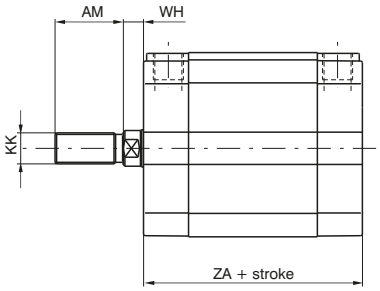
Table of dimensions

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	M12
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 stroke 0	88	90	140	170	210	320	460	690	1390	2290
g every 5 mm	8	8	12	13	15	19	25	31	50	66

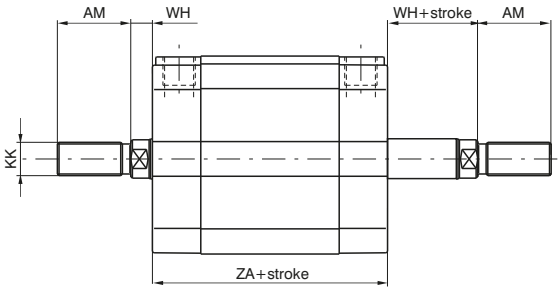
* **These dimensions increase of 10 mm for cylinders ø 12 front spring version.**

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

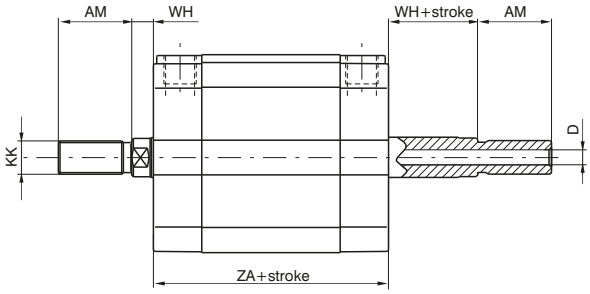
Basic version male piston rod



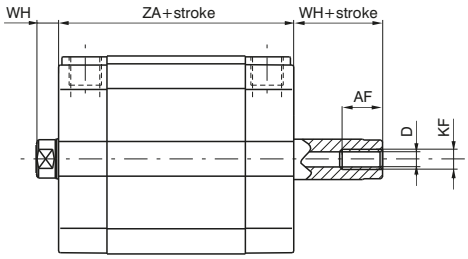
Through rod cylinder version, male rod



Through rod cylinder version, bored male piston rod

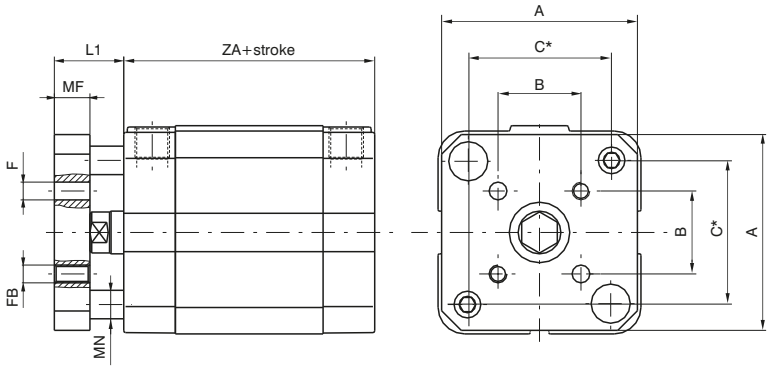


Through rod cylinder version, bored female piston rod



Maximum allowed stroke = ZB (see table)

Non-rotating version

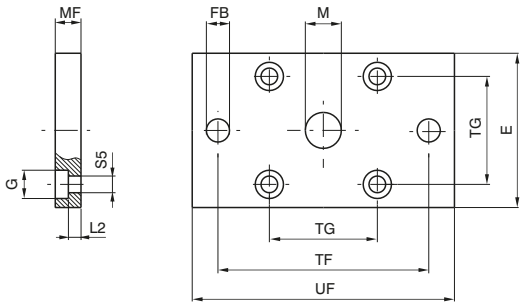


* = Distance between rods centres

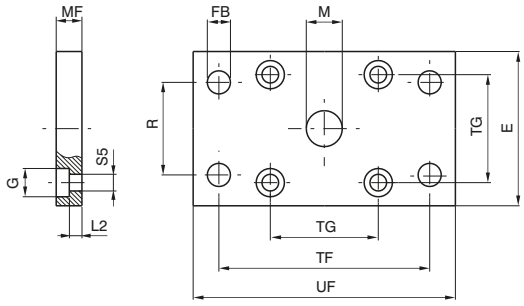
Bore	12	16	20	25	32	40	50	63	80	100
A	28,5	28,5	35,5	39,5	45	55	65	80	100	120
AF	6	8	10	10	12	12	12	12	16	20
AM	16	20	22	22	22	22	24	24	32	40
B	9,9	9,9	12	15,6	19,8	23,3	29,7	35,4	46	56,6
C	18	18	22	26	34	40,5	49	59,5	77	94
D	2,3	3,2	3,8	3,8	4,5	4,5	6	6	8	10
F	3	3	4	5	5	5	6	6	8	10
FB	M 3	M 3	M 4	M 5	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

Ordering code
ISO **1500.Ø.03F** *steel* *UNITOP* **1580.Ø.03F** *steel* **1580.Ø.03/1F** *aluminium*

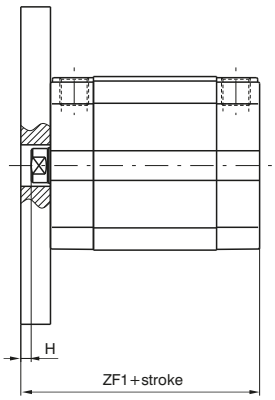


For bores from 12 to 25

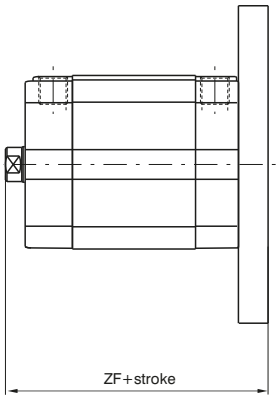


For bores from 32 to 100

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

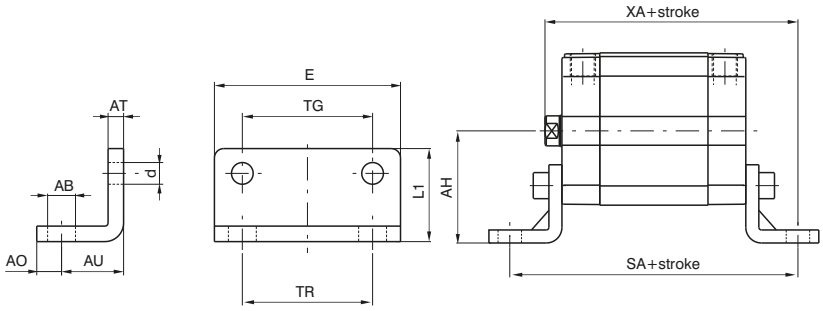


Rear

		ISO Dimensions						UNITOP Dimensions								
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
S5 (H13)		6,6	6,6	9	9	11	11	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	11	15	15	18	18	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
L2		5	5	6,5	6,5	8	8	4,6	4,6	4,6	3,6	3,6	3,4	6,4	4,4	4,4
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
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	Steel	160	250	480	620	1430	1970	100	170	210	270	430	600	1210	1810	2610
g	Aluminium	/	/	/	/	/	/	35	60	70	90	150	210	420	630	900

Foot

Ordering code
ISO **1500.Ø.05/1F** (1 piece) *UNITOP* **1580.Ø.05/1F** (1 piece)

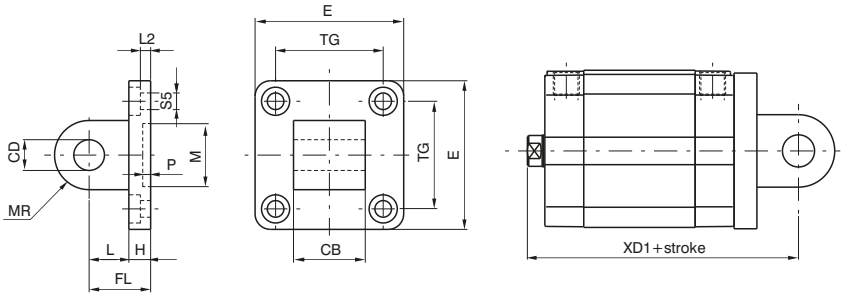


Element used to anchor the cylinder parallel to the mounting plane. They are made with stamped and pierced sheet metal black painted.

	ISO Dimensions						UNITOP Dimensions								
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 (±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 (±0,2)	24	28	32	32	41	41	13	16	16	18	20	24	27	30	33
d	7	7	9	9	11	11	4,4	5,4	5,4	6,6	6,6	9	9	11	11
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
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 g	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

Ordering code
1580.Ø.09/1F (Aluminium) **1580.Ø.09/2F** (Steel)

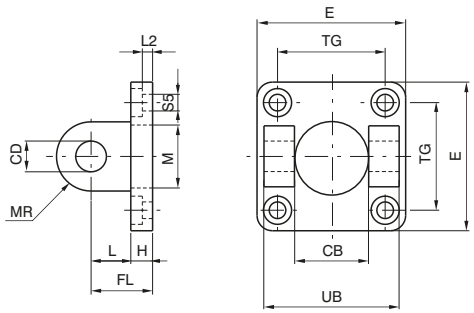


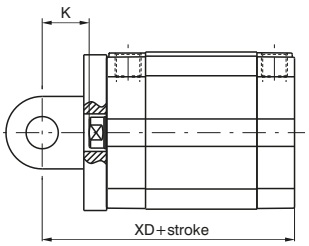
This type of mounting allows anchorage of the cylinder both parallel and at the right angle to the plane. The cylinder rod can oscillate and self-align to the connected load. It's made with aluminium alloy black painted or with zinc plated steel (from Ø 20).

Bore		12-16	20	25
CB(h14)		12	16	16
CD (H9)		6	8	8
E (±0,5)		27	34	38
FL		16	20	20
H		6	6	6
L		10	14	14
L2 (±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 (±0,2)		18	22	26
XD1		58,5	62,5	65
Weight g	Steel	/	70	80
	Aluminium	13	25	28

Front female clevis for bores from 32 to 100

Ordering code
ISO Aluminium **1500.Ø.08F** *UNITOP* (Aluminium) **1580.Ø.11F** *UNITOP* (Steel) **1580.Ø.13F**

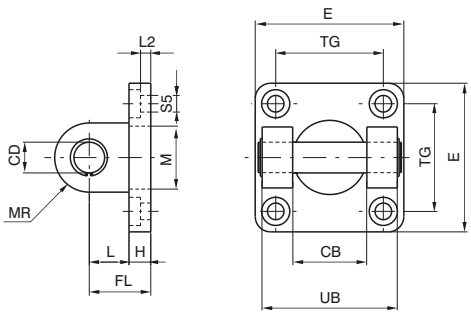


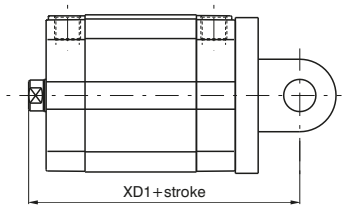


This type of mounting allows anchorage of the cylinder both parallel and at the right angle to the plane. The cylinder rod can oscillate and self-align to the connected load. It's made with aluminium alloy black painted or with zinc plated steel.

Rear female clevis for bores from 32 to 100

Ordering code
ISO Aluminium **1500.Ø.09F** *UNITOP* (Aluminium) **1580.Ø.10F** *UNITOP* (Steel) **1580.Ø.12F**



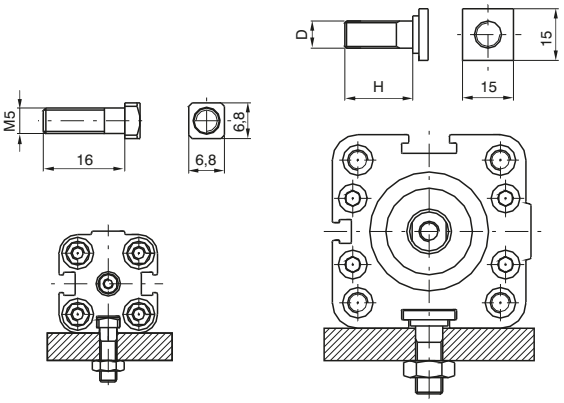


This type of mounting allows anchorage of the cylinder both parallel and at the right angle to the plane. The cylinder rod can oscillate and self-align to the connected load. It's made with aluminium alloy black painted or with zinc plated steel.

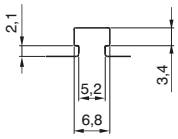
			ISO Dimensions						UNITOP Dimensions					
Bore			32	40	50	63	80	100	32	40	50	63	80	100
CB (H14)			26	28	32	40	50	60	26	28	32	40	50	60
CD (H9)			10	12	12	16	16	20	10	12	12	16	16	20
E			45	52	65	75	95	115	48	58	66	83	102	123
FL			22	25	27	32	36	41	22	25	27	32	36	41
H			9	9	11	11	14	14	9	9	11	11	13	15
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
Weight g	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

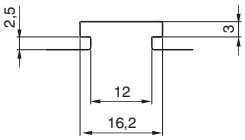
Ordering code
1500.17F small slot (from Ø12 to Ø50) **1500.15F** large slot (Ø32) **1500.16F** large slot (from Ø40 to Ø63) **1500.18F** large slot (from Ø80 to Ø100)



Example of mounting with square head screws



Small slot detail

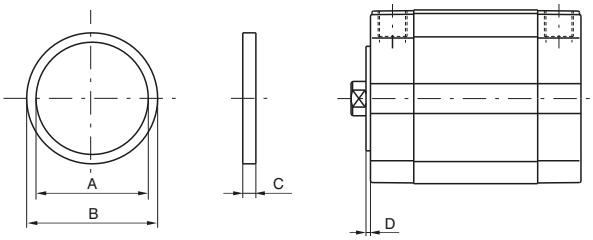


Large slot detail

Bore	12÷50	32	40÷63	80÷100
D	/	M6	M8	M10
H	/	15	20	25
Weight g	8	10	18	25

Centering rings

Ordering code
1580.Ø.02F



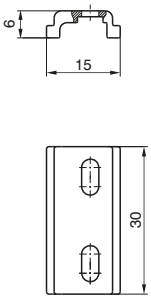
This aluminium ring allows the center assembling of the cylinder.

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 g	2	2	3	4	5	6

Sensor adapter

Ordering code
1380.01F

Weight g 2



Nylon accessory for sensor mounting 1580._, MRS._, MHS._ inside "A" shape.

Series 1500 - Compact cylinders ECOMPACT-S

General

Based on the **ECOMPACT** series with piston rods and centring diameters according to ISO 15552 standard.

Construction characteristics

Body	anodised aluminium
End caps	aluminium alloy casting painted with brass centring bearing
Bearing piston rod	spheroid bronze on steel band with P.T.F.E. coat
Piston rod	C43 chromed steel (on request stainless steel)
Piston	Ø32 and Ø40 acetal resin (aluminium on request) Ø50 and Ø63 aluminium (with FPM seals, aluminium for all of standard diameters)
Seals	standard: NBR oil resistant rubber, PUR piston rod seals (PUR or FPM on request)
Spring	stainless steel
Fixing screws	plated zinc steel

Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous
Max. pressure	10 bar
Operating temperature	-5°C - +70°C with standard seals (magnetic or non magnetic piston) -30°C - +80°C with PUR seals (magnetic or non magnetic piston) -5°C - +80°C with FPM seals (magnetic piston) -5°C - +150°C with FPM seals (non magnetic piston)

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device and aluminium piston)
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

Please note: air must be dried for applications with lower temperature.
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.
Our Technical Department will be glad to help.

Stroke tolerance, minimum and maximum spring loads and cushioning length

Bore	Stroke tolerance	Minimum and maximum spring load		Cushioning length
(mm)	(mm)	(N)		(mm)
		min.	max.	
Ø32	+2 / 0 mm	19,6	25,5	6,5
Ø40		25,5	42,2	8
Ø50		44,1	96,3	7,5
Ø63	+2,5 / 0 mm	44,1	96,3	7,5

Standard stroke

**DOUBLE ACTING
BASIC and
THROUGH ROD CYLINDER version**

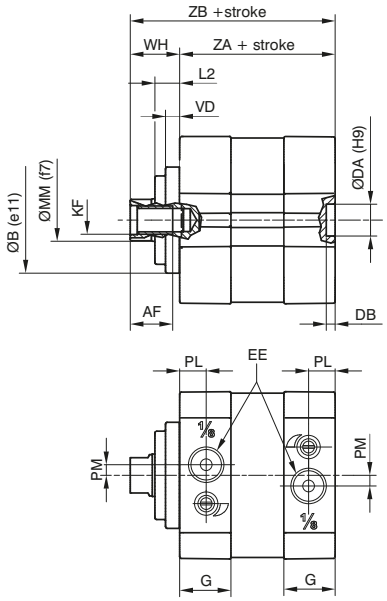
Bore	Stroke																												
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	100	125	150	160	200	250	300	320	350	400	450	500
	WITHOUT CUSHIONING DEVICE																											
Ø32	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					
Ø40	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					
Ø50	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Ø63	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	WITH CUSHIONING DEVICE																											
Ø32					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					
Ø40					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					
Ø50					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Ø63					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		

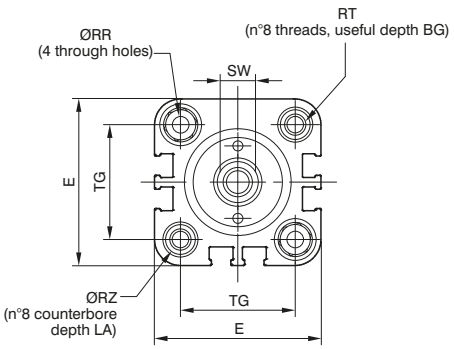
**DOUBLE ACTING
THROUGH ROD CYLINDER
BORED version**

Bore	Stroke																												
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	25	30	35	40	45	50	55	60	65	70	75	80
	WITHOUT CUSHIONING DEVICE																WITH CUSHIONING DEVICE											
Ø32	●	●	●	●	●	●	●	●	●	●							●	●	●	●	●	●						
Ø40	●	●	●	●	●	●	●	●	●	●							●	●	●	●	●	●						
Ø50	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	
Ø63	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	

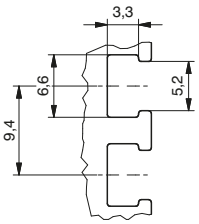
Available versions

BASIC version

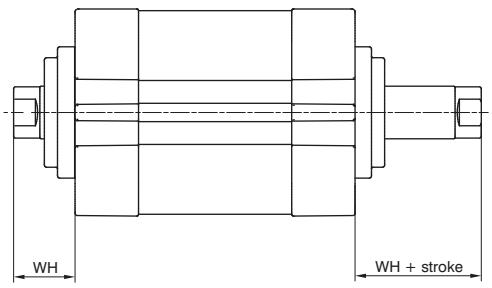




Sensor slot detail
type “B”
(n° 6 slots)



THROUGH ROD CYLINDER version



Ordering codes

15 _ _ .Ø.stroke. _ _ . _

- **1** = Double acting, magnetic piston
- **4** = Double acting, non magnetic piston

- **0** = NBR seals and C43 chromed plated rod
- **1** = NBR seals and stainless steel rod
- **4** = PUR seals and C43 chromed plated rod
- **5** = PUR seals and stainless steel rod
- **6** = FPM seals and C43 chromed plated rod
- **7** = FPM seals and stainless steel rod

- **10** = Basic, female threaded rod
- **11** = Basic, male threaded rod
- **12** = through rod, female threaded rod
- **13** = through rod, male threaded rod
- **14** = through rod, bored female threaded rod
- **15** = through rod, bored male threaded rod

- **4** = Non-cushioned version (mechanical cushioning only)
- **5** = Versions with adjustable end of stroke cushioning system

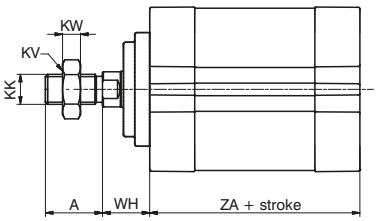
** It is possible to order the Ø32 and Ø40 cylinders with an aluminium piston by replacing the '1' with '2' in the ordering code.
Example: 1540.32.10.10.1 (Acetyl Resin Piston)
1540.32.10.20.1 (Aluminium Piston version)

Seals compounds scheme
NBR: oil resistant nitrilic rubber seals
PUR: polyurethane seals
FPM: fluoropolymer rubber seals

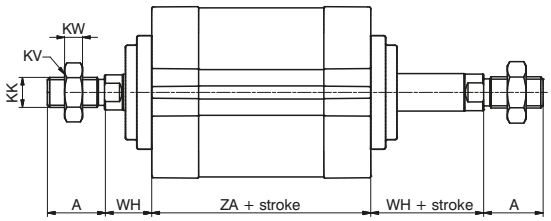
Table of dimensions

Bore	Ø32	Ø40	Ø50	Ø63
AF (min)	12	16	20	20
ØB (e11)	30	35	40	45
BG	16	16	16	16
ØDA (H9)	9	9	12	12
DB (+0,1/0)	2,5	2,5	2,6	2,6
E (max)	47,5	55	66	78
EE	G1/8"	G1/8"	G1/8"	G1/8"
G	14,5	15	15	15
KF	M8	M10	M12	M12
LA (0/-0,1)	5	5	5	5
L2	7	7	10	10
ØMM (f 7)	12	16	20	20
PL (+0,1/0)	7,5	8	8	8
PM	3	/	/	/
ØRR (min)	5,1	5,1	6,6	6,6
RT	M6	M6	M8	M8
ØRZ (min)	8,5	8,5	10,5	10,5
SW (0/-0,1)	10	13	17	17
TG (±0,2)	32,5	38	46,5	56,5
VD	4	4	5	5
WH (±1)	14	14	18	18
ZA (±0,5)	44	45	45	49
ZB (+1/0)	58	59	63	67
Weight stroke	240	330	530	700
gr. every 5mm	13	17	24	27

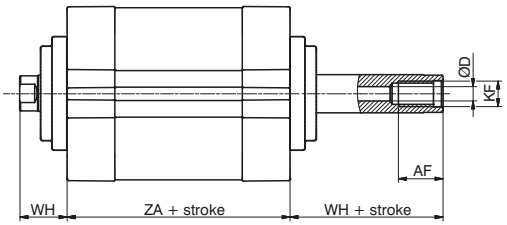
Basic version male piston rod



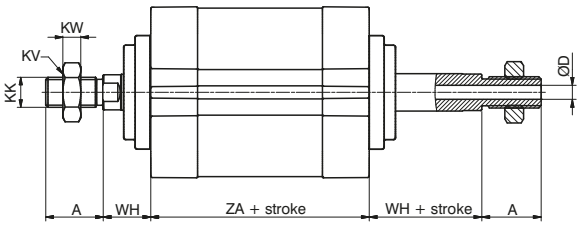
Through rod version male rod



Through rod version bored female piston rod

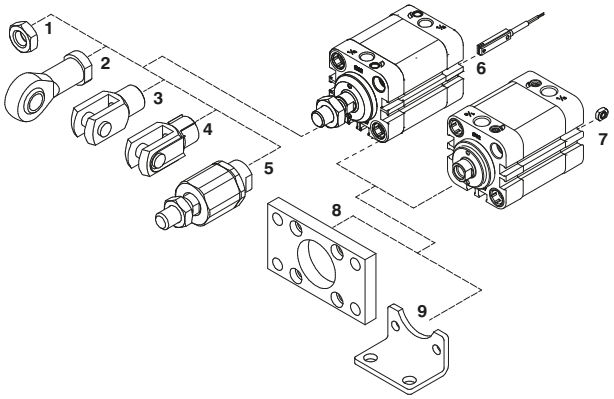


Through rod version bored male piston rod

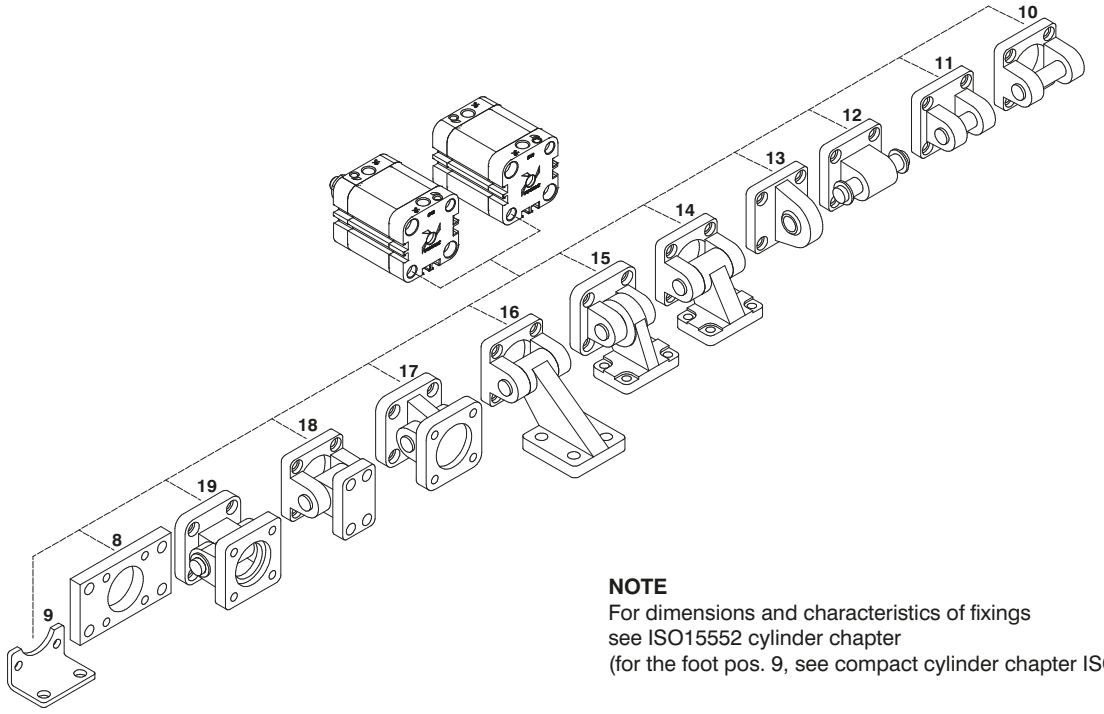


Bore	A (0/-0,5)	AF (min)	ØD	KF	KK	KV	KW	WH (±1)	ZA (±0,5)
Ø32	22	14	4,5	M8	M10x1,25	17	6	14	44
Ø40	24	18	4,5	M10	M12x1,25	19	7	14	45
Ø50	32	24	6	M12	M16x1,5	24	8	18	45
Ø63	32	24	6	M12	M16x1,5	24	8	18	49

Sensor and piston rod accessories



Pos.	Description	Ordering code	
1	Rod lock nut	**1320.32.18F** **1320.40.18F** **1320.50.18F**	(Ø32) (Ø40) (Ø50-Ø63)
2	Ball joint	**1320.32.32F** **1320.40.32F** **1320.50.32F**	(Ø32) (Ø40) (Ø50-Ø63)
3	Fork	**1320.32.13F** **1320.40.13F** **1320.50.13F**	(Ø32) (Ø40) (Ø50-Ø63)
4	Fork with clips	**1320.32.13/1F** **1320.40.13/1F** **1320.50.13/1F**	(Ø32) (Ø40) (Ø50-Ø63)
5	Self aligning joint	**1320.32.33F** **1320.40.33F** **1320.50.33F**	(Ø32) (Ø40) (Ø50-Ø63)
6	Sensors	(See chapter 6 magnetic sensor)	
7	Valves direct mounting bolt	**1500.20F**	(Ø32 - Ø63)

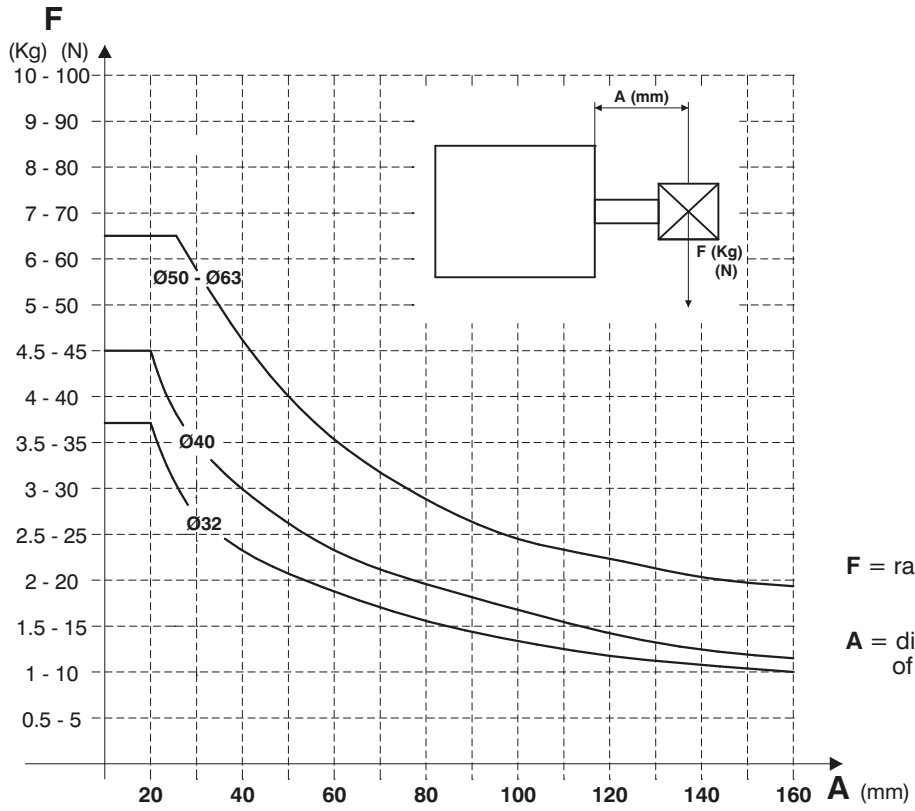


NOTE
For dimensions and characteristics of fixings
see ISO15552 cylinder chapter
(for the foot pos. 9, see compact cylinder chapter ISO 21287).

Fixing

Pos.	Description	Ordering code	
		Aluminium	Steel
8	Flange (MF2)	**1390.Ø.03FP**	**1380.Ø.03F**
9	Foot (MS1)	/	**1540.Ø.05/1F**
10	Rear female clevis (MP2)	**1380.Ø.09F**	**1320.Ø.20F**
11	Narrow rear female clevis (AB6)	**1380.Ø.30F**	**1320.Ø.29F**
12	Rear male clevis (MP4)	**1380.Ø.09/1F**	**1320.Ø.21F**
13	Rear male clevis (with jointed head - MP6)	**1380.Ø.15F**	**1320.Ø.25F**
14	Square angle trunnion (Ab7)	**1380.Ø.35F**	**1320.Ø.23F**
15	Square angle trunnion (with jointed head)	/	**1320.Ø.27F**
16	Square angle trunnion (not specified by ISO 15552)	**1380.Ø.11F**	/
17	Standard trunnion (with jointed head)	**1380.Ø.36F**	**1320.Ø.26F**
18	Standard trunnion (not specified by ISO 15552)	**1380.Ø.10F**	/
19	Complete standard trunnion	**1380.Ø.22F**	**1320.Ø.22F**

Admissible maximum radial load diagram

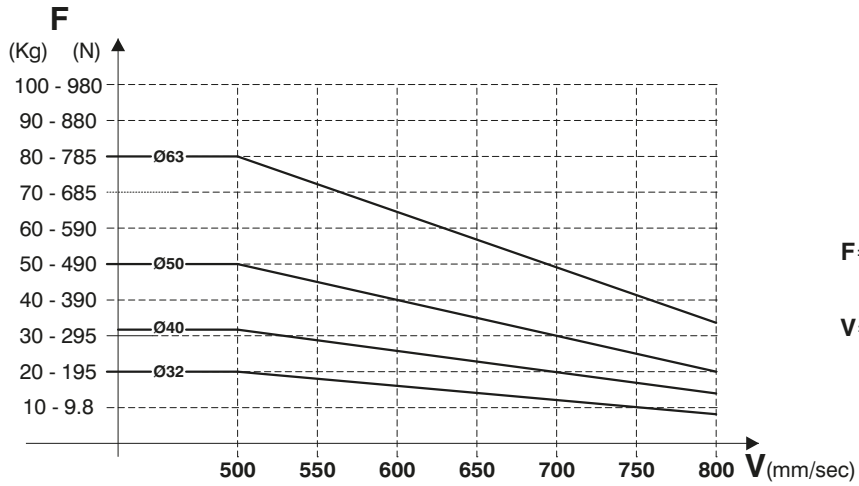


F = radial load (Kg and N)

A = distance between the load (F) centre of gravity and the cylinder front end cap

The diagram shows the maximum radial load F (in Newtons) that can be applied to the cylinder piston rod as a function of the distance **A** (in mm), under static conditions

End of stroke cushioning capacity diagram



F= moved cylinder load (Kg and N)

V= load speed

The diagram shows, for each diameter, the safety curves relative to the maximum loads which can be moved by the cylinder in function of it's speed **V**. The data has been calculated under the following test conditions:
Cylinder mounted vertically with the rod pointing down, air pressure at 5 bar and with a guided load.
Important: Do not exceed the recommended values in the table as reduced life or damage to the cylinder may result.

Multimount cylinders

Ordering code

6500.Ø.stroke. 1 . _

- Ø: **10**, **16**, **20**, **25**
- _: = non magnetic; **M** = magnetic

Construction characteristics

Body	anodised aluminium
Piston rod	stainless steel
Piston	brass
Rods bushing	sinterize bronze
End plate	anodised aluminium
Cushioning washer	PUR
Seal	oil resistant NBR rubber

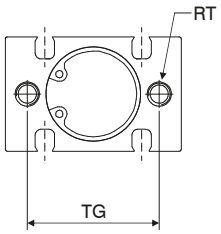
Technical characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Minimum working pressure	0.6 bar (for bore Ø10 - Ø16) 0.5 bar (for bore Ø20 - Ø32)
Max pressure	7 bar
Operating temperature	-5°C - +70°C
Cushioning	with elastic bumper
Stroke tolerance	+1 / 0 mm
Piston speed	50 - 500 mm/sec (without load)

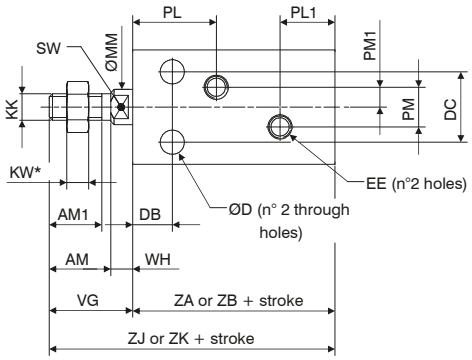
Standard stroke

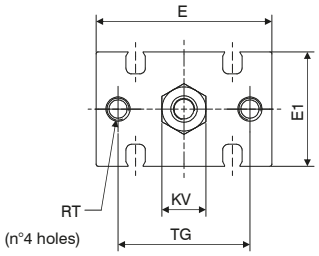
	Stroke							
Bore	5	10	15	20	25	30	40	50
Ø10	●	●	●	●	●	●		
Ø16	●	●	●	●	●	●		
Ø20	●	●	●	●	●	●	●	●
Ø25	●	●	●	●	●	●	●	●

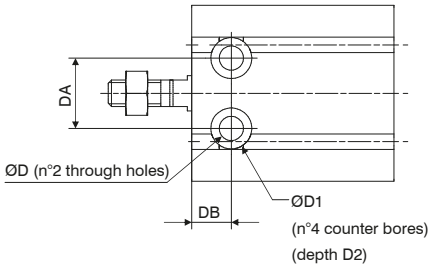
Overall dimensions



*Ø10: n° 2 piston rod nuts
Ø16: n° 1 piston rod nut







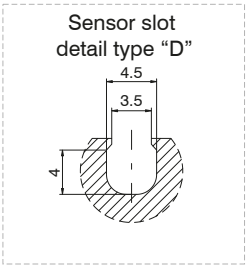
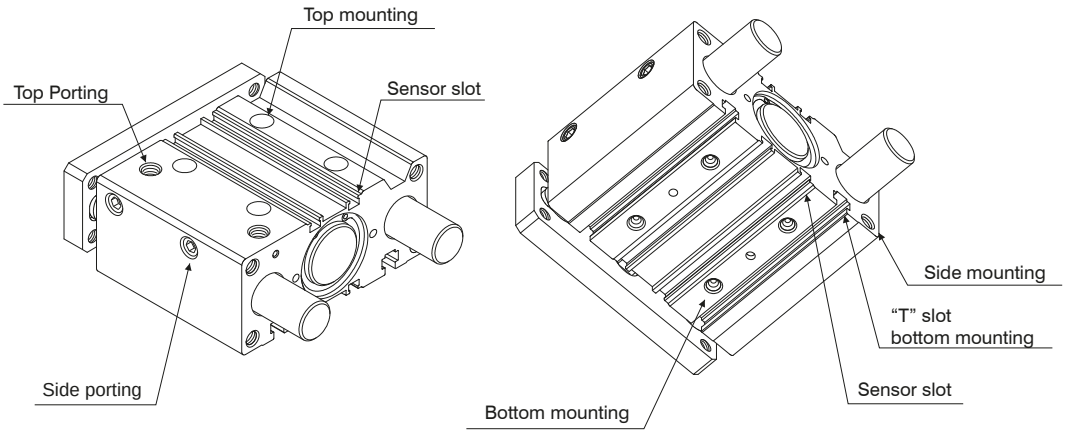


Table of dimensions

		Bore			
		Ø10	Ø16	Ø20	Ø25
AM		/	12,5	14	18
AM1		10	11	12	15,5
ØD		Ø3,2	Ø4,5	Ø5,5	Ø5,5
ØD1		Ø6	Ø7,6	Ø9,3	Ø9,3
D2		5	6,5	8	9
DA		11	14	16	20
DB		7	7	9	10
DC		9	12	16	20
E		24	32	40	50
E1		15	20	26	32
EE		M5	M5	M5	M5
KK		M4	M5	M6	M8
KV		7	8	10	13
KW		3	4	5	5
ØMM		Ø4	Ø6	Ø8	Ø10
PL		16,5	16,5	19	21,5
PL1		10	11,5	12,5	13
PM		/	4	9	9
PM1		/	2	4,5	4,5
RT		M3 (useful depth 5)	M4 (useful depth 6)	M5 (useful depth 8)	M5 (useful depth 8)
SW		/	5	6	8
TG		18	25	30	38
VG		16	16	19	23
WH		/	3,5	5	5
ZA	magnetic	36	40	46	50
ZB	non magnetic	36	30	36	40
ZJ	magnetic	52	56	65	73
ZK	non magnetic	52	46	55	63
Weight (g)					
Stroke 0		32	44	84	159
every 5 mm		4	6	11	17

Series 6100 - 6101 - 6110 - Guided compact cylinder



These guided compact cylinders, characterised by reduced overall dimensions, can be used for the compression, conveyance and manipulation of objects in many industrial sectors; similarly they can also be used in pushing, lifting and stopping applications.

These cylinders are available in sizes 32mm to 63 mm diameter, and comprise a single compact cylinder with integral guide rods, making it a true guide cylinder designed with installation flexibility and space saving in mind.

The rod guide is available in two styles:
Self-lubricating bronze bushes - useful for absorbing lateral loads and forces, especially as a stopper.
Bearing bushes - guaranteeing high precision and uniform movement with low friction characteristics, useful with mis-aligned loads.
Guided compact cylinders are ideal for use in applications requiring a combination of reduced dimensions and anti-rotation features. Mounting can be achieved on three sides through holes or "T" slots.

Adjustable mounting holes in the front plate ensure safe and accurate assembly. Pneumatic connections can be made to either lateral or top ports (lateral ports plugged on standard units).
When sensors are required, there are special slots in the barrel extrusion where 1580 series miniaturised sensors are easily fitted.

Guided compact cylinder

Ordering code

6100.Ø.stroke. _ . _

- Ø: **12**, **16**, **20**, **25**, **32**, **40**, **50**, **63**
- stroke
- **B** = Control unit with bronze bush
- **C** = Control unit with bearing bush
- **L** = Top supply ports closed
- Side supply ports closed

Construction characteristics

Body	anodised aluminium
Guide rods	C43 chromed steel (control unit with bronze bush) tempered and chromed steel (control unit with bearing bush)
Piston	aluminium
Piston rod	stainless steel (for bores Ø12, Ø16, Ø20, Ø25) C43 chromed steel (for bores Ø32, Ø40, Ø50, Ø63)
Rods bushing	bronze or bearing bushing
End cap	anodised aluminium
Piston seal	oil resistant NBR rubber
Piston rod seal	PUR (NBR 12-16)
Wipers	PUR
Plate	nickel plated steel

Operational characteristics

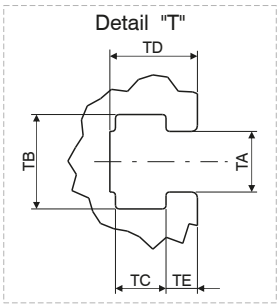
Function	double acting
Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Working pressure	max. 10 bar
Working temperature	-5°C - +70°C
Cushioning	elastic bumper on both ends

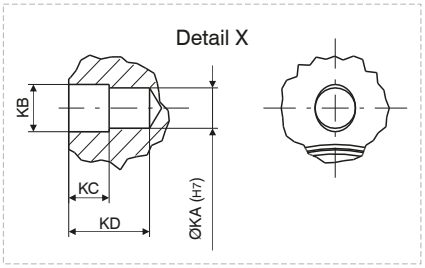
Standard stroke

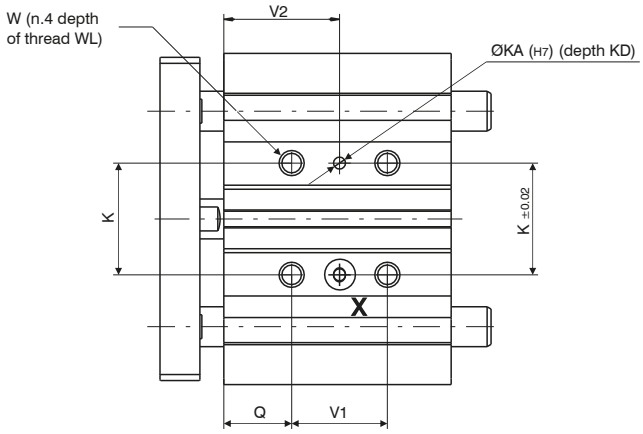
	Stroke											
Bore	**10**	**20**	**25**	**30**	**40**	**50**	**75**	**100**	**125**	**150**	**175**	**200**
Ø12	●	●		●	●	●	●	●				
Ø16	●	●		●	●	●	●	●				
Ø20		●		●	●	●	●	●	●	●	●	●
Ø25		●		●	●	●	●	●	●	●	●	●
Ø32			●			●	●	●	●	●	●	●
Ø40			●			●	●	●	●	●	●	●
Ø50			●			●	●	●	●	●	●	●
Ø63			●			●	●	●	●	●	●	●

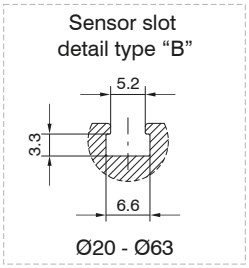
Intermediate strokes can be obtained using spacers with defined length (5, 10, 15, 20 mm).
Example: It is possible to obtain a **6100.32.45.B** cylinder from a **6100.32.50.B** cylinder by inserting a spacer with length of 5 mm.
The intermediate strokes manufactured without the use of spacers are considered special executions.

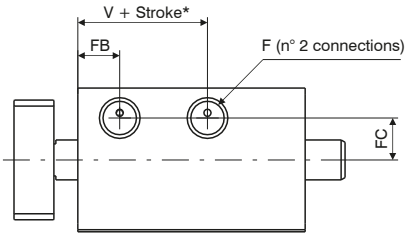
Overall dimensions

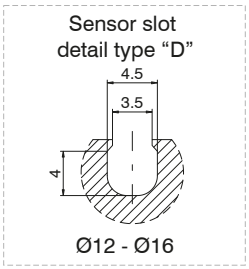


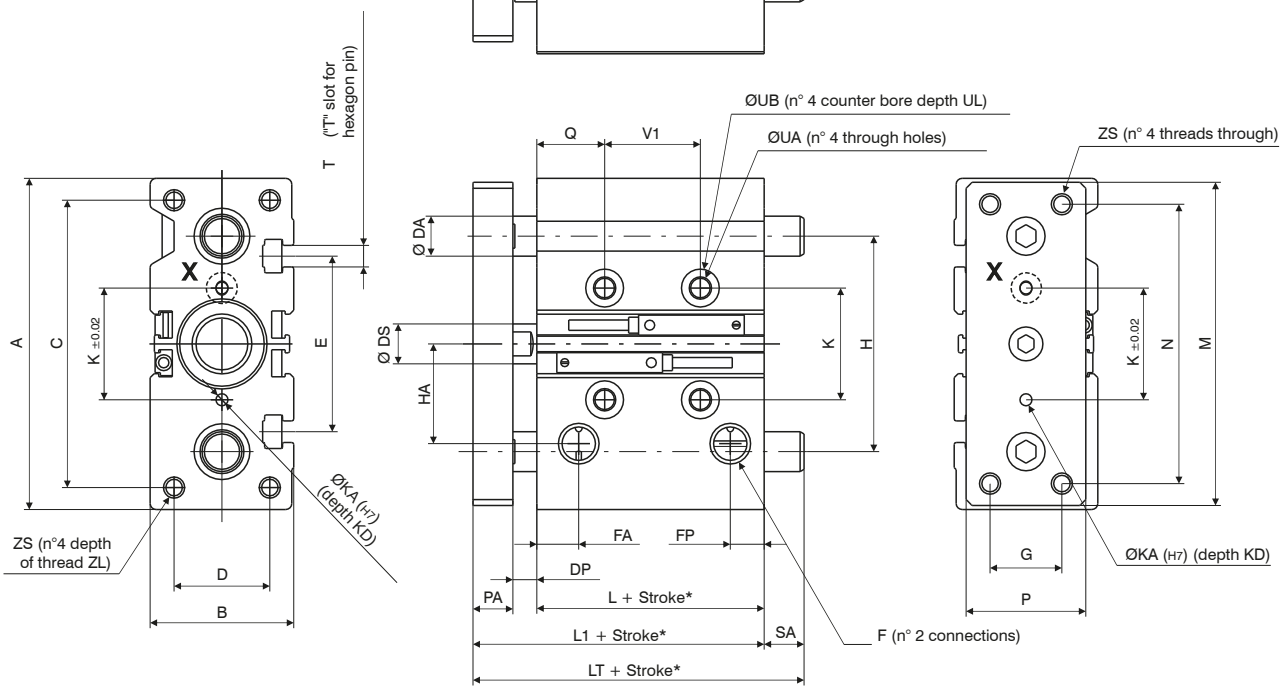












*Dimensions only refer to the "standard stroke"

Overall dimensions

Bore	Ø12	Ø16	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63
Table of dimensions								
A	58	64	83	93	112	120	148	162
B	26	30	36	42	48	54	64	78
C	40	42	72	82	98	106	130	142
D	18	22	24	30	34	40	46	58
DA (Control unit with bronze bushes)	8	10	12	16	20	20	25	25
DA (Control unit with bearing bushes)	6	8	10	14	16	16	20	20
DP	2	2	5,5	5,5	9,5	10	13	13
DS	6	8	10	12	16	16	20	20
E	/	/	44	50	63	72	92	110
F	M5	M5	G1/8"	G1/8"	G1/8"	G1/8"	G1/4"	G1/4"
FA	11	11	11	12	13	13	13	14
FB	11	11	11	12	13	13	13	14
FC	8,5	10	10,5	13,5	15	18	21,5	28
FP	15	17	9	10,5	9,5	11	11	12,5
G	14	16	18	26	30	30	40	50
H	41,5	46	54	64	78	86	110	124
HA	19,5	23	25	28,5	34	38	47	55
K	23	24	28	34	42	50	66	80
KA	/	/	3	4	4	4	5	5
KB	/	/	3,5	4,5	4,5	4,5	6	6
KC	/	/	3	3	3	3	4	4
KD	/	/	6	6	6	6	8	8
L	29	31	38	38,5	38,5	44	44	49
L1	39	43	53,5	54	60	66	72	77
LT (Control unit with bronze bushes, ≤50 stroke)	39	43	53,5	54	97	97	106,5	106,5
LT (Control unit with bronze bushes, 50< stroke ≤200)	57	64	84,5	85	102	102	118	118
LT (Control unit with bearing bushes)	See table 1							
M	56	62	81	91	110	118	146	158
N	48	52	70	78	96	104	130	130
PA	8	10	10	10	12	12	15	15
P	22	25	30	38	44	44	60	70
Q	5	5	17,5	17,5	21,5	22	24	24
SA (Control unit with bronze bushes, ≤50 stroke)	/	/	/	/	37	31	34,5	29,5
SA (Control unit with bronze bushes, 50< stroke ≤200)	18	21	31	31	42	36	46	41
SA (Control unit with bearing bushes)	See table 1							
T	/	/	M5	M5	M6	M6	M8	M10
TA	/	/	5,4	5,4	6,5	6,5	8,5	11
TB	/	/	8,4	8,4	10,5	10,5	13,5	17,8
TC	/	/	4,5	4,5	5,5	5,5	7,5	10
TD	/	/	7,8	8,2	9,5	11	13,5	18,5
TE	/	/	2,8	3	3,5	4	4,5	7
UA	4,3	4,3	5,6	5,6	6,6	6,6	8,6	8,6
UB	8	8	9,5	9,5	11	11	14	14
UL	4,5	4,5	5,5	5,5	7,5	7,5	9	9
V	14	14	13	13	7,5	13	9	14
V1	See table 2							
V2								
W	M5	M5	M6x1	M6x1	M8x1,25	M8x1,25	M10x1,5	M10x1,5
WL	10	10	12	12	16	16	20	20
Z	M4	M5	M5x0,8	M6x1	M8x1,25	M8x1,25	M10x1,5	M10x1,5
ZL	9	11	13	15	20	20	22	22

Control unit with bearing bushes

Table 1	LT			SA		
Bore	stroke≤30	30<stroke≤100	100<stroke≤200	stroke≤30	30<stroke≤100	100<stroke≤200
Ø12	39	53	53	/	14	/
Ø16	43	64	64	/	21	/
Ø20	47	72	72	/	18,5	49
Ø25	49	77	77	/	23	48
	stroke <50	50≤stroke≤100	100<stroke≤200	stroke <50	50≤stroke≤100	100<stroke≤200
Ø32	/	87	117	/	27	57
Ø40	/			/	21	51
Ø50	/	92	127	/	20	55
Ø63	/			/	15	50

Table 2	V1			V2		
Bore	stroke≤30	30<stroke≤100	100<stroke≤200	stroke≤30	30<stroke≤100	100<stroke≤200
Ø12	4+stroke			/	/	/
Ø16				/	/	/
Ø20	24	44	120	29,5	39,5	77,5
Ø25						
	stroke≤25	25<stroke≤100	100<stroke≤200	stroke≤25	25<stroke≤100	100<stroke≤200
Ø32	24	48	124	33,5	45,5	83,5
Ø40				34	46	84
Ø50				36	48	86
Ø63	28	52	128	38	50	88

Weight - Cylinder force - kinetic energy

	Bore							
	Ø12	Ø16	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63
Stroke	**Control unit with bronze bushes**							**Weight g**
10	240	330	/	/	/	/	/	/
20	280	380	670	950	/	/	/	/
25	/	/	/	/	1690	1950	3360	4180
30	310	430	750	1050	/	/	/	/
40	350	480	830	1160	/	/	/	/
50	390	530	910	1270	2070	2370	4000	4940
75	500	680	1170	1650	2470	2830	4730	5780
100	5903	800	1370	1920	2850	3250	5370	6540
125	/	/	1570	2190	3240	3680	6010	7290
150	/	/	1760	2470	3620	4100	6650	8050
175	/	/	1960	2740	4000	4530	7290	8800
200	/	/	2160	3010	4380	4950	7930	9560
Stroke	Moving parts							
10	100	155	/	/	/	/	/	/
20	108	170	330	520	/	/	/	/
25	/	/	/	/	1070	1140	2150	2500
30	116	185	350	560	/	/	/	/
40	124	200	380	600	/	/	/	/
50	132	215	400	640	1230	1300	2400	2750
75	152	250	520	840	1420	1490	2750	3090
100	172	285	580	950	1580	1650	3000	3350
125	/	/	640	1050	1740	1810	3260	3600
150	/	/	700	1150	1910	1980	3510	3860
175	/	/	760	1250	2070	2140	3760	4110
200	/	/	820	1350	2230	2300	4020	4360
Stroke	**Control unit with bearing bushes**							
10	240	340	/	/	/	/	/	/
20	270	390	700	980	/	/	/	/
25	/	/	/	/	1540	1790	3110	3930
30	300	430	770	1070	/	/	/	/
40	350	510	890	1250	/	/	/	/
50	390	560	970	1340	1850	2150	3660	4590
75	470	670	1140	1570	2300	2640	4410	5460
100	560	790	1310	1810	2620	3000	4960	6120
125	/	/	1520	2080	2990	3420	5600	6880
150	/	/	1690	2310	3310	3780	6150	7540
175	/	/	1870	2540	3620	4140	6700	8210
200	/	/	2040	2770	3940	4500	7250	8870
Stroke	Moving parts							
10	95	145	/	/	/	/	/	/
20	100	153	310	490	/	/	/	/
25	/	/	/	/	820	890	1770	2110
30	105	161	330	520	/	/	/	/
40	110	169	370	580	/	/	/	/
50	120	177	390	610	940	1010	1950	2300
75	145	197	440	690	1110	1180	2240	2590
100	170	217	480	760	1230	1300	2430	2770
125	/	/	560	880	1410	1480	2710	3050
150	/	/	600	950	1530	1600	2890	3240
175	/	/	650	1020	1650	1720	3080	3420
200	/	/	700	1100	1770	1830	3270	3610

Working pressure	**Cylinder theoretic force (N)**															
2 bar	23	17	40	30	63	47	98	76	161	121	251	211	393	330	623	561
3 bar	34	26	60	45	94	71	147	113	241	181	377	317	589	495	935	841
4 bar	45	34	80	60	126	94	196	151	322	241	503	422	785	660	1247	1121
5 bar	57	43	101	76	157	118	246	189	402	302	629	528	982	825	1559	1402
6 bar	68	51	121	91	188	142	295	227	482	362	754	634	1178	989	1870	1682
7 bar	79	60	141	106	220	165	344	265	563	422	880	739	1374	1154	2182	1962
8 bar	90	68	161	121	251	189	393	302	643	482	1006	845	1570	1319	2494	2242
9 bar	102	77	181	136	283	212	442	340	724	543	1131	950	1767	1484	2805	2523
10 bar	113	85	201	151	314	236	491	378	804	603	1257	1056	1963	1649	3117	2803
Piston area	out	in	out	in	out	in	out	in	out	in	out	in	out	in	out	in
(mm^2)	113	85	201	151	314	236	491	378	804	603	1257	1056	1963	1649	3117	2803

	Maximum permissible Momentum							
J	0,08	0,09	0,11	0,18	0,29	0,52	0,91	1,54

How to calculate the Momentum: $\mathbf{Ec} = \frac{1}{2}\ \mathbf{m}\ \mathbf{V}^2$ (J)

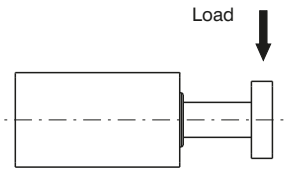
m = Total moving mass: weight of driven object added to weight of cylinder moving parts (kg)
V = max. speed: equal to average speed + 40% (m/sec)

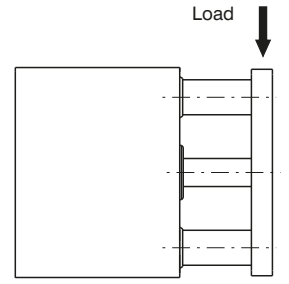
Operating criteria

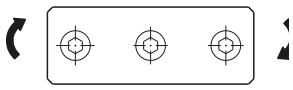
Permissible lateral load (applied on overall plate)

		Bore							
		Ø12	Ø16	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63
Version	**Stroke**	**Permissible lateral load (N)***							
Control unit with bronze bushes	10	30	48						
	20	23	37	49	69				
	25					203	203	296	296
	30	19	30	43	60				
	40	16	25	38	54				
	50	14	20	35	49	164	164	245	245
	75	12	18	87	116	182	182	273	273
	100	10	15	75	100	159	159	241	241
	125			66	88	142	142	216	216
	150			59	79	127	127	195	195
	175			54	71	116	116	179	179
	200			49	65	106	106	164	164
Control unit with bearing bushes	10	20	35						
	20	15	28	58	69				
	25					191	190	208	206
	30	13	22	48	68				
	40	11	18	101	132				
	50	10	16	90	118	157	157	173	171
	75	8	14	70	93	164	163	223	221
	100	6	11	58	77	144	144	199	196
	125			62	80	203	203	264	262
	150			54	70	186	185	242	240
	175			48	62	171	171	224	221
	200			43	55	158	158	207	205
Version	**Stroke**	**Recommended torque moments (Nm)**							
Control unit with bronze bushes	10	0,40	0,70						
	20	0,35	0,65	1,1	1,8				
	25					6,4	7,0	13,0	14,7
	30	0,28	0,48	0,9	1,6				
	40	0,25	0,45	0,8	1,4				
	50	0,21	0,39	0,8	1,3	5,1	5,7	10,8	12,1
	75	0,42	0,68	1,9	3,0	5,7	6,3	12,0	13,5
	100	0,40	0,60	1,6	2,6	5,0	5,5	10,6	11,9
	125			1,4	2,3	4,4	4,9	9,5	10,7
	150			1,3	2,0	4,0	4,4	8,6	9,7
	175			1,2	1,8	3,6	4,0	7,9	8,9
	200			1,1	1,7	3,3	3,7	7,2	8,2
Control unit with bearing bushes	10	0,62	0,70						
	20	0,41	0,65	1,3	2,1				
	25					6,0	6,6	9,2	10,2
	30	0,33	0,48	1,0	1,8				
	40	0,30	0,45	2,2	3,4				
	50	0,48	0,39	1,9	3,0	4,9	5,4	7,6	8,5
	75	0,38	0,68	1,5	2,4	5,1	5,6	9,8	11,0
	100	0,32	0,60	1,3	2,0	4,5	5,0	8,7	9,7
	125			1,3	2,1	6,3	7,0	11,6	13,0
	150			1,2	1,8	5,8	6,4	10,7	11,9
	175			1,0	1,6	5,3	5,9	9,8	11,0
	200			0,9	1,4	4,9	5,4	9,1	10,2

*(Applied on overall plate)

