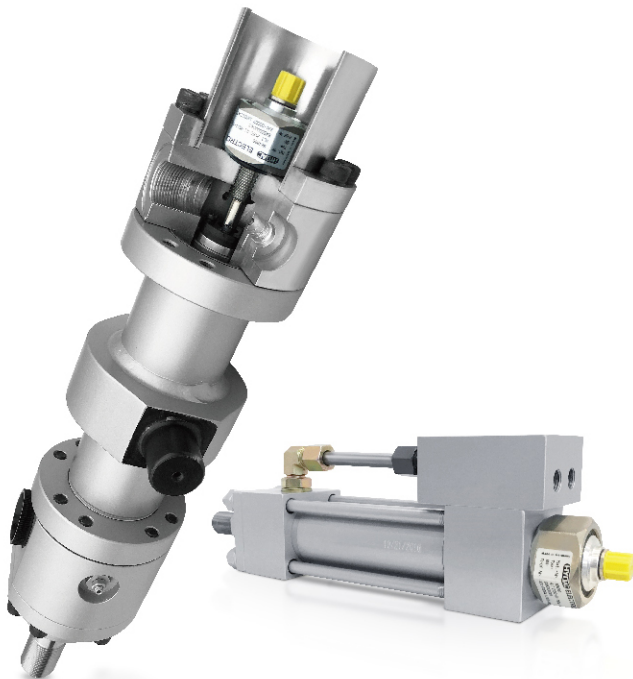


ASHUN

Heavy Duty Metric Mill Types |

- ✦ AH series (ISO 6022)
- ✦ AK series (ISO 6020-1)
- ✦ AT series (ISO 6020-2)



Jan. 2017

油順精密股份有限公司
ASHUN FLUID POWER CO., LTD.

www.ashun.com

**A WORLD-CLASS MANUFACTURER
of Fluid Power Systems**

Your Partner for Fluid Power Systems

ASHUN FLUID POWER was established in 1984.

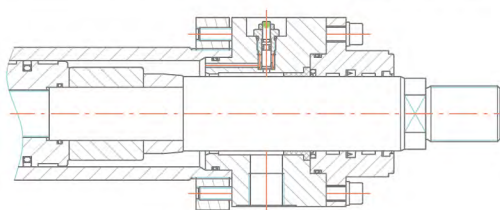
As an international qualified manufacturer of fluid power systems, our products are hydraulic cylinders, pneumatic cylinders, hydraulic valves, accumulators and hydraulic power units, etc. Customized products are available.

ASHUN is based on professional fluid power systems, and has been devoting continuously efforts on developing new products and replenishing automation equipment to promote efficiency of product lines and quality. Now ASHUN products are sold to oversea markets with excellent reputation.

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AH series

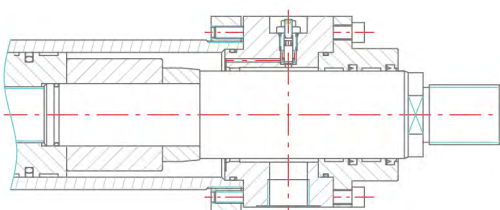
■ ISO 6022 25MPa Standard Hydraulic Cylinders



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AK series

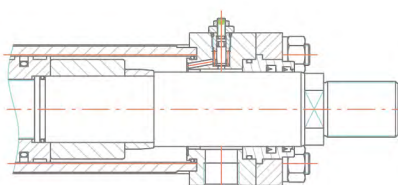
■ ISO 6020-1 16 MPa Standard Hydraulic Cylinders



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AT series

■ ISO 6020-2 16MPa Standard Hydraulic Cylinders



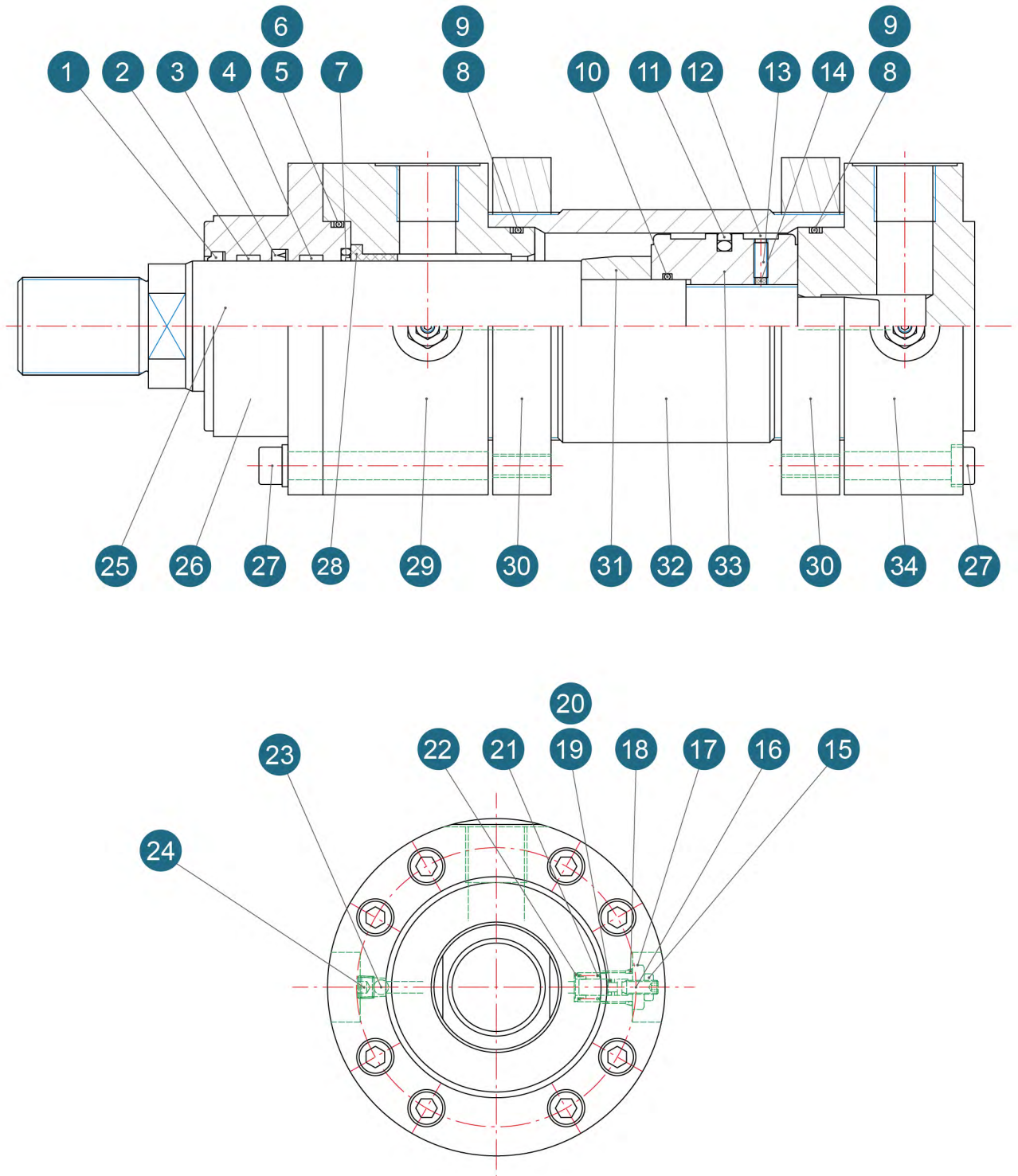
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- **ISO 6022** 25MPa Standard Hydraulic Cylinders
- MF3 / MF4 / MP3 / MP5 / MS2 / MT4

Parts List



STANDARD CYLINDERS

NO	Description
1	Dust Wiper
2	Wearing Ring
3	Rod Seal
4	Wearing Ring
5	O Ring
6	Backup Ring
7	Rod Seal
8	O Ring
9	Backup Ring
10	O Ring
11	Piston Seal
12	Wearing Ring
13	Screw Stop Pin
14	Copper Bushing

NO	Description
15	Nut
16	Cushion Pin
17	Cushion Pin Cap
18	O Ring
19	O Ring
20	Backup Ring
21	Spring
22	Cushion Pin Sleeve
23	Ball Bearing
24	PT Stopper

NO	Description
25	Piston Rod
26	Front Cap
27	Hex Socket Screws
28	Rod Bush
29	Front Cap
30	Flange
31	Cushion Sleeve
32	Cylinder Tube
33	Piston
34	End Cap

■ ISO 6022 25MPa Standard Hydraulic Cylinders

MF3 / MF4 / MP3 / MP5 / MS2 / MT4

HOW TO ORDER

Model Code:

AH R - MP5 - 063 - B - A A - 040 - B - B B - D D - 0100 - H2 - H1 - ES2

SERIES

SENSORS

Magnet + Sensors Switch = **R**
Linear Position Transmitter = **S**
Proximity Sensors = **T**
(No Symbol - No Device)

MOUNTING TYPES

Round Flange at Head = **MF3**
Round Flange at Base = **MF4**
Plain Clevis at Base = **MP3**
Self-aligning Clevis at Base = **MP5**
Foot Mounting = **MS2**
Trunnion = **MT4**

BORE

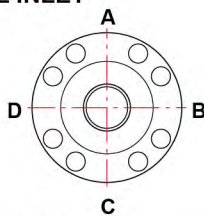
Piston Ø **40** to **320** mm

SEAL

Standard (-20° C ~ +80° C) = **B**
Viton (-20° C ~ +150° C) = **C**

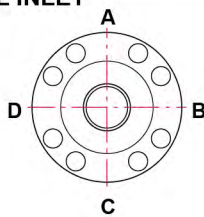
POSITION OF OIL INLET

Location at Head
A = Standard



POSITION OF OIL INLET

Location at Base
A = Standard



ROD

Piston Rod Ø **25** to **220** mm
(S45C = Standard)

CUSHION DEVICE

Front and Rear = **B**
Front only = **X**
Rear only = **Y**
None = **N**

SENSORS SWITCH

Only Front Rear = **ES1** /
Front and Rear = **ES2** /
Position Not Fixed = **ES3** /
Position Not Fixed = **ES4** /
Position Not Fixed = **ES5** /
(No Symbol "R" - No Accessory)

ROD ACCESSORY

Please Refer Page **07 ~ 08**
(No Symbol - No Accessory)

BORE ACCESSORY

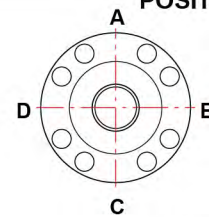
Please Refer Page **07 ~ 08**
(No Symbol - No Accessory)

STROKE

Stroke Length in **mm**

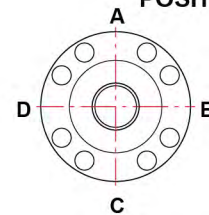
POSITION OF AIR VENT

Location at Base
D = Standard



POSITION OF AIR VENT

Location at Head
D = Standard



POSITION OF CUSHION

Location at Base
Please Refer Oil Inlet Configuration
B = Standard

POSITION OF CUSHION

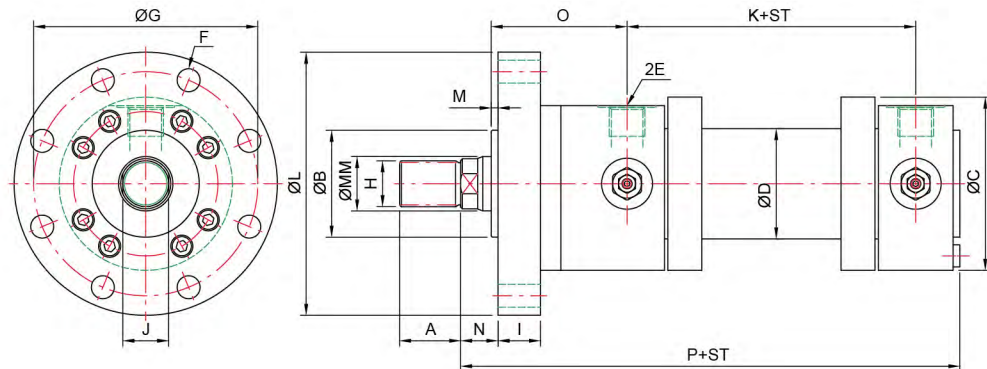
Location at Head
Please Refer Oil Inlet Configuration
B = Standard

SPACERS

0 mm . For stroke of 0 ~ 1000 mm
50 mm . For stroke of 1001 ~ 1500 mm
100 mm . For stroke of 1501 ~ 2000 mm
150 mm . For stroke of 2001 ~ 2500 mm
200 mm . For stroke of 2501 ~ 3000 mm

The Cylinder Length is increased

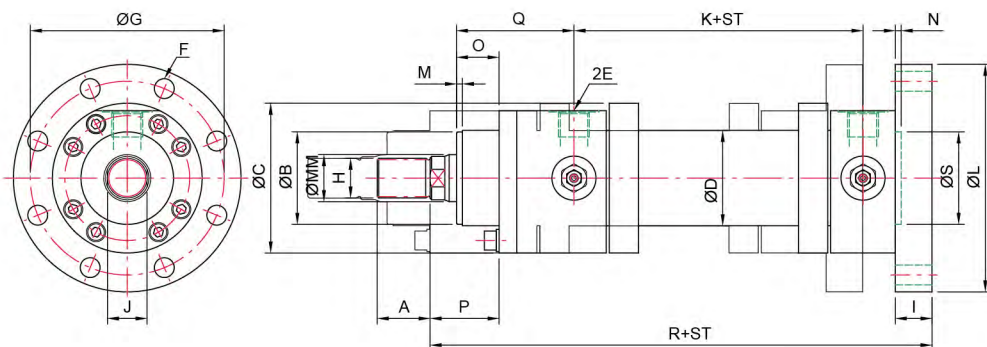
AH-MF3



DIMENSION

BORE	MM	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Ø40	25 / 28	28	52	88	55	1/2"G	8xØ11	115	M20xP1.5	25	19 / 22	120	138	4	22	83	230
Ø50	32 / 36	36	63	102	65	1/2"G	8xØ13.5	132	M27xP2	25	27 / 30	120	155	4	22	98	244
Ø63	40 / 45	45	75	120	76	3/4"G	8xØ13.5	150	M33xP2	28	32 / 36	133	175	4	25	112	274
Ø80	50 / 56	56	90	145	100	3/4"G	8xØ17.5	180	M42xP2	32	41 / 46	155	210	4	28	120	305
Ø100	63 / 70	63	110	170	120	1"G	8xØ22	212	M48xP2	36	50 / 60	171	250	5	32	134	340
Ø125	80 / 90	85	132	206	150	1"G	8xØ22	250	M64xP3	40	65 / 75	205	290	5	36	153	396
Ø140	90 / 100	90	145	226	170	1 1/4"G	8xØ26	280	M72xP3	40	75 / 85	219	325	5	36	166	431
Ø160	100 / 110	95	160	265	190	1 1/4"G	8xØ26	315	M80xP3	45	85 / 95	235	360	5	40	185	467
Ø180	110 / 125	105	185	292	216	1 1/4"G	8xØ33	350	M90xP3	50	95 / 110	264	405	5	45	194	510
Ø200	125 / 140	112	200	306	245	1 1/4"G	8xØ33	385	M100xP3	56	110 / 120	278	440	5	45	220	550
Ø220	140 / 160	125	235	355	270	1 1/2"G	8xØ39	435	M125xP4	63	120 / 140	325	500	8	50	244	637
Ø250	160 / 180	125	250	412	299	1 1/2"G	8xØ39	475	M125xP4	63	140 / 160	325	540	8	50	260	652
Ø320	200 / 220	160	320	500	385	2"G	8xØ45	600	M160xP4	80	180 / 200	350	675	8	56	310	764

AH-MF4



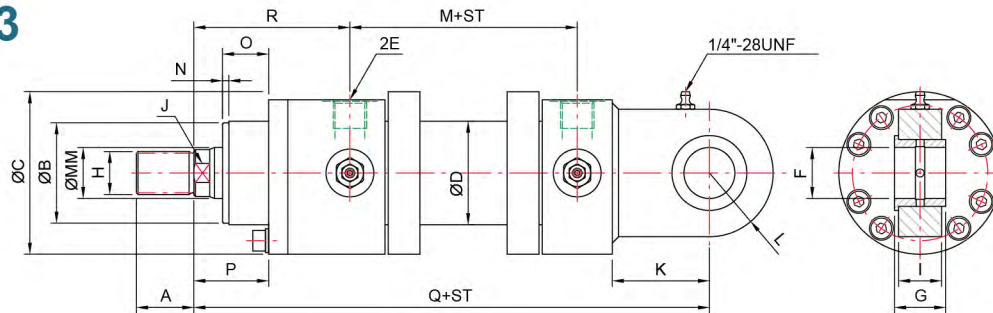
DIMENSION

BORE	MM	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
Ø40	25 / 28	28	52	88	55	1/2"G	8xØ11	115	M20xP1.5	25	19 / 22	120	138	4	5	29	47	83	250	52
Ø50	32 / 36	36	63	102	65	1/2"G	8xØ13.5	132	M27xP2	25	27 / 30	120	155	4	4	29	47	98	265	63
Ø63	40 / 45	45	75	120	76	3/4"G	8xØ13.5	150	M33xP2	28	32 / 36	133	175	4	4	32	53	112	298	75
Ø80	50 / 56	56	90	145	100	3/4"G	8xØ17.5	180	M42xP2	32	41 / 46	155	210	4	5	36	60	120	332	90
Ø100	63 / 70	63	110	170	120	1"G	8xØ22	212	M48xP2	36	50 / 60	171	250	5	5	41	68	134	371	110
Ø125	80 / 90	85	132	206	150	1"G	8xØ22	250	M64xP3	40	65 / 75	205	290	5	6	45	76	153	430	132
Ø140	90 / 100	90	145	226	170	1 1/4"G	8xØ26	280	M72xP3	40	75 / 85	219	325	5	6	45	76	166	465	145
Ø160	100 / 110	95	160	265	190	1 1/4"G	8xØ26	315	M80xP3	45	85 / 95	235	360	5	7	50	85	185	505	160
Ø180	110 / 125	105	185	292	216	1 1/4"G	8xØ33	350	M90xP3	50	95 / 110	264	405	5	10	55	95	194	550	185
Ø200	125 / 140	112	200	306	245	1 1/4"G	8xØ33	385	M100xP3	56	110 / 120	278	440	5	10	61	101	220	596	200
Ø220	140 / 160	125	235	355	270	1 1/2"G	8xØ39	435	M125xP4	63	120 / 140	325	500	8	10	71	113	244	690	235
Ø250	160 / 180	125	250	412	299	1 1/2"G	8xØ39	475	M125xP4	63	140 / 160	325	540	8	12	71	113	260	703	250
Ø320	200 / 220	160	320	500	385	2"G	8xØ45	600	M160xP4	80	180 / 200	350	675	8	14	88	136	310	830	320

Standard Cylinders 6022 AH

ISO 6022 25MPa Standard Hydraulic Cylinders

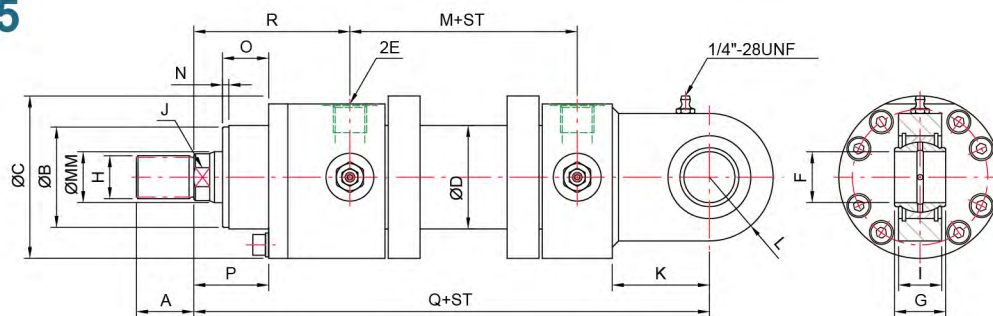
AH-MP3



DIMENSION

BORE	MM	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
Ø40	25 / 28	28	52	88	55	1/2"G	Ø25	25	M20xP1.5	22	19 / 22	53	R32	120	4	29	47	283	83
Ø50	32 / 36	36	63	102	65	1/2"G	Ø32	32	M27xP2	27	27 / 30	61	R40	120	4	29	47	305	98
Ø63	40 / 45	45	75	120	76	3/4"G	Ø40	40	M33xP2	32	32 / 36	74	R50	133	4	32	53	348	112
Ø80	50 / 56	56	90	145	100	3/4"G	Ø50	50	M42xP2	40	41 / 46	90	R63	155	4	36	60	395	120
Ø100	63 / 70	63	110	170	120	1"G	Ø63	63	M48xP2	52	50 / 60	102	R71	171	5	41	68	442	134
Ø125	80 / 90	85	132	206	150	1"G	Ø80	80	M64xP3	66	65 / 75	124	R90	205	5	45	76	520	153
Ø140	90 / 100	90	145	226	170	1 1/4"G	Ø90	90	M72xP3	72	75 / 85	149	R101	219	5	45	76	580	166
Ø160	100 / 110	95	160	265	190	1 1/4"G	Ø100	100	M80xP3	84	85 / 95	150	R112	235	5	50	85	617	185
Ø180	110 / 125	105	185	292	216	1 1/4"G	Ø110	110	M90xP3	88	95 / 110	180	R129	264	5	55	95	690	194
Ø200	125 / 140	112	200	306	245	1 1/4"G	Ø125	125	M100xP3	102	110 / 120	206	R145	278	5	61	101	756	220
Ø220	140 / 160	125	235	355	270	1 1/2"G	Ø160	160	M125xP4	130	120 / 140	251	R170	325	8	71	113	888	244
Ø250	160 / 180	125	250	412	299	1 1/2"G	Ø160	160	M125xP4	130	140 / 160	251	R200	325	8	71	113	903	260
Ø320	200 / 220	160	320	500	385	2"G	Ø200	200	M160xP4	162	180 / 200	316	R250	350	8	88	136	1080	310

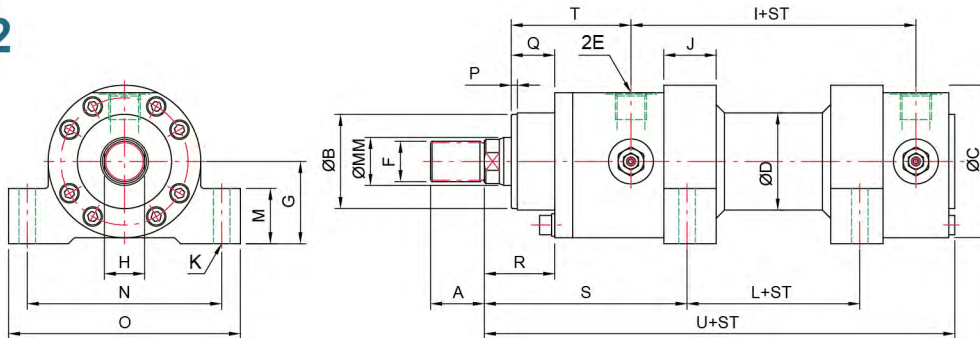
AH-MP5



DIMENSION

BORE	MM	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
Ø40	25 / 28	28	52	88	55	1/2"G	Ø25	25	M20xP1.5	22	19 / 22	53	R32	120	4	29	47	283	83
Ø50	32 / 36	36	63	102	65	1/2"G	Ø32	32	M27xP2	27	27 / 30	61	R40	120	4	29	47	305	98
Ø63	40 / 45	45	75	120	76	3/4"G	Ø40	40	M33xP2	32	32 / 36	74	R50	133	4	32	53	348	112
Ø80	50 / 56	56	90	145	100	3/4"G	Ø50	50	M42xP2	40	41 / 46	90	R63	155	4	36	60	395	120
Ø100	63 / 70	63	110	170	120	1"G	Ø63	63	M48xP2	52	50 / 60	102	R71	171	5	41	68	442	134
Ø125	80 / 90	85	132	206	150	1"G	Ø80	80	M64xP3	66	65 / 75	124	R90	205	5	45	76	520	153
Ø140	90 / 100	90	145	226	170	1 1/4"G	Ø90	90	M72xP3	72	75 / 85	149	R101	219	5	45	76	580	166
Ø160	100 / 110	95	160	265	190	1 1/4"G	Ø100	100	M80xP3	84	85 / 95	150	R112	235	5	50	85	617	185
Ø180	110 / 125	105	185	292	216	1 1/4"G	Ø110	110	M90xP3	88	95 / 110	180	R129	264	5	55	95	690	194
Ø200	125 / 140	112	200	306	245	1 1/4"G	Ø125	125	M100xP3	102	110 / 120	206	R145	278	5	61	101	756	220
Ø220	140 / 160	125	235	355	270	1 1/2"G	Ø160	160	M125xP4	130	120 / 140	251	R170	325	8	71	113	888	244
Ø250	160 / 180	125	250	412	299	1 1/2"G	Ø160	160	M125xP4	130	140 / 160	251	R200	325	8	71	113	903	260
Ø320	200 / 220	160	320	500	385	2"G	Ø200	200	M160xP4	162	180 / 200	316	R250	350	8	88	136	1080	310

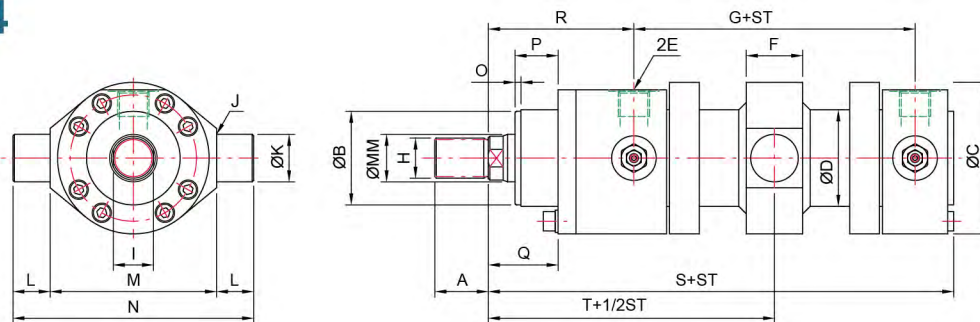
AH-MS2



DIMENSION

BORE	MM	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Ø40	25 / 28	28	52	88	55	1/2"G	M20xP1.5	45	19 / 22	120	30	Ø11	50	32	110	140	4	29	47	118	83	230
Ø50	32 / 36	36	63	102	65	1/2"G	M27xP2	55	27 / 30	120	35	Ø11	45	37	130	155	4	29	47	135.5	98	244
Ø63	40 / 45	45	75	120	76	3/4"G	M33xP2	65	32 / 36	133	40	Ø13.5	49	42	150	180	4	32	53	154	112	274
Ø80	50 / 56	56	90	145	100	3/4"G	M42xP2	75	41 / 46	155	50	Ø17.5	52	47	180	220	4	36	60	171.5	120	305
Ø100	63 / 70	63	110	170	120	1"G	M48xP2	90	50 / 60	171	60	Ø22	61	57	210	255	5	41	68	189	134	340
Ø125	80 / 90	85	132	206	150	1"G	M64xP3	105	65 / 75	205	70	Ø26	75	67	255	305	5	45	76	218	153	396
Ø140	90 / 100	90	145	226	170	1 1/4"G	M72xP3	115	75 / 85	219	85	Ø30	70	72	290	350	5	45	76	240.5	166	431
Ø160	100 / 110	95	160	265	190	1 1/4"G	M80xP3	135	85 / 95	235	105	Ø33	65	77	330	400	5	50	85	270	185	467
Ø180	110 / 125	105	185	292	216	1 1/4"G	M90xP3	150	95 / 110	264	115	Ø40	69	92	360	440	5	55	95	291.5	194	510
Ø200	125 / 140	112	200	306	245	1 1/4"G	M100xP3	160	110 / 120	278	125	Ø40	73	97	385	465	5	61	101	322.5	220	550
Ø220	140 / 160	125	235	355	270	1 1/2"G	M125xP4	185	120 / 140	325	155	Ø45	74	102	445	541	8	71	113	369.5	244	637
Ø250	160 / 180	125	250	412	299	1 1/2"G	M125xP4	215	140 / 160	325	155	Ø52	80	112	520	620	8	71	113	382.5	260	652
Ø320	200 / 220	160	320	500	385	2"G	M160xP4	260	180 / 200	350	190	Ø62	100	152	620	740	8	88	136	435	310	764

