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Description

- Standard cylinder to ISO 6020/1
- Strokes up to 2000 mm
- Piston diameter: 25 – 320 mm
- With/without end position cushioning (with same installation dimensions)
- Two area ratios phi = 1.4 and phi = 2.0
- Construction of all mounting types by screwing-on of components
- End position cushioning is precisely adjustable
- Generously dimensioned start-up check valves allow a high speed extension with full pressure loading of the effective piston area
- The mounting type, the threaded cylindrical design and generously dimensioned guide lengths at the piston rod allow the application of the cylinders under most difficult conditions
- Different seals may be mounted on the piston and on the piston rod

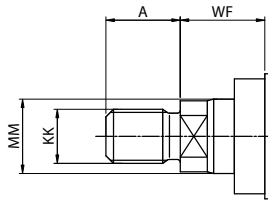
Technical data

- Operating pressure: 160 bar (16 MPa)
- Test pressure: 240 bar (24 MPa)
- Hydraulic fluid temperature range: - 20 ... + 80 °C
- Viscosity range: (20 ... 80) 10^{-6} m^2/s
- Piston speed: ≤ 0.5 m/s (higher speeds on request)

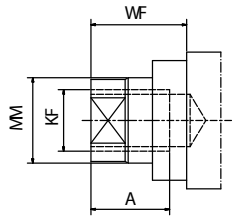
Hydraulic fluids:

- Mineral oils, HFC, HFD liquids in combination with seals made of PTFE and fluoric elastomeres
- HFA and HFB liquids on request

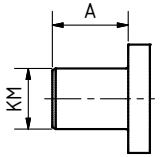
Piston rod end



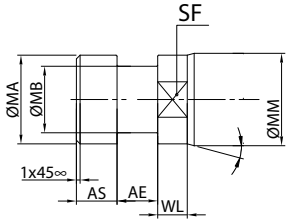
External thread, ref. no. 0
External thread, ref. no. 4



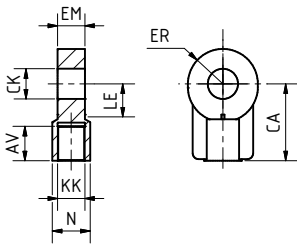
Inside thread, ref. no. 1



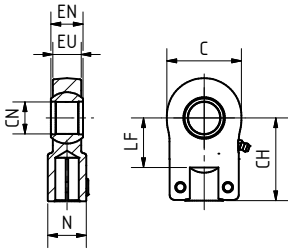
Cylindrical, ref. no. 2



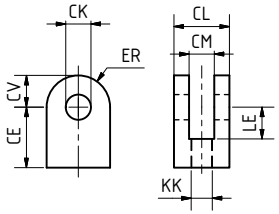
Clutch element, ref. no. 3



Plain rod eye, ref. no. 5



Swivel head, ref. no. 8



Clevis, ref. no. 9

Special design on request!

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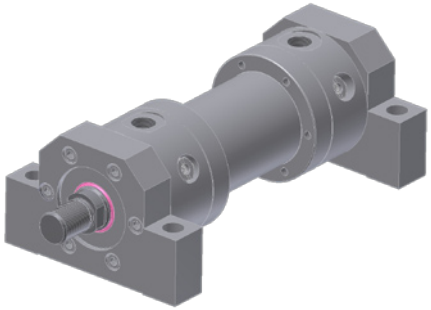
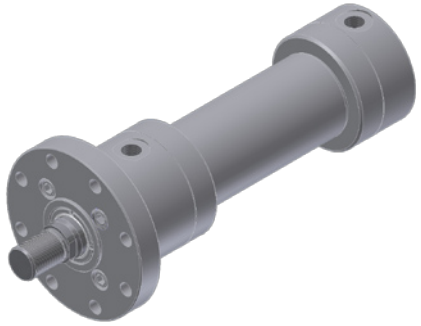
Mounting types

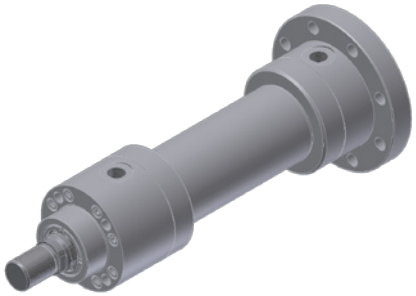
Mounting type: 00
Description: Basic form
ISO-des.: --



Mounting type: 02
Description: Foot mounting
ISO-des.: MS 2

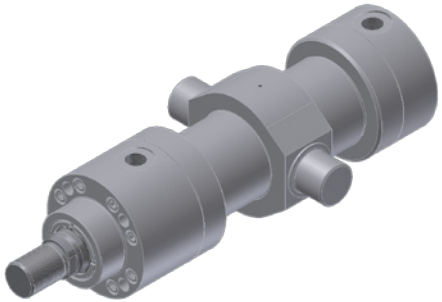


Mounting type: 03
Description: Flange head end
ISO-des.: MF 3



Mounting type: 04
Description: Flange cap end
ISO-des.: MF 4

Mounting type: 05
Description: Rod eye
ISO-des.: MP 3

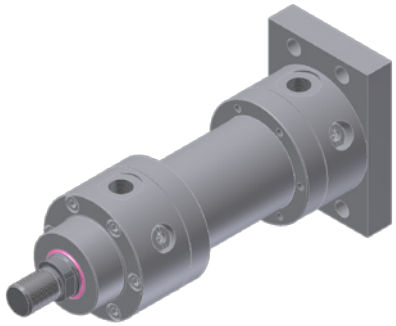


Mounting type: 06
Description: Trunnion
ISO-des.: MT 4

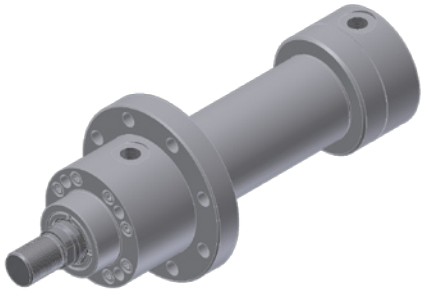
Mounting type: 08
Description: Rod end bearing
ISO-des.: MP 5

