



# Hydraulic cylinders

Standard &  
custombuilt

## Hydrowa... specialists in standard and special hydraulics

Hydrowa specializes in hydraulics. Although we offer a comprehensive standard package, our wide range of special cylinders separates us from the rest. After all, there is not a standard solution for every application. In such cases our engineering department provides specialized designs. Of course, we manufacture all our cylinders ourselves. This brochure contains the technical specifications of our standard package, which comprises well-thought-out series of single and double-action hydraulic cylinders with pressure levels varying from 200 bar (20MPa) to 320 bar (32 MPa), and bores from 25 to 500 millimetres. The maximum stroke length is 20 metres. In addition to the standard series, we also offer cylinders designed according to the international ISO 6020/1 standard. The cylinders in this series have an operating pressure of 160 bar (16 MPa) and bores of 32 to 200 mm.

## Options available for the standard package

Our standard package can be expanded with the addition of a range of options required for specific applications. The following features are just some of the options available:

- various piston rod coatings, including Altiox 300® high-quality ceramic material
- our self-designed measuring system Hypos®, which is integrated into the ceramic layer
- bolted head and bottom structures
- adjustable end cushioning
- special connections, such as SAE
- special materials
- covered spherical bearings
- underwater application
- special fluid
- built-on valves
- piping
- electric junction box
- special paint systems
- supplied with guarantee of inspection (by USCG, Lloyd's, DNV, ABS, RWS, MOW, TÜV, CSSC, BV, ASME BPV VIII and others)

## Special cylinders and their applications

We go a step further than the standard package with our special cylinders. The cylinders we design and manufacture to our customers' specifications have a maximum stroke length of as much as 20 metres.

Applications like these are not uncommon in the market in which Hydrowa is engaged. Our products are in demand in the civil engineering sector, the offshore industry, steel industry, OEM and the mobile industry.

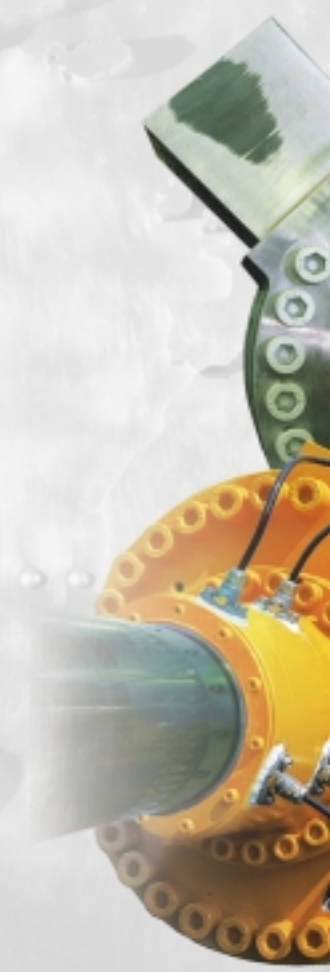
## Controllability

Hydrowa provides power and precision. We devote the utmost care to the controllability of our hydraulic cylinders. That is why our products incorporate the latest developments in integrated measuring systems and control functions.

## Quality




Hydrowa cylinders meet the highest quality standards. Independent inspection agencies submit our products to stringent testing on a regular basis. A quality control system based on ISO 9001 is our guide to maintain superior quality.

Hydrowa is a subsidiary of the IMC Company, which has earned an international reputation in the world of hydraulics. Together Hydrowa and IMC Company operate worldwide.

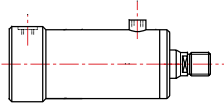




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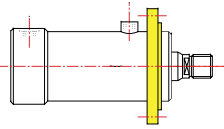
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# Mounting method



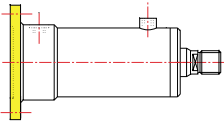
**BA** Basic design

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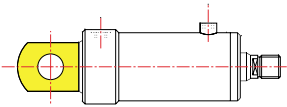
**FF** Front flange

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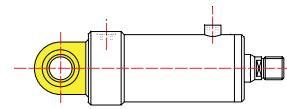
**BF** Rear flange

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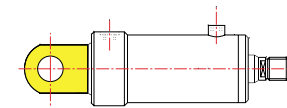
**OB** Rear eye mounting

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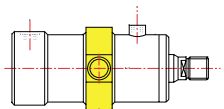
**ZB** Rear spherical eye mounting

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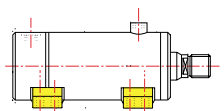
**GB** Rear double clevis

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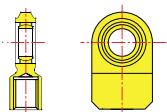
**ZT** Intermediate trunnion mountig

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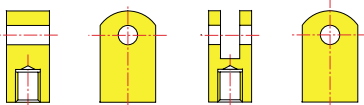
**VN** Foot mounting

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**ZS** Rod spherical eye mounting

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 upto 250 bar Page 23  
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**OS** Rod eye mounting  
**GS** Double clevis at rod

upto 200 bar Page 13  
 upto 250 bar Page 24  
 upto 320 bar Page 35

# Specification of HYDROWA cylinders

**Operating pressure 200 bar**  
Test pressure 250 bar

**Operating pressure 250 bar**  
Test pressure 320 bar

**Operating pressure 320 bar**  
Test pressure 360 bar

**Temperature**  
-20°C - +70°C

**Preservation**  
Primer 30 microns

**Oil**  
Mineral oil according to DIN 51524 (HL, HLP) or equivalent

The figure below shows the standard (1) and the low-friction (2) types

In the low-friction model the compact seals and U-seals are replaced by step seals

All cylinders are also available with other seals, bearings or scrapers. Specification on request

## Piston Bearings (standard type)

A	Bore	25 - 32	mm:	bearing strip
B	Bore	40 - 100	mm:	compact seal
C	Bore	125 - 180	mm:	compact seal + bearing strip
D	Bore	200 - 280	mm:	bearing strip
E	Bore	320 - 500	mm:	bearing strip

## Head / coverbearings (standard type)

A	Bore	25 - 32	mm:	GGG 40
B	Bore	40 - 100	mm:	GGG 40 or bearing strip
C	Bore	125 - 180	mm:	bearing strip
D	Bore	200 - 280	mm:	bearing strip
E	Bore	320 - 500	mm:	bearing strip

## Piston seals (standard type)

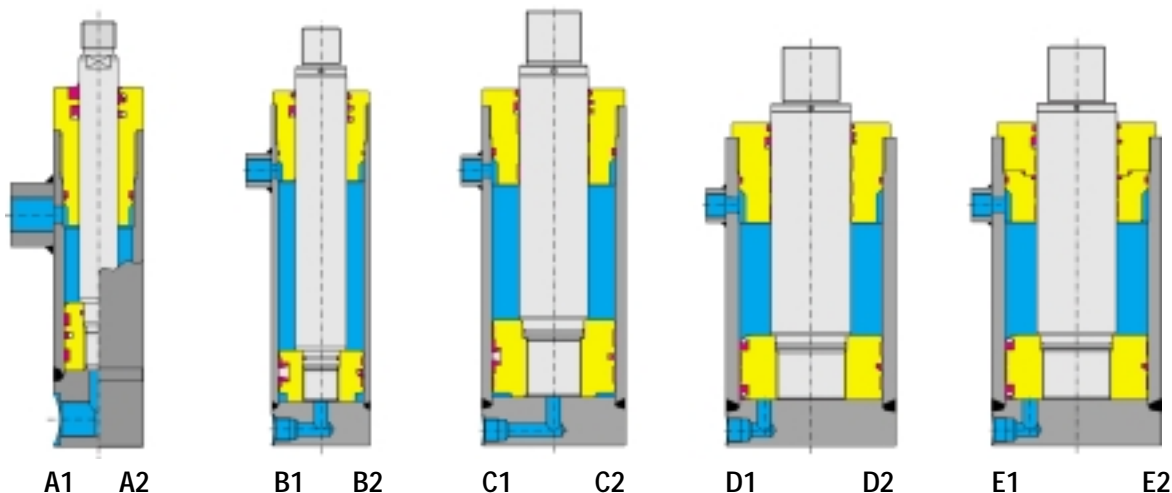
A	Bore	25 - 32	mm:	double-action step seal
B	Bore	40 - 100	mm:	double-action compact seal
C	Bore	125 - 180	mm:	double-action compact seal
D	Bore	200 - 280	mm:	2x U-seal with back-up seal
E	Bore	320 - 500	mm:	2x U-seal with back-up seal

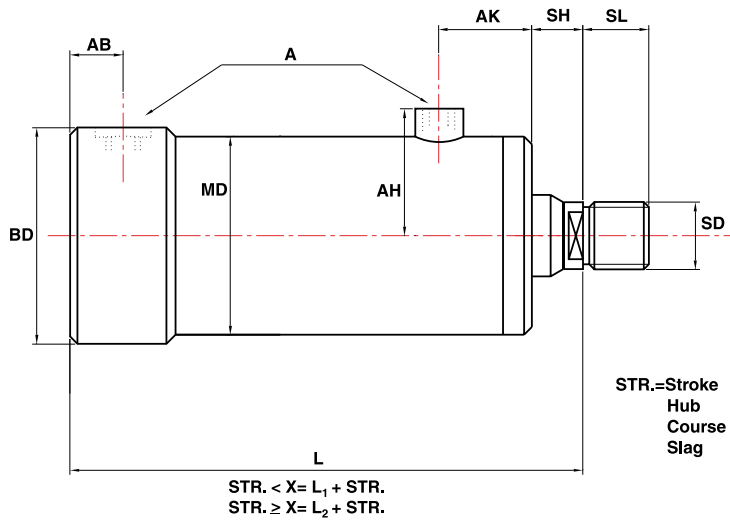
## Rod seals, vacuum (standard type)

A	Bore	25 - 32	mm:	compact rod seal or U-seal
B	Bore	40 - 100	mm:	compact rod seal or U-seal
C	Bore	125 - 180	mm:	U-seal
D	Bore	200 - 280	mm:	U-seal
E	Bore	320 - 500	mm:	step seal and U-seal

## Piston rod scraper (standard type)

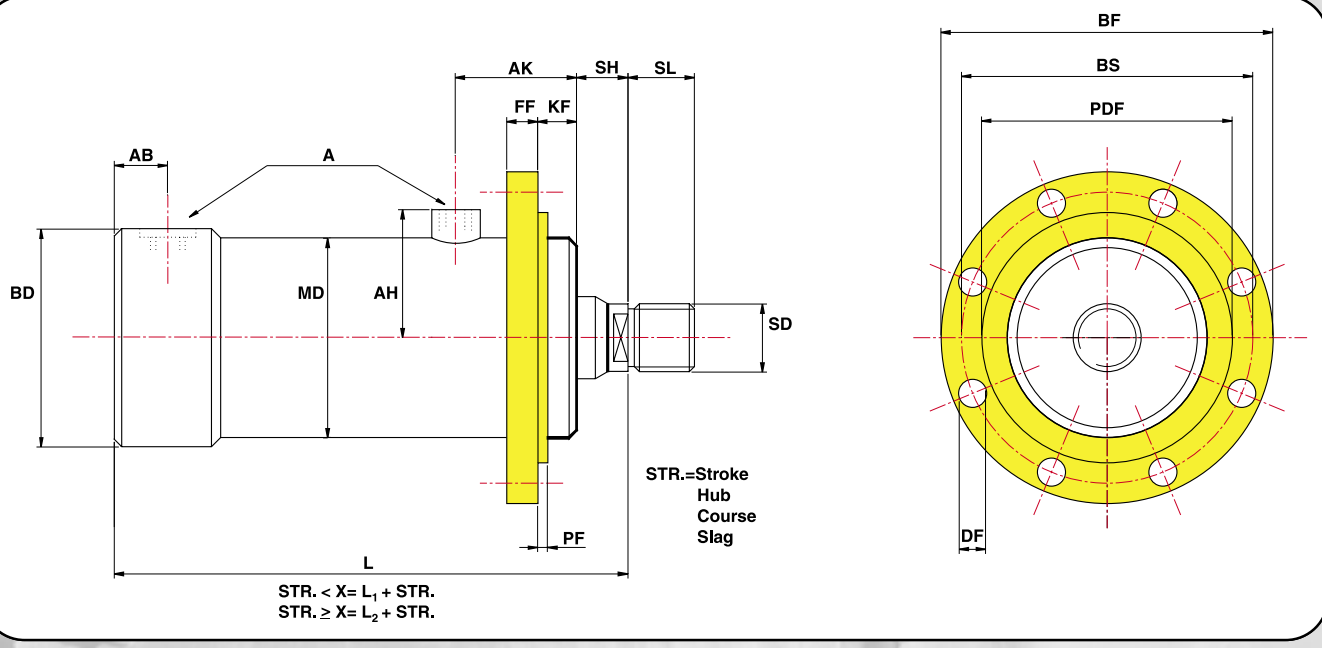
A	Bore	25 - 32	mm:	rubber or PUR
B	Bore	40 - 100	mm:	rubber or PUR
C	Bore	125 - 180	mm:	rubber or PUR
D	Bore	200 - 280	mm:	rubber or PUR
E	Bore	320 - 500	mm:	rubber or PUR



