AROS Hydraulik GmbH

Product catalogue – ZE1 series
Single-acting hydraulic cylinders

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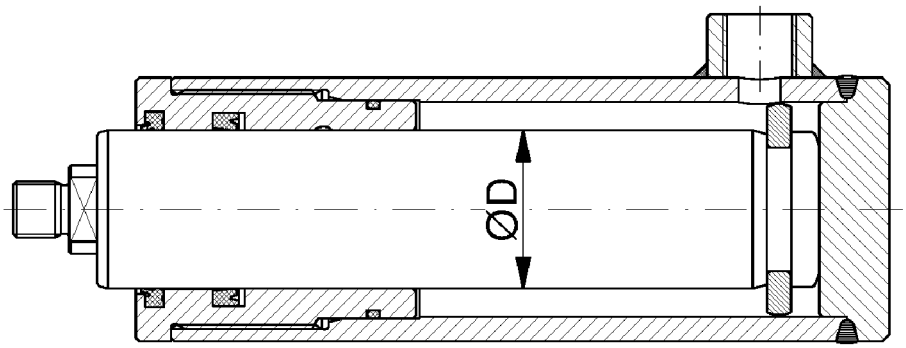
1 General technical data

ZE1 series hydraulic cylinders are single-acting cylinders that produce force in the extension direction only. The piston is returned to its original position either by its self-weight or by an external force. ZE1 series plunger cylinders are fitted with an internal stop that prevents the plunger (piston) from leaving the cylinder. 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
Nominal pressure:	280 bar
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.

Danger

Overpressurisation

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 ZE1 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

ZE1 E – 60 – 350 – G – E + SA1-25

Single-acting hydraulic cylinders
Series 1

Design:
X – Basic version without mounting
A – Swivel eye on the cylinder base and bore on the piston rod
B – Swivel eye on the cylinder base
G – Spherical plain bearing on the cylinder base (standard spherical plain bearing)
K – Spherical plain bearing 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

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; these must then be specified in the type designation as shown in the following example:

ZE1G – 50 – 400 - G ½ - E

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

Longer installation lengths:

The installation lengths L can be increased by using an extended piston. The installation lengths corresponding to the design must then also be stated in the type designation.

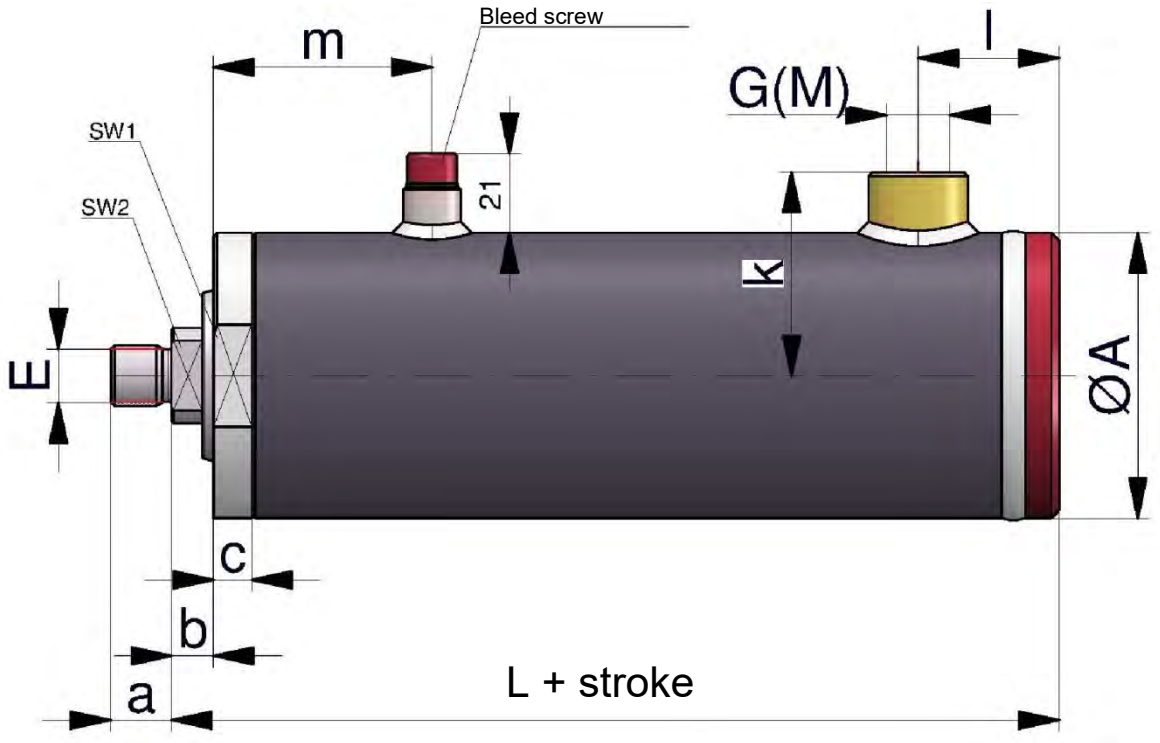
ZE1G – 50 – 400 - 368 - G ½ - E
Stroke
30mm longer installation dimension

