

Hydraulic Cylinder ZB 2001

without end position cushioning,
Piston - $\varnothing$ 25÷200 mm,
Nominal pressure 16 MPa

Brochure	SD-11511-1
Edition	11/98
Replaces	SD-11510-1

Storz
HYDRAULIKSYSTEME



Description

The ZB 2001 hydraulic cylinder series is a cylinder series of welded construction designed for general industrial use.

As standard, two piston rod diameters are available for one cylinder size ($\varphi = 1,4$ and $\varphi = 2$). The piston rods are optionally hard chrome-plated, induction-hardened or induction-hardened and hard chrome-plated.

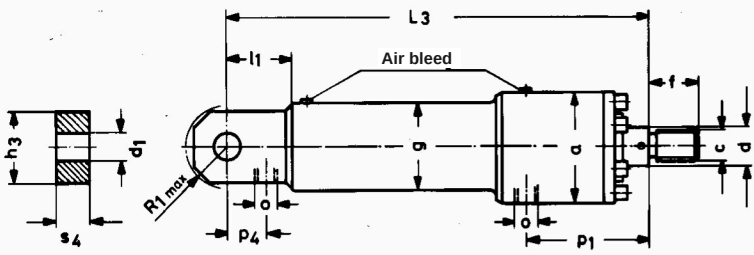
6 different mounting types and several seal variants guarantee a broad range of applications. The close diameter grading also allows a technically optimum and economical design of hydraulic systems.

Technical data

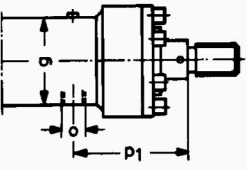
Nominal pressure	16 MPa (160 bar)
Static test pressure	24 MPa (240 bar)
Area ratio φ	1,4 and 2
Pressure medium temperature range	$\varphi_{\text{m min}} \dots \varphi_{\text{m max}} - 20 \dots + 80^\circ \text{C}$
Viscosity range	$\nu_{\text{min}} \dots \nu_{\text{max}} (10 \dots 600) 10^{-6} \frac{\text{m}^2}{\text{s}}$
Stroke speed range	$v_{\text{min}} \dots v_{\text{max}} 0 - 0,5 \frac{\text{m}}{\text{s}}$ standard (higher speeds on request)
Hydraulic fluid	a) Mineral oil b) fire-resistant fluids based on phosphate ester in combination with PTFE and Viton seals. c) for other fluids please consult us.

Dimensions

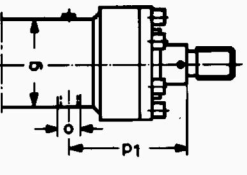
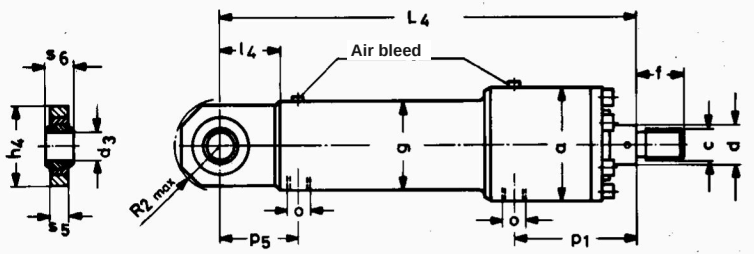
Mounting types



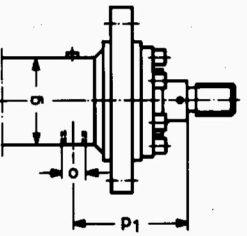
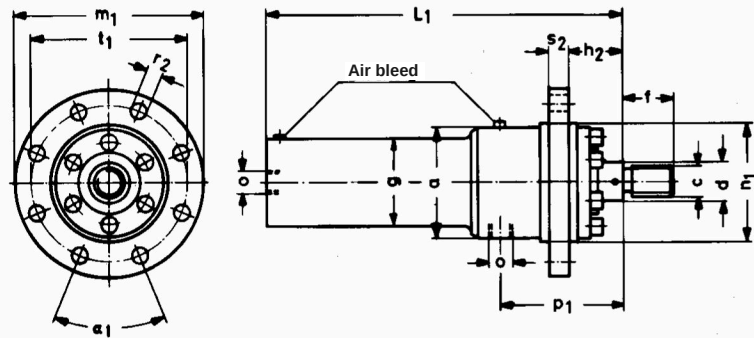
Version > Ø 160