Mounting type: 11
Description: Threaded holes head end
ISO-des.: MX 5

Mounting type: 13
Description: Rectangular flange head end
ISO-des.: MF 1

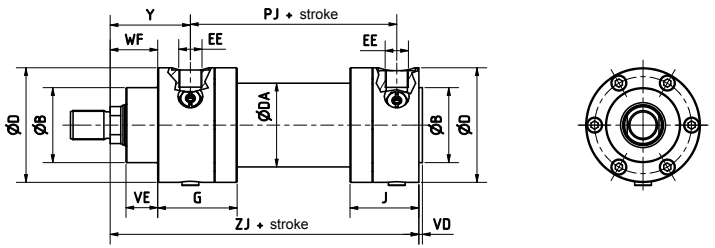


Mounting type: 14
Description: Rectangular flange cap end
ISO-des.: MF 2

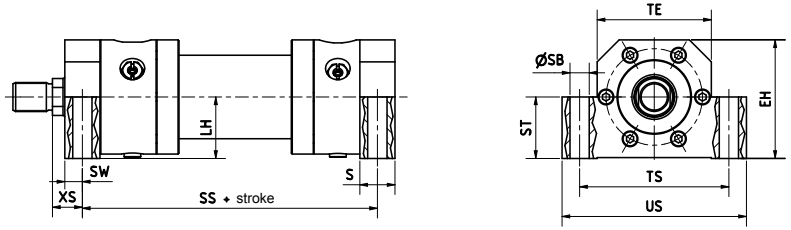


Mounting type: 33
Description: Flange on cylinder
ISO-des.: --

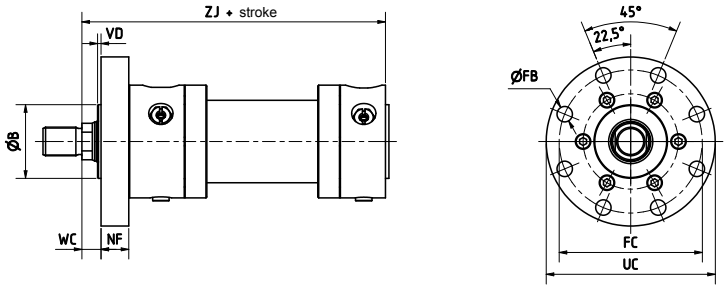
Mounting types



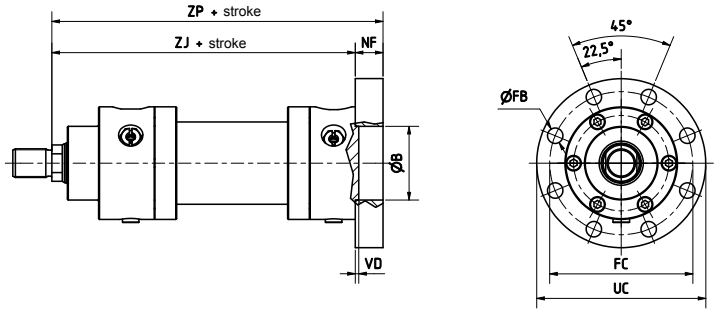
Mounting type 00: Basic form; ISO-des.: --



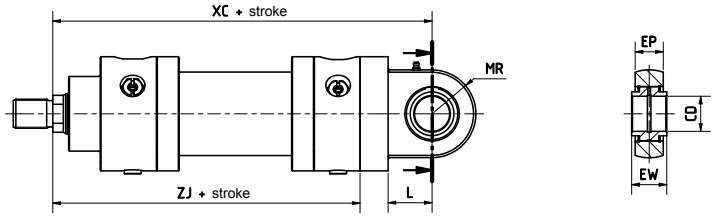
Mounting type 02: Foot mounting; ISO-des.: MS 2



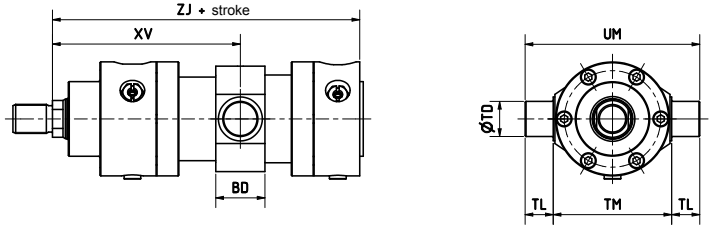
Mounting type 03: Flange head end; ISO-des.: MF 3



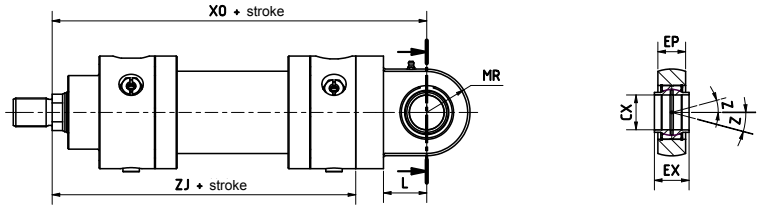
Mounting type 04: Flange cap end; ISO-des.: MF 4



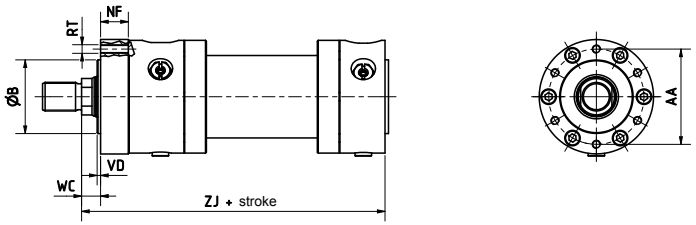
Mounting type 05: Rod eye; ISO-des.: MP 3



