

SERIES HOL-T

HYDRAULIC CYLINDERS



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Series HOL-T Tie Rod Construction Hydraulic Cylinders

Description

Series HOL-T hydraulic cylinders are of a tie rod construction which conform to the requirements of ISO 6020/2 – 1991, DIN 24554. They are of a heavy-duty construction and are available in a wide range of mounting styles together with accessories and options enabling them to be used for a wide range of applications.

All designs are created utilising 3D design software, which can then be exported, enabling customers to import the cylinder or actuator model directly into their own machine design.

Component parts are manufactured using latest CNC machinery ensuring part interchangeability. Our stocks of components enable us to offer quick turnaround on new cylinders and service items. All cylinders are tested to 1.5 x the designed working pressure.

Series HOL-T hydraulic cylinders are designed with generous internal bearing lengths, using high quality materials in their construction together with proven seal types and a choice of sealing systems and materials. End of stroke cushioning is available at either, or both, ends of stroke.

All Series HOL-T hydraulic cylinders can be supplied with: custom designed mountings, internal full displacement positional transducers, end of stroke sensors, seals for all types of hydraulic fluids and operational speeds. Control valve packages with valves built directly into the cylinder endcap or manifolded onto the cylinder are also an option.

The cylinders are supplied as standard in satin black enamel paint but can be supplied with external surfaces plated or shotblasted, and marine-specification painted.

Standard Cylinders:

Working pressure: 160 bar working; 210 bar peak.

Fluids: Mineral oils, soluble oils, HWB fluids, and Esther-based fluids.

Operational speeds: 500mm/sec subject to fluid type and pressure.

Temperature range: Standard seals -20C to + 80C, Viton seals -20C to +150C

Materials of Construction

Tubes:

Up to and including 100 bore: ERW, DOM, grade E355 (ST52). Bore tolerance H9–H11. Surface finish 0.8 microns Ra max.

100 bore up to and including 200 bore: Cold drawn and honed, grade E355 (ST52). Bore tolerance ISO H8 –H9. Surface finish 0.3 microns Ra max.

Rods:

CK45 (EN8D) carbon steel.

431S29T stainless steel, hardened and tempered, stress-relieved.

Micro-cracked hard chrome plated.

Standard chrome plate deposit 25 microns.

Additional plating depths or plating systems available if required.

Gland bearings:

Gland bearings are manufactured from a high grade self lubricating bronze and provide maximum rod support within the cylinder envelope dimensions.

Longer stroke cylinders are fitted with internal stop tubes to increase the overall bearing length. When stop tubes are fitted, this length is in addition to the base length of the cylinder.

Rod Bellows

Series HOL-T cylinders are available fitted with collapsible rod bellows to assist piston rod protection. The bellows as standard are nitrile rubber and can be supplied in a variety of materials including heat-resistant fabrics.

The addition of rod bellows will require an increase in the length of the piston rod to accommodate the collapsed bellows. Please consult our Technical Sales Team for further information.

Rod Positioning

Full displacement with digital or analogue outputs available using internal linear transducers or internal linear potentiometers.

End of stroke and multiple mid stroke positioning is available using external proximity or reed switch sensors attached to the cylinder tie rods. External switches are used in conjunction with a stainless-steel cylinder barrel. Please consult our Technical Sales Team for further information.

Port Location

As standard, ports are positioned at location 1. Ports can be positioned at locations 1,2,3 or 4 subject to cylinder mounting style.

For non-standard port location, add option 003 to the Special Design Modification and indicate port location required e.g.

- FH2 front head port located at position 2.
- RH4 rear head port located at position 4.

Cushioning

Series HOL-T cylinders can be supplied with built in cushioning at the head end, cap end or both ends of stroke without change to the external dimensions of the cylinder.

The cushion profile has been developed to produce an optimum deceleration curve and the cushioning rate can be easily externally adjusted to suit the application requirements.

A unique floating cushion also acts as a high flow one-way valve to allow a positive cylinder start up with immediate full load capability.

Air Bleeds

Air bleeds can be supplied in the cylinder heads. With the standard port location, the bleed points are at position 2 or 3 subject to mounting style. Specify option 001 in the Special Design Modification for air bleeds.

Gland Drain Port

A gland drain port option can be supplied when required as a M5 female port in the cylinder head. The drain port should be connected to the oil reservoir using clear tubing. Specify option 002 in the Special Design Modification for the gland drain port.

