

Hydraulic Cylinder

for industrial
automation

ISO 6020/2

 **SERVOCOMANDI**

Brand Incorporated by

NEXOIL

FLUID SYSTEMS MANUFACTURING

www.nexoil.it

V.03/2014

NEXOIL products are warranted for a period of one year from date of shipment from our plant to be free from defects in workmanship and material under correct use, normal operating conditions and proper applications as specified on product technical documents. This warranty does not extend to goods damaged, or subjected to accident, abuse, or misuse after shipment from our factory, nor to goods altered or repaired by anyone other than authorized NEXOIL representatives. This one year limited warranty is the only warranty extended by NEXOIL in connection with any sale by NEXOIL. This warranty is in lieu of all other warranties, express or implied, including warranties of merchantability and fitness for a particular purpose. An affirmation of fact or promise made on behalf of NEXOIL shall not be deemed to create an express warranty that the goods shall conform to the affirmation of promise. NEXOIL's obligation upon breach of warranty shall be limited to replacing or repairing at our

option, only at our plant free of charge, but not including installation, dismantling, reassembling or any other charge. Written permission for any warranty claim return must be first obtained from authorized NEXOIL representatives. All returns must be accompanied with a complete written explanation of claimed defects and the circumstances of operational failure. Replacement of cylinders or parts repaired under this warranty shall be warranted under the terms of this warranty for the remainder of the term of the original warranty or for a period of six months after such repair or replacement, whichever is longer. Upon expiration of the warranty, all of NEXOIL obligations hereunder shall terminate.

In no event shall NEXOIL have any liability for payment of any consequential, incidental, indirect, special, or tort damages of any kind including, but not limited to, any loss of profits.

The specifications indicated in this catalogue are subject to change, without prior notice, due to our policy of continuous product development.



NEXOIL srl - Servocomandi Division offers to the Fluid Power Transmission Industry a wide range of high performing Hydraulic and Pneumatic cylinders and accessories. Our cylinders are both innovative and suitable for a great deal of applications. These products are the result of the company's vast experience and has acquired us our customers total confidence, these mostly being leaders in their own industry sector. Our ability for working in collaboration with our customers, placing the most successful and functional solutions at their disposal, has cemented and strengthened the existing mutual relationship.

NEXOIL is the ideal partner, thanks to our reliability and confidence in our company.

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<i>Iso 6020/2 Standard</i>	
Accessories NXM/GNXM series	p.14

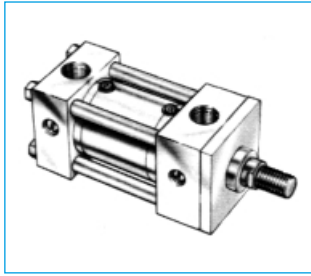
Each NEXOIL cylinder has a label with part number and description for easy identification

Please always refer to cylinder part number when ordering spare parts and seal kits

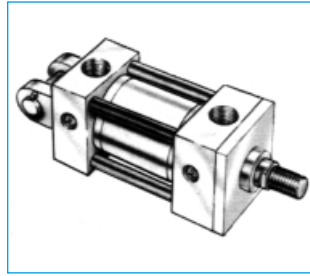
Features	ref.	Description	Example
SERIES	NXM	ISO 6020/2 cylinde 16 MPa - Chromed piston rod Honed tube	NXM ME5 D X - 100 - 45 - M - 0.0 - L - AP - E1
	NXM	ISO 6020/2 cylinder 15 MPa - Magnetic stainless steel piston Chromed piston rod, stainless steel honed tube (bore size 25 mm to 100 mm)	
STANDARD MOUNTINGS	MX5	Front tapped holes	
	ME5	Head rectangular flange	
	* ME6	Cap rectangular flange	
	* MP1	Cap fixed clevis	
	* MP3	Cap eye	
	* MP5	Cap spherical bearing	
	MS2	Side lugs	
	MT1	Head trunnion	
	* MT2	Cap trunnion	
	MT4	Intermediate fixed trunnion	
	MX1	All tie rods extended	
* mounting not available on double rod cylinders	MX2	Cap end tie rods extended	
	MX3	Head end tie rods extended	
DOUBLE ROD	D	Include ONLY for double-rod cylinder	
SPECIAL MODIFICATIONS * please include a drawing	X	Include ONLY if required	
	Q	Balancing cylinder	
BORE	-	Specify in mm	
PISTON ROD DIAMETER	-	Specify in mm	
ROD END STYLE	M	Male	
	MY	Male modified	
	F	Female	
	FY	Female modified	
STROKE	-	Specify in mm	
SEALS	L*	PISTON Nitrile ROD Polyurethane	
	V	Viton Viton	
	BL	Low-friction nitrile Low-friction nitrile	
	BV	Low-friction viton Low-friction viton	
CUSHIONINGS	N	No cushioning	
	A	Head end cushioning	
	P	Cap end cushioning	
	AP	Both ends cushioning	
SERIAL NO.	E1	To be always indicated	

Specifications

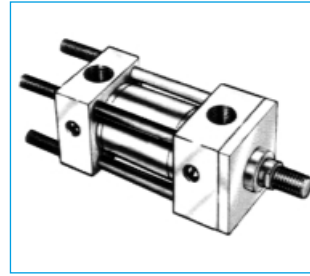
- Heavy duty metric hydraulic cylinder
- Nominal pressure: 160 bar
- In accordance with ISO 6020/2 (1991), DIN 24554 standards
- Security factor 4:1 at nominal pressure and with reference to min. breaking point
- Hydraulic mineral oil - other fluids available upon request
- Temperature range for standard seals: from -20°C to +80°C
- Construction: tie-rod design
- Bore sizes: 25 mm to 200 mm
- Piston rod diameters: 12 mm to 140 mm
- Cushions: adjustable and available on either or both ends (non-adjustable cushionings on bore size 25)
- Special modifications to customer's requirements



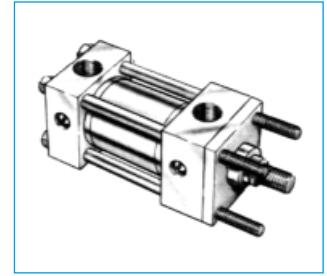
No Mount
NXM-MX5 - NXM-MX5D



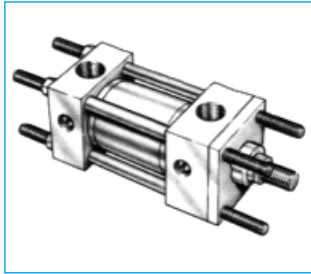
Cap fixed clevis
NXM-MP1



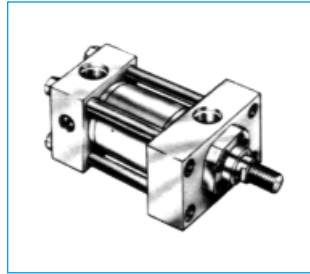
Cap end tie rods extended
NXM-MX2



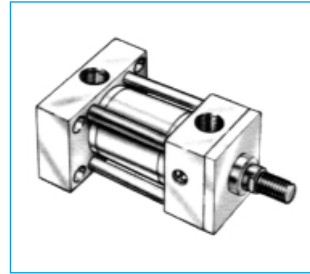
Head end tie rods extended
NXM-MX3 - NXM-MX3D



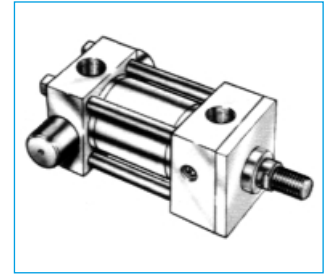
All tie rods extended
NXM-MX1 - NXM-MX1D



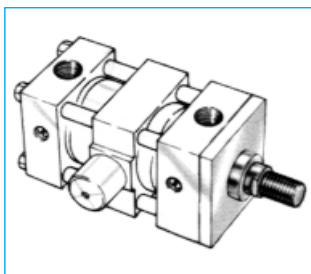
Head rectangular flange
NXM-ME5 - NXM-ME5D



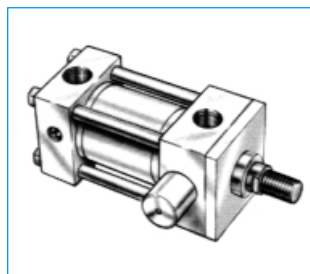
Cap rectangular flange
NXM-ME6



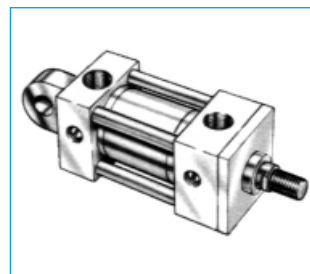
Cap trunnion
NXM-MT2



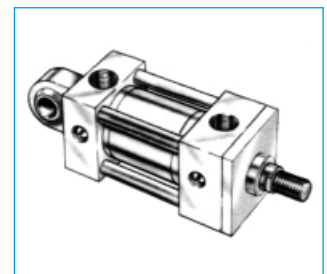
Intermediate fixed trunnion
NXM-MT4 - NXM-MT4D



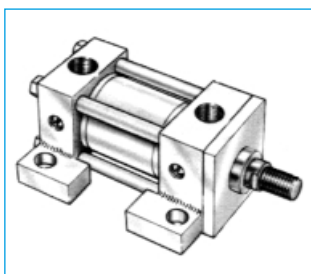
Head trunnion
NXM-MT1 - NXM-MT1D



Cap eye
NXM-MP3



Cap spherical bearing
NXM-MP5



Piedini laterali
NXM-MS2-MS2DN

MOUNTING INFORMATION

• **Extended tie rod mountings**

They are suitable for use on straight line forces and applications where mounting space is limited.