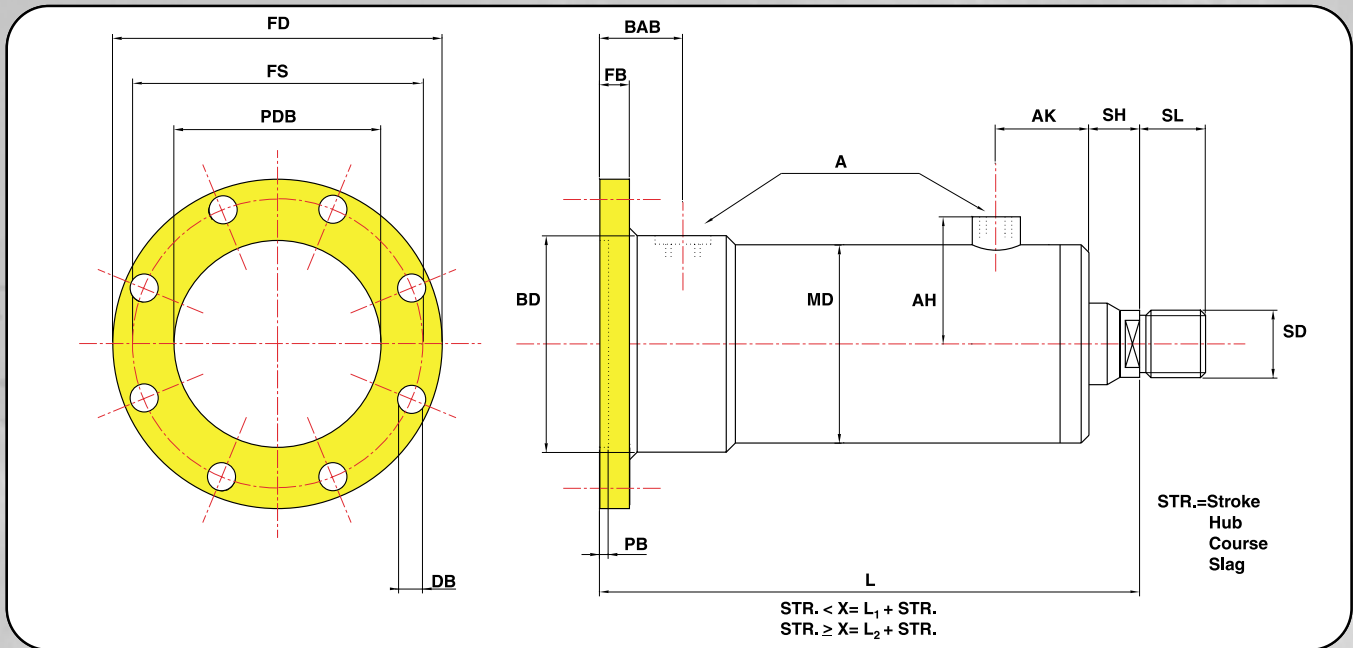


Piston Kolben Piston Zuiger Ø	Rod Stange Tige Stang			x	A G/BSP	AB Ø	BD Ø	SL	AK	L <sub>1</sub>	L <sub>2</sub>	MD Ø	SH	SD M	AH
	Ø 1	Ø 2	Ø 3												
25	16	-	-	-	3/8"	13	35	16	57	145	-	35	15	16 x 1,5	38
32	18	22	-	-	3/8"	13	42	16	60	148	-	42	15	16 x 1,5	41
40	22	28	-	-	3/8"	13	55	16	60	168	-	50	20	16 x 1,5	45
50	28	35	-	-	3/8"	13	65	22	60	168	-	60	20	22 x 1,5	50
65	35	45	-	-	1/2"	15	80	28	64	183	-	80	20	28 x 1,5	65
80	45	55	-	800	1/2"	15	95	35	83	213	248	95	20	35 x 1,5	73
100	60	70	-	800	3/4"	19	120	45	93	247	287	115	30	45 x 1,5	88
125	70	80	90	1200	3/4"	19	150	58	98	277	327	145	30	58 x 1,5	103
140	80	90	100	1200	3/4"	19	165	58	108	293	353	160	30	58 x 1,5	110
160	90	100	110	1500	1"	23	190	65	118	323	393	185	35	65 x 2	123
180	100	110	125	1500	1"	23	220	80	120	360	440	210	35	80 x 2	135
200	110	125	140	1500	1"	23	230	90	130	370	450	230	35	90 x 2	145
220	125	140	160	2000	1 1/4"	28	254	100	145	405	505	254	35	100 x 2	162
250	140	160	180	2000	1 1/4"	28	298	110	145	422	522	298	35	110 x 2	184
280	160	180	200	2000	1 1/4"	28	323	120	165	452	572	323	35	120 x 2	197
320	160	180	-	2500	1 1/2"	40	368	125	180	510	630	368	40	125 x 3	224
320	200	220	-	2500	1 1/2"	40	368	125	180	510	630	368	40	125 x 3	224
360	180	200	-	2500	1 1/2"	43	419	125	190	550	700	419	50	125 x 3	250
360	220	250	-	2500	1 1/2"	43	419	135	190	550	700	419	50	135 x 3	250
400	200	220	-	2500	1 1/2"	43	457	135	205	580	730	457	50	135 x 3	275
400	250	280	-	2500	1 1/2"	43	457	150	205	580	730	457	50	150 x 3	275
450	220	250	-	3000	1 1/2"	50	508	150	220	650	830	508	60	150 x 3	294
450	280	320	-	3000	1 1/2"	50	508	170	220	650	830	508	60	170 x 3	294
500	250	280	-	3000	1 1/2"	50	572	170	230	685	865	572	60	170 x 3	326
500	320	360	-	3000	1 1/2"	50	572	190	230	685	865	572	60	190 x 4	326

**Front flange**    **200 bar**  
**Flansch am Zylinderkopf**    **FF**  
**Bride avant**  
**Frontflens**

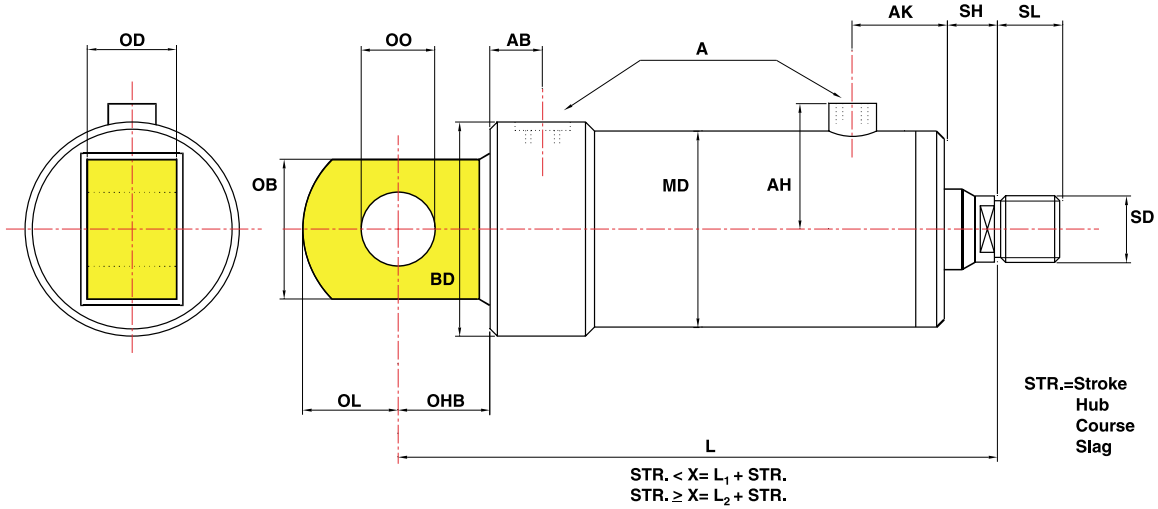


Piston Kolben Piston Zuiger	Rod Stange Tige Stang			x	A	AB	BD	DF	SL	FF	BF	KF	AK	L <sub>1</sub>	L <sub>2</sub>	MD	PF	PDF	SH	SD	AH	BS
	Ø	Ø 1	Ø 2																			
25	16	-	-	-	3/8"	13	35	6,6 (4x)	16	12	90	23	57	145	-	35	3	50	15	16 x 1,5	38	70
32	18	22	-	-	3/8"	13	42	9 (4x)	16	15	110	23	60	148	-	42	3	60	15	16 x 1,5	41	80
40	22	28	-	-	3/8"	13	55	11 (4x)	16	15	130	23	60	168	-	55	3	70	20	16 x 1,5	48	100
50	28	35	-	-	3/8"	13	65	14 (4x)	22	18	140	24	60	168	-	65	4	80	20	22 x 1,5	53	110
65	35	45	-	-	1/2"	15	80	14 (8x)	28	22	165	24	64	183	-	80	4	100	20	28 x 1,5	65	130
80	45	55	-	800	1/2"	15	95	18 (8x)	35	31	200	19	83	213	248	95	4	120	20	35 x 1,5	73	160
100	60	70	-	800	3/4"	19	120	22 (8x)	45	32	215	20	93	247	287	120	5	135	30	45 x 1,5	90	175
125	70	80	90	1200	3/4"	19	150	22 (8x)	58	40	245	20	98	277	327	145	5	165	30	58 x 1,5	103	205
140	80	90	100	1200	3/4"	19	165	26 (8x)	58	40	290	25	108	293	353	160	5	180	30	58 x 1,5	110	235
160	90	100	110	1500	1"	23	190	26 (8x)	65	40	320	25	118	323	393	185	5	205	35	65 x 2	123	265
180	100	110	125	1500	1"	23	220	33 (8x)	80	50	360	30	120	360	440	210	5	230	35	80 x 2	135	300
200	110	125	140	1500	1"	23	230	33 (8x)	90	50	380	30	130	370	450	230	5	260	35	90 x 2	145	320
220	125	140	160	2000	1 1/4"	28	254	33 (8x)	100	60	410	33	145	405	505	254	8	290	35	100 x 2	162	350
250	140	160	180	2000	1 1/4"	28	298	39 (8x)	110	60	460	33	145	422	522	298	8	310	35	110 x 2	184	390
280	160	180	200	2000	1 1/4"	28	323	39 (8x)	120	60	500	33	165	452	572	323	8	340	35	120 x 2	197	430
320	160	180	-	2500	1 1/2"	40	368	39 (12x)	125	65	540	38	180	510	630	368	8	390	40	125 x 3	224	460
320	200	220	-	2500	1 1/2"	40	368	39 (12x)	125	65	540	38	180	510	630	368	8	390	40	125 x 3	224	460
360	180	200	-	2500	1 1/2"	43	419	39 (12x)	125	75	600	38	190	550	700	419	8	430	50	125 x 3	250	510
360	220	250	-	2500	1 1/2"	43	419	39 (12x)	135	75	600	38	190	550	700	419	8	430	50	135 x 3	250	510
400	200	220	-	2500	1 1/2"	43	457	39 (16x)	135	85	680	38	205	580	730	457	8	500	50	135 x 3	269	600
400	250	280	-	2500	1 1/2"	43	457	39 (16x)	150	85	680	38	205	580	730	457	8	500	50	150 x 3	269	600
450	220	250	-	3000	1 1/2"	50	508	45 (16x)	150	95	730	43	220	650	830	508	8	550	60	150 x 3	294	640
450	280	320	-	3000	1 1/2"	50	508	45 (16x)	170	95	730	43	220	650	830	508	8	550	60	170 x 3	294	640
500	250	280	-	3000	1 1/2"	50	572	45 (20x)	170	110	790	47	230	685	865	572	12	610	60	170 x 3	326	700
500	320	360	-	3000	1 1/2"	50	572	45 (20x)	190	110	790	47	230	685	865	572	12	610	60	190 x 4	326	700



