AROS Hydraulik GmbH

Product catalogue – ZD5 series
Double-acting hydraulic cylinders

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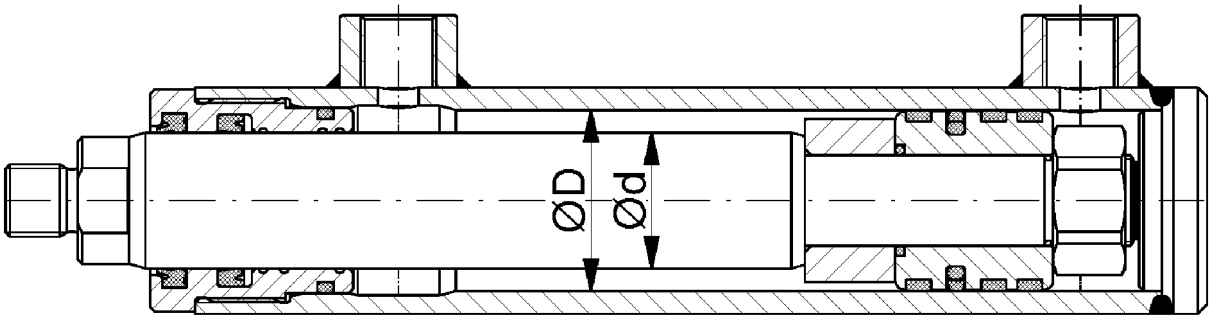
AROS Hydraulik GmbH
Föhrenweg 3-11
D-87700 Memmingen

Phone: +49 8331 8209-0
Fax: +49 8331 8209-90
Email: info@aros-hydraulik.de
Internet: www.aros-hydraulik.de

1 General technical data

Robust and universally usable welded-bolted construction for simpler applications. Easy dismantling and replaceability of all wear parts is ensured. PTFE-based piston seals and piston guide bands ensure smooth, stick-slip-free running. Due to its low friction, it is particularly well suited for differential arrangements. Please note our boundary and use conditions.



Piston rod:	ground, polished and hard-chrome plated
End cushioning:	not possible
Operating temperature:	-20°C to +80°C (other temperatures available on request)
Operating fluid:	Mineral-based hydraulic oil (other operating fluids possible on request)
Connections:	for pipe fittings according to DIN 2353 / ISO 8434-1
max. operating pressure:	280 bar
max. piston speed:	0.5 m/s (higher speeds available on request)
Glydring:	smooth-running, stick-slip-free, no retaining function (standard version)
AQ seal:	smooth-running, stick-slip-free, for retaining function
Seals:	Viton available on request
Tolerance:	For stroke tolerance, see 1.6 Angular tolerances of the mounting holes according to EN ISO 13920-BE

1.1 Boundary and use conditions

- The mechanical alignment of the movement axis and, consequently, the mounting points of the AROS cylinder and piston rod must be ensured. Lateral forces on the piston rod and piston guides must be avoided. Where applicable, the self-weight of the AROS cylinder or piston rod must be taken into account.
- The buckling length/buckling load of the piston rod or the AROS cylinder must be noted. The maximum buckling load is calculated on request.
- Note the maximum allowable stroke speeds with regard to the suitability of the seals and their compatibility with the operating fluid used.
- The maximum allowable speeds when moving to the end positions, taking external loads into account, must be observed. If the end positions are approached at a speed > 0.1 m/s (guide value), a cylinder with end cushioning should be provided.

Overpressurisation

Danger

- The maximum allowable operating pressure must be observed in all operating states of the AROS cylinder. Potential pressure intensification resulting from the ratio of the annular area to the piston area and any potential restriction points must be avoided.
- Harmful environmental factors, such as aggressive ultrafine particles, vapours, high temperatures, etc., as well as dirt and damage to the hydraulic fluid, must be avoided.

If you are unsure about media (fluid) compatibility or if the boundary and use conditions are exceeded, please contact us.

1.2 Service life

The AROS ZD5 series cylinders are robust, welded cylinders. Reliability is highly dependent on the application. Because it is welded, its service life is significantly shorter than that of a bolted version. Please contact our engineering department regarding the operating limits for > 300,000 cycles.

1.3 Acceptance

Every cylinder is tested in accordance with the AROS standard and ISO 10100:2001.

1.4 Safety instructions

For the assembly, commissioning and maintenance of AROS cylinders, refer to the “General Operating and Assembly Instructions for Hydraulic Cylinders”!
Servicing and repair work must be carried out by AROS Hydraulik GmbH or by personnel specially trained for this purpose. No warranty is provided for damage resulting from assembly, maintenance or repair.

1.5 Checklists

Cylinders whose characteristics and operating data differ from the values stated in the data sheet can only be supplied on request as customised cylinders. For quotations, any deviations from the characteristics and/or operating data set out in the AROS cylinder specifications must be described.

1.6 Stroke tolerances

Nominal stroke	Tolerance
≤ 1,250	+2 0
> 1,250 ≤ 3,150	+5 0
> 3,150 ≤ 8,000	+8 0

Dimensions in millimetres

2 Type code

ZD5 B – 50/35 – 400 – G – E + GA2-40

Double-acting hydraulic cylinder
Series 5

Design:
X – Basic version without mounting
A – Swivel eye on the cylinder base and on the piston rod
B – Swivel eye on the cylinder base
G – Spherical rod eye on the cylinder base (standard spherical plain bearing)
K – Spherical rod eye on the cylinder base (wide spherical plain bearing)
H – Clevis on the cylinder base
C – Flange on the cylinder head
D – Flange on the cylinder base
E – Trunnion on the cylinder head
F – Foot mounting

Piston Ø in mm (D)

Piston rod Ø in mm (d)

Cylinder stroke in mm
Further details regarding allowable stroke lengths (buckling lengths) can be found in publication 0-Z-01

Connections
G – Whitworth pipe thread
M – Metric thread

Bleeding
(omitted if not required)

Mounting eye
Screwed onto the piston rod (omitted if not required)

Smaller and larger connections are also possible as custom versions; these must then be specified in the type designation as shown in the following example:

ZD5G – 50/35 – 400 - G ½

The max. possible connection thread is shown in the dimension table for design X.