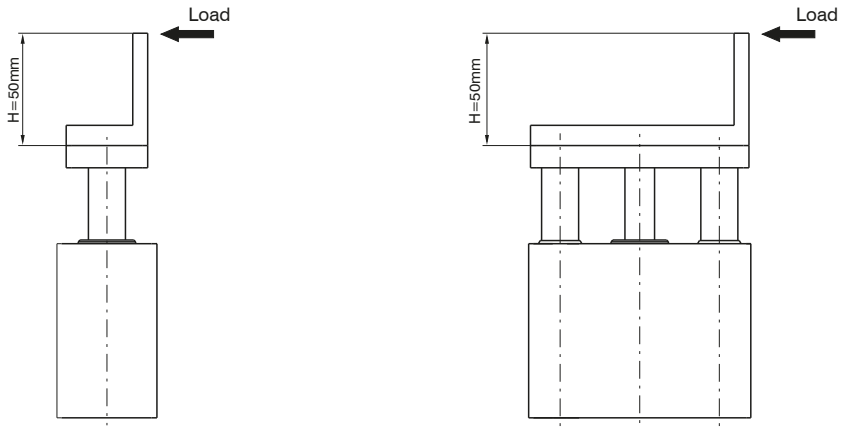






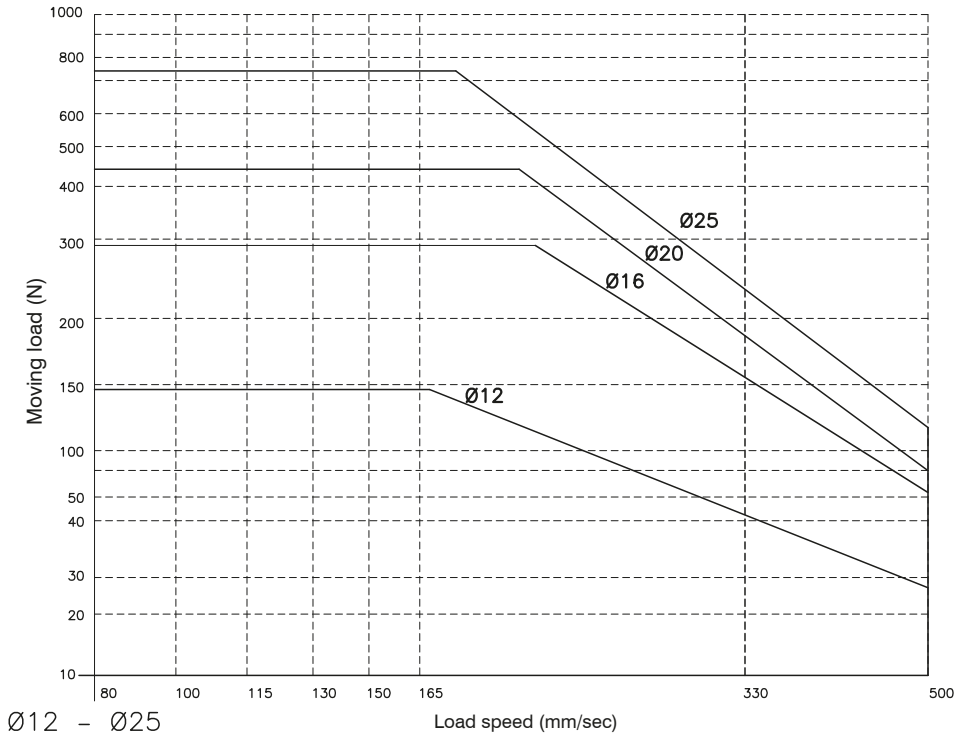
Operating criteria

Stopper device applications



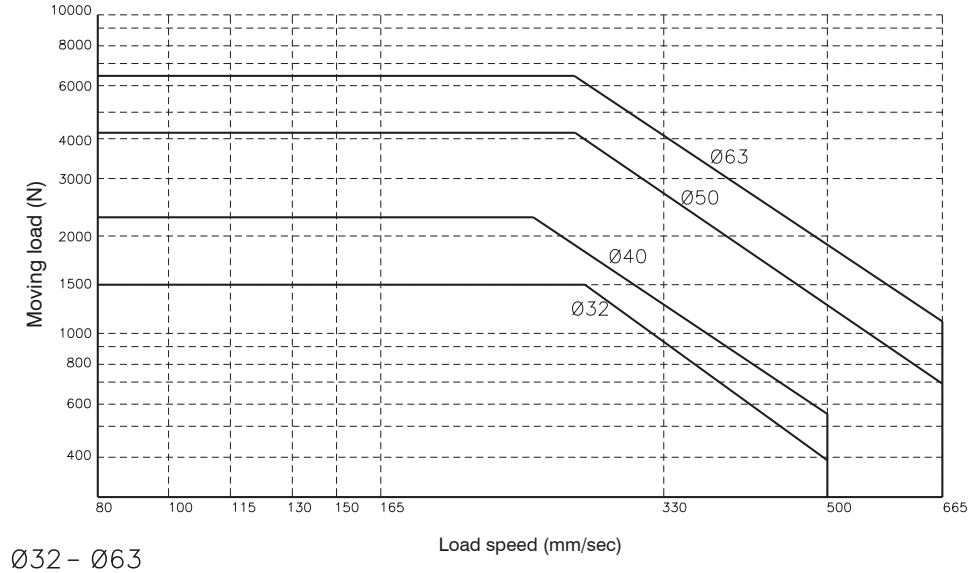
Control unit with bronze bushes

ATTENTION: if H>50 mm use larger bore



Ø12 – Ø25

ATTENTION: use with stroke £ 30 mm

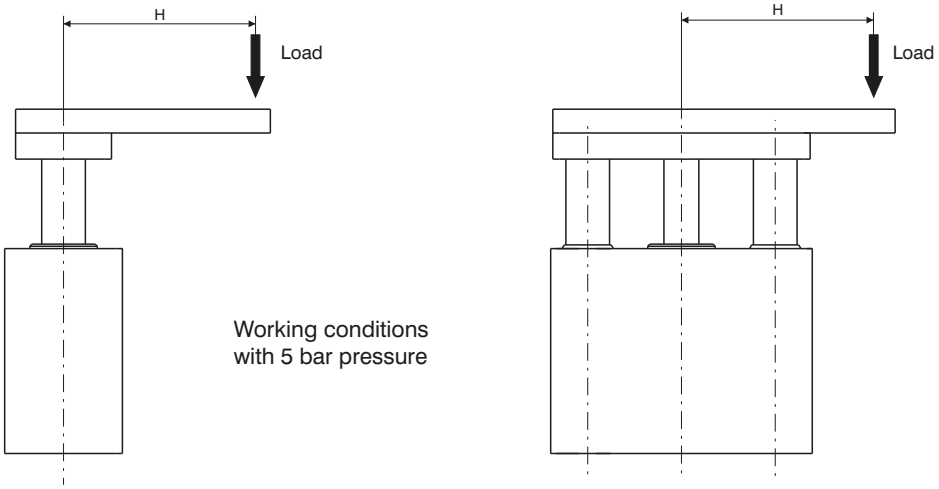


Ø32 – Ø63

ATTENTION: use with stroke £ 50 mm

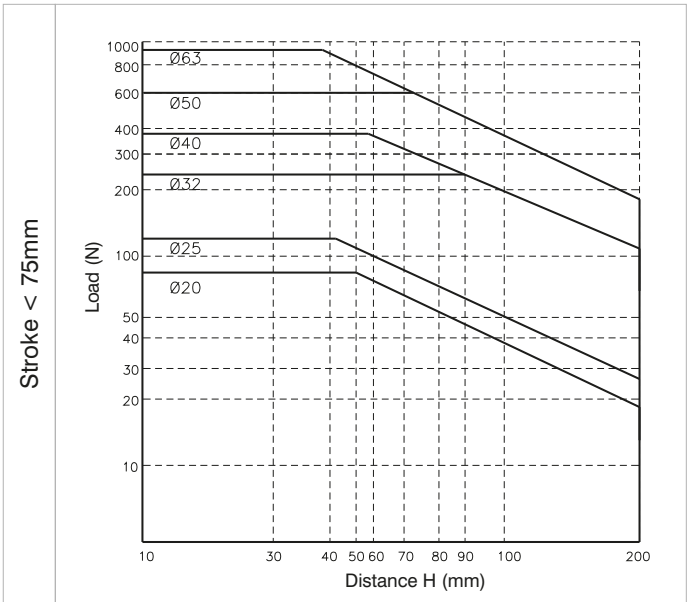
Operating criteria

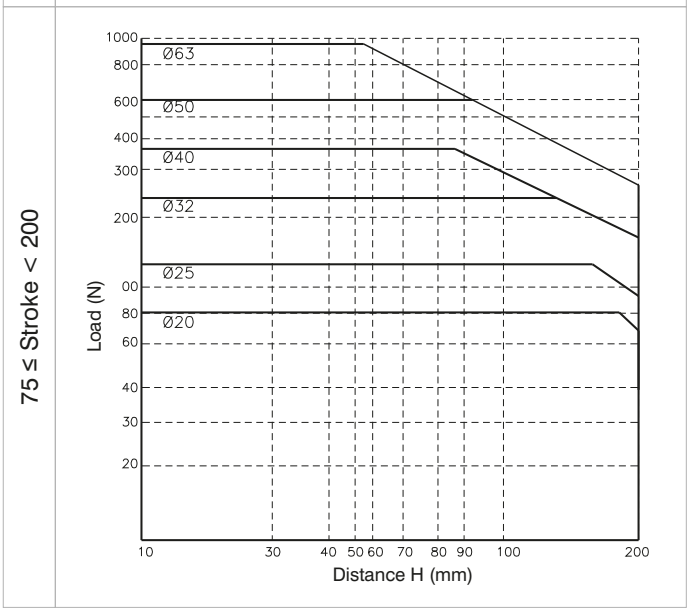
Handling applications



Working conditions
with 5 bar pressure

Control unit with bronze bushes

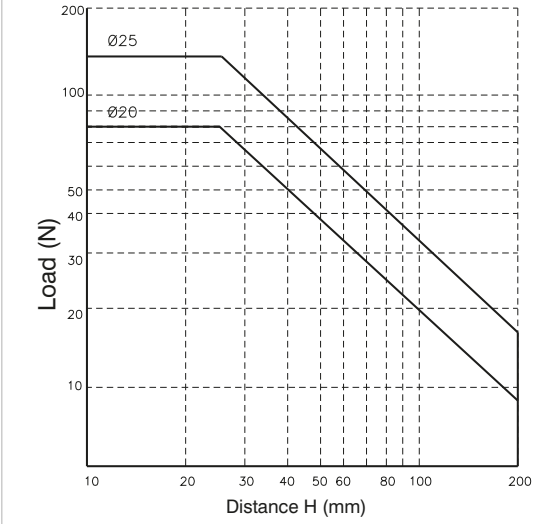
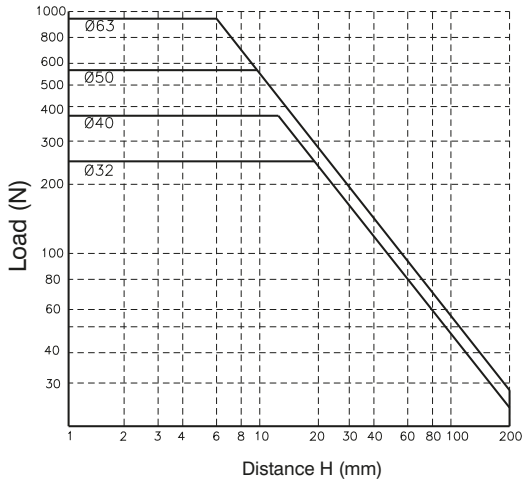
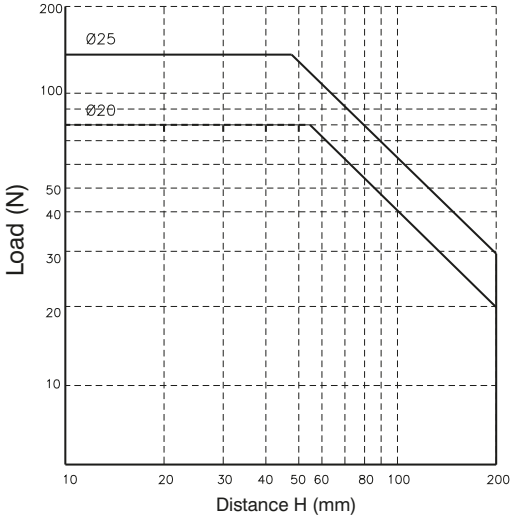
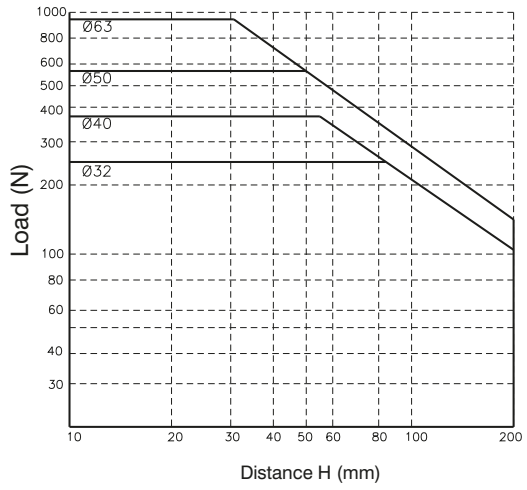
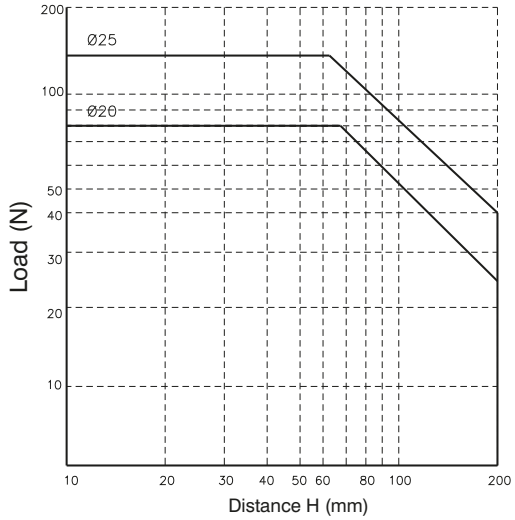
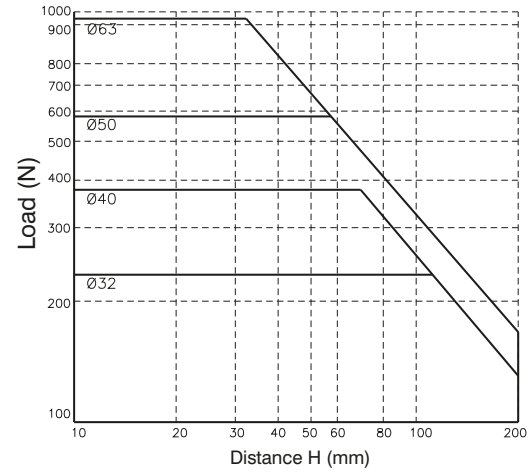




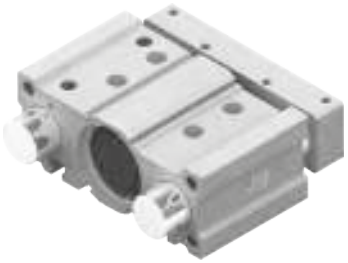
Operating criteria

Handling applications

Control unit with bearing bushes

	Ø20 – Ø25	Ø32 - Ø63
Stroke < 40 mm		
40 < Stroke < 125 mm		
125 ≤ Stroke < 200 mm		

Heavy duty guided short stroke cylinder



Ordering code

6101.80.stroke. B . _

Side supply ports closed
L = Top supply ports closed

Construction characteristics

Body	anodised aluminium
Rods	C43 chromed steel
Piston	aluminium
Piston rod	C43 chromed steel
Piston rod bushing	sintered bronze
Rod bushing	teflon coated bush
End cap	aluminium
Piston seal	NBR oil-resistant rubber
Piston rod seal	PUR
Plate	anodised aluminium

Operational characteristics

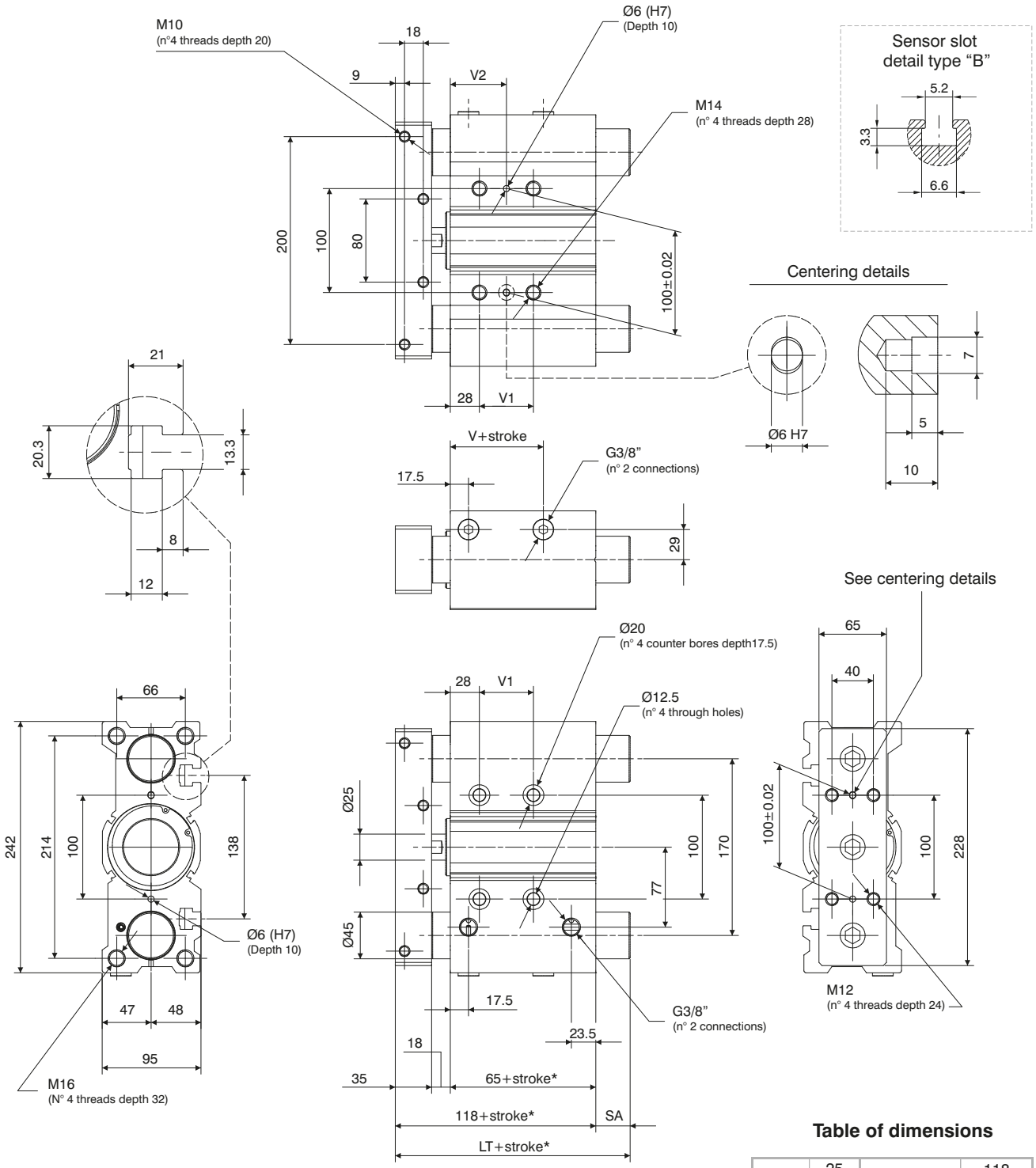
Function	double acting
Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Max. pressure	max. 10 bar
Working temperature	-5°C - +70°C
Cushioning	elastic bumper on both ends

Standard strokes

	Stroke							
Bore	25	50	75	100	125	150	175	200
Ø80	●	●	●	●	●	●	●	●

Intermediate strokes can be obtained by adding specific spacers (5, 10, 15, 20mm).
Example: It is possible to obtain a **6101.80.45.B** cylinder from a **6101.80.50.B** cylinder by adding a 5mm spacer.
The Intermediate strokes manufactured without the use of spacers are considered special executions.

Overall dimensions



*Dimensions only refer to the "standard stroke"

Table of dimensions

	25	**LT**	118
stroke	50		118
	> 50		151
		V	14.5
	25	**V1**	28
	50		52
stroke	75		52
	100		52
	>100		128
	25	**V2**	42
	50		54
stroke	75		54
	100		54
	>100		92
	25	**SA**	0
stroke	50		
	> 50		33

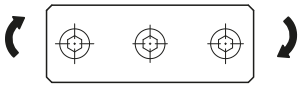
Operating criteria

Cylinder theoretic force (N)

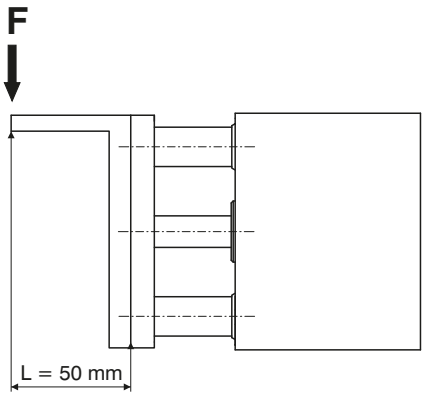
Working pressure		
2 bar	1005	907
3 bar	1508	1361
4 bar	2011	1814
5 bar	2513	2268
6 bar	3016	2721
7 bar	3519	3175
8 bar	4021	3629
9 bar	4524	4082
10 bar	5027	4536
Effective area (mm^2)	out	in
	5027	4536

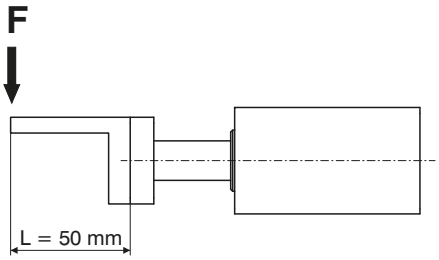
Recommended torque moments

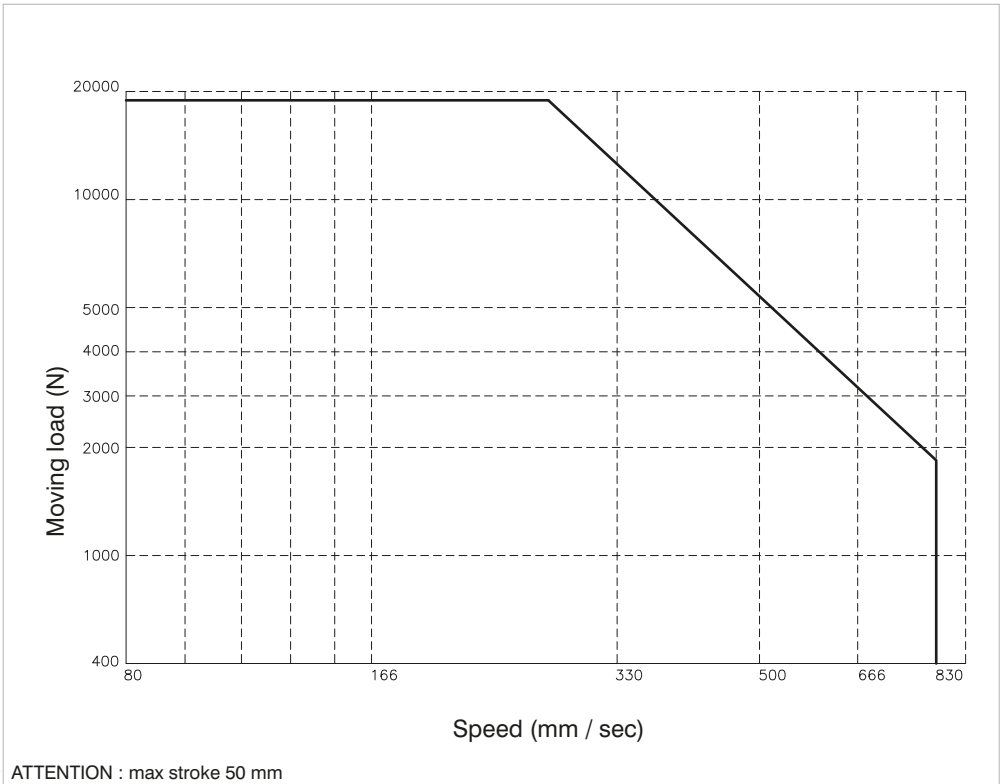
Stroke	N/m
25	49
50	41
75	51
100	45
125	41
150	38
175	35
200	32



"Stopper" device applications





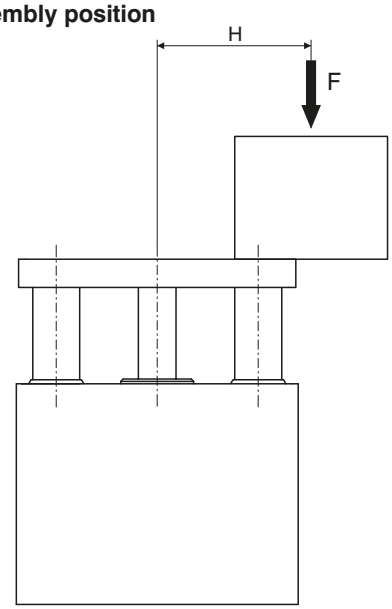


ATTENTION : max stroke 50 mm

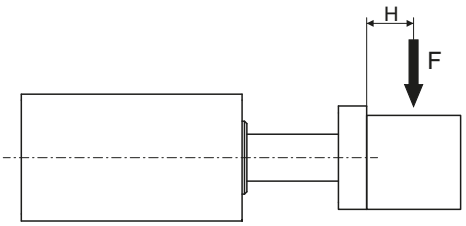
Operating criteria

Handling applications

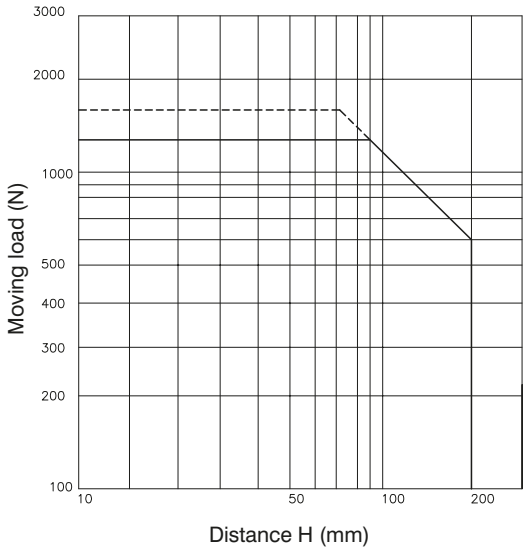
VERTICAL assembly position



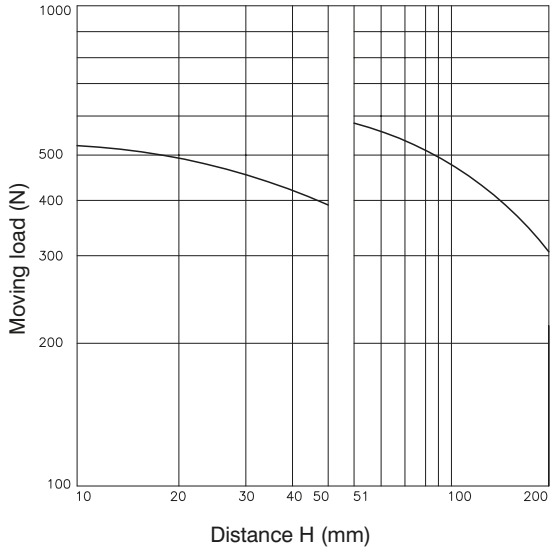
HORIZONTAL assembly position



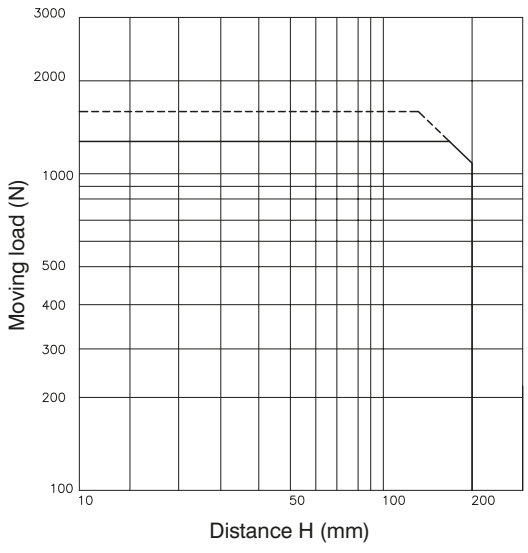
STROKE ≤ 50 mm / V = 200 mm/s



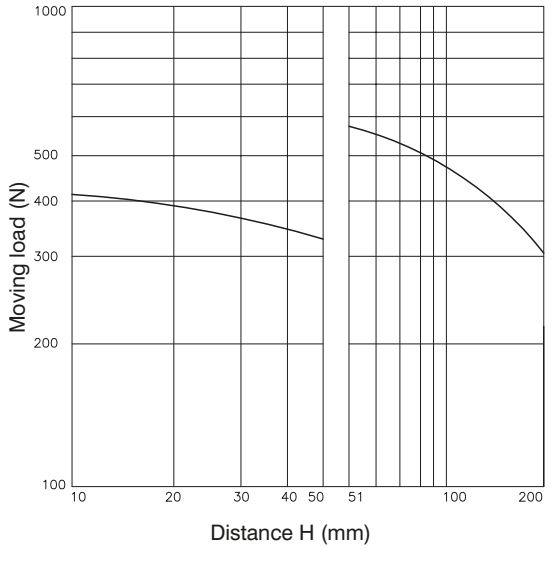
H= 50 mm / V = 200 mm/s



STROKE > 50 mm / V = 200 mm/s



H= 100 mm / V = 200 mm/s



——— Working pressure : 4 bar
- - - - - - - - Working pressure : 5 bar

Guided compact cylinder with additional metal rod scrapers

Ordering code

6110.Ø.stroke. C . _

- Ø: **32**, **40**, **50**, **63**
- _: Side supply ports closed; **L** = Top supply ports closed

Construction characteristics

Body	anodised aluminium
Guide rods	tempered and chromed steel
Piston	aluminium
Piston rod	C43 chromed steel
Rods bushing	bearing bushing
End cap	anodised aluminium
Piston seal	oil resistant NBR rubber
Piston rod seal	PUR
External rod scraper	brass
Internal rod scraper	NBR
Plate	nickel plated steel

The cylinders are equipped with 4 rod scrapers on the guide rods and 1 rod scraper on the central piston rod

Operational characteristics

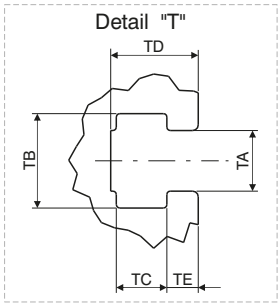
Function	double acting
Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Working pressure	max. 10 bar
Working temperature	-5°C - +70°C
Cushioning	elastic bumper on both ends

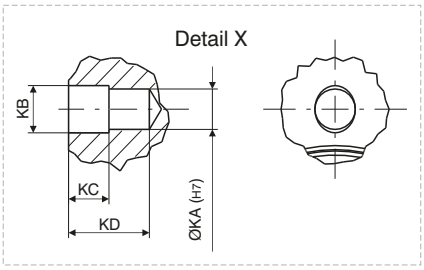
Standard strokes

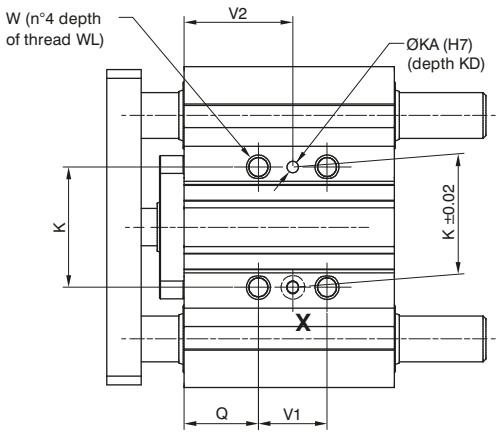
	Stroke									
Bore	10	20	25	50	75	100	125	150	175	200
Ø32			●	●	●	●	●	●	●	●
Ø40			●	●	●	●	●	●	●	●
Ø50			●	●	●	●	●	●	●	●
Ø63			●	●	●	●	●	●	●	●

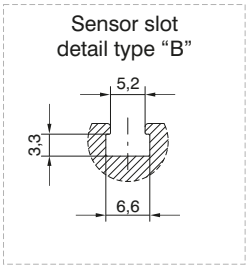
Intermediate strokes can be obtained using spacers with defined length (5, 10, 15, 20 mm).
Example: It is possible to obtain a **6110.32.45.B** cylinder from a **6110.32.50.B** cylinder by inserting a spacer with length of 5 mm.
The intermediate strokes manufactured without the use of spacers are considered special executions.

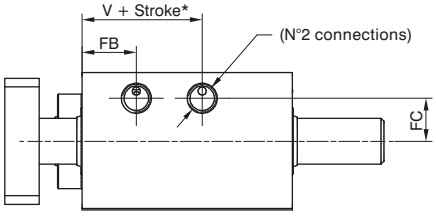
Overall dimensions

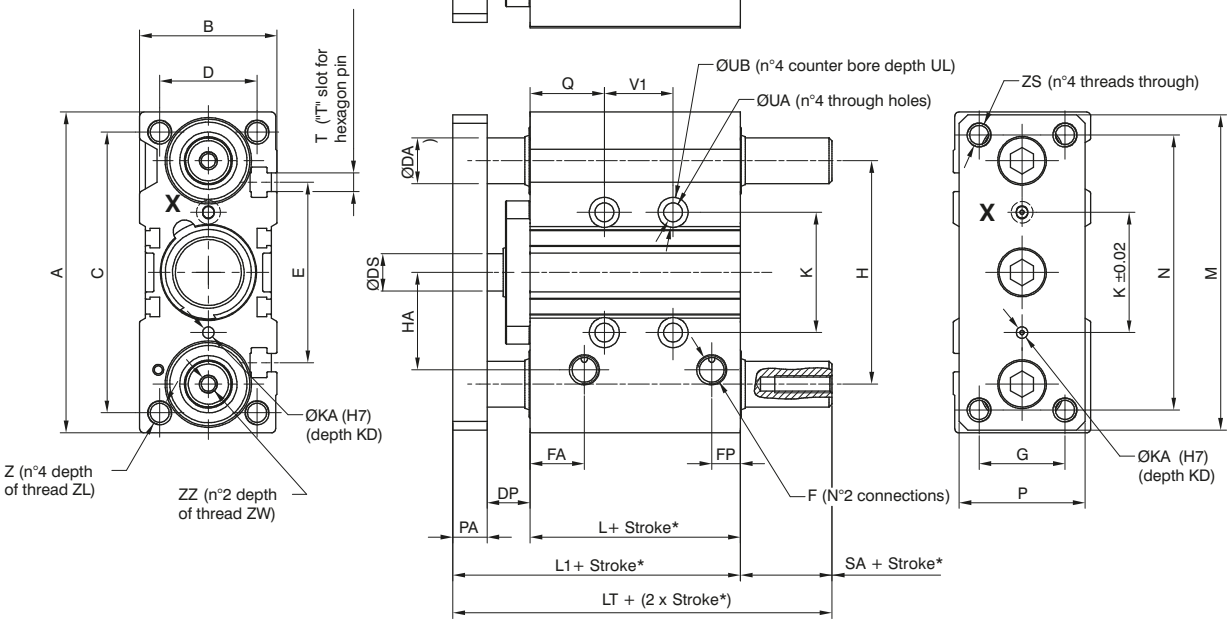












Overall dimensions

Bore	Ø32	Ø40	Ø50	Ø63
Table of dimensions				
A	112	120	148	162
B	48	54	64	78
C	98	106	130	142
D	34	40	46	58
DA	16	16	20	20
DP	15	20	23	23
DS	16	16	20	20
E	63	72	92	110
F	G1/8"	G1/8"	G1/4"	G1/4"
FA	19	13	13	14
FB	19	13	13	14
FC	15	18	21,5	28
FP	10	11	11	12,5
G	30	30	40	50
H	78	86	110	124
HA	34	38	47	55
K	42	50	66	80
KA	4	4	5	5
KB	4,5	4,5	6	6
KC	3	3	4	4
KD	6	6	8	8
L	48,5	50	50	55
L1	75,5	82	88	93
LT	82,5	89	93	100
M	110	118	146	158
N	96	104	130	130
PA	12	12	15	15
P	44	44	60	70
Q	26	22	24	24
SA	7	7	5	7
T	M6	M6	M8	M10
TA	6,5	6,5	8,5	11
TB	10,5	10,5	13,5	17,8
TC	5,5	5,5	7,5	10
TD	9,5	11	13,5	18,5
TE	3,5	4	4,5	7
UA	6,6	6,6	8,6	8,6
UB	11	11	14	14
UL	7,5	7,5	9	9
V	17	19	15	20
V1	See table 1			
V2				
W	M8x1,25	M8x1,25	M10x1,5	M10x1,5
WL	16	16	20	20
Z	M8x1,25	M8x1,25	M10x1,5	M10x1,5
ZL	20	20	22	22
ZS	M8x1,25	M8x1,25	M10x1,5	M10x1,5
ZZ	M6	M8	M10	M10
ZW	20	20	25	25

Table 1	V1			V2		
Bore	stroke≤25	25<stroke≤100	100<stroke≤200	stroke≤25	25<stroke≤100	100<stroke≤200
Ø32	24	48	124	38	50	88
Ø40				34	46	84
Ø50				36	48	86
Ø63	28	52	128	38	50	88

Slide cylinders

Ordering code

6600.Ø.stroke. _ . _

- **8**
- **12**
- **16**
- **20**
- **25**

= Without accessories
A = Double regulation end stroke
AU = Regulation front end stroke
AR = Regulation rear end stroke
D = Double shock absorber
DU = Front shock absorber
DR = Rear shock absorber

Construction characteristics

Body	anodised aluminium
Piston rod	stainless steel
Piston	stainless steel
Piston rod bushing	sintered bronze
End cap	anodised aluminium
Cushioning washer	PUR
Seal	oil resistant NBR rubber
Flange	anodised aluminium
Upper plate	anodised aluminium

Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Working pressure	1.5 - 7 bar
Working temperature	-5°C - +70°C
Cushioning	with elastic bumper

Theoretical force

Bore	Effective area (mm^2)	Force (N)						
Ø8	Out	101	20	30	40	51	61	71
	In	75	15	23	30	38	45	53
Ø12	Out	226	45	68	90	113	136	158
	In	170	34	51	68	85	102	119
Ø16	Out	402	80	121	161	201	241	281
	In	302	60	91	121	151	181	211
Ø20	Out	628	126	188	251	314	377	440
	In	471	94	141	188	236	283	330
Ø25	Out	982	196	295	393	491	589	687
	In	756	151	227	302	378	454	529
			2	3	4	5	6	7
			Working pressure(bar)					

Standard strokes

	Stroke								
Bore	10	20	30	40	50	75	100	125	150
Ø8	●	●	●	●	●	●			
Ø12	●	●	●	●	●	●	●		
Ø16	●	●	●	●	●	●	●	●	
Ø20	●	●	●	●	●	●	●	●	●
Ø25	●	●	●	●	●	●	●	●	●

Overall dimensions Ø8

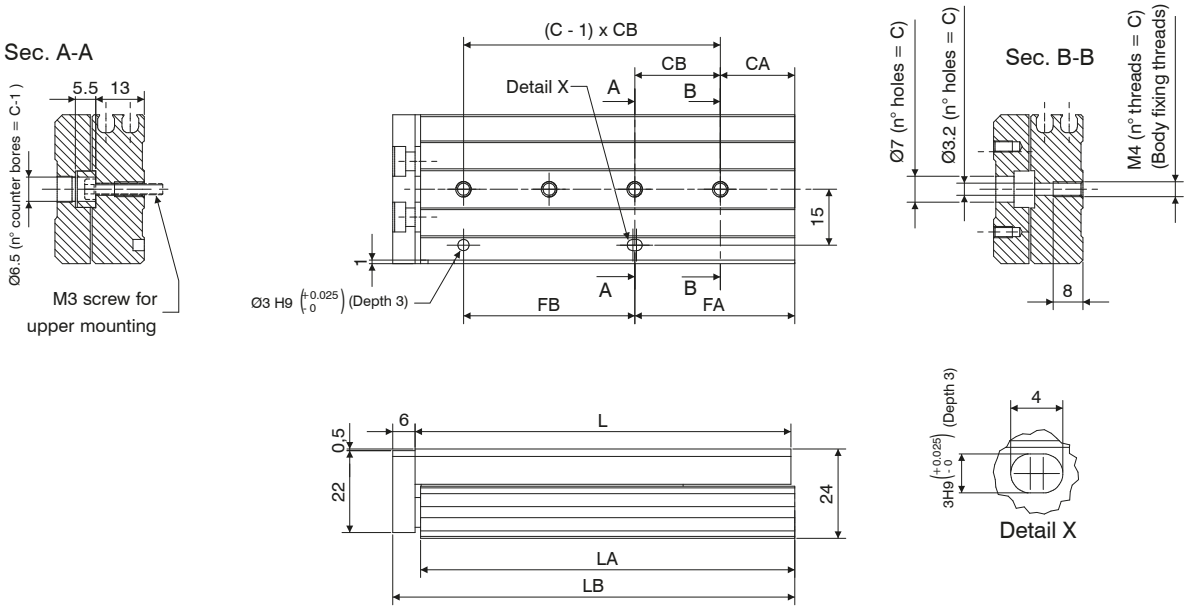


Table of dimensions

	Standard stroke					
	10	**20**	**30**	**40**	**50**	**75**
B	4	4	4	4	6	6
BA	25	25	40	50	38	50
C	2	2	3	3	4	5
CA	9	12	13	15	20	27
CB	28	30	20	28	23	28
DA	23,5	33,5	43,5	53,5	63,5	88,5
DB	/	/	/	/	82,5	132,5
FA	17	12	33	43	43	83
FB	20	30	20	28	46	56
EA	13	8,5	9,5	10,5	24,5	38,5
EB	19,5	29	39	56	60	96
L	49	54	65	83	101	151
LA	48,5	53,5	64,5	82,5	100,5	150,5
LB	56	61	72	90	108	158
Weight g	150	160	190	235	285	410

Overall dimensions Ø12

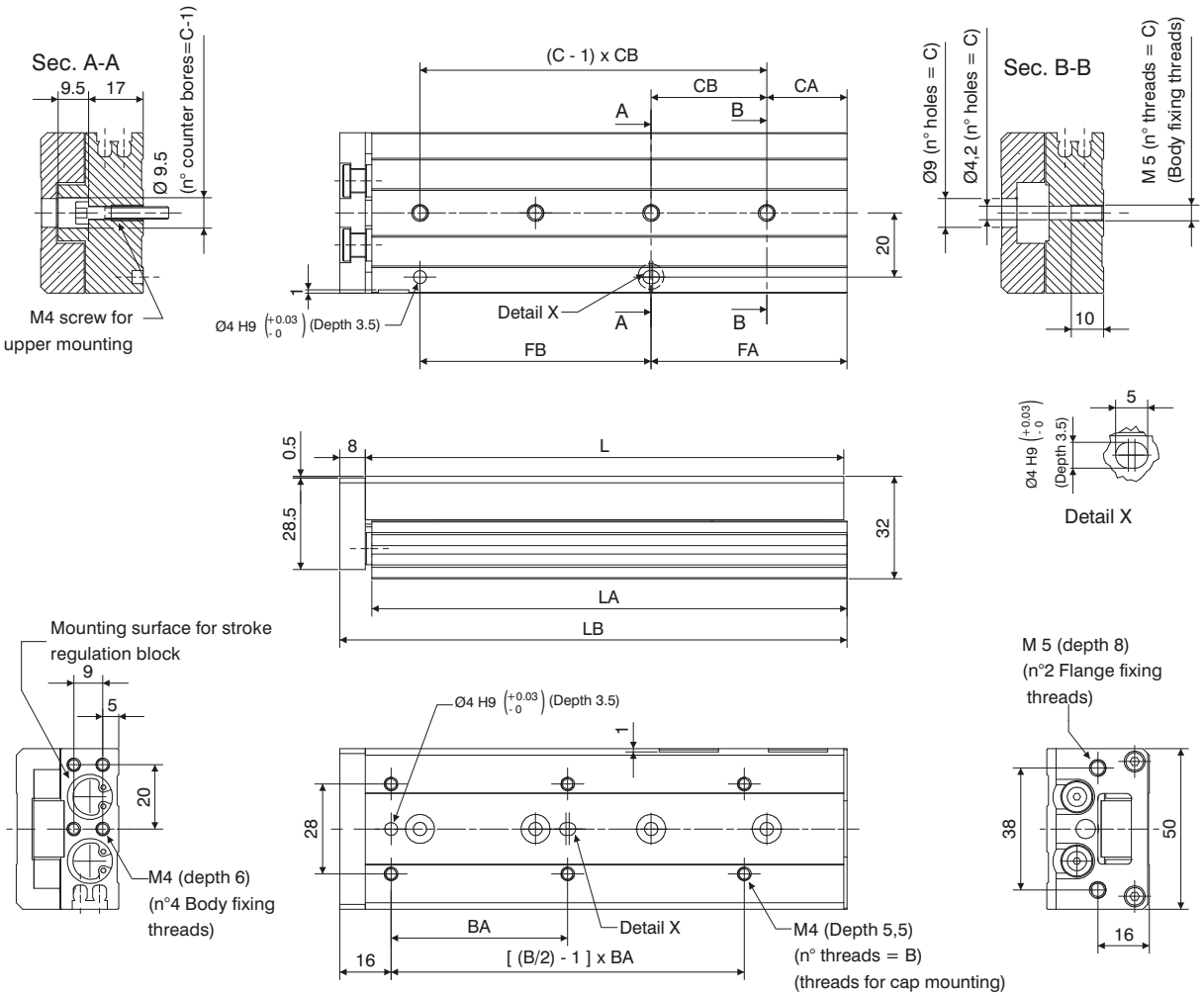


Table of dimensions

	Standard stroke						
	10	**20**	**30**	**40**	**50**	**75**	**100**
B	4				6		
BA		35		50	35	55	65
C		2		3	3	4	5
CA		15		17	15	25	35
CB		40		25	36	36	38
DA	26,5	36,5	46,5	56,5	66,5	91,5	116,5
DB	/	/	/	/	/	125,5	179,5
FA		15		42	51	61	111
FB		40		25	36	72	76
EA	10				22	43	52
EB		40		52	60	85	130
L		71		83	103	149	203
LA		70		82	102	148	202
LB		80		92	112	158	212
Weight (gr.)		325		385	480	660	890

Overall dimensions Ø16

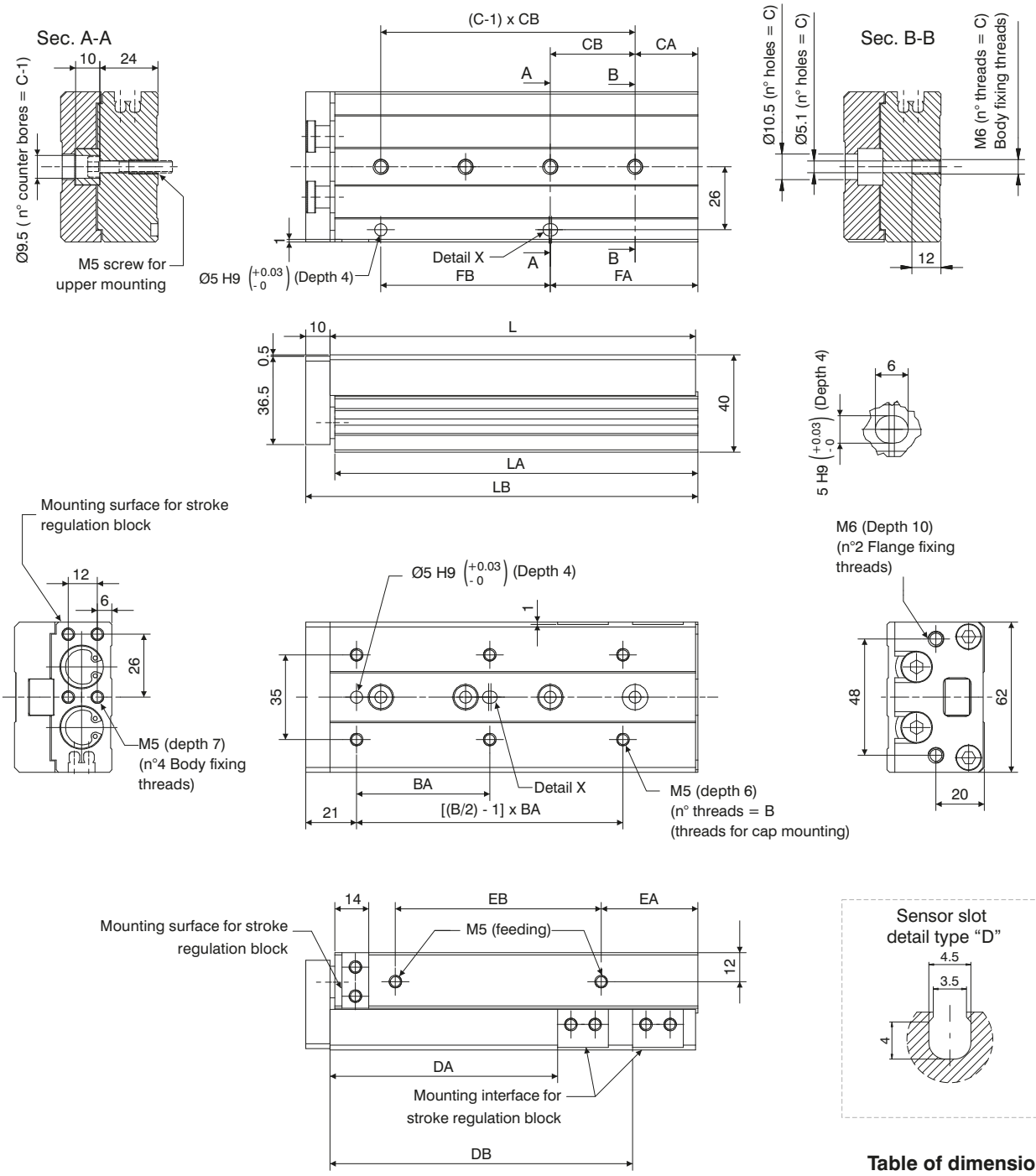


Table of dimensions

	Standard stroke							
	10	**20**	**30**	**40**	**50**	**75**	**100**	**125**
B	4	4	4	4	6	6	6	8
BA	35	35	35	40	30	55	65	70
C	2	2	2	2	3	4	5	7
CA	16	16	16	16	21	26	39	19
CB	40	40	40	50	30	35	35	35
DA	29	39	49	59	69	94	119	144
DB	/	/	/	/	/	125	173	223
FA	16	16	16	16	51	61	109	159
FB	40	40	40	50	30	70	70	70
EA	10	10	10	10	15	40	55	68
EB	40	40	40	50	60	85	118	155
L	76	76	76	86	101	151	199	249
LA	75	75	75	85	100	150	198	248
LB	87	87	87	97	112	162	210	260
Weight (gr.)	570	570	580	640	760	1090	1370	1700

Overall dimensions Ø20

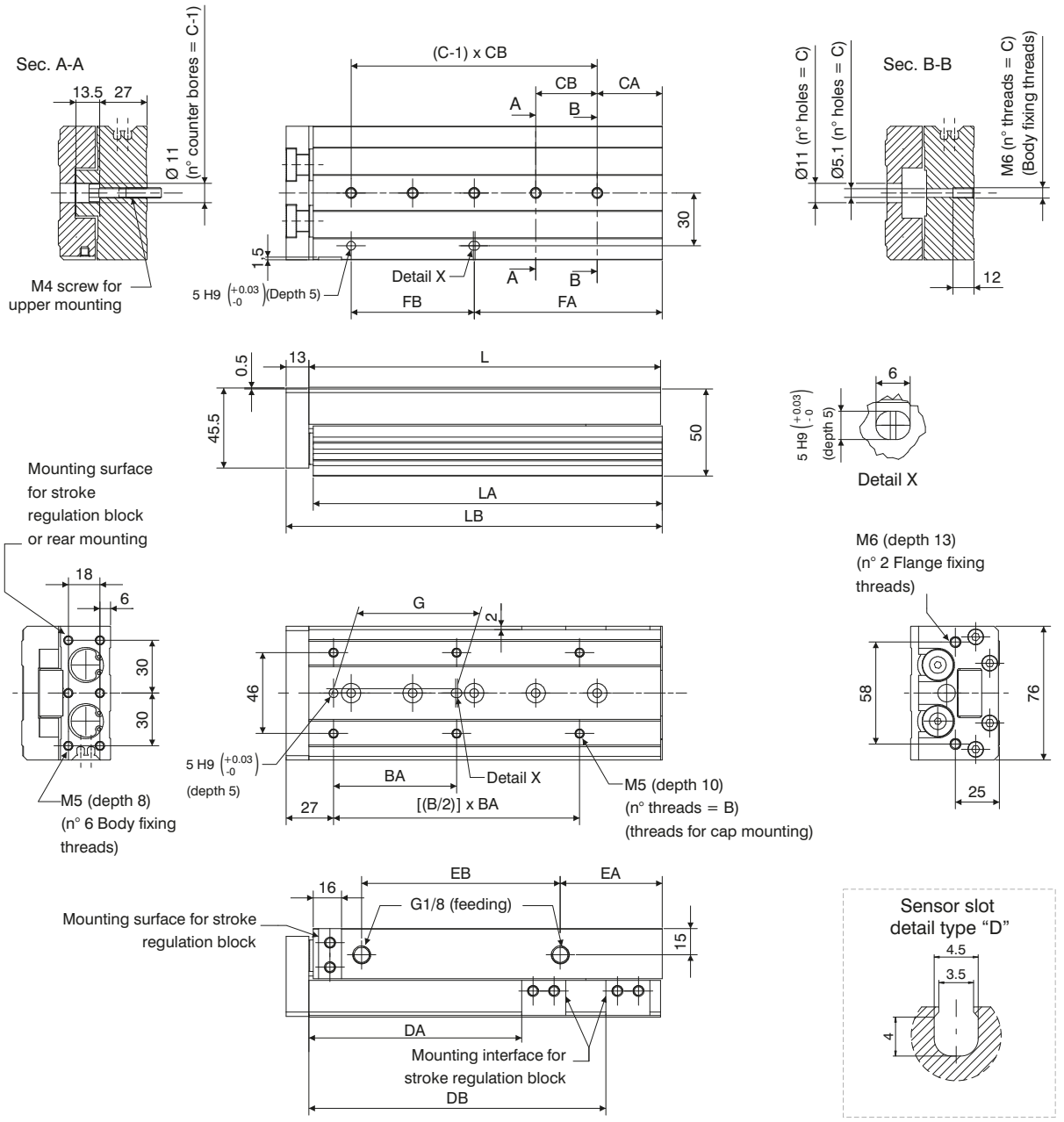


Table of dimensions

	Standard stroke								
	10	**20**	**30**	**40**	**50**	**75**	**100**	**125**	**150**
B	4	4	4	4	6	6	6	8	8
BA	50	50	50	60	35	60	70	70	80
C	2	2	2	2	3	4	5	6	7
CA	15	15	15	15	15	19	37	41	19
CB	45	45	45	55	35	35	35	38	44
DA	31	41	51	61	71	96	121	146	171
DB	/	/	/	/	/	/	169	223	275
EA	10	10	10	10	10	10	58	70	87
EB	44	44	44	54	69	108	113	155	190
FA	25	25	25	35	50	54	107	155	195
FB	35	35	35	35	35	70	70	76	88
G	40	40	40	50	35	60	70	70	80
L	83	83	83	93	108	147	200	254	306
LA	81,5	81,5	81,5	91,5	106,5	145,5	198,5	252,5	304,5
LB	97	97	97	107	122	161	214	268	320
Weight (gr.)	960	980	1010	1100	1250	1630	2150	2670	3190

Overall dimensions Ø25

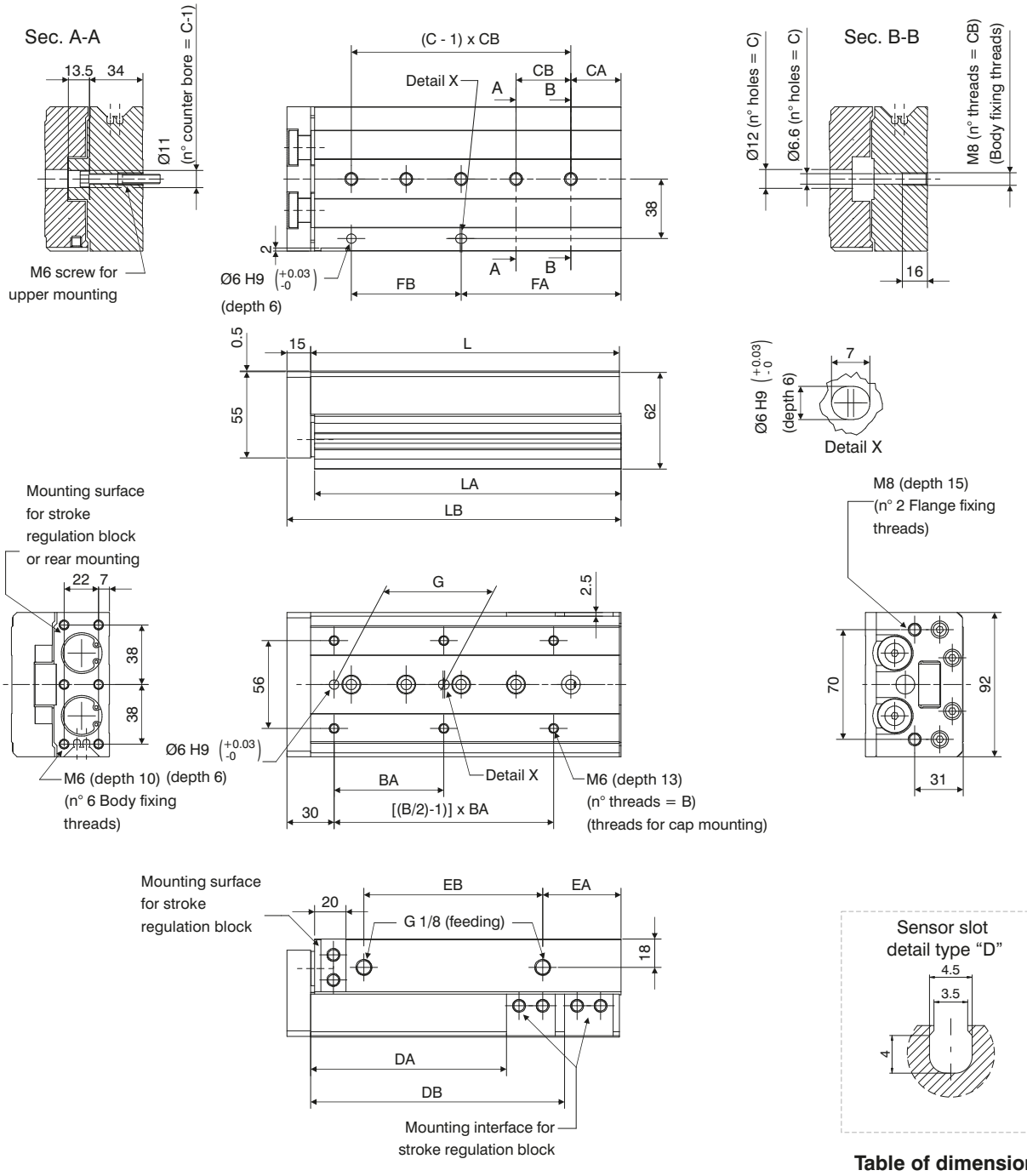
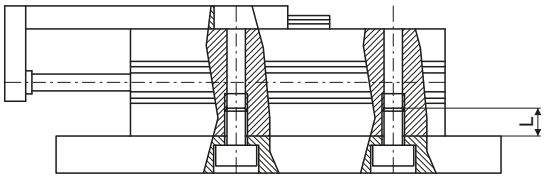


Table of dimensions

	Standard stroke								
	10	**20**	**30**	**40**	**50**	**75**	**100**	**125**	**150**
B	4	4	4	4	6	6	6	8	8
BA	50	50	50	60	35	60	70	75	80
C	2	2	2	2	3	4	5	6	7
CA	22	22	22	22	20	26	32	40	30
CB	45	45	45	55	35	35	35	38	40
DA	35	45	55	65	75	100	125	150	175
DB	/	/	/	/	/	/	162	218	258
EA	12	12	12	12	12	33	50	67	82
EB	47	47	47	57	70	90	114	155	180
FA	22	22	22	22	55	61	102	154	190
FB	45	45	45	55	35	70	70	76	80
G	40	40	40	50	35	60	70	75	80
L	92	92	92	102	115	156	197	255	295
LA	90,5	90,5	90,5	100,5	113,5	154,5	195,5	253,5	293,5
LB	108	108	108	118	131	172	213	271	311
Weight g	1660	1680	1690	1840	2090	2650	3270	4140	4710

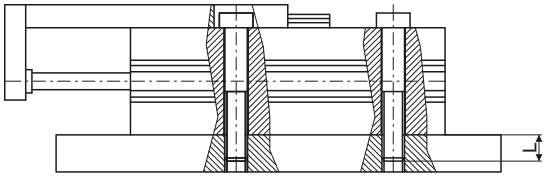
Mounting options

SIDE THREADED HOLES



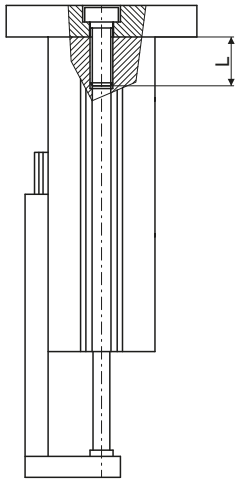
Bore	Screw	Torque (Nm)	Max. Lenght L (mm)
Ø8	M3	2,1	8
Ø12	M4	4,4	10
Ø16	M5	7,4	12
Ø20	M5	7,4	12
Ø25	M6	18	16

SIDE THROUGH HOLES



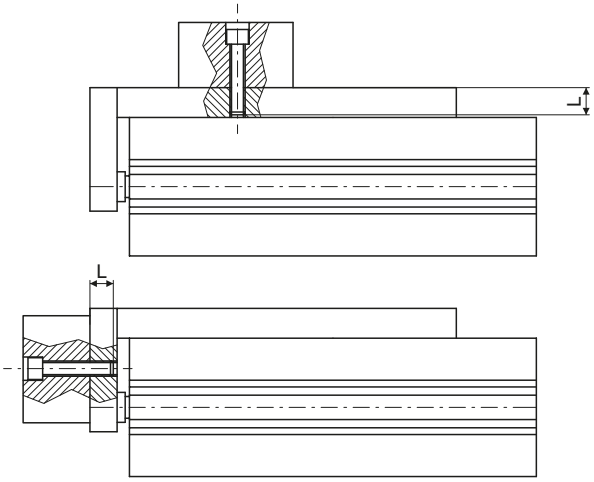
Bore	Screw	Torque (Nm)	Max. Lenght L (mm)
Ø8	M3	1,2	13
Ø12	M4	2,8	18,5
Ø16	M5	5,7	24
Ø20	M5	5,7	29
Ø25	M6	18	34

AXIAL THREADED HOLES



Bore	Screw	Torque (Nm)	Max. Lenght L (mm)
Ø8	M3	0,9	4
Ø12	M4	2,1	6
Ø16	M5	4,4	7
Ø20	M5	4,4	8
Ø25	M6	7,4	10

Mounting load



Bore	Screw	Torque (Nm)	Max. Lenght L (mm)
Ø8	M3	2,1	6
Ø12	M4	4,4	8
Ø16	M5	7,4	10
Ø20	M5	7,4	13
Ø25	M6	18	15

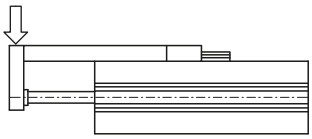
Bore	Screw	Torque (Nm)	Max. Lenght L (mm)
Ø8	M3	0,9	5
Ø12	M4	2,1	5,5
Ø16	M5	4,4	6
Ø20	M5	4,4	10
Ø25	M6	7,4	13

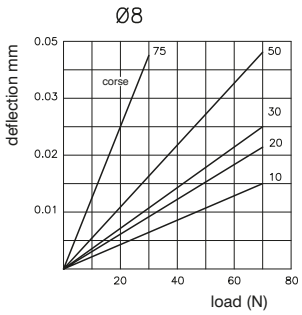
Kinetic energy (J)

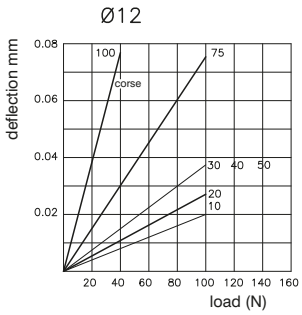
Bore	With elastic bumper	With shock absorber
Ø8	0,027	See Dampers 6900
Ø12	0,055	
Ø16	0,11	
Ø20	0,16	
Ø25	0,24	

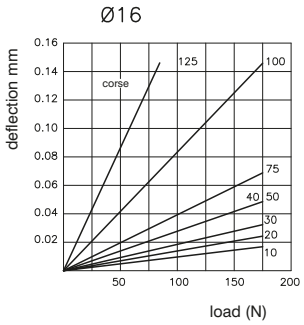
Plate deflection

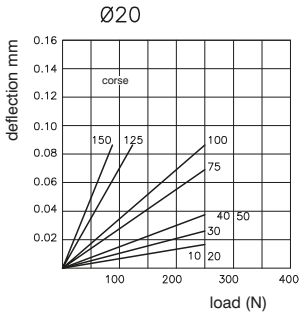
With front moment under static conditions completely extended and with load applied as indicated by the arrows.

