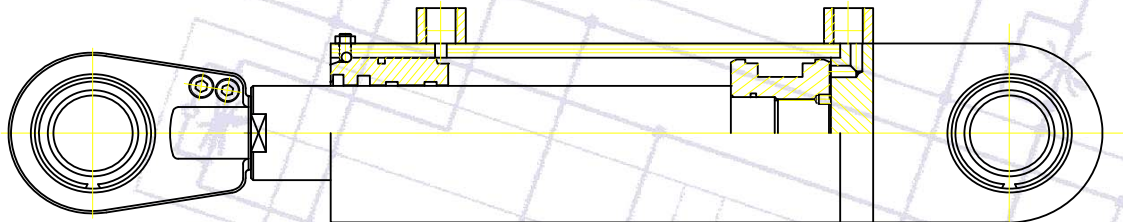


## MMS Cylinders

DIN 24334  
working pressure up to 250 bar

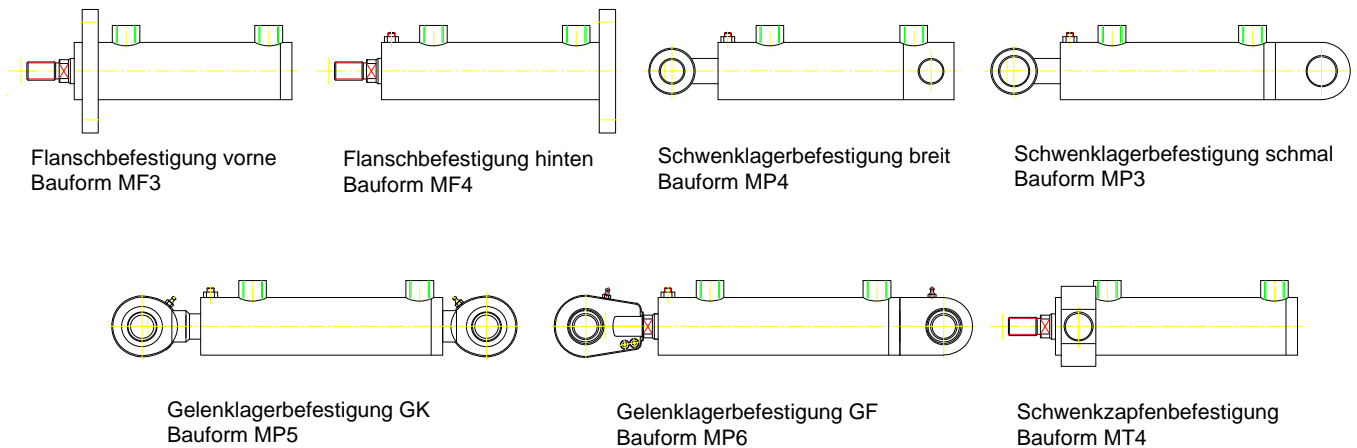


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## General Specification MMS

- Piston-Ø und Rod-Ø Form DIN 24334
- Rated pressure: 250 bar
- Bore sizes: 40 mm to 125 mm
- Piston rod diameters 20 mm to 80 mm
- 7 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:



## 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.

## Port Types

MMS 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

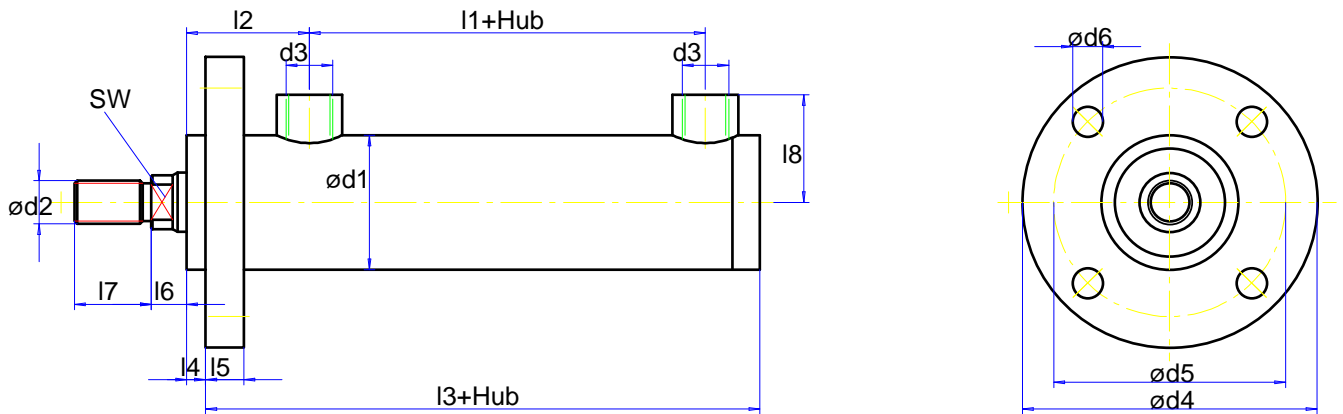
Fluid velocity in connecting lines should be limited to 5 m/s to minimize fluid turbulence, pressure loss and hydraulic shock.

