



Hydraulic cylinders
HYDRAULICS

Hydraulic cylinders

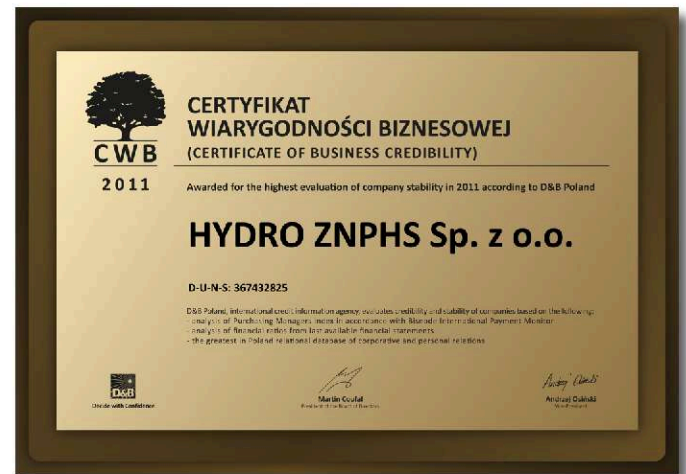
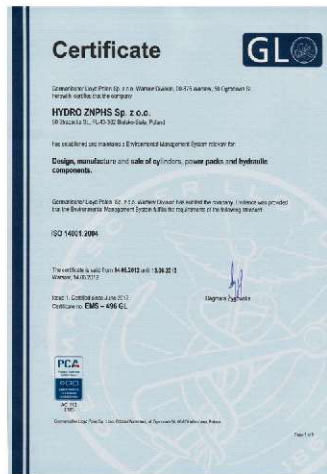


Quality Management System
ISO 9001:2008

Environmental Management System
ISO 14001:2004

Certificate of Business Credibility 2011

European Committee for Oil Hydraulics and Pneumatics



Hydraulic cylinders

HYDRO ZNPHS Sp. z o.o., was established in 1988 in Bielsko-Biala. From the beginning the company was focused on the production, sale and repair of power hydraulics components. Years of experiences and customer's requirements have contributed to the gradual development of our business. As a result the company founded with really small capital and without any place of business, currently takes 8000 sq. m of usable area and employs 91 people.

Nowadays **HYDRO** focuses its business on sale and manufacturing of the power hydraulics components. Our consistent development policy carried out achievement of high level in sales and the strong market position. Established contacts with well-known and respected leaders in the hydraulic world the intensive and hard work, technical progress have contributed to professional, fast and competent custom service with the guarantee of the highest quality.

A very good knowledge of the product's sources, direct access to producers and the long-term cooperation with them allow **HYDRO** to provide high quality goods at very competitive prices. During 25 years the staff of our company has become matured, stable and professional in each section.

During our company's development, our offer increased automatically.

Our main fields are:

- own production: hydraulic systems, power packs and mini power packs, hydraulic cylinders, filtration units, hose assemblies
- distribution: all components used in power hydraulics

We invest in order to develop our customer service and to offer you only a high quality product. We are planning significant investments. We hope that we will be able to even better fulfill your expectations.



Precise and high advanced production technology.

The biggest and well-equipped warehouse in Poland.

An offer for small, medium and corporate enterprises.

25 years of experience in hydraulic branch and consistent development.

Quality management certificate ISO 9001:2008.

Environmental Management System ISO 14001:2004

Hydraulic cylinders

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Hydraulic cylinders - standard



1 HYDRAULIC CYLINDERS - STANDARD

TYPE HS

Nominal pressure 210bar (21MPa)

Main features:

- Piston diameter from 25mm to 300mm
- Rod diameter from 14mm to 200mm
- Stroke 5500mm
- Welded construction
- Maximum working pressure up to 250bar (25MPa)
- 6 mounting styles

Type HS - Introduction

Overview:

Hydraulic cylinders produced by HYDRO ZNPHS are designed to operate in hydraulic drives of machines. Wide range of diameters and mounting styles suits the requirements of both industrial and mobile applications is available.

Working conditions:

Working pressure	Standard: 21MPa (210bar) Maximum: 25MPa (250bar)
Temperature	Standard: - 20°C ÷ 80°C, Maximum: for VITON - 20°C ÷ 150°C
Speed	Standard: 0,5 m/s Maximum: 1 m/s
Fluid	Standard: Hydraulic mineral oils Special: HFC fluids, phosphate esters

Type HS - Materials

Cylinder: Cylinders are basically made of cold drawn welded steel tubes (ST52.3). Also seamless tubes, cold drawn and inside honed, in diameter tolerance H8 and range from 25 mm to 320 mm may be used.

Rod: In standard, chrome plated steel bars C45 (CK45) and 20MnV6 (high welding factor) are used for rod material. In other executions, chrome plated and induction hardened bar CK45H may be used, and for heavy duty requirements, chrome plated quenched and tempered bars 42CrMo4 (42CD4). For corrosive environments, stainless steel bars with chrome plating like AISI 431, AISI 316, AISI 304, or bars with nickel-chromium (NI-Cr) plating NICROM 350 are recommended. Each material is attested by its producer.

Sealing system: There are several types of sealing systems from companies like Trelleborg, Freudenberg, Simrit and Guarnitec, used respectively according to working conditions. If necessary, Slip-Cup type sealings, Teflon (PTFE) tapes are used. In case of high temperatures, Viton sealings or other high temperature-resistant systems are recommended.

Finishing: Cylinders are finished with primer painting and on customer request it is possible to use lacquer, tin or zinc coating.

Quality: Each cylinder is supplied with quality certificate and warranty.

Type HS - Ordering code



Hydraulic cylinder - HS

Mounting style

Ball jointed eye	P
Bearing sleeve	W
Front flange	Kp
Rear flange	Kt
Front trunnions	C
Feet	L

Piston D in mm

Piston rod d in mm

Cylinder stroke in mm

Thread on rod

Type of thread on piston rod

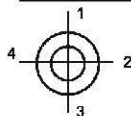
Male thread	Z
Female thread	w

Size and type of oil port G or M

Position of oil port - front

Position of oil port - rear

View to piston rod



Option

WF=	piston rod extension
XG=	extension for mounting C*

Piston rod ends

PR..N	ball joint ends**
PR..U	ball joint ends**
S..C	ball joint end to weld **
MA..D	ball joint ends**
PR..CE	ball joint ends**

Cylinder's cover

	base paint (standard)
Sn	coating tin (electroplating)
Zn	coating zine (electroplating)

Material on piston rods

	hard chromium (standard)
NiCr	Nickel-chrome
AISI	Stainless steel
H	hardened
U	quenched and tempered

Cushioning

	not cushioned
h1	front only
h2	rear only
2h	front and rear

* - for cylinder with mounting style „C” , see page 10

** - rod eye – see pages 14 - 18

Ordering example: HS-Kp 50/28x320-M22x1,5z-G3/8”,11-H-Sn

Cylinder with front flange mounting style, bore diameter 50 and rod 28, Stroke of 320mm, rod ended with male thread M22x1,5.

Hydraulic ports G3/8” in position “1” for both front and rear.

No cushionings; rod made with hardened bar; cylinder's body with tin coating.

Type HS - Mounting styles

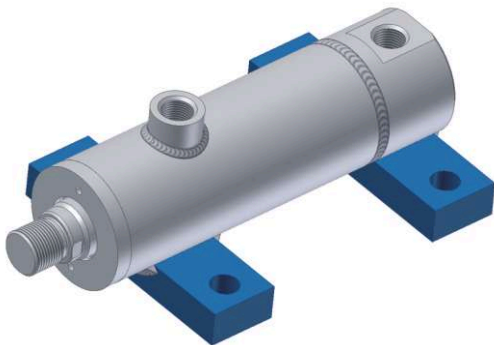
HS-P/HS-W



HS-C



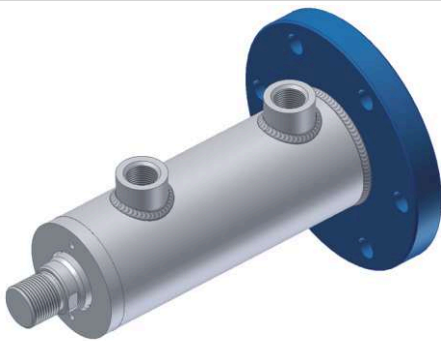
HS-L



HS-Kp



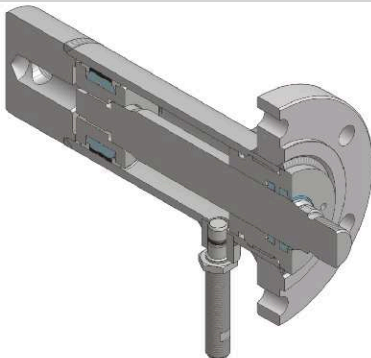
HS-Kt



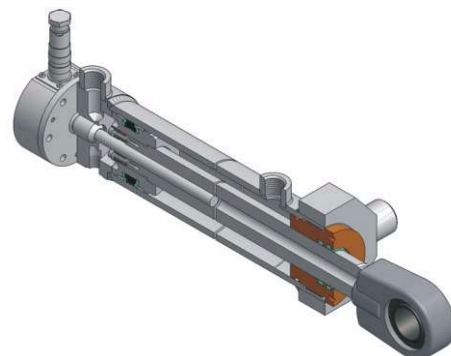
Ball joint eyes PR..N / PR..U / S..C / MA..D / PR..CE



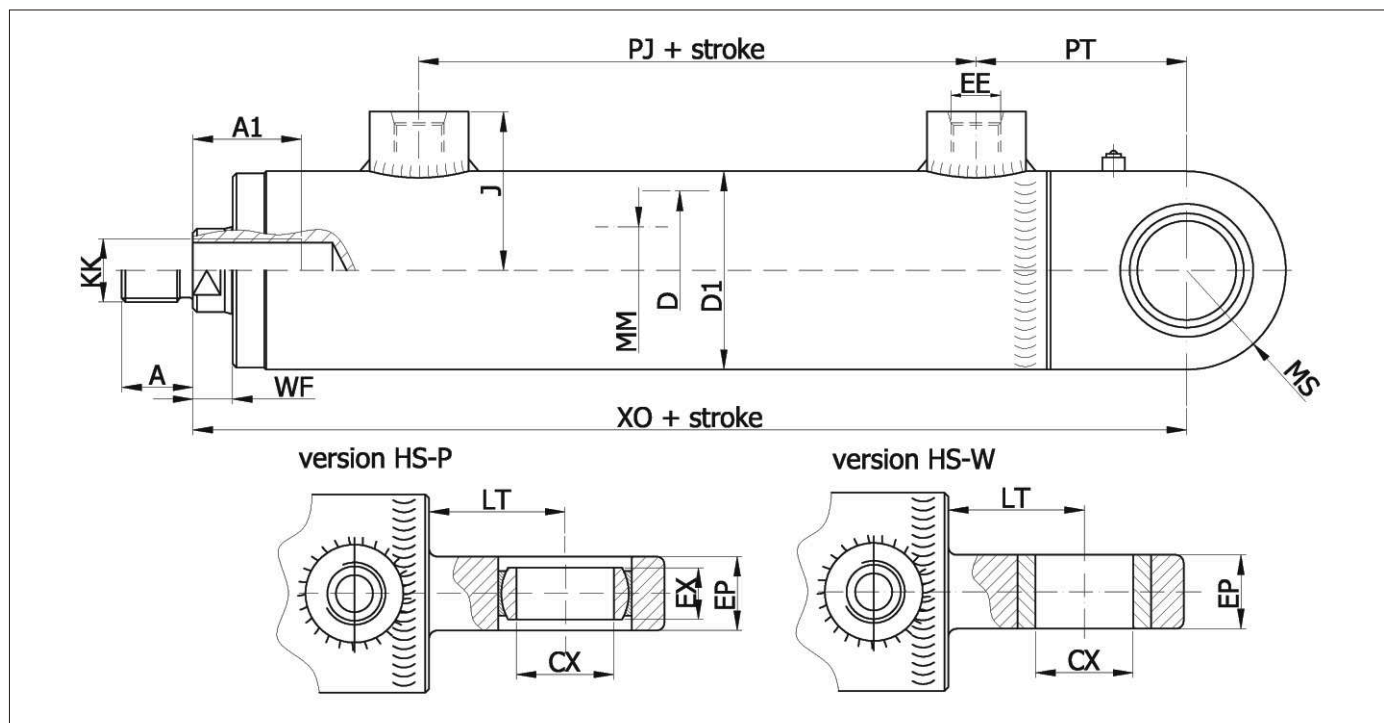
Cylinders with proximity switches



Cylinders with position transducers



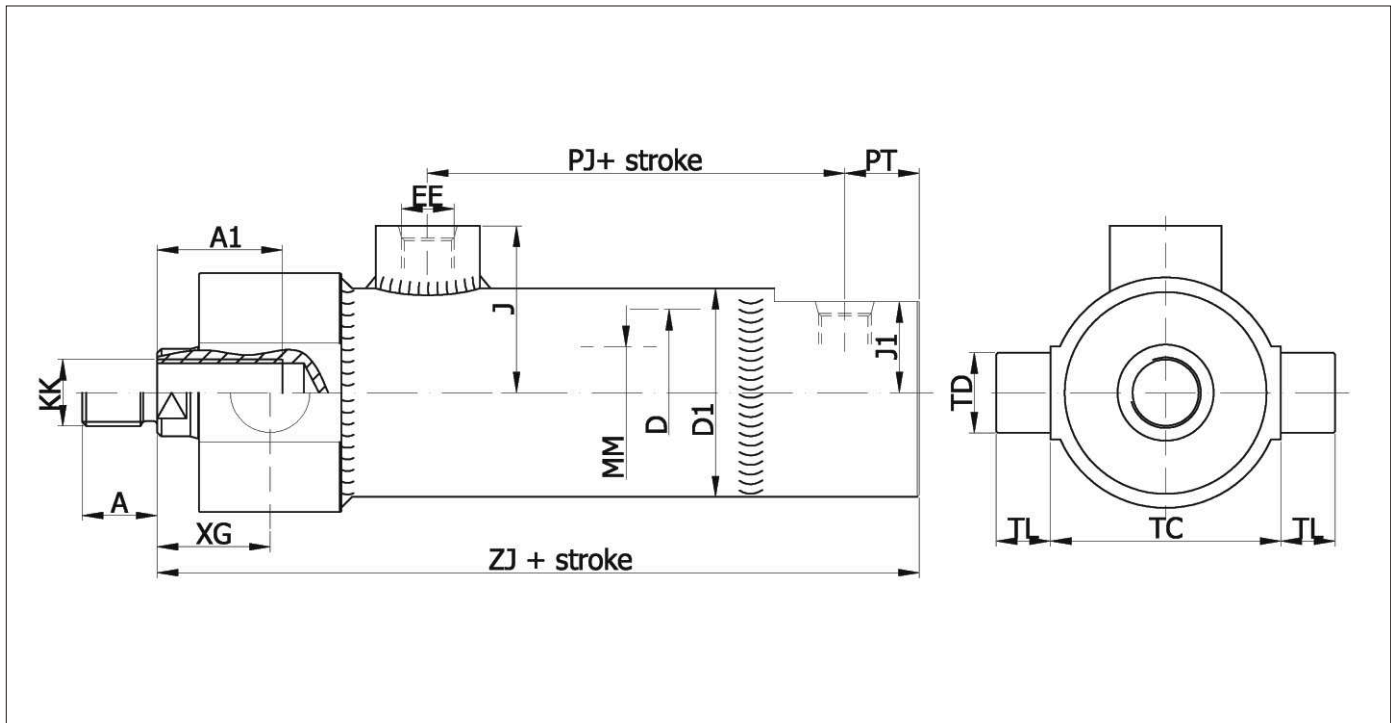
Ball jointed eye /Ball jointed eye with spherical bearing mounting



D	MM	D1	EE		KK	A	A1	CX	WF	MS	EX	EP	J	PJ	PT	LT	XO
			M	G													
25	18	35	M14x1,5	G1/4"	M12x1,5	14	16	16	12	22	14	14	31	48	26	17	128
32	20	42	M14x1,5	G1/4"	M16x1,5	16	22	20	12	25	16	19	35	49	52	35	149
40	22	50	M16x1,5	G3/8"	M16x1,5	18	22	25	10,5	27	20	23	43	35	67	43	160
	25																
50	25	60	M16x1,5	G3/8"	M22x1,5	20	30	30	9,5	33	22	28	48	47,5	72	47	176
	28																
	35																
63	30	75	M22x1,5	G1/2"	M27x2 M28x1,5	22	36	35	12,5	41,5	25	30	56	60	84	50	212
	36																
	40																
	40																
80	40	95	M27x2	G1/2"	M33x2 M35x1,5	30	45	40	33,5	50	28	35	70	64	93	66	255
	45																
	50																
100	50	115	M33x2	G3/4"	M42x2 M54x1,5	36	50	50	20	61,5	35	40	80	81	113	80	300
	56																
	60																
110	60	130	M33x2	G3/4"	M45x2 M58x1,5	40	55	60	23	70	44	50	87	88	130	85	330
125	70	150	M33x2	G3/4"	M48x2 M58x1,5	45	63	60	28	70	44	50	97	89	127	85	338
140	80	165	M33x2	G3/4"	M56x2 M65x1,5	50	75	70	30	82	49	55	105	116	143	100	391
160	80	194	M33x2	G3/4"	M64x2 M80x2	56	85	80	20	90	55	60	120	102	179	141	411
	90																
200*	110	230	M33x2 M42x2	G3/4" G1"	M80x3 M100x2	80	110	90	40	113	60	65	145	130	185	150	462
	120																
250*	140	297	M33x2 M42x2	G3/4" G1"	M100x3 M120x3	80	110	110	50	148	70	80	176	130	220	185	532
	160																

* versions under construction - for further details contact with our technical department
 1) other piston diameters available: D - 45, 55, 60, 65, 70, 90, 135, 150, 180mm

Front trunnion mounting



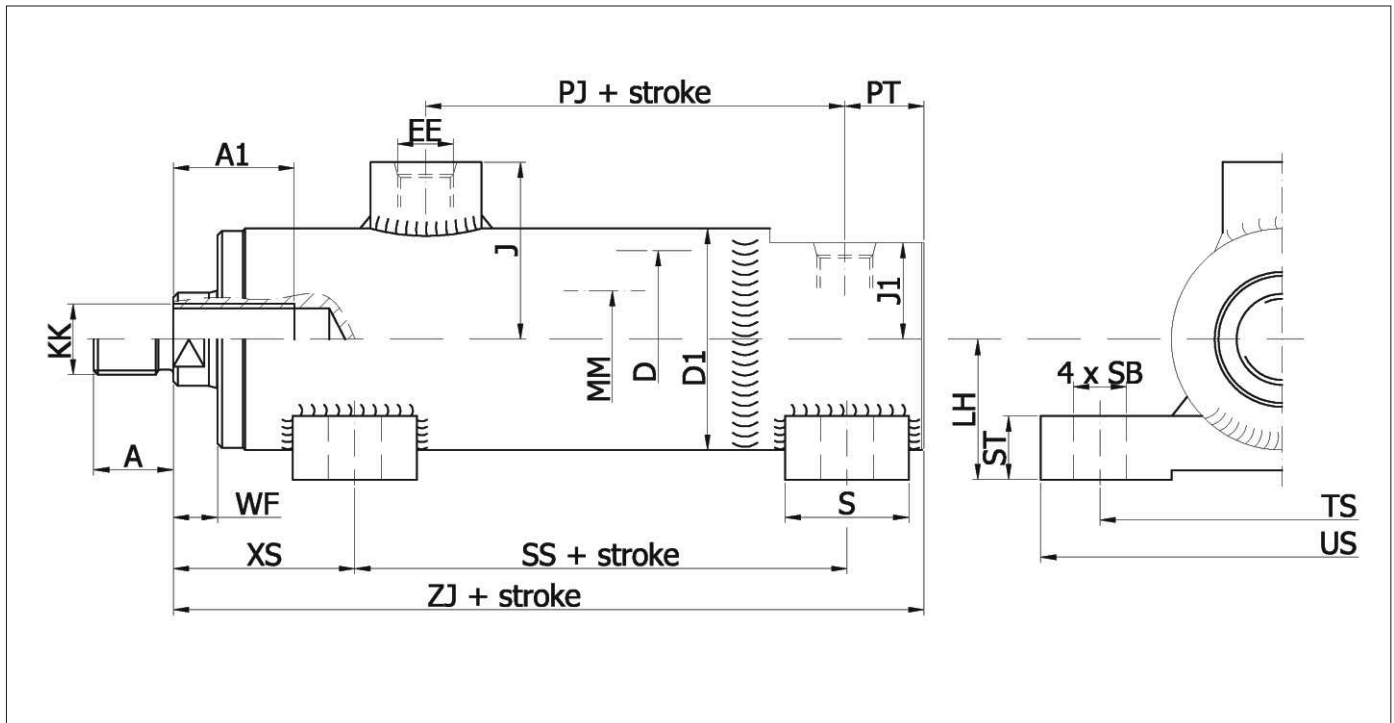
D	MM	D1	EE		KK	A	A1	XG	TD	TL	TC	J	J1	PJ	PT	ZJ
			M	G												
25	18	35	M14x1,5	G1/4"	M12x1,5	14	16	22	15	10	50	31	14	46	12	115
32	20	42	M14x1,5	G1/4"	M16x1,5	16	22	22	20	15	60	35	18	60	13	129
40	22	50	M16x1,5	G3/8"	M16x1,5	18	22	22	25	15	65	43	22	61	16	141
	25															
50	25	60	M16x1,5	G3/8"	M22x1,5	20	30	22	30	20	75	48	27	75	17	152
	28															
	35															
63	30	76	M22x1,5	G1/2"	M27x2 M28x1,5	22	36	25	35	25	95	56	33	86	17	170
	36															
	40															
80	40	95	M27x2	G1/2"	M33x2 M35x1,5	30	45	32	40	35	120	70	43	92	20	210
	45															
	50															
100	50	120	M33x2	G3/4"	M42x2 M54x1,5	36	50	53	50	40	145	80	53	110	27	247
	56															
	60															
110	60	130	M33x2	G3/4"	M45x2 M58x1,5	40	55	56	50	40	155	92	61	126	30	289
125	70	145	M33x2	G3/4"	M48x2 M58x1,5	45	63	55	55	50	195	97	70	127	27	281
140	80	165	M33x2	G3/4"	M56x2 M65x1,5	50	75	50	60	50	225	103	78	155	35	316
160*	80	185	M33x2	G3/4"	M64x2 M80x2	56	85	80	80	63	240	120	90	143	32	345
	90															
200*	110	230	M33x2 M42x2	G3/4" G1"	M80x3 M100x2	80	110	111	100	80	295	140	112	148	37	392
	120															
250*	140	297	M33x2 M42x2	G3/4" G1"	M100x3 M120x3	70	85	135	120	90	380	176	147	148	37	437
	160															