AH-MT4



DIMENSION

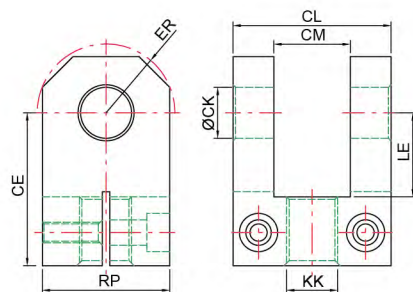
BORE	MM	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
Ø40	25 / 28	28	52	88	55	1/2"G	38	120	M20xP1.5	19 / 22	1	25	20	95	135	4	29	47	83	230	143
Ø50	32 / 36	36	63	102	65	1/2"G	38	120	M27xP2	27 / 30	2	32	25	112	162	4	29	47	98	244	158
Ø63	40 / 45	45	75	120	76	3/4"G	48	133	M33xP2	32 / 36	2.5	40	32	125	189	4	32	53	112	274	178.5
Ø80	50 / 56	56	90	145	100	3/4"G	58	155	M42xP2	41 / 46	2.5	50	40	150	230	4	36	60	120	305	197.5
Ø100	63 / 70	63	110	170	120	1"G	78	171	M48xP2	50 / 60	3	63	50	180	280	5	41	68	134	340	219.5
Ø125	80 / 90	85	132	206	150	1"G	98	205	M64xP3	65 / 75	3	80	63	224	350	5	45	76	153	396	255.5
Ø140	90 / 100	90	145	226	170	1 1/4"G	118	219	M72xP3	75 / 85	3	90	70	265	405	5	45	76	166	431	275.5
Ø160	100 / 110	95	160	265	190	1 1/4"G	128	235	M80xP3	85 / 95	3.5	100	80	280	440	5	50	85	185	467	303
Ø180	110 / 125	105	185	292	216	1 1/4"G	138	264	M90xP3	95 / 110	3.5	110	90	320	500	5	55	95	194	510	326
Ø200	125 / 140	112	200	306	245	1 1/4"G	178	278	M100xP3	110 / 120	3.5	125	100	335	535	5	61	101	220	550	359
Ø220	140 / 160	125	235	355	270	1 1/2"G	180	325	M125xP4	120 / 140	3.5	160	125	385	635	8	71	113	244	637	406.5
Ø250	160 / 180	125	250	412	299	1 1/2"G	180	325	M125xP4	140 / 160	3.5	160	125	425	675	8	71	113	260	652	423
Ø320	200 / 220	160	320	500	385	2"G	220	350	M160xP4	180 / 200	4	200	160	530	850	8	88	136	310	764	485

Standard Cylinders 6022 AH

ISO 6022 25MPa Standard Hydraulic Cylinders

H-1

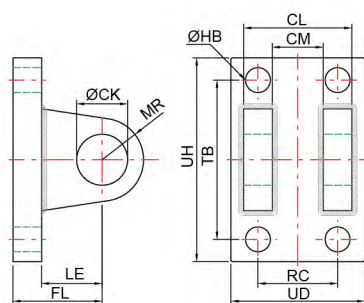
DIMENSION



REFERENCE	KK	CE	CK	CL	CM	ER	LE	RP
H-1-25	M20x1.5	65	25	56	25	32	34	50
H-1-32	M27x2	80	32	70	32	40	41	65
H-1-40	M33x2	97	40	90	40	50	51	80
H-1-50	M42x2	120	50	110	50	63	63	100
H-1-63	M48x2	140	63	140	63	71	75	140
H-1-70	M56x2	160	70	150	70	80	84	140
H-1-80	M64x3	180	80	170	80	90	94	180
H-1-90	M72x3	195	90	190	90	100	109	200
H-1-100	M80x3	210	100	210	100	110	114	220

H-2

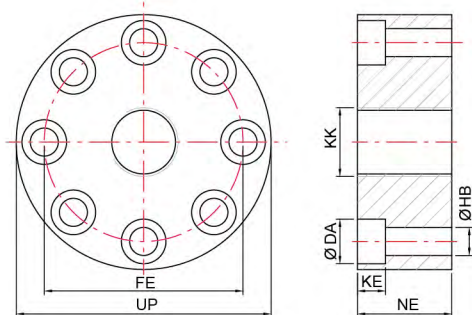
DIMENSION



REFERENCE	CK	CL	CM	FL	HB	LE	MR	RC	TB	UD	UH
H-2-25	25	56	25	55	13.5	37	25	40	85	70	113
H-2-32	32	70	32	65	17.5	43	32	50	110	85	143
H-2-40	40	90	40	76	22	52	40	65	130	108	170
H-2-50	50	110	50	95	26	65	50	80	170	130	220
H-2-63	63	140	63	112	33	75	63	100	210	160	270
H-2-70	70	150	70	130	33	90	70	110	230	175	300
H-2-80	80	170	80	140	39	95	80	125	250	210	320
H-2-90	90	190	90	160	45	108	90	140	290	230	370
H-2-100	100	210	100	180	45	120	100	160	315	260	400
H-2-110	110	240	110	200	52	138	110	180	350	290	445
H-2-125	125	270	125	230	52	170	125	200	385	320	470

H-3

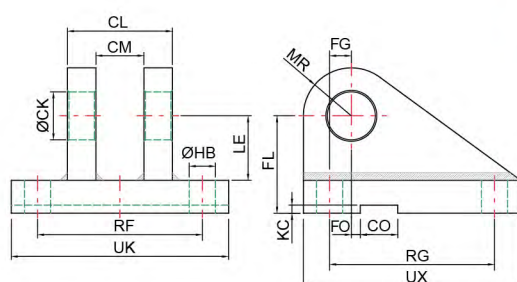
DIMENSION



REFERENCE	KK	DA	FE	HB	KE	NE	UP
H-3-32	M27x2	17.5	78	6xØ11	11	37	100
H-3-40	M33x2	20	95	8xØ13.5	13	46	120
H-3-50	M42x2	26	120	8xØ17.5	17.5	57	150
H-3-63	M48x2	33	150	8xØ22	21.5	64	190
H-3-70	M56x2	36	165	8xØ24	23.5	77	212
H-3-80	M64x3	39	180	8xØ26	25.5	86	230
H-3-90	M72x3	43	195	8xØ29	28.5	89	250
H-3-100	M80x3	43	210	8xØ29	28.5	96	270

H-4

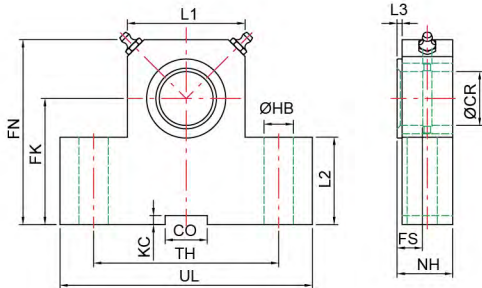
DIMENSION



REFERENCE	CK	CL	CM	CO	FG	FL	FO	HB	KC	LE	MR	RF	RG	UK	UX
H-4-25	25	56	25	25	10	55	10	13.5	5.4	37	25	90	85	120	115
H-4-32	32	70	32	25	14.5	65	6	17.5	5.4	43	32	110	110	145	145
H-4-40	40	90	40	36	17.5	76	6	22	8.4	52	40	140	125	185	170
H-4-50	50	110	50	36	25	95	-	26	8.4	65	50	165	150	215	200
H-4-63	63	140	63	50	33	112	-	33	11.4	75	63	210	170	270	230
H-4-70	70	150	70	50	40	130	-	33	11.4	90	70	230	190	290	250
H-4-80	80	170	80	50	45	140	-	39	11.4	95	80	250	210	320	280
H-4-90	90	190	90	63	47.5	160	-	45	12.4	108	90	280	235	360	320
H-4-100	100	210	100	63	52.5	180	-	52	12.4	120	100	315	250	405	345
H-4-110	110	240	110	80	62.5	200	-	52	15.4	138	110	335	305	425	400
H-4-125	125	270	125	80	75	230	-	52	15.4	170	125	365	350	455	450

H-5

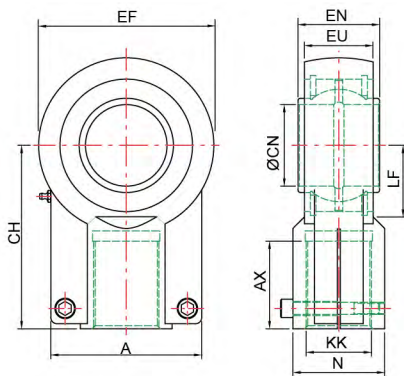
DIMENSION



REFERENCE	CR	CO	FK	FN	FS	HB	KC	L1	L2	L3	NH	TH	UL
H-5-25	25	25	55	80	12	13.5	5.4	56	45	1.5	26	80	110
H-5-32	32	25	65	100	15	17.5	5.4	70	52	2	33	110	150
H-5-40	40	36	76	120	16	22	8.4	88	60	2.5	41	125	170
H-5-50	50	36	95	140	20	26	8.4	100	75	2.5	51	160	210
H-5-63	63	50	112	180	25	33	11.4	130	85	3	61	200	265
H-5-80	80	50	140	220	31	39	11.4	170	112	3	81	250	325

H-6

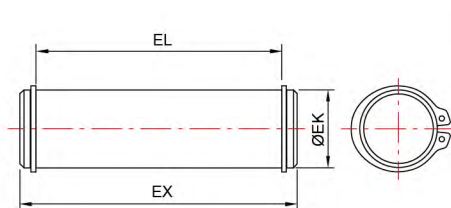
DIMENSION



REFERENCE	KK	A	AX	CH	CN	EF	EN	EU	LF	N
H-6-25	M20x1.5	54	29	65	25	58	25	21	27	30
H-6-32	M27x2	66	37	80	32	70	32	27	32	38
H-6-40	M33x2	80	46	97	40	89	40	32	41	47
H-6-50	M42x2	96	57	120	50	108	50	40	50	58
H-6-63	M48x2	114	64	140	63	132	63	52	62	70
H-6-80	M64x3	148	86	180	80	168	80	66	78	90
H-6-90	M72x3	160	91	195	90	185	90	72	85	100
H-6-100	M80x3	178	96	210	100	210	100	84	98	110
H-6-110	M90x3	190	106	235	110	235	110	88	105	125
H-6-125	M100x3	200	113	260	125	262	125	102	120	135
H-6-160	M125x4	250	126	310	160	326	160	130	150	165
H-6-200	M160x4	320	161	390	200	418	200	162	195	215

H-7

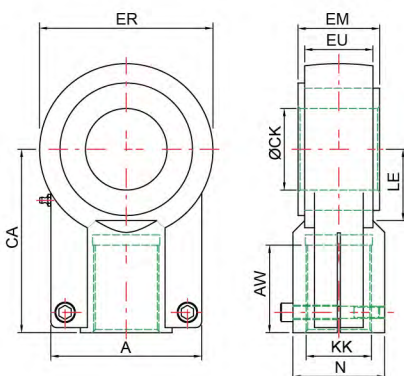
DIMENSION



REFERENCE	EK	EL	EX
H-7-25	25	57	65
H-7-32	32	72	80
H-7-40	40	92	105
H-7-50	50	112	130
H-7-63	63	142	160
H-7-70	70	152	170
H-7-80	80	172	190

H-8

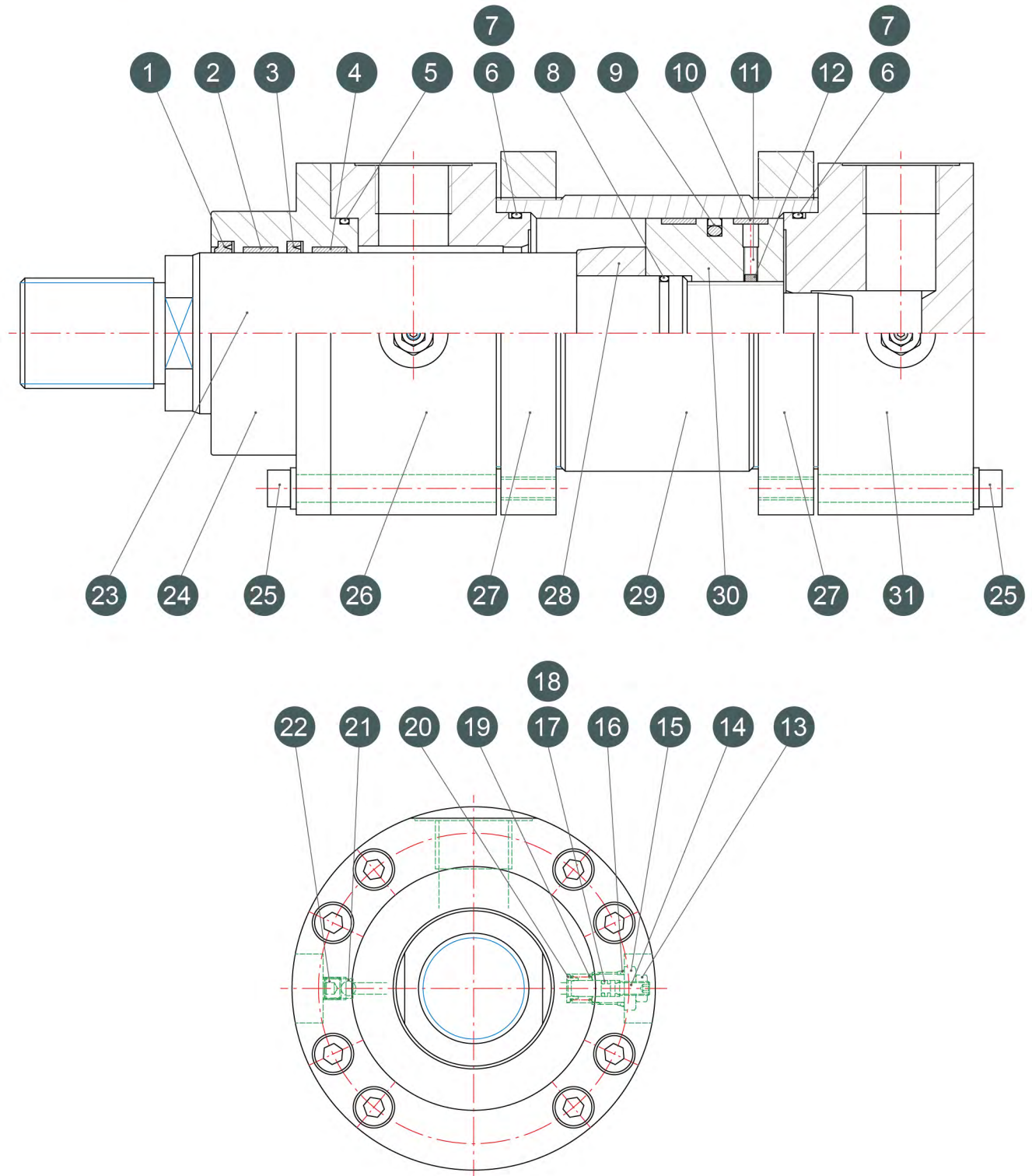
DIMENSION



REFERENCE	KK	A	AW	CA	CK	EM	ER	EU	LE	N
H-8-32	M27x2	66	37	80	32	32	70	27	32	38
H-8-40	M33x2	80	46	97	40	40	89	32	41	47
H-8-50	M42x2	96	57	120	50	50	108	40	50	58
H-8-63	M48x2	114	64	140	63	63	132	52	62	70
H-8-80	M64x3	148	86	180	80	80	168	66	78	90
H-8-90	M72x3	160	91	195	90	90	185	72	85	100
H-8-100	M80x3	178	96	210	100	100	210	84	98	110
H-8-110	M90x3	190	106	235	110	110	235	88	105	125
H-8-125	M100x3	200	113	260	125	125	262	102	120	135
H-8-160	M125x4	250	126	310	160	160	326	130	150	165
H-8-200	M160x4	320	161	390	200	200	418	162	195	215

- **ISO 6020-1** 16MPa Standard Hydraulic Cylinders
MF1 / MF2 / MF3 / MF4 / MP3 / MP5 / MS2 / MT4

Parts List



STANDARD CYLINDERS

NO	Description
1	Dust Wiper
2	Wearing Ring
3	Rod Seal
4	Wearing Ring
5	O Ring
6	O Ring
7	Backup Ring
8	O Ring
9	Piston Seal
10	Wearing Ring
11	Screw Stop Pin
12	Copper Bushing

NO	Description
13	Nut
14	Cushion Pin
15	Cushion Pin Cap
16	O Ring
17	O Ring
18	Backup Ring
19	Spring
20	Cushion Pin Sleeve
21	Ball Bearing
22	PT Stopper

NO	Description
23	Piston Rod
24	Front Cap
25	Hex Socket Screws
26	Front Cap
27	Flange
28	Cushion Sleeve
29	Cylinder Tube
30	Piston
31	End Cap

■ ISO 6020-1 16MPa Standard Hydraulic Cylinders

MF1 / MF2 / MF3 / MF4 / MP3 / MP5 / MS2 / MT4

HOW TO ORDER

Model Code:

AK R - MP5 - 063 - B - A A - 036 - B - B B - D D - 0100 - K2 - K1 - ES2

SERIES

SENSORS

Magnet + Sensors Switch = **R**
Linear Position Transmitter = **S**
Proximity Sensors = **T**
(No Symbol - No Device)

MOUNTING TYPES

Square Flange at Head = **MF1**
Square Flange at Base = **MF2**
Round Flange at Head = **MF3**
Round Flange at Base = **MF4**
Plain Clevis at Base = **MP3**
Self-aligning Clevis at Base = **MP5**
Foot Mounting = **MS2**
Trunnion = **MT4**

BORE

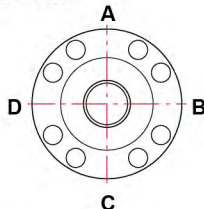
Piston Ø **25** to **320** mm

SEAL

Standard (-20° C ~ +80° C) = **B**
Viton (-20° C ~ +150° C) = **C**

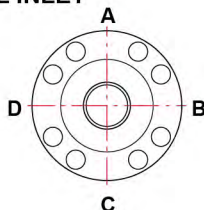
POSITION OF OIL INLET

Location at Head
A = Standard



POSITION OF OIL INLET

Location at Base
A = Standard



ROD

Piston Rod Ø **14** to **220** mm
(S45C = Standard)

CUSHION DEVICE

Front and Rear = **B**
Front only = **X**
Rear only = **Y**
None = **N**

SENSORS SWITCH

Only Front Rear = **ES1** /
Front and Rear = **ES2** /
Position Not Fixed = **ES3** /
Position Not Fixed = **ES4** /
Position Not Fixed = **ES5** /
(No Symbol "R" - No Accessory)

ROD ACCESSORY

Please Refer Page **16 ~ 18**
(No Symbol - No Accessory)

BORE ACCESSORY

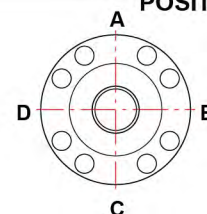
Please Refer Page **16 ~ 18**
(No Symbol - No Accessory)

STROKE

Stroke Length in **mm**

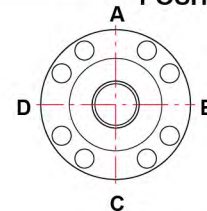
POSITION OF AIR VENT

Location at Base
D = Standard



POSITION OF AIR VENT

Location at Head
D = Standard



POSITION OF CUSHION

Location at Base
Please Refer Oil Inlet Configuration
B = Standard

POSITION OF CUSHION

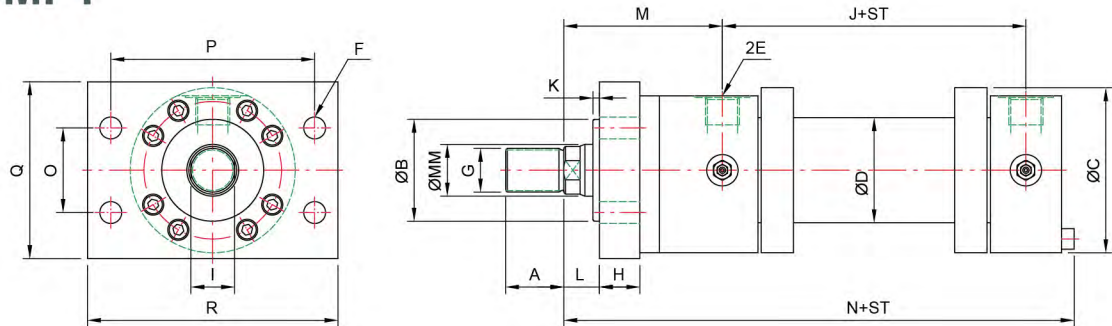
Location at Head
Please Refer Oil Inlet Configuration
B = Standard

SPACERS

0 mm . For stroke of 0 ~ 1000 mm
50 mm . For stroke of 1001 ~ 1500 mm
100 mm . For stroke of 1501 ~ 2000 mm
150 mm . For stroke of 2001 ~ 2500 mm
200 mm . For stroke of 2501 ~ 3000 mm

The Cylinder Length is increased

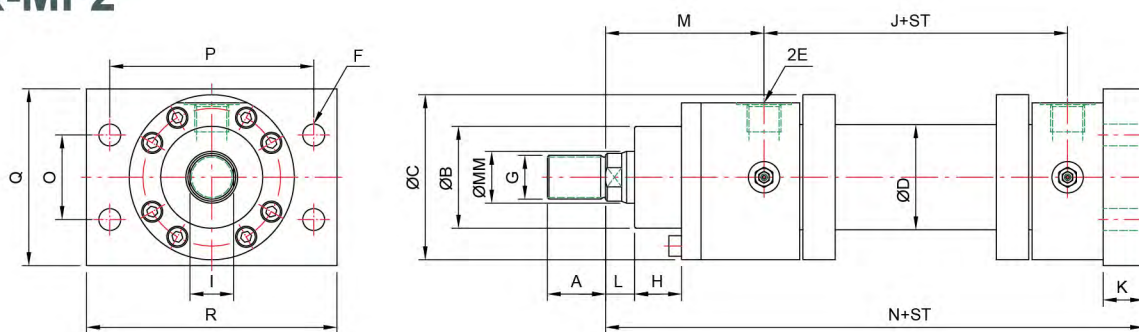
AK-MF1



DIMENSION

BORE	MM	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
Ø25	14 / 18	16 / 18	32	56	35	1/4"G	4xØ6.5	M12xP1.25 / M14xP1.5	12	12 / 15	77	3	16	58	158	28.7	69.2	60	85
Ø32	18 / 22	18 / 22	40	67	42	3/8"G	4xØ9	M14xP1.5 / M16xP1.5	16	15 / 18	89	3	16	64	178	35.2	85	70	105
Ø40	22 / 28	22 / 28	50	78	55	1/2"G	4xØ9	M16xP1.5 / M20xP1.5	16	18 / 22	97	3	16	71	198	40.6	98	80	115
Ø50	28 / 36	28 / 36	60	95	65	1/2"G	4xØ11	M20xP1.5 / M27xP2.0	20	22 / 30	111	4	18	72	213	48.2	116.4	100	140
Ø63	36 / 45	36 / 45	70	116	76	3/4"G	4xØ13.5	M27xP2.0 / M33xP2.0	25	30 / 36	117	4	20	82	234	55.5	134	120	160
Ø80	45 / 56	45 / 56	85	130	100	3/4"G	4xØ17.5	M33xP2.0 / M42xP2.0	32	36 / 46	134	4	22	91	260	63.1	152.5	135	185
Ø100	56 / 70	56 / 63	106	158	120	1"G	4xØ22	M42xP2.0 / M48xP2.0	32	46 / 60	162	5	25	108	314	76.5	184.5	160	225
Ø125	70 / 90	63 / 85	132	192	152	1"G	4xØ22	M48xP2.0 / M64xP3.0	32	60 / 2xØ10	174	5	28	121	342	90.2	217.1	195	255

AK-MF2



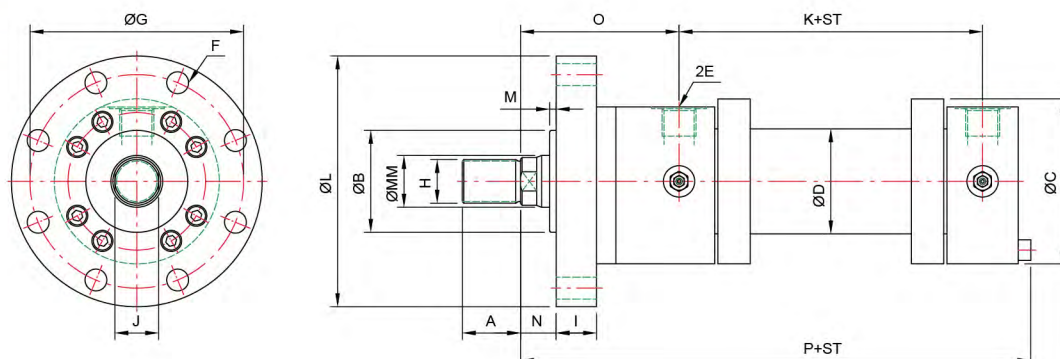
DIMENSION

BORE	MM	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
Ø25	14 / 18	16 / 18	32	56	35	1/4"G	4xØ6.5	M12xP1.25 / M14xP1.5	15	12 / 15	77	12	13	58	162	28.7	69.2	60	85
Ø32	18 / 22	18 / 22	40	67	42	3/8"G	4xØ9	M14xP1.5 / M16xP1.5	19	15 / 18	89	16	13	64	186	35.2	85	70	105
Ø40	22 / 28	22 / 28	50	78	55	1/2"G	4xØ9	M16xP1.5 / M20xP1.5	19	18 / 22	97	16	13	71	206	40.6	98	80	115
Ø50	28 / 36	28 / 36	60	95	65	1/2"G	4xØ11	M20xP1.5 / M27xP2.0	24	22 / 30	111	20	14	72	225	48.2	116.4	100	140
Ø63	36 / 45	36 / 45	70	116	76	3/4"G	4xØ13.5	M27xP2.0 / M33xP2.0	29	30 / 36	117	25	16	82	249	55.5	134	120	160
Ø80	45 / 56	45 / 56	85	130	100	3/4"G	4xØ17.5	M33xP2.0 / M42xP2.0	36	36 / 46	134	32	18	91	282	63.1	152.5	135	185
Ø100	56 / 70	56 / 63	106	158	120	1"G	4xØ22	M42xP2.0 / M48xP2.0	37	46 / 60	162	32	20	108	332	76.5	184.5	160	225
Ø125	70 / 90	63 / 85	132	192	152	1"G	4xØ22	M48xP2.0 / M64xP3.0	37	60 / 2xØ10	174	32	23	121	357	90.2	217.1	195	255

Standard Cylinders 6020-1 AK

ISO 6020-1 16MPa Standard Hydraulic Cylinders

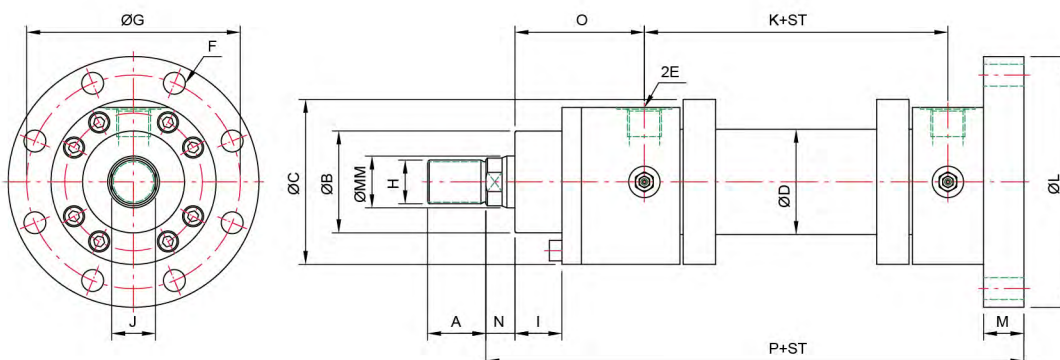
AK-MF3



DIMENSION

BORE	MM	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Ø25	14 / 18	16 / 18	32	56	35	1/4"G	8xØ6.5	75	M12xP1.25 / M14xP1.5	12	12 / 15	77	90	3	16	58	158
Ø32	18 / 22	18 / 22	40	67	42	3/8"G	8xØ9	92	M14xP1.5 / M16xP1.5	16	15 / 18	89	110	3	16	64	178
Ø40	22 / 28	22 / 28	50	78	55	1/2"G	8xØ9	106	M16xP1.5 / M20xP1.5	16	18 / 22	97	125	3	16	71	198
Ø50	28 / 36	28 / 36	60	95	65	1/2"G	8xØ11	126	M20xP1.5 / M27xP2.0	20	22 / 30	111	148	4	18	72	213
Ø63	36 / 45	36 / 45	70	116	76	3/4"G	8xØ13.5	145	M27xP2.0 / M33xP2.0	25	30 / 36	117	170	4	20	82	234
Ø80	45 / 56	45 / 56	85	130	100	3/4"G	8xØ17.5	165	M33xP2.0 / M42xP2.0	32	36 / 46	134	195	4	22	91	260
Ø100	56 / 70	56 / 63	106	158	120	1"G	8xØ22	200	M42xP2.0 / M48xP2.0	32	46 / 60	162	238	5	25	108	314
Ø125	70 / 90	63 / 85	132	192	152	1"G	8xØ22	235	M48xP2.0 / M64xP3.0	32	60 / 2xØ10	174	272	5	28	121	342
Ø160	90 / 110	85 / 95	160	238	185	1 1/4"G	8xØ22	280	M64xP3.0 / M80xP3.0	36	2xØ10	191	316	5	30	143	390
Ø200	110 / 140	95 / 112	200	285	232	1 1/4"G	8xØ26	340	M80xP3.0 / M100xP3.0	40	2xØ10	224	385	5	35	190	474
Ø250	140 / 180	112 / 125	250	365	299	1 1/2"G	8xØ33	420	M100xP3.0 / M125xP4.0	56	2xØ10	290	490	8	40	205	580
Ø320	180 / 220	125 / 160	320	450	368	1 1/2"G	8xØ39	520	M125xP4.0 / M160xP4.0	63	2xØ10	358	600	8	45	250	696