## 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**

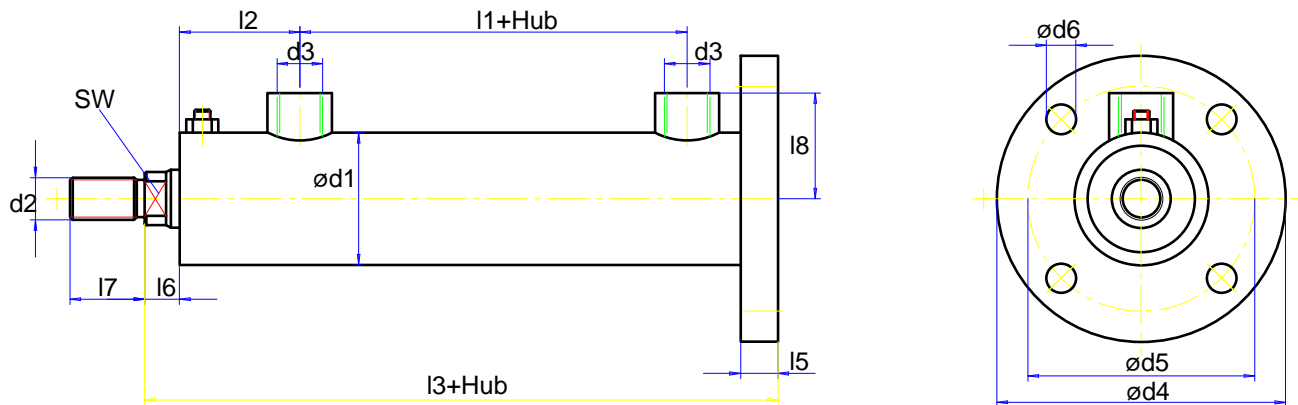
**MMS**



Bore Ø	Rod Ø	d1	d2	d3	d4	d5	d6	l1	l2	l3	l4	l5	l6	l7	l8	SW
40	20	50	M16x1,5	G1/4"	108	85	4x11	45	45	110	0	14	13	28	40	17
	22	50	M16x1,5	G1/4"	108	85	4x11	45	45	110	0	14	13	28	40	17
50	28	60	M16x1,5	G3/8"	128	100	4x13,5	45	45	110	0	16	13	28	45	22
	32	60	M16x1,5	G3/8"	128	100	4x13,5	45	60	125	0	16	13	28	45	28
60	32	70	M22x1,5	G3/8"	148	120	4x17,5	45	60	125	0	20	14	36	50	28
	40	70	M22x1,5	G3/8"	148	120	4x17,5	45	60	125	0	20	14	36	50	34
63	32	73	M22x1,5	G3/8"	148	120	4x17,5	45	60	125	0	20	14	36	52	28
	40	73	M22x1,5	G3/8"	148	120	4x17,5	45	60	125	0	20	14	36	52	34
70	40	80	M28x1,5	G3/8"	160	130	4x17,5	50	60	130	0	20	16	45	55	34
80	40	95	M35x1,5	G1/2"	188	150	4x22	50	60	130	0	25	16	45	67	34
	50	95	M35x1,5	G1/2"	188	150	4x22	50	60	130	0	25	16	45	67	43
100	56	115	M45x1,5	G1/2"	218	180	4x22	50	70	145	0	25	18	56	77	46
	63	115	M45x1,5	G1/2"	218	180	4x22	50	70	145	0	25	18	56	77	46
	70	115	M45x1,5	G1/2"	218	180	4x22	50	70	145	0	25	18	56	77	60
125	70	145	M58x1,5	G3/4"	238	200	8x17,5	55	80	165	0	32	20	63	94	60
	80	145	M58x1,5	G3/4"	238	200	8x17,5	55	80	165	0	32	20	63	94	65