*versions under construction - for further details contact with our technical department

1) other piston diameters available: D - 45, 55, 60, 65, 70, 90, 135, 150, 180mm

2) other rod diameters available: MM - 100, 150, 180, 200mm

Side foot mounting



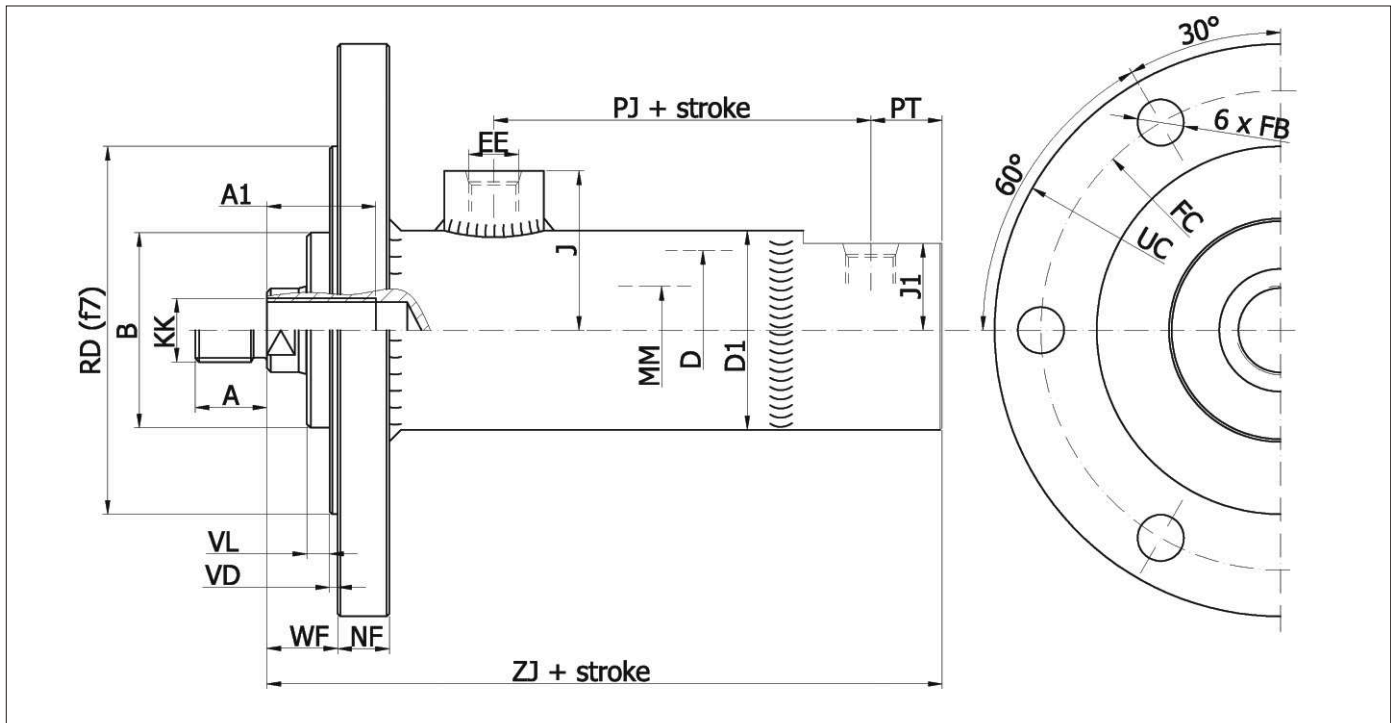
D	MM	D1	EE		KK	A	A1	WF	ST	LH	S	TS	US	SS	XS	SB	J	J1	PJ	PT	ZJ
			M	G																	
25	18	35	M14x1,5	G1/4"	M12x1,5	14	16	12	13	28	22	68	90	58	44	9	31	14	46	12	115
32	20	42	M14x1,5	G1/4"	M16x1,5	16	22	16	12	27	25	78	100	50	45	11	35	18	51	13	113
40	22	50	M16x1,5	G3/8"	M16x1,5	18	22	10	15	31	30	83	110	64	58	11	43	22	64	16	138
	25																				
50	25	60	M16x1,5	G3/8"	M22x1,5	20	30	15	18	38	35	102	130	73	62	14	48	27	74	17	152
	28																				
	35																				
63	30	75	M22x1,5	G1/2"	M27x2 M28x1,5	22	36	19	25	44	50	124	165	85	74	20	56	33	85	21	180
	36																				
	40																				
	40																				
80	40	95	M27x2	G1/2"	M33x2 M35x1,5	30	45	18	30	57	50	149	190	105	85	20	73	43	108	20	210
	45																				
	50																				
100	50	115	M33x2	G3/4"	M42x2 M54x1,5	36	50	20	35	68	50	172	240	124	96	26	80	53	126	27	247
	56																				
	60																				
110	60	130	M33x2	G3/4"	M45x2 M58x1,5	40	55	22	35	78	55	190	240	135	90	26	92	61	126	30	269
125	70	145	M33x2	G3/4"	M48x2 M58x1,5	45	63	23	35	85	60	205	255	138	108	26	97	70	137	27	281
140	80	165	M33x2	G3/4"	M56x2 M65x1,5	50	75	26	35	95	70	220	280	166	115	30	103	78	160	35	321
160	80	185	M33x2	G3/4"	M64x2 M80x2	56	85	36	40	115	75	250	310	154	99	33	120	90	143	32	321
	90																				
200*	110	230	M33x2 M42x2	G3/4"G1"	M80x3 M100x2	80	110	40	55	140	100	320	410	155	118	39	140	112	148	37	332
	120																				
250*	140	298	M33x2 M42x2	G3/4"G1"	M100x3 M120x3	70	85	50	75	175	110	420	540	150	143	45	176	147	148	30	367
	160																				

*versions under construction - for further details contact with our technical department

1) other piston diameters available: D - 45, 55, 60, 65, 70, 90, 135, 150, 180mm

2) other rod diameters available: MM - 100, 150, 180, 200mm

Front flange mounting

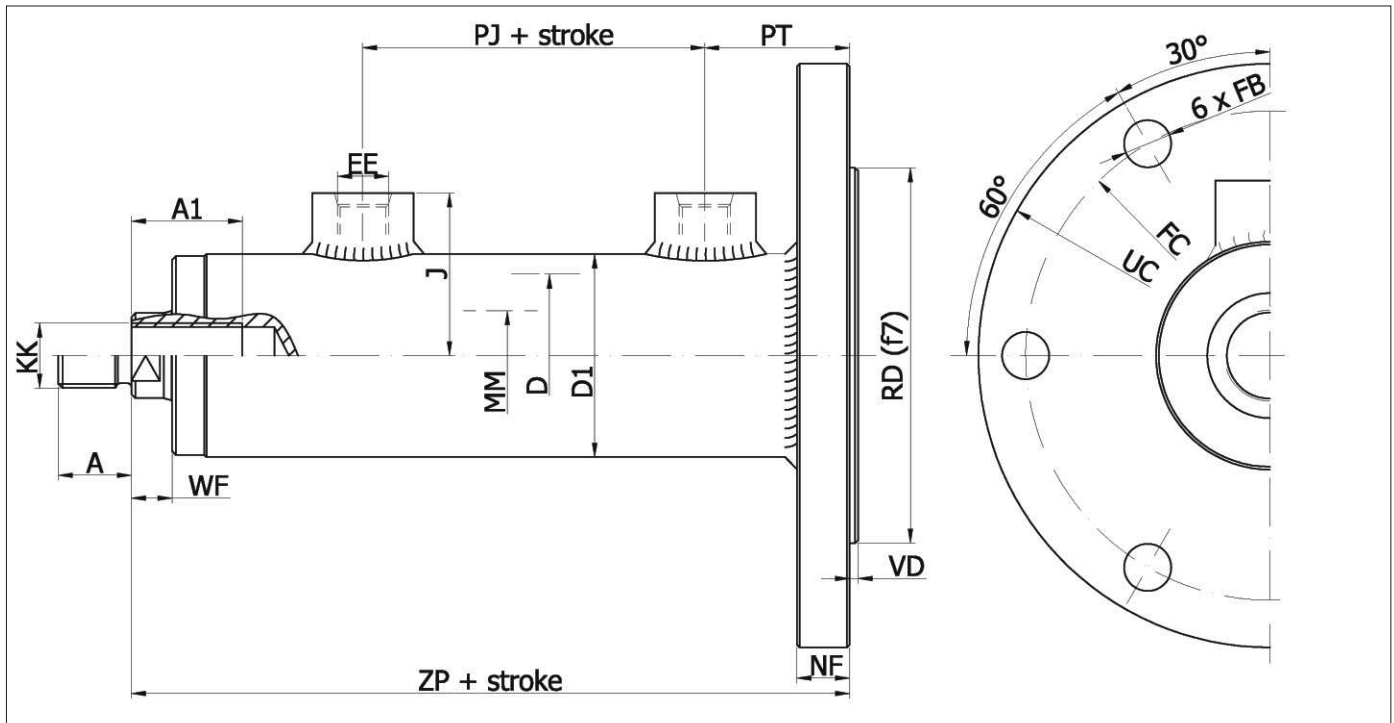


D	MM	D1	EE		KK	A	A1	FB	NF	WF	RD	B	VL	VD	J	J1	UC	FC	PJ	PT	ZJ
			M	G																	
25	18	35	M14x1,5	G1/4"	M12x1,5	14	16	7	10	14	50	-	-	2	33	14	80	66	46	13	115
32	20	42	M14x1,5	G1/4"	M16x1,5	16	22	9	12	14	60	42	4	2	35	18	105	85	73	13	129
40	22	50	M16x1,5	G3/8"	M16x1,5	18	22	9	14	12	65	50	2	3	43	22	110	90	64	16	138
	25																				
50	25	60	M16x1,5	G3/8"	M22x1,5	20	30	11	16	18	85	60	5	3	48	27	130	106	73	17	153
	28																				
	35																				
63	30	75	M22x1,5	G1/2"	M27x2 M28x1,5	22	36	13,5	18	20	100	73	7	3	56	33	160	130	92	21	180
	36																				
	40																				
	40																				
80	40	95	M27x2	G1/2"	M33x2 M35x1,5	30	45	17	19	31	135	92	10	3	70	43	210	175	102	20	210
	45																				
	50																				
100	50	120	M33x2	G3/4"	M42x2 M54x1,5	36	50	22	25	30	150	115	12	5	80	53	240	200	116	27	247
	56																				
	60																				
110	60	130	M33x2	G3/4"	M45x2 M58x1,5	40	55	22	30	30	160	125	7	5	92	61	250	210	126	30	235
125	70	150	M33x2	G3/4"	M48x2 M58x1,5	45	63	22	30	32	180	145	7	4	97	70	280	230	122	28	271
140	80	165	M33x2	G3/4"	M56x2 M65x1,5	50	75	26	30	37	185	160	12	5	103	78	288	240	139	30	291
160	80	185	M33x2	G3/4"	M64x2 M80x2	56	85	26	35	50	240	180	12	5	115	88	340	280	143	32	321
	90																				
200	110	230	M33x2 M42x2	G3/4" G1"	M80x3 M100x2	80	110	26	50	45	290	218	18	5	142	112	380	330	148	37	314
	120																				
250	140	297	M33x2 M42x2	G3/4" G1"	M100x3 M120x3	70	85	42	67	50	295	-	-	5	175	147	480	410	147	30	359
	160																				

1) other piston diameters available: D - 45, 55, 60, 65, 70, 90, 135, 150, 180mm

2) other rod diameters available: MM - 100, 150, 180, 200mm

Rear flange mounting

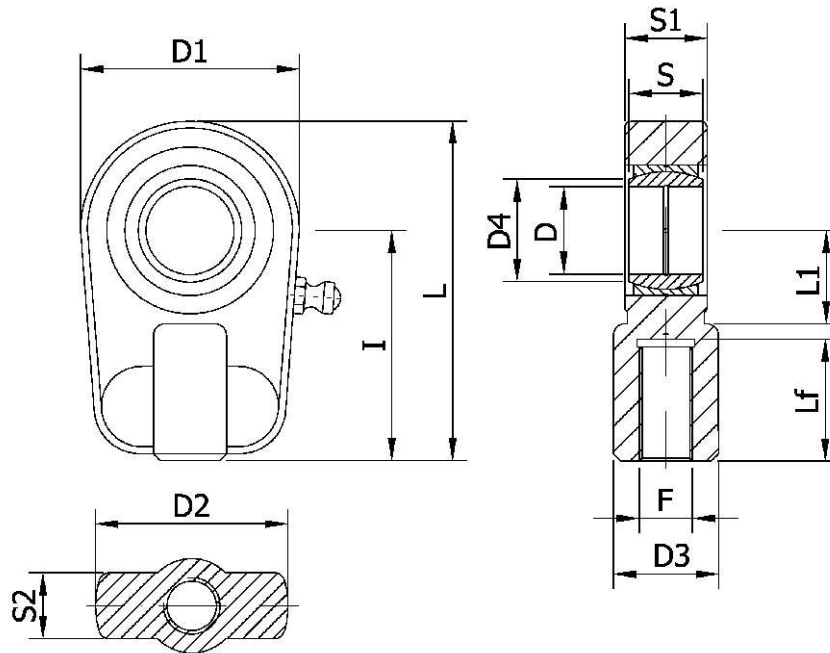


D	MM	D1	EE		KK	A	A1	FB	NF	WF	RD	VD	J	UC	FC	PJ	PT	ZP
			M	G														
25	18	35	M14x1,5	G1/4"	M12x1,5	14	16	7	10	12	50	2	33	80	66	29	30	115
32	20	42	M14x1,5	G1/4"	M16x1,5	16	22	9	12	13	60	2	35	105	85	39	39	129
40	22	50	M16x1,5	G3/8"	M16x1,5	18	22	9	14	10	65	3	40	110	90	31	39	123
	25																	
50	25	60	M16x1,5	G3/8"	M22x1,5	20	30	11	16	16	85	3	45	130	106	42	49	152
	28																	
	35																	
63	30	76	M22x1,5	G1/2"	M27x2 M28x1,5	22	36	13,5	18	15	100	3	54	160	130	59	46	180
	36																	
	40																	
80	40	95	M27x2	G1/2"	M33x2 M35x1,5	30	45	17	19	18	135	3	63	210	175	76	55	215
	45																	
	50																	
100	50	115	M33x2	G3/4"	M42x2 M54x1,5	36	50	22	25	20	150	3	74	240	200	111	62	284
	56																	
	60																	
110	60	130	M33x2	G3/4"	M45x2 M58x1,5	40	55	22	25	23	160	5	92	250	210	80	66	260
125	70	146	M33x2	G3/4"	M48x2 M58x1,5	45	63	22	30	23	180	4	91	280	230	81	70	271
140	80	165	M33x2	G3/4"	M56x2 M65x1,5	50	75	26	30	26	185	5	109	288	240	105	84	316
160	80	185	M33x2	G3/4"	M64x2 M80x2	56	85	26	35	36	240	5	115	340	280	98	76	321
	90																	
200	110	230	M33x2 M42x2	G3/4" G1"	M80x3 M100x2	80	110	26	50	40	290	5	140	380	330	95	100	342
	120																	
250	140	297	M33x2 M42x2	G3/4" G1"	M100x3 M120x3	70	85	42	67	50	295	5	176	480	410	95	117	394
	160																	

1) other piston diameters available: D - 45, 55, 60, 65, 70, 90, 135, 150, 180mm

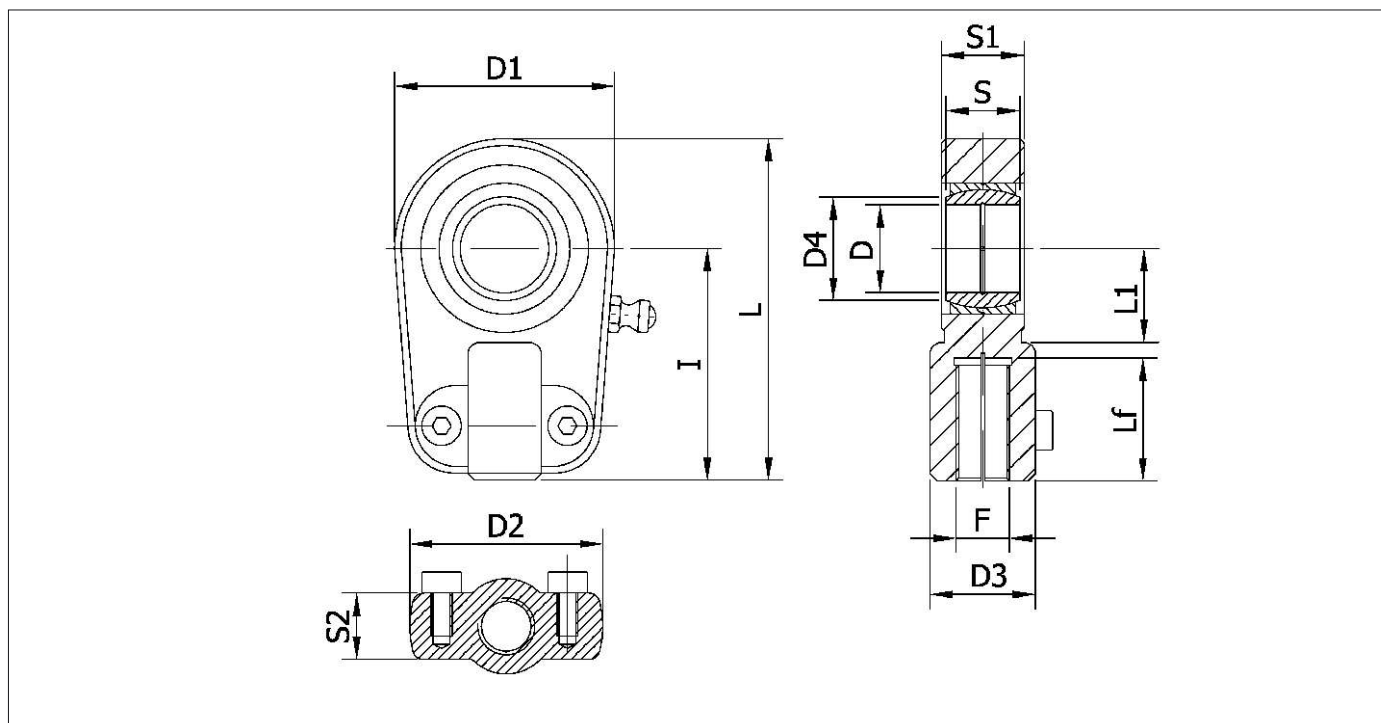
2) other rod diameters available: MM - 100, 150, 180, 200mm