3 Designs

3.1 Design X

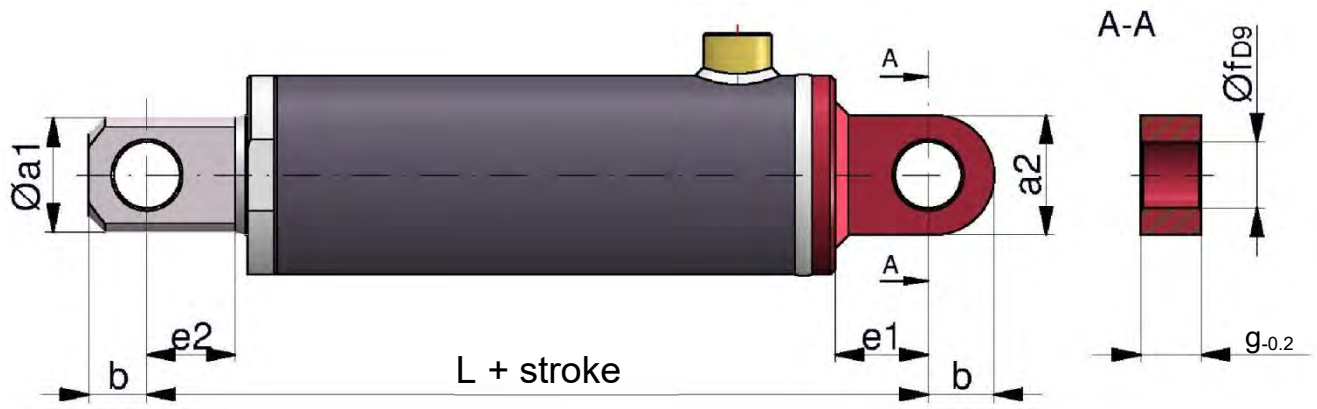
Basic version without mounting

If the connections differ (G, M), the dimension ‘k’ changes.
The bleed screw is on the same side as the barrel connection. For very short strokes, position accordingly relative to the barrel connection.
The max. tightening torque for the bleed screw is 30 Nm.



