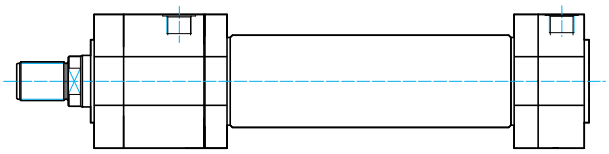
ISO 6022 hydraulic cylinders are suitable for particularly heavy-duty applications, in industrial applications where great robustness, high working pressures (up to 250 bar) and technical solutions that ensure durability and reliability even in difficult environments are required, thanks to the use of the best materials.

The overall dimensions and the mounting configurations comply with ISO 6022. The cylinder can be provided with reliable end-of-stroke cushioning, equipped with a quick restart system and adjustable to suit the needs and loads to be cushioned.
The cylinder is equipped with a long bronze rod guide bushing and double bronze guides on the piston to offer the best performance even under unexpected radial loads.
Available in various sealing configurations to suit the desired operating conditions and performance.
Before delivery, each cylinder is tested in accordance with ISO 10100 and we record these results in our systems to ensure product quality and performance.
They can be equipped with various types of sensors to detect the piston at the end of the stroke or in intermediate positions, or continuously along the entire stroke. In addition, the cylinder can be equipped with a CETOP plate for the installation of a control valve with ISO 4401 mounting surfaces.
Spare parts are easy to find and are always available at our warehouse, with rapid support service to deal with any urgency.

Standard		ISO 6022 - DIN 24333	
Bore	**mm**	from 50 to 200	
Pressure	**bar**	operational 250	testing 375
Maximum stroke	**mm**	6000	
Fluid		Mineral hydraulic oil Phosphoric esters HFC-fluid	

HEAVY-DUTY CYLINDER SERIES

DP Bore from 50 to 200

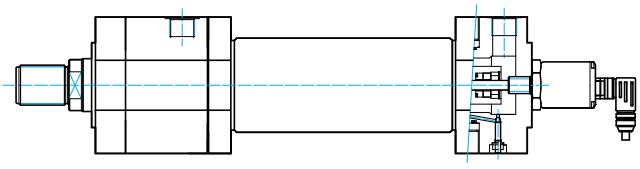


The DP series hydraulic cylinders comply with ISO 6022 standard. Technical characteristics, dimensions, and available versions and options are detailed from page 43.

They are available in a wide variety of configurations, with rod in various materials, with CETOP plate for valve and with end-stroke sensors integrated in the cylinder heads, and many other special options.

HEAVY-DUTY CYLINDER SERIES WITH POSITION TRANSDUCER

TP Bore from 50 to 200



The TP series hydraulic servo cylinders have the same technical features, dimensions and available options as the DP basic series, but are equipped with a magnetostrictive linear position transducer (see page 53) for precise and continuous detection of the piston at any point in the cylinder stroke.

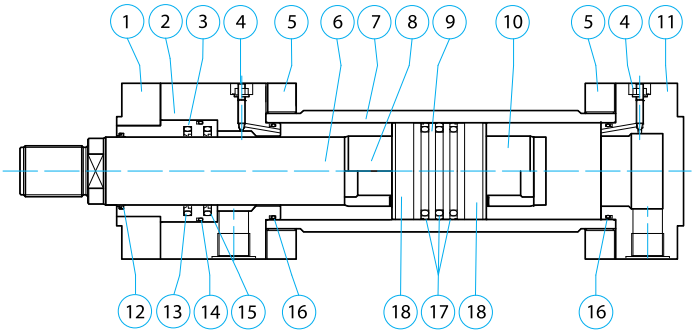
The external parts of the position transducer are protected against accidental impact during transport, installation and operation by a removable steel cover.

AVAILABLE SEALS

Seal code	Performances					Fluid		
	High sealing	Low friction	Max speed	Temp °C Min	Temp °C Max	Hydraulic oil	Phosphoric esters	HFC-fluid
S	√		0.5 m/s	-20	+80	√		
L		√	1 m/s	-20	+80	√		
H		√	1 m/s	-20	+150	√	√	
G		√	1 m/s	-20	+80			√

For speeds and temperatures exceeding the indicated limits, please contact our technical department.

BORE 50-200



The cylinders are equipped with a bronze guide bushing with a wiper and a double seal with high or low friction.

	Component	Material	Features
1	Closing flange	Steel	
2	Front head	Steel	
3	Guide bushing	Bronze	
4	Cushioning adjusting + air bleed	Steel	
5	Counterflange	Steel	
6	Piston rod	Hardened and tempered chromeplated steel	Cr 25 µm ISO f7 - Ra 0.20 µm
7	Cylinder body	Steel	Honed H8 - Ra 0.40 µm
8	Front cushioning	Hardened steel	
9	Piston	Steel	
10	Rear cushioning	Hardened steel	
11	Rear head	Steel	

The original floating ring cushioning system guarantees perfect centring and performs the function of rapid opening for quick restart of the cylinder.
Made of hardened steel guarantees a long service life, thanks to the steel housing of the cylinder head.