Ball joint end



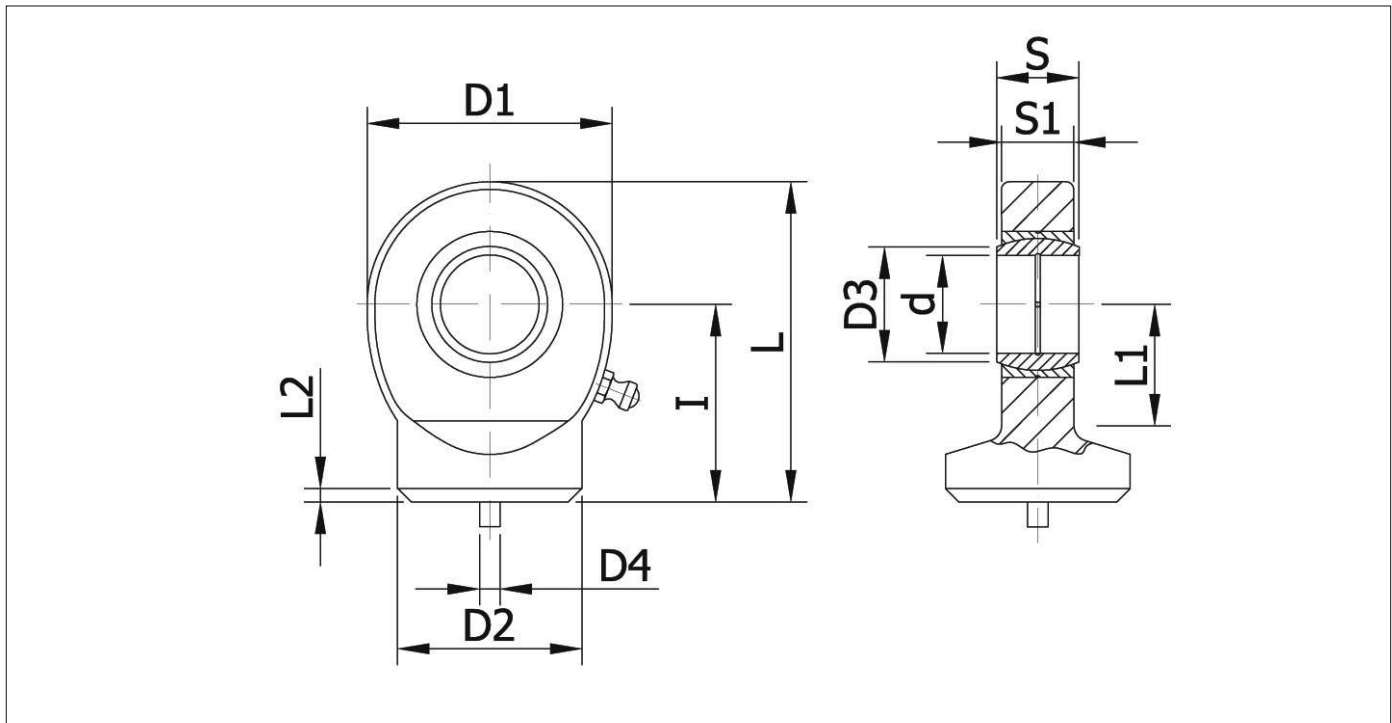
Code	D	I	S	LF	D1	D2	D3	D4	S1	S2	L	L1	F	Load	
														Stat [kN]	Dyn [kN]
PR20N	20	50	16	17	56	46	25	24,1	19	21	80	25	M 16x1.5	72	30
PR25N	25	50	20	17	56	46	25	29,3	23	21	80	28	M 16x1.5	72	48
PR30N	30	60	22	23	64	50	32	34,2	28	26	94	30	M 22x1.5	106	62
PR35N	35	70	25	29	78	66	40	39,7	30	28	112	38	M 27x2	153	80
PR35N	35	70	25	29	78	66	40	39,7	30	28	112	38	M 28x1.5	153	80
PR40N	40	85	28	36	94	76	49	45	35	33	135	45	M 33x2	250	100
PR40N	40	85	28	36	94	76	49	45	35	33	135	45	M 35x1.5	250	100
PR50N	50	105	35	46	116	90	61	56	40	37	168	55	M 42x2	365	156
PR50N	50	105	35	46	116	90	61	56	40	37	168	55	M 45x1.5	365	156
PR60N	60	130	44	59	130	120	75	66,8	50	46	200	65	M 58X1.5	400	245
PR70N	70	150	49	66	157	130	86	77,8	55	51	232	75	M 65x1.5	540	315
PR80N	80	170	55	81	178	160	105	89,4	60	55	265	80	M 80x2	670	400
PR90N	90	210	60	101	210	180	124	98,1	65	63	323	90	M 100x2	980	490
PR100N	100	235	70	111	234	200	138	110	70	65	361	105	M 110x2	1120	610
PR110N	110	265	70	125	270	220	152	121	80	76	408	115	M 120x3	1700	655
PR120N	120	310	85	135	342	300	172	136	90	87	490	140	M 130X3	2900	950

Ball joint end



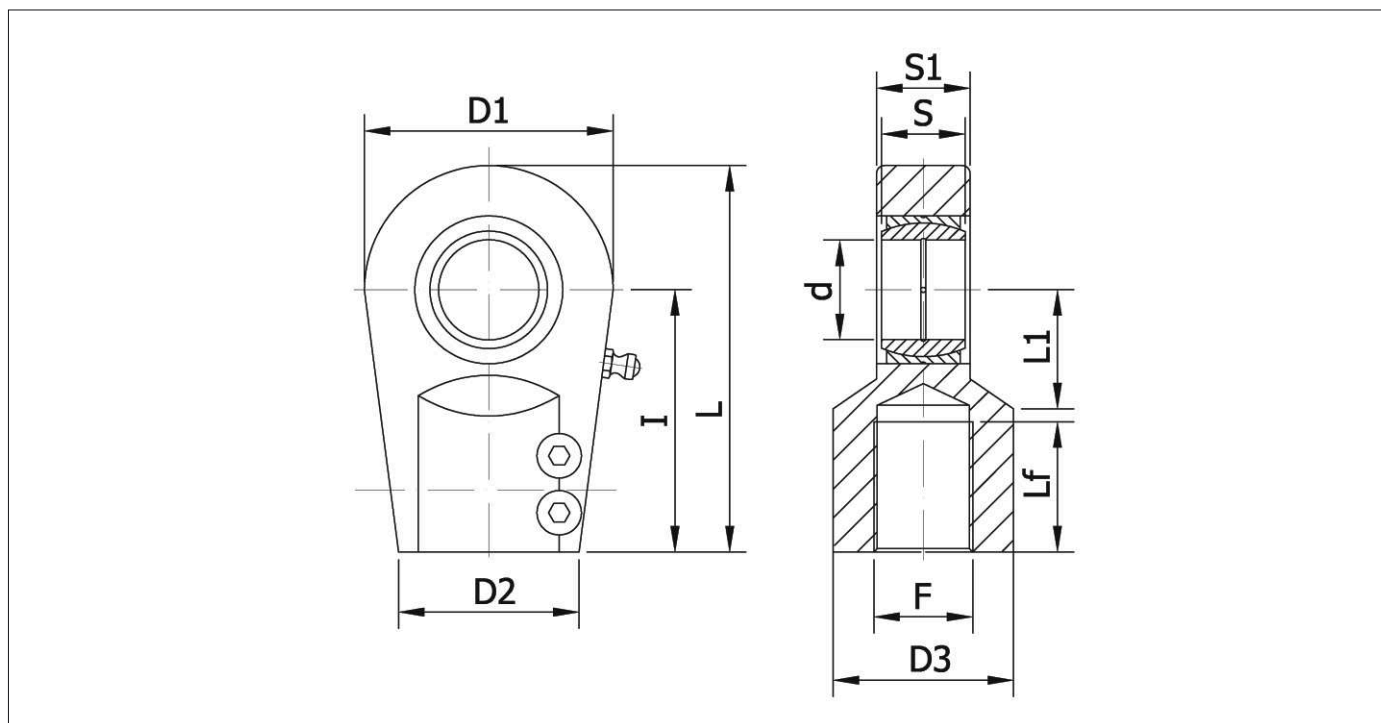
Code	D	I	S	LF	D1	D2	D3	D4	S1	S2	L	L1	F	Load	
														Stat [kN]	Dyn [kN]
PR20U	20	50	16	17	56	46	25	24,1	19	21	80	25	M 16x1.5	72	30
PR25U	25	50	20	17	56	46	25	29,3	23	21	80	28	M 16x1.5	72	48
PR30U	30	60	22	23	64	50	32	34,2	28	26	94	30	M 22x1.5	106	62
PR35U	35	70	25	29	78	66	40	39,7	30	28	112	38	M 27x2	153	80
PR35U	35	70	25	29	78	66	40	39,7	30	28	112	38	M 28x1.5	153	80
PR40U	40	85	28	36	94	76	49	45	35	33	135	45	M 33x2	250	100
PR40U	40	85	28	36	94	76	49	45	35	33	135	45	M 35x1.5	250	100
PR50U	50	105	35	46	116	90	61	56	40	37	168	55	M 42x2	365	156
PR50U	50	105	35	46	116	90	61	56	40	37	168	55	M 45x1.5	365	156
PR60U	60	130	44	59	130	120	75	66,8	50	46	200	65	M 58x1.5	400	245
PR70U	70	150	49	66	157	130	86	77,8	55	51	232	75	M 65x1.5	540	315
PR80U	80	170	55	81	178	160	105	89,4	60	55	265	80	M 80x2	670	400
PR90U	90	210	60	101	210	180	124	98,1	65	63	323	90	M 100x2	980	490
PR100U	100	235	70	111	234	200	138	110	70	65	361	105	M 110x2	1120	610
PR110U	110	265	70	125	270	220	152	121	80	76	408	115	M 120x3	1700	655
PR120U	120	310	85	135	342	300	172	136	90	87	490	140	M 130x3	2900	950

Ball joint end



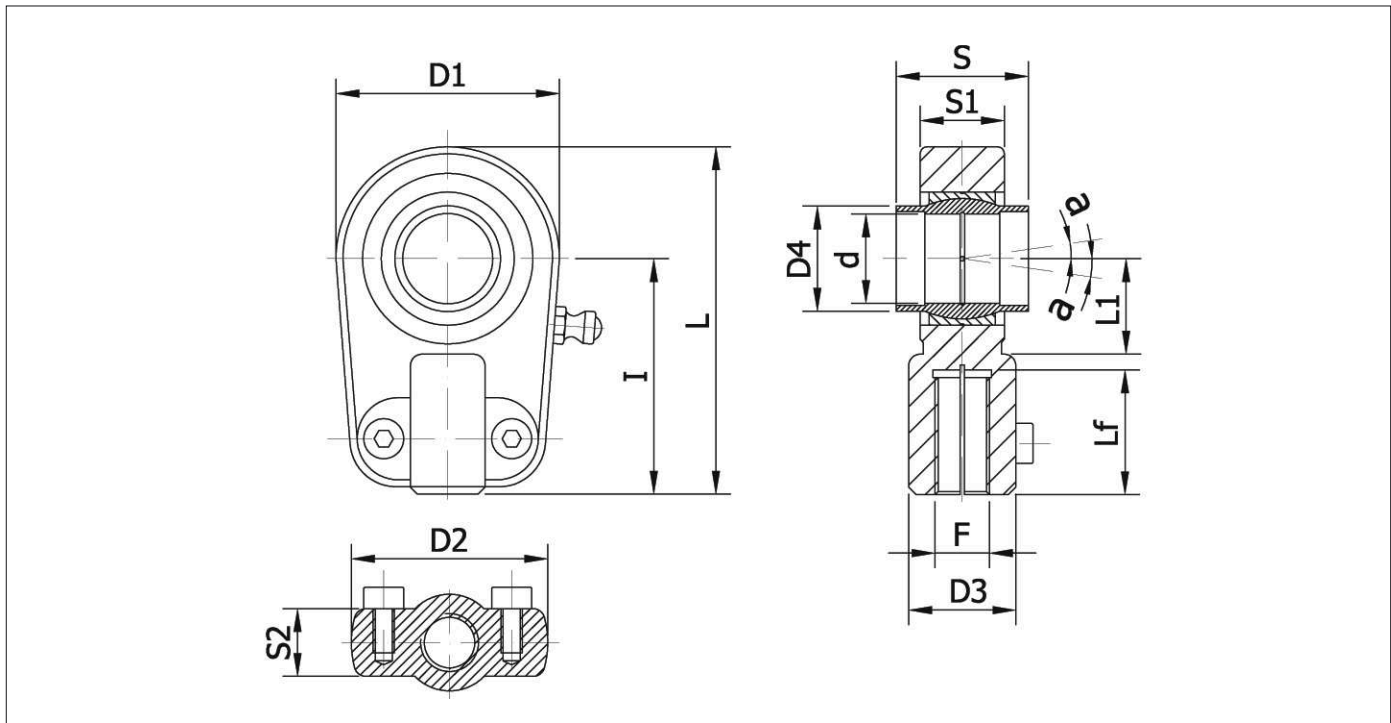
Code	d	S	I	D1	D2	D4	D3	S1	L	L1	L2	Load	
												Stat [kN]	Dyn [kN]
S10C	10	9	24	29	15	3	13,2	6,5	38,5	14	2	15,6	8,15
S12C	12	10	27	36	17,5	3	15	8	44	18	2	21,6	10,8
S15C	15	12	31	40	21	4	18,4	10	51	20	2,5	32	17
S16C	17	14	35	47	24	4	20,7	11	58	23	3	40	21,2
S17C	17	14	35	47	24	4	20,7	11	58	23	3	40	21,2
S20C	20	16	38	53	27,5	4	24,1	13	64,5	27,5	3	54	30
S25C	25	20	45	64	33,5	4	29,3	17	77	33	4	72	48
S30C	30	22	51	73	40	4	34,2	19	87,5	37,5	4	95	62
S35C	35	25	61	82	47	4	39,7	21	102	43	4	125	80
S40C	40	28	69	92	52	4	45	23	115	48	5	156	100
S45C	45	32	77	102	58	6	50,7	27	128	52	5	208	127
S50C	50	35	88	112	62	6	56	30	144	59	6	250	156
S60C	60	44	100	137	70	6	66,8	38	167,5	72,5	8	390	245
S70C	70	49	115	161	80	6	77,8	42	195	86	10	510	315
S80C	80	55	141	180	95	6	89,4	47	231	98	10	620	400

Ball joint end



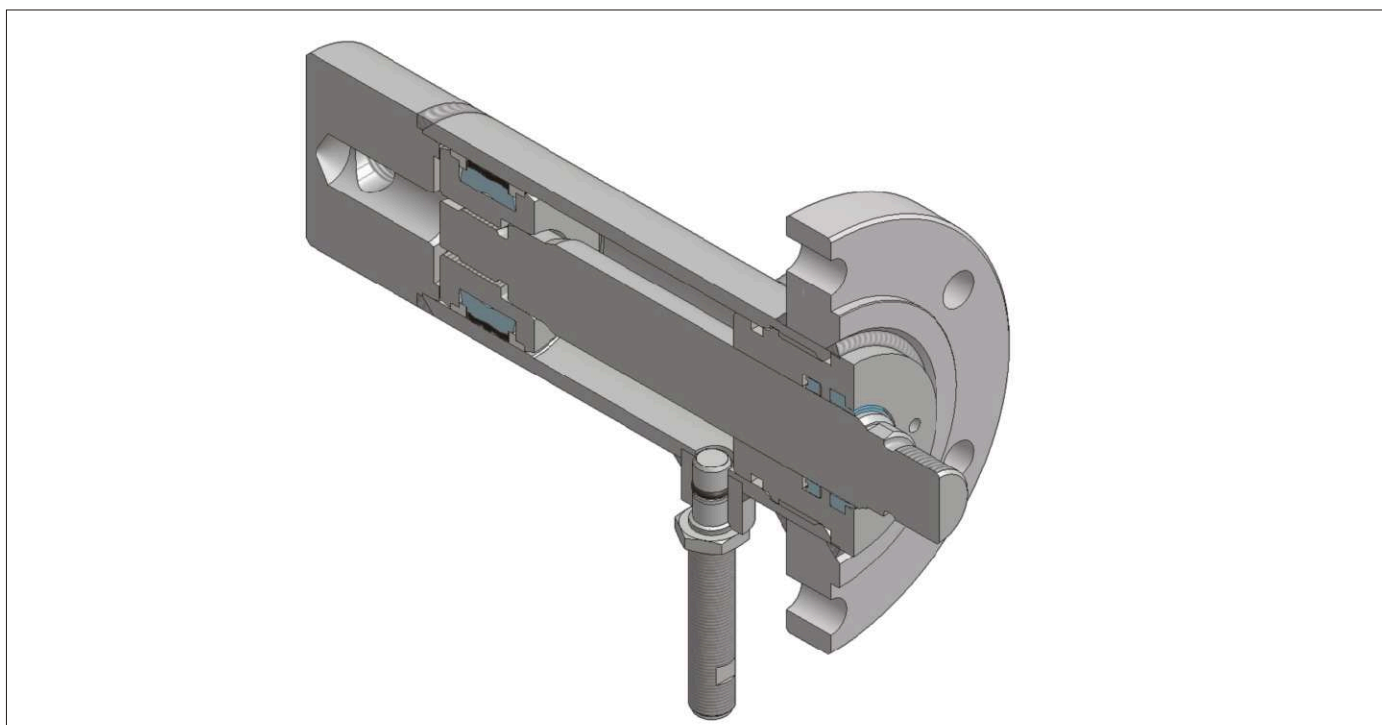
Code	d	I	LF	D1	D2	D3	S	S1	L	F	[°]	Load	
												Stat [kN]	Dyn [kN]
MA25D	25	65	30	56	48	28	20	23	95	M18x2	8	66	51
MA30D	30	75	35	64	54	34	22	28	109	M24x2	7	96	65,5
MA35D	35	90	45	78	66	44	25	30	132	M30x2	7	185	112
MA40D	40	105	55	94	78	55	28	35	155	M39x3	7	297	140
MA50D	50	135	75	116	90	70	35	40	198	M50x3	7	442	220
MA60D	60	170	95	130	118	87	44	50	240	M64x3	7	539	345
MA70D	70	195	110	144	130	105	49	55	278	M80x3	6	721	440
MA80D	80	210	120	176	158	125	55	60	305	M90x3	6	895	570
MA90D	90	250	140	206	162	150	60	65	363	M100x3	5	1330	695

Ball joint end



Code	D	S1	I	LF	D1	D2	D3	D4	S	S2	L	L1	a[°]	F	Load	
															Stat [kN]	Dyn [kN]
PR12CE	12	12	38	17	32	32	16	15,5	11	15	54	14	4	M 12x1.25	24,5	10,8
PR16CE	16	16	44	19	40	40	21	20	13,8	15	64	20	4	M 14x1.5	36,5	17,6
PR20CE	20	20	52	23	47	47	25	25	17,8	18,7	75	22	4	M 16x1.5	48	30
PR25CE	25	25	65	29	59	54	30	30,5	21,9	19	96	27	4	M 20x1.5	78	48
PR32CE	32	32	80	37	71	66	38	38	27,5	22	118,5	32	4	M 27x2	114	67
PR40CE	40	40	97	46	90	80	47	46	33	27	146,1	41	4	M 33x2	204	100
PR50CE	50	50	120	57	109	96	58	57	41	32	179,6	50	4	M 42x2	310	156
PR63CE	63	63	140	64	132	114	70	71,5	53	38	211,6	62	4	M 48x2	430	255
PR70CE	70	70	160	81	157	135	80	79	57	42	245	70	4	M 56x2	540	315
PR80CE	80	80	180	86	169,3	148	90	91	67	48	270,6	78	4	M 64x3	695	400
PR90CE	90	90	195	91	185	160	100	99	72	52	296	85	4	M 72x3	750	490
PR100CE	100	100	210	96	211,4	178	110	113	86	64	322,7	98	4	M 80x3	1060	610
PR110CE	110	110	235	106	235	190	125	124	88	62	364	105	4	M 90x3	1200	655
PR125CE	125	125	260	113	269	200	135	138	105	74	405,7	120	4	M 100x3	1430	950
PR160CE	160	160	310	126	326	250	165	177	130	82	488	150	4	M 125x4	2200	1370
PR200CE	200	200	390	161	418	320	215	221	167	105	620	195	4	M 160x4	3650	2120

