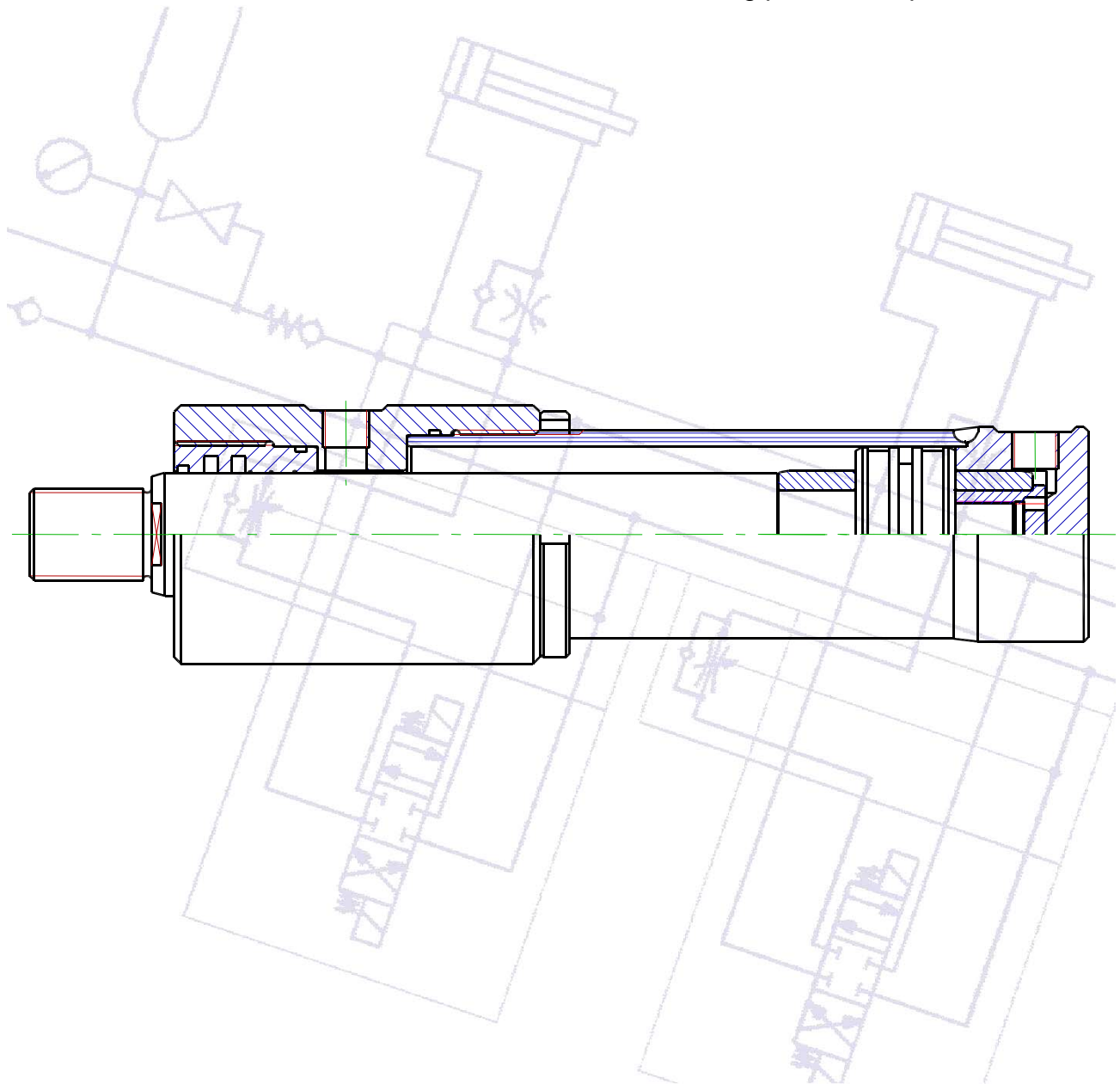


MMT Cylinders

DIN 24334
working pressures up to 250 bar



Introduction

Contents

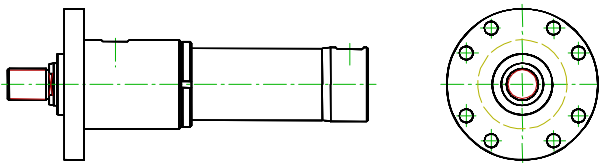
Page

Introduction	2
Mounting Styles	2
Design Features and Materials	3
Round Flange Mountings	4
Clevis Mountings	5
Trunnion Mountings	6
Foot Mountings	7
Rod end Accessories	8
Push and Pull Forces	8
Ports, Air Bleeds and Cushion Adjustment Locations	9
Special Requirements	9
Filtration	9
Servicing	9
Service Kits	9
Model Numbers	10

