Series CP95
ISO/VDMA Air Cylinders

Specifications

Type		Model	Bore						Stroke end cushioning	Rod specifications				Upon receipt of order
			32	40	50	63	80	100	as standard	Standard type hard chromed	W	E	R	XB6
Double acting	Standard	CP95SB	•	•	•	•	•	•	•	•	•	•	•	•
		CP95SDB	•	•	•	•	•	•	•	•	•	•	•	–
	Double rod	CP95SB•W	•	•	•	•	•	•	•	•	–	•	•	•
		CP95SDB•W	•	•	•	•	•	•	•	•	–	•	•	–
	Non-rotating rod	CP95KB	•	•	•	•	•	•	•	–	•	•	•	–
		CP95KDB	•	•	•	•	•	•	•	–	•	•	•	–

W = double/through rod
E = extended rod
R = stainless rod
XB6= heat resistant (to 150° C)

• available
– not available

How to order: Cylinders

CP95 S D B 32 – 80 ☐ ☐

Piston rod

S	Standard
K	Non-rotating
Q	Low friction

Standard (Order the mounting accessories separately – see page 5)

Nil	Non-magnetic
D	With built-in magnet

Ø Bore [mm]

32
40
50
63
80
100

Stroke [mm] (Standard strokes – see page 6)

Rod specifications

Nil	Hard chromed rod as standard
W	Double/through rod
E+..	Extended rod
R	Stainless rod (not rquired for KB/KDB non-rotating model which already includes stainless rod)

Special specifications

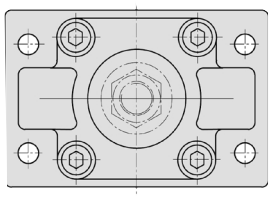
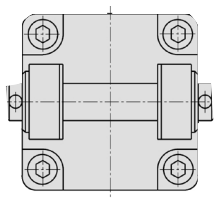
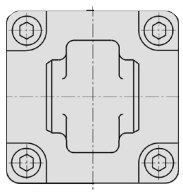
Nil	With dry compressed air or lubricated (Standard)
CA	Low friction in output direction
CB	Low friction in input direction
XB6	Heat resistant to 150° C (without magnet)*

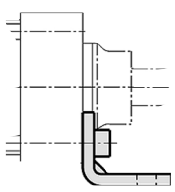
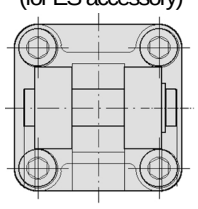
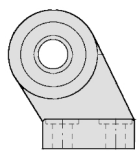
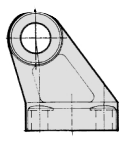
* The non-rotating rod is not available for XB6 specification.

How to order: Accessories

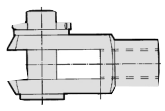
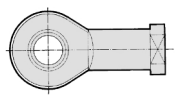
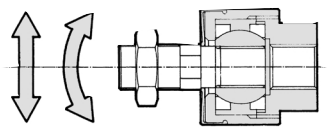
How to order mounting accessories

Mounting accessories, cylinders

Ø bore	**F** Front/rear flange	**D** Female rear clevis (corresponds to E accessories)	**C** Male rear clevis
	 Supplied with 4 screws	 Supplied with bolt, safety device and 4 screws	 Supplied with 4 screws
32	F5032	D5032	Plain: C5032 / with ball joint: CR5032
40	F5040	D5040	C5040 / CR5040
50	F5050	D5050	C5050 / CR5050
63	F5063	D5063	C5063 / CR6063
80	F5080	D5080	C5080 / CR5080
100	F5100	D5100	C5100 / CR5100
	See page 10 for dimensions	See pages 10/11 for dimensions	See pages 10/11 for dimensions Note: See page 11 for male rear clevis with swivel CR50

Ø bore	**L** Foot	**DS** Female rear clevis (for ES accessory)	**ES** Angled rear clevis with ball joint	**E** Angled rear clevis
	 Supplied with two pieces			
32	L5032	DS5032	ES5032	E5032
40	L5040	DS5040	ES5040	E5040
50	L5050	DS5050	ES5050	E5050
63	L5063	DS5063	ES5063	E5063
80	L5080	DS5080	ES5080	E5080
100	L5100	DS5100	ES5100	E5100
	See page 10 for dimensions	See page 12 for dim.	See page 12 for dim.	See page 11 for dimensions

Mounting accessories, rod

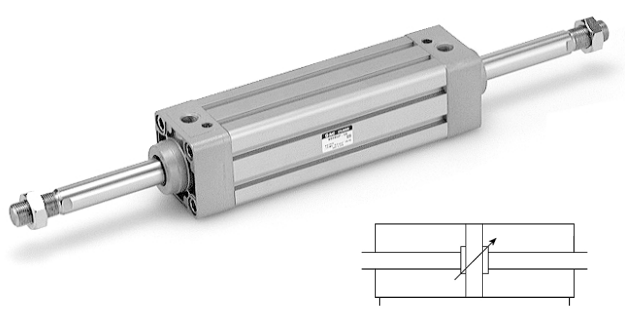
Ø bore	**GKM** Rod clevis DIN 71752	**KJ** Piston rod ball joint DIN 648	**JA** Floating joint
	 Supplied with bolts and safety devices		
32	GKM 10-20	KJ10 D	JA30-10-125
40	GKM12-24	KJ12 D	JA40-12-125
50	GKM16-32	KJ16 D	JA50-16-150
63	GKM16-32	KJ16 D	JA50-16-150
80	GKM20-40	KJ20D	JAH50-20-150
100	GKM20-40	KJ20D	JAH50-20-150
	See page 18 for dimensions	See page 18 for dimensions	See page 18 for dimensions

