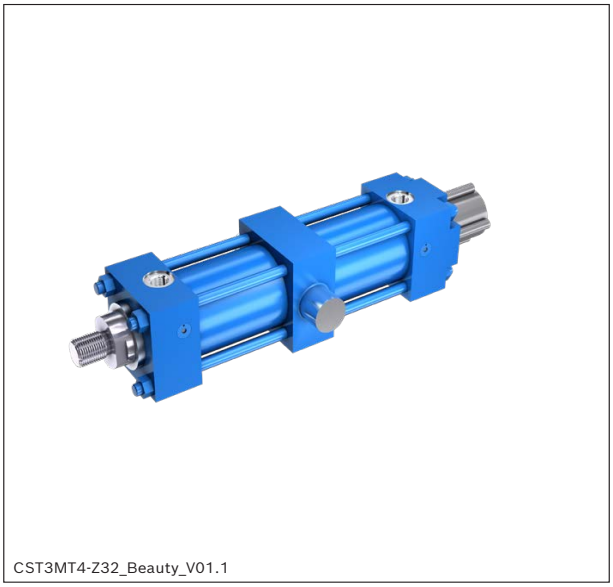
RE 17053
Edition: 2024-03
Replaces: 2022-10

rexroth
A Bosch Company

Hydraulic cylinder
Tie rod design

Series CST3...Z



CST3MT4-Z32_Beauty_V01.1

- Nominal pressure 160 bar
- Component series 3X

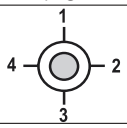
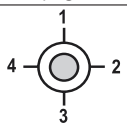
Features

- Installation dimensions according to Rexroth standard
- 5 types of mounting
- Piston Ø (ØAL): 40 ... 200 mm
- Piston rod Ø (ØMM): 28 ... 140 mm
- Stroke length up to 3000 mm
- Integrated guide socket for fast and easy maintenance
- Patented safety vent for easy and safe bleeding
- Easy assembly thanks to freely selectable position of the line connections at head and base

Contents

Ordering code

01	02	03		04		05		06	07	08		09	10	11	12	13	14	15	16	17	18	19	20	21
CS	T3		/		/		/		Z	3X	/													*

01	Differential cylinder with position measurement system [1]	**CS**
02	Series	**T3**
	Types of mounting	
03	Rectangular flange at head	**ME5**
	Self-aligning clevis at base	**MP5**
	Foot mounting	**MS2** [2]
	Trunnion mounting in center	**MT4** [3]
	Tapped hole at head	**MX5**
04	Piston Ø (ØAL) **40 ... 200** mm	
05	Piston rod Ø (ØMM) **28 ... 140** mm	
06	Stroke length in mm [4]	
07	Design principle: Head and base connected to tie rod	**Z**
08	Component series 30 ... 39 (30 ... 39: Unchanged installation and mounting dimensions)	**3X**
	Line connection/version	
09	According to ISO 1179-1 (pipe thread)	**B**
	Switching and proportional directional valves, page 27	
	Subplate NG6	**P** [2; 5]
	Subplate NG10	**T** [2]
	Subplate NG16	**U** [2; 6]
	Line connection/position at head (see page 24)	
10	View to piston rod 	**1** **2** **3** **4**
	Line connection/position at base (see page 24)	
11	View to piston rod 	**1** **2** **3** **4**
	Piston rod design	
12	Hard chromium-plated	**C**
	Hardened and hard chromium-plated	**H**
	Piston rod end (see page 12 ... 21)	
13	Thread (ISO) for swivel head CGKA / CGKD	**D**
	With mounted swivel head CGKA (DIN/ISO)	**F**
	Thread (DIN/ISO) for swivel head CGKA	**H**
	With mounted swivel head CGKA / CGKD (ISO)	**K** [8]
	End position damping	
14	Without	**U**

Ordering code

01	02	03		04		05		06	07	08		09	10	11	12	13	14	15	16	17	18	19	20	21
CS	**T3**		**/**		**/**		**/**		**Z**	**3X**	**/**													*****

Seal design (selection criteria for seals, see page 39)

15	**For mineral oil HL, HLP and HFA**	
	Standard seal system	**M**
	For mineral oil HL, HLP, HFA and water glycol HFC	
	Servo quality / reduced friction	**T**
	For phosphate ester HFDR	
	High temperature with reduced friction	**S**

Option 1 (see page 8, 9)

16	Position measurement system (magnetostrictive) without mating connector	**T** [7]

Option 2

17	Analog output 4–20 mA	**C**
	Analog output 0–10 V	**F**
	Digital output SSI (resolution 5 µm, asynchronous forward)	**D**
	IO-Link	**L** [9; 10]
	Profinet RT and IRT with encoder profile	**R** [11]

Color set-up

18	Priming class CP3	**W**
	Painting class CP4	**B** [12]

Hydraulic fluid filling

19	Without	**W**
	With corrosion protection oil VG 68	**F**

Test certificate

20	Without	**W**
	With certificate of compliance 2.1 based on EN 10204	**B**
	With acceptance test certificate 3.1 based on EN 10204	**C**

21	Further details in the plain text	

Comments

[1] Not standardized.
[2] Only position 11 possible.
[3] Trunnion mounting position freely selectable; when ordering, always specify the "XV" dimension in the plain text in mm.
[4] Observe the maximum available stroke length pages 12 ... 21 and admissible stroke length (according to buckling calculation) pages 34 ... 38.
[5] Only up to piston Ø 80 mm.
[6] Piston Ø 100 - 200 mm.
[7] CGKD only possible with piston Ø 160 / piston rod Ø 110 and piston Ø 200 mm.
[8] Mating connector separate order, see page 9.
[9] Not possible for “MP5”.
[10] Note min. stroke length 50 mm / max. stroke length 2540 mm.
[11] On request.
[12] Specify RAL color in the plain text.

Order example:
CST3ME5/50/36/300Z3X/P11HDUTTDWWW
CST3MT4/125/70/500Z3X/T11HHUTTLWWW
XV = 320 mm

When selecting, please observe the limitations on the corresponding catalog pages!

RE 17053, edition: 2024-03, **Bosch Rexroth AG**

Technical data

(For applications outside these values, please consult us!)

general		
Installation position		any
Ambient temperature range		see page 39
Priming		see page 43
Painting		see page 43

hydraulic		
Nominal pressure	bar	160
Minimum operating pressure (without load)	bar	10 [2]
Maximum operating pressure [3; 4] (only static load)	bar	160
Static test pressure	bar	240
Hydraulic fluid		see table below
Hydraulic fluid temperature range	°C	see page 39
Viscosity range	mm^2/s	2.8 ... 380
Viscosity at operating temperature (recommended)	mm^2/s	20 ... 100
Maximum admissible degree of contamination of the hydraulic fluid, cleanliness class according to ISO 4406 (c)		Class 20/18/15
Bleeding		by default

Hydraulic fluid	Classification	Data sheet
Mineral oils	HL, HLP	90220
Phosphate ester	HFDR	90222
Oil-in-water emulsion	HFA	90223
Water glycol	HFC	90223

1) Depending on the application, a certain minimum pressure is required in order to guarantee good functioning of the cylinder. Without load, a minimum pressure of 10 bar is recommended for differential cylinders; for lower pressures, please contact us.

2) Static load: less than 10,000 load cycles over the entire life cycle.

3) The admissible dynamic operating pressure amounts to 75% of the maximum operating pressure with maximum amplitude and oscillatory load.

The specified operating pressures apply to applications with shock-free operation with reference to excess pressure and/or external loads. With extreme loads like e. g. high sequence cycle, mounting elements and threaded piston rod connections must be designed for durability.

Bosch Rexroth AG, RE 17053, edition: 2024-03

Technical data

(For applications outside these values, please consult us!)

Stroke velocity

See information on stroke length and stroke velocity, higher stroke velocity on request.
If the extension velocity is considerably higher than the retraction velocity of the piston rod, drag-out losses of the medium may result. If necessary, please consult us.

Piston Ø **ØAL** in mm	**Piston rod Ø** **ØMM** in mm	**Line connection "B"** **EE**	**Maximum stroke velocity** in m/s
40	**28**	G3/8	0,50
50	**28**	G1/2	0,50
	36		0,80
63	**36**	G1/2	0,30
	45		0,50
80	**45**	G3/4	0,30
	56		0,40
100	**56**	G3/4	0,20
	70		0,30
125	**70**	G1	0,20
	90		0,30
160	**70**	G1	0,20
	110		0,20
200	**90**	G1 1/4	0,20
	140		0,20

Information on stroke velocity

ØAL in mm		**40**	**50**	**63**	**80**	**100**	**125**	**160**	**200**
Maximum velocity in m/s (recommended)	Seal design “M”; 160 bar	0.50		0.40		0.30		0.25	
	Seal design “M”; 100 bar	0.70		0.60		0.40		0.35	
	Seal design “T,” “S”; 160 bar	1.00		0.80		0.60		0.50	
Minimum velocity in mm/s (recommended)	Seal design “M”	30							
	Seal design “T”, “S”	1							

Technical data

(For applications outside these values, please consult us!)

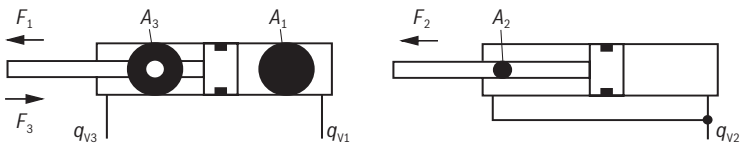
Areas, forces, flow

Piston	Piston rod	Area ratio	Areas			Force [1]			Flow at 0.1 m/s [2]			max. available stroke length in mm [3]
			Piston	Rod	Ring	Pressure	Diff.	Pulling	OFF	Diff.	ON	
ØAL in mm	ØMM in mm	ϕ A_1/A_3	A_1 cm²	A_2 cm²	A_3 cm²	F_1 kN	F_2 kN	F_3 kN	q_{V1} L/min	q_{V2} L/min	q_{V3} L/min	
40	**28**	2.0	12.6	6.2	6.4	20.1	9.9	10.3	7.5	3.7	3.8	1000
50	**28**	1.5	19.6	6.2	13.5	31.4	9.9	21.6	11.8	3.7	8.1	1200
	36	2.0	19.6	10.2	9.5	31.4	16.3	15.1	11.8	6.1	5.7	
63	**36**	1.5	31.2	10.2	21.0	49.9	16.3	33.6	18.7	6.1	12.6	1400
	45	2.0	31.2	15.9	15.2	49.9	25.5	24.4	18.7	9.5	9.2	
80	**45**	1.5	50.3	15.9	34.4	80.4	25.5	55.0	30.2	9.5	20.6	1700
	56	2.0	50.3	24.6	25.6	80.4	39.4	41.0	30.2	14.8	15.4	
100	**56**	1.5	78.5	24.6	53.9	125.7	39.4	86.3	47.1	14.8	32.3	2000
	70	2.0	78.5	38.5	40.1	125.7	61.6	64.1	47.1	23.1	24.0	
125	**70**	1.5	122.7	38.5	84.2	196.4	61.6	134.8	73.6	23.1	50.5	2300
	90	2.1	122.7	63.6	59.1	196.4	101.8	94.6	73.6	38.2	35.5	
160	**70**	1.3	201.1	38.5	162.6	321.7	61.6	260.1	120.6	23.1	97.5	2600
	110	1.9	201.1	95.0	106.0	321.7	152.0	169.6	120.6	57.0	63.6	
200	**90**	1.3	314.2	63.6	250.5	502.7	101.8	400.9	188.5	38.2	150.3	3000
	140	2.0	314.2	153.9	160.2	502.7	246.3	256.4	188.5	92.4	96.1	

[1] Theoretical static cylinder force (without consideration of the efficiency and admissible load for attachment parts like e.g. swivel heads, plates or valves, etc.)

[2] Stroke velocity

[3] Larger stroke lengths upon request



Technical data

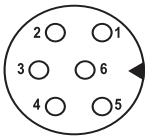
(For applications outside these values, please consult us!)

Weight for cylinder (in kg)

ØAL in mm	ØMM in mm	"ME5", "MS2"	"MP5"	"MT4"	"MX5"w	Stroke 100 mm
40	**28**	3.5	3.8	4.2	3.2	1.1
50	**28**	5.4	5.8	6.7	4.9	1.3
	36	5.5	5.9	6.8	5.0	1.6
63	**36**	7.9	8.5	9.3	7.1	1.7
	45	8.2	8.7	9.5	7.3	2.2
80	**45**	14	16.1	17	13	2.6
	56	15	17.3	19	14	3.3
100	**56**	20	21.8	24	18	4.1
	70	21	24.1	25	19	5.1
125	**70**	38	43.7	46	35	7.3
	90	39	44.8	48	37	9.3
160	**70**	62	72.5	78	59	8.7
	110	64	74.8	80	61	13.2
200	**90**	112	132	147	107	13.4
	140	115	134.5	149	109	20.5

Swivel head, clevis bracket and trunnion mounting bearing block see pages 28 ... 33

Technical data position measurement system
(For applications outside these values, please consult us!)