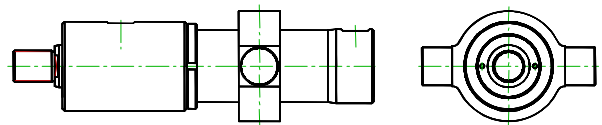
General Specification MMT

- Piston-Ø und Rod-Ø Form DIN 24334
- Cushioning – optional both ends
- Rated pressure: 250 bar
- Bore sizes: 40 mm to 125 mm
- Piston rod diameters 20 mm to 90 mm
- 4 standard constructions
- Seal Materials for Fluid Medium to ISO 6743/4-1982
- Temperature Range -20°C bis +80°C
- Air bleeders – optional both ends
- plus special designs to customer’s requirements

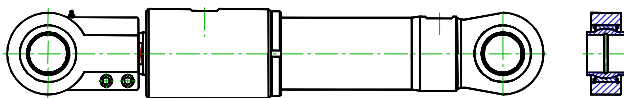
Mounting Styles:



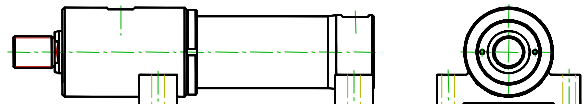
Circular Flange MF3



Intermediate Trunnion MT4



Eye with Spherical Bearing MP6



Foot Mounting MSP

Piston Rod

Manufactured from precision ground, high tensile carbon alloy steel, hard chrome plated and polished to 0,2 µm max. All Piston rods can be case hardened on request.

Cylinder Body

The heavy wall steel tubing is honed to a high surface finish, to minimize internal friction and prolong seal life.

Seals

The Seal standard material is Polyurethan and Elastomer. Other types of seals and wiper/scrapper seals can be fitted to suit customer preference or application.

Cushioning

Optional cushions at the head and cap are progressive in action, providing controlled deceleration which reduces noise and shock loading, and prolongs machine life. The cushion is a self-centering sleeve. Needle valves are provided at both ends of the cylinder for precise cushion adjustment, and are retained so that they cannot be inadvertently removed.

Port Types

MMT cylinders are supplied as standard with BSP/G (parallel thread) ports to ISO 228/1, spot faced for sealing washers

Air Bleeds

Captive bleed screws are provided in the head and cap as an option. The air bleed location, in the relation to the supply port location, must be specified on the order.

Operating Medium

The group 1 seal materials supplied with standard cylinders are suitable for use with any petroleum-based hydraulic fluid. If there is any doubt regarding seal compatibility with the operating medium, please consult us.

Fluid Flow

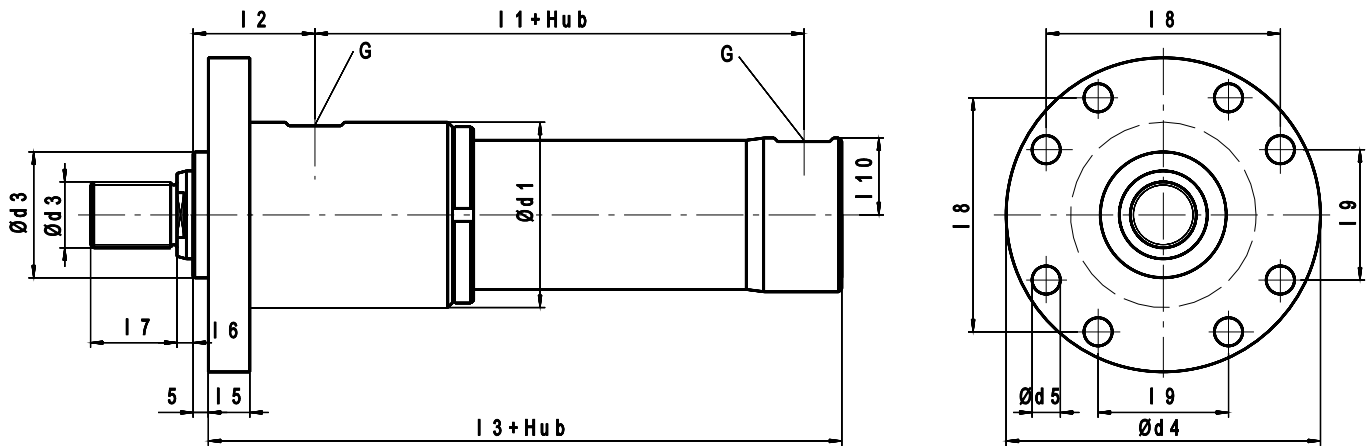
Fluid velocity in connecting lines should be limited to 5 m/s to minimize fluid turbulence, pressure loss and hydraulic shock.

