

ZB 2550

Differential Cylinder



Description:

Differential cylinder **ZB 2550**
NP 250 bar (25 MPa)

The differential hydraulic cylinder series ZB 2550 with a nominal pressure of 250 bar is designed for universal use.

As standard, seven different mounting types and four different seal variants are available.

When determining the mounting type, please note that the cylinder can only take up axial forces and that under compressive load the buckling resistance must be checked.

Technical data:

Nominal pressure	250 bar (25 MPa)
Static test pressure	375 bar (37,5 MPa)
Piston Ø	25 - 100 mm
Area ratio ϕ	1,6
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 or 0 - 1 m/s depending on seal variant.
Hydraulic fluid	Mineral oil according to DIN 51524, HFD fluids. For HFA, HFB and HFC fluids please consult us.



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Available mounting types

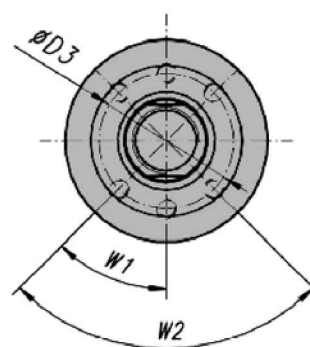
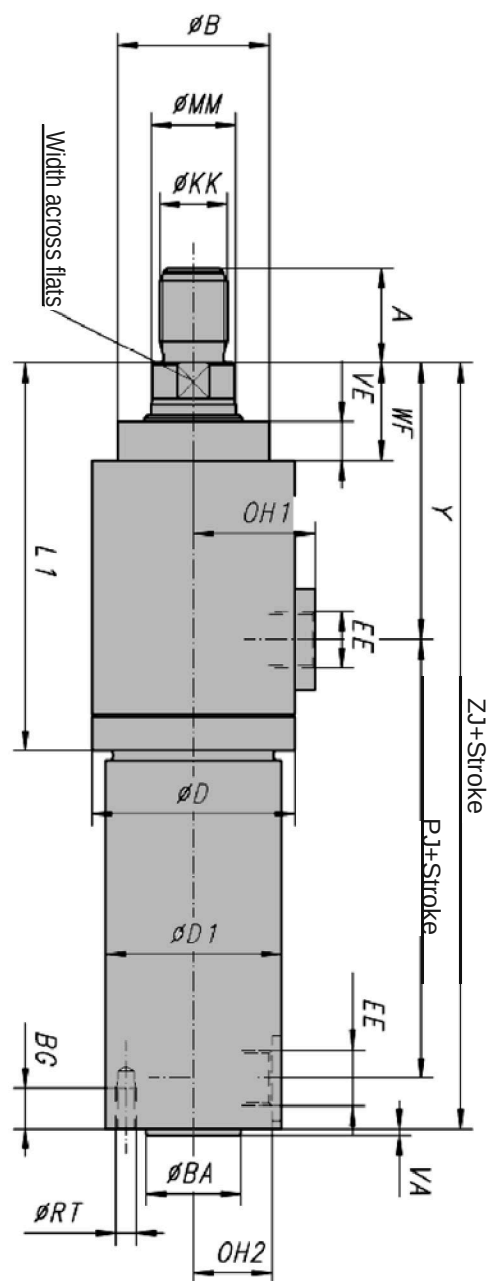
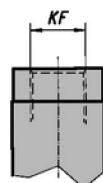
A	Basic design	4
MT 4	Trunnion	5
ME 9	Square flange, head end	6
ME 10	Square flange, cap end	7
MP 5 MP 3	Swivel eye at cylinder cap Spherical eye at cylinder cap	8
MR 3	Thread head end	9