ISO/VDMA Air Cylinder

Series CP95 VDMA

Double acting with end of stroke cushioning Ø32 - Ø100

- Conforms to VDMA 24 562 (parts 1 and 2), ISO 6431 and CETOP standards
- Combines lightweight profile barrel design with enclosed tie rods for extra strength
- Unique seal system ensures efficient performance and long life
- Fully adjustable cushioning at end of stroke
- Magnetic proximity sensing
- Superior cushioning performance and kinetic energy absorption



Technical specifications

Bore [mm]	32	40	50	63	80	100
Type	Non-lube type					
Action	Double acting single rod					
Fluid	Compressed air filtered to <10 µm,lubricated or non lubricated (dry air)					
Proof pressure	1.5MPa {15.3kgf/cm^2}					
Maximum operating pressure	1.0MPa {10.2kgf/cm^2}					
Minimum operating pressure	0.05MPa {0.5kgf/cm^2}					
Piston force	Up to 7500N					
Piston rod	Hard chromed steel (25µm finish)					
Lubrication	Not required (non-lube)					
Rod diameter [mm]	12	16	20	20	25	30
Piston rod thread	M10x1.25	M12x1.25	M16x1.5	M16x1.5	M20x1.5	M20x1.5
Ports	G1/8	G1/4	G1/4	G3/8	G3/8	G1/2
Cushioning stroke [mm]	19	19	24	24	30	30
Mounting position	Any					
Standard strokes (DIN ISO 4393) [mm]	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600, 700, 800 Other stroke lengths in accordance with ISO497 R 10					
Stroke tolerance [mm]	<250mm: + 1.0/-0mm, <1000mm: + 1.4/-0mm, <1500mm: + 1.8/-0mm					
Working pressure [MPa]	0.05 - 1.0					
Fluid and ambient temperature [°C]	-10°C to +60°C, -10°C to +70°C without magnet					
Piston speed [mm/s]	50 - 1000					

Standard strokes [mm]

Ø Bore	Standard stroke	Max. stroke
32	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 450, 500	700
40	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 450, 500	800
50	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 450, 500, 600	1200
63	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 450, 500, 600	1200
80	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 450, 500, 600, 700, 800	1400
100	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 450, 500, 600, 700, 800	1500

Note: Intermediate strokes are also available

Theoretical output table [N]

Ø Bore [mm]	Ø Rod diam. [mm]	Operating direction	Piston area [mm²]	Working pressure [MPa]								
				0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	10
32	12	OUT	804	161	241	322	402	482	563	643	724	804
		IN	691	138	207	276	346	415	484	553	622	691
40	16	OUT	1257	251	377	503	629	754	880	1006	1131	1257
		IN	1056	211	317	422	528	634	739	845	950	1056
50	20	OUT	1963	393	589	785	982	1178	1374	1570	1767	1963
		IN	1649	330	495	660	825	989	1154	1319	1484	1649
63	20	OUT	3117	623	935	1247	1559	1870	2182	2494	2805	3117
		IN	2803	561	841	1121	1402	1682	1862	2242	2523	2803
80	25	OUT	5027	1005	1508	2011	2514	3016	3519	4022	4524	5027
		IN	4536	907	1361	1814	2268	2722	3175	3629	4082	4536
100	30	OUT	7854	1571	2356	3142	3927	4712	5498	6283	7069	7854
		IN	7147	1429	2144	2859	3574	4288	5003	5718	6432	7147

Note: Theoretical output OUT [N] =
Pressure [MPa] x Piston area [mm²]

Weight table

[kg]

Ø Bore	Mounting type	32	40	50	63	80	100
Basic weight	Basic type B	0.59	0.87	1.44	2.00	3.37	4.45
	Foot L	0.16	0.20	0.38	0.46	0.89	1.09
	Front/rear flange F	0.20	0.23	0.47	0.58	1.30	1.81
	Male rear clevis C	0.16	0.23	0.37	0.60	1.07	1.73
	Female rear clevis D	0.20	0.32	0.45	0.71	1.28	2.11
	Angled rear clevis E	0.16	0.22	0.42	0.52	0.94	1.40
	Female rear clevis DS	0.17	0.27	0.45	0.64	1.37	2.05
	Spherical bearing ES	0.18	0.27	0.46	0.55	0.97	1.33
Additional weight per 50 mm stroke		0.11	0.17	0.28	0.40	0.67	0.89
Accessories	Piston rod ball joint KJ	0.15	0.23	0.26	0.26	0.60	0.83
	Rod clevis GKM	0.22	0.37	0.43	0.43	0.87	1.27
	Floating joint JA	0.015	0.20	0.26	0.26	0.9	0.9