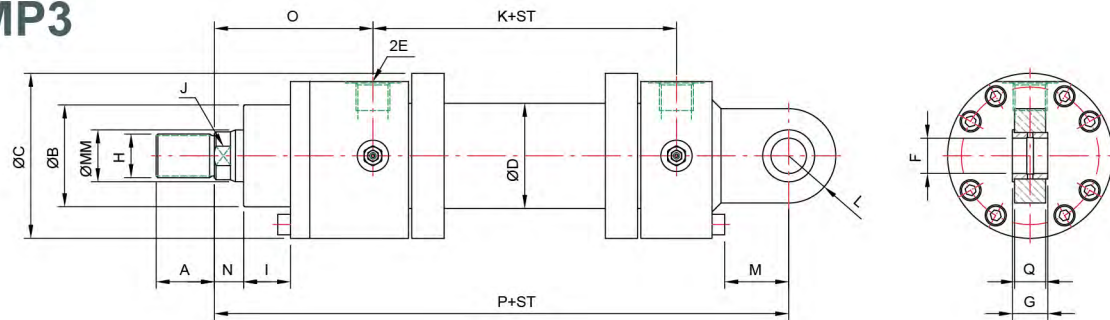
AK-MF4



DIMENSION

BORE	MM	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Ø25	14 / 18	16 / 18	32	56	35	1/4"G	8xØ6.5	75	M12xP1.25 / M14xP1.5	15	12 / 15	77	90	12	13	58	162
Ø32	18 / 22	18 / 22	40	67	42	3/8"G	8xØ9	92	M14xP1.5 / M16xP1.5	19	15 / 18	89	110	16	13	64	186
Ø40	22 / 28	22 / 28	50	78	55	1/2"G	8xØ9	106	M16xP1.5 / M20xP1.5	19	18 / 22	97	125	16	13	71	206
Ø50	28 / 36	28 / 36	60	95	65	1/2"G	8xØ11	126	M20xP1.5 / M27xP2.0	24	22 / 30	111	148	20	14	72	225
Ø63	36 / 45	36 / 45	70	116	76	3/4"G	8xØ13.5	145	M27xP2.0 / M33xP2.0	29	30 / 36	117	170	25	16	82	249
Ø80	45 / 56	45 / 56	85	130	100	3/4"G	8xØ17.5	165	M33xP2.0 / M42xP2.0	36	36 / 46	134	195	32	18	91	282
Ø100	56 / 70	56 / 63	106	158	120	1"G	8xØ22	200	M42xP2.0 / M48xP2.0	37	46 / 60	162	238	32	20	108	332
Ø125	70 / 90	63 / 85	132	192	152	1"G	8xØ22	235	M48xP2.0 / M64xP3.0	37	60 / 2xØ10	174	272	32	23	121	357
Ø160	90 / 110	85 / 95	160	238	185	1 1/4"G	8xØ22	280	M64xP3.0 / M80xP3.0	41	2xØ10	191	316	36	25	143	406
Ø200	110 / 140	95 / 112	200	285	232	1 1/4"G	8xØ26	340	M80xP3.0 / M100xP3.0	45	2xØ10	224	385	40	30	190	490
Ø250	140 / 180	112 / 125	250	365	299	1 1/2"G	8xØ33	420	M100xP3.0 / M125xP4.0	64	2xØ10	290	490	56	32	205	606
Ø320	180 / 220	125 / 160	320	450	368	1 1/2"G	8xØ39	520	M125xP4.0 / M160xP4.0	71	2xØ10	358	600	63	37	250	723

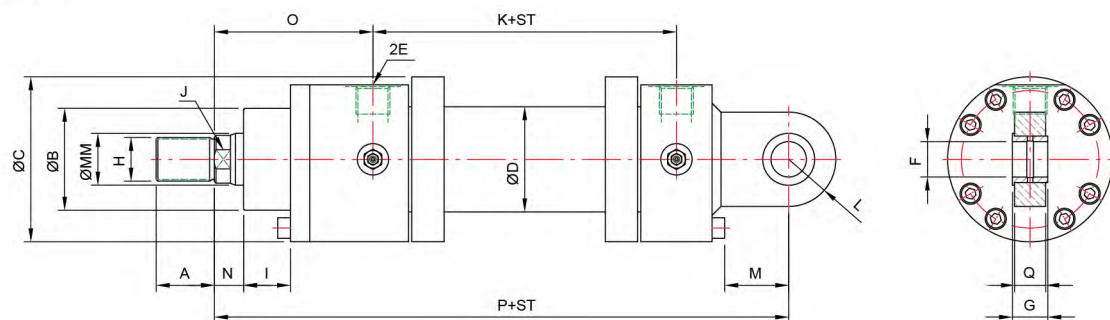
AK-MP3



DIMENSION

BORE	MM	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Ø25	14 / 18	16 / 18	32	56	35	1/4"G	Ø12	12	M12xP1.25 / M14xP1.5	15	12 / 15	77	16	20	13	58	178	12
Ø32	18 / 22	18 / 22	40	67	42	3/8"G	Ø16	16	M14xP1.5 / M16xP1.5	19	15 / 18	89	20	28	13	64	206	16
Ø40	22 / 28	22 / 28	50	78	55	1/2"G	Ø20	20	M16xP1.5 / M20xP1.5	19	18 / 22	97	25	33	13	71	231	20
Ø50	28 / 36	28 / 36	60	95	65	1/2"G	Ø25	25	M20xP1.5 / M27xP2.0	24	22 / 30	111	32	44	14	72	257	22
Ø63	36 / 45	36 / 45	70	116	76	3/4"G	Ø32	32	M27xP2.0 / M33xP2.0	29	30 / 36	117	40	55	16	82	289	27
Ø80	45 / 56	45 / 56	85	130	100	3/4"G	Ø40	40	M33xP2.0 / M42xP2.0	36	36 / 46	134	50	72	18	91	332	35
Ø100	56 / 70	56 / 63	106	158	120	1"G	Ø50	50	M42xP2.0 / M48xP2.0	37	46 / 60	162	63	81	20	108	395	40
Ø125	70 / 90	63 / 85	132	192	152	1"G	Ø63	63	M48xP2.0 / M64xP3.0	37	60 / 2xØ10	174	71	86	23	121	428	52
Ø160	90 / 110	85 / 95	160	238	185	1 1/4"G	Ø80	80	M64xP3.0 / M80xP3.0	41	2xØ10	191	90	115	25	143	505	66
Ø200	110 / 140	95 / 112	200	285	232	1 1/4"G	Ø100	100	M80xP3.0 / M100xP3.0	45	2xØ10	224	112	141	30	190	615	84
Ø250	140 / 180	112 / 125	250	365	299	1 1/2"G	Ø125	125	M100xP3.0 / M125xP4.0	64	2xØ10	290	160	193	32	205	773	102
Ø320	180 / 220	125 / 160	320	450	368	1 1/2"G	Ø160	160	M125xP4.0 / M160xP4.0	71	2xØ10	358	200	234	37	250	930	130

AK-MP5



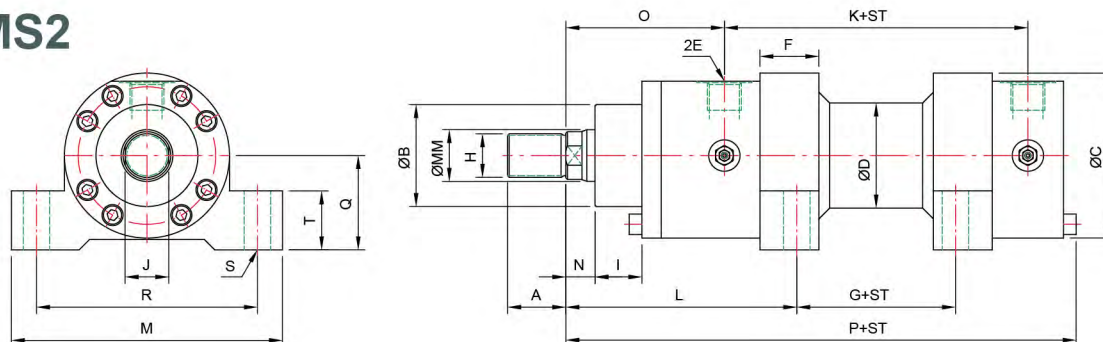
DIMENSION

BORE	MM	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Ø25	14 / 18	16 / 18	32	56	35	1/4"G	Ø12	12	M12xP1.25 / M14xP1.5	15	12 / 15	77	16	20	13	58	178	10.6
Ø32	18 / 22	18 / 22	40	67	42	3/8"G	Ø16	16	M14xP1.5 / M16xP1.5	19	15 / 18	89	20	28	13	64	206	14
Ø40	22 / 28	22 / 28	50	78	55	1/2"G	Ø20	20	M16xP1.5 / M20xP1.5	19	18 / 22	97	25	33	13	71	231	18
Ø50	28 / 36	28 / 36	60	95	65	1/2"G	Ø25	25	M20xP1.5 / M27xP2.0	24	22 / 30	111	32	44	14	72	257	22
Ø63	36 / 45	36 / 45	70	116	76	3/4"G	Ø32	32	M27xP2.0 / M33xP2.0	29	30 / 36	117	40	55	16	82	289	27
Ø80	45 / 56	45 / 56	85	130	100	3/4"G	Ø40	40	M33xP2.0 / M42xP2.0	36	36 / 46	134	50	72	18	91	332	35
Ø100	56 / 70	56 / 63	106	158	120	1"G	Ø50	50	M42xP2.0 / M48xP2.0	37	46 / 60	162	63	81	20	108	395	40
Ø125	70 / 90	63 / 85	132	192	152	1"G	Ø63	63	M48xP2.0 / M64xP3.0	37	60 / 2xØ10	174	71	86	23	121	428	52
Ø160	90 / 110	85 / 95	160	238	185	1 1/4"G	Ø80	80	M64xP3.0 / M80xP3.0	41	2xØ10	191	90	115	25	143	505	66
Ø200	110 / 140	95 / 112	200	285	232	1 1/4"G	Ø100	100	M80xP3.0 / M100xP3.0	45	2xØ10	224	112	141	30	190	615	84
Ø250	140 / 180	112 / 125	250	365	299	1 1/2"G	Ø125	125	M100xP3.0 / M125xP4.0	64	2xØ10	290	160	193	32	205	773	102
Ø320	180 / 220	125 / 160	320	450	368	1 1/2"G	Ø160	160	M125xP4.0 / M160xP4.0	71	2xØ10	358	200	234	37	250	930	130

Standard Cylinders 6020-1 AK

ISO 6020-1 16MPa Standard Hydraulic Cylinders

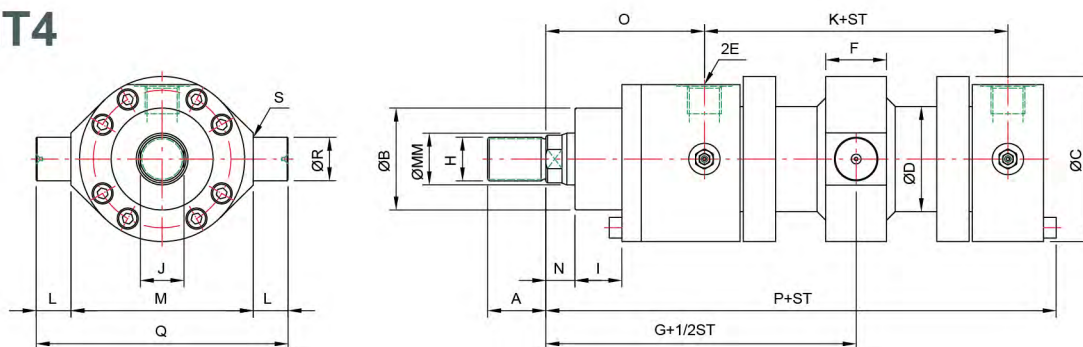
AK-MS2



DIMENSION

BORE	MM	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
Ø25	14 / 18	16 / 18	32	56	35	1/4"G	20	12	M12xP1.25 / M14xP1.5	15	12 / 15	77	87	92	13	58	158	32	75	Ø9	20
Ø32	18 / 22	18 / 22	40	67	42	3/8"G	25	16	M14xP1.5 / M16xP1.5	19	15 / 18	89	97.5	110	13	64	178	38	90	Ø11	20
Ø40	22 / 28	22 / 28	50	78	55	1/2"G	25	20	M16xP1.5 / M20xP1.5	19	18 / 22	97	106	130	13	71	198	48	110	Ø11	20
Ø50	28 / 36	28 / 36	60	95	65	1/2"G	32	25	M20xP1.5 / M27xP2.0	24	22 / 30	111	114	145	14	72	213	52	120	Ø14	25
Ø63	36 / 45	36 / 45	70	116	76	3/4"G	32	32	M27xP2.0 / M33xP2.0	29	30 / 36	117	124	180	16	82	234	62	145	Ø18	25
Ø80	45 / 56	45 / 56	85	130	100	3/4"G	40	40	M33xP2.0 / M42xP2.0	36	36 / 46	134	137	210	18	91	260	70	170	Ø22	30
Ø100	56 / 70	56 / 63	106	158	120	1"G	50	50	M42xP2.0 / M48xP2.0	37	46 / 60	162	164.5	245	20	108	314	82	200	Ø26	35
Ø125	70 / 90	63 / 85	132	192	152	1"G	56	63	M48xP2.0 / M64xP3.0	37	60 / 2xØ10	174	180.5	300	23	121	342	100	245	Ø33	35
Ø160	90 / 110	85 / 95	160	238	185	1 1/4"G	56	80	M64xP3.0 / M80xP3.0	41	2xØ10	191	206	400	25	143	390	142	320	Ø33	45
Ø200	110 / 140	95 / 112	200	285	232	1 1/4"G	60	100	M80xP3.0 / M100xP3.0	45	2xØ10	224	267	500	30	190	474	170	400	Ø36	50
Ø250	140 / 180	112 / 125	250	365	299	1 1/2"G	70	125	M100xP3.0 / M125xP4.0	64	2xØ10	290	287.5	570	32	205	580	195	480	Ø45	60
Ø320	180 / 220	125 / 160	320	450	368	1 1/2"G	80	160	M125xP4.0 / M160xP4.0	71	2xØ10	358	351	680	37	250	696	245	580	Ø52	70

AK-MT4

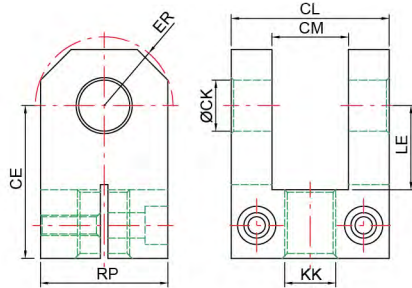


DIMENSION

BORE	MM	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
Ø25	14 / 18	16 / 18	32	56	35	1/4"G	20	96.5	M12xP1.25 / M14xP1.5	15	12 / 15	77	10	63	13	58	158	83	12	1
Ø32	18 / 22	18 / 22	40	67	42	3/8"G	25	108.5	M14xP1.5 / M16xP1.5	19	15 / 18	89	12	75	13	64	178	99	16	1
Ø40	22 / 28	22 / 28	50	78	55	1/2"G	30	119.5	M16xP1.5 / M20xP1.5	19	18 / 22	97	16	90	13	71	198	122	20	1
Ø50	28 / 36	28 / 36	60	95	65	1/2"G	35	127.5	M20xP1.5 / M27xP2.0	24	22 / 30	111	20	105	14	72	213	145	25	1
Ø63	36 / 45	36 / 45	70	116	76	3/4"G	45	140.5	M27xP2.0 / M33xP2.0	29	30 / 36	117	25	120	16	82	234	170	32	2
Ø80	45 / 56	45 / 56	85	130	100	3/4"G	50	158	M33xP2.0 / M42xP2.0	36	36 / 46	134	32	135	18	91	260	199	40	2.5
Ø100	56 / 70	56 / 63	106	158	120	1"G	60	189	M42xP2.0 / M48xP2.0	37	46 / 60	162	40	160	20	108	314	240	50	2.5
Ø125	70 / 90	63 / 85	132	192	152	1"G	75	208	M48xP2.0 / M64xP3.0	37	60 / 2xØ10	174	50	195	23	121	342	295	63	3
Ø160	90 / 110	85 / 95	160	238	185	1 1/4"G	90	238.5	M64xP3.0 / M80xP3.0	41	2xØ10	191	63	240	25	143	390	366	80	3
Ø200	110 / 140	95 / 112	200	285	232	1 1/4"G	110	302	M80xP3.0 / M100xP3.0	45	2xØ10	224	80	295	30	190	474	455	100	3.5
Ø250	140 / 180	112 / 125	250	365	299	1 1/2"G	135	350	M100xP3.0 / M125xP4.0	64	2xØ10	290	100	370	32	205	580	570	125	3.5
Ø320	180 / 220	125 / 160	320	450	368	1 1/2"G	175	429	M125xP4.0 / M160xP4.0	71	2xØ10	358	125	470	37	250	696	720	160	3.5

K-1

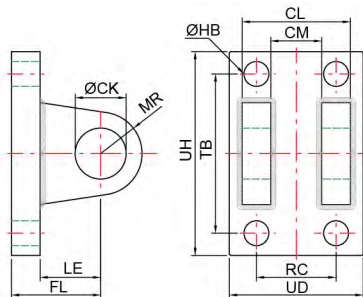
DIMENSION



REFERENCE	KK	CE	CK	CL	CM	ER	LE	RP
K-1-12	M12x1.25	38	12	28	12	16	18	25
K-1-16	M14x1.5	44	16	36	16	20	22	30
K-1-20	M16x1.5	52	20	45	20	25	27	40
K-1-25	M20x1.5	65	25	56	25	32	34	50
K-1-32	M27x2	80	32	70	32	40	41	65
K-1-40	M33x2	97	40	90	40	50	51	80
K-1-50	M42x2	120	50	110	50	63	63	100
K-1-63	M48x2	140	63	140	63	71	75	140
K-1-70	M56x2	160	70	150	70	80	84	140
K-1-80	M64x3	180	80	170	80	90	94	180
K-1-90	M72x3	195	90	190	90	100	109	200
K-1-100	M80x3	210	100	210	100	110	114	220

K-2

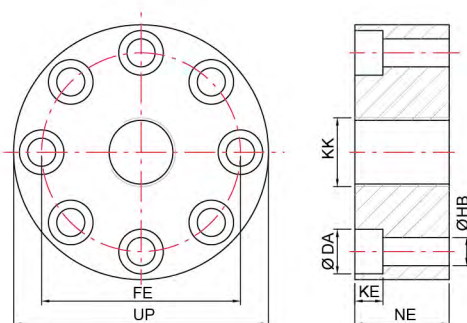
DIMENSION



REFERENCE	CK	CL	CM	FL	HB	LE	MR	RC	TB	UD	UH
K-2-12	12	28	12	34	9	22	12	20	50	40	70
K-2-16	16	36	16	40	11	27	16	26	65	50	90
K-2-20	20	45	20	45	11	30	20	32	75	58	98
K-2-25	25	56	25	55	13.5	37	25	40	85	70	113
K-2-32	32	70	32	65	17.5	43	32	50	110	85	143
K-2-40	40	90	40	76	22	52	40	65	130	108	170
K-2-50	50	110	50	95	26	65	50	80	170	130	220
K-2-63	63	140	63	112	33	75	63	100	210	160	270
K-2-70	70	150	70	130	33	90	70	110	230	175	300
K-2-80	80	170	80	140	39	95	80	125	250	210	320
K-2-90	90	190	90	160	45	108	90	140	290	230	370
K-2-100	100	210	100	180	45	120	100	160	315	260	400
K-2-110	110	240	110	200	52	138	110	180	350	290	445
K-2-125	125	270	125	230	52	170	125	200	385	320	470

K-3

DIMENSION



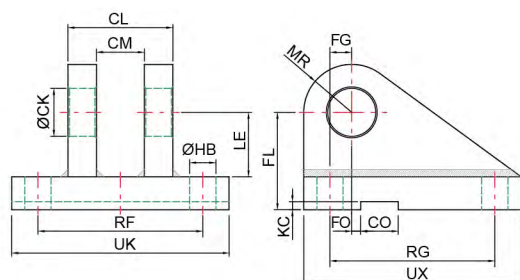
REFERENCE	KK	DA	FE	HB	KE	NE	UP
K-3-12	M12x1.25	11	40	4xØ6.5	6.8	17	56
K-3-16	M14x1.5	14.5	45	4xØ9	9	19	63
K-3-20	M16x1.5	14.5	54	6xØ9	9	23	72
K-3-25	M20x1.5	14.5	63	6xØ9	9	29	82
K-3-32	M27x2	17.5	78	6xØ11	11	37	100
K-3-40	M33x2	20	95	8xØ13.5	13	46	120
K-3-50	M42x2	26	120	8xØ17.5	17.5	57	150
K-3-63	M48x2	33	150	8xØ22	21.5	64	190
K-3-70	M56x2	36	165	8xØ24	23.5	77	212
K-3-80	M64x3	39	180	8xØ26	25.5	86	230
K-3-90	M72x3	43	195	8xØ29	28.5	89	250
K-3-100	M80x3	43	210	8xØ29	28.5	96	270

Standard Cylinders 6020-1 AK

ISO 6020-1 16MPa Standard Hydraulic Cylinders

K-4

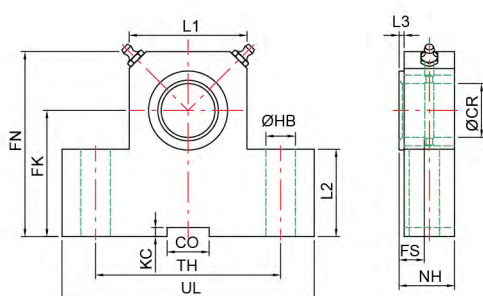
DIMENSION



REFERENCE	CK	CL	CM	CO	FG	FL	FO	HB	KC	LE	MR	RF	RG	UK	UX
K-4-12	12	28	12	10	2	34	10	9	3.3	22	12	52	45	72	65
K-4-16	16	36	16	16	3.5	40	10	11	4.3	27	16	65	55	90	80
K-4-20	20	45	20	16	7.5	45	10	11	4.3	30	20	75	70	100	95
K-4-25	25	56	25	25	10	55	10	13.5	5.4	37	25	90	85	120	115
K-4-32	32	70	32	25	14.5	65	6	17.5	5.4	43	32	110	110	145	145
K-4-40	40	90	40	36	17.5	76	6	22	8.4	52	40	140	125	185	170
K-4-50	50	110	50	36	25	95	-	26	8.4	65	50	165	150	215	200
K-4-63	63	140	63	50	33	112	-	33	11.4	75	63	210	170	270	230
K-4-70	70	150	70	50	40	130	-	33	11.4	90	70	230	190	290	250
K-4-80	80	170	80	50	45	140	-	39	11.4	95	80	250	210	320	280
K-4-90	90	190	90	63	47.5	160	-	45	12.4	108	90	280	235	360	320
K-4-100	100	210	100	63	52.5	180	-	52	12.4	120	100	315	250	405	345
K-4-110	110	240	110	80	62.5	200	-	52	15.4	138	110	335	305	425	400
K-4-125	125	270	125	80	75	230	-	52	15.4	170	125	365	350	455	450

K-5

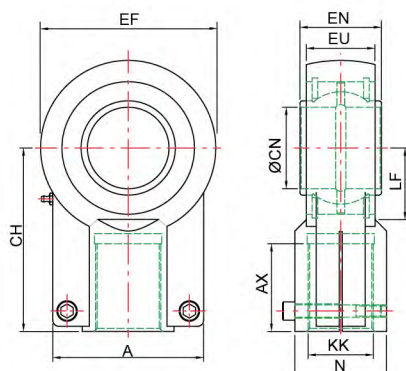
DIMENSION



REFERENCE	CR	CO	FK	FN	FS	HB	KC	L1	L2	L3	NH	TH	UL
K-5-12	12	10	34	50	8	9	3.3	25	25	1	17	40	63
K-5-16	16	16	40	60	10	11	4.3	30	30	1.5	21	50	80
K-5-20	20	16	45	70	10	11	4.3	40	38	1.5	21	60	90
K-5-25	25	25	55	80	12	13.5	5.4	56	45	1.5	26	80	110
K-5-32	32	25	65	100	15	17.5	5.4	70	52	2	33	110	150
K-5-40	40	36	76	120	16	22	8.4	88	60	2.5	41	125	170
K-5-50	50	36	95	140	20	26	8.4	100	75	2.5	51	160	210
K-5-63	63	50	112	180	25	33	11.4	130	85	3	61	200	265
K-5-80	80	50	140	220	31	39	11.4	160	112	3	81	250	325
K-5-90	90	63	160	250	40	45	12.4	180	130	4	91	265	345
K-5-100	100	63	180	280	45	52	12.4	205	145	5	102	295	385
K-5-110	110	80	200	310	50	52	15.4	230	165	5	112	320	410
K-5-125	125	80	220	345	56	55	15.4	280	200	6	132	385	490

K-6

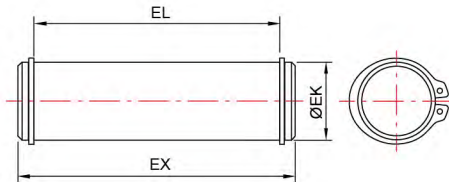
DIMENSION



REFERENCE	KK	A	AX	CH	CN	EF	EN	EU	LF	N
K-6-12	M12x1.25	32	17	38	12	32	12	10.5	14	16
K-6-16	M14x1.5	40	19	44	16	40	16	13	18	21
K-6-20	M16x1.5	47	23	52	20	47	20	17	22	25
K-6-25	M20x1.5	54	29	65	25	58	25	21	27	30
K-6-32	M27x2	66	37	80	32	70	32	27	32	38
K-6-40	M33x2	80	46	97	40	89	40	32	41	47
K-6-50	M42x2	96	57	120	50	108	50	40	50	58
K-6-63	M48x2	114	64	140	63	132	63	52	62	70
K-6-80	M64x3	148	86	180	80	168	80	66	78	90
K-6-100	M80x3	178	96	210	100	210	100	84	98	110
K-6-125	M100x3	200	113	260	125	262	125	102	120	135
K-6-160	M125x4	250	126	310	160	326	160	130	150	165
K-6-200	M160x4	320	161	390	200	418	200	162	195	215

K-7

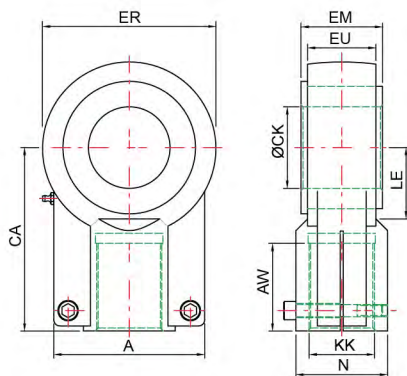
DIMENSION



REFERENCE	EK	EL	EX
K-7-12	12	29	37
K-7-16	16	37	45
K-7-20	20	46	54
K-7-25	25	57	65
K-7-32	32	72	80
K-7-40	40	92	105
K-7-50	50	112	130
K-7-63	63	142	160
K-7-70	70	152	170
K-7-80	80	172	190