**Cap Circular Flange**  
**Style MF3**  
**Rod No. 4**

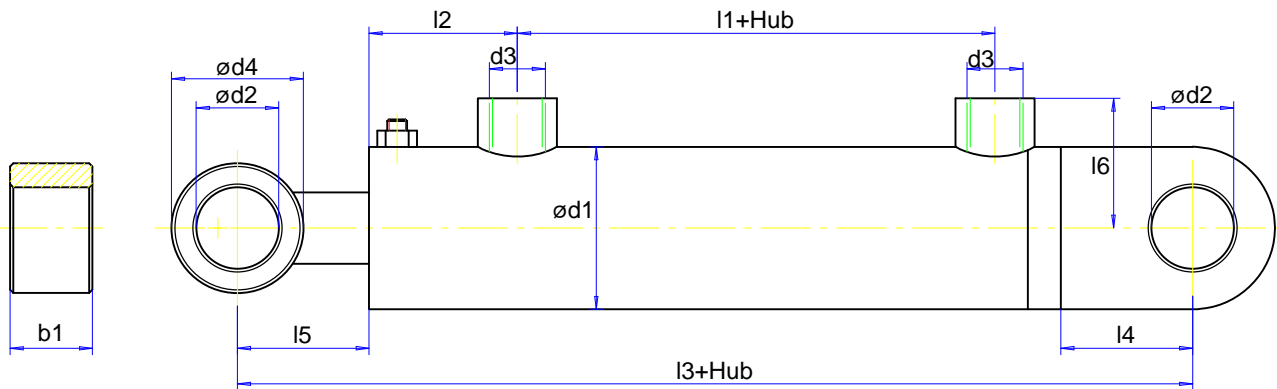
**MMS**



Bore Ø	Rod Ø	d1	d2	d3	d4	d5	d6	l1	l2	l3	l5	l6	l7	l8	SW
40	20	50	M16x1,5	G1/4"	108	85	4x11	45	45	137	14	13	28	40	17
	22	50	M16x1,5	G1/4"	108	85	4x11	45	45	137	14	13	28	40	17
50	28	60	M16x1,5	G3/8"	128	100	4x13,5	45	45	139	16	13	28	45	22
	32	60	M16x1,5	G3/8"	128	100	4x13,5	45	60	154	16	13	28	45	28
60	32	70	M22x1,5	G3/8"	148	120	4x17,5	45	60	159	20	14	36	50	28
	40	70	M22x1,5	G3/8"	148	120	4x17,5	45	60	159	20	14	36	50	34
63	32	73	M22x1,5	G3/8"	148	120	4x17,5	45	60	159	20	14	36	52	28
	40	73	M22x1,5	G3/8"	148	120	4x17,5	45	60	159	20	14	36	52	34
70	40	80	M28x1,5	G3/8"	160	130	4x17,5	50	60	166	20	16	45	55	34
80	40	95	M35x1,5	G1/2"	188	150	4x22	50	60	171	25	16	45	67	34
	50	95	M35x1,5	G1/2"	188	150	4x22	50	60	171	25	16	45	67	43
100	56	115	M45x1,5	G1/2"	218	180	4x22	50	70	193	25	18	56	77	46
	63	115	M45x1,5	G1/2"	218	180	4x22	50	70	193	25	18	56	77	46
	70	115	M45x1,5	G1/2"	218	180	4x22	50	70	193	25	18	56	77	60
125	70	145	M58x1,5	G3/4"	238	200	8x17,5	55	80	217	32	20	63	94	60
	80	145	M58x1,5	G3/4"	238	200	8x17,5	55	80	217	32	20	63	94	65

