AROS Hydraulik GmbH

Product catalogue – ZD1 series
Double-acting hydraulic cylinders

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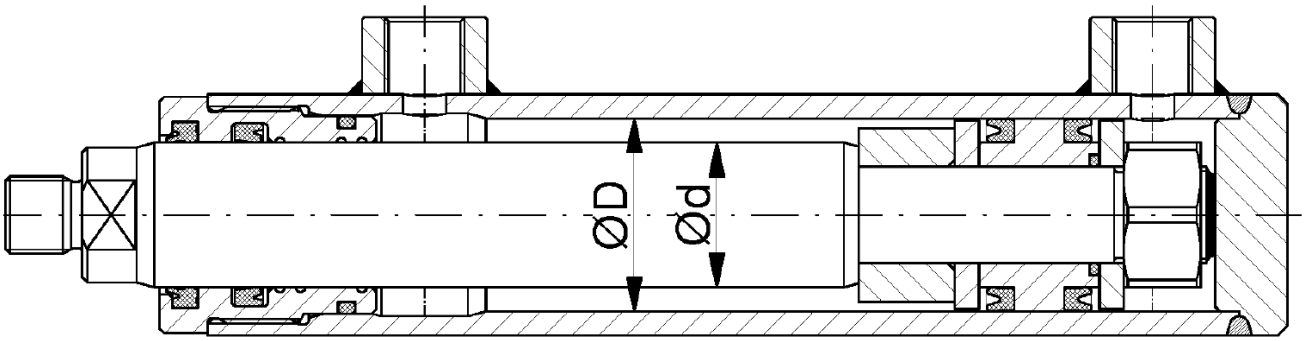
1 General technical data

Robust and universally usable welded-bolted construction for simpler applications.
Easy dismantling and replaceability of all wear parts is ensured. 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)
2x grooved ring seal piston seal:	achieves 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 ZD1 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 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

ZD1 B – 50/35 – 400 – G – E + SA1-25

Double-acting hydraulic cylinders
Series 1

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:

ZD1G – 50/35 – 400 - G ½

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

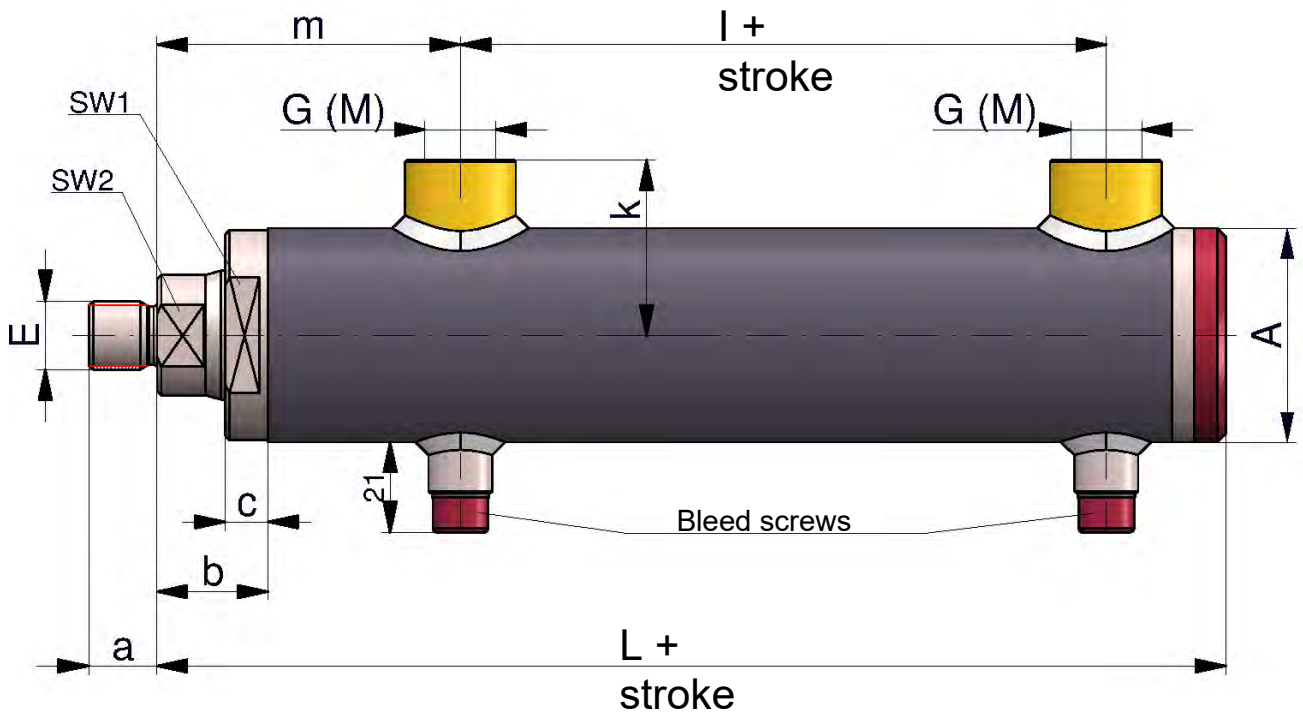
3 Designs

3.1 Design X

Basic version without mounting

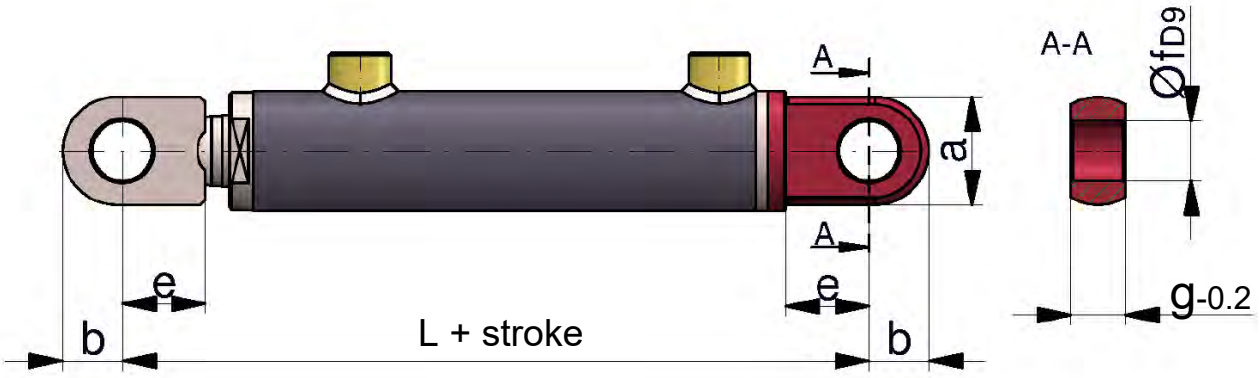
If the connections differ (G, M), the dimension ‘k’ changes; for larger connections, the dimension ‘m’ may increase slightly for designs C and E (dimension ‘l’ decreases accordingly). The bleed screws are located opposite the barrel connections.