For compression-type applications (push) cap end tie rods extended type MX2 is recommended; head end tie rods extended MX3 is the most appropriate for tension-type applications (pull).

• **Flange mounted cylinders**

This type of mounting is suitable for use on straight line force transfer applications. Two mounting styles are available, with flanges at the head (ME5) or cap (ME6). ME6 is most appropriate for compression-type applications (push); ME5 should be used where the major load places the piston rod in tension (pull).

• **Clevis mounted cylinders**

Cylinders with this type of mounting, which absorb forces on their centre-line, should be used for applications where the item to be

moved travels in a curved path. They can be used for tension (pull) or compression (push) applications. Fixed cap clevis mounting cylinders MP1 and MP3 may be used if the curved path of the piston rod travels in a single plane; for applications where the piston rod will travel in a path either side of the true plane of motion, the spherical bearing mounting MP5 is highly recommended.

• **Foot mounted cylinder**

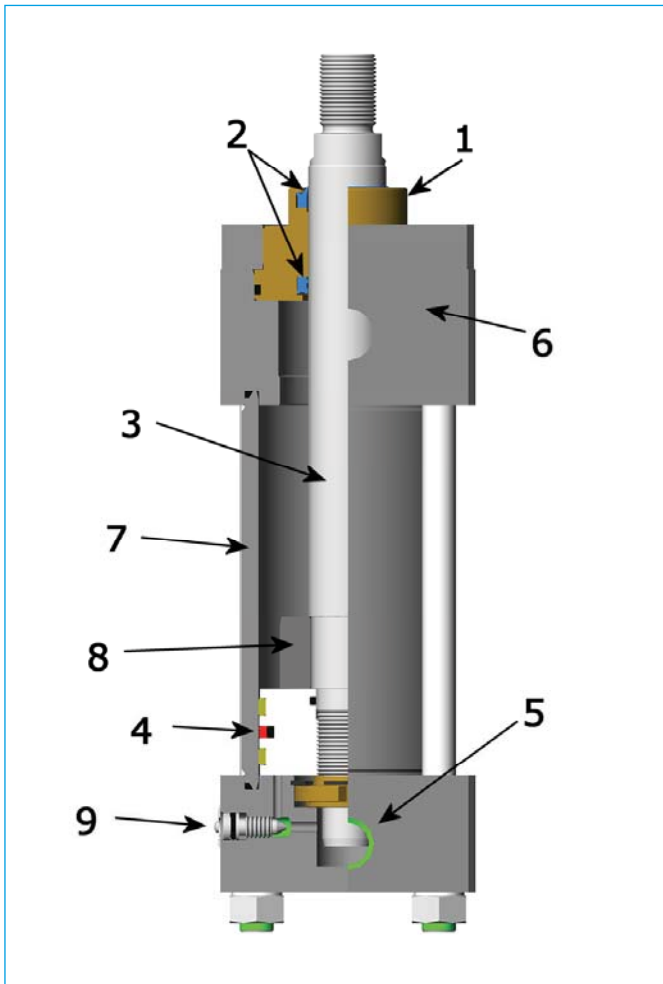
MS2 cylinders do not absorb force on their centre-lines. As a result, the application of force by the cylinder produces a turning moment which attempts to rotate the cylinder about its mounting bolts. It is therefore important for the cylinder to be firmly secured to the machine and for the load to be effectively guided.

• **Trunnion mounted cylinder**

Cylinders with this type of mounting (MT1, MT2 and MT4) are designed to absorb force on their centre-lines. They are suitable for tension (pull) or compression (push) applications, and may be used where the machine member to be moved travels in a curved path, in a single plane.

Trunnion pins are designed for shear loads only, and should be subject to minimum bending stresses.

DESIGN FEATURES



1 Rod cartridge

Machined from steel with bronze guiding elements, the NXM standard cartridge provides maximum bearing support and wear resistance. Cartridge removal is easily allowed with hex wrench without loosening the tie rods.

2 Rod seals

Standard rod seals are made from poliurethane, and provide long life sealing together with high wear resistance. A heavy duty double-lipped rod wiper removes foreign polluted or dusty materials from the exposed rod to extend rod seal life. Standard rod seal temperature range is -20° $+80^{\circ}$. Viton seals are available for higher temperatures (up to 150°) upon request. Low-friction seals are highly suggested when cylinder works with high frequencies. Different seal types are also available upon customer's request.

3 Piston rod

They are manufactured from high tensile carbon alloy C45 steel, hard chrome plated and polished (0,025 mm) to maximum surface finishing of 0,2 μ m, tolerance f7.

4 Piston and piston seals

The standard piston is of one-piece steel construction, and is piloted to the rod for concentricity. The standard version of the seal of the overall piston, comprising: an element made of polyurethane, for the sealing dynamic, one of NBR, for static sealing and two rings Heavy duty friction. Temperature range of standard piston seal is -20° $+80^{\circ}$. Low-friction seals and viton seals are available upon request. Seals for special applications are also available upon customer's request.

5 Ports

Series NXM cylinders are supplied as standard with BSPP/GAS ports. Other ports are also available upon request.

6 Head & cap ends

These are machined from steel and located into the cylinder body's internal diameter for added strenght and precise alignment of tube and rod cartridge.

7 Cylinder body

The cylinder body is made from high resistance steel, honed to 0,4 Ra finishing. Two O-rings ensure sealing between cylinder body and both cylinder ends.

8 Cushioning

Optional cushions at the head and cap end are available upon request. They provide controlled deceleration which reduces noise and shock loading, and prolongs machine life. Our patented cushioning system is operative on both cylinder ends.

9 Cushion adjustment screw

Cushion adjustment screws are provided at both end of the cylinder for precise cushion adjustment, and are retained so that they can not possibly be unintentionally ejected. The screw is profiled for fine adjustment. On bore size 25 cushion adjustment screws are not available (cushionings are non-adjustable).

Long stokes

When considering the use of long stroke cylinders (more than 1000 mm) the use of stop tubes should be considered to reduce piston and cartridge wear. For selection of stop tube in connection with cylinder stroke please refer to the following chart:

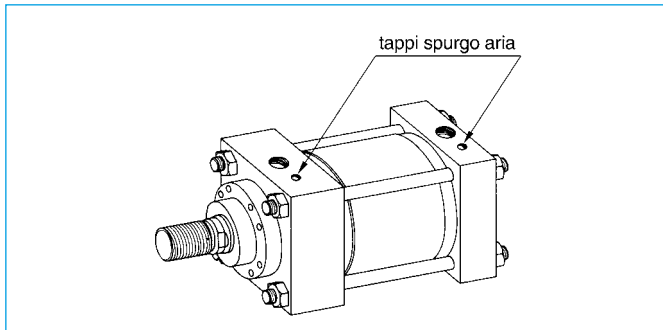
	1001	1501	2001	2501
stroke (mm)	÷ 1500	÷ 2000	÷ 2500	÷ 3000
stop tube length (mm)	50	100	150	200

For long stroke cylinders (more than 1000 mm) construction with head and cap bolted to heavy steel flanges may be considered.

SPECIAL MODIFICATIONS

1 Air bleeds

Available as an option at both ends. Standard location is position 1. Non-standard air bleed location is also available upon request, and must be specified on the order.



2 Rod end bellow

A rod end bellow is recommended to protect the rod surface from external contamination and dust. Additional rod length is required to accommodate the collapsed length. For further information please contact our Technical Department.