Stroke Adjusters

For applications requiring precise stroke lengths, a screwed stroke adjuster can be supplied at the cylinder cap (not mounting styles D & M). This can be adjusted and set to provide an accurate stop position of the piston rod when fully retracted.

Oversize Ports

The chart below shows the sizes available for applications requiring oversize fluid ports. These can be supplemented, if required, by fitting additional ports.

Bore Diameter	Front (Head) Port	Rear (Cap) Port
25	G 3/8"W	G 3/8"
32	G 3/8"W	G 3/8"
40	G 1/2"W	G 1/2"
50	G 3/4"W	G 3/4"
63	G 3/4" W	G 3/4"
80	G 1" W	G 1"
100	G 1" W	G 1"
125	G 1 1/4"	G1 1/4"
160	G 1 1/4"	G 1 1/4"
200	G 1 1/2"	G1 1/2"

Metric and JIC port threads or SAE flange connections can be supplied if required. "W" denotes welded port boss.

Series HOL-T Hydraulic Cylinders Rod Buckling/Stroke Length Limitations

Piston rod selection

To correctly size the hydraulic cylinder, it is necessary to consider the compressive loading applied to the piston rod together with the stroke length and mounting style required. A further factor is whether the piston rod end is guided or unguided.

From Chart 1, page 8, identify the body mounting style and rod guidance type and read across to give the corrected stroke length. Apply the corrected stroke length to Chart 2, Page 8 in conjunction with the required thrust to give the minimum piston rod diameter.

Internal stop tubes

For stroke lengths in excess of 1 metre, it is recommended that the stop tube length is increased to provide additional spread length to reduce bearing loads: an additional 25mm stop tube length is recommended for each additional 250 mm of stroke length.

Note: additional stop tube length will have a corresponding increase in the overall length of the cylinder.

Chart 1

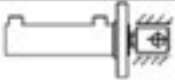
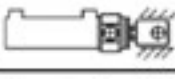
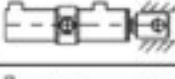
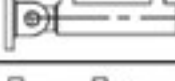
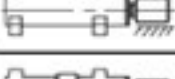
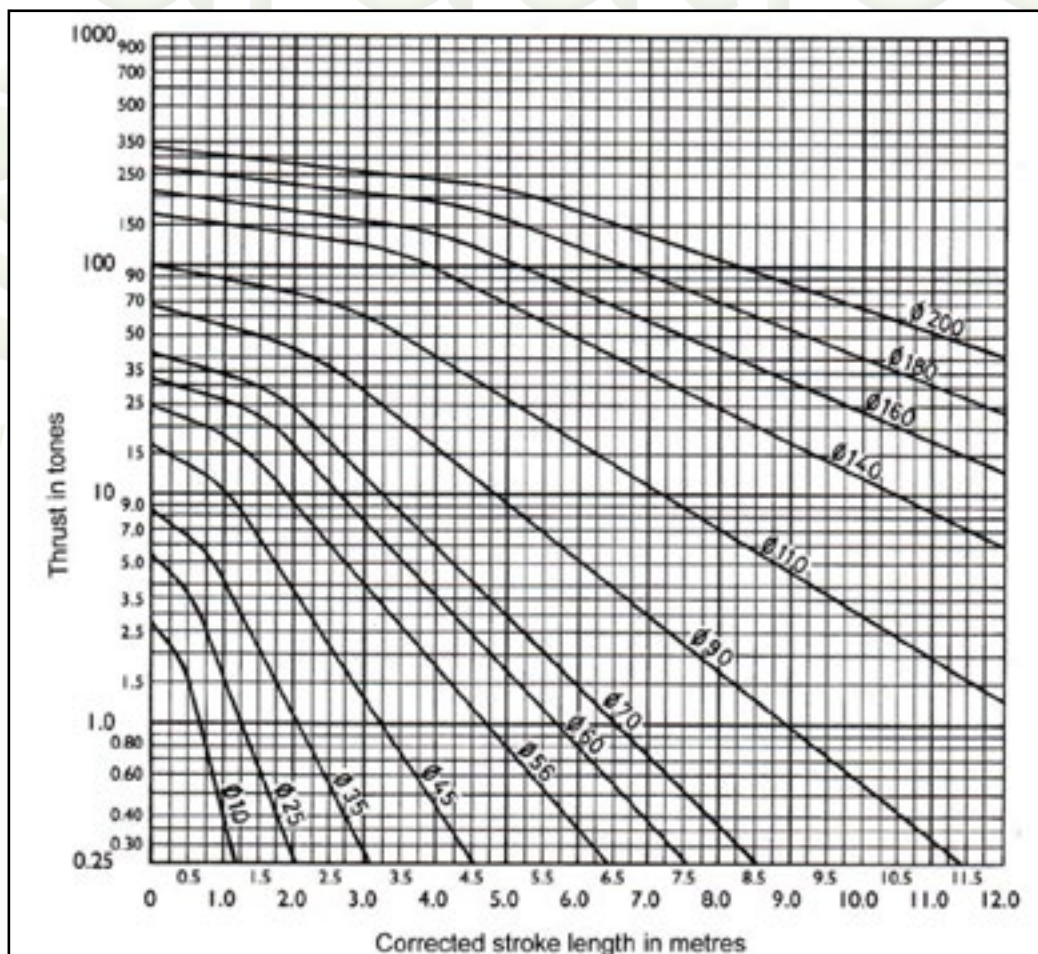
MOUNTING STYLE	MOUNTING TYPE	ROD END MOUNTING	CORRECTED STROKE LENGTH
A,R,X		GUIDED	0.7 x STROKE
B,S,T		GUIDED	1.0 x STROKE
G		GUIDED	1.0 x STROKE
H		GUIDED	1.5 x STROKE
D,L,M		GUIDED	2.0 x STROKE
E		UNGUIDED	2.0 x STROKE
H		UNGUIDED	3.0 x STROKE
B,S,T		UNGUIDED	4.0 x STROKE