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



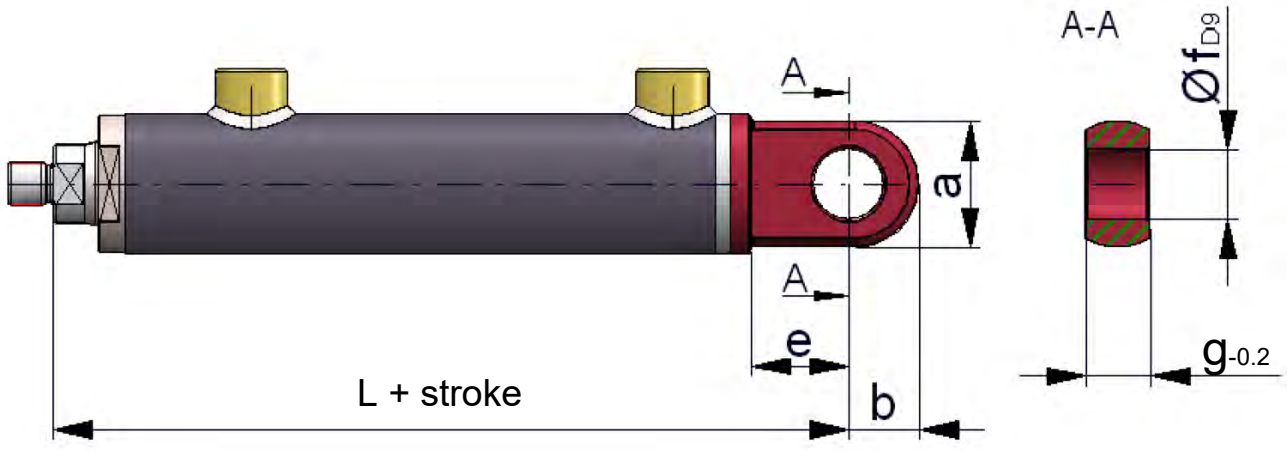
Type ZD1X																					
Piston	30	40			50			60			80			100			120				
Rod	22	22	25	30	25	30	35	30	35	40	40	50	55	55	60	70	70		85		
A	40	50			60			75			95			120			140				
E	M16 x 1.5	M16 x 1.5			M22 x 1.5			M28 x 1.5			M35 x 1.5			M45 x 1.5			M58 x 1.5				
L	117	150			170			194			228			280			312				
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		
a	16	16			22			28			35			45			58				
b	22	26			26			26			35			37			44				
c	10	10			10			10			10			10			12				
k	36	41			46			56			66			78			91				
l	38	51			64			79			90			124			119				
m	59	71			76			82			101			111			138				
G	G ¼	G ⅜			G ⅜			G ½			G ½			G ½			G ¾				
M	M14 x 1.5	M18 x 1.5			M18 x 1.5			M22 x 1.5			M22 x 1.5			M22 x 1.5			M27 x 2				
G max. M max.	G ⅜ M18 x 1.5	G ½ M22 x 1.5			G ¾ M27 x 2			G 1 M33 x 2			G 1 M33 x 2			G 1 M33 x 2			G 1¼ M42 x 2				

3.2 Design A



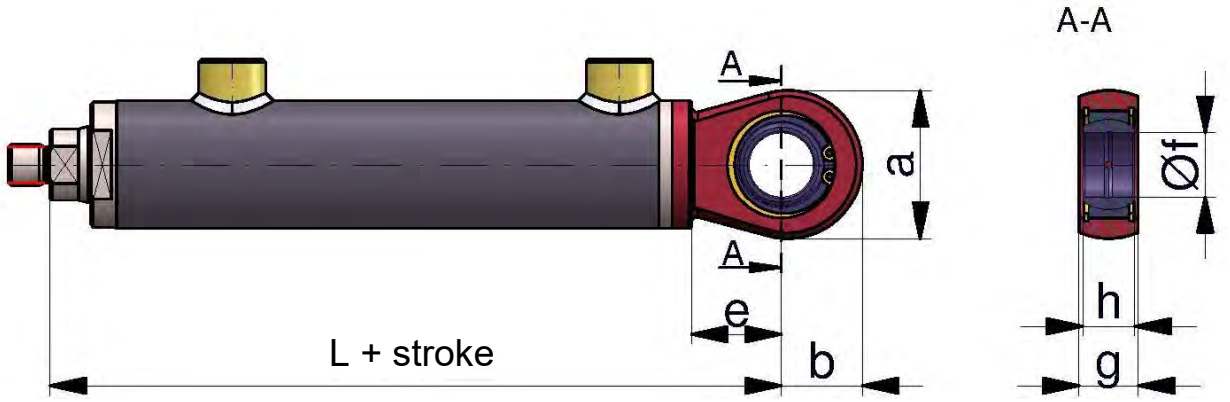
Type ZD1A																			
Piston	30	40			50			60			80			100			120	
Rod	22	22	25	30	25	30	35	30	35	40	40	50	55	55	60	70	70	85
L	175	214			244			290			335			408			450	
a	35	45			55			65			75			95			110	
b	20	25			30			35			40			50			60	
e	30	35			40			50			60			70			70	
f	20	25			30			35			40			50			60	
g	19	23			28			30			35			40			50	