further mounting types on request

Mounting type A Basic design

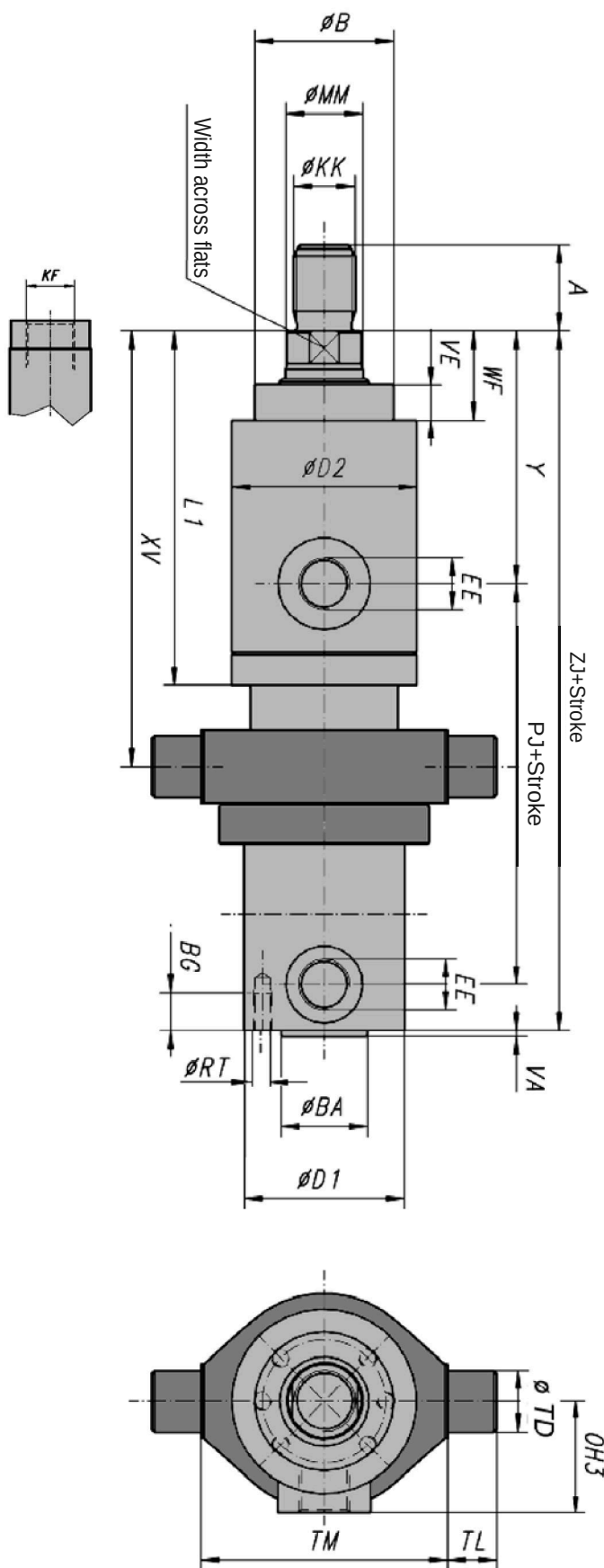
	100	80	63	50	40	32	25	Piston Ø (mm)
	63	50	40	32	25	20	16	Rod Ø (mm) MM
	196300	125600	77900	49000	31400	20100	12200	Pushing force at 250 bar operating pressure (N)
	118400	76500	46500	28900	19100	12200	7200	Pulling force at 250 bar operating pressure (N)
	78,5	50,3	31,2	19,6	12,6	8,0	4,9	Piston area A ₁ (cm ²)
	47,4	30,6	18,6	11,6	7,7	4,9	2,9	Annular area A ₂ (cm ²)
	243	217	197	164	168	144	132	ZJ + Stroke
	G ¾	G ½	G ½	G ¾	G ¾	G ¾	G ¾	Pipe connection EE
	M48x2	M42x2	M33x2	M27x2	M20x1,5	M16x1,5	M12x1,25	Rod external thread KK
	M42x2	M30x2	M24x1,5	M22x1,5	M16	M12	M10	Rod internal thread KF
	63	56	45	36	28	22	18	A max.
	130	100	80	62	45	36	32	Ø B
	74	53	45	34	28	20	18	Ø BA
	24	24	15	15	12	9	9	BG
	130	105	83	65	60	48	41	Ø D
	130	105	83	65	52	42	35	Ø D1
	102	77	63	50	40	31	26	Ø D3
	0	0	0	0	135	111	102	L1
	113	99	88	73	71	62	59	PJ + Stroke
	M16	M16	M10	M10	M6	M6	M5	Ø RT
	3	3	3	2	2	2	2	VA
	16	14	13	12	11,5	9,5	9,5	VE
	44	38	34	30	29	25	22	WF
	60°	45°	45°	*	45°	*	*	W1
	120°	90°	90°	90°	90°	90°	80°	W2
	71,0	59,0	48,5	39,0	27,5	27,5	24,0	OH1
	62,0	50,0	39,0	30,0	23,5	18,5	15,0	OH2
	105	99	92	75,5	82	69	61	Y
	55	41	32	27	21	17	13	Width across flats
	0	0	0	0	10	10	10	Minimum stroke ¹⁾
								Max. stroke