Weight calculation method

Example: CP95S32-100
(basic Ø32, 100st)

- Basic weight 0.59kg
  (Standard Ø32)
- Additional weight . .0.11kg/50mm stroke
- Cylinder stroke . . .100st

Cylinder weight =
0.59+(0.11 x 100/50)=0.81kg

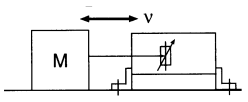
Kinetic energy absorbable by air cushion mechanism

Ø Bore [mm]	Cushioning stroke [mm]	Absorbable kinetic energy [J]
32	19	2.2
40	19	3.4
50	24	5.9
63	24	11
80	30	20
100	30	29

At the stroke end, when stopping a large amount of kinetic energy generated by a large load and high speed operation, compression of air is used to absorb the impact without transmitting vibration to the surroundings. The purpose of an air cushion is not to reduce the speed of a piston as it nears the stroke end. The kinetic energy of a load can be found using the following formula:

$$E = \frac{1}{2} m \cdot v^2$$

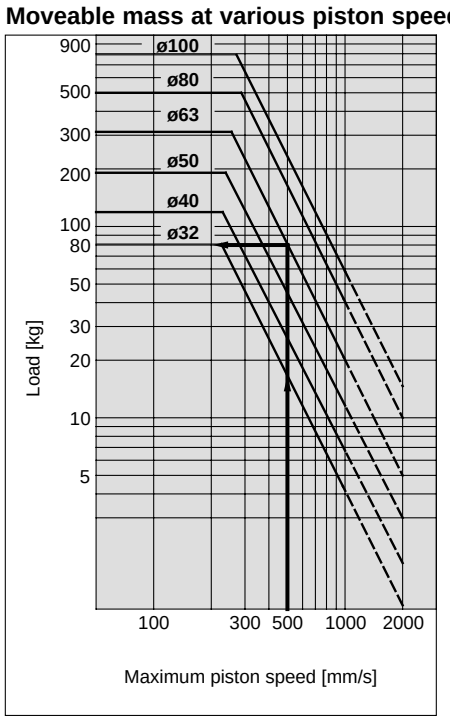
E: Kinetic energy [J = Nm]
m: Load weight [kg]
v: Piston speed [m/s]



Note: v is final velocity which is 1.4 • average velocity.

If the kinetic energy obtained is no greater than the absorbable kinetic energy shown in the table above, the life of the cushion seal should be 10 million cycles or more.

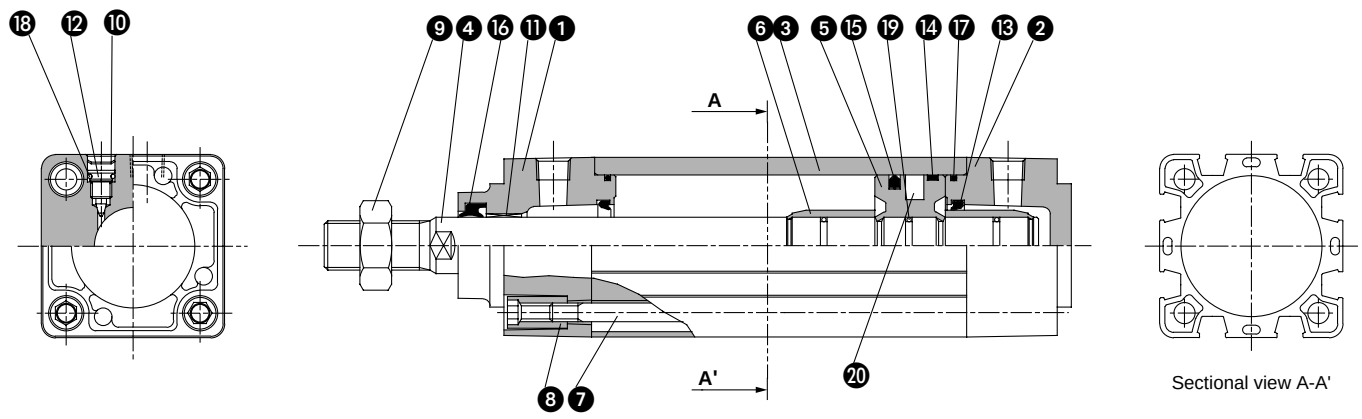
Moveable mass at various piston speeds



Example: Find the rod end load limit when a ø63 air cylinder is operated at a maximum drive speed of 500mm/s. Extend upward from 500mm/s on the horizontal axis of the graph to the intersection point with the line for a tube bore of 63mm, and then extend lefward from this point to find the load of 80kg.