3.3 Design B



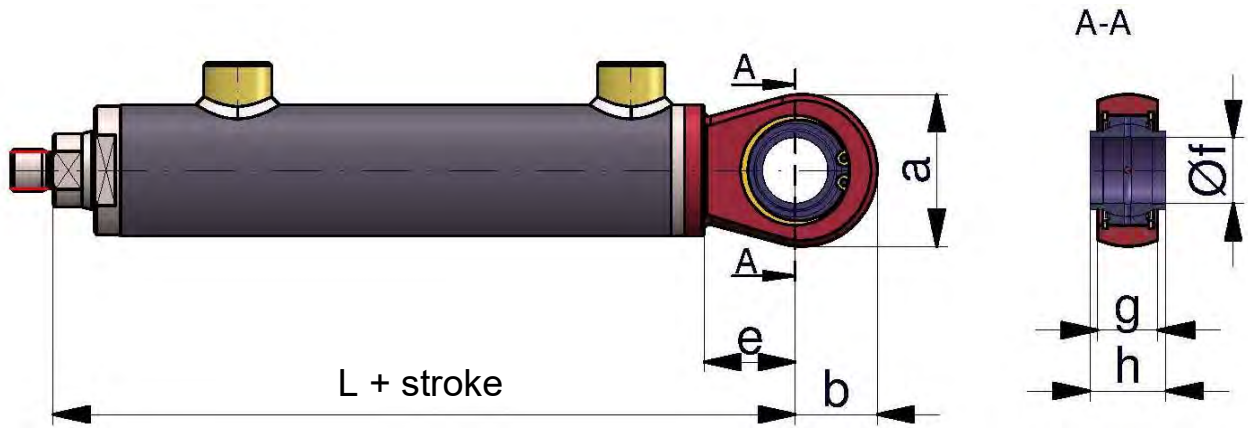
Type ZD1A																			
Piston	30	40			50			60			80			100			120	
Rod	22	22	25	30	25	30	35	30	35	40	40	50	55	55	60	70	70	85
L	147	185			210			244			288			350			382	
a	35	45			55			65			75			95			110	
b	20	25			30			35			40			50			60	
e	30	35			40			50			60			70			70	
f	20	25			30			35			40			50			60	
g	19	23			28			30			35			40			50	

3.4 Design G



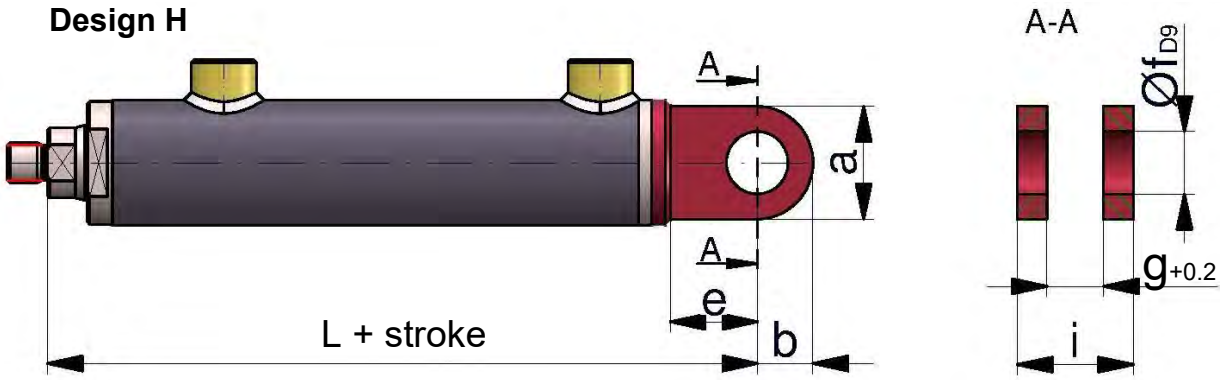
Type ZD1G																		
Piston	30	40			50			60			80			100			120	
Rod	22	22	25	30	25	30	35	30	35	40	40	50	55	55	60	70	70	85
L	147	185			210			244			288			350			382	
a	50	58			65			80			94			116			130	
b	27	32			33			44			50			63			70	
e	30	35			40			50			60			70			70	
f	20	25			30			35			40			50			60	
g	19	23			28			30			35			40			50	
h	16	20			22			25			28			35			44	