Temperature

Standard seals are suitable for use at temperatures between -20°C and +80°C. Where operating temperatures exceed these limits, special seal compounds may be required to ensure satisfactory service life.

Head Circular Flange
Style MF3
Rod No. 4

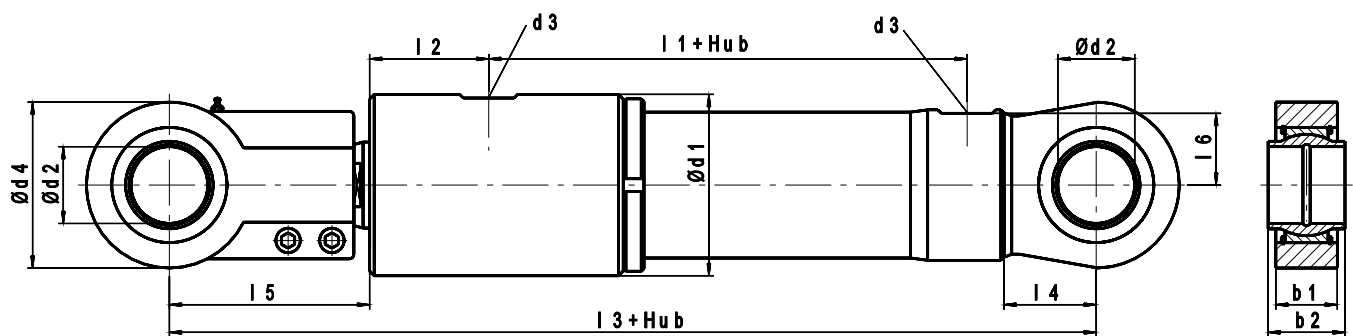
MMT



Bore \varnothing	Rod \varnothing	d1	d2	G	d3	d4	d5	l1	l2	l3	l5	l6	l7	l8	l9	l10	SW
40	22	70	M20x1,5	G3/8"	45	118	12	99	60	171	12	11	28	87	41	29	18
	28	70	M20x1,5	G3/8"	45	118	12	99	60	171	12	11	28	87	41	29	22
50	28	80	M27x2	G3/8"	55	145	14	99	65	176	16	11	35	105	52	33	22
	36	80	M27x2	G3/8"	55	145	14	99	65	176	16	16	35	105	52	33	32
63	36	98	M27x2	G1/2"	68	160	14	99	65	176	17	16	35	118	65	37	32
	45	98	M27x2	G1/2"	68	160	14	99	65	176	17	16	35	118	65	37	39
80	45	118	M33x2	G1/2"	82	200	18	109	77	205	20	22	44	149	83	46	39
	56	118	M33x2	G1/2"	82	200	18	109	77	205	20	22	44	149	83	46	46
100	56	140	M42x2	G3/4"	100	220	18	106	95	225	22	22	55	162	97	59	46
	70	140	M42x2	G3/4"	100	220	18	106	95	225	22	22	55	162	97	59	62
125	70	165	M48x2	G1"	115	280	23	114	113	255	24	22	62	208	126	70	62
	90	165	M48x2	G1"	115	280	23	114	113	255	24	22	62	208	126	70	80