Mounting type 06: Trunnion; ISO-des.: MT 4



Mounting type 08: Rod end bearing; ISO-des.: MP 5



Mounting type 11: Threaded holes head end; ISO-des: MX 5

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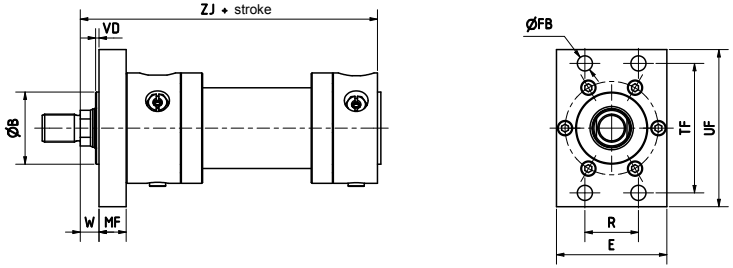
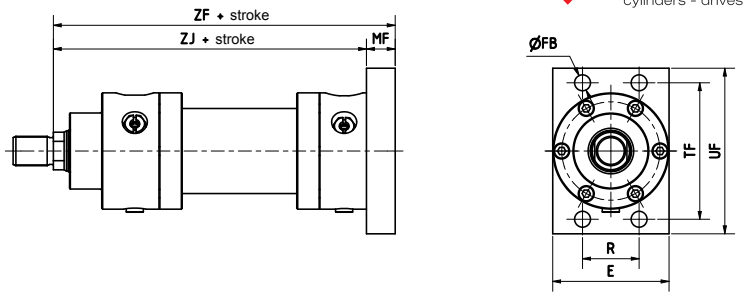
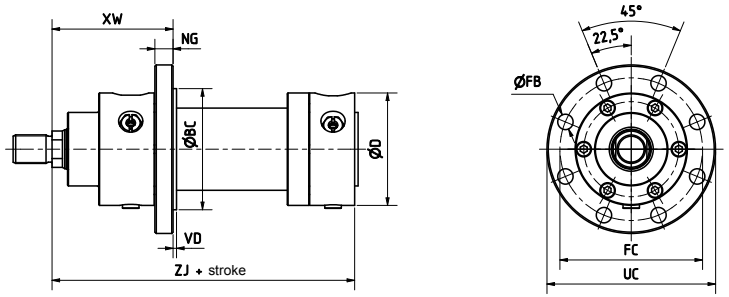
Mounting types



Mounting type 13: Rectangular flange head end; ISO-des: MF 1



Mounting type 14: Rectangular flange cap end; ISO-des: MF 2



Mounting type 33: Flange on cylinder; ISO-des: --

Datasheet Type 47 · Single rod cylinder according to DIN / ISO 6020/1

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Piston rod dimensions

Piston Ø	Rod end	Tol.	25		32		40		50		63		80		100		125		140		160		180		200		250		320	
Piston rod Ø MM			**14**	**18**	**18**	**22**	**22**	**28**	**28**	**36**	**36**	**45**	**45**	**56**	**56**	**70**	**70**	**90**	**80**	**100**	**90**	**110**	**100**	**125**	**110**	**140**	**140**	**180**	**180**	**220**
A	0, 1		16		18		22		28		36		45		56		63		75		85		85		95		112		125	
A	4		18		22		28		36		45		56		63		85		85		95		95		112		125		160	
C	8		32		40		47		58		71		90		109		136		155		170		185		211		265		326	
CH	8	js13	38		44		52		65		80		97		120		140		160		180		195		210		260		310	
CK	5, 9	H7	12		16		20		25		32		40		50		63		70		80		90		100		125		160	
CN	8	H7	12		16		20		25		32		40		50		63		70		80		90		100		125		160	
EN	8	h12	12		16		20		25		32		40		50		63		70		80		90		100		125		160	
EU	8		10,5		13		17		22		27		32		40		52		57		66		72		84		102		130	
KF	1		M12x1,25		M14x1,5		M16x1,5		M20x1,5		M27x2		M33x2		M42x2		M48x2		M56x2		M64x3		M72x3		M80x3		M100x3		M125x4	
KK	0		M12x1,25		M14x1,5		M16x1,5		M20x1,5		M27x2		M33x2		M42x2		M48x2		M56x2		M64x3		M72x3		M80x3		M100x3		M125x4	
KK	4		M14x1,5		M16x1,5		M20x1,5		M27x2		M33x2		M42x2		M48x2		M64x3		M72x3		M80x3		M80x3		M100x3		M125x4		M160x4	
LF	8	min	14		18		22		27		32		41		50		62		70		78		85		98		120		150	
N	8	max	16,5		21		25		30		38		47		58		70		80		90		100		110		135		165	
SF	0		12	15	15	17	17	22	22	30	30	36	36	46	46	60	60	75	70	85	75	90	85	110	90	120	120	160	160	200