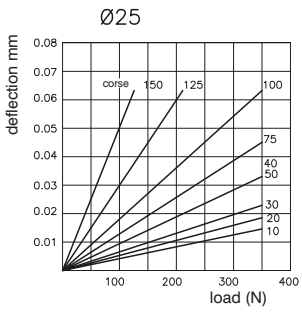




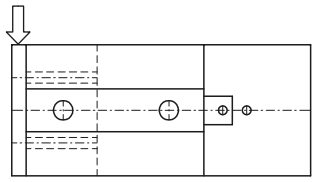


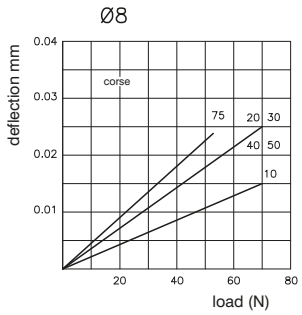


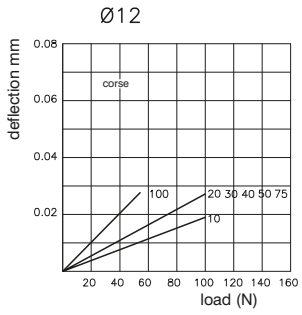


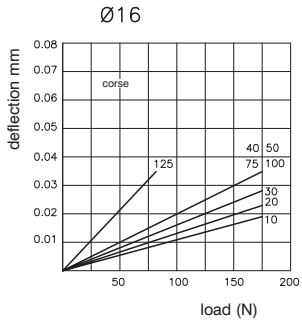


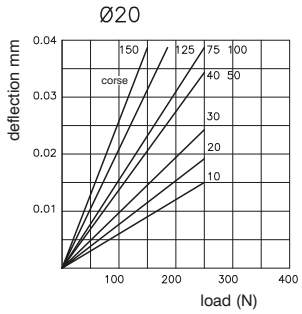
With side moment under static conditions completely extended and with load applied as indicated by the arrow

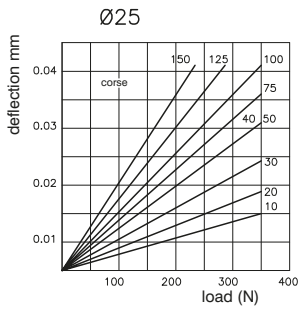




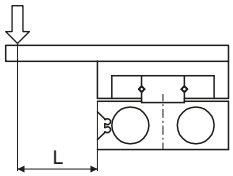


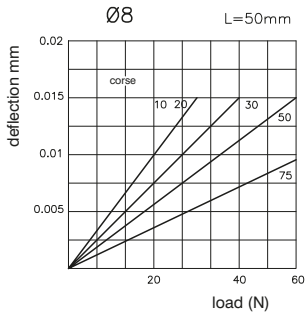


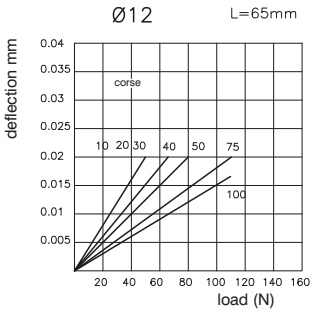


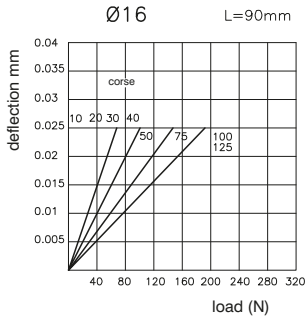


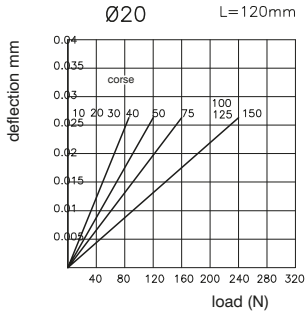
With misaligned side moment with load applied as indicated by the arrow at a distance “L” and with plate completely retracted.

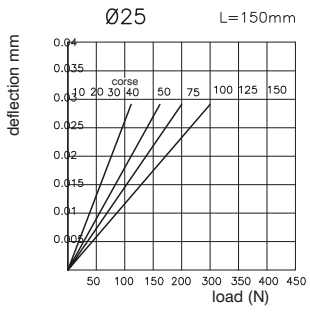






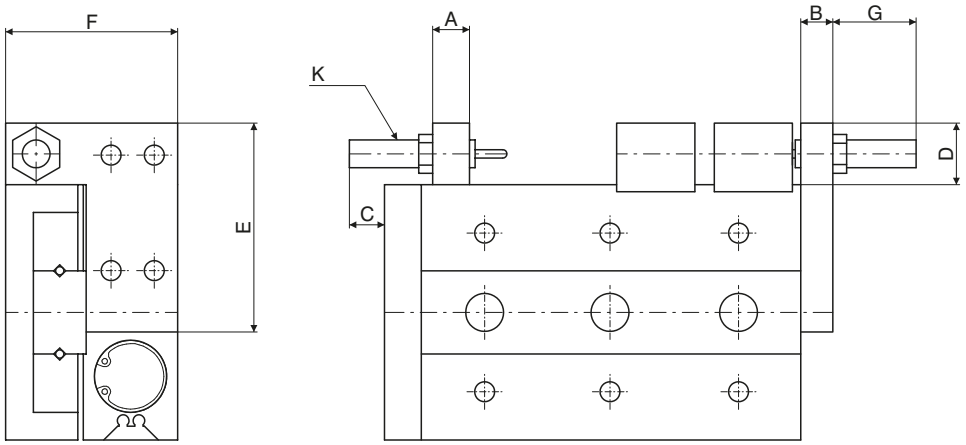




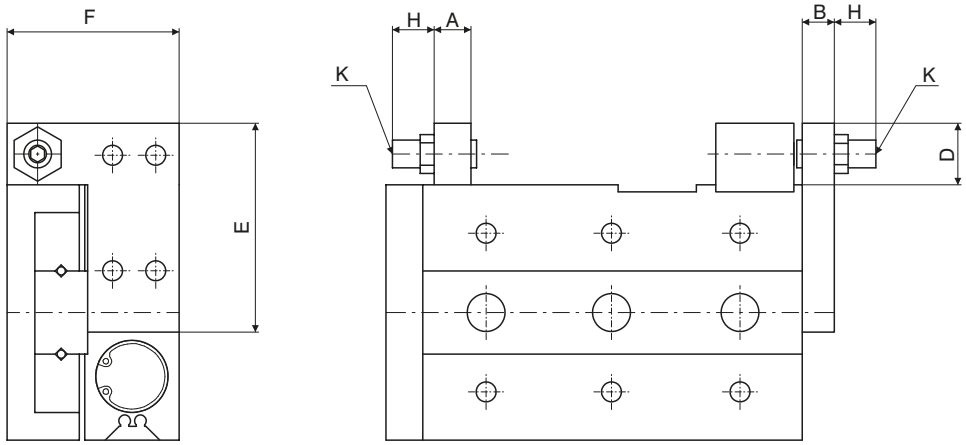


Accessories - Static moment

Dimensions with dampers



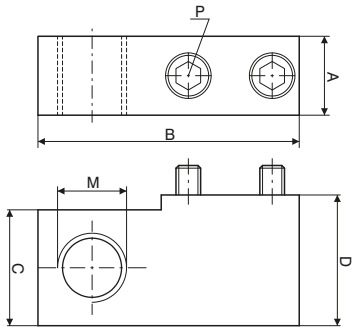
Dimensions with adjusting screw



Bore	A	B	C	D	E	F	G max.	H max.	K
Ø8	7	8	26	14,5	38,5	23	25,5	28,5	M8x1
Ø12	9,5	8	21	15	45	31,5	24,5	32	M8x1
Ø16	11	10	19	18	55	37,5	29	34,5	M10x1
Ø20	13	12	28	24,5	70	47,5	42,5	35,5	M14x1,5
Ø25	16	15	34	24,5	80	54,5	39,5	37,5	M14x1,5

Shock absorber mounting block / front stroke adjusting screw

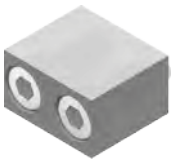
Ordering code
6600.Ø.SU

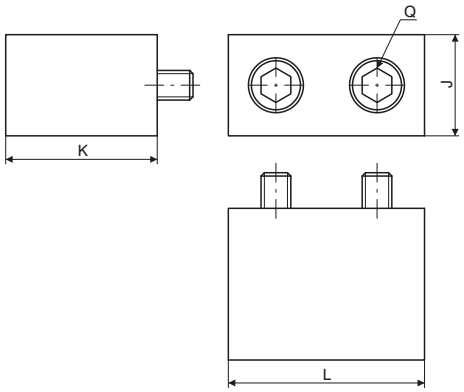


Bore	A	B	C	D	M	P
Ø8	7	23	14	15,5	M8x1	M3x16
Ø12	9,5	31	14,5	16		M4x16
Ø16	11	37	17,5	19	M10x1	M5x18
Ø20	13	45,5	23,5	26	M14x1,5	M6x25
Ø25	16	53,5		26,5		M8x25

Reference block

Ordering code
6600.Ø.SI

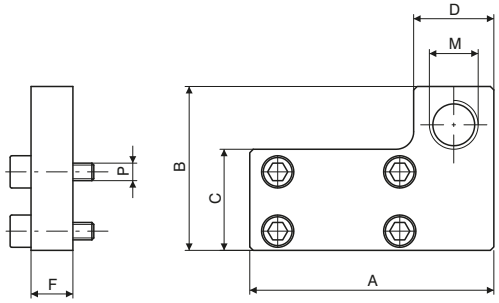




Bore	J	K	L	Q
Ø8	7	15,5	14,6	M3x16
Ø12	10	15	18,5	M4x14
Ø16	12	18,5	21	M5x18
Ø20	13	25,5	25	M6x25
Ø25	17		31	M8x25

Shock absorber mounting block / rear stroke adjusting screw

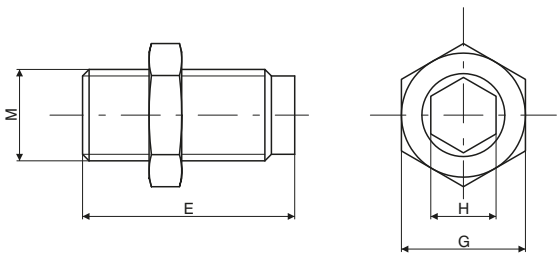
Ordering code
6600.Ø.SR



Bore	A	B	C	D	F	M	P
Ø8	38	23	12,5	14	8	M8x1	M3x12
Ø12	45	31	18				M4x12
Ø16	55	37	23,5	16	10	M10x1	M5x14
Ø20	70	47	29	23	12	M14x1,5	M5x16
Ø25	80	54	35		15		M6x20

Adjusting screw

Ordering code
6600.Ø.VR



Bore	E	G	H	M
Ø8	36,5	12	4	M8x1
Ø12	40			
Ø16	44,5	14	5	M10x1
Ø20	47,5	22	8	M14x1,5
Ø25	52,5			

Series 6200 - Twin-rod slide units

General

TWIN-ROD SLIDE UNITS SERIES 6200 AND 6210

The 6200 series twin-rod linear guide units are wide cylinders used in manipulation applications and are characterised by their high force output thanks to their double piston design.
Bores range from 10mm to 32mm diameter, with sintered bronze bearings for standard applications and linear ball bearings for more rugged applications.
One major characteristic of these cylinders is the precision of their anti-rotational design, with the possibility of regulating the stroke to within 0.5mm.
When using magnetic sensors, the 1580 series sensor sits entirely within the extrusion, resulting in a smooth profile.

The liner guided units range includes , alongside the conventional two rod version with flange series 6200 , also the through rod version with twin flanges series 6210

Thanks to the twin-rod, double yoke design of the 6210 series it is possible to either fix the body and use the ends of the rods, or alternatively to fix the rod ends and use the body as the moving part. The cylinder can be piped through the body or through the rods depending on the application.
Stroke limiting screws are fitted at either end of the stroke. The substitution of these screws with shock absorbers makes it possible to use the cylinder on higher velocity applications (up to 500mm/sec.) Slots are provided along the edge of these units to accommodate 1580 series miniature sensors.

Twin-rod slide units

Ordering code

6200.Ø.stroke. _

- Ø: **10**, **15**, **20**, **25**, **32**
- **B** = Control unit with bronze bush
- **C** = Control unit with bearing bush

Construction characteristics

Body	anodised aluminium
Rods	C43 chromed steel (control unit with bronze bush) tempered and chromed steel (control unit with bearing bush)
Piston	aluminium
Rod bushing	brass
End cap	anodised aluminium
Piston seal	oil resistant NBR rubber
Piston rod seal	PUR
Plate	anodised aluminium

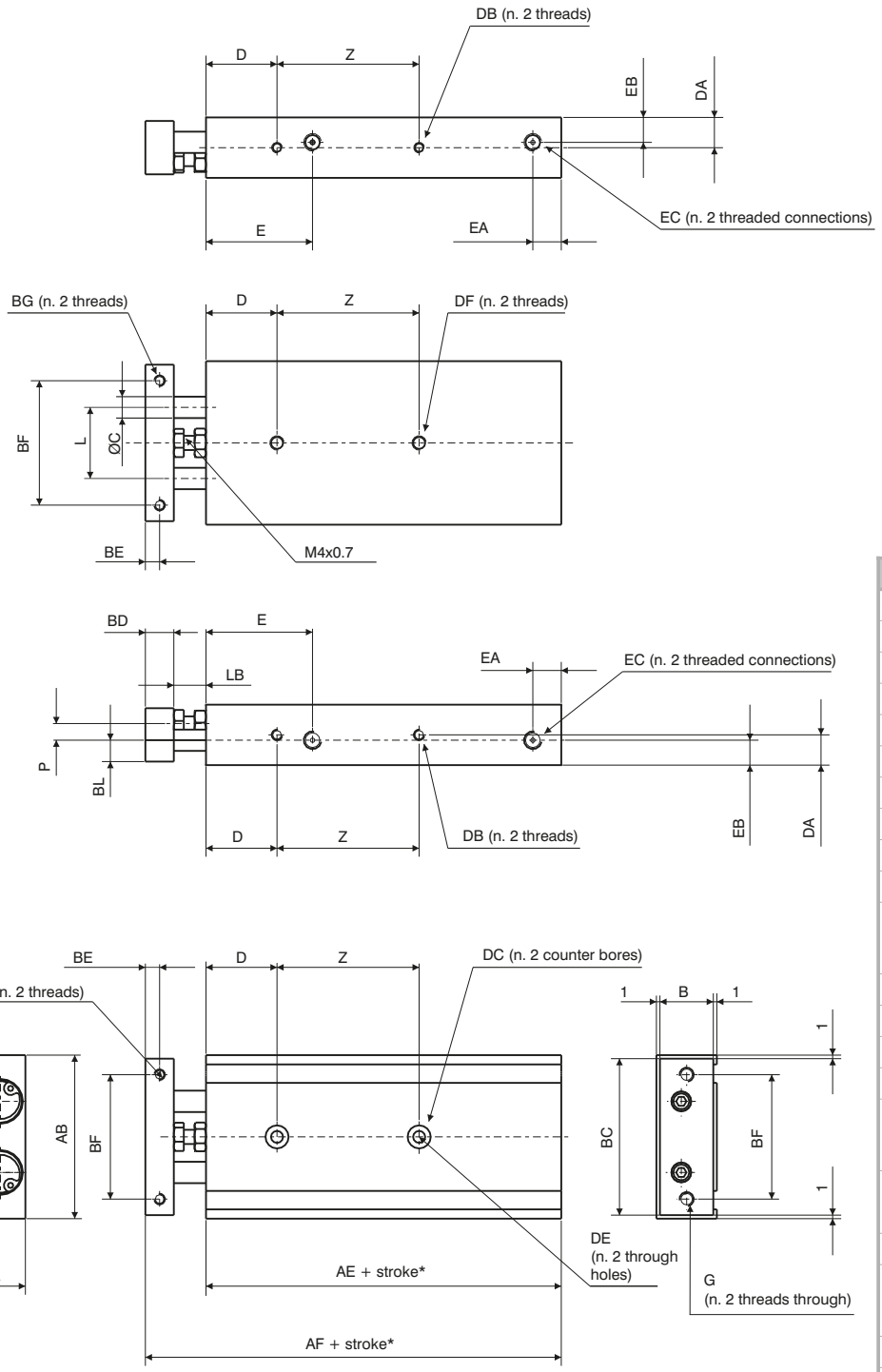
Operational characteristics

Function	double acting
Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Max. pressure	7 bar
Working temperature	-5°C - +70°C
Cushioning	elastic bumper

Standard strokes

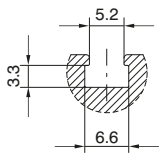
Bore	Stroke														
	10	15	20	25	30	35	40	45	50	60	70	75	80	90	100
Ø10	●	●	●	●	●	●	●	●	●	●	●	●			
Ø15	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ø20	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ø25	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ø32	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Overall dimensions Ø10 - Ø15



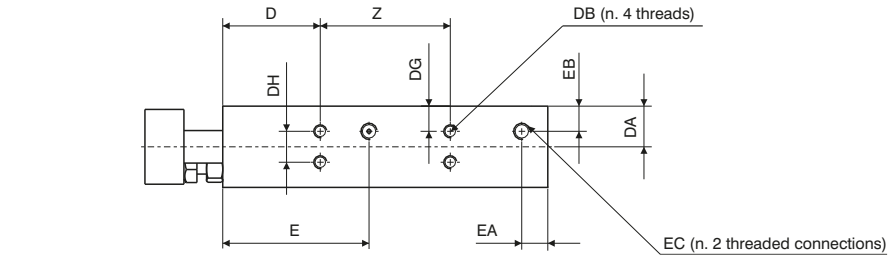
*Dimensions only refer to the "standard stroke"

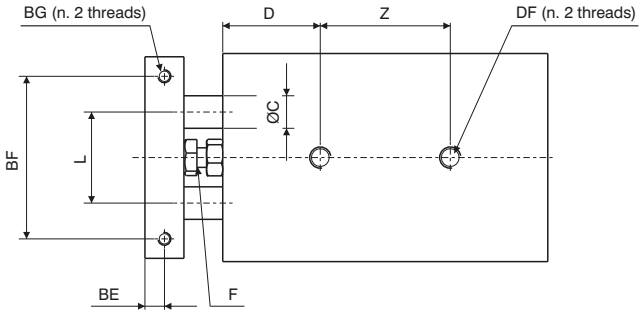
Sensor slot
detail type “B”

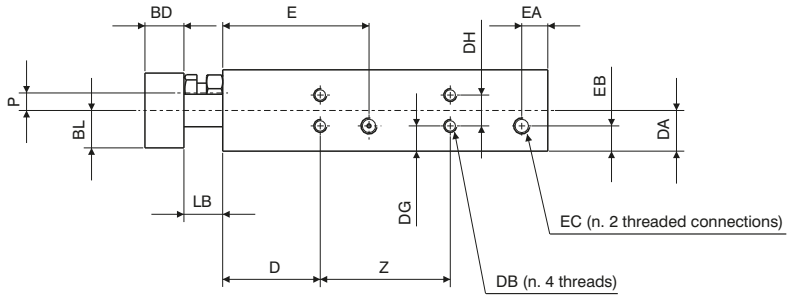


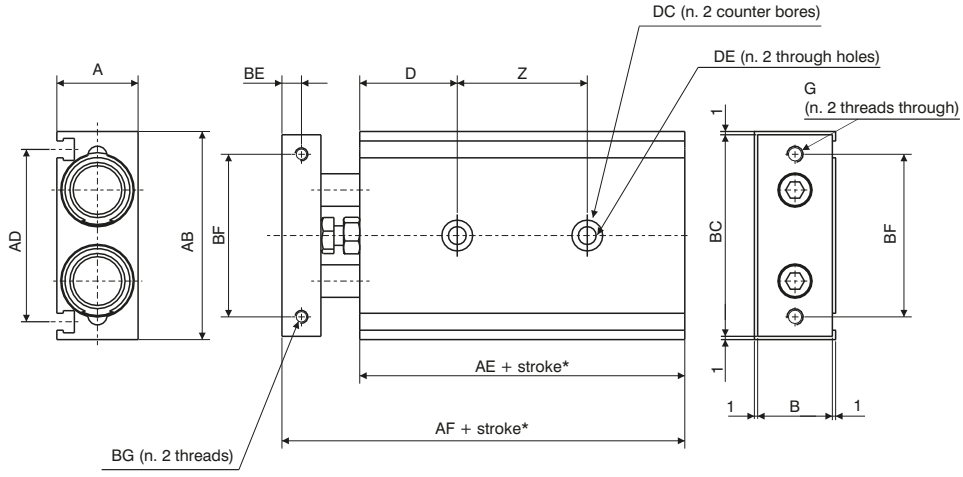
Bore		Ø10	Ø15
A		17	20
AB		46	58
AD		35,6	48
AE		55	60
AF		72	79
B		15	18
BC		44	56
BD		8	10
BE		4	5
BF		35	45
BG		M3x0,5	M4x0,7
	Useful depth	5	6
BL		6	9
C		6	8
D		20	30
DA		8,5	10
DB		M3x0,5	M4x0,7
	Useful depth	4,5	5
DC		6,5	8
	depth	3,3	4,4
DE		3,4	4,3
DF		M4x0,7	M5x0,8
	Useful depth	7	8
E		30	38,5
EA		8	8
EB		7	10
EC		M5x0,8	M5x0,8
	Useful depth	4,5	4,5
F		M4x0,7	M4x0,7
G		M4x0,7	M5x0,8
L		20	25
LB		9	9
P		4,7	4,5
Z	stroke 10 - 25	30	25
	stroke 30 - 50	40	35
	stroke 60 - 75	50	45
	stroke 80	-	45
	stroke 90-100	-	55

Overall dimensions Ø20 - Ø25 - Ø32



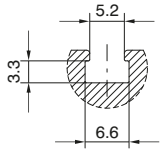






*Dimensions only refer to the "standard stroke"

Sensor slot
detail type “B”



Bore		Ø20	Ø25	Ø32
A		25	30	38
AB		64	80	98
AD		53	64	76
AE		70	72	82
AF		94	96	112
B		23	28	36
BC		62	78	96
BD		12	12	16
BE		6	6	8
BF		50	60	75
BG		M4x0,7	M5x0,8	M5x0,8
	Useful depth	6	7,5	8
BL		11,5	14	18
C		10	12	16
D		30	30	30
DA		12,5	15	19
DB		M4x0,7	M5x0,8	M5x0,8
	Useful depth	6	7,5	7,5
DC		9,5	11	11
	depth	5,3	6,3	6,3
DE		5,5	6,9	6,9
DF		M6x1	M8x1,25	M8x1,25
	Useful depth	10	12	12
DG		7,75	8,5	9
DH		9,5	13	20
E		45	46	56
EA		8	9	10
EB		7,75	15	19
EC		M5x0,8	G1/8	G1/8
	Useful depth	4,5	6,5	6,5
F		M6x1	M6x1	M8x1,25
G		M5x0,8	M6x1	M6x1
L		28	35	44
LB		12	12	14
P		5,4	7,8	12
Z	stroke 10 - 25	30	30	40
	stroke 30 - 50	40	40	50
	stroke 60 - 100	60	60	70

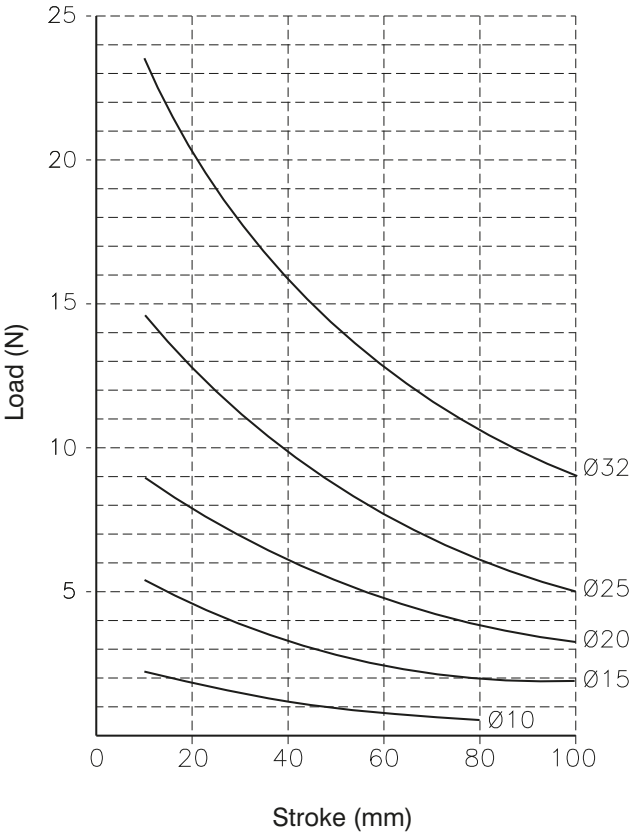
Operating instructions

	Bore									
	Ø10		Ø15		Ø20		Ø25		Ø32	
Stroke	**Control unit with bronze bush**								**Weight g**	
10	150		250		400		610		1150	
15	160		265		420		635		1190	
20	170		280		440		660		1230	
25	180		290		460		690		1275	
30	190		300		480		720		1320	
35	200		315		495		745		1360	
40	210		330		510		770		1400	
45	220		345		530		800		1450	
50	230		360		550		830		1490	
60	250		390		585		890		1580	
70	270		420		620		950		1665	
75	280		435		640		970		1710	
80			450		660		995		1755	
90			480		700		1060		1840	
100			510		740		1000		1930	
Stroke	**Control unit with bearing bush**									
10	160		270		430		620		1160	
15	165		285		445		645		1205	
20	170		300		460		670		1250	
25	180		310		480		700		1295	
30	190		320		500		730		1340	
35	200		335		515		755		1380	
40	210		350		530		780		1420	
45	220		365		550		810		1465	
50	230		380		570		840		1510	
60	250		410		605		895		1595	
70	270		440		640		955		1680	
75	280		455		660		980		1720	
80			470		680		1005		1765	
90			500		715		1065		1855	
100			530		750		1110		1940	
Working pressure									**Theoretical slide force**	
1 bar	16	10	35.5	25	63	47	98	75.5	161	120.5
1.5 bar	23.5	15	53	38	94	62.5	147.5	113.5	241	181
2 bar	31.5	20.0	70.5	50.5	125.5	94	196.5	151	321.5	241
3 bar	47	30	106	75.5	188.5	141	294.5	227	482.5	362
4 bar	63	40	141	101	251	188	393	302.5	643	482.5
5 bar	78.5	50	176.5	126	314	236	491	378	804	603
6 bar	94	60	212	151	377	283	589	453.5	965	723.5
7 bar	110	70	247	176.5	440	330	687.5	529	1125.6	844
	Out	In	Out	In	Out	In	Out	In	Out	In

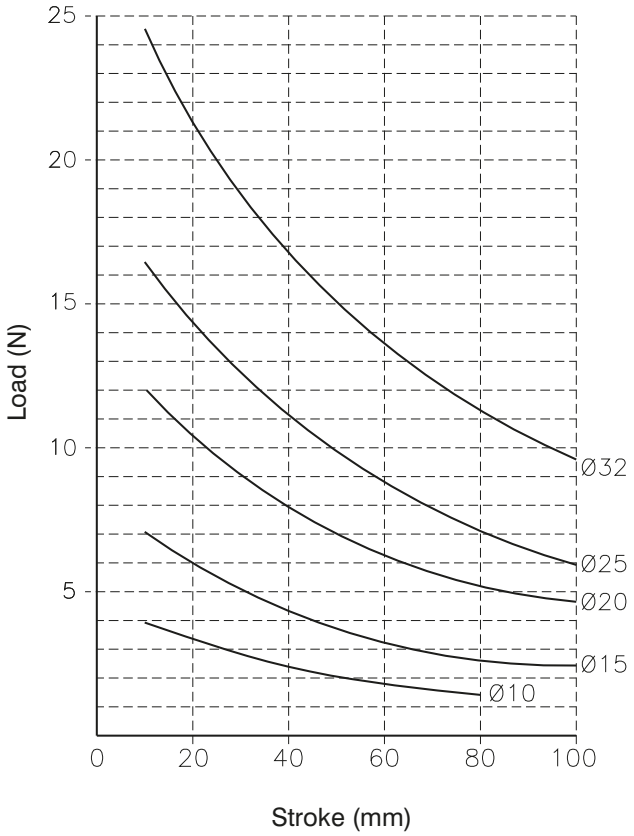
Operating instructions

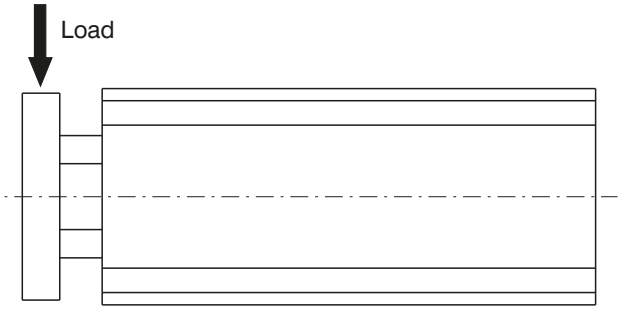
Possible loads

Control unit with bronze bush



Control unit with bearing bush





Twin-rod slide units

Ordering code

6200.Ø.stroke. _

- Ø: **10**, **15**, **20**, **25**, **32**
- **B** = Control unit with bronze bush
- **C** = Control unit with bearing bush

Construction characteristics

Body	anodised aluminium
Rods	C43 chromed steel (control unit with bronze bush) tempered and chromed steel (control unit with bearing bush)
Piston	aluminium
Rod bushing	brass
End plate	anodised aluminium
Piston seal	oil resistant NBR rubber
Piston rod seal	PUR
Plate	anodised aluminium

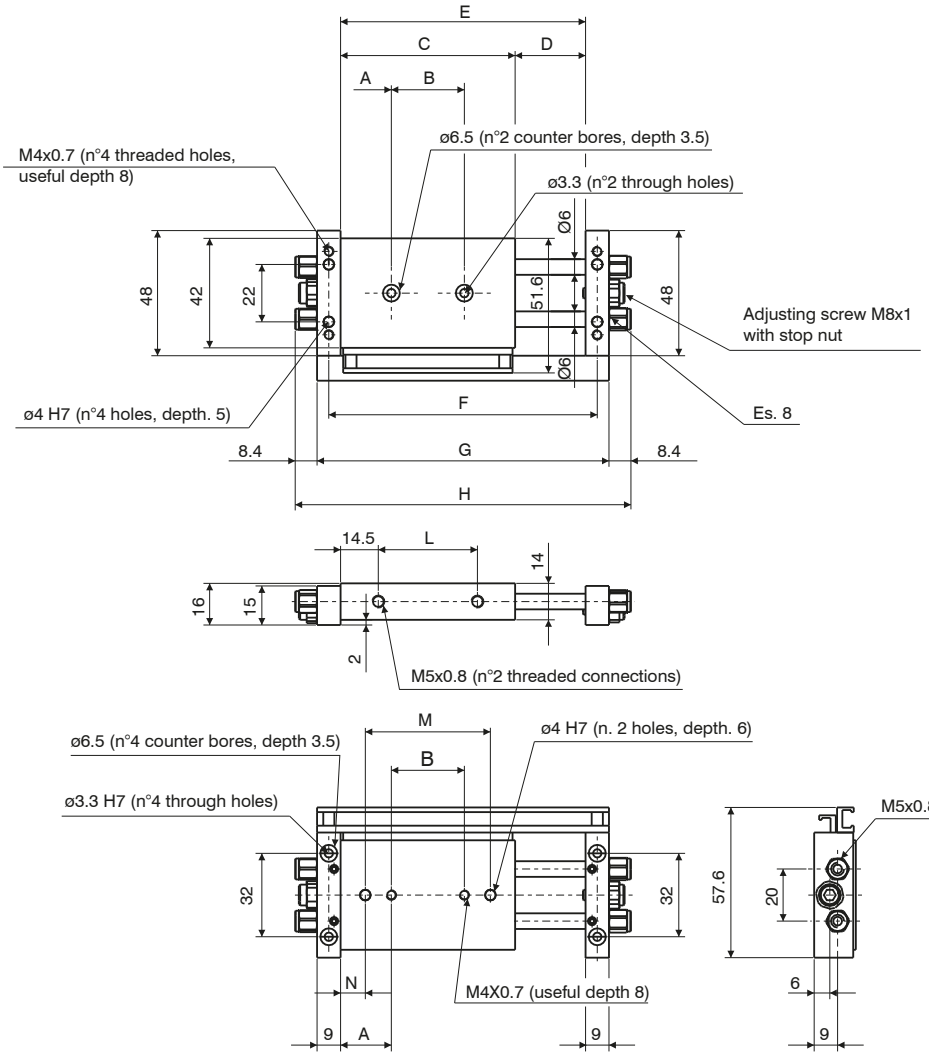
Technical characteristics

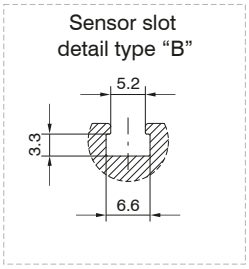
Function	double acting
Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Max. pressure	7 bar
Working temperature	-5°C - +70°C
Cushioning	elastic bumper

Standard strokes

Bore	Stroke														
	10	15	20	25	30	35	40	45	50	60	70	75	80	90	100
Ø10	●	●	●	●	●	●	●	●	●	●	●	●			
Ø15	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ø20	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ø25	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ø32	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

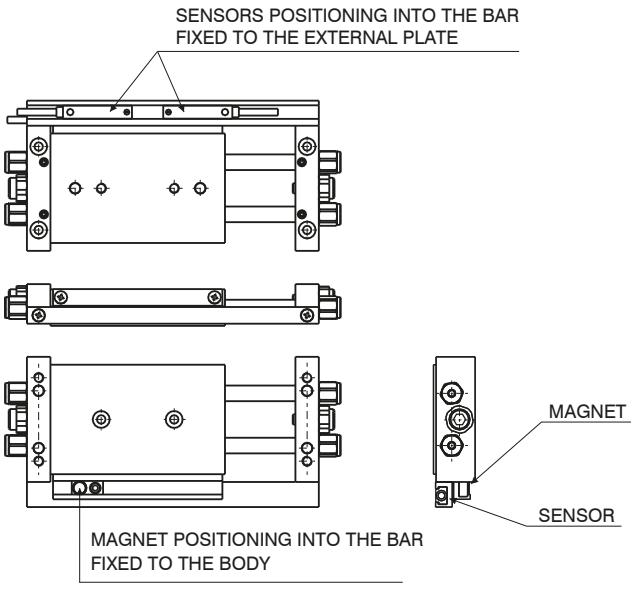
Overall dimensions Ø10



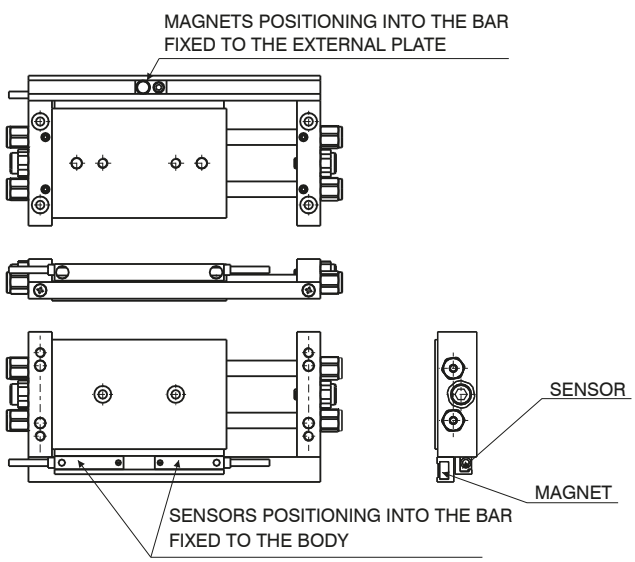


Stroke	25	50	75	100
A	19,5	30	35	35
B	28	32	47	72
C	67	92	117	142
D	27	52	77	102
E	94	144	194	244
F	103	153	203	253
G	112	162	212	262
H	129	179	229	279
L	38	63	88	113
M	48	52	67	92
N	9,5	20	25	25
				Weight
g	160	230	280	310

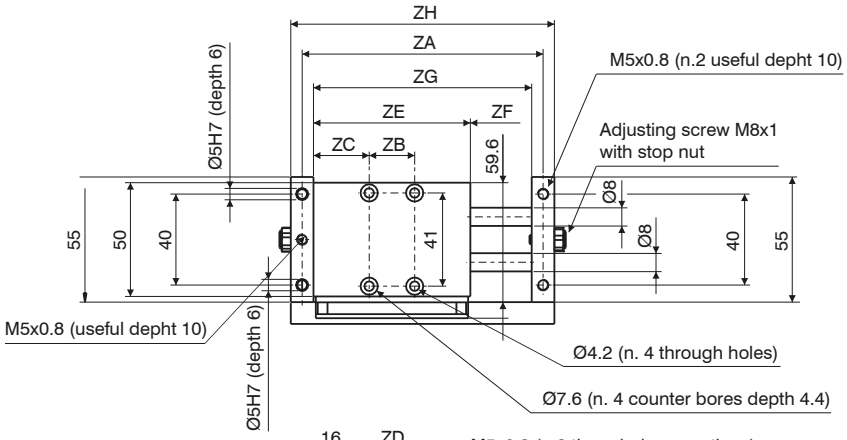
MOUNTING WITH FIXED PLATE

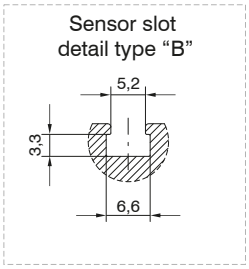


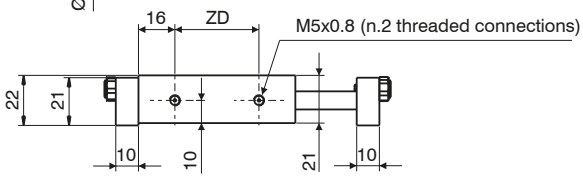
MOUNTING WITH A FIXED BODY

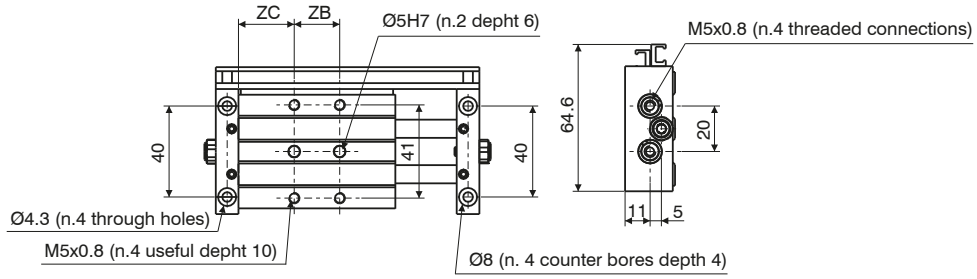


Overall dimensions Ø15



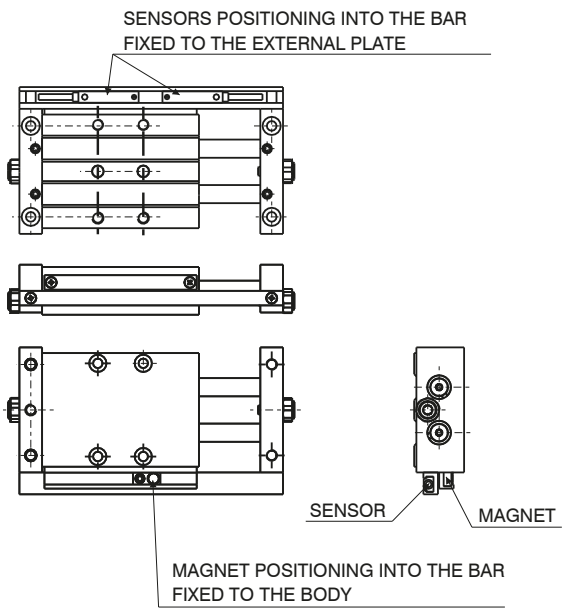




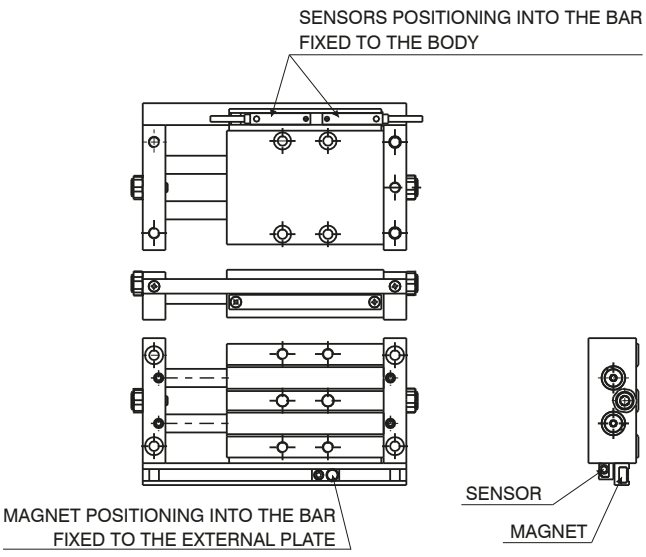


Stroke	25	50	75	100	125	150	175	200
ZA	106	156	206	256	306	356	406	456
ZB	20	45	65	90	90	90	90	90
ZC	24,5	24,5	27	27	39,5	52	64,5	77
ZD	37	62	87	112	137	162	187	212
ZE	69	94	119	144	169	194	219	244
ZF	27	52	77	102	127	152	177	202
ZG	96	146	196	246	296	346	396	446
ZH	116	166	216	266	316	366	416	466
								Weight
g	240	350	450	550	670	750	900	1000

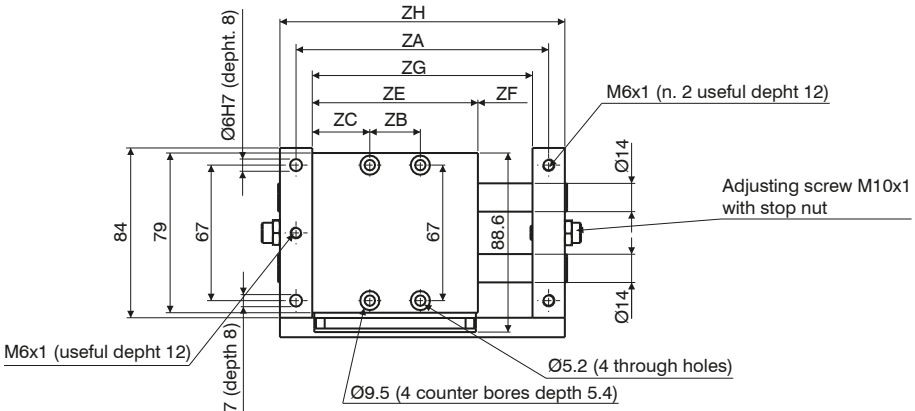
MOUNTING WITH FIXED PLATE

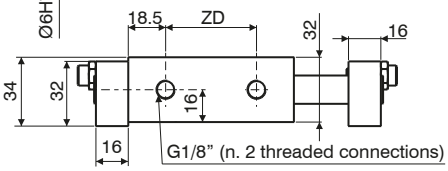


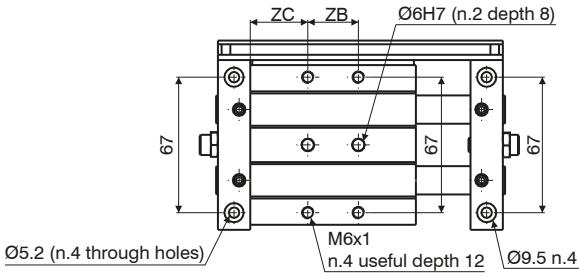
MOUNTING WITH FIXED BODY

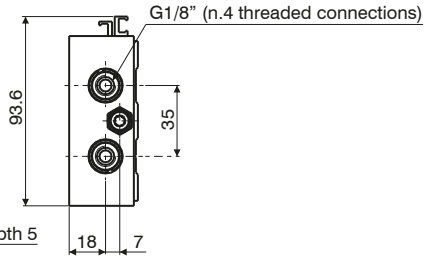


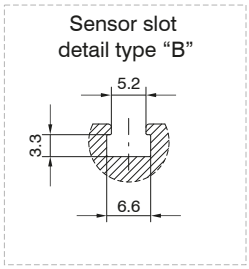
Overall dimensions Ø25





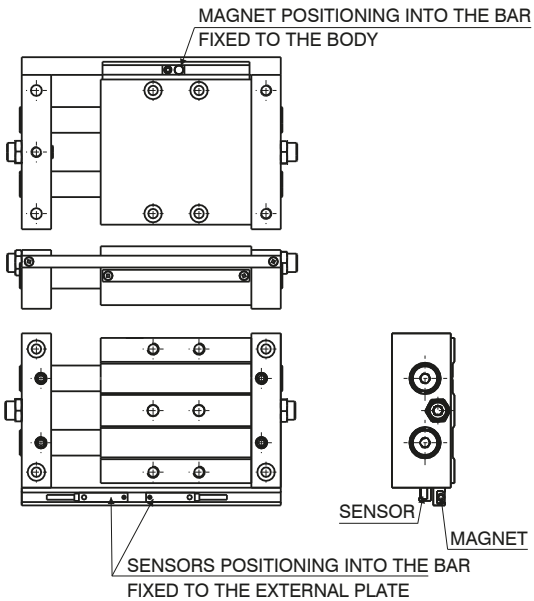




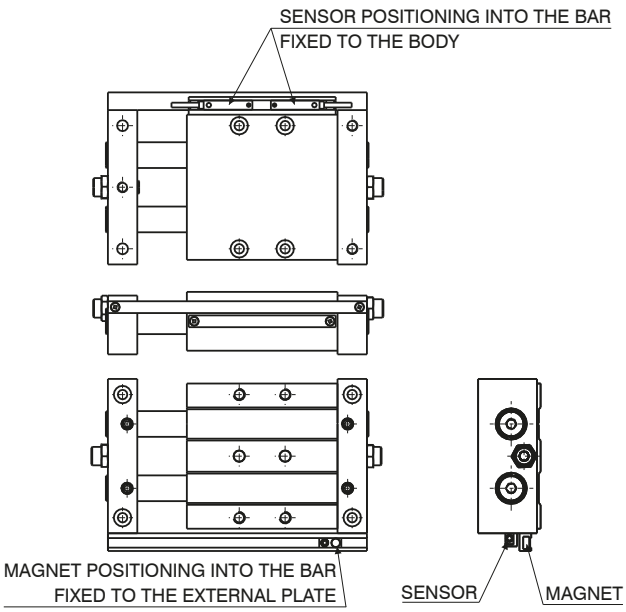


Stroke	25	50	75	100	125	150	175	200
ZA	125	175	225	275	325	375	425	475
ZB	25	45	65	90	90	90	90	90
ZC	28,5	31	33,5	33,5	46	58,5	71	83,5
ZD	45	70	95	120	145	170	195	220
ZE	82	107	132	157	182	207	232	257
ZF	27	52	77	102	127	152	177	202
ZG	109	159	209	259	309	359	409	459
ZH	141	191	241	291	341	391	441	491
								Weight
g	950	1140	1350	1600	1800	2000	2300	2500

MOUNTING WITH FIXED PLATE



MOUNTING WITH FIXED BODY



Operating conditions

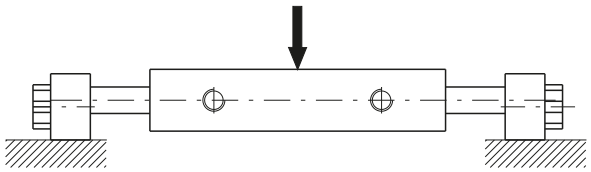
Theoretical force (N)

Working pressure	Bore		
	Ø10	Ø15	Ø25
2 bar	20	41	119
3 bar	30	62	179
4 bar	40	83	239
5 bar	51	104	299
6 bar	61	124	358
7 bar	71	145	418
8 bar	81	166	478
9 bar	91	186	537
	101	207	597
	Effective area (mm^2)		

Deflection of piston rods

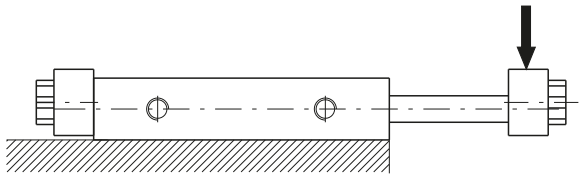
Applied load to body centre

Bore	Load	Deflection (mm)	
Ø10	10 N	0,07	/
Ø15	30 N	0,08	0,28
Ø25	60 N	0,02	0,08
		100	200
		Stroke	

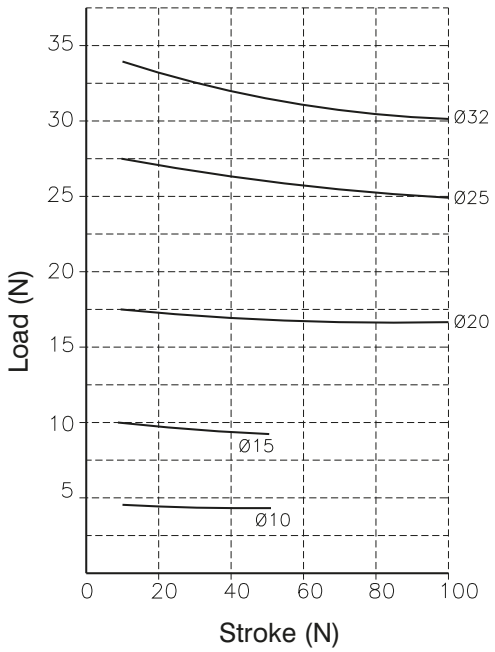


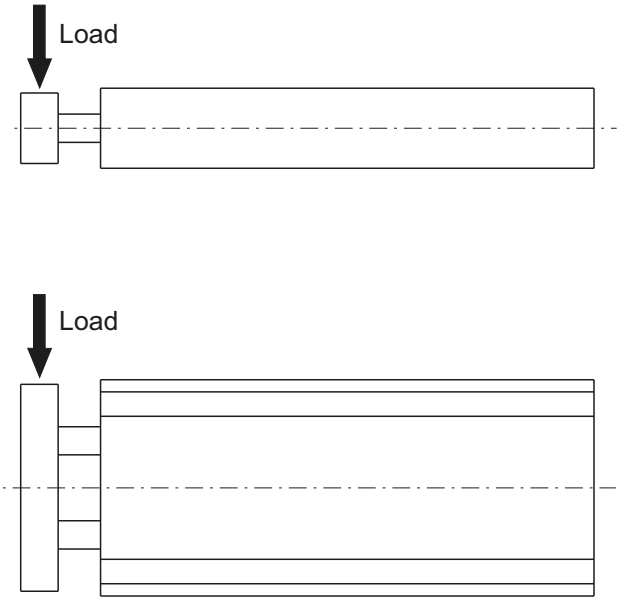
Applied load to body centre

Bore	Load	Deflection (mm)			
Ø10	3 N	0,06	0,3	/	/
Ø15	5 N	0,1	0,2	0,5	1
Ø25	10 N	0,03	0,1	0,15	0,25
		50	100	150	200
		Stroke			



Control unit with bronze bushes





Guide cylinders

Ordering code

6700.Ø.stroke

- 10
- 16
- 20

Construction characteristics

Body	anodised aluminium
Piston rod	stainless steel
Piston	aluminium
Piston rod bushing	aluminium
End cap	anodised aluminium
Seals	oil resistant NBR rubber
Table	anodised aluminium

Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Working pressure	1.2 - 7 bar
Working temperature	-5°C - +70°C
Cushioning	with elastic bumper

Standard strokes

	Stroke								
Bore	**5**	**10**	**15**	**20**	**25**	**30**	**40**	**50**	**60**
Ø10	●	●	●	●	●	●	●	●	●
Ø16	●	●	●	●	●	●	●	●	●
Ø20	●	●	●	●	●	●	●	●	●

Theoretical force

Bore	**Effective area (mm²)**		**Force (N)**					
Ø10	Out	28,3	5,7	8,5	11,3	14,2	17	19,8
	In	21,2	4,2	6,4	8,5	10,6	12,7	14,8
Ø16	Out	78,5	15,7	23,6	31,4	39,3	47,1	55
	In	66	13,2	19,8	26,4	33	39,6	46,2
Ø20	Out	314	62,8	94,2	125,6	157	188,4	219,8
	In	264	52,8	79,2	105,6	132	158,4	184,8
			2	3	4	5	6	7
			Working pressure (bar)					

Overall dimensions - Ø10

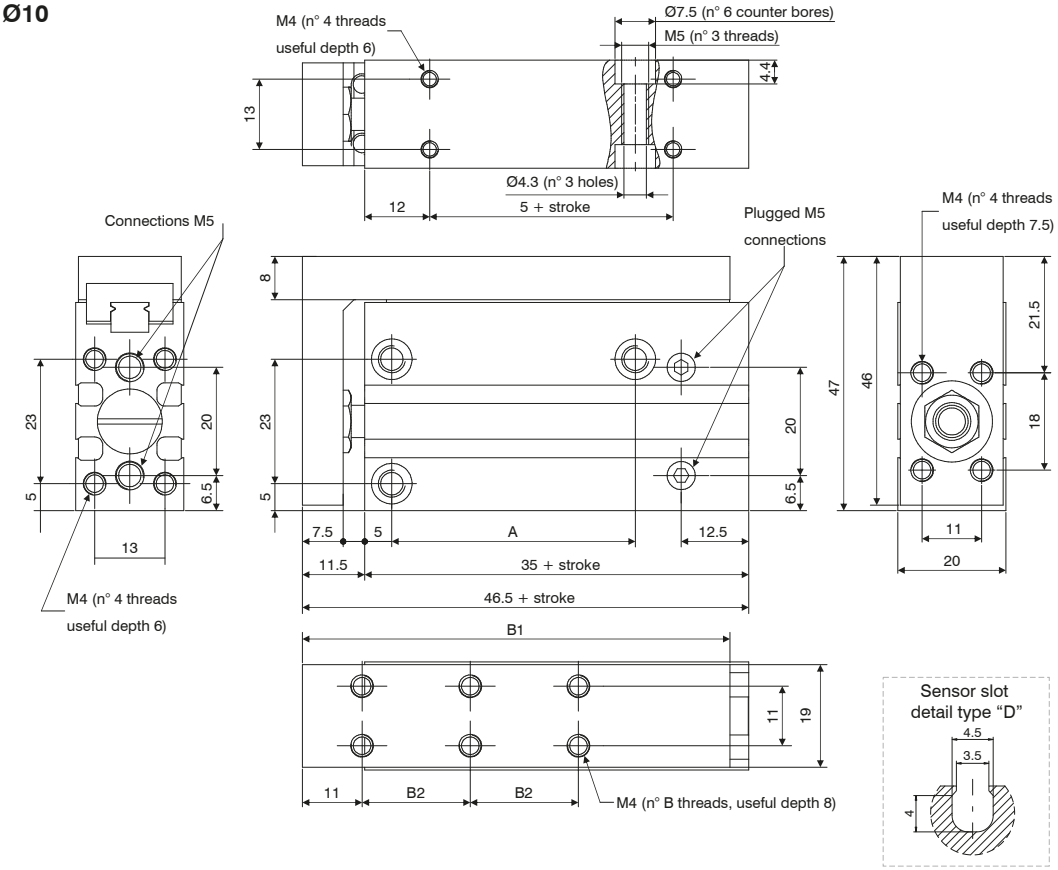


Table of dimensions

	Standard strokes								
	5	**10**	**15**	**20**	**25**	**30**	**40**	**50**	**60**
A	14		24		30		45	45	60
B1	49		59		69		79	79	99
B2	10		20		30		20	20	30
B	4						6		
Weight (g)	117	125	140	148	162	170	192	215	238

Overall dimensions - Ø16

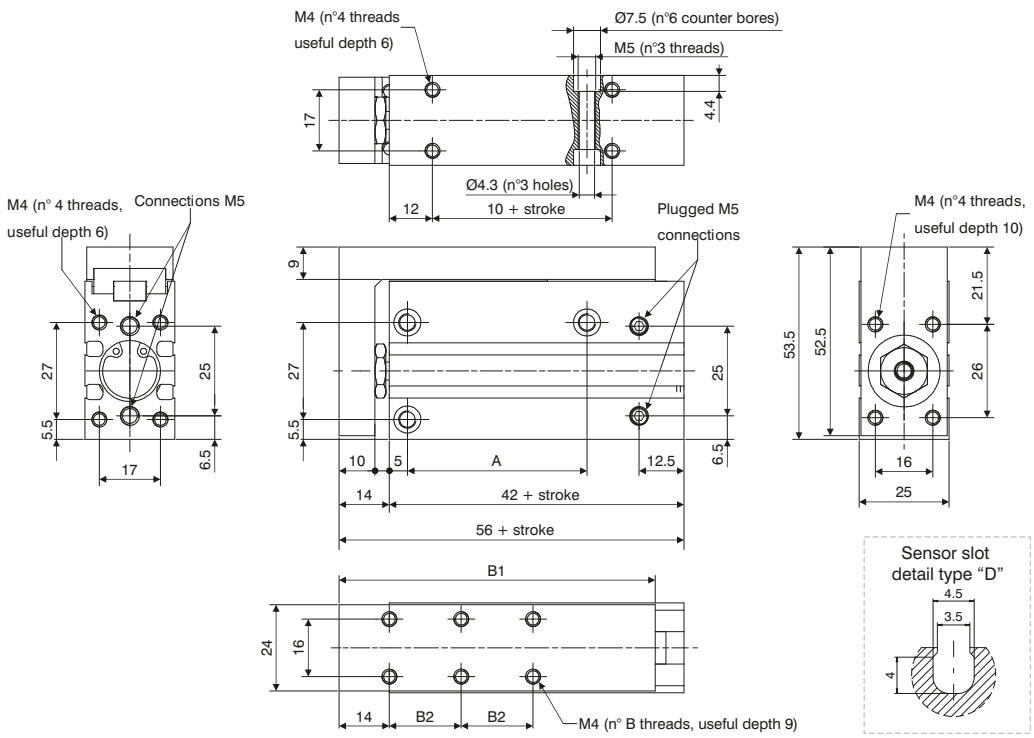


Table of dimensions

	Standard strokes								
	5	10	15	20	25	30	40	50	60
A	20		30		40		50	60	
B1	58		68		78		88	98	108
B2	10		20		30		20	25	30
B	4						6		
Weight (g)	215	230	250	260	280	290	325	350	390

Overall dimensions - Ø20

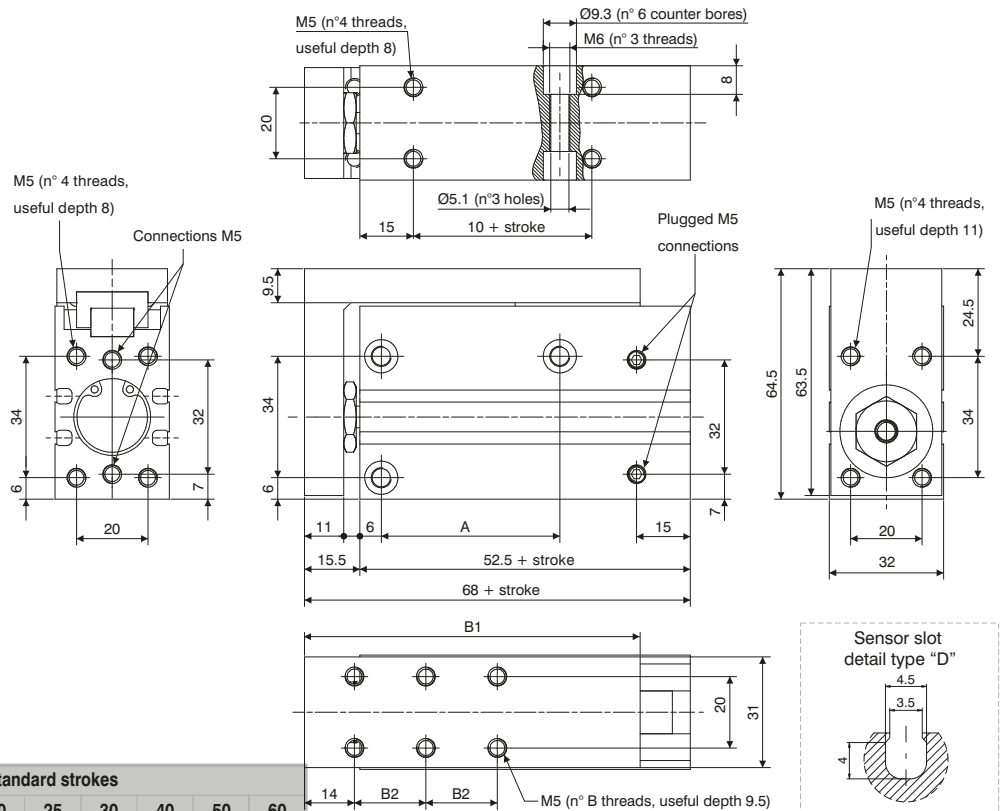
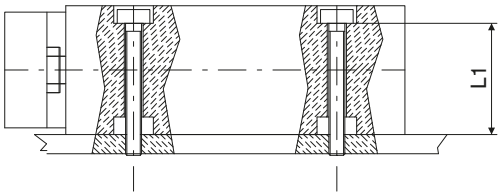


Table of dimensions

	Standard strokes								
	5	10	15	20	25	30	40	50	60
A	20		25		40		50	70	
B1	64		74		84		94	104	114
B2	10		20		30		20	25	30
B	4						6		
Weight (g)	440	455	490	505	540	560	600	660	700

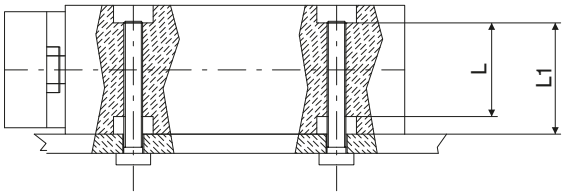
Fixing - Load

LATERAL (THROUGH SCREW)



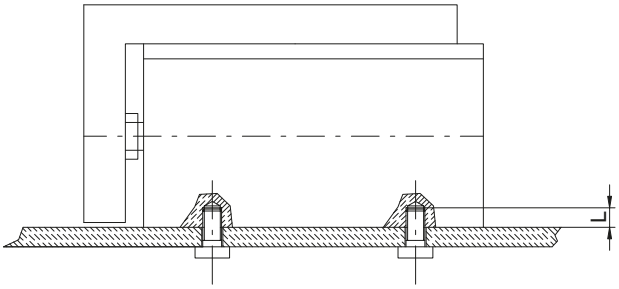
	SCREW	Maximum torque (Nm)	L1
Ø10	M4	2.5	15.6
Ø16	M4	2.5	20.6
Ø20	M5	5.1	24

LATERAL (THREADED HOLE)



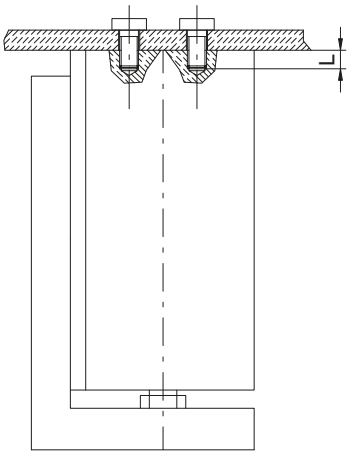
	SCREW	Maximum torque (Nm)	L1	L
Ø10	M5	5.1	15.6	11.2
Ø16	M5	5.1	20.6	16.2
Ø20	M6	8.1	24	16

VERTICAL (THREADED HOLE)



	SCREW	Maximum torque (Nm)	L
Ø10	M4	2.5	6
Ø16	M4	2.5	6
Ø20	M5	5.1	8

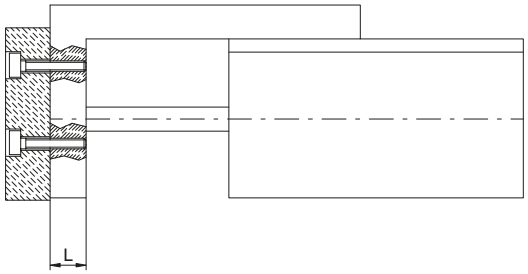
AXIAL (THREADED HOLE)



	SCREW	Maximum torque (Nm)	L
Ø10	M4	2.5	6
Ø16	M4	2.5	6
Ø20	M5	5.1	8

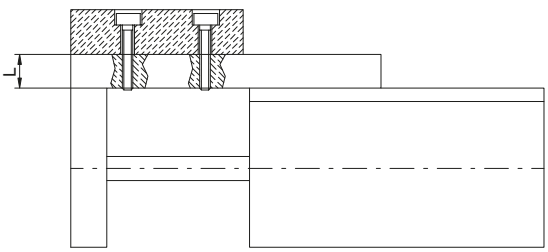
LOAD

FRONTAL MOUNTING



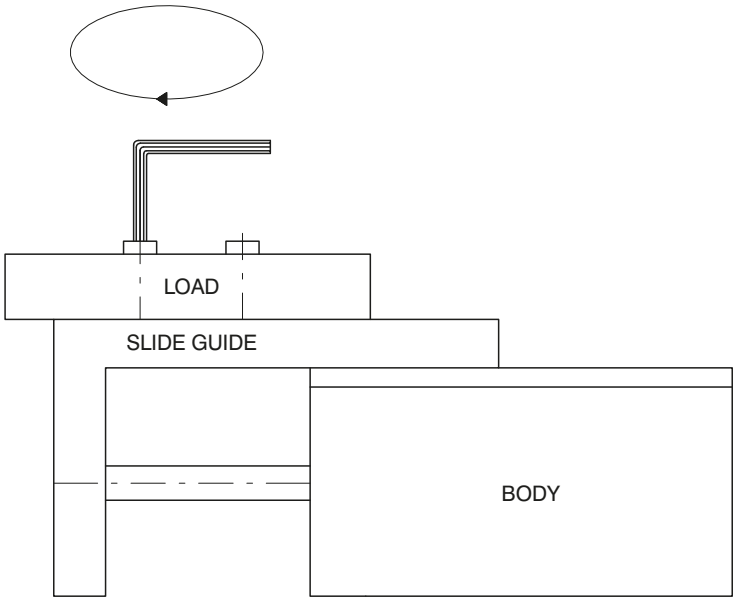
	SCREW	Maximum torque (Nm)	L
Ø10	M4	2.5	7.5
Ø16	M4	2.5	10
Ø20	M5	5.1	11

BACK MOUNTING



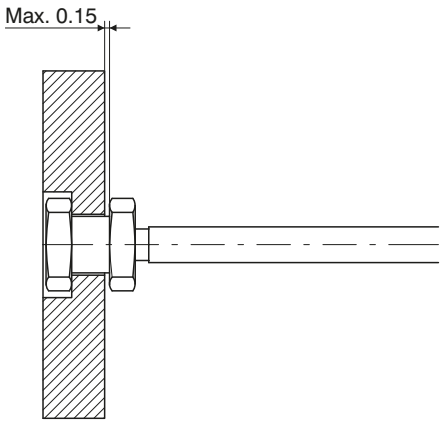
	SCREW	Maximum torque (Nm)	L
Ø10	M4	2.5	8
Ø16	M4	2.5	9
Ø20	M5	5.1	9.5

Fixing - Load



ATTENTION : Slide must be blocked before fixing the load this operation shoul not be done by blocking the body as the guide could get damaged.

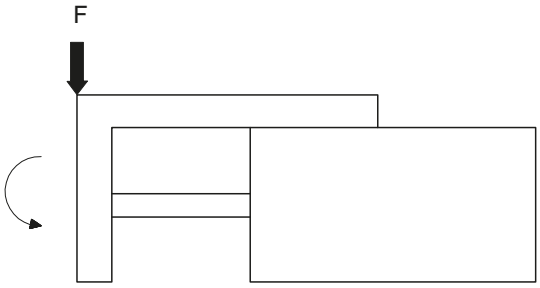
CONNECTION BETWEEN PLATE AND ROD



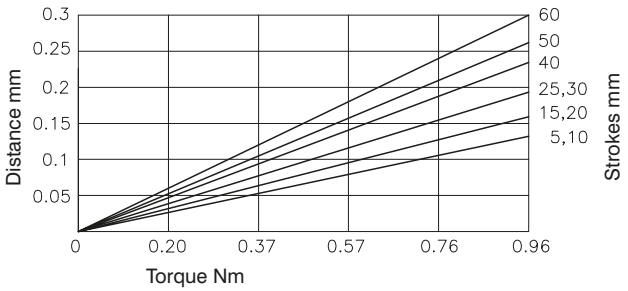
The fluctuating connection, maximum clearence 0.15mm as indicated by the arrow

Plate deflection graphs

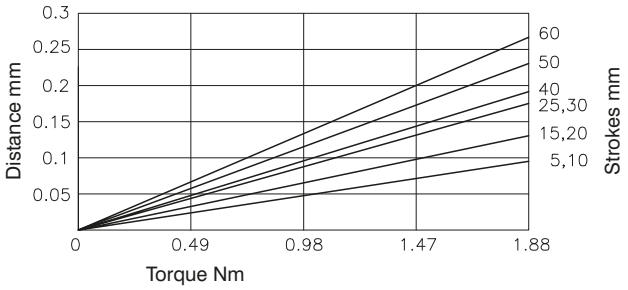
Plate deviation (arrow) when the load is applied on the spot indicated with the arrow and the unit completely extended



Ø10



Ø16



Ø20

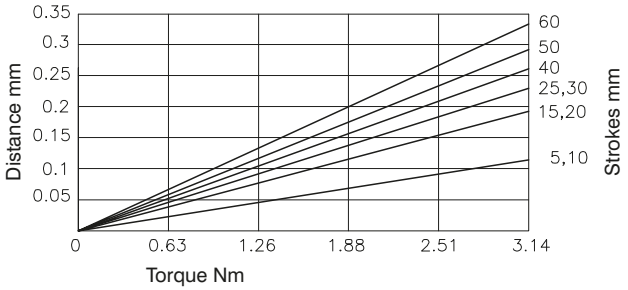
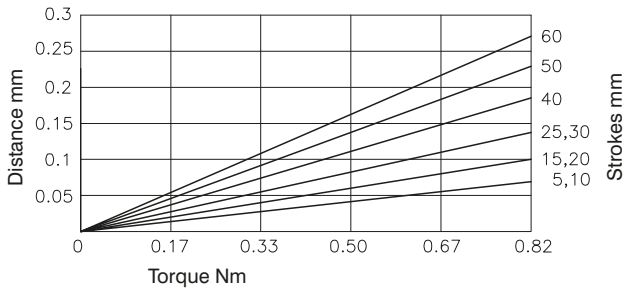
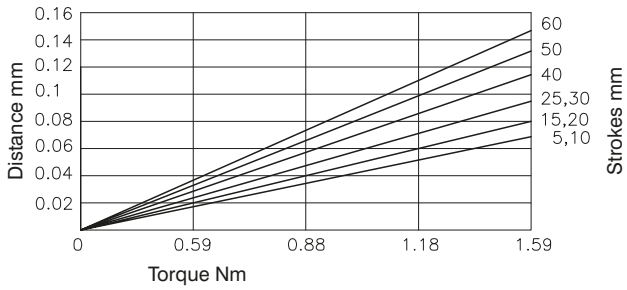


Plate deviation (arrow) when the load is applied on the spot indicated with the arrow and the unit completely extended

Ø10



Ø16



Ø20

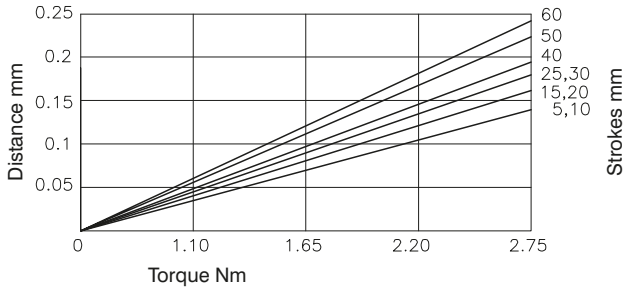
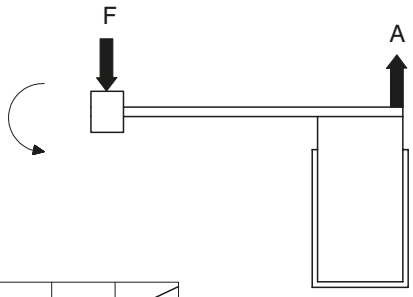
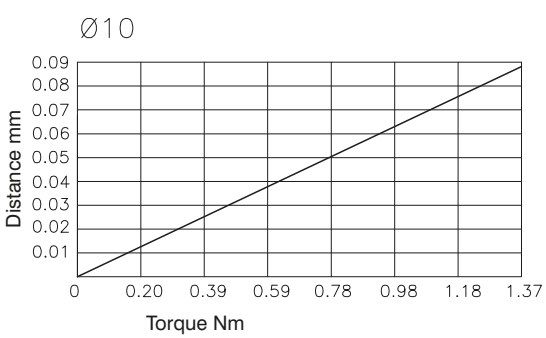
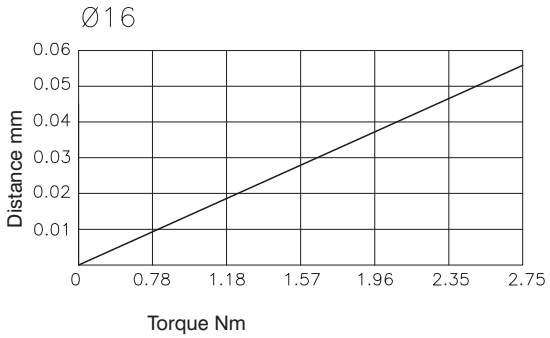


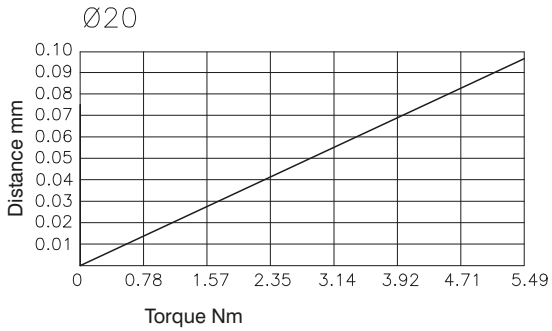
Plate deflection graphs outer stroke - selection graphs

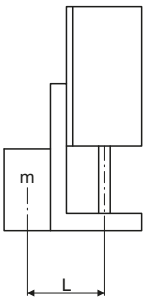
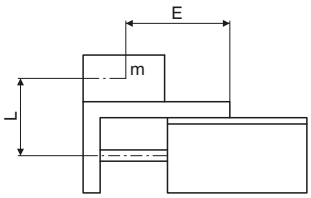
Plate deviation (compared to A) when the load is applied on the spot indicated with the arrow and the unit completely extended







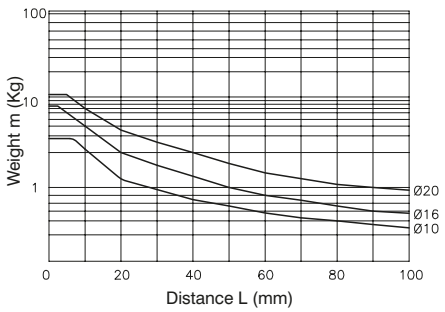


MOUNTING POSITION	VERTICAL			HORIZONTAL								
												
MAX. SPEED (mm/sec.)	100	200	300	100			200			300		
Load eccentricity				50	100	200	50	100	200	50	100	200
Selection graphs	1	2	3	4	5	6	7	8	9	10	11	12

Selection graphs 1 - 3 (vertical mounting)

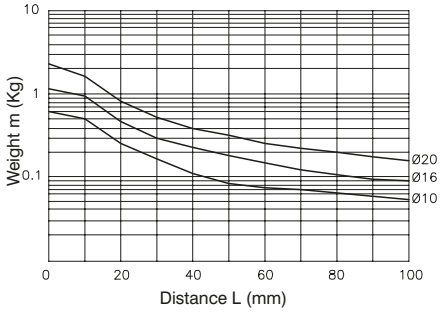
Drawing 1

Maximum speed 100 mm/s or lower



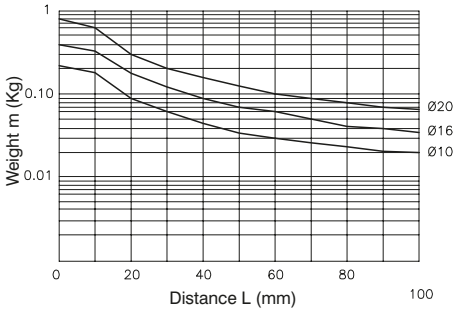
Drawing 2

Maximum speed 300 mm/s or lower



Drawing 3

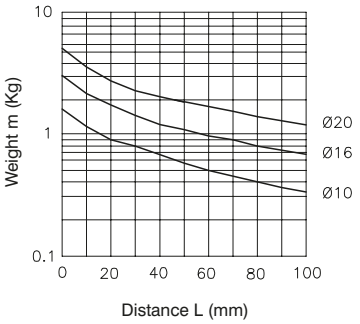
Maximum speed 500 mm/s or lower



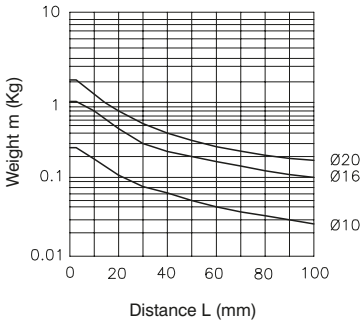
Selection graphs

Selection graphs 4 - 12 (horizontal mounting)

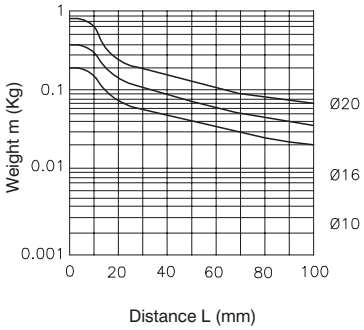
Drawing 4 load eccentricity 50mm
Maximum speed 100 mm/s or lower



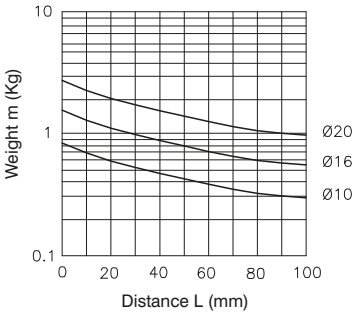
Drawing 7 load eccentricity 50mm
Maximum speed 300 mm/s or lower



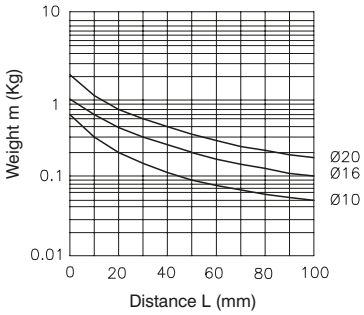
Drawing 10 load eccentricity 50mm
Maximum speed 500 mm/s or lower



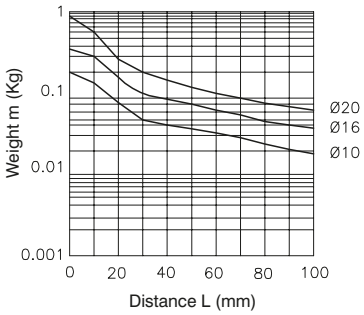
Drawing 5 load eccentricity 100mm
Maximum speed 100 mm/s or lower



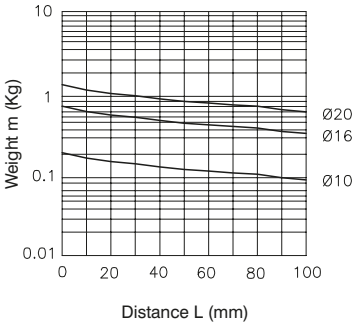
Drawing 8 load eccentricity 100mm
Maximum speed 300 mm/s or lower



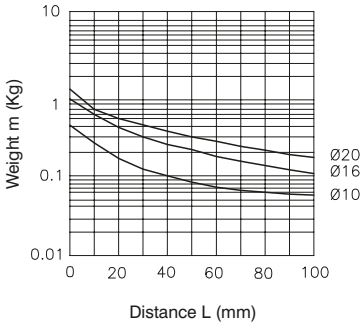
Drawing 11 load eccentricity 100mm
Maximum speed 500 mm/s or lower



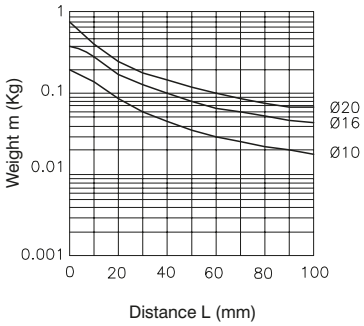
Drawing 6 load eccentricity 200mm
Maximum speed 100 mm/s or lower



Drawing 9 load eccentricity 200mm
Maximum speed 300 mm/s or lower



Drawing 12 load eccentricity 200mm
Maximum speed 500 mm/s or lower



Series 1605, Mechanically coupled

General

The purpose of producing a rodless cylinder is to provide a space saving option 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 is little more than its stroke. Profiled tube allows mounting of sensors 1500._, RS._, HS._ and 1580._, MRS._, MHS._ on the two sides of carriage, by means of suitable brackets. 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 metre), 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	anodised aluminium
Barrel	anodised aluminium
Bands	tempered stainless steel
Mounting place	anodised aluminium
Piston	acetal resin
Guide blocks	acetal resin
Cushion bearings	aluminium
Piston seals	special 80 shore nitril mixture, wear resistant
Other seals	NBR oil-resistant rubber

Caratteristiche di funzionamento

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
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. strokes	6 m

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air
- Please adequately evaluate the load involved and its direction, especially in respect to the moving carriage (also see tables for loads and admitted moments).
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device)
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

Please note: air must be dried for applications with lower temperature.
Use hydraulic oils H class (ISO Vg32) for correct continued lubrication.
Our Technical Department will be glad to help.

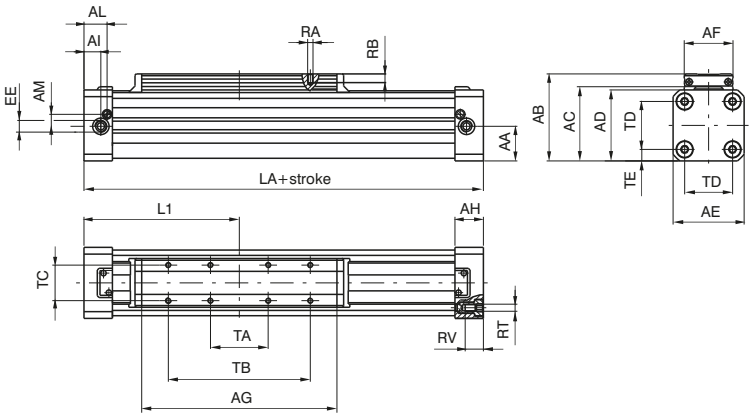
For applications where a low smooth uniform operations speed is required, you must specify this on your purchase order so that we can use the proper special grease.

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.

Basic version

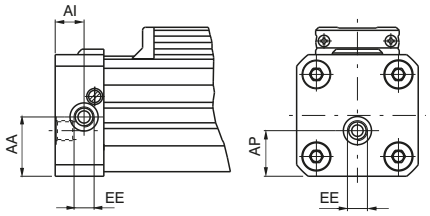
Ordering code
1605.Ø.stroke.01.M (Max. stroke 6 mt.)



Left head

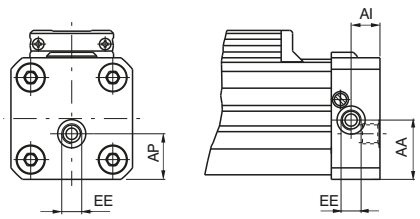
Ordering code
1605.Ø.stroke.02.M (Max. stroke 6 mt.)

Possibility of a single feed cylinder head



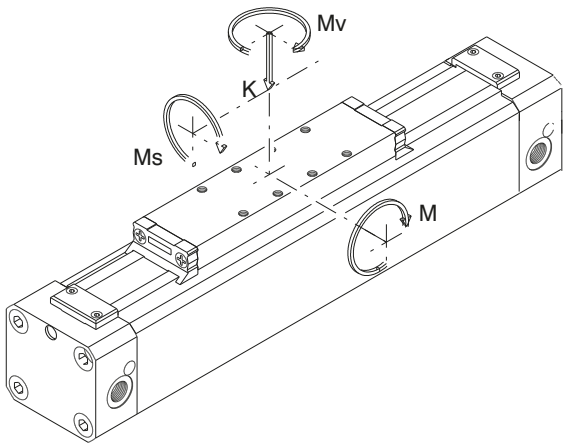
Right head

Ordering code
1605.Ø.stroke.03.M (Max. stroke 6 mt.)

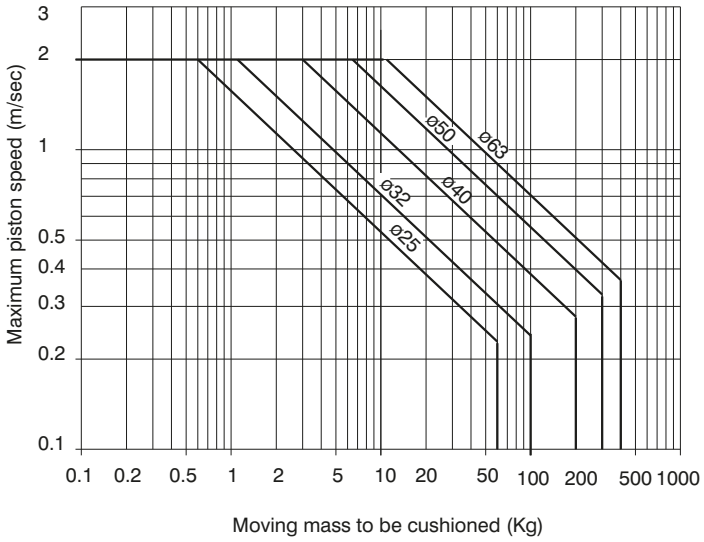


Bore		25	32	40	50	63
AA		19,5	25,5	31	39	46,5
AB		56	70	80	98	113,5
AC		48,5	60	70	85	100
AD		44	55	65	80	95
AE		40	55	65	80	95
AF		30	40	40	55	55
AG		117	146	186	220	255
AH		23	27	30	32	36
AI		12,5	14,5	17,5	19	23
AL		19	22,5	24,5	26	30
AM		7,5	10,5	11,5	13,5	16
AP		13	15,2	23	30	35,5
EE		G1/8"	G1/4"	G1/4"	G1/4"	G3/8"
L1		100	125	150	175	215
LA		200	250	300	350	430
RA		M4	M5	M5	M6	M6
RB		7,5	9,5	9,5	11,5	11,5
RT		M5	M6	M6	M8	M8
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	13	13,5
Weight	stroke 0	900	1650	2650	4330	8010
g	every 100mm	225	340	490	725	1070
STROKE TOLERANCE: + 2 mm.						

Basic version cylinder



Operating end stroke decelerator diagram



3

PNEUMATIC ACTUATION

Recommended loads and moments in static conditions

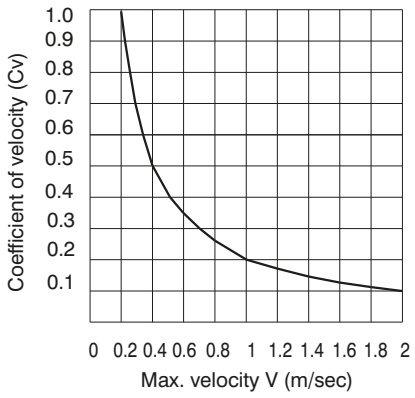
CYLINDER BORE	DECELERATING STROKE (mm)	MAX. RECOMMENDED LOAD K (N)	MAX. RECOMMENDED BENDING MOMENT M (Nm)	MAX. RECOMMENDED CROSS MOMENT Ms (Nm)	MAX. RECOMMENDED TWISTING MOMENT Mv (Nm)
25	20	300	15	0.8	3
32	25	450	30	2.5	5
40	31	750	60	4.5	8
50	38	1200	115	7.5	15
63	49	1600	150	8.5	24

Attention: use guided carriage for heavier loads or precise linear movements (MG or MH versions).

All reported data are referred to carriage plane and indicates MAX - values in statical conditions. These values should not be exceeded either in dynamic conditions (best speed <1m/sec). Should the cylinder be utilised at its maximum performances, ensure the proper additional absorbers are used.

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

Coefficient of velocity diagram



Loads under combined stressing conditions

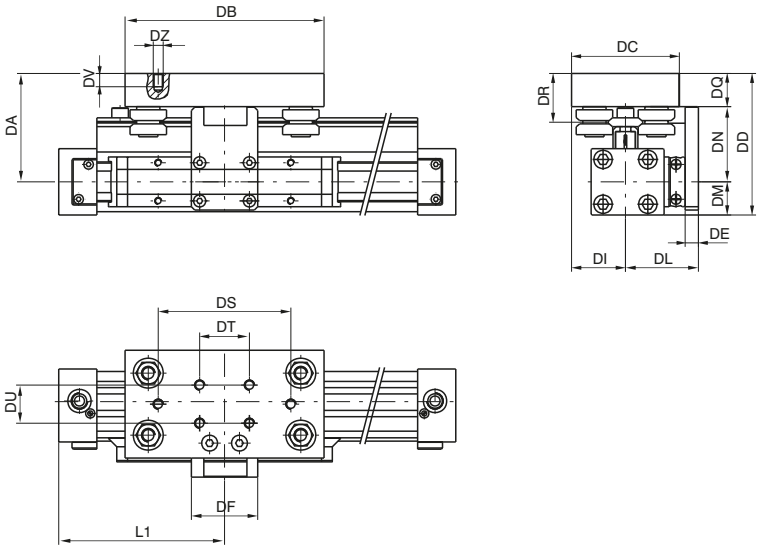
It is important to take into consideration the following formula when there are a combination of forces with torque:

$$\left[\left(2 \times \frac{Ms}{Ms\ max}\right)+\left(1.5 \times \frac{Mv}{Mv\ max}\right)+\frac{M}{M\ max}+\frac{K}{K\ max}\right] \times \frac{100}{Cv} \leq 100$$

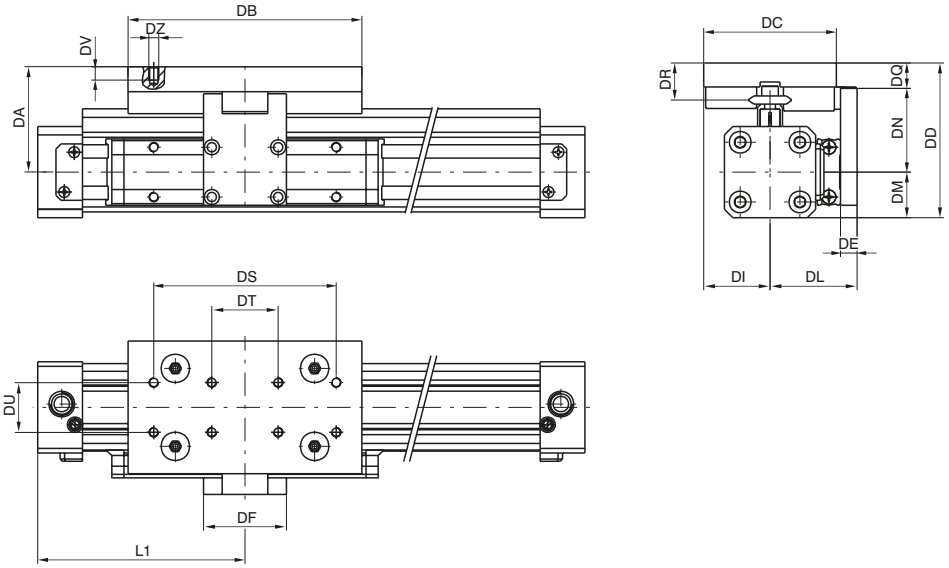
Cylinder with linear control unit (Ø 25, Ø32, Ø40 and Ø50)

Ordering code
1605.Ø.stroke.01.MG (Max. stroke 3mt.)

Cylinders Ø 25



Cylinders Ø 32, Ø 40, Ø 50



Bore	DA	DB	DC	DD	DE	DF	DI	DL	DM	DN	DQ	DR	DS	DT	DU	DV	DZ	L1	Weight guide	every 100mm
25	65	120	65	85	8	40	32,5	44	20	45,5	19,5	29	80	30	23	8	M6	100	g 850	g 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	g 950	g 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	g 950	g 90
50	76	141	80	116	12	80	40	70	40	61,5	14,5	21,5	110	40	30	8	M5	175	g 950	g 90

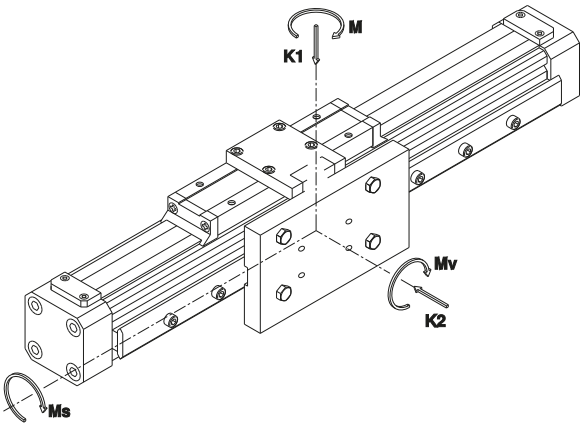
For cylinder weight refer to base version

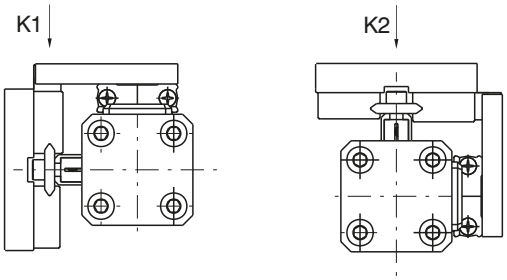
Construction characteristics of linear control unit

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

Cylinders with linear control unit Ø32, Ø40 and Ø50

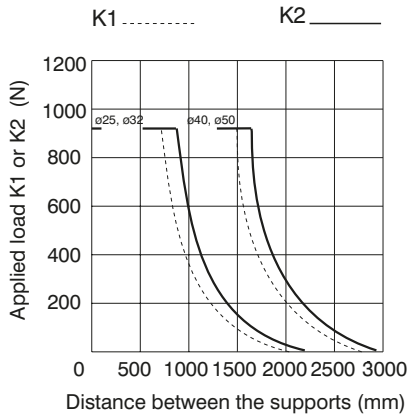
Max. suggested loads and moments

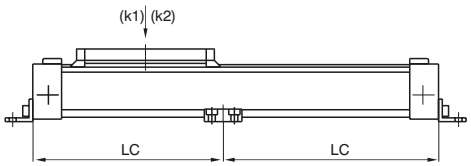




K1 (N)	K2 (N)	M (Nm)	Ms (Nm)	Mv (Nm)
960	960	40	12	40

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



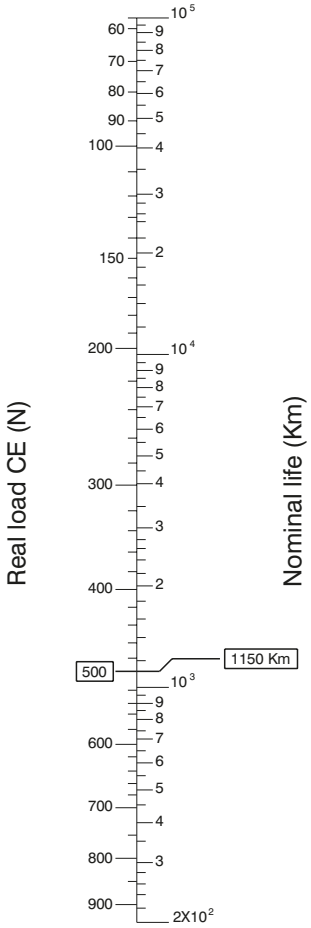


Real load (CE) under combined stressing conditions

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

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

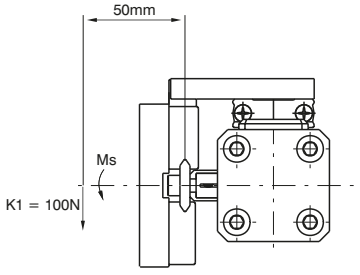
Nomograph load / life



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 x 100 = 5 Nm K1 = 100 N

How to compute the real load using the formula:

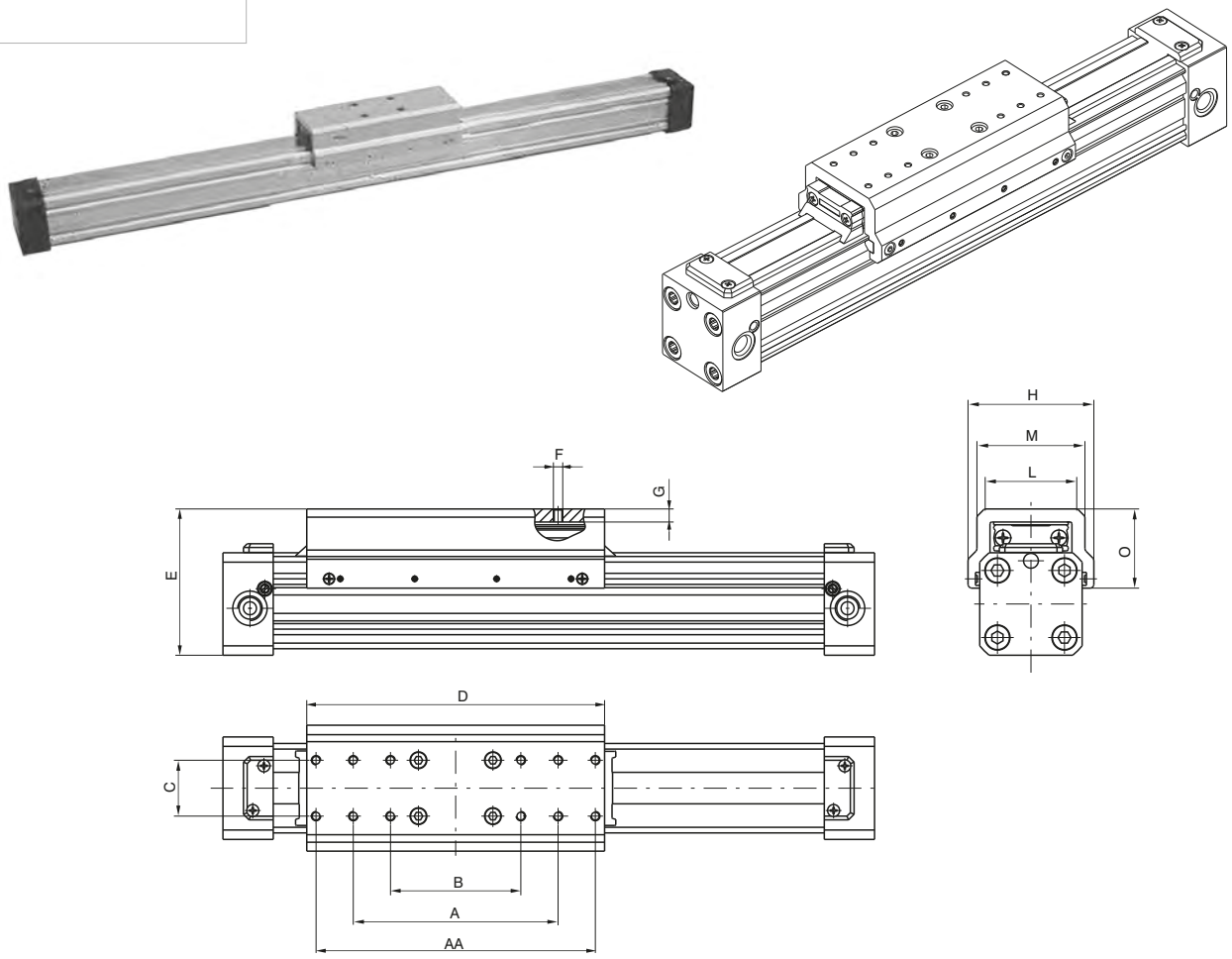
$$CE = \left[K1 + K2 + \left(24 \times M\right) + \left(80 \times Ms\right) + \left(24 \times Mv\right)\right]$$

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

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

Cylinder with sliding shoes guide (Ø 25, Ø 32, Ø 40, Ø 50 and Ø 63)

Ordering code
1605.Ø.stroke.01.MH



Bore	AA	A	B	C	D	E	F	G	H	L	M	O	Weight g
Ø25	/	80	55	23	130	64 $^{\pm 1}$	M4	6,5	57	36	42	32	g 235
Ø32	/	110	70	30	160	78,5 $^{\pm 1}$	M5	7	68	50	58	42,5	g 445
Ø40	/	110	70	30	202	88,5 $^{\pm 1}$	M5	7	77	52	60	45,5	g 595
Ø50	210	160	110	40	235	114,5 $^{\pm 1}$	M6	14	100	71	83	61,5	g 1453
Ø63	210	160	110	40	270	130 $^{\pm 1}$	M6	14	116	76	90	65,5	g 1810

For cylinders weight refer to base version

Complete sliding shoes guide

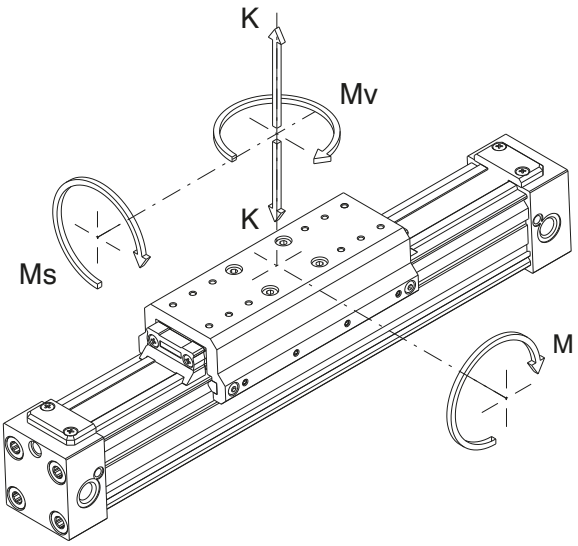
Ordering code
1600.Ø.05F

Construction characteristics of guide

Sliding shoes guide	reinforced carbon fibre nylon
Mounting plate	extruded anodised aluminium

Cylinder with sliding shoes guide ø25, ø32, ø40, ø50 and ø63

Max. suggested loads and moments

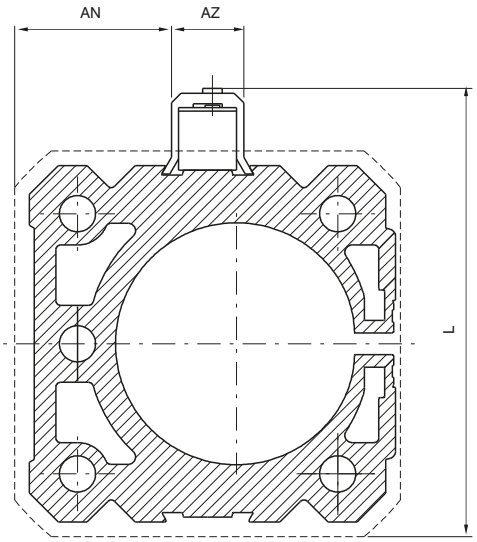


Recommended loads and moments in static conditions

CYLIDER BORE	MAX RECOMMENDED LOAD K (N)	MAX RECOMMENDED BENDING MOMENT M (Nm)	MAX RECOMMENDED CROSS MOMENT Ms (Nm)	MAX RECOMMENDED CROSS MOMENT Ms (Nm)
ø 25	300	20	1	4
ø 32	450	35	3	6
ø 40	750	70	5	9
ø 50	1200	120	8	16
ø 63	1600	155	9	25

Sensor brackets codes 1600._, SRS._, SHS._

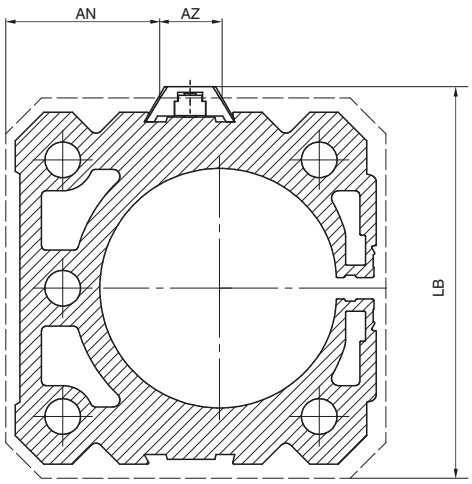
Ordering code
1600.A



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
LB		45	58	69	84	100
Weight g	1600.A	3	3	3	3	3
	1600.B	1	1	1	1	1

Sensor brackets codes 1580._, MRS._, MHS._

Ordering code
1600.B



Sensors

For technical characteristics and ordering codes see magnetic sensors section

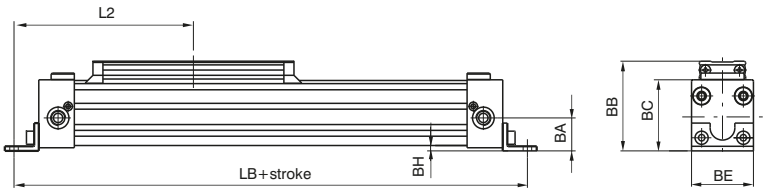
Instruction on how to use the sensors properly

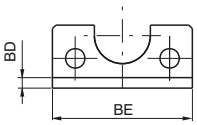
Particular attention must be paid not to exceed the working limits listed in the tables and that the sensor is never connected to the mains without a load connected in series; these are the only measures that if not observed can put the circuits out of order.
In the case of direct current (D.C.) connection 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 metres, with tension above 100 V. In this case a serial resistance is added to reduce the cumulative effects of the line.
As an example 1000 W per 100-130 V e 2000 W per 200-240 V.

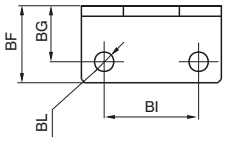
Foot

Ordering code
1600.Ø.01F (1 piece)

Bore
25 - 32

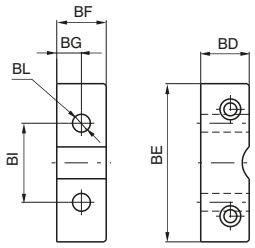


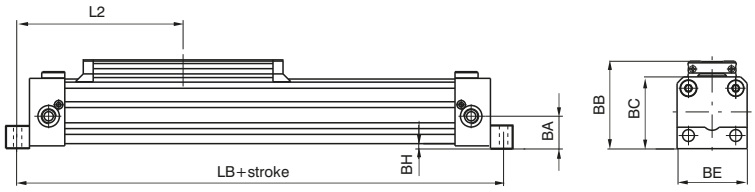




Bore	25	32	40	50	63
BA	21,5	28	32,5	41	49
BB	58	72,5	81,5	100	116
BC	46	57,5	66,5	82	97,5
BD	3	3	20	25	30
BE	40	55	65	80	95
BF	22	25	25	25	30
BG	16	18	12,5	12,5	15
BH	3,5	6	4,5	5	5
BI	27	36	30	40	48
BL	5,5	6,6	9	9	11
L2	116	143	162,5	187,5	230
LB	232	286	32,5	375	460
Weight g	30	45	65	110	190

Bore
40 - 50 - 63

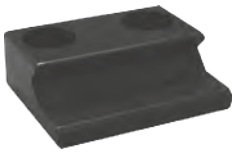


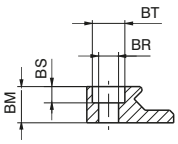


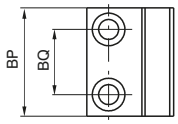
Intermediate support

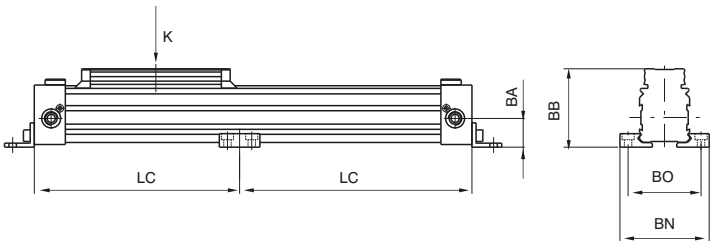
Ordering code
1600.Ø.02F

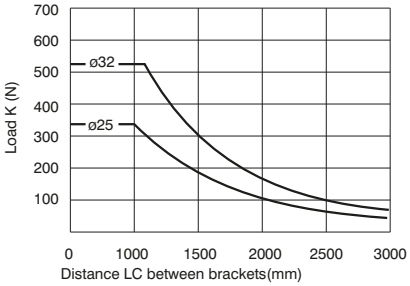
Bore
25 - 32





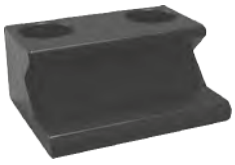


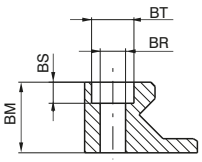


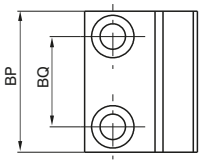


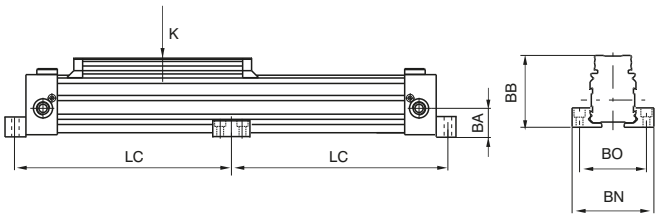
Bore	25	32	40	50	63
BA	21,5	28	32,5	41	49
BB	58	72,5	81,5	100	116
BM	10	18	18	25	30
BN	66	86	96	120	140
BO	54	70	80	100	120
BP	30	40	40	50	50
BQ	18	25	25	32	32
BR	5,5	6,6	6,6	9	9
BS	4,5	5,5	5,5	7,5	7,5
BT	9	11	11	15	15
Weight g	25	80	80	160	215

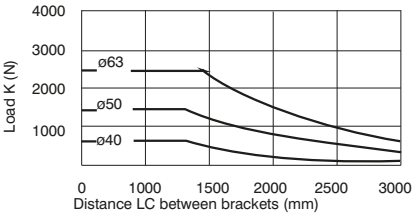
Bore
40 - 50 - 63







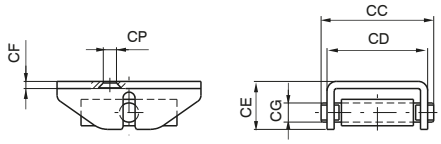


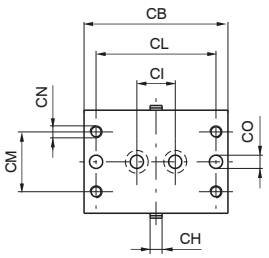


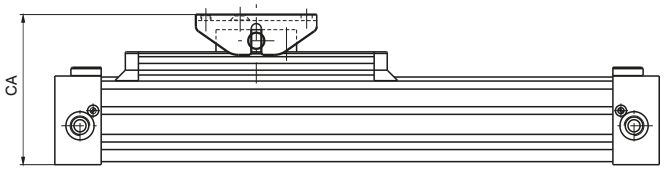
Oscillating hinge

Ordering code
1600.Ø.03F

Bore
25 - 32

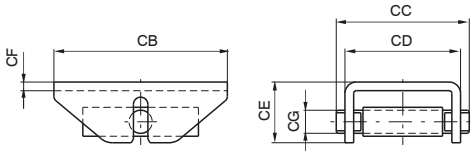


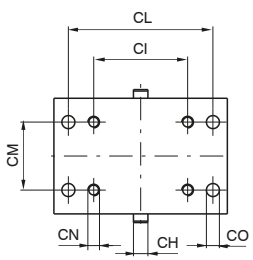


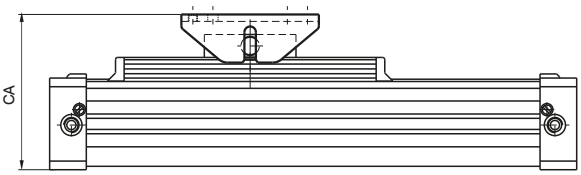


Bore	25	32	40	50	63
CA (±5,5)	76	99,5	108,5	135,5	151
CB	60	100	100	120	120
CC	47	64	64	92	92
CD (±5)	42	56	56	80	80
CE	20	30	30	42	42
CF	3	4	4	6	6
CG	8	12	12	16	16
CH	5	8	8	10	10
CI	16	40	40	65	65
CL	50	80	80	100	100
CM	25	30	30	47	47
CN	M5	M6	M6	M8	M8
CO	5,5	6,5	6,5	9	9
CP	5,5	7	7	-	-
Weight g	130	380	380	990	990

Bore
40 - 50 - 63







Series 1600, Mechanically coupled cylinders Ø16

General

Mechanically coupled cylinder based on the stainless steel strip sealing technology widely used and tested on bigger bore sizes.
Available versions: sliding shoe as standard ("MH").
This system ensures high resistance and long life as the carriage which supports the weight is not tied to the piston and therefore the piston only transfers the movement without bearing any force.
Air connections: M5 threaded connections.
All air connections on one end cap version available. (side-back-bottom side)
Mountings:
- Foot brackets and intermediate supports if needed (depending on the stroke)
- Swivel bracket
- Directly in position via the slot on the end caps- in this conditions the air supply can come directly from the mounting plate.