**Cap Fixed Eye**  
**Style MP3**  
**Rod No Nr. 8**

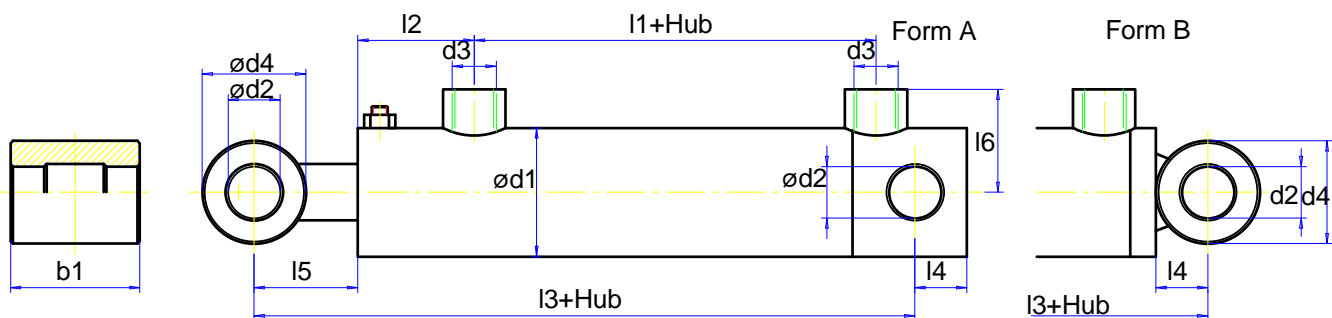
**MMS**



Bore Ø	Rod Ø	d1	d2 H9	d3	d4	b1	l1	l2	l3	l4	l5	l6
40	20	50	25	G¼"	40	25	45	45	190	38	40	40
	22	50	25	G¼"	40	25	45	45	190	38	40	40
50	28	60	32	G3/8"	45	32	45	45	205	50	42,5	45
	32	60	32	G3/8"	45	32	45	60	220	50	42,5	45
60	32	70	40	G3/8"	60	40	45	60	235	60	50	50
	40	70	40	G3/8"	60	40	45	60	235	60	50	50
63	32	73	40	G3/8"	60	40	45	60	235	60	50	52
	40	73	40	G3/8"	60	40	45	60	235	60	50	52
70	40	80	45	G3/8"	70	45	50	60	255	70	55	55
80	40	95	50	G½"	80	50	50	60	275	75	70	67
	50	95	50	G½"	80	50	50	60	275	75	70	67
100	56	115	63	G½"	100	63	50	70	320	95	80	77
	63	115	63	G½"	100	63	50	70	320	95	80	77
	70	115	63	G½"	100	63	50	70	320	95	80	77
125	70	145	80	G¾"	120	80	55	80	375	120	90	94
	80	145	80	G¾"	120	80	55	80	375	120	90	94
140	80	160	80	G¾"	120	80	55	80	375	120	90	100