Analog			
Operating temperature		°C	–40 ... +85
Electrical connection	Type of connection		1 x M16 connector (6-pole)
	Power consumption	W	<3.25
Tightening torque M_A		Nm	65 ±4%
Wrench size SW		mm	46
Voltage "F"		V	0 ... 10
	Input resistance control system	kΩ	> 5
	Resolution		16 bit (internal resolution 0.1 µm)
Current "C"		mA	4 ... 20
	Load	Ω	min/max: 0/500
	Resolution		16 bit (internal resolution 0.1 µm)
Connector	Pin 1 / cable: gray		Position 1 (solenoid)
(View to pin side)	Pin 2 / cable: pink		DC ground
	Pin 3 / cable: yellow		Not used
	Pin 4 / cable: green		DC ground
	Pin 5 / cable: brown	VDC	+12 ... 30 ±20 % (9.6...36 VDC)
	Pin 6 / cable: white		DC ground (0 V)

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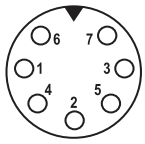
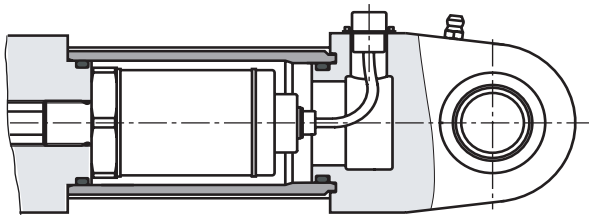
Technical data position measurement system
(For applications outside these values, please consult us!)

Digital			
Operating temperature		°C	–40 ... +85
Electrical connection	Type of connection		1 x M16 connector (7-pole)
	Power consumption	W	1.2 typical
Tightening torque M_A		Nm	65 ±4%
Wrench size SW		mm	46
SSI "D"	Interface		SSI 24 Bit (RS–485/RS–422)
	Resolution	µm	5
	Direction of measurement		asynchronous forward
	Data format		Gray
Connector	Pin 1 / cable: gray		Data (–)
(View to pin side)	Pin 2 / cable: pink		Data (+)
	Pin 3 / cable: yellow		Clock (–)
	Pin 4 / cable: green		Clock (+)
	Pin 5 / cable: brown	VDC	+12 ... 30 ±20 % (9.6...36 VDC)
	Pin 6 / cable: white		DC ground (0 V)
	Pin 7 / –		Not used

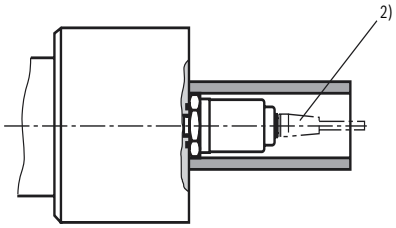


Types of mounting

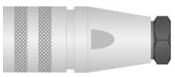
"MP5"



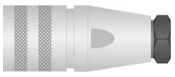
"ME5", "MT4", "MS2", "MX5"



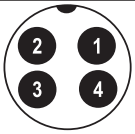
[1] **For analog output**
6-pole Amphenol mating connector, material no. **R900072231**
(Mating connector is **not** included in the scope of delivery and must be ordered separately)



[2] **For digital output**
7-pole Amphenol mating connector, material no. **R900079551**
(Mating connector is **not** included in the scope of delivery and must be ordered separately)



Technical data IO-link
(For applications outside these values, please consult us!)

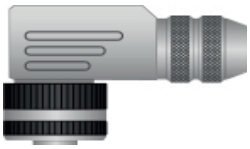
IO-link "L"			**IO-link V1.1**
Operating temperature		°C	−40 ... +75
Electrical connection	Type of connection		1 x M16 connector (4-pole)
	Operating voltage	VDC	+24 (±25 %) / residual ripple ≤ 0.28 Vpp
	Current consumption	mA	< 50
Tightening torque M_A		Nm	50 ±4%
Wrench size SW		mm	34
Output	Interface		digital
	Transmission record	µm	IO-Link V1.1
	Data format	Bit	32 signed (position in µm)
	Data transmission rate		COM3 (230.4 kBaud)
	Process data Device – Master	Bytes	4
	Process data Master – Device	Bytes	0
	Measured variable	MBit/s	Position
Measured values	Resolution [1]	µm	5, 10, 20, 50 or 100
	Cycle time:	ms	≤ 1 (depending on master)
	Linearity [2]	%	≤ ±0.02 F.S. (≤ ±60 µm)
	Measurement repetition accuracy	%	≤ ±0.005 F.S. (≤ ±20 µm)
Connector (A-coded) (View to sensor) 	Pin 1		+24 VDC (±25 %)
	Pin 2		DI / DQ
	Pin 3		DC ground (0 V)
	Pin 4		C / Q

[1] Selectable via IO link master.
[2] Tested with position magnet 251 416-2.

Mating connectors

M12 A-coded (5-pole), straight,
Material number **R913045873**
(Mating connector is **not** included in the scope of delivery and must be ordered separately)

M12 A-coded (5-pole), angled,
Material number **R901500328**
(Mating connector is **not** included in the scope of delivery and must be ordered separately)



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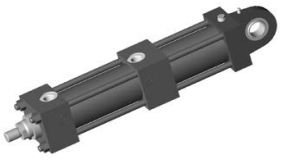
Overview of types of mounting

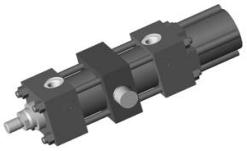
"ME5" (see page 12, 13)

"MP5" (see page 14, 15)



"MS2" (see page 16, 17)

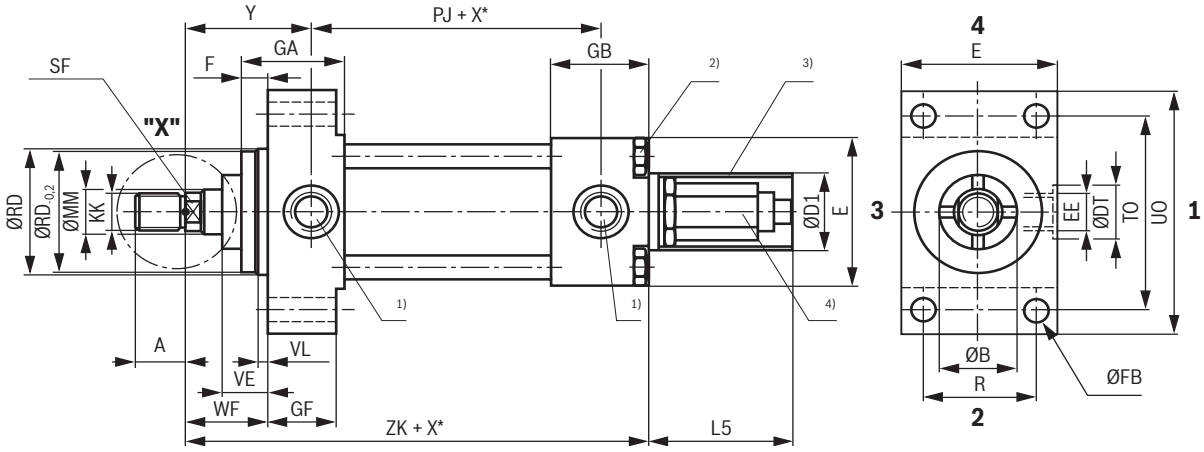
"MT4" (see page 18, 19)

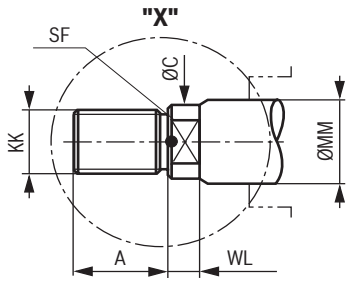


"MX5" (see page 20, 21)

RE 17053, edition: 2024-03, **Bosch Rexroth AG**

Dimensions: Rectangular flange at head "ME5"
(dimensions in mm)





1 ... 4 = Position of the line connections

ØAL	ØMM	PJ [10] ±1.25	PJ [11] ±1.25	R JS13	TO JS13	UO max	VE max	VL min	ZK ±1	L5	ØD1 max	X* min **without** subplate	X* min **with** subplate
40	**28**	73	77	41	87	110	22	3	195	–	–	1	50
50	**28**	74	78	52	105	130	25	4	194	–	–	1	50
	36	74	78	52	105	130	25	4	194	–	–	1	50
63	**36**	80	81	65	117	145	29	4	205	82	96	1	45
	45	80	81	65	117	145	29	4	205	82	96	1	45
80	**45**	93	93	83	149	180	29	4	234	82	96	1	32
	56	93	93	83	149	180	29	4	234	82	96	1	32
100	**56**	101	101	97	162	200	32	5	248	82	96	1	57
	70	101	101	97	162	200	32	5	248	82	96	1	57
125	**70**	117	117	126	208	250	32	5	265.5	82	96	1	35
	90	117	117	126	208	250	32	5	265.5	82	96	1	35
160	**70**	130	130	155	253	300	32	5	277	82	96	20	20
	110	130	130	155	253	300	32	5	277	82	96	20	20
200	**90**	165	160	190	300	360	32	5	326.5	82	96	20	20
	140	165	160	190	300	360	32	5	326.5	82	96	20	20

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Dimensions: Rectangular flange at head "ME5"
(dimensions in mm)

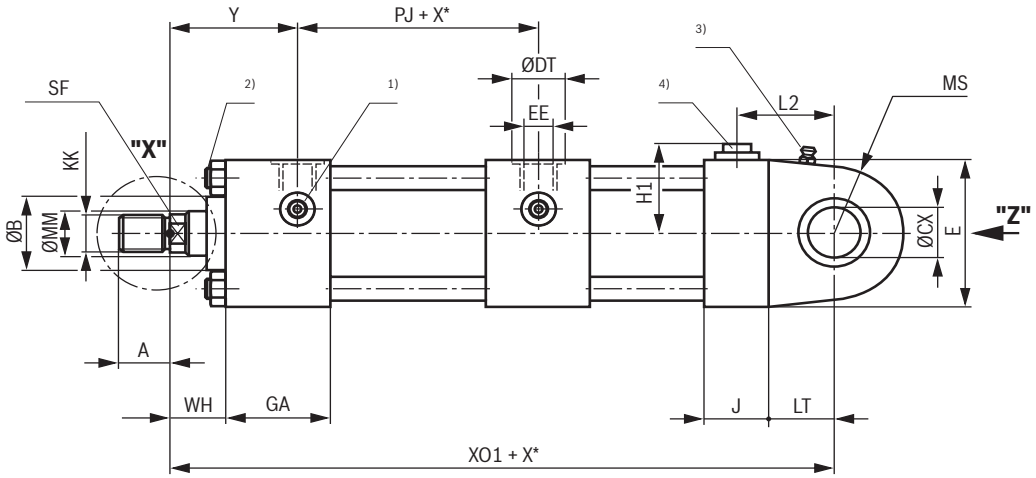
ØAL	ØMM	DIN / ISO 5)					ISO 6)					ØB f9	ØRD f8
		KK 5)	A 5) max	ØC	SF	WL	KK 6)	A 6) max	ØC	SF	WL		
40	**28**	M14 x 1.5	18	26	22	7	M20 x 1.5	28	26	22	7	42	62
50	**28**	M16 x 1.5	22	26	22	7	M20 x 1.5	28	26	22	7	42	74
	36	M16 x 1.5	22	34	30	8	M27 x 2	36	34	30	8	50	74
63	**36**	M20 x 1.5	28	34	30	8	M27 x 2	36	34	30	8	50	88
	45	M20 x 1.5	28	43	36	10	M33 x 2	45	43	36	10	60	88
80	**45**	M27 x 2	36	43	36	10	M33 x 2	45	43	36	10	60	105
	56	M27 x 2	36	54	46	10	M42 x 2	56	54	46	10	72	105
100	**56**	M33 x 2	45	54	46	10	M42 x 2	56	54	46	10	72	125
	70	M33 x 2	45	68	60	15	M48 x 2	63	68	60	15	88	125
125	**70**	M42 x 2	56	68	60	15	M48 x 2	62	68	60	15	88	150
	90	M42 x 2	56	88	75	15	M64 x 3	85	86	75	15	108	150
160	**70**	M48 x 2	63	68	60	15	–	–	–	–	–	88	125
	110	M48 x 2	63	106	95	15	M80 x 3	95	106	95	15	133	170
200	**90**	M64 x 3	85	88	75	15	–	–	–	–	–	108	150
	140	M64 x 3	85	136	120	15	M100 x 3	112	136	120	15	163	210

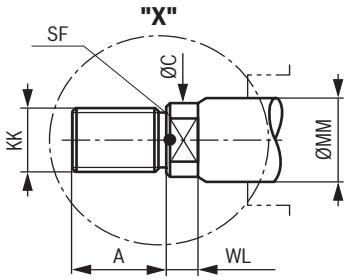
ØAL	F max	ØFB H13	GF	E	EE	ØDT min	GA	GB	WF ±2	Y 7) ±2	Y 8) ±2
40	10	11	38	63 ±1.5	G3/8	24.5	52.5	75.5	35	62	58
50	16	14	38	75 ±1.5	G1/2	29.6	57.5	68.5	41	67	63
63	16	14	38	90 ±1.5	G1/2	29.6	57.5	72.5	48	71	70
80	20	18	45	115 ±1.5	G3/4	36.9	67	85	51	77	77
100	22	18	45	130 ±2	G3/4	36.9	70	88	57	82	82
125	22	22	58	165 ±2	G1	46.1	80	87.5	57	86	86
160	25	26	58	205 ±2	G1	46.1	83	90	57	86	86
200	25	33	76	245 ±2	G 1 1/4	54	107.5	105	57	98	98

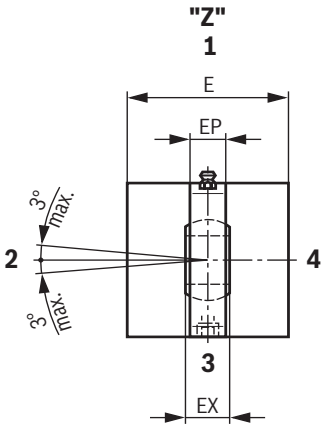
ØAL = Piston Ø
ØMM = Piston rod Ø
X* = Stroke length
X^*_{min} = minimum stroke length
X^*_{max} = maximum stroke length