Piston Kolben Piston Zuiger	Rod Stange Tige Stang			x	A	BAB	BD	DB	SL	FB	FD	AK	L <sub>1</sub>	L <sub>2</sub>	MD	PB	PDB	SH	SD	AH	FS
	Ø 1	Ø 2	Ø 3																		
25	16	-	-	-	3/8"	35	35	6,6 (4x)	16	12	90	57	167	-	35	3	50	15	16 x 1,5	38	70
32	18	22	-	-	3/8"	38	42	9 (4x)	16	15	110	60	173	-	42	3	60	15	16 x 1,5	41	80
40	22	28	-	-	3/8"	38	55	11 (4x)	16	15	130	60	193	-	50	3	70	20	16 x 1,5	45	100
50	28	35	-	-	3/8"	41	65	14 (4x)	22	18	140	60	196	-	60	4	80	20	22 x 1,5	50	110
65	35	45	-	-	1/2"	47	80	14 (8x)	28	22	165	64	215	-	80	4	100	20	28 x 1,5	65	130
80	45	55	-	800	1/2"	53	95	18 (8x)	35	28	200	83	251	286	95	4	120	20	35 x 1,5	73	160
100	60	70	-	800	3/4"	61	120	22 (8x)	45	32	215	93	289	329	115	5	135	30	45 x 1,5	88	175
125	70	80	90	1200	3/4"	67	150	22 (8x)	58	38	245	98	325	375	145	5	165	30	58 x 1,5	103	205
140	80	90	100	1200	3/4"	67	165	26 (8x)	58	38	290	108	341	401	160	5	180	30	58 x 1,5	110	235
160	90	100	110	1500	1"	71	190	26 (8x)	65	38	320	118	371	441	185	5	205	35	65 x 2	123	265
180	100	110	125	1500	1"	81	220	33 (8x)	80	48	360	120	418	498	210	5	230	35	80 x 2	135	300
200	110	125	140	1500	1"	81	230	33 (8x)	90	48	380	130	428	508	230	5	260	35	90 x 2	145	320
220	125	140	160	2000	1 1/4"	96	254	33 (8x)	100	58	410	145	473	573	254	8	290	35	100 x 2	162	350
250	140	160	180	2000	1 1/4"	96	298	39 (8x)	110	58	460	145	490	590	298	8	310	35	110 x 2	184	390
280	160	180	200	2000	1 1/4"	96	323	39 (8x)	120	58	500	165	520	640	323	8	340	35	120 x 2	197	430
320	160	180	-	2500	1 1/2"	115	368	39 (12x)	125	65	540	180	585	705	368	8	390	40	125 x 3	224	460
320	200	220	-	2500	1 1/2"	115	368	39 (12x)	125	65	540	180	585	705	368	8	390	40	125 x 3	224	460
360	180	200	-	2500	1 1/2"	133	419	39 (12x)	125	75	600	190	640	790	419	8	430	50	125 x 3	250	510
360	220	250	-	2500	1 1/2"	133	419	39 (12x)	135	75	600	190	640	790	419	8	430	50	135 x 3	250	510
400	200	220	-	2500	1 1/2"	148	457	39 (12x)	135	85	680	205	685	835	457	8	500	50	135 x 3	275	600
400	250	280	-	2500	1 1/2"	148	457	39 (12x)	150	85	680	205	685	835	457	8	500	50	150 x 3	275	600
450	220	250	-	3000	1 1/2"	165	508	39 (12x)	150	95	700	220	765	945	508	8	540	60	150 x 3	294	620
450	280	320	-	3000	1 1/2"	165	508	39 (12x)	170	95	700	220	765	945	508	8	540	60	170 x 3	294	620
500	250	280	-	3000	1 1/2"	180	572	39 (16x)	170	110	780	230	815	995	572	12	610	60	170 x 3	326	700
500	320	360	-	3000	1 1/2"	180	572	39 (16x)	190	110	780	230	815	995	572	12	610	60	190 x 4	326	700

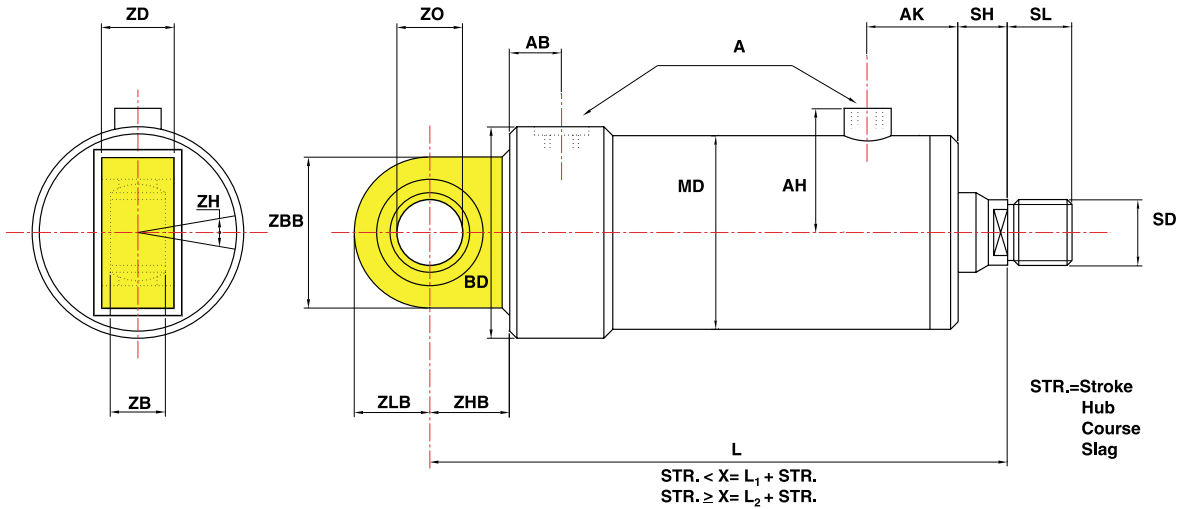




Piston Kolben Piston Zuiger	Rod Stange Tige Stang			x	A G/BSP	AB Ø	BD Ø	SL	AK	L <sub>1</sub>	L <sub>2</sub>	MD Ø	OO ØE8	OB	OD	OHB	OL	SH	SD M	AH
	Ø 1	Ø 2	Ø 3																	
25	16	-	-	-	3/8"	13	35	16	57	185	-	35	15	30	20	40	15	15	16 x 1,5	38
32	18	22	-	-	3/8"	13	42	16	60	188	-	42	15	30	20	40	15	15	16 x 1,5	41
40	22	28	-	-	3/8"	13	55	16	60	208	-	50	20	40	25	40	20	20	16 x 1,5	45
50	28	35	-	-	3/8"	13	65	22	60	213	-	60	30	50	30	45	25	20	22 x 1,5	50
65	35	45	-	-	1/2"	15	80	28	64	233	-	80	35	60	40	50	30	20	28 x 1,5	65
80	45	55	-	800	1/2"	15	95	35	83	273	308	95	40	70	50	60	40	20	35 x 1,5	73
100	60	70	-	800	3/4"	19	120	45	93	317	357	115	50	90	60	70	45	30	45 x 1,5	88
125	70	80	90	1200	3/4"	19	150	58	98	367	417	145	60	100	70	90	60	30	58 x 1,5	103
140	80	90	100	1200	3/4"	19	165	58	108	393	453	160	65	120	80	100	70	30	58 x 1,5	110
160	90	100	110	1500	1"	23	190	65	118	443	513	185	70	140	90	110	80	35	65 x 2	123
180	100	110	125	1500	1"	23	220	80	120	480	560	210	80	160	98	120	90	35	80 x 2	135
200	110	125	140	1500	1"	23	230	90	130	510	590	230	90	160	118	140	95	35	90 x 2	145
220	125	140	160	2000	1 1/4"	28	254	100	145	555	655	254	100	180	118	150	110	35	100 x 2	162
250	140	160	180	2000	1 1/4"	28	298	110	145	592	692	298	120	200	138	170	130	35	110 x 2	184
280	160	180	200	2000	1 1/4"	28	323	120	165	642	762	323	130	220	158	190	140	35	120 x 2	197
320	160	180	-	2500	1 1/2"	40	368	125	180	710	830	368	150	230	176	200	145	40	125 x 3	224
320	200	220	-	2500	1 1/2"	40	368	125	180	710	830	368	150	230	176	200	145	40	125 x 3	224
360	180	200	-	2500	1 1/2"	43	419	125	190	780	930	419	170	270	196	230	165	50	125 x 3	250
360	220	250	-	2500	1 1/2"	43	419	135	190	780	930	419	170	270	196	230	165	50	135 x 3	250
400	200	220	-	2500	1 1/2"	43	457	135	205	840	990	457	190	300	216	260	190	50	135 x 3	275
400	250	280	-	2500	1 1/2"	43	457	150	205	840	990	457	190	300	216	260	190	50	150 x 3	275
450	220	250	-	3000	1 1/2"	50	508	150	220	930	1110	508	210	350	236	280	215	60	150 x 3	294
450	280	320	-	3000	1 1/2"	50	508	170	220	930	1110	508	210	350	236	280	215	60	170 x 3	294
500	250	280	-	3000	1 1/2"	50	572	170	230	985	1165	572	240	390	256	300	235	60	170 x 3	326
500	320	360	-	3000	1 1/2"	50	572	190	230	985	1165	572	240	390	256	300	235	60	190 x 4	326

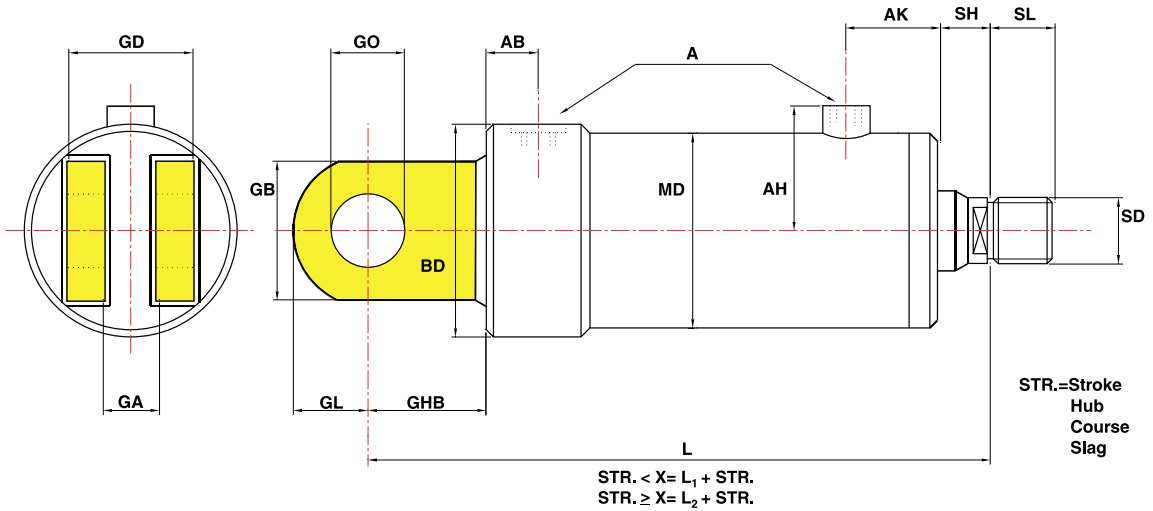
# 200 bar ZB

Rear spherical eye mounting  
Gelenkauge am Zylinderboden  
Oeillet à rotule arrière  
Zwenklager aan bodem