3 Drainback

A 1/8 BSPP drainback port can be provided to drain off any accumulation of fluid. This can happen on long stroke cylinders, cylinders with constant back pressure, cylinders with in/out speed rating more than 2:1.

4 MT4 mounting

XV dimension must be included between XV min. and XV max + stroke, and must always be specified while ordering a cylinder. If the required cylinder stroke is lesser than the min. XV dimension outlined in the chart, specers will be eventually used (please consider them in the cylinder overall length).

5 Stroke tolerance

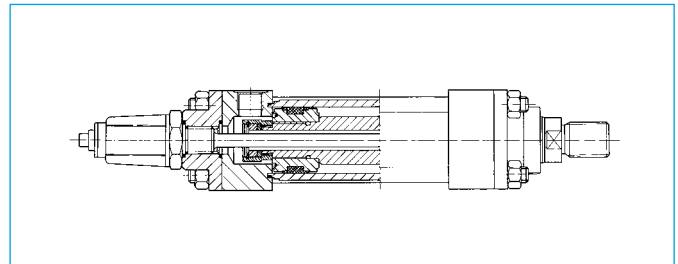
It is recommended to choose a few mm longer stroke than the effective one, so as to avoid that cylinder inner edges function as mechanical stops.

Stroke length tolerances are required due to build-up of tolerances of piston, head, cap and cylinder body:

± 1 mm	0 ÷ 499
± 1,5	500 ÷ 1249
± 2,5 mm	1250 ÷ 3149
± 4,5 mm	3150 ÷ 8000

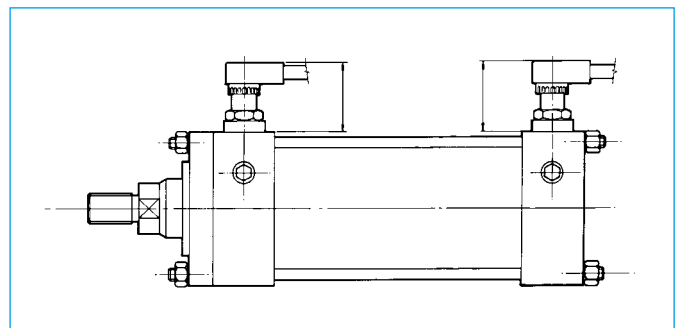
6 Linear transducer

Linear position transducers of various types may be fitted to NXM series cylinders. Please contact our Technical Department for further details.



7 Proximity sensors

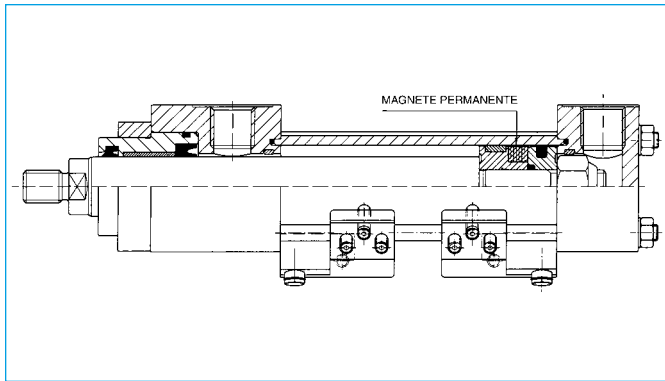
Proximity sensors are available at each or both sides on NXM series cylinders. Please contact our Technical Department for further details.



8 Tandem cylinders

Tandem cylinders consist of two cylinders interconnected. Pressure can act on two effective piston areas allowing the cylinder to be used as a force multiplier (cylinders must have the same stroke).

For any further information please do not hesitate to contact our Technical Department.

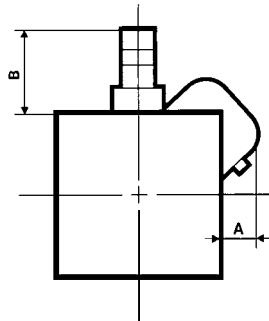


Technical data & instructions for use

Solid state PNP switches are available on all bore sizes. These switches are activated by a magnetic band fitted around the cylinder piston. They are attached securely on the tie rod; the extruded aluminium brackets mount steadily to the tie rod, and do not allow the switch to pull away from the barrel. Switches are always to be used with a load (either inductive, or capacitive, or resistive). Minimum input voltage is 3V. When used in sequence each switch has a voltage drop of 3V. We recommend the use of the shortest cable, in order not to damage the switch. Should the cable be longer than 10 metres, we recommend the use of an inductor too, in order to nullify the cable capacity effect. Switches can detect a maximum speed of 1mt/sec.

Cylinder specifications

Cylinders manufactured in accordance with ISO 6020/2 standard. Max. working pressure 15 MPa (150 bar).



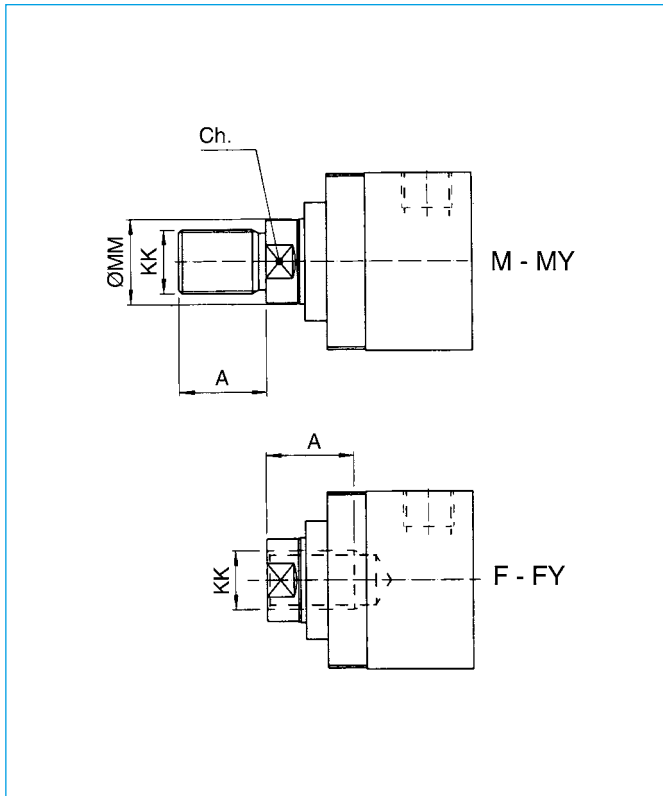
Bore Ø	A mm	B mm
32/40	16	27
50/100	18	27

TECHNICAL DATA - PNP SWITCHES

Electric data	Normally open contact IP 65 protection
Voltage	6-30 Volt
Current at 25°	250 mAmp
Max power	6 Watt
Switch on time	0,8 micro sec
Switch off time	0,3 micro sec
Switch on point	30 Gauss
Switch off point	25 Gauss
Electric life	10 ⁹ pulses
Voltage drop	0,7 Volt
Temperature	-20°C+85°C

GNXM	ME5	D	X	50	22	M	200	L	AP	E1	M2
Series	Mounting	Double rod	Special modifications	Bore	Rod diam.	Thread	Stroke (mm)	Seals	Cushion	Ser.No.	2 switches
GNXM	ME5 Head rectangular flange			25	12 18	M Male	L Nitrile				M2
	ME6 Cap rectangular flange			32	14 22	MY Male modified	V Viton				
	MP1 Cap fixed clevis			40	18 28	F Female	BL Low-friction nitrile		N No cushioning		
	MP3 Cap eye			50	22 36 (*) 28	FY Female modified	BV Low-friction viton		A He ad end cushioning		
	MP5 Cap spherical bearing			63	28 45 (*) 36				P Cap end cushioning		
	MS2 Side lugs			80	36 56 (*) 45				A Both ends cushioning		
	MT1 Head trunnion			100	45 70 (*) 56						
	MT2 Cap trunnion										
	MT4 Intermediate fixed trunnion										
	MX1 All tie rods extended										
	MX2 Cap end tie rods extended										
	MX3 Head end tie rods extended										
	MX5 Front tapped holes										

(*) Rod diam. no. 3 do not conform to ISO standards.