Cylinders with proximity switches



General characteristics:

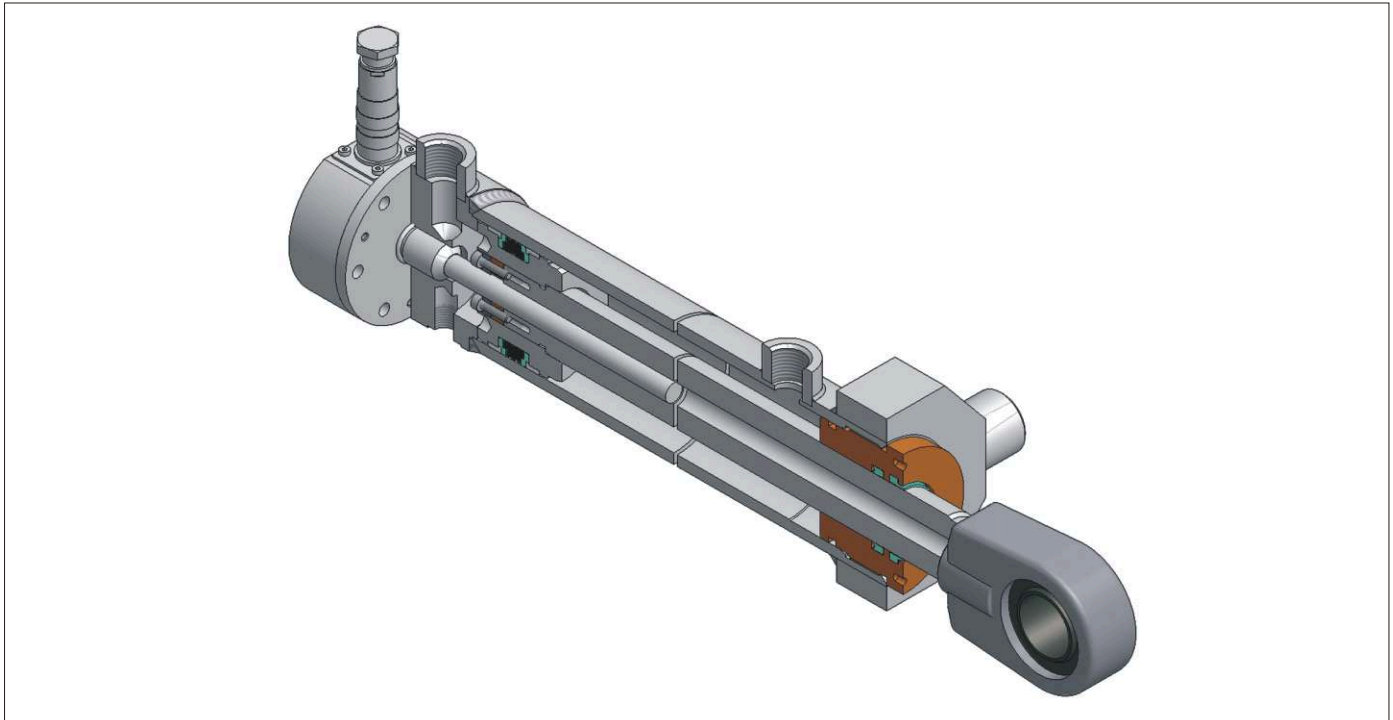
Hydraulic cylinders with proximity switches generates signal when maximum rod's position is reached. Proximity switch detects maximum rod's position and produces electrical contact. The inductive sensor is built in cylinder body ensuring compact design, dirt and shock protection.

Basic parameters of switches *:

Repeatability	$\leq 5\%$
Frequency	Max. 1000Hz
Interface (output signal)	PNP (NO normally open)
Nominal voltage	24VDC
Working temperature	$-40^{\circ}\text{C} \div 80^{\circ}\text{C}$

* For further details, please contact our technical department

Cylinders with position transducer



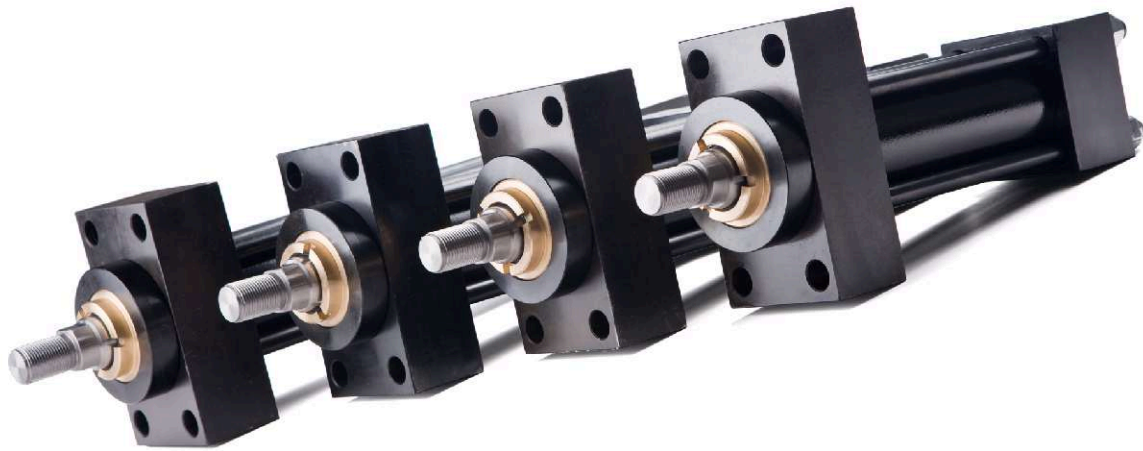
General characteristics*:

Hydraulic cylinders with position transducer are designed to operate with constant measurement of rod position. According to measured information, transducer generates output signal analog or digital. The rod position transducer is built in cylinder body ensuring compact design, dirt and shock protection.

Basic parameters of transducer:

Accuracy	Min. 2µm
Hysteresis	5µm
Linearity error	±100µm for range up to 500mm, ±0,2% for range over 500mm
Interface (output signal)	Analog: 0-10V, 4-20mA, 0-20mA Digital: Impulse,SSI, CANOpen, PROFIBUS
Nominal voltage	24VDC
Working temperature	-40°C ÷ 80°C

* For further details, please contact our technical department



2 HYDRAULIC CYLINDERS ISO 6020/2

TYPE HCD

Nominal pressure 210 bar (21MPa)

Main features:

- Piston diameter from 25mm to 200mm
- Rod diameter from 14mm to 140mm
- Stroke up to 2000mm
- Modular design
- Maximum pressure 250bar (25MPa)
- 14 mounting styles

Type HCD - Introduction

Overview:

Hydraulic cylinders produced by HYDRO ZNPHS are designed to operate in hydraulic drives of machines. Wide range of diameters and mounting styles suits the requirements of both industrial and mobile applications.

Working conditions:

Working pressure	Standard: 21MPa (210 bar) Maximum: 25MPa (250bar)
Temperature	Standard: - 20°C ÷ 80°C, Maximum: for VITON - 20°C ÷ 150°C
Speed	Standard: 0,5 m/s Maximum: 1 m/s
Fluid	Standard: Hydraulic mineral oils Special: HFC fluids, phosphate esters
Viscosity	12 ÷ 80 mm ² /S

Type HCD - Materials

Cylinder: Cylinders are basically made of cold drawn welded steel tubes (ST52.3), in diameter tolerance H8.

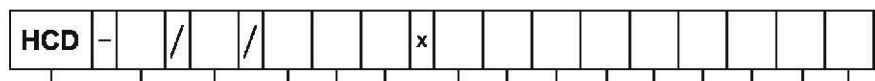
Rod: In standard, chrome plated bars quenched and tempered 42CrMo4 are used for rod material. In other executions, chrome plated and induction hardened bars CK45H may be used. For corrosive environments, stainless steel bars with chrome plating like AISI 431, AISI 316, AISI 304, or bars with nickel-chromium (NI-Cr) plating NICROM 350 are recommended. Each material is attested by its producer.

Sealing system: There are several types of sealing systems from companies like Trelleborg, Freudenberg, Simrit and Guarnitec, used respectively according to working conditions. If necessary Slip-Cup type sealings, Teflon (PTFE) tapes are used. In case of high temperatures, Viton sealing or other high temperature-resistant systems are recommended.

Finishing: Cylinders are finished with primer painting and on customer request it's possible to use lacquer, tin or zinc coating.

Quality: Each cylinder is supplied with quality certificate and warranty.

Type HCD - Ordering code



Hydraulic cylinder - type

Standard	HCD
Magnetic (piston 25-100)	HMD

Piston in mm

Rod in mm

Rod in mm (only for double rod version)

Mounting style ISO

Front tapped holes MX5	X
Front flange ME5	A
Rear flange ME6	B
Ball jointed eye MP5	D
Feet MS2	E
Front trunnions MT1	G
Intermediate trunnions MT4	H
Rear trunnions MT2	L
Female clevis MP1	M
Extended front tie-rods MX3	R
Extended rear tie-rods MX2	S
Rear tapped holes MX6	T
Extended front and rear tie-rods MX1	Q

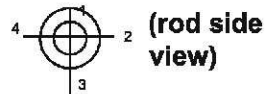
Cushioning

without	
Front only	V
Rear only	Z
Front and rear	K

Stroke in mm

Switch (for HMD)

SR	REED 24-110V AC/DC
SH	PNP 24V.DC



Rear port position
Front port position

Rod extension

	None
LY=	rod extension in mm (added to standard length)

Drains

SD	Bushing drains
-----------	----------------

Air bleeder

	none
SV	Front only
SZ	Rear only
SK	Front and rear

Piston rod ends

	standard - Male thread
SF	Female thread
ST	Tenon
SL	Male thread DIN 24554

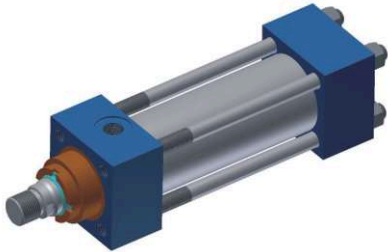
Seals

	standard (mineral oil, water and glikole)
Y	low friction PTFE + braz
W	high temperatures
N	HFC fluids

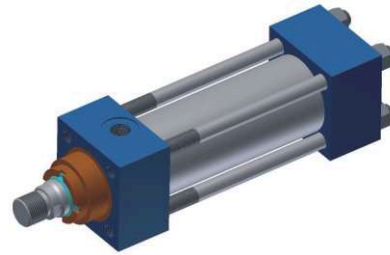
Examples:
HCD 50/28 A K 500 Y SF 11
HCD 125/70 M 200 LY=100 12

Type HCD - Mounting styles

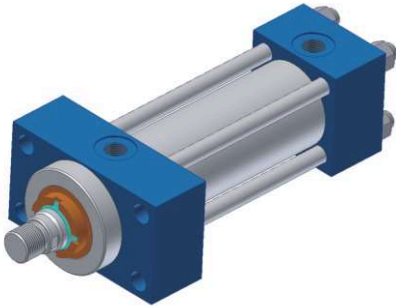
X (ISO MX5) for piston 25 - 100mm



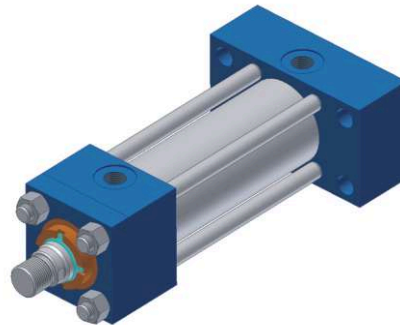
X (ISO MX5) for piston 125 - 200mm



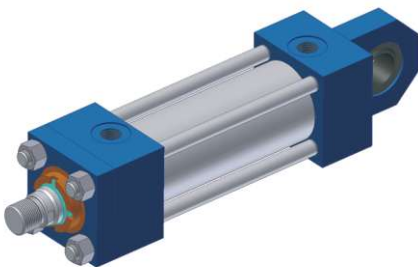
A (ISO ME5)



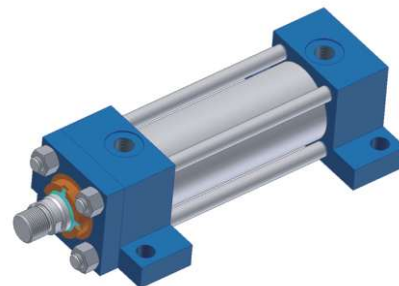
B (ISO ME6)



D (ISO MP5)

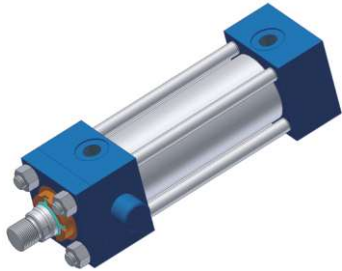


E (ISO MS2)

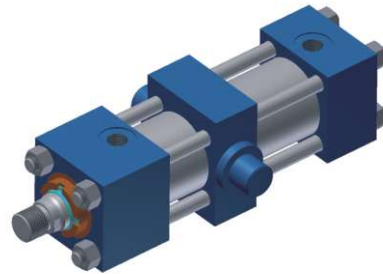


Type HCD - Mounting styles

G (ISO MT1)



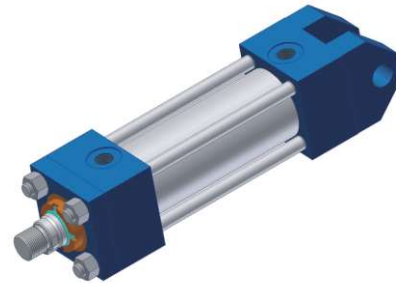
H (ISO MT4)



L (ISO MT2)



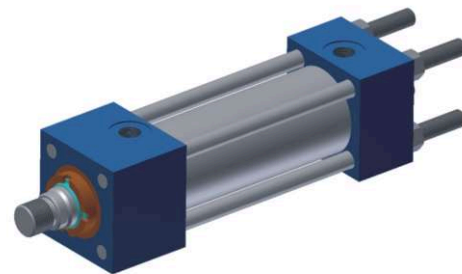
M (ISO MP1)



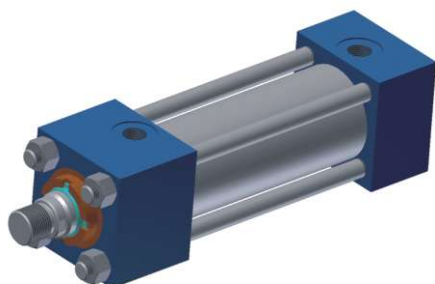
R (ISO MX3)



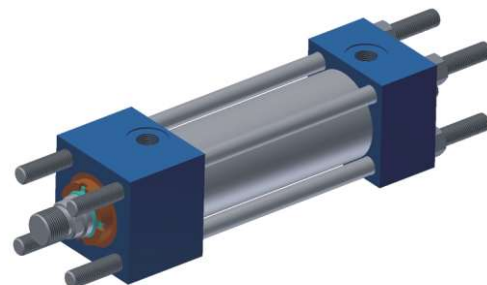
S (ISO MX2)



T (ISO MX6)

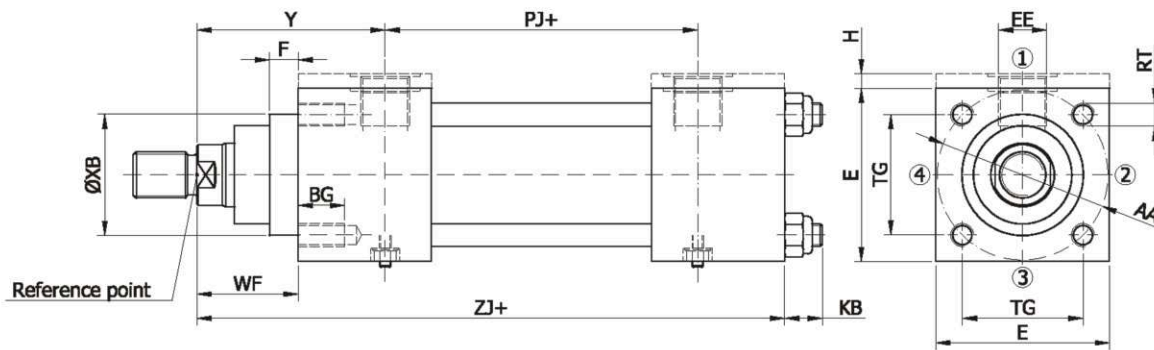


Q (ISO MX1)

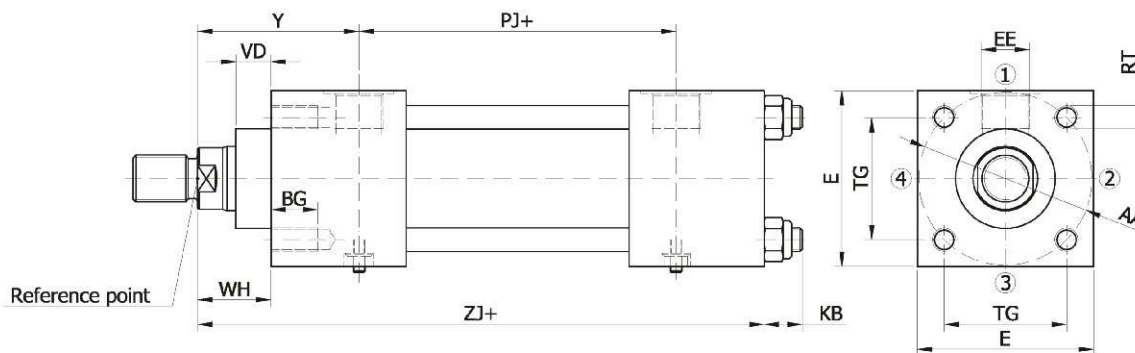


Type HCD - Dimensions

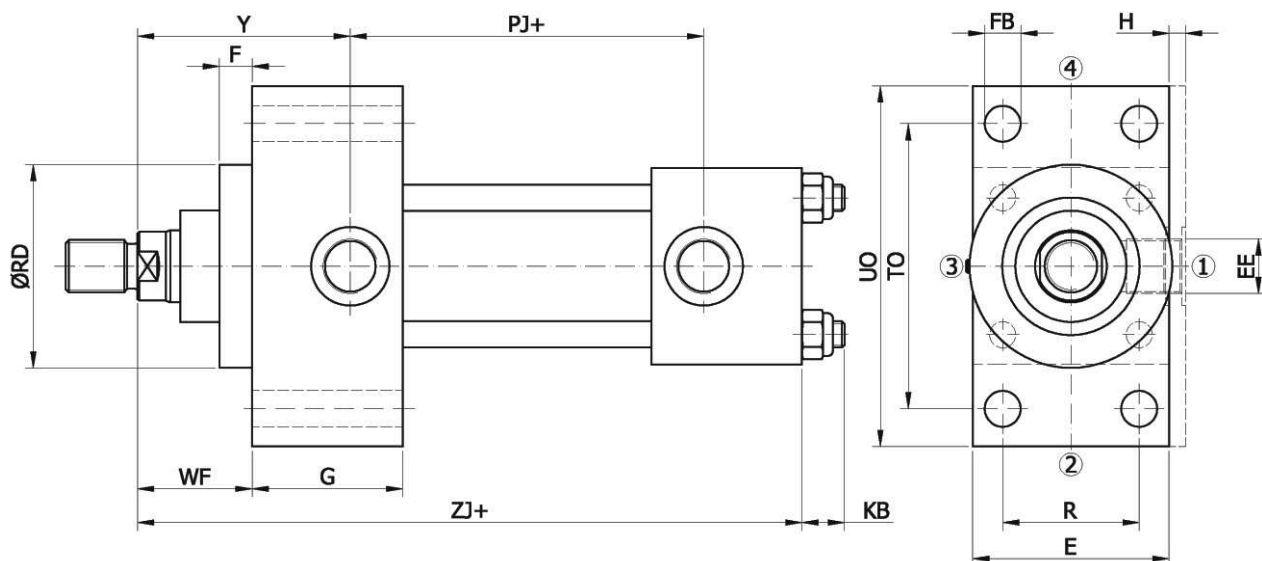
X (ISO MX5) for piston 25-100mm



X (ISO MX5) for piston 125-200mm

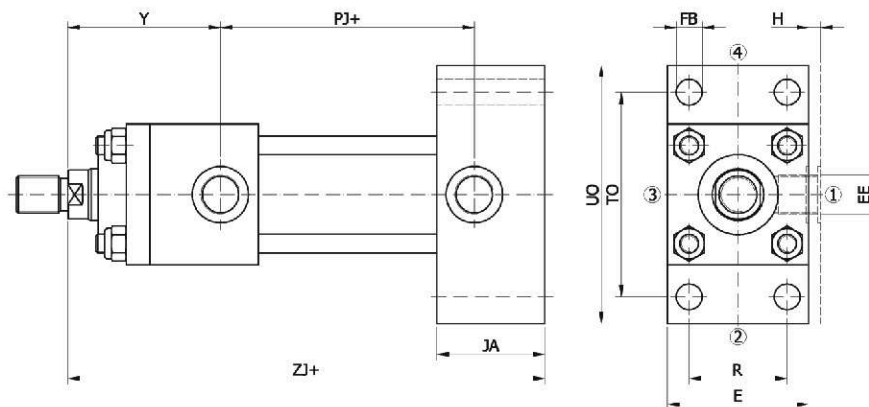


A (ISO ME5)