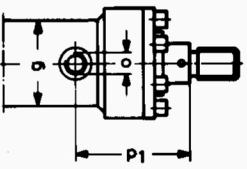
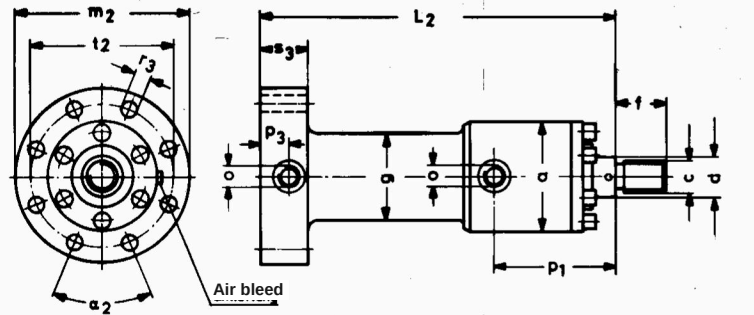
S
Spherical eye



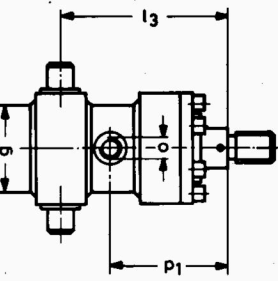
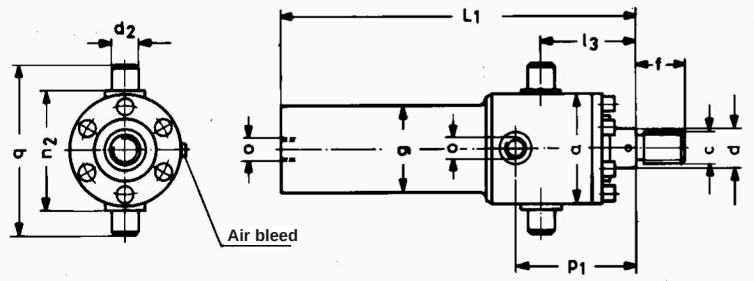
SG
Spherical eye
with spherical bearing