Series ***CP95***

Construction



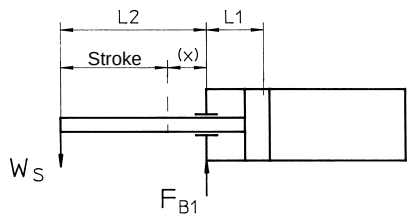
Parts list

No.	Description	Material
❶	Head cover	Die-cast aluminum
❷	End cover	Die-cast aluminum
❸	Cylinder tube	Die-cast aluminum
❹	Piston rod	Hard chromed steel C45
❺	Piston	Die-cast aluminum
❻	Cushion ring	Brass
❼	Tie rod	Steel, zinc chromate plated
❽	Tie rod nut	Steel, zinc chromate plated
❾	Rod end nut	Steel, zinc chromate plated
❿	Snap ring	Steel nickel plated
⓫	Bushing	Lead-bronze casting
⓬	Cushion valve	Steel, zinc chromate plated
⓭	Cushion seal	Elastomer
⓮	Wear ring	Antifriction material
⓯	Piston seal	NBR
⓰	Rod seal	NBR
⓱	Cylinder tube gasket	NBR
⓲	Cushioning valve seal	NBR
⓳	Piston/rod gasket	NBR
⓴	Magnet ring	

Replacement parts: Seal kits
Ø32 includes order No. from ⓭ to ⓱,
Ø40 - Ø100 includes from ⓬ to ⓲

Ø	**Order No.**
32	**CS95-32**
40	**CS95-40**
50	**CS95-50**
63	**CS95-63**
80	**CS95-80**
100	**CS95-100**

Maximum allowable radial loads



$$F_{B1} = W_S \left(1+\frac{L2}{L1}\right) \leq F_{B\ allowable}$$

Ø	L1	L2	F_{B1} allowable
32	62.5	34.5 + st	80 N
40	74.0	39.0 + st	125 N
50	76.0	44.5 + st	195 N
63	91.0	44.5 + st	310 N
80	93.0	53.0 + st	500 N
100	104.0	57.5 + st	785 N

e.g. 63mm bore, 100mm stroke, W_S = 20N

W_S = (2kgs) 20N

$F_{B1} = 20\left(1+\frac{144.5}{91}\right) = 51.76N$

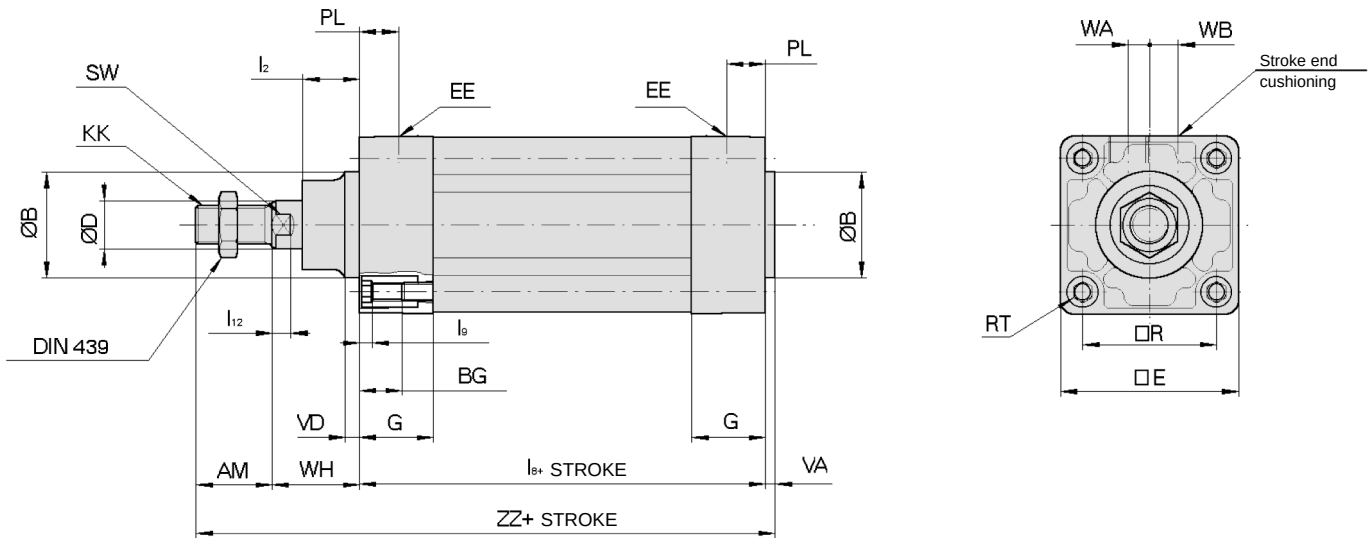
F_{B1} = 51.76N ≤ 310N (from table)