Magnetic sensors: sensors series (1590.... , LRS.... and LHS....) can be used directly in the 2 slots on the barrel.

Construction characteristics

End cap	Anodised aluminium
Barrel	Anodised aluminium
Bands	Stainless steel
External carriage	Anodised aluminium
Sliding bushes	Special technopolymer
Piston	Acetal resin
Cushion bearings	Aluminium
Piston seals	Special NBR
Other seals	NBR

Technical characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Working pressure	1,5 - 8 bar
Working temperature	-5°C - +70°C
Max. speed	1 m/s (normal working conditions)
Max. stroke	2,5 meters
Cushioning length	18 mm

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air
- Please adequately evaluate the load involved and its direction, especially in respect to the moving carriage (also see tables for loads and admitted moments).
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device)
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

Please note: air must be dried for applications with lower temperature.
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.
Our Technical Department will be glad to help.

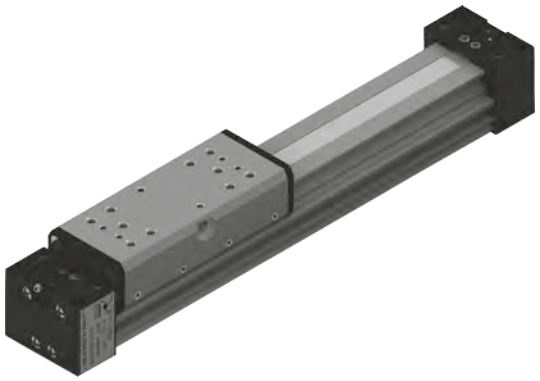
For applications where a low smooth uniform operations speed is required, you must specify this on your purchase order so that we can use the proper special grease.

Use and maintenance

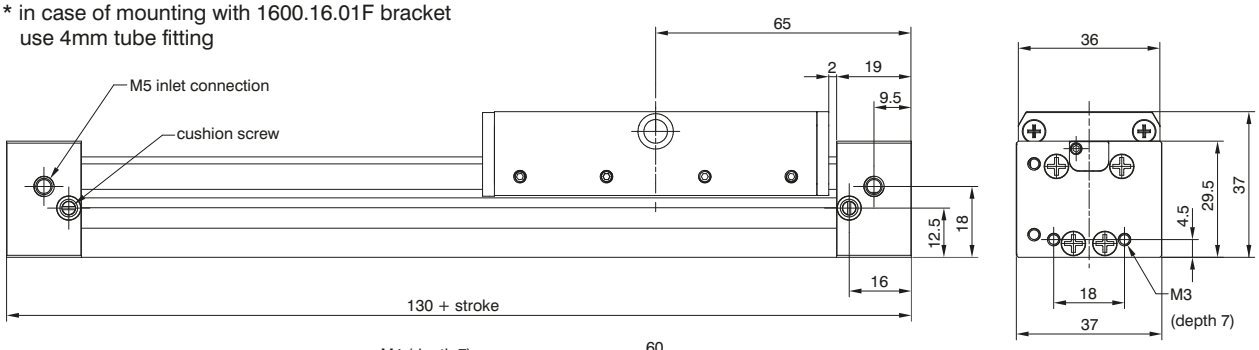
This type of cylinder, due to its characteristics, has to be used within certain criteria. Correct use will give long and troublefree operation. Filtered and lubricated compressed air reduce seal wear. Verify that the load will not produce unforeseen stresses. Never combine high speed with heavy load.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

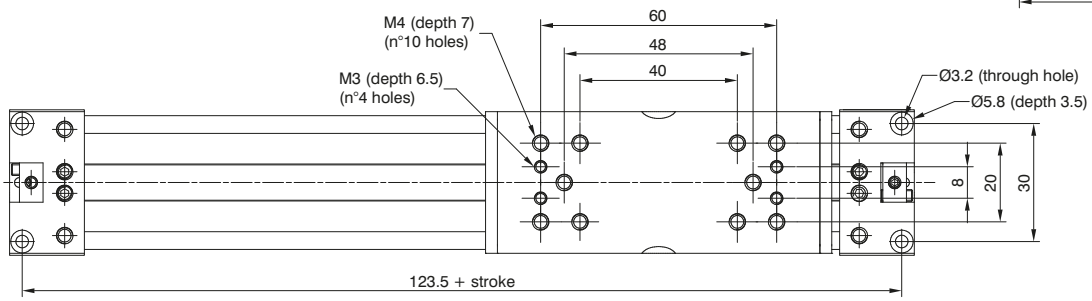
Basic version (cylinder with sliding shoes bushes)

Ordering code
1605.16.stroke.01.MH
Possibility of a single feed cylinder head
1605.16.stroke.02.MH left end cap-side connection
1605.16.stroke.03.MH right end cap-side connection
1605.16.stroke.04.MH left end cap-rear connection*
1605.16.stroke.05.MH right end cap-rear connection*
1605.16.stroke.06.MH left end cap-bottom connection
1605.16.stroke.07.MH right end cap-bottom connection

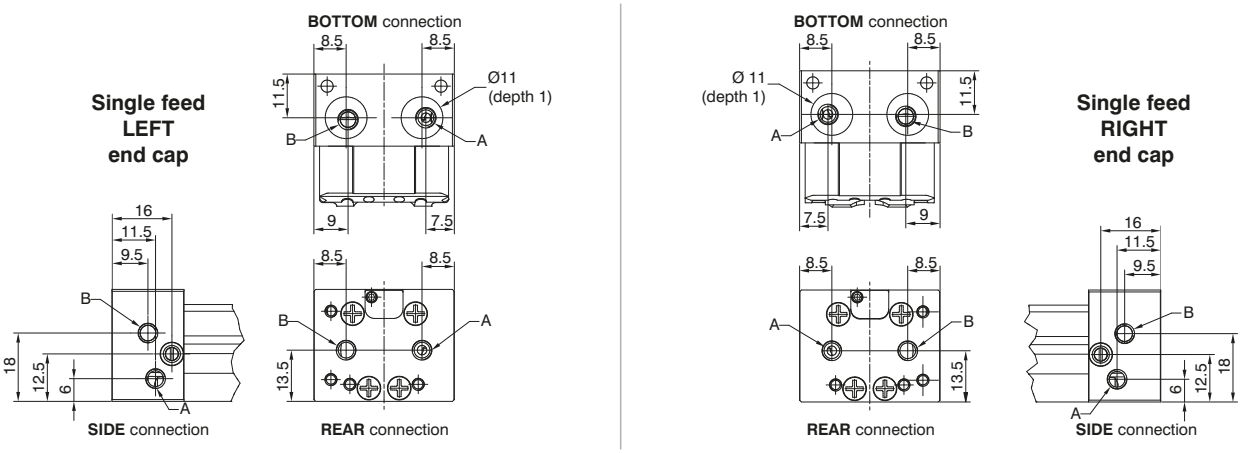


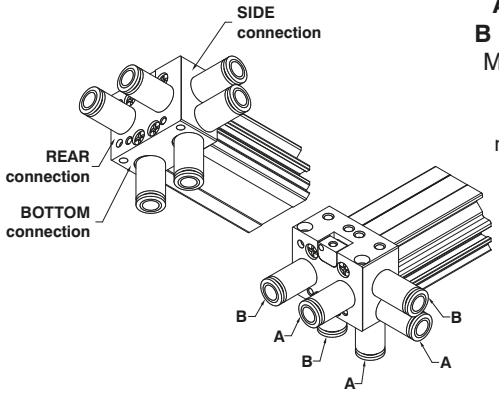
* in case of mounting with 1600.16.01F bracket use 4mm tube fitting



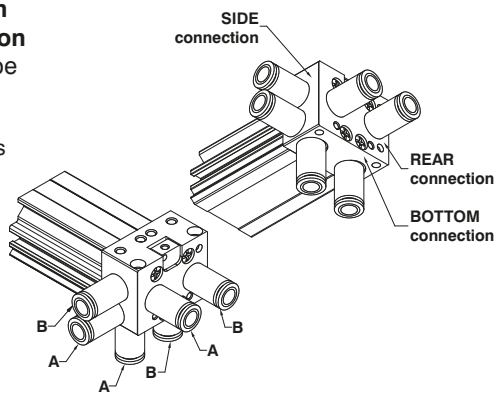


Possibility of a single feed right or left cylinder head and on 3 different end cap sides

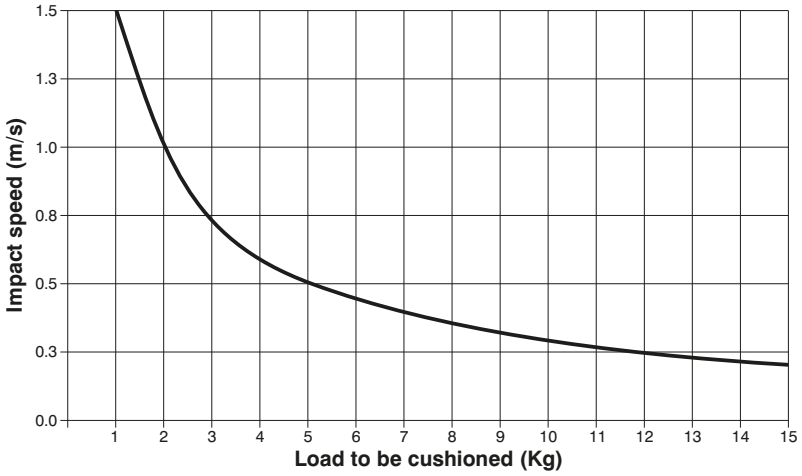




A = forward stroke connection
B = backwards stroke connection
M5 tube Ø4 and Ø6 fittings can be used for air connections.
In case of use with 1600.16.01F mounting and REAR air connections use a 4mm pipe fitting.



Operating end stroke decelerator diagram

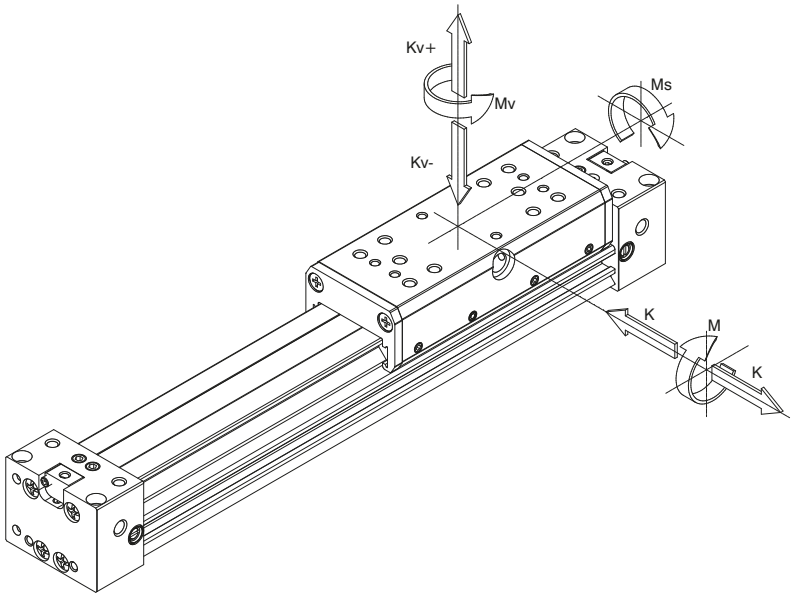


In case of extreme applications close to the maximum allowed values in the graph it is strongly recommended to ad external damping systems.

Suggested loads and moments

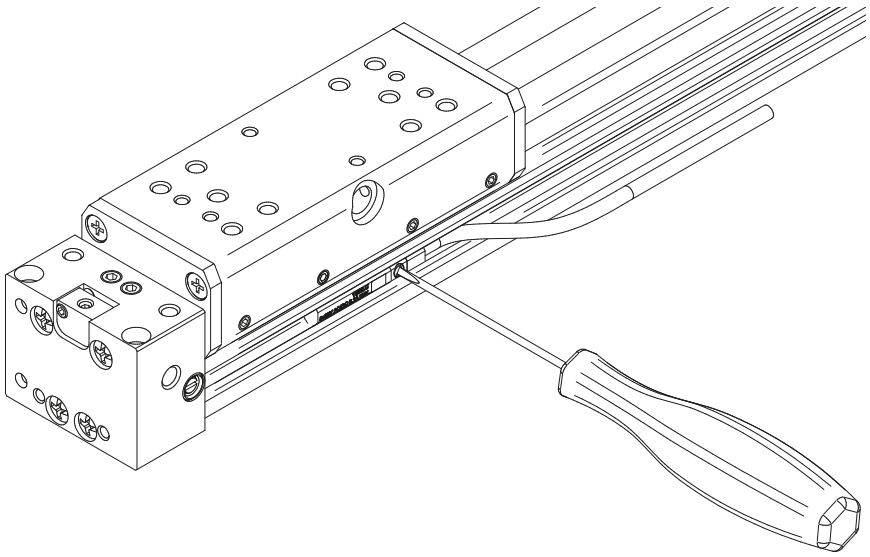
K1	K2	K	M	Ms	Mv
200	250	100	10	2	3
(N)			*(Nm)*		

Maximum Load and moments allowed in static or dynamic conditions (max. speed 0,2 m/s)



Magnetic sensors

Ordering code
1590... **LRS...** **LHS...**



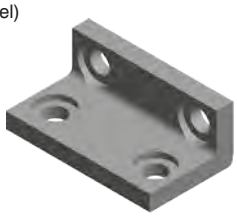
The two side slots allow the direct use of 1590....LRS... and LHS... sensors mounted from the top and positioned via the built in screw.

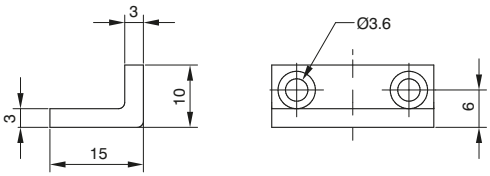
Mounting foot brackets

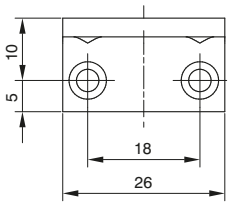
Ordering code
1600.16.01F (1 piece)

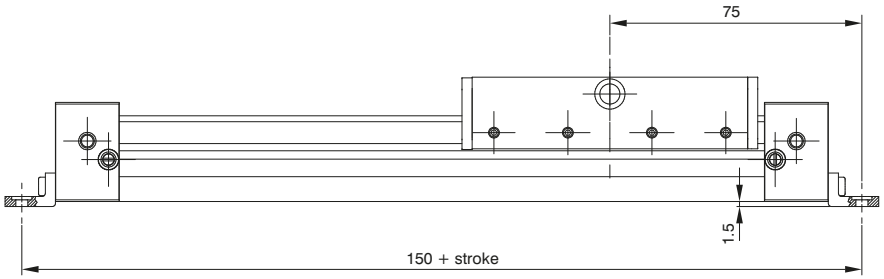
The kit comprises:
n°1 foot (plated zinc steel)
n°2 screws (plated zinc steel)

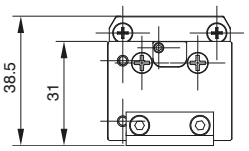
Attention: based on the stroke evaluate the need to use also side mounted supports. (see below)







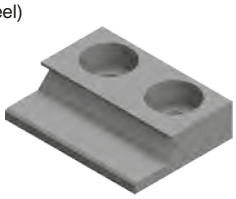


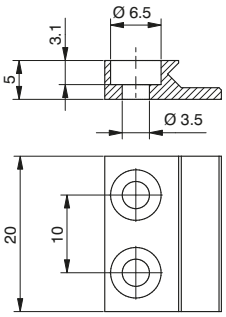


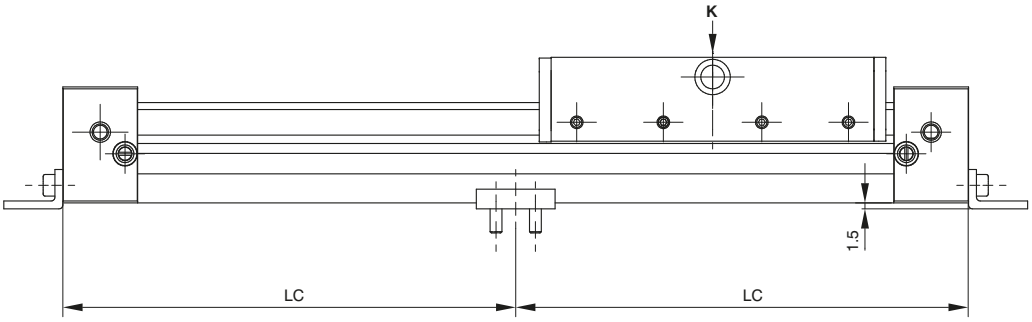
Intermediate support

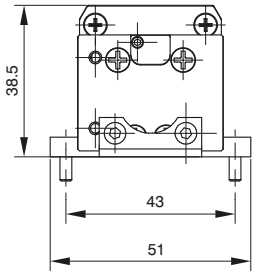
Ordering code
1600.16.02F (1 piece)

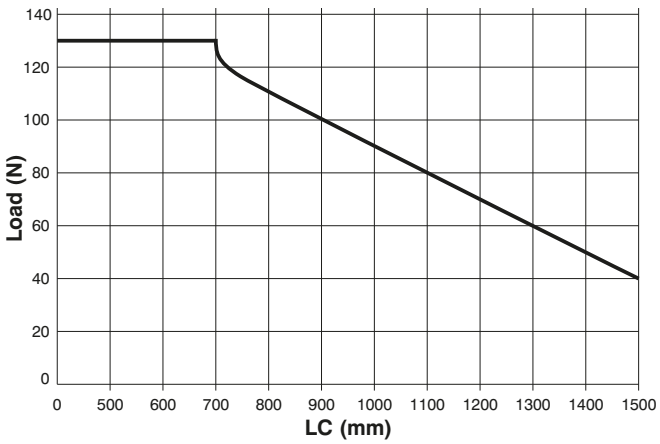
The kit comprises:
n°1 support (aluminium)
n°2 screws (plated zinc steel)









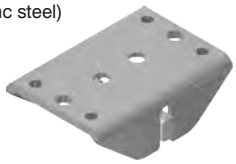


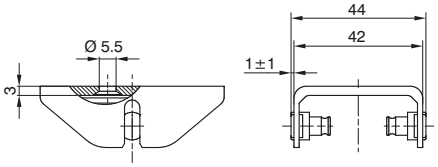
The graph shows the LC limit in conjunction with the applied load K beyond which it is necessaryto mount an intermediate side support in order to prevent the barrel from bending.

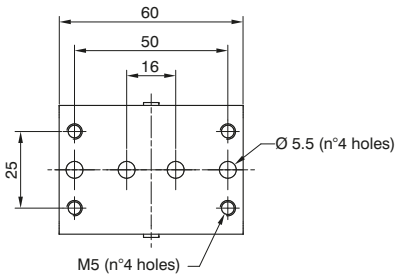
Oscillating hinge

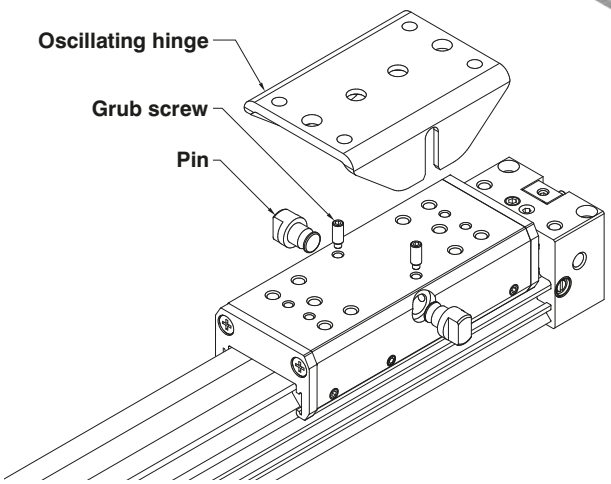
Ordering code
1600.16.03F (1 piece)

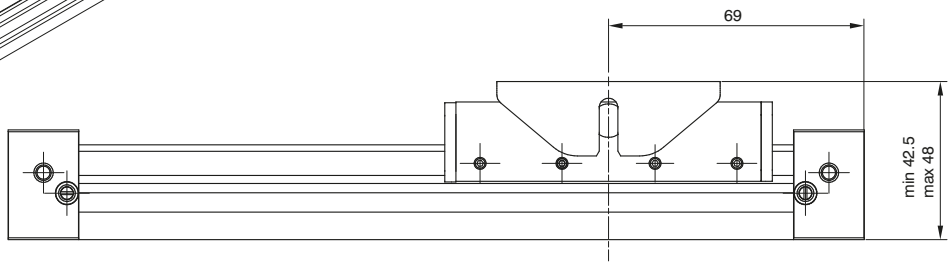
The kit comprises:
n°2 pins (plated zinc steel)
n°2 grub screw (steel)
n°1 oscillating hinge (plated zinc steel)











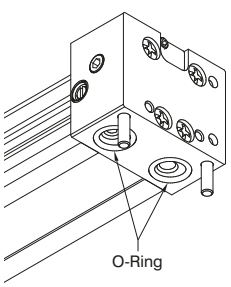
mounting sequence:
- mount the pin into the dedicated housing
- tighten the blocking grub screws in the dedicated housing

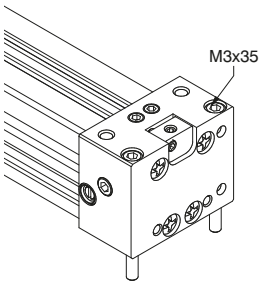
Direct mounting without brackets

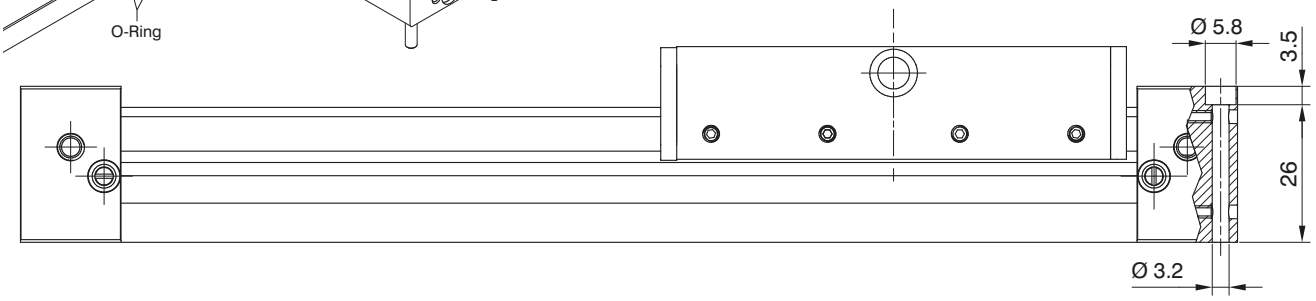
Ordering code
1600.16.04F (1 piece)

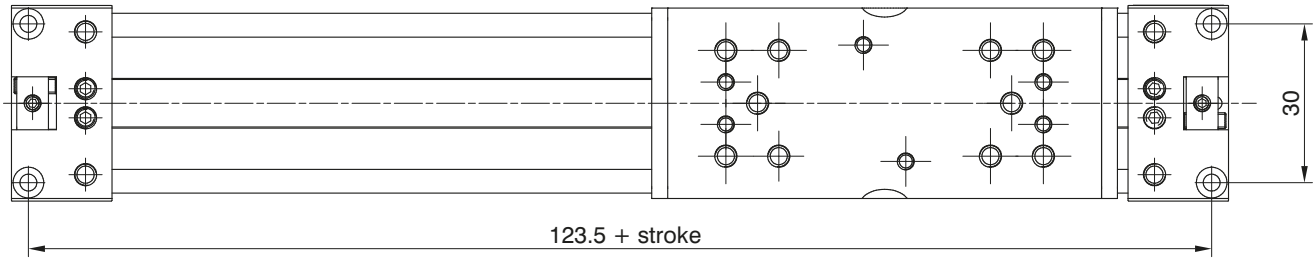
The kit comprises:
n°4 screws M3x35 (plated zinc steel)
n°2 O-Rings (NBR)

Direct mounting without brackets
Thanks to the mounting holes with counter bores on the end caps it is possible to mount the cylinder directly onto the mounting surface. Having the end caps and barrel flush and in contact with the mounting plate it is not necessary to use any intermediate mounting brackets even in case of long strokes. It is also possible to supply air to the cylinder directly through the mounting plate through the two air connection on the bottom side of the end cap (06.MH and 07.MH) which are machined with counterbores.









1600 Series, Cable driven cylinders

General

The cable driven cylinders work in a linear translation systems, they are very compact and can 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 is 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 care. 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 lengthens the overall dimensions by 50 mm; the 1200 series microcylinder sensors are used along with the clips of that series.

Construction characteristics

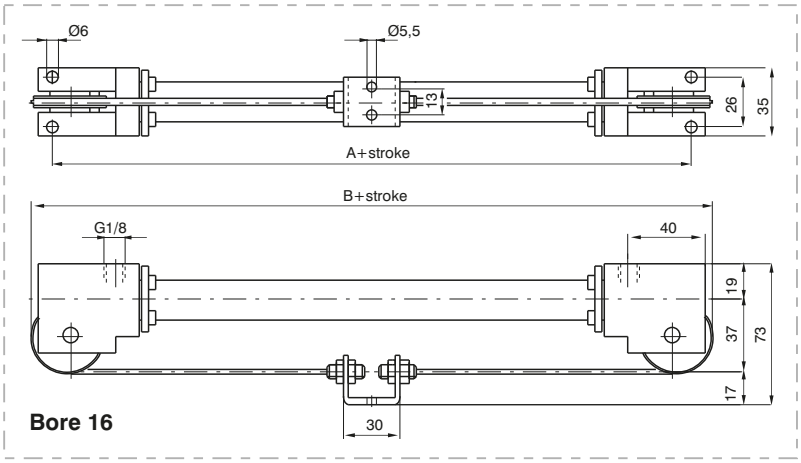
End caps	anodised black aluminium	Piston seals	NBR 80 Shore (at lip)
Barrel	anodised aluminium	Cable seal	PUR
Piston	aluminium	Bracket	steel
Cable	steel	Cable clamps	brass
Cable covering	Rilsan	Pulleys	aluminium with ball bearing

Technical characteristics

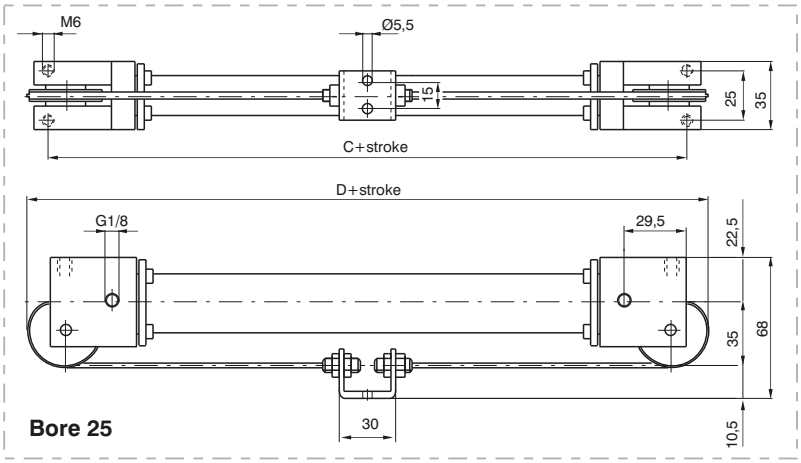
Filtered air. No lubrication needed, if applied it shall be continuous.	Max. pressure:6 bar	Min. and max. temperature: -5°C - +70°C	Max speed: 0.5 m/sec.

"Attention: Dry air must be used for application below 0°C"

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



Bore 16



Bore 25

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.

Series 1330-1331-1332-1333, rotary actuators

Construction characteristics

End cap	UNI 5079 aluminium alloy casting
Central body	oxidised aluminium
Pinion	18 NiCrMo4 cemented and tempered
Rack	C43
Barrel	anodised aluminium Ra=0.3-0.5
Sliding shoe	acetal resin
Cushion bushings	hardened aluminium
Piston	vulcanized rubber block on steel core with incorporated permanent magnet or without magnet plus rear spacer for non magnetic version
Seals	NBR 80 shore rubber
Cushion adjustment screw	nickel plated steel
Rotating angle adjustment assy	nickel plated brass

Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Max. pressure	10 bar
Working temperature	-5°C - +70°C
Standard rotation	90° - 180° - 270° - 360°(+1°)
Rotating angle adjustment assy	±10° (±5° start position, ±5° end position)

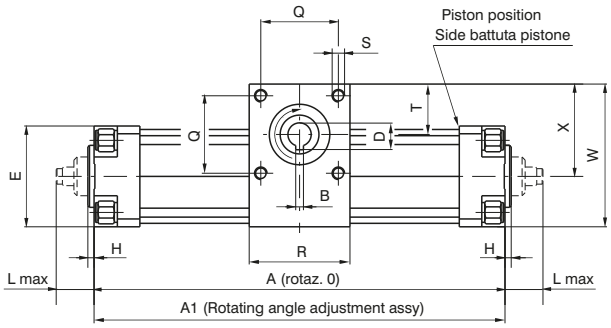
Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device)
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

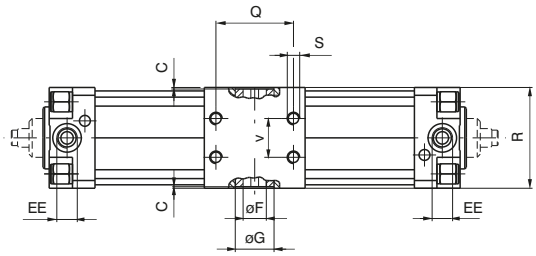
Please note: air must be dried for applications with lower temperature.
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.
Our Technical Department will be glad to help.

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°

Female pinion version

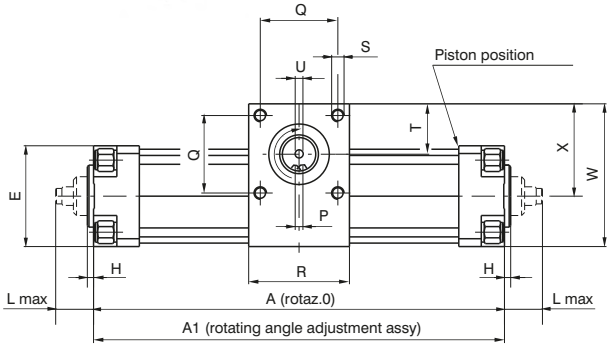
Ordering code
1330.Ø.*.01 magnetic **1331.Ø.*.01** non magnetic **1330.Ø.*.01R** magnetic with rotating adjustment angle **1331.Ø.*.01R** non magnetic with rotating adjustment angle * = rotating angle

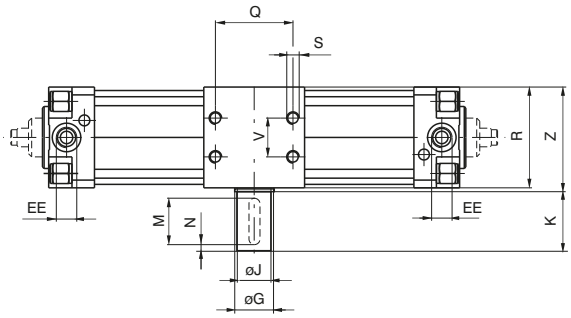




Male pinion version

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
A1rot. 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 g	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 g	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

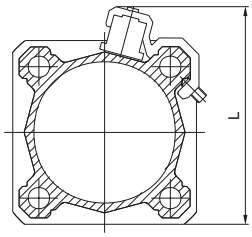
Magnetic sensors

Sensors 1500._, RS._, HS._ series
Mounting brackets codes 1320._(A, B, C)

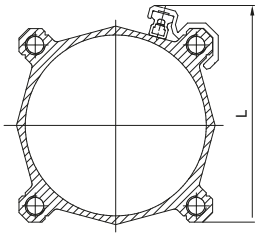
Sensor brackets

Sensor brackets codes 1500._, RS._, HS._	Sensor brackets codes 1595.HAP	Bore	L
Code	Code		
1320.A	1320.ASC	Ø32	60
		Ø40	65
1320.B	1320.BSC	Ø50	77
		Ø63	87
1320.C	1320.CSC	Ø80	105
		Ø100	125
1320.D	1320.DSC	Ø125	145
1320.E	1320.ESC	Ø160	184
1320.F	1320.FSC	Ø200	222

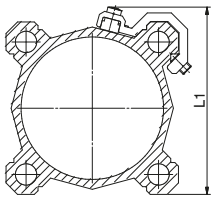
Sensor brackets codes 1580._, MRS._, MHS._		
Code	Bore	L1
1320.AS	Ø32	48
	Ø40	54
1320.BS	Ø50	66
	Ø63	76
1320.CS	Ø80	96
	Ø100	112
1320.DSC	Ø125	145
1320.ESC	Ø160	184
1320.FSC	Ø200	222



Sensors 1500._,RS._,HS._



Sensors 1595.HAP

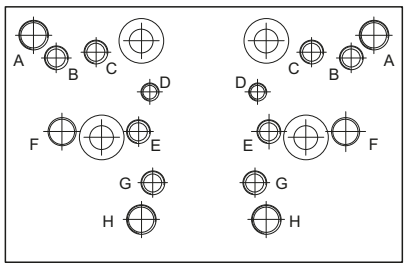


Sensors 1580._, MRS._, MHS._

Sensors for microbore cylinders: for technical characteristics and ordering codes see "Magnetic sensors" section

Solenoid valves supports

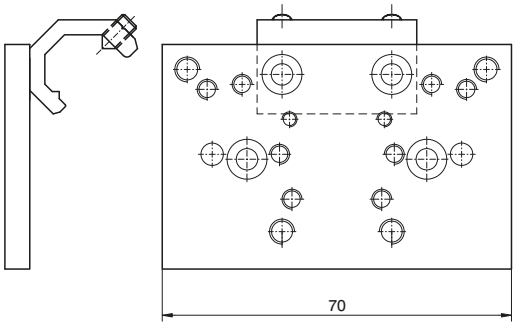
This accessory permits to mount a valve or an electrovalve on a side of the cylinder. The plate can be fitted on the cylinder profiled barrel, and, on it, can be mounted either a threaded distributor or a base on whic can be mounted an ISO distributor. Once installed the connections must be done with fittings and pipes. All of the threaded holes on the support plate are dedicated to different valves series as per attached drawing.



Fixing holes for valves series:

A = 414/2
B = 824
C = 828, T488, 488, 484
D = 2400
E = 2600
F = Bases for ISO distributors
G = 858/2
H = T424

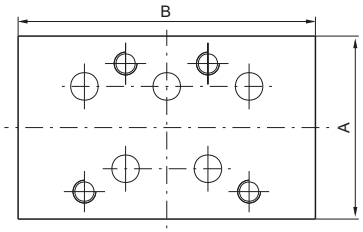
Ordering code
1320.15 (Ø32 - Ø40) **1320.16** (Ø50 - Ø63) **1320.17** (Ø80 - Ø100) **1320.18** (Ø125) **1320.19** (Ø160) **1320.20** (Ø200)



Bases for ISO solenoid valves

Ordering code

1320.21	bases for ISO 1 solenoid valves
1320.22	bases for ISO 2 solenoid valves



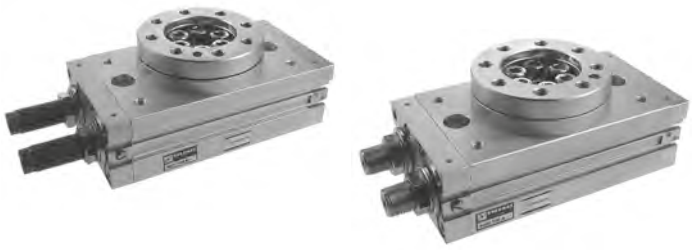
		Dimensions			
		A	B	C	D
1320.21	bases for ISO 1 solenoid valves	40	75	15	G 1/8"
1320.22	bases for ISO 2 solenoid valves	50	95	20	G 1/4"

Series 6400 - Rotary actuators

General

These rotary actuators convert linear motion of a piston into a rotary motion via a rack and pinion device, using a single pinion-rack system for the 6411 version and a double system on 6400 versions. The 6410 series actuators have fixed stops at 90 and 180 degrees; while on the 6400 series, rotation can be adjusted between 0 and 190 degrees using variable stops that can also be substituted with hydraulic stoppers (shock absorbers). These devices are equipped with a rotating table upon which the load is fixed.

Double rack rotary actuators with turn table



Ordering code

6400. _ . _

- **A** = Standard
- **R** = Cushioning (shock absorber)

- **10** (piston ø15)
- **30** (piston ø20)
- **50** (piston ø25)
- **100** (piston ø32)
- **200** (piston ø40)

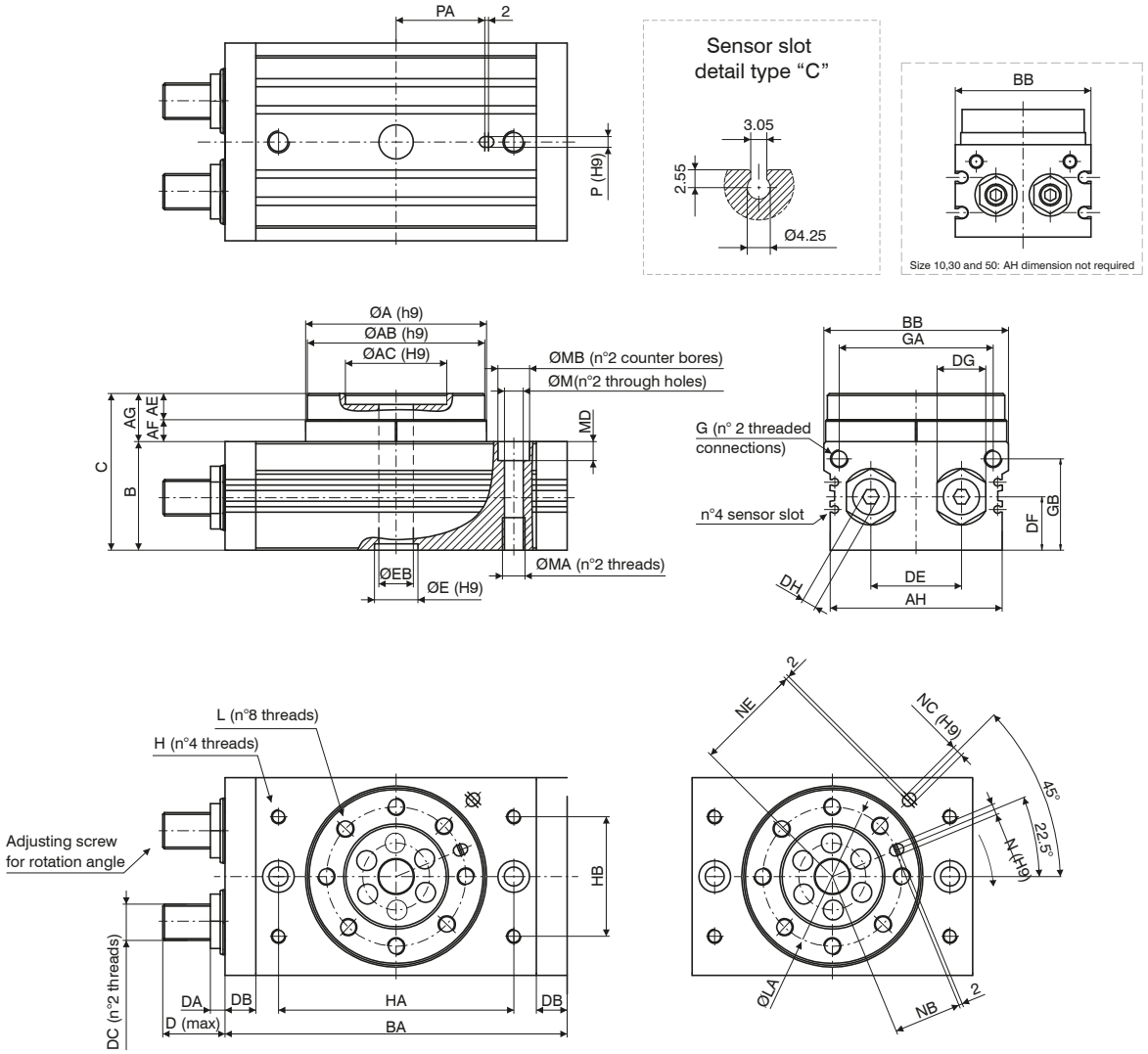
Construction characteristics

Body	anodised aluminium
End cap	anodised aluminium
Piston seal	NBR rubber
Pinion	steel
Rack	steel
Turn table	anodised aluminium
Cushioning	elastic bumper (hydraulic damper available on request)

Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.)
Max. pressure	10 bar (for type 100 and 200, 6 bar)
Working temperature	-5°C - +70°C
Rotation angle range	0 - 190°
Max. rotation	190°
Rotation speed	s/90° (see rotation time table)

Overall dimensions

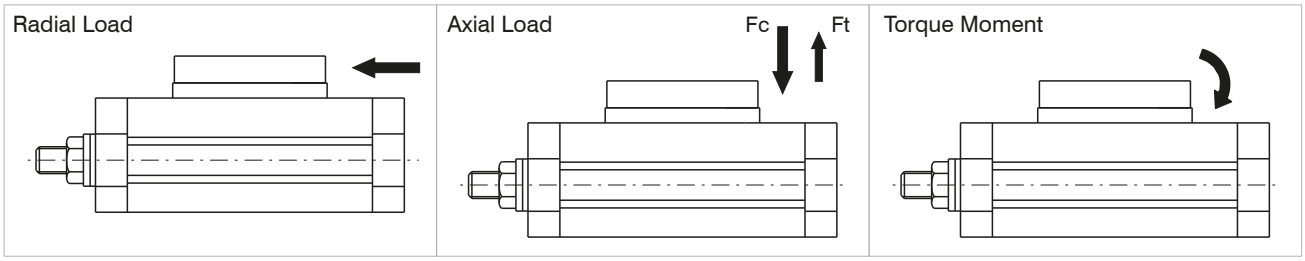


Size	10	30	50	100	200
Ø piston	Ø15	Ø21	Ø25	Ø32	Ø40
ØA h9	46	67	77	100	118
ØAB h9	45	65	75	98	116
ØAC H9	20	32	35	56	64
Useful depth	4	4,5	5	6	9
AE	8	10	12	14,5	16,5
AF	5	7	8	12,5	15,5
AG	13	17	20	27	32
AH	/	/	/	95	114
B +0,5 / 0	34	40	46	59	74
BA	92	127	152	189	240
BB +0,5 / 0	50	70	80	102	120
C +0,5 / 0	47	57	66	86	106
D	17,7	25	31,4	34,3	40,2
DA	8,6	10,6	14	8	20
DB	9,5	12	15,5	17	24
DC	M8x1	M10x1	M14x1,5	M20x1,5	M27x1,5
DE	20	29	38	50	60
DF	15,5	18,5	22	29,5	36,5
DG	12	14	19	27	36
DH	4	5	6	8	10
ØE H9	15	22	26	24	32
Useful depth	3	3	3	3,5	5,5
ØEB	5	9	10	19	24
G	M5x0,8	G1/8	G1/8	G1/8	G1/8

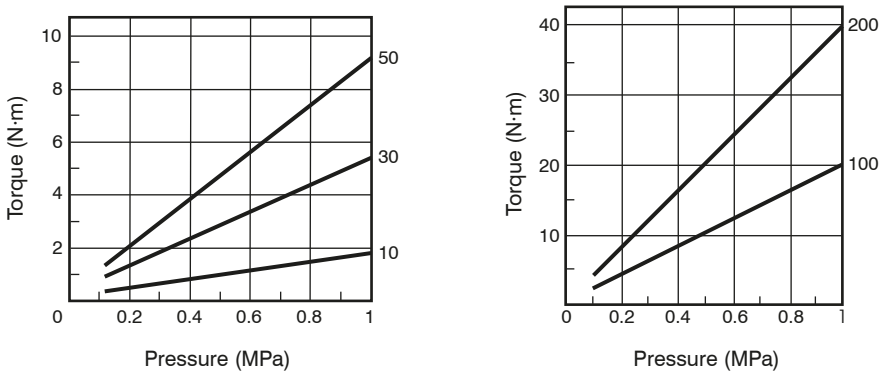
Size	10	30	50	100	200
Ø piston	Ø15	Ø21	Ø25	Ø32	Ø40
GA	34,5	50	63	85	103
GB	27,8	32	37,5	50,5	65,5
H	M5x0,8	M6x1	M8x1,25	M8x1,25	M12x1,75
Useful depth	8	8	8	10	13
HA	60	84	100	130	150
HB	27	37	50	66	80
L	M5x0,8	M6x1	M8x1,25	M10x1,5	M12x1,75
Useful depth	8	10	12	14,5	16,5
LA	32	48	55	77	90
M	6,8	8,6	10,5	10,4	14,2
MA	M8x1,25	M10x1,5	M12x1,75	M12x1,75	M16x2
Useful depth	12	15	18	18	25
MB	11	14	18	17,5	20
MD	6,5	8,5	10,5	10,5	12,5
N H9	3	4	5	6	8
Useful depth	3,5	4,5	5,5	6,5	8,5
NB	15	23	26,5	37,5	44
NC H9	/	/	/	6	8
Useful depth	/	/	/	4,5	4,5
NE	/	/	/	59	69
P H9	/	/	/	6	8
Useful depth	/	/	/	4,5	6,5
PA	/	/	/	49	54
Weight (g)	530	1230	2080	4100	7650

Permissible Loads

		Size				
		10	30	50	100	200
Radial Load (N)		80	200	320	400	550
Axial Load (N)	Fc	80	370	450	710	1000
	Ft	75	200	300	500	750
Torque Moment (Nm)		2,5	5,5	9,5	18	25



Torque Diagrams



Rotation time (sec./90°)

Dimension	With adjusting screw	With hidraulic decelerator
10 - 30 - 50	0.2 - 1	0.2 - 0,7
100	0.2 - 2	0.2 - 1
200	0.2 - 2.5	0.2 - 1

Kinetic energy

Dimension	With adjusting screw	With hidraulic decelerator
10	0.006	Please apply to our tech-dpt for info (as general rule expressed valves can be multiplied by 3)
30	0.045	
50	0.08	
100	0.30	
200	0.52	

Single rack rotary actuators

Ordering code

6411.Ø. _

- **50**
- **63**
- **80**
- **100**

90 = rotation 90°
180 = rotation 180°

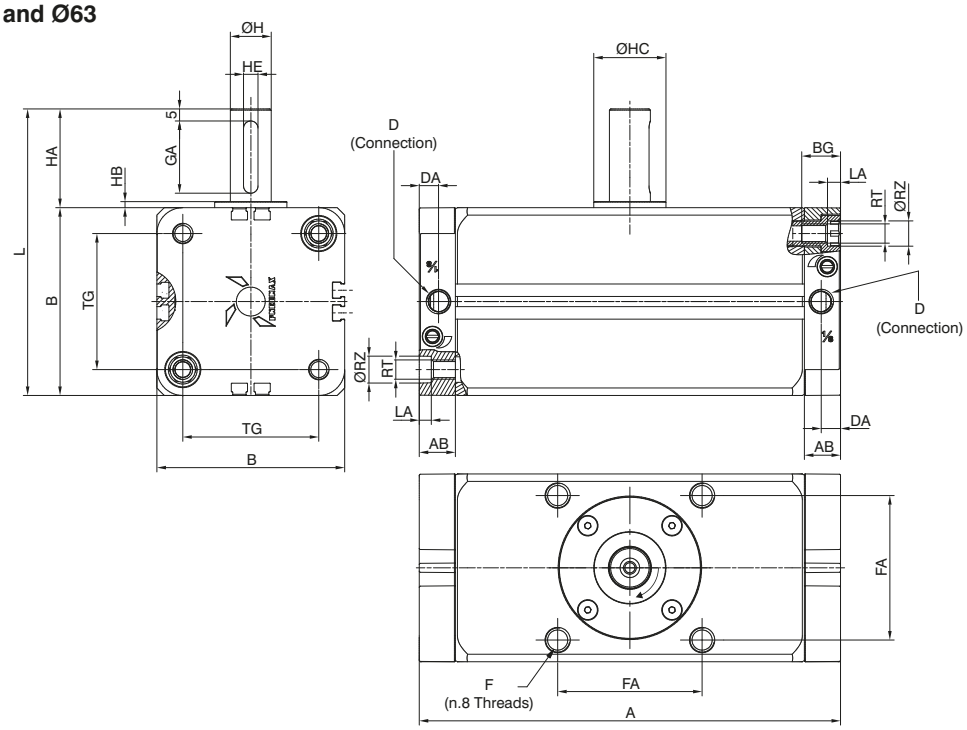
Construction characteristics

Body	anodised aluminium
Piston	aluminium
End cap	anodised aluminium
Piston seal	NBR rubber
Pinion	steel
Rack	steel

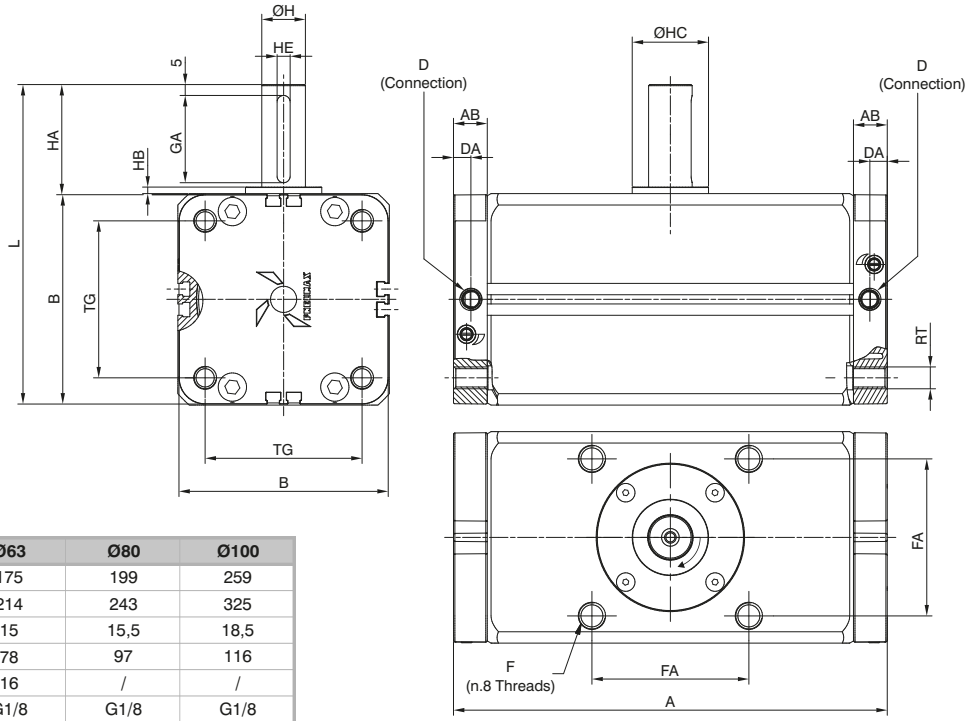
Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Max. pressure	10 bar
Working temperature	-5°C - +70°C
Rotation tolerance	0° - +4°

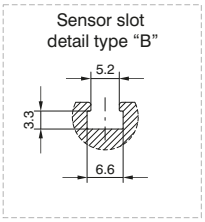
Overall dimensions Ø50 and Ø63



Overall dimensions Ø80 and Ø100



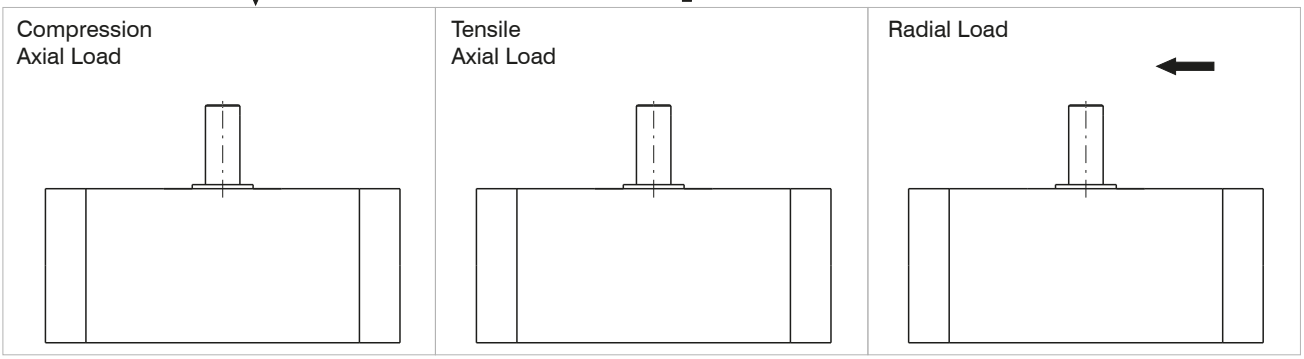
Bore		Ø50	Ø63	Ø80	Ø100
A	90°	156	175	199	259
	180°	189	214	243	325
AB		15	15	15,5	18,5
B		66	78	97	116
BG		16	16	/	/
D		G1/8	G1/8	G1/8	G1/8
DA		8	8	8	8
F		M8x1,25	M10x1,5	M12x1,75	M12x1,75
	Useful depth	12	15	15	18
FA		48	60	72	85
GA		25	30	40	45
H		15	17	20	25
HA		36	41	50	60
HB		2,5	2,5	3	4
HC		25	30	35	39,5
HE^{H9}		5	6	6	8
L		102	119	147	176
LA		5	5	/	/
RT		M8	M8	M10	M10
RZ		10,5	10,5	/	/
TG		46,5	56,5	72	89
Weight (gr.)	90°	1575	2451	4162	6989
	180°	1815	2823	4774	8329



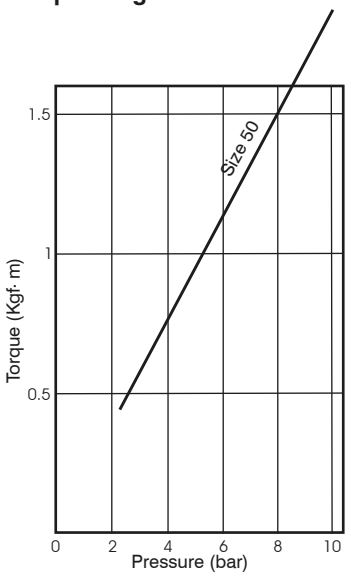
Usable sensors code
1590._
LRS._
LHS._

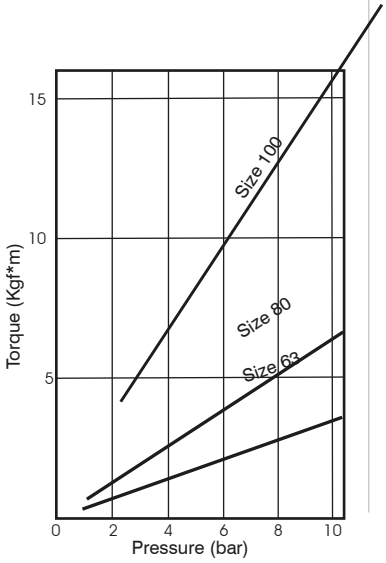
Allowable Loads

	Bore			
	Ø50	Ø63	Ø80	Ø100
Radial load (N)	200	300	400	600
Axial Load in compression (N)	500	600	900	1000
Tensile Axial Load (N)	200			



Torque Diagrams

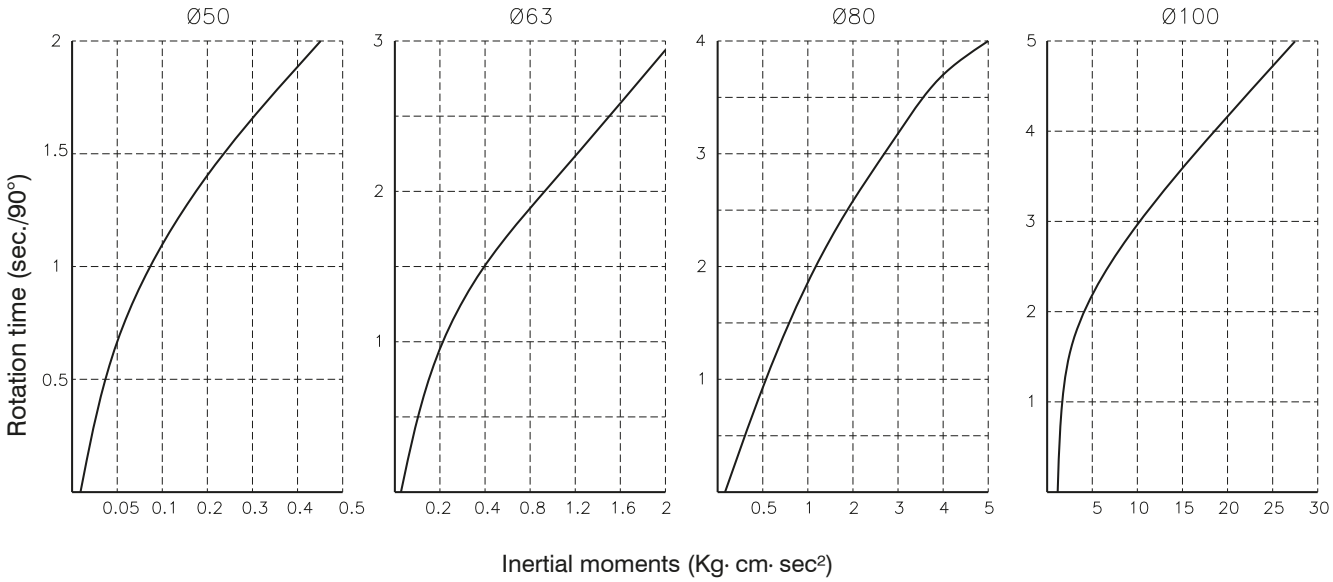




Max Kinetic energy (Kg·cm)
Kinetic energy (cushioning angle 35°)

Bore			
Ø50	Ø63	Ø80	Ø100
10	15	20	30

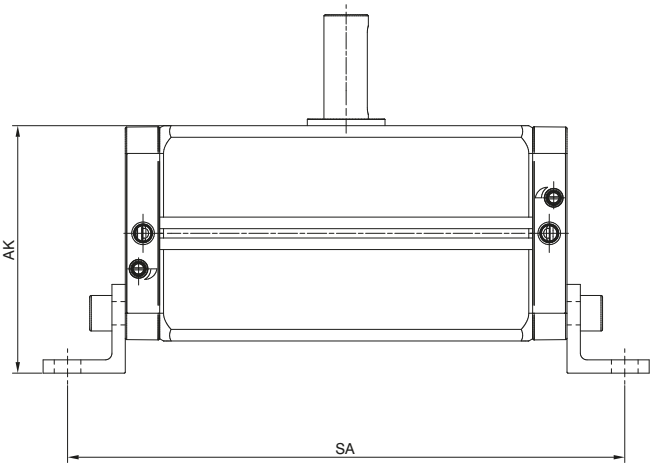
Rotation time according to inertial moments

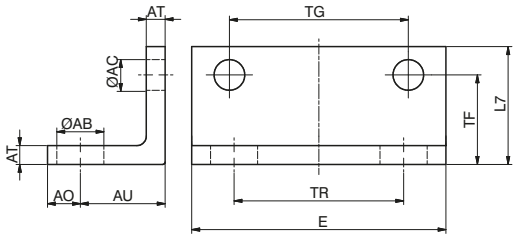


Foot (MS1)

Ordering code
1540.Ø.05/1F

The kit comprises:
n°1 foot (plated zinc steel)
n°2 screws (plated zinc steel)





Bore		Ø50	Ø63	Ø80	Ø100
AK		78	89	111,5	132
SA	90°	198	217	251	313
	180°	231	256	295	379

Vane type rotary actuators



General

The vane type rotary actuators, 6420 series is designed to operate at 90-180 or 270 deg. In a contained space. Dimensionally are more compact than other types of rotary actuators.