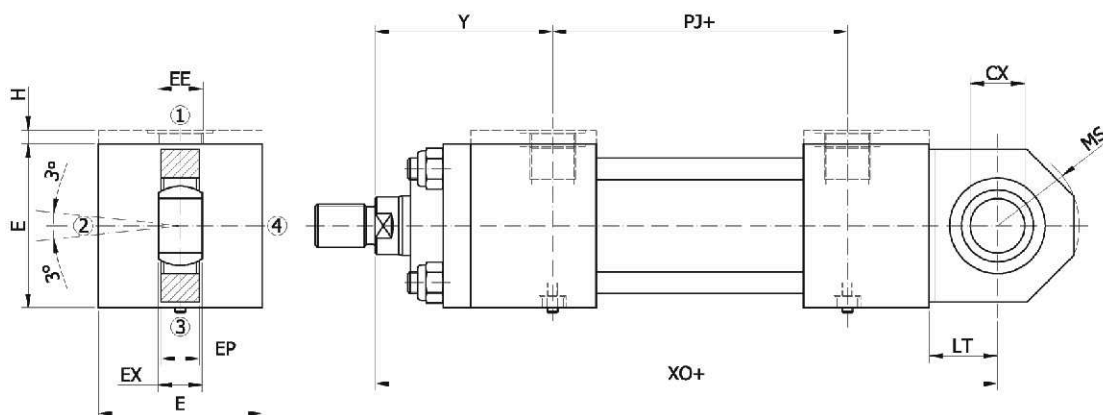


Type HCD - Dimensions

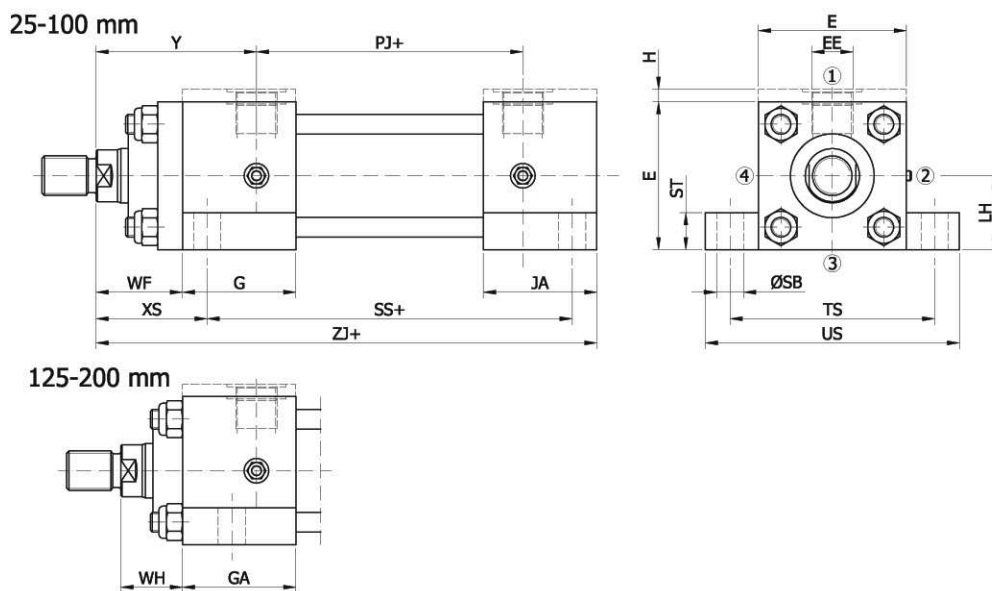
B (ISO ME5)



D (ISO MP5)

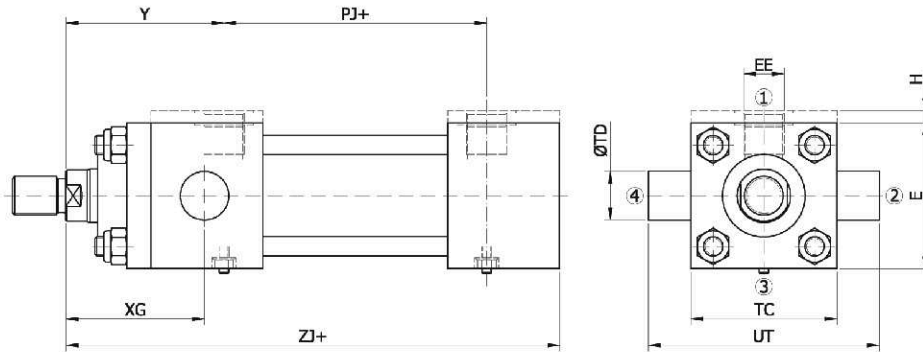


E (ISO MS2)

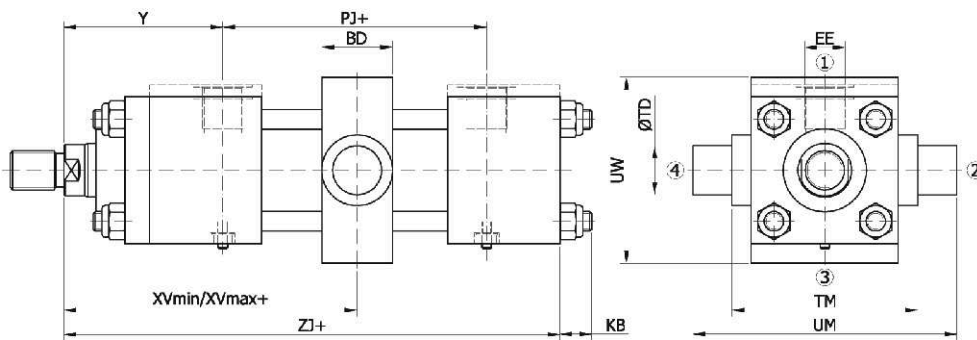


Type HCD - Dimensions

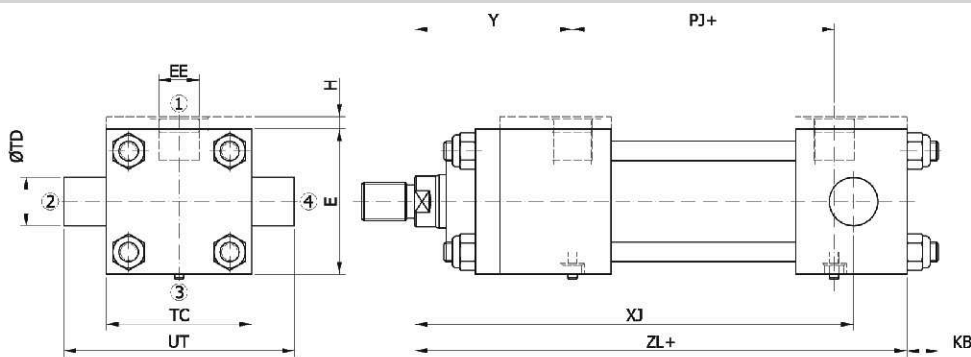
G (ISO MT1)



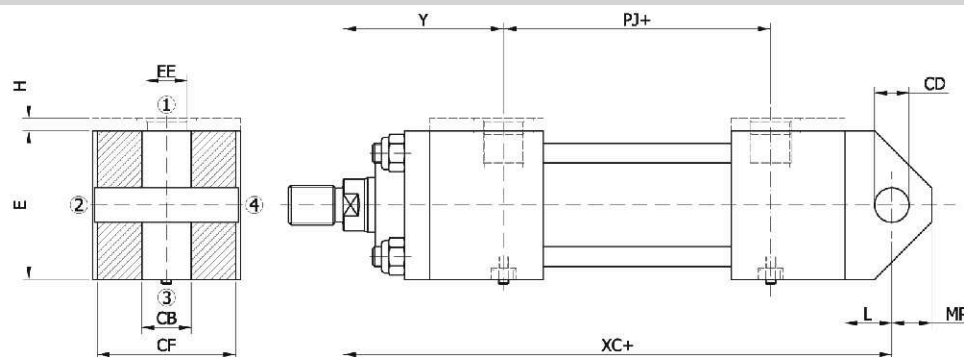
H (ISO MT4)



L (ISO MT2)

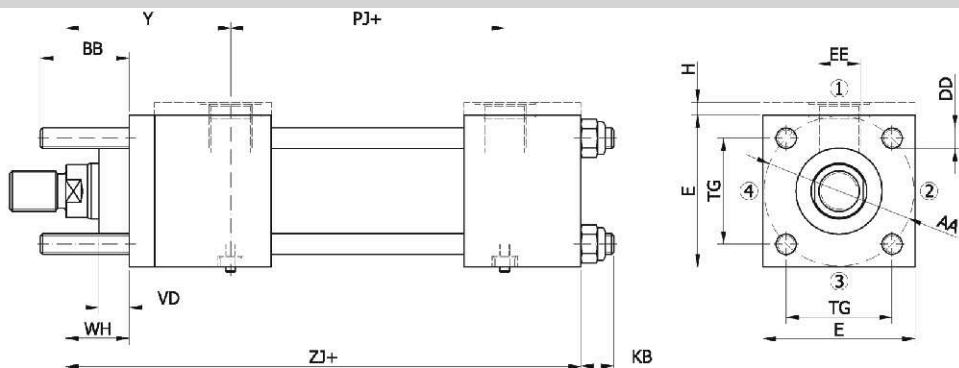


M (ISO MP1)

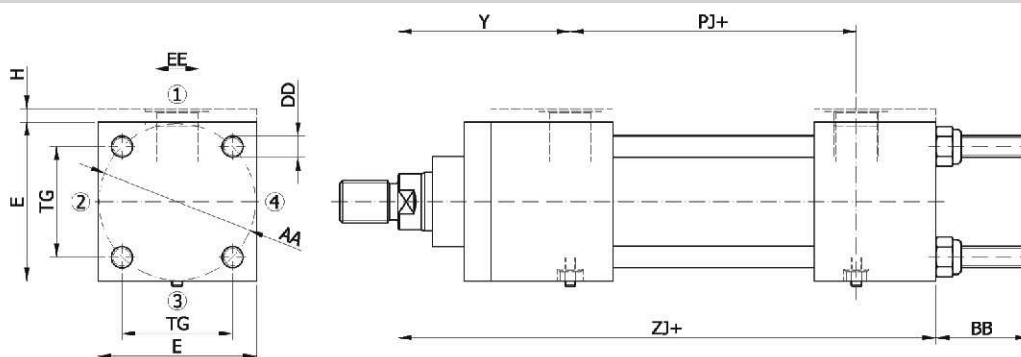


Type HCD - Dimensions

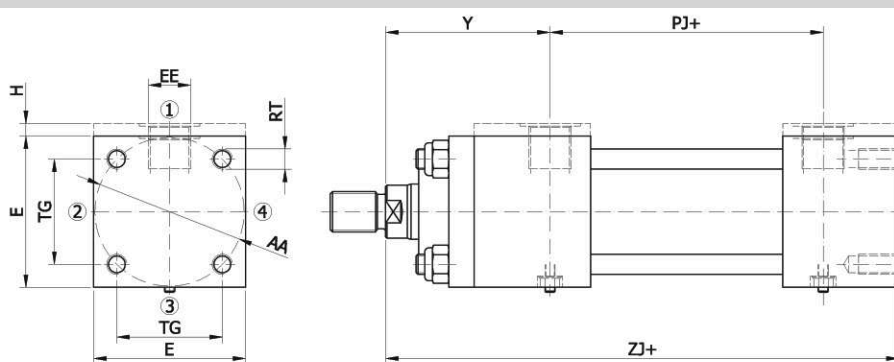
R (ISO MX3)



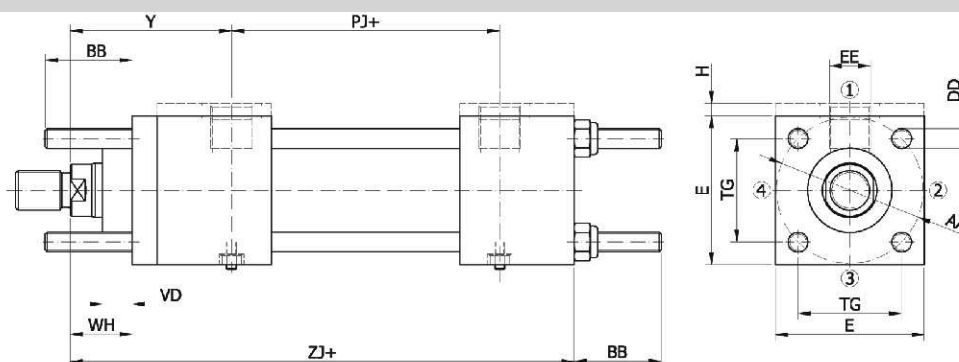
S (ISO MX2)



T (ISO MX6)



Q (ISO MX1)



Type HCD - Dimensions

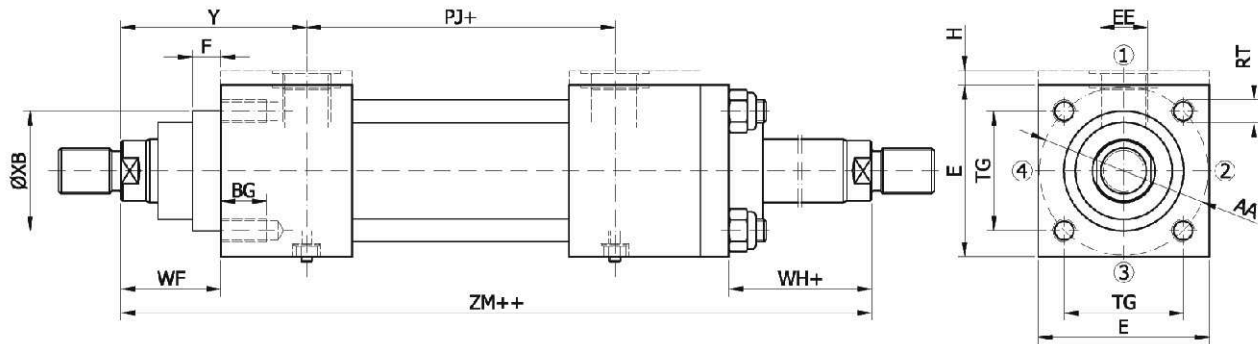
Piston	Rod			AA	BB	BD	BG	CB	CD	CF	CX	DD	E	EE	EP	EX	F	FB
25	12		18	40	19	20	12	16	10	40	12	M5x0.8	40	G1/4	9	10	10	5.5
32	14	18	22	47	24	25	15	16	12	45	16	M6x1	45	G1/4	12	14	10	6.6
40	18	22	28	59	35	29	16	20	14	60	20	M8x1	60	G3/8	14	16	10	11
50	22	28	36	74	46	38	18	30	20	74	25	M12x1.25	75	G1/2	18	20	16	14
63	28	36	45	91	46	48	18	30	20	90	30	M12x1.25	90	G1/2	20	22	16	14
80	36	45	56	117	59	58	24	40	28	110	40	M16x1.5	115	G3/4	24	28	20	18
100	45	56	70	137	59	68	24	50	36	130	50	M16x1.5	130	G3/4	30	35	22	18
125	56	70	90	178	81	88	30	64(*)	45	164	60	M22x1.5	165	G1	38	44	22	22
160	70	90	110	219	92	108	35	80(*)	56	200	80	M27x2	200	G1	47	55	25	26
200	90	110	140	269	115	125	40	80	70	240	100	M30x2	245	G1 1/4	58	70	25	33
Piston	G	GA	H	JA	KB	L	LH H10	LT	MR	MS	PJ	R	RD f8	RT	SB	SS	ST	TC
25	32	-	5	32	7	13	19	16	12	20	49(*)	27	38	M5	6.6	73	8.5	38
32	35.5	-	5	35.5	10	19	22	20	11	25	47(*)	33	42	M6	9	73	12.5	44
40	46	-	-	46	13	19	31	25	16	30	58(*)	41	62	M8	11	98	12.5	63
50	45	-	-	45	17	32	37	31	18	35	62(*)	52	74	M12	14	92	19	76
63	45	-	-	45	17	32	44	38	18	40	64(*)	65	88(**)	M12	18	86	26	89
80	52	-	-	52	23	39	57	48	31	55	77(*)	83	105(**)	M16	18	105	26	114
100	55	-	-	55	23	54	63	58	46	65	78(*)	97	125(**)	M16	26	102	32	127
125	65	87	-	65	30	57	82	72	43	90	117	126	150(**)	M22	26	131	32	165
160	70	95	-	70	35	63	101	92	57	100	130	155	170(**)	M27	33	130	38	203
200	92	117	-	92	37	82	122	116	68	135	165	190	210(**)	M30	39	172	44	241
Piston	TD f8	TG	TM	TO	TS	UM	UO	US	UT	UW	VD	WF	WH	XB f9	XC	XG	XJ*	X0
25	12	28.3	48	51	54	68	65	72	58	45	6	25	15	30	127+	44	95+	130
32	16	33.2	55	58	63	79	70	84	68	50	12	35	25	34	147+	54	109+	148
40	20	41.7	76	87	83	108	110	103	95	70	12	35	25	42	172+	57	131+	178
50	25	52.3	89	105	102	129	130	127	116	90	9	41	25	50	191+	64	136+	190
63	32	64.3	100	117	124	150	145	161	139	100	13	48	32	60	200+	70	146+	206
80	40	82.7	127	149	149	191	180	186	178	130	9	51	31	72	229+	76	165+	238
100	50	96.9	140	162	172	220	200	216	207	140	10	57	35	88	257+	71	177+	261
125	63	125.9	178	208	210	278	250	254	265	180	10	57	35	-	289+	75	214+	304
160	80	154.9	215	253	260	341	300	318	329	215	7	57	32	-	308+	75	227+	337
200	100	190.2	279	300	311	439	360	381	401	300	7	57	32	-	381+	85	271+	415
Piston	XS	XV		Y	ZJ	ZL	(1)	(2)										
		MIN	MAX															
25	33	67	72+	45(*)	114+	114+	10	5										
32	45	83	80+	58(*)	128+	128+	10	9										
40	45	96	92+	65(*)	153+	153+	15	20										
50	54	106	94+	69(*)	159+	159+	20	70										
63	65	118	98+	76(*)	168+	168+	30	70										
80	68	133	108+	82(*)	190+	190+	35	160										
100	79	147	113+	91(*)	203+	203+	45	160										
125	79	166	123+	86	232+	254+	60	460										
160	86	182	120+	86	245+	270+	70	820										
200	92	213	142+	98	299+	324+	80	1150										

(1) Minimal stroke for H (ISO MT4) mounting; (2) – Recommended torque for fixing screws [Nm]

