

ZBD 3501

Differential Cylinder



Description:

Differential cylinder **ZBD 3501**
with and without end position cushioning
NP 350 bar (35 MPa)

This Storz hydraulic cylinder series is designed for system pressures up to 350 bar in quasi-static operation, i.e. not for applications with predominantly high-frequency and fluctuating loads.

Each cylinder diameter is assigned a piston rod diameter with the area ratio $\phi = 2$.

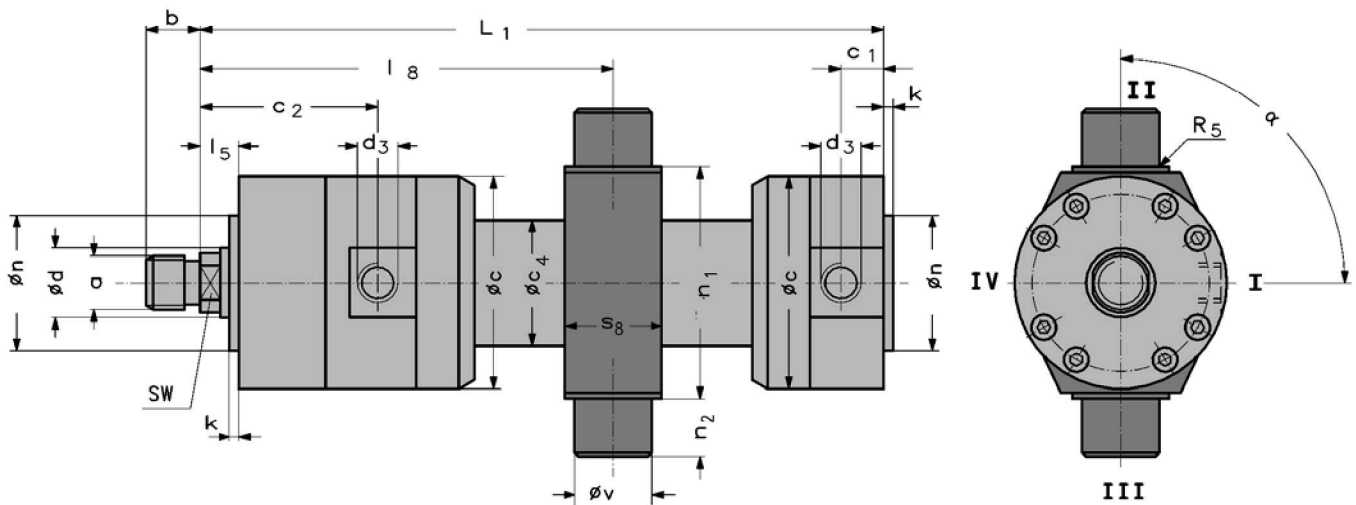
All piston rods are induction-hardened and hard chrome-plated. In addition, the 4 most common mounting types are available for this hydraulic cylinder series. Bleed screws with thread G $\frac{1}{4}$ are provided at the head and cap end. Instead of the bleed screws, gauge connections can therefore also be used.

Technical data:

Nominal pressure	350 bar (35 MPa)
Static test pressure	375 bar (37,5 MPa)
Piston Ø	50 - 100 mm
Area ratio ϕ	2
Temperature range (of the hydraulic fluid) ϑ min. ... ϑ max.	- 20° ... + 80° C
Viscosity range ν min. ... ν max.	(10... 600) 10⁻⁶ m²/s
Stroke speed range u min. ... u max.	0 - 0,5 m/s depending on seal variant. Higher speeds on request.
Hydraulic fluid	Mineral oil according to DIN 51524 and DIN 51 525 HFD fluids in conjunction with PTFE and Viton seals. For HFA, HFB and HFC fluids please consult us.