Cap fixed Eye
 Style MP6
 Rod No. 4 + GIHNK

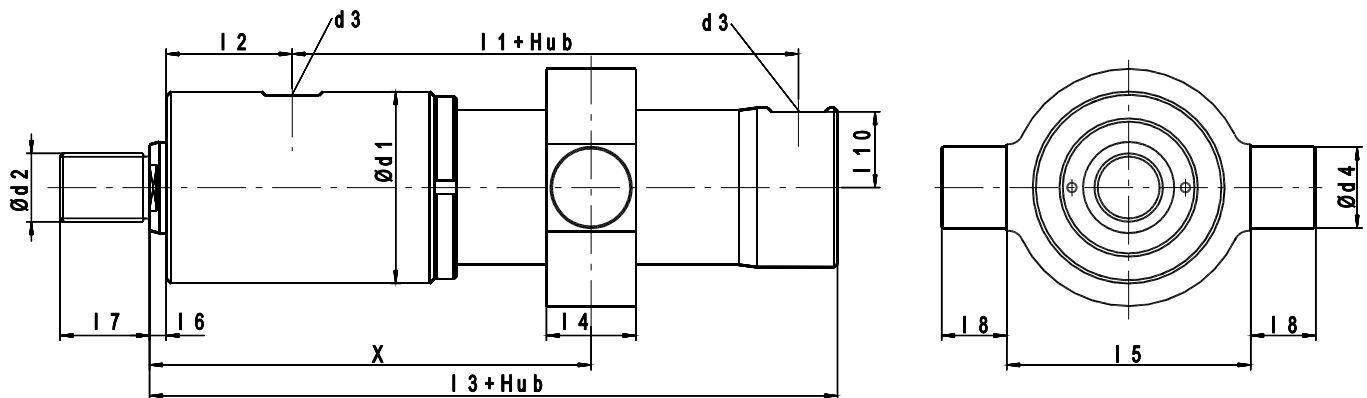
MMT



Bore Ø	Rod Ø	d1	d2	d3	d4	l1	l2	l3	l4	l5	l6	b1	b2	SW
40	22	70	25	G3/8"	58	99	60	292	40	76	29	21	25	18
	28	70	25	G3/8"	58	99	60	292	40	76	29	21	25	22
50	28	80	32	G3/8"	70	99	65	317	45	91	33	27	32	22
	36	80	32	G3/8"	70	99	65	322	45	96	33	27	32	32
63	36	98	32	G1/2"	70	99	65	322	45	96	37	27	32	32
	45	98	32	G1/2"	70	99	65	322	45	96	37	27	32	39
80	45	118	40	G1/2"	89	109	77	382	53	119	46	32	40	39
	56	118	40	G1/2"	89	109	77	382	53	119	46	32	40	46
100	56	140	50	G3/4"	108	106	95	432	60	142	59	40	50	46
	70	140	50	G3/4"	108	106	95	432	60	142	59	40	50	62
125	70	165	63	G1"	132	114	113	498	76	162	70	52	63	62
	90	165	63	G1"	132	114	113	498	76	162	70	52	63	80