**Cap Fixed Eye**  
**Style MP4**  
**Rod No Nr. 6**

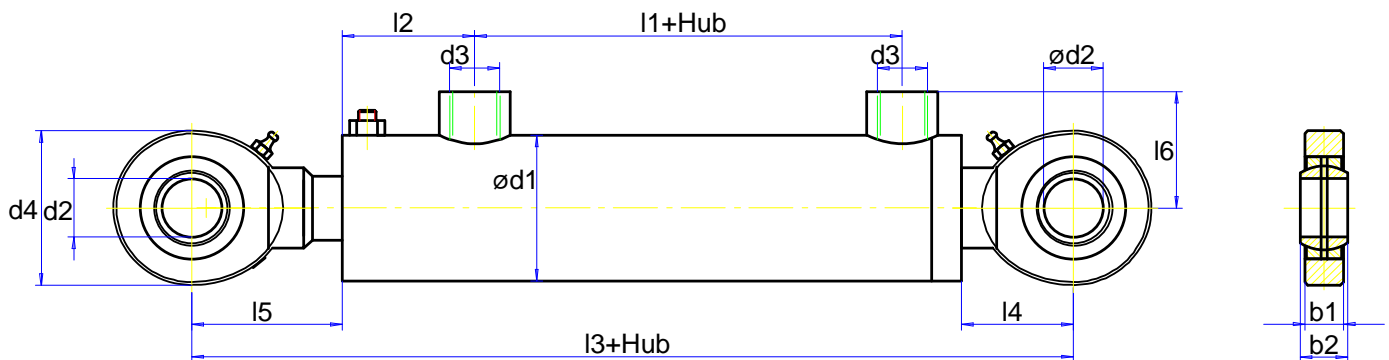
**MMS**



Bore Ø	Rod Ø	d1	d2 H9	d3	d4	b1	l1	l2	l3	l4	l5	l6	Form
40	20	50	20	G¼"	30	50	45	45	150	20	35	40	A
	22	50	20	G¼"	30	50	45	45	150	20	35	40	A
50	28	60	25	G3/8"	40	60	45	45	160	20	40	45	A
	32	60	25	G3/8"	40	60	45	60	175	20	40	45	A
60	32	70	30	G3/8"	45	70	45	60	190	22,5	42,5	50	B
	40	70	30	G3/8"	45	70	45	60	190	22,5	42,5	50	B
63	32	73	30	G3/8"	45	73	45	60	190	22,5	42,5	52	B
	40	73	30	G3/8"	45	73	45	60	190	22,5	42,5	52	B
70	40	80	30	G3/8"	45	80	50	60	195	22,5	42,5	55	B
80	40	95	40	G½"	60	95	50	60	210	30	50	67	B
	50	95	40	G½"	60	95	50	60	210	30	50	67	B
100	56	115	50	G½"	80	115	50	70	255	40	70	77	B
	63	115	50	G½"	80	115	50	70	255	40	70	77	B
	70	115	50	G½"	80	115	50	70	255	40	70	77	B
125	70	145	50	G¾"	80	145	55	80	275	40	70	94	B
	80	145	50	G¾"	80	145	55	80	275	40	70	94	B
140	80	160	60	G¾"	80	160	55	80	285	45	75	100	B