The screw adjustment system allows a precise adjustment of the cushioning effect and at the same time bleeding the air (see page 45).

	Component	Groove	Material			
			S	L	H	G
12	Rod wiper		NBR + PTFE	NBR + PTFE	Viton® + PTFE	NBR + PTFE CG
13	First rod seal	ISO 7425/2	PU	NBR + PTFE	Viton® + PTFE	NBR + PTFE CG
14	Head / bushing sealing		NBR + PTFE	NBR + PTFE	Viton® + PTFE	NBR + PTFE
15	Second rod seal	ISO 7425/2	NBR + PTFE	NBR + PTFE	Viton® + PTFE	NBR + PTFE CG
16	Tube seal		NBR	NBR	Viton®	NBR
17	External piston seals	ISO 7425/1	NBR + PTFE + PU	NBR + PTFE	Viton® + PTFE	NBR + PTFE CG
18	Piston guide		Bronze	Bronze	Bronze	Bronze

SIZING AND FORCES

Dimension		Piston area		Force at 100 bar		Force at 250 bar		Screws tightening torque
Bore	Rod	push	pull	push	pull	push	pull	
mm	mm	cm²	cm²	kN	kN	kN	kN	Nm
50	32	19.6	11.6	20	12	49	29	30
	36		9.5		9		24	
63	40	31.2	18.6	31	19	78	47	50
	45		15.3		15		38	
80	50	50.3	30.6	50	31	126	77	80
	56		25.6		26		64	
100	63	78.5	47.4	79	47	196	118	125
	70		40.1		40		100	
125	80	122.7	72.5	123	72	307	181	250
	90		59.1		59		148	
140	90	153.9	90.3	154	90	385	226	250
	100		75.4		75		188	
160	100	201.1	122.5	201	123	503	306	300
	110		106		106		265	
200	125	314.2	191.4	314	191	785	479	480
	140		160.2		160		401	

STROKE

During testing, the cylinder stroke is checked, assuring compliance with the tolerance of 0/+2 mm as per ISO 8135.
For space requirements of the cylinder components or switches, the stroke cannot be less than a minimum value in some circumstances.
This problem can be overcome by inserting a spacer.

	Bore		50	63	80	100	125	140	160	200
Minimum stroke	DP (mm)	Mounting H (ISO MT4)	80	100	120	145	175	190	190	200
		Other	0	0	0	0	0	0	0	0

OPERATIONAL LIFE-TIME

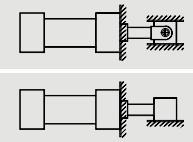
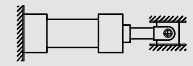
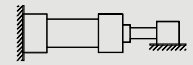
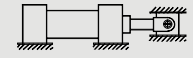
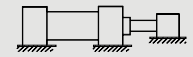
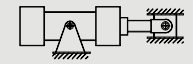
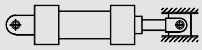
The cylinders are manufactured from high-quality materials and according to design guidelines validated by many years of experience with these products. Under ideal conditions, the cylinders are capable of working for millions of cycles requiring only regular basic maintenance and replacement of wear parts.
The real application situations can subject cylinders to conditions that reduce their service life and would therefore be preferable to avoid.

The most frequent are:
- radial loads, generated by external forces or misalignments in fixing to machinery
- end-stroke impacts and external impulsive forces
- pressure peaks and water hammers;
- contaminated hydraulic fluid;
- over-temperatures, caused either by the environment or internal causes such as frequent cycles with short strokes, which prevent sufficient oil change.