Therefore, side load is allowable

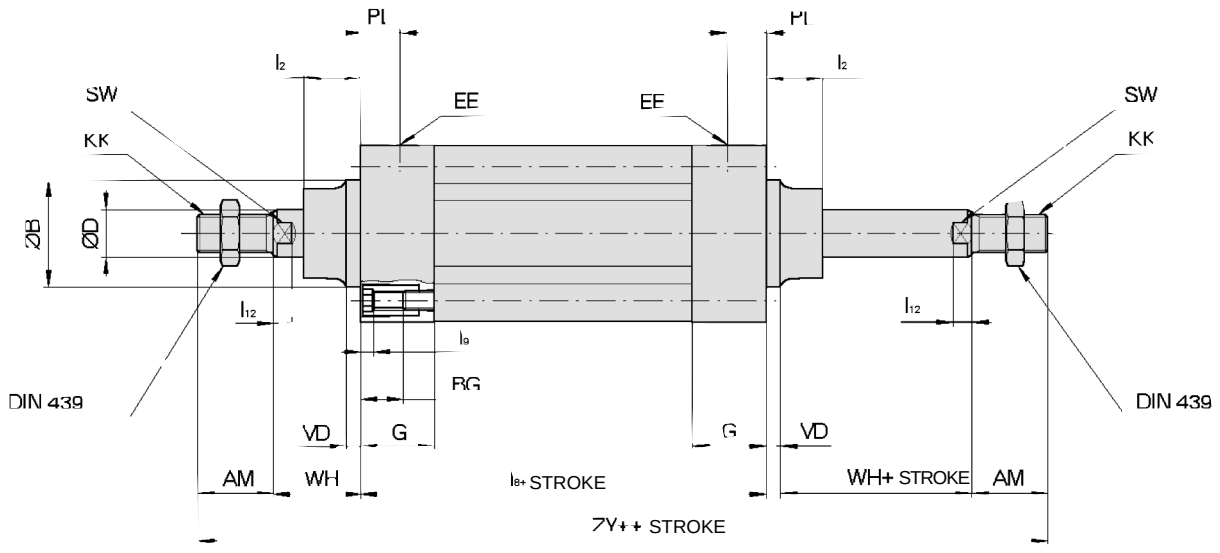
Dimensions - standard specifications

[mm]

CP95S□BØ-stroke



CP95S□BØ-stroke W

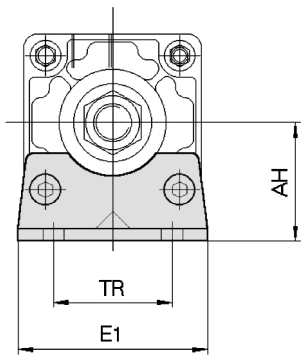


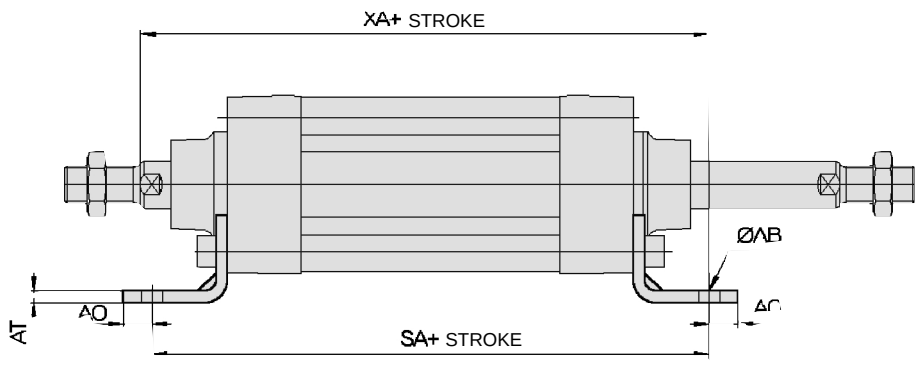
Ø Bore	AM	ØB	ØD	EE	PL	RT	l_{12}	KK	SW	G	BG	l_8	VD	VA	WA	WB	WH	ZZ	ZY	□E	□R	l_2	l_9
32	22	30	12	G1/8	13	M6	6	M10x1.25	10	27	16	94	4	4	4	6.5	26	146	190	46	32.5	15	4
40	24	35	16	G1/4	14	M6	6.5	M12x1.25	13	27	16	105	4	4	4	9	30	163	213	52	38	17	4
50	32	40	20	G1/4	15.5	M8	8	M16x1.5	16	31.5	16	106	6	4	5	10.5	37	179	244	65	46.5	24	5
63	32	45	20	G3/8	16.5	M8	8	M16x1.5	16	31.5	16	121	6	4	9	12	37	194	259	75	56.5	24	5
80	40	45	25	G3/8	19	M10	10	M20x1.5	21	38	16	128	8	4	11.5	14	46	218	300	95	72	30	5
100	40	55	30	G1/2	19	M10	10	M20x1.5	21	38	16	138	8	4	17	15	51	233	320	114	89	32	5

Dimensions – mounting accessories L, F, C and D

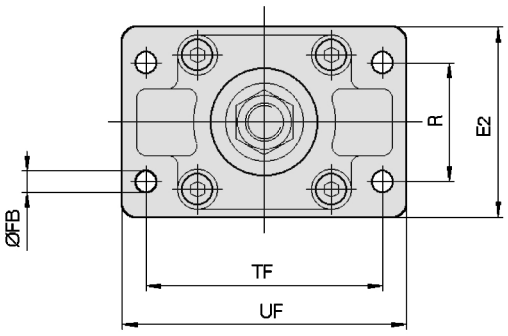
[mm]