**Cap Fixed Eye with Spherical Bearing**  
**Style MP5**  
**Rod No Nr. 5**

**MMS**

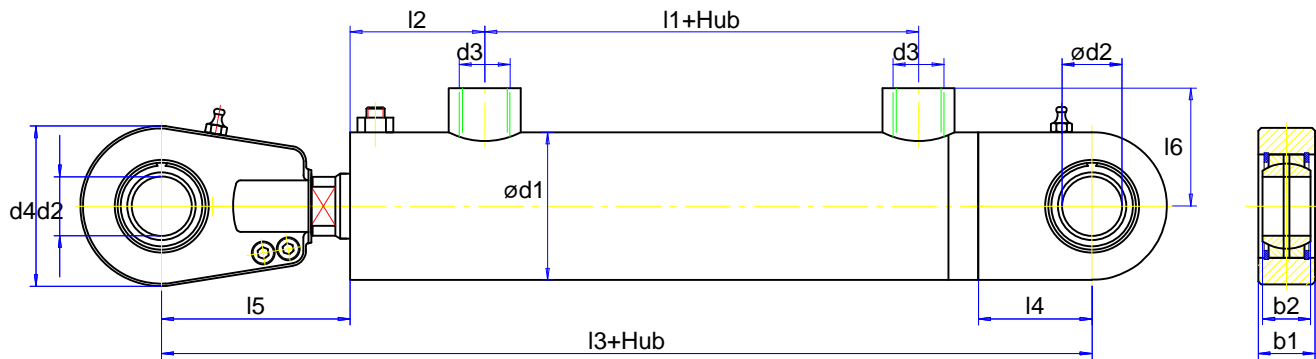


Bore Ø	Rod Ø	d1	d2 H7	d3	d4	b1	b2	l1	l2	l3	l4	l5	l6
40	20	50	20	G¼"	53	13	16	45	45	206	38	58	40
	22	50	20	G¼"	53	13	16	45	45	206	38	58	40
50	28	60	25	G3/8"	64	17	20	45	45	220	45	65	45
	32	60	25	G3/8"	64	17	20	45	60	235	45	65	45
60	32	70	30	G3/8"	73	19	22	45	60	247	51	71	50
	40	70	30	G3/8"	73	19	22	45	60	247	51	71	50
63	32	73	30	G3/8"	73	19	22	45	60	247	51	71	52
	40	73	30	G3/8"	73	19	22	45	60	247	51	71	52
70	40	80	35	G3/8"	82	21	25	50	60	272	61	81	55
80	40	95	40	G½"	92	23	28	50	60	288	69	89	67
	50	95	40	G½"	92	23	28	50	60	288	69	89	67
100	56	115	50	G½"	112	30	35	50	70	351	88	118	77
	63	115	50	G½"	112	30	35	50	70	351	88	118	77
	70	115	50	G½"	112	30	35	50	70	351	88	118	77
125	70	145	60	G¾"	135	38	44	55	80	395	100	130	94
	80	145	60	G¾"	135	38	44	55	80	395	100	130	94



**Cap Fixed Eye with Spherical Bearing**  
**Style MP6**  
**Rod No Nr. 4 + GIHRK**

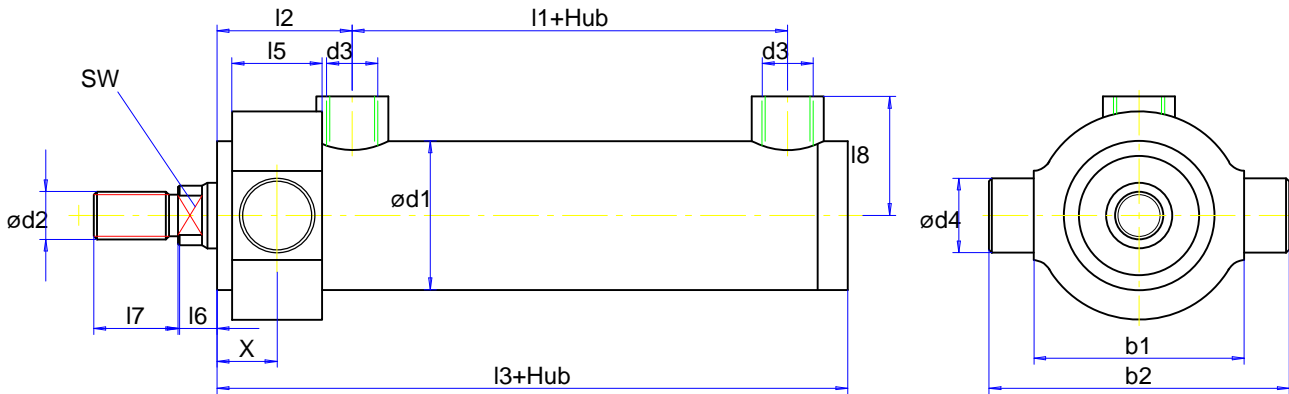
**MMS**



Bore Ø	Rod Ø	d1	d2 H7	d3	d4	b1	b2	l1	l2	l3	l4	l5	l6
40	20	50	20	G¼"	53	19	16	45	45	211	38	63	40
	22	50	20	G¼"	53	19	16	45	45	211	38	63	40
50	28	60	25	G3/8"	64	23	20	45	45	218	45	63	45
	32	60	25	G3/8"	64	23	20	45	60	233	45	63	45
60	32	70	30	G3/8"	73	28	22	45	60	250	51	74	50
	40	70	30	G3/8"	73	28	22	45	60	250	51	74	50
63	32	73	30	G3/8"	73	28	22	45	60	250	51	74	52
	40	73	30	G3/8"	73	28	22	45	60	250	51	74	52
70	40	80	35	G3/8"	82	30	25	50	60	277	61	86	55
80	40	95	40	G½"	92	35	28	50	60	300	69	101	67
	50	95	40	G½"	92	35	28	50	60	300	69	101	67
100	56	115	50	G½"	112	40	35	50	70	356	88	123	77
	63	115	50	G½"	112	40	35	50	70	356	88	123	77
	70	115	50	G½"	112	40	35	50	70	356	88	123	77
125	70	145	60	G¾"	135	50	44	55	80	415	100	150	94
	80	145	60	G¾"	135	50	44	55	80	415	100	150	94