K-8

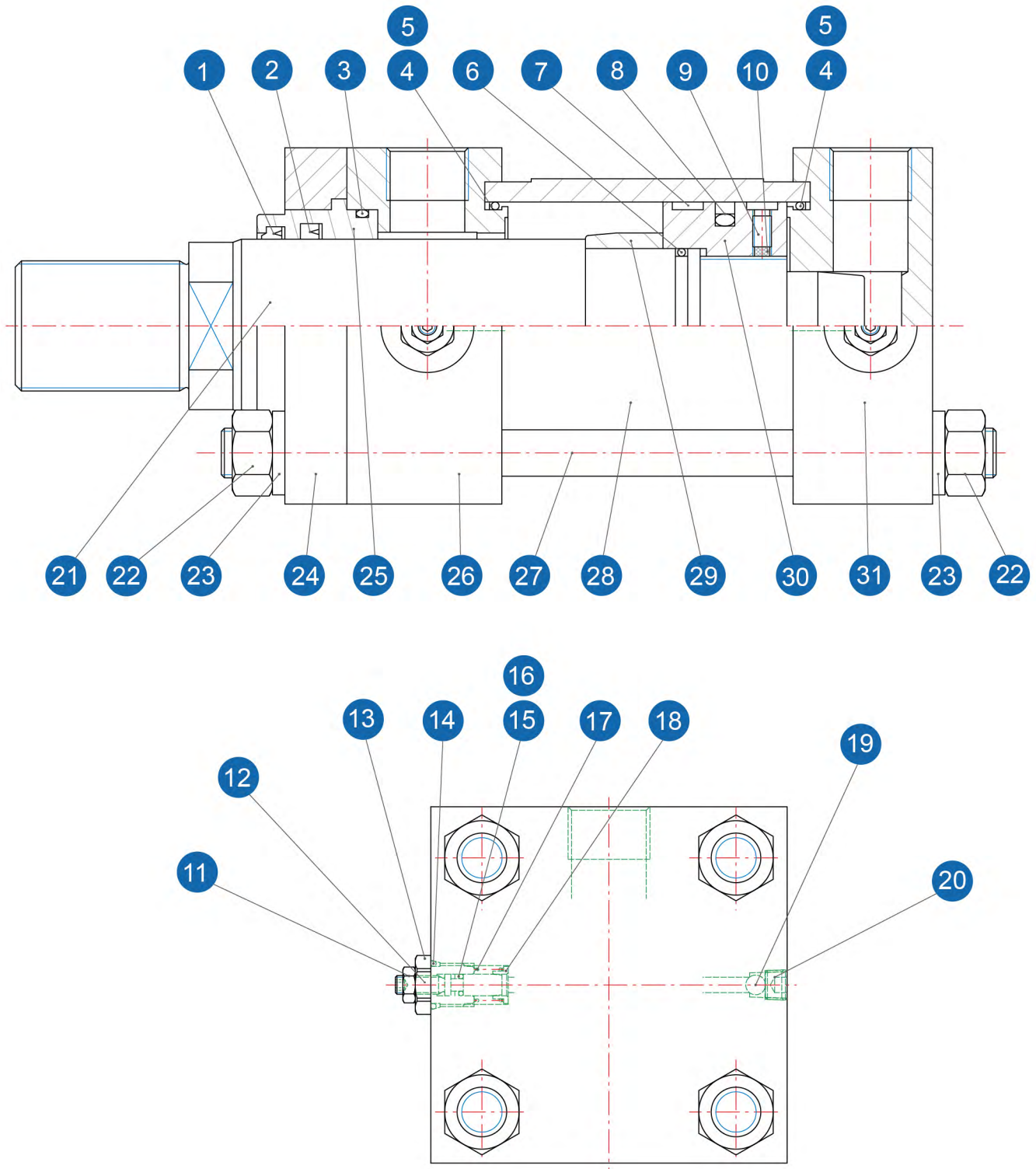
DIMENSION



REFERENCE	KK	A	AW	CA	CK	EM	ER	EU	LE	N
K-8-12	M12x1.25	32	17	38	12	12	32	10.5	14	16
K-8-16	M14x1.5	40	19	44	16	16	40	13	18	21
K-8-20	M16x1.5	47	23	52	20	20	47	17	22	25
K-8-25	M20x1.5	54	29	65	25	25	58	21	27	30
K-8-32	M27x2	66	37	80	32	32	70	27	32	38
K-8-40	M33x2	80	46	97	40	40	89	32	41	47
K-8-50	M42x2	96	57	120	50	50	108	40	50	58
K-8-63	M48x2	114	64	140	63	63	132	52	62	70
K-8-80	M64x3	148	86	180	80	80	168	66	78	90
K-8-100	M80x3	178	96	210	100	100	210	84	98	110
K-8-125	M100x3	200	113	260	125	125	262	102	120	135
K-8-160	M125x4	250	126	310	160	160	326	130	150	165
K-8-200	M160x4	320	161	390	200	200	418	162	195	215

- **ISO 6020-2** 16MPa Standard Hydraulic Cylinders
- ME5 / ME6 / MP1 / MP3 / MP5 / MS2 / MT1 / MT2 / MT4

Parts List



STANDARD CYLINDERS

NO	Description
1	Dust Wiper
2	Rod Seal
3	O Ring
4	O Ring
5	Backup Ring
6	O Ring
7	Wearing Ring
8	Piston Seal
9	Screw Stop Pin
10	Copper Bushing

NO	Description
11	Nut
12	Cushion Pin
13	Cushion Pin Cap
14	O Ring
15	O Ring
16	Backup Ring
17	Spring
18	Cushion Pin Sleeve
19	Ball Bearing
20	PT Stopper

NO	Description
21	Piston Rod
22	Nut
23	Washer
24	End Plate
25	Rod Bush
26	Front Cap
27	Tie Bolt
28	Cylinder Tube
29	Cushion Sleeve
30	Piston
31	End Cap

■ ISO 6020-2 16MPa Standard Hydraulic Cylinders

ME5 / ME6 / MP1 / MP3 / MP5 / MS2 / MT1 / MT2 / MT4

HOW TO ORDER

Model Code:

AT R - MT4 - 063 - B - A A - 028 - B - B B - D D - 0100 - T15 - T1 - ES2

SERIES

SENSORS

Magnet + Sensors Switch = **R**
Linear Position Transmitter = **S**
Proximity Sensors = **T**
(No Symbol - No Device)

MOUNTING TYPES

Rectangular Flange at Head = **ME5**
Rectangular Flange at Base = **ME6**
Clevis Mounting = **MP1**
Plain Clevis at Base = **MP3**
Self-aligning Clevis at Base = **MP5**
Foot Mounting = **MS2**
Trunnion at Head = **MT1**
Trunnion at Base = **MT2**
Trunnion = **MT4**

BORE

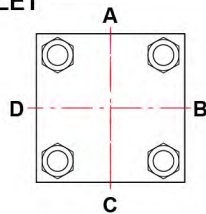
Piston Ø 25 to 200 mm

SEAL

Standard (-20° C ~ +80° C) = **B**
Viton (-20° C ~ +150° C) = **C**

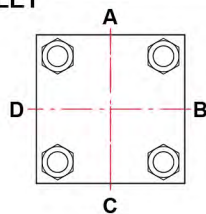
POSITION OF OIL INLET

Location at Head
A = Standard



POSITION OF OIL INLET

Location at Base
A = Standard



ROD

Piston Rod Ø 12 to 140 mm
(S45C = Standard)

CUSHION DEVICE

Front and Rear = **B**
Front only = **X**
Rear only = **Y**
None = **N**

SENSORS SWITCH

Only Front Rear = **ES1** /
Front and Rear = **ES2** /
Position Not Fixed = **ES3** /
Position Not Fixed = **ES4** /
Position Not Fixed = **ES5** /
(No Symbol "R" - No Accessory)

ROD ACCESSORY

Please Refer Page 27 ~ 30
(No Symbol - No Accessory)

BORE ACCESSORY

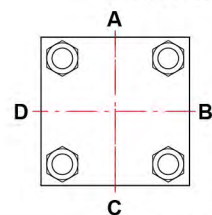
Please Refer Page 27 ~ 30
(No Symbol - No Accessory)

STROKE

Stroke Length in mm

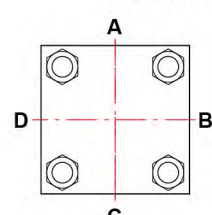
POSITION OF AIR VENT

Location at Base
D = Standard



POSITION OF AIR VENT

Location at Head
D = Standard



POSITION OF CUSHION

Location at Base
Please Refer Oil Inlet Configuration
B = Standard

POSITION OF CUSHION

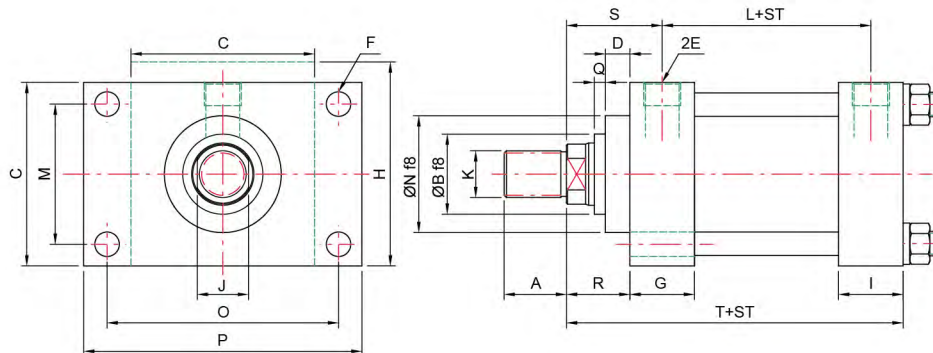
Location at Head
Please Refer Oil Inlet Configuration
B = Standard

SPACERS

0 mm . For stroke of 0 ~ 1000 mm
50 mm . For stroke of 1001 ~ 1500 mm
100 mm . For stroke of 1501 ~ 2000 mm
150 mm . For stroke of 2001 ~ 2500 mm
200 mm . For stroke of 2501 ~ 3000 mm

The Cylinder Length is increased

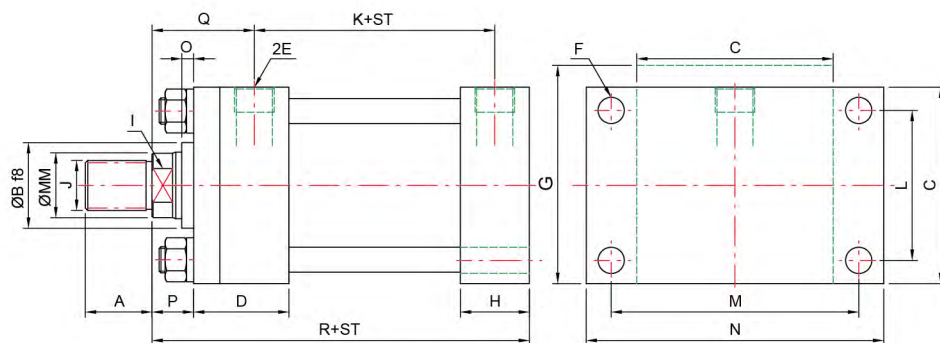
AT-ME5



DIMENSION

BORE	MM	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
Ø25	12 / 18	14 / 18	24 / 30	40	10	1/4"G	4xØ5.5	25	45	25	10 / 15	M10xP1.25 / M14xP1.5	53	27	38	51	65	6	25	50	114
Ø32	14 / 22	16 / 22	26 / 34	45	10	1/4"G	4xØ6.5	25	50	25	12 / 18	M12xP1.25 / M16xP1.5	56	33	42	58	70	12	35	60	128
Ø40	18 / 28	18 / 28	30 / 42	63	10	3/8"G	4xØ11	38	-	38	15 / 22	M14xP1.5 / M20xP1.5	73	41	62	87	110	12	35	62	153
Ø50	22 / 36	22 / 36	34 / 50	75	16	1/2"G	4xØ14	38	-	38	18 / 30	M16xP1.5 / M27xP2.0	74	52	74	105	130	9	41	67	159
Ø63	28 / 45	28 / 45	42 / 60	90	16	1/2"G	4xØ14	38	-	38	22 / 36	M20xP1.5 / M33xP2.0	80	65	75 / 88	117	145	13	48	71	168
Ø80	36 / 56	36 / 56	50 / 72	115	20	3/4"G	4xØ18	45	-	45	30 / 46	M27xP2.0 / M42xP2.0	93	83	82 / 105	149	180	9	51	77	190
Ø100	45 / 70	45 / 63	60 / 88	130	22	3/4"G	4xØ18	45	-	45	36 / 60	M33xP2.0 / M48xP2.0	101	97	92 / 125	162	200	10	57	82	203
Ø125	56 / 90	56 / 85	72 / 108	165	22	1"G	4xØ22	58	-	58	46 / 2xØ10	M42xP2.0 / M64xP3.0	117	126	105 / 150	208	250	10	57	86	232
Ø160	70 / 110	63 / 95	88 / 133	205	25	1"G	4xØ26	58	-	58	60 / 2xØ10	M48xP2.0 / M80xP3.0	130	155	125 / 170	253	300	7	57	86	245
Ø200	90 / 140	85 / 112	108 / 163	245	25	1 1/4"G	4xØ33	76	-	76	2xØ10	M64xP3.0 / M100xP3.0	165	190	150 / 210	300	360	7	57	98	299

AT-ME6



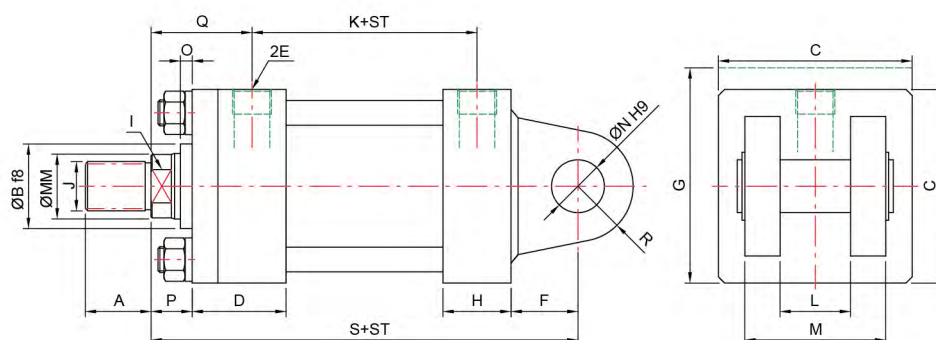
DIMENSION

BORE	MM	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
Ø25	12 / 18	14 / 18	24 / 30	40	50	1/4"G	4xØ5.5	45	25	10 / 15	M10xP1.25 / M14xP1.5	53	27	51	65	6	15	50	114
Ø32	14 / 22	16 / 22	26 / 34	45	50	1/4"G	4xØ6.5	50	25	12 / 18	M12xP1.25 / M16xP1.5	56	33	58	70	12	25	60	128
Ø40	18 / 28	18 / 28	30 / 42	63	55	3/8"G	4xØ11	-	38	15 / 22	M14xP1.5 / M20xP1.5	73	41	87	110	12	25	62	153
Ø50	22 / 36	22 / 36	34 / 50	75	61	1/2"G	4xØ14	-	38	18 / 30	M16xP1.5 / M27xP2	74	52	105	130	9	25	67	159
Ø63	28 / 45	28 / 45	42 / 60	90	61	1/2"G	4xØ14	-	38	22 / 36	M20xP1.5 / M33xP2	80	65	117	145	13	32	71	168
Ø80	36 / 56	36 / 56	50 / 72	115	70	3/4"G	4xØ18	-	45	30 / 46	M27xP2 / M42xP2	93	83	149	180	9	31	77	190
Ø100	45 / 70	45 / 63	60 / 88	130	72	3/4"G	4xØ18	-	45	36 / 60	M33xP2 / M48xP2	101	97	162	200	10	35	82	203
Ø125	56 / 90	56 / 85	72 / 108	165	80	1"G	4xØ22	-	58	46 / 2xØ10	M42xP2 / M64xP3	117	126	208	250	10	35	86	232
Ø160	70 / 110	63 / 95	88 / 133	205	83	1"G	4xØ26	-	58	60 / 2xØ10	M48xP2 / M80xP3	130	155	253	300	7	32	86	245
Ø200	90 / 140	85 / 112	108 / 163	245	101	1 1/4"G	4xØ33	-	76	2xØ10	M64xP3 / M100xP3	165	190	300	360	7	32	98	299

Standard Cylinders 6020-2 AT

ISO 6020-2 16MPa Standard Hydraulic Cylinders

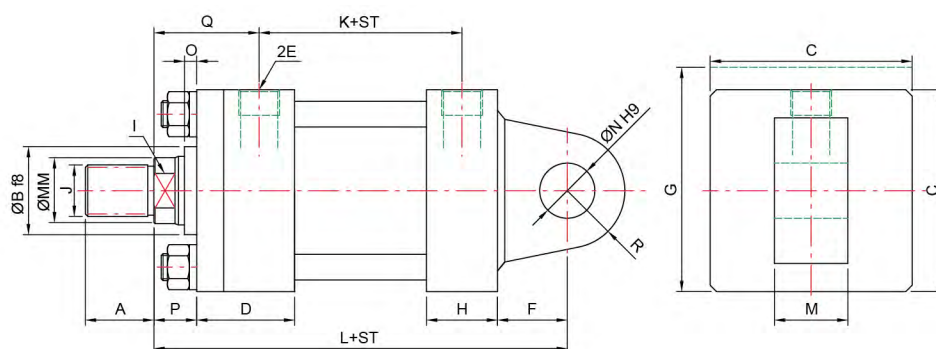
AT-MP1



DIMENSION

BORE	MM	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
Ø25	12 / 18	14 / 18	24 / 30	40	50	1/4"G	13	45	25	10 / 15	M10xP1.25 / M14xP1.5	53	12	24	10	6	15	50	10	127
Ø32	14 / 22	16 / 22	26 / 34	45	50	1/4"G	19	50	25	12 / 18	M12xP1.25 / M16xP1.5	56	16	32	12	12	25	60	14	147
Ø40	18 / 28	18 / 28	30 / 42	63	55	3/8"G	19	-	38	15 / 22	M14xP1.5 / M20xP1.5	73	20	40	14	12	25	62	14	172
Ø50	22 / 36	22 / 36	34 / 50	75	61	1/2"G	32	-	38	18 / 30	M16xP1.5 / M27xP2	74	30	60	20	9	25	67	24	191
Ø63	28 / 45	28 / 45	42 / 60	90	61	1/2"G	32	-	38	22 / 36	M20xP1.5 / M33xP2	80	30	60	20	13	32	71	24	200
Ø80	36 / 56	36 / 56	50 / 72	115	70	3/4"G	39	-	45	30 / 46	M27xP2 / M42xP2	93	40	80	28	9	31	77	30	229
Ø100	45 / 70	45 / 63	60 / 88	130	72	3/4"G	54	-	45	36 / 60	M33xP2 / M48xP2	101	50	100	36	10	35	82	40	257
Ø125	56 / 90	56 / 85	72 / 108	165	80	1"G	57	-	58	46 / 2xØ10	M42xP2 / M64xP3	117	60	120	45	10	35	86	47	289
Ø160	70 / 110	63 / 95	88 / 133	205	83	1"G	63	-	58	60 / 2xØ10	M48xP2 / M80xP3	130	70	140	56	7	32	86	54	308
Ø200	90 / 140	85 / 112	108 / 163	245	101	1 1/4"G	82	-	76	2xØ10	M64xP3 / M100xP3	165	80	160	70	7	32	98	70	381

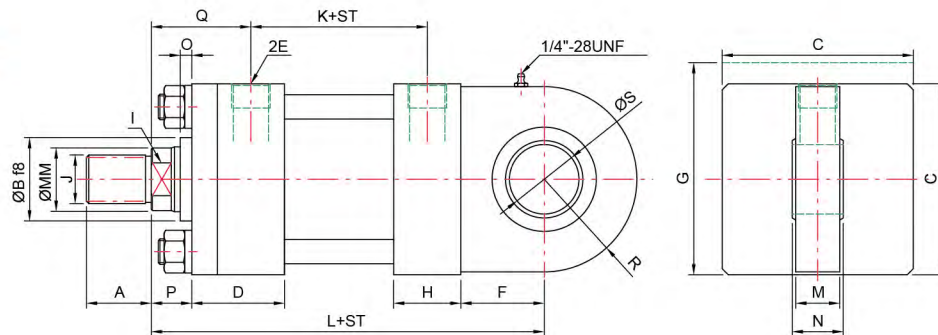
AT-MP3



DIMENSION

BORE	MM	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
Ø25	12 / 18	14 / 18	24 / 30	40	50	1/4"G	13	45	25	10 / 15	M10xP1.25 / M14xP1.5	53	127	12	10	6	15	50	10
Ø32	14 / 22	16 / 22	26 / 34	45	50	1/4"G	19	50	25	12 / 18	M12xP1.25 / M16xP1.5	56	147	16	12	12	25	60	14
Ø40	18 / 28	18 / 28	30 / 42	63	55	3/8"G	19	-	38	15 / 22	M14xP1.5 / M20xP1.5	73	172	20	14	12	25	62	14
Ø50	22 / 36	22 / 36	34 / 50	75	61	1/2"G	32	-	38	18 / 30	M16xP1.5 / M27xP2	74	191	30	20	9	25	67	24
Ø63	28 / 45	28 / 45	42 / 60	90	61	1/2"G	32	-	38	22 / 36	M20xP1.5 / M33xP2	80	200	30	20	13	32	71	24
Ø80	36 / 56	36 / 56	50 / 72	115	70	3/4"G	39	-	45	30 / 46	M27xP2 / M42xP2	93	229	40	28	9	31	77	30
Ø100	45 / 70	45 / 63	60 / 88	130	72	3/4"G	54	-	45	36 / 60	M33xP2 / M48xP2	101	257	50	36	10	35	82	40
Ø125	56 / 90	56 / 85	72 / 108	165	80	1"G	57	-	58	46 / 2xØ10	M42xP2 / M64xP3	117	289	60	45	10	35	86	47
Ø160	70 / 110	63 / 95	88 / 133	205	83	1"G	63	-	58	60 / 2xØ10	M48xP2 / M80xP3	130	308	70	56	7	32	86	54
Ø200	90 / 140	85 / 112	108 / 163	245	101	1 1/4"G	82	-	76	2xØ10	M64xP3 / M100xP3	165	381	80	70	7	32	98	70

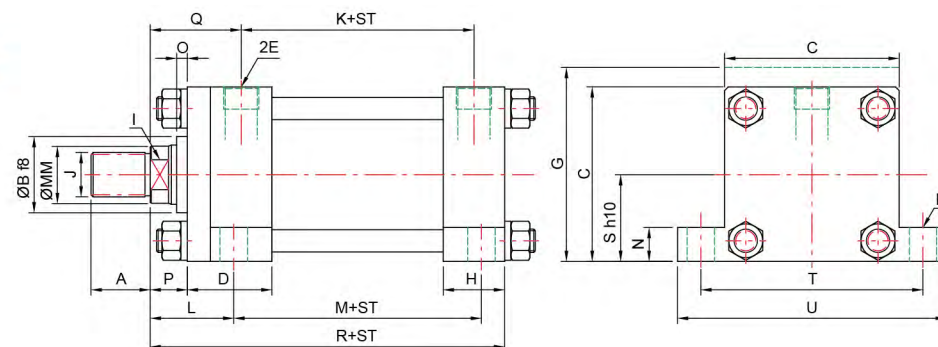
AT-MP5



DIMENSION

BORE	MM	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
Ø25	12 / 18	14 / 18	24 / 30	40	50	1/4"G	16	45	25	10 / 15	M10xP1.25 / M14xP1.5	53	130	8	10	6	15	50	20	12
Ø32	14 / 22	16 / 22	26 / 34	45	50	1/4"G	20	50	25	12 / 18	M12xP1.25 / M16xP1.5	56	148	11	14	12	25	60	22.5	16
Ø40	18 / 28	18 / 28	30 / 42	63	55	3/8"G	25	-	38	15 / 22	M14xP1.5 / M20xP1.5	73	178	13	16	12	25	62	29	20
Ø50	22 / 36	22 / 36	34 / 50	75	61	1/2"G	31	-	38	18 / 30	M16xP1.5 / M27xP2	74	190	17	20	9	25	67	33	25
Ø63	28 / 45	28 / 45	42 / 60	90	61	1/2"G	38	-	38	22 / 36	M20xP1.5 / M33xP2	80	206	19	22	13	32	71	40	30
Ø80	36 / 56	36 / 56	50 / 72	115	70	3/4"G	48	-	45	30 / 46	M27xP2 / M42xP2	93	238	23	28	9	31	77	50	40
Ø100	45 / 70	45 / 63	60 / 88	130	72	3/4"G	58	-	45	36 / 60	M33xP2 / M48xP2	101	261	30	35	10	35	82	32	50
Ø125	56 / 90	56 / 85	72 / 108	165	80	1"G	72	-	58	46 / 2xØ10	M42xP2 / M64xP3	117	304	38	44	10	35	86	80	60
Ø160	70 / 110	63 / 95	88 / 133	205	83	1"G	92	-	58	60 / 2xØ10	M48xP2 / M80xP3	130	337	47	55	7	32	86	100	80
Ø200	90 / 140	85 / 112	108 / 163	245	101	1 1/4"G	116	-	76	2xØ10	M64xP3 / M100xP3	165	415	57	70	7	32	98	120	100

AT-MS2



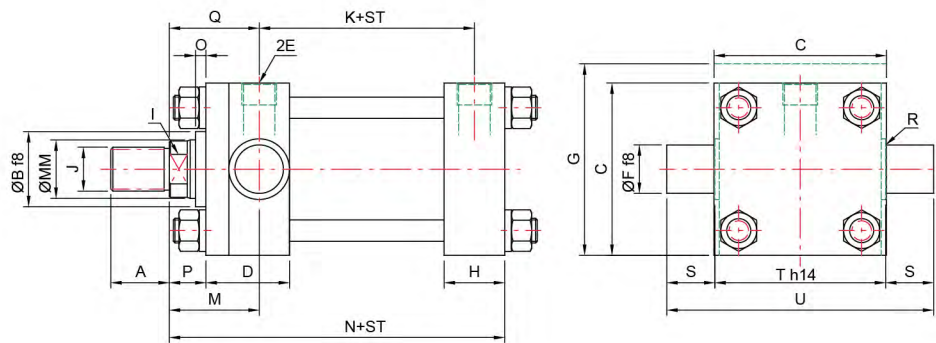
DIMENSION

BORE	MM	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Ø25	12 / 18	14 / 18	24 / 30	40	50	1/4"G	4xØ6.5	45	25	10 / 15	M10xP1.25/M14xP1.5	53	33	73	8.5	6	15	50	114	19	54	72
Ø32	14 / 22	16 / 22	26 / 34	45	50	1/4"G	4xØ9	50	25	12 / 18	M12xP1.25/M16xP1.5	56	45	73	12.5	12	25	60	128	22	63	84
Ø40	18 / 28	18 / 28	30 / 42	63	55	3/8"G	4xØ11	-	38	15 / 22	M14xP1.5 / M20xP1.5	73	45	98	12.5	12	25	62	153	31	83	103
Ø50	22 / 36	22 / 36	34 / 50	75	61	1/2"G	4xØ14	-	38	18 / 30	M16xP1.5 / M27xP2	74	54	92	19	9	25	67	159	37	102	127
Ø63	28 / 45	28 / 45	42 / 60	90	61	1/2"G	4xØ18	-	38	22 / 36	M20xP1.5 / M33xP2	80	65	86	26	13	32	71	168	44	124	161
Ø80	36 / 56	36 / 56	50 / 72	115	70	3/4"G	4xØ18	-	45	30 / 46	M27xP2 / M42xP2	93	68	105	26	9	31	77	190	57	149	186
Ø100	45 / 70	45 / 63	60 / 88	130	72	3/4"G	4xØ26	-	45	36 / 60	M33xP2 / M48xP2	101	79	102	32	10	35	82	203	63	172	216
Ø125	56 / 90	56 / 85	72 / 108	165	80	1"G	4xØ26	-	58	46 / 2xØ10	M42xP2 / M64xP3	117	79	131	32	10	35	86	232	82	210	254
Ø160	70 / 110	63 / 95	88 / 133	205	83	1"G	4xØ33	-	58	60 / 2xØ10	M48xP2 / M80xP3	130	86	130	38	7	32	86	245	101	260	318
Ø200	90 / 140	85 / 112	108 / 163	245	101	1 1/4"G	4xØ39	-	76	2xØ10	M64xP3 / M100xP3	165	92	172	44	7	32	98	299	122	311	381