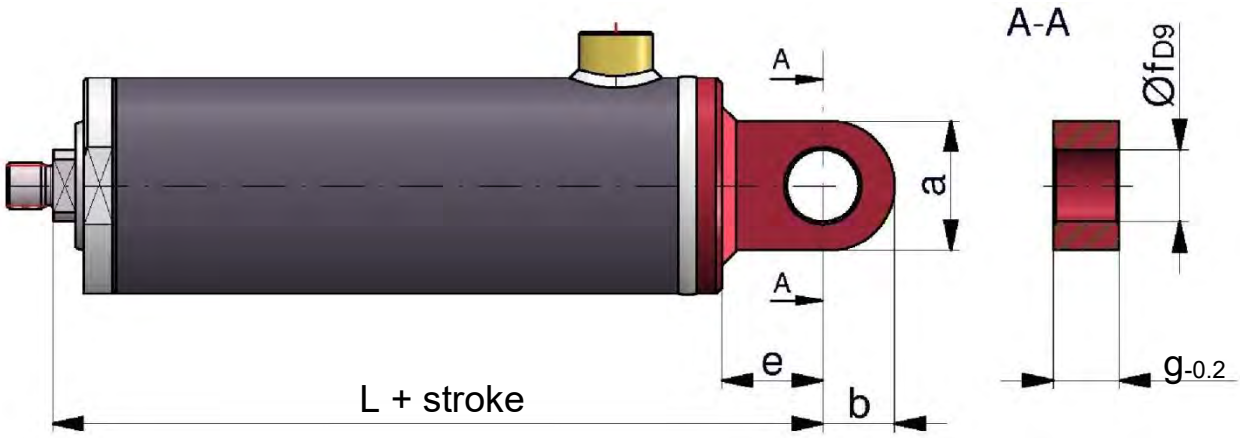
Type ZE1X													
Rod	22	25	30	35	40	45	50	55	60	70	80	90	100
A	40	45	50	60	70	75	80	90	95	105	120	130	153
E	M14x1.5		M16x1.5				M22x1.5		M28x1.5	M35x1.5		M45x1.5	
L	70	81	96	103	119	133	140	150	162	175	210	230	250
AF1	36	41	46	55	60	70	70	80	85	Holes / grooves on the circumference			
AF2	17	17	17	17	17	17	27	27	32	41	41	75	85
a	14	14	16	16	16	16	22	22	28	35	35	45	45
b	12	14	16	16	16	18	20	20	20	26	28	33	36
c	10	10	10	10	10	10	10	10	10	10	12	12	12
k	36	39	41	46	52	56	58	63	66	74	81	86	98
l	20	22	30	30	35	37	37	38	40	42	45	45	50
m	42	47	57	62	72	82	87	92	102	112	132	147	162
G	G ¼	G ¼	G ⅜	G ⅜	G ½	G ½	G ½	G ½	G ½	G ¾	G ¾	G ¾	G ¾
M	M14x1.5		M18x1.5		M22x1.5					M27x2			
G max.	G ½	G ½	G ½	G ½	G ¾	G ¾	G ¾	G ¾	G1	G1	G1	G1	G1 ¼
M max.	M22x1.5				M27x2				M33x2				M42x2

3.2 Design A



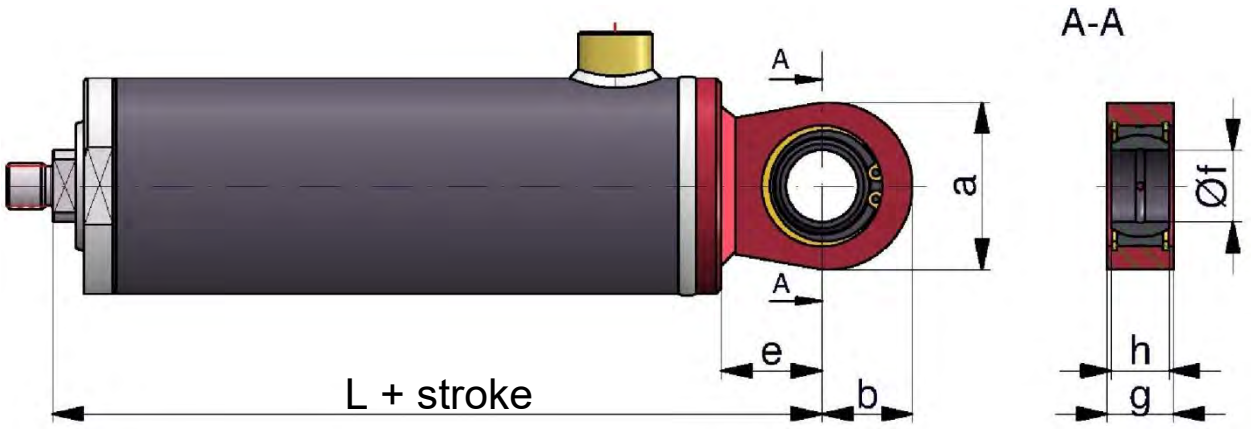
Type ZE1A													
Rod	22	25	30	35	40	45	50	55	60	70	80	90	100
L	107	115	140	147	173	188	205	215	242	277	310	344	362
a1	21	23	29	33	38	43	48	53	58	68	78	88	98
a2	30	30	40	40	50	45	60	60	65	75	75	95	95
b	15	15	20	20	25	25	30	30	35	40	40	50	50
e1	25	23	30	30	35	35	40	40	50	60	60	70	70
e2	20	20	25	25	30	32	40	40	45	62	62	70	70
f	15	15	20	20	25	25	30	30	35	40	40	50	50
g	15	15	19	19	23	23	28	28	30	35	35	40	40