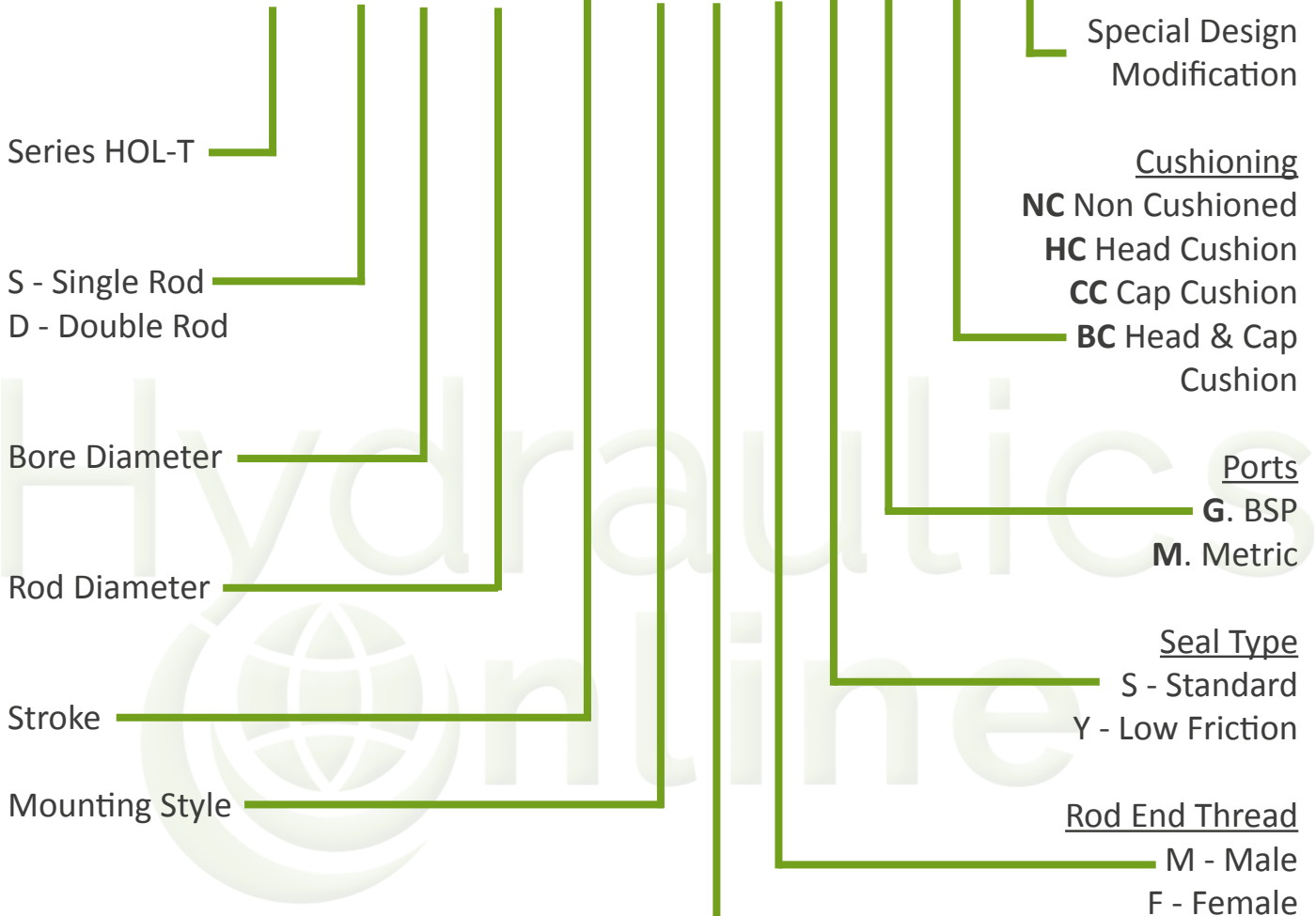
Chart 2



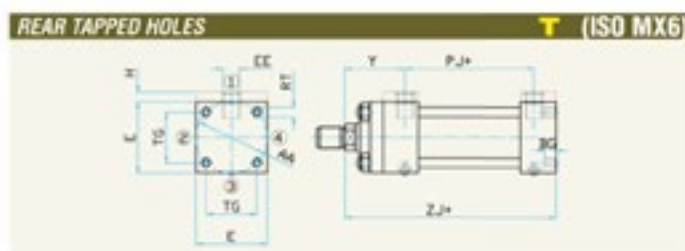
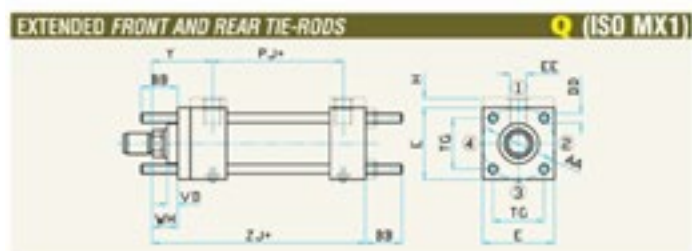
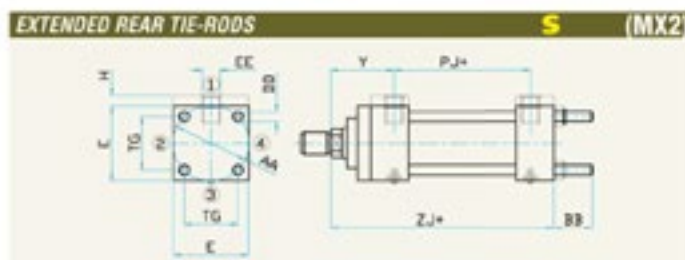
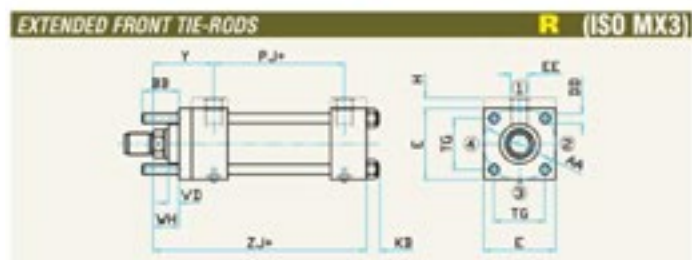