Mounting type B cylinder with trunnion



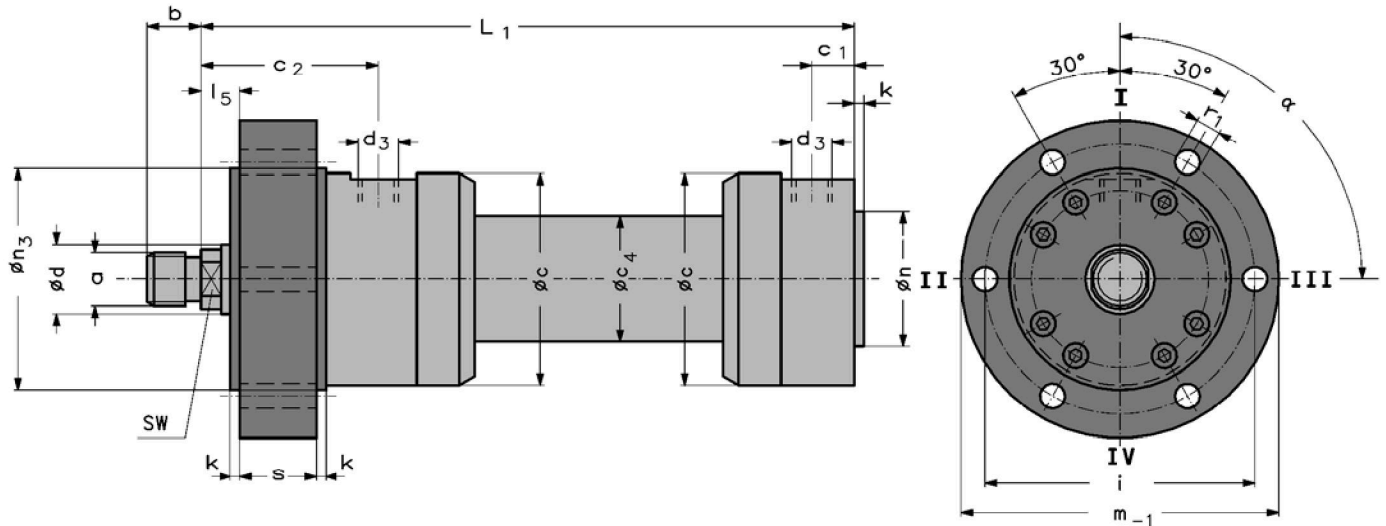
- I Pipe connection
- II Start-up valve
- III Throttle screw
- IV Bleed screw

Projection of throttle screw
and start-up valve = 3 mm

Piston Ø (mm)	Rod Ø d (mm)	Piston area A ₁ (cm ²)	Annular area A ₂ (cm ²)	L ₁ = Stroke +	Pipe connection Whitworth pipe thread d ₃	Rod thread a	b	Ø c	c ₁	c ₂	Ø c ₄ ~	k	min	max = Stroke +	l ₈ variable	Ø n f8	n ₁ h13	n ₂ js16	R ₅	s ₈	Ø v f8	α	Width across flats SW	Cushioning length	Stroke min form B
50	36	19,6	9,5	232	G 1/2	M 28 x 1,5	28	110	20	92	65	5	195	115		70	120	30	2	50	40	90°	30	22	70
63	45	31,2	15,3	280	G 3/4	M 35 x 1,5	35	135	27,5	105	83	5	215	130		88	150	35	2	50	45	90°	36	25	80
80	56	50,3	25,6	300	G 3/4	M 45 x 1,5	45	156	30	111	100	5	235	140		100	160	50	2	60	55	90°	46	28	90
100	70	78,5	40,1	325	G 1	M 58 x 1,5	58	190	32,5	120	127	5	285	125		120	200	55	2	65	60	90°	60	35	140

(further sizes on request)