3.3 Design B



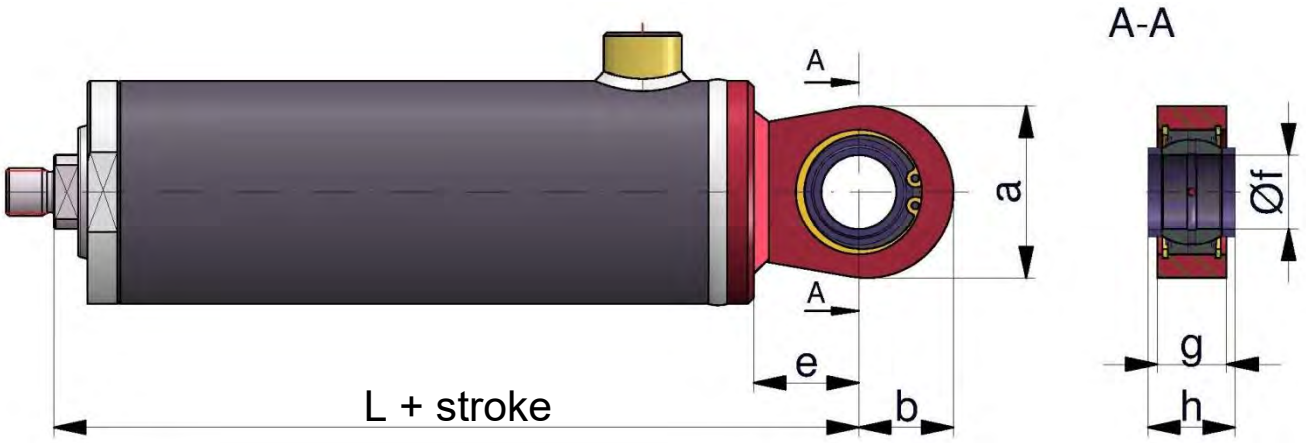
Type ZE1B													
Rod	22	25	30	35	40	45	50	55	60	70	80	90	100
L	95	104	126	133	154	168	180	190	212	235	270	300	320
a	30	30	40	40	50	45	60	60	65	75	75	95	95
b	15	15	20	20	25	25	30	30	35	40	40	50	50
e	25	23	30	30	35	35	40	40	50	60	60	70	70
f	15	15	20	20	25	25	30	30	35	40	40	50	50
g	15	15	19	19	23	23	28	28	30	35	35	40	40

3.4 Design G



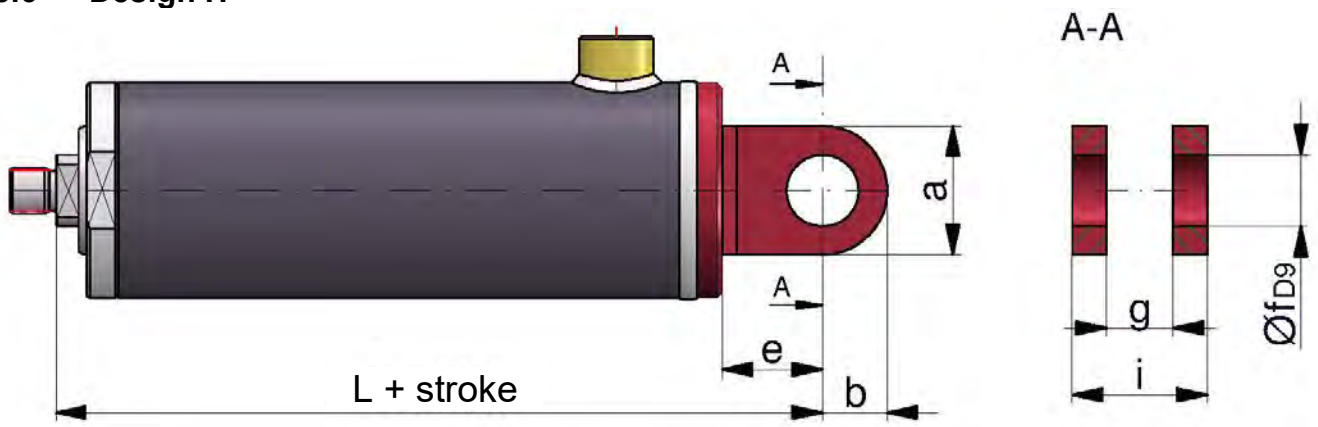
Type ZE1G													
Rod	22	25	30	35	40	45	50	55	60	70	80	90	100
L	95	104	126	133	154	168	180	190	212	235	270	300	320
a	40	40	50	50	58	58	65	65	80	94	94	116	116
b	20	20	27	27	32	32	33	33	44	50	50	63	63
e	25	25	30	30	35	35	40	40	50	60	60	70	70
f	15	15	20	20	25	25	30	30	35	40	40	50	50
g	15	15	19	19	23	23	28	28	30	35	35	40	40
h	12	12	16	16	20	20	22	22	25	28	28	35	35