Mounting type L

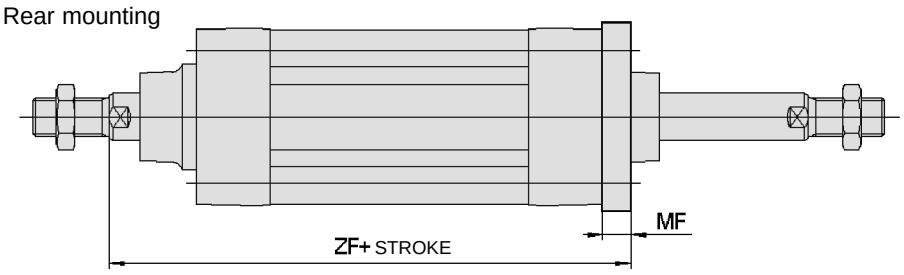




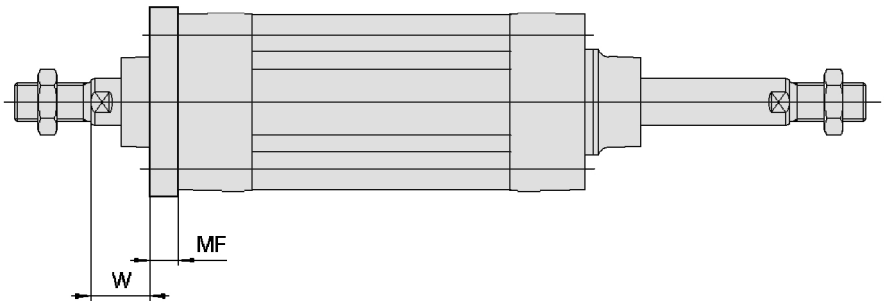
Mounting type F



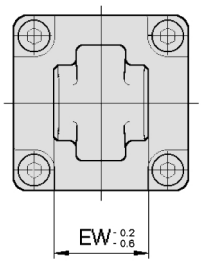
Rear mounting



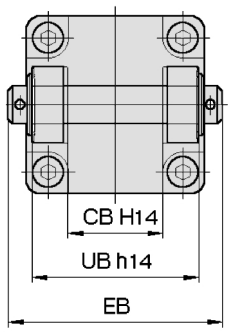
Front mounting

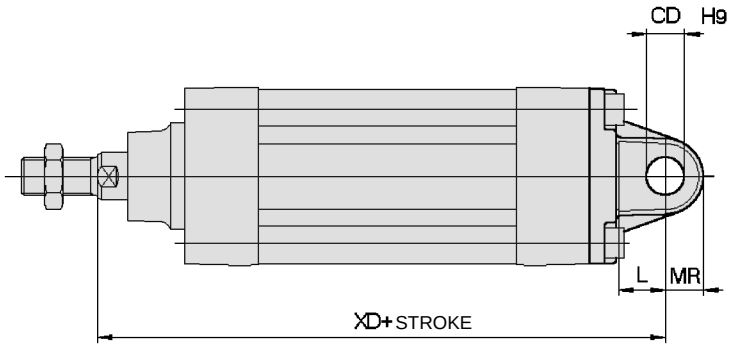


Mounting type C



Mounting type D



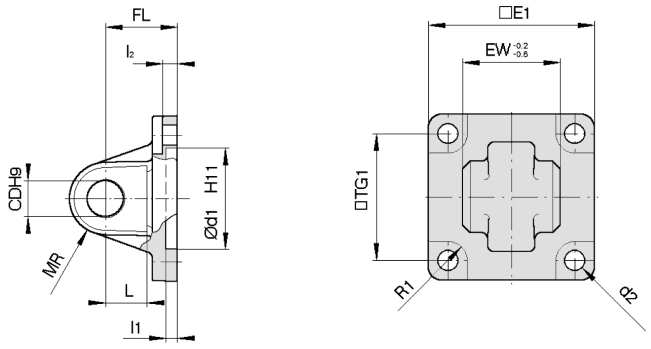


Ø Bore	E1	R	W	MF	ZF	ØFB	CD	EB	L	XD	UB	CB	EW	MR	TR	AO	AT	XA	SA	AH	ØAB	TF	UF	E2
32	48	32	16	10	130	7	10	65	12	142	45	26	26	9.5	32	10	4	144	142	32	7	64	79	50
40	55	36	20	10	145	9	12	75	15	160	52	28	28	12	36	11	4	163	161	36	9	72	90	55
50	68	45	25	12	155	9	12	80	15	170	60	32	32	12	45	12	5	175	170	45	9	90	110	70
63	80	50	25	12	170	9	16	90	20	190	70	40	40	16	50	12	5	190	185	50	9	100	120	80
80	100	63	30	16	190	12	16	110	20	210	90	50	50	16	63	14	6	215	210	63	12	126	153	100
100	120	75	35	16	205	14	20	140	25	230	110	60	60	20	75	16	6	230	220	71	14	150	178	120

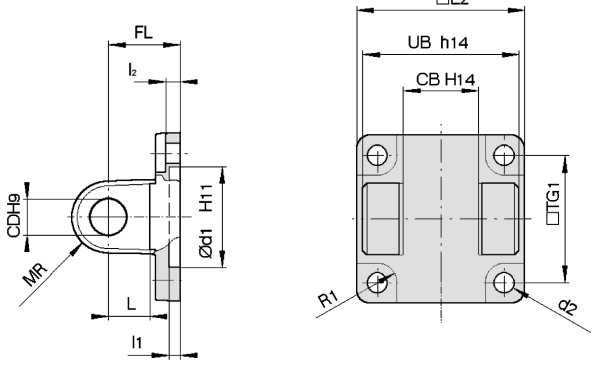
Dimensions – mounting accessories C, D, E and CR