Mounting type CA round flange at cylinder head



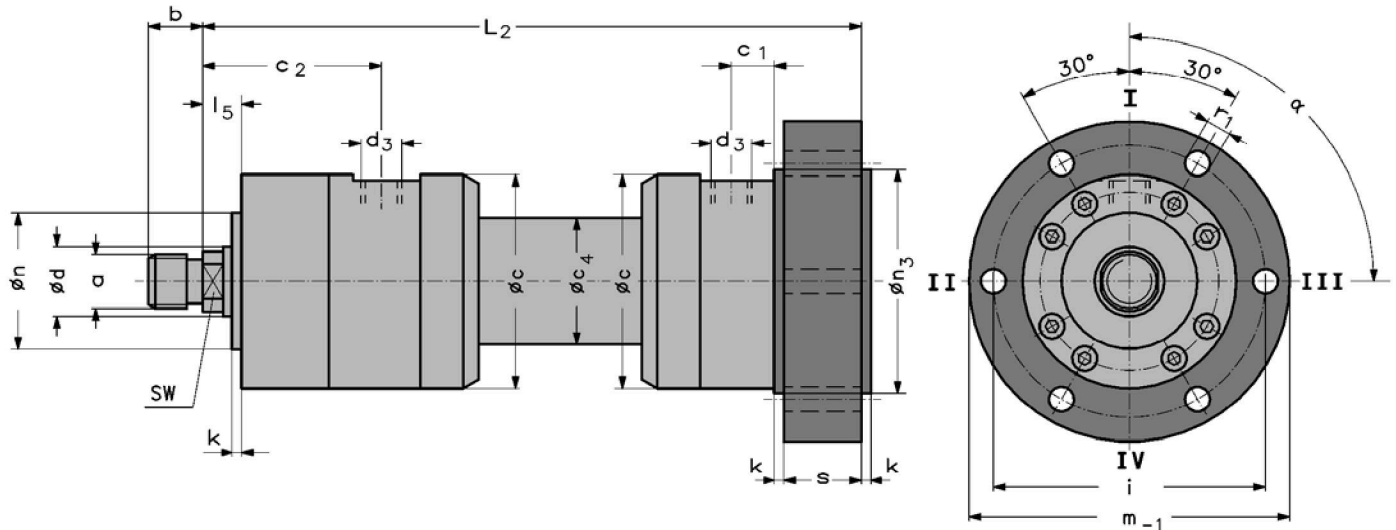
- I Pipe connection
- II Start-up valve
- III Throttle screw
- IV Bleed screw

Projection of throttle screw
and start-up valve = 3 mm

Piston $\varnothing$ (mm)	Rod $\varnothing d$ (mm)	Piston area A_1 (cm ²)	Annular area A_2 (cm ²)	$L_1 = \text{Stroke} +$	Pipe connection Whitworth pipe thread d_3	Rod thread a	b	$\varnothing c$	c_1	c_2	$\varnothing c_4$	$\varnothing i_{js 13}$	k	L_5	$\varnothing m_{-1}$	$\varnothing n_{f8}$	$\varnothing n_{3 f8}$	$\varnothing r_1$	s	α	Width across flats SW	Cushioning length	Stroke _{min} form CA
50	36	19,6	9,5	232	G 1/2	M 28 x 1,5	28	110	20	92	65	140	5	20	165	70	115	13	40	90°	30	22	0
63	45	31,2	15,3	280	G 3/4	M 35 x 1,5	35	135	27,5	105	83	180	5	20	210	88	150	18	40	90°	36	25	0
80	56	50,3	25,6	300	G 3/4	M 45 x 1,5	45	156	30	111	100	195	5	20	230	100	160	18	50	90°	46	28	0
100	70	78,5	40,1	325	G 1	M 58 x 1,5	58	190	32,5	120	127	230	5	20	270	120	200	22	55	90°	60	35	40

(further sizes on request)