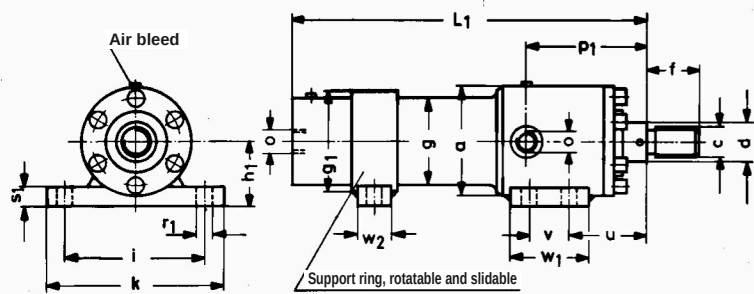
F
Flange



P
Base plate



SZ
Trunnion



Version
only up to
piston Ø 160

L
Foot mounting

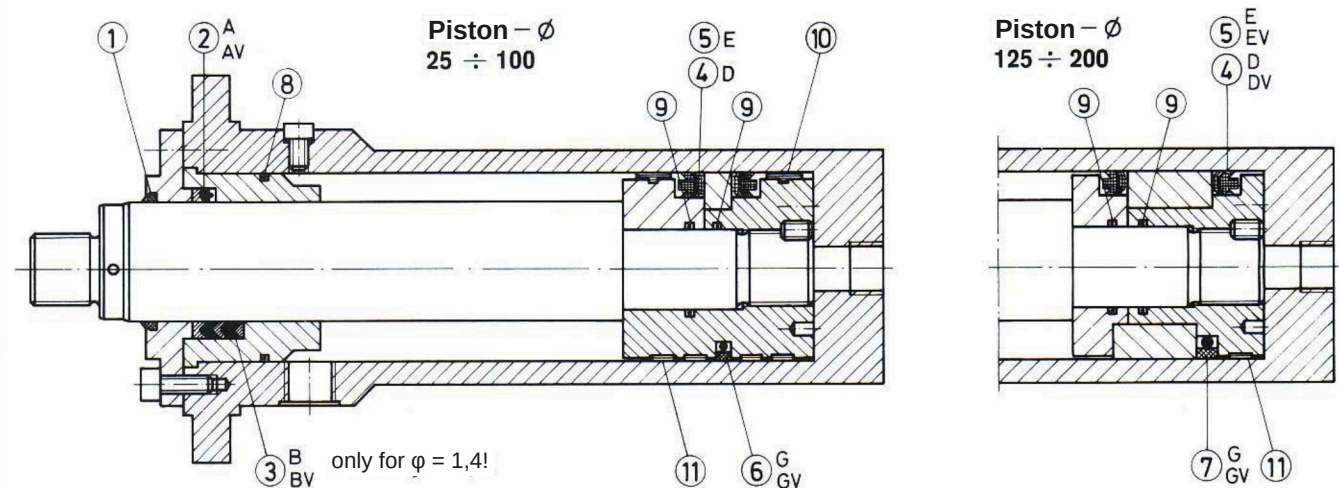
Dimension table

Piston – Ø D	25	32	40	50	63	80	100
Rod – Ø d	18	22	22 28	28 36	36 45	45 56	56 70
Piston area A ₁ [cm ²]	4,9	8,0	12,6	19,6	31,2	50,3	78,5
Annular area A ₂ [cm ²]	2,4	4,2	8,8 6,4	13,5 9,5	21 15,3	34,4 25,6	54 40
L ₁ = Stroke +	127	138	151	165	194	207	229
L ₂ = Stroke +	137	146	163	177	212	225	245
L ₃ = Stroke +	157	170	191	210	250	270	299
L ₄ = Stroke +	162	174	198	217	257	281	315
Connection thread o	R 1/4	R 1/4	R 3/8	R 3/8	R 1/2	R 1/2	R 1/2
Rod thread c	M 10	M 12×1,5	M 14×1,5	M 18×1,5	M 22×1,5	M 30×1,5	M 38×1,5
f	16	18	20	25	30	30	30
Ø a	60	64	72	80	98	118	142
Ø d ₁ H8	14	18	20	25	32	40	50
Ø d ₂ f8	14	16	18	20	25	32	40
Ø d ₃	12 ^{-0,008}	15 ^{-0,008}	17 ^{-0,008}	20 ^{-0,01}	25 ^{-0,01}	30 ^{-0,01}	40 ^{-0,012}
Ø g ~	35	42	50	62	78	102	121
Ø g ₁	45	55	60	75	88	112	133
h ₁	32	36	40	50	56	70	80
h ₂	26	28	33	37	40	40	42
h ₃	35	42	50	50	62	85	100
h ₄	35	42	50	60	70	90	110
i	75	80	90	100	115	140	170
k	92	98	108	118	135	165	200
l ₁	30	32	40	45	56	63	70
l ₃	48	52	60	67	70	76	76
l ₄	25	28	35	40	45	56	70
Ø m ₁	88	98	110	115	145	165	200
Ø m ₂	62	72	88	98	118	138	175
Ø n ₁ f8	63	70	80	85	105	125	150
n ₂	63	70	75	85	100	125	150
p ₁	55	59	69	75	86	90	98
p ₃	13	13	14	15	18	18	18
p ₄	18	20	24	29	38	45	50
p ₅	36	39	48	55	62	74	88
q	80	90	100	110	130	165	200
Ø r ₁	9	9	9	9	11	14	18
Ø r ₂	5,5	6,6	9	9	11	11	14
Ø r ₃	5,5	6,6	9	9	11	11	14
R ₁ max	18	22	26	27	34	46	54
R ₂ max	21	23	30	37	42	56	68
s ₁	10	10	14	14	14	18	18
s ₂	8	10	12	12	14	16	18
s ₃	24	24	27	29	34	34	34
s ₄	20	22	25	28	36	45	56
s ₅	7	9	10	12	16	18	22
s ₆	10	12	14	16	20	22	28
Ø t ₁	75	85	95	100	125	145	175
Ø t ₂	50	60	70	80	100	120	150
u	34	40	47	53	60	60	60
v	18	18	18	18	22	25	30
w ₁	35	35	35	35	40	50	60
w ₂	20	20	20	20	20	25	30
α ₁ °	60	60	90	60	60	45	45
α ₂ °	60	60	90	60	60	60	60

(dimensions in mm)