3.5 Design K



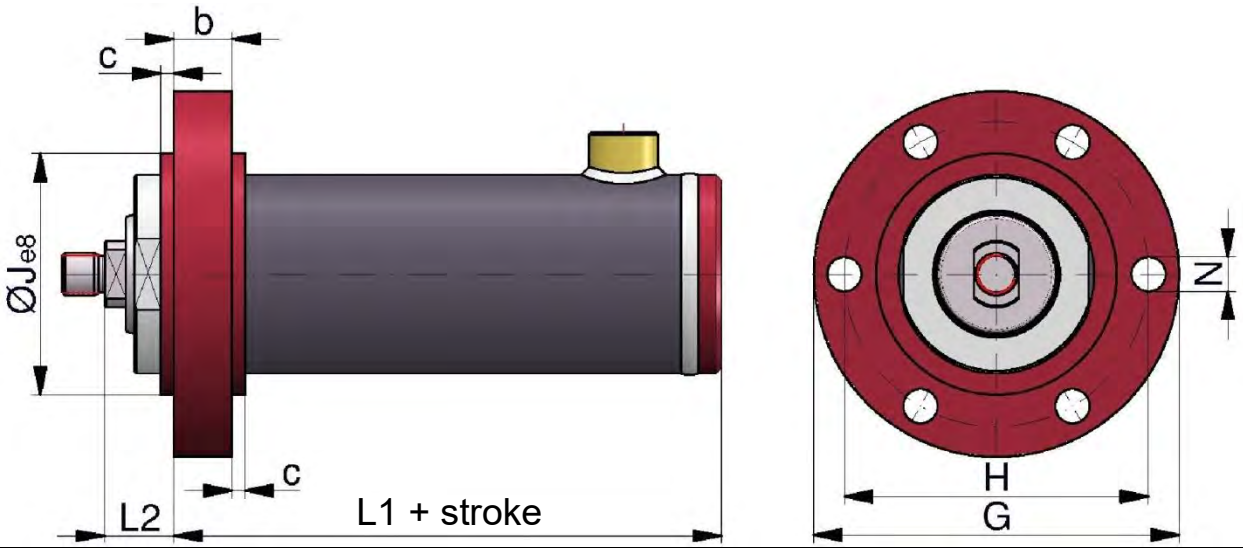
Type ZE1K													
Rod	22	25	30	35	40	45	50	55	60	70	80	90	100
L	-	-	126	133	154	168	180	190	212	235	270	300	320
a	-	-	50	50	58	58	65	65	80	94	94	116	116
b	-	-	27	27	32	32	33	33	44	50	50	63	63
e	-	-	30	30	35	35	40	40	50	60	60	70	70
f	-	-	20	20	25	25	30	30	35	40	40	50	50
g	-	-	19	19	23	23	28	28	30	35	35	40	40
h	-	-	24	24	29	29	30	30	35	38	38	43	43