Standard Cylinders 6020-2 AT

ISO 6020-2 16MPa Standard Hydraulic Cylinders

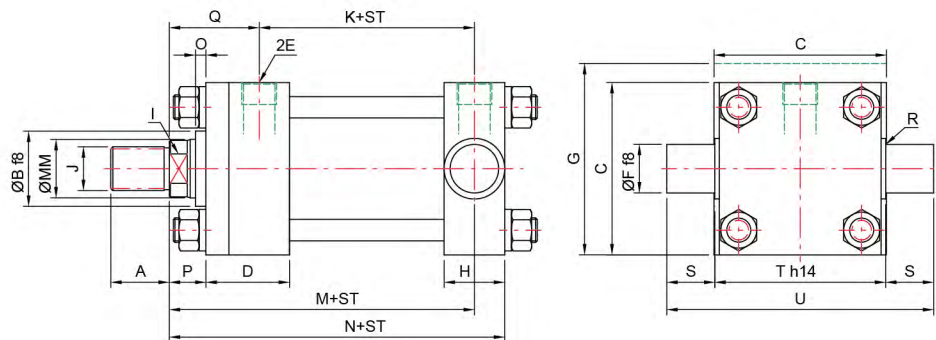
AT-MT1



DIMENSION

BORE	MM	A	B	C	D	E	F	G	H	I	J	K	M	N	O	P	Q	R	S	T	U
Ø25	12 / 18	14 / 18	24 / 30	40	50	1/4"G	12	45	25	10 / 15	M10xP1.25 / M14xP1.5	53	44	114	6	15	50	1	10	38	58
Ø32	14 / 22	16 / 22	26 / 34	45	50	1/4"G	16	50	25	12 / 18	M12xP1.25 / M16xP1.5	56	54	128	12	25	60	1	12	44	68
Ø40	18 / 28	18 / 28	30 / 42	63	55	3/8"G	20	-	38	15 / 22	M14xP1.5 / M20xP1.5	73	57	153	12	25	62	1	16	63	95
Ø50	22 / 36	22 / 36	34 / 50	75	61	1/2"G	25	-	38	18 / 30	M16xP1.5 / M27xP2.0	74	64	159	9	25	67	2	20	76	116
Ø63	28 / 45	28 / 45	42 / 60	90	61	1/2"G	32	-	38	22 / 36	M20xP1.5 / M33xP2.0	80	70	168	13	32	71	2	25	89	139
Ø80	36 / 56	36 / 56	50 / 72	115	70	3/4"G	40	-	45	30 / 46	M27xP2.0 / M42xP2.0	93	76	190	9	31	77	2	32	114	178
Ø100	45 / 70	45 / 63	60 / 88	130	72	3/4"G	50	-	45	36 / 60	M33xP2.0 / M48xP2.0	101	71	203	10	35	82	2	40	127	207
Ø125	56 / 90	56 / 85	72 / 108	165	80	1"G	63	-	58	46 / 2xØ10	M42xP2.0 / M64xP3.0	117	75	232	10	35	86	2	50	165	265
Ø160	70 / 110	63 / 95	88 / 133	205	88	1"G	80	-	58	60 / 2xØ10	M48xP2.0 / M80xP3.0	130	75	250	7	32	91	2	63	203	329
Ø200	90 / 140	85 / 112	108 / 163	245	108	1 1/4"G	100	-	76	2xØ10	M64xP3.0 / M100xP3.0	165	85	306	7	32	105	2	80	241	401

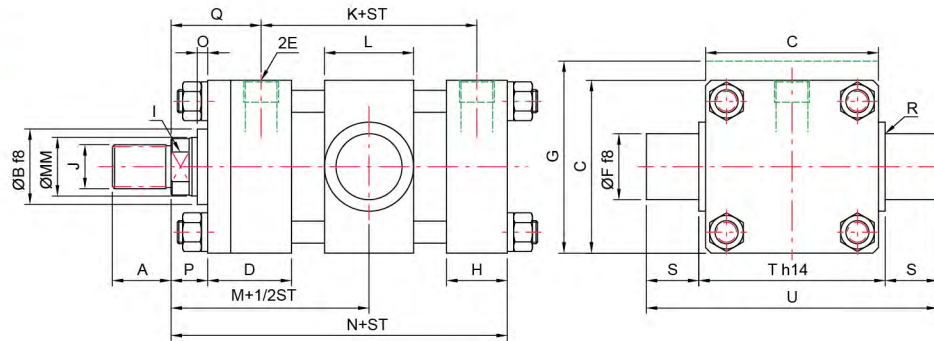
AT-MT2



DIMENSION

BORE	MM	A	B	C	D	E	F	G	H	I	J	K	M	N	O	P	Q	R	S	T	U
Ø25	12 / 18	14 / 18	24 / 30	40	50	1/4"G	12	45	25	10 / 15	M10xP1.25 / M14xP1.5	53	101	114	6	15	50	1	10	38	58
Ø32	14 / 22	16 / 22	26 / 34	45	50	1/4"G	16	50	25	12 / 18	M12xP1.25 / M16xP1.5	56	115	128	12	25	60	1	12	44	68
Ø40	18 / 28	18 / 28	30 / 42	63	55	3/8"G	20	-	38	15 / 22	M14xP1.5 / M20xP1.5	73	134	153	12	25	62	1	16	63	95
Ø50	22 / 36	22 / 36	34 / 50	75	61	1/2"G	25	-	38	18 / 30	M16xP1.5 / M27xP2.0	74	140	159	9	25	67	2	20	76	116
Ø63	28 / 45	28 / 45	42 / 60	90	61	1/2"G	32	-	38	22 / 36	M20xP1.5 / M33xP2.0	80	149	168	13	32	71	2	25	89	139
Ø80	36 / 56	36 / 56	50 / 72	115	70	3/4"G	40	-	45	30 / 46	M27xP2.0 / M42xP2.0	93	168	190	9	31	77	2	32	114	178
Ø100	45 / 70	45 / 63	60 / 88	130	72	3/4"G	50	-	58	36 / 60	M33xP2.0 / M48xP2.0	101	187	216	10	35	82	2	40	127	207
Ø125	56 / 90	56 / 85	72 / 108	165	80	1"G	63	-	70	46 / 2xØ10	M42xP2.0 / M64xP3.0	117	209	244	10	35	86	2	50	165	265
Ø160	70 / 110	63 / 95	88 / 133	205	83	1"G	80	-	87	60 / 2xØ10	M48xP2.0 / M80xP3.0	130	230	274	7	32	86	2	63	203	329
Ø200	90 / 140	85 / 112	108 / 163	245	101	1 1/4"G	100	-	107	2xØ10	M64xP3.0 / M100xP3.0	165	276	330	7	32	98	2	80	241	401

AT-MT4



DIMENSION

BORE	MM	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Ø25	12 / 18	14 / 18	24 / 30	40	50	1/4"G	12	45	25	10 / 15	M10xP1.25 / M14xP1.5	53	20	77	114	6	15	50	1	10	48	68
Ø32	14 / 22	16 / 22	26 / 34	45	50	1/4"G	16	50	25	12 / 18	M12xP1.25 / M16xP1.5	56	25	89	128	12	25	60	1	12	55	79
Ø40	18 / 28	18 / 28	30 / 42	63	55	3/8"G	20	-	38	15 / 22	M14xP1.5 / M20xP1.5	73	30	97.5	153	12	25	62	1	16	76	108
Ø50	22 / 36	22 / 36	34 / 50	75	61	1/2"G	25	-	38	18 / 30	M16xP1.5 / M27xP2.0	74	40	103.5	159	9	25	67	2	20	89	129
Ø63	28 / 45	28 / 45	42 / 60	90	61	1/2"G	32	-	38	22 / 36	M20xP1.5 / M33xP2.0	80	48	111.5	168	13	32	71	2	25	100	150
Ø80	36 / 56	36 / 56	50 / 72	115	70	3/4"G	40	-	45	30 / 46	M27xP2.0 / M42xP2.0	93	55	123	190	9	31	77	2	32	127	191
Ø100	45 / 70	45 / 63	60 / 88	130	72	3/4"G	50	-	45	36 / 60	M33xP2.0 / M48xP2.0	101	65	132.5	203	10	35	82	2	40	140	220
Ø125	56 / 90	56 / 85	72 / 108	165	80	1"G	63	-	58	46 / 2xØ10	M42xP2.0 / M64xP3.0	117	85	144.5	232	10	35	86	2	50	178	278
Ø160	70 / 110	63 / 95	88 / 133	205	83	1"G	80	-	58	60 / 2xØ10	M48xP2.0 / M80xP3.0	130	105	151	245	7	32	86	2	63	215	341
Ø200	90 / 140	85 / 112	108 / 163	245	101	1 1/4"G	100	-	76	2xØ10	M64xP3.0 / M100xP3.0	165	125	178	299	7	32	98	2	80	279	439

Standard Cylinders 6020-2 AT

ISO 6020-2 16MPa Standard Hydraulic Cylinders

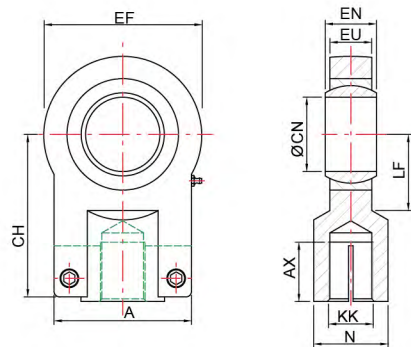
ACCESSORIES

To select the correct accessories, refer to the desired chart and look opposite the thread size of the rod end as indicated in the first column. The mating parts will be found in the same line.

T1 ROD EYE WITH SPHERICAL BEARING
T2 CLEVIS BRACKET
T6 ROD CLEVIS
T8 EYE BRACKET
T7 ROD EYE
T9 CLEVIS BRACKET
T15 TRUNNION BRACKET
T16 CLEVIS BRACKET FOR SPHERICAL BEARING
T17 PIVOT PIN

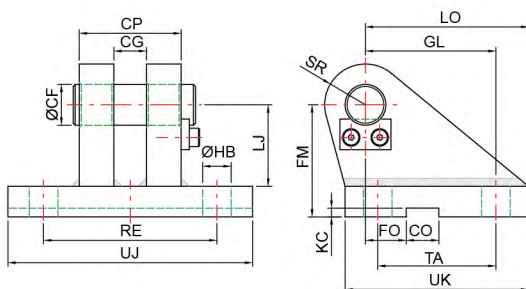
ROD EYE WITH SPHERICAL BEARING AND MATING PARTS

THREAD	H8 ROD EYE	CLEVIS BRACKET-PIVOT PIN
M10x1.25	T-1-12	T-2-12
M12x1.25	T-1-16	T-2-16
M14x1.5	T-1-20	T-2-20
M16x1.5	T-1-25	T-2-25
M20x1.5	T-1-30	T-2-30
M27x2	T-1-40	T-2-40
M33x2	T-1-50	T-2-50
M42x2	T-1-60	T-2-60
M48x2	T-1-80	T-2-80
M64x3	T-1-100	T-2-100



T-1 DIMENSION

REFERENCE	KK	A	AX	CN	CH	EF	EN	EU	LF	N
T-1-12	M10x1.25	40	15	12	42	40	10	8	16	17
T-1-16	M12x1.25	45	17	16	48	45	14	11	20	21
T-1-20	M14x1.5	55	19	20	58	55	16	13	25	25
T-1-25	M16x1.5	62	23	25	68	65	20	17	30	30
T-1-30	M20x1.5	77	29	30	85	80	22	19	35	36
T-1-40	M27x2	90	37	40	105	100	28	23	45	45
T-1-50	M33x2	105	46	50	130	120	35	30	58	55
T-1-60	M42x2	134	57	60	150	160	44	38	68	68
T-1-80	M48x2	156	64	80	185	205	55	47	82	90
T-1-100	M64x3	190	86	100	240	240	70	55	116	110



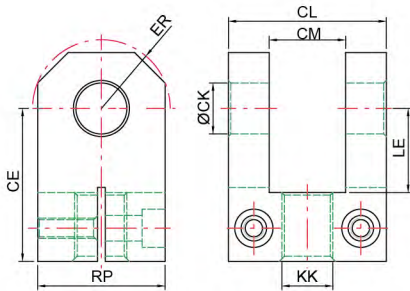
T-2 DIMENSION

REFERENCE	CF	CG	CO	CP	FM	FO	GL	HB	KC	LJ	LO	RE	SR	TA	UJ	UK
T-2-12	12	10	10	30	40	16	46	9	3.3	29	56	55	12	40	75	60
T-2-16	16	14	16	40	50	18	61	11	4.3	38	74	70	16	55	95	80
T-2-20	20	16	16	50	55	20	64	14	4.3	40	80	85	20	58	120	90
T-2-25	25	20	25	60	65	22	78	16	5.4	49	98	100	25	70	140	110
T-2-30	30	22	25	70	85	24	97	18	5.4	63	120	115	30	90	160	135
T-2-40	40	28	36	80	100	24	123	22	8.4	73	148	135	40	120	190	170
T-2-50	50	35	36	100	125	35	155	30	8.4	92	190	170	50	145	240	215
T-2-60	60	44	50	120	150	35	187	39	11.4	110	225	200	60	185	270	260
T-2-80	80	55	50	160	190	35	255	45	11.4	142	295	240	80	260	320	340
T-2-100	100	70	63	200	210	35	285	48	12.4	152	335	300	100	300	400	400

ROD CLEVIS AND MATING PARTS

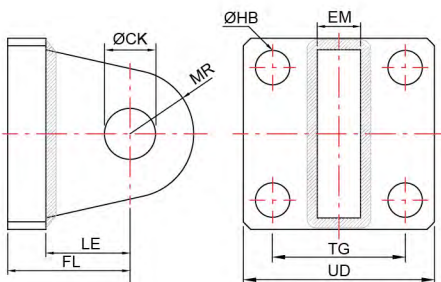
THREAD	H1 ROD CLEVIS	EYE BRACKET	H7 PIVOT PIN
M10x1.25	T-6-10	T-8-10	T-10-10
M12x1.25	T-6-12	T-8-12	T-10-12
M14x1.5	T-6-16	T-8-16	T-10-16
M16x1.5	T-6-20	T-8-20	T-10-20
M20x1.5	T-6-25	T-8-25	T-10-25
M27x2	T-6-30	T-8-30	T-10-30
M33x2	T-6-40	T-8-40	T-10-40
M42x2	T-6-50	T-8-50	T-10-50
M48x2	T-6-60	T-8-60	T-10-60
M64x3	T-6-80	T-8-80	T-10-80

T-6 DIMENSION



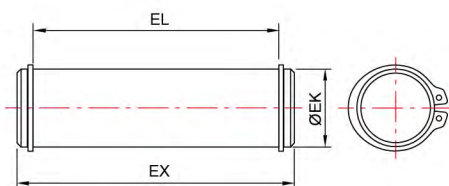
REFERENCE	KK	CE	CK	CL	CM	ER	LE	RP
T-6-10	M10x1.25	32	10	26	12	12	14	21
T-6-12	M12x1.25	36	12	34	16	17	20	28
T-6-16	M14x1.5	38	14	42	20	17	20	30
T-6-20	M16x1.5	54	20	62	30	27	33	50
T-6-25	M20x1.5	60	20	62	30	27	33	50
T-6-30	M27x2	75	28	83	40	33	40	62
T-6-40	M33x2	99	36	103	50	48	55	85
T-6-50	M42x2	113	45	123	60	52	58	90
T-6-60	M48x2	126	56	143	70	59	64	112
T-6-80	M64x3	168	70	163	80	78	84	140

T-8 DIMENSION



REFERENCE	CK	HB	EM	FL	LE	MR	TG	UD
T-8-10	10	5.5	12	23	14	11	28.3	40
T-8-12	12	6.5	16	29	20	15	33.2	45
T-8-16	14	9	20	29	20	16	41.7	65
T-8-20	20	13.5	30	48	33	25	52.3	75
T-8-25	20	13.5	30	48	33	28	64.3	90
T-8-30	28	17.5	40	59	40	33	82.7	115
T-8-40	36	17.5	50	79	55	45	96.9	130
T-8-50	45	24	60	87	58	52	125.9	165
T-8-60	56	30	70	103	64	58	154.9	205
T-8-80	70	33	80	132	84	75	190.2	240

T-10 DIMENSION



REFERENCE	EK	EL	EX
T-10-10	10	27	34
T-10-12	12	35	43
T-10-16	14	43	51
T-10-20	20	63	73
T-10-25	20	63	73
T-10-30	28	84	95
T-10-40	36	104	117
T-10-50	45	124	139
T-10-60	56	144	161
T-10-80	70	164	181

Standard Cylinders 6020-2 AT

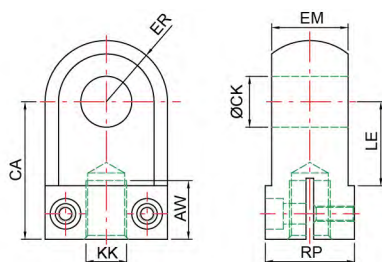
ISO 6020-2 16MPa Standard Hydraulic Cylinders

ROD EYE AND MATING PARTS

THREAD	H8 ROD EYE	H4 CLEVIS BRACKET	H7 PIVOT PIN
M10x1.25	T-7-10	T-9-10	T-10-10
M12x1.25	T-7-12	T-9-12	T-10-12
M14x1.5	T-7-16	T-9-16	T-10-16
M16x1.5	T-7-20	T-9-20	T-10-20
M20x1.5	T-7-25	T-9-25	T-10-25
M27x2	T-7-30	T-9-30	T-10-30
M33x2	T-7-40	T-9-40	T-10-40
M42x2	T-7-50	T-9-50	T-10-50
M48x2	T-7-60	T-9-60	T-10-60
M64x3	T-7-80	T-9-80	T-10-80

T-7

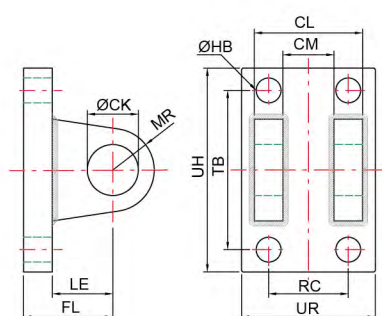
DIMENSION



REFERENCE	KK	AW	CA	CK	EM	ER	LE	RP
T-7-10	M10x1.25	15	32	10	12	11	14	19
T-7-12	M12x1.25	17	36	12	16	14	20	25
T-7-16	M14x1.5	19	38	14	20	16	20	28
T-7-20	M16x1.5	23	54	20	30	24	33	35
T-7-25	M20x1.5	29	60	20	30	24	33	40
T-7-30	M27x2	37	75	28	40	31	40	50
T-7-40	M33x2	46	99	36	50	41	55	60
T-7-50	M42x2	57	113	45	60	48	58	80
T-7-60	M48x2	64	126	56	70	58	64	90
T-7-80	M64x3	86	168	70	80	73	84	110

T-9

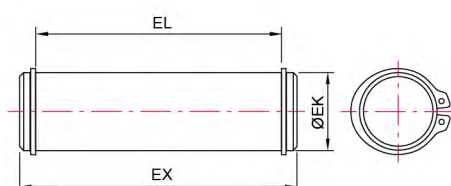
DIMENSION



REFERENCE	CK	CL	CM	FL	HB	LE	MR	RC	TB	UH	UR
T-9-10	10	26	12	23	5.5	14	11	18	47	60	35
T-9-12	12	34	16	29	6.5	20	15	24	57	73	45
T-9-16	14	42	20	29	9	20	16	30	68	88	55
T-9-20	20	62	30	48	13.5	33	25	45	102	132	80
T-9-25	20	62	30	48	13.5	33	28	45	102	132	80
T-9-30	28	83	40	59	17.5	40	33	60	135	175	100
T-9-40	36	103	50	79	17.5	55	45	75	167	212	130
T-9-50	45	123	60	87	24	58	52	90	203	238	150
T-9-60	56	143	70	103	30	64	58	105	242	302	180
T-9-80	70	163	80	132	33	84	75	120	300	370	200

T-10

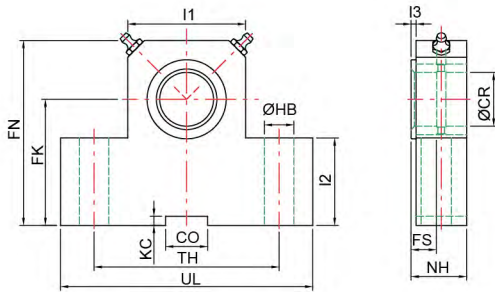
DIMENSION



REFERENCE	EK	EL	EX
T-10-10	10	27	34
T-10-12	12	35	43
T-10-16	14	43	51
T-10-20	20	63	73
T-10-25	20	63	73
T-10-30	28	84	95
T-10-40	36	104	117
T-10-50	45	124	139
T-10-60	56	144	161
T-10-80	70	164	181

T-15

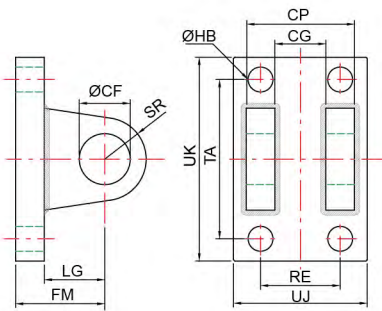
DIMENSION



REFERENCE	CR	CO	FK	FN	FS	HB	KC	NH	TH	UL	I1	I2	I3
T-15-12	12	10	38	55	8	9	3.3	17	40	63	25	25	1
T-15-16	16	16	45	65	10	11	4.3	21	50	80	30	30	1
T-15-20	20	16	55	80	10	11	4.3	21	60	90	40	38	1.5
T-15-25	25	25	65	90	12	14	5.4	26	80	110	56	45	1.5
T-15-32	32	25	75	110	15	18	5.4	33	110	150	70	52	2
T-15-40	40	36	95	140	16	22	8.4	41	125	170	88	60	2.5
T-15-50	50	36	105	150	20	26	8.4	51	160	210	90	72	2.5
T-15-63	63	50	125	195	25	33	11.4	61	200	265	136	87	3
T-15-80	80	50	150	230	31	39	11.4	81	250	325	160	112	3
T-15-100	100	63	200	300	42	52	12.4	101	320	410	200	150	4.5

T-16

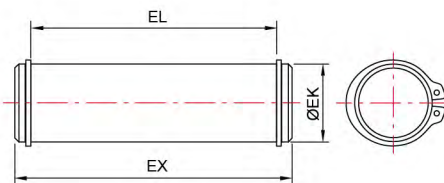
DIMENSION



REFERENCE	CF	CG	CP	FM	HB	LG	RE	SR	TA	UJ	UK
T-16-12	12	12	30	36	6.5	27	20	16	65	40	81
T-16-16	16	16	38	42	9	33	25	20	84	50	104
T-16-20	20	18	50	51	13.5	36	33	24	106	70	136
T-16-25	25	22	54	64	13.5	49	37	30	130	75	160
T-16-30	30	24	67	72	17.5	53	44	35	137	90	177
T-16-40	40	30	83	104	17.5	80	55	45	191	110	236
T-16-50	50	38	101	123	24	94	68	55	234	130	289
T-16-60	60	47	120	144	30	105	82	59	288	150	348
T-16-80	80	58	141	182	33	133	98	78	366	180	436
T-16-100	100	75	165	195	39	140	130	100	390	205	470

T-17

DIMENSION



REFERENCE	EK	EL	EX
T-17-12	12	31	39
T-17-16	16	39	47
T-17-20	20	51	61
T-17-25	25	55	65
T-17-30	30	68	78
T-17-40	40	84	97
T-17-50	50	102	120
T-17-60	60	121	139
T-17-80	80	142	160
T-17-100	100	166	186

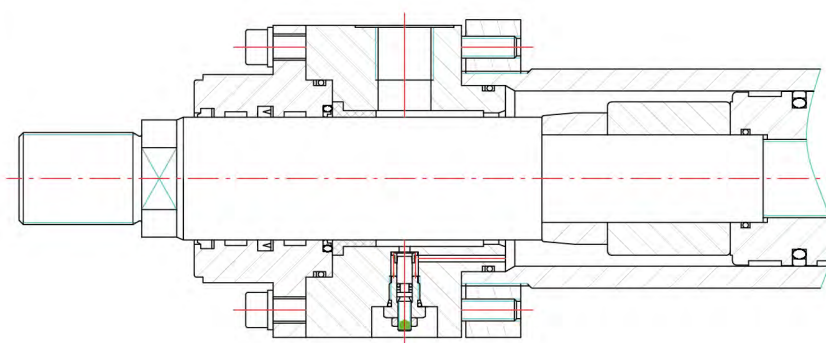
Stop Tube

When compression loads are involved, it's also necessary to consider bearing pressures on rod cartridge and piston and if we want to keep these values within proper limits, it could be necessary to increase bearing length; this is achieved by means of a stop tube between piston and rod cartridge.

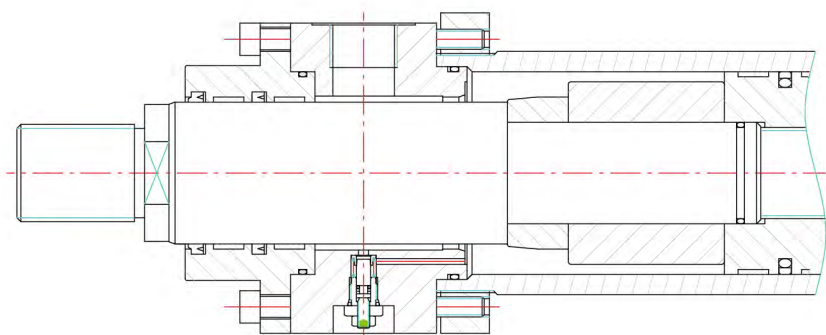
The next table shows different stop tube lengths according to cylinder strokes but sometimes other designs can be supplied according to application requirements; in these cases, please consult factory.

STROKE	STOP TUBE
0 - 1000 mm	0 mm
1001 - 1500 mm	50 mm
1501 - 2000 mm	100 mm
2001 - 2500 mm	150 mm
2501 - 3000 mm	200 mm

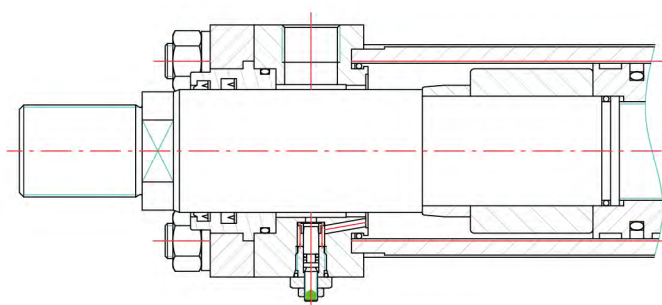
AH Series (ISO 6022)



AK Series (ISO 6020-1)



AT Series (ISO 6020-2)



Linear Position Transmitter Series

The selection of a transducer for a specific application depends on accuracy, cost and durability. ASHUN uses 2 basic types of devices shown below but it is possible to use other types, especially when integrated solution in hydraulic cylinders is not possible.