Bore	rod MM	Type M-F*		Type MY-FY*		Ch
		KK	A	KK	A	
25	12	M10x1.25	14			10
	18	M14x1.5	18	M10x1.25	14	15
32	14	M12x1.25	16			12
	22	M16x1.5	22	M12x1.25	16	19
40	18	M14x1.5	18			15
	28	M20x1.5	28	M14x1.5	18	24
50	22	M16x1.5	22			19
	**28	M20x1.5	28			24
63	36	M27x2	36	M16x1.5	22	32
	28	M20x1.5	28			24
80	**36	M27x2	36			32
	45	M33x2	45	M20x1.5	28	40
100	36	M27x2	36			32
	**45	M33x2	45			40
125	56	M42x2	56	M27x2	36	50
	45	M33x2	45			40
160	**56	M42x2	56			50
	70	M48x2	63	M33x2	45	60
200	56	M42x2	56			50
	**70	M48x2	63			60
250	90	M64x3	85	M42x2	56	80
	70	M48x2	63			60
320	**90	M64x3	85			80
	110	M80x3	95	M48x2	63	100
400	90	M64x3	85			80
	**110	M80x3	95			100
500	140	M100x3	130	M64x3	85	130

(*) Female rod thread variants:

F 25-12: M 8 x 1

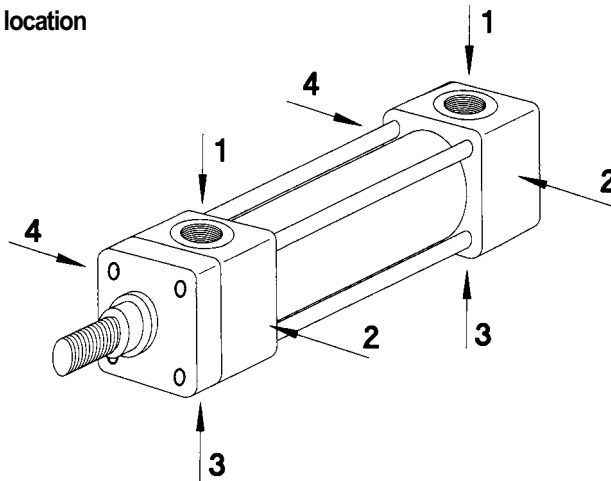
FY 25-18: M12 x 1,25

F 32-14: M10 x 1,25

F 40-18: M12 x 1,25

* Rod diam. no. 3 do not conform to ISO standard

Port & cushion adjustment screw location



Bore	Ports	Oversize ports	Port location	Cushion adjustment screw location (according to mounting)	
				MX5-MS2-MP1 MP3-MP5	ME5-ME6 MT1-MT2
25	G 1/4"	G 3/8"	1	not available	not available
32	G 1/4"	G 3/8"	1	2	2
40	G 3/8"	G 1/2"	1	2	3
50	G 1/2"	G 3/4"	1	2	3
63	G 1/2"	G 3/4"	1	2	3
80	G 3/4"	G 1"	1	2	3
100	G 3/4"	G 1"	1	2	3
125	G 1"	G 1. 1/4"	1	2	3
160	G 1"	G 1. 1/4"	1	2	3
200	G 1. 1/4"	G 1. 1/2"	1	2	3

Cushion adjustment screws are not available on bore size 25 and 32. Cushioning can only be non-adjustable on these bore sizes. Oversize ports and/or non-standard port and cushioning screw locations are available upon request, and are always to be considered as special modifications. To order non-standard port and cushion adjustment screw locations please specify them by using position numbers from the drawing above.

Piston rod size selection

The selection of a piston rod for thrust conditions requires the following steps to be carried out: Determine the type of cylinder mounting (chart 1) and take length D (in mm). Determine L using the formulas indicated below. Should L dimension be over 1.000 mm please see Stop Tube paragraph at page 7.

Find the load imposed for the thrust application as follows:
 F_p (in kilos) = full bore area (in cm^2) x system pressure (in bar).

Carry the values L and F_p to chart no. 2; draw the coordinates and note the point of intersection. The correct piston rod size is read from the diagonally curved line above the point of intersection.

Example:
 $L=6500$ mm $F_p = 10.000$ N
 the most suitable rod size is 70 mm (see chart no. 2)

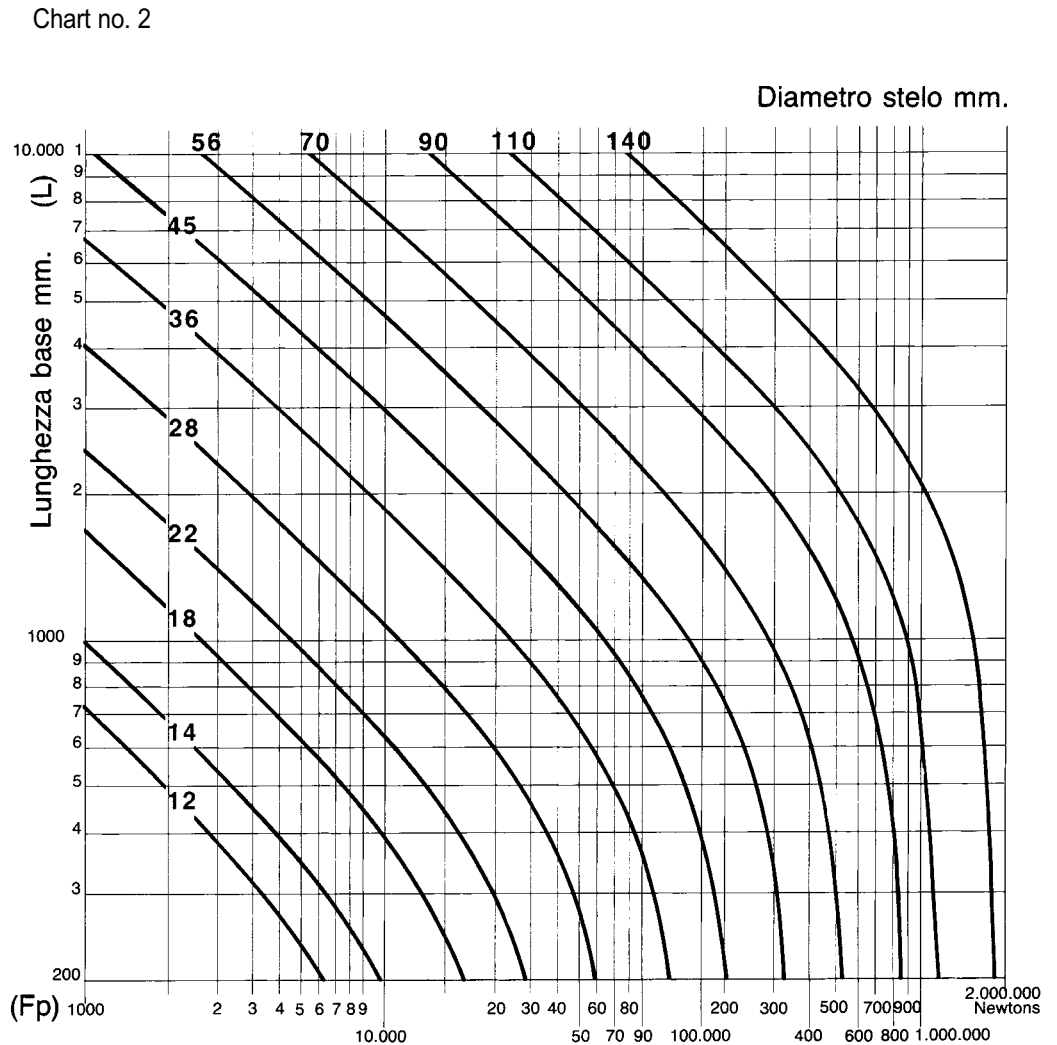
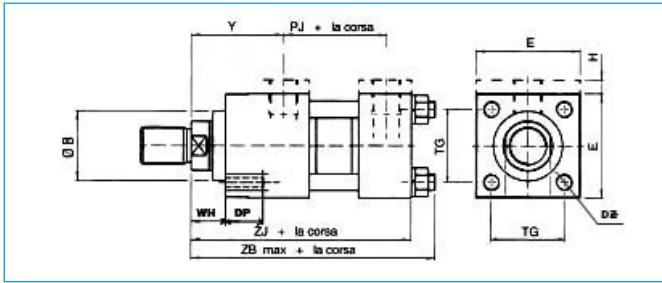


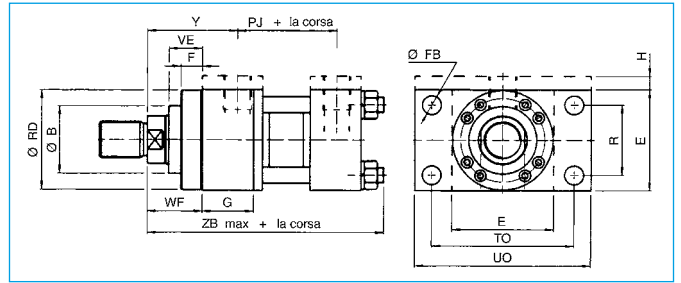
Chart no. 1

Unsupported rod end		$L = D \times 4$
Supported rod end		$L = D$
Firmly guided rod end		$L = \frac{D}{2}$
Pivoted Firmly guided rod end		$L = D$