3.6 Design H



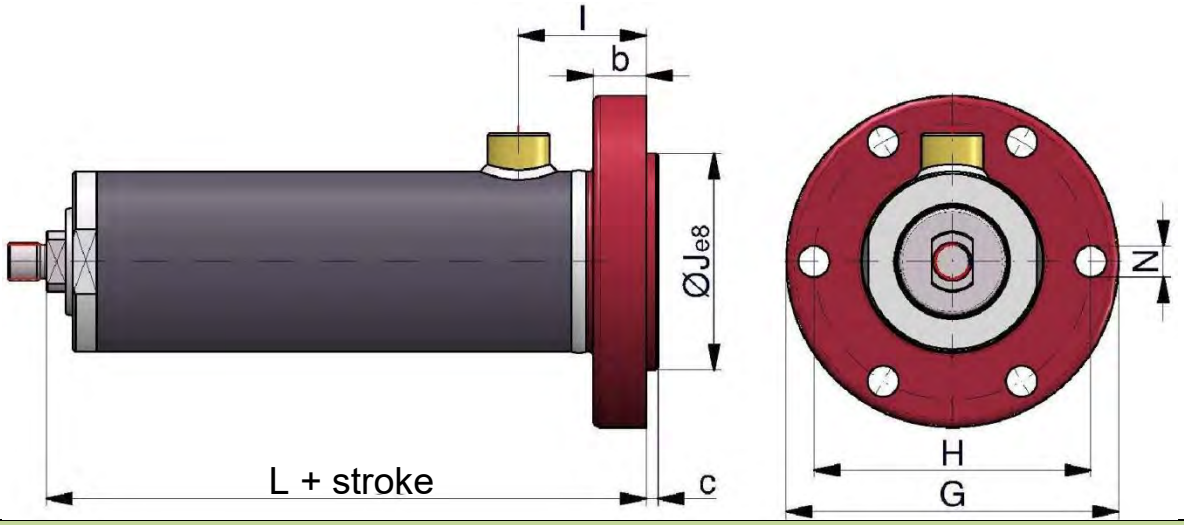
Type ZE1H													
Rod	22	25	30	35	40	45	50	55	60	70	80	90	100
L	95	106	126	133	154	168	180	190	212	235	270	300	320
a	30	30	35	35	45	45	55	55	65	75	75	95	95
b	18	18	25	25	25	25	30	30	35	40	40	51	51
e	25	25	30	30	35	35	40	40	50	60	60	70	70
f	15	15	20	20	25	25	30	30	35	40	40	50	50
g	15	15	19	19	23	23	28	28	30	35	35	40	40
i	31	31	39	39	47	47	56	56	62	71	71	80	80

3.7 Design C



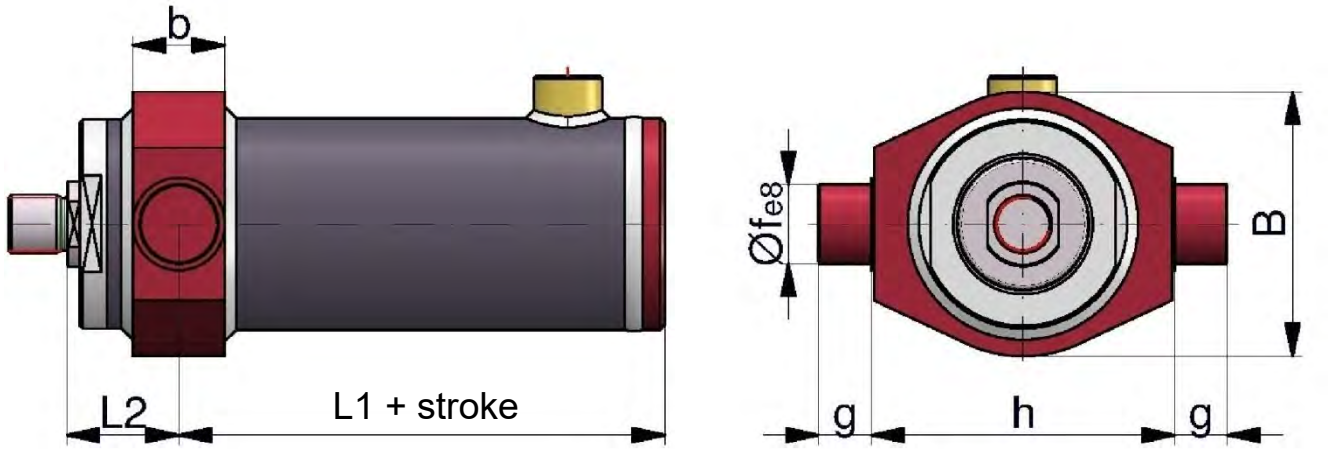
Type ZE1C													
Rod	22	25	30	35	40	45	50	55	60	70	80	90	100
L1	43	52	65	72	88	100	105	115	127	134	165	180	197
L2	27	29	31	31	31	33	35	35	35	41	45	50	53
G	94	94	104	118	138	138	138	178	178	188	205	215	245
H	75	75	85	95	115	115	115	145	145	155	170	180	205
J	60	60	65	75	90	90	90	115	115	120	140	150	165
N	9	9	11	11	13	13	13	17	17	17	17	17	21
b	12	12	15	18	22	22	22	25	25	35	35	35	40
c	5	5	5	5	5	5	5	5	5	5	5	5	5