110	125	140	160	180	200	220	250
63 80 95 63,9 44,8	70 90 123 84,2 59,1	80 100 154 104 75,4	90 110 201 137 106	100 125 254 176 132	110 140 314 219 160	125 160 380 257 179	140 180 491 337 236
252 270 332 345 R ³ / ₄ M 45×1,5 36	272 290 356 375 R ³ / ₄ M 48×1,5 36	302 314 397 409 R ³ / ₄ M 56×1,5 40	328 347 428 455 R 1 M 60×1,5 40	368 385 483 505 R 1 M 70×1,5 45	400 415 525 540 R 1 M 80×1,5 50		
155 55 45 45 _{-0,012} 133 150 90	170 60 50 50 _{-0,012} 153 165 100	192 70 60 60 _{-0,015} 171 190 112	214 80 70 70 _{-0,015} 194 214 125	244 90 80 80 _{-0,015} 219	270 100 90 90 _{-0,02} 245		
45 90 120 190 225 80 90	48 100 140 200 240 84 95	54 120 160 230 280 95 102	58 130 180 250 300 100 112	63 140 200 115 265	67 160 220 125 285		
75 220 198 160 160 115 22	85 240 218 180 180 122 22	95 260 238 200 200 134 22	108 300 258 220 220 142 28	120 330 298 250 250 161 30	125 360 328 280 290 177 30		
55 95 220 22 18 18 53	59 105 240 22 18 18 58	67 115 270 26 18 18 73	70 132 300 26 22 18 75	83 150 350 22 18 90	93 155 410 22 22 100		
73 22 20 40 63 25 32	86 22 22 40 70 28 35	97 28 25 40 75 36 44	108 28 28 51 90 40 49	120 32 51 110 45 55	135 36 51 120 50 60		
190 170 70 40 80 40 60 90	210 190 76 40 80 40 60 60	230 210 78 50 100 50 45 60	260 230 85 50 100 50 60 45	290 260 45 45	320 290 30 45		

Schematic sections



Spare parts ordering

Information required when ordering **individual replacement seals**:

Item number of the seal and complete type designation of the cylinder

Example: 2 seals item 9 for ZB 2001-80/56-SG-500-AV GV 1B. 1

Information required when ordering **complete seal kits**:

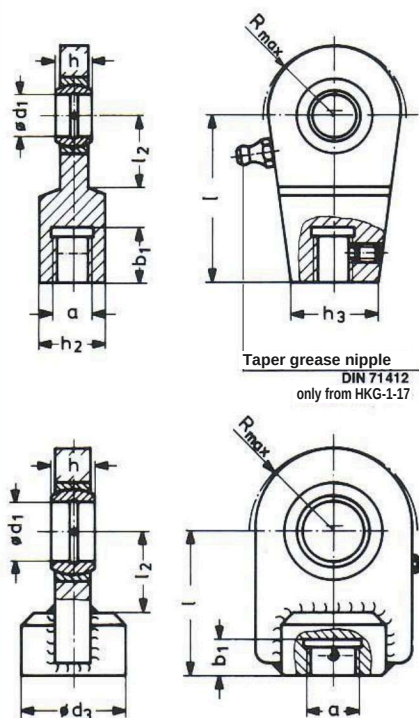
Complete type designation of the cylinder

Example: 1 compl. seal kit for ZB 2001-63/45-F-30-AE 1 B. 1

Accessories – Piston rod heads (order separately)

Rod eyes HKG

(corresponds to SD 19020 and 19030)