Rod end = piston rod ends which correspond to dimensions

Cylinder dimensions

Piston Ø	Mt.	Tol.	25		32		40		50		63		80		100		125		140		160		180		200		250		320	
Piston rod Ø MM			**14**	**18**	**18**	**22**	**22**	**28**	**28**	**36**	**36**	**45**	**45**	**56**	**56**	**70**	**70**	**90**	**80**	**100**	**90**	**110**	**100**	**125**	**110**	**140**	**140**	**180**	**180**	**220**
Annulus area A_1 (cm^2)			4,91		8,04		12,57		19,64		31,17		50,27		78,54		122,7		153,9		201,1		254,5		314,2		490,9		804,2	
Annulus area A_2 (cm^2)			3,37	2,37	5,5	4,24	8,77	6,41	13,5	9,46	21	15,27	34,4	25,64	54	40,1	84,2	59,1	103,6	75,4	137	106,1	176	131,8	219	160,3	336,9	236,4	549,8	424,1
AA	11	±0,2	44		53		63		78		93		110		132		160		176		204		226		252					
Ø B	00	H8/f8	32		40		50		60		70		85		106		132		145		160		185		200		250		320	
BD	06		20		25		32		36		45		56		70		90		100		110		120		140		140		180	
ØBC	33	f8	60		70		80		100		125		140		170		200		220		250		280		300					
CD	05	H9	12		16		20		25		32		40		50		63		70		80		90		100		125		160	
CX	08	H7	12		16		20		25		32		40		50		63		70		80		90		100		125		160	
ØD	00	±1,5	56		67		77		95		114		130		157		190		205		235		262		290		365		450	
ØDA	00		35		45		55		65		78		100		125		150		165		195		215		240		300		381	
E	13,14	-1	60		70		80		100		120		130		160		190		205		235		265		290		365		450	
EE (Whitworth pipe thread)	00		G 1/4"		G 3/8"		G 1/2"		G 1/2"		G 3/4"		G 3/4"		G 1"		G 1"		G 1 1/4"		G 1 1/4"		G 1 1/4"		G 1 1/4"		G 1 1/2"		G 1 1/2"	
EH	02	max.	60		72		82		100		120		135		161		196		216		238		266		288					
EP	05,08		10,5		13		17		22		27		32		40		52		57		66		72		84		102		130	
EW	05	h12	12		16		20		25		32		40		50		63		70		80		90		100		125		160	
EX	08	h12	12		16		20		25		32		40		50		63		70		80		90		100		125		160	
Ø FB	03,04,33	H13	6,6		9		9		11		14		18		22		22		22		22		26		26		33		39	
FC	03,04,33	js13	75		92		106		126		145		165		200		235		260		280		320		340		420		520	
G	00	+2	79		85		93		104		109		90		133		145		147		152		197		213					
J	00		41		45		57		63		76		78		93		105		116		121		121		141					
L	05,08		16		20		25		32		40		50		63		71		85		90		115		112		167		207	
LH	02	h10	32		38		43		52		62		70		82		100		112		119		134		145					

Mt. = mounting types which correspond to dimensions

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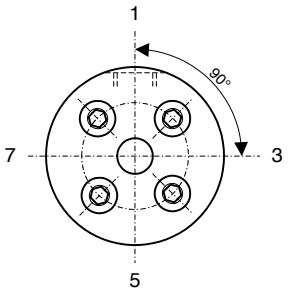
Cylinder dimensions

Piston Ø	Mt.	Tol.	25		32		40		50		63		80		100		125		140		160		180		200		250		320	
Piston rod Ø MM			**14**	**18**	**18**	**22**	**22**	**28**	**28**	**36**	**36**	**45**	**45**	**56**	**56**	**70**	**70**	**90**	**80**	**100**	**90**	**110**	**100**	**125**	**110**	**140**	**140**	**180**	**180**	**220**
Annulus area A_1 (cm^2)			4.91		8.04		12.57		19.64		31.17		50.27		78.54		122.7		153.9		201.1		254.5		314.2		490.9		804.2	
Annulus area A_2 (cm^2)			3.4	2.4	5.5	4.2	8.8	6.4	13.5	9.5	21.0	15.3	34.4	25.6	54.0	40.1	84.2	59.1	103.6	75.4	137	106.1	176	131.8	219	160.3	336.9	236.4	549.8	424.1
MF	13,14	js13	12		16		16		20		25		32		32		32		36		36		40		40		56		63	
MR (R)	05,08		16		20		23.5		29		35.5		45		54.5		68		77.5		85		92.5		105.5		132.5		163	
NF (h_2)	03,04	js13	12		16		16		20		25		32		32		32		36		36		40		40		56		63	
NG	33		9		9		13		16		21		21		27		31		35		40		40		45					
PJ+stroke (L_1+stroke)	00	±1.25	77		89		97		111		117		134		162		174		187		191		198		224		290		358	
R	13,14	js13	28.7		35.2		40.6		48.2		55.5		63.1		76.5		90.2		99.5		107.2		122.5		130.1		160.7		199	
RT	11		M5x4		M6x4		M6x4		M8x4		M10x4		M10x6		M12x6		M16x6		M16x6		M16x8		M20x8		M20x8					
S	02	js13	20		25		25		32		32		40		50		56		58		60		68		72					
Ø SB	02	H13	9		11		11		14		18		22		26		33		33		33		39		39					
SS + stroke	02	±1.25	142		163		183		199		211		236		293		321		352		364		418		447					
ST	02		32		38		43		52		62		70		82		100		112		119		134		145					
SW	02		10		12.5		12.5		16		16		20		25		28		29		30		34		36					
Ø TD (d_{21})	06	f8	12		16		20		25		32		40		50		63		70		80		90		100		125		160	
TE	02	js13	56		67		78		95		116		130		158		192		215		238		260		285					
TF	13,14	js13	69.2		85		98		116.4		134		152.5		184.8		217.1		240.2		258.7		295.6		314.1		388		480.4	
TL	06	js13	10		12		16		20		25		32		40		50		56		63		70		80		100		125	
TM (l_{17})	06	h12	63		75		90		105		120		135		160		195		220		240		275		295		370		470	
TS	02	js13	75		90		100		120		150		170		205		245		270		295		325		350					
UC (d_{14})	03,04,33	-2	90		110		125		148		170		195		238		272		296		316		365		385		490		600	
UF (l_7)	13,14	-1	85		105		115		140		160		185		225		255		290		310		360		380		490		600	
UM	06		83		99		122		145		170		199		240		295		332		366		415		455		570		720	
US	02		92		110		120		145		180		210		250		300		325		350		390		415					
VD (l_{11})	00		3		3		3		4		4		4		5		5		5		5		5		5		8		8	
VE (l_3)	00	max	15		19		19		24		29		36		37		37		41		41		45		45		64		71	
W	13	±2	16		16		16		18		20		22		25		28		30		30		35		35		40		45	
WC (l_{22})	03	±2	16		16		16		18		20		22		25		28		30		30		35		35		40		45	
WF	00	±2	28		32		32		38		45		54		57		60		66		66		75		75		96		108	
XC+stroke (L_5+stroke)	05	±1.25	178		206		231		257		289		332		395		428		485		505		580		615		773		930	
XO+stroke (L_8+stroke)	08	±1.25	178		206		231		257		289		332		395		428		485		505		580		615		773		930	
XS	02	±2	18		19.5		19.5		22		29		34		32		32		37		36		41		39					
XV min ($L_{6,min}$)	06		120		132		144		163		179		175		229		256		270		279		339		364		393		486	
XW	33	±3	104		114		122		138		150		140		189		203		212		217		272		287					
Y (l_4)	00	±2	58		64		71		72		82		91		108		121		137		143		187		190		205		250	
Z	08		4		4		4		4		4		4		4		4		4		4		4		4		4		4	
ZF + stroke	14	±1.5	162		186		206		225		249		282		332		357		396		406		465		490		606		723	
ZJ+stroke (L_0+stroke)	00	±1.5	150		170		190		205		224		250		300		325		360		370		425		450		550		660	
ZP+stroke (L_4+stroke)	04	±1.5	162		186		206		225		249		282		332		357		396		406		465		490		606		723	
Cushioning path	00		20		20		25		25		25		28		34		38		42		42		45		47		47		50	
min. stroke Mt.06 ISO MT4	06		25		23		31		43		57		35		58		85		80		88		98		128					