Intermediate Fixed Trunnion
Style MT4
Rod No. 4

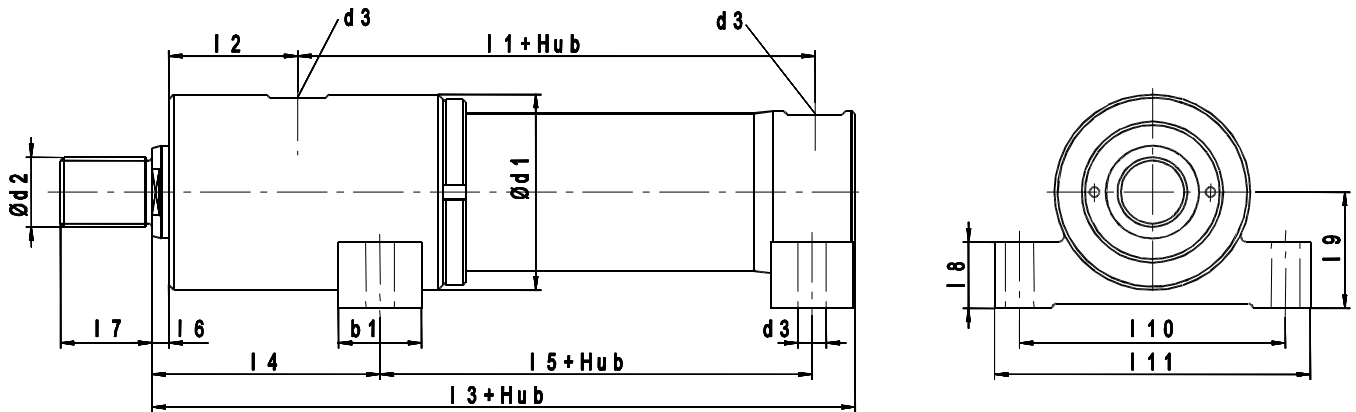
MMT



Bore Ø	Rod Ø	d1	d2	d3	d4	l1	l2	l3	l4	l5	l6	l7	l8	l10	SW
40	22	70	M20x1,5	G3/8"	30	99	60	187	35	76	11	28	25	29	18
	28	70	M20x1,5	G3/8"	30	99	60	187	35	76	11	28	25	29	22
50	28	80	M27x2	G3/8"	32	99	65	192	40	112	11	35	25	33	22
	36	80	M27x2	G3/8"	32	99	65	197	40	112	16	35	25	33	32
63	36	98	M27x2	G1/2"	40	99	65	197	45	125	16	35	32	37	32
	45	98	M27x2	G1/2"	40	99	65	197	45	125	16	35	32	37	39
80	45	118	M33x2	G1/2"	50	109	77	232	55	150	22	44	40	46	39
	56	118	M33x2	G1/2"	50	109	77	232	55	150	22	44	40	46	46
100	56	140	M42x2	G3/4"	63	106	95	252	70	180	22	55	50	59	46
	70	140	M42x2	G3/4"	63	106	95	252	70	180	22	55	50	59	62
125	70	165	M48x2	G1"	80	114	113	282	90	224	22	62	63	70	62
	90	165	M48x2	G1"	80	114	113	282	90	224	22	62	63	70	80

Foot Mounting
Style MSP
Rod No. 4

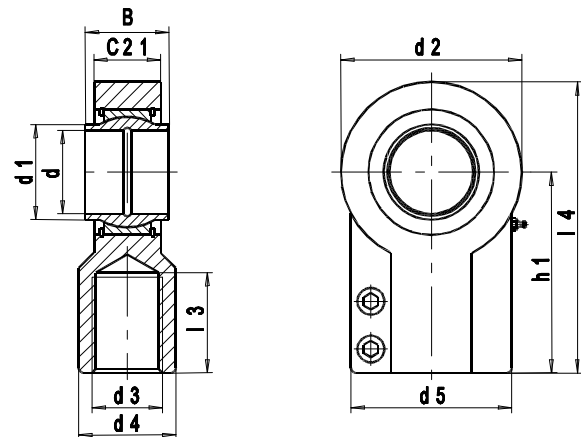
MMT



Bore Ø	Rod Ø	d1	d2	d3	d4	l1	l2	l3	l4	l5	l6	l7	l8	l9	l10	l11	b1
40	22	70	M20x1,5	G3/8"	11,5	99	60	18 7	96	75	11	28	30	45	11 4	13 8	30
	28	70	M20x1,5	G3/8"	11,5	99	60	18 7	96	75	11	28	30	45	11 4	13 8	30
50	28	80	M27x2	G3/8"	11,5	99	65	19 2	97	74	11	35	30	55	12 2	14 6	40
	36	80	M27x2	G3/8"	11,5	99	65	19 7	10 2	74	16	35	30	55	12 2	14 6	40
63	36	98	M27x2	G1/2"	13	99	65	19 7	11 2	64	16	35	35	65	13 1	15 6	40
	45	98	M27x2	G1/2"	13	99	65	19 7	11 2	64	16	35	35	65	13 1	15 6	40
80	45	11 8	M33x2	G1/2"	17	10 9	77	23 2	13 3	73	22	44	40	70	16 0	19 0	50
	56	11 8	M33x2	G1/2"	17	10 9	77	23 2	13 3	73	22	44	40	70	16 0	19 0	50
100	56	14 0	M42x2	G3/4"	21	10 6	95	25 2	14 4	82	22	55	45	85	19 5	24 0	50
	70	14 0	M42x2	G3/4"	21	10 6	95	25 2	14 4	82	22	55	45	85	19 5	24 0	50
125	70	16 5	M48x2	G1"	25	11 4	11 3	28 2	16 7	89	22	62	55	10 5	24 0	29 0	50
	90	16 5	M48x2	G1"	25	11 4	11 3	28 2	16 7	89	22	62	55	10 5	24 0	29 0	50

Spherical Bearing Rod Eye

DIN 24338 – ISO 6982



Bore \varnothing	Type	d	B	d1	d2	d3	d4	d5	h1	C1	l3	l4
40	GIHN-K 25 LO	25	25	30,5	58	M20x1,5	30	54	65	21	29	94
50, 63	GIHN-K 32 LO	32	32	38	70	M27x2	38	66	80	27	37	115
80	GIHN-K 40 LO	40	40	46	89	M33x2	47	80	97	32	46	141,5
100	GIHN-K 50 LO	50	50	57	108	M42x2	58	96	120	40	57	174
125	GIHN-K 63 LO	63	63	71,5	132	M48x2	70	114	140	52	64	211

Theoretical Push and Pull Forces

Calculation of Cylinder Diameter

Given that the load and operating pressure of the system are known, and that a piston rod size has been estimated taking account of whether the rod is in tension (pull) or compression (push), then the cylinder bore can be selected.