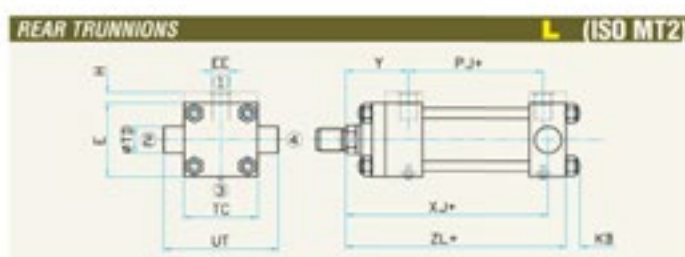
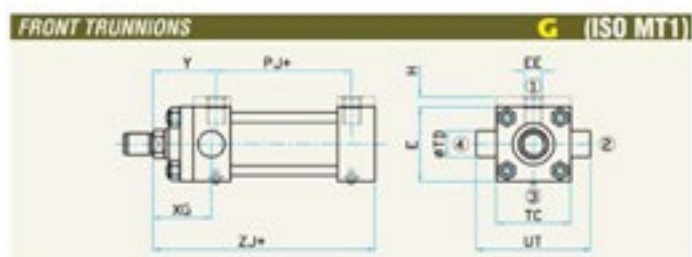
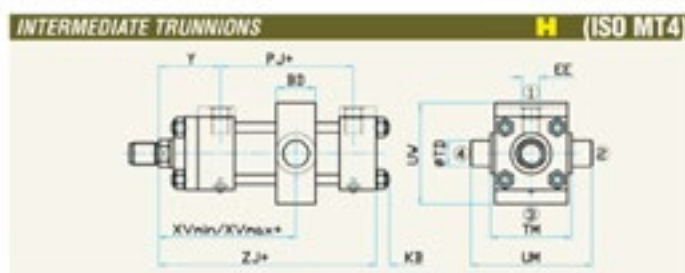
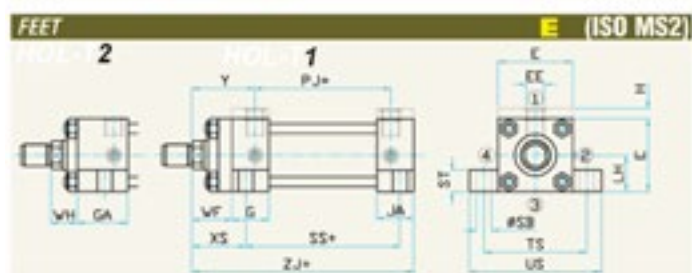
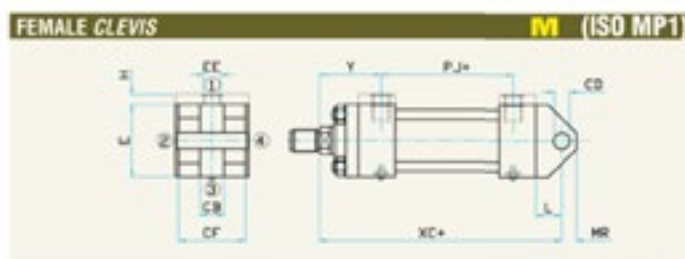