[mm]

Mounting type C

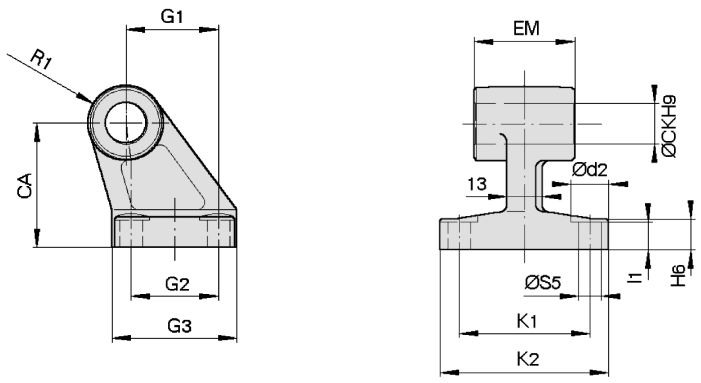


Mounting type D



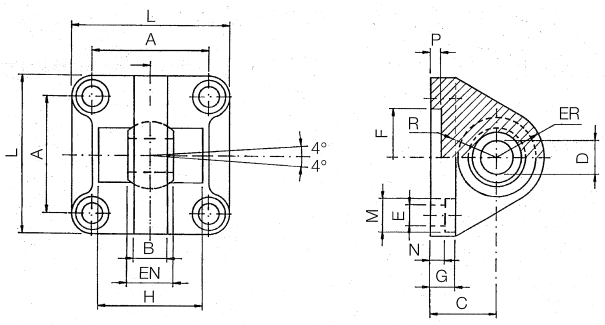
Ø Bore	□E1	EW	□TG1	FL	l_1	L	l_2	Ød1	CD	MR	d2	R1	□E2	UB	CB
32	45	26	32.5	22	5	12	5.5	30	10	9.5	6.6	6.5	48	45	26
40	51	28	38	25	5	15	5.5	35	12	12	6.6	6.5	56	52	28
50	64	32	46.5	27	5	15	6.5	40	12	12	9	8.5	64	60	32
63	74	40	56.5	32	5	20	6.5	45	16	16	9	8.5	75	70	40
80	94	50	72	36	5	20	10	45	16	16	11	11	95	90	50
100	113	60	89	41	5	25	10	55	20	20	11	12	115	110	60

Mounting type E



Ø Bore	Ød2	ØCK	ØS5	K1	K2	l3	G1	l_1	G2	EM	G3	CA	H6	R1
32	11	10	6.6	38	51	10	21	7	18	26	31	32	8	10
40	11	12	6.6	41	54	10	24	9	22	28	35	36	10	11
50	15	12	9	50	65	12	33	11	30	32	45	45	12	12
63	15	16	9	52	67	14	37	11	35	40	50	50	12	15
80	18	16	11	66	86	18	47	12.5	40	50	60	63	14	15
100	18	20	11	76	96	20	55	13.5	50	60	70	71	15	19