Piston Kolben Piston Zuiger	Rod Stange Tige Stang			x	A	AB	BD	SL	AK	L <sub>1</sub>	L <sub>2</sub>	ZB	MD	ZO	ZBB	ZD	ZHB	ZLB	SH	SD	AH	ZH
	Ø 1	Ø 2	Ø 3																			
25	16	-	-	-	3/8"	13	35	16	57	183	-	16	35	20	50	19	38	25	15	16 x 1,5	38	9"
32	18	22	-	-	3/8"	13	42	16	60	186	-	16	42	20	50	19	38	25	15	16 x 1,5	41	9"
40	22	28	-	-	3/8"	13	55	16	60	213	-	20	50	25	55	23	45	28	20	16 x 1,5	45	7"
50	28	35	-	-	3/8"	13	65	22	60	219	-	22	60	30	65	28	51	33	20	22 x 1,5	50	6"
65	35	45	-	-	1/2"	15	80	28	64	244	-	25	80	35	83	30	61	42	20	28 x 1,5	65	6"
80	45	55	-	800	1/2"	15	95	35	83	282	317	28	95	40	94	35	69	55	20	35 x 1,5	73	7"
100	60	70	-	800	3/4"	19	120	45	93	335	375	35	115	50	120	40	88	75	30	45 x 1,5	88	6"
125	70	80	90	1200	3/4"	19	150	58	98	365	415	35	145	50	120	40	88	75	30	58 x 1,5	103	6"
140	80	90	100	1200	3/4"	19	165	58	108	393	453	44	160	60	160	50	100	95	30	58 x 1,5	110	6"
160	90	100	110	1500	1"	23	190	65	118	423	493	44	185	60	160	50	100	95	35	65 x 2	123	6"
180	100	110	125	1500	1"	23	220	80	120	475	555	49	210	70	190	55	115	115	35	80 x 2	135	6"
200	110	125	140	1500	1"	23	230	90	130	511	591	55	230	80	220	60	141	130	35	90 x 2	145	6"
220	125	140	160	2000	1 1/4"	28	254	100	145	555	655	60	254	90	250	65	150	150	35	100 x 2	162	5"
250	140	160	180	2000	1 1/4"	28	298	110	145	587	687	70	298	100	280	70	165	170	35	110 x 2	184	7"
280	160	180	200	2000	1 1/4"	28	323	120	165	637	757	70	323	110	310	80	185	190	35	120 x 2	197	6"
320	160	180	-	2500	1 1/2"	40	368	125	180	710	830	85	368	120	335	90	200	215	40	125 x 3	224	6"
320	200	220	-	2500	1 1/2"	40	368	125	180	710	830	85	368	120	335	90	200	215	40	125 x 3	224	6"
360	180	200	-	2500	1 1/2"	43	419	125	190	780	930	90	419	140	390	110	230	245	50	125 x 3	250	7"
360	220	250	-	2500	1 1/2"	43	419	135	190	780	930	90	419	140	390	110	230	245	50	135 x 3	250	7"
400	200	220	-	2500	1 1/2"	43	457	135	205	840	990	105	457	160	450	130	260	275	50	135 x 3	275	8"
400	250	280	-	2500	1 1/2"	43	457	150	205	840	990	105	457	160	450	130	260	275	50	150 x 3	275	8"
450	220	250	-	3000	1 1/2"	50	508	150	220	930	1110	105	508	180	500	140	280	300	60	150 x 3	294	6"
450	280	320	-	3000	1 1/2"	50	508	170	220	930	1110	105	508	180	500	140	280	300	60	170 x 3	294	6"
500	250	280	-	3000	1 1/2"	50	572	170	230	985	1165	130	572	200	560	160	300	330	60	170 x 3	326	7"
500	320	360	-	3000	1 1/2"	50	572	190	230	985	1165	130	572	200	560	160	300	330	60	190 x 4	326	7"

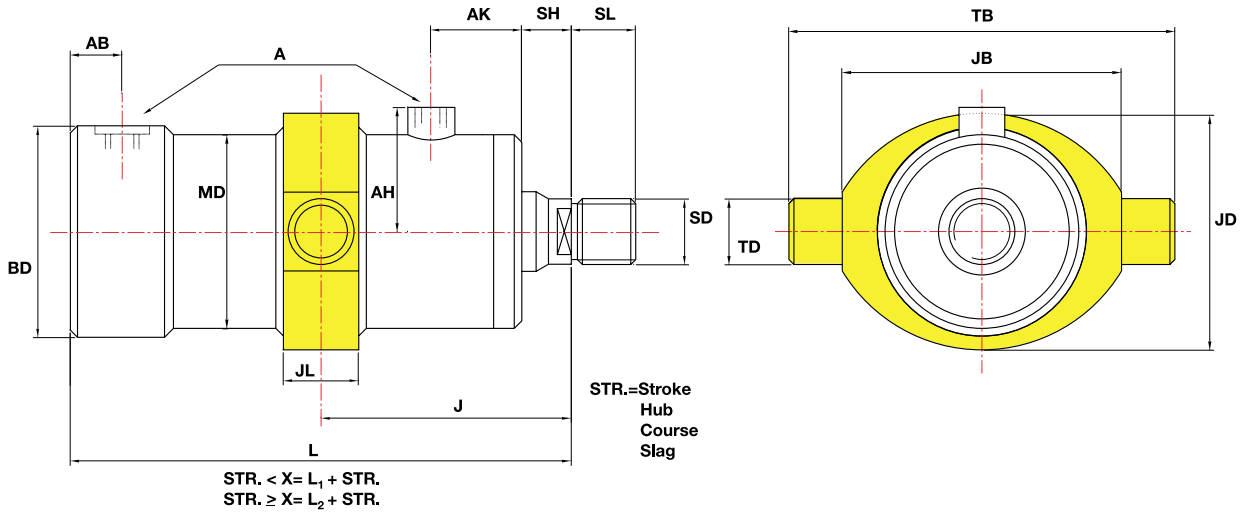
Rear double clevis **200 bar**  
 Gabel am Zylinderboden  
**GB**  
 Fourche arrière  
 Gaffel aan bodem



Piston Kolben Piston Zuiger	Rod Stange Tige Stang			x	A	AB	BD	SL	AK	L <sub>1</sub>	L <sub>2</sub>	MD	GO	GB	GD	GHB	GL	SH	SD	AH	GA
Ø	Ø 1	Ø 2	Ø 3		G/BSP	Ø						Ø	ØE8						M		
25	16	-	-	-	3/8"	13	35	16	57	180	-	35	20	30	50	35	15	15	16 x 1,5	38	25
32	18	22	-	-	3/8"	13	42	16	60	183	-	42	20	30	50	35	15	15	16 x 1,5	41	25
40	22	28	-	-	3/8"	13	55	16	60	208	-	50	25	40	60	40	20	20	16 x 1,5	45	30
50	28	35	-	-	3/8"	13	65	22	60	213	-	60	30	50	70	45	25	20	22 x 1,5	50	35
65	35	45	-	-	1/2"	15	80	28	64	238	-	80	35	60	80	55	30	20	28 x 1,5	65	40
80	45	55	-	800	1/2"	15	95	35	83	273	308	95	40	80	90	60	35	20	35 x 1,5	73	45
100	60	70	-	800	3/4"	19	120	45	93	322	362	115	50	100	100	75	45	30	45 x 1,5	88	50
125	70	80	90	1200	3/4"	19	150	58	98	362	412	145	50	100	100	85	60	30	58 x 1,5	103	50
140	80	90	100	1200	3/4"	19	165	58	108	398	458	160	60	120	120	105	70	30	58 x 1,5	110	60
160	90	100	110	1500	1"	23	190	65	118	428	498	185	60	120	120	105	80	35	65 x 2	123	60
180	100	110	125	1500	1"	23	220	80	120	490	570	210	70	140	130	130	90	35	80 x 2	135	65
200	110	125	140	1500	1"	23	230	90	130	515	595	230	80	160	140	145	95	35	90 x 2	145	70
220	125	140	160	2000	1 1/4"	28	254	100	145	570	670	254	90	180	155	165	110	35	100 x 2	162	80
250	140	160	180	2000	1 1/4"	28	298	110	145	612	712	298	100	200	165	190	130	35	110 x 2	184	85
280	160	180	200	2000	1 1/4"	28	323	120	165	662	782	323	110	220	180	210	140	35	120 x 2	197	95
320	160	180	-	2500	1 1/2"	40	368	125	180	750	870	368	120	240	215	240	145	40	125 x 3	224	110
320	200	220	-	2500	1 1/2"	40	368	125	180	750	870	368	120	240	215	240	145	40	125 x 3	224	110
360	180	200	-	2500	1 1/2"	43	419	125	190	820	970	419	140	280	250	270	165	50	125 x 3	250	130
360	220	250	-	2500	1 1/2"	43	419	135	190	820	970	419	140	280	250	270	165	50	135 x 3	250	130
400	200	220	-	2500	1 1/2"	43	457	135	205	885	1015	457	160	320	280	305	190	50	135 x 3	275	150
400	250	280	-	2500	1 1/2"	43	457	150	205	885	1015	457	160	320	280	305	190	50	150 x 3	275	150
450	220	250	-	3000	1 1/2"	50	508	150	220	980	1160	508	180	360	310	330	215	60	150 x 3	294	170
450	280	320	-	3000	1 1/2"	50	508	170	220	980	1160	508	180	360	310	330	215	60	170 x 3	294	170
500	250	280	-	3000	1 1/2"	50	572	170	230	1050	1230	572	200	400	350	365	235	60	170 x 3	326	190
500	320	360	-	3000	1 1/2"	50	572	190	230	1050	1230	572	200	400	350	365	235	60	190 x 4	326	190

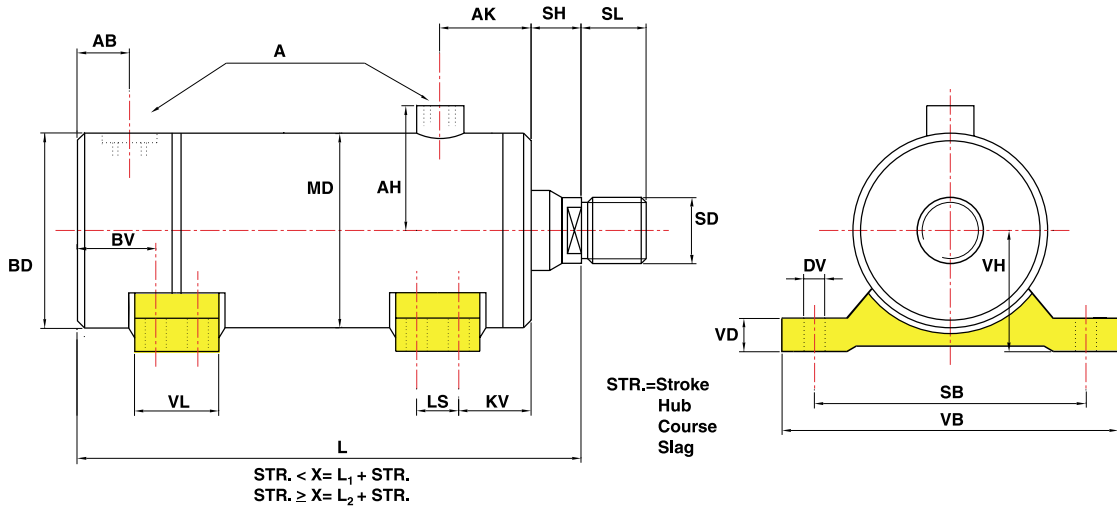
# 200 bar ZT

Intermediate trunnion mounting  
Schwenzapfen in Zylindermitte  
Tourillons intermédiaires  
Zwenktappen