for strokes from 1000 mm
please consult us



Remarks

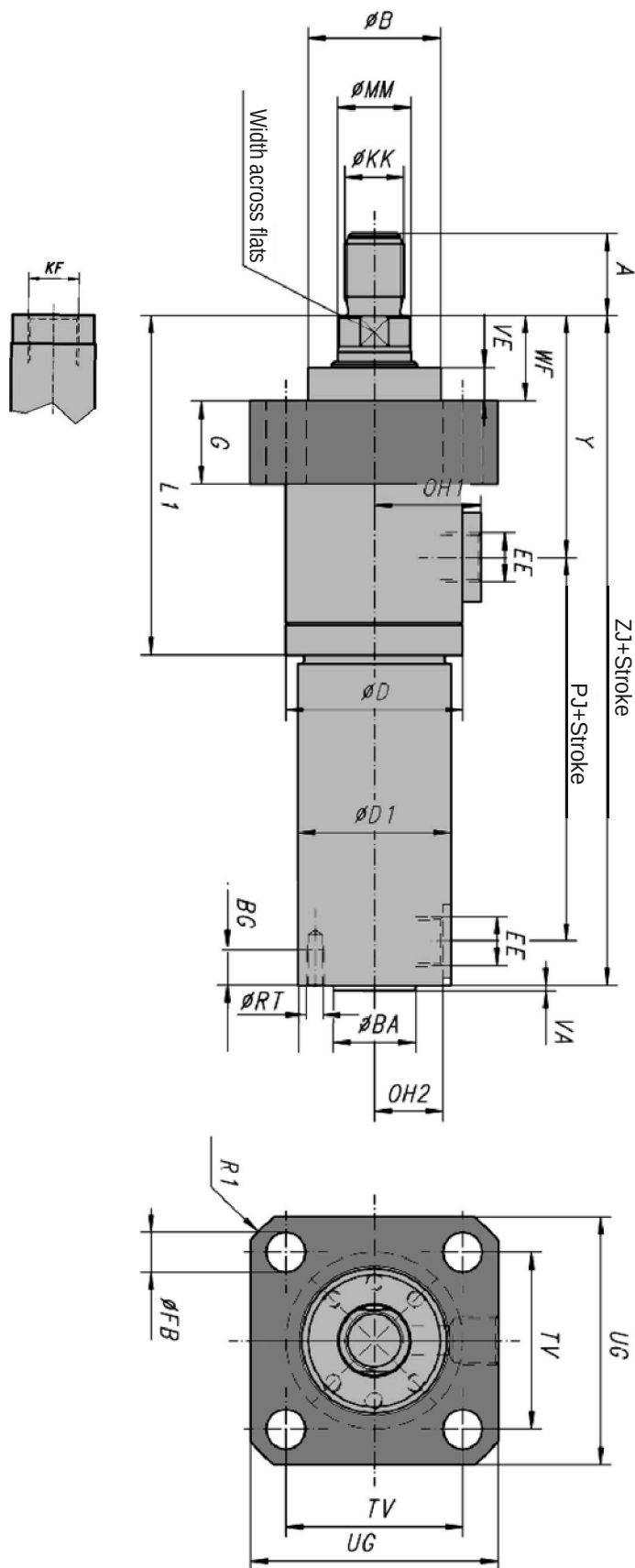
1) Production-related minimum stroke. Shorter stroke lengths possible by using a spacer sleeve.

[illegible]

- 1) Production-related minimum stroke. Shorter stroke lengths possible by using a spacer sleeve.
- 2) Caution: observe the cylinder's external dimensions and check for collision.

State the XV dimension in plain text when ordering.

Piston Ø (mm)															
	Rod Ø (mm) MM														
Pushing force at 250 bar operating pressure (N)															
	Pulling force at 250 bar operating pressure (N)														
Piston area A ₁ (cm ²)															
Annular area A ₂ (cm ²)															
ZJ + Stroke															
Pipe connection EE															
Rod external thread KK															
Rod internal thread KF															
A max.															
Ø B ₁₈															
Ø B _{A18}															
B _G															
Ø D ₁															
Ø D ₁															
Ø F _B	H13														
G															
L ₁															
PJ + R ₁	Stroke														
Ø R _T															
TV															
UG															
VA															
VE															
WF															
OH1															
OH2															
Y															
Width across flats															
Minimum stroke ¹⁾															
Max. stroke															