If the piston is in compression, use the „Push Force“ table below.

1. Identify operating pressure closest to that required.
2. In the same column, identify the force required to move the load (always rounding up)
3. In the same row, look along to the cylinder bore required.

If the cylinder envelope dimensions are too large for your application increase the operating pressure, if possible, and repeat the exercise.

If the piston rod is in tension, use the Deduction for Pull Force table. The procedure is the same but, due to the reduced piston surface area resulting from the piston rod, the force available on the 'pull' stroke will be smaller. To determine the pull force:

1. Follow the procedure given for 'Push' applications, as described above.
2. Using the 'Deduction for Pull Force' table below, establish the force indicated according to the rod diameter and pressure selected.
3. Deduct this from the original 'Push' force. The resultant is the net force available to move the load.

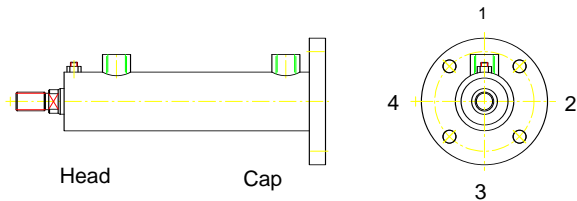
If this force is not large enough, go through the process again but increase the system operating pressure or cylinder diameter if possible. If in doubt, our design engineers will be pleased to assist.

Bore \varnothing	Cylinder Bore Area	Cylinder Push Force				
		50bar	100bar	150bar	200bar	250bar
mm	mm ²					
40	1257	6	12	18	24	30
50	1964	10	20	30	40	50
60	2827	14	28	42	56	70
63	3117	15	31	45	63	79
70	3848	19	38	57	76	96
80	5026	25	51	76	102	128
100	7854	40	80	120	160	200
125	12272	62	125	187	250	312

Piston Rod \varnothing	Piston Rod Area	Reduction in Force in kN				
		50bar	100bar	150bar	200bar	250bar
mm	mm ²					
20	314	1,5	3,1	4,7	6,2	7,8
22	380	1,9	3,8	5,7	7,6	9,5
28	615	3	6	9	12	15
36	1018	5	10	15	20	25
45	1590	7,9	15,9	23,8	31,8	39,7
56	2463	12	25	37	50	62
63	3117	15	31	46	62	77
70	3848	19	39	58	78	98
80	5027	25	50	76	100	126
90	6361	31,8	63,6	95,4	127,2	159

Ports, Air Bleeds and Cushion Adjustment Location

Standard port location is position 1, air bleeds at position 2 as shown.



The port location can be repositioned at 90° or 180° from standard. To order non-standard port locations, specify using position numbers from the drawing above.

Captive bleed screws are provided in the head and cap as an option. The air bleed location, in relation to the supply port location, must be specified on the order. Air bleeds are available at all positions.

Sonderausführungen

Special Requirements Special Mounting Styles

Mounting styles other than those specified in this catalogue can be supplied on request. Please consult us.

Rod Material

As an alternative to the normal piston rod material, stainless steel and or special materials and finishes can be supplied

Long Stroke Cylinders

When using long stroke cylinders, a stop tube may be required.