Piston Kolben Piston Zuiger	Rod Stange Tige Stang			x	A	AB	BD	SL	J <sub>min</sub>	J <sub>max</sub> =L-	JB	JD	JL	AK	L <sub>1</sub>	L <sub>2</sub>	MD	SH	SD	AH	TB	TD	STR.
	Ø 1	Ø 2	Ø 3																				
25	16	-	-	-	3/8"	13	35	16	122	65	45	45	30	57	145	-	35	15	16 x 1,5	38	65	18	37
32	18	22	-	-	3/8"	13	42	16	125	67	52	52	30	60	148	-	42	15	16 x 1,5	41	80	22	39
40	22	28	-	-	3/8"	13	55	16	130	67	70	70	30	60	168	-	50	20	16 x 1,5	45	105	25	24
50	28	35	-	-	3/8"	13	65	22	135	72	80	80	40	60	168	-	60	20	22 x 1,5	50	118	30	34
65	35	45	-	-	1/2"	15	80	28	144	83	100	105	40	64	183	-	80	20	28 x 1,5	65	148	35	44
80	45	55	-	800	1/2"	15	95	35	168	86	130	120	50	83	213	248	95	20	35 x 1,5	73	184	45	41
100	60	70	-	800	3/4"	19	120	45	198	100	165	140	60	93	247	287	115	30	45 x 1,5	88	230	55	51
125	70	80	90	1200	3/4"	19	150	58	213	111	185	180	80	98	277	327	145	30	58 x 1,5	103	280	65	47
140	80	90	100	1200	3/4"	19	165	58	233	122	210	195	90	108	293	353	160	30	58 x 1,5	110	320	75	62
160	90	100	110	1500	1"	23	190	65	256	137	235	220	100	118	323	393	185	35	65 x 2	123	360	85	70
180	100	110	125	1500	1"	23	220	80	268	146	260	250	120	120	360	440	210	35	80 x 2	135	390	100	54
200	110	125	140	1500	1"	23	230	90	283	151	300	290	130	130	370	450	230	35	90 x 2	145	440	110	64
220	125	140	160	2000	1 1/4"	28	254	100	315	171	320	325	140	145	405	505	254	35	100 x 2	162	500	120	81
250	140	160	180	2000	1 1/4"	28	298	110	320	176	360	350	150	145	422	522	298	35	110 x 2	184	550	130	74
280	160	180	200	2000	1 1/4"	28	323	120	350	185	400	390	170	165	452	572	323	35	120 x 2	197	620	150	83
320	160	180	-	2500	1 1/2"	40	368	125	398	235	450	420	180	180	510	630	368	40	125 x 3	224	680	160	108
320	200	220	-	2500	1 1/2"	40	368	125	398	235	450	420	180	180	510	630	368	40	125 x 3	224	680	160	108
360	180	200	-	2500	1 1/2"	43	419	125	423	250	500	480	180	190	550	700	419	50	125 x 3	250	730	170	108
360	220	250	-	2500	1 1/2"	43	419	135	423	250	500	480	180	190	550	700	419	50	135 x 3	250	730	170	108
400	200	220	-	2500	1 1/2"	43	457	135	448	260	550	540	200	205	580	710	457	50	135 x 3	275	780	180	113
400	250	280	-	2500	1 1/2"	43	457	150	448	260	550	540	200	205	580	710	457	50	150 x 3	275	780	180	113
450	220	250	-	3000	1 1/2"	50	508	150	518	310	600	580	250	220	650	830	508	60	150 x 3	294	840	220	148
450	280	320	-	3000	1 1/2"	50	508	170	518	310	600	580	250	220	650	830	508	60	170 x 3	294	840	220	148
500	250	280	-	3000	1 1/2"	50	572	170	558	325	660	630	280	230	685	865	572	60	170 x 3	326	920	250	153
500	320	360	-	3000	1 1/2"	50	572	190	558	325	660	630	280	230	685	865	572	60	190 x 4	326	920	250	153





Piston Kolben Piston Zuiger	Rod Stange Tige Stang				x	A	AB	BD	SB	BV	DV	SL	AK	KV	L <sub>1</sub>	L <sub>2</sub>	LS	MD	SH	SD	AH	VB	VD	VH	VL
	Ø 1	Ø 2	Ø 3	Ø																					
	G/BSP	Ø	Ø	Ø																					
25	16	-	-	-	3/8"	13	35	60	18	6,6 (8x)	16	57	38	145	-	15	35	15	16 x 1,5	38	80	8	24	30	
32	18	22	-	-	3/8"	13	42	70	18	6,6 (8x)	16	60	38	148	-	15	42	15	16 x 1,5	41	90	10	28	30	
40	22	28	-	-	3/8"	13	55	80	20	9 (8x)	16	60	40	168	-	20	55	20	16 x 1,5	48	105	10	35	40	
50	28	35	-	-	3/8"	13	65	95	20	9 (8x)	22	60	40	168	-	20	65	20	22 x 1,5	53	120	10	40	40	
65	35	45	-	-	1/2"	15	80	120	23	11 (8x)	28	64	43	183	-	25	80	20	28 x 1,5	65	150	15	50	50	
80	45	55	-	800	1/2"	15	95	135	23	11 (8x)	35	83	38	213	248	25	95	20	35 x 1,5	73	170	20	60	50	
100	60	70	-	800	3/4"	19	120	160	25	14 (8x)	45	93	40	247	287	30	120	30	45 x 1,5	88	200	30	75	60	
125	70	80	90	1200	3/4"	19	150	200	30	18 (8x)	58	98	45	277	327	40	150	30	58 x 1,5	105	240	30	90	80	
140	80	90	100	1200	3/4"	19	165	230	45	22 (8x)	58	108	65	293	353	50	165	30	58 x 1,5	113	280	30	100	100	
160	90	100	110	1500	1"	23	185	250	45	22 (8x)	65	118	65	323	393	50	185	35	65 x 2	123	300	40	120	100	
180	100	110	125	1500	1"	23	210	275	55	26 (8x)	80	120	75	360	440	60	210	35	80 x 2	135	330	50	135	120	

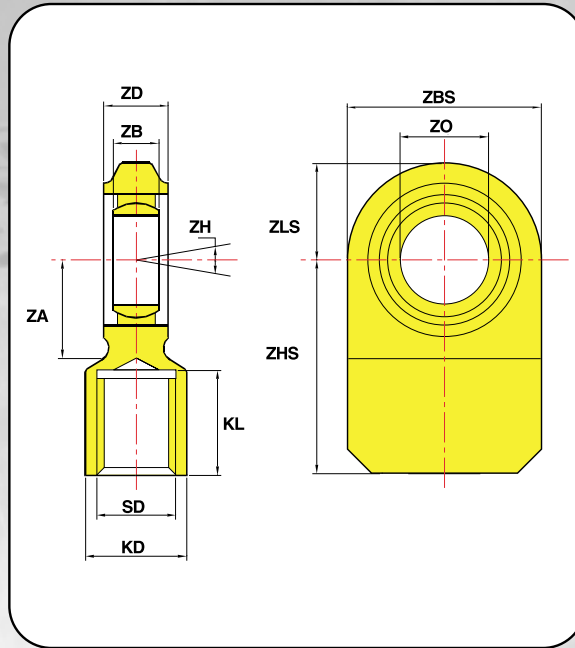
# 200 bar ZS

Rod spherical eye mounting

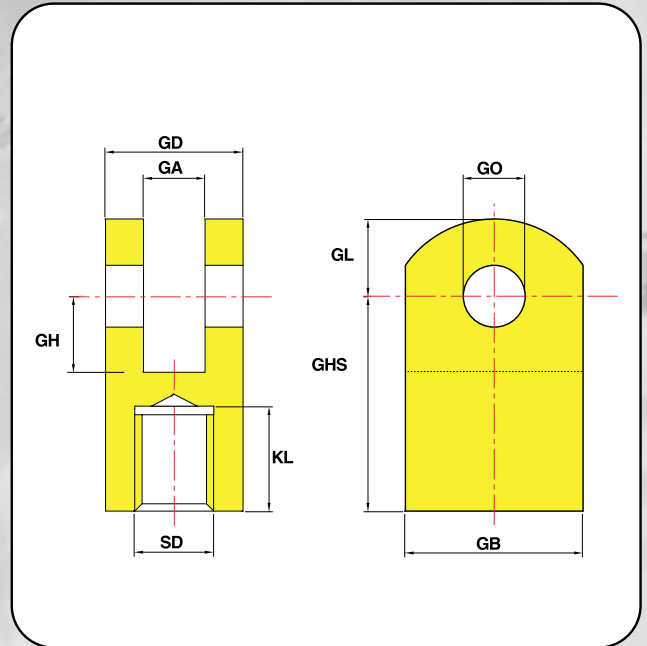
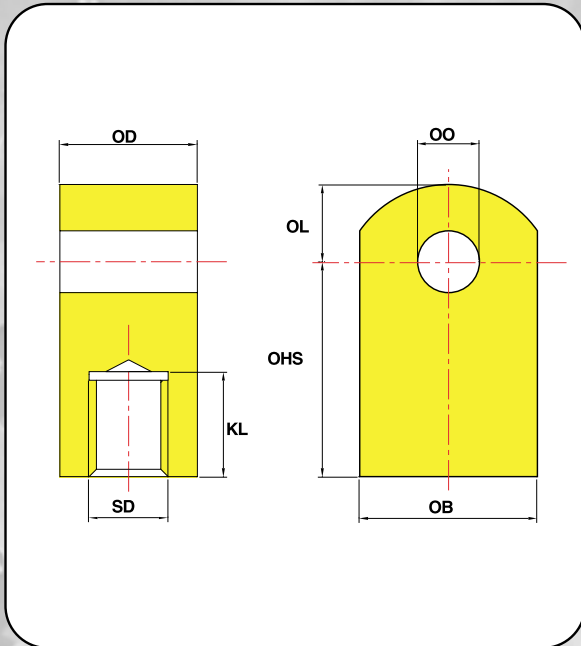
Gelenkauge an Kolbenstange

Oeillet à rotule sur la tige

Zwenklager aan stang



Piston Kolben Piston Zuiger	Rod Stange Tige Stang			KL	KD Ø	ZB	ZO Ø	ZBS	ZD	ZHS	ZLS	SD M	ZA	ZH max.
	Ø 1	Ø 2	Ø 3											
25	16	-	-	17	25	16	20	56	19	50	28	16 x 1,5	25	9'
32	18	22	-	17	25	16	20	56	19	50	28	16 x 1,5	25	9'
40	22	28	-	17	25	20	25	56	23	50	28	16 x 1,5	28	7'
50	28	35	-	23	32	22	30	64	28	60	32	22 x 1,5	30	6'
65	35	45	-	29	40	25	35	78	30	70	39	28 x 1,5	38	6'
80	45	55	-	37	55	28	40	94	35	85	55	35 x 1,5	39	7'
100	60	70	-	48	70	35	50	120	40	135	75	45 x 1,5	69	6'
125	70	80	90	61	100	35	50	120	40	150	75	58 x 1,5	69	6'
140	80	90	100	61	100	44	60	160	50	160	95	58 x 1,5	74	6'
160	90	100	110	68	110	44	60	160	50	160	95	65 x 2	74	6'
180	100	110	125	84	130	49	70	190	55	190	115	80 x 2	87	6'
200	110	125	140	94	140	55	80	220	60	225	130	90 x 2	95	6'
220	125	140	160	104	150	60	90	250	65	255	150	100 x 2	115	5'
250	140	160	180	114	160	70	100	280	70	290	170	110 x 2	125	7'
280	160	180	200	125	180	70	110	310	80	320	190	120 x 2	140	6'
320	160	180	-	130	180	85	120	335	90	340	215	125 x 3	150	6'
320	200	220	-	130	180	85	120	335	90	340	215	125 x 3	150	6'
360	180	200	-	130	180	90	140	390	110	370	245	125 x 3	170	7'
360	220	250	-	140	200	90	140	390	110	370	245	135 x 3	170	7'
400	200	220	-	140	200	105	160	450	130	390	275	135 x 3	200	8'
400	250	280	-	155	220	105	160	450	130	390	275	150 x 3	200	8'
450	220	250	-	155	220	105	180	500	140	430	300	150 x 3	220	6'
450	280	320	-	175	260	105	180	500	140	430	300	170 x 3	220	6'
500	250	280	-	175	260	130	200	560	160	470	330	170 x 3	240	7'
500	320	360	-	195	280	130	200	560	160	470	330	190 x 4	240	7'