Mounting Parts List And Types

NO	Description
1	Cylinder Tube
2	Piston
3	Cushion Sleeve
4	End Cap
5	Set Screw
6	Linear Position Transmitter HLT 1000-R2
7	Linear Position Transmitter HLT 2150-R1
8	End Plate
9	Non Ferrous Distance Ring
10	Position magnets
11	Hex Socket Screws
12	Protective Case

Design Data

1. Stroke Length Range 50 ~ 2500 mm

2. ISO 6022 AH Series

Bore Design Restrictions - Piston Ø 50 ~ Ø 320 mm

Type restrictions - **MF4 + MP3 + MP5** → B

3. ISO 6020-1 AK Series

Bore Design Restrictions - Piston Ø 50 ~ Ø 320 mm

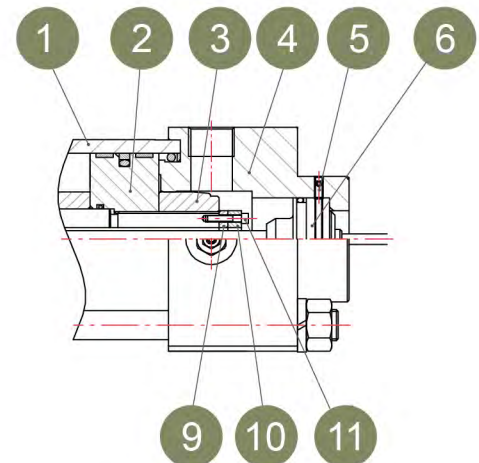
Type restrictions - **MF2 + MF4 + MP3 + MP5** → B

4. ISO 6020-2 AT Series

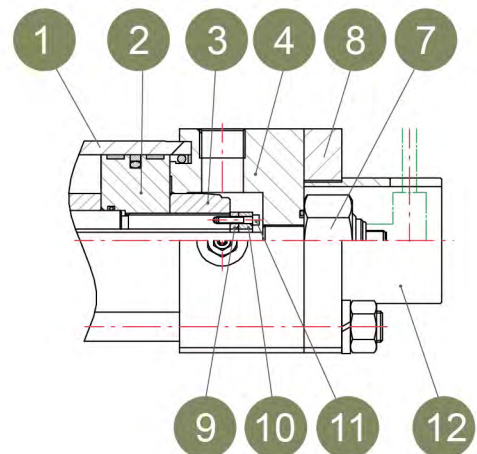
Bore Design Restrictions - Piston Ø 63 ~ Ø 200 mm

Type restrictions - **ME6 + MP1 + MP3 + MP5** → B

5. Signal Output And Pin Connections Please Refer To Model Code



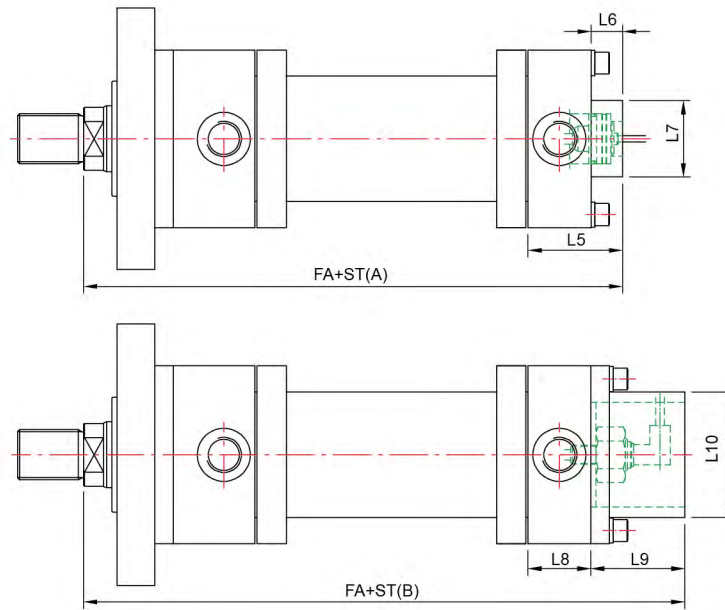
A - Cylinder Integrated



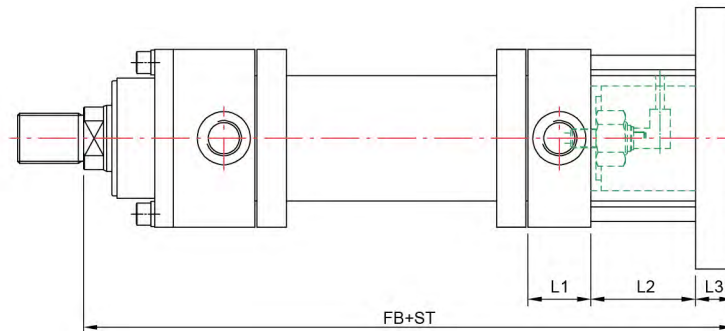
B - Cylinder Semi-Integrated

Linear Position Transmitter series

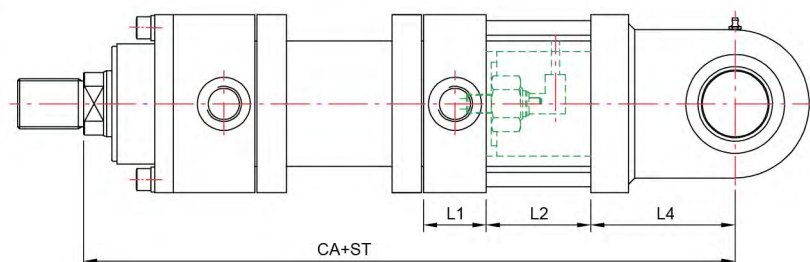
AHS-MF3



AHS-MF4



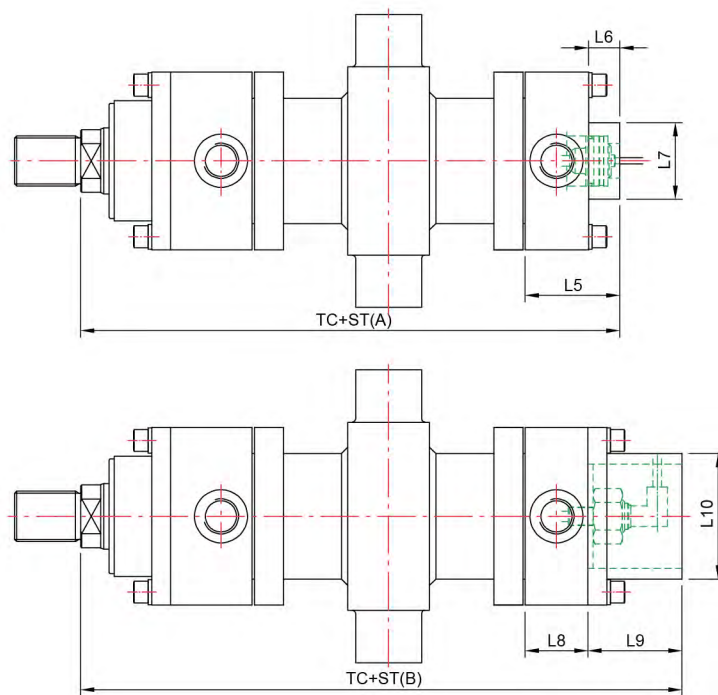
AHS-MP3/5



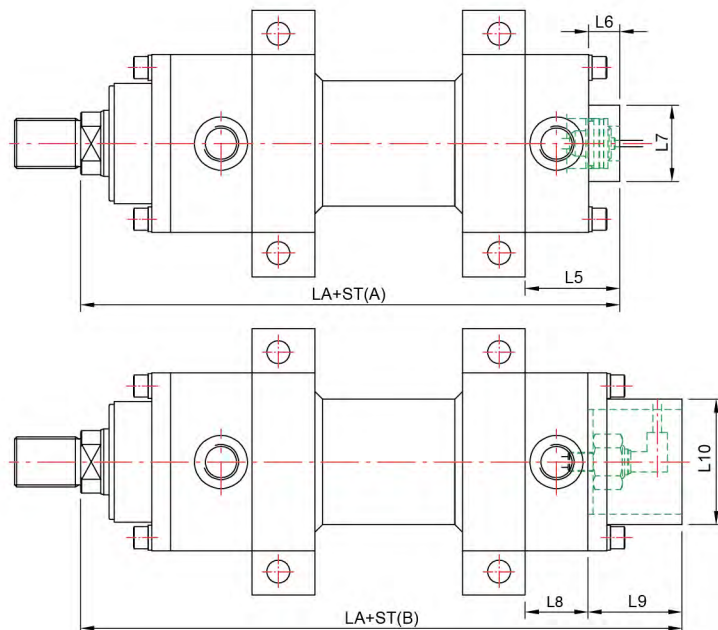
DIMENSION

BORE	FA (A/B)	FB	CA	LA (A/B)	TC (A/B)	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
Ø50	281.5 / 340	-	-	281.5 / 340	281.5 / 340	-	-	-	-	85.5	31.5	Ø68	54	90	Ø68
Ø63	310.5 / 364	398	472	310.5 / 364	310.5 / 364	50	100	28	102	90.5	36.5	Ø76	54	90	Ø76
Ø80	339.5 / 397	434	524	339.5 / 397	339.5 / 397	53	100	32	122	90.5	30	Ø73	58	90	Ø100
Ø100	365.5 / 425	471	573	365.5 / 425	365.5 / 425	60	100	36	138	90.5	30	Ø73	60	90	Ø120
Ø125	421.5 / 480	540	664	421.5 / 480	421.5 / 480	64	110	40	164	95.5	30	Ø73	64	90	Ø120
Ø140	450.5 / 515	575	724	450.5 / 515	450.5 / 515	80	110	40	189	105.5	25.5	Ø73	80	90	Ø120
Ø160	485.5 / 550	615	765	485.5 / 550	485.5 / 550	80	110	45	195	105.5	25.5	Ø73	80	90	Ø120
Ø180	526.5 / 590	660	840	526.5 / 590	526.5 / 590	89	110	50	230	115.5	26.5	Ø73	89	90	Ø120
Ø200	564.5 / 630	706	912	564.5 / 630	564.5 / 630	91	110	56	262	115.5	24.5	Ø73	91	90	Ø120
Ø220	637 / 712	795	1046	637 / 712	637 / 712	112	110	63	314	127	25	Ø73	112	90	Ø120
Ø250	652 / 727	810	1061	652 / 727	652 / 727	111	110	63	314	126	25	Ø73	111	90	Ø120
Ø320	764 / 764	939	1255	764 / 764	764 / 764	149	110	80	396	154	-	Ø120	150	-	Ø120

AHS-MT4



AHS-MS2

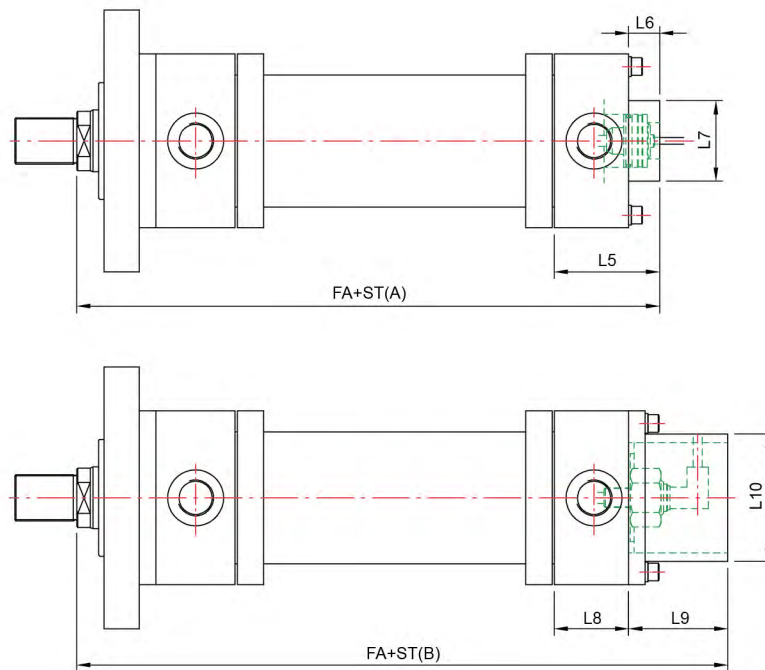


DIMENSION

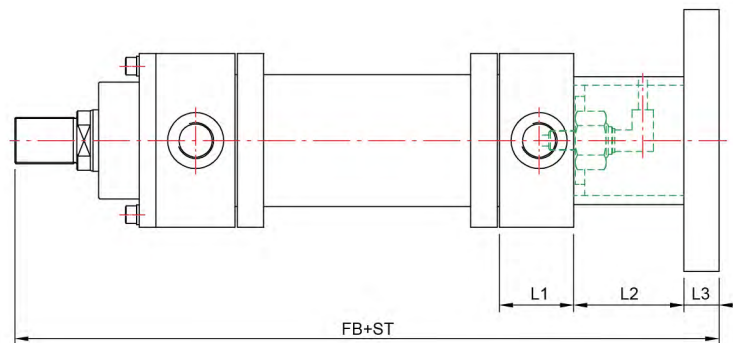
BORE	FA (A/B)	FB	CA	LA (A/B)	TC (A/B)	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
Ø50	281.5 / 340	-	-	281.5 / 340	281.5 / 340	-	-	-	-	85.5	31.5	Ø68	54	90	Ø68
Ø63	310.5 / 364	398	472	310.5 / 364	310.5 / 364	50	100	28	102	90.5	36.5	Ø76	54	90	Ø76
Ø80	339.5 / 397	434	524	339.5 / 397	339.5 / 397	53	100	32	122	90.5	30	Ø73	58	90	Ø100
Ø100	365.5 / 425	471	573	365.5 / 425	365.5 / 425	60	100	36	138	90.5	30	Ø73	60	90	Ø120
Ø125	421.5 / 480	540	664	421.5 / 480	421.5 / 480	64	110	40	164	95.5	30	Ø73	64	90	Ø120
Ø140	450.5 / 515	575	724	450.5 / 515	450.5 / 515	80	110	40	189	105.5	25.5	Ø73	80	90	Ø120
Ø160	485.5 / 550	615	765	485.5 / 550	485.5 / 550	80	110	45	195	105.5	25.5	Ø73	80	90	Ø120
Ø180	526.5 / 590	660	840	526.5 / 590	526.5 / 590	89	110	50	230	115.5	26.5	Ø73	89	90	Ø120
Ø200	564.5 / 630	706	912	564.5 / 630	564.5 / 630	91	110	56	262	115.5	24.5	Ø73	91	90	Ø120
Ø220	637 / 712	795	1046	637 / 712	637 / 712	112	110	63	314	127	25	Ø73	112	90	Ø120
Ø250	652 / 727	810	1061	652 / 727	652 / 727	111	110	63	314	126	25	Ø73	111	90	Ø120
Ø320	764 / 764	939	1255	764 / 764	764 / 764	149	110	80	396	154	-	Ø120	150	-	Ø120

Linear Position Transmitter series

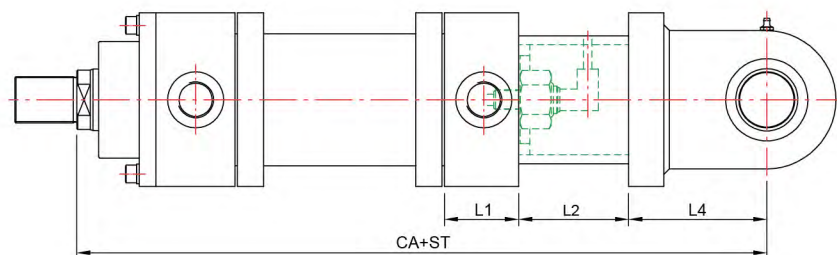
AKS-MF1/3



AKS-MF2/4



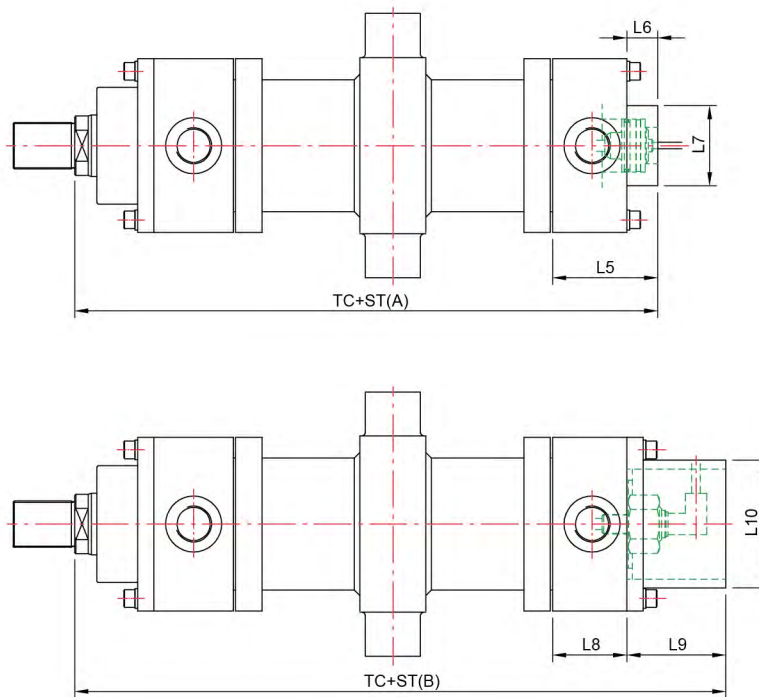
AKS-MP3/5



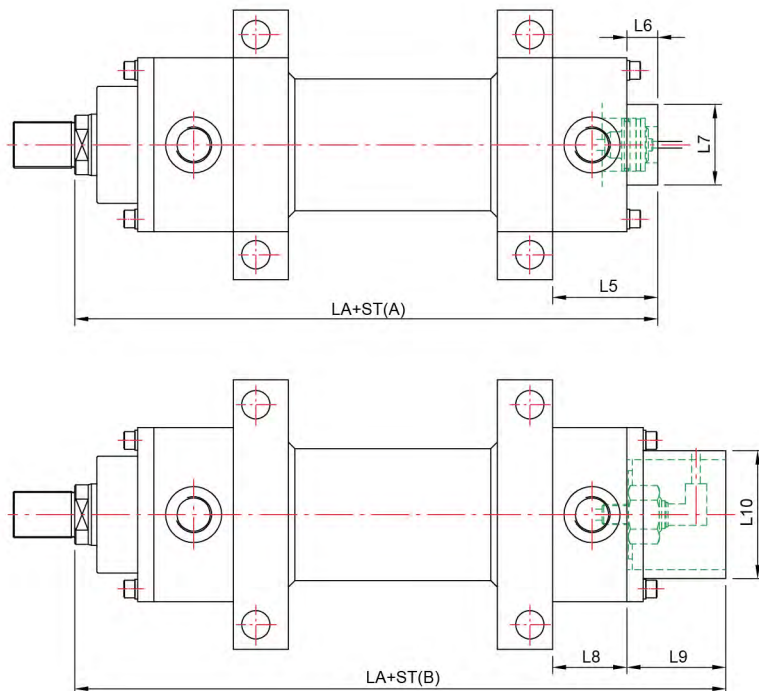
DIMENSION

BORE	FA (A/B)	FB	CA	LA (A/B)	TC (A/B)	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
Ø50	241 / 299.5	-	-	241 / 299.5	241 / 299.5	-	-	-	-	80.5	31.5	Ø65	49	90	Ø65
Ø63	259.5 / 318	353	418	259.5 / 318	259.5 / 318	54	100	25	90	85.5	31.5	Ø76	54	90	Ø76
Ø80	282.5 / 340	382	464	282.5 / 340	282.5 / 340	53	100	32	114	85.5	32.5	Ø73	53	90	Ø90
Ø100	329.5 / 391.5	433.5	527	329.5 / 391.5	329.5 / 391.5	67.5	100	32	125.5	95.5	28	Ø73	67.5	90	Ø116
Ø125	356.5 / 417	469	570	356.5 / 417	356.5 / 417	66	110	32	133	95.5	29.5	Ø73	66	90	Ø120
Ø160	399.5 / 462.5	518.5	651	399.5 / 462.5	399.5 / 462.5	78.5	110	36	168.5	105.5	27	Ø73	78.5	90	Ø120
Ø200	477.5 / 544	604	765	477.5 / 544	477.5 / 544	87	110	40	201	110.5	23.5	Ø73	87	90	Ø120
Ø250	571.5 / 634	710	929	571.5 / 634	571.5 / 634	98	110	56	275	125.5	27.5	Ø73	98	90	Ø120
Ø320	688 / 750	824	1088	688 / 750	688 / 750	107	110	63	327	144	22	Ø120	116	90	Ø120

AKS-MT4



AKS-MS2

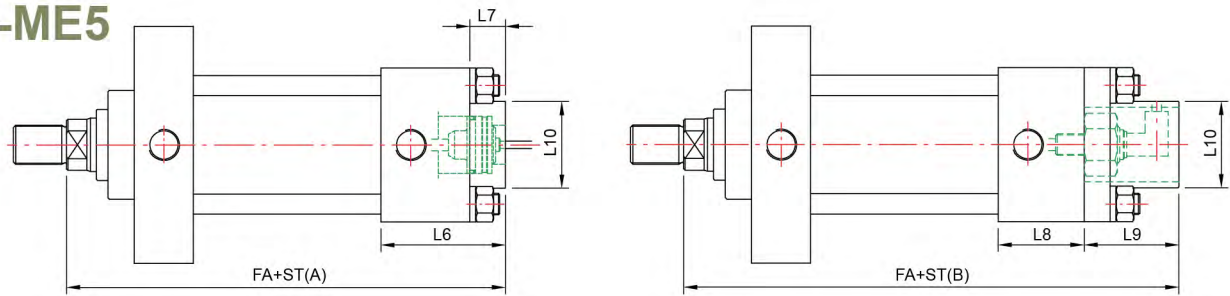


DIMENSION

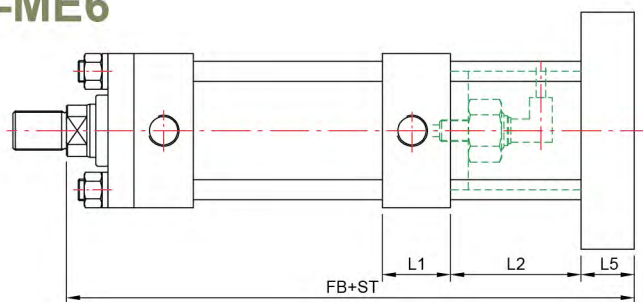
BORE	FA (A/B)	FB	CA	LA (A/B)	TC (A/B)	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
Ø50	241 / 299.5	-	-	241 / 299.5	241 / 299.5	-	-	-	-	80.5	31.5	Ø65	49	90	Ø65
Ø63	259.5 / 318	353	418	259.5 / 318	259.5 / 318	54	100	25	90	85.5	31.5	Ø76	54	90	Ø76
Ø80	282.5 / 340	382	464	282.5 / 340	282.5 / 340	53	100	32	114	85.5	32.5	Ø73	53	90	Ø90
Ø100	329.5 / 391.5	433.5	527	329.5 / 391.5	329.5 / 391.5	67.5	100	32	125.5	95.5	28	Ø73	67.5	90	Ø116
Ø125	356.5 / 417	469	570	356.5 / 417	356.5 / 417	66	110	32	133	95.5	29.5	Ø73	66	90	Ø120
Ø160	399.5 / 462.5	518.5	651	399.5 / 462.5	399.5 / 462.5	78.5	110	36	168.5	105.5	27	Ø73	78.5	90	Ø120
Ø200	477.5 / 544	604	765	477.5 / 544	477.5 / 544	87	110	40	201	110.5	23.5	Ø73	87	90	Ø120
Ø250	571.5 / 634	710	929	571.5 / 634	571.5 / 634	98	110	56	275	125.5	27.5	Ø73	98	90	Ø120
Ø320	688 / 750	824	1088	688 / 750	688 / 750	107	110	63	327	144	22	Ø120	116	90	Ø120

Linear Position Transmitter series

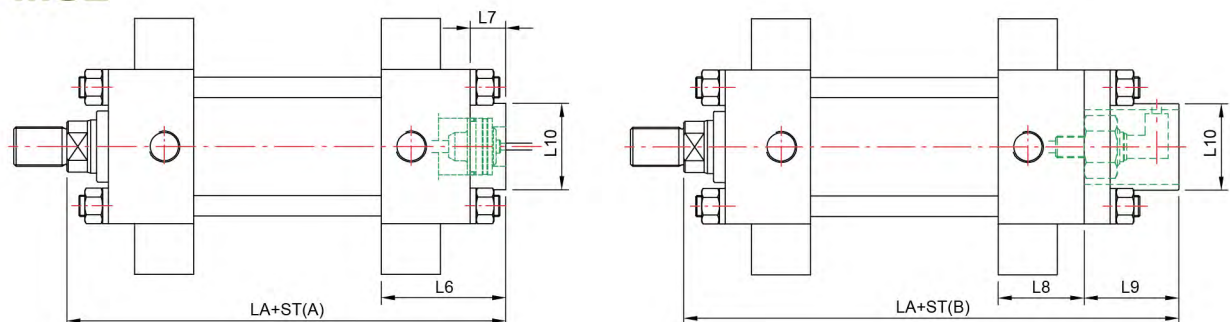
ATS-ME5



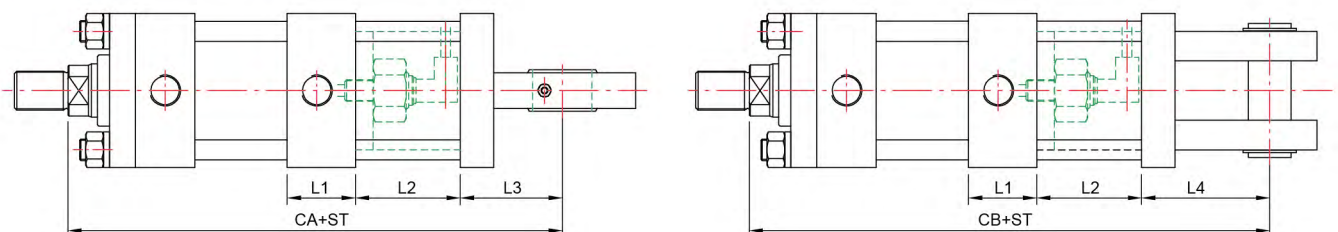
ATS-ME6



ATS-MS2



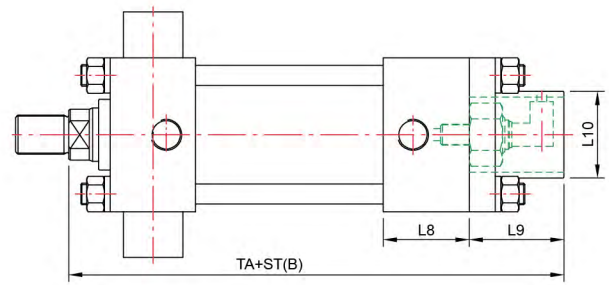
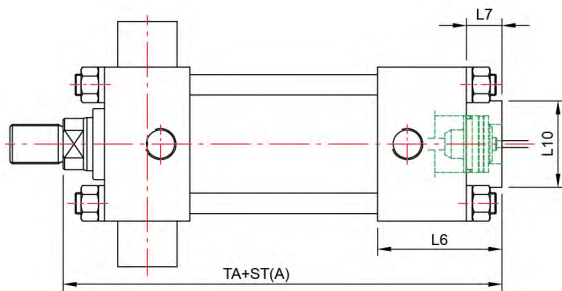
ATS-MP1/3/5



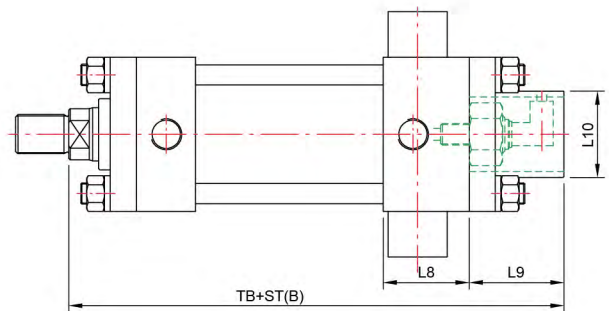
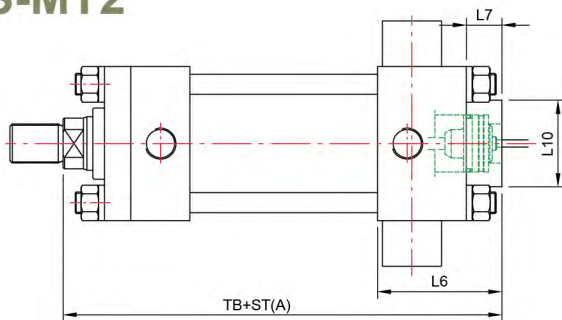
DIMENSION

BORE	FA (A/B)	FB	CB	CA	LA (A/B)	TC (A/B)	TA (A/B)	TB (A/B)	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
Ø63	222 / 269.5	317.5	333.5	339.5	222 / 269.5	222 / 269.5	222 / 269.5	222 / 269.5	49.5	100	60	54	38	92	16	59.5	80	Ø63
Ø80	243.5 / 291	348.5	366.5	375.5	243.5 / 291	243.5 / 291	243.5 / 291	243.5 / 291	52.5	105	72	63	45	98.5	20	66	80	Ø73
Ø100	263 / 310.5	370.5	407.5	411.5	263 / 310.5	263 / 310.5	263 / 310.5	263 / 310.5	57.5	110	86	82	45	105	30	72.5	80	Ø73
Ø125	285 / 332.5	405.5	438.5	453.5	285 / 332.5	285 / 332.5	285 / 332.5	285 / 332.5	63.5	110	106	91	58	111	35	78.5	80	Ø73
Ø160	296.5 / 344	417	460	489	296.5 / 344	296.5 / 344	301.5 / 349	296.5 / 344	62	110	130	101	58	109.5	40	77	80	Ø73
Ø200	338.5 / 386	417	528	562	338.5 / 386	338.5 / 386	345.5 / 393	338.5 / 386	68	110	161	127	76	115.5	42.5	83	80	Ø73

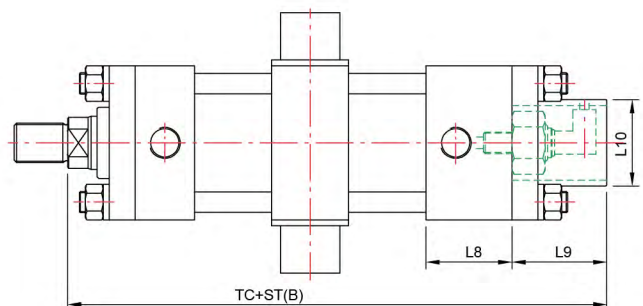
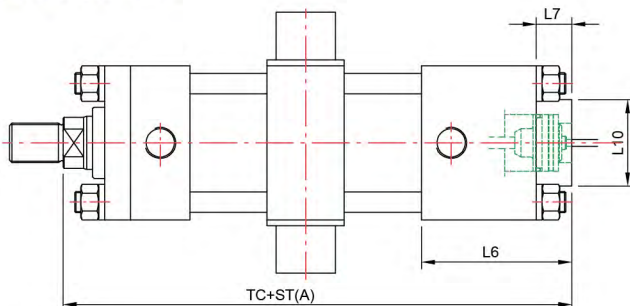
ATS-MT1



ATS-MT2



ATS-MT4



DIMENSION

BORE	FA (A/B)	FB	CB	CA	LA (A/B)	TC (A/B)	TA (A/B)	TB (A/B)	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
Ø63	222 / 269.5	317.5	333.5	339.5	222 / 269.5	222 / 269.5	222 / 269.5	222 / 269.5	49.5	100	60	54	38	92	16	59.5	80	Ø63
Ø80	243.5 / 291	348.5	366.5	375.5	243.5 / 291	243.5 / 291	243.5 / 291	243.5 / 291	52.5	105	72	63	45	98.5	20	66	80	Ø73
Ø100	263 / 310.5	370.5	407.5	411.5	263 / 310.5	263 / 310.5	263 / 310.5	263 / 310.5	57.5	110	86	82	45	105	30	72.5	80	Ø73
Ø125	285 / 332.5	405.5	438.5	453.5	285 / 332.5	285 / 332.5	285 / 332.5	285 / 332.5	63.5	110	106	91	58	111	35	78.5	80	Ø73
Ø160	296.5 / 344	417	460	489	296.5 / 344	296.5 / 344	301.5 / 349	296.5 / 344	62	110	130	101	58	109.5	40	77	80	Ø73
Ø200	338.5 / 386	417	528	562	338.5 / 386	338.5 / 386	345.5 / 393	338.5 / 386	68	110	161	127	76	115.5	42.5	83	80	Ø73



HLT 1000-R2

Magnetostrictive	fully integrated	Resolution 1000 µm
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Analogue and digital interfaces

CANopen

Description:

The sensor works on the principle of magnetostriction.