Mt. = mounting types which correspond to dimensions

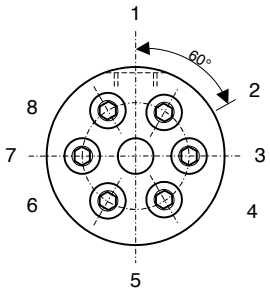
Position of connections

Piston-Ø 25...63



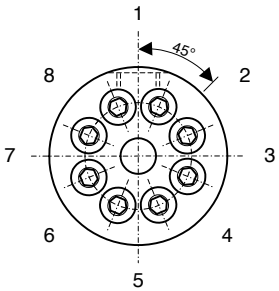
Piston rod view

Piston-Ø 80...140



Piston rod view

Piston-Ø 160…320



Piston rod view

Connections: Standard position of connections is side 1 for all mounting types.
Connections in different positions are available on request.

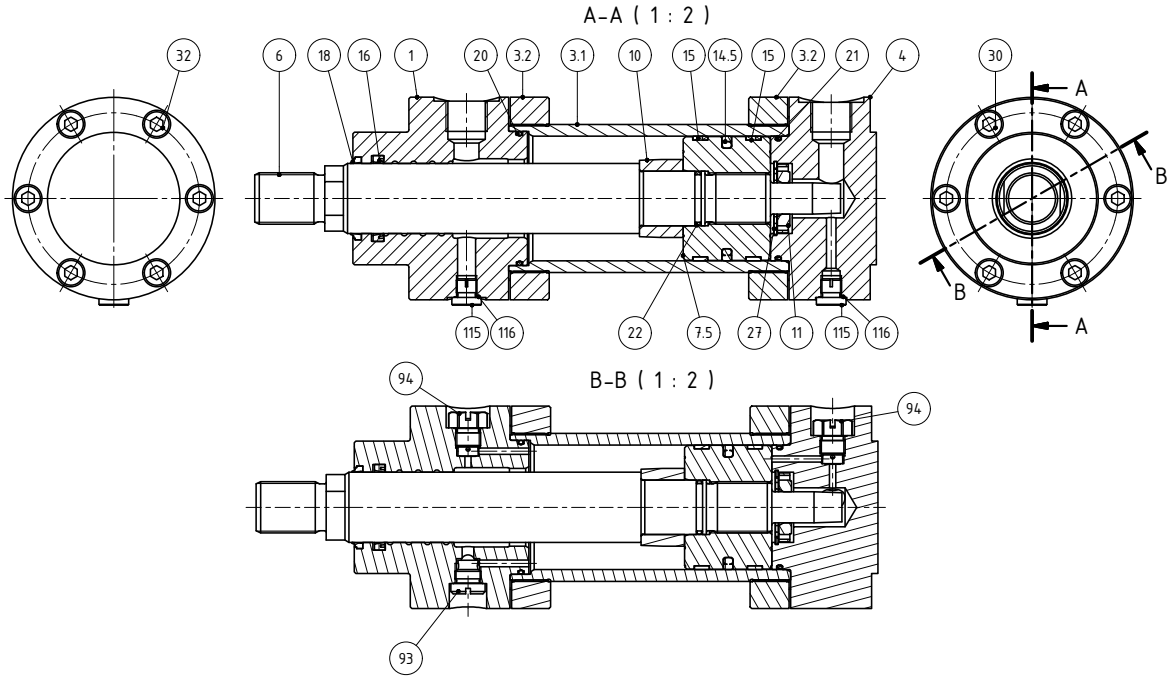
Cushioning: The standard position of the adjustment screw for cushioning depends on the piston diameter:

Piston diameter 25 - 63: side 3
Piston diameter 80 - 140: side 2
Piston diameter 160 - 320: side 3

Different positions are available on request.

Air bleed: Standard position of the adjustment screw for air bleed is side 5 for all mounting types.
Air bleed screws in different positions are available on request.