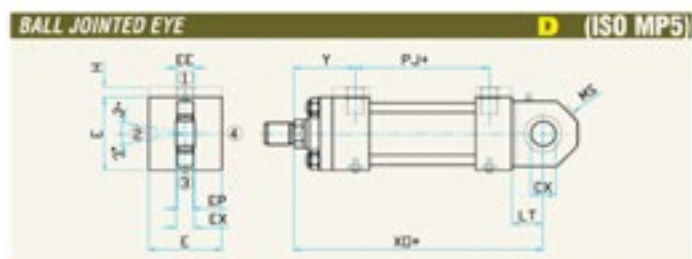
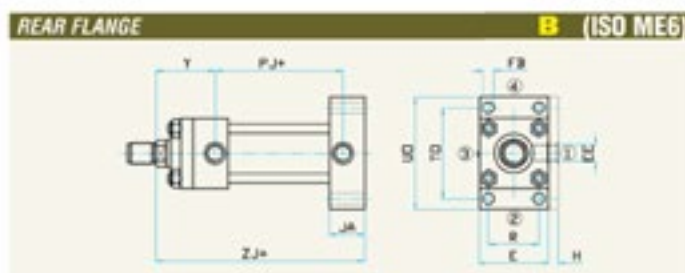
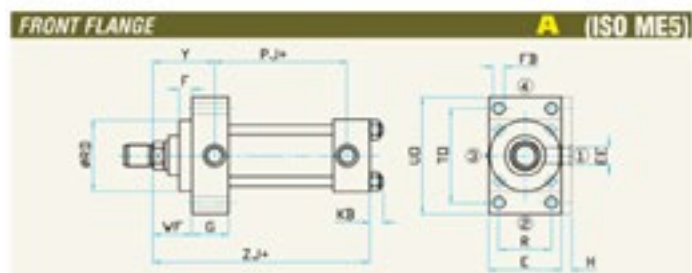
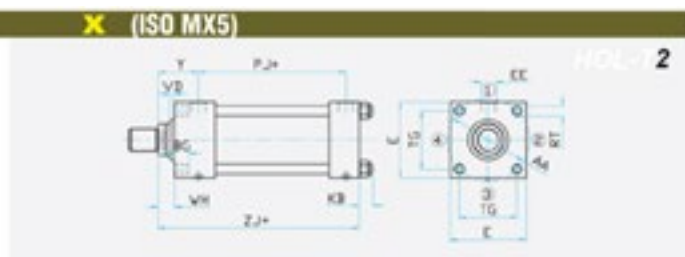
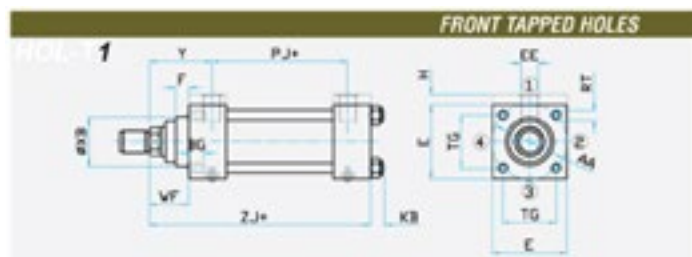
Series HOL-T Hydraulic Cylinders