The measuring principle determines the position, distance and / or speed with great precision, if required, and is based on transit time measurement.

Based on this non-contact and wear-free measuring system, we offers a version in a pressure-resistant stainless steel housing for full integration in hydraulic cylinders.

The different output signals (analogue / CANopen) facilitate the connection of all measurement and control devices as well as connection to standard evaluation systems (e.g. also to PLC controls).

Primary applications are in mobile hydraulics.

Technical Data:

Input data		
Measurement ranges	50 .. 2500 mm	
Measured variable	Position / distance	
Type	Cylinder integrated	
Hydraulic pipe	Stainless steel 1.4571	
Pressure resistance	450 bar	
Peak pressure	630 bar	
Housing	Stainless steel 1.4301	
Output data		
Output signal	Current: 4 ..20 mA or 20 ..4 mA Voltage: 0 ..10 V or 10 .. 0 V 0.25 .. 4.75 V or 4.75 .. 0.25 V 0.5 .. 9.5 V 0.5 .. 4.5 V	
Output signal Digital	CANopen	
Measuring accuracy	Analogue	CANopen
Resolution	12 Bit, min. 0.1 mm	0.1 mm
Ohmic resistance to GND	Current: 200 .. 500Ω Spannung:>2 kΩ	
CAN Interface		ISO/DIS 11898
Accuracy in accordance with DIN 16086	≤ ± 0.5 % FS typ.	≤ ± 0.2 % FS typ.
Non linearity	≤ ± 0.05 % FS	≤ ± 0.02 % FS
Hysteresis	≤ ± 0.1 % FS	≤ ± 0.1 mm
Repeatability	≤ ± 0.1 % FS	≤ ± 0.1 mm
Temperature coefficient	≤ ± 0.01 % FS / °C	≤ ± 0.003 % FS / °C
Sampling rate (internal)	2 ms	2 ms
Installation position and movement speed No restrictions		
Ambient conditions		
Operating temperature range	-40 .. +85 °C	
Storage temperature range	-40 .. +100 °C, dry	
Fluid temperature range	-40 .. +120°C	
Relative humidity	90 %, non-condensing	
CE - mark	EN 61000-6-1 / 2 / 3 / 4	
Vibration resistance per DIN EN 60068-2-6 at 10 .. 500 Hz at 5 kHz	≤ 20 g ≤ 15 g	
Shock resistance to DIN EN 60068-2-27 (11 ms)	≤ 50 g	
Protection class to IEC 60529 ¹⁾	IP 67	
Other data		
Electrical connection ¹⁾	Jacketed cable (PUR) Shouldered flange connector M12x1	
Supply voltage	9 .. 36 V DC	
Residual ripple of supply voltage	≤ 250 mVPP	
Current consumption without output	< 100 mA	
Weight	1000 g, depends on length	

Note: Reverse polarity protection of the supply voltage, excess voltage and short circuit protection are provided.

FS (Full Scale) = relative to the complete measuring range

1) Other versions are possible.

HOW TO ORDER

Model Code: HLT 1 0 00 - R2 - XXX - XXX - XXXX - 000

Design/Geometry type

1 = rod

Type

R2 = Cylinder integrated

Electrical connection

Cable outlet

K01 = single lead, length 1 m

K02 = single lead, length 2 m

K05 = single lead, length 5 m

K10 = single lead, length 10 m

Shouldered flange connector M12x1

(4 pole for Signal output analogue, 5 pole for Signal Output: CANopen)

L06 = 60 mm lead length

L18 = 180 mm lead length

L24 = 240 mm lead length

Output signal

C01 = Analogue 4 .. 20 mA, 3 conductor

C02 = Analogue 20 .. 4 mA, 3 conductor

B01 = Analogue 0 .. 10 V

B02 = Analogue 10 .. 0 V

G01 = Analogue 0.25 .. 4.75 V

G02 = Analogue 4.75 .. 0.25 V

G03 = Analogue 0.5 .. 9.5 V

G04 = Analogue 0.5 .. 4.5 V

F11 = CANopen

Measuring range in mm (50 to 2500 mm)

Example

0150 = 150 mm

Modification

000 = Standard

003 = special assigned plug (only in conjunction with analogue output signal)

004 = special assigned plug (only in conjunction with analogue output signal)

Notes:

Special models on request.

Accessories available: (not supplied with instrument)

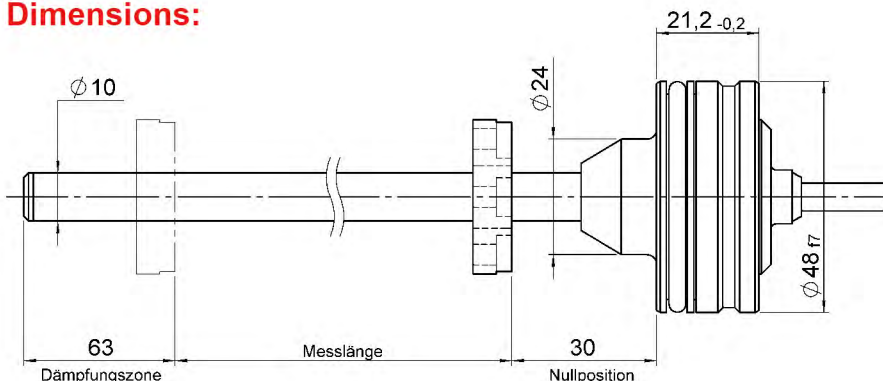
ZBL MR 17.4 Position magnet Part no.: 6119372

ZBL MR22 Position magnet Part no.: 6084453

ZBL MR33 Position magnet Part no.: 6084207

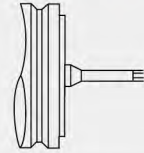
More detailed information on accessories as well as on further accessories, such as female connectors, etc. can be found in the accessories brochure.

Dimensions:



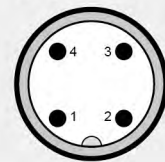
Steckerbelegung:

Cable outlet



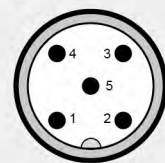
Ader	Analog	CANopen
braun	+U _B	+U _B
weiß	0 V	0V
grün	Analog	CAN_L
gelb	n.c.	CAN_H

M12x1, 4-polig



Pin	Mod. 000	Mod. 003	Mod. 004
1	+U _B	+U _B	n.c.
2	n.c.	Signal	+U _B
3	Analog	0 V	0 V
4	Signal	n.c.	Signal

M12x1, 5-polig



Pin	Signal	Beschreibung
1	n.c.	
2	+U _B	Supply +
3	0 V	Supply -
4	CAN_H	bus line dominant high
5	CAN_L	bus line dominant low

Note:

The information in this brochure relates to the operating conditions and applications described. For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.

Linear Position Transmitter

series



Description:

The sensor works on the principle of magnetostriction.

The measurement principle for high-precision determination of the position, of the distance and/or also of a velocity signal is based on a runtime asurement.

Utilizing this non-contact and wear-free measuring system, We offers a version in a pressure-resistant, tubular casing in stainless steel, for direct installation into hydraulic cylinders.

The different output signals (analogue/digital) facilitate the connection of all measurement and control instruments as well as standard evaluation systems (e.g. PLC controls)

HLT 2100-R1 is primarily used in stationary applications as partly integrated solutions in hydraulic cylinders.

HLT 2100-R1

Magnetostrictive	partly integrated	Resolution 5 µm
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Analogue and digital interfaces

Logos :
Profibus, CANopen,
DeviceNet,
SSI, EtherCAT

Technical Data:

Input data	
Measurement ranges	50 .. 4000 mm
Measured variable	Distance, position, speed
Mechanical connection	Threaded flange M18x1.5
Hydraulic pipe	Stainless steel
Pressure resistance	450 bar
Peak pressure	750 bar
Housing	Aluminium
Output data	
Output signal Analogue	Current: 4 .. 20 mA or 20 .. 4 mA Voltage: 0 .. 10 V or 10 .. 0 V
Output signal Digital	Profibus, CANopen, DeviceNet, SSI, EtherCAT
Resolution	Analogue: 16 Bit; ≥ 0.005 mm Digital: 0.005 mm ¹⁾
Ohmic resistance to GND (only with analogue signal output)	Current: 200 .. 500 Ω voltage: > 2 k Ω
Accuracy	$\leq \pm 0.5$ % FS typ.
Non linearity	± 0.1 mm to 1,500 mm ± 0.15 mm $> 1,500$ mm
Hysteresis	$\leq \pm 0.1$ % FS
Repeatability	≤ 0.005 mm - ≤ 0.05 mm (depends on length)
Temperature coefficient	$\leq \pm 0.004$ % FS / °C (analogue) $\leq \pm 0.0015$ % FS / °C (digital)
Sampling rate	2 ms
Installation position and movement speed	No orientation restrictions
Ambient conditions	
Operating temperature range	0 .. +70 °C
Storage temperature range	-30 .. +85 °C, dry
Relative humidity	98 %, non-condensing
CE - mark	EN 61000-6-1 / 2 / 3 / 4
Vibration resistance per DIN EN 60068-2-6 at 50 .. 2000 Hz	≤ 10 g
Shock resistance according to DIN EN 60068-2-27	C100 g / 11 ms / half sine
Protection class to IEC 60529 ¹⁾	IP 65
Other data	
Electrical connection	
- Analogue	- Jacketed cable, length 1 m ¹⁾ - Male M16, 6 pole - Male M16, 8 pole
- CANopen, Device Net	Female M12x1, 5 pole + Male M12x1, 5 pole
- Profibus	Female M12x1, 5 pole + Male M12x1, 5 pole + Male M8, 4 pole
- Synchronous Serial Interface	CONTACT male connector, 12 pole
- EtherCAT	2 female M12x1, 4 pole + male M8, 4 pole
Supply voltage	24 V DC ± 10 %
Residual ripple of supply voltage	≤ 250 mVPP
Current consumption without output	< 250 mA
Weight	Depends on length

Note: Reverse polarity protection of the supply voltage, excess voltage and short circuit protection are provided.

FS (Full Scale) = relative to the complete measuring range

1) further variants on request

HOW TO ORDER

Model Code:

HLT 2 1 00 - R1 - XXX - XXX - XXXX - 000

Design/Geometry type

1 = rod

Type

R1 = threaded flange M18 x 1.5

Electrical connection

Signal Analogue

K01 = Jacketed cable, length 1 m

M06 = male M16, 6 pole

M08 = Male M16, 8 pole

Signal CANopen, DeviceNet

C61 = Female M12x1, 5 pole + male M12x1, 5 pole

Signal Profibus

P61 = female M12x1, 5 pole + male M12x1, 5 pole
+ male M8, 4 pole

Signal Synchronous Serial Interface

S01 = CONTACT male connector, 12 pole

Signal EtherCAT

E51 = 2 female M12x1, 4 pole + male M8, 4 pole

Signal output

C01 = Analog 4 .. 20 mA, 3 conductor

C02 = Analog 20 .. 4 mA, 3 conductor

B01 = analogue 0 .. 10 V

B02 = analogue 10 .. 0 V

ETC = EtherCAT

SSI = Synchronous serial interface

F11 = CANopen

F41 = Profibus

DVN = Device Net

Measuring range in mm (50 to 4000 mm)

Example

0150 = 150 mm

Modification

000 = Standard

Notes:

Special models on request.

Accessories available: (not supplied with instrument)

ZBL MR 17.4	Position magnet	Part no.: 6119372
ZBL MR22	Position magnet	Part no.: 6084453
ZBL MR33	Position magnet	Part no.: 6084207
Distance ring	AD 17.4 x ID 13.5x5	Part No.: 3903233
Distance ring	AD 33 x ID 13.5x5	Part No.: 3887829
ZBL MV 63	Position magnet	Part no.: 6084454
ZBL MU 38-20	Position magnet	Part no.: 6084455

More detailed information on accessories as well as on further accessories, such as female connectors, etc. can be found in the accessories brochure.

Pin connections: Analogue:

Male M16, 6 pole



Pin

1	Signal
2	0 V (analogue output)
3	n.c.
4	n.c.
5	0 V
6	+U _B

Male M16, 8 pole



Pin

1	n.c.
2	0 V (analogue output)
3	n.c.
4	n.c.
5	Signal
6	0 V
7	+U _B
8	n.c.

Cable outlet

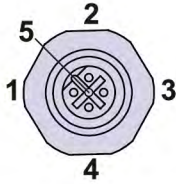
Lead

braunbrown	0 V (analogue output)
Green	n.c.
yellow	n.c.
grey	Signal
pink	0 V
Blue	+U _B

Linear Position Transmitter

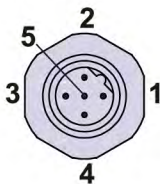
CANopen / DeviceNet:

Female M12x1, 5 pole, A encoded



Pin	CANopen_OUT	
1	Housing	Shield/housing
2	+U _B	Supply +
3	0 V	Supply -
4	CAN_H	Bus line dominant high
5	CAN_L	Bus line dominant low

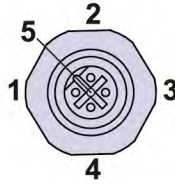
Female M12x1, 5 pole, A encoded



Pin	CANopen_IN	
1	Housing	Shield/housing
2	+U _B	Supply +
3	0 V	Supply -
4	CAN_H	Bus line dominant high
5	CAN_L	Bus line dominant low

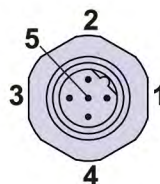
Profibus:

Female M12x1, 5 pole, B encoded



Pin	Profibus_OUT	
1	VP, +5 V DC	
2	Profibus, Data A	
3	0 V	
4	Profibus, Data B	
5	n.c.	
screw connection	Shield/housing	

Female M12x1, 5 pole, B encoded



Pin	Profibus_IN	
1	n.c.	
2	Profibus, Data A	
3	n.c.	
4	Profibus, Data B	
5	n.c.	
screw connection	Shield/housing	

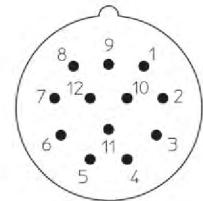
Male M 8x1, 4 pole



Pin	Profibus_IN	
1	+U _B	
2	n.c.	
3	0 V	
4	n.c.	

Synchronous Serial Interface:

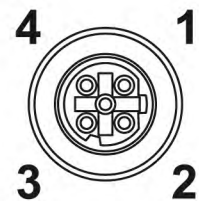
CONTACT male connector, 12 pole



Pin		
1	SSI_Clock- IN	
2	SSI_Clock+ IN	
3	SSI_DATA+ OUT	
4	SSI_DATA- OUT	
5	RS 485 + IN/OUT	
6	RS 485 - IN/OUT	
7	n.c.	
8	Direction IN	
9	Preset1 IN	
10	n.c.	
11	+U _B IN	
12	0 V IN	

EtherCAT:

Female M12x1, 4 pole, D encoded



Pin	Port IN / Port OUT	
1	Transmission data +	
2	Received data +	
3	Transmission data -	
4	Received data -	

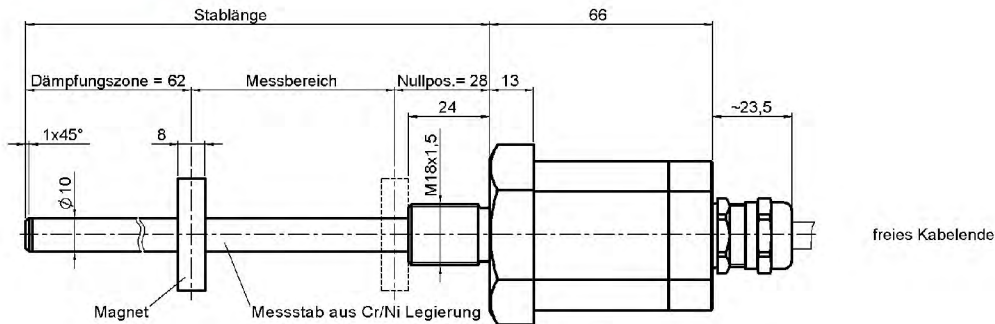
Female M8x1, 4 pole, A encoded



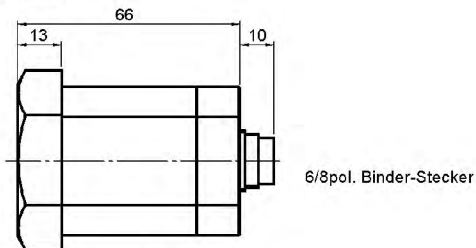
Pin		
1	+U _B	
2	n.c.	
3	0 V	
4	n.c.	

Dimensions:

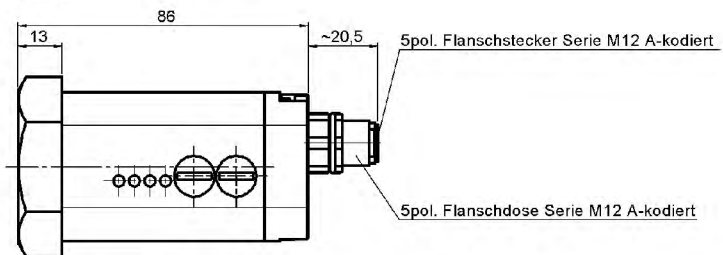
Signal output: analogue (K01)



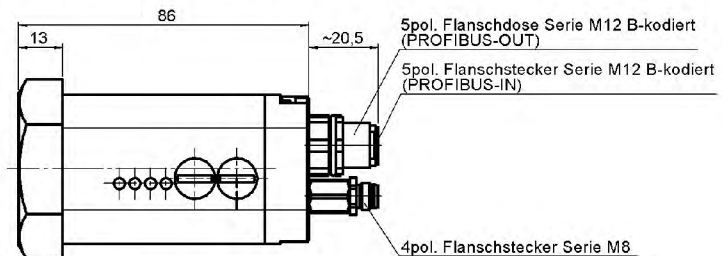
Signal output: analogue (M06, M08)



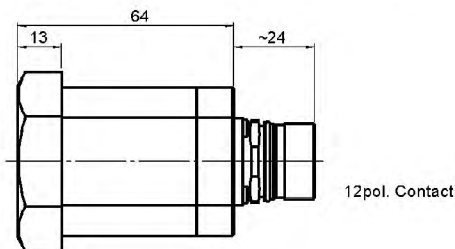
Signal output CANopen, Device Net (C61)



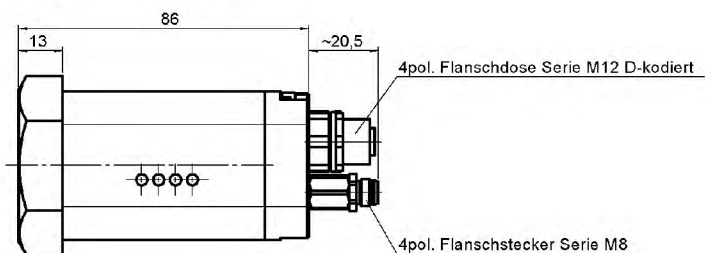
Signal output: Profibus (P61)



Signal output: synchronous serial interface (S01)



Signal output: EtherCAT (E51)



Note:

The information in this brochure relates to the operating conditions and applications described. For applications or operating conditions not described please contact the relevant technical department.
Subject to technical modifications.

Linear Position Transmitter



HLT 2500-F1

Magnetostrictive

Flat profile

Resolution 5 μ m

Analogue and digital interfaces

Logos :
Profibus, CANopen,
DeviceNet,
SSI, EtherCAT

Description:

The sensor works on the principle of magnetostriction.
The measurement principle for high-precision determination of the position, of the distance and/or also of a velocity signal is based on a runtime measurement.

Utilizing this non-contact and wear-free measuring system, We offers a flat housing version in aluminium.

The different output signals (analogue/digital) facilitate the connection of all measurement and control instruments as well as standard evaluation systems (e.g. PLC controls)

The HLT 2500-F1 is primarily used in stationary applications, especially when a semi-integrated solution in hydraulic cylinders is not possible.

Technical Data:

Input data	
Measurement ranges	50 .. 4000 mm
Measured variable	Distance, position, speed
Mechanical Connection	Flat profile, without magnetic guidance
Housing	Aluminium
Output data	
Output signal Analogue	Current: 4 .. 20 mA or 20 .. 4 mA Voltage: 0 .. 10 V or 10 .. 0 V
Output signal Digital	Profibus, CANopen, Device Net, SSI, EtherCAT
Resolution	Analogue: 16 Bit; ≥ 0.005 mm Digital: 0.005 mm ¹⁾
Ohmic resistance to GND (only with analogue signal output)	Current: 200 .. 500 Ω voltage: > 2 k Ω
Accuracy	$\leq \pm 0.5$ % FS typ.
Non linearity	± 0.1 mm to 1,500 mm ± 0.15 mm $> 1,500$ mm
Hysteresis	$\leq \pm 0.1$ % FS
Repeatability	≤ 0.005 mm - ≤ 0.05 mm (depends on length)
Temperature coefficient	$\leq \pm 0.004$ % FS / °C (analogue) $\leq \pm 0.0015$ % FS / °C (digital)
Sampling rate	2 ms
Installation position and movement speed	No orientation restrictions
Ambient conditions	
Operating temperature range	0 .. +70 °C
Storage temperature range	-30 .. +85 °C, dry
Relative humidity	98 %, non-condensing
CE - mark	EN 61000-6-1 / 2 / 3 / 4
Vibration resistance per DIN EN 60068-2-6 at 50 .. 2000 Hz	≤ 10 g
Shock resistance according to DIN EN 60068-2-27	≤ 100 g / 11 ms / half sine
Protection class to IEC 60529 ¹⁾	IP 65
Other data	
Electrical connection	
- Analogue	- Jacketed cable, length 1 m ¹⁾ - Male M16, 6 pole VMale M16, 8 pole
- CANopen, Device Net	Female M1 2x1, 5 pole + Male M12x1, 5 pole
- Profibus	Female M12x1, 5 pole + Male M12x1, 5 pole + Male M8, 4 pole
- Synchronous Serial Interface	CONTACT male connector, 12 pole
- EtherCAT	2 female M12x1, 4 pole + male M8, 4 pole
Supply voltage	24 V DC ± 10 %
Residual ripple of supply voltage	≤ 250 mVPP
Current consumption without output	< 250 mA
Weight	Depends on length

Note: Reverse polarity protection of the supply voltage, excess voltage and short circuit protection are provided.

FS (Full Scale) = relative to the complete measuring range

1) further variants on request

HOW TO ORDER

Model Code:

HLT 2 5 00 - F1 - XXX - XXX - XXXX - 000

Design/Geometry type

5 = profile

Type

F1 = Flat profile, without magnetic guidance

Electrical connection

Signal Analogue

K01 = Jacketed cable, length 1 m

M06 = male M16, 6 pole

M08 = Male M16, 8 pole

Signal CANopen, DeviceNet

C61 = Female M12x1, 5 pole + male M12x1, 5 pole

Signal Profibus

P61 = female M12x1, 5 pole + male M12x1, 5 pole
+ male M8, 4 pole

Signal Synchronous Serial Interface

S01 = CONTACT male connector, 12 pole

Signal EtherCAT

E51 = 2 female M12x1, 4 pole + male M8, 4 pole

Signal output

C01 = Analog 4 .. 20 mA, 3 conductor

C02 = Analog 20 .. 4 mA, 3 conductor

B01 = analogue 0 .. 10 V

B02 = analogue 10 .. 0 V

ETC = EtherCAT

SSI = Synchronous serial interface

F11 = CANopen

F41 = Profibus

DVN = Device Net

Measuring range in mm (50 to 4000 mm)

Example

0150 = 150 mm

Modification

000 = Standard

Notes:

Special models on request.

Accessories available: (not supplied with instrument)

ZBL Mounting kit

ZBL MU 38-18 Position magnet Part No.: 6105653

ZBL MF 55-20 Position magnet Part no.: 6084456

ZBL MF 55-20 Position magnet Part no.: 6084457

More detailed information on accessories as well as on further accessories, such as female connectors, etc. can be found in the accessories brochure.

Male M16, 6 pole



Pin

1	Signal
2	0 V (analogue output)
3	n.c.
4	n.c.
5	0 V
6	+U _B

Male M16, 8 pole



Pin

1	n.c.
2	0 V (analogue output)
3	n.c.
4	n.c.
5	Signal
6	0 V
7	+U _B
8	n.c.

Cable outlet

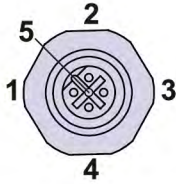
Lead

braunbrown	0 V (analogue output)
Green	n.c.
yellow	n.c.
grey	Signal
pink	0 V
Blue	+U _B

Linear Position Transmitter

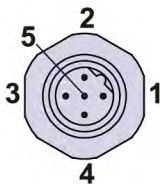
CANopen / DeviceNet:

Female M12x1, 5 pole, A encoded



Pin	CANopen_OUT	
1	Housing	Shield/housing
2	+U _B	Supply +
3	0 V	Supply -
4	CAN_H	Bus line dominant high
5	CAN_L	Bus line dominant low

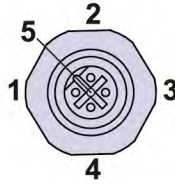
Female M12x1, 5 pole, A encoded



Pin	CANopen_IN	
1	Housing	Shield/housing
2	+U _B	Supply +
3	0 V	Supply -
4	CAN_H	Bus line dominant high
5	CAN_L	Bus line dominant low

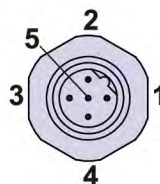
Profibus:

Female M12x1, 5 pole, B encoded



Pin	Profibus_OUT	
1	VP, +5 V DC	
2	Profibus, Data A	
3	0 V	
4	Profibus, Data B	
5	n.c.	
screw connection	Shield/housing	

Female M12x1, 5 pole, B encoded



Pin	Profibus_IN	
1	n.c.	
2	Profibus, Data A	
3	n.c.	
4	Profibus, Data B	
5	n.c.	
screw connection	Shield/housing	

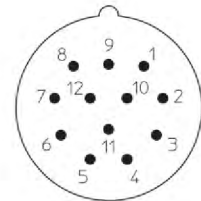
Male M 8x1, 4 pole



Pin	Profibus_IN	
1	+U _B	
2	n.c.	
3	0 V	
4	n.c.	