1) Position of the line connections and the bleeding see page 24
2) Tightening torque see page 41
3) With piston Ø 40 – 50 mm without protective pipe
4) Installation space for position measurement system at least 200 mm
5) Thread for piston rod ends "F" and "H"
6) Thread for piston rod ends "D" and "K"
7) "ME5": for line connection position "1" and "3" at head
8) "ME5": for line connection position "2" and "4" at head

Dimensions: Self-aligning clevis at base "MP5"
(dimensions in mm)







1 ... 4 = Position of the line connections

ØAL	ØMM	ØCX	EP h13	EX	LT min	XO1 ±1.5	MS max	X* min **without** subplate	X* min **with** subplate
40	**28**	20 $_{-0.012}$	13	16 $_{-0.12}$	25	348	29	1	50
50	**28**	25 $_{-0.012}$	17	20 $_{-0.12}$	31	365	33	1	50
	36	25 $_{-0.012}$	17	20 $_{-0.12}$	31	365	33	1	50
63	**36**	30 $_{-0.012}$	19	22 $_{-0.12}$	38	383	40	1	45
	45	30 $_{-0.012}$	19	22 $_{-0.12}$	38	383	40	1	45
80	**45**	40 $_{-0.012}$	23	28 $_{-0.12}$	48	410	50	1	32
	56	40 $_{-0.012}$	23	28 $_{-0.12}$	48	410	50	1	32
100	**56**	50 $_{-0.012}$	30	35 $_{-0.12}$	58	436	62	1	57
	70	50 $_{-0.012}$	30	35 $_{-0.12}$	58	436	62	1	57
125	**70**	60 $_{-0.015}$	38	44 $_{-0.15}$	72	487	80	1	35
	90	60 $_{-0.015}$	38	44 $_{-0.15}$	72	487	80	1	35
160	**70**	80 $_{-0.015}$	47	55 $_{-0.15}$	92	528	100	20	20
	110	80 $_{-0.015}$	47	55 $_{-0.15}$	92	528	100	20	20
200	**90**	100 $_{-0.020}$	57	70 $_{-0.20}$	116	632	120	20	20
	140	100 $_{-0.020}$	57	70 $_{-0.20}$	116	632	120	20	20

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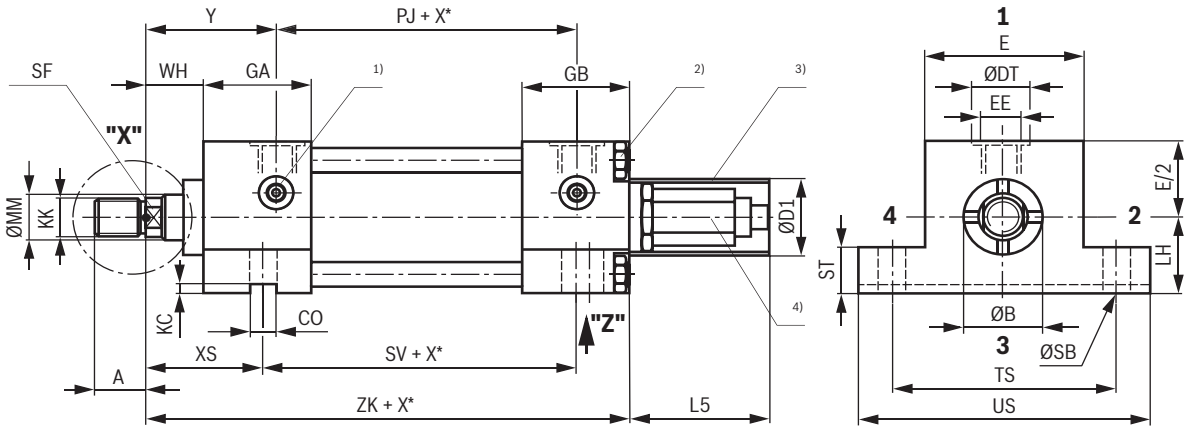
Dimensions: Self-aligning clevis at base "MP5"
(dimensions in mm)

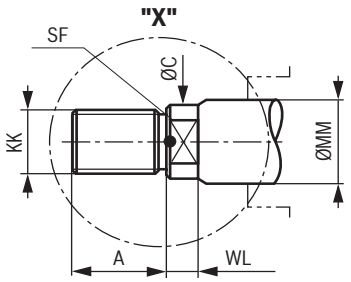
ØAL	ØMM	DIN / ISO [5]					ISO [6]					
		KK [5]	A [5] max	ØC	SF	WL	KK [6]	A [6] max	ØC	SF	WL	ØB f9
40	**28**	M14 x 1.5	18	26	22	7	M20 x 1.5	28	26	22	7	42
50	**28**	M16 x 1.5	22	26	22	7	M20 x 1.5	28	26	22	7	42
	36	M16 x 1.5	22	34	30	8	M27 x 2	36	34	30	8	50
63	**36**	M20 x 1.5	28	34	30	8	M27 x 2	36	34	30	8	50
	45	M20 x 1.5	28	43	36	10	M33 x 2	45	43	36	10	60
80	**45**	M27 x 2	36	43	36	10	M33 x 2	45	43	36	10	60
	56	M27 x 2	36	54	46	10	M42 x 2	56	54	46	10	72
100	**56**	M33 x 2	45	54	46	10	M42 x 2	56	54	46	10	72
	70	M33 x 2	45	68	60	15	M48 x 2	63	68	60	15	88
125	**70**	M42 x 2	56	68	60	15	M48 x 2	62	68	60	15	88
	90	M42 x 2	56	88	75	15	M64 x 3	85	86	75	15	108
160	**70**	M48 x 2	63	68	60	15	–	–	–	–	–	88
	110	M48 x 2	63	106	95	15	M80 x 3	95	106	95	15	133
200	**90**	M64 x 3	85	88	75	15	–	–	–	–	–	108
	140	M64 x 3	85	136	120	15	M100 x 3	112	136	120	15	163

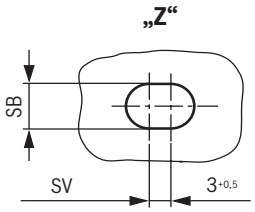
ØAL	H1	L2	E	EE	ØDT min	GA	J	PJ ±1.25	WH ±2	Y ±2
40	40	43.5	63 ±1.5	G3/8	24.5	52.5	33.5	73	25	62
50	45.5	49	75 ±1.5	G1/2	29.6	57.5	33.5	74	25	67
63	53	55	90 ±1.5	G1/2	29.6	57.5	35.5	80	32	71
80	65.5	68	115 ±1.5	G3/4	36.9	67	41	93	31	77
100	73	78	130 ±2	G3/4	36.9	70	43	101	35	82
125	90.5	101	165 ±2	G1	46.1	76	54	117	35	86
160	110.5	121	205 ±2	G1	46.1	83	58	130	32	86
200	130.5	157	245 ±2	G1 1/4	54	107.5	77.5	165	32	98

ØAL = Piston Ø
ØMM = Piston rod Ø
X* = Stroke length
X^*_{min} = minimum stroke length
X^*_{max} = maximum stroke length
1) Position of the line connections and the bleeding see page 24
2) Tightening torque see page 41
3) Grease nipple M6 DIN71412
4) Only in line connection position 1 at base
5) Thread for piston rod ends "F" and "H"
6) Thread for piston rod ends "D" and "K"

Dimensions: Foot mounting "MS2"
(dimensions in mm)







1 ... 4 = Position of the line connections

ØAL	CO N9	KC +0.2	LH h10	ØSB H13	PJ +1.25	ST	SV ±1	TS JS13	US max
40	12	4	31	11	73	12.5	106,5	83	103
50	12	4.5	37	14	74	19	99,5	102	127
63	16	4.5	44	18	80	26	91,5	124	161
80	16	5	57	18	93	26	110,5	149	186
100	16	6	63	26	101	32	106,5	172	216
125	20	6	82	26	117	32	128.5	210	254
160	30	8	101	33	130	38	129	260	318
200	40	8	122	39	165	44	171	311	381

ØAL	E	EE	ØDT min	GA	GB	WH ±2	Y ±2
40	63 ±1.5	G3/8	24.5	52.5	75.5	25	62
50	75 ±1.5	G1/2	29.6	57.5	68.5	25	67
63	90 ±1.5	G1/2	29.6	57.5	72.5	32	71
80	115 ±1.5	G3/4	36.9	67	85	31	77
100	130 ±2	G3/4	36.9	70	88	35	82
125	165 ±2	G1	46.1	76	87.5	35	86
160	205 ±2	G1	46.1	83	90	32	86
200	245 ±2	G1 1/4	54	107.5	105	32	98

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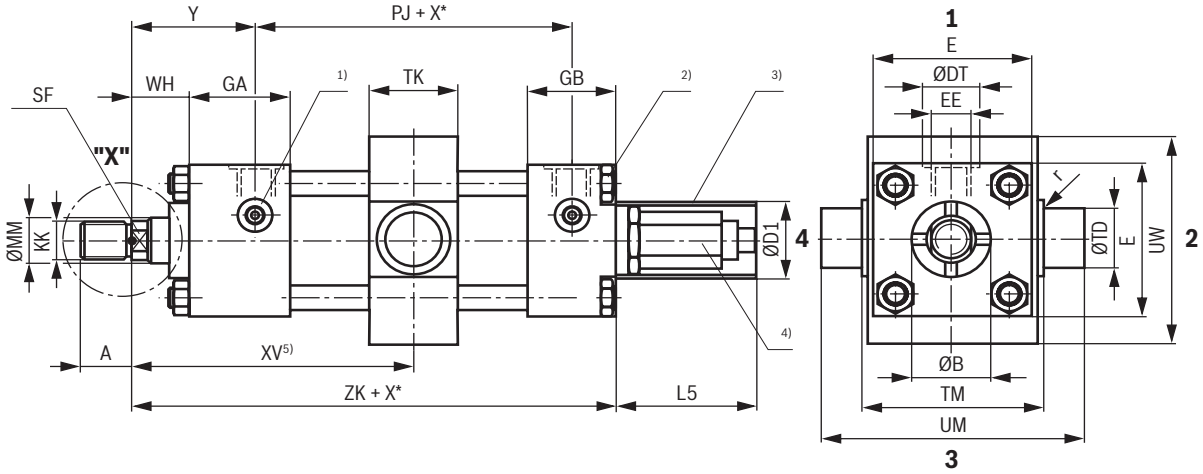
Dimensions: Foot mounting "MS2"
(dimensions in mm)

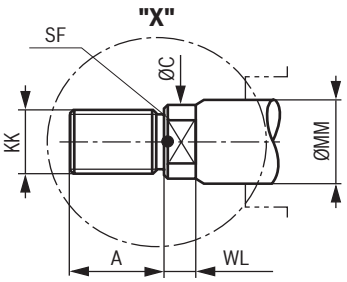
ØAL	ØMM	DIN / ISO [5]					ISO [6]					ØB f9
		KK [5]	A [5] max	ØC	SF	WL	KK [6]	A [6] max	ØC	SF	WL	
40	**28**	M14 x 1.5	18	26	22	7	M20 x 1.5	28	26	22	7	42
50	**28**	M16 x 1.5	22	26	22	7	M20 x 1.5	28	26	22	7	42
	36	M16 x 1.5	22	34	30	8	M27 x 2	36	34	30	8	50
63	**36**	M20 x 1.5	28	34	30	8	M27 x 2	36	34	30	8	50
	45	M20 x 1.5	28	43	36	10	M33 x 2	45	43	36	10	60
80	**45**	M27 x 2	36	43	36	10	M33 x 2	45	43	36	10	60
	56	M27 x 2	36	54	46	10	M42 x 2	56	54	46	10	72
100	**56**	M33 x 2	45	54	46	10	M42 x 2	56	54	46	10	72
	70	M33 x 2	45	68	60	15	M48 x 2	63	68	60	15	88
125	**70**	M42 x 2	56	68	60	15	M48 x 2	62	68	60	15	88
	90	M42 x 2	56	88	75	15	M64 x 3	85	86	75	15	108
160	**70**	M48 x 2	63	68	60	15	–	–	–	–	–	88
	110	M48 x 2	63	106	95	15	M80 x 3	95	106	95	15	133
200	**90**	M64 x 3	85	88	75	15	–	–	–	–	–	108
	140	M64 x 3	85	136	120	15	M100 x 3	112	136	120	15	163

ØAL	ØMM	XS ±2	ZK ±1	L5	ØD1 max	X* min **without** subplate	X* min **with** subplate
40	**28**	45	195	–	–	1	50
50	**28**	54	194	–	–	1	50
	36	54	194	–	–	1	50
63	**36**	65	205	–	–	1	45
	45	65	205	–	–	1	45
80	**45**	68	234	82	96	1	32
	56	68	234	82	96	1	32
100	**56**	79	248	82	96	1	57
	70	79	248	82	96	1	57
125	**70**	79	265.5	82	96	1	35
	90	79	265.5	82	96	1	35
160	**70**	86	277	82	96	20	20
	110	86	277	82	96	20	20
200	**90**	92	326.5	82	96	20	20
	140	92	326.5	82	96	20	20

ØAL = Piston Ø
ØMM = Piston rod Ø
X* = Stroke length
X^*_{min} = minimum stroke length
X^*_{max} = maximum stroke length
[1] Position of the line connections and the bleeding see page 24
[2] Tightening torque see page 41
[3] With piston Ø 40 – 50 mm without protective pipe
[4] Installation space for position measurement system at least 200 mm
[5] Thread for piston rod ends "F" and "H"
[6] Thread for piston rod ends "D" and "K"

Dimensions: Trunnion mounting in the center "MT4" (dimensions in mm)

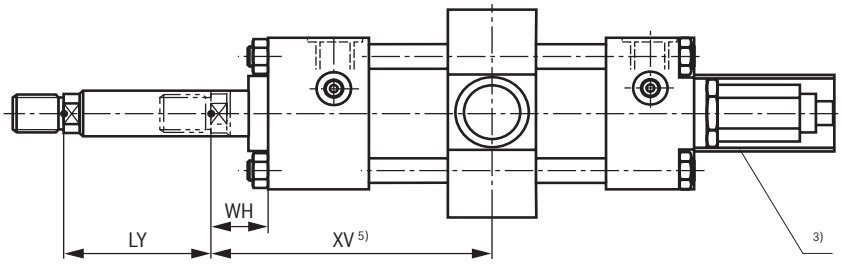




Notice:
We recommend lubricating the trunnion mounting on a regular basis.