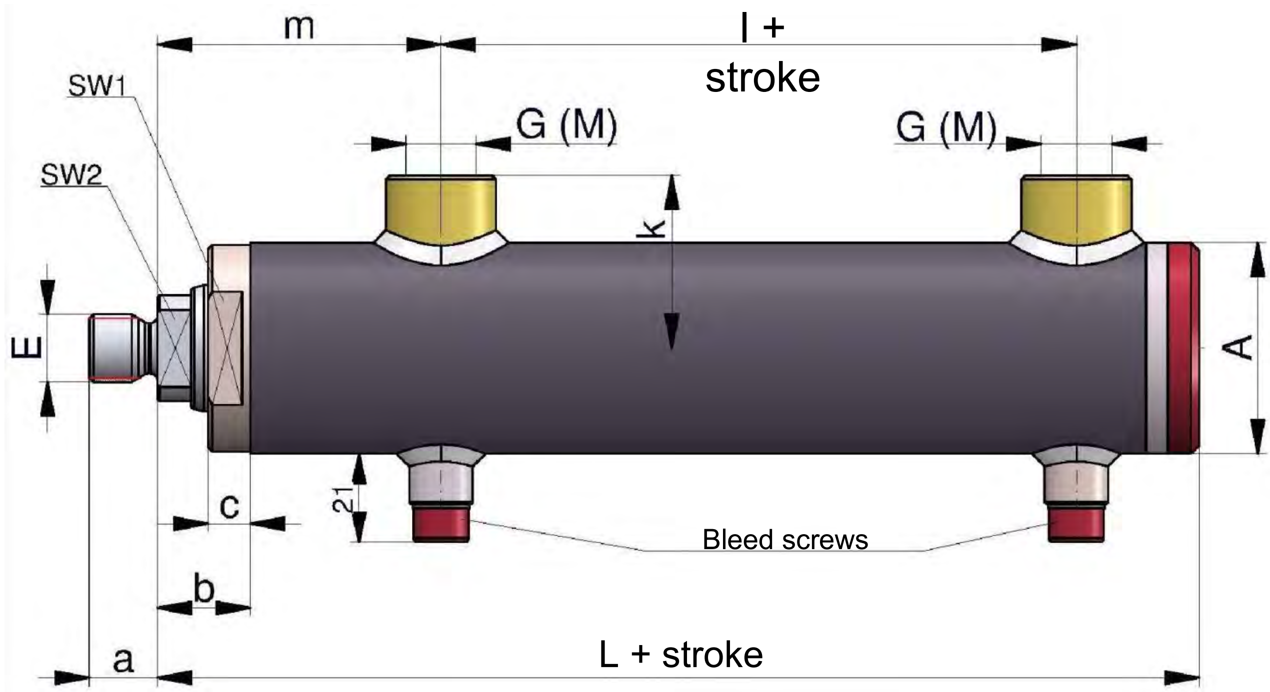
3 Designs

3.1 Design X

Basic version without mounting

If the connections differ (G, M), the dimension ‘k’ changes. For larger connections, the dimension ‘m’ may increase slightly in designs C and E. (Dimension ‘l’ is reduced accordingly) The bleed screws are located opposite the barrel connections

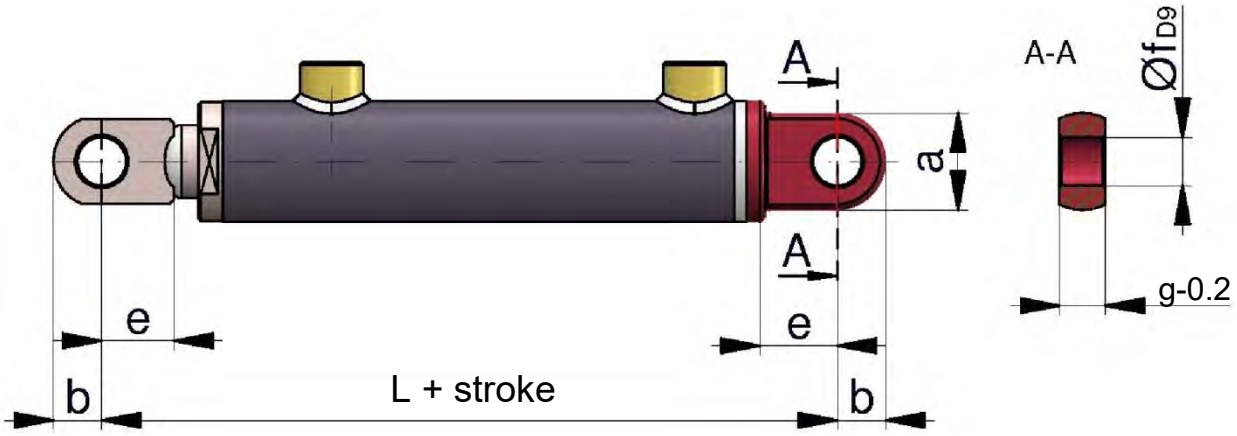
Exception: Design F (see dimension table) max. tightening torque 30 Nm.