If the connections are ordered on a position deviating from side 1, then the position of the adjustment screw for cushioning and the position of the air bleed screw change accordingly. If you wish differing positions, please specify when ordering.



Spare parts		
Piston rod and piston complete with seals consisting of:		
Pos.	**Unit**	**Description**
6	1	Piston rod
7.5	1	Piston
14.5	*	Piston seal
15	*	Piston guide ring
22	1	O-ring

Seal kit consisting of:		
Pos.	**Unit**	**Description**
14.5	*	Piston seal
15	*	Piston guide ring
16	*	Rod seal
18	1	Scraper ring
20	1	O-ring
21	1	O-ring
22	1	O-ring

Other components (also available on request)								
Pos.	**Unit**	**Description**	**Pos.**	**Unit**	**Description**	**Pos.**	**Unit**	**Description**
1	1	Cylinder head	11	*	Damping ring	93	*	Check valve
3.1	1	Cylinder tube	26	1	Grub screw	94	*	Damping cartridge
3.2	2	Ring	27	*	Locking ring	115	2	Air bleed screw
4	1	Cylinder cover	30	6	head cap screw	116	2	ED seal
10	*	Damper piston	32	6	head cap screw			

*Number of units depends on design

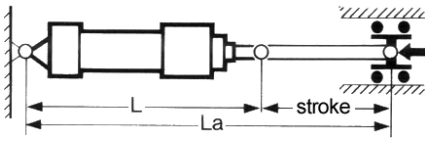
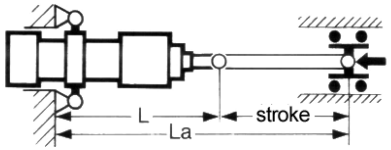
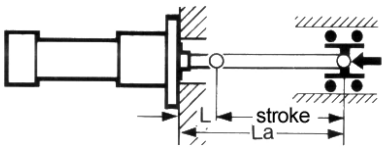
Calculation of buckling strength

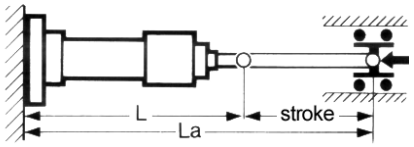
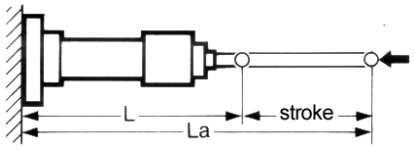
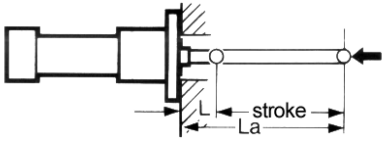
Proceeding:

1. Determine the necessary length La of the piston rod (including stroke).
2. Define the effective buckling length S_{kv} with the help of the table.
3. Identify the allowable buckling length $S_{K,zul.}$ using the diagram.
4. The effective buckling length must be less than or equal to the allowable buckling length.