The range includes bore sizes from 10 to 100 in 4 configurations:
- basic.
- with rotary angle adjustment mechanism.
- with sensing support.
- with rotary angle adjustment mechanism and sensing support.

The bodies are in aluminium , the shafts in chrome plated steel and the seals in NBR.
The sensing support kit enables for the sensors to be positioned in any position.
The rotary angle adjustment mechanism enables the adjustment of the complete rotation on bore sizes 10 to 40 while on the others sizes carries as standard hydraulic dampers which enable the adjustment only of the last part of the rotation.
The units can be fixed using the thread on the body or the through holes on the body.
On bore sizes 50 to 100 the shaft runs into ball bearings which ensure high resistence.o rotante è guidato su cuscinetti a sfere che assorbono i carichi radiali e assiali, garantendo durata e affidabilità. assiali, garantendo durata e affidabilità.

Ordering code

6420.Ø._._

Size
Ø10
Ø15
Ø20
Ø30
Ø40
Ø50
Ø63
Ø80
Ø100

Rotation angle
90 = 90°
180 = 180°
270 = 270°

Version
/ = Without adjustable rotation angle, and without sensor support
R = With adjustable rotation angle
S = With sensor supports
T = With adjustable rotation angle and sensor supports

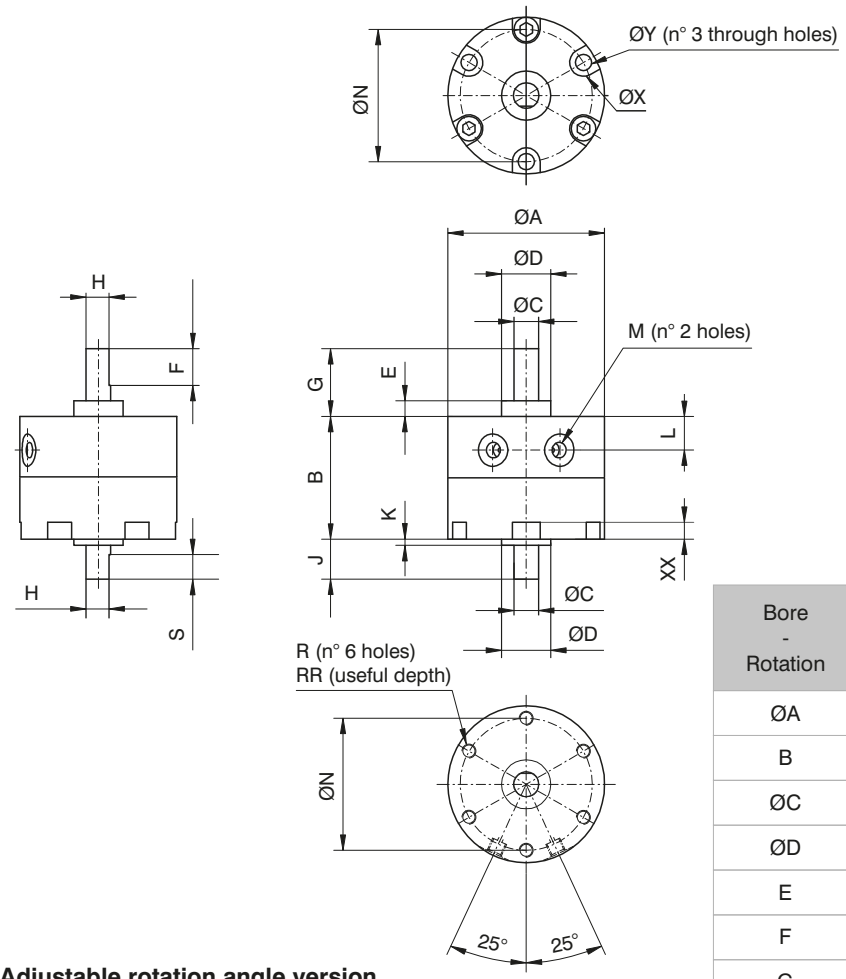
Construction characteristics

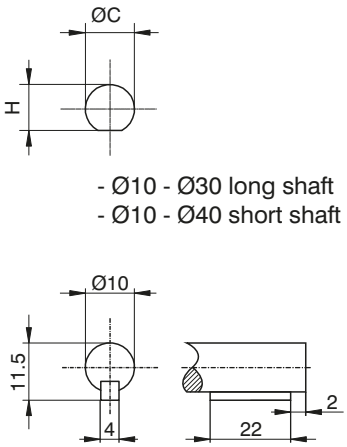
Body	anodised aluminium
Rod	steel
Seals	NBR
Vane	vulcanized NBR rubber on steel core
Cushoning	elastic bumper; hydraulic dampers from size Ø50 - Ø100 versions R or T

Operational characteristics

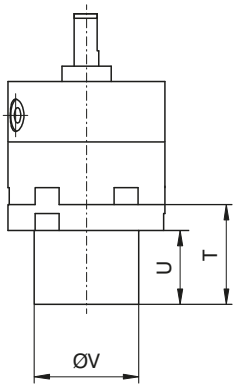
Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Working pressure	1,5 - 7 bar
Temperature	0°C - 50°C
Rotation range	90° - 180° - 270°
Max. allowed leak	Ø10 - Ø40 = 0,3 Nl/min / Ø50 - Ø100 = 0,5 Nl/min

Overall dimensions Ø10 - Ø40

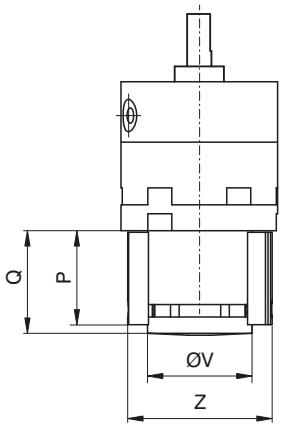




Adjustable rotation angle version

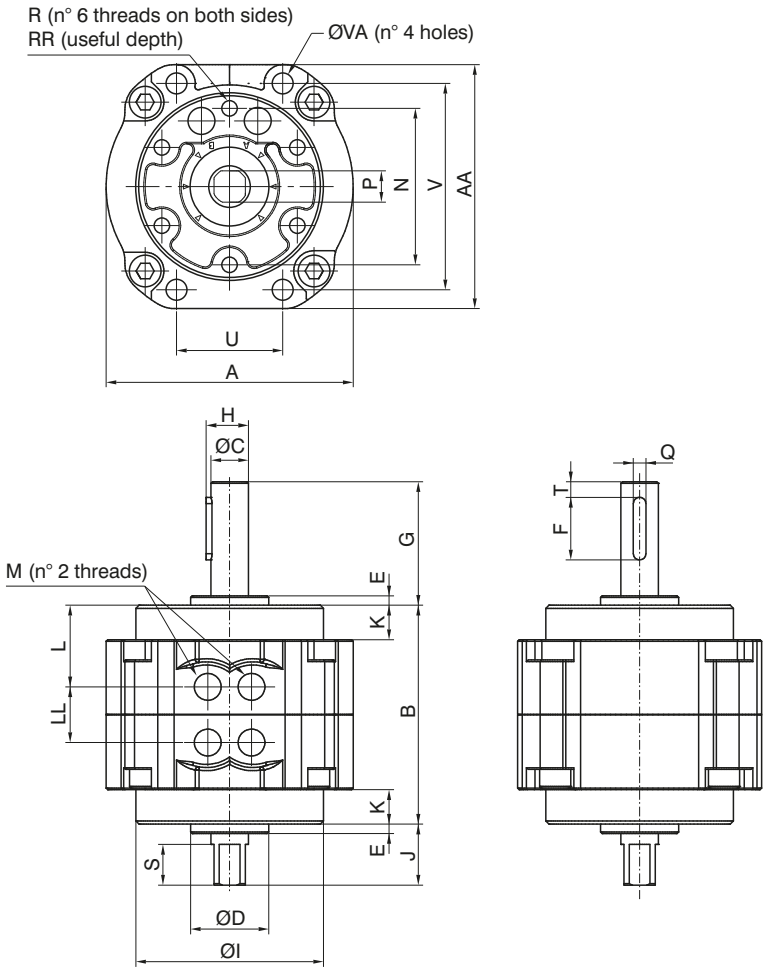


With sensor support version

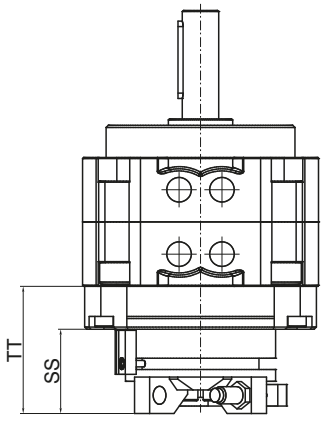


Bore - Rotation	10 - 90° / 10 - 180° / 10 - 270°	15 - 90° / 15 - 180° / 15 - 270°	20 - 90° / 20 - 180° / 20 - 270°	30 - 90° / 30 - 180° / 30 - 270°	40 - 90° / 40 - 180° / 40 - 270°
ØA	30	35	44	51	64
B	17	20,1	29,1	40	45
ØC	4	5	6	8	10
ØD	9	12	14	16	25
E	3	4	4,5	5	6,5
F	9	10	10	12	22
G	14	18	20,3	22	30
H	3,5	4,5	5,5	7,5	9
J	8	9	9,6	13	15
K	1	1,5	1,6	2	4,5
L	4,2	5	8,5	11	9,5
M	M5x0,8	M5x0,8	M5x0,8	M5x0,8	M5x0,8
ØN	24	29	36	43	56
P	23,3	28	28	30,8	33
Q	24	29,5	30,5	34	36
R	M3x0,5	M3x0,5	M4x0,7	M5x0,8	M5x0,8
RR	3	3	4,5	9	9
S	5	6	7	8	9
T	24	28	28,5	32,5	34,5
U	18	22	21	24	26
ØV	18	24	30	34	34
ØX	6	6	7,5	9	9
XX	3,5	3,5	4,5	5,5	5,5
ØY	2,3	2,3	3,2	4,2	4,2
Z	29	34	42	47	47
Weight (g) Base	28	48	112	200	342
Weight (g) With regulation rotation system	78	116	240	390	805

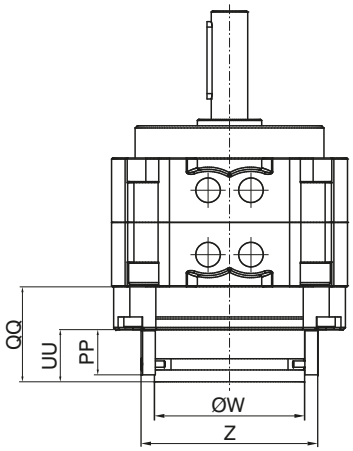
Overall dimensions Ø50 - Ø100



Adjustable rotation angle version



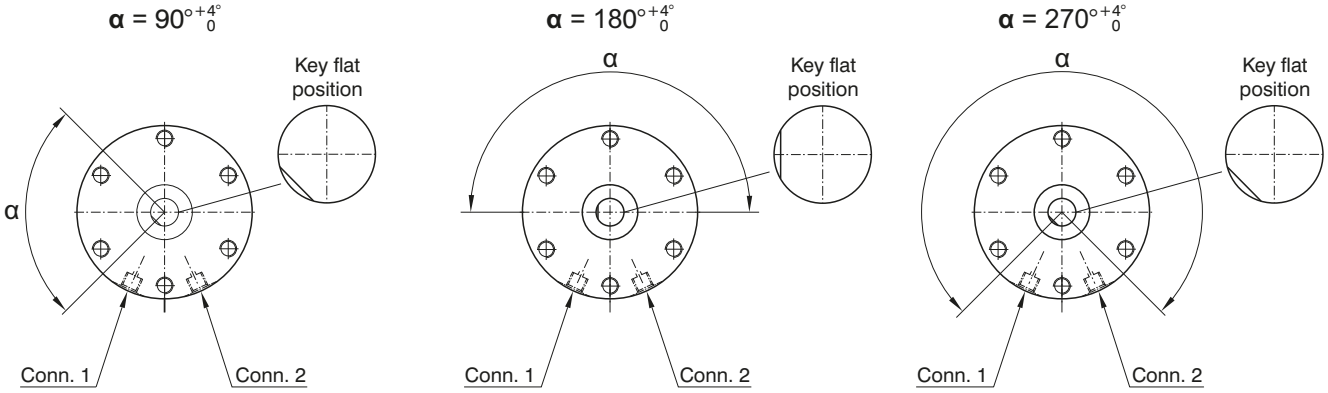
With sensor support version



Bore - Rotation	50 - 90°	63 - 90°	80 - 90°	100 - 90°
	50 - 180°	63 - 180°	80 - 180°	100 - 180°
	50 - 270°	63 - 270°	80 - 270°	100 - 270°
A	79	98	110	140
AA	78	98	110	140
B	70	80	90	103
ØC	12	15	17	25
ØD	25	28	30	45
E	3	3	3	4
F	20	25	36	40
G	39,5	45	53,5	65
H	13,5	17	19	29
ØI	60	75	88	108
J	19,5	21	23,5	30
K	11	14	15	11,5
L	26	28,9	30	35,4
LL	18	22,2	30	32,2
M	G1/8"	G1/8"	G1/4"	G1/4"
N	50	60	70	80
P	10	12	13	19
PP	21	21	21	21
Q	4	5	5	7
QQ	39,4	43	44	48,5
R	M6x1	M8x1,25	M8x1,25	M10x1,5
RR	8	10	14	14
S	13	14	16	16
SS	38	38	39	39,5
T	5	7,5	5	5
TT	53	56,5	59	63
U	34	39	48	60
UU	24,5	24,5	24,5	24,5
V	66	83	94	120
ØVA	6,5	9	9	11
ØW	60	60	70	70
Z	73	73	83	83
Weight (g) Base	760	1290	1920	4100
Weight (g) With regulation rotation system	1100	1690	2370	4840

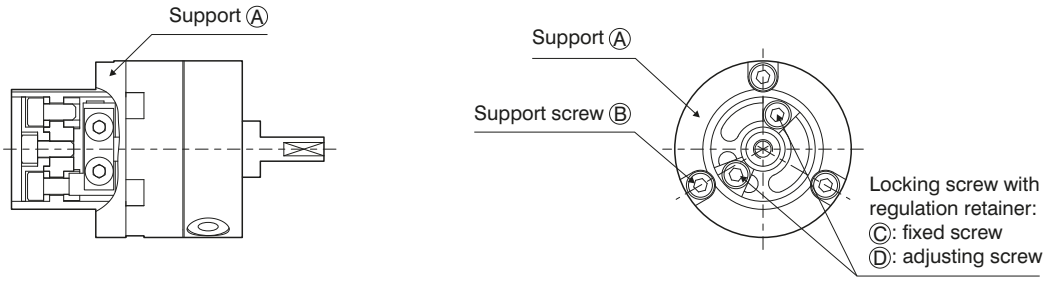
Key flat position and adjustable rotation angle Ø10 - Ø40

ROTATING SHAFT KEY FLAT POSITION



ROTATION ANGLE SETUP

To regulate the rotation angle (codes 6420..R or T), follow the instructions below

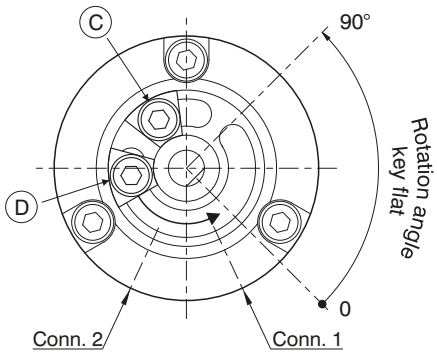


Phase 1 : Choose the regulation configuration based on the following options (consider the actuator base position):
rotation 90°, regulation 0 - 90°, rotation 180°, regulation 0 - 180°, rotation 270°, regulation 0 - 175°

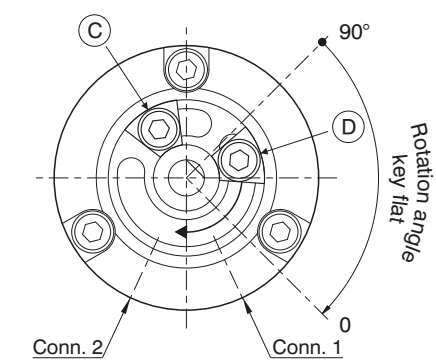
ROTATION CONFIGURATION

90°

Standard version — from 0° to 90°



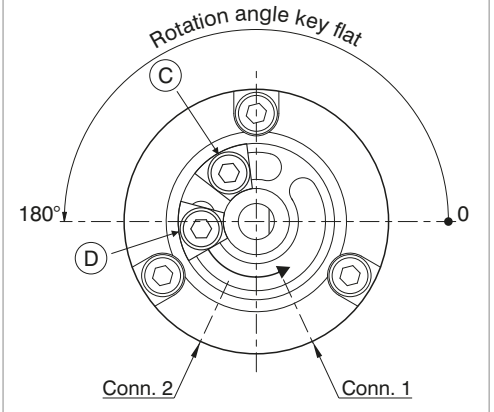
from 90° to 0°



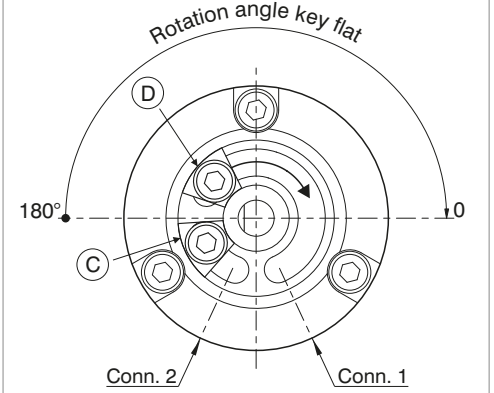
ROTATION CONFIGURATION

180°

Standard version — from 0° to 180°



from 180° to 0°

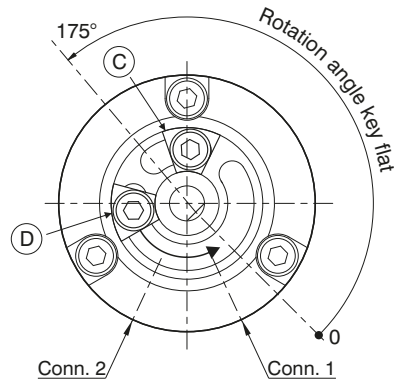


Key flat position and adjustable rotation angle Ø10 - Ø40

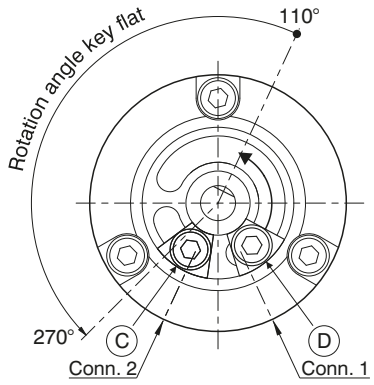
ROTATION CONFIGURATION

270°

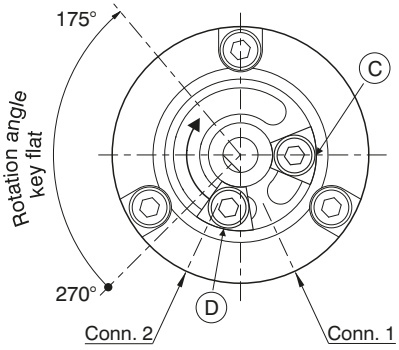
Standard version — from 0° to 175°



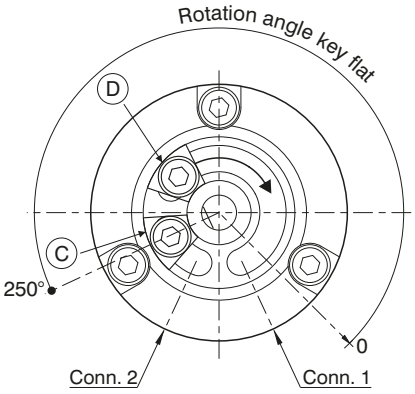
from 110° to 270°



from 270° to 175°



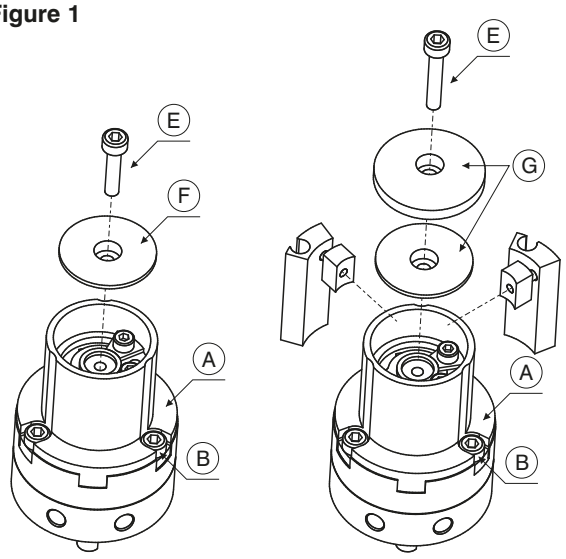
from 250° to 0°



Ⓒ = **Fixed screw** Ⓓ = **Adjusting screw**

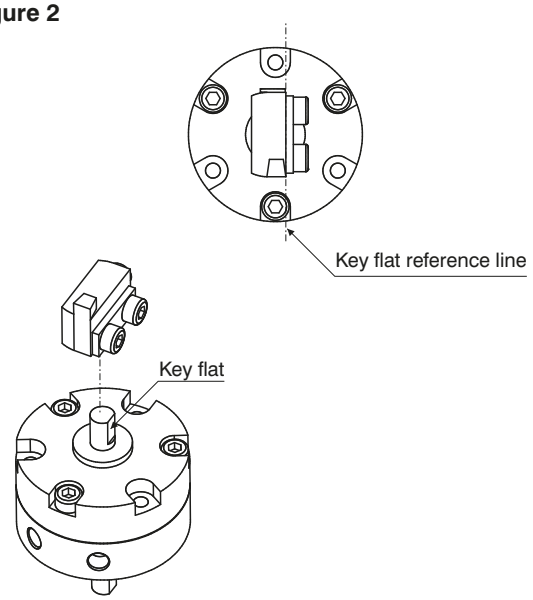
Phase 2 : If the desired settings do not correspond to the basic version settings:
- remove screw Ⓔ and disk Ⓕ or Ⓖ (depending on the version) (see figure 1)
- remove screws Ⓑ, the actuator support Ⓐ (see figure 1) and unlock blocking screws Ⓒ and Ⓓ (see rotation configuration)
- position screws Ⓒ and Ⓓ and the key flat of rotating shaft as indicated in the chosen rotation configuration in order to align the key flat of rotating shaft (see figure 2)
- re-assemble actuator support Ⓐ, tighten screws Ⓑ
- position screws Ⓒ and Ⓓ according to the desired adjustment and tighten the screws
- re-assemble disk Ⓕ or Ⓖ and screw Ⓔ

Figure 1



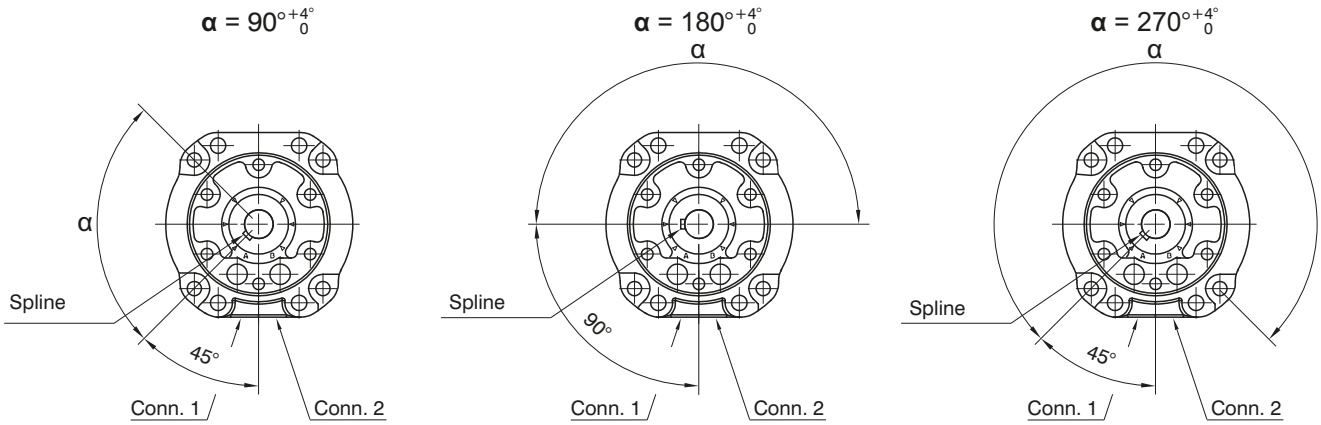
Version "R" **Version "T"**

Figure 2



Spline position and adjustable rotation angle Ø50-Ø100

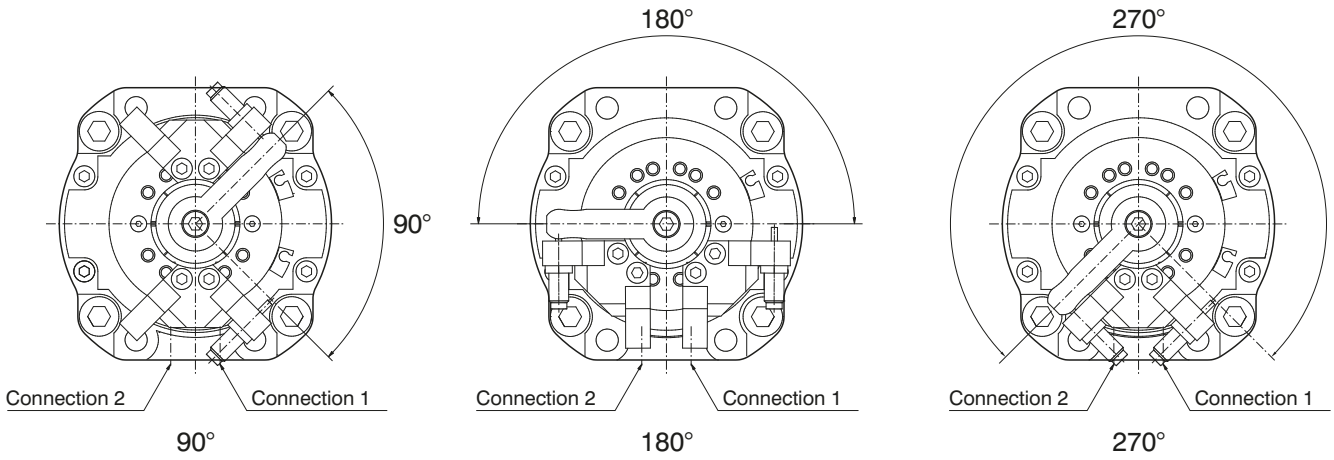
ROTATING SHAFT SPLINE POSITION



ROTATION ANGLE SETUP

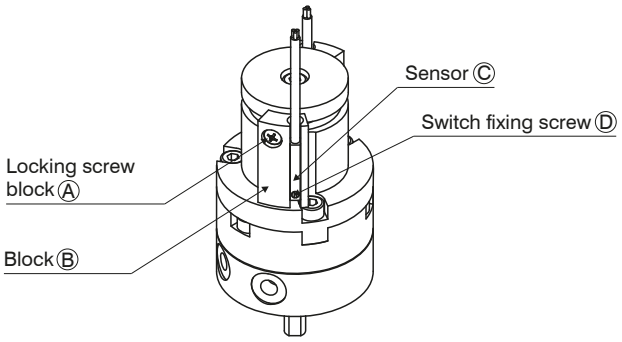
The version with adjustable rotation angle (cod. 6420..R or T) is available with hydraulic dampers which enable to regulate the rotation angle by 15° and to decelerate moving mass.

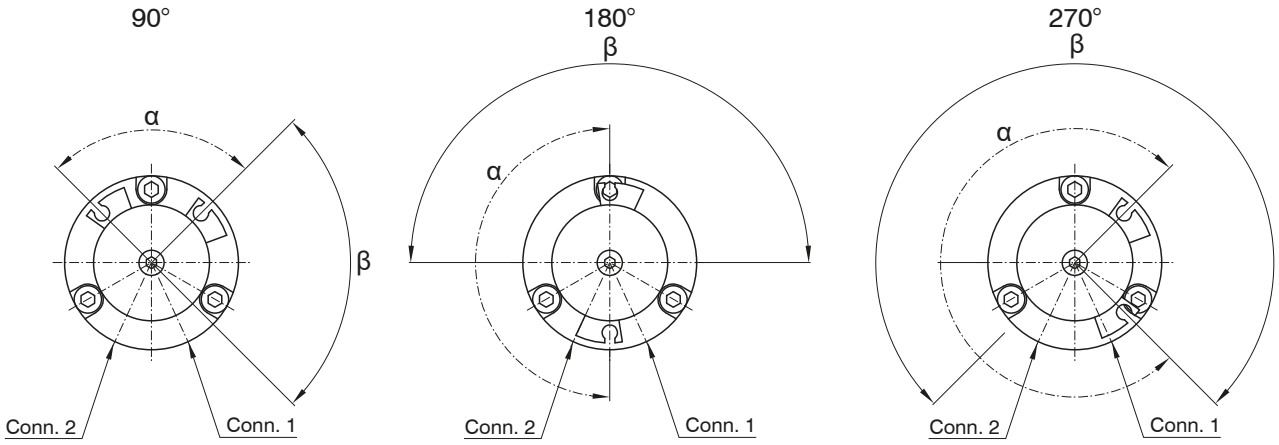
Example: for 90° rotation and 15° regulation per decelerator, the effective rotation angle is 60°
Example: for 180° rotation and 15° regulation per decelerator, the effective rotation angle is 150°
Example: for 270° rotation and 15° regulation per decelerator, the effective rotation angle is 240°



Switch positioning instructions Ø10 - Ø40

Phase 1 - Unfasten screw Ⓐ
Phase 2 - Assemble the switch Ⓒ into the dedicated housing Ⓑ and lock with screw Ⓓ
Phase 3 - Rotate block Ⓑ in the desired position (see following image)





α - magnet rotating angle
β - shaft key flat rotating angle
For correct functionality position the switch within angle **α**

Phase 4 - tighten screw Ⓐ
Phase 5 - repeat the following phases for the second switch

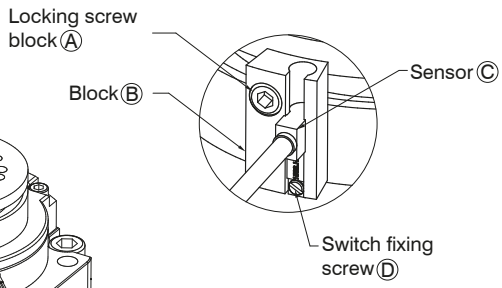
AVAILABLE SENSORS

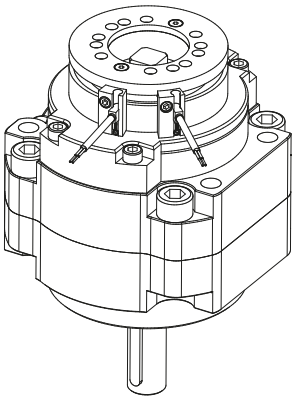
Code
1581.U
TRS.U
1581.HAP
THS.P

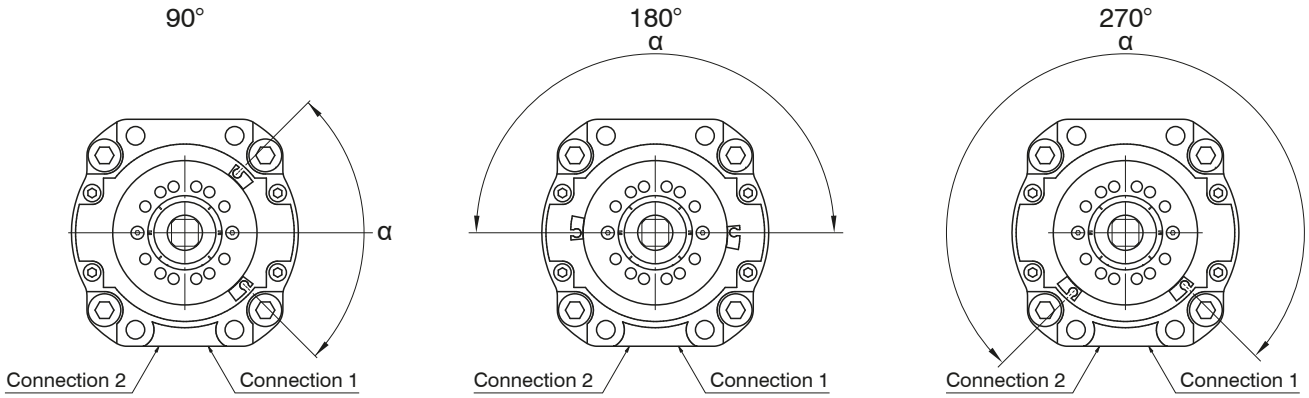
Code
1583.DC
1583.HAP
THR.P

Switch positioning instructions Ø50 - Ø100

Phase 1 - Unfasten screw (A)
Phase 2 - Assemble the switch (C) into the dedicated housing (B) and lock with screw (D)
Phase 3 - Rotate block (B) in the desired position (see following image)







α - magnet rotating angle (that corresponds to the shaft key flat rotating angle)
For correct functionality position the switch within angle **α**

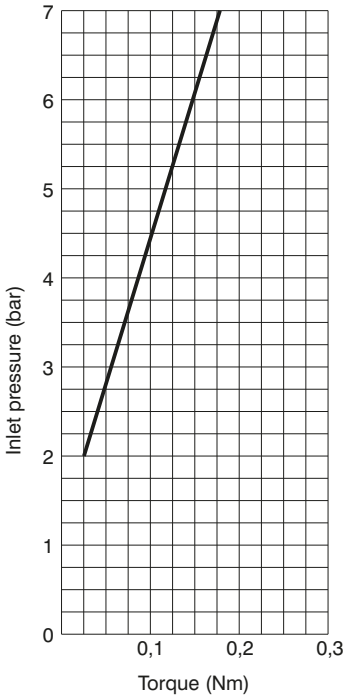
Phase 4 - tighten screw (A)
Phase 5 - repeat the following phases for the second switch

AVAILABLE SENSORS

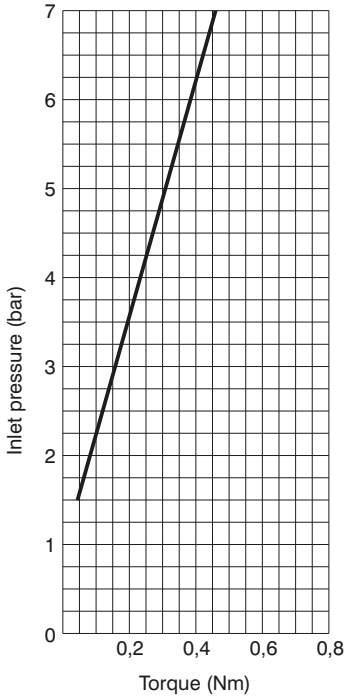
	Code
	**1583.DC**
	1583.HAP
	THR.P

Available torques

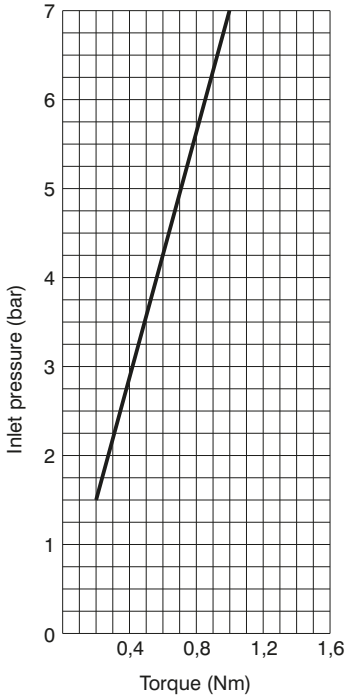
Ø10



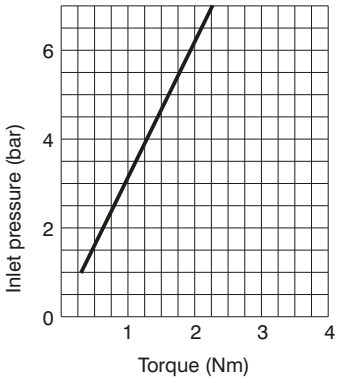
Ø15



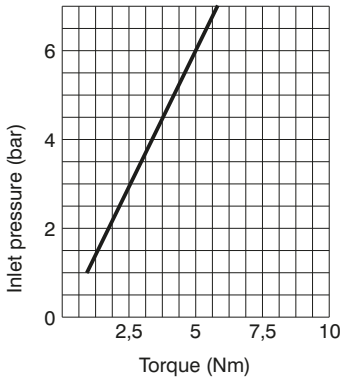
Ø20



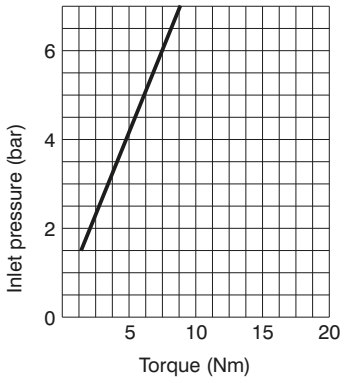
Ø30



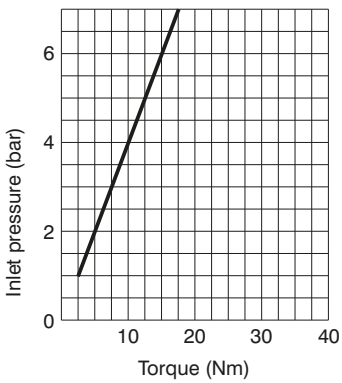
Ø40



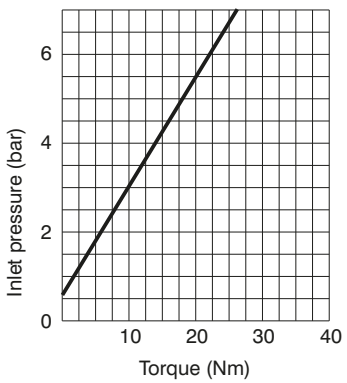
Ø50



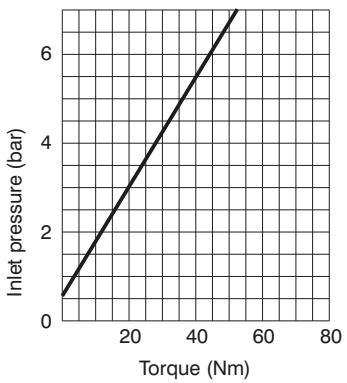
Ø63



Ø80

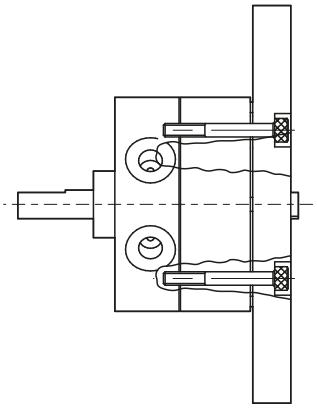


Ø100

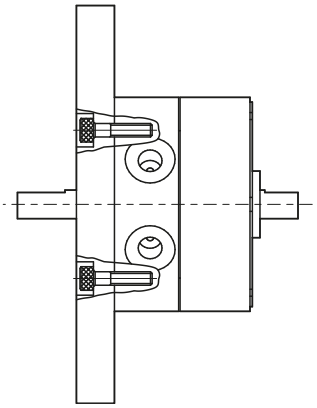


Direct mounting

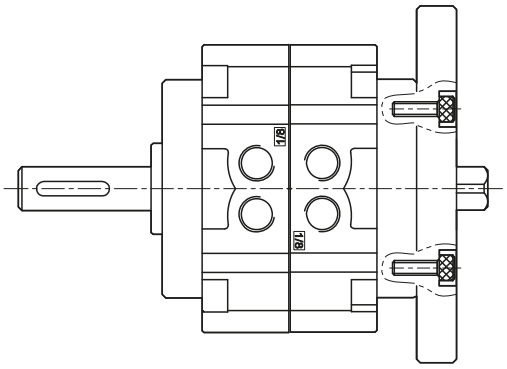
Mounting types



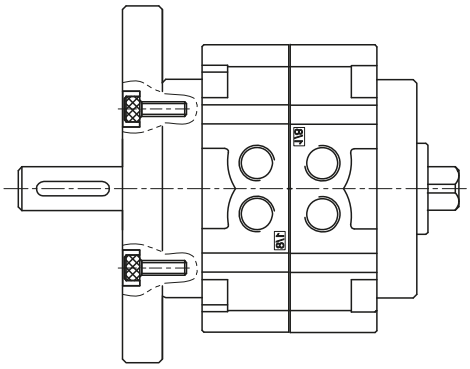
Rear mounting



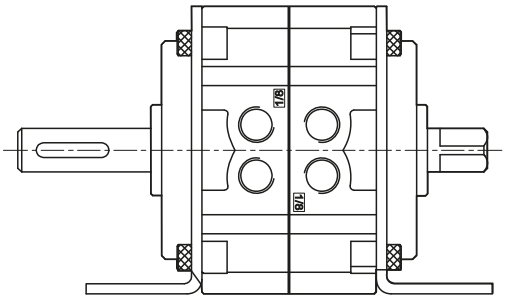
Frontal mounting



Rear mounting



Frontal mounting



Mounting with flange

Series 6300 - Pneumatic grippers

General

Pneumatic grippers from the 6300 series are typically used in complex systems such as assembly machines, robots, manipulators etc.
This series covers the wide range requirements of this sector, allowing a variety of applications.
The range includes grippers equipped with holding fingers operating from -10° to +30° degrees, with 180° degree opening, or a parallel guided gripper with great rigidity throughout the stroke.
The parallel grippers cater for larger openings (three different strokes for each diameter) with synchronised operation via a pinion-rack system with high strength thanks to a double piston mechanism.
For the typical application of supplying a piece upon to a machine tool, make provision for an automatic three-pronged movement carried along by a wedge mechanism, containing the elevated force dimensions.
The holding fingers can have a tolerance reference as a precise fixing device for the catching mechanism. Every type of “hand” offers different functional levels of performance at varying diameters and lengths, secondary to the application by the “fingers”.

Pneumatic grippers, angular - Standard version

Ordering code

6301.Ø. _

- **10**
- **16**
- **20**
- **25**

- **D** = Double acting
- **S** = Single acting (normally open)

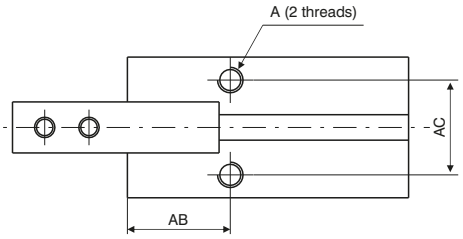
Construction characteristics

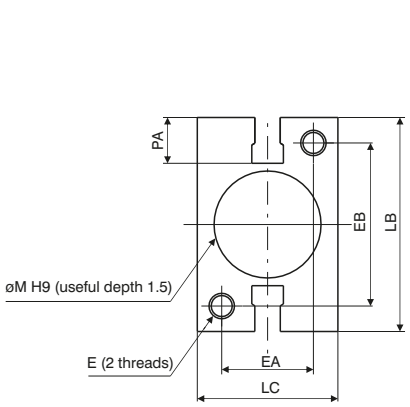
Body	anodised aluminium
Piston	AISI 303 stainless steel
Fingers	nitrate steel
End cap	anodised aluminium
Seals	oil resistant NBR rubber

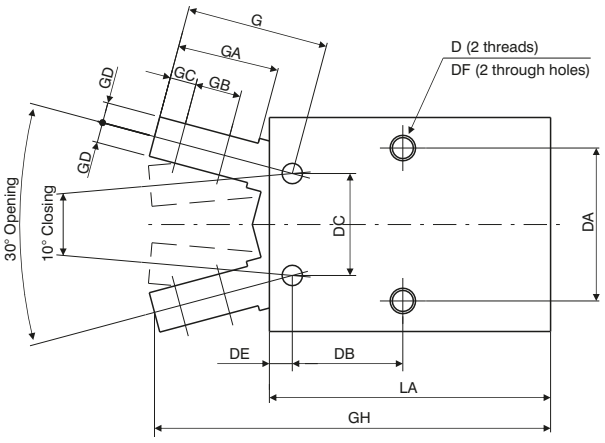
Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.		
Working pressure	1 - 6 bar (double acting) - 2.5 - 6 bar (single acting)		
Operating temperature	-5°C - +70°C		
Opening total stroke	-10° - 30°		
Holding force (Nm) at 5 bar	Bore	Double acting	Single acting
	Ø10	0.1	0.07
	Ø16	0.4	0.30
	Ø20	0.7	0.55
	Ø25	1.35	1.08
Maximum operating frequency	from Ø10 to Ø25, 190 cycles/minute		

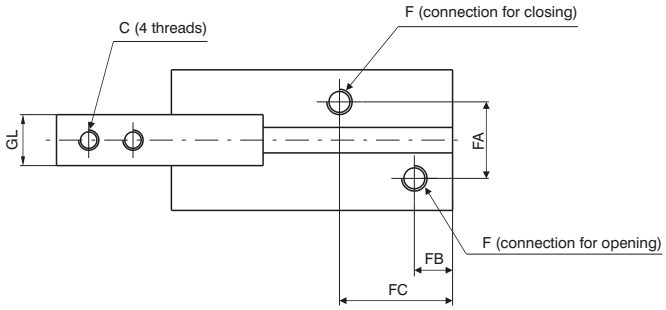
Overall dimensions



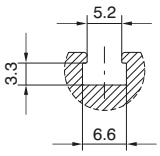




Bore		Ø10	Ø16	Ø20	Ø25
A		M3x0,5	M4x0,7	M5x0,8	M6
	Useful depht	6	6,5	8	10
AB		11,6	14,6	20,2	23,9
AC		11,4	16	18,6	22
C		M2,5x0,45	M3x0,5	M4x0,7	M5x0,8
D		M3x0,5	M4x0,7	M5x0,8	M6
	Useful depht	5	8	10	12
DA		16	24	30	36
DB		12,8	16,2	21,7	25,8
DC		10	16	20	25
DE		2,8	3,9	4,5	4,6
DF		2,6	3,4	4,3	5,1
E		M3x0,5	M4x0,7	M5x0,8	M6
	Useful depht	6	8	10	12
EA		12	15	18	22
EB		18	22	32	40
F		M3x0,5	M5x0,8	M5x0,8	M5x0,8
FA		11	13	15	20
FB		7,2	7	7,5	7,7
FC		18,8	18,3	22,2	23,5
G		17,2	22,6	28	37,5
GA		12	16	20	27
GB		5,7	7	9	12
GC		3	4	5,2	8
GD		2	3,5	4	5
GH		52,4	62,5	78,7	92
GL	0/-0,1	6,4	8	10	12
LA		38,6	44,6	55,2	60,4
LB		23	30,6	42	52
LC		16,4	23,6	27,6	33,6
M	H9	11	17	21	26
PA		5,4	5,8	9	11,5
Weight (g)		40	90	180	315



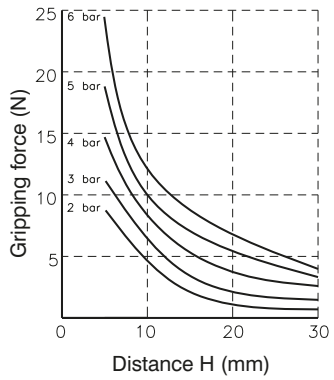
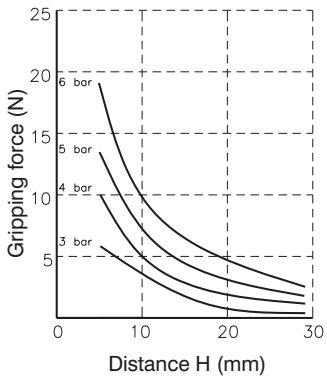
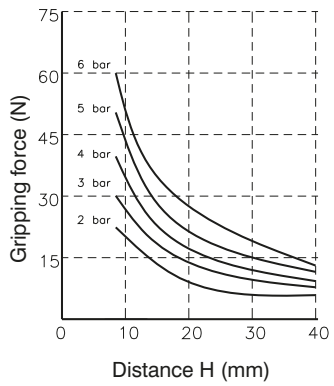
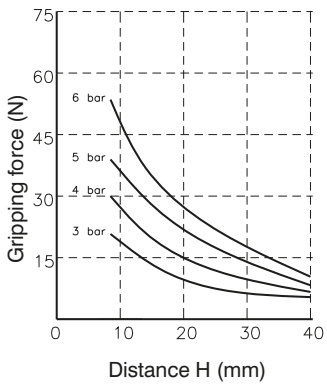
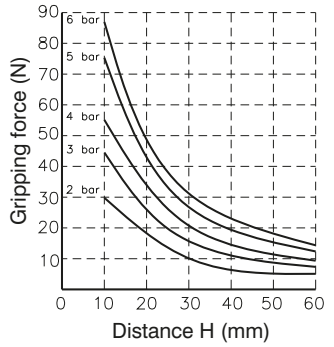
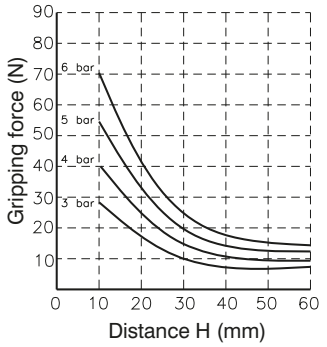
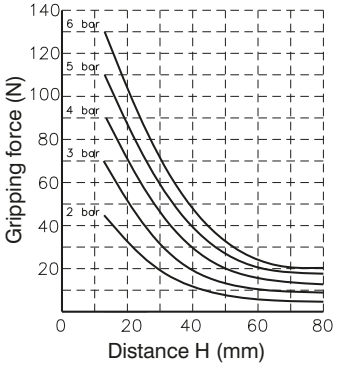
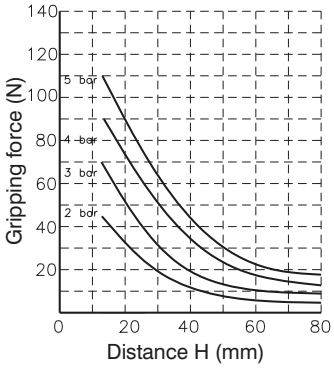
Sensor slot
detail type “B”

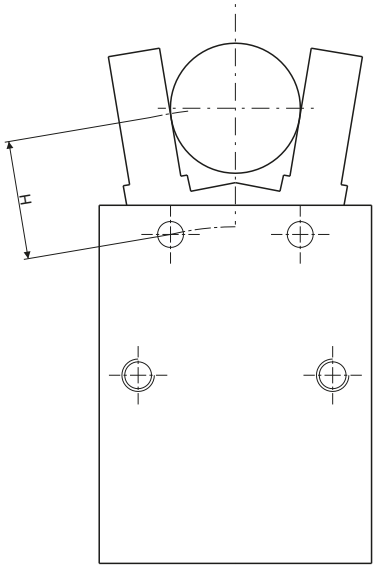


Gripping force 5 bar (Nm)

Bore	Ø10	Ø16	Ø20	Ø25
Double acting (Nm)	0,1	0,4	0,7	1,35
Single acting (Nm)	0,07	0,3	0,55	1,08

NOTE:
Bore selection should be made considering a holding force 10 to 20 times the component weight.
In case of acceleration/deceleration a further margin of safety should be considered.