Type ZD5X

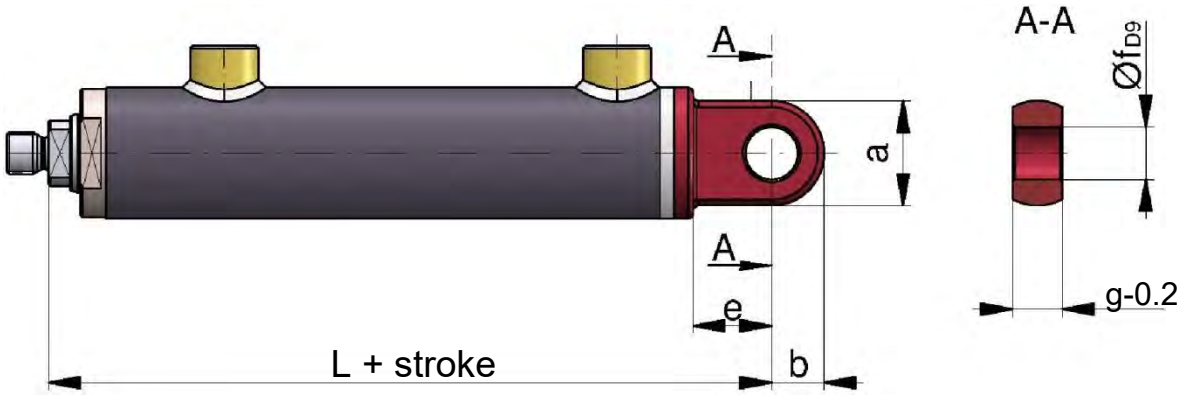
Piston	30	40			50			60			80			100			120		140		160		180		200	
Rod	22	22	25	30	25	30	35	30	35	40	40	50	55	55	60	70	70	85	85	100	90	110	110	125	125	140
A	40	50			60			75			95			120			140		170		190		210		245	
E	M16x1.5	M16x1.5			M22x1.5			M28x1.5			M35x1.5			M45x1.5			M58x1.5		M65x1.5		M80x2		M100x2		M110x2	
L	117	150			170			194			228			280			312		317		382		422		477	
AF1	36	41			50			65			85			100			Grooves on the circumference									
AF2	17	17	19	24	19	24	27	24	27	32	32	41	46	46	50	60	60	75	75	85	80	95	100	110	110	120
a	16	16			22			28			35			45			58		65		80		100		110	
b	22	26			26			26			35			37			44		47		52		57		72	
c	10	10			10			10			10			10			12		12		15		15		25	
k	36	41			46			56			66			78			91		106		119		129		147	
l	38	51			64			79			90			124			119		108		140		150		170	
m	59	71			76			82			101			111			138		147		177		207		237	
G	G ¼	G ⅜			G ⅜			G ½			G ½			G ½			G ¾		G ¾		G 1		G 1		G 1	
M	M14x1.5	M18x1.5			M18x1.5			M22x1.5			M22x1.5			M22x1.5			M27x2		M27x2		M33x2		M33x2		M33x2	
G max. M max.	G ⅜ M22x1.5	G ½ M22x1.5			G ¾ M27x2			G 1 M33x2			G 1 M33x2			G 1 M33x2			G 1¼ M42x2		G 1¼ M42x2		G 1½ M48x2		G 1½ M48x2		G 1½ M48x2	

3.2 Design A



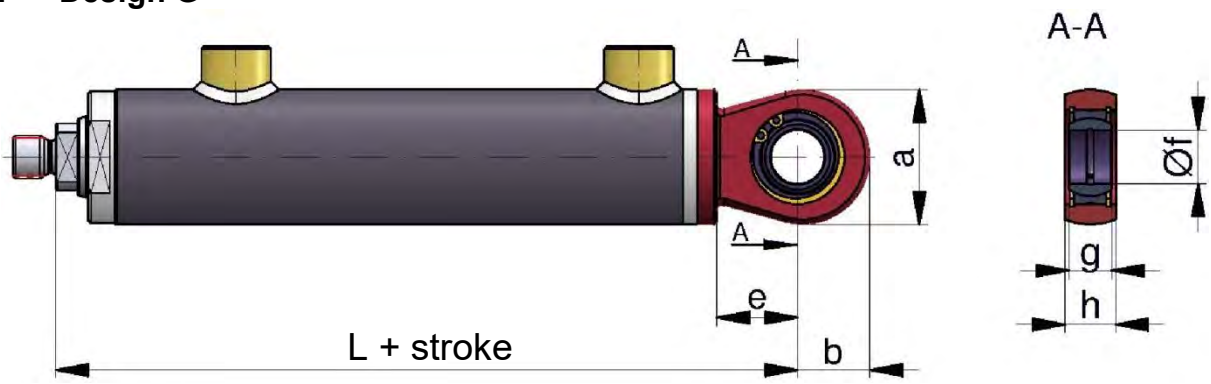
Type ZD5A																						
Piston	30	40			50			60			80			100			120		140		160		180		200	
Rod	22	22	25	30	25	30	35	30	35	40	40	50	55	55	60	70	70	85	85	100	90	110	110	125	125	140
L	175	214			244			290			335			408			450		462		560		625		700	
a	35	45			55			65			75			95			110		120		146		170		190	
b	20	25			30			35			40			50			60		65		80		95		105	
e	30	35			40			50			60			70			70		75		95		110		120	
f	20	25			30			35			40			50			60		70		80		90		100	
g	19	23			28			30			35			40			50		55		60		65		70	