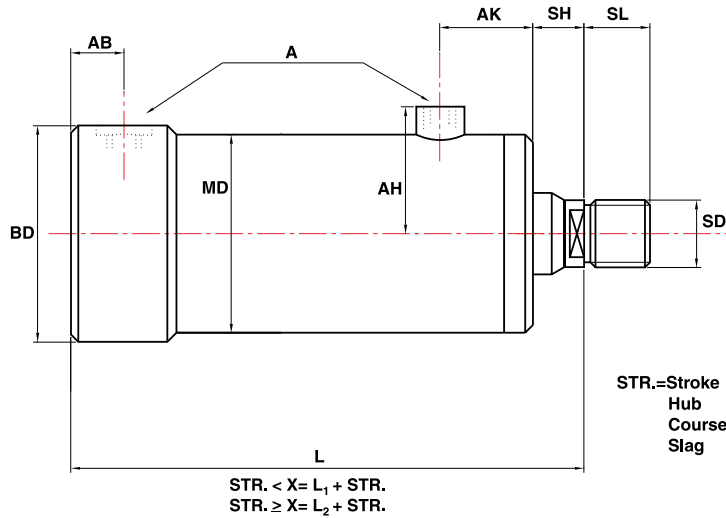
Piston Kolben Piston Zuiger	Rod Stange Tige Stang			KL	OO	OB	OD	OHS	OL	SD
	Ø 1	Ø 2	Ø 3							
Ø	ØE8			M						
25	16	-	-	17	15	30	20	40	15	16 x 1,5
32	18	22	-	17	15	30	20	40	15	16 x 1,5
40	22	28	-	17	20	40	25	45	20	16 x 1,5
50	28	35	-	23	30	50	30	50	25	22 x 1,5
65	35	45	-	29	35	60	40	60	30	28 x 1,5
80	45	55	-	37	40	70	50	70	40	35 x 1,5
100	60	70	-	48	50	90	60	90	45	45 x 1,5
125	70	80	90	61	60	100	70	115	60	58 x 1,5
140	80	90	100	61	65	120	80	125	70	58 x 1,5
160	90	100	110	68	70	140	90	140	80	65 x 2
180	100	110	125	84	80	160	98	160	90	80 x 2
200	110	125	140	94	90	160	118	170	95	90 x 2
220	125	140	160	104	100	180	118	190	110	100 x 2
250	140	160	180	114	120	200	138	210	130	110 x 2
280	160	180	200	125	130	220	158	240	140	120 x 2
320	160	180	-	130	150	230	176	255	145	125 x 3
320	200	220	-	130	150	230	176	255	145	125 x 3
360	180	200	-	130	170	270	196	275	165	125 x 3
360	220	250	-	140	170	270	196	275	165	135 x 3
400	200	220	-	140	190	300	216	300	190	135 x 3
400	250	280	-	155	190	300	216	300	190	150 x 3
450	220	250	-	155	210	350	236	340	215	150 x 3
450	280	320	-	175	210	350	236	340	215	170 x 3
500	250	280	-	175	240	390	256	380	235	170 x 3
500	320	360	-	195	240	390	256	380	235	190 x 4

Piston Kolben Piston Zuiger	Rod Stange Tige Stang			KL	GO	GB	GD	GHS	GL	GA	GH	SD
	Ø 1	Ø 2	Ø 3									
Ø	ØE8			M								
25	16	-	-	17	20	30	50	60	15	25	35	16 x 1,5
32	18	22	-	17	20	30	50	60	15	25	35	16 x 1,5
40	22	28	-	17	25	40	60	65	20	30	40	16 x 1,5
50	28	35	-	23	30	50	70	80	25	35	45	22 x 1,5
65	35	45	-	29	35	60	80	100	30	40	55	28 x 1,5
80	45	55	-	37	40	80	90	110	40	45	60	35 x 1,5
100	60	70	-	48	50	100	100	140	55	50	75	45 x 1,5
125	70	80	90	61	50	100	100	160	55	50	85	58 x 1,5
140	80	90	100	61	60	120	120	185	70	60	105	58 x 1,5
160	90	100	110	68	60	120	120	190	70	60	105	65 x 2
180	100	110	125	84	70	140	130	235	80	65	130	80 x 2
200	110	125	140	94	80	160	140	260	95	70	145	90 x 2
220	125	140	160	104	90	180	155	295	110	80	165	100 x 2
250	140	160	180	114	100	200	165	330	130	85	190	110 x 2
280	160	180	200	125	110	220	180	370	140	95	210	120 x 2
320	160	180	-	130	120	240	215	405	145	110	240	125 x 3
320	200	220	-	130	120	240	215	405	145	110	240	125 x 3
360	180	200	-	130	140	280	250	450	165	130	270	125 x 3
360	220	250	-	140	140	280	250	450	165	130	270	135 x 3
400	200	220	-	140	160	320	280	510	190	150	305	135 x 3
400	250	280	-	155	160	320	280	510	190	150	305	150 x 3
450	220	250	-	155	180	360	310	560	215	170	330	150 x 3
450	280	320	-	175	180	360	310	560	215	170	330	170 x 3
500	250	280	-	175	200	400	350	620	235	190	365	170 x 3
500	320	360	-	195	200	400	350	620	235	190	365	190 x 4



*- Biggest mobile crane in the world (3800 T. lifting capacity).*





Piston Kolben Piston Zuiger Ø	Rod Stange Tige Stang			x	A G/BSP	AB Ø	BD Ø	SL	AK	L <sub>1</sub>	L <sub>2</sub>	MD Ø	SH	SD M	AH
	Ø 1	Ø 2	Ø 3												
25	16	-	-	-	3/8"	13	35	16	57	145	-	35	15	16 x 1,5	38
32	18	22	-	-	3/8"	13	41	16	60	148	-	42	15	16 x 1,5	41
40	22	28	-	-	3/8"	13	55	16	60	168	-	50	20	16 x 1,5	45
50	28	35	-	-	3/8"	13	65	22	60	168	-	60	20	22 x 1,5	50
65	35	45	-	-	1/2"	15	80	28	64	183	-	80	20	28 x 1,5	65
80	45	55	-	800	1/2"	15	95	35	83	213	248	95	20	35 x 1,5	73
100	60	70	-	800	3/4"	19	120	45	93	247	287	120	30	45 x 1,5	90
125	70	80	90	1200	3/4"	19	150	58	98	277	327	150	30	58 x 1,5	105
140	80	90	100	1200	3/4"	19	165	58	108	293	353	165	30	58 x 1,5	113
160	90	100	110	1500	1"	23	190	65	118	323	393	190	35	65 x 2	125
180	100	110	125	1500	1"	23	220	80	120	360	440	210	35	80 x 2	135
200	110	125	140	1500	1"	23	244	90	130	370	450	244	35	90 x 2	152
220	125	140	160	2000	1 1/4"	28	267	100	145	405	505	267	35	100 x 2	169
250	140	160	180	2000	1 1/4"	28	298	110	145	422	522	298	35	110 x 2	184
280	160	180	200	2000	1 1/4"	28	343	120	165	452	572	343	35	120 x 2	207
320	160	180	-	2500	1 1/2"	40	394	125	190	520	640	394	40	125 x 3	224
320	200	220	-	2500	1 1/2"	40	394	125	190	520	640	394	40	125 x 3	224
360	180	200	-	2500	1 1/2"	43	419	125	200	560	710	419	50	125 x 3	250
360	220	250	-	2500	1 1/2"	43	419	135	200	560	710	419	50	135 x 3	250
400	200	220	-	2500	1 1/2"	43	470	135	220	595	745	470	50	135 x 3	275
400	250	280	-	2500	1 1/2"	43	470	150	220	595	745	470	50	150 x 3	275
450	220	250	-	3000	1 1/2"	50	521	150	230	660	840	521	60	150 x 3	301
450	280	320	-	3000	1 1/2"	50	521	170	230	660	840	521	60	170 x 3	301
500	250	280	-	3000	1 1/2"	50	610	170	250	705	885	610	60	170 x 3	345
500	320	360	-	3000	1 1/2"	50	610	190	250	705	885	610	60	190 x 4	345