3.8 Design D



Type ZE1D													
Rod	22	25	30	35	40	45	50	55	60	70	80	90	100
L	82	91	106	116	136	149	156	169	176	202	238	258	283
G	94	94	104	118	138	138	138	178	178	188	205	215	245
H	75	75	85	95	115	115	115	145	145	155	170	180	205
I	32	32	40	43	52	53	53	57	54	69	73	73	83
J	60	60	65	75	90	90	90	115	115	120	140	150	165
N	9	9	11	11	13	13	13	17	17	17	17	17	21
b	12	12	15	18	22	22	22	25	25	35	35	35	40
c	5	5	5	5	5	5	5	5	5	5	5	5	5

3.9 Design E

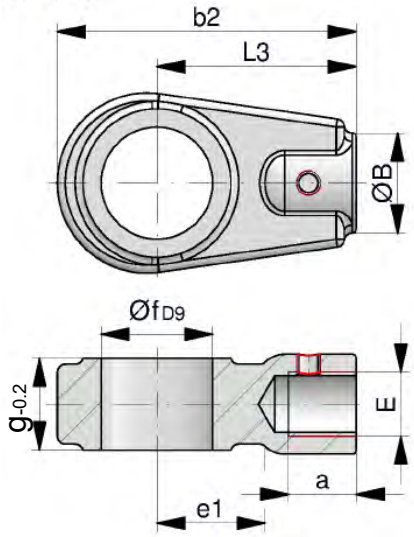


Type ZE1D													
Rod	22	25	30	35	40	45	50	55	60	70	80	90	100
L1	28	37	47.5	52	66	78	82.5	90	102	105	130	140	150
L2	42	44	48.5	51	53	55	57.5	60	60	70	80	90	100
B	60	60	70	80	100	100	100	125	125	130	150	160	175
g	10	10	15	15	18	18	20	20	20	25	30	30	35
h	70	70	80	90	115	115	115	140	140	140	170	170	190
f	15	15	20	20	25	25	30	30	35	40	50	50	60
b	20	20	25	30	34	34	35	38	40	40	50	50	60

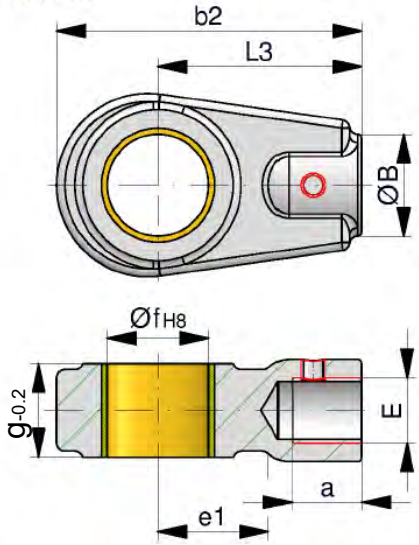
4 Mounting eyes

Type					Cyl. Ø D	Dimensions (mm)													
						B	E	L3	a	b1	b2	e1	e2	f	g	h1	h2	i	k
SA1-15	-	GK1-15	GA2-15	-	22;25	22	M14 x 1.5	47	15	69	63.5	20	20	15	15	12	-	31	M6
SA1-20	-	GK1-20	GA2-20	GA2-20 B	30;35	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;45	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;55	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	70;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	90;100	61	M45 x 1.5	105	46	168	168	55	60	50	40	35	43	80	M12

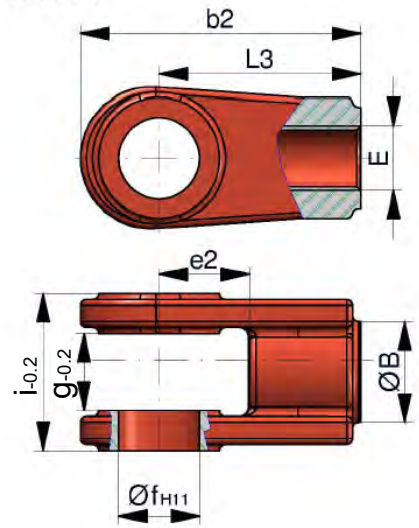
SA1-...