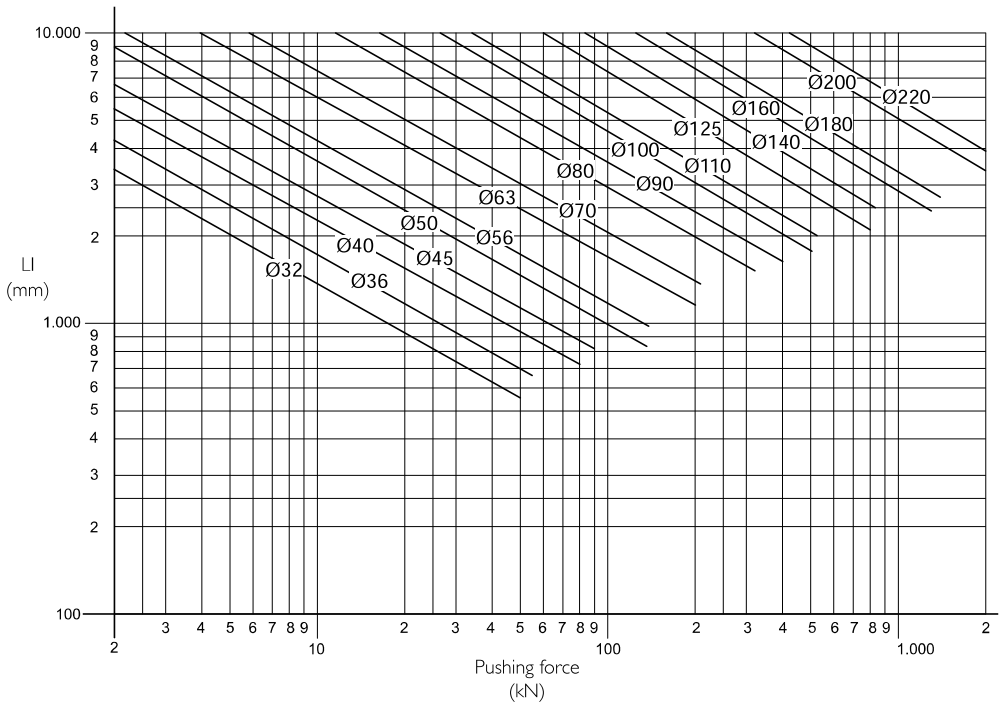
Our technical department will be able to advise you on how best to prevent or reduce problems.

BUCKLING VERIFICATION

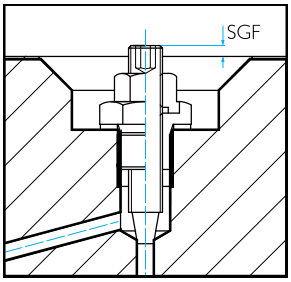
When the cylinder is pushing, it can be subject to buckling instability, depending on mounting, stroke and pushing force. The graph illustrates the boundary working conditions for each rod. Stay below for optimal operation. The mounting of the cylinder determines the stroke factor FC. Multiplying the cylinder stroke CO by FC gives the ideal length LI. The value of LI, read on the vertical axis, meets the line corresponding to the diameter of the rod to be checked, identifying on the horizontal axis the maximum possible push. If the actual thrust does not exceed this limit value, the verification is passed.
Spacers and rod extensions must be added to the stroke to obtain the CO value to be multiplied by FC.

MOUNTING		FC
A (MF3)		0.7
		2
B (MF4)		1.5
		4
E (MS2)		0.7
		2
H (MT4)		1.5
C (MP4) D (MP6) R (MP3) S (MP5)		2

ROD SELECTION CHART



CUSHIONING ADJUSTMENT AND AIR BLEEDING



All the cushioned cylinders are equipped with a screw that allows the cushioning adjustment.

Slightly loosen the Seal-Lock® sealing nut, adjust the screw and tighten carefully.

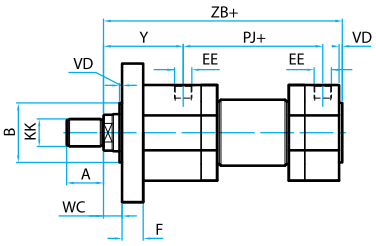
The cushioning adjustment unit can also be used as an air bleeder by loosening the nut until the air has escaped.

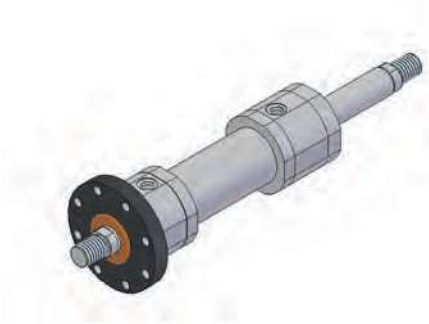
On cylinders with cushioning, if the stroke is shorter than the cushioning length, the cylinder is always cushioned.

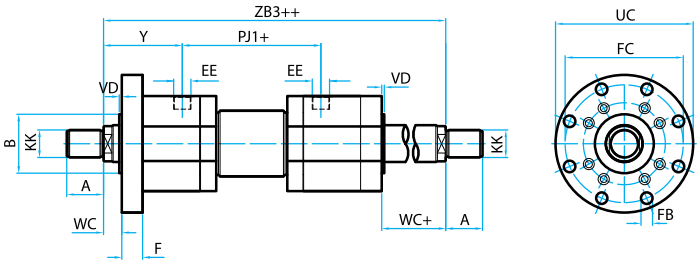
Bore		50	63	80	100	125	140	160	200
Cushioning lenght	mm	32	32	40	40	40	46	46	65
Cushioning area	cm^2	8.2	13.8	23.8	37.8	56	67	99	151
SGF	mm	5	4	5	2	0	0	0	0