3.3 Design B



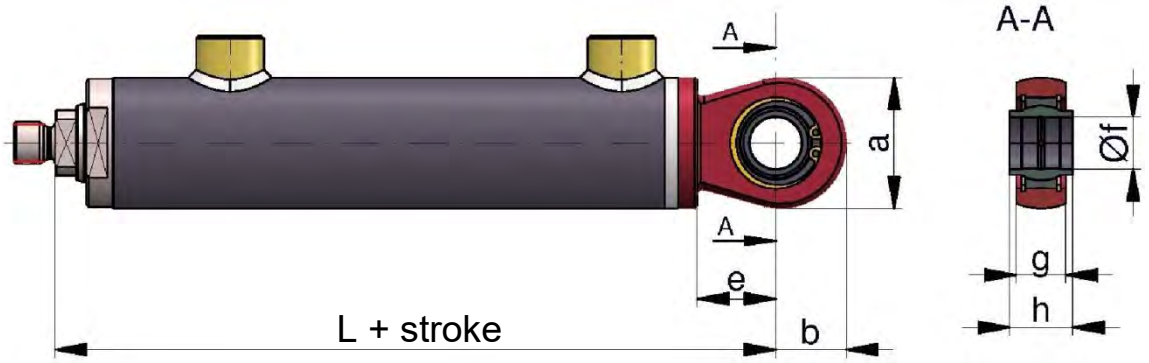
Type ZD5B																						
Piston	30	40			50			60			80			100			120		140		160		180		200	
Rod	22	22	25	30	25	30	35	30	35	40	40	50	55	55	60	70	70	85	85	100	90	110	110	125	125	140
L	147	185			210			244			288			350			382		392		477		532		597	
a	35	45			55			65			75			95			110		120		146		170		190	
b	20	25			30			35			40			50			60		65		80		95		105	
e	30	35			40			50			60			70			70		75		95		110		120	
f	20	25			30			35			40			50			60		70		80		90		100	
g	19	23			28			30			35			40			50		55		60		65		70	

3.4 Design G



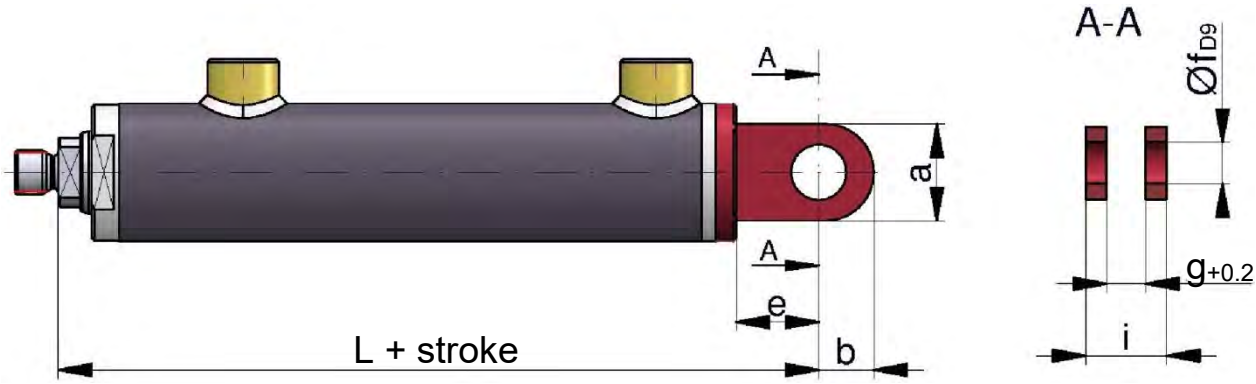
Type ZD5G												
Piston	30	40	50	60	80	100	120	140	160	180	200	
Rod	22	22 25 30	25 30 35	30 35 40	40 50 55	55 60 70	70 85	85 100	90 110	110 125	125 140	
L	147	185	210	244	288	350	382	392	477	532	597	
a	50	58	65	80	94	116	130	154	176	206	230	
b	27	32	33	44	50	63	70	82	95	113	125	
e	30	35	40	50	60	70	70	75	95	110	120	
f	20	25	30	35	40	50	60	70	80	90	100	
g	19	23	28	30	35	40	50	55	60	65	70	
h	16	20	22	25	28	35	44	49	55	60	70	

3.5 Design K



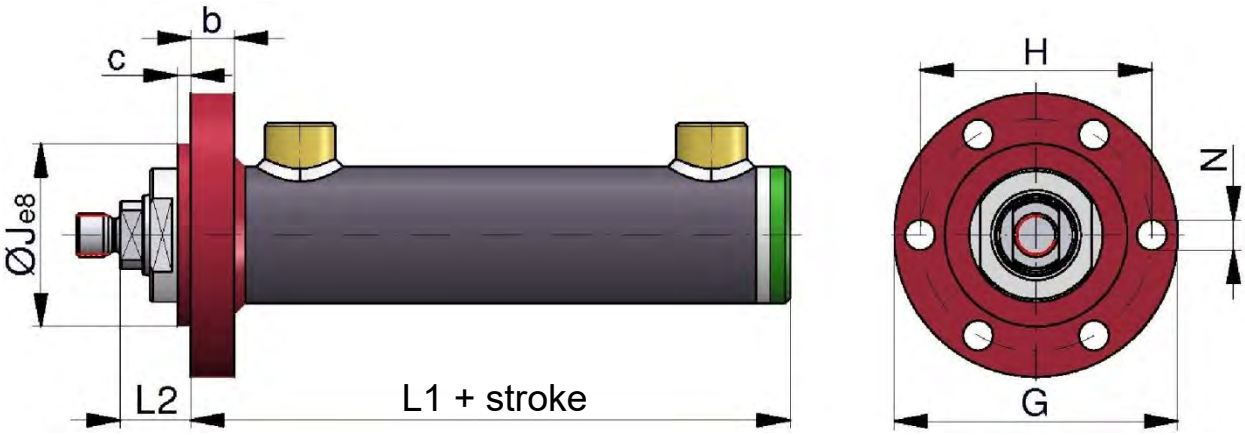
Type ZD5K									
Piston	30	40	50	60	80	100	120	140	160
Rod	22	22 25 30	25 30 35	30 35 40	40 50 55	55 60 70	70 85	85 100	90 110
L	147	185	210	244	288	350	382	392	477
a	50	58	65	80	94	116	130	154	176
b	27	32	33	44	50	63	70	82	95
e	30	35	40	50	60	70	70	75	95
f	20	25	30	35	40	50	60	70	80
g	19	23	28	30	35	40	50	55	60
h	24	29	30	35	38	43	54	65	74