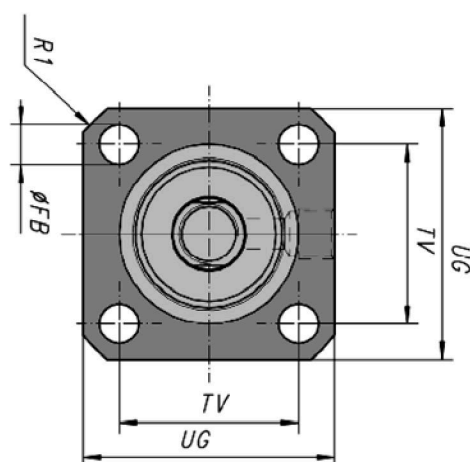
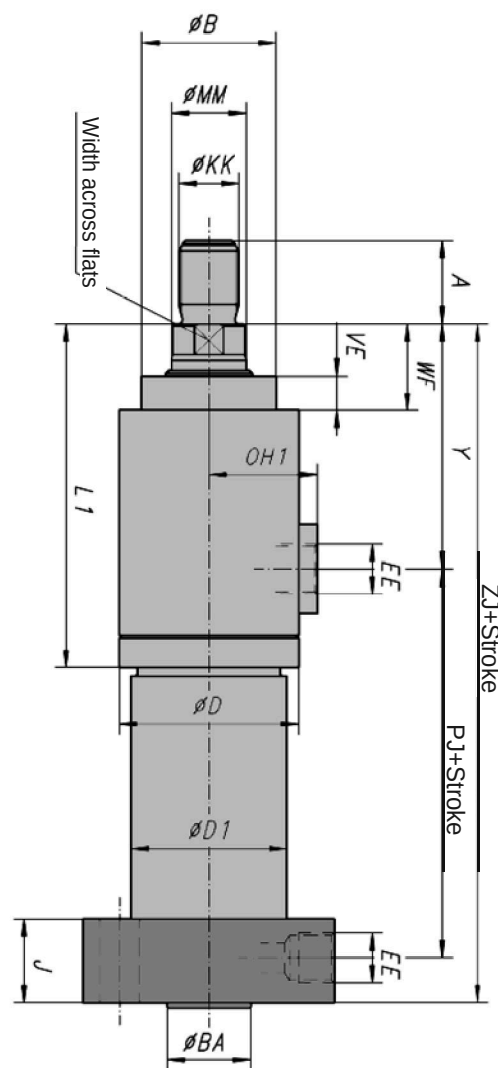
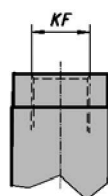


1) Production-related minimum stroke. Shorter stroke lengths possible by using a spacer sleeve.

Mounting type ME 10 Square flange, cap end

	100	80	63	50	40	32	25		
Piston Ø (mm)	63	50	40	32	25	20	16		
Rod Ø (mm) MM	196300	125600	77900	49000	31400	20100	12200		
Pushing force at 250 bar operating pressure (N)	118400	76500	46500	28900	19100	12200	7200		
Pulling force at 250 bar operating pressure (N)	78,5	50,3	31,2	19,6	12,6	8,0	4,9		
Piston area A ₁ (cm ²)	47,4	30,6	18,6	11,6	7,7	4,9	2,9		
Annular area A ₂ (cm ²)	243	217	197	164	168	144	132		
ZJ + Stroke	G ¾	G ½	G ½	G ¾	G ¾	G ¾	G ¾		
Pipe connection EE	M48x2	M42x2	M33x2	M27x2	M20x1,5	M16x1,5	M12x1,25		
Rod external thread KK	M42x2	M30x2	M24x1,5	M22x1,5	M16	M12	M10		
Rod internal thread KF	max. 18	18	18	18	18	18	18		
Ø B	130	100	80	62	45	28	22		
Ø BA	74	53	45	34	28	20	18		
Ø D	130	105	83	65	60	48	41		
Ø D1	130	105	83	65	52	42	35		
Ø FB	17,5	17,5	17,5	15,5	13,5	11	9		
J	45	35	32	28	28	24	24		
L1	0	0	0	0	135	111	102		
PJ + R1	113	99	88	73	71	62	59		
TV	110	90	83	65	54	45	39		
UG	125	100	92	70	60	50	43		
VE	160	145	125	105	84	70	64		
WF	16	14	13	12	11,5	9,5	9,5		
OH1	44	38	34	30	29	25	22		
Y	71,0	59,0	48,5	39,0	27,5	27,5	24,0		
Width across flats	105	99	92	75,5	69	61	55		
Minimum stroke ¹⁾	0	0	0	0	10	10	10		
Max. stroke									