1 ... 4 = Position of the line connections

Dimensions for cylinder with piston rod extension dimension "LY" in retracted condition.



ØAL = Piston Ø
ØMM = Piston rod Ø
X* = Stroke length
X^*_{min} = minimum stroke length
X^*_{max} = maximum stroke length
1) Position of the line connections and the bleeding see page 24
2) Tightening torque see page 41
3) With piston Ø 40 – 50 mm without protective pipe
4) Installation space for position measurement system at least 200 mm
5) "XV" dimension in mm, always specify in the plain text
6) Thread for piston rod ends "F" and "H"
7) Thread for piston rod ends "D" and "K"

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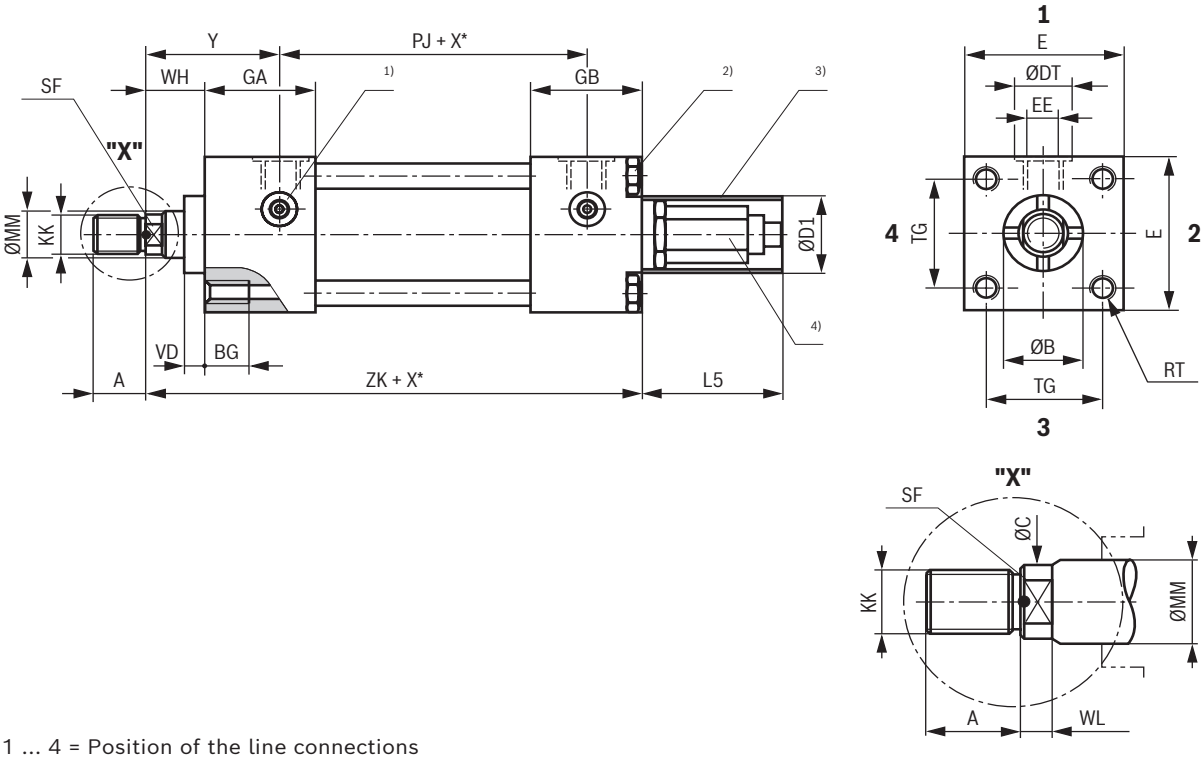
Dimensions: Trunnion mounting in the center "MT4"
(dimensions in mm)

ØAL	ØMM	DIN / ISO [6]					ISO [7]					
		KK [6]	A [6] max	ØC	SF	WL	KK [7]	A [7] max	ØC	SF	WL	ØB f9
40	28	M14 x 1.5	18	26	22	7	M20 x 1.5	28	26	22	7	42
50	28	M16 x 1.5	22	26	22	7	M20 x 1.5	28	26	22	7	42
	36	M16 x 1.5	22	34	30	8	M27 x 2	36	34	30	8	50
63	36	M20 x 1.5	28	34	30	8	M27 x 2	36	34	30	8	50
	45	M20 x 1.5	28	43	36	10	M33 x 2	45	43	36	10	60
80	45	M27 x 2	36	43	36	10	M33 x 2	45	43	36	10	60
	56	M27 x 2	36	54	46	10	M42 x 2	56	54	46	10	72
100	56	M33 x 2	45	54	46	10	M42 x 2	56	54	46	10	72
	70	M33 x 2	45	68	60	15	M48 x 2	63	68	60	15	88
125	70	M42 x 2	56	68	60	15	M48 x 2	62	68	60	15	88
	90	M42 x 2	56	88	75	15	M64 x 3	85	86	75	15	108
160	70	M48 x 2	63	68	60	15	–	–	–	–	–	88
	110	M48 x 2	63	106	95	15	M80 x 3	95	106	95	15	133
200	90	M64 x 3	85	88	75	15	–	–	–	–	–	108
	140	M64 x 3	85	136	120	15	M100 x 3	112	136	120	15	163

ØAL	PJ ±1.25	TK max	TM h14	UM h15	UW max	r	ØTD f8	E	EE	ØDT min	GA	GB	WH ±2	Y ±2
40	73	30	76	108	74	1.6	20	63 ±1.5	G3/8	24.5	52.5	75.5	25	62
50	74	40	89	129	81	1.6	25	75 ±1.5	G1/2	29.6	57.5	68.5	25	67
63	80	50	100	150	97	2.0	32	90 ±1.5	G1/2	29.6	57.5	72.5	32	71
80	93	60	127	191	124	2.5	40	115 ±1.5	G3/4	36.9	67	85	31	77
100	101	70	140	220	137	2.5	50	130 ± 2	G3/4	36.9	70	88	35	82
125	117	90	178	278	175	3.2	63	165 ± 2	G1	46.1	76	87.5	35	86
160	130	110	215	341	212	3.5	80	205 ± 2	G1	46.1	83	90	32	86
200	160	130	279	439	276	4.5	100	245 ±2	G1 1/4	54	107.5	105	32	98

ØAL	ØMM	Line connection "B"			Line connection "P", "T", "U"			ZK ± 1	L5	ØD1 max
		X* min	XV min ± 2	XV max ± 2	X* min	XV min ± 2	XV max ± 2			
40	28	1	95	104 + stroke	50	95	76 + stroke	195	–	–
50	28	1	105	105 + stroke	50	105	77 + stroke	194	–	–
	36	1	105	105 + stroke	50	105	77 + stroke	194	–	–
63	36	10	117	107 + stroke	45	117	82 + stroke	205	82	96
	45	10	117	107 + stroke	45	117	82 + stroke	205	82	96
80	45	12	130	118 + stroke	35	130	96 + stroke	234	82	96
	56	12	130	118 + stroke	35	130	96 + stroke	234	82	96
100	56	18	142	124 + stroke	57	142	101 + stroke	248	82	96
	70	18	142	124 + stroke	57	142	101 + stroke	248	82	96
125	70	25	157	132 + stroke	63	157	94 + stroke	265.5	82	96
	90	25	157	132 + stroke	63	157	94 + stroke	265.5	82	96
160	70	40	171	131 + stroke	74	171	97 + stroke	277	82	96
	110	40	171	131 + stroke	74	171	97 + stroke	277	82	96
200	90	48	202	154 + stroke	73	205	129 + stroke	326.5	82	96
	140	48	202	154 + stroke	73	205	129 + stroke	326.5	82	96

Dimensions: tapped hole at head "MX5"
(dimensions in mm)



1 ... 4 = Position of the line connections

ØAL	ØMM	BG min	PJ ±1.25	RT 6H	TG js13	VD	ZK ±1	x* min **without** subplate	x* min **with** subplate
40	**28**	12	73	M8 x 1.25	41.7	12	195	1	50
50	**28**	18	74	M12 x 1.75	52.3	9	194	1	50
	36	18	74	M12 x 1.75	52.3	9	194	1	50
63	**36**	18	80	M12 x 1.75	64.3	13	205	1	45
	45	18	80	M12 x 1.75	64.3	13	205	1	45
80	**45**	24	93	M16 x 2	82.7	9	234	1	32
	56	24	93	M16 x 2	82.7	9	234	1	32
100	**56**	24	101	M16 x 2	96.9	10	248	1	57
	70	24	101	M16 x 2	96.9	10	248	1	57
125	**70**	27	117	M22 x 2.5	125.9	10	265.5	1	35
	90	27	117	M22 x 2.5	125.9	10	265.5	1	35
160	**70**	32	130	M27 x 3	154.9	7	277	20	20
	110	32	130	M27 x 3	154.9	7	277	20	20
200	**90**	40	165	M30 x 3.5	190.2	7	326.5	20	20
	140	40	165	M30 x 3.5	190.2	7	326.5	20	20

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Dimensions: tapped hole at head "MX5"
(dimensions in mm)

ØAL	ØMM	DIN / ISO [5]					ISO [6]					ØB f9
		KK [5]	A [5] max	ØC	SF	WL	KK [6]	A [6] max	ØC	SF	WL	
40	**28**	M14 x 1.5	18	26	22	7	M20 x 1.5	28	26	22	7	42
50	**28**	M16 x 1.5	22	26	22	7	M20 x 1.5	28	26	22	7	42
	36	M16 x 1.5	22	34	30	8	M27 x 2	36	34	30	8	50
63	**36**	M20 x 1.5	28	34	30	8	M27 x 2	36	34	30	8	50
	45	M20 x 1.5	28	43	36	10	M33 x 2	45	43	36	10	60
80	**45**	M27 x 2	36	43	36	10	M33 x 2	45	43	36	10	60
	56	M27 x 2	36	54	46	10	M42 x 2	56	54	46	10	72
100	**56**	M33 x 2	45	54	46	10	M42 x 2	56	54	46	10	72
	70	M33 x 2	45	68	60	15	M48 x 2	63	68	60	15	88
125	**70**	M42 x 2	56	68	60	15	M48 x 2	62	68	60	15	88
	90	M42 x 2	56	88	75	15	M64 x 3	85	86	75	15	108
160	**70**	M48 x 2	63	68	60	15	–	–	–	–	–	88
	110	M48 x 2	63	106	95	15	M80 x 3	95	106	95	15	133
200	**90**	M64 x 3	85	88	75	15	–	–	–	–	–	108
	140	M64 x 3	85	136	120	15	M100 x 3	112	136	120	15	163

ØAL	L5	ØD1 max	E	EE	ØDT min	GA	GB	WH ±2	Y ±2
40	–	–	63 ±1.5	G3/8	24.5	52.5	75.5	25	62
50	–	–	75 ±1.5	G1/2	29.6	57.5	68.5	25	67
63	82	96	90 ±1.5	G1/2	29.6	57.5	72.5	32	71
80	82	96	115 ±1.5	G3/4	36.9	67	85	31	77
100	82	96	130 ±2	G3/4	36.9	70	88	35	82
125	82	96	165 ±2	G1	46.1	76	87.5	35	86
160	82	96	205 ±2	G1	46.1	83	90	32	86
200	82	96	245 ±2	G1 1/4	54	107.5	105	32	98

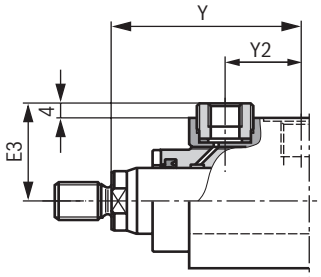
ØAL = Piston Ø
ØMM = Piston rod Ø
X* = Stroke length
X^*_{min} = minimum stroke length
X^*_{max} = maximum stroke length
1) Position of the line connections and the bleeding see page 24
2) Tightening torque see page 41
3) With piston Ø 40 – 50 mm without protective pipe
4) Installation space for position measurement system at least 200 mm
5) Thread for piston rod ends "F" and "H"
6) Thread for piston rod ends "D" and "K"

Leakage oil connection (dimensions in mm)

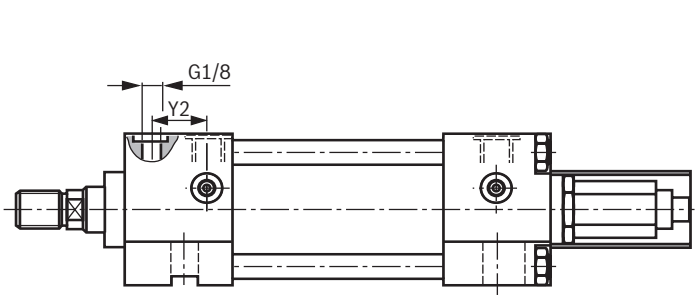
If technical high-quality seals are used, use of a leakage oil connection is generally not necessary. A drag oil collection connection is only recommended in special cases such as extension velocity more than 2 times retraction velocity with larger strokes, permanent pressurization and the like. In case the extension velocities are more than 5 times the retraction velocity, please contact us.