3.6 Design H



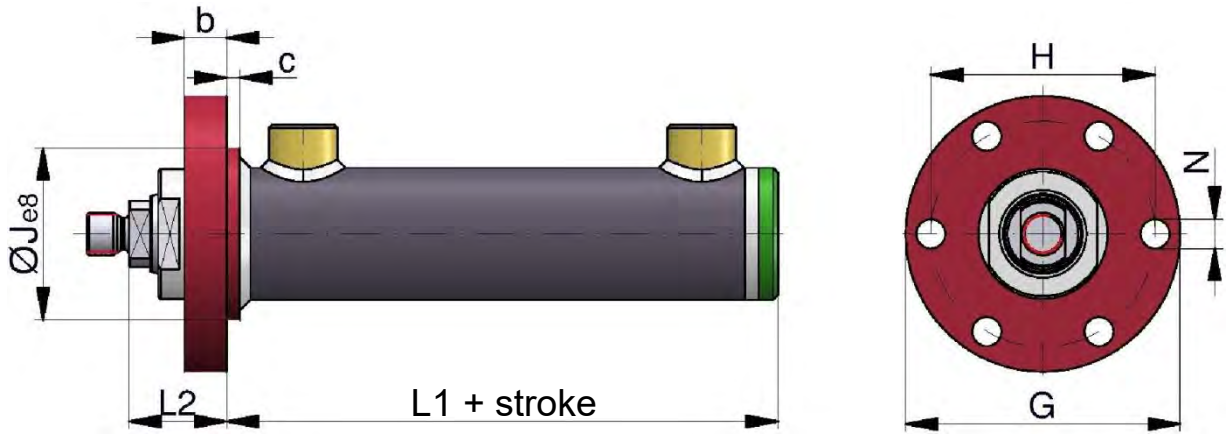
Type ZD5H											
Piston	30	40	50	60	80	100	120	140	160	180	200
Rod	22	22 25 30	25 30 35	30 35 40	40 50 55	55 60 70	70 85	85 100	90 110	110 125	125 140
L	147	185	210	244	288	350	382	392	477	532	597
a	35	45	55	65	75	95	110	120	146	170	190
b	20	25	30	35	40	50	60	65	80	95	105
e	30	35	40	50	60	70	70	75	95	110	120
f	20	25	30	35	40	50	60	70	80	90	100
g	19	23	28	30	35	40	50	55	60	65	70
i	39	47	56	60	71	80	100	111	120	125	140

3.7 Design C1



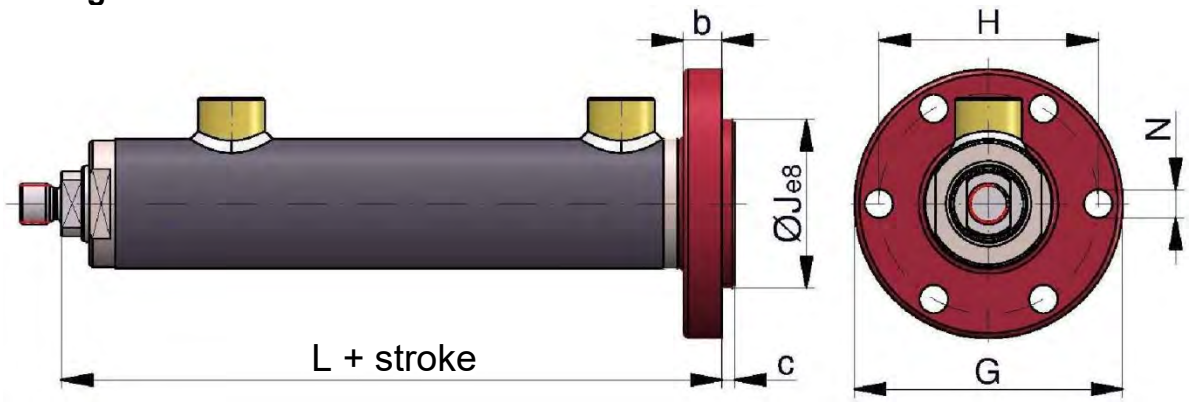
Type ZD5C1											
Piston	30	40	50	60	80	100	120	140	160	180	200
Rod	22	22 25 30	25 30 35	30 35 40	40 50 55	55 60 70	70 85	85 100	90 110	110 125	125 140
G	94	104	118	138	178	205	245	280	335	360	420
H	75	85	95	115	145	170	205	240	275	300	345
J	60	65	75	90	115	140	165	200	225	250	285
L1	90	119	139	163	188	238	263	265	320	355	395
L2	27	31	31	31	40	42	49	52	62	67	82
N	9	11	11	13	17	17	21	21	30	30	33
b	12	15	18	22	25	35	40	45	55	60	70
c	5	5	5	5	5	5	5	5	10	10	10