Synchronous Serial Interface:

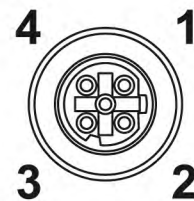
CONTACT male connector, 12 pole



Pin		
1	SSI_Clock- IN	
2	SSI_Clock+ IN	
3	SSI_DATA+ OUT	
4	SSI_DATA- OUT	
5	RS 485 + IN/OUT	
6	RS 485 - IN/OUT	
7	n.c.	
8	Direction IN	
9	Preset1 IN	
10	n.c.	
11	+U _B IN	
12	0 V IN	

EtherCAT:

Female M12x1, 4 pole, D encoded



Pin	Port IN / Port OUT	
1	Transmission data +	
2	Received data +	
3	Transmission data -	
4	Received data -	

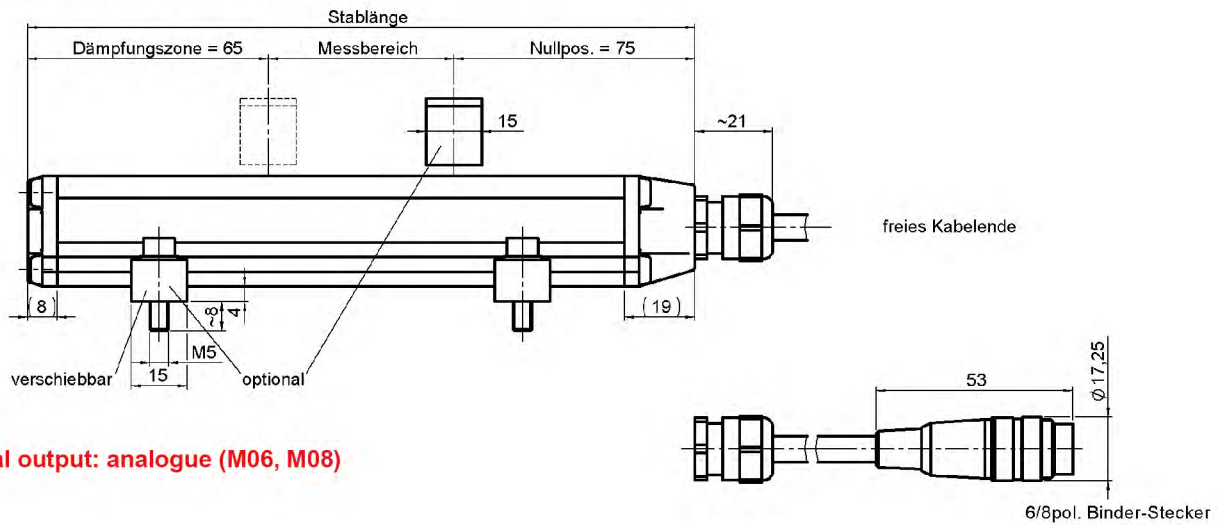
Female M8x1, 4 pole, A encoded



Pin		
1	+U _B	
2	n.c.	
3	0 V	
4	n.c.	

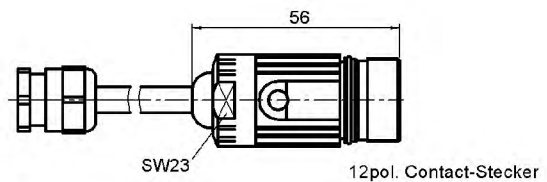
Dimensions:

Signal output: analogue (K01)

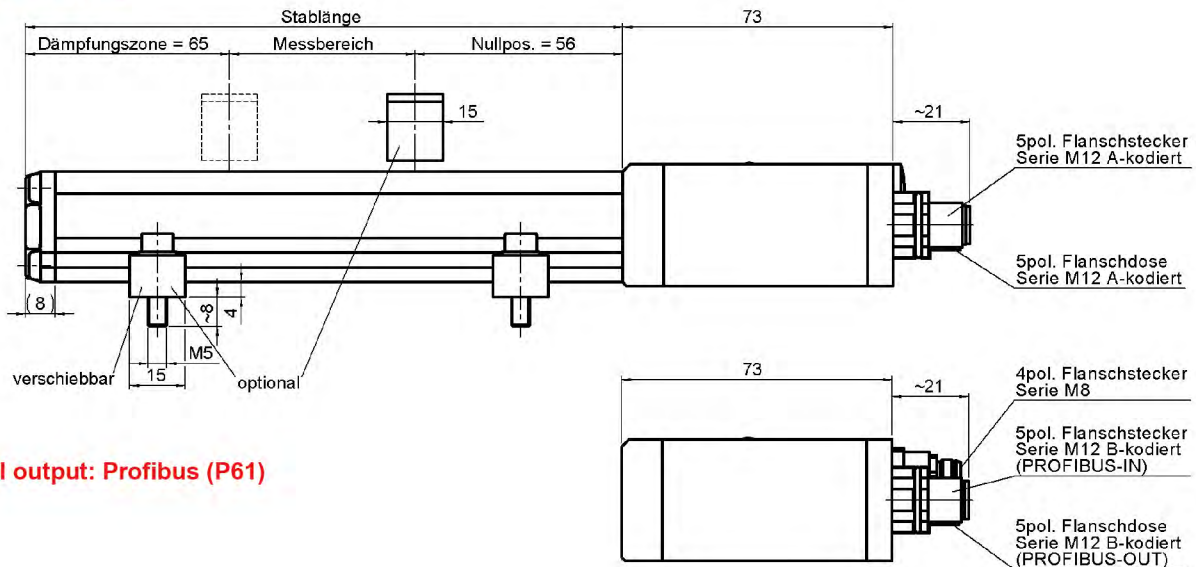


Signal output: analogue (M06, M08)

Signal output: synchronous serial interface (S01)

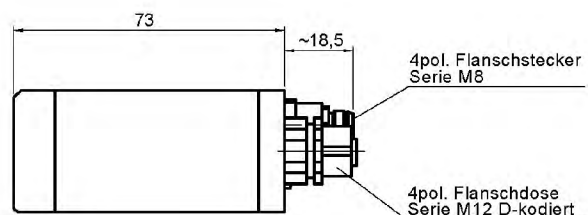


Signal output CANopen, Device Net (C61)



Signal output: Profibus (P61)

Signal output: EtherCAT (E51)



Note:

The information in this brochure relates to the operating conditions and applications described. For applications or operating conditions not described please contact the relevant technical department.
Subject to technical modifications.

Linear Position Transmitter



HLT 2500-L2

Magnetostrictive

Flat profile

Resolution 5 μm

Analogue and digital interfaces

Logos :
Profibus, CANopen,
DeviceNet,
SSI, EtherCAT

Description:

The sensor works on the principle of magnetostriction.
The measurement principle for high-precision determination of the position, of the distance and/or also of a velocity signal is based on a runtime measurement.

Utilizing this non-contact and wear-free measuring system, We offers a version in an aluminium profile housing with external measuring slides or with a sliding magnet for positioning by the operator.

The different output signals (analogue/digital) facilitate the connection of all measurement and control instruments as well as standard evaluation systems (e.g. PLC controls)

The HLT 2500-L2 is primarily used in stationary applications, especially when a semi-integrated solution in hydraulic cylinders is not possible.

Technical Data:

Input data	
Measurement ranges	50 .. 4000 mm
Measured variable	Distance, position, speed
Mechanical Connection	Flat profile, without magnetic guidance
Housing	Aluminium
Output data	
Output signal Analogue	Current: 4 .. 20 mA or 20 .. 4 mA Voltage: 0 .. 10 V or 10 .. 0 V
Output signal Digital	Profibus, CANopen, Device Net, SSI, EtherCAT
Resolution	Analogue: 16 Bit; ≥ 0.005 mm Digital: 0.005 mm ¹⁾
Ohmic resistance to GND (only with analogue signal output)	Current: 200 .. 500 Ω voltage: > 2 k Ω
Accuracy	$\leq \pm 0.5$ % FS typ.
Non linearity	± 0.1 mm to 1,500 mm ± 0.15 mm > 1,500 mm
Hysteresis	$\leq \pm 0.1$ % FS
Repeatability	≤ 0.005 mm - ≤ 0.05 mm (depends on length)
Temperature coefficient	$\leq \pm 0.004$ % FS / °C (analogue) $\leq \pm 0.0015$ % FS / °C (digital)
Sampling rate	2 ms
Installation position and movement speed	No orientation restrictions
Ambient conditions	
Operating temperature range	0 .. +70 °C
Storage temperature range	-30 .. +85 °C, dry
Relative humidity	98 %, non-condensing
CE - mark	EN 61000-6-1 / 2 / 3 / 4
Vibration resistance per DIN EN 60068-2-6 at 50 .. 2000 Hz	≤ 10 g
Shock resistance according to DIN EN 60068-2-27	≤ 100 g / 11 ms / half sine
Protection class to IEC 60529 ¹⁾	IP 65
Other data	
Electrical connection	
- Analogue	- Jacketed cable, length 1 m ¹⁾ - Male M16, 6 pole VMale M16, 8 pole
- CANopen, Device Net	Female M12x1, 5 pole + Male M12x1, 5 pole
- Profibus	Female M12x1, 5 pole + Male M12x1, 5 pole + Male M8, 4 pole
- Synchronous Serial Interface	CONTACT male connector, 12 pole
- EtherCAT	2 female M12x1, 4 pole + male M8, 4 pole
Supply voltage	24 V DC ± 10 %
Residual ripple of supply voltage	≤ 250 mVPP
Current consumption without output	< 250 mA
Weight	Depends on length

Note: Reverse polarity protection of the supply voltage, excess voltage and short circuit protection are provided.

FS (Full Scale) = relative to the complete measuring range

1) further variants on request

HOW TO ORDER

Model Code:

HLT 2 5 00 - L2 - XXX - XXX - XXXX - 000

Design/Geometry type

5 = profile

Type

L2 = Flat profile, with magnetic guidance

Electrical connection

Signal Analogue

K01 = Jacketed cable, length 1 m

M06 = male M16, 6 pole

M08 = Male M16, 8 pole

Signal CANopen, DeviceNet

C61 = Female M12x1, 5 pole + male M12x1, 5 pole

Signal Profibus

P61 = female M12x1, 5 pole + male M12x1, 5 pole
+ male M8, 4 pole

Signal Synchronous Serial Interface

S01 = CONTACT male connector, 12 pole

Signal EtherCAT

E51 = 2 female M12x1, 4 pole + male M8, 4 pole

Signal output

C01 = Analog 4 .. 20 mA, 3 conductor

C02 = Analog 20 .. 4 mA, 3 conductor

B01 = analogue 0 .. 10 V

B02 = analogue 10 .. 0 V

ETC = EtherCAT

SSI = Synchronous serial interface

F11 = CANopen

F41 = Profibus

DVN = Device Net

Measuring range in mm (50 to 4000 mm)

Example

0150 = 150 mm

Modification

000 = Standard

Notes:

Special models on request.

Accessories available: (supplied with the instrument)

ZBL MS35-39 Magnet slide Part No.: 6105654

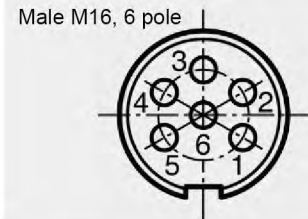
Accessories available: (not supplied with instrument)

ZBL MV 63 Position magnet Part no.: 6084454

ZBL Mounting kit Part No.: 6105653

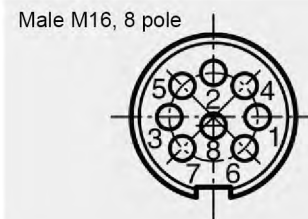
ZBL MU 38-20 Position magnet Part no.: 6084454

More detailed information on accessories as well as on further accessories, such as female connectors, etc. can be found in the accessories brochure.



Pin

1	Signal
2	0 V (analogue output)
3	n.c.
4	n.c.
5	0 V
6	+U _B



Pin

1	n.c.
2	0 V (analogue output)
3	n.c.
4	n.c.
5	Signal
6	0 V
7	+U _B
8	n.c.

Cable outlet

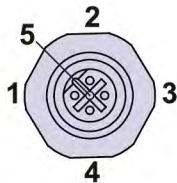
Lead

braunbrown	0 V (analogue output)
Green	n.c.
yellow	n.c.
grey	Signal
pink	0 V
Blue	+U _B

Linear Position Transmitter

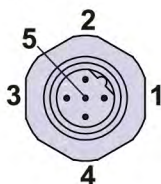
CANopen / DeviceNet:

Female M12x1, 5 pole, A encoded



Pin	CANopen_OUT	
1	Housing	Shield/housing
2	+U _B	Supply +
3	0 V	Supply -
4	CAN_H	Bus line dominant high
5	CAN_L	Bus line dominant low

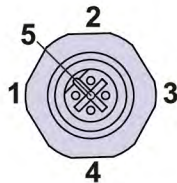
Female M12x1, 5 pole, A encoded



Pin	CANopen_IN	
1	Housing	Shield/housing
2	+U _B	Supply +
3	0 V	Supply -
4	CAN_H	Bus line dominant high
5	CAN_L	Bus line dominant low

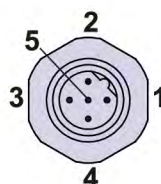
Profibus:

Female M12x1, 5 pole, B encoded



Pin	Profibus_OUT	
1	VP, +5 V DC	
2	Profibus, Data A	
3	0 V	
4	Profibus, Data B	
5	n.c.	
screw connection	Shield/housing	

Female M12x1, 5 pole, B encoded



Pin	Profibus_IN	
1	n.c.	
2	Profibus, Data A	
3	n.c.	
4	Profibus, Data B	
5	n.c.	
screw connection	Shield/housing	

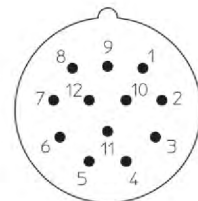
Male M 8x1, 4 pole



Pin	Profibus_IN	
1	+U _B	
2	n.c.	
3	0 V	
4	n.c.	

Synchronous Serial Interface:

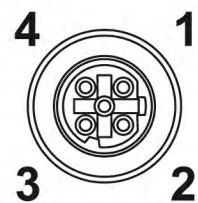
CONTACT male connector, 12 pole



Pin		
1	SSI_Clock- IN	
2	SSI_Clock+ IN	
3	SSI_DATA+ OUT	
4	SSI_DATA- OUT	
5	RS 485 + IN/OUT	
6	RS 485 - IN/OUT	
7	n.c.	
8	Direction IN	
9	Preset1 IN	
10	n.c.	
11	+U _B IN	
12	0 V IN	

EtherCAT:

Female M12x1, 4 pole, D encoded



Pin	Port IN / Port OUT	
1	Transmission data +	
2	Received data +	
3	Transmission data -	
4	Received data -	

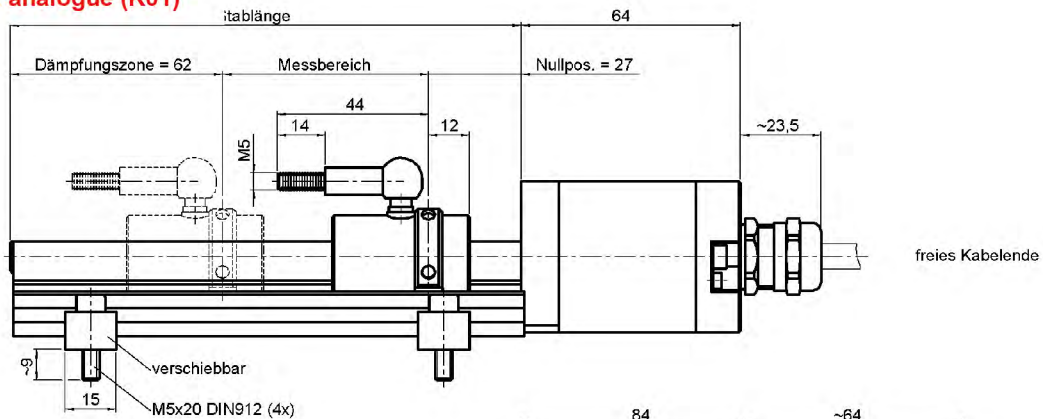
Female M8x1, 4 pole, A encoded



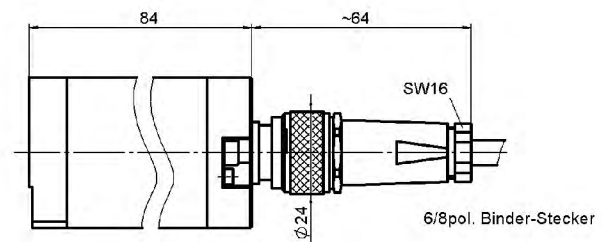
Pin		
1	+U _B	
2	n.c.	
3	0 V	
4	n.c.	

Dimensions:

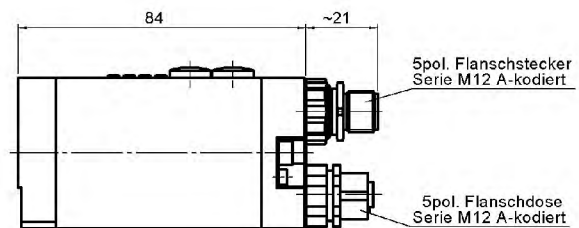
Signal output: analogue (K01)



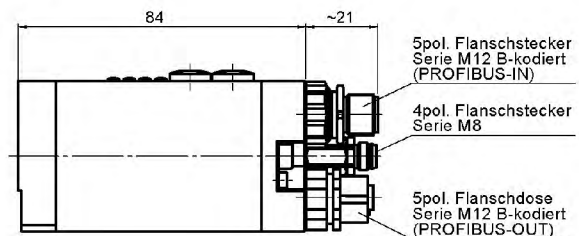
Signal output: analogue (M06, M08)



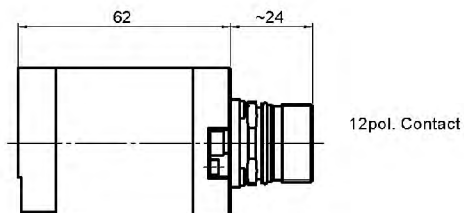
Signal output CANopen, Device Net (C61)



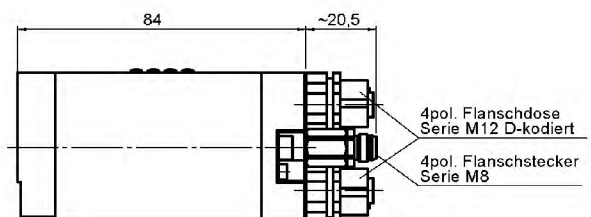
Signal output: Profibus (P61)



Signal output: synchronous serial interface (S01)



Signal output: EtherCAT (E51)



Note:

The information in this brochure relates to the operating conditions and applications described. For applications or operating conditions not described please contact the relevant technical department.
Subject to technical modifications.

Linear Position Transmitter



HLT 2550-L2

Magnetostrictive	Flat profile	Resolution 50 µm
------------------	--------------	------------------

Analogue and digital interfaces

Logos :
CANopen
SSI

Description:

The HLT 2550-L2 is a linear position sensor which, due to its compact design, was developed in particular for use in applications where space is very limited. The measuring profile can be individually adapted to various mounting conditions by means of spacers.

The HLT 2550-L2 is available for measuring ranges up to 3 m and in various signal output versions (analogue, CANopen, SSI) with a resolution of 50 µm and a non-linearity of $\leq 0.02\%$ FS.

The main areas of application for the HLT 2550-L2 are, for example, general positioning tasks in mechanical engineering and in industrial hydraulics, or as a wear-free alternative for existing measuring sensors such as potentiometers.

Special features:

Compact design

- Used in applications where space is very limited.
- Individual adaptation to various mounting conditions
- For measuring ranges up to 3 m
- Non-contact and wear-free
- Convincing price / performance ratio

Technical Data:

Input data	
Measuring ranges ¹⁾	30 .. 3000 mm in steps of 50 mm
Housing	Measuring body: aluminium
Output data	
Output Signal Analogue	Current: 4 .. 20 mA or 20 .. 4 mA Voltage: 0 .. 10 V or 10 .. 0 V
Output Signal Digital	CANopen SSI
Resolution	12 bit, ≥ 0.05 mm
Ohmic resistance to GND (only with analogue signal output)	Current: 200 ... 500 Ω Voltage: > 2 k Ω
Non linearity	$\leq \pm 0.02\%$ FS, ≥ 0.06 mm
Hysteresis	$\leq \pm 0.1$ mm
Repeatability	$\leq \pm 0.005\%$ FS, ≥ 0.05 mm
Temperature coefficient	$\pm 0.01\%$ FS / °C typ.
Sampling rate (internal)	0.5 ms to 1,200 mm 1.0 ms to 2,400 mm 2.0 ms to 3,000 mm
Installation position and movement speed	
No restrictions	
Ambient conditions	
Operating temperature range	-20 .. +75 °C, optionally -40 .. +75 °C
Storage temperature range	-30 .. +85 °C, dry
Relative humidity	98 %, non -condensing
CE - mark	EN 61000 -6-1 / 2 / 3 / 4
Vibration resistance to DIN EN 60068 -2-6 at 50 .. 2000 Hz	≤ 10 g
Shock resistance to DIN EN 60068 -2-27	≤ 100 g / 11 ms / half sine
Protection class to IEC 60529	IP 67
Other data	
Electrical connection	M12x1 plug
Supply voltage	24 V DC $\pm 20\%$
Residual ripple of supply voltage	≤ 250 mVpp
Current consumption without output	max. 100 mA
Weight	Depends on length

Note: Reverse polarity protection of the supply voltage, excess voltage and short circuit protection are provided.

FS (Full Scale) = relative to the complete measuring range

¹⁾ further variants on request

HOW TO ORDER

Model Code:

HLT 2 5 50 - L2 - XXX - XXX - XXXX - 000

Design/Geometry type

5 = profile

Type

L2 = Flat profile, with magnetic guidance

Electrical connection

Signal output analogue

M04 = Male connector M 12x1, 4 pole

Signal Output CANopen

M05 = Male connector M 12x1, 5 pole

Signal output SSI

M08 = Male connector M 12x1, 8 pole

Signal output

C01 = Analog 4 .. 20 mA, 3 conductor

C02 = Analog 20 .. 4 mA, 3 conductor

B01 = analogue 0 .. 10 V

B02 = analogue 10 .. 0 V

F11 = CANopen

SSI = SSI

Measuring range in mm (30 to 3000 mm in steps of 50 mm)

Example

0150 = 150 mm

Modification

000 = Standard

Notes:

Special models on request.

The position magnet must be ordered separately.

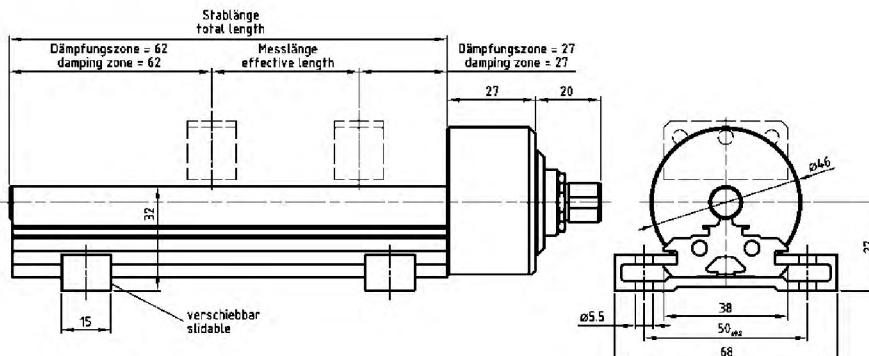
Items supplied:

- HLT 2550
- Operating Instructions

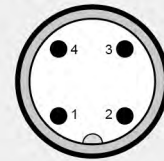
Accessories:

Appropriate accessories, such as position magnets, magnet slides or spacers, can be found in the Accessories section of the Electronics brochure.

Dimensions:



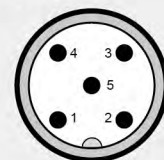
M12x1, 4-polig



Pin

1	+U _B
2	n.c.
3	0 V
4	Signal

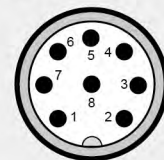
M12x1, 5-polig



Pin Signal Beschreibung

1	n.c.	
2	+U _B	Supply +
3	0 V	Supply -
4	CAN_H	bus line dominant high
5	CAN_L	bus line dominant low

M12x1, 8-polig



Pin

1	Clock input +
2	Clock input -
3	Data output +
4	Data output -
5	n.c.
6	n.c.
7	+U _B
8	0 V

Note:

The information in this brochure relates to the operating conditions and applications described. For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.

Linear Position Transmitter



HLT 2150-R1

Magnetostrictive	partly integrated	Resolution 100 µm
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Analogue and digital interfaces

CANopen

Description:

The HLT 2150-R1 is a linear position sensor which, due to its compact design, was developed in particular for use in applications where space is very limited. A wide range of accessories such as magnets is available for individual adaptation to the particular application.

The HLT 2150-R1 is suited for measuring ranges up to 2.5 m

The different output signals (analogue, CANopen) facilitate the connection of all measurement and control devices as well as connection to standard evaluation systems (e.g. also to PLC controls).

The main areas of application for the HLT 2150 are, for example, general positioning tasks in mechanical engineering and in mobile and industrial hydraulics, as a semi-integrated solution in hydraulic cylinders.

Special features:

- Compact construction
- High shock and vibration resistance
- Excellent EMC characteristics
- For measuring ranges up to 2.5 m
- Non-contact and wear-free
- Convincing price / performance ratio

Technical Data:

Inp ut data		
Measurement ranges	50 .. 2500 mm	
Pressure resistance	450 bar	
Peak pressure	630 bar	
Housing	stainless steel (1.4301 / 1.4571)	
Output data		
Signal output	Current: 4 .. 20 mA or 20 .. 4 mA Voltage: 0 .. 10 V or 10 .. 0 V 0.25 .. 4.75 V or 4.75 .. 0.25 V 0.5 .. 9.5 V 0.5 .. 4.5 V	
	CANopen	
Measuring accuracy	Analogue	CANopen
Resolution	12 bit, ≥ 0.1 mm	0.1 mm
Ohmic resistance to GND	Current: 200 .. 500Ω Spannung:> 2 kΩ	
Non linearity	≤ ± 0.05 % FS	≤ ± 0.02 % FS
Hysteresis	≤ ± 0.1 % FS	≤ ± 0.1 mm
Repeatability	≤ ± 0.1 % FS	≤ ± 0.1 mm
Temperature coefficient	≤ ± 0.01 % FS / °C	≤ ± 0.003 % FS / °C
Sampling rate (internal)	2 ms	2 ms
Installation position and movement speed		No restrictions
Ambient conditions		
Operating temperature range	-40 .. +85 °C	
Storage temperature range	-40 .. +100 °C, dry	
Fluid temperature range	-40 .. +1 20°C	
Relative humidity	90 %, non - condensing	
CE - mark	EN 61000 - 6-1 / 2 / 3 / 4	
Vibration resistance per		
DIN EN 60068 -2-6 at 10 .. 500 Hz	≤ 20 g	
at 5 kHz	≤ 15 g	
Shock resistance to	≤ 50 g	
DIN EN 60068 -2-27 (11 ms)		
Protection class to IEC 60529	IP 67	
Other data		
Electrical connection	M12x1 plug	
Supply voltage	12 .. 30 V DC	
Residual ripple of supply voltage	≤ 250 mVpp	
Current consumption without output	max. 100 mA	
Weight	Depends on length	

Note: Reverse polarity protection of the supply voltage, excess voltage and short circuit protection are provided.

FS (Full Scale) = relative to the complete measuring range

HOW TO ORDER

Model Code:

HLT 2 1 50 - R1 - XXX - XXX - XXXX - 000

Design/Geometry type

1 = rod

Type

R1 = threaded flange M18 x 1.5

Electrical connection

Signal output analogue

M04 = Male connector M 12x1, 4 pole

Signal Output CANopen

M05 = Male connector M 12x1, 5 pole

Signal output

C01 = Analogue 4 .. 20 mA, 3 conductor

C02 = Analogue 20 .. 4 mA, 3 conductor

B01 = Analogue 0 .. 10 V

B02 = Analogue 10 .. 0 V

F11 = CANopen

G01 = Analogue 0.25 .. 4.75 V

G02 = Analogue 4.75 .. 0.25 V

G03 = Analogue 0.5 .. 9.5 V

G04 = Analogue 0.5 .. 4.5 V

Measuring range in mm (50 to 2500 mm)

Example

0150 = 150 mm

Modification

000 = Standard

Notes:

Special models on request.

The position magnet must be ordered separately.

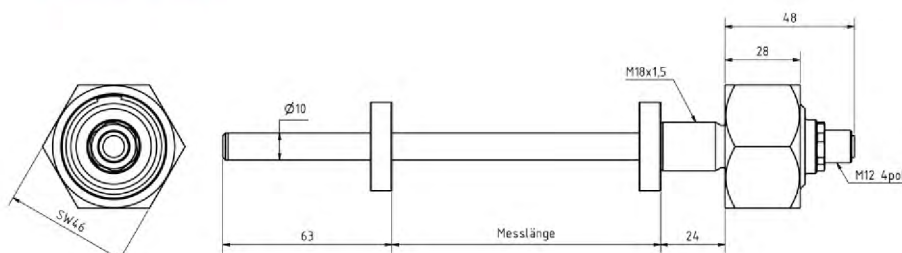
Items supplied:

- HLT 2150
- Operating Instructions

Accessories:

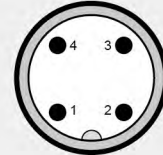
Appropriate accessories, such as position magnets, etc. can be found in the Accessories section of the Electronics brochure.

Dimensions:



Pin connections:

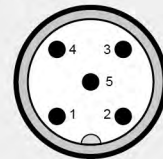
M12x1, 4-polig



Pin

1	+U _B
2	n.c.
3	0 V
4	Signal

M12x1, 5-polig



Pin	Signal	Beschreibung
1	n.c.	
2	+U _B	Supply +
3	0 V	Supply -
4	CAN_H	bus line dominant high
5	CAN_L	bus line dominant low

Note:

The information in this brochure relates to the operating conditions and applications described. For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.

ASHUN

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