3.5 Design K



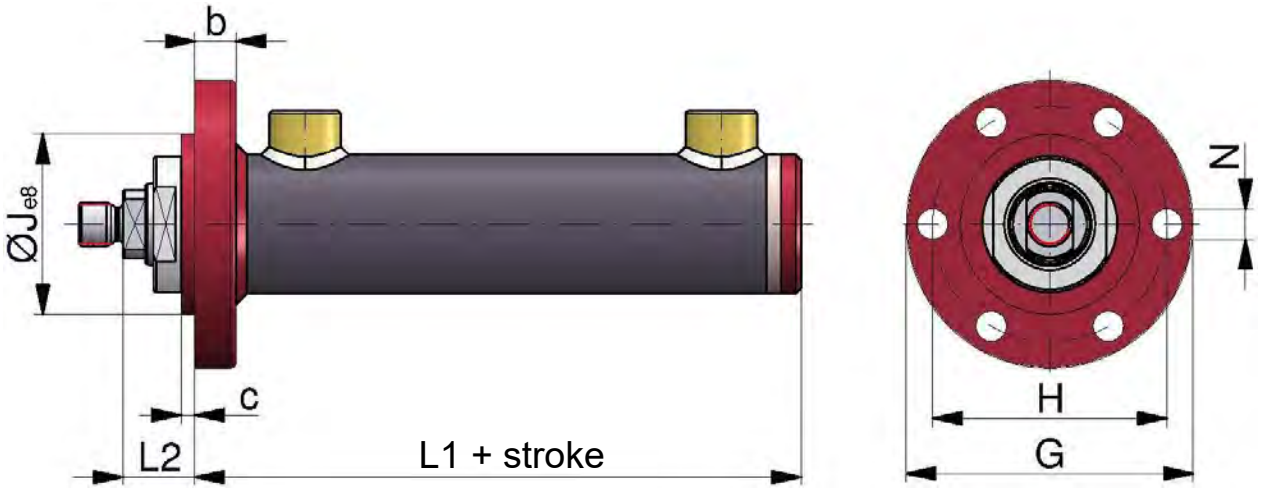
Type ZD1K																		
Piston	30	40			50			60			80			100			120	
Rod	22	22	25	30	25	30	35	30	35	40	40	50	55	55	60	70	70	85
L	147	185			210			244			288			350			382	
a	50	58			65			80			94			116			130	
b	27	32			33			44			50			63			70	
e	30	35			40			50			60			70			70	
f	20	25			30			35			40			50			60	
g	19	23			28			30			35			40			50	
h	24	29			30			35			38			43			54	

3.6 Design H



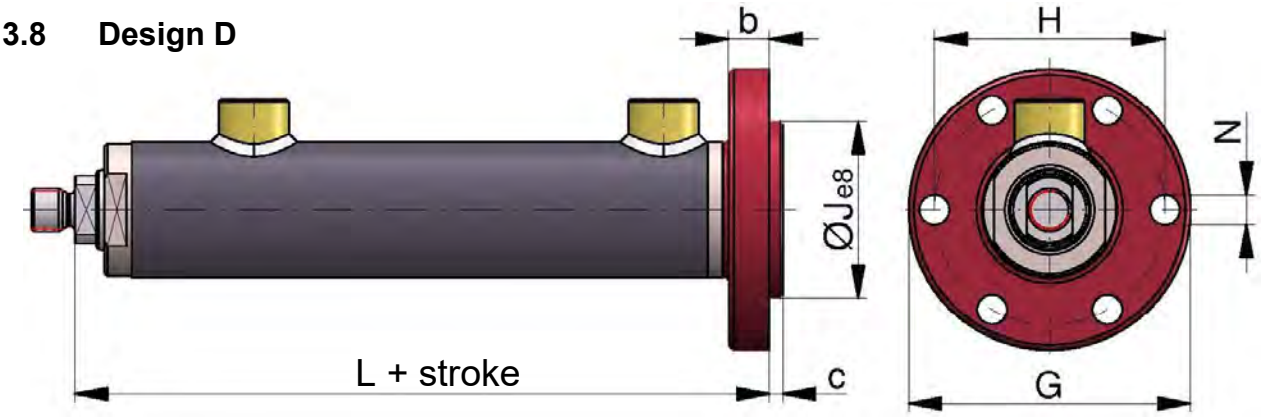
Type ZD1H																			
Piston	30	40			50			60			80			100			120		
Rod	22	22	25	30	25	30	35	30	35	40	40	50	55	55	60	70	70	85	
L	147	185			210			244			288			350			382		
a	35	45			55			65			75			95			110		
b	20	25			30			35			40			50			60		
e	30	35			40			50			60			70			70		
f	20	25			30			35			40			50			60		
g	19	23			28			30			35			40			50		
i	39	47			56			60			71			80			100		