3.8 Design C2



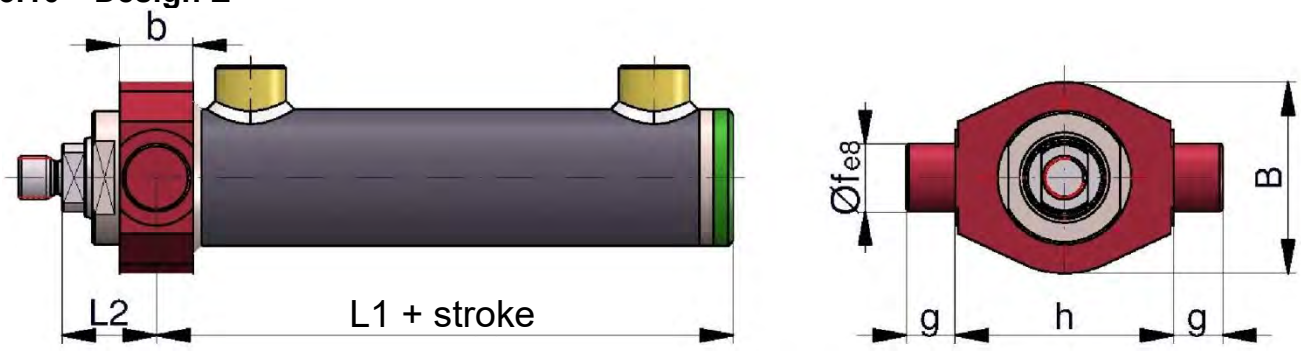
Type ZD5C2											
Piston	30	40	50	60	80	100	120	140	160	180	200
Rod	22	22 25 30	25 30 35	30 35 40	40 50 55	55 60 70	70 85	85 100	90 110	110 125	125 140
G	94	104	118	138	178	205	245	280	335	360	420
H	75	85	95	115	145	170	205	240	275	300	345
J	60	65	75	90	115	140	165	200	225	250	285
L1	83	109	126	146	168	208	228	225	275	305	335
L2	34	41	44	48	60	72	84	92	107	117	142
N	9	11	11	13	17	17	21	21	30	30	33
b	12	15	18	22	25	35	40	45	55	60	70
c	6	6	6	6	6	6	6	6	11	12	12

3.9 Design D



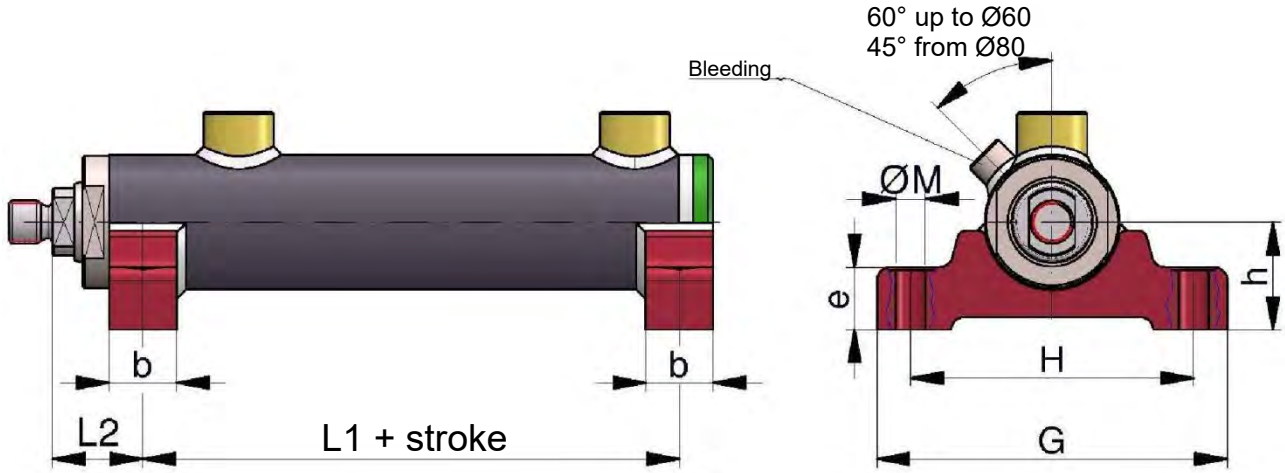
Type ZD5D											
Piston	30	40	50	60	80	100	120	140	160	180	200
Rod	22	22 25 30	25 30 35	30 35 40	40 50 55	55 60 70	70 85	85 100	90 110	110 125	125 140
G	94	104	118	138	178	205	245	280	335	360	420
H	75	85	95	115	145	170	205	240	275	300	345
J	60	65	75	90	115	140	165	200	225	250	285
L	129	160	183	211	247	308	345	347	412	457	522
N	9	11	11	13	17	17	21	21	30	30	33
b	12	15	18	22	25	35	40	45	55	60	70
c	5	5	5	5	5	5	5	5	10	10	10

3.10 Design E



Type ZD5E																						
Piston	30	40			50			60			80			100			120		140		160		180		200	
Rod	22	22	25	30	25	30	35	30	35	40	40	50	55	55	60	70	70	85	85	100	90	110	110	125	125	140
B	60	70			80			100			125			150			175		210		235		255		295	
L1	85	111			129			150.5			173			218			238		238		290		323		357	
L2	32	39			41			43.5			55			62			74		79		92		99		120	
b	20	26			30			35			40			50			60		67		80		85		95	
f	20	25			30			35			40			50			60		65		75		80		90	
g	15	18			20			20			25			30			35		40		50		55		55	
h	70	80			90			115			140			170			190		230		245		275		320	