ISO MF3 - FRONT FLANGE

A

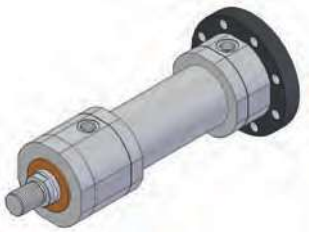


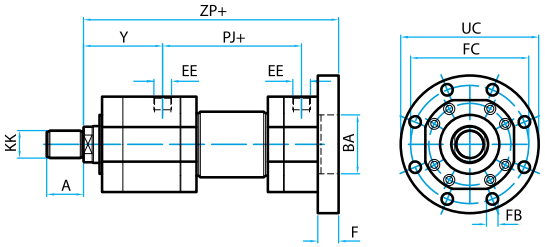




ISO MF4 - REAR FLANGE

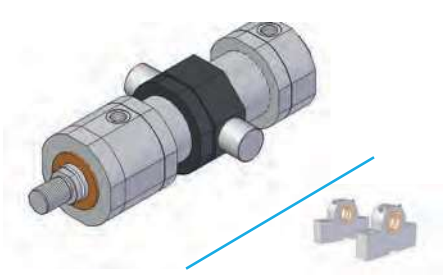
B

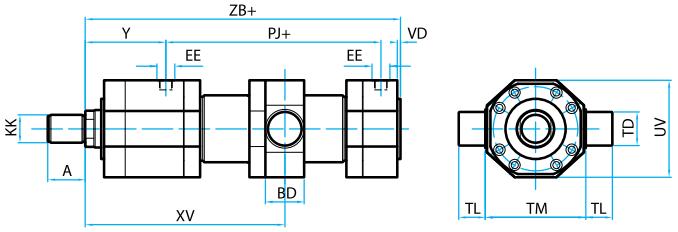




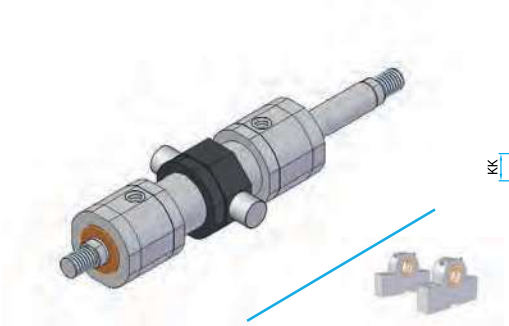
ISO MT4 - INTERMEDIATE TRUNNIONS

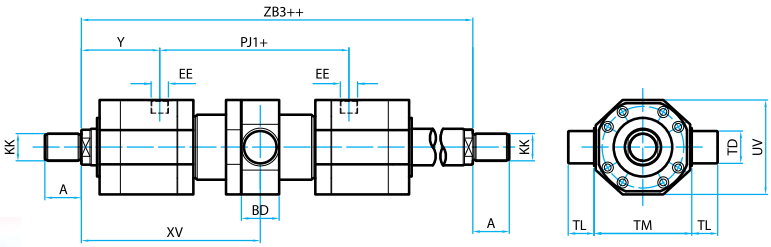
H





Accessory LK available on page 59

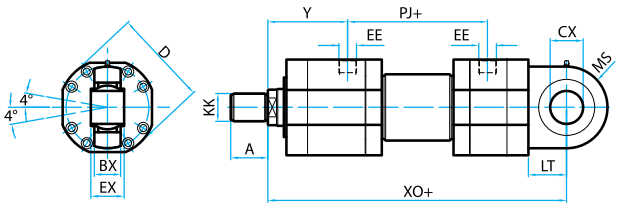




Accessory LK available on page 59

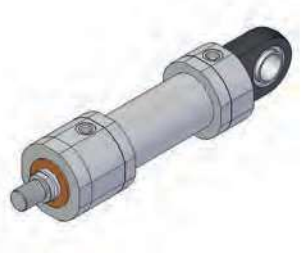
ISO MP6 - DEMOUNTABLE CLEVIS WITH BALL JOINTED EYE