3.7 Design C



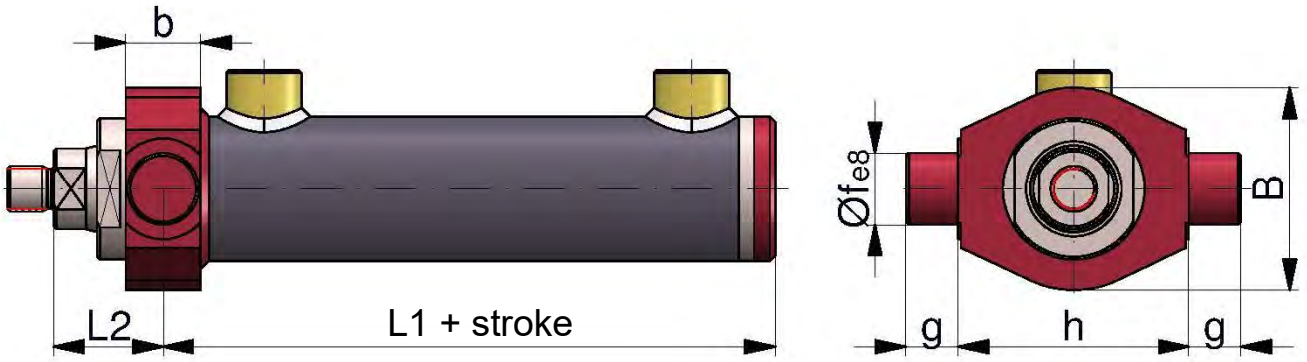
Type ZD1C																			
Piston	30	40			50			60			80			100			120		
Rod	22	22	25	30	25	30	35	30	35	40	40	50	55	55	60	70	70	85	
L1	90	119			139			163			188			238			263		
L2	27	31			31			31			40			42			49		
G	94	104			118			138			178			205			245		
H	75	85			95			115			145			170			205		
J	60	65			75			90			115			140			165		
N	9	11			11			13			17			17			21		
b	12	15			18			22			25			35			40		
c	5	5			5			5			5			5			5		