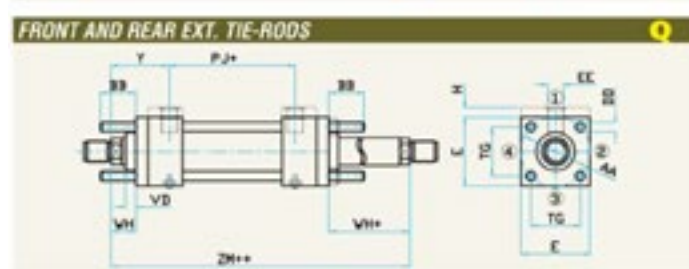
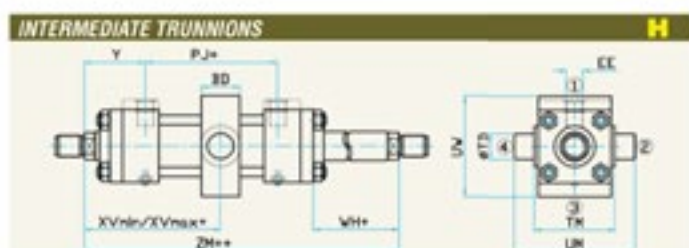
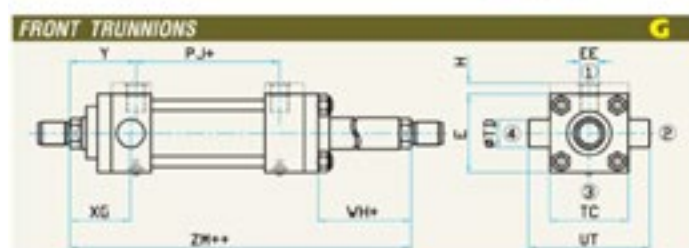
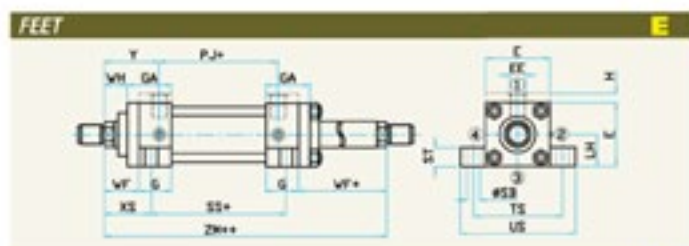
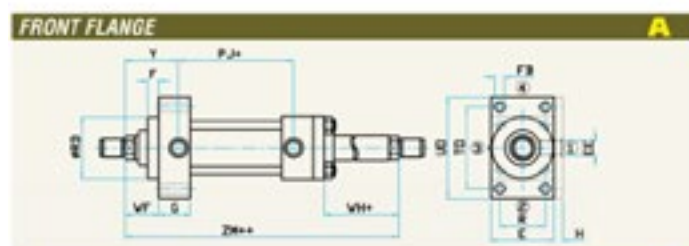
Ordering code