3.11 Design F

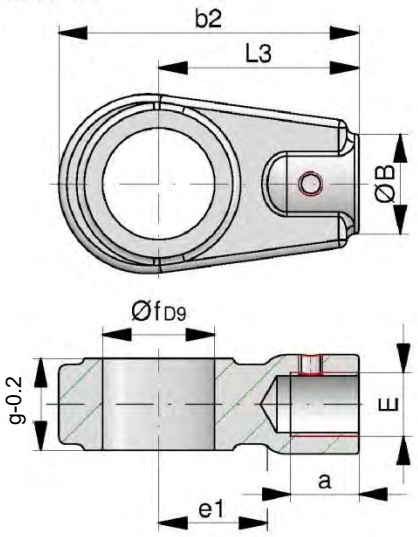


Type ZD5F																						
Piston	30	40			50			60			80			100			120		140		160		180		200	
Rod	22	22	25	30	25	30	35	30	35	40	40	50	55	55	60	70	70	85	85	100	90	110	110	125	125	140
G	110	130			150			175			215			265			295		340		400		450		510	
H	90	105			120			140			175			215			240		280		330		380		430	
L1	75	99			114			133			153			193			213		210		260		285		315	
L2	32	38.5			41			43.5			55			62			71.5		77		87		97		117	
M	9	11			13			13			17			21			25		28		31		37		37	
b	20	25			30			35			40			50			55		60		70		80		90	
e	18.5	23.5			28.5			33.5			39			50			50.5		60		70		80		90	
h	35	40			45			55			68			80			100		115		130		145		165	

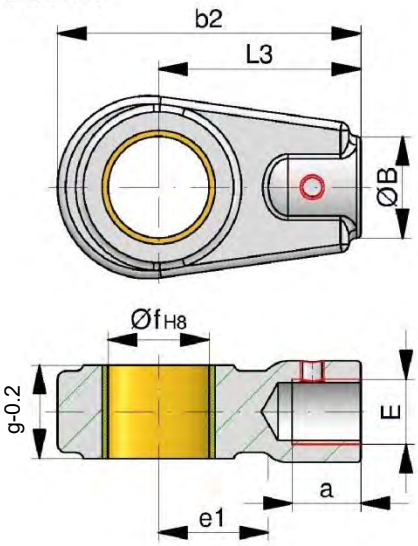
4 Mounting eyes

Type					Cyl. Ø	Dimensions (mm)													
						B	E	L3	a	b1	b2	e1	e2	f	g	h1	h2	i	k
SA1-20	-	GK1-20	GA2-20	GA2-20 B	30	25	M16 x 1.5	50	17	80	70	25	25	20	19	16	24	39	M8
SA1-25	SA2-25	GK1-25	GA2-25	GA2-25 B	40	25	M16 x 1.5	50	17	80	75	28	30	25	23	20	29	47	M8
SA1-30	SA2-30	GK1-30	GA2-30	GA2-30 B	50	34	M22 x 1.5	60	23	94	90	30	35	30	28	22	30	56	M8
SA1-35	SA2-35	GK1-35	GA2-35	GA2-35 B	60	44	M28 x 1.5	70	29	112	106	38	40	35	30	25	35	62	M10
SA1-40	SA2-40	GK1-40	GA2-40	GA2-40 B	80	55	M35 x 1.5	85	36	135	126	45	47	40	35	28	38	71	M10
SA1-50	SA2-50	GK1-50	GA2-50	GA2-50 B	100	61	M45 x 1.5	105	46	168	168	55	60	50	40	35	43	80	M12
SA1-60	SA2-60	GK1-60	GA2-60	GA2-60 B	120	75	M58 x 1.5	130	59	200	189	65	67	60	50	44	54	100	M10
SA1-70	-	GK1-70	GA2-70	GA2-70 B	140	86	M65 x 1.5	150	66	232	220	75	80	70	55	49	65	111	M12
SA1-80	-	GK1-80	GA2-80	GA2-80 B	160	102	M80 x 2	170	81	265	251	80	80	80	60	55	74	120	M16
SA1-90	-	GK1-90	GA2-90	-	180	124	M100 x 2	210	101	323	302	90	95	90	65	60	-	125	M16
SA1-100	-	GK1-100	GA2-100	-	200	138	M110 x 2	235	111	360	338	105	105	100	70	70	-	140	M20

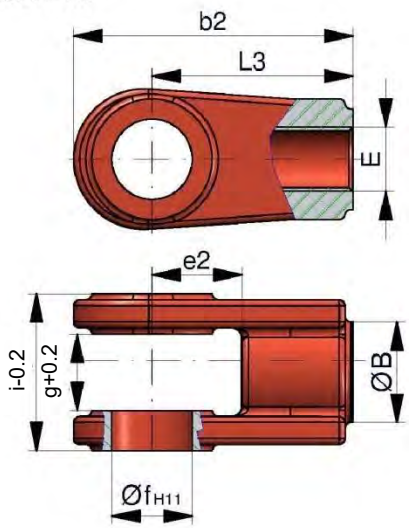
SA1-...