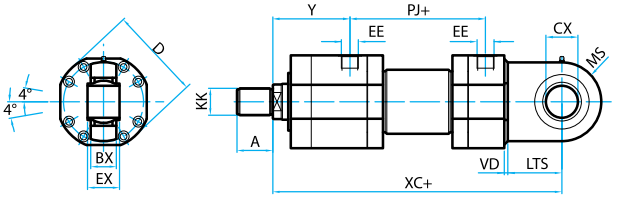
D



ISO MP5 - EXTENDED WELDED CLEVIS WITH BALL JOINTED EYE

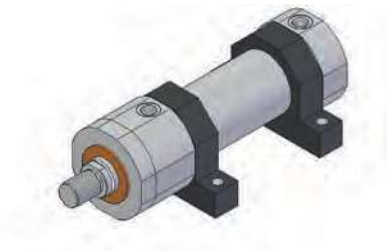
S

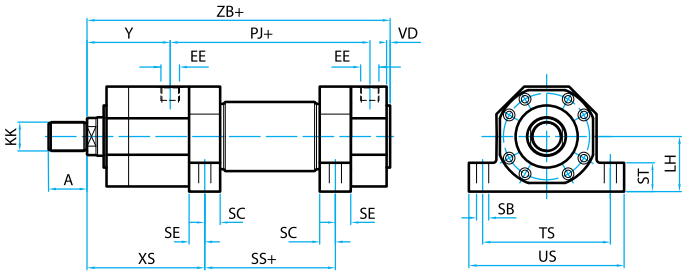


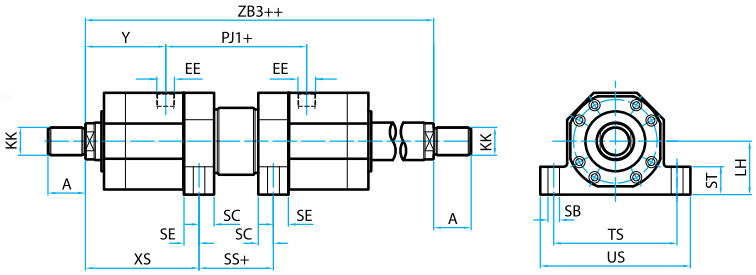


ISO MS2 - FEET

E

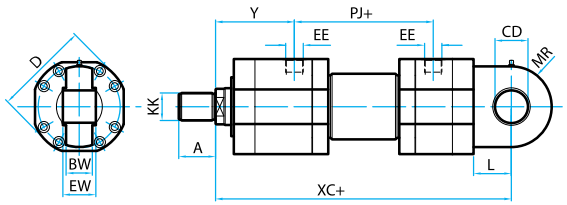






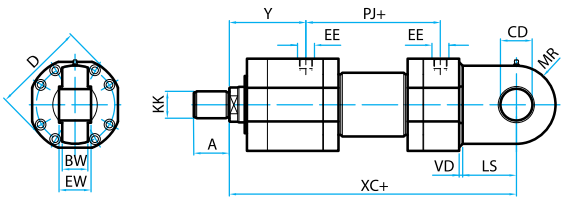
ISO MP4 - DEMOUNTABLE CLEVIS

C



ISO MP3 - EXTENDED WELDED CLEVIS

R



Bore	50	63	80	100	125	140*	160	200
B f8	63	75	90	110	132	145	160	200
BA F8	63	75	90	110	132	145	160	200
BD	38	48	58	73	88	98	108	133
BW	27	35	40	52	60	65	84	102
BX	27	35	40	52	60	65	84	102
CD H9	32	40	50	63	80	90	100	125
CX H7	32	40	50	63	80	90	100	125
D max	105	124	148	177	207	255	270	330
EW	32	40	50	63	80	90	100	125
EX	32	40	50	63	80	90	100	125
EE (page 50)	G 1/2"	G 3/4"	G 3/4"	G 1"	G 1"	G 1 1/4"	G 1 1/4"	G 1 1/4"
F	25	28	32	36	40	40	45	56
FB	8 x Ø 13.5	8 x Ø 13.5	8 x Ø 17.5	8 x Ø 22	8 x Ø 22	8 x Ø 26	8 x Ø 26	8 x Ø 33
FC	132	150	180	212	250	300	315	385
L	40	50	63	71	90	115	112	160
LS	61	74	90	102	124	150	150	206
LT	40	50	63	71	90	115	112	160
LTS	61	74	90	102	124	150	150	206
LH h10	60	68	80	95	115	135	145	170
MR	38	50	61.5	71	90	113	112	145
MS	38	50	61.5	71	90	113	112	145
PJ	120+	136+	156+	172+	205+	208+	235+	278+
PJ1	120+	136+	156+	172+	214+	208+	240+	280+
SB	11	13.5	17.5	22	26	30	33	40
SC	15.5	17.5	22.5	27.5	30	35.5	37.5	45
SE	15.5	17.5	22.5	27.5	30	35.5	37.5	45
ST	32	37	42	52	62	77	77	87
SS	55+	55+	55+	55+	60+	61+	79+	90+
TD f8	32	40	50	63	80	90	100	125
TL	25	32	40	50	63	70	80	100
TM	112	125	150	180	224	265	280	335
TS	135	155	185	220	270	325	340	405
UC	155	175	210	250	290	340	360	440
US	160	185	225	265	325	390	405	480
UV	105	124	145	168	205	248	270	330
VD	4	4	5	5	6	5	7	10
WC	22	25	28	32	36	36	40	45
XC	305+	348+	395+	442+	520+	580+	617+	756+
XO	305+	348+	395+	442+	520+	580+	617+	756+
XS	130	147.5	170.5	192.5	230	254.5	265.5	315
Y	98	107	120	134	153	181	185	221
ZB	244+	274+	305+	340+	396+	430+	467+	550+
ZB3	315++	350++	396++	440++	520++	570++	610++	720++
ZP	265+	298+	332+	371+	430+	465+	505+	569+