Example: HOL-T - S - 80 - 56 - 500 - H - 1 - M - S - G - BC - ***



	ISO6020/2	DIN24554	Mounting
Front Tapped Holes	MX5		X
Front Flange	ME5	ME5	A
Rear Flange	ME6	ME6	B
Feet	MS2	MS2	E
Rear Spherical Brg	MP5	MP5	D
Female Clevis	MP1		M
Front Trunnion	MT1		G
Intermediate Trunnion	MT4	MT4	H
Rear Trunnion	MT2		L
Ext' Front & Rear Tie Rods	MX1		Q
Ext' Front Tie Rods	MX3		R
Ext' Rear Tie Rods	MX2		S
Rear Tapped Holes	MX6		T





- (1) Minimum stroke for H mounting (ISO MT4)
(2) Tightening torque tie-rods value (in Nm)
(3) For longer strokes, a version with counterflanges is available

Pistone Piston	Stelo Rod		AA	BB	BD	BG	DD	E	EE	F	FB	G	GA	H	JA	LH H10	PJ	R	RD I8	RT	SB	SS	ST
25	12	18	40	19	20	12	M5x0.8	40	G1/4	10	5.5	32	—	5	32	19	49+	27	38	M5	6.6	73	8.5
32	14	18	22	47	24	25	M6x1	45	G1/4	10	6.6	35.5	—	5	35.5	22	47+	33	42	M6	9	73	12.5
40	18	22	28	59	35	29	M8x1	60	G3/8	10	11	46	—	—	46	31	58+	41	62	M8	11	98	12.5
50	22	28	36	74	46	38	M12x1.25	75	G1/2	16	14	45	—	—	45	38	62+	52	74	M12	14	92	19
63	28	36	45	91	46	48	M12x1.25	90	G1/2	16	14	45	—	—	45	44	64+	65	88	M12	18	86	26
80	36	45	56	117	59	58	M16x1.5	115	G3/4	20	18	52	—	—	52	57	77+	83	105	M16	18	105	26
100	45	56	70	137	59	68	M16x1.5	130	G3/4	22	18	55	—	—	55	63	78+	97	125	M16	26	102	32
125	56	70	90	178	81	88	M22x1.5	165	G1	22	22	65	87	—	65	82	117	126	150	M22	26	131	32
160	70	90	110	219	92	108	M27x2	200	G1	25	26	70	95	—	70	101	130	155	170	M27	33	130	38
200	90	110	140	269	115	125	M30x2	245	G1 1/4	25	33	92	117	—	92	122	165	190	210	M30	39	172	44

Pistone Piston	TC	TD I8	TG	TM	TO	TS	UM	UO	US	UT	UW	VD	WF	WH	XB I9	XG	XS	XV MIN	XV MAX	Y	ZM	(1)	(2)	(3)
25	38	12	28.3	48	51	54	68	65	72	58	45	6	25	15	30	44	33	67	72+	45	139++	10	5	1000
32	44	16	33.2	55	58	63	79	70	84	68	50	12	35	25	34	54	45	83	80+	58	163++	10	9	1200
40	63	20	41.7	76	87	83	108	110	103	95	70	12	35	25	42	57	45	96	92+	65	188++	15	20	1500
50	76	25	52.3	89	105	102	129	130	127	116	90	9	41	25	50	64	54	106	94+	69	200++	20	70	1800
63	89	32	64.3	100	117	124	150	145	161	139	100	13	48	32	60	70	65	118	98+	76	216++	30	70	2300
80	114	40	82.7	127	149	149	191	180	186	178	130	9	51	31	72	76	68	133	108+	82	241++	35	160	3000
100	127	50	96.9	140	162	172	220	200	216	207	140	10	57	35	88	71	79	147	113+	91	260++	45	160	3500
125	165	63	125.9	178	208	210	278	250	254	265	180	10	57	35	—	75	79	166	123+	86	289++	60	460	3500
160	203	80	154.9	215	253	260	341	300	318	329	215	7	57	32	—	75	86	182	120+	86	302++	70	820	3500
200	241	100	190.2	279	300	311	439	360	381	401	300	7	57	32	—	85	92	213	142+	86	356++	80	1150	3500