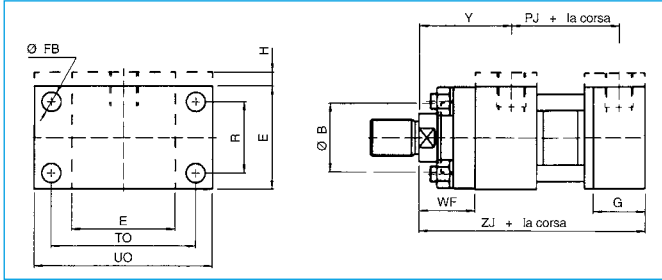
Front tapped holes - MX5



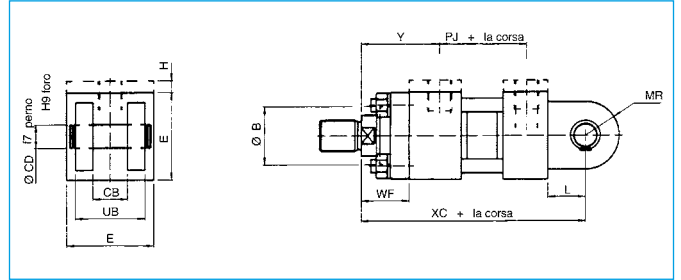
Head rectangular flange - ME5



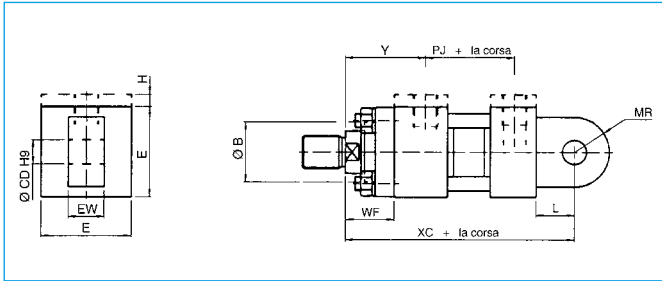
Cap rectangular flange - ME6



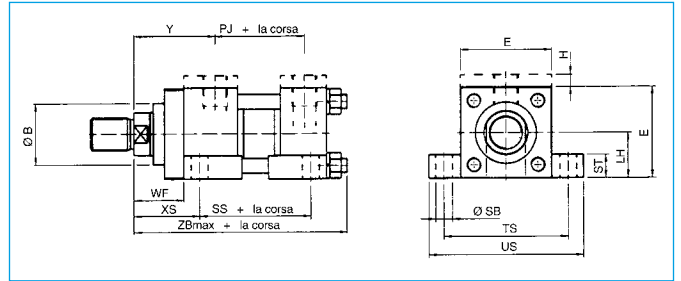
Cap fixed clevis - MP1



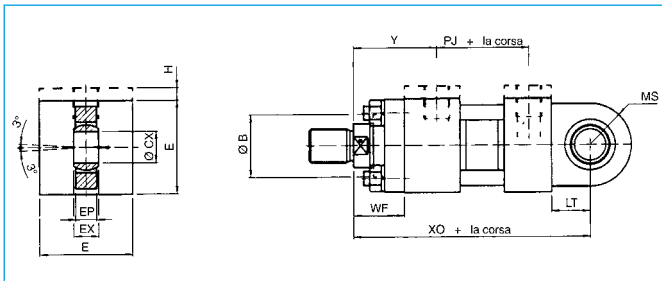
Cap eye - MP3



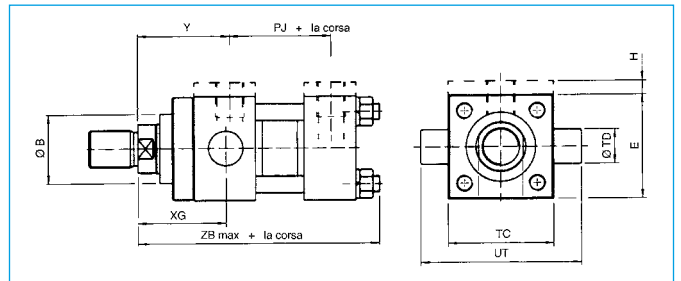
Side lugs - MS2



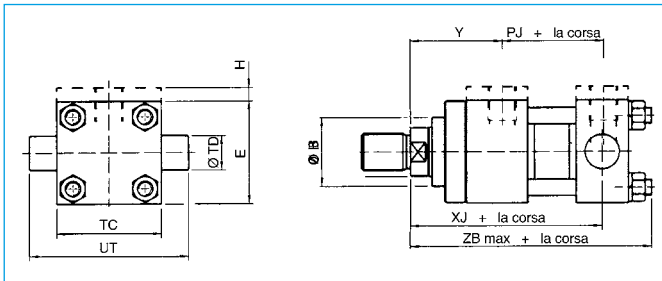
Cap spherical bearing - MP5



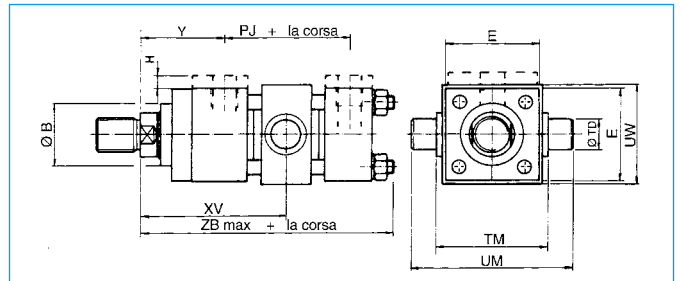
Head trunnion - MT1



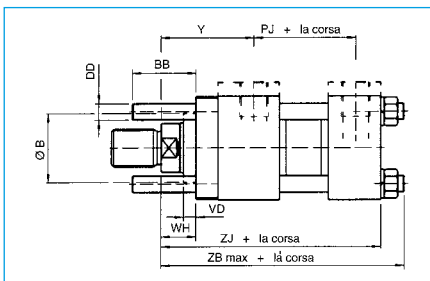
Cap trunnion - MT2



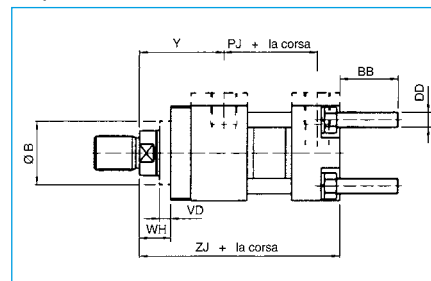
Intermediate fixed trunnion - MT4



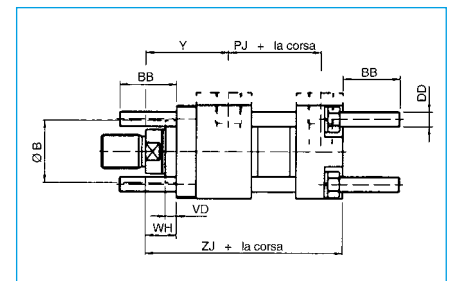
Head end tie rods extended - MX3



Cap end tie rods extended - MX2



All tie rods extended - MX1



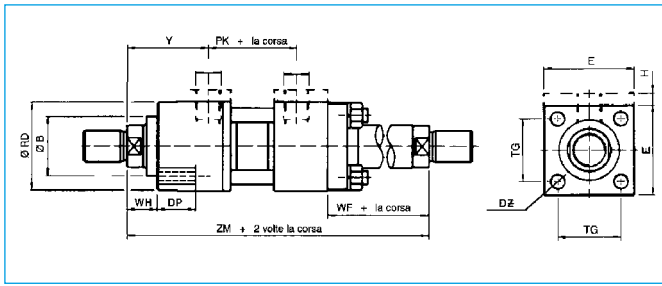
Bore	Ø Rod	B	BB	CB A16	CD Toll.	CX	DD	E	EP	EW h14	EX	F	FB	G	H	L	LH h10	LT	MR	MS	PJ	R	RD f8	SB	SS
25	12	24	19	12	10	12 ⁰ _{-0.008}	M5x0.8	40	8	12	10	10	5.5	25	5	13	19	16	12	20	53	27	38	6.6	73
	18	30																							
32	14	26	24	16	12	16 ⁰ _{-0.008}	M6x1	45	11	16	14	10	6.6	25	5	19	22	20	17	22.5	56	33	42	9	73
	22	34																							
40	18	30	35	20	14	20 ⁰ _{-0.012}	M8x1	63	13	20	16	10	11	38		19	31	25	17	29	73	41	62	11	98
	28	42																							
50	22	34	46	30	20	25 ⁰ _{-0.012}	M12x1.25	75	17	30	20	16	14	38		32	37	31	29	33	74	52	74	14	92
	36	50																							
63	28	42	46	30	20	30 ⁰ _{-0.012}	M12x1.25	90	19	30	22	16	14	38		32	44	38	29	40	80	65	75	18	86
	45	60																					88		
80	36	50	59	40	28	40 ⁰ _{-0.012}	M16x1.5	115	23	40	28	20	18	45		39	57	48	34	50	93	83	82	18	105
	56	72																					105		
100	45	60	59	50	36	50 ⁰ _{-0.012}	M16x1.5	130	30	50	35	22	18	45		54	63	58	50	62	101	97	92	26	102
	70	88																					125		
125	56	72	81	60	45	60 ⁰ _{-0.015}	M22x1.5	165	38	60	44	22	22	58		57	82	72	53	80	117	126	105	26	131
	90	108																					150		
160	70	88	92	70	56	80 ⁰ _{-0.015}	M27x2	205	47	70	55	25	26	58		63	101	92	59	100	130	155	125	33	130