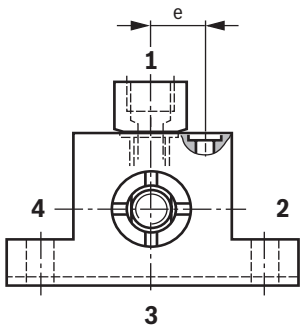
ØAL	ØMM	"MP5", "MS2", "MT4", "MX5"			"ME5"	
		e	Y2	E3	e	Y2
40	28	0	26	35.5	22	15
50	28	14.5	28	–	34	15
	36	14.5	28	–	34	15
63	36	16	25.5	–	43	12
	45	16	25.5	–	43	12
80	45	16	29	–	27	15
	56	16	29	–	27	15
100	56	16	27	–	30	14
	70	16	27	–	30	14
125	70	18	30.5	–	39	16
	90	18	30.5	–	39	16
160	70	24	31.5	–	30	13
	110	24	31.5	–	40	13
200	90	24	38.5	–	45	26
	140	24	38.5	–	60	26

Ø 40 (except for "E5")



Ø 50 ... 200, "ME5": Ø 40 ... 200



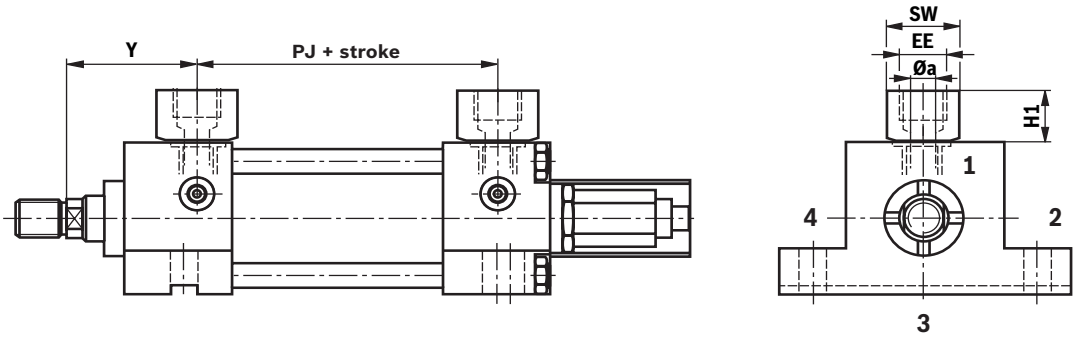


Bosch Rexroth AG, RE 17053, edition: 2024-03

Enlarged line connection (dimensions in mm)

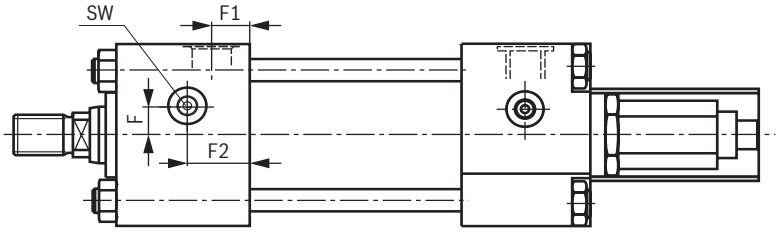
The line connections of this series are generously dimensioned according to the standard; with high velocity, the pressure drop ***Δp*** can be reduced by using larger oil ports; sometimes, it is, however, no longer possible to comply with the standard dimensions, see table. Cannot be realized for the types of mounting "ME5" with connection position 2 or 4.

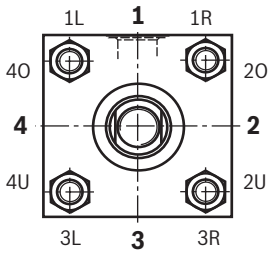
ØAL	EE	H1	Y ±2	PJ ±1.25	SW	Øa	Tightening torque M_A Nm (±5 %)
40	G1/2	23	62	73	32	11	26
50	G3/4	29	67	74	41	14	48
63	G3/4	29	71	80	41	14	48
80	G1	33	77	93	46	18	74
100	G1	33	82	101	46	18	74
125	G1 1/4	39	86	117	60	23	127
160	G1 1/4	–	86	130	–	–	–
200	G1 1/2	–	98	165	–	–	–



RE 17053, edition: 2024-03, **Bosch Rexroth AG**

Position of line connections, bleeding





Type of mounting	Line connection	Bleeding	
		Head	Base
"MP5", "MT4", "MX5"	1	2	2
	2	3	3
	3	4	4
	4	1	1
"ME5"	1	2	2
	2	3R	3
	3	4	4
	4	1L	1
"MS2"	1	2O	2O

ØAL in mm	F Head/base[1]			F1 Position Line connection [1]		F2 Position Bleeding [1]		SW Allen wrench	M_A Nm
	[2]	(head) 2/4 "ME5"	"MS2"	1/3 "ME5"	2/4 "ME5"	1/3 "ME5"	2/4 "ME5"		
40	10	10	10	15.5	19.5	15.5	15.5	5	5
50	10	10	10	15.5	29.5	15.5	15.5	5	5
63	14	14	14	18.5	20	18.5	18.5	5	5
80	10	10	10	21	21	21	21	6	15
100	24	24	12	23	23	23	23	6	15
125	0	0	0	25	25	25	25	6	24
160	0	0	0	29	29	29	29	6	24
200	0	0	0	41.5	41.5	31.5	31.5	6	24

M_A = tightening torque
[1] Position of line connection
[2] Types of mounting "ME5" (only base), "MT4" and "MX5"
[3] Protrusion 3 mm

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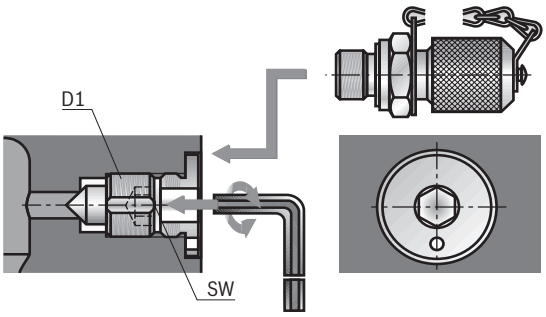
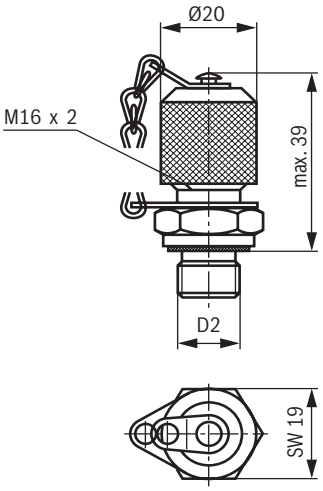
Bleeding / measuring coupling (dimensions in mm)

By default, a patented safety vent against unintended screwing out in head and base is delivered for piston Ø ≥ 40 mm.
The port allows for the installation of a measuring coupling with check valve for pressure measurement or contamination-free bleeding. Measuring coupling with check valve function, i.e. it can also be connected when the system is pressurized.

Connection possibility for measuring coupling

Piston Ø (AL) 40 ... 200 mm





Scope of delivery: Measuring coupling **G1/8**
MEASURING COUPLING AB 20-11/K3 G1/8 with seal ring made of NBR
Material no. **R900014363**
MEASURING COUPLING AB 20-11/K3V G1/8 with seal ring made of FKM
Material no. **R900024710**

Scope of delivery: Measuring coupling **G1/4**
MEASURING COUPLING AB 20-11/K1 G1/4 with seal ring made of NBR
Material no. **R900009090**
MEASURING COUPLING AB 20-11/K1V G1/4 with seal ring made of FKM
Material no. **R900001264**

	Bleed screw			Measuring coupling	Tightening torque M_A
ØAL	**D1**	**Fuse**	**SW**	**D2**	Nm
40 ... 63	G1/8	secured	5	G1/8	18
80 ... 200	G1/4	secured	6	G1/4	40

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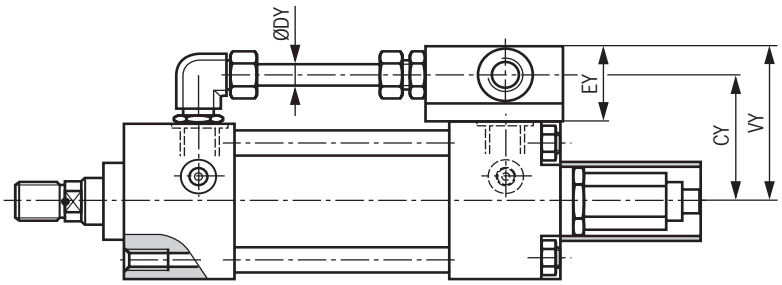
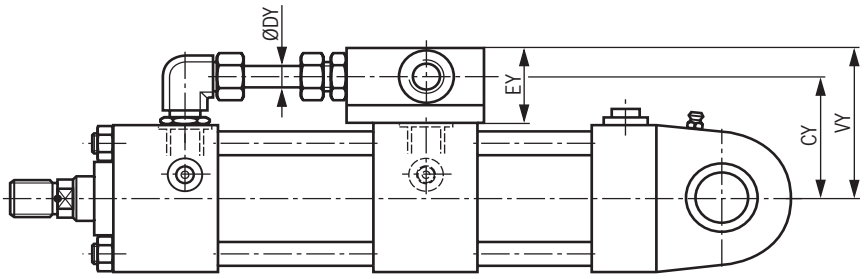
Subplates for valve mounting – Dimensions and porting pattern (dimensions in mm)

"MX5", "ME5", "MS2", "MT4"



"MP5"

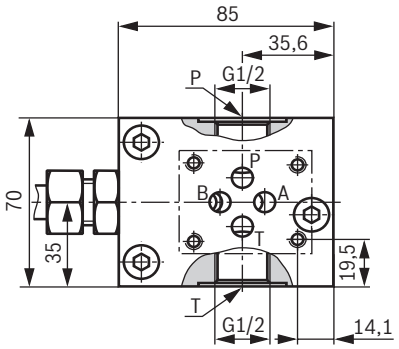


ØAL	NG6				NG10										NG16			
	CY	EY	VY	ØDY	CY	EY	VY	ØDY	LG	L1	L2	b1	b2	b3	CY	EY	VY	ØDY
40	62.2	49.7	80.2	15	62.2	49.7	80.2	15	85	8.5	35.5	70	35	13	–	–	–	–
50	68.2	49.7	86.2	15	68.2	49.7	86.2	15	85	8.5	35.5	70	35	13	–	–	–	–
63	75.7	49.7	93.7	15	75.7	49.7	93.7	15	85	8.5	35.5	70	35	13	–	–	–	–
80	88.2	49.7	106.2	15	88.2	49.7	106.2	15	85	8.5	35.5	70	35	13	–	–	–	–
100	–	–	–	–	103	64.7	128.7	20	110	27	54	125	62.5	39.5	104	79.7	144.7	20
125	–	–	–	–	120	64.7	145.7	20	110	27	54	125	62.5	39.5	121.5	79.7	162.2	20
160	–	–	–	–	140	64.7	165.7	20	110	27	54	125	62.5	39.5	141.5	79.7	182.2	20
200	–	–	–	–	160	64.7	185.7	20	110	27	54	125	62.5	39.5	161.5	79.7	202.2	20

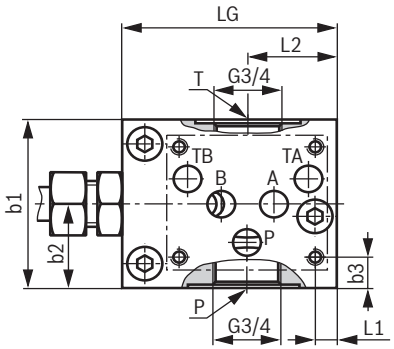
Bosch Rexroth AG, RE 17053, edition: 2024-03

Subplates for valve mounting (switching and proportional directional valves)
(dimensions in mm)

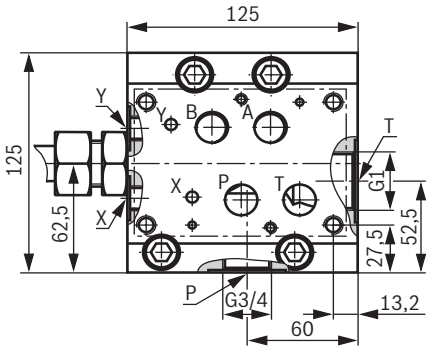
NG6 (Porting pattern according to ISO 4401)



NG10 (Porting pattern according to ISO 4401)



NG16 (Porting pattern according to ISO 4401)



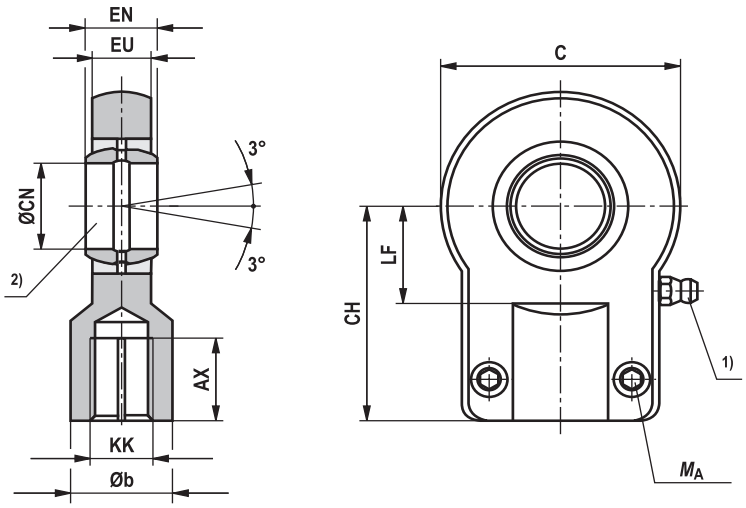
Weight of subplates

ØAL	NG6 in kg	NG10 in kg	NG16 in kg
40	2.3	2.3	–
50	2.3	2.3	–
63	2.3	2.3	–
80	2.3	2.3	–
100	–	7.0	9.8
125	–	7.0	9.8
160	–	7.0	9.8
200	–	7.0	9.8