$$S_{kv} \leq S_{k,zul.}$$

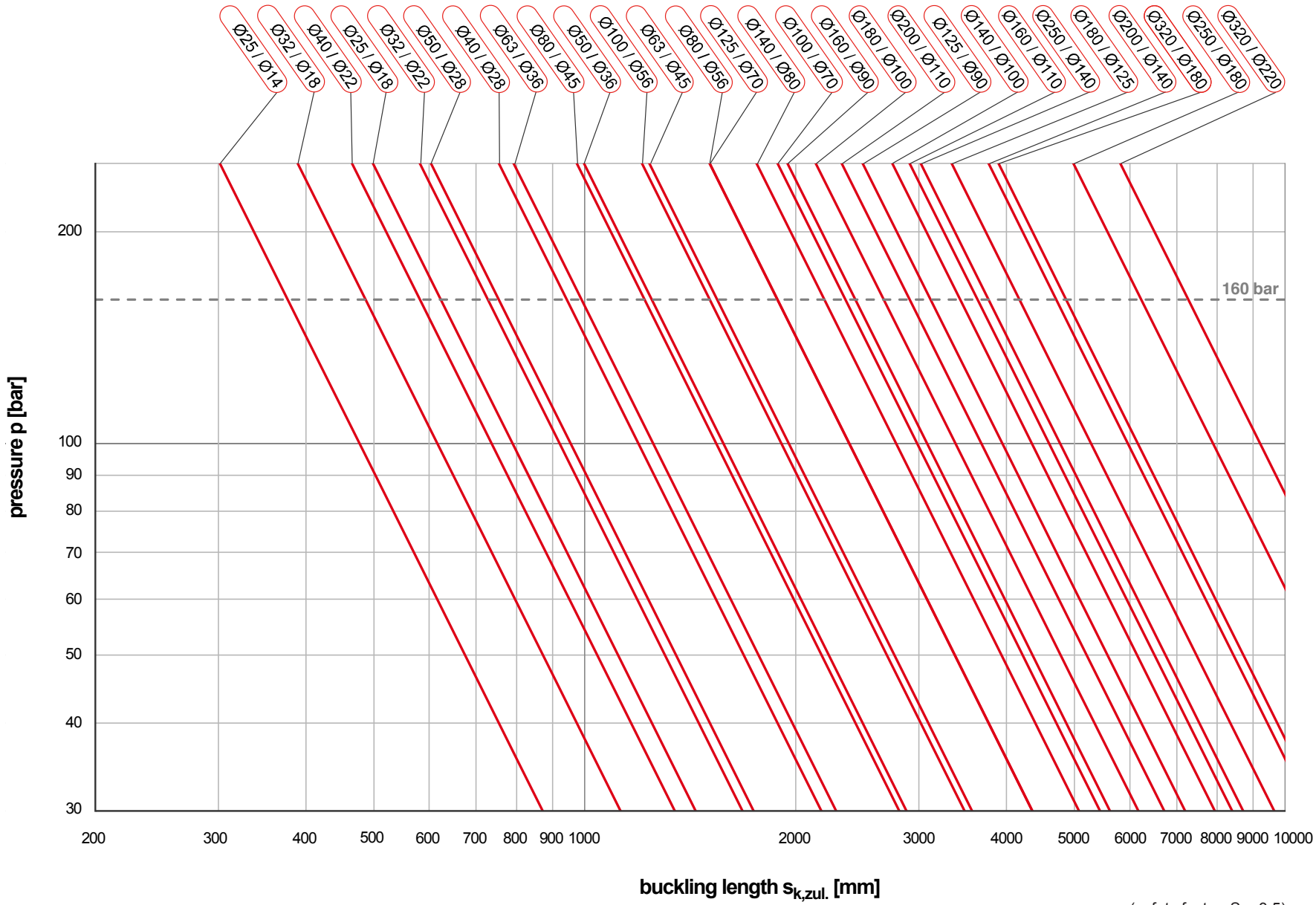
Effective buckling length S_{kv}

Type of fixing			
Mounting type	05, 08	06	02, 03, 11, 13, 33
Effective buckling length	$S_{kv}=L_a$	$S_{kv}=L_a$	$S_{kv}=0.7\ L_a$

Type of fixing			
Mounting type	04, 14	04, 14	02, 03, 11, 13, 33
Effective buckling length	$S_{kv}=0.7\ L_a$	$S_{kv}=2\ L_a$	$S_{kv}=2\ L_a$

Buckling

Allowable buckling length $S_{k,zul.}$



(safety factor S = 3.5)

Datasheet Type 47 · Single rod cylinder according to DIN / ISO 6020/1

HYDROPNEU
partner for hydraulics
cylinders - drives - special solutions

Ordering Code Standard Cylinders / Standard Cylinders DIN/ISO

																					in case of deviation from standard only								for cylinders with proximity switch only						
Classification / order number	TYP	.	KST	KSTH	KSTV	.	BEA	.	BAA	.	DAE	-	DKO	-	MM	-	HUB	-	KDI	.	KSDI	.	EE	-	EEV	EEH	-	DAEV	DAEH	-	ELV	ELH	-	S	SZA	-	SVO	SHI
Example	51	.	0	0	8	.	02	.	2	.	1	-	050	-	022	-	0350	-	5	.	0	.	0	-	1	1	-	2	0	-	0	0	-	N	0	-	3	3

Abbr.	Characteristics	Types of cylinders								
TYP	**Type of cylinder**	**41**	**44**	**46**	**47**	**48**	**51**	**53**	**55**	**57**

Abbr.	Characteristics	41	44	46	47	48	51	53	55	57
KST	**Piston rod**									
0	single	X	X	X	X	X	X	X	X	X
1	on both sides (double rod cylinder)	X					X		X	
2	on both sides, small rear rod						X		X	
3	on both sides, large rear rod						X		X	
4	on both sides, medium rear rod						X		X	
KSTH	**Piston rod end, rear**									
0	external thread	X	X	X	X	X	X		X	
1	internal thread	X					X		X	
2	cylindrical	X								
4	external thread ISO 4395						X		X	
5	plain rod eye	X								
8	swivel head (Type 51, 55: DIN 24555)	X					X		X	
KSTV	**Piston rod end, front**									
0	external thread	X	X	X	X	X	X	X	X	X
1	internal thread	X	X	X	X	X	X	X	X	X
2	cylindrical	X	X	X	X	X	X	X	X	X
3	coupling	X	X	X	X	X	X	X	X	X
4	external thread ISO 4395	X	X	X	X	X	X	X	X	X
5	plain rod eye	X	X	X	X	X	X	X	X	X
8	swivel head (Type 51, 55: DIN 24555)	X	X	X	X	X	X	X	X	X
9	clevis	X	X	X	X	X	X	X	X	X

Abbr.	Characteristics	ISO-des.	41	44	46	47	48	51	53	55	57
BEA	**Mounting type**										
00	basic form		X		X	X	X	X	X	X	
01	threaded flange head end		X								
	threaded holes head end	MX5						X	X	X	
02	foot mounting	MS2	X	X	X	X	X	X	X	X	X
03	flange head end	MF3	X	X	X	X	X				
04	flange cap end	MF4	X	X	X	X	X				
05	rod eye	MP3	X	X	X	X	X	X	X	X	
06	trunnion	MT4	X		X	X	X	X	X	X	
08	rod end bearing	MP5	X		X	X	X	X	X	X	
11	threaded holes head end	MX5			X	X	X				X
	tie rods elongated head end	MX3						X	X	X	
12	threaded holes cap end										X
	tie rods elongated cap end	MX2						X	X	X	
13	rectangular flange head end [1), 3)]	MF1/ME5			X	X	X	X	X	X	X
14	rectangular flange cap end [2), 3)]	MF2/ME6			X	X	X	X	X	X	X
15	clevis mounting	MP1						X	X	X	
16	trunnion on the head	MT1						X	X	X	
19	tie rods elongated both ends	MX1						X	X	X	
22	foot mounting with fit-in key	MS2						X	X	X	X
23	rectangular flange head end (wide)							X	X	X	
26	trunnion on the bottom	MT2						X	X	X	
33	flange on cylinder		X		X	X	X				
43	longitudional bores, sinks on both sides										X

Abbr.	Characteristics	41	44	46	47	48	51	53	55	57
BAA	**Type of construction**									
2	double-acting	X	X	X	X	X	X	X	X	X
3+4	single-acting (3=pushing; 4=pulling)	X	X	X	X	X	X	X	X	X
5+6	single-acting with spring (5=pushing; 6=pulling)	X		X	X	X	X			X