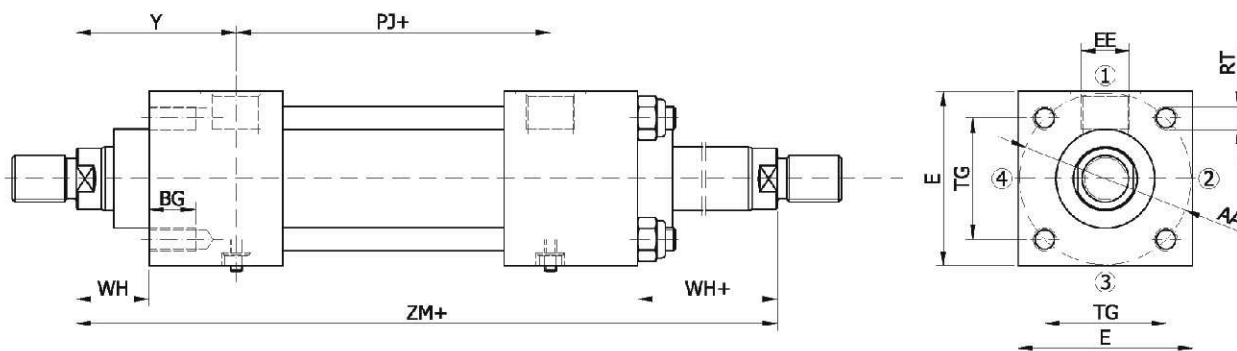
(*) – dimension noncompliant to ISO 6020/2; (**) – dimension noncompliant to ISO 6020/2 for the smallest rod

Double rod cylinders - Dimensions

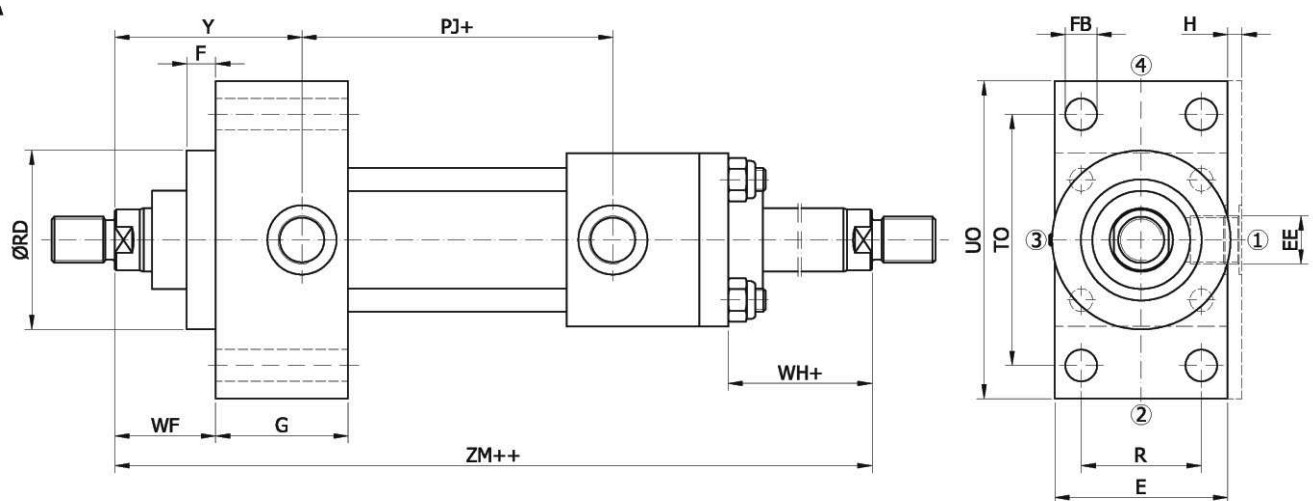
X (ISO MX5) for piston 25-100mm



X (ISO MX5) for piston 125-200mm

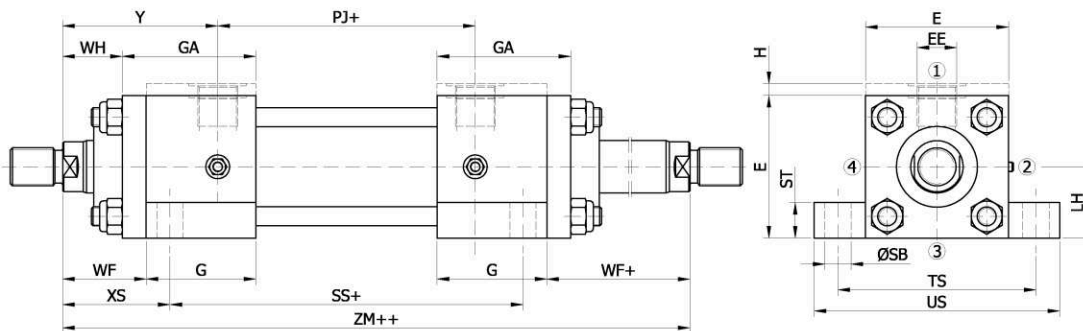


A (ISO ME5)

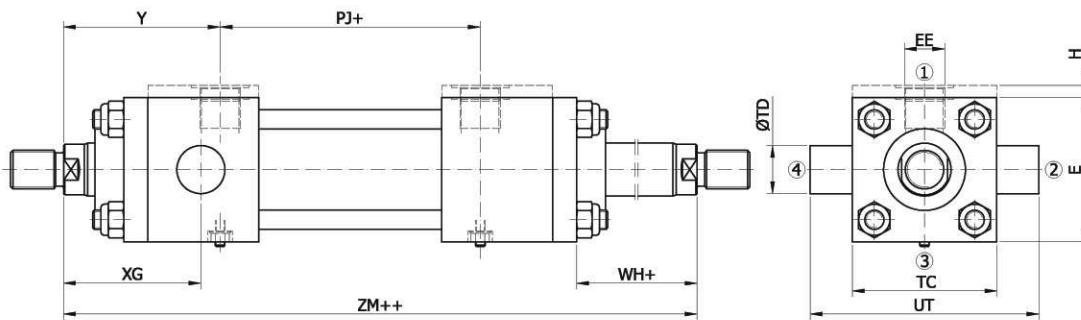


Double rod cylinders - Dimensions

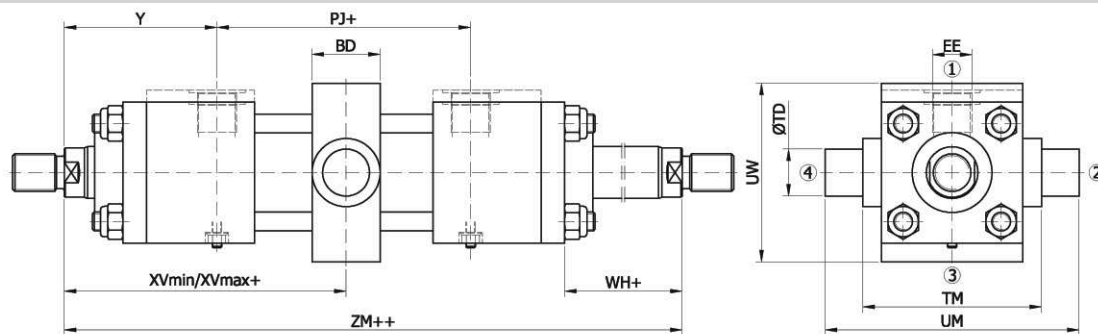
E (ISO MS2)



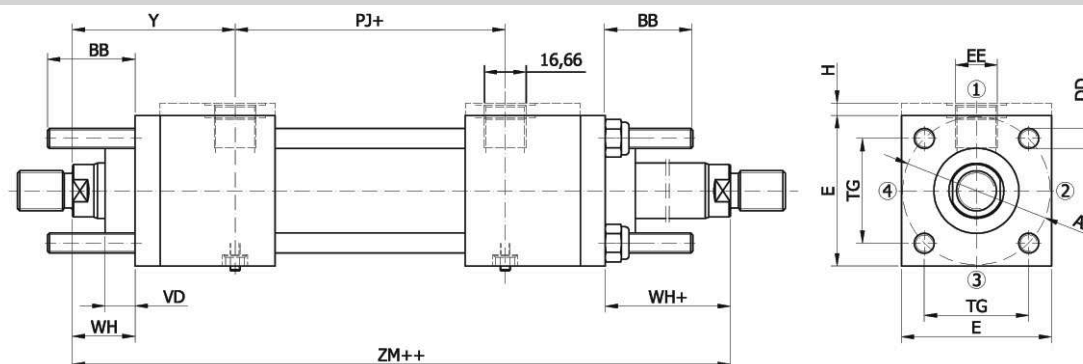
G (ISO MT1)



H (ISO MT4)



Q (ISO MX1)



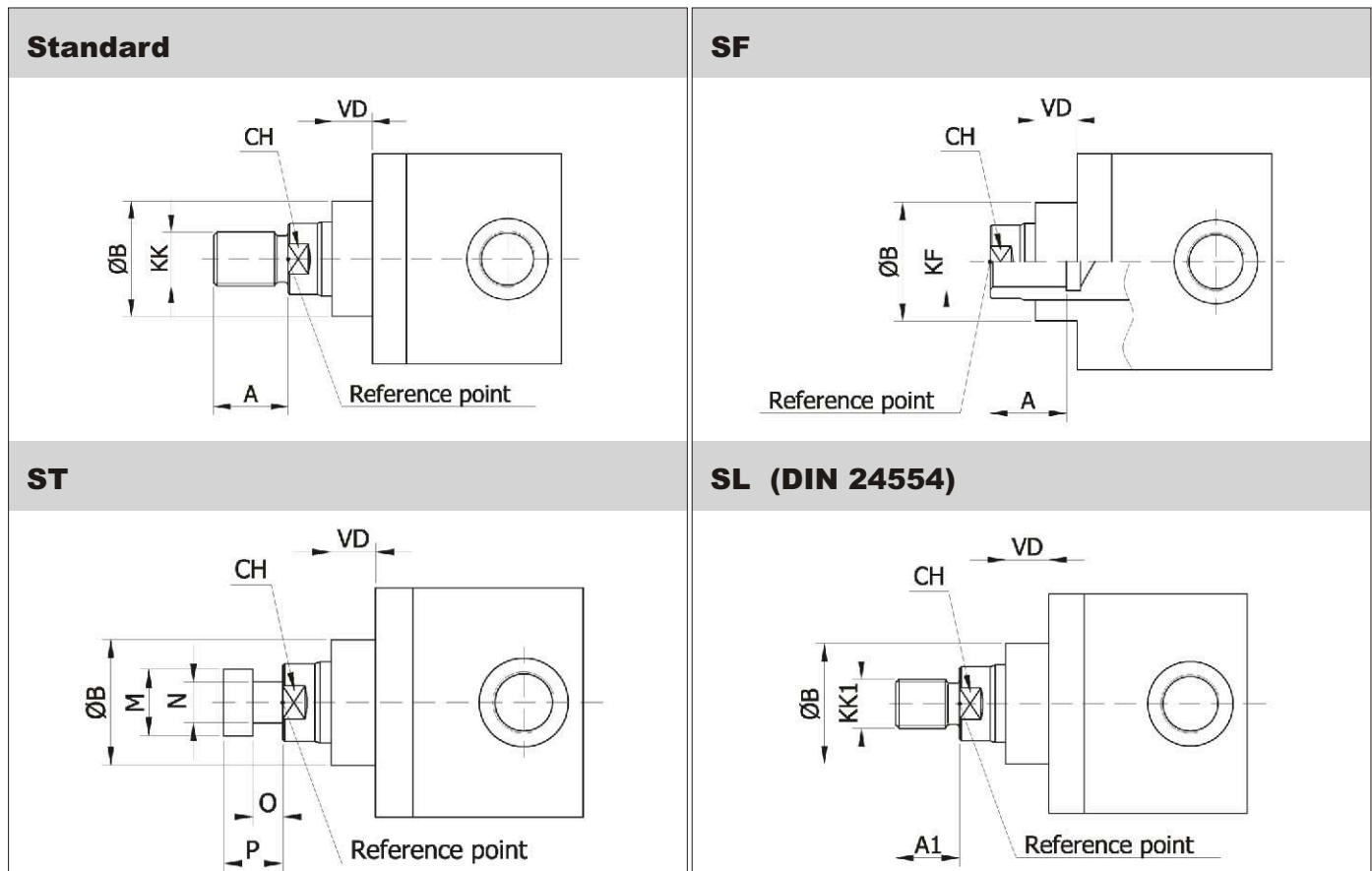
Double rod cylinders - Dimensions

Piston	Rod			AA	BB	BD	BG	DD	E	EE	F	FB	G	GA	H	JA	LH H10	PJ			
	25	12		18	40	19	20	12	M5x0.8	40	G1/4	10	5.5	32	-	5	32	19	49		
32	14	18	22	47	24	25	15	M6x1	45	G1/4	10	6.6	35.5	-	5	35.5	22	47			
40	18	22	28	59	35	29	18	M8x1	60	G3/8	10	11	46	-	-	46	31	58			
50	22	28	36	74	46	38	18	M12x1.25	75	G1/2	16	14	45	-	-	45	38	62			
63	28	36	45	91	46	48	18	M12x1.25	90	G1/2	16	14	45	-	-	45	44	64			
80	36	45	56	117	59	58	24	M16x1.5	115	G3/4	20	18	52	-	-	52	57	77			
100	45	56	70	137	59	68	24	M16x1.5	130	G3/4	22	18	55	-	-	55	63	78			
125	56	70	90	178	81	88	30	M22x1.5	165	G1	22	22	65	87	-	65	82	117			
160	70	90	110	219	92	108	35	M27x2	200	G1	25	26	70	95	-	70	101	130			
200	90	110	140	269	115	125	40	M30x2	245	G1 1/4	25	33	92	117	-	92	122	160			
Piston	R	RD f8	RT	SB	SS	ST	TC	TD f8	TG	TM	TO	TS	UM	UO	US	UT	UW	VD			
25	27	38	M5	6.6	73	8.5	38	12	28.3	48	51	54	68	65	72	58	45	6			
32	33	42	M6	9	73	12.5	44	16	33.2	55	58	63	79	70	84	68	50	12			
40	41	62	M8	11	98	12.5	63	20	41.7	76	87	83	108	110	103	95	70	12			
50	52	74	M12	14	92	19	76	25	52.3	89	105	102	129	130	127	116	90	9			
63	65	88(**)	M12	18	86	26	89	32	64.3	100	117	124	150	145	161	139	100	13			
80	83	105(**)	M16	18	105	26	114	40	82.7	127	149	149	191	180	186	178	130	9			
100	97	125(**)	M16	26	102	32	127	50	96.9	140	162	172	220	200	216	207	140	10			
125	126	150(**)	M22	26	131	32	165	63	125.9	178	208	210	278	250	254	265	180	10			
160	155	170(**)	M27	33	130	38	203	80	154.9	215	253	260	341	300	318	329	215	7			
200	190	210(**)	M30	39	172	44	241	100	190.2	279	300	311	439	360	381	401	300	7			
Piston	WF	WH	XB f9	XG	XS	XV		Y	ZM	(1)	(2)										
						MIN	MAX														
25	25	15	30	44	33	67	72+	45(*)	139++	10	5										
32	35	25	34	54	45	83	80+	58(*)	163++	10	9										
40	35	25	42	57	45	96	92+	65(*)	188++	15	20										
50	41	25	50	64	54	106	94+	69(*)	200++	20	70										
63	48	32	60	70	65	118	98+	76(*)	216++	30	70										
80	51	31	72	76	68	133	108+	82(*)	241++	35	160										
100	57	35	88	71	79	147	113+	91(*)	260++	45	160										
125	57	35	-	75	79	166	123+	86	289++	60	460										
160	57	32	-	75	86	182	120+	86	302++	70	820										
200	57	32	-	85	92	213	142+	98	356++	80	1150										

(1) Minimal stroke for H (ISO MT4) mounting; (2) Recommended torque for fixing screws [Nm]

(*) - dimension noncompliant to ISO 6020/2; (**) - dimension noncompliant to ISO 6020/2 for the smallest rod

Types of rod ends - Dimensions



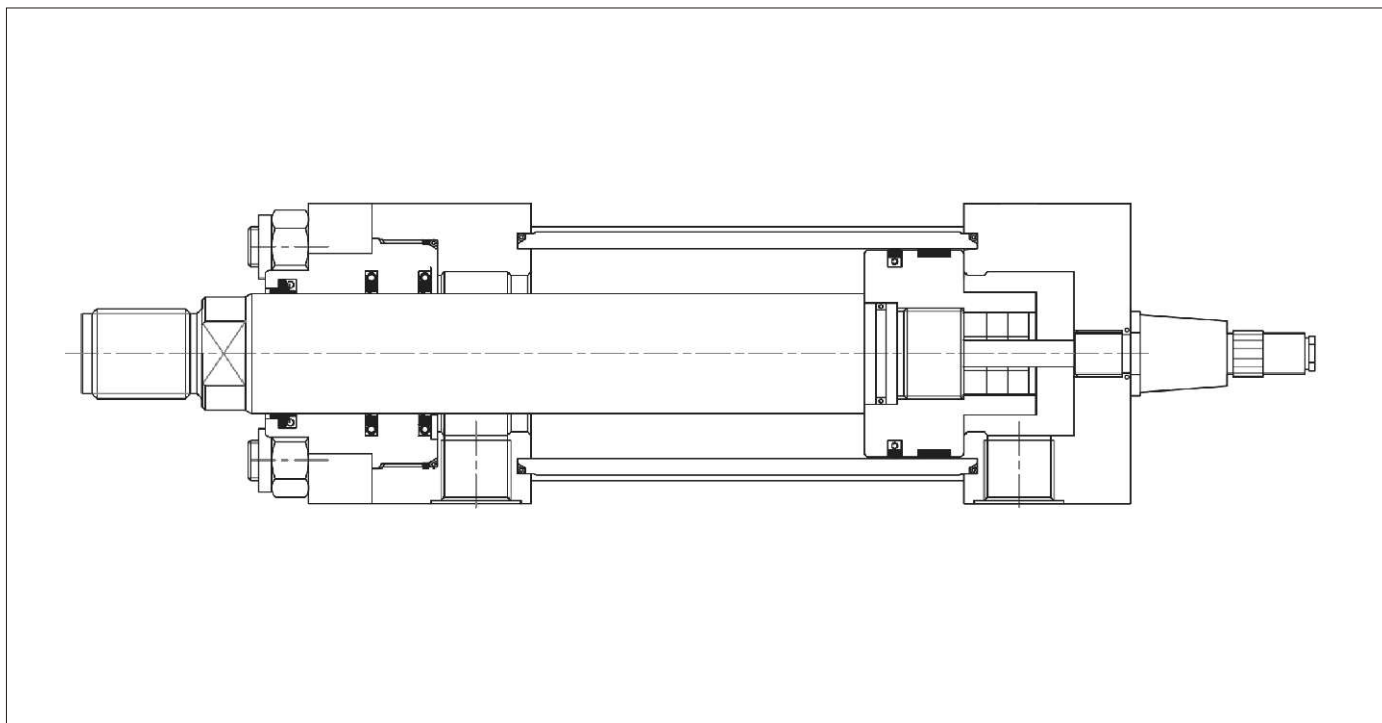
For types: Standard / SF/ ST

Rod	12	14	18	22	28	36	45	56	70	90	110	140
A	14	16	18	22	28	36	45	56	63	85	95	112
B f9	24	26	30	34	42	50	60	72	88	108	133	163
CH	10	12	15	19	22	30	36	46	60	75	95	120
KK	M10x1.25	M12x1.25	M14x1.5	M16x1.5	M20x1.5	M27x2	M33x2	M42x2	M48x2	M64x3	M80x3	M100x3
KF	M8x1	M10x1.25	M12x1.25	M16x1.5	M20x1.5	M27x2	M33x2	M42x2	M48x2	M64x3	M80x3	M100x3
M	11	13	16	18	22	28	35	45	56	70		
N	6.5	8	10	11	14	18	22	28	35	45		
O	5	6	7	8	10	13	16	20	25	35		
P	10	12	14	16	20	25	32	40	50	70		

For types: SL

Piston	25			32			40			50			63			80			100			125			160			200		
Rod	12	18	14	18	22	18	22	28	22	28	36	28	36	45	36	45	56	45	56	70	56	70	90	70	90	110	90	110	140	
A1	14			16			18			22			28			36			45			56			63			85		
B f9	24	30	26	30	34	30	34	42	34	42	50	42	50	60	50	60	72	60	72	88	72	88	108	88	108	133	108	133	163	
CH	10	15	12	15	19	15	19	22	19	22	30	22	30	36	30	36	46	36	46	60	46	60	75	60	75	95	75	95	120	
KK1	M10x1.25			M12x1.25			M14x1.5			M16x1.5			M20x1.5			M27x2			M33x2			M42x2			M48x2			M64x3		
VD	6			12			12			9			13			9			10			10			7			7		