RE 17053, edition: 2024-03, **Bosch Rexroth AG**

Swivel head CGKA – AP 6 (clampable) (dimensions in mm)

ISO 8133 / ISO 8132



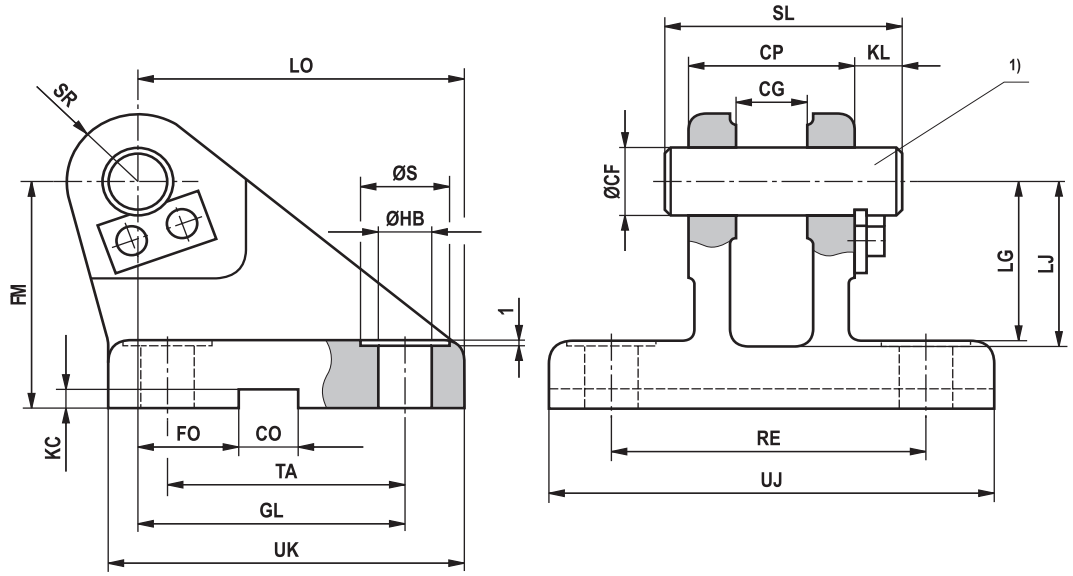
Type	Material no.	KK	AX min	Øb	C max	CH js13	ØCN	EN	EU max	LF min	M_A [7] Nm	m [8] kg	C_0 [9] (head) kN	F_{adm} [10] kN
CGKA 20 [4]	R900306874	M14x1.5	19	25	55	58	20 $_{-0.012}$	16 $_{-0.12}$	13	25	23	0.43	42.5	15.7
CGKA 25	R900327191	M16x1.5	23	30	65	68	25 $_{-0.012}$	20 $_{-0.12}$	17	30	23	0.73	67	24.7
CGKA 30	R900327187	M20x1.5	29	36	80	85	30 $_{-0.012}$	22 $_{-0.12}$	19	35	46	1.3	108	39.9
CGKA 40	R900327188	M27x2	37	45	100	105	40 $_{-0.012}$	28 $_{-0.12}$	23	45	46	2.3	156	57.6
CGKA 50	R900327368	M33x2	46	55	125	130	50 $_{-0.012}$	35 $_{-0.12}$	30	58	80	4.4	245	90.4
CGKA 60	R900327369	M42x2	57	68	160	150	60 $_{-0.012}$	44 $_{-0.12}$	38	68	195	8.4	380	140.2
CGKA 80	R900327370	M48x2	64	90	205	185	80 $_{-0.015}$	55 $_{-0.15}$	47	82 [6]	385	15.6	585	215.9
CGKA 100	R900327371	M64x3	86	110	240	240	100 $_{-0.02}$	70 $_{-0.2}$	57	116	660	28	865	319.2
CGKD 100 [5]	R900322030	M80x3	96	110	210	210	100 H7	100 h12	84	98	385	28	1060	391.1
CGKD 125 [5]	R900322026	M100x3	113	135	262	260	125 H7	125 h12	102	120	385	43	1430	527.7

1) Grease nipple, cone head form A according to DIN 71412
2) Related bolt Ø h6
3) Cannot be re-lubricated
4) Can be re-lubricated via lubricating hole
5) Swivel head according to ISO 8132, related bolt Ø m6
6) Dimensions may differ from the standard depending on the manufacturer
7) M_A = tightening torque
The swivel head must always be screwed against the piston rod shoulder. Afterwards, the clamping screws must be tightened with the specified tightening torque.
8) m = mass of swivel head in kg
9) C_0 = static load rating of the swivel head
10) F_{adm}= maximum admissible load on the swivel head during oscillatory or alternating loads

☞ **Notice:**
Geometry and dimensions may differ depending on the manufacturer.
In case of combination with other mounting elements, the usability must be checked.

Clevis-bearing block CLCB – AP 5 (clampable) (dimensions in mm)

ISO 8133



Type	Material no.	Nominal force kN	ØCF K7 [1]	CP h14	CG +0.1 +0.3	CO N9	FO js14	FM js11	GL js13	ØHB	ØS
CLCB 20	R900327373	20	20	50	16	16	20	55	64	14 [3]	20
CLCB 25	R900326961	32	25	60	20	25	22	65	78	16 [3]	24
CLCB 30	R900327374	50	30	70	22	25	24	85	97	18 [3]	26
CLCB 40	R900327375	80	40	80	28	36	24	100	123	22	33
CLCB 50	R900327376	125	50	100	35	36	35	125	155	30	48
CLCB 60	R900327377	200	60	120	44	50	35	150	187	39	60
CLCB 80	R900327378	320	80	160	55	50	35	190	255	45	80
CLCB 100	R900327379	500	100	200	70	63	35	210	285	48	80

Type	KC +0.3	KL	LG	LJ	LO	RE js13	SL	SR max	TA js13	UJ	UK	m [2] in kg
CLCB 20	4.3	10	39	40	80	85	62	20	58	120	90	2.1
CLCB 25	5.4	10	48	49	98	100	72	25	70	140	110	3.2
CLCB 30	5.4	13	62	63	120	115	85	30	90	160	135	6.5
CLCB 40	8.4	16	72	73	148	135	100	40	120	190	170	12.0
CLCB 50	8.4	19	90	92	190	170	122	50	145	240	215	23.0
CLCB 60	11.4	20	108	110	225	200	145	60	185	270	260	37.0
CLCB 80	11.4	26	140	142	295	240	190	80	260	320	340	79.0
CLCB 100	12.4	30	150	152	335	300	235	100	300	400	400	140.0

[1] Related bolt Ø h6, suitable for swivel head CGKA... (bolt and bolt lock are included in the scope of delivery)

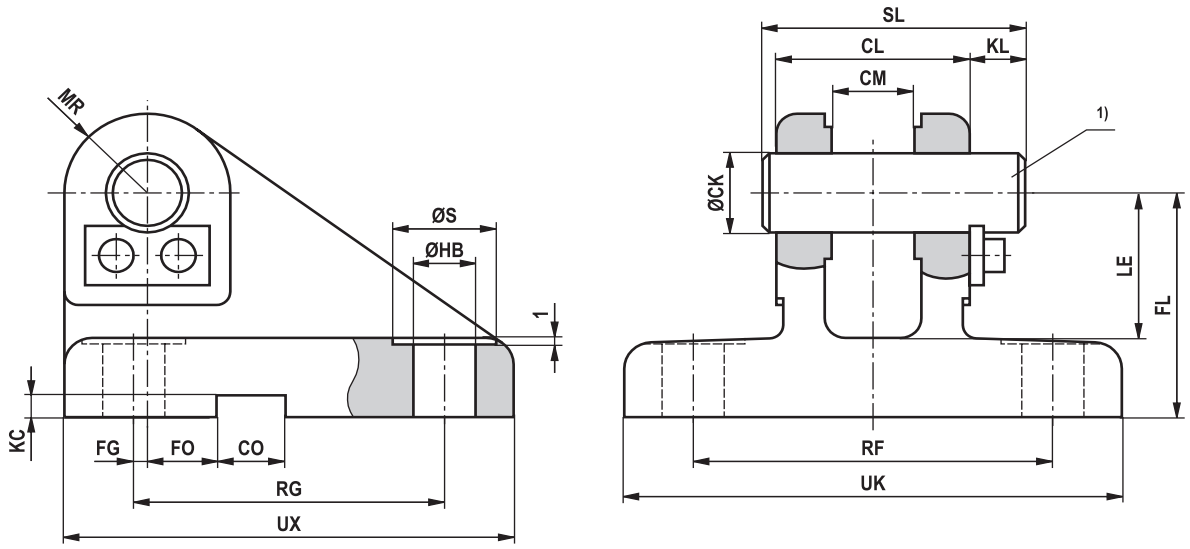
[2] m = mass of clevis bracket in kg

[3] Dimensions may differ from the standard depending on the manufacturer

Notice:
Geometry and dimensions may differ depending on the manufacturer.
In case of combination with other mounting elements, the usability must be checked.

Clevis bracket CLCA (clampable) (dimensions in mm)

ISO 8132



ØAL	ØMM	Type	Material no.	Nominal force kN	ØCK H9 1)	CL h16	CM A12	CO N9	FG js14	FL js12	FO js14	ØHB H13
160	**110**	**CLCA 100**	2)	500	100	210	100	63	52.5	180	0	52
200	**140**	**CLCA 125**	2)	800	125	270	125	80	75	230	0	52

ØAL	ØMM	Type	KC +0.3	KL	LE min.	MR max.	RF js14	RG js14	ØS	SL	UK max.	UX max.	m 3) in kg
160	**110**	**CLCA 100**	12.4	30	120	100	315	250	76	246	405	345	99.2
200	**140**	**CLCA 125**	15.4	32	170	125	365	350	76	310	455	450	174.1

ØAL = piston Ø
ØMM = Piston rod Ø
1) Related bolt Ø m6
(bolt and bolt lock are included in the scope of delivery and are not mounted upon delivery)
2) On request
3) m = mass of clevis bracket

☞ **Notice:**
Geometry and dimensions may differ depending on the manufacturer.
In case of combination with other mounting elements, the usability must be checked. The clevis brackets are suitable for attachment in case of type of mounting MP5 and at the swivel head.

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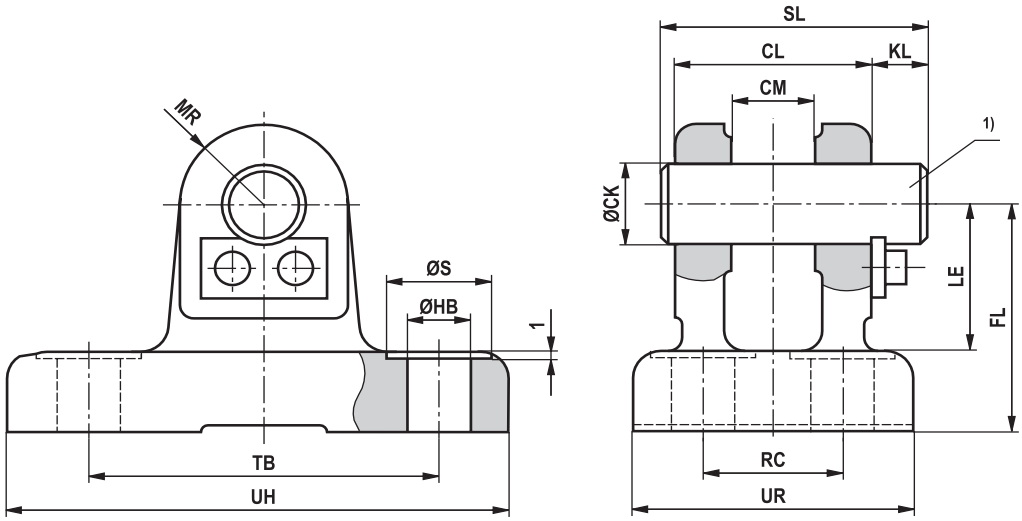
Clevis bracket CLCD (clampable) (dimensions in mm)

ISO 8132



ØAL	ØMM	Type	Material no.	Nominal force kN	ØCK H9 [1]	CL h16	CM A12	FL js12	ØHB H13
160	**110**	**CLCD 100**	[2]	500	100	210	100	180	45
200	**140**	**CLCD 125**	[2]	800	125	270	125	230	52

ØAL	ØMM	Type	KL	LE min.	MR max.	RC js14	ØS	SL	TB js14	UR max.	UH max.	m [3] in kg
160	**110**	**CLCD 100**	30	120	100	160	66	246	315	260	400	74
200	**140**	**CLCD 125**	32	170	125	200	76	310	385	320	470	129

ØAL = piston Ø
ØMM = piston rod Ø

[1] Related bolt Ø m6
(bolt and bolt lock are included in the scope of delivery and are not mounted upon delivery)