Rod eyes

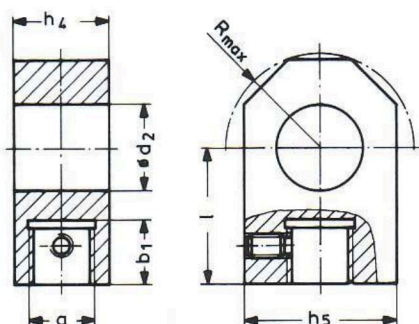
Type	$\varnothing d_1$	h	a	b ₁	l	l ₂	R _{max}	h ₂	h ₃	$\varnothing d_3$
HKG-1-12	12-0,008	10	M 10	16	50	22	17,5	20	25	
HKG-1-15	15-0,008	12	M 12×1,5	18	53	23	20	22	30	
HKG-1-17	17-0,008	14	M 14×1,5	20	63	28	27	25	35	
HKG-1-20	20-0,01	16	M 18×1,5	25	76	33	33	30	40	
HKG-1-25	25-0,01	20	M 22×1,5	30	87	39	38	35	50	
HKG-1-30	30-0,01	22	M 30×1,5	30	98	41	49	45	65	
HKG-1-40	40-0,012	28	M 38×1,5	30	112	52	60	55	75	
HKG-1-45	45-0,012	32	M 45×1,5	36	125	70	65			80
HKG-1-50	50-0,012	35	M 48×1,5	36	137	77	72			85
HKG-1-60	60-0,015	44	M 56×1,5	40	150	85	83			100
HKG-1-70	70-0,015	49	M 60×1,5	40	164	94	98			120
HKG-1-80	80-0,015	55	M 70×1,5	45	184	104	108			130
HKG-1-90	90-0,02	60	M 80×1,5	50	195	110	118			140

Swivel heads

Type	$\varnothing d_2$ H7	h ₄	a	b ₁	l	R _{max}	h ₅		
HK-1- 14	14	20	M 10	16	30	16	25		
HK-1- 18	18	22	M 12×1,5	18	32	18	30		
HK-1- 20	20	25	M 14×1,5	20	40	22	40		
HK-1- 25	25	28	M 18×1,5	25	45	24	40		
HK-1- 32	32	36	M 22×1,5	30	56	30	50		
HK-1- 40	40	45	M 30×1,5	30	63	43	70		
HK-1- 50	50	56	M 38×1,5	30	70	48	80		
HK-1- 55	55	63	M 45×1,5	36	80	52	90		
HK-1- 60	60	70	M 48×1,5	36	84	58	100		
HK-1- 70	70	75	M 56×1,5	40	95	73	120		
HK-1- 80	80	90	M 60×1,5	40	100	75	130		
HK-1- 90	90	110	M 70×1,5	45	115	90	140		
HK-1-100	100	120	M 80×1,5	50	125	100	160		

Swivel heads HK

(corresponds to 1150-15)



Model code

ZB 2001

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additional
specifications

Double-acting hydraulic cylinder

Nominal pressure 16 MPa (160 bar)

Piston diameter in mm

Piston rod diameter in mm

Mounting types

- S Spherical eye
- SG Spherical eye with spherical bearing
- F Flange at cylinder head
- P Base plate
- SZ Trunnion (l3 dimension **to be stated when ordering!**)
- L Foot mounting (for force-fit installation max. operating pressure p max ≤ 10 MPa)

Cylinder stroke in mm

Rod seal

- A **U-cup seal of NBR (standard version)**
 - AV U-cup seal of FKM (Viton) for p ≤ 12 MPa
 - B Seal kit 3-piece of NBR
 - BV Seal kit 3-piece of FKM (Viton)
 - S Special seal (identified by additional specifications)
- only for area ratio $\phi = 1,4$

Piston seal

- E **Seal kit 2-piece of fabric + NBR (standard version)**
- EV Seal kit 2-piece of fabric + FKM (Viton) (only for piston $\phi 125 \div 200$) on request
- D U-cup seal of NBR
- DV U-cup seal of FKM (Viton) (only for piston $\phi 125 \div 200$)
- G **Glydring of PTFE + NBR (standard version)**
- GV Glydring of PTFE + FKM (Viton)
- S Special seal (identified by additional specifications)

Piston rod end

- 1 **External thread**
- 2
- 3 Special version (identified by additional specifications)

Piston rod surface

- B **hard chrome-plated (standard version)**
- A induction-hardened
- C induction-hardened + hard chrome-plated

Version code (specified by the manufacturer)

Additional specifications e.g.:

- a) Metric connection thread instead of Whitworth pipe thread.
Connection thread offset on the circumference.
- b) Piston rod end modified:
Thread enlarged or piston rod extension lengthened.
- c) Special seal
- d) Extended guide
- e) Cylinder single-acting for pulling or pushing.

Order example:

Double-acting hydraulic cylinder with piston $\phi 80$ mm, piston rod $\phi 45$ mm, mounting type SG, stroke 500 mm, rod seal: U-cup seal of NBR, piston seal: Glydring of PTFE + NBR, piston rod end with external thread, piston rod hard chrome-plated.

Type: ZB 2001 - 80 / 45 - SG - 500 - AG1B.

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