Mounting type CR Rear clevis with ball joint

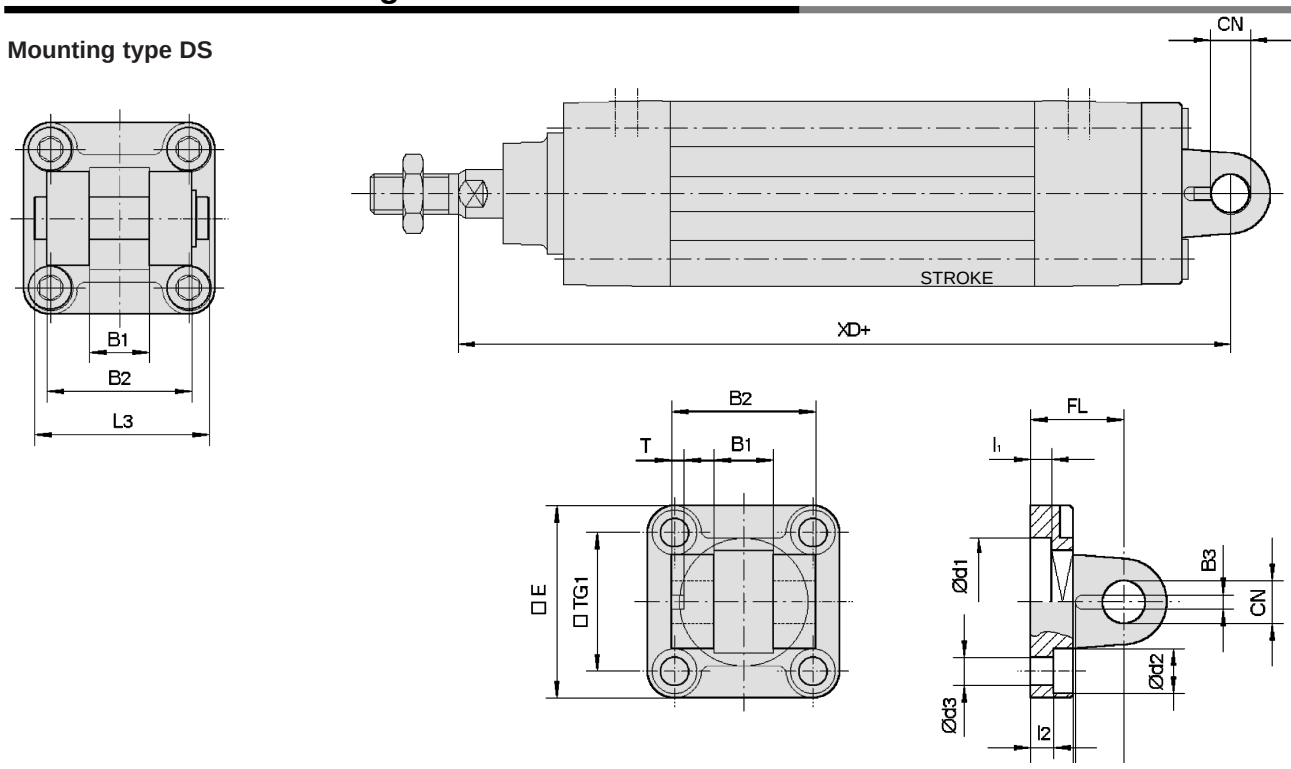


Ø (mm)	A ±0.2	B maxi	C JS15	D H7	EN -0.1	ER maxi	ØF H11	G	E H13	L	M H13	N ±0.5	P	H ±0.5	R ±0.5
32	32.5	10.5	22	10	14	15	30	10	6.6	45	10.5	5.5	5	–	–
40	38	12	25	12	16	18	35	10	6.6	55	11	5.5	5	–	–
50	46.5	15	27	16	21	20	40	10	9	65	15	6.5	5	51	19
63	56.5	15	32	16	21	23	45	12	9	75	15	6.5	5	–	–
80	72	18	36	20	25	27	45	14	11	95	18	10	5	–	–
100	89	18	41	20	25	30	55	16	11	115	18	10	5	–	–

Dimensions – mounting accessories DS and ES

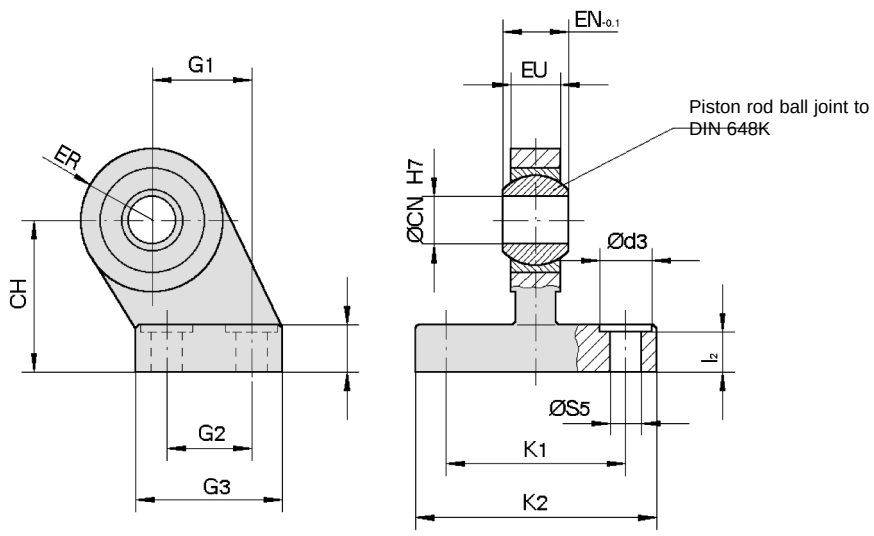
[mm]

Mounting type DS



Ø Bore	□E	B1	B2	B3	□TG1	T	L1	L3	l_1	l_2	FL	H	Ød1	Ød2	Ød3	CN	XD
32	45	14	34	3.3	32.5	3	11.5	41	5	5.5	22	10	30	10.5	6.6	10	142
40	55	16	40	4.3	38	4	12	48	5	5.5	25	10	35	11	6.6	12	160
50	65	21	45	4.3	46.5	4	14	54	5	6.5	27	10	40	15	9	16	170
63	75	21	51	4.3	56.5	4	14	60	5	6.5	32	12	45	15	9	16	190
80	95	25	65	4.3	72	4	16	75	5	10	36	16	45	18	11	20	210
100	115	25	75	6.3	89	4	16	85	5	10	41	16	55	18	11	20	230

Mounting type ES



Ø Bore	Ød3	ØCN	ØS5	K1	K2	l_2	G1	G2	G3	EN	EU	CH	H6	ER
32	11	10	6.6	38	51	8.5	21	18	31	14	10.5	32	10	15
40	11	12	6.6	41	54	8.5	24	22	35	16	12	36	10	18
50	15	16	9	50	65	10.5	33	30	45	21	15	45	12	20
63	15	16	9	52	67	10.5	37	35	50	21	15	50	12	23
80	18	20	11	66	86	11.5	47	40	60	25	18	63	14	27
100	18	20	11	76	96	12.5	55	50	70	25	18	71	15	30