Mounting type CB round flange at cylinder cap



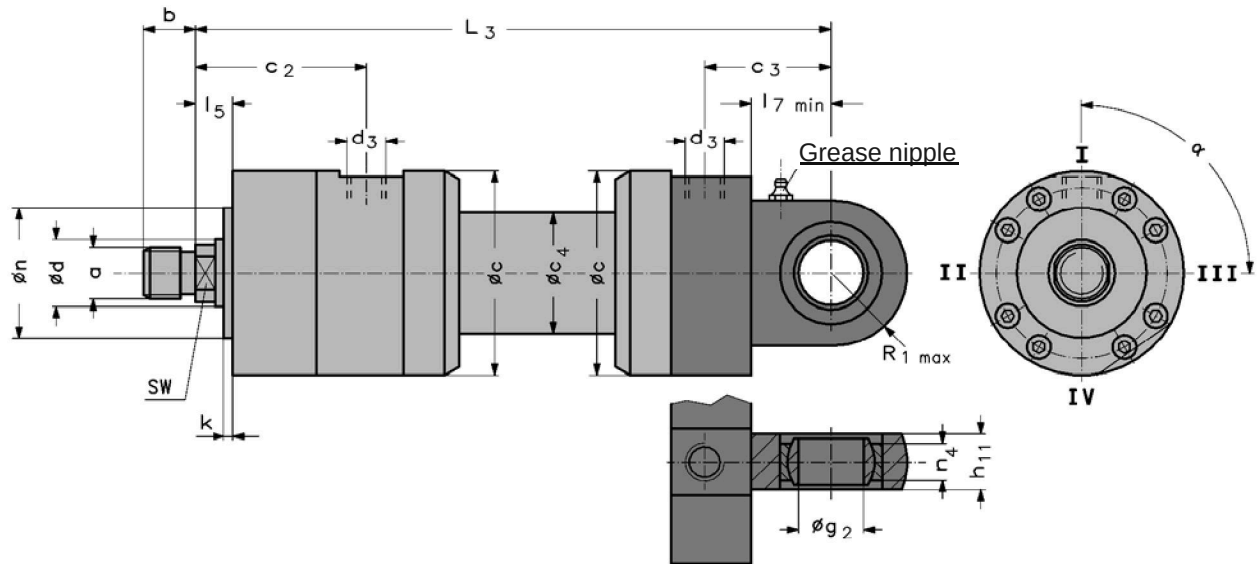
- I Pipe connection
- II Start-up valve
- III Throttle screw
- IV Bleed screw

Projection of throttle screw
and start-up valve = 3 mm

Piston $\varnothing$ (mm)	Rod $\varnothing d$ (mm)	Piston area A_1 (cm ²)	Annular area A_2 (cm ²)	$L_2 = \text{Stroke} +$	Pipe connection Whitworth pipe thread d_3	Rod thread a	b	$\varnothing c$	c_1	c_2	$\varnothing c_4$	$\varnothing i_{js 13}$	k	I_5	$\varnothing m_{-1}$	$\varnothing n_{f8}$	$\varnothing n_{3 f8}$	$\varnothing r_1$	s	α	Width across flats SW	Cushioning length	Stroke _{min} form CB
50	36	19,6	9,5	277	G 1/2	M 28 x 1,5	28	110	20	92	65	140	5	20	165	70	115	13	40	90°	30	22	0
63	45	31,2	15,3	325	G 3/4	M 35 x 1,5	35	135	27,5	105	83	180	5	20	210	88	150	18	40	90°	36	25	0
80	56	50,3	25,6	355	G 3/4	M 45 x 1,5	45	156	30	111	100	195	5	20	230	100	160	18	50	90°	46	28	0
100	70	78,5	40,1	385	G 1	M 58 x 1,5	58	190	32,5	120	127	230	5	20	270	120	200	22	55	90°	60	35	40

(further sizes on request)

Mounting type DB swivel eye at cylinder cap



- I Pipe connection
- II Start-up valve
- III Throttle screw
- IV Bleed screw

Projection of throttle screw
and start-up valve = 3 mm

Piston Ø (mm)	Rod Ø d (mm)	Piston area A ₁ (cm ²)	Annular area A ₂ (cm ²)	L ₃ = Stroke +	Pipe connection Whitworth pipe thread d ₃	Rod thread a	b	Ø c	c ₂	c ₃	Ø c ₄	Ø g ₂	h ₁₁	k	l ₅	l _{7 min}	Ø n ₁₈	n ₄	R _{1 max}	α	Width across flats SW	Cushioning length	Stroke _{min} form DB
50	36	19,6	9,5	280	G 1/2	M 28 x 1,5	28	110	92	68	65	35 _{-0,012}	30 _{-0,4}	5	20	43	70	25 _{-0,12}	41	90°	30	22	0
63	45	31,2	15,3	330	G 3/4	M 35 x 1,5	35	135	105	82,5	83	40 _{-0,012}	35 _{-0,4}	5	20	50	88	28 _{-0,12}	50	90°	36	25	0
80	56	50,3	25,6	355	G 3/4	M 45 x 1,5	45	156	111	85	100	50 _{-0,012}	40 _{-0,4}	5	20	55	100	35 _{-0,12}	63	90°	46	28	0
100	70	78,5	40,1	390	G 1	M 58 x 1,5	58	190	120	97,5	127	60 _{-0,015}	50 _{-0,4}	5	20	65	120	44 _{-0,15}	70	90°	60	35	40