for strokes from 1000 mm
please consult us


Remarks

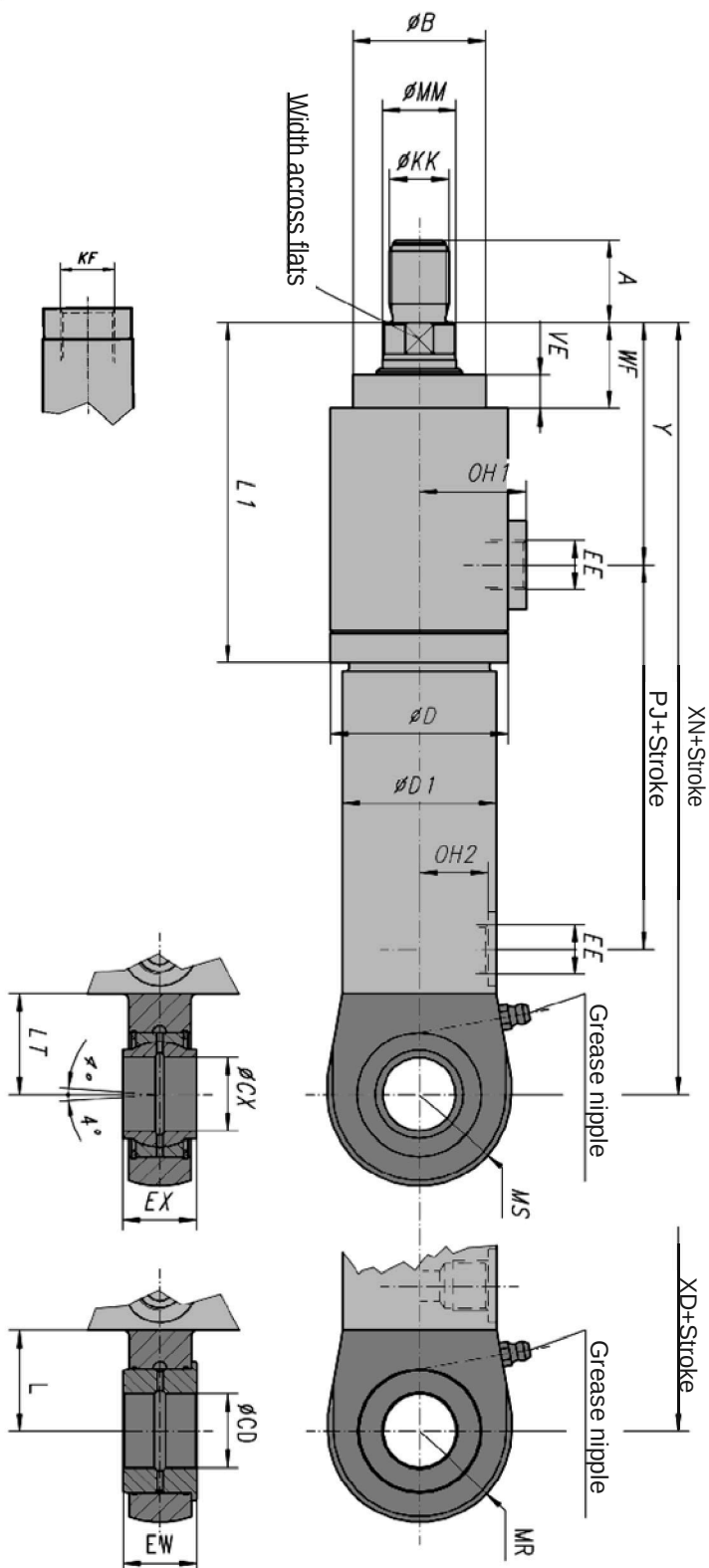
1) Production-related minimum stroke. Shorter stroke lengths possible by using a spacer sleeve.

Mounting type MP 5 Swivel eye at cylinder cap

Mounting type MP 3 Spherical eye at cylinder cap

100	80	63	50	40	32	25	Piston Ø (mm)
63	50	40	32	25	20	16	Rod Ø (mm) MM
196300	125600	77900	49000	31400	20100	12200	Pushing force at 250 bar operating pressure (N)
118400	76500	46500	28900	19100	12200	7200	Pulling force at 250 bar operating pressure (N)
78,5	50,3	31,2	19,6	12,6	8,0	4,9	Piston area A ₁ (cm ²)
47,4	30,6	18,6	11,6	7,7	4,9	2,9	Annular area A ₂ (cm ²)
318	282	250	207	202	171	154	XN+Stroke/XD+Stroke
G ¾	G ¾	G ¾	G ¾	G ¾	G ¾	G ¾	Pipe connection EE
M48x2	M42x2	M33x2	M27x2	M20x1,5	M16x1,5	M12x1,25	Rod external thread KK
M42x2	M30x2	M24x1,5	M22x1,5	M16	M12	M10	Rod internal thread KF
63	56	45	36	28	22	18	A max.
130	100	80	62	45	36	32	Ø B
63	50	40	32	25	20	16	Ø C D
130	105	83	65	60	48	41	Ø D
130	105	83	65	52	42	35	Ø D1
63	50	40	32	25	20	16	EW h12
75	65	53	43	34	27	22	L/LT
0	0	0	0	135	111	102	L1
65	54	47	38	31	24	20	MR/MS
113	99	88	73	71	62	59	PJ + Stroke
44	38	34	30	29	25	22	OH1
71,0	59,0	48,5	39,0	27,5	27,5	24,0	OH2
62,0	50,0	39,0	30,0	23,5	18,5	15,0	Y
105	99	92	75,5	82	69	61	Width across flats
55	41	32	27	21	17	13	Minimum stroke ¹⁾
0	0	0	0	10	10	10	Max. stroke

for strokes from 1000 mm
please consult us



Remarks

1) Production-related minimum stroke. Shorter stroke lengths possible by using a spacer sleeve.