	110	133																					170		
200	90	108	115	80	70	100 ⁰ _{-0.020}	M30x2	245	57	80	70	25	33	76		82	122	116	82	120	165	190	150	39	172
	140	163																					210		
	110	133	F	L																			210		

Bore	Ø Rod	ST	TC	TD f8	TG	TM	TO	TS	UB	UM	UO	US	UT	UW □	VD	VE	WF	WH	XC	XG	XJ	XO	XS	XV MIN	XV MAX	Y	ZB	ZJ	min. stroke for mounting MT4	
25	12	8.5	38	12	28.3	48	51	54	24	68	65	72	58	48	6	16	25	15	127	44	101	130	33	82	72	50	121	114	10	
	18																							+ stroke						
32	14	12.5	44	16	33.2	55	58	63	32	79	70	84	68	55	12	22	35	25	147	54	115	148	45	96	82	60	137	128	14	
	22																							+ stroke						
40	18	12.5	63	20	41.7	76	87	83	40	108	110	103	95	76	12	22	35	25	172	57	134	178	45	107	88	62	166	153	19	
	28																							+ stroke						
50	22	19	76	25	52.3	89	105	102	60	129	130	127	116	89	9	25	41	25	191	64	140	190	54	117	90	67	176	159	27	
	36																							+ stroke						
63	28	26	89	32	64.3	100	117	124	60	150	145	161	139	100	13	29	48	32	200	70	149	206	65	132	91	71	185	168	41	
	45																							+ stroke						
80	36	26	114	40	82.7	127	149	149	80	191	180	186	178	127	9	29	51	31	229	76	168	238	68	147	99	77	212	190	48	
	56																							+ stroke						
100	45	32	127	50	96.9	140	162	172	100	220	200	216	207	140	10	32	57	35	257	71	187	261	79	158	107	82	225	203	51	
	70																							+ stroke						
125	56	32	165	63	125.9	178	208	210	120	278	250	254	265	178	10	32	57	35	289	75	209	304	79	180	109	86	260	232	71	
	90																							+ stroke						
160	70	38	203	80	154.9	215	253	260	140	341	300	318	329	215	7	32	57	32	308	75	230	337	86	198	104	86	279	245	94	
	110																							+ stroke						
200	90	44	241	100	190.2	279	300	311	160	439	360	381	401	279	7	32	57	32	381	85	276	415	92	226	130	98	336	299	96	
	140																							+ stroke						
	110																													

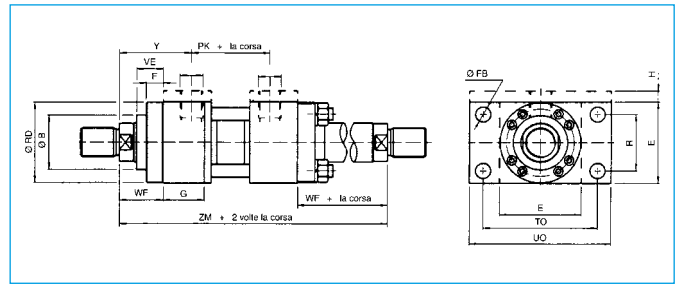
See above chart for minimum stroke for MT4 mounting.

XV dimension is always to be specified when ordering a cylinder with MT4 mounting. The value must be between minimum XV and maximum XV + stroke