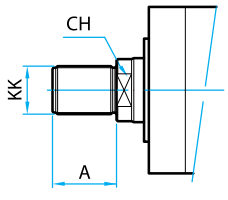
(*) = bore not included in ISO 6022

\+ = add the stroke

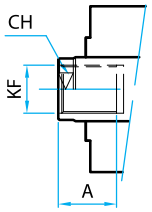
++ = add twice the stroke

ROD END

- Male thread ISO 6022



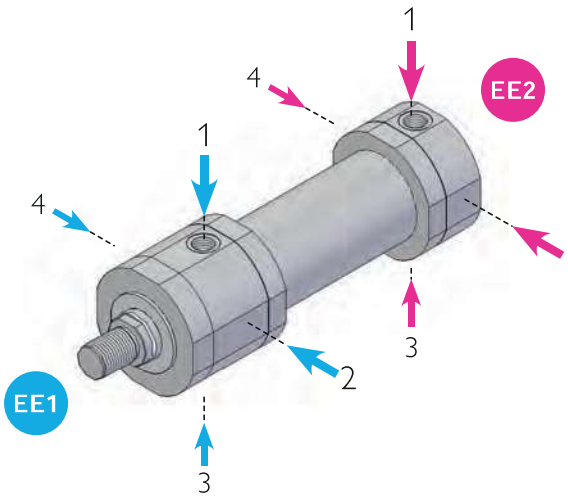
SF Female thread



Rod		32	36	40	45	50	56	63	70	80	90	90	100	100	110	125	140
CH		28	30	34	36	43	46	52	60	65	75	75	85	85	95	110	120
Standard	A	36	36	45	45	56	56	63	63	85	85	90	90	95	95	112	112
	KK	M27x2	M27x2	M33x2	M33x2	M42x2	M42x2	M48x2	M48x2	M64x3	M64x3	M72x3	M72x3	M80x3	M80x3	M100x3	M100x3
Female	A	28	36	36	45	45	56	56	63	63	85	85	90	90	95	95	112
	KF	M20x1.5	M27x2	M27x2	M33x2	M33x2	M42x2	M42x2	M48x2	M48x2	M64x3	M64x3	M72x3	M72x3	M80x3	M80x3	M100x3

For the ISO 6022 standard male rod end, ball-joint or clevis pin ends are available on page 56.
Different threads, lengths and rod extensions are available on request.

OIL PORTS



	ISO 1179-1 (GAS)		SAE 3000		SAE 6000	
Bore	Standard	Oversize	Standard	Oversize	Standard	Oversize
50	G 1/2"	G 3/4"	-	-	-	-
63	G 3/4"	G 1"	1/2"	-	1/2"	-
80	G 3/4"	G 1"	1/2"	-	1/2"	-
100	G 1"	G 1 1/4"	3/4"	1"	3/4"	1"
125	G 1"	G 1 1/4"	3/4"	1"	3/4"	1"
140	G 1 1/4"	G 1 1/2"	1"	1 1/4"	1"	1 1/4"
160	G 1 1/4"	G 1 1/2"	1"	1 1/4"	1"	1 1/4"
200	G 1 1/4"	G 1 1/2"	1"	1 1/4"	1"	1 1/4"

The standard configuration has the oil port in position 1 and the cushioning adjustment or air bleed on position 3.

ROD MATERIAL

-	Hardened and tempered chromeplated steel
RRX	Chromeplated Stainless steel
RRK	Nikrom steel
RRH	Hardened chromeplated steel

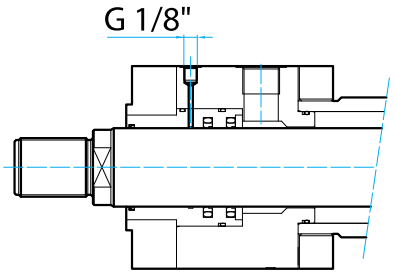
The cylinder rod is made of high-quality chrome-plated ground steel to reduce seal wear and achieve the best sealing performance over time.

The standard version is hardened and tempered chrome-plated steel. For special requirements regarding resistance to corrosion, mechanical stress and wear, stainless steel, Nikrom-coated, hardened steel rods are available.

BUSHING DRAIN

SD Stroke longer than 2000 mm and high-speed movement can generate a build-up of fluid between the wiper and the rod guide bushing seal.