3.8 Design D



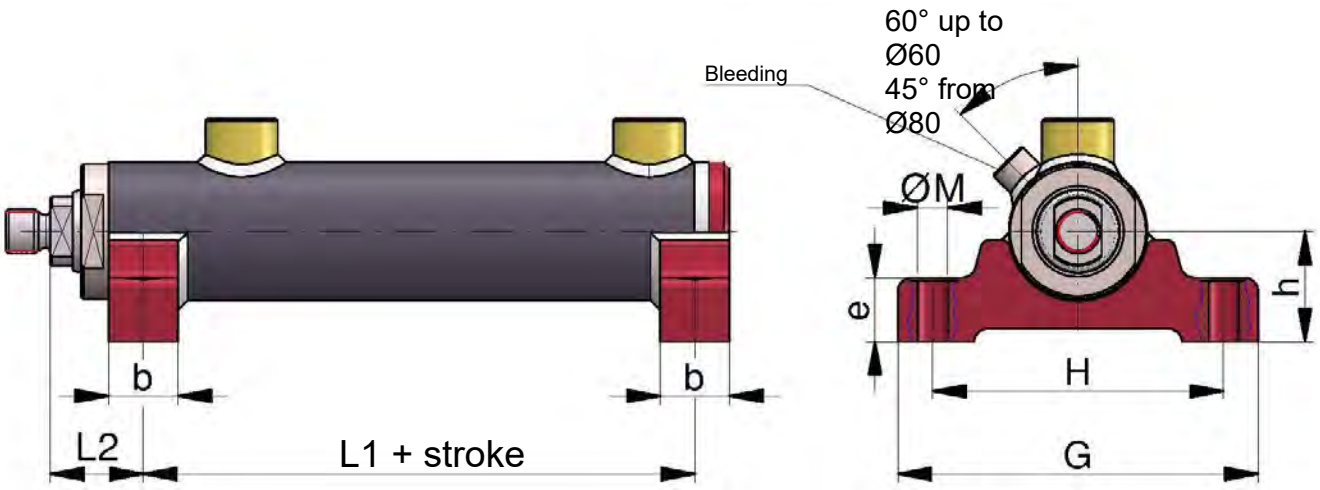
Type ZD1D																		
Piston	30	40			50			60			80			100			120	
Rod	22	22	25	30	25	30	35	30	35	40	40	50	55	55	60	70	70	85
L	129	160			183			211			247			308			345	
G	94	104			118			138			178			205			245	
H	75	85			95			115			145			170			205	
J	60	65			75			90			115			140			165	
N	9	11			11			13			17			17			21	
b	12	15			18			22			25			35			40	
c	5	5			5			5			5			5			5	

3.9 Design E



Type ZD1E																		
Piston	30	40			50			60			80			100			120	
Rod	22	22	25	30	25	30	35	30	35	40	40	50	55	55	60	70	70	85
B	60	70			80			100			125			150			175	
L1	85	111			129			150.5			173			218			238	
L2	32	39			41			43.5			55			62			74	
b	20	26			30			35			40			50			60	
f	20	25			30			35			40			50			60	
g	15	18			20			20			25			30			35	
h	70	80			90			115			140			170			190	

3.10 Design F

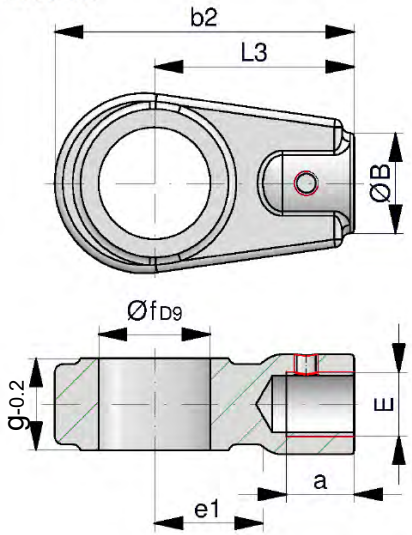


Type ZD1F																	
Piston	30	40			50			60			80			100			120	
Rod	22	22	25	30	25	30	35	30	35	40	40	50	55	55	60	70	70	85
G	110	130			150			175			215			265			295	
H	90	105			120			140			175			215			240	
L1	75	99			114			133			153			193			213	
L2	32	38.5			41			43.5			55			62			71.5	
M	9	11			13			13			17			21			25	
b	20	25			30			35			40			50			55	
e	20	25			30			35			40			50			55	
h	35	40			45			55			68			80			100	

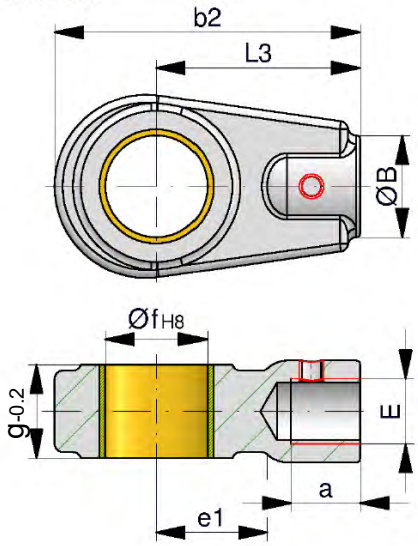
4 Mounting eyes

Type					Cyl. Ø	Dimensions (mm)												
					D	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