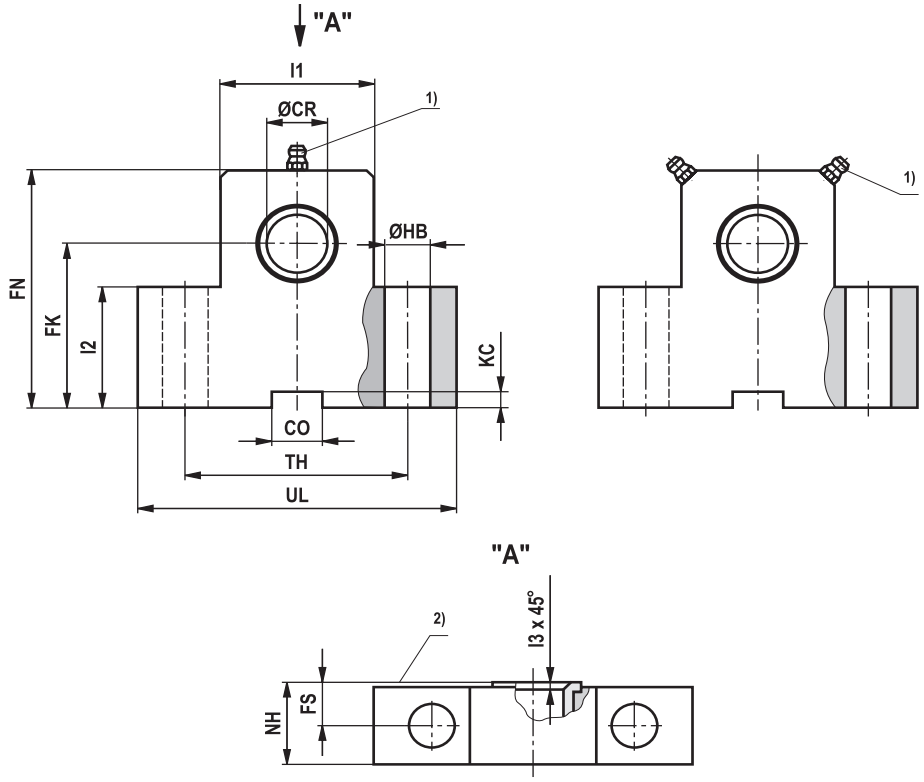
[2] On request

[3] m = mass of clevis bracket in kg

Notice:
Geometry and dimensions may differ depending on the manufacturer.
In case of combination with other mounting elements, the usability must be checked. The clevis brackets are suitable for attachment in case of type of mounting MP5 and at the swivel head.

Trunnion mounting– bearing block CLTA–AT 4 (clampable) (dimensions in mm)

CLTA 20



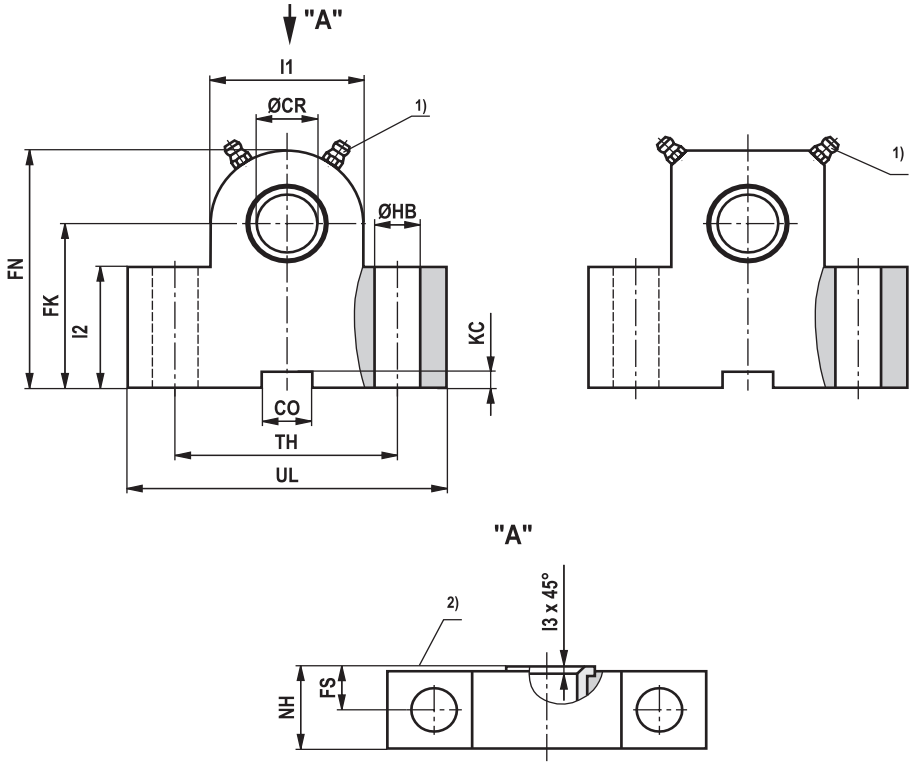
ØAL	Type	Material no.	Nominal force kN [4]	ØCR H7	CO N9	FK js12	FN max	FS js14	ØHB H13	KC +0.3	NH max	TH js14	UL max	l1	l2	l3	m [5] in kg
40	**CLTA 20**	R901071365	20	20	16	55	80	10	11	4.3	21	60	90	40	38	1.5	1.35

ØAL = piston Ø
1) Grease nipple, cone shape A according to DIN 71412
2) Inside
3) Dimensions may differ depending on the manufacturer
4) Nominal force applies to applications in pairs
5) m = mass per pair in kg, brackets are delivered in pairs

Notice:
Geometry and dimensions may differ depending on the manufacturer.
In case of combination with other mounting elements, the usability must be checked.

Trunnion mounting– bearing block CLTA–AT 4 (clampable) (dimensions in mm)

CLTA 25–100



ØAL	Type	Material no.	Nominal force kN [4]	ØCR H7	CO N9	FK js12	FN max	FS js14	ØHB H13	KC +0.3	NH max	TH js14	UL max	l1	l2	l3	m [5] in kg
50	**CLTA 25**	R901071368	32	25	25	65	90	12	14 [3]	5.4	26	80	110	56	45	1.5	2.4
63	**CLTA 32**	R901071377	50	32	25	75	110	15	18 [3]	5.4	33	110	150	70	52	2	5.0
80	**CLTA 40**	R901071380	80	40	36	95	140	16	22	8.4	41	125	170	88	60	2.5	8.5
100	**CLTA 50**	R901071385	125	50	36	105	150	20	26	8.4	51	160	210	90	72	2.5	15
125	**CLTA 63**	R901071395	200	63	50	125	195	25	33	11.4	61	200	265	136	87	3	30
160	**CLTA 80**	R901071398	320	80	50	150	230	31	39	11.4	81	250	325	160	112	3.5	59
200	**CLTA 100**	R901071400	500	100	63	200	300	42	52	12.4	101	320	410	200	150	4.5	131

ØAL = piston Ø

1) Grease nipple, cone shape A according to DIN 71412
2) Inside
3) Dimensions may differ depending on the manufacturer
4) Nominal force applies to applications in pairs
5) m = mass per pair, brackets are delivered in pairs

Notice:
Geometry and dimensions may differ depending on the manufacturer.
In case of combination with other mounting elements, the usability must be checked.

Buckling

For the admissible stroke length with flexibly guided load and a factor of 3.5 for safety against buckling, please refer to the relevant table. For other installation positions of the cylinder, the admissible stroke length must be interpolated. Admissible stroke length for non-guided load on request.
Buckling calculations are carried out according to the following formulas:

1. Calculation according to Euler

$$F = \frac{\pi^2 \cdot E \cdot I}{v \cdot L_K^2} \qquad \text{if } \lambda > \lambda g$$

2. Calculation according to Tetmajer

$$F = \frac{d^2 \cdot \pi \,(335 - 0{,}62 \cdot \lambda)}{4 \cdot v} \qquad \text{if } \lambda > \lambda g$$

E Module of elasticity in N/mm²
2.1 x 10^5 for steel

I Geometrical moment of inertia in mm⁴ for circular cross-section

$$= \frac{d^4 \cdot \pi}{64} = 0{,}0491 \cdot d^4$$

v 3.5 (safety factor)

L_K free buckling length in mm (depending on the type of mounting see sketches A, B, C)

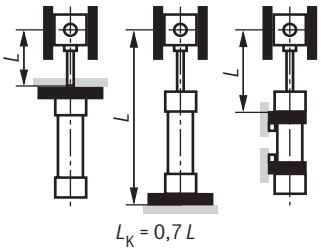
d Piston rod Ø in mm

λ Slenderness ratio

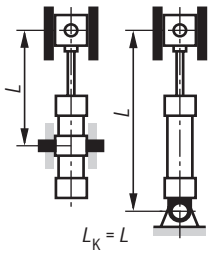
$$= \frac{4 \cdot L_K}{d} \qquad \lambda_g = \pi \cdot \sqrt{\frac{E}{0{,}8 \cdot R_e}}$$

R_e Yield strength of the piston rod material

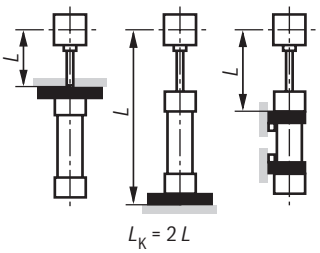
Influence of the type of mounting on the buckling length:



$L_K = 0{,}7\,L$



$L_K = L$



$L_K = 2\,L$

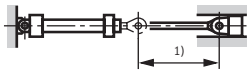
Buckling
(stroke length in mm)

Admissible stroke length for type of mounting "MP5"

ØAL in mm	ØMM in mm	70 bar			100 bar			160 bar		
		0°	45°	90°	0°	45°	90°	0°	45°	90°
40	**28**	465	485	580	400	415	465	315	320	340
50	**28**	420	430	475	355	360	380	270	275	280
	36	620	650	790	545	565	640	435	445	475
63	**36**	560	580	645	480	490	520	375	380	390
	45	770	810	995	680	710	805	555	565	605
80	**45**	695	715	800	600	610	650	470	475	490
	56	945	995	1225	840	870	995	685	670	745
100	**56**	850	880	1000	740	760	820	590	600	625
	70	1150	1210	1550	1030	1075	1260	855	875	955
125	**70**	1065	1105	1290	940	965	1060	765	775	810
	90	1445	1535	2110	1315	1380	1690	1115	1150	1285
160	**70**	730	755	850	610	625	670	455	460	475
	110	1715	1815	2450	1565	1640	2015	1335	1380	1540
200	**90**	945	985	1140	800	825	900	610	620	645
	140	2120	2255	2700	1955	2060	2625	1690	1755	2010

Installation position

0°



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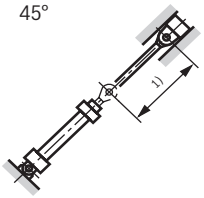
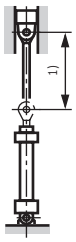


90°



1) Admissible stroke length

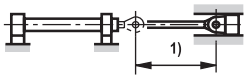
Buckling
(stroke length in mm)

Admissible stroke length for type of mounting "MS2"

ØAL in mm	ØMM in mm	70 bar			100 bar			160 bar		
		0°	45°	90°	0°	45°	90°	0°	45°	90°
40	**28**	1000	1000	1000	1000	1000	1000	1000	1000	1000
50	**28**	855	1200	1200	1100	1130	1200	895	910	945
	36	1200	1200	1200	1200	1200	1200	1200	1200	1200
63	**36**	1400	1400	1400	1400	1400	1400	1185	1200	1255
	45	1400	1400	1400	1400	1400	1400	1400	1400	1400
80	**45**	1700	1700	1700	1700	1700	1700	1460	1480	1555
	56	1700	1700	1700	1700	1700	1700	1700	1700	1700
100	**56**	2000	2000	2000	2000	2000	2000	1800	1835	1950
	70	2000	2000	2000	2000	2000	2000	2000	2000	2000
125	**70**	2300	2300	2300	2300	2300	2300	2240	2290	2300
	90	2300	2300	2300	2300	2300	2300	2300	2300	2300
160	**70**	2515	2595	2600	2200	2245	2415	1780	1800	1855
	110	2600	2600	2600	2600	2600	2600	2600	2600	2600
200	**90**	2700	2700	2700	2700	2700	2700	2700	2700	2700
	140	2700	2700	2700	2700	2700	2700	2700	2700	2700

Installation position

0°



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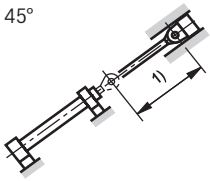

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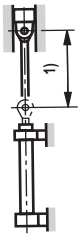


[1] Admissible stroke length

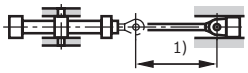
Buckling
(stroke length in mm)

Admissible stroke length for type of mounting "MT4" (trunnion mounting position in cylinder center)

ØAL	ØMM	70 bar			100 bar			160 bar		
in mm	in mm	0°	45°	90°	0°	45°	90°	0°	45°	90°
40	**28**	670	700	825	590	605	670	475	480	505
50	**28**	570	590	645	485	495	520	375	380	390
	36	885	925	1115	785	810	910	640	655	690
63	**36**	755	780	865	650	660	700	510	575	530
	45	1095	1145	1390	975	1010	1140	800	815	870
80	**45**	890	920	1025	760	775	830	590	595	615
	56	1340	1400	1700	1195	1240	1405	1000	1010	1075
100	**56**	1090	1130	1295	940	965	1045	740	750	782
	70	1615	1700	2000	1460	1515	1770	1225	1255	1355
125	**70**	1340	1395	1640	1170	1205	1330	940	955	1000
	90	2035	2150	2300	1860	1945	2300	1590	1635	1815
160	**70**	1100	1300	1255	935	955	1015	730	735	760
	110	2410	2550	2600	2210	2315	2600	1905	1960	2180
200	**90**	1420	1470	1680	1225	1255	1360	770	830	1020
	140	2700	2700	2700	2700	2700	2700	2415	2495	2700