The cylinder can be equipped with a bushing drain port to allow excess fluid to be removed and returned to the tank. The drain port is normally located on the side opposite the oil port and must be connected to an atmospheric pressure tank.



METAL WIPER

RM The metal wiper is particularly suitable for keeping extraneous particles, even small ones, outside the cylinder in the surrounding operating environment, thanks to the perfect adhesion between the scraper and the cylinder rod.
Recommended in environments with a high quantity of small dust particles.

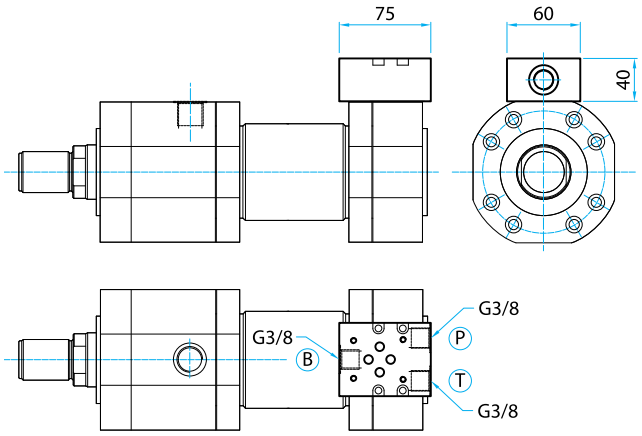
CETOP PLATES FOR ISO 4401 VALVES

CETOP plates with ISO 4401 mounting surfaces allow fixing a four-way control valves to reduce oil volumes between the cylinder and the valve, achieving better control accuracy.

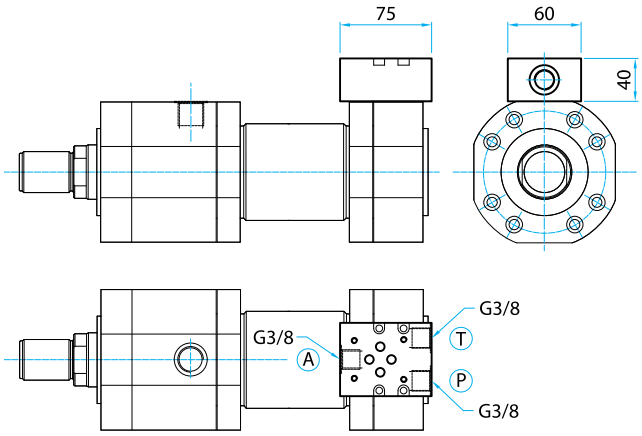
They are mounted directly on the rear head of the cylinder by means of a nipple and four screws, which ensure stable attachment even in the case of continuous vibrations. They are often chosen in combination with the use of position transducers for absolute and precise detection of the rod. On request, the cylinder can be supplied with the connection tube to the front end fitted.

CETOP 3 PLATES FOR ISO 4401-03 NG6 VALVES (for bores from 80 to 125)

BV3-A Link configuration A on rear side

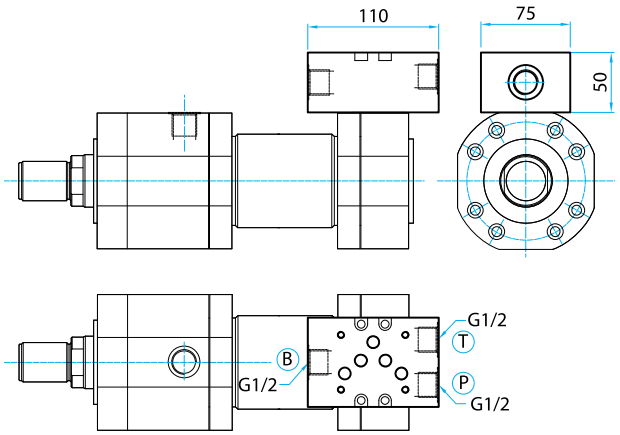


BV3-B Link configuration B on rear side



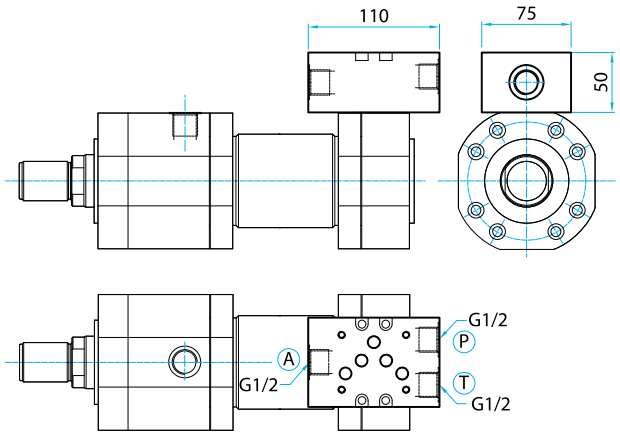
CETOP 5 PLATES FOR ISO 4401-05 NG10 VALVES (for bores from 100 to 200)