Cylinders with position transducers

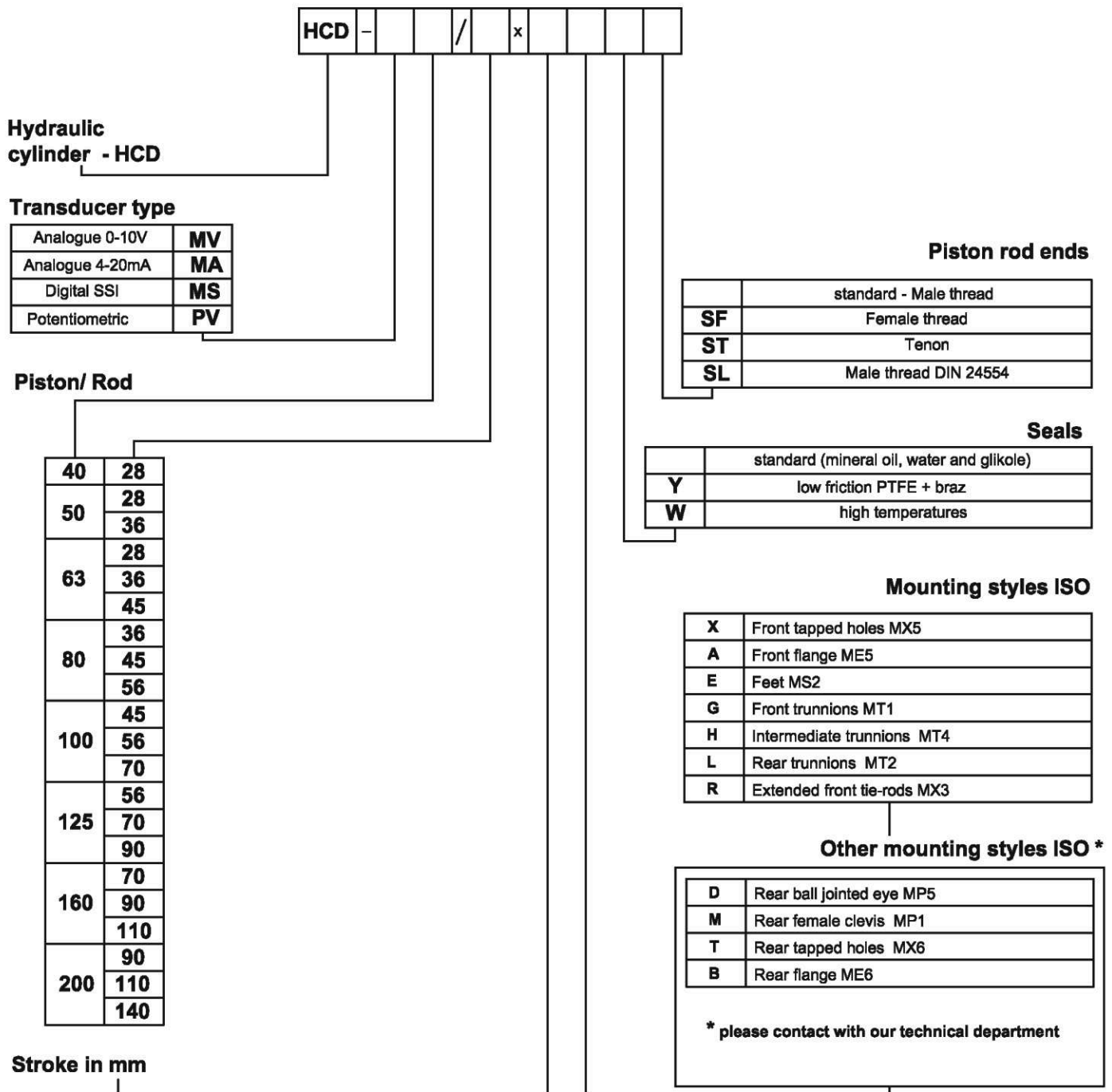


General characteristics*:

Hydraulic cylinders with position transducer are designed to operate with constant measurement of rod position. According to measured information, transducer generates an output signal analog or digital. The rod position transducer is built in cylinder's body ensuring compact design, dirt and shock protection.

Code	MV	MA	MS	PV
Transducer type	Temposonic	Temposonic	Temposonic	Potentiometric
Output signal	0-10V	4-20mA	SSI	
Supply voltage	24VDC			Maks. 60V
Resolution			0.005mm	
Linearity	$\leq \pm 0.05\%$ F.S. min. $\pm 0.05\text{mm}$	$\leq \pm 0.05\%$ F.S. min. $\pm 0.05\text{mm}$	$\leq \pm 0.02\%$ F.S.	
Repeatability	$\leq \pm 0.01\%$ F.S. min. $\pm 0.0025\text{mm}$	$\leq \pm 0.01\%$ F.S. min. $\pm 0.0025\text{mm}$	$\leq \pm 0.01\%$ F.S. min. $\pm 0.0025\text{mm}$	
Hysteresis	$\leq \pm 0.02\text{mm}$	$\leq \pm 0.02\text{mm}$		
Absorption	80mA	80mA	70mA	
Max speed	2m/s	2m/s	2m/s	1m/s
Temperature	-20 +65C	-20 +65C	-20 +65C	-20 +70C
Max stroke	2000mm	2000mm	2000mm	500mm

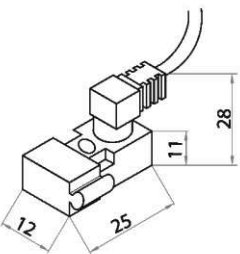
Cylinders with position transducers - Ordering code

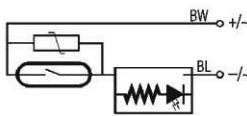


Example:
HCD-MV 50/28 500 AY SF
HCD-MA 125/70 200 E W

Cylinders with magnetic proximity switches - Types of switches

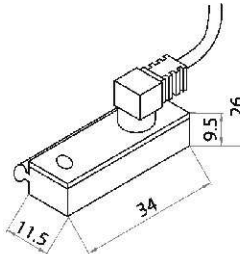
SR	
Voltage	24-110 V AC/DC
Max current	0,3A
Electric circuit	REED
Protection class	IP67 EN60529
Temperature range	-20°C + 80°C
Indication	LED
Cable	2x0,25 m ²
Cable length	5,0 mt

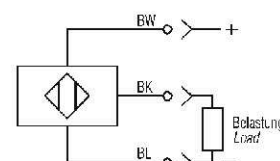




BW = braun / brown
BL = blau / blue

SH	
Voltage	24 VDC
Max current	0,25A
Electric circuit	PNP
Protection class	IP67 EN60529
Temperature range	-20°C + 80°C
Indication	LED
Cable	3x0,25 m ²
Cable length	5,0 mt





BW = braun / brown
BL = blau / blue
BK = schwarz / black

Hydraulic compact cylinders



3

HYDRAULIC COMPACT CYLINDERS

TYPE HCDU

Nominal pressure 160bar

Main features:

- Piston diameter from 25mm to 100mm
- Rod diameter from 18mm to 45mm
- Stroke 20 or 50mm
- Cylinder body made with special light alloy
- Version with proximity switches available

Type HCDU - Introduction

General characteristics:

Double acting cylinders designed to ensure strong and compact construction, dirt and shock protection. It is also version with built-in proximity switches available. This type of cylinders is designed mainly for use in the industrial automation.

Working conditions:

Working pressure	Maximum: 16MPa (160bar)
Temperature	Standard: - 20°C ÷ 80°C, Maximum: for VITON - 20°C ÷ 150°C
Speed	Standard: 0,5 m/s Maximum: 1 m/s
Fluid	Standard: Hydraulic mineral oils Special: HFC fluids, phosphate esters
Viscosity	12 ÷ 80 mm ² /S

Type HCDU - Materials

Cylinder's body: Cylinder's body is made of special light alloy.

Rod: In standard, chrome plated bars quenched and tempered 42CrMo4 are used. In special executions, chrome plated and induction surface hardened bars CK45H may be used. For corrosive environments, stainless steel bars with chrome plating like AISI 431, AISI 316, AISI 304, or bars with nickel-chromium (NI-Cr) plating NICROM 350 are recommended. Each material is attested by its producer.

Sealing system: There are several types of sealing systems from companies like Trelleborg, Freudenberg, Simrit and Guarnitec, used respectively according to working conditions. If necessary, Slip-Cup type sealing, Teflon (PTFE) tapes are used. In case of high temperatures Viton sealing or other high temperature-resistant systems are recommended.

Finishing: Cylinders are finished with oxidizing.

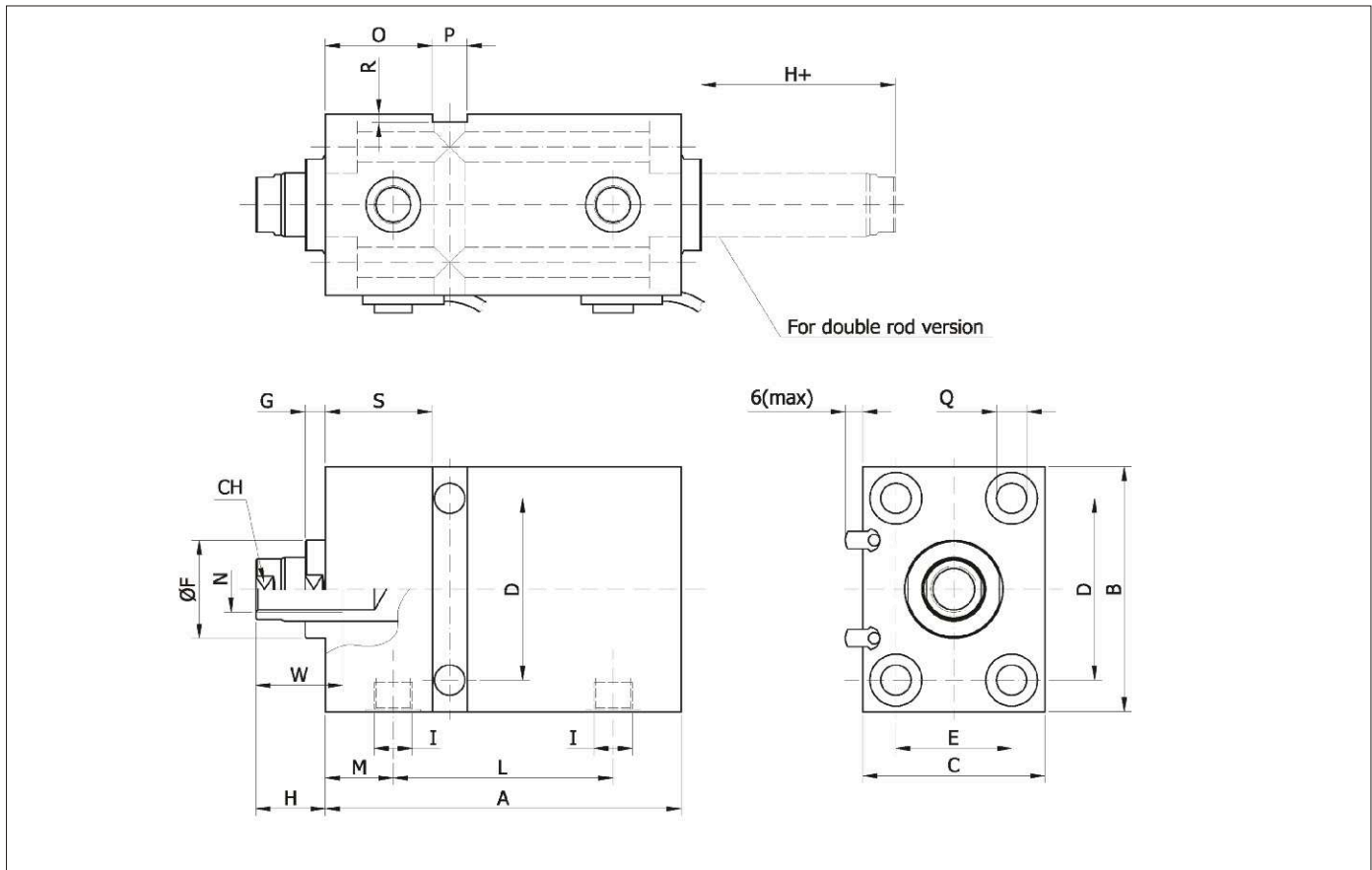
Quality: Each cylinder is supplied with quality certificate and warranty.

Type HCDU - Ordering code

HCDU -																									
Hydraulic cylinder - HCDU	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Standard</td> <td style="padding: 2px; text-align: center;">R</td> </tr> <tr> <td style="padding: 2px;">Magnetic</td> <td style="padding: 2px; text-align: center;">M</td> </tr> </table>	Standard	R	Magnetic	M	Quantity of proximity switches		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px; text-align: center;">2</td> <td style="padding: 2px;">in standard- 2 switches</td> </tr> </table>		2	in standard- 2 switches	Option- proximity switch		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px; text-align: center;">SC</td> <td style="padding: 2px;">Standard for magnetic version MU</td> </tr> </table>		SC	Standard for magnetic version MU	Seals				Spacer			
Standard	R																								
Magnetic	M																								
2	in standard- 2 switches																								
SC	Standard for magnetic version MU																								
Piston in mm	Rod no. 1 in mm		Rod no. 2 in mm (optional)		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px;">standard (mineral oil, water and glykole)</td> </tr> <tr> <td style="padding: 2px; text-align: center;">Y</td> <td style="padding: 2px;">low friction PTFE + braz</td> </tr> <tr> <td style="padding: 2px; text-align: center;">W</td> <td style="padding: 2px;">high temperatures</td> </tr> <tr> <td style="padding: 2px; text-align: center;">N</td> <td style="padding: 2px;">HFC fluids</td> </tr> </table>					standard (mineral oil, water and glykole)	Y	low friction PTFE + braz	W	high temperatures	N	HFC fluids	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px; text-align: center;">SJ</td> <td style="padding: 2px;">SJ=... -length in mm</td> </tr> </table>				SJ	SJ=... -length in mm			
	standard (mineral oil, water and glykole)																								
Y	low friction PTFE + braz																								
W	high temperatures																								
N	HFC fluids																								
SJ	SJ=... -length in mm																								
Oil ports	Stroke in mm																								
Standard	20mm		50mm																						
Front																									
Rear																									
Lateral																									

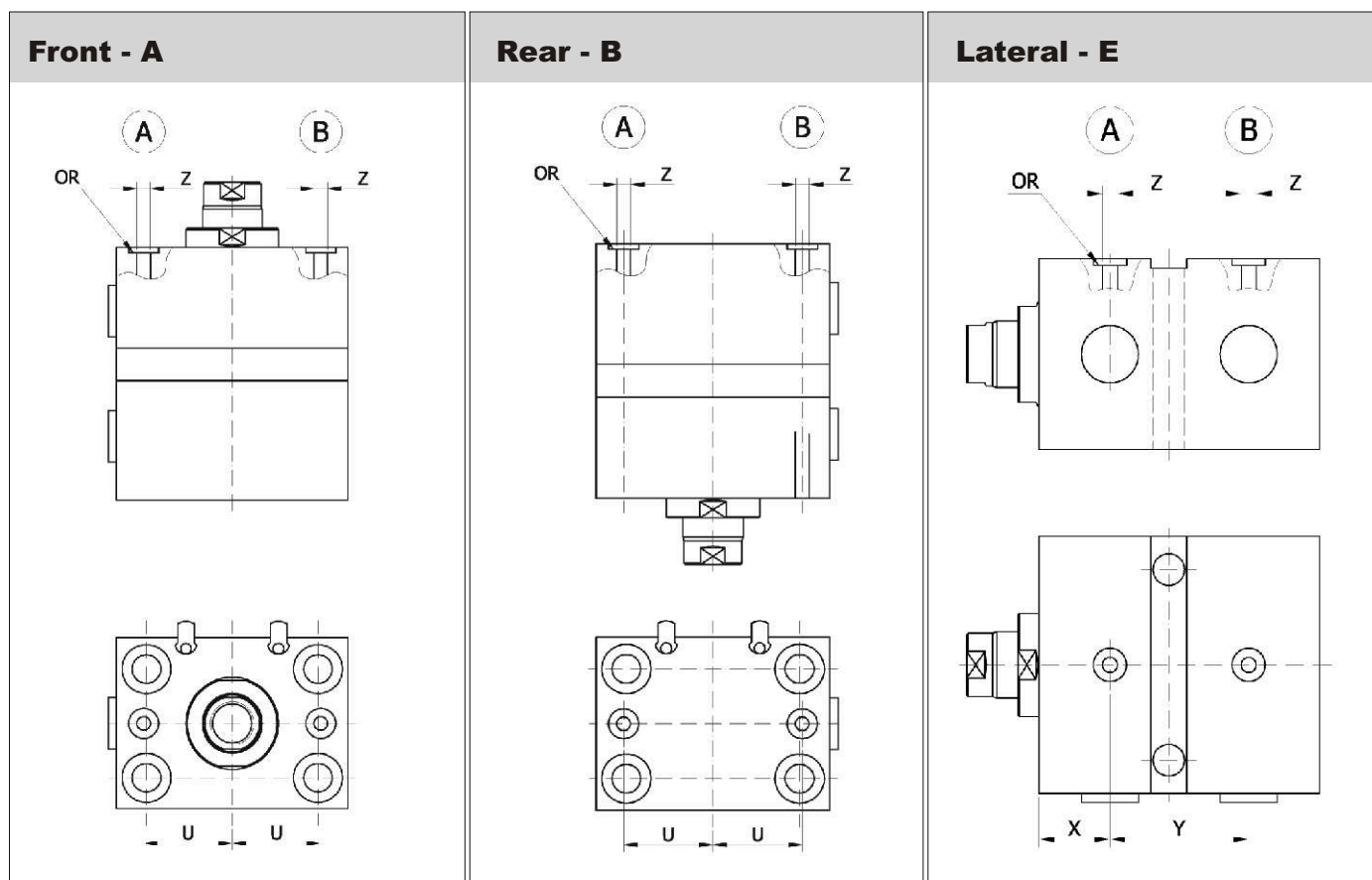
Examples:
HCDU-R 32/22 X 20 SJ 5mm
HCDU-M 50/28 X 50 Y SC 2

Type HCDU - Dimensions



Piston	25		32		40		50		63		80		100	
Rod	18		22		22		28		28		36		45	
Stroke	20	50	20	50	20	50	20	50	20	50	20	50	20	50
A	77	107	80	110	93	123	95	125	105	135	120	150	130	160
B	65		75		85		100		115		140		170	
C	45		55		63		75		90		110		140	
CH	15		19		19		22		22		30		36	
D	50		55		63		76		90		110		135	
E	30		35		40		45		55		75		95	
F f8	32		34		34		42		50		60		72	
G	6.5		8		7		8		7		7		8	
H	14		15		17		20		20		20		25	
I	G1/4"		G1/4"		G1/4"		G1/4"		G3/8"		G1/2"		G1/2"	
L	43	73	44	74	46	76	48	78	53	83	60	90	60	90
M	17		18		23.5		23.5		26		30		35	
N	M10		M12		M14		M20		M20		M27		M33	
O	32		34		37		37.5		47.5		50		60	
P	10		12		12		15		15		20		20	
Q	8.5		10.5		10.5		13		13		17		17	
R	2		3		3		5		5		5		5	
S	37		40		43		45		55		60		70	
W	23		23		30		30		30		40		50	

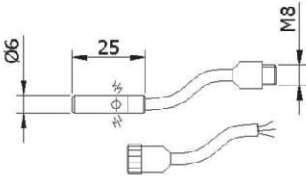
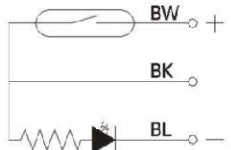
Type HCDU - Oil ports versions



Piston	U	X	Y	Z	OR
25	25.5	17	23	4	106 (610)
32	30	18	24	4	106 (610)
40	32.5	23.5	26	5	106 (610)
50	40	23.5	28	7	108 (611)
63	47.5	26	33	7	108 (611)
80	59	30	40	7	108 (611)
100	70	35	40	7	108 (611)

Type HCDU - Proximity switches

SC	
Max voltage	24V AC/DC
Max current (at 25C)	0.25A
Electric circuit	REED
Protection class	IP 67
Temperature range	-20°C ÷ 80°C
Indication	LED
Cable	3x0.25mm ²
Cable lenght	3mb



4

HYDRAULIC CYLINDERS ISO 6022

TYPE HDP

Nominal pressure 250bar (25MPa)

Main features:

- Piston diameter from 50mm to 320mm
- Rod diameter from 32mm to 220mm
- Stroke up to 6000mm
- Maximum pressure 320bar (32MPa)
- 7 mounting styles

Type HDP - Introduction

Overview:

Hydraulic cylinders produced by HYDRO ZNPHS are designed to operate in hydraulic drives of machines. Wide range of diameters and mounting styles suits the requirements of both industrial and mobile applications.