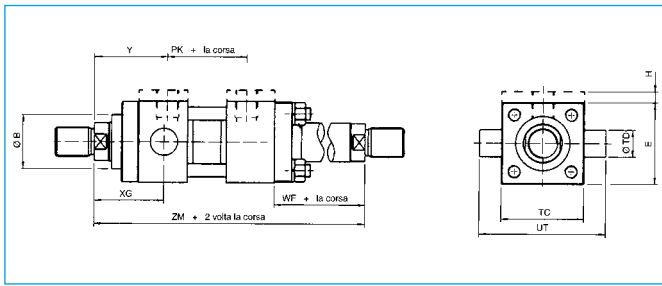
All tie rods extended - MX1D



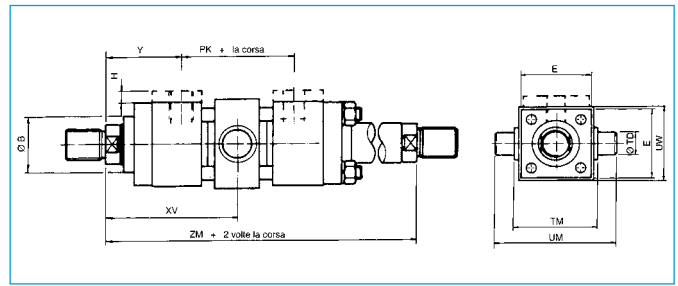
Head rectangular flange - ME5D



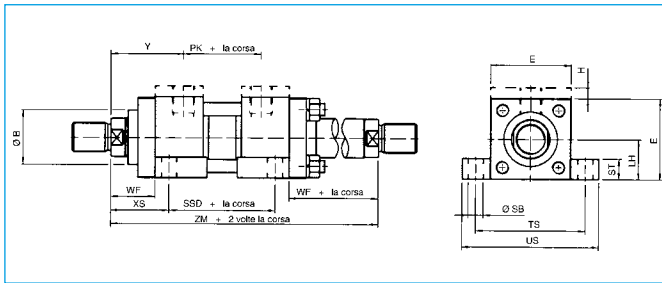
Head trunnion - MT1D



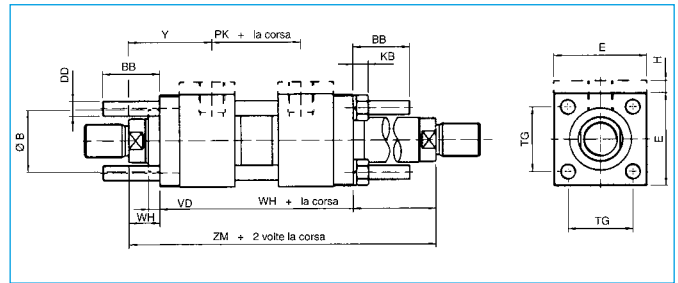
Intermediate fixed trunnion - MT4D



Side lugs - MS2D



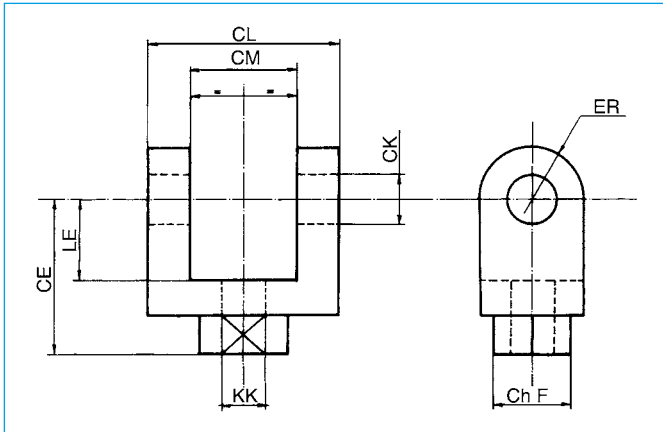
Head end tie rods extended - MX3D



Bore	Ø rod	B	BB	DD	E	F	FB	G	H	KB	LH	PK	R	RD	SB	SSD	ST	TC	TD	TG	TM	TO	TS	UM	UO	US	UT	UW	VD	VE	WF	WH	XG	XS	XV min	XV max	Y	ZM	minim. stroke mounting MT4D	
25	12	24	19	M5x0,8	40	10	5,5	25	5	5,2	19	54	27	38	6,6	88	8,5	38	12	28,3	48	51	54	68	65	72	58	48	6	16	25	15	44	33	82	72	50	154	10	
	18	30																																						
	32	22	24	M6x1	45	10	6,6	25	5	6,6	22	58	33	42	9	88	12,5	44	16	33,2	55	58	63	79	70	84	68	55	12	22	35	25	54	45	96	82	60	178	14	
	40	28	35	M8x1	63	10	11	38		8,5	31	71	41	62	11	105	12,5	63	20	41,7	76	87	83	108	110	103	95	76	12	22	35	25	57	45	107	88	62	195	19	
	50	36	46	M12x1,25	75	16	14	38		12,5	37	73	52	74	14	99	19	76	25	52,3	89	105	102	129	130	127	116	89	9	25	41	25	64	54	117	90	67	207	27	
	63	45	46	M12x1,25	90	16	14	38		12,5	44	81	65	75	18	93	26	89	32	64,3	100	117	124	150	145	161	139	100	13	29	48	32	70	65	132	91	71	223	41	
	80	56	59	M16x1,5	115	20	18	45		16,5	57	92	83	82	18	110	26	114	40	82,7	127	149	149	191	180	186	178	127	9	29	51	31	76	68	147	99	77	246	48	
	100	70	59	M16x1,5	130	22	18	45		16,5	63	101	97	92	26	107	32	127	50	96,9	140	162	172	220	200	216	207	140	10	32	57	35	71	79	158	107	82	265	51	
	125	90	81	M22x1,5	165	22	22	58		22	82	117	126	105	26	131	32	165	63	125,9	178	208	210	278	250	254	265	178	10	32	57	35	75	79	180	109	86	289	71	
	160	110	92	M27x2	205	25	26	58		27	101	130	155	125	33	130	38	203	80	154,9	215	253	260	341	300	318	329	215	7	32	57	32	75	86	198	104	86	302	84	
	200	140	115	M30x2	245	25	33	76		30	122	160	190	150	39	172	44	241	100	190,2	279	300	311	439	360	381	401	279	7	32	57	32	85	92	226	130	98	356	96	
		110	133										210	210																										

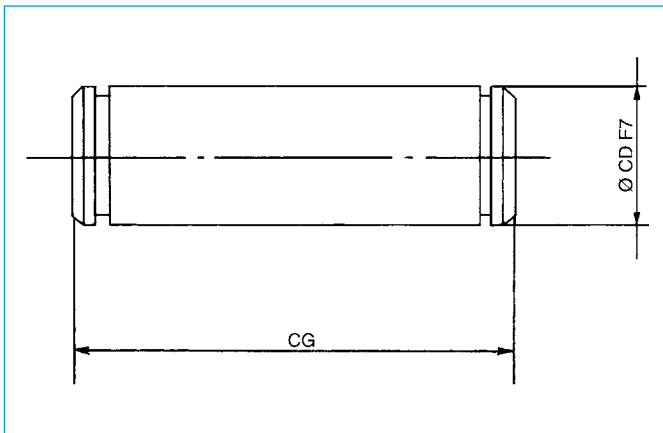
See above chart for minimum stroke for MT4 mounting
 XV dimension is always to be specified when ordering a cylinder with MT4 mounting. The value must be between minimum XV and maximum XV + stroke

Femal clevis ISO 6982 (pivot pin not included)



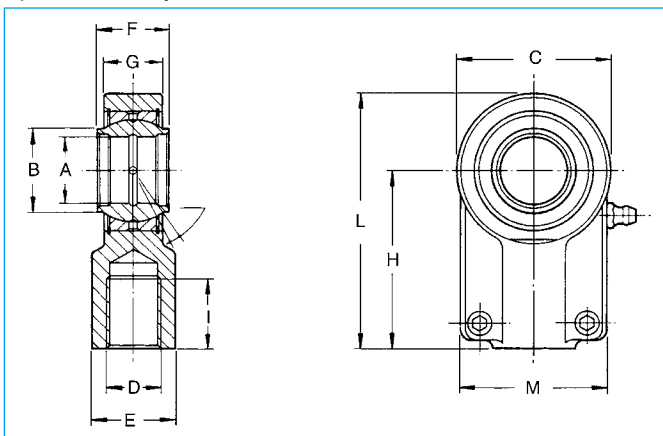
Part number	CM	CKH9	CE	CL	ChF	KK	LE	ER
CF-H-10125	12	10	32	26	19	10x1,25	13	12
CF-H-12125	16	12	36	34	21	12x1,25	19	17
CF-H-1415	20	14	38	42	21	14x1,5	19	17
CF-H-1615	30	20	54	62	32	16x1,5	32	29
CF-H-2015	30	20	60	62	32	20x1,5	32	29
CF-H-272	40	28	75	83	40	27x2	39	34
CF-H-332	50	36	99	103	56	33x2	54	50
CF-H-422	60	45	113	123	56	42x2	57	53
CF-H-482	70	56	126	143	75	48x2	63	59
CF-H-643	80	70	168	163	95	64x3	83	78
CF-H-803	80	70	168	163	95	80x3	83	78
CF-H-1003	100	100	250	230	160	100x3	90	95

Pivot pin



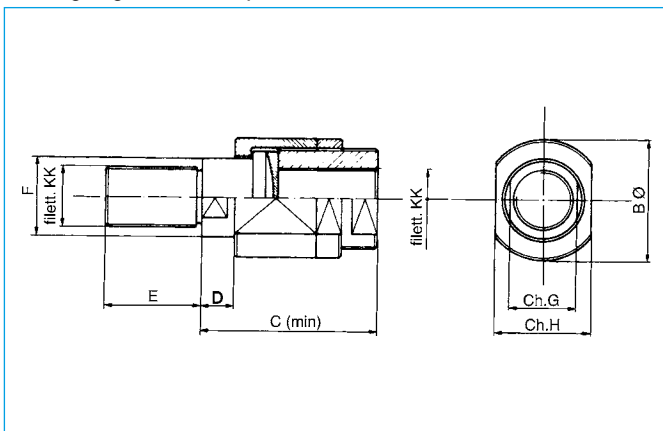
Part number	CD	CG
2.44.01.37.95	10	32
2.44.05.37.95	12	40
2.44.10.37.95	14	50
2.44.15.37.95	20	70
2.44.25.37.95	28	92
2.44.30.37.95	36	114
2.44.35.37.95	45	135
2.44.40.37.95	56	158
2.44.45.37.95	70	180

Spherical rod eye ISO 6982



Type	A	B	C	D	E	F	G	H	I	L	M	Stat. load	Din. load
TAPR	H7					h12							
10CE	10	12,5	32	M10x1,25	15	10	7	37	14	53	32	20	8,15
12CE	12	15,5	32	M12x1,25	16	12	10,5	38	17	54	32	24,5	10,8
16CE	16	20	40	M14x1,5	21	16	13	44	19	64	40	36,5	17,8
20CE	20	25	47	M16x1,5	25	20	17	52	23	77	47	48	30
25CE	25	30,5	58	M20x1,5	30	25	21	65	29	96	54	78	48
32CE	32	38	70	M27x2	38	32	27	80	37	118	66	114	67
40CE	40	46	89	M33x2	47	40	32	97	46	145,5	80	114	67
50CE	50	57	108	M42x2	58	50	40	120	57	179	96	310	156
63CE	63	71,5	132	M48x2	70	63	52	140	64	211	114	430	255
80CE	80	91	168	M64x3	90	80	66	180	86	270	148	695	400
100CE	100	113	210	M80x3	110	100	84	210	96	322	178	1060	610
125CE	125	138	264	M100x3	135	125	102	260	113	405	200	3650	2120