BV5-A Link configuration A on rear side

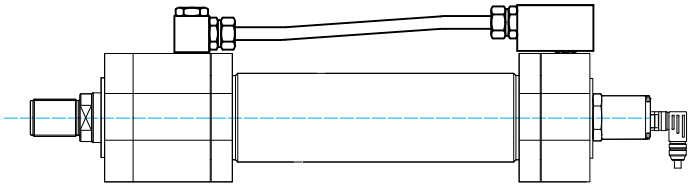


It cannot be fitted on cylinders with B mounting (ISO MF4 rear flange)

BV5-B Link configuration B on rear side



TBV Connection pipe to front head (on request)



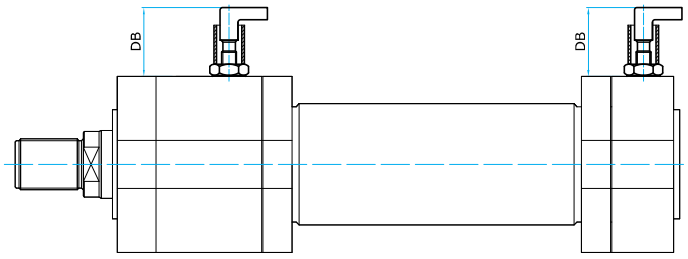
On request, it is possible to supply the cylinder already equipped with the connection pipe to the front head.

HEAVY-DUTY CYLINDERS WITH END-OF-STROKE SWITCHES

The DP Series cylinders can be equipped with proximity sensors integrated in the cylinder heads, for detecting the position of the piston at the end of the stroke, on one or both sides.

The sensor generates a magnetic field and it is able to detect the change resulting from the approaching of the cushioning bushing.

The sensors are mounted on the cylinder head, usually in position 4, and are protected from accidental impact by a solid steel cover (see page 50).



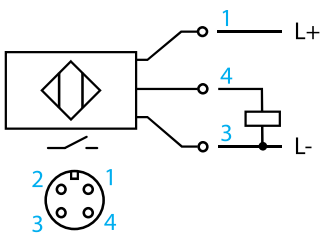
Bore	DB max (mm)
50	80
63	80
80	70
100	60
125	65
160	55
200	50

SPV	Front-side switch option
SPZ	Rear-side switch option
SPK	Front and rear side switches option

The switches are made of stainless steel and are supplied correctly mounted in the cylinder and tested before delivery.

The sensor is supplied with a 5-metre PUR cable with M12 connector.

The output signal is regulated by a 'normally open' contact.



Switch technical features	
Operating temperature	-25°C / +120°C
Maximum pressure	500 bar
Protection grade	IP69k
Connector	S4
Hysteresis	<= 15%
Repeatability	<= 5%
Wiring	3 wires
Switching function	Normally open
Output signal	PNP
Rated operational voltage	24 V DC
Rated operational current	200 mA
Supply voltage	10 / 36 V DC

CODE COMPOSITION

The entry fields for the example values are mandatory.

DP		125	/	90	/		A		500		S				

Type: **DP**

Special version (1): **SX**

Bore	Rod
50	32 / 36
63	40 / 45
80	50 / 56
100	63 / 70
125	80 / 90
140	90 / 100
160	100 / 110
200	125 / 140

Second rod

Stroke in mm

Options (see from page 50)

Air bleed	
-	No air bleed
SV	Front
SZ	Rear
SK	Front + Rear

Rod end (see page 49)		
-		Male thread
SF		Female thread

Seals (see page 43)	
S	High sealing
L	Low friction
H	Viton®
G	HFC-fluid

Spacer	
-	For stroke from 0 to 1500
SJ 50	from 1500 to 2000
SJ 100	from 2000 to 3000
SJ 150	over 3000

Adjustable cushioning		
-		Not cushioned
V		Front
Z		Rear
K		Front + Rear

See mounting list from page 46	ISO 6022	Mounting	
Front flange	MF3	A	
Rear flange	MF4	B	
Demountable clevis with ball jointed eye	MP6	D	
Demountable clevis	MP4	C	
Extended welded clevis with ball jointed eye	MP5	S	
Extended welded clevis	MP3	R	
Intermediate trunnions (2)	MT4	H	
Feet	MS2	E	

(1) Indicate SX whenever the cylinder has special requests or executions, by filling in the options section of the code, followed by our drawing number if applicable. (see list of available options from page 50)

(2) For H mounting (MT4), enter 'XV' at the end of the code followed by the value of dimension XV (see page 47).

Interactive online coding wizard available at www.confortinet.com