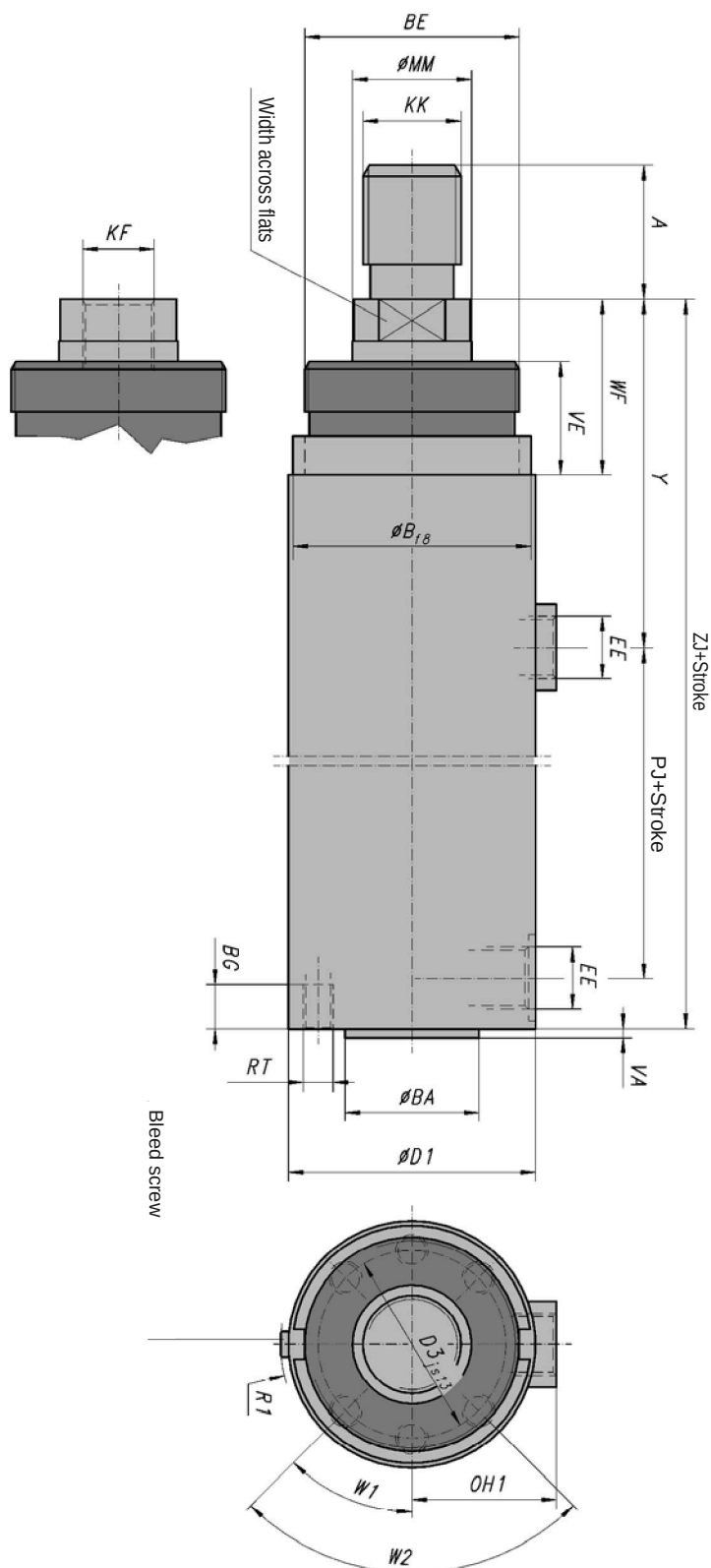
Mounting type MR 3 Thread head end

100	80	63	50	40	32	25	Piston Ø (mm)
63	50	40	32	25	20	16	Rod Ø (mm) MM
196300	125600	77900	49000	31400	20100	12200	Pushing force at 250 bar operating pressure (N)
118400	76500	46500	28900	19100	12200	7200	Pulling force at 250 bar operating pressure (N)
78,5	50,3	31,2	19,6	12,6	8,0	4,9	Piston area A ₁ (cm ²)
47,4	30,6	18,6	11,6	7,7	4,9	2,9	Annular area A ₂ (cm ²)
243	217	197	164	168	144	132	ZJ + Stroke
G ¾	G ½	G ½	G ¾	G ¾	G ¾	G ¾	Pipe connection EE
M48x2	M42x2	M33x2	M27x2	M20x1,5	M16x1,5	M12x1,25	Rod external thread KK
M42x2	M30x2	M24x1,5	M22x1,5	M16	M12	M10	Rod internal thread KF
63	56	45	36	28	22	18	A max. 18
130	100	80	62	45	36	32	Ø B 18
74	53	45	34	28	20	18	Ø BA 18
M110x3	M92x2	M72x2	M54x2	M48x1,5	M38x1,5	M33x1,5	Ø BE
24	105	15	65	12	48	9	BG 9
130	105	83	65	60	42	35	Ø D 41
102	77	63	50	40	31	26	Ø D1 35
113	99	88	73	135	111	102	Ø D3 1313
110	90	83	65	71	62	59	L1 59
M16	M16	M10	M10	54	45	39	PJ + R1 39
3	3	3	2	6	6	5	Ø RT M5
16	14	13	11,5	2	2	2	VA 9,5
44	38	34	30	29	25	22	VE 22
60°	45°	45°	*	45°	*	*	WF 45°
120°	90°	90°	90°	90°	90°	80°	W1 80°
71,0	59,0	48,5	39,0	27,5	18,5	24,0	W2 24,0
62,0	50,0	39,0	30,0	23,5	15,0	15,0	OH1 15,0
105	99	92	75,5	82	69	61	OH2 61
55	41	32	27	21	17	13	Y 13
0	0	0	0	10	10	10	Width across flats
							Minimum stroke ¹⁾
							Max. stroke

for strokes from 1000 mm
please consult us

Remarks

1) Production-related minimum stroke. Shorter stroke lengths possible by using a spacer sleeve.



Model code

ZB 2550 -	/	-	-	-	-			-		.