Installation position

0°



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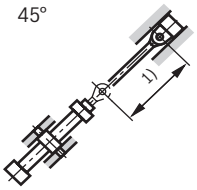

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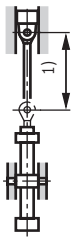


1) Admissible stroke length

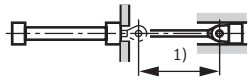
Buckling
(stroke length in mm)

Admissible stroke length for types of mounting "ME5", "MX5"

ØAL in mm	ØMM in mm	70 bar			100 bar			160 bar		
		0°	45°	90°	0°	45°	90°	0°	45°	90°
40	**28**	1000	1000	1000	1000	1000	1000	1000	1000	1000
50	**28**	1200	1200	1200	1125	1150	1200	920	930	965
	36	1200	1200	1200	1200	1200	1200	1200	1200	1200
63	**36**	1400	1400	1400	1400	1400	1400	1205	1225	1280
	45	1400	1400	1400	1400	1400	1400	1400	1400	1400
80	**45**	1700	1700	1700	1700	1700	1700	1485	1510	1580
	56	1700	1700	1700	1700	1700	1700	1700	1700	1700
100	**56**	2000	2000	2000	2000	2000	2000	1815	1850	1965
	70	2000	2000	2000	2000	2000	2000	2000	2000	2000
125	**70**	2300	2300	2300	2300	2300	2300	2255	2300	2300
	90	2300	2300	2300	2300	2300	2300	2300	2300	2300
160	**70**	2540	2600	2600	2225	2275	2440	1805	1825	1885
	110	2600	2600	2600	2600	2600	2600	2600	2600	2600
200	**90**	2700	2700	2700	2700	2700	2700	2360	2395	2510
	140	2700	2700	2700	2700	2700	2700	2700	2700	2700

Installation position

0°



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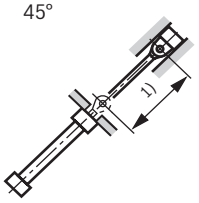

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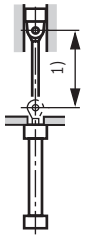

1) Admissible stroke length

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Selection criteria for seals

Working conditions

Hydraulic fluid	Hydraulic fluid temperature range	Seal versions		
		"M"	"T"	"S"
HL, HLP	**–20 °C ... +80°C**	++	++	++
HFA	**+5 °C ... +55°C**	+/–	++	+/–
HFC	**–20 °C ... +60°C**	–	++	–
HFDR	**–15 °C ... +80°C**	–	–	++

Environmental conditions

Ambient and rod temperature in the area of the piston rod		Seal versions		
		"M"	"T"	"S"
Standard	**–20 °C ... +80 °C** [1]	++	+	++ [2]
Extended	**+80 °C ... +120 °C** [1]	–	–	++

++ = very good + = good +/– = conditional, depending on the application parameters – = inappropriate

General technical data in corresponding data sheets will remain valid, see page 4.

[1] Moreover, observe the corresponding hydraulic fluid temperature range

[2] Lower temperature limit –15 °C

☞ **Notice:**
Generally, a hydraulic fluid temperature of approx. 40 °C is recommended. The specified values are to be regarded as guidelines; depending on the case of application, it may be necessary to check the suitability of the seal system.

Seal kits

Only for cylinder

ØAL in mm	ØMM in mm	Material number "M"	"T"	"S"
40	28	R961008006	R961008032	R961008058
50	28	R961008008	R961008034	R961008060
	36	R961008009	R961008035	R961008061
63	36	R961008011	R961008037	R961008063
	45	R961008012	R961008038	R961008064
80	45	R961008014	R961008040	R961008066
	56	R961008015	R961008041	R961008067
100	56	R961008017	R961008043	R961008069
	70	R961008018	R961008044	R961008070
125	70	R961011581	R961011588	R961011596
	90	R961011582	R961011589	R961011597
160	70	R961011583	R961011590	R961011598
	110	R961011584	R961011591	R961011599
200	90	R961011585	R961011592	R961011601
	140	R961011586	R961011593	R961011602

Only for position measurement system

ØAL in mm	Material number for seal design "M", "T"	"S"
40	R961008156	R961008161
50	R961008157	R961008162
63	R961008158	R961008163
80	R961008159	R961008164
100	R961008160	R961008165
125	R961011625	R961011626
160	R961011627	R961011628
200	R961011629	R961011630

Only for subplate mounting

Subplates NG	Material number "M", "T"	"S"
6	R961008236	R961008239
10, 16	R961011631	R961011632

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Tightening torques

Tie rod nut

ØAL in mm	**ØMM** in mm	**Tightening torques in Nm for types of mounting** "ME5", "MP5", "MS2", "MT4", "MX5"
40	28	20
50	28	50
	36	
63	36	60
	45	
80	45	125
	56	
100	56	190
	70	
125	70	400
	90	
160	70	800
	110	
200	90	1250
	140	

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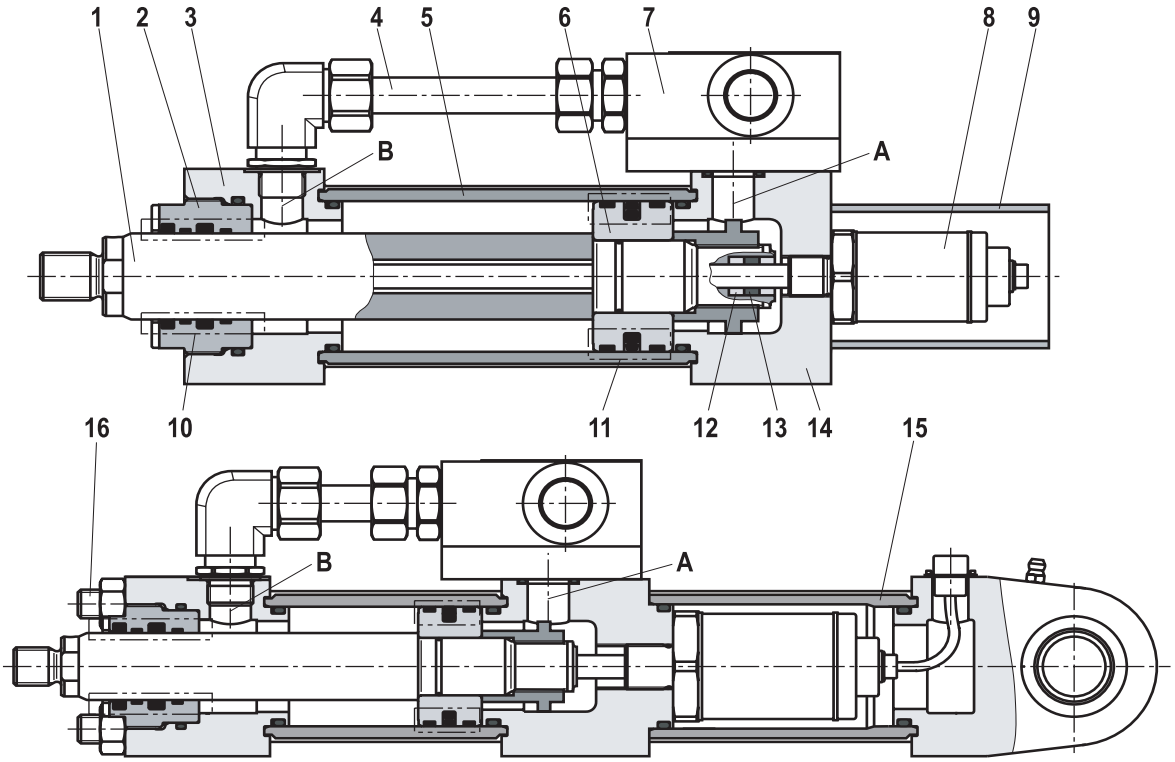
Components



Piston rod seals

Ø 40 ... 200

„M“

„T“, „S“

Piston seals

"M", "T", "S" for piston Ø 40 ... 63

"M", "T", "S" for piston Ø 80 ... 200

A	Piston chamber
B	Annulus area
1	Piston rod
2	Guide socket
3	Cylinder head
4	Piping
5	Cylinder pipe
6	Piston
7	Subplate
8	Position measurement system
9	Protective pipe
10	Piston rod seal
11	Piston seal
12	Insulating socket
13	Solenoid
14	Cylinder base
15	Connection pipe
16	Tie rod

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Priming / painting

Priming | By default, hydraulic cylinders are primed with a coating (color gentian blue RAL 5010) of min. 40 µm. Other colors on request.
The following surfaces of cylinders and attachment parts are not primed:

- All fit diameters to the customer side
- Sealing surfaces for line connection
- Sealing surfaces for flange connection
- Connection surface for valve mounting
- Position measurement system
- Measuring coupling
- Spherical bearing
- Grease nipples

Painting | By default, hydraulic cylinders can be ordered in the CP4 corrosivity category in the RAL colors.
The following surfaces of cylinders and attachment parts are not painted

- All fit diameters and connection surfaces to the customer side
- Sealing surfaces for line connection
- Sealing surfaces for flange connection
- Connection surface for valve mounting
- Position measurement system
- Measuring coupling
- Spherical bearing
- Grease nipples

☞ **Notice:**
Surfaces not primed or painted are protected with solvent-free corrosion protection agent. Accessories ordered as a separate order item are not primed or painted by default.
Corresponding priming and/or painting on request.

Corrosivity categories

	Class	Requirements	Applications	
			Inside	Outside
Priming	CP3	240 h salt spray test SST (DIN EN ISO 9227) 240 h condensation water test KKT (DIN EN ISO 6270-2) Layer thickness: min. 40 µm	Field of application, e.g. Hall atmosphere, Air humidity ≤ 60%, no thermal load.	Not suitable for outdoor exposure.
Painting	CP4	480 h salt spray test SST. (DIN EN ISO 9227) 480 h condensation water test KKT (DIN EN ISO 6270-2) Nominal layer thickness: 120 µm	Unheated buildings in which there may be condensation (production rooms, storage and sport halls).	Urban and industrial atmosphere with little salt or sulfur dioxide load.

In this connection, observe the information on the color set-up on page 4.
The specified resistances of the individual Bosch Rexroth classes only refer to the primed and painted cylinder areas, not, for example, to piston rods, trunnion mounting, etc.
In this connection, special measures may be necessary.

Project planning / maintenance instructions

Boundary and application conditions:

- The mechanical alignment of the movement axis and thus the mounting points of hydraulic cylinder and piston rod must be ensured. Lateral forces on the guides of piston rod and piston are to be avoided. It may be necessary to consider the own weight of the hydraulic cylinder ("MP5", "MT4") or the piston rod.
- The buckling length / buckling load of the piston rod and / or the hydraulic cylinder must be observed (see page 34).
- The maximum admissible stroke velocities with regard to the suitability / load of seals must be observed as must their compatibility with the properties of the hydraulic fluid (see page 39).
- The maximum admissible velocities / kinetic energies when moving into the end positions, also considering external loads, must be observed (excess pressure).
- The maximum admissible operating pressure must be complied with in any operating state of the hydraulic cylinder. Possible pressure intensification resulting from throttling points is to be observed.
- Detrimental environmental influences, like e.g. aggressive finest particles, vapors, high temperatures, etc. as well as contamination and deterioration of the hydraulic fluid are to be avoided.

Standards

The installation dimensions and types of mounting of the hydraulic cylinders comply with the Rexroth standard in accordance with ISO 6020-2.

Acceptance

Every hydraulic cylinder is tested according to Rexroth standards and following ISO 10100: 2020 module L.

☞ **Notice:**
This list does not claim to be complete. In case of questions regarding the compatibility with the medium or exceedance of the boundary or application conditions, please contact us.

All graphical pictures in the data sheet are examples.
The product supplied may therefore differ from the figure shown.

Safety instructions

For assembly, commissioning and maintenance of hydraulic cylinders, observe the operating instructions 07100-B. Service and repair work has to be performed by Bosch Rexroth AG or by personnel especially trained for this purpose. No warranty is accepted for damage as a consequence of assembly, maintenance or repair work not performed by Bosch Rexroth AG.

Check lists for hydraulic cylinders

Cylinders the characteristics and/or application parameters of which deviate from the values specified in the data sheet can only be offered as a special version upon request. For offers, the deviations of the characteristics and / or application parameters must be described in the check lists for hydraulic cylinders (07200).

Stroke tolerances

According to ISO 6020-2, a stroke tolerance of +2 mm is admissible for strokes up to 1250 mm; the stroke tolerance for cylinder strokes over 1250 mm to 3000 mm is +5 mm. A tolerance of ±0.3 mm is possible as option, smaller tolerances are not reasonable for tie rod cylinders.

Minimum strokes

For type of mounting "MT4", the minimum stroke is to be observed due to the trunnion mounting width, see page 19.
Support width extension and tie rod support are possible upon request.

Line connections

The hydraulic cylinders of series CST3 are supplied with pipe thread according to ISO 1179-1 or with subplates in NG6, NG10 or NG16.

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Project planning software ICS (Interactive Catalog System)

The ICS is a selection and project planning aid for hydraulic cylinders. The ICS allows designers for machines and systems to quickly and reliably find the perfect hydraulic cylinder solution through logic-guided type key enquiries. This software helps to solve design and project planning tasks more quickly and efficiently.
After having been guided through the product selection, the user quickly and reliably gets the exact technical data of the selected component as well as 3D CAD data in the correct file format for all common CAD systems.
This allows users to reduce costs while increasing their competitiveness.

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