(further sizes on request)

ZBD 3501 -		/	-	-	-							.		Additional specifications
Double-acting hydraulic cylinder														
Nominal pressure 350 bar (35 MPa) optionally with or without end position cushioning														
Piston diameter in mm														
Piston rod diameter in mm														
Mounting types														
B	Trunnion (state dimension la when ordering)													
CA	Round flange at cylinder head													
CB	Round flange at cylinder cap													
DB	Swivel eye at cylinder cap													
Cylinder stroke in mm														
Rod seal														
L	Seal kit (material NBR + fabric) Standard version													
LV	Seal kit (material Viton + fabric) on request													
T	Teflon seal in tandem version with NBR O-ring													
TV	Teflon seal in tandem version with Viton O-ring													
F	U-cup seal (material polyurethane AU) + Teflon seal with NBR O-ring													
S	Special seal (marked by additional specifications)													
Piston seal														
E	Seal kit, 2-piece (material NBR + fabric) Standard version													
EV	Seal kit, 2-piece (material Viton + fabric) on request													
G	Teflon seal (material PTFE + NBR O-ring)													
GV	Teflon seal (material PTFE + Viton O-ring)													
S	Special seal (marked by additional specifications)													
End position cushioning														
0	without													
1	both ends													
2	head end only													
3	cap end only													
Piston rod surface														
C	induction-hardened and hard chrome-plated													
Piston rod end														
1	External thread													
2														
3	Special version (marked by additional specifications)													
Piston rod material														
C	tempered steel standard version													
N	stainless steel													
Pipe connection														
G	Whitworth pipe thread (preferably)													
Version code (specified by the manufacturer)														
Additional specifications														

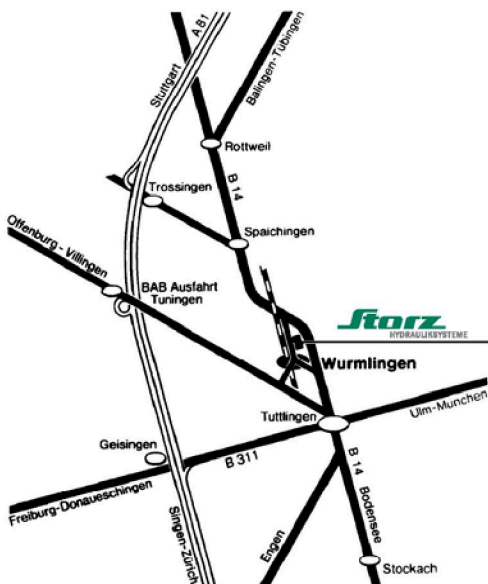
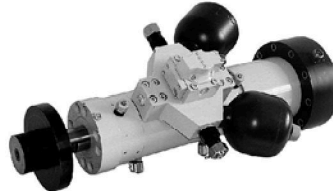
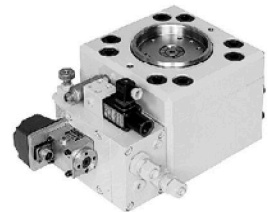
- Order example:** Double-acting hydraulic cylinder 350 bar nominal pressure with the following data:
Piston Ø 80 mm, piston rod Ø 56 mm, trunnion, stroke 250 mm,
Rod seal: seal kit of NBR + fabric,
Piston seal: seal kit 2-piece of NBR + fabric, end position cushioning cap end only,
induction-hardened and hard chrome-plated piston rod of tempered steel with external thread,
pipe connection with Whitworth pipe thread.

Type: ZBD 3501 - 80/56 - B - 250 - LE3C1CG.

Product range



Hydraulic cylinders to DIN/ISO
Hydraulic standard cylinders
Hydraulic telescopic cylinders
Hydraulic cylinders with position measuring systems
Test-machine cylinders
Special cylinders for all applications
Standardized mounting parts
Hydraulic power units and components
Plant engineering



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