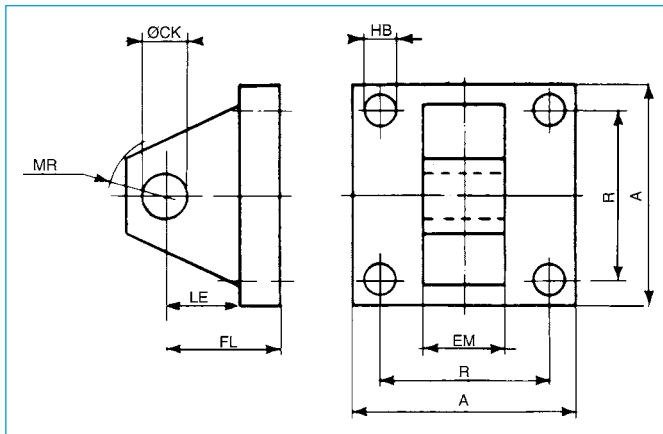
Self-aligning rod end coupler



Part number	B	C	D	E	F	chG	chH	KK
AUT-H-10125	31,7	50,8	12,7	19	15,9	14	20	10x1,25
AUT-H-12125	31,7	50,8	12,7	19	15,9	14	20	12x1,25
AUT-H-1415	42,8	58,7	12,7	28,5	24,6	22	28	14x1,5
AUT-H-1615	42,8	58,7	12,7	28,5	24,6	22	28	16x1,5
AUT-H-2015	42,8	58,7	12,7	28,5	24,6	22	28	20x1,5
AUT-H-272	57	73,8	12,7	41	34,1	30	42	27x2
AUT-332	66,6	91,8	19	51	43,6	38	50	33x2
AUT-H-422	76,2	105,5	22,2	57	50	44	60	42x2
AUT-482	95,2	138,1	25,4	76	62,7	54	76	48x2
AUT-H-643	127	163,5	25,4	89	88,1	76	102	64x3
AUT-H-803	184	238,1	25,4	140	138,9	*	146	80x3
AUT-H-1003	184	238,1	25,4	140	138,9	*	146	100x3

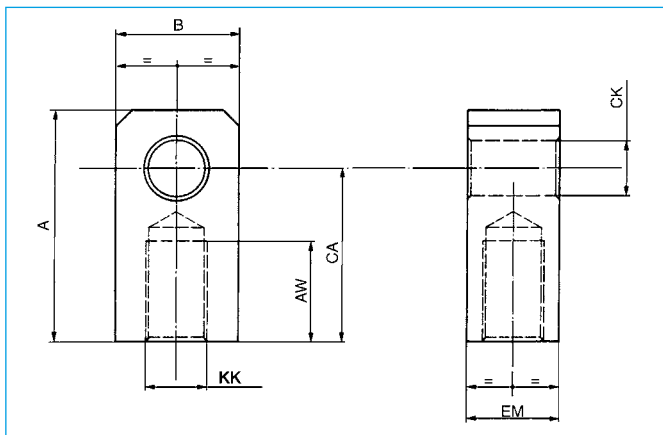
* No 4 spanner holes at 90° instead of flats

Eye bracket



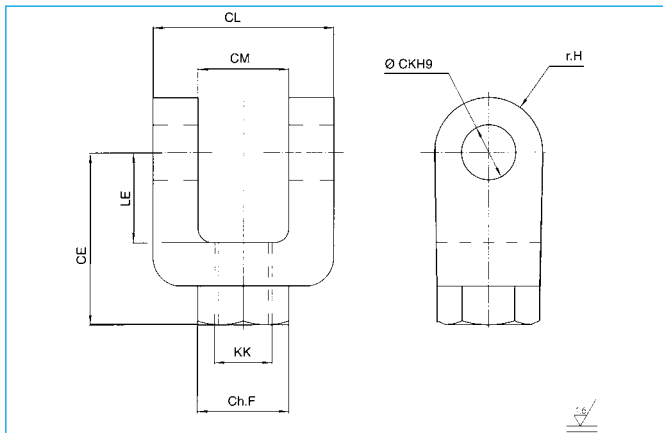
Part number	A	R	EM h13	HB	CKH9	MR _{max}	LE _{min}	FL
CCM-H-10	40	28,3	12	5,5	10	12	13	23
CCM-H-12	45	33,2	16	6,6	12	17	19	29
CCM-H-14	65	41,7	20	9	14	17	19	29
CCM-H-20	75	52,3	30	13,5	20	29	32	48
CCM-H-20-A	90	64,3	30	13,5	20	29	32	48
CCM-H-28	115	82,7	40	17,5	28	34	39	59
CCM-H-36	130	96,9	50	17,5	36	50	54	79
CCM-H-45	165	125,9	60	26	45	53	57	87
CCM-H-56	205	154,9	70	30	56	59	63	103
CCM-H-70	240	190,2	80	33	70	78	82	132

Female eye



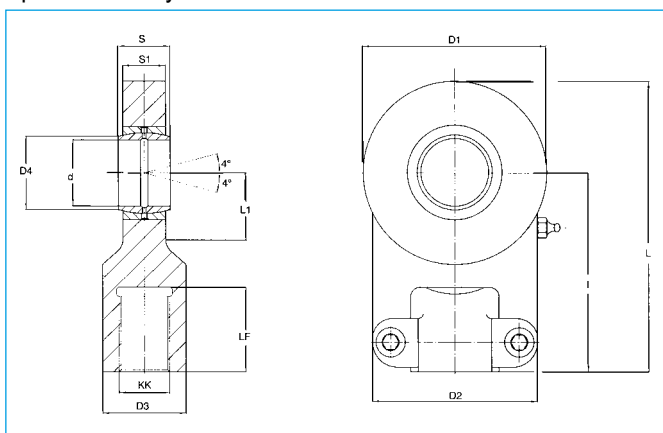
Part number	A	B	EM	CKH9	CA	AW	KK
CM-H-10125	44	20	12	10	32	14	10x1,25
CM-H-12125	53	24	16	12	36	16	12x1,25
CM-H-1415	55	28	20	14	38	18	14x1,5
CM-H-1615	83	40	30	20	54	22	16x1,5
CM-H-2015	89	40	30	20	60	28	20x1,5
CM-H-272	109	56	40	28	75	36	27x2
CM-H-332	149	72	50	36	99	45	33x2
CM-H-422	166	90	60	45	113	56	42x2
CM-H-482	185	112	70	56	126	63	48x2
CM-H-643	246	140	80	70	168	85	64x3
CM-H-803	246	140	80	70	168	95	80x3
CM-H-1003	345	200	100	100	250	112	100x3

Female clevis ISO 8133 (pivot pin included)



Part number	CM	KK	CL	CE	LE	CK (H9)	Ch.F	r.H
260CF1310	12	M10x1,25	24	32	13	10	19	12
260CF1312	16	M12x1,25	32	36	19	12	21	17
260CF1314	20	M14x1,5	40	38	19	14	21	17
260CF1316	30	M16x1,5	60	54	32	20	32	29
260CF1320	30	M20x1,5	60	60	32	20	32	29
260CF1327	40	M27x2	80	75	39	28	40	34
260CF1333	50	M33x3	100	99	54	36	56	50
260CF1342	60	M42x2	120	113	57	45	56	53
260CF1348	70	M48x2	140	126	63	56	75	59
260CF1364	80	M64x3	160	168	83	70	95	78
260CF1380	80	M80x3	160	168	83	70	95	78

Spherical rod eye ISO 8133



Part number	d	S	D4	I	D1	D2	S1	L	L1	D3	LF	KK
290TAPR12S	12	10	15	42	35	40	8	58	16	17	15	M10x1,25
290TAPR16S	16	14	20,7	48	45	45	11	69	20	21	17	M12x1,25
290TAPR20S	20	16	24,1	58	55	55	13	83	28	25	19	M14x1,5
290TAPR25S	25	20	29,3	68	65	62	17	99	31	30	23	M16x1,5
290TAPR30S	30	22	34,2	85	80	77	19	123	35	36	29	M20x1,5
290TAPR40S	40	28	45	105	100	90	23	153	45	45	37	M27x2
290TAPR50S	50	35	56	130	120	105	30	188	58	55	46	M33x3
290TAPR60S	60	44	66,8	150	160	134	38	255	68	68	55	M42x2
290TAPR80S	80	55	89,4	185	205	156	47	282,5	82	90	64	M48x2
290TAPR100S	100	70	109,5	240	240	190	55	357,5	116	110	86	M64x3





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Brands incorporated



Nexoil s.r.l.

Sede legale ed amministrativa

Headquarters

Via per Fagnano, 27 - 21052 Busto Arsizio (VA)

Tel. +39 0331 636390 Fax +39 0331 635860

C.F. e P.I. 03175670128

Unità produttiva, commerciale e tecnica

Production, Sales and Technical Dept.s

Corso Moncenisio, 18 - 10090 Rosta (TO)

Tel. +39 011 9342434 Fax +39 011 9370532

Ufficio commerciale

Sales Dept.

Via per Fagnano, 27 - 21052 Busto Arsizio (VA)

Tel. +39 0331 636390 Fax +39 0331 635860



www.nexoil.it