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Double-acting hydraulic cylinder

Nominal pressure 250 bar (25MPa)

Piston diameter in mm

Piston rod diameter in mm

Mounting types

A	Basic design
MT4	Trunnion (state dimension XV when ordering!)
ME9	Square flange, head end
ME10	Square flange, cap end
MP3	Spherical eye at cylinder cap
MP5	Swivel eye at cylinder cap
MR3	Thread head end

Cylinder stroke in mm

Seal variant

FG	Standard version, U-cup seal + Teflon slide ring / Teflon seal
Option:	
TG	Teflon slide ring in tandem version / Teflon seal
FH	U-cup seal + Teflon slide ring / compact seal
TVGV	Teflon slide ring in tandem version / Teflon seal (Viton version)

Piston rod surface

B	Standard version: hard chrome-plated	Option: C induction-hardened and hard chrome-plated
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Piston rod end

- 1 External thread
- 2 Internal thread
- 3 External thread with mounted rod end spherical eye KG, see brochure 19112
- 4 External thread with mounted rod end plain eye KS, see brochure 19112

Piston rod material

C structural/tempered steel

Version of pipe connection

G Whitworth pipe thread (form X DIN 3852 part 2)

Version code (specified by the manufacturer)

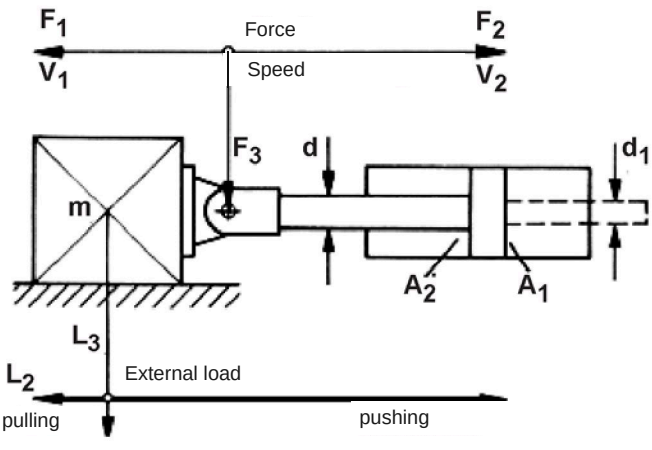
Order example: Double-acting hydraulic cylinder 250 bar nominal pressure with the following data:
Piston $\varnothing$ 63 mm, rod $\varnothing$ 40 mm, mounting type MT4, stroke 300 mm, seal variant FG.
Piston rod surface B, piston rod end 1, piston rod material C.
Version of pipe connection G.