250 bar

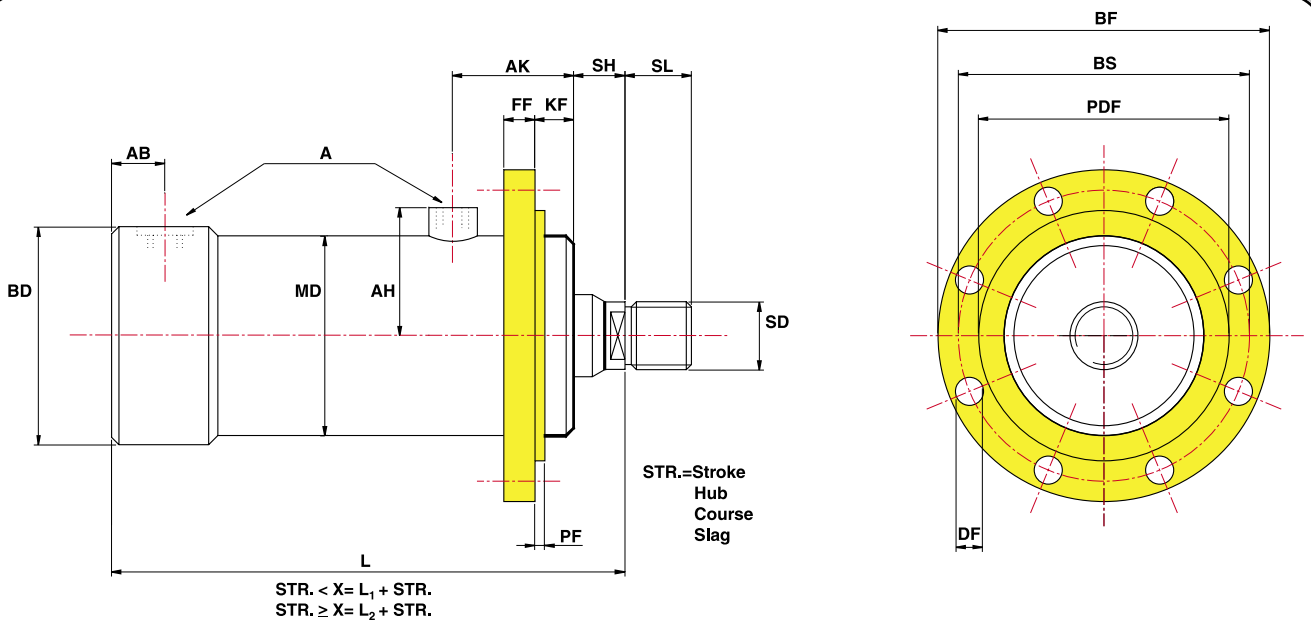
Front flange

FF

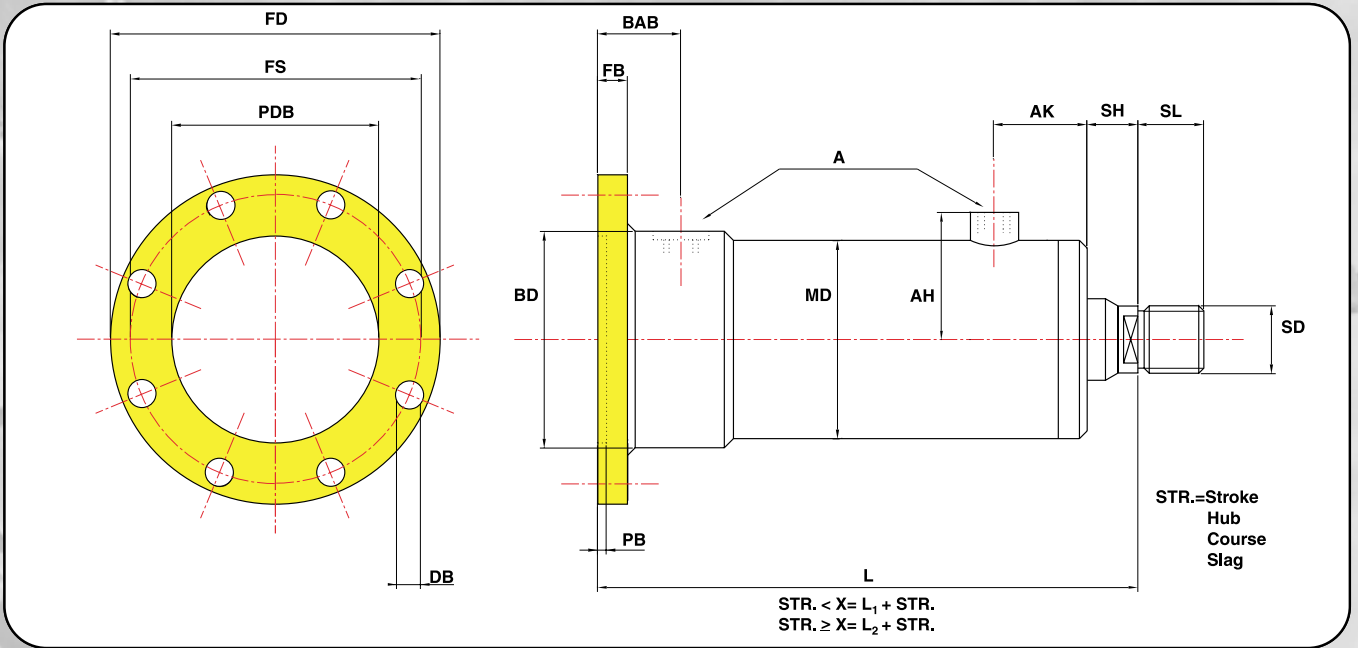
Flansch am Zylinderkopf

Bride avant

Frontflens



Piston Kolben Piston Zuiger	Rod Stange Tige Stang			x	A	AB	BD	DF	SL	FF	BF	KF	AK	L <sub>1</sub>	L <sub>2</sub>	MD	PF	PDF	SH	SD	AH	BS
	Ø 1	Ø 2	Ø 3																			
25	16	-	-	-	3/8"	13	35	6,6 (4x)	16	12	90	23	57	145	-	35	3	50	15	16 x 1,5	38	70
32	18	22	-	-	3/8"	13	42	9 (4x)	16	15	110	23	60	148	-	42	3	60	15	16 x 1,5	41	80
40	22	28	-	-	3/8"	13	55	11 (4x)	16	15	130	23	60	168	-	55	3	70	20	16 x 1,5	48	100
50	28	35	-	-	3/8"	13	65	14 (4x)	22	18	140	24	60	168	-	65	4	80	20	22 x 1,5	53	110
65	35	45	-	-	1/2"	15	80	14 (8x)	28	22	165	24	64	183	-	80	4	100	20	28 x 1,5	65	130
80	45	55	-	800	1/2"	15	95	18 (8x)	35	31	200	19	83	213	248	95	4	120	20	35 x 1,5	73	160
100	60	70	-	800	3/4"	19	120	22 (8x)	45	32	215	20	93	247	287	120	5	135	30	45 x 1,5	90	175
125	70	80	90	1200	3/4"	19	150	22 (8x)	58	40	245	20	98	277	327	150	5	165	30	58 x 1,5	105	205
140	80	90	100	1200	3/4"	19	165	26 (8x)	58	40	290	25	108	293	353	165	5	180	30	58 x 1,5	113	235
160	90	100	110	1500	1"	23	190	26 (8x)	65	40	320	25	118	323	393	190	5	205	35	65 x 2	125	265
180	100	110	125	1500	1"	23	220	33 (8x)	80	50	360	30	120	360	440	210	5	230	35	80 x 2	135	300
200	110	125	140	1500	1"	23	244	33 (8x)	90	50	410	30	130	370	450	244	5	270	35	90 x 2	152	340
220	125	140	160	2000	1 1/4"	28	267	33 (8x)	100	60	420	33	145	405	505	267	8	290	35	100 x 2	169	350
250	140	160	180	2000	1 1/4"	28	298	39 (8x)	110	60	460	33	145	422	522	298	8	310	35	110 x 2	184	390
280	160	180	200	2000	1 1/4"	28	343	39 (8x)	120	60	530	33	165	452	572	343	8	370	35	120 x 2	207	460
320	160	180	-	2500	1 1/2"	40	394	39 (12x)	125	75	580	38	190	520	640	394	8	410	40	125 x 3	237	490
320	200	220	-	2500	1 1/2"	40	394	39 (12x)	125	75	580	38	190	520	640	394	8	410	40	125 x 3	237	490
360	180	200	-	2500	1 1/2"	43	419	39 (16x)	125	85	600	38	200	560	710	419	8	430	50	125 x 3	250	510
360	220	250	-	2500	1 1/2"	43	419	39 (16x)	135	85	600	38	200	560	710	419	8	430	50	135 x 3	250	510
400	200	220	-	2500	1 1/2"	43	470	39 (16x)	135	95	680	38	220	595	745	470	8	500	50	135 x 3	275	600
400	250	280	-	2500	1 1/2"	43	470	39 (16x)	150	95	680	38	220	595	745	470	8	500	50	150 x 3	275	600
450	220	250	-	3000	1 1/2"	50	521	45 (16x)	150	110	730	43	230	660	840	521	8	550	60	150 x 3	301	640
450	280	320	-	3000	1 1/2"	50	521	45 (16x)	170	110	730	43	230	660	840	521	8	550	60	170 x 3	301	640
500	250	280	-	3000	1 1/2"	50	610	45 (20x)	170	120	790	47	250	705	885	610	12	610	60	170 x 3	345	700
500	320	360	-	3000	1 1/2"	50	610	45 (20x)	190	120	790	47	250	705	885	610	12	610	60	190 x 4	345	700



Piston Kolben Piston Zuiger	Rod Stange Tige Stang			x	A G / BSP	BAB ø	BD ø	DB ø	SL	FB	FD ø	AK	L <sub>1</sub>	L <sub>2</sub>	MD ø	PB	PDB øF8	SH	SD M	AH	FS ø
	ø 1	ø 2	ø 3																		
25	16	-	-	-	3/8"	35	35	6,6 (4x)	16	12	90	57	167	-	35	3	50	15	16 x 1,5	38	70
32	18	22	-	-	3/8"	38	42	9 (4x)	16	15	110	60	173	-	42	3	60	15	16 x 1,5	41	80
40	22	28	-	-	3/8"	38	55	11 (4x)	16	15	130	60	193	-	50	3	70	20	16 x 1,5	45	100
50	28	35	-	-	3/8"	41	65	14 (4x)	22	18	140	60	196	-	60	4	80	20	22 x 1,5	50	110
65	35	45	-	-	1/2"	47	80	14 (8x)	28	22	165	64	215	-	80	4	100	20	28 x 1,5	65	130
80	45	55	-	800	1/2"	53	95	18 (8x)	35	28	200	83	251	286	95	4	120	20	35 x 1,5	73	160
100	60	70	-	800	3/4"	61	120	22 (8x)	45	32	215	93	289	329	120	5	135	30	45 x 1,5	90	175
125	70	80	90	1200	3/4"	67	150	22 (8x)	58	38	245	98	325	375	150	5	165	30	58 x 1,5	105	205
140	80	90	100	1200	3/4"	67	165	26 (8x)	58	38	290	108	341	401	165	5	180	30	58 x 1,5	113	235
160	90	100	110	1500	1"	71	190	26 (8x)	65	38	320	118	371	441	190	5	205	35	65 x 2	125	265
180	100	110	125	1500	1"	81	220	33 (8x)	80	48	360	120	418	498	210	5	230	35	80 x 2	135	300
200	110	125	140	1500	1"	81	244	33 (8x)	90	48	410	130	428	508	244	5	260	35	90 x 2	152	340
220	125	140	160	2000	1 1/4"	96	267	33 (8x)	100	58	420	145	473	573	267	8	290	35	100 x 2	169	350
250	140	160	180	2000	1 1/4"	96	298	39 (8x)	110	58	460	145	490	590	298	8	310	35	110 x 2	184	390
280	160	180	200	2000	1 1/4"	96	343	39 (8x)	120	58	530	165	520	640	343	8	340	35	120 x 2	207	460
320	160	180	-	2500	1 1/2"	115	394	39 (12x)	125	75	560	190	605	725	394	8	390	40	125 x 3	224	480
320	200	220	-	2500	1 1/2"	115	394	39 (12x)	125	75	560	190	605	725	394	8	390	40	125 x 3	224	480
360	180	200	-	2500	1 1/2"	133	419	39 (12x)	125	85	600	200	660	810	419	8	430	50	125 x 3	250	510
360	220	250	-	2500	1 1/2"	133	419	39 (12x)	135	85	600	200	660	810	419	8	430	50	135 x 3	250	510
400	200	220	-	2500	1 1/2"	148	470	39 (12x)	135	95	660	220	710	860	470	8	490	50	135 x 3	275	580
400	250	280	-	2500	1 1/2"	148	470	39 (12x)	150	95	660	220	710	860	470	8	490	50	150 x 3	275	580
450	220	250	-	3000	1 1/2"	165	521	39 (12x)	150	110	700	230	790	970	521	8	540	60	150 x 3	301	620
450	280	320	-	3000	1 1/2"	165	521	39 (12x)	170	110	700	230	790	970	521	8	540	60	170 x 3	301	620
500	250	280	-	3000	1 1/2"	180	610	39 (16x)	170	120	800	250	845	1025	610	12	630	60	170 x 3	345	720
500	320	360	-	3000	1 1/2"	180	610	39 (16x)	190	120	800	250	845	1025	610	12	630	60	190 x 4	345	720