Piston	Rod			AA	BB	BD	BG	CB	CD	CF	CX	DD	E	EE	EP	EX	F	FB	G	GA	H	JA
25	12	18	40	19	20	12	16(°)	10	40	12	M5x0.8	40	G1/4	9	10	10	5.5	32	—	5	32	
32	14	18	22	47	24	25	16	12	45	16	M6x1	45	G1/4	12	14	10	6.6	35.5	—	5	35.5	
40	18	22	28	59	35	29	16	20	14	60	20	M8x1	60	G3/8	14	16	10	11	46	—	—	46
50	22	28	36	74	46	38	18	30	20	74	25	M12x1.25	75	G1/2	18	20	16	14	45	—	—	45
63	28	36	45	91	46	48	18	30	20	90	30	M12x1.25	90	G1/2	20	22	16	14	45	—	—	45
80	36	45	56	117	59	58	24	40	28	110	40	M16x1.5	115	G3/4	24	28	20	18	52	—	—	52
100	45	56	70	137	59	68	24	50	36	130	50	M16x1.5	130	G3/4	30	35	22	18	55	—	—	55
125	56	70	90	178	81	88	30	64(°)	45	164	60	M22x1.5	165	G1	38	44	22	22	65	87	—	65
160	70	90	110	219	92	108	35	80(°)	56	200	80	M27x2	200	G1	47	55	25	26	70	95	—	70
200	90	110	140	269	115	125	40	80	70	240	100	M30x2	245	G1 1/4	58	70	25	33	92	117	—	92

Piston	KB	L	LH H10	LT	MR	MS	PJ	R	RD R8	RT	SB	SS	ST	TC	TD R8	TG	TM	TO	TS	UM
25	7	13	19	16	12	20	49+ (°)	27	38	M5	6.6	73	8.5	38	12	28.3	48	51	54	68
32	10	19	22	20	11	25	47+ (°)	33	42	M6	9	73	12.5	44	16	33.2	55	58	63	79
40	13	19	31	25	16	30	58+ (°)	41	62	M8	11	98	12.5	63	20	41.7	76	87	83	108
50	17	32	37	31	18	35	62+ (°)	52	74	M12	14	92	19	76	25	52.3	89	105	102	129
63	17	32	44	38	18	40	64+ (°)	65	88(°)	M12	18	86	26	89	32	64.3	100	117	124	150
80	23	39	57	48	31	55	77+ (°)	83	105(°)	M16	18	105	26	114	40	82.7	127	149	149	191
100	23	54	63	58	46	65	78+ (°)	97	125(°)	M16	26	102	32	127	50	96.9	140	162	172	220
125	30	57	82	72	43	90	117	126	150(°)	M22	26	131	32	165	63	125.9	178	208	210	278
160	35	63	101	92	57	100	130	155	170(°)	M27	33	130	38	203	80	154.9	215	253	260	341
200	37	82	122	116	68	135	165	190	210(°)	M30	39	172	44	241	100	190.2	279	300	311	439

Piston	UO	US	UT	UW	VD	WF	WH	XB R9	XC	XG	XJ*	XO	XS	XV MIN MAX		Y	ZJ	ZL	(1)	(2)	(3)
25	65	72	58	45	6	25	15	30	127+	44	95+	130	33	67	72+	45 (°)	114+	114+	10	5	1000
32	70	84	68	50	12	35	25	34	147+	54	109+	148	45	83	80+	58 (°)	128+	128+	10	9	1200
40	110	103	95	70	12	35	25	42	172+	57	131+	178	45	96	92+	65 (°)	153+	153+	15	20	1500
50	130	127	116	90	9	41	25	50	191+	64	136+	190	54	106	94+	69 (°)	159+	159+	20	70	1800
63	145	161	139	100	13	48	32	60	200+	70	146+	206	65	118	98+	76 (°)	168+	168+	30	70	2300
80	180	186	178	130	9	51	31	72	229+	76	165+	238	68	133	108+	82 (°)	190+	190+	35	160	3000
100	200	216	207	140	10	57	35	88	257+	71	177+	261	79	147	113+	91 (°)	203+	203+	45	160	3500
125	250	254	265	180	10	57	35	—	289+	75	214+	304	79	166	123+	86	232+	254+	60	460	3500
160	300	318	329	215	7	57	32	—	308+	75	227+	337	86	182	120+	86	245+	270+	70	820	3500
200	360	381	401	300	7	57	32	—	381+	85	271+	415	92	213	142+	98	299+	324+	80	1150	3500