Abbr.	Characteristics	41	44	46	47	48	51	53	55	57
DAE	**Cushioning**									
0	without cushioning	X	X	X	X	X	X	X	X	X
1	cushioning in the front	X	X	X	X	X	X	X	X	
2	cushioning in the head	X	X	X	X	X	X	X	X	
3	cushioning on both sides	X	X	X	X	X	X	X	X	
DKO	**Piston diameter**									
	see measuring index									
MM	**Piston rod diameter**									
	see measuring index									
HUB	**Stroke**									
	consider buckling									
KDI	**Piston seal**									
0	NBR lip seals / PUR lip seals	X s	X	X	X	X	X	X	X	
2	PUR lip seal / Viton®	X	X							
3	piston ring / casting		X s							
5*	sleeve ring/o-ring; tefl./NBR	X (S)	X	X s	X s	X s	X s	X	X s	X s
6	sleeve ring/o-ring;tefl./Viton®	X	X	X	X	X	X	X	X	X
7	compact seal / NBR	X		X	X	X	X	X s	X	
KSDI	**Piston rod seal**									
0	NBR lip seals / PUR lip seals	X s		X	X s	X s	X s	X s	X s	
1	PUR lip seal, u-seal				X	X	X	X	X	X s
2	lip seal / Viton®	X			X	X	X	X	X	X
3	chevron ring NBR		X s	X s						
4	chevron ring Viton®		X	X						
5	stepseal/o-ring; tefl./NBR			X	X	X	X	X	X	
6	stepseal/o-ring;tefl./Viton®			X	X	X	X	X	X	
9	PUR lip seal, u-seal+scraper Viton®				X		X	X		X
EE	**Hydraulic connections**									
0	pipe thread (DIN/ISO 228)	X s	X s	X s	X s	X s	X s	X s	X s	X s
1	metrical ISO thread	X		X	X	X	X	X	X	
2	UNF thread	X		X	X	X	X	X	X	
3	flange connection			X	X	X	X	X	X	
EEV	**Hydr. connection, front position**									
1	0 degrees (at top)	X s	X s	X s	X s	X s	X s	X s	X s	X
2	45 / 60 degrees (clockwise)			X	X	X				
2 / 3	90 degrees (clockwise)			3	3	3	2	2	2	X
4	135 degrees (clockwise)			X	X	X				
3 / 5	180 degrees (clockwise)			5	5	5	3	3	3	
6	225 degrees (clockwise)			X	X	X				
4 / 7	270 degrees (clockwise)			7	7	7	4	4	4	
8	315 degrees (clockwise)			X	X	X				

[1)] MF 1 for 44, 46, 47, 48; ME 5 for 51, 53, 55
[2)] MF 2 for 44, 46, 47, 48; ME 6 for 51, 53, 55
[3)] mounting type 13 (14) for type 57: longitudinal bores, sinks on rear (front)
* type 41: standard for piston diameter = 12, 15, 20
s = standard design
(S) = standard design, not for all forms of construction
RC = rear center

Abbr.	Characteristics	41	44	46	47	48	51	53	55	57
EEH	**Hydr. Connection, rear position**									
1	0 degrees (at top)	RC		X s	X s	X s	X s	X s	X s	X
2	45 / 60 degrees (clockwise)			X	X	X				
2 / 3	90 degrees (clockwise)			3	3	3	2	2	2	X
4	135 degrees (clockwise)			X	X	X				
3 / 5	180 degrees (clockwise)			5	5	5	3	3	3	
6	225 degrees (clockwise)			X	X	X				
4 / 7	270 degrees (clockwise)			7	7	7	4	4	4	
8	315 degrees (clockwise)			X	X	X				
DAEV	**Cushioning, front position**									
0	without cushioning	X		X	X	X	X	X	X	
1	0 degrees (at top)			X	X	X	X	X	X	
2	45 / 60 degrees (clockwise)	X		X	X	X				
2 / 3	90 degrees (clockwise)	X s		3 s	3 s	3 s	2 s	2 (S)	2 s	
4	135 degrees (clockwise)			X	X	X				
3 / 5	180 degrees (clockwise)	X		5	5	5	3	3 s	3	
6	225 degrees (clockwise)			X	X	X				
4 / 7	270 degrees (clockwise)	X		7	7	7	4	4	4	
8	315 degrees (clockwise)			X	X	X				
DAEH	**Cushioning, rear position**									
0	without cushioning	X		X	X	X	X	X	X	
1	0 degrees (at top)			X	X	X	X	X	X	
2	45 / 60 degrees (clockwise)	X		X	X	X				
2 / 3	90 degrees (CW; 51/55: Bf. 02->S)	X s		3 s	3 s	3 s	2 (S)	2 (S)	2 (S)	
4	135 degrees (clockwise)			X	X	X				
3 / 5	180 degrees (clockwise)	X		5	5	5	3 s	3 s	3 s	
6	225 degrees (clockwise)			X	X	X				
4 / 7	270 degrees (clockwise)	X		7	7	7	4	4	4	
8	315 degrees (clockwise)			X	X	X				
ELV	**Air bleed, front position**									
0	without air bleed	X	X							X
1 - 8	see cushioning position	X	X	X	X	X	X	X	X	X
ELH	**Air bleed, rear position**									
0	without air bleed	X	X							X
1 - 8	see cushioning position	X	X	X	X	X	X	X	X	X
S	**Position detection**									
Z	attached proximity switches								X	
N	built-in proximity switches	X	X	X	X	X	X	X		X
SZA	**Number of switches**									
1 - 9	for S = Z								X	
1 - 2	for S = N	X	X	X	X	X	X	X		X
SVO	**Switch, front position**									
0	without switch	X	X	X	X	X	X	X	X	X
1 - 8	see cushioning position	X	X	X	X	X	X	X	X	X
SHI	**Switch, rear position**									
0	without switch	X	X	X	X	X	X	X	X	X
1 - 8	see cushioning position	X	X	X	X	X	X	X	X	X