	Double acting	Single acting
Ø10		
Ø16		
Ø20		
Ø25		



Pneumatic grippers, 180 °angular

Ordering code

6302.Ø.D

- **10**
- **16**
- **20**
- **25**

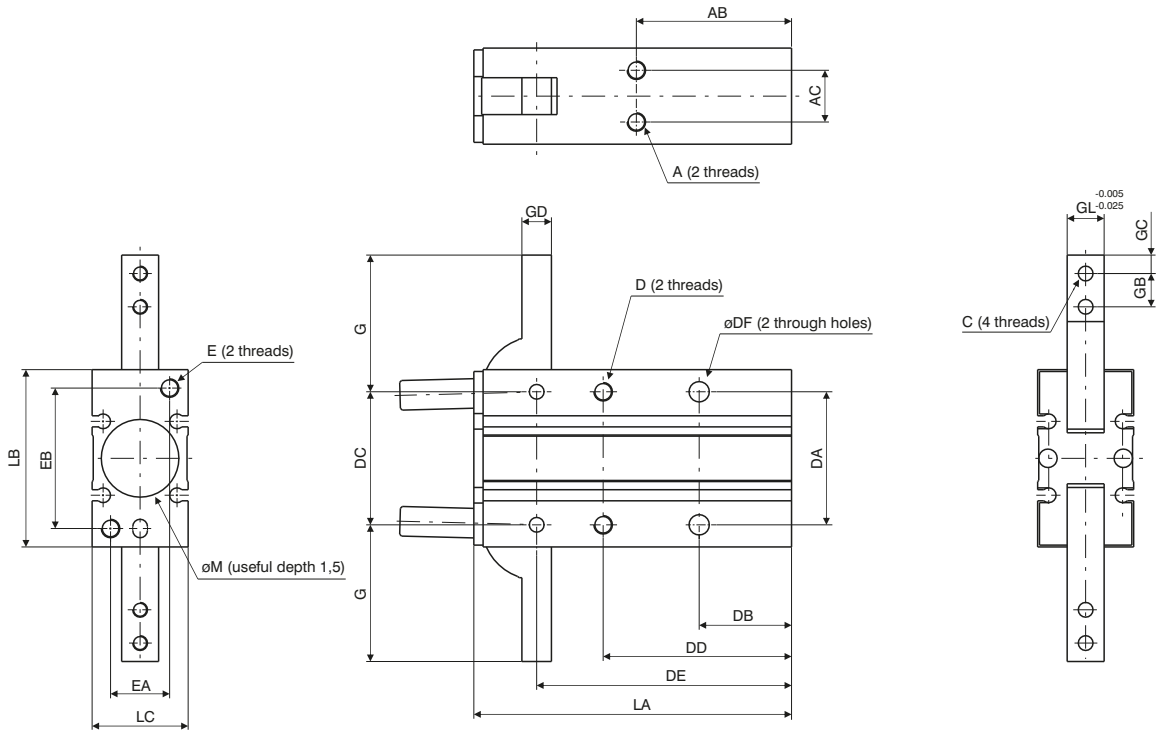
Construction characteristics

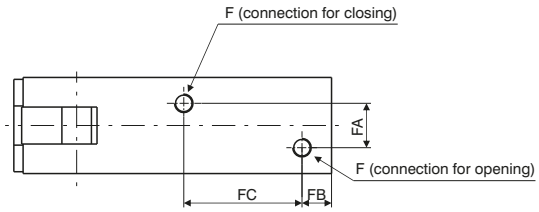
Body	anodised aluminium
Piston	aluminium
Fingers	steel
End cap	anodised aluminium

Operational characteristics

Function	double acting
Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Working pressure	1 - 6 bar
Working temperature	-5C° - +70C°
Opening total stroke	-3° - 180°
Maximum operating frequency	from Ø10 to Ø25, 60 cycles/minute

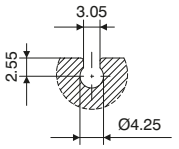
Overall dimensions



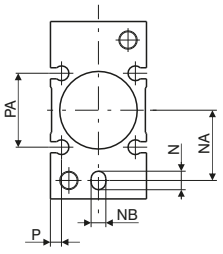


Bore		Ø10	Ø16	Ø20	Ø25
A		M3x0,5	M4x0,7	M5x0,8	M6x1
	Useful depth	4	5	8	10
AB		30	33	42	50
AC		9	12	14	16
C		M3x0,5	M3x0,5	M4x0,7	M5x0,8
D		M3x0,5	M4x0,7	M5x0,8	M6x1
	Useful depth	6	8	10	12
DA		24	30	36	42
DB		18	20	25	30
DC		22	28	36	45
DD		35	41	51	60
DE		47,5	55,5	69	86
DF		3,4	4,5	5,5	6,6
E		M3x0,5	M4x0,7	M5x0,8	M6x1
	Useful depth	6	8	10	12
EA		9	12	16	18
EB		24	30	38	46
F		M5x0,8	M5x0,8	M5x0,8	M5x0,8
FA		3	8	2	14
FB		7	7	8	8
FC		23	25	32	42
G		23,5	28,5	37	45
GB		6	7	9	12
GC		3	4	5	6
GD		4	5	8	10
GL		6	8	10	12
LA		58	69	86	107
LB		30	38	48	58
LC		15	20	26	30
N		4	4	5	5
	Useful depth	3	3	4	4
NA		9	15	19	23
ØM^{H9}		11	17	21	26
ØNB^{H9}		3	3	4	4
P		2	2,5	3	3
PA		13	18	20	24
Weight (g)		70	150	320	550

Sensor slot detail type “C”



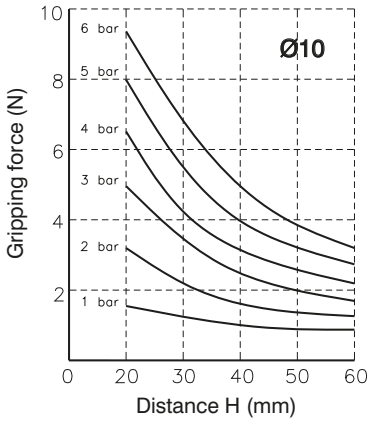
Back view detail

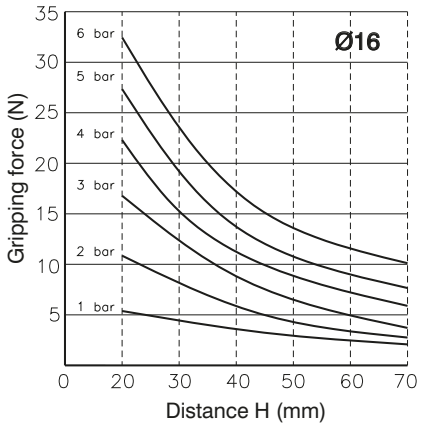


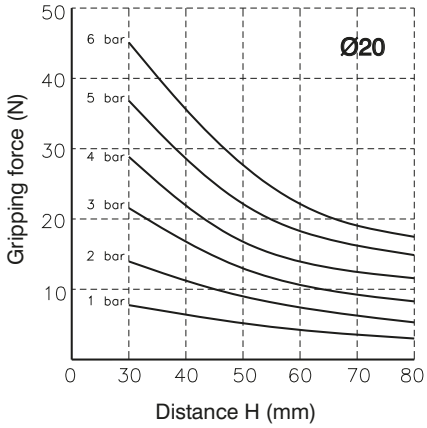
Operating criteria

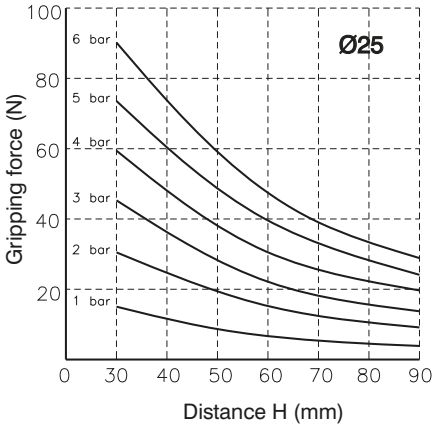
Gripping force 5 bar (Nm)

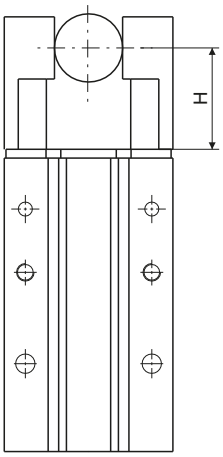
Bore	Ø10	Ø16	Ø20	Ø25
(Nm)	0,16	0,54	1,1	2,28



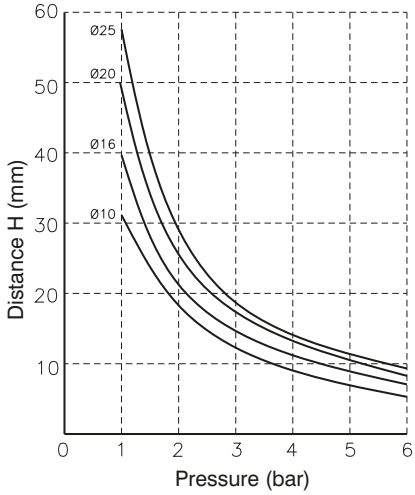


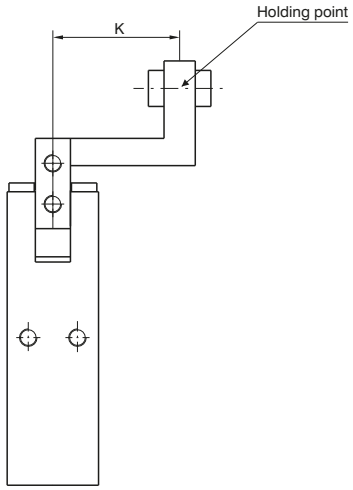






Confirmation of Holding point





Applications where the holding point is outside the recommended parameters shown on the above graph might affect the product life.

180° angular gripper rack & pinion style

Ordering code

6303.Ø.D_

- **F** = Fingers, end fixing
- **L** = Fingers, side fixing

- **20**
- **25**
- **32**
- **40**
- **50**

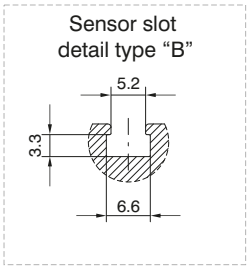
Construction characteristics

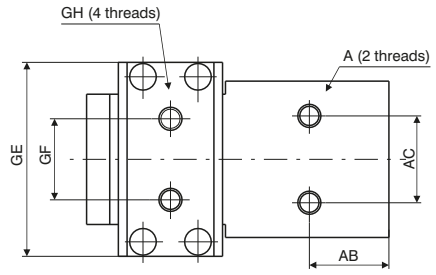
Body	anodised aluminium
Piston	aluminium
Fingers	steel
End cap	anodised aluminium

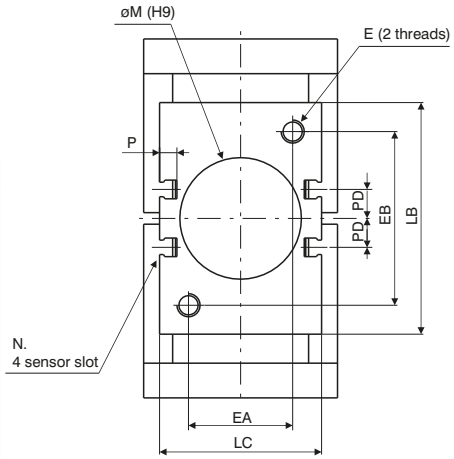
Operational characteristics

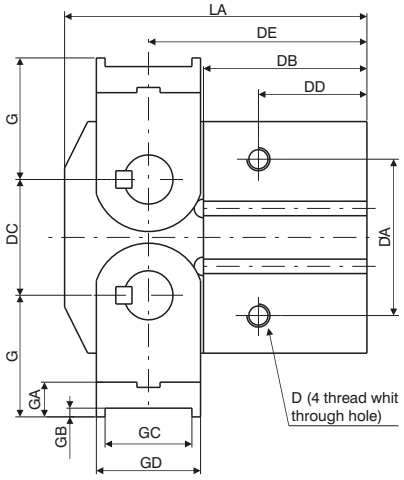
Function	double acting
Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Working pressure	1.5 - 7 bar
Working temperature	-5C° - +70C°
Opening total stroke	-5° - 180°
Maximum operating frequency	from Ø20 to Ø25, 60 cycles/minute from Ø32 to Ø50, 30 cycles/minute

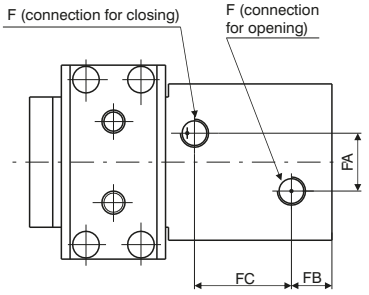
Overall dimensions





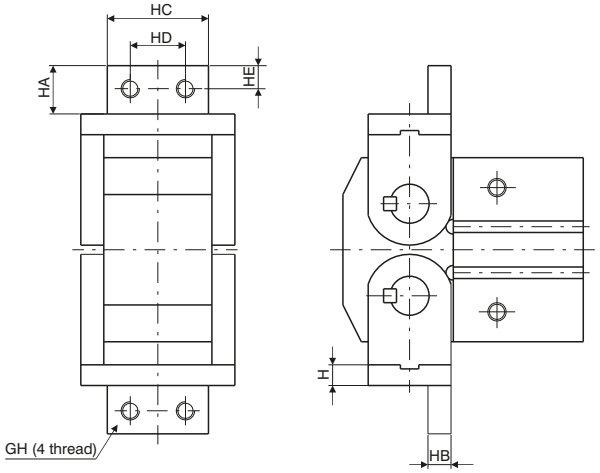






Bore		Ø20	Ø25	Ø32	Ø40	Ø50
A		M5	M6	M6	M8	M10
	Useful depth	7	10	10	15	20
AB		17	20	21	27,5	36
AC		20	24	24	30	40
D		M5	M6	M6	M8	M10
	Useful depth	10	12	12	16	20
DA		27	34	42	54	70
DB		35	40	47	56,5	69
DC		18	24	30	40	56
DD		23	27	29	37,5	48
DE		45	51	61,5	75,5	96
E		M5	M6	M6	M8	M10
	Useful depth	10	12	12	15	20
EA		26	30	30	36	40
EB		26	30	45	60	80
F		M5	M5	G1/8	G1/8	G1/4
FA		12	16	20	20	30
FB		9	10	13	14	16
FC		20	23	25	33,5	44
G		23	27	32	42	58
GA		7	8	9	12	17
GB		2	2	2	3	4
GC		12	17	23	30	44
GD		16	21	27	36	52
GE		41	45	51	67	85
GF		18	20	20	28	38
GH		M4	M5	M6	M8	M10
H		5	6	7	9	13
HA		10	12	14	21	24
HB		5	6	7	10	13
HC		28	30	34	44	58
HD		14	16	18	24	30
LA		60	69	83,5	104,5	136
LB		36	45	58	80	112
LC		36	40	45	56	66
ØM^{H9}		21	26	34	42	52
	Useful depth	3	3	4	4	5
P		6	5,5	5,5	6	6
PD		4	4,5	11	10	13
Weight (g)		300	500	900	2100	5000

Fingers side fixing

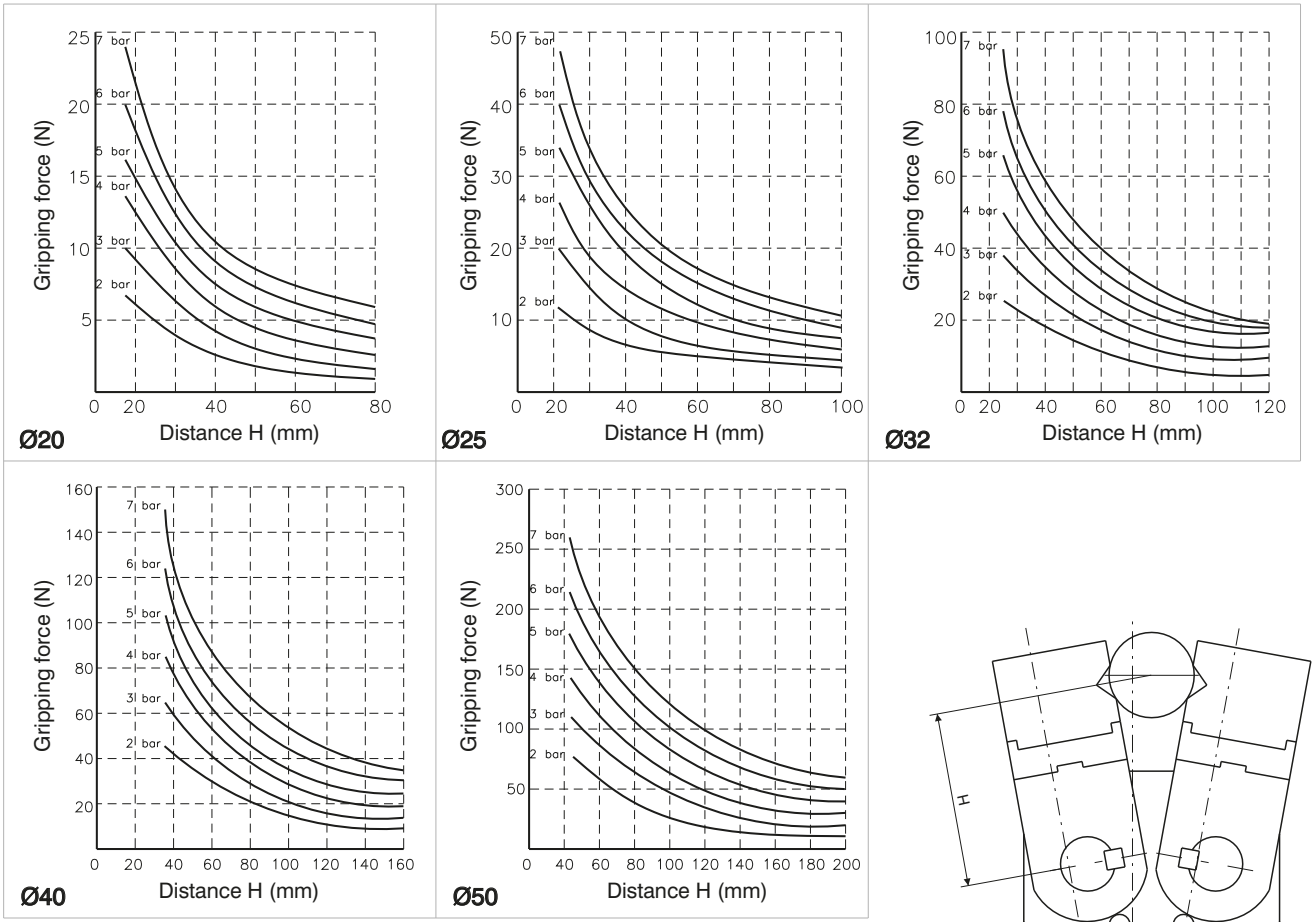


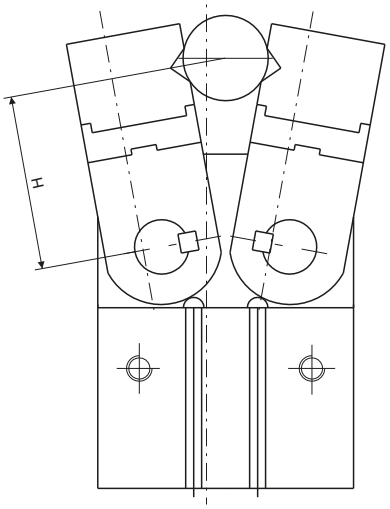
Operating criteria

Gripping force

NOTE:
Bore selection should be made considering a holding force 10 to 20 times the component weight.
In case of acceleration/deceleration a further margin of safety should be considered.

Bore	Ø20	Ø25	Ø32	Ø40	Ø50
(Nm)	0,3	0,7	1,6	3,7	8,3





Parallel style pneumatic grippers - Standard version

Ordering code

6310.Ø __

- **10**
- **16**
- **20**
- **25**

- **D** = Double acting
- **NC** = Single acting (normally closed)
- **NO** = Single acting (normally open)

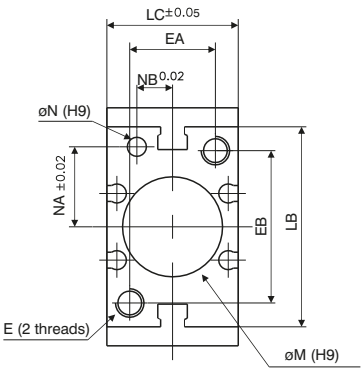
Construction characteristics

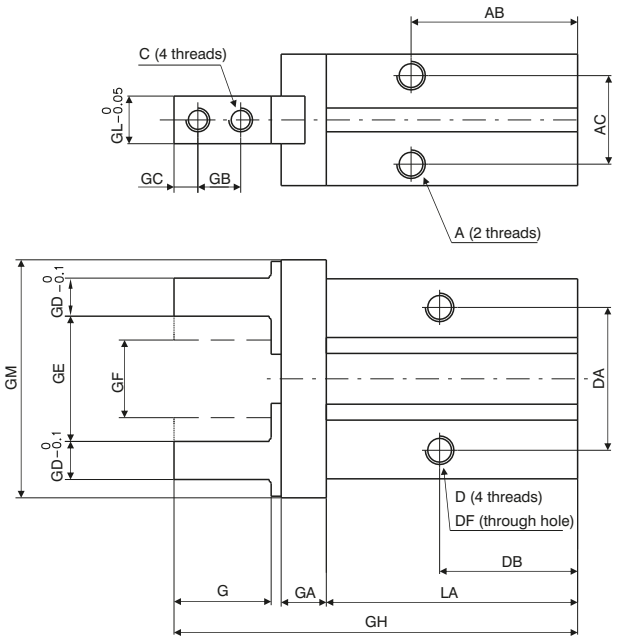
Body	anodised aluminium
Piston	aluminium or stainless steel (depending on the bore)
Fingers	steel
End cap	anodised aluminium
Seals	oil resistant NBR rubber

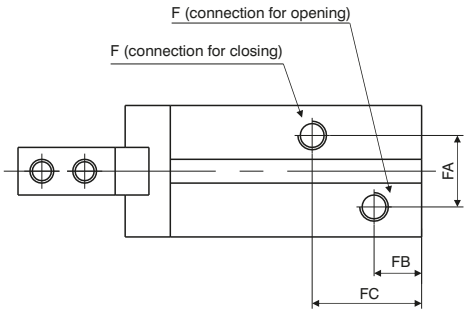
Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Working pressure	double acting : 2 - 7 bar (for ø10) - 1 - 7 (for other bores) single acting : 3.5 - 7 bar (for ø10) - 2.5 - 7 (for other bores)
Operating temperature	-5°C - +70°C
Maximum operating frequency	from Ø10 to Ø25, 180 cycles/minute

Overall dimensions

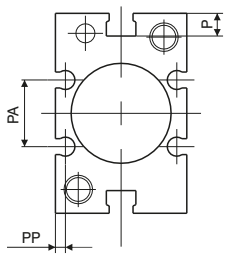






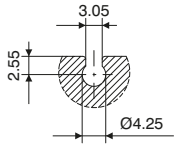
Bore		Ø10	Ø16	Ø20	Ø25
A		M3x0,5	M4x0,7	M5x0,8	M6x1
	Useful depth	6	4,5	8	10
AB		27	30	35	36,5
AC		11,4	16	18,6	22
C		M2,5x0,45	M3x0,5	M4x0,7	M5x0,8
D		M3x0,5	M4x0,7	M5x0,8	M6x1
	Useful depth	5,5	8	10	12
DA		16	24	30	36
DB		23	24,5	29	30
ØDF		2,6	3,4	4,3	5,1
E		M3x0,5	M4x0,7	M5x0,8	M6x1
	Useful depth	6	8	10	12
EA		12	15	18	22
EB		18	22	32	40
F		M3x0,5	M5x0,8	M5x0,8	M5x0,8
FA		11	13	15	20
FB		9	7,5	10	10,7
FC		19	19	23	23,5
G		12	15,5	20	25
GA		6	7,5	9,5	11
GB		5,7	7	9	12
GC		3	4	5	6
GD		4	5	8	10
GE		15,2	20,9	26,3	33,3
GF		11,2	14,9	16,3	19,3
GH		57	67,5	84,8	102,7
GL		5	8	10	12
GM		29	38	50	63
LA		37,8	42,5	52,8	63,6
LB		23	30,6	42	52
LC		16,4	23,6	27,6	33,6
ØM H9		11	17	21	26
	Useful depth	2	2	3	3,5
ØN H9		2	3	4	4
	Useful depth	3	3	4	4
NA		7,6	11	16,8	21,8
NB		5,2	6,5	7,5	10
P		5,4	5,8	9	11,5
PA		/	11,6	14	19
PP		/	2,1	2,1	3,5
Weight (g)		55	120	230	425

Sensor slot detail



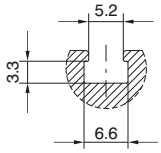
Ø16 - Ø25

Sensor slot detail type “C”



Ø10 - Ø25

Sensor slot detail type “B”

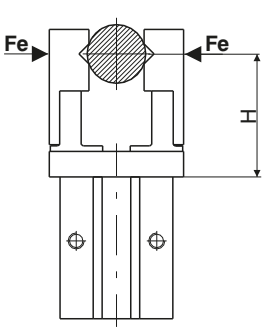


Operating criteria

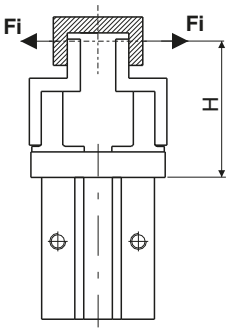
Holding force (N) (pressure 5 bar, holding point H=20 half stroke)

Version		Force	Bore Ø10	Ø16	Ø20	Ø25
Double acting		Fe	9,8	30	42	65
		Fi	17	40	66	104
Single acting	N.O.	Fe	6,3	24	28	45
	N.C.	Fi	12	31	56	83

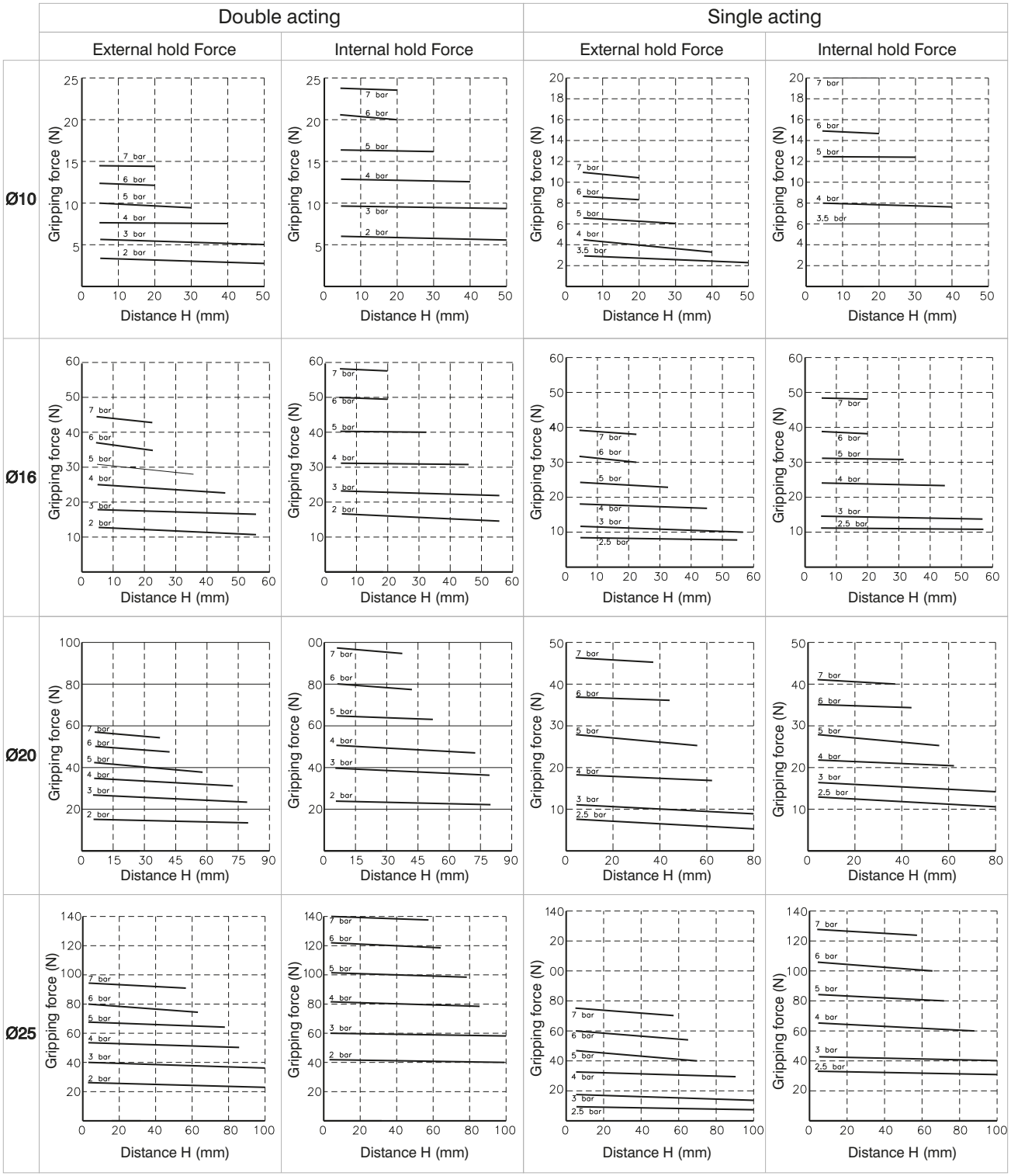
Fe =external holding force **Fi** = internal holding force



EXTERNAL HOLD



INTERNAL HOLD



Parallel style pneumatic grippers - Wide opening

Ordering Code

6311.Ø.D. __

- **10**
- **16**
- **20**
- **25**
- **32**
- **40**

Ordering code options	Stroke					
	20	30	40	50	70	100
1	40	60	80	100	120	160
2	60	80	100	120	160	200
	Ø10	**Ø16**	**Ø20**	**Ø25**	**Ø32**	**Ø40**
	Bore					

Construction characteristics

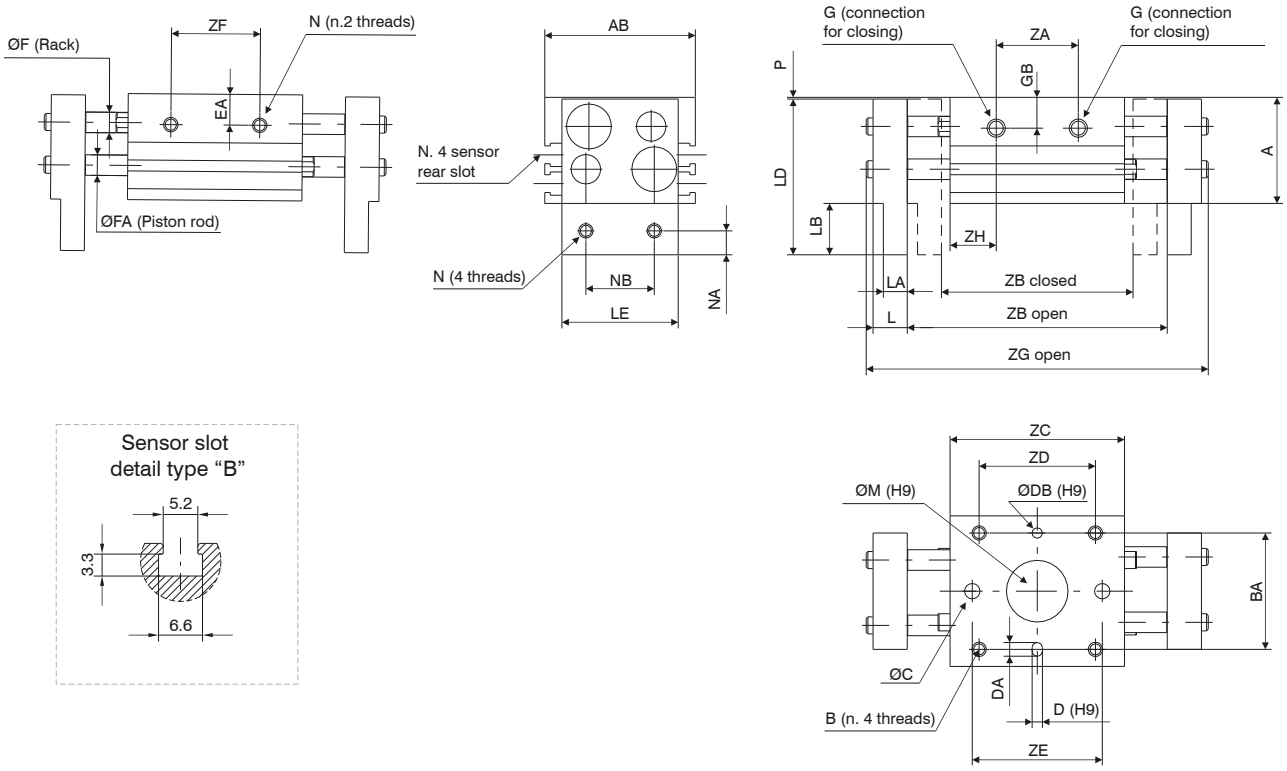
Body	anodised aluminium
Piston	aluminium
Fingers	anodised aluminium
Rod	steel
Rack	steel
Pinion	steel

Operational characteristics

Function	double acting
Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Working pressure	Ø10: 1.5 - 6 bar - Ø16 - 40: 1 - 6 bar
Working temperature	-5°C - +70°C

Model	Diameter (mm)	Max.operating frequence cicles/min.	Model	Diameter (mm)	Max.operating frequence cicles/min.
6311.10.D	10	60	6311.25.D	25	60
6311.10.D.1		40	6311.25.D.1		40
6311.10.D.2			6311.25.D.2		
6311.16.D	16	60	6311.32.D	32	30
6311.16.D.1		40	6311.32.D.1		20
6311.16.D.2			6311.32.D.2		
6311.20.D	20	60	6311.40.D	40	30
6311.20.D.1		40	6311.40.D.1		20
6311.20.D.2			6311.40.D.2		

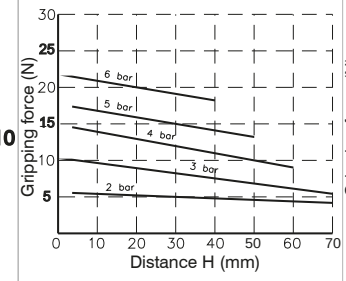
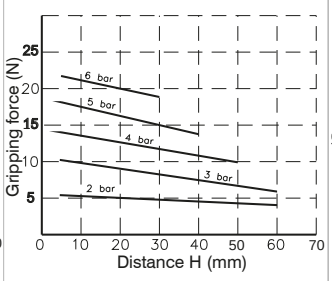
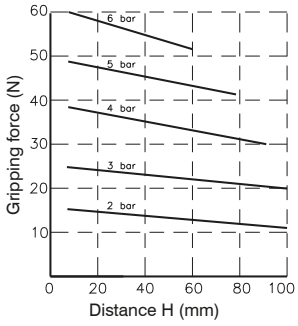
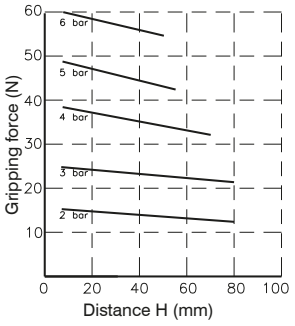
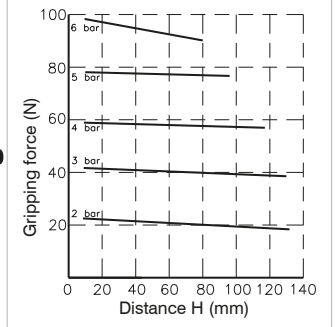
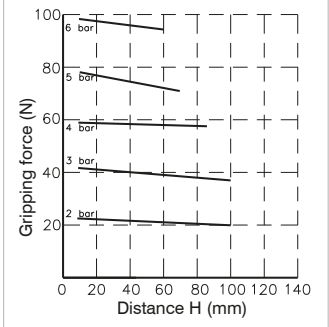
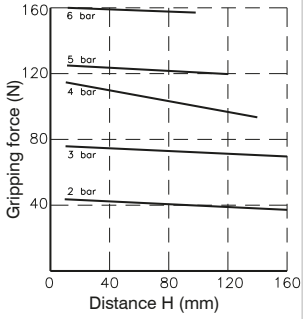
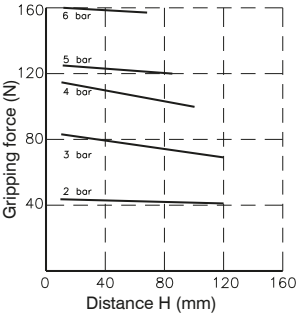
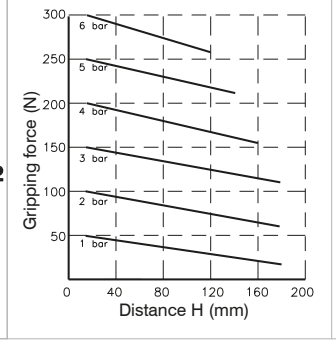
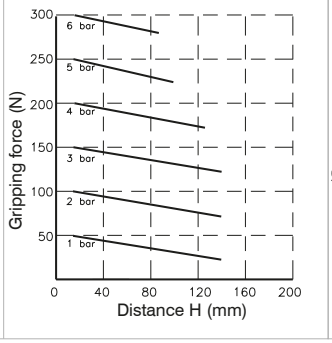
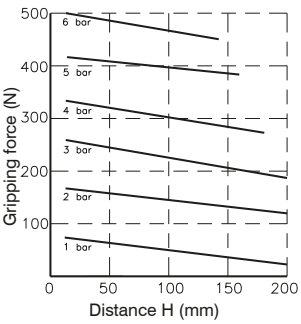
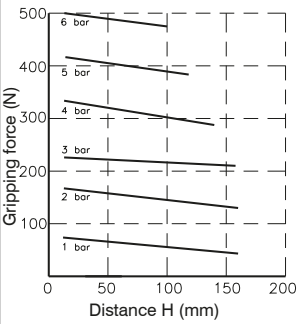
Overall dimensions

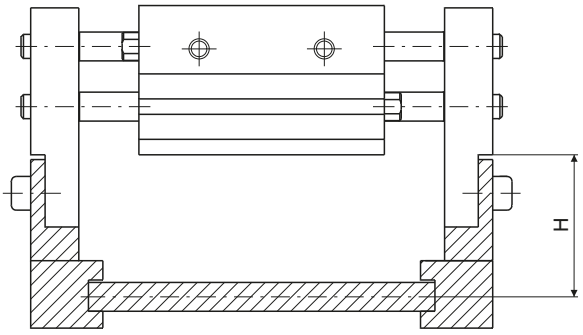


Bore		Ø10			Ø16			Ø20			Ø25			Ø32			Ø40		
A		31			39			46			52			68			79		
AB		44			55			65			76			82			98		
B		M4x0,7			M5x0,8			M6x1			M8x1.25			M8x1.25			M10x1.5		
	Useful depth	8			10			12			16			16			20		
BA		34			42			52			62			64			76		
ØC		4,5			5,5			6,6			9			/			/		
D H9		3			3			4			4			6			6		
	Useful depth	3			3			4			4,5			8			8		
DA		4			4			5			5			7			7		
ØDB H9		3			3			4			4			6			6		
	Useful depth	3			3			4			4,5			8			8		
E		M4x0,7			M5x0,8			M6x1			M8x1.25			M8x1.25			M10x1.5		
	Useful depth	5			7			7			7			11			16		
EA		9			10			11			12,5			22			28		
ØF		6			8			10			12			14			16		
FA		6			8			10			12			16			20		
G		M5x0,8			M5x0,8			M5x0,8			M5x0,8			G1/8			G1/8		
GB		9			10			11			16			16			18		
L		10			13			17			21			24			28		
LA		7			9			12,5			14			15			18		
LB		15			19			24			29			32			38		
LD		45,5			57,5			69			80			100			117		
LE		34			43			54			64			70			86		
ØM H9		18			23			27			32			35			40		
	Useful depth	1,5			1,5			1,5			1,5			1,5			1,5		
N		M4x0,7			M5x0,8			M6x1			M8x1,25			M10x1,5			M10x1,5		
NA		7			8			10			12			15			18		
NB		20			25			30			40			50			60		
P		0,5			0,5			1			1			1			1		
ZA		24	39	57	26	50	70	32	68	88	38	86	104	54	104	148	72	130	170
ZB	closed	56	78	96	68	110	130	82	142	162	100	182	200	150	198	242	188	246	286
	open	76	118	156	98	170	210	122	222	262	150	282	320	220	318	402	288	406	486
ZC		51	67	85	60	90	110	71	113	133	88	142	160	110	158	202	148	206	246
ZD		36	52	70	45	75	95	58	100	120	70	124	142	86	134	178	116	174	214
ZE		38	54	72	40	70	90	54	96	116	66	120	138	/	/	/	/	/	/
ZF		26	42	60	28	58	78	38	80	100	48	102	120	60	108	152	80	138	178
ZG	open	100	142	180	128	200	240	160	260	300	196	328	366	272	370	454	348	466	546
ZH		13,5	14	14	17	20	20	19,5	22,5	22,5	25	28	28	28	27		38		
Weight (g)		280	350	430	600	800	950	1000	1500	1700	1700	2500	2800	2900	3800	4700	5300	6850	7900
		20	40	60	30	60	80	40	80	100	50	100	120	70	120	160	100	160	200
		Stroke																	

Operating criteria

Holding force

	Opening / Closing Stroke			Opening / Closing Stroke	
	Basic Version	Versions 1 & 2		Basic Version	Versions 1 & 2
Ø10			Ø16		
Ø20			Ø25		
Ø32			Ø40		



3 finger parallel style pneumatic grippers

Ordering code

6312.Ø.D

- **16**
- **20**
- **25**
- **32**
- **40**
- **50**
- **63**
- **80**
- **100**
- **125**

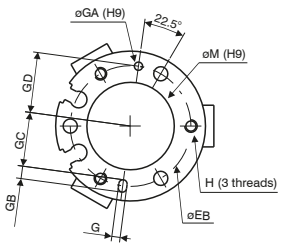
Construction characteristics

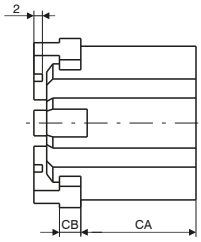
Body	aluminium
Piston	aluminium
Wedge	steel
Fingers	steel

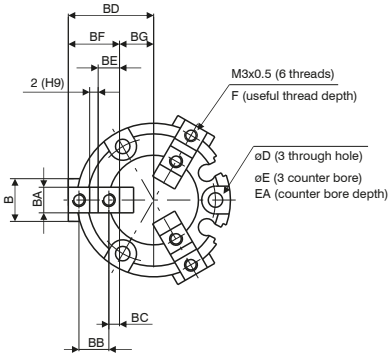
Operational characteristics

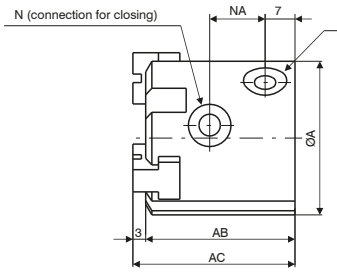
Function	double acting
Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Working pressure	2 - 6 bar (Ø16 - Ø20 - Ø25) - 1 - 6 bar (Ø32 - Ø125)
Working temperature	-5°C - +70°C
Maximum operating frequency	from Ø 16 to Ø 25, 120 cycles/minute from Ø 32 to Ø 63, 60 cycles/minute from Ø 80 to Ø 125, 30 cycles/minute

Overall dimensions Ø16 - Ø25

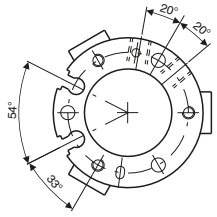




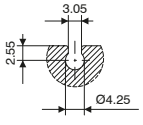




Sensor slots detail and inlet connections

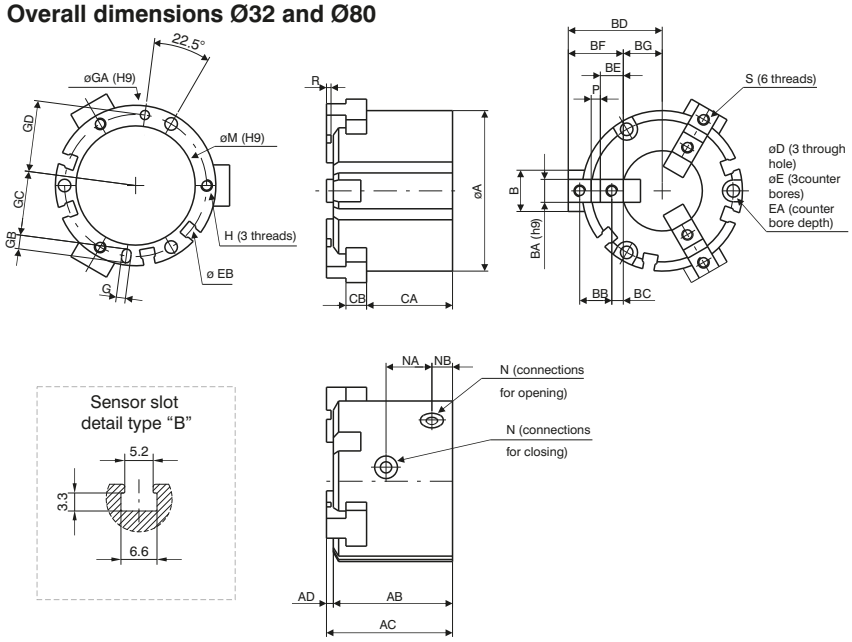


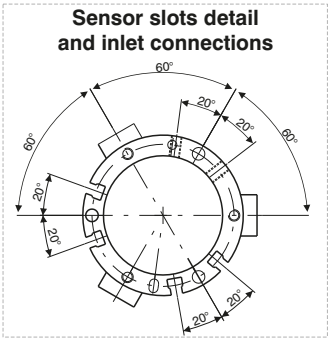
Sensor slot detail type "C"



Bore		Ø16	Ø20	Ø25
ØA		30	36	42
AB		32	35	37
AC		35	38	40
B		8	10	12
BA H9		5	6	6
BB		6	7	8
BC		2	2,5	3
BD	open	17	20	24
	close	15	18	21
BE		4	5	6
BF		10	12	14
BG	open	7	8	10
	close	5	6	7
CA		25	27	28
CB		4	5	5
D		3,4	3,4	4,5
E		6,5	6,5	8
EA		8	9,5	10
EB		25	29	34
F		5	6	6
G H9		2	2	3
	Useful depth	2	2	3
ØGA H9		2	2	3
	Useful depth	2	2	3
GB		3	3	5
GC		11	13	14,5
GD		12,5	14,5	17
H		M3x0,5	M3x0,5	M4x0,7
	Useful depth	4,5	6	6
ØM H9		17	21	26
	Useful depth	1,5	1,5	1,5
N		M3x0,5	M5x0,8	M5x0,8
NA		11	13	15
Weight (g)		62	98	139

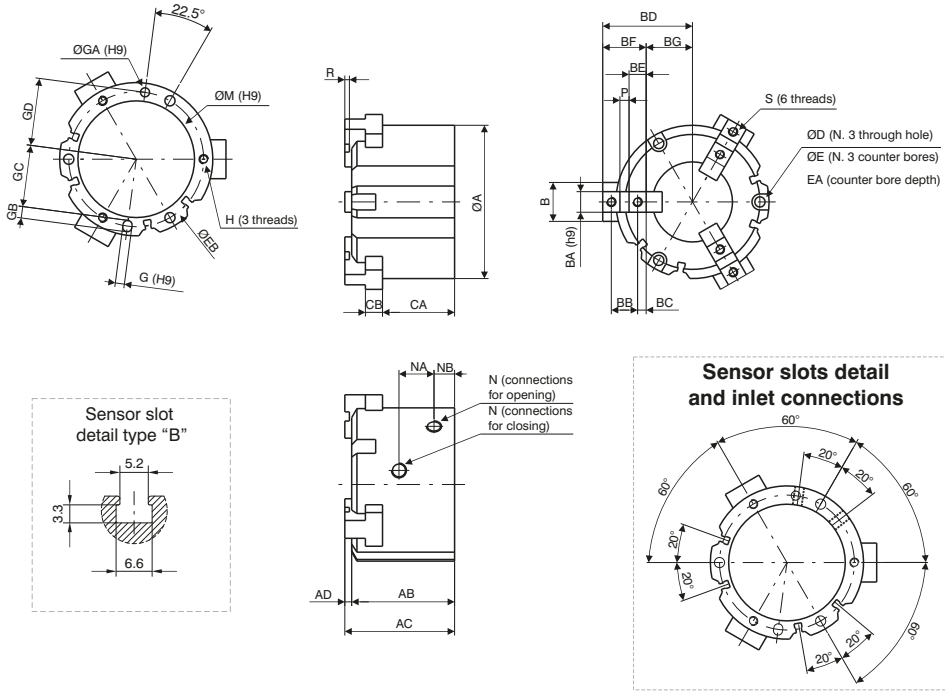
Overall dimensions Ø32 and Ø80





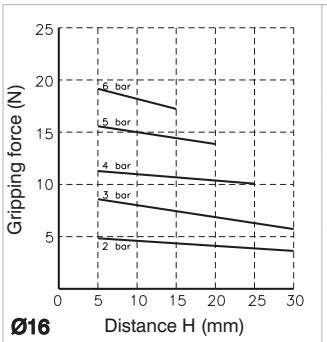
Bore		Ø32	Ø40	Ø50	Ø63	Ø80
ØA		52	62	70	86	106
AB		41	44	52	62	77
AC		44	47	55	66	82
AD		3	3	3	4	5
B		14	16	18	24	28
BA h9		8	8	10	12	14
BB		11	12	14	17	20
BC		4,5	4,5	5	5,5	6
BD	open	32	35	41	51	63,5
	close	28	31	35	43	53,5
BE		9	9	10	11	12
BF		20	21	24	28	32
BG	open	12	14	17	23	31,5
	close	8	10	11	15	21,5
CA		30,5	32	37,5	44	56
CB		6	7	9	11	12
D		4,5	5,5	5,5	6,6	6,6
E		8	9,5	9,5	11	11
EA		9	9	12	14	19
EB		44	53	62	76	95
H		M4x0,7	M5x0,8	M5x0,8	M6x1	M6x1
	Useful depth	6	7,5	10	9	12
G H9		3	4	4	5	6
	Useful depth	3	4	4	5	6
ØGA H9		3	4	4	5	6
	Useful depth	3	4	4	5	6
GB		5	6	6	7	8
GC		19,5	23,5	28	34,5	43,5
GD		22	26,5	31	38	47,5
N		M5x0,8	M5x0,8	M5x0,8	M5x0,8	G1/8
ØM H9		34	42	52	65	82
	Useful depth	2	2	2	2,5	3
NA		16	17	20	22	27
NB		8	9	9	12	13,5
P h9		2	3	4	6	8
R		2	2	2	3	4
S		M4x0,7	M4x0,7	M5x0,8	M5x0,8	M6x1
	Useful depth	8	8	10	10	12
Weight (g)		240	354	542	1000	1850

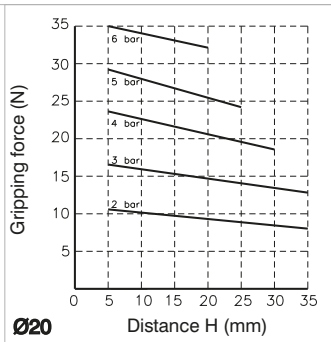
Overall dimensions Ø100 and Ø125

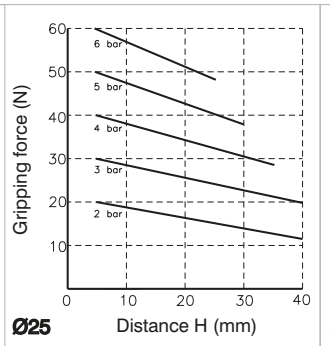


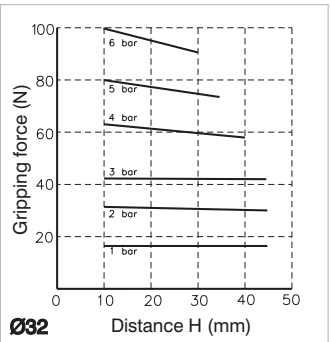
Bore		Ø100	Ø125
ØA		134	166
AB		90	114
AC		96	122
AD		6	8
B		34	40
BA h9		18	22
BB		23	31
BC		7,5	10,5
BD	open	78	98
	close	66	82
BE		15	21
BF		38	52
BG	open	40	46
	close	28	30
CA		63	84
CB		15	18
ØD		9	11
ØE		14	17,5
EA		21	34
EB		118	148
G H9		8	10
	Useful depth	6	8
ØGA H9		8	10
	Useful depth	6	8
GB		10	12
GC		54	68
GD		59	74
H		M8x1,25	M10x1,5
	Useful depth	16	20
ØM H9		102	130
	Useful depth	4	6
N		G1/4	G3/8
NA		30,6	38
NB		18	23,5
P h9		8	10
R		4	6
S		M8x1,25	M10x1,5
	Useful depth	16	20
Weight (g)		3360	6430

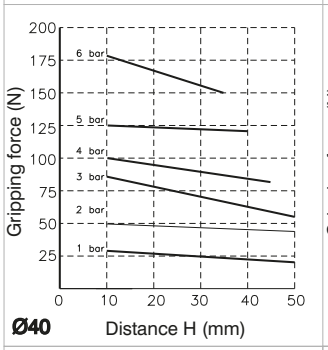
Gripping force (N)

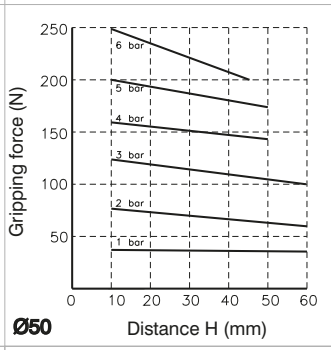


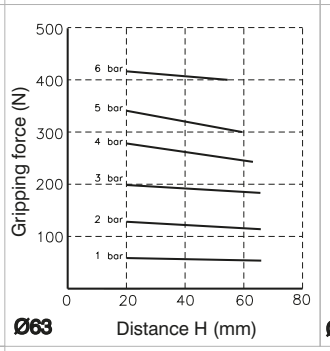


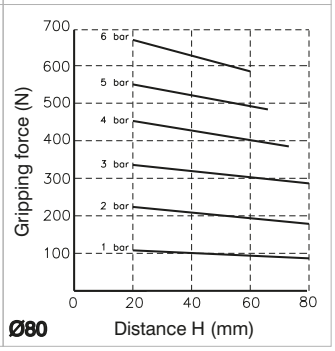


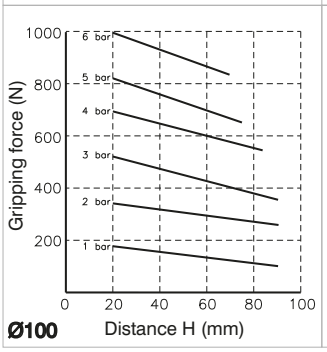


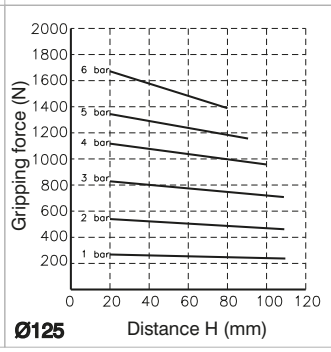


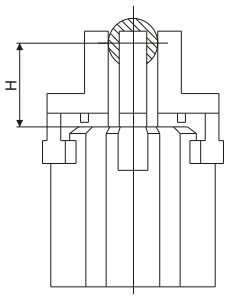


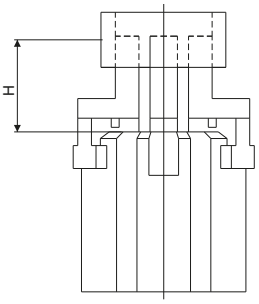












Series SA

General

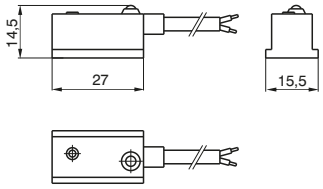
The limit switches, or magnetic sensors, must be mounted on cylinders with magnetic piston.
These, when hit by the magnetic field generated by the piston as it approaches, close the circuit sending an electrical signal to relay, solenoid valve or converse with the controlling electronic system of the machine. There are both ampulla Reed and Hall effect magnetic sensor available. The sensors are attached to the cylinder by a proper clamp, slot or adapter and may have an activation LED indicator.

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

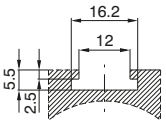
Instruction on how to use the sensors properly

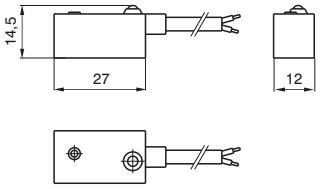
Particular attention should be paid in order not to exceed the wide operating limits shown in the next pages. Besides, the 2 wires sensors have never to be connected to the mains if a load has not been yet connected in series. These are the only cares that, if not followed, may cause damages to the sensor. Besides, please consider that, while loading, the current absorbed by the sensors might be 50% higher that the rated one.
In case of direct current (DC) feeding, the polarity of the connection must be observed: the brown cable must be connected to the plus (+) and the blue one to the minus (-).
For all sensors, particular attention has to be paid to external factors (like, for example, nearby live cables, electromagnetic fields generated by electric motors, nearby metallic bodies, etc.) since they can affect the magnetic field generated by the magnet inside the piston and therefore causing malfunctions.
Electrical cable length must be kept below 10 meters in order to guarantee proper functioning.
If needed, 10 meters cable length can be exceeded; Pneumax suggests the use of an inductor or resistor in series to the load in order to reduce the capacitive behavior of the cable.
In this case, the customer is responsible for the selection of the inductor or resistor value. Pneumax assume no responsibility in case of malfunction.
When using a two wire Reed type sensor always ensure that the correct load is applied in series on any of the two wires.
When using a sensor fitted with the SNAP connector pay attention to the orientation of the connector (see fig. page 6.6) because by inverting the connection the circuit will not be damaged, but the LED will not turn on. In case two or more sensors need to be connected in series, pay attention to the voltage drop generated (around 3V for each sensor), and, in case, use the version designed for in series connection.
Hall effect sensors are longer lasting if compared to the Reed version since they do not include any moving mechanical part.

Sensors with 2 wires cable (PUR Ø4,2 mm 2x0,34 mm²)



Slot detail
type "A"

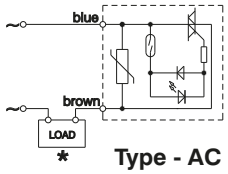




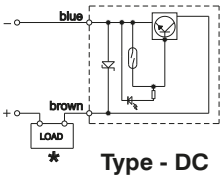
Diagrams and connections

Ordering code

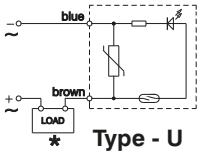
Cylinders and microbore cylinders	**1500.AC**	sensor for alternating current with led
	1500.DC	sensor for continuous current with led
	1500. U	universal sensor with led
	1500.U/1	universal sensor without led (REED ampulla only)
Rodless cylinders	**1600.AC**	sensor for alternating current with led
	1600.DC	sensor for continuous current with led
	1600.U	universal sensor with led
	1600.U/1	universal sensor without led (REED ampulla only)



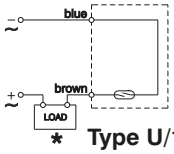
Type - AC



Type - DC



Type - U



Type U/1

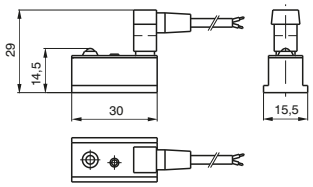
Technical characteristics	A.C.	D.C.	U		U/1	
			a.c.	d.c.	a.c.	d.c.
Maximum permanent current	1,5A	1,2A	0,5A		0,3A	
Maximum current (pulses of 0,5 sec.)	6A	1,5A	1A		0,8A	
Voltage range	12 - 230V	12 - 30V	3 - 230V	12 - 48V	0 - 230V	0 - 48V
Maximum permanent power	375VA	32W	20VA	15W	10VA	8W
Working temperature	-20° C - 70°C					
Maximum voltage drop	3V max	2V max	3V max		0V	
Cable section	2x0,34 mm² Ø4,2 mm PUR					
Degree of protection	IP 65					
Connecting time	2 ms					
Disconnecting time	1 ms					
Average working period	10^7 cicles					
Repetition of intervention point	± 0,1 mm					
Type of contact	N.O.					

✱The load (LOAD) can be connected either to negative or positive pole.