**Intermediate Fixed Trunnion**  
**Style MT4**  
**Rod No. 4**

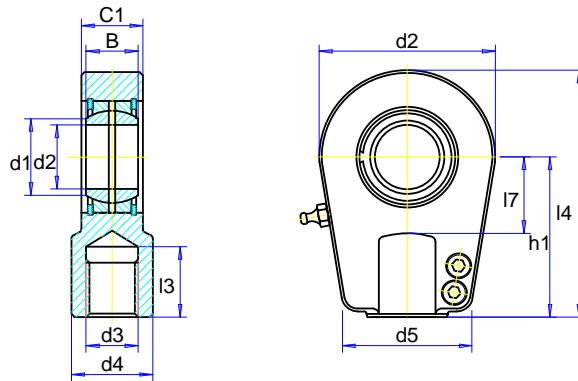
**MMS**



Bore Ø	Rod Ø	d1	d2	d3	d4 f8	b1	b2	l1	l2	l3	l5	l6	l7	l8	SW
40	20	50	M16x1,5	G1/4"	25	70	110	45	45	110	30	13	28	40	17
	22	50	M16x1,5	G1/4"	25	70	110	45	45	110	30	13	28	40	17
50	28	60	M16x1,5	G3/8"	30	80	130	45	45	110	35	13	28	45	22
	32	60	M16x1,5	G3/8"	30	80	130	45	60	125	35	13	28	45	28
60	32	70	M22x1,5	G3/8"	40	100	160	45	60	125	45	14	36	50	28
	40	70	M22x1,5	G3/8"	40	100	160	45	60	125	45	14	36	50	34
63	32	73	M22x1,5	G3/8"	40	100	160	45	60	125	45	14	36	52	28
	40	73	M22x1,5	G3/8"	40	100	160	45	60	125	45	14	36	52	34
70	40	80	M28x1,5	G3/8"	45	110	180	50	60	130	50	16	45	55	34
80	40	95	M35x1,5	G1/2"	50	120	200	50	60	130	55	16	45	67	34
	50	95	M35x1,5	G1/2"	50	120	200	50	60	130	55	16	45	67	43
100	56	115	M45x1,5	G1/2"	63	140	240	50	70	145	70	18	56	77	46
	63	115	M45x1,5	G1/2"	63	140	240	50	70	145	70	18	56	77	46
	70	115	M45x1,5	G1/2"	63	140	240	50	70	145	70	18	56	77	60
125	70	145	M58x1,5	G3/4"	80	180	300	55	80	165	90	20	63	94	60
	80	145	M58x1,5	G3/4"	80	180	300	55	80	165	90	20	63	94	65

Gelenklagerkopf

DIN 648 Maßreihe E  
mit klemmbarem Gewinde



Bore ø	Type	d	B	d1	d2	d3	d4	d5	h1	C1	l3	l4	l7
40	GIHR-K 20 DO	20	16	24,1	56	M16x1,5	25	41	50	19	17	78	25
50	GIHR-K 25 DO	25	20	29,3	56	M16x1,5	25	41	50	23	17	78	25
60,63	GIHR-K 30 DO	30	22	34,2	64	M22x1,5	32	46	60	28	23	92	30
70	GIHR-K 35 DO	35	25	39,7	78	M28x1,5	40	58	70	30	29	109	38
80	GIHR-K 40 DO	40	28	45,0	94	M35x1,5	49	66	85	35	36	132	45
100	GIHR-K 50 DO	50	35	55,9	116	M45x1,5	61	88	105	40	46	163	55
125	GIHR-K 60 DO	60	44	66,8	130	M58x1,5	75	90	130	50	59	200	65
	GIHR-K 70 DO	70	49	77,8	154	M65x1,5	86	100	150	55	66	232	75
	GIHR-K 80 DO	80	55	89,4	176	M80x2	102	125	170	60	81	265	80

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.

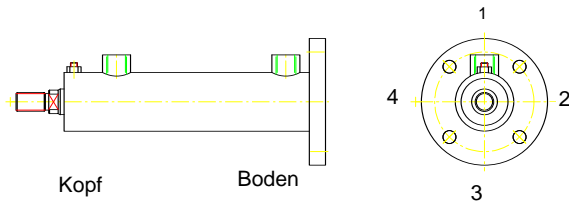
If this force is not large enough, go through the process again but increase the system operating pressure or cylinder diameter if possible. If in doubt, our design engineers will be pleased to assist.