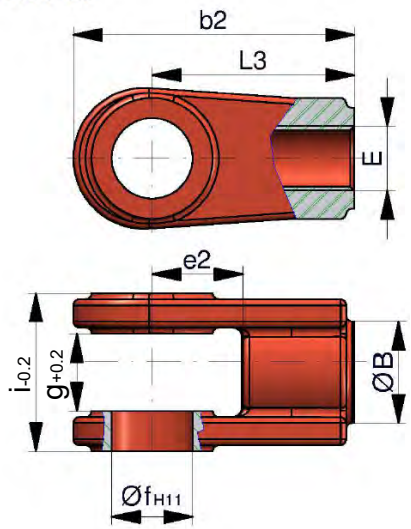
SA1-…



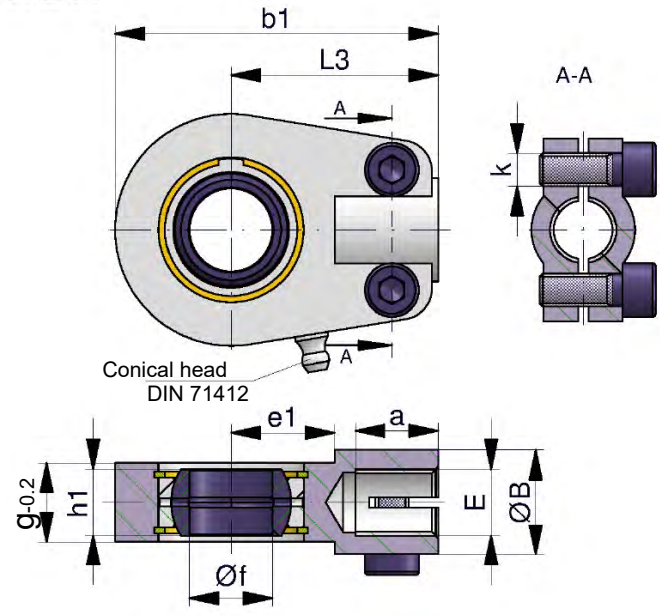
SA2-…



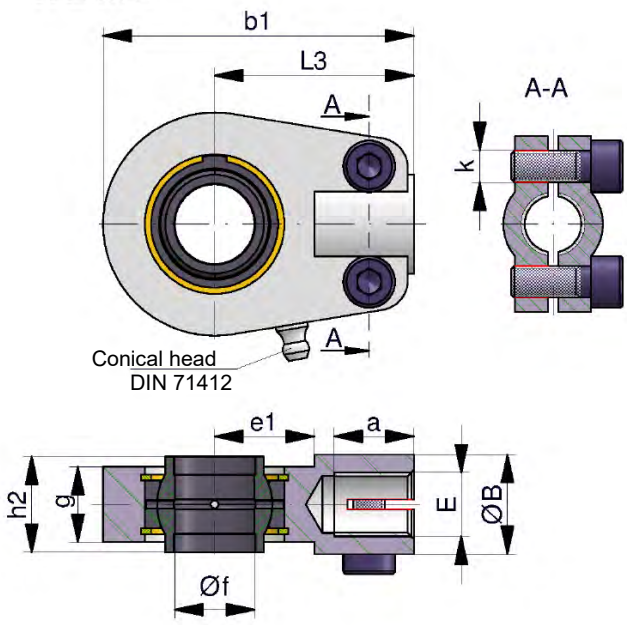
GK1-…



GA2-…



GA2-… B



5 Weight table (kg)

Cylinder type		Designs (Stroke = 0)								50 mm	Mounting eyes					Ø f
		X	A	B	G,K	H	C,D	E	F	Stroke	SA1-	SA2-	GK1-	GA2-	GA2-B	mm
ZD1.- 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
ZD1.- 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						
ZD1.- 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						
ZD1.- 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						
ZD1.- 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						
ZD1.-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						
ZD1.-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						