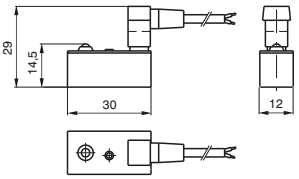
These sensors can be used on cylinders series:

SERIES	DESCRIPTION	MOUNTED
1200	for microbore with threaded end covers and "TECNO-MIR" microbore	with clamps code 1260.Ø.F
	for microbore "MIR" with rolled end covers, cylinders from Ø16 to Ø32	with clamps code 1280.Ø.F
	for microbore "MIR-INOX" with rolled end covers	with clamps code 1280.Ø.FX
1306 - 1307 - 1308	for cylinders from Ø32 to Ø63	with brackets code 1306.A
	for cylinders from Ø80 to Ø125	with brackets code 1306.B
	for cylinders from Ø160 to Ø200	with brackets code 1306.C
1315	for cylinders Ø250 and Ø320 (ISO)	with brackets code 1306.D
1319 - 1320	for cylinders Ø32 and Ø40	with brackets code 1320.A
	for cylinders Ø50 and Ø63	with brackets code 1320.B
	for cylinders Ø80 and Ø100	with brackets code 1320.C
	for cylinders Ø125	with brackets code 1320.D
	for cylinders Ø160	with brackets code 1320.E
	for cylinders Ø200	with brackets code 1320.F
1390 - 1391	for cylinders ECOLIGHT Ø32 and Ø40	with brackets code 1390.A
	for cylinders ECOLIGHT Ø50 and Ø63	with brackets code 1390.B
	for cylinders ECOLIGHT Ø80 and Ø100	with brackets code 1390.C
	for cylinders ECOLIGHT Ø125 - Ø200	with brackets code 1390.D
1500	Compact cylinders "Europe" (from Ø32)	directly on groove
1605	Rodless cylinders	with brackets code 1600.A

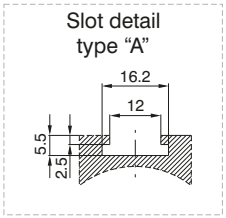
2 pin sensor for SNAP connector

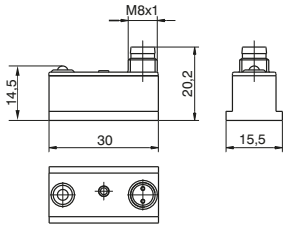


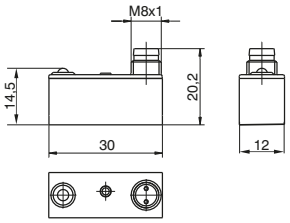
for cylinders and microbore



for rodless cylinders







Ordering code

Cylinders and microbore	**RS.DC**	sensor for continuous current with led normally open N.O.
	RS.UA	universal sensor with led normally open N.O.
	RS.UC	universal sensor with led normally closed N.C.
	RS.UA/1	universal sensor without led N.O. (REED ampulla only)
Rodless cylinders	**SRS.DC**	sensor for continuous current with led normally open N.O.
	SRS.UA	universal sensor with led N.O.
	SRS.UC	universal sensor with led normally closed N.C.
	SRS.UA/1	universal sensor without led N.O.
Cable	**C1**	connector with 2.5 m. cable 2 wires (PVC Ø3,5 mm 2x 0,25mm^2)
	C2	connector with 5 m. cable 2 wires (PVC Ø3,5 mm 2x 0,25mm^2)
	C3	connector with 10 m. cable 2 wires (PVC Ø3,5 mm 2x 0,25mm^2)

2 pin sensor for SNAP connector + C1 cable 2 wires (PVC Ø3.5 mm 2x0.25 mm^2)

Cylinders and microbore	**RS.DCC1**	sensor for DC current N.O. with LED and 2.5 m. cable
	RS.UAC1	universal sensor with led N.O. with connector and 2.5 m. cable
	RS.UCC1	universal sensor with led N.C. with connector and 2.5 m. cable
	RS.UAC1/1	universal sensor without led N.O. with connector and 2.5 m. cable (REED ampulla only)
Rodless cylinders	**SRS.DCC1**	sensor for continuous current with led normally closed N.O. with connector and 2.5 m. cable
	SRS.UAC1	universal sensor with led N.O. with connector and 2.5 m. cable
	SRS.UCC1	universal sensor with led N.C. with connector and 2.5 m. cable
	SRS.UAC1/1	universal sensor without led N.O. with connector and 2.5 m. cable (REED ampulla only)

2 pin sensor with M8 connettor

Cylinders and microbore	**RS8.DC**	sensor for DC current N.O. with LED and M8 plug
	RS8.UA	universal sensor N.O. with LED and M8 plug
	RS8.UC	universal sensor N.C. with LED and M8 plug
Rodless cylinders	**SRS8.DC**	sensor for DC current N.O. with LED and M8 plug
	SRS8.UA	universal sensor N.O. with LED and M8 plug
	SRS8.UC	universal sensor N.C. with LED and M8 plug
Cable	**MCH1**	cable 3 wires l=2.5m with M8 connector three wires (PUR Ø2.6 mm 3x 0.15 mm^2)
	MCH2	cable 3 wires l=5m with M8 connector three wires (PUR Ø2.6 mm 3x 0.15 mm^2)
	MCH3	cable 3 wires l=10m with M8 connector three wires (PUR Ø2.6 mm 3x 0.15 mm^2)

3 pin sensor for SNAP connector with 2 wires according to IEC 947 norms

Cylinders and microbore	**RS.DCNO**	sensor for continuous current with led normally open N.O., according to standard IEC 947
	RS.UANO	universal sensor with led normally open N.O., according to standard IEC 947
Cable	**C1NO**	connector with 2.5 m. cable, according to standard IEC 947 (PVC Ø3.5 mm 2x0.25 mm^2)
	C2NO	connector with 5 m. cable, according to standard IEC 947 (PVC Ø3.5 mm 2x0.25 mm^2)
	C3NO	connector with 10 m. cable, according to standard IEC 947 (PVC Ø3.5 mm 2x0.25 mm^2)

3 pin sensors for in series assembling with SNAP connector

Cylinders and microbore Rodless cylinders	**RS.UA/1L**	universal sensor with led normally open N.O., for series assembly (3 wires)
	SRS.UA/1L	universal sensor with led N.O., for series assembly (3 wires)
Cable	**CH1**	connector with 2.5 m. cable 3 wires (PVC Ø3.5 mm 3x0.25 mm^2)
	CH2	connector with 5 m. cable 3 wires (PVC Ø3.5 mm 3x0.25 mm^2)
	CH3	connector with 10 m. cable 3 wires (PVC Ø3.5 mm 3x0.25 mm^2)

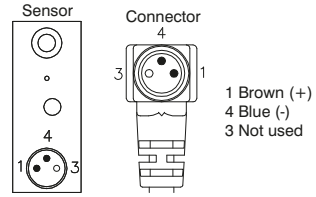
3 pin sensors for in series assembling with SNAP conn. + CH1 cable 3 wires (PVC ø3.5mm 3x0.25 mm^2)

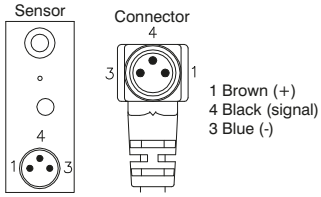
Cylinders and microbore	**RS.UACH1/1L**	universal sensor with led N.O. with connector and 2.5 m. cable, for series mounting (3 wires)
Rodless cylinders	**SRS.UACH1/1L**	universal sensor with led N.O. with connector and 2.5 m. cable, for series assembly (3 wires)

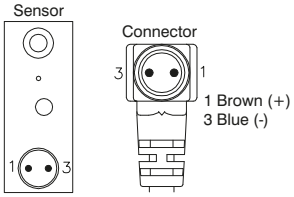
3 pin sensors for in series assembling with M8 connector

Cylinders and microbore Rodless cylinders	**RS8.UA/1L**	universal sensor N.O. with LED for in series assembling (3wires) and M8 plug
	SRS8.UA/1L	universal sensor N.O. with LED for in series assembling (3wires) and M8 plug
Cable	**MCH1**	M8 connector with 2.5 m. cable 3 wires (PUR Ø2.6 mm 3x 0.15 mm^2)
	MCH2	M8 connector with 5 m. cable 3 wires (PUR Ø2.6 mm 3x 0.15 mm^2)
	MCH3	M8 connector with 10 m. cable 3 wires (PUR Ø2.6 mm 3x 0.15 mm^2)

For sensors according to IEC 947 Standard	For 3 wires SNAP & M8 sensors	For 2 wires SNAP sensors
Connection 2 wires 3 PIN	*Connection 3 wires 3 PIN*	*Connection 2 wires 2 PIN*







SNAP code connectors		M8 code connectors	
C1NO	Ø 3.5 mm	MC1	Ø 2.6 mm
C2NO	PVC	MC2	PUR
C3NO	2x 0.25 mm^2	MC3	2x 0.15 mm^2

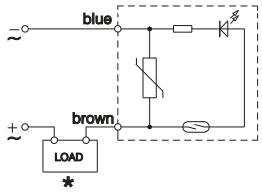
SNAP code connectors		M8 code connectors	
CH1	Ø 3.5 mm	MCH1	Ø 2.6 mm
CH2	PVC	MCH2	PUR
CH3	3x 0.25 mm^2	MCH3	3x 0.15 mm^2

SNAP code connectors	
C1	Ø 3.5 mm
C2	PVC
C3	2x 0.25 mm^2

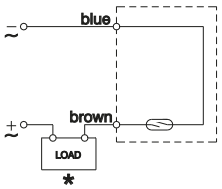
Technical characteristics	DC	UA				UA/1L		UA/1	
		a.c.		d.c.		a.c.	d.c.	a.c.	d.c.
Type of contact	N.O.	N.O.	N.C.	N.O.	N.C.	N.O.		N.O.	
Maximum permanent current	1.2A	0.5A	0.3A	0.5A	0.3A	0.5A		0.5A	
Maximum current (pulses of 0.5 sec.)	1.5A	1A	0.8A	1A	0.8A	1A		1A	
Voltage range	12 - 30V	3 - 250V	3 - 110V	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			
Cables number	2					3		2	
Degree of protection	IP65								
Connecting time	2 ms								
Disconnecting time	1 ms								
Average working period	10^7 cicles								
Repetition of intervention point	±0.1 mm								

Diagrams and connections

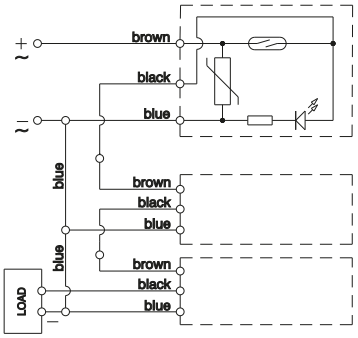
Type - UA



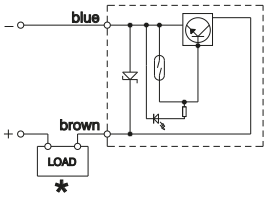
Type UA/1



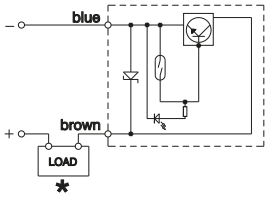
Type - UA/1L



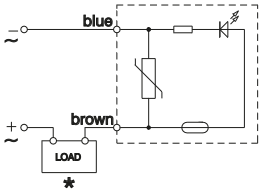
Type - DC



Type - DCNO



Type - UC

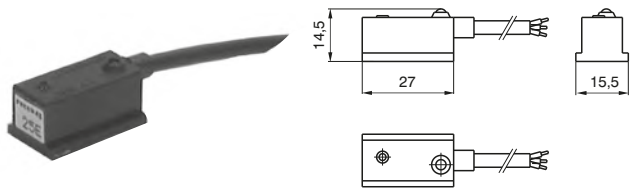


✱The load (LOAD) can be connected either to negative or positive pole.

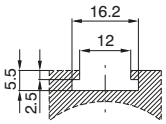
These sensors can be used on cylinders series:

SERIES	DESCRIPTION	MOUNTED
1200	for microbore with threaded end covers and “TECNO-MIR” microbore	with clamps code 1260.Ø.F
	for microbore "MIR" with rolled end covers, cylinders from Ø16 to Ø32	with clamps code 1280.Ø.F
	for microbore "MIR-INOX" with rolled end covers	with clamps code 1280.Ø.FX
1306 - 1307 - 1308	for cylinders from Ø32 to Ø63	with brackets code 1306.A
	for cylinders from Ø80 to Ø125	with brackets code 1306.B
	for cylinders from Ø160 to Ø200	with brackets code 1306.C
1315	for cylinders Ø250 and Ø320 (ISO)	with brackets code 1306.D
1319 - 1320	for cylinders Ø32 and Ø40	with brackets code 1320.A
	for cylinders Ø50 and Ø63	with brackets code 1320.B
	for cylinders Ø80 and Ø100	with brackets code 1320.C
	for cylinders Ø125	with brackets code 1320.D
	for cylinders Ø160	with brackets code 1320.E
	for cylinders Ø200	with brackets code 1320.F
1390 - 1391	for cylinders ECOLIGHT Ø32 and Ø40	with brackets code 1390.A
	for cylinders ECOLIGHT Ø50 and Ø63	with brackets code 1390.B
	for cylinders ECOLIGHT Ø80 and Ø100	with brackets code 1390.C
	for cylinders ECOLIGHT Ø125 - Ø200	with brackets code 1390.D
1500	Compact cylinders "Europe" (from Ø32)	directly on groove
1605	Rodless cylinders	with brackets code 1600.A

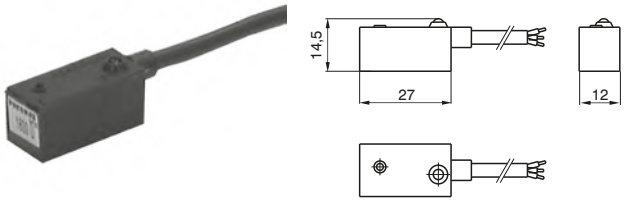
Sensors with 3 wires cable PUR ø 4.2 mm 3x0.34mm²)



Slot detail
type "A"



for cylinders and microbore



for rodless cylinders

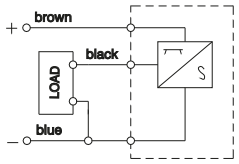
Ordering code

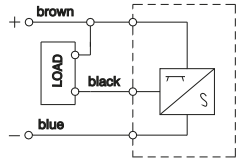
Cylinders and microbore	**1500.HAP**	PNP sensor Hall effect with led, normally open N.O.
	1500.HAN	NPN sensor Hall effect with led, normally open N.O.
Rodless cylinders	**1600.HAP**	PNP sensor Hall effect with led, normally open N.O.
	1600.HAN	NPN sensor Hall effect with led, normally open N.O.

Technical characteristics

Maximum permanent current	0.5A
Voltage range	10 - 30V DC
Power (inductive load)	10W
Maximum voltage drop	2V
Working temperature	-20°C - 70°C
Cable section	PUR 4.2mm 3x0.34 mm²
Degree of protection	IP 65
Connecting time	0.8 μs
Disconnecting time	0.3 μs
Average working period	10⁹ cicles
Repetition of intervention point	± 0.1 mm
Type of contact	N.O.

Diagrams and connections

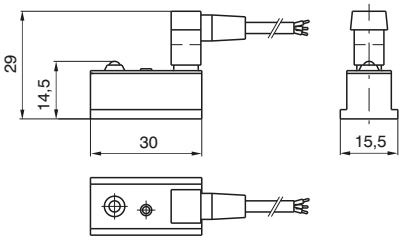




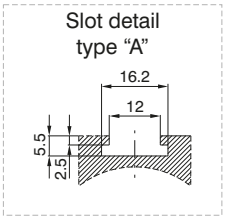
These sensors can be used on cylinders series:

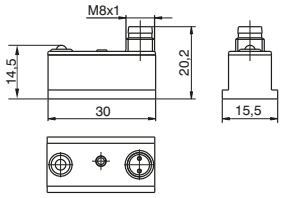
SERIES	DESCRIPTION	MOUNTED
1200	for microbore with threaded end covers and "TECNO-MIR" microbore	with clamps code 1260.Ø.F
	for microbore "MIR" with rolled end covers, cylinders from Ø16 to Ø32	with clamps code 1280.Ø.F
	for microbore "MIR-INOX" with rolled end covers	with clamps code 1280.Ø.FX
1306 - 1307 - 1308	for cylinders from Ø32 to Ø63	with brackets code 1306.A
	for cylinders from Ø80 to Ø125	with brackets code 1306.B
	for cylinders from Ø160 to Ø200	with brackets code 1306.C
1315	for cylinders Ø250 and Ø320 (ISO)	with brackets code 1306.D
1319 - 1320	for cylinders Ø32 and Ø40	with brackets code 1320.A
	for cylinders Ø50 and Ø63	with brackets code 1320.B
	for cylinders Ø80 and Ø100	with brackets code 1320.C
	for cylinders Ø125	with brackets code 1320.D
	for cylinders Ø160	with brackets code 1320.E
	for cylinders Ø200	with brackets code 1320.F
1390 - 1391	for cylinders ECOLIGHT Ø32 and Ø40	with brackets code 1390.A
	for cylinders ECOLIGHT Ø50 and Ø63	with brackets code 1390.B
	for cylinders ECOLIGHT Ø80 and Ø100	with brackets code 1390.C
	for cylinders ECOLIGHT Ø125 - Ø200	with brackets code 1390.D
1500	Compact cylinders "Europe" (from Ø32)	directly on groove
1605	Rodless cylinders	with brackets code 1600.A

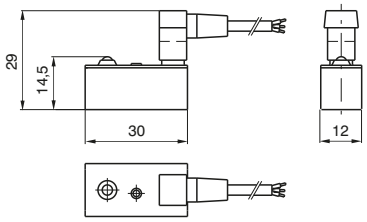
3 PIN sensor for SNAP connector



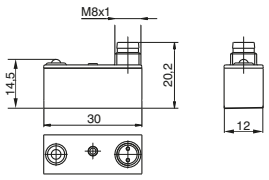
for cylinders and microbore







for rodless cylinders



Ordering code

Cylinders and microcylinders	**HS.PA**	PNP sensor Hall effect with led, normally open N.O.
Rodless cylinders	**SHS.PA**	PNP sensor Hall effect with led, normally open N.O.
Cable	**CH1**	connector with 2.5 m. cable 3 wires (PVC Ø3.5 mm 3x0.25 mm^2)
	CH2	connector with 5 m. cable 3 wires (PVC Ø3.5 mm 3x0.25 mm^2)
	CH3	connector with 10 m. cable 3 wires (PVC Ø3.5 mm 3x0.25 mm^2)

3 PIN sensor for SNAP connector + CH1 cable 3 wires (PVC ø3.5 mm 3x0.25 mm^2)

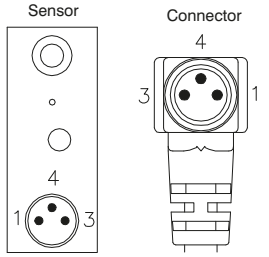
Cylinders and microbore	**HS.PAC1**	PNP sensor Hall effect N.O. with led, with connector and 2.5 m. cable
Rodless cylinders	**SHS.PAC1**	PNP sensor Hall effect N.O. with led, with connector and 2.5 m. cable

3 PIN sensor for M8 connector

Cylinders and microbore	**HS8.NA**	NPN Hall effect sensor N.O. with LED and M8 plug
	HS8.PA	PNP Hall effect sensor N.O. with LED and M8 plug
Rodless cylinders	**SHS8.NA**	NPN Hall effect sensor N.O. with LED and M8 plug
	SHS8.PA	PNP Hall effect sensor N.O. with LED and M8 plug
Cable	**MCH1**	M8 connector with cable 2.5 m. 3 wires (PUR Ø2.6 mm 3x0.15mm^2)
	MCH2	M8 connector with cable 5 m. 3 wires (PUR Ø2.6 mm 3x0.15mm^2)
	MCH3	M8 connector with cable 10 m. 3 wires (PUR Ø2.6 mm 3x0.15mm^2)

For 3 wires SNAP & M8 sensors

Connection 3 wires 3 PIN



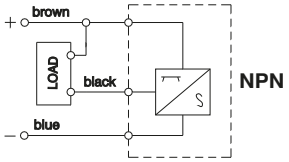
SNAP code connectors	
CH1	Ø 3.5 mm
CH2	PVC
CH3	3x 0.25 mm^2

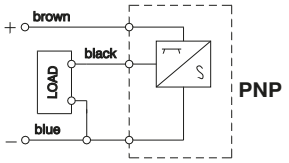
M8 code connectors	
MCH1	Ø 2.6 mm
MCH2	PUR
MCH3	3x 0.15 mm^2

Technical characteristic

Maximum permanent current	0,25A
Voltage range	6 - 30V DC
Power (inductive load)	6W
Maximum Voltage drop	2V
Working temperature	-20°C - 70°C
Cables number	3
Degree of protection	IP 65
Connecting time	0,8 ms
Disconnecting time	0,3 ms
Average working period	10^9 cicles
Repetition of intervention point	± 0,1 mm
Contact normally open	N.O.

Diagrams and connections





These sensors can be used on cylinders series:

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	for cylinders Ø80 and Ø100	with brackets code 1320.C
	for cylinders Ø125	with brackets code 1320.D
	for cylinders Ø160	with brackets code 1320.E
	for cylinders Ø200	with brackets code 1320.F
1390 - 1391	for cylinders ECOLIGHT Ø32 and Ø40	with brackets code 1390.A
	for cylinders ECOLIGHT Ø50 and Ø63	with brackets code 1390.B
	for cylinders ECOLIGHT Ø80 and Ø100	with brackets code 1390.C
	for cylinders ECOLIGHT Ø125 - Ø200	with brackets code 1390.D
1500	Compact cylinders "Europe" (from Ø32)	directly on groove
1605	Rodless cylinders	with brackets code 1600.A

Series SR - SU - SQ - ST

General

The limit switches, or magnetic sensors, must 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 to relay, solenoid valve or converse with the controlling electronic system of the machine. There are both ampulla Reed and Hall effect magnetic sensor available. The sensors are attached to the cylinder by a proper clamp, slot or adapter and may have an activation LED indicator.

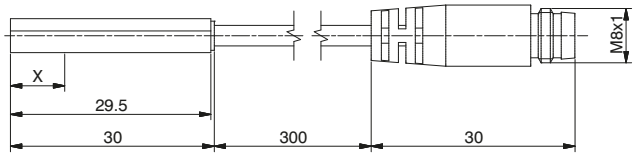
Note: The magnetic sensors are according to the Directive **EMC 89/336/CEE** and following amendments.

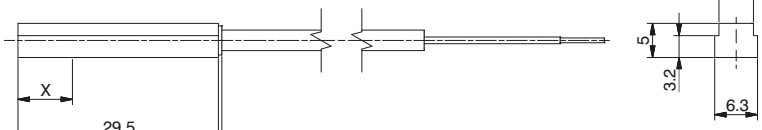
Instruction on how to use the sensors properly

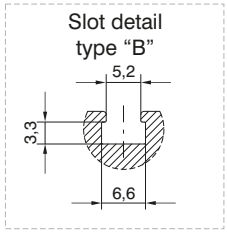
Particular attention should be paid in order not to exceed the wide operating limits shown in the next pages. Besides, the 2 wires sensors have never to be connected to the mains if a load has not been yet connected in series. These are the only cares that, if not followed, may cause damages to the sensor. Besides, please consider that, while loading, the current absorbed by the sensors might be 50% higher that the rated one.
In case of direct current (DC) feeding, the polarity of the connection must be observed: the brown cable must be connected to the plus (+) and the blue one to the minus (-).
For all sensors, particular attention has to be paid to external factors (like, for example, nearby live cables, electromagnetic fields generated by electric motors, nearby metallic bodies, etc.) since they can affect the magnetic field generated by the magnet inside the piston and therefore causing malfunctions.
Electrical cable length must be kept below 10 meters in order to guarantee proper functioning.
If needed, 10 meters cable length can be exceeded; Pneumax suggests the use of an inductor or resistor in series to the load in order to reduce the capacitive behavior of the cable.
In this case, the customer is responsible for the selection of the inductor or resistor value. Pneumax assume no responsibility in case of malfunction.
When using a two wire Reed type sensor always ensure that the correct load is applied in series on any of the two wires.
In case two or more sensors need to be connected in series, pay attention to the voltage drop generated (around 3V for each sensor), and, in case, use the version designed for in series connection.
Hall effect sensors are longer lasting if compared to the Reed version since they do not include any moving mechanical part.

Sensor with 2.5 m. cable

Weight g 27







Sensor with cable and M8 connector

Weight g 15

Ordering code

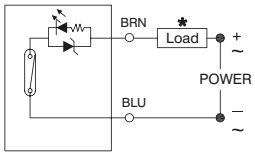
Ampulla Reed sensors, with led, Universal, N.O. (Normally open)

			X=point of commutation
1580.U		(2 wires) cable 2.5 mt.	15 mm
MRS.U		(2 wires) cable 300 mm, M8 connector (use MC1 or MC2 connectors)	15 mm
1580.UAP	PNP	(3 wires) cable 2.5 mt.	15 mm
MRS.UAP	PNP	(3 wires) cable 300 mm, M8 connector (use MCH1 or MCH2 connectors)	15 mm

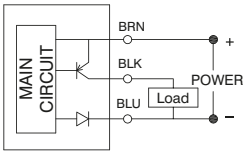
Hall effect sensors, with led, DC, N.O. (Normally open)

			X=point of commutation
1580.HAP	PNP	(3 wires) cable 2.5 mt.	8 mm
1580.HAN	NPN	(3 wires) cable 2.5 mt.	8 mm
MHS.P	PNP	(3 wires) cable 300 mm, M8 connector (use MCH1 or MCH2 connectors)	8 mm

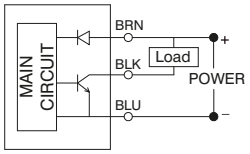
Diagrams and connections



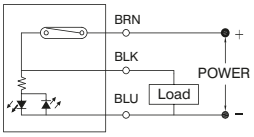
with Reed bulb (2 wires)



Hall-PNP effect (3 wires)



Hall-NPN effect (3 wires)



with Reed bulb (3 wires)

*** The load (LOAD) can be connected either to negative or positive pole**

Technical characteristics	1580.U	MRS.U	1580.UAP	MRS.UAP	1580.HAP	1580.HAN	MHS.P
Type of contact	N.O.						
Output type			PNP			NPN	PNP
Maximum current	100mA						
Maximum permanent power	14 VA - 10 W		4 VA - 3 W		3 W		
Voltage range	5 - 230V DC/AC	5 - 30V DC/AC	10 - 30 V DC/AC		10 - 30 V DC		
Working temperature	-10°C - +70°C						
Maximum voltage drop	3.5 V		0V **		2 V		
Cable section (mm²)	2 x 0.14 Ø3.3mm PUR	2 x 0.14 Ø3.3mm PUR	3 x 0.14 Ø3.3 mm PUR		3 x 0.14 Ø3.3 mm PUR		
Degree of protection	IP 67						

**** Even if one sensor generates a voltage drop very close to 0 Volts, we suggest to connect no more than 30 sensors in series.**

Cable ordering code

MC1	cable 2 wires l=2.5m with M8 connector
MC2	cable 2 wires l=5m with M8 connector
MC3	cable 2 wires l=10m with M8 connector
MCH1	cable 3 wires l=2.5m with M8 connector
MCH2	cable 3 wires l=5m with M8 connector
MCH3	cable 3 wires l=10m with M8 connector

Connection 2 wires

Connector

Sensor

1 Brown (+)
4 Blue (-)
3 Not use

Connection 3 wires

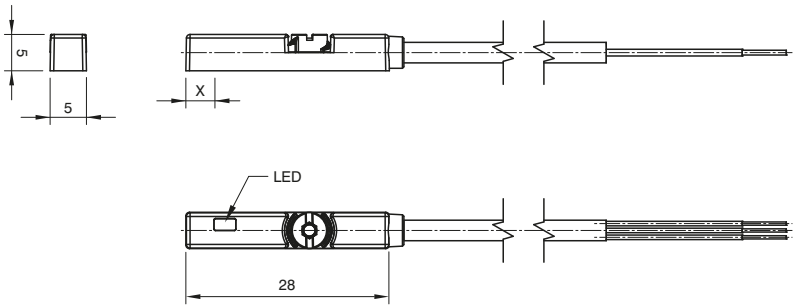
Connector

Sensor

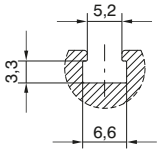
1 Brown (+)
4 Black (signal)
3 Blue (-)

Sensor with 2.5 m. cable

Weight g 23



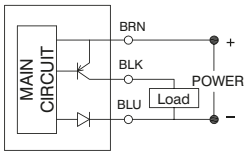
Slot detail type “B”



Ordering code

Hall effect sensors, with led, DC, N.O. (Normally open)		X= point of commutation
1595.HAP	PNP (3 wires) cable 2.5 mt.	2.3 mm

Diagrams and connections

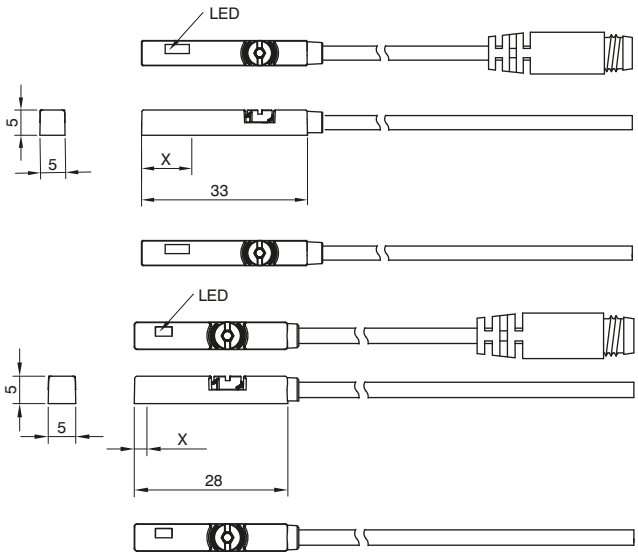


Hall-PNP effect (3 wires)

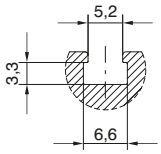
Technical characteristics	1595.HAP
Type of contact	N.O.
Output type	PNP
Maximum current	100 mA
Maximum permanent power	3W
Voltage range	10 - 28 VDC
Working temperature	-10 - +70°C
Maximum voltage drop	1,5V
Cable section (mm^2)	3 x 0,14 Ø2.8 mm PUR
Degree of protection	IP67

Sensor with 2,5 m cable

Weight g 27



Slot detail type “B”



Sensor with cable and M8 connector

Weight g 15

Ordering code

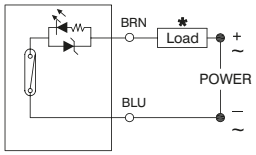
Ampulla Reed sensors, with led, Universal, N.O. (Normally open)

		X=point of commutation
1590.U	(2 wires) cable 2.5 mt.	10 mm
LRS.U	(2 wires) cable 300 mm, M8 connector (use MC1 or MC2 connectors)	10 mm
1590.UAP	PNP (3 wires) cable 2.5 mt.	10 mm
LRS.UAP	PNP (3 wires) cable 300 mm, M8 connector (use MCH1 or MCH2 connectors)	10 mm

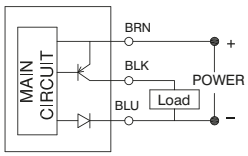
Hall effect sensors, with led, DC, N.O. (Normally open)

		X=point of commutation
1590.HAP	PNP (3 wires) cable 2.5 mt.	2,3 mm
LHS.P	PNP (3 wires) cable 300 mm, M8 connector (use MCH1 or MCH2 connectors)	2,3 mm

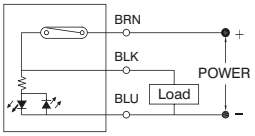
Diagrams and connections



with Reed bulb (2 wires)



Hall-PNP effect (3 wires)



with Reed bulb (3 wires)

*** The load (LOAD) can be connected either to negative or positive pole**

Technical characteristics	1590.U	LRS.U	1590.UAP	LRS.UAP	1590.HAP	LHS.P
Type of contact	N.O.					
Maximum current	100mA		500mA		200mA	
Maximum permanent power	14 VA - 10 W		14 VA - 10 W		6 W	
Voltage range	5 - 30V DC/AC		10 - 30 V DC/AC		10 - 30 V DC	
Working temperature	-10°C - +70°C					
Maximum voltage drop	3 V		0V **		1.5 V	
Cable section (mm²)	2 x 0.14 Ø3 mm PUR		3 x 0.14 Ø3 mm PUR			
Degree of protection	IP 67					

**** Even if one sensor generates a voltage drop very close to 0 Volts, we suggest to connect no more than 30 sensors in series.**

Cable ordering code

MC1	cable 2 wires l=2.5m with M8 connector
MC2	cable 2 wires l=5m with M8 connector
MC3	cable 2 wires l=10m with M8 connector
MCH1	cable 3 wires l=2.5m with M8 connector
MCH2	cable 3 wires l=5m with M8 connector
MCH3	cable 3 wires l=10m with M8 connector

Connection 2 wires

Connector

Sensor

1 Brown (+)
4 Blue (-)
3 Not use

Connection 3 wires

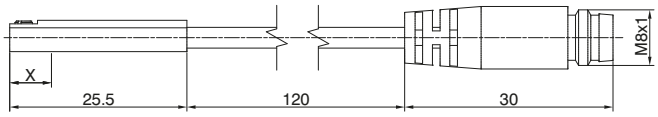
Connector

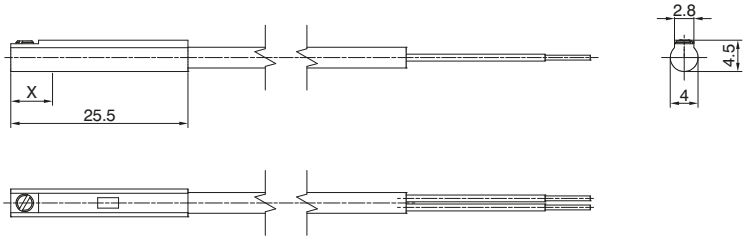
Sensor

1 Brown (+)
4 Black (signal)
3 Blue (-)

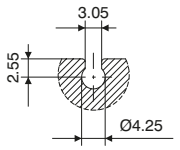
Sensor with 2.5 m. cable

Weight g 22

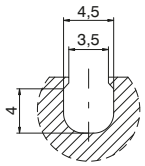




Slot detail type "C"



Slot detail type "D"



Sensor with cable and M8 connector

Weight g 10

Ordering code

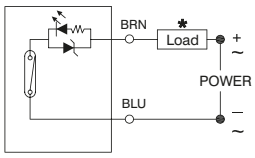
Ampulla Reed sensors, with led, Universal, N.O. (Normally open)

		X=point of commutation
1581.U	(2 wires) cable 2.5 mt.	10 mm
TRS.U	(2 wires) cable 100 mm, M8 connector (use MC1 or MC2 connectors)	10 mm

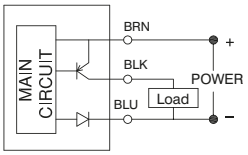
Hall effect sensors, with led, DC, N.O. (Normally open)

		X=point of commutation
1581.HAP	PNP (3 wires) cable 2.5 mt.	7,5 mm
THS.P	PNP (3 wires) cable 100 mm, M8 connector (use MCH1 or MCH2 connectors)	7,5 mm

Diagrams and connections



with Reed bulb (2 wires)



Hall-PNP effect (3 wires)

*** The load (LOAD) can be connected either to negative or positive pole**

Technical characteristics	1581.U	TRS.U	1581.HAP	THS.P
Type of contact	N.O.			
Maximum current	50mA			
Maximum permanent power	8 VA - 1,5 W		1,5 W	
Voltage range	5 - 30V DC/AC		10 - 30 V DC	
Working temperature	-10°C - +70°C			
Maximum voltage drop	3,5 V		1 V	
Cable section (mm²)	2 x 0,14 Ø2,8 mm PUR		3 x 0,14 Ø2,8 mm PUR	
Degree of protection	IP 67			

Cable ordering code

MC1	cable 2 wires l=2.5m with M8 connector
MC2	cable 2 wires l=5m with M8 connector
MC3	cable 2 wires l=10m with M8 connector

Connection 2 wires

Connector

Sensor

1 Brown (+)
4 Blue (-)
3 Not use

MCH1	cable 3 wires l=2.5m with M8 connector
MCH2	cable 3 wires l=5m with M8 connector
MCH3	cable 3 wires l=10m with M8 connector

Connection 3 wires

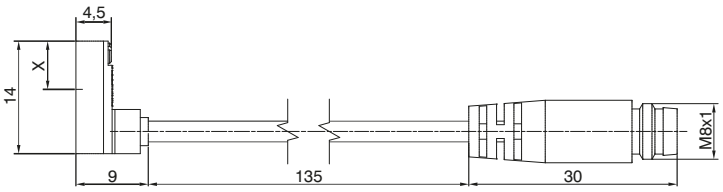
Connector

Sensor

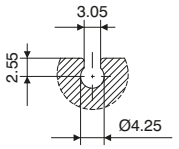
1 Brown (+)
4 Black (signal)
3 Blue (-)

Sensor with cable

Weight g 22

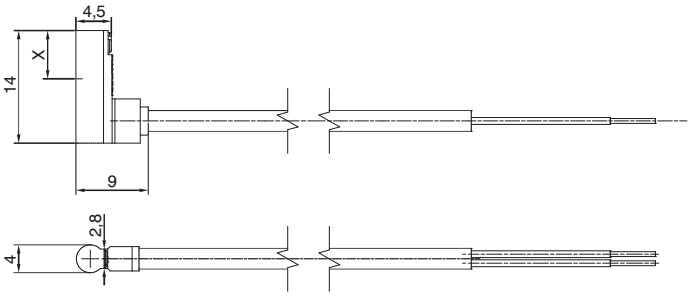


Slot detail type “C”

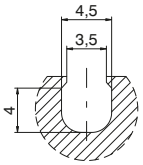


Sensor with cable and M8 connector

Weight g 10



Slot detail type “D”



Ordering code

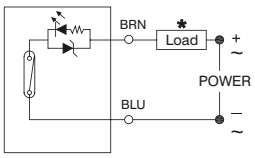
Ampulla Reed sensors, with led, DC, N.O. (Normally open)

		X=point of commutation
1583.DC	(2 wires) cable 2 mt.	6 mm

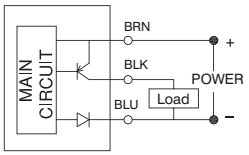
Hall effect sensors, with led, N.O. (Normally open)

		X=point of commutation
1583.HAP	PNP (3 wires) cable 3 mt.	6 mm
THR.P	PNP (3 wires) cable 100 mm, M8 connector (use MCH1 or MCH2 connectors)	6 mm

Diagrams and connections



with Reed bulb (2 wires)



Hall-PNP effect (3 wires)

*** The load (LOAD) can be connected either to negative or positive pole**

TECHNICAL CHARACTERISTICS	1583.DC	1583.HAP	THR.P
Type of contact	N.O.		
Maximum current	20mA	50mA	
Maximum permanent power	0,6 W	1,5 W	
Voltage range	10 - 28V DC	4,5 - 28 V DC	
Working temperature	-10°C - +70°C		
Maximum voltage drop	3,5 V	0,5 V	
Cable	Ø2,6 mm PVC - 2 m	Ø2,6 mm PVC - 3 m	
Degree of protection	IP 67		

Cable ordering code

MCH1	cable 3 wires l=2.5m with M8 connector
MCH2	cable 3 wires l=5m with M8 connector

Connection 3 wires

Connector

Sensor

1 Brown (+)
4 Black (signal)
3 Blue (-)

Rectangular section version (for sensor slot type “B”)

SERIES	DESCRIPTION	MOUNTED
1200	Microbore with threaded end covers and “TECNO-MIR” microbore “MIR” with rolled end covers Microbore “MIR-INOX” with rolled end covers	with clamps code **1260.Ø.FS** with clamps code **1280.Ø.FS** with clamps code **1280.Ø.FSX**
1319 - 1320 1325 - 1345 1330 - 1332 1348 - 1349	for cylinders Ø32 - Ø40	with brackets code **1320.AS**
	for cylinders Ø50 ÷ Ø63	with brackets code **1320.BS**
	for cylinders Ø80 ÷ Ø100	with brackets code **1320.CS**
	for cylinders Ø125	with brackets code **1320.DSC**
	for cylinders Ø160	with brackets code **1320.ESC**
	for cylinders Ø200	with brackets code **1320.FSC**
1386-87 / 1396-97	Cylinders according to standard ISO 15552 ECOPLUS	directly on groove
1390 - 1391	Cylinders according to standard ISO 15552 ECOLIGHT **Warning:** To use only into the lateral slot, from Ø32 to Ø63 cylinders. (do not use into the 2 slots positioned on the side of feeding connection)	directly on groove
1370÷1373	Cylinders ECOFLAT	directly on groove
1500	Short stroke compact cylinders	with adapter code **1380.01F**
	Compact cylinders “Europe”	from Ø12 to Ø25: directly on groove
		from Ø32 to Ø50:directly on groove or with adapter **1380.01F**
		from Ø63 to Ø100: with adapter cod. **1380.01F**
	Compact cylinder according to standard ISO 21287 ECOMPACT	directly on groove
1605	Rodless cylinders	with adapter code **1600.B**
6100	Guided compact cylinder (Ø20 - Ø63)	directly on groove
6101	Heavy duty guided shortstroke cylinder	
6200	Twin rod slides units	
6210	Twin through rod slides units	
6301	Pneumatic grippers, angular standard version	
6303	180° angular gripper rack & pinion style	
6310	Parallel style pneumatic grippers standard version (Ø10 - Ø25)	
6311	Parallel style pneumatic grippers wide opening	
6312	3 finger parallel style pneumatic grippers (Ø32 - Ø125)	

Square section version (for sensor slot type “B”)

SERIES	DESCRIPTION	MOUNTED
1200	Microbore with threaded end covers and “TECNO-MIR” microbore “MIR” with rolled end covers Microbore “MIR-INOX” with rolled end covers	with clamps code **1260.Ø.FS** with clamps code **1280.Ø.FS** with clamps code **1280.Ø.FSX**
1319 - 1320 1325 - 1345 1330 - 1332 1348 - 1349	for cylinders Ø32 - Ø40	with brackets code 1320.ASC
	for cylinders Ø50 - Ø63	with brackets code 1320.BSC
	for cylinders Ø80 - Ø100	with brackets code 1320.CSC
	for cylinders Ø125	with brackets code 1320.DSC
	for cylinders Ø160	with brackets code 1320.ESC
	for cylinders Ø200	with brackets code 1320.FSC
1386-87 / 1396-97	Cylinders according to standard ISO 15552 ECOPLUS	directly on groove
1390 - 1391	Cylinders according to standard ISO 15552 ECOLIGHT	directly on groove
1370÷1373	Cylinders ECOFLAT	directly on groove
1500	Compact cylinders “Europe”	from Ø12 to Ø25: directly on groove
		from Ø32 to Ø50: directly on groove
	Compact cylinder according to standard ISO 21287 ECOMPACT	directly on groove
6100	Guided compact cyalinder (Ø20 - Ø63)	directly on groove
6101	Heavy duty guided shortstroke cylinder	
6200	Twin rod slides units	
6210	Twin through rod slides units	
6301	Pneumatic grippers, angular standard version	
6303	180° angular gripper rack & pinion style	
6310	Parallel style pneumatic grippers standard version (Ø10 - Ø25)	
6311	Parallel style pneumatic grippers wide opening	
6312	3 finger parallel style pneumatic grippers (Ø32 - Ø125)	
6411	Single rack rotary actuators	

Round section version (for sensor slot type “C” and “D”)

SERIES	DESCRIPTION	MOUNTED
6100	Guided compact cylinder (Ø12 - Ø16)	directly on groove
6302	Pneumatic grippers, 180 °angular	
6310	Parallel style pneumatic grippers standard version (Ø16 and Ø25)	
6312	3 finger parallel style pneumatic grippers (Ø16 - Ø25)	
6400	Double rack rotary actuators with turn table	
6420	Vane type rotary actuators (from Ø10 to Ø40)	
6500	Arbitrary mount cylinders	
6600	Slide cylinders	
6700	Guide cylinders	

Round section 90° cable version (for sensor slot type “C” and “D”)

SERIES	DESCRIPTION	MOUNTED
6420	Vane type rotary actuators	directly on groove

Series 1260/1320 - Piston rod lock

General

The piston rod lock devices are clamping units mounted on the microbore cylinders front head. They allow the piston rod to lock 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.

Construction characteristics

Mounting bracket	Anodised aluminium
Body	Anodised aluminium
Clamping jaws	Hardened alloy copper
Piston	Acetal resin
Seal	NBR
Springs	Springs steel

Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.						
Working pressure	3 bar - 6 bar						
Working temperature	-5°C - +70°C						
Functioning	mechanical double jaws						
Locking	axial, two-direction (normally locked)						
Unlocking	pneumatic						
Clamping force with static load (microbore cylinders)	Ø12 180N	Ø16 180N	Ø20 350N	Ø25 350N	Ø32 600N		
Clamping force with static load (cylinders)	Ø32 600N	Ø40 1000N	Ø50 1400N	Ø63 2000N	Ø80 5000N	Ø100 5000N	Ø125 7000N

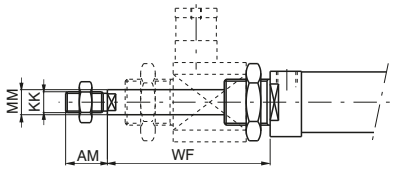
"Attention: Dry air must be used for application below 0°C"

Use and maintenance

Operate within the specified technical characteristics.
The piston rod lock does not require maintenance if properly utilised.
The working inlet port has to be pressurised for assembling the piston rod lock device on cylinder. Alternatively adjust the jaws with screw located on connection.
Spare parts are not available.

Microbore cylinders for piston rod lock

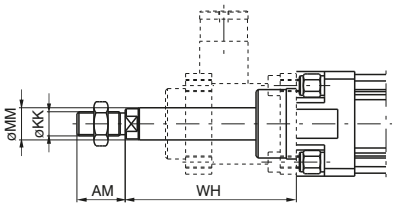
Threaded end covers version



Ordering code
12_ _.Ø.stroke.B

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

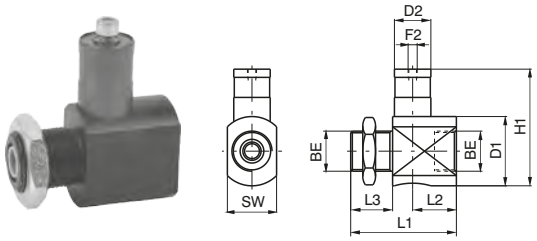
Cylinders for piston rod lock)



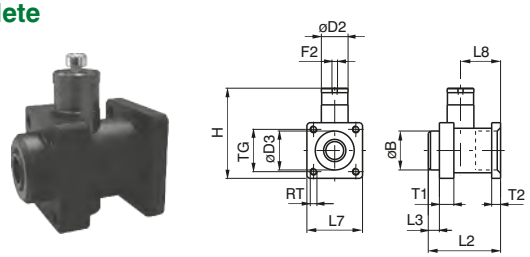
Order piston rod lock separately. Do not use with stainless steel piston rod.

Ordering code
13 – –.Ø.stroke.– –.B

Piston rod lock complete



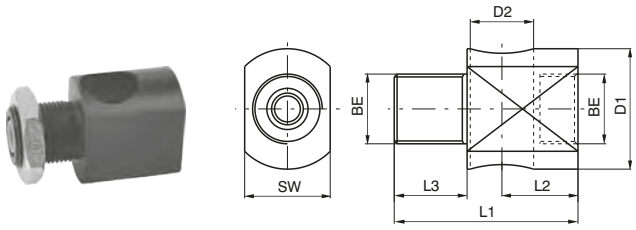
Do not use as safety device

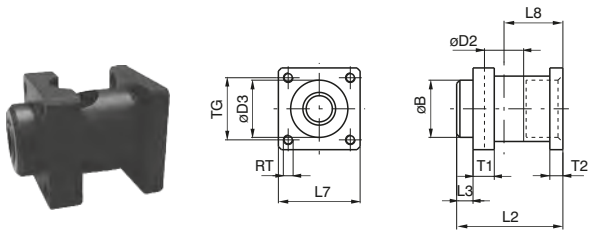


Ordering code	Ø	12	16	20	25	32
1260.Ø.51BS	Weight g	82	82	140	140	188

Ordering code	Ø	32	40	50	63	80	100	125
1320.Ø.51BS	Weight g	191	276	535	852	1772	2412	5250

Piston rod lock bracket

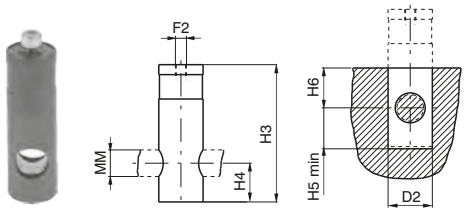




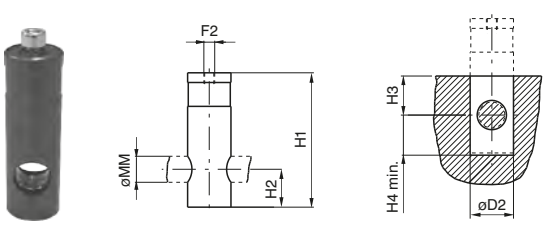
Ordering code	Ø	12	16	20	25	32
1260.Ø.51S	Weight g	60	60	85	85	133

Ordering code	Ø	32	40	50	63	80	100	125
1320.Ø.51S	Weight g	142	171	360	486	1060	1700	3500

Piston rod lock and housing



Do not use as safety device



Ordering code	Ø	12	16	20	25	32
1260.Ø.51B (Ø12÷Ø25)	Weight g	22	22	55	55	55
1320.32.51B (Ø32)						

Ordering code	Ø	32	40	50	63	80	100	125
1320.Ø.51B	Weight g	49	105	175	366	712	712	1750

Table of dimensions (series 1200)

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
32	20	M30x1,5	39,5	20	M5	64	62	17,5	18,5	18	M10x1,25	60	26	22	12	35	76,5

Table of dimensions (series 1300)

Bore	AM	B	D2	D3	F2	H	H1	H2	H3	H4	KK	L2	L3	L7	L8	MM	RT	T1	T2	TG	WH
32	22	30	20	30,5	M5	67	62	17,5	18	18,5	M10x1,25	58	10	45	31,5	12	M6	13	8	32,5	74
40	24	35	24	35	G 1/8”	86	83	22	22	23	M12x1,25	65	10	50	36	16	M6	13	8	38	85
50	32	40	30	40	G 1/8”	105	100	25	25	26	M16x1,5	82	12	60	45,5	20	M8	16	15	46,5	107
63	32	45	38	45	G 1/8”	121	116	30	30	31	M16x1,5	82	12	70	49,5	20	M8	16	15	56,5	107
80	40	45	48	45	G 1/8”	164	155	36	36	37	M20x1,5	110	20	90	61	25	M10	20	18	72	126
100	40	55	48	55	G 1/8”	172	155	36	36	37	M20x1,5	115	23	105	65	25	M10	20	18	89	143
125	54	60	65	60	G 1/8”	210	195	56	55	56	M27x2	167	45	140	86,5	32	M12	30	22	110	187

Series 1260 - 1320 - Linear control units

Construction characteristics

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

Technical characteristics

Max. suggested strokes for 1200 series:

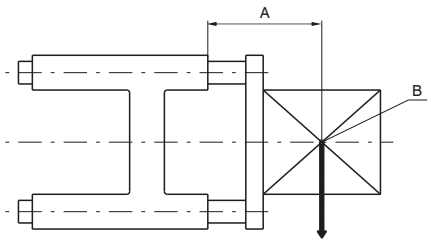
Diameter	20	25
Stroke mm	200	250

Max. suggested strokes for 1320 series:

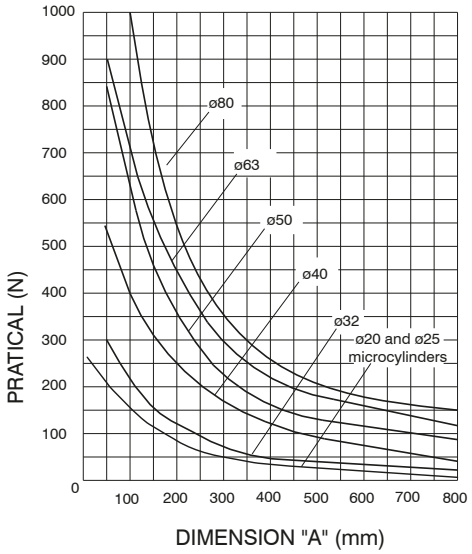
Diameter	32	40	50	63	80
Stroke mm	300	350	450	500	550

On request are available strokes up to 2800 mm

Loading diagram based on dimension "**A**"



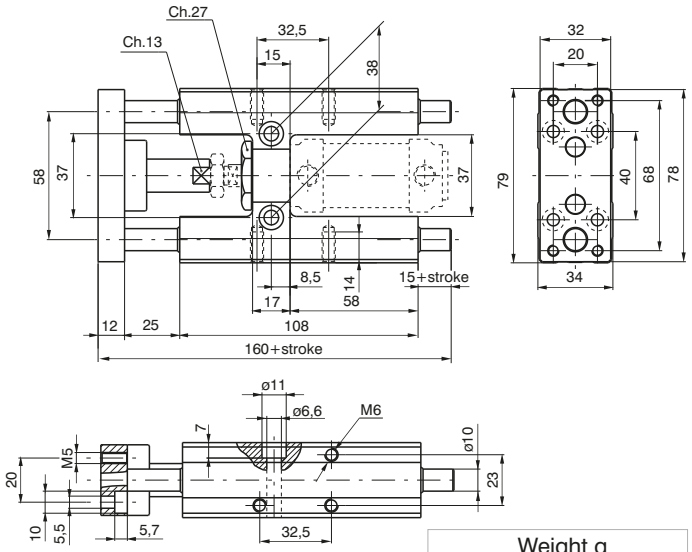
A = Protusion
B = Load centre of gravity



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.

Dimensions for microbore cylinders ISO 6432



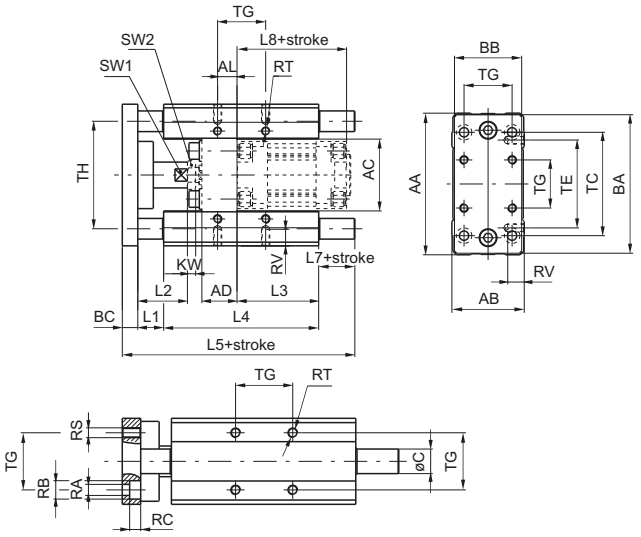
Ordering code
1260.Ø.stroke.GLB (Microbore cylinders ISO 6432 must be ordered separately)

Weight g	
stroke 100	every 50 mm
970	60

Standard strokes
ø 20 100 - 150 - 200 mm
ø 25 100 - 150 - 200 - 250 mm

Sensors and sensor clamps: Use standard sensors and clamps.

Dimensions for microbore cylinders ISO 15552



Ordering code
1320.Ø.stroke.GLB (Cylinders must be ordered separately)

	Bore	Ø32	Ø40	Ø50	Ø63	Ø80
Weight g	stroke 100	1720	2900	4700	6000	11300
	every 50 mm	91	159	159	250	380

Bore	AA	AB	AC	AD	AL	BA	BB	BC	C	KW	L1	L2	L3	L4	L5
32	97	49	50	24	4.3	93	45	12	12	6	25	39	76	125	187
40	115	58	57.5	28	11	112	55	12	16	7	25	44	81	140	207
50	137	70	69.5	34	18.8	134	65	15	20	8	25	48	79	150	225
63	152	85	84.5	34	15.3	149	80	15	20	8	25	48	111	182	242
80	189	105	106	34	21	180	100	20	25	9	25	53	128	215	302

Bore	L7	L8	RA	RB	RC	RS	RT	RV	SW1	SW2	TC	TE	TG	TH
32	25	94	6.6	11	6.5	M6	M6	12	15	17	78	61	32.5	74
40	30	105	6.6	11	6.5	M6	M6	14	15	19	84	69	38	87
50	35	106	9	15	9	M8	M8	16	22	24	100	85	46.5	104
63	20	121	9	15	9	M8	M8	16	22	24	105	100	56.5	119
80	42	128	11	18	11	M10	M10	20	27	24	130	130	72	148

Standard strokes
Ø 32 100 - 150 - 200 - 250 - 300 mm
Ø 40 100 - 150 - 200 - 250 - 300 - 350 mm
Ø 50 100 - 150 - 200 - 250 - 300 - 350 - 400 - 450 mm
Ø 63 100 - 150 - 200 - 250 - 300 - 350 - 400 - 450 - 500 mm
Ø 80 100 - 150 - 200 - 250 - 300 - 350 - 400 - 450 - 500 - 550 mm

Sensor clamps and brackets for 1319-1320 series
Use standard sensors and brackets on the rear and following special brackets on front of cylinders for use sensors codes 1500._, RS._, HS._ which have the following ordering codes:

1320.AGL sensor bracket for cylinders Ø32 and Ø40
1320.BGL sensor bracket for cylinders Ø50 and Ø63
1320.CGL sensor bracket for cylinders Ø80

Series 6900 - Dampers

Dampers

Ordering code

6900.__

- A = Thread M8x1
- B = Thread M10x1
- C = Thread M14x1.5
- D = Thread M20x1.5
- E = Thread M27x1.5

Operational characteristics

Code	Max. power (Nm)		Return force	Operating temperature	Weight
	For cicle	For hour			
6900.A	4	14400	2,5 - 6 N	-20°C - 80°C	10 gr.
6900.B	15	24000	3,6 - 8 N		20 gr.
6900.C	30	50000	13 - 23 N		50 gr.
6900.D	100	76500	12 - 23 N		140 gr.
6900.E	390	175500	14 - 31 N		340 gr.

Overall dimensions

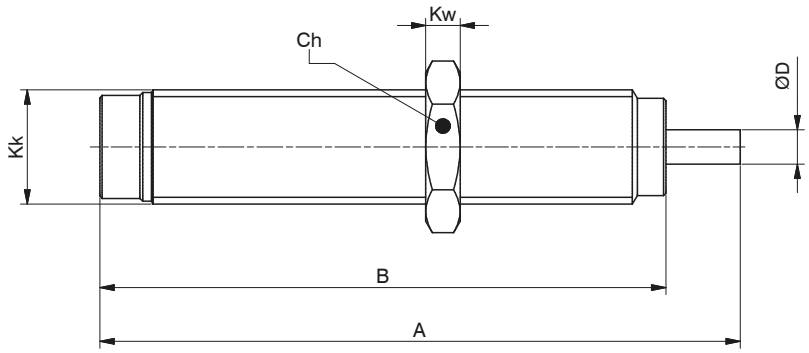


Table of dimensions

Code	A	B	Ch	D	Kk	Kw
6900.A	51	44	11	2,5	M8x1	3
6900.B	56	49,5	13	3	M10x1	3
6900.C	79	69	17	4	M14x1,5	5
6900.D	107	88	24	6	M20x1,5	6
6900.E	126,5	108,5	30	8	M27x1,5	8