Bore ø	Cylinder Bore Area	Cylinder Push Force				
		50bar	100bar	150bar	200bar	250bar
mm	mm <sup>2</sup>					
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 ø	Piston Rod Area	Reduction in Force in kN				
		50bar	100bar	150bar	200bar	250bar
mm	mm <sup>2</sup>					
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
32	804	4	8	12	16	20
40	1257	6	12	19	24	31
50	1964	10	19	29	38	49
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

## Ports and Air Bleeds 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.

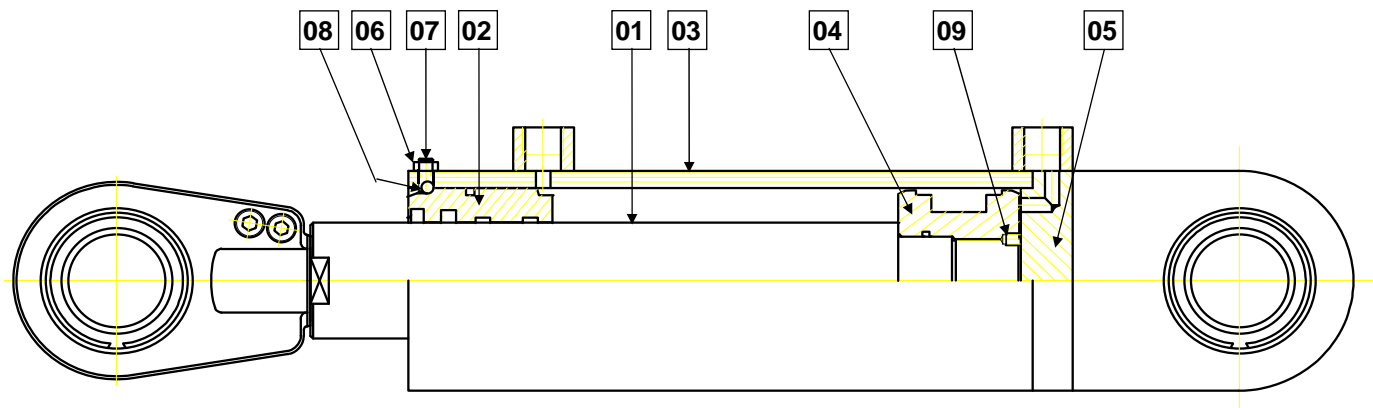
### Proximity Sensors

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 MMS



1. Empty hydraulic cylinder.
2. Solve screw pos. 07 and nut pos. 06
3. Move back rod bearing pos. 02
4. remove retaining ring pos. 08
5. Pull out piston-rod pos. 01 with plunger pos. 04
6. Remove setscrew pos. 09
7. Unscrew piston pos. 04

## Model Numbers

MMS

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.

Ausführung	Beschreibung		Symbol	Example 40 K MF3 MMS R E S 1 4 M 250 M 11 11
Bore	in Millimeter angeben	-	-	←
Double Rod	If required		K	←
Mounting Style	Head Circular Flange Cap Circular Flange Eye with Spherical Bearing GK Eye with Spherical Bearing GF Fixed Eye Fixed Eye Intermediate Trunnion		MF3 MF4 MP5 MP6 MP3 MP4 MT4	←
Series	Series name		MMS	←
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 Rod No. 3		1 2 3	←
Piston Rod End	Style 4 (metric) Style 5 Style 6 Style 8 Style 3 (please supply description)		4 5 6 8 3	←
Rod Thread	Metric (standard)		M	←
Stroke	Millimetres	-	-	←
Fluid Medium nach ISO 6743/4 (1982)	Mineral oil HH, HL, HLP, HM, HV, Mil-H-5606 oil, air, nitrogen Water Glycol HFC Fire resistant fluids based on Phosphate esters HFD-R Water, oil in water emulsion 95/5 HFA 60/40 HFB	Group 1 Group 2 Group 5 Group 6 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/MMS 40 K E 1 1
Series	Series name		DS/MMS	←
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.