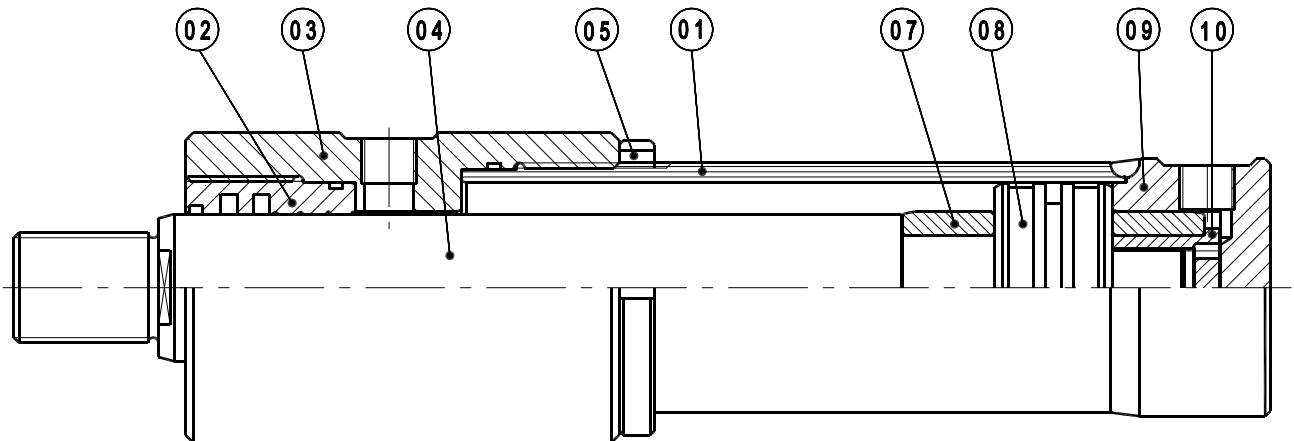
Proximity Sensors

Non-contacting position sensors are available for MMT series cylinders. Please contact us for further details.

Double Rodded Cylinders

MMT series cylinders are available with the option of a double-ended piston rod. Please contact us for further details.

Dismantling instruction Cylinders series MMT



1. Empty hydraulic cylinder.
2. Solve groove mother POS.5.
3. Screw off cylinder head POS. 03 with guided tour can..
4. Pull out piston-rod POS. 04 with plunger POS. 08.
5. Unscrew rod bearing Pos. 02
6. Hold nut Pos. 10 secured with Loctite.

Model Numbers

MMT

Each MMT series cylinder is assigned a model number, select those characters. To develop a model number, select those characters which represent the features required and put them down in the sequence indicated by the example below.

Features	Description		Symbol	Example 40 C K MF3 MMT R E S 1 4 M C 250 M 11 11
Bore	Millimetres	-	-	←
Head Cushion	If required		C	←
Double Rod	If required		K	←
Mounting Style	Head Circular Flange Cap Fixed Eye Intermediate Trunnion Foot Mounting		MF3 MP6 MT4 MSP	←
Series	Series name		MMT	←
Ports	Standard BSP parallel Optional Metric to DIN 3852 Pt. 1		R M	←
Piston	Standard: Elastomer Optional: PTFE/Bronze		E P	←
Special	Use only if required for: Oversized ports Special seals Or detailed descriptions or Drawings supplied by customer		S	←
Piston Rod No.	Rod No. 1 Rod No. 2		1 2	←
Piston Rod End	Style 4 (metric) Style 3 (Please supply description)		4 3	←
Rod Thread	Metric (standard)		M	←
Cap Cushion	If required		C	←
Stroke	Millimetres	-	-	←
Fluid Medium ISO 6743/4 (1982)	Mineral oil HH, HL, HLP, HM, HV, Mil-H-5606 oil, air, nitrogen Group 1 Water Glycol HFC Group 2 Fire resistant fluids based on Phosphate esters HFD-R Group 5 Water, oil in water emulsion 95/5 HFA Group 6 60/40 HFB Group 7		M C D A1 B	←
Port Position	Head position 1-4 Cap position 1-4		1 1	←
Air Bleeds	No air bleed Head position 1-4 Cap position 1-4		1 1	←

Model Numbers Seal-Kit

Features	Description		Symbol	Example DS/MMT 40 K E 1 1
Series	Series name		DS/MMT	←
Bore	Millimetres	-	-	←
Double Rod	If required		K	←
Piston	Standard: Elastomer Optional: PTFE/Bronze		E P	←
Piston Rod No.	Rod No. 1 Rod No. 2		1 2	←
Fluid Medium	Group 1 - 7		1	←

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Power Units to Customer Specifications from projecting to realisation. Complete systems. Capacity from 10 to 10000 l . Reservoirs to DIN specification. Customised specials possible.



S.K. designs and manufactures special cylinders to meet customers' unique requirements. Various types of electronic position & velocity feedback devices are offered for use with proportional and servo valves. Electrical and mechanical position indicators signal when end of stroke is reached.



Note: In line with our policy of continuing product improvement, specifications in this catalogue are subject to change without notice.