Working conditions:

Working pressure	Standard: 25MPa (250 bar) Maximum: 32MPa (320bar)
Temperature	Standard: - 20°C ÷ 80°C, Maximum: for VITON - 20°C ÷ 150°C
Speed	Standard: 0,5 m/s Maximum: 1 m/s
Fluid	Standard: Hydraulic mineral oils Special: HFC fluids, phosphate esters
Viscosity	12 ÷ 90 mm ² /S

Type HDP - Materials

Cylinder: Cylinders are basically made of cold drawn welded steel tubes (ST52.3), honed, in diameter tolerance H8.

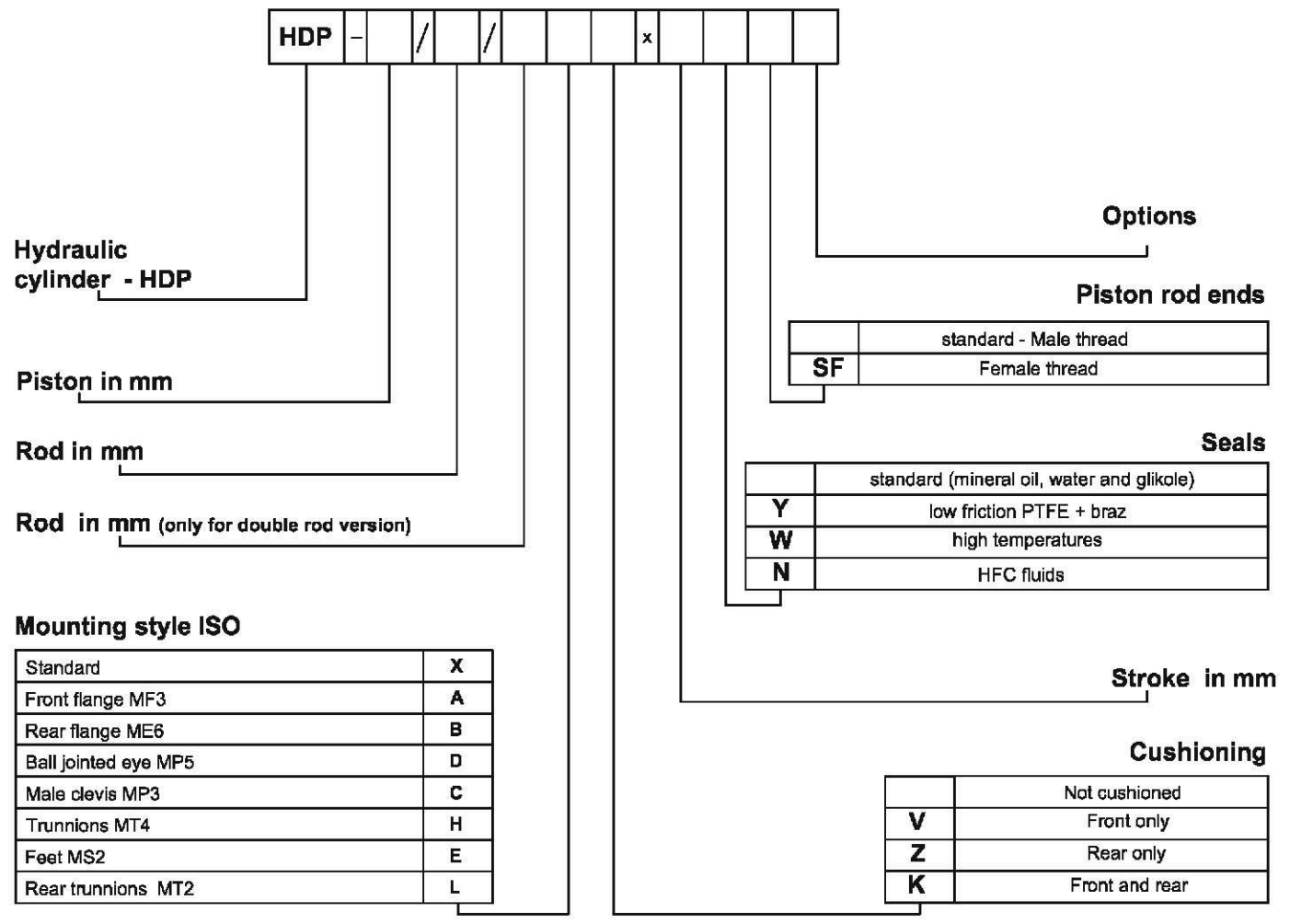
Rod: In standard, chrome plated bar hardened and tempered 42CrMo4 are used for the rod material. In other executions, chrome plated and induction hardened bars CK45H may be used. For corrosive environments, stainless steel bars with chrome plating like AISI 431, AISI 316, AISI 304, or bars with nickel-chromium (NI-Cr) plating NICROM 350 are recommended. Each material is attested by its producer.

Sealing system: There are several types of sealing systems from companies like Trelleborg, Freudenberg, Simrit and Guarnitec, used respectively according to working conditions. If necessary, Slip-Cup type sealing, Teflon (PTFE) tapes are used. In case of high temperatures, Viton sealing or other high temperature-resistant systems are recommended.

Finishing: Cylinders are finished with primer painting and on customer request it's possible to use lacquer, tin or zinc coating.

Quality: Each cylinder is supplied with quality certificate and warranty.

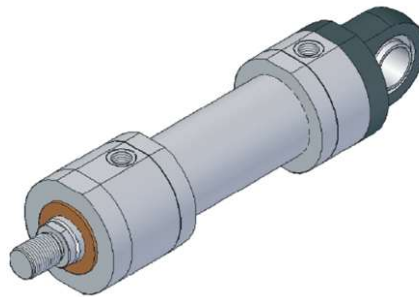
Type HDP - Ordering code



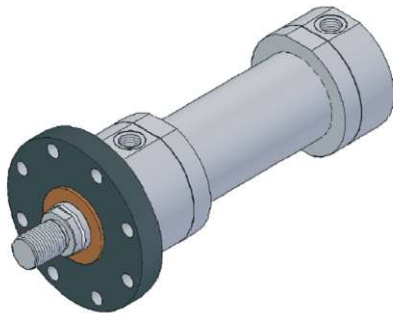
Examples:
HDP 50/36 A K 500 Y

Type HCD - Mounting styles

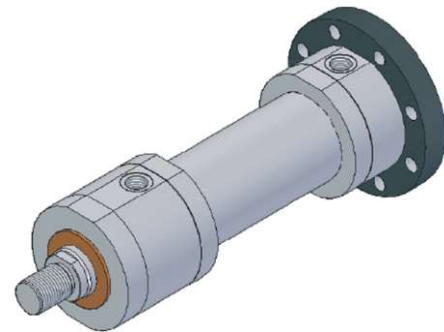
X BASIC VERSION



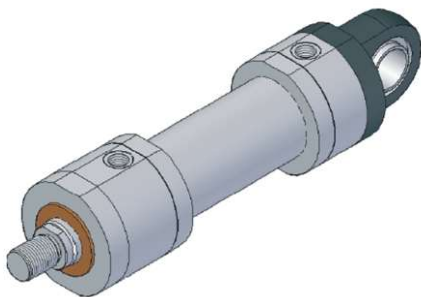
A (ISO MF3)



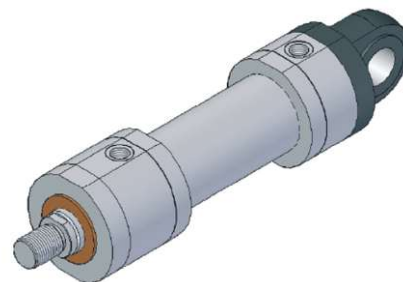
B (ISO MF4)



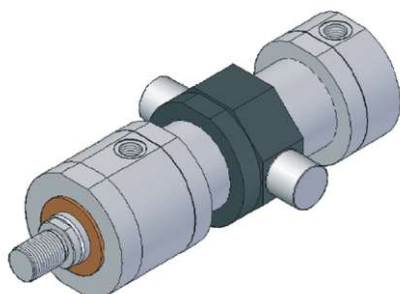
D (ISO MP5)



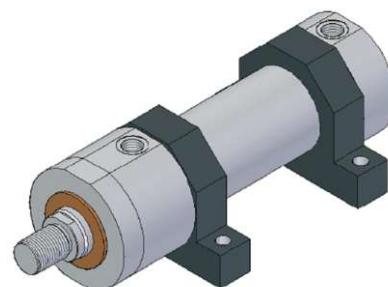
C (ISO MP3)



H (ISO MT4)

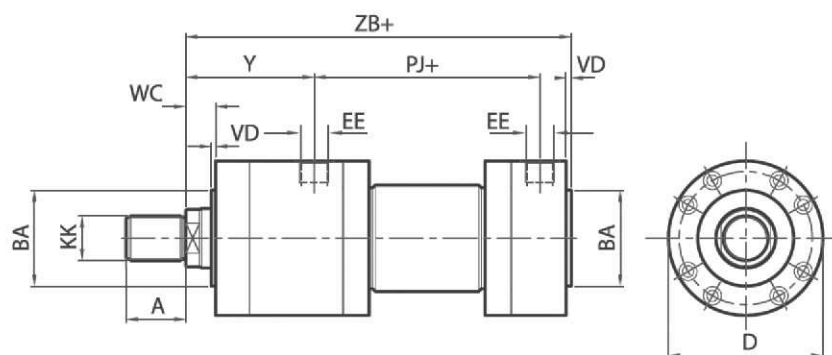


E (ISO MS2)

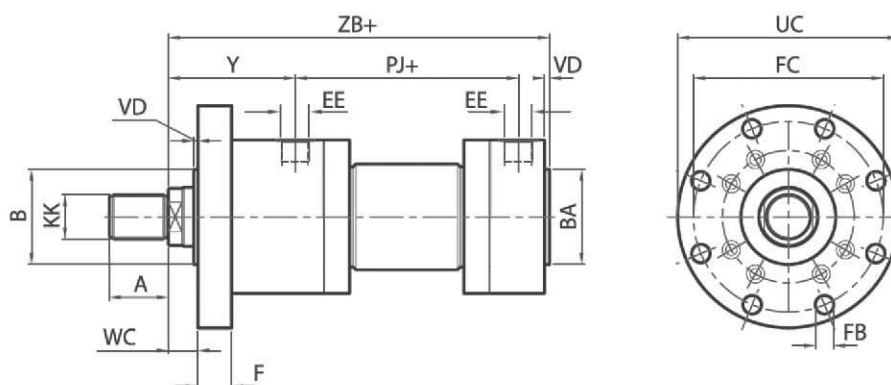


Type HDP - Dimensions

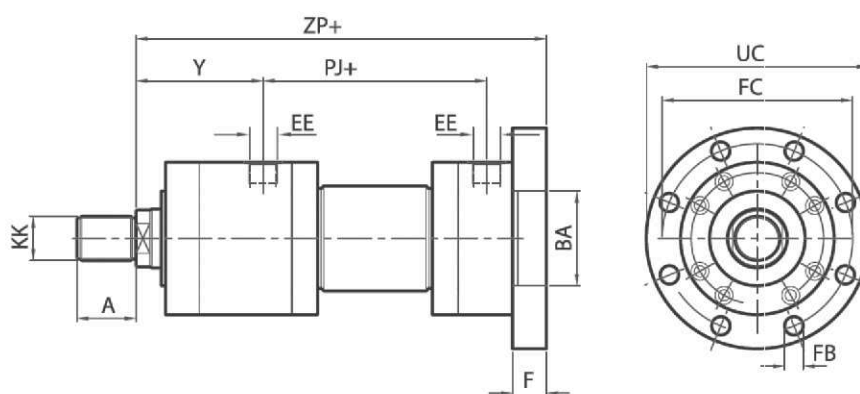
X



A (ISO MF3)

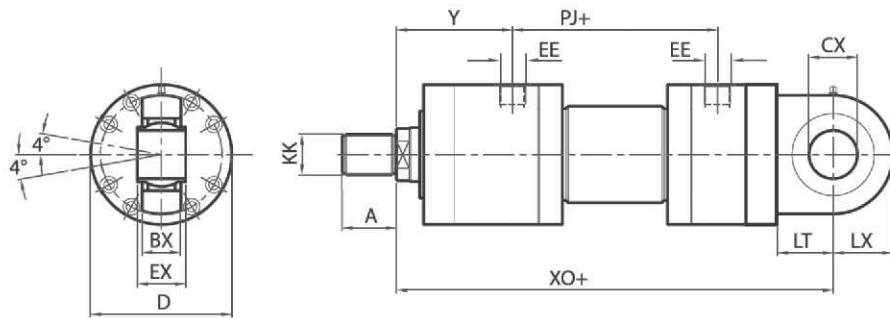


B (ISO MF4)

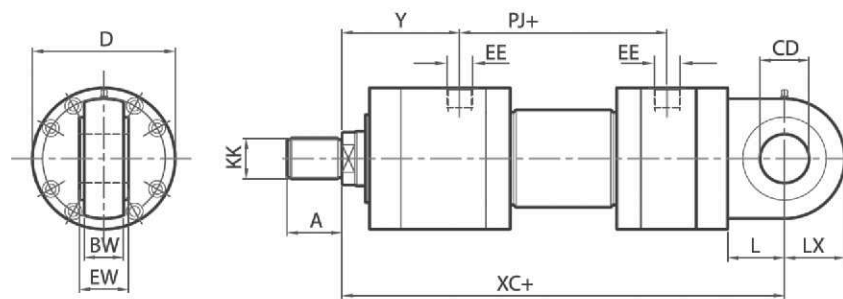


Type HDP - Dimensions

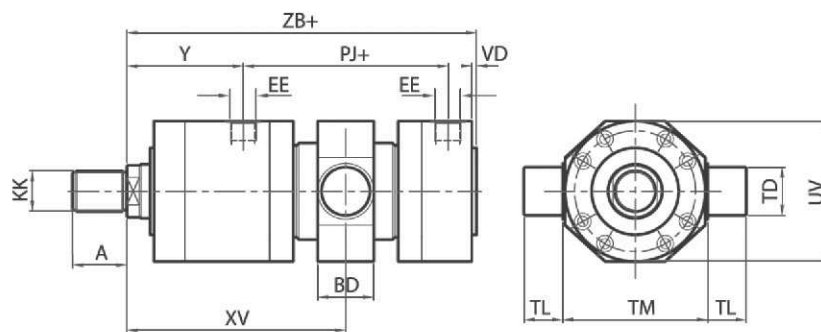
D (ISO MP5)



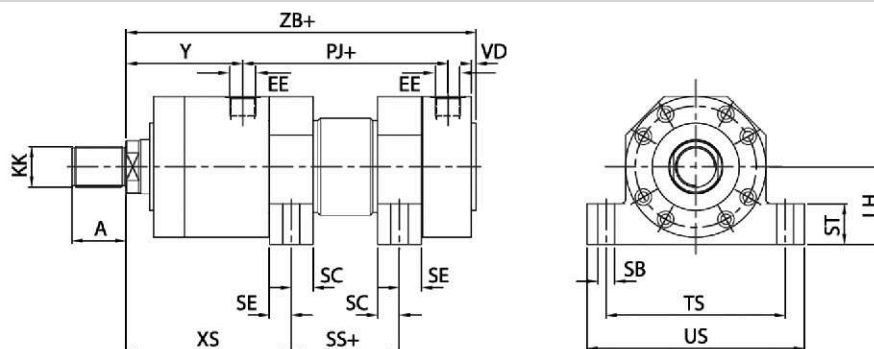
C (ISO MP3)



H (ISO MT4)



E (ISO MS2)



Type HDP - Dimensions

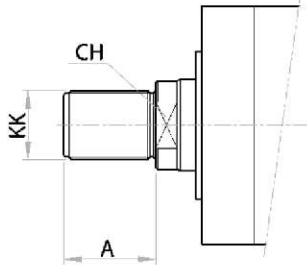
Piston	50	63	80	100	125	140*	160	200	250	320
B f8	63	75	90	110	132	145	160	200	250	320
BA f8	63	75	90	110	132	145	160	200	250	320
BD	38	48	58	73	88	98	108	133	180	220
BW	27	35	40	52	60	65	84	102	130	162
BX	27	35	40	52	60	65	84	102	130	162
CD H9	32	40	50	63	80	90	100	125	160	200
CX H7	32	40	50	63	80	90	100	125	160	200
D	105	124	148	175	208	255	270	330	412	510
EW	32	40	50	63	80	90	100	125	160	200
EX	32	40	50	63	80	90	100	125	160	200
EE	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"	G 1 1/2"	G 1 1/2"
F	25	28	32	36	40	40	45	56	63	80
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	8 x Ø 39	8 x Ø 45
FC	132	150	180	212	250	300	315	385	475	600
L	40	50	63	71	90	115	112	160	200	250
LT	40	50	63	71	90	115	112	160	200	250
LH h10	60	68	80	95	115	135	145	170	215	260
LX	38	50	61.5	71	90	113	112	145	178	230
PJ	120+	136+	156+	172+	205+	208+	235+	278+	325+	350+
PJ1	120+	136+	156+	172+	214+	208+	240+	280+	320+	350+
SB	11	13.5	17.5	22	26	30	33	40	52	62
SC	15.5	17.5	22.5	27.5	30	35.5	37.5	45	50	60
SE	15.5	17.5	22.5	27.5	30	35.5	37.5	45	50	60
ST	32	37	42	52	62	77	77	87	112	152
SS	55+	55+	55+	55+	60+	61+	79+	90+	120+	120+
TD f8	32	40	50	63	80	90	100	125	160	200
TL	25	32	40	50	63	70	80	100	125	160
TM	112	125	150	180	224	265	280	335	425	530
TS	135	155	185	220	270	325	340	405	520	620
UC	155	175	210	250	290	340	360	440	540	675
US	160	185	225	265	325	390	405	480	620	740
UV	108	124	148	175	218	260	280	330	412	510
VD	4	4	5	5	6	5	5	10	12	14
WC	22	25	28	32	36	36	40	45	50	56
XC	305+	348+	395+	442+	520+	580+	617+	756+	903+	1080+
XO	305+	348+	395+	442+	520+	580+	617+	756+	903+	1080+
XS	130	147.5	170.5	192.5	230	254.5	265.5	315	360	425
XV min	187	212	245	280	340	380	400	450	540	625
XV max	132+	137+	155+	160+	180+	200+	220+	260+	300+	325+
Y	98	107	120	134	153	181	185	220	260	310
ZB	244+	274+	305+	340+	396+	430+	467+	550+	652+	764+
ZB3	316++	350++	396++	440++	520++	570++	610++	720++	840++	970++
ZP	265+	298+	332+	371+	430+		505+	596+	703+	830+

Rod	32	36	40	45	50	56	63	70	80	90	90	100	100	110	125	140	160	180	200	220
A	36	36	45	45	56	56	63	63	85	85	90	90	95	95	112	112	125	125	160	160
CH	28	32	34	36	43	46	52	60	65	75	75	-	-	-	-	-	-	-	-	-
KK	M27x2		M33x2		M42x2		M48x2		M64x3		M72x3		M80x3		M100x3		M125x4		M160x4	
KF	-	M27x2	-	M33x2	-	M42x2	-	M48x2	-	M64x3	-	M72x3	-	M80x3	-	M100x3	-	M125x4	-	M160x4

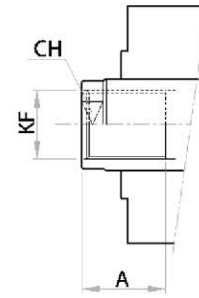
(+) Add stroke, (++) Add the double of stroke, (**) Bore noncompliant with ISO 6022 standard

Types of rod ends - Dimensions

Standard



SF (Female)



Hydraulic cylinders

Applications



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