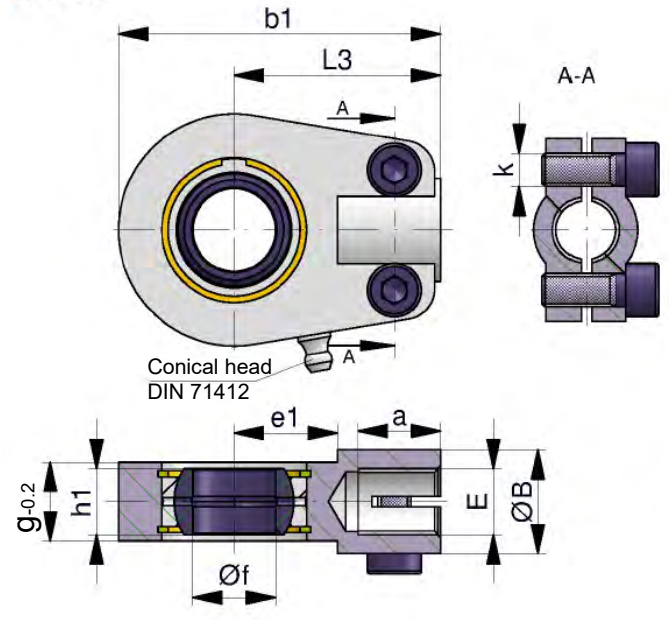
SA2-...



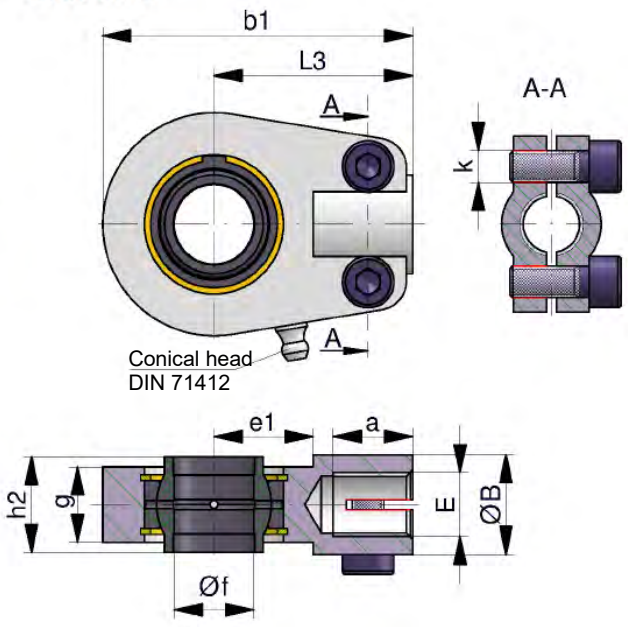
GK1-...



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		SA1-	SA2-	GK1-	GA2-	GA2-B	
ZE1.- 22	0.64	0.83	0.79	0.83	0.81	1.54	0.94	0.37	0.12	--	0.16	0.22	--	15
ZE1.- 25	0.90	1.10	1.06	1.10	1.08	1.80	1.23	0.44						
ZE1.- 30	1.47	1.82	1.72	1.83	1.85	2.83	2.22	0.56	0.25	--	0.25	0.37	0.37	20
ZE1.- 35	2.26	2.67	2.53	2.65	2.62	4.30	3.17	0.72						
ZE1.- 40	3.40	4.19	3.93	4.02	3.99	6.58	5.04	1.02	0.30	0.45	0.35	0.43	0.43	25
ZE1.- 45	4.60	5.54	5.19	5.25	5.19	7.15	6.12	1.21						
ZE1.- 50	5.65	6.91	6.44	6.40	6.66	9.11	6.91	1.44	0.50	0.75	0.65	0.70	0.70	30
ZE1.- 55	7.53	8.83	8.26	8.45	8.59	12.58	10.16	1.74						
ZE1.- 60	9.52	12.22	11.44	11.09	11.32	15.73	12.43	2.16	0.90	1.15	1.00	1.11	1.13	35
ZE1.- 70	13.05	16.74	15.18	15.55	15.75	22.44	15.84	2.72	2.00	1.40	1.70	1.32	1.34	40
ZE1.- 80	19.46	23.61	21.66	22.14	21.99	31.67	24.41	3.34						
ZE1.- 90	25.71	31.99	29.29	29.95	29.51	32.74	31.00	4.02	2.20	3.40	3.50	3.28	3.32	50
ZE1.- 100	32.78	40.07	36.89	36.34	36.89	51.96	39.92	5.99						