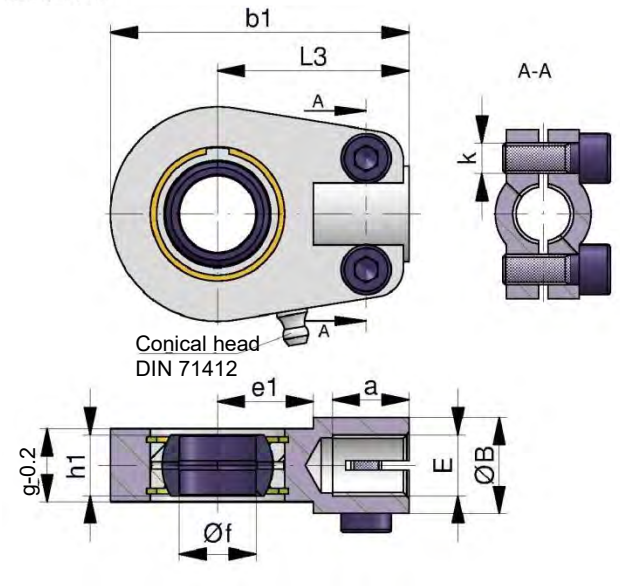
SA2-...



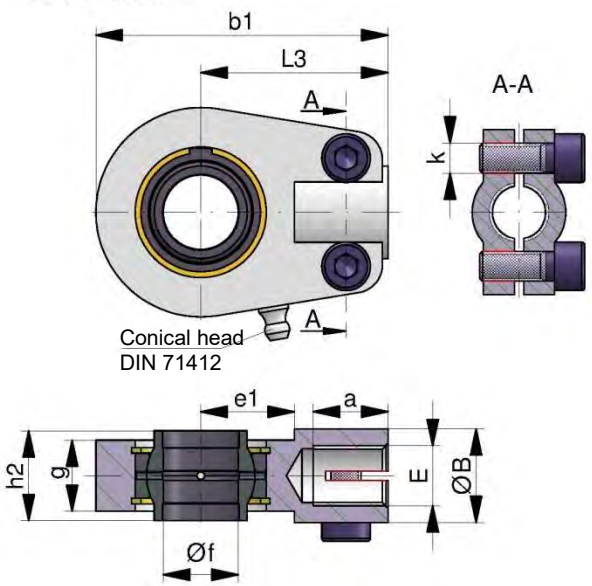
GK1-...



GA2-...



GA2-... B



5 Weight table (kg)

Cylinder type		Designs (stroke = 0)								50 mm Stroke	Mounting eyes					Ø f mm
		X	A	B	G,K	H	C,D	E	F		SA1-	SA2-	GK1-	GA2-	GA2-B	
ZD5.- 30/	22	1.10	1.32	1.20	1.45	1.30	1.60	1.40	1.40	0.28	0.25	--	0.25	0.37	0.37	20
ZD5.- 40/	22	2.05	2.65	2.35	2.47	2.45	2.85	2.65	3.05	0.45	0.30	0.45	0.35	0.43	0.43	25
	25	2.10	2.70	2.40	2.52	2.50	2.90	2.70	3.10	0.48						
	30	2.20	2.80	2.50	2.62	2.60	3.00	2.80	3.20	0.55						
ZD5.- 50/	25	2.96	4.08	3.58	3.64	3.68	4.16	3.96	4.56	0.50	0.50	0.75	0.65	0.70	0.70	30
	30	3.07	4.19	3.69	3.75	3.79	4.27	4.07	4.67	0.65						
	35	3.20	4.32	3.82	3.88	3.92	4.40	4.20	4.80	0.68						
ZD5.- 60/	30	5.51	7.31	6.41	6.74	6.51	7.51	7.11	8.11	0.65	0.90	1.15	1.00	1.11	1.13	35
	35	5.65	7.45	6.55	6.88	6.65	7.65	7.25	8.25	0.72						
	40	5.81	7.61	6.71	7.04	6.81	7.81	7.41	8.41	0.78						
ZD5.- 80/	40	9.90	12.90	10.40	11.72	11.30	13.40	12.70	14.10	1.35	2.00	1.40	1.70	1.32	1.34	40
	50	10.40	13.40	10.90	12.22	11.80	13.90	13.20	14.60	1.60						
	55	10.70	13.70	11.20	12.52	12.10	14.20	13.50	14.90	1.80						
ZD5.-100/	55	19.30	24.70	22.10	22.80	22.30	25.60	23.90	27.30	1.95	2.20	3.40	3.50	3.28	3.32	50
	60	19.60	25.00	22.40	23.10	22.60	25.90	24.20	28.00	2.20						
	70	20.40	25.80	23.20	23.90	23.40	26.70	25.00	28.40	2.50						
ZD5.-120/	70	29.34	37.24	33.24	33.94	33.04	39.14	36.14	41.34	3.10	5.00	5.20	5.50	5.47	5.53	60
	85	31.04	38.94	34.94	35.64	34.74	40.48	37.84	43.04	3.80						
ZD5.-140/	85	43.60	55.80	51.70	52.15	50.10	58.60	54.50	59.60	5.00	8.10	—	8.60	8.57	8.68	70
	100	46.00	58.20	54.10	54.55	52.50	61.00	56.90	62.00	5.95						
ZD5.-160/	90	73.70	90.00	81.80	84.00	90.00	99.20	89.60	105.2	5.73	12.00	—	12.40	12.18	12.35	80
	110	78.70	95.00	86.80	89.00	95.00	104.2	94.60	110.2	6.95						
ZD5.-180/	110	114.00	134.4	124.2	129.5	132.8	146	135.6	159.2	6.68	18.50	--	19.50	21.41	—	90
	125	119.00	139.4	129.2	134.5	137.8	151	140.6	164.2	8.40						
ZD5.-200/	125	166.3	210.5	183.9	189.1	183.9	217	198.9	231.1	10.96	26.00	--	26.80	27.46	—	100
	140	172.7	207.9	190.3	195.5	190.3	223	205.3	237.5	12.19						