Type: ZB 2550 - 63/40 - MT4 - 300 - FG - B1C - G.1

Requirements list for hydraulic cylinders

Customer address		Telephone/Fax	
.....		Contact person	
.....		Department	

Load diagram



F_1 Force F_2
 V_1 Speed V_2

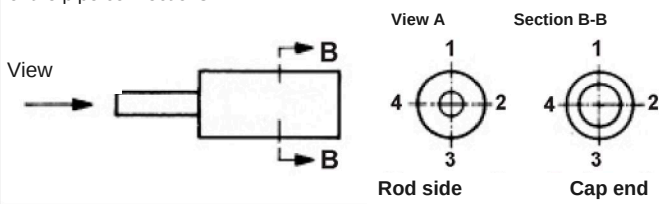
F_3 d d_1
 A_2 A_1

L_2 External load L_3
pulling pushing

L_3 neither pushing nor pulling load

13	Required cylinder forces	F_1	N
		F_2	N
14	max. Side force	F_3	N
15	Switching frequency	Double strokes per min.	
		Double strokes per sec.	
16	min. + max. Amplitude (α_{min} ; α_{max}) + associated frequency (f)	$\alpha_{min} + f$	
		$\alpha_{max} + f$	
17	Moving mass		kg
18	Temperature range of hydraulic fluid $\vartheta_{min} \dots \vartheta_{max}$	°C	
	Ambient temperature range $\vartheta_{min} \dots \vartheta_{max}$	°C	

desired radial position of the pipe connections



View A Section B-B

View Rod side Cap end

19	Size of pipe connections	Cap end	Rod side
20	Piston rod material	Standard	Stainless
21	Painting	Standard	without
		Special	

Cylinder data

1	Operating pressure	min	bar
		max	bar
2	Piston $\varnothing$	D	mm
3	Rod $\varnothing$	d	mm
		d ₁	mm
4	Mounting type		
5	Stroke	S	mm
6	Stroke speed max.	V_{1max}	m/s
		V_{2max}	m/s
7	Hydraulic fluid		
8	Rod seal Wiper		
9	Piston seal		
10	Piston rod end		
11	Air bleed	yes	no
12	End position cushioning	Cap end	
		Rod side	

Accessories

End positions

Position feedback

Clamping head

Position measuring system with indication of the Pos. accuracy

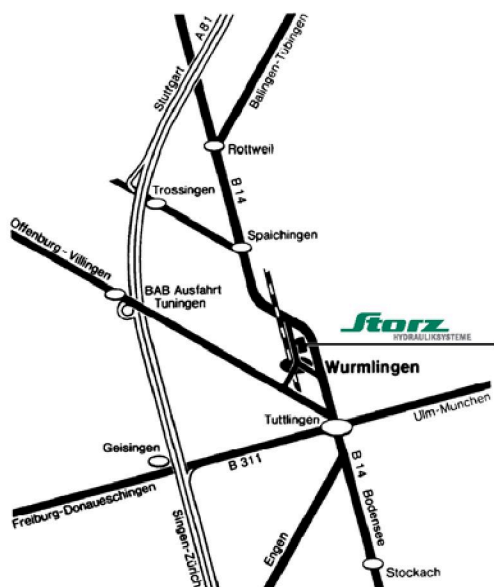
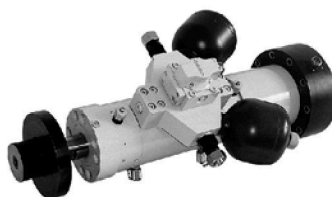
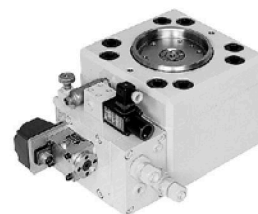
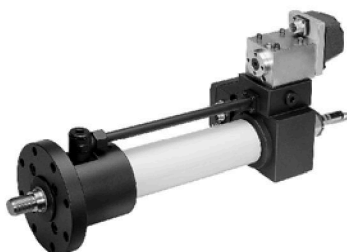
	yes	no	
inductive			○
digital			
Ultrasonic			
potentiometric			
capacitive			

Remarks and notes on the application or special requests please with date and signature!

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



Storz
HYDRAULIKSYSTEME

Storz • Hydrauliksysteme GmbH • Postfach 70 • D-78571 Wurmlingen
Obere Hauptstraße 64 • D-78573 Wurmlingen
Telefon: 07461 96653-0 • Telefax: 07461 96653-29
Internet: www.storz-hydraulik.de • info@storz-hydraulik.de