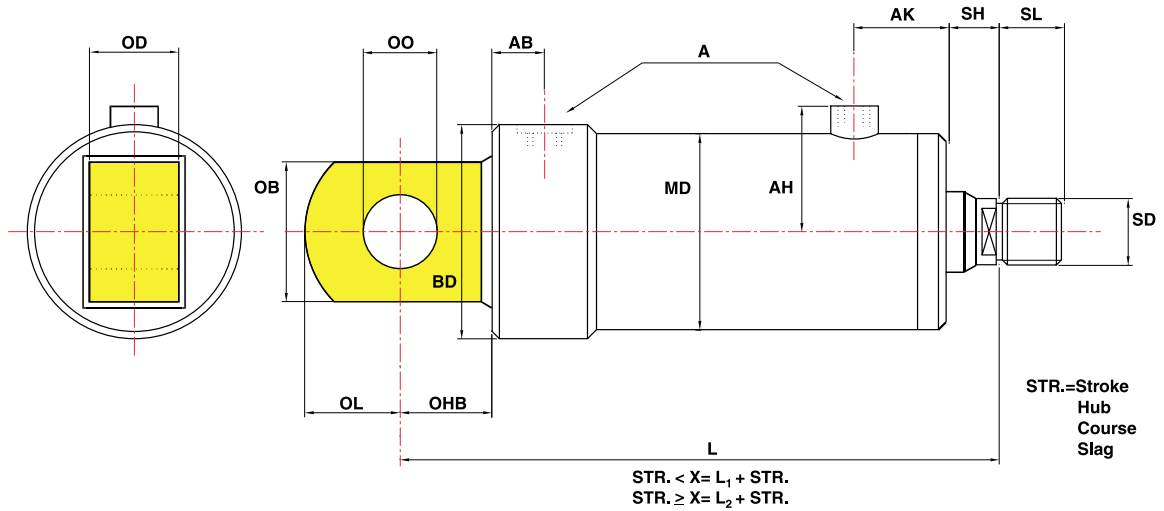
# 250 bar OB

Rear eye mounting

Schwenkaugen am Zylinderboden

Oeillet arrière à trou lisse

Oog aan bodem

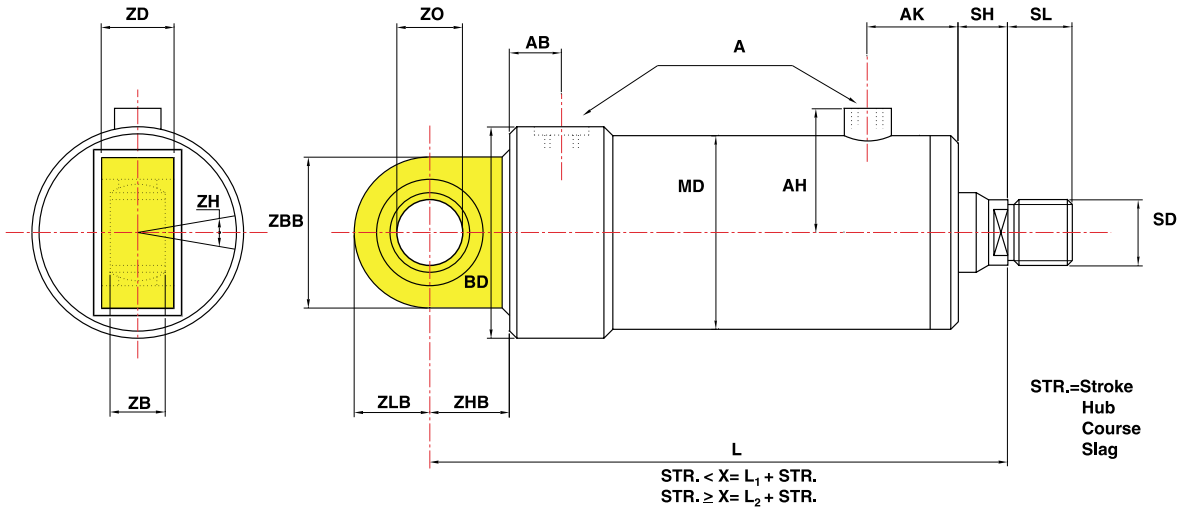


Piston Kolben Piston Zuiger	Rod Stange Tige Stang			x	A	AB	BD	SL	AK	L <sub>1</sub>	L <sub>2</sub>	MD	OO	OB	OD	OHB	OL	SH	SD	AH
	Ø 1	Ø 2	Ø 3																	
25	16	-	-	-	3/8"	13	35	16	57	185	-	35	15	30	20	40	15	15	16 x 1,5	38
32	18	22	-	-	3/8"	13	42	16	60	188	-	42	15	30	20	40	15	15	16 x 1,5	41
40	22	28	-	-	3/8"	13	55	16	60	208	-	50	20	40	25	40	20	20	16 x 1,5	45
50	28	35	-	-	3/8"	13	65	22	60	213	-	60	30	50	30	45	25	20	22 x 1,5	50
65	35	45	-	-	1/2"	15	80	28	64	233	-	80	35	60	40	50	30	20	28 x 1,5	65
80	45	55	-	800	1/2"	15	95	35	83	273	308	95	40	70	50	60	40	20	35 x 1,5	73
100	60	70	-	800	3/4"	19	120	45	93	317	357	120	50	90	60	70	45	30	45 x 1,5	90
125	70	80	90	1200	3/4"	19	150	58	98	377	427	150	65	120	80	100	70	30	58 x 1,5	105
140	80	90	100	1200	3/4"	19	165	58	108	398	458	165	70	140	90	105	80	30	58 x 1,5	113
160	90	100	110	1500	1"	23	190	65	118	443	513	190	80	160	98	120	90	35	65 x 2	125
180	100	110	125	1500	1"	23	220	80	120	500	580	210	90	160	118	140	90	35	80 x 2	135
200	110	125	140	1500	1"	23	244	90	130	520	600	244	100	180	118	150	100	35	90 x 2	152
220	125	140	160	2000	1 1/4"	28	267	100	145	565	665	267	120	200	138	160	110	35	100 x 2	169
250	140	160	180	2000	1 1/4"	28	298	110	145	612	712	298	130	220	158	190	130	35	110 x 2	184
280	160	180	200	2000	1 1/4"	28	343	120	165	642	762	343	150	230	176	190	135	35	120 x 2	207
320	160	180	-	2500	1 1/2"	40	394	125	190	750	870	394	170	270	196	230	160	40	125 x 3	224
320	200	220	-	2500	1 1/2"	40	394	125	190	750	870	394	170	270	196	230	160	40	125 x 3	224
360	180	200	-	2500	1 1/2"	43	419	125	200	820	970	419	190	300	216	260	190	50	125 x 3	250
360	220	250	-	2500	1 1/2"	43	419	135	200	820	970	419	190	300	216	260	190	50	135 x 3	250
400	200	220	-	2500	1 1/2"	43	470	135	220	875	1025	470	210	320	236	280	210	50	135 x 3	275
400	250	280	-	2500	1 1/2"	43	470	150	220	875	1025	470	210	320	236	280	210	50	150 x 3	275
450	220	250	-	3000	1 1/2"	50	521	150	230	960	1140	521	240	370	256	300	235	60	150 x 3	301
450	280	320	-	3000	1 1/2"	50	521	170	230	960	1140	521	240	370	256	300	235	60	170 x 3	301
500	250	280	-	3000	1 1/2"	50	610	170	250	1055	1235	610	260	400	296	350	250	60	170 x 3	345
500	320	360	-	3000	1 1/2"	50	610	190	250	1055	1235	610	260	400	296	350	250	60	190 x 4	345



Rod spherical eye mounting  
 Gelenkauge an Kolbenstange  
 Oeillet à rotule sur la tige  
 Zwenklager aan bodem

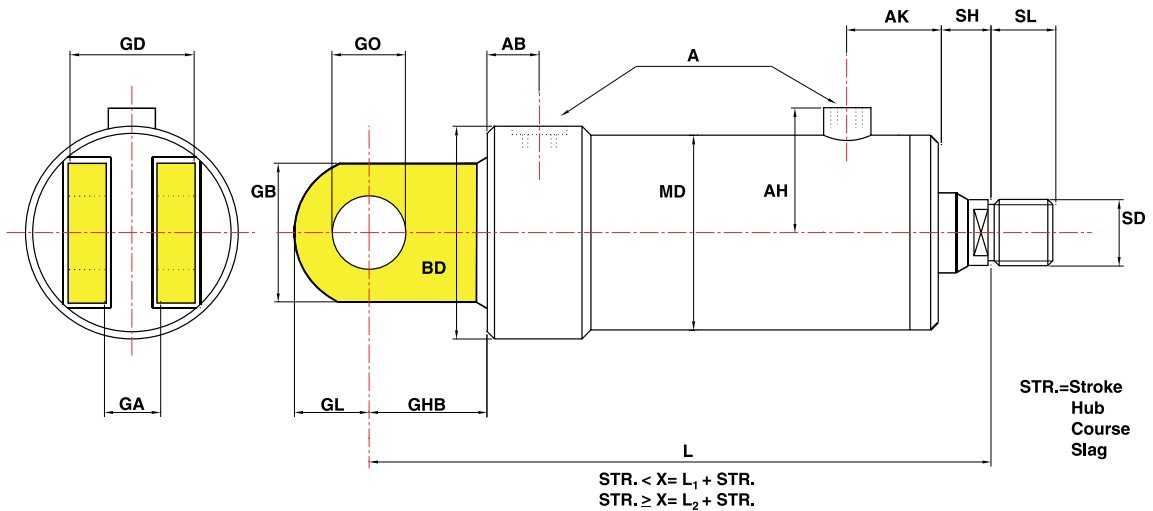
250 bar  
 ZB



Piston Kolben Piston Zuiger	Rod Stange Tige Stang			x	A	AB	BD	SL	AK	L <sub>1</sub>	L <sub>2</sub>	ZB	MD	ZO	ZBB	ZD	ZHB	ZLB	SH	SD	AH	ZH
	Ø 1	Ø 2	Ø 3																			
25	16	-	-	-	3/8"	13	35	16	57	183	-	16	35	20	50	19	38	25	15	16 x 1,5	38	9"
32	18	22	-	-	3/8"	13	42	16	60	186	-	16	42	20	50	19	38	25	15	16 x 1,5	41	9"
40	22	28	-	-	3/8"	13	55	16	60	213	-	20	50	25	55	23	45	28	20	16 x 1,5	45	7"
50	28	35	-	-	3/8"	13	65	22	60	219	-	22	60	30	65	28	51	33	20	22 x 1,5	50	6"
65	35	45	-	-	1/2"	15	80	28	64	244	-	25	80	35	83	30	61	42	20	28 x 1,5	65	6"
80	45	55	-	800	1/2"	15	95	35	83	282	317	28	95	40	94	35	69	55	20	35 x 1,5	73	7"
100	60	70	-	800	3/4"	19	120	45	93	335	375	35	120	50	120	40	88	75	30	45 x 1,5	90	6"
125	70	80	90	1200	3/4"	19	150	58	98	377	427	44	150	60	160	50	100	95	30	58 x 1,5	105	6"
140	80	90	100	1200	3/4"	19	165	58	108	393	453	44	165	60	160	50	100	95	30	58 x 1,5	113	6"
160	90	100	110	1500	1"	23	190	65	118	438	508	49	190	70	190	55	115	115	35	65 x 2	125	6"
180	100	110	125	1500	1"	23	220	80	120	501	581	55	210	80	220	60	141	130	35	80 x 2	135	6"
200	110	125	140	1500	1"	23	244	90	130	520	600	60	244	90	250	65	150	150	35	90 x 2	152	5"
220	125	140	160	2000	1 1/4"	28	267	100	145	570	670	70	267	100	280	70	165	170	35	100 x 2	169	7"
250	140	160	180	2000	1 1/4"	28	298	110	145	607	707	70	298	110	310	80	185	190	35	110 x 2	184	6"
280	160	180	200	2000	1 1/4"	28	343	120	165	652	772	85	343	120	335	90	200	215	35	120 x 2	207	6"
320	160	180	-	2500	1 1/2"	40	394	125	190	750	870	90	394	140	390	110	230	245	40	125 x 3	224	7"
320	200	220	-	2500	1 1/2"	40	394	125	190	750	870	90	394	140	390	110	230	245	40	125 x 3	224	7"
360	180	200	-	2500	1 1/2"	43	419	125	200	820	970	105	419	160	450	130	260	275	50	125 x 3	250	8"
360	220	250	-	2500	1 1/2"	43	419	135	200	820	970	105	419	160	450	130	260	275	50	135 x 3	250	8"
400	200	220	-	2500	1 1/2"	43	470	135	220	875	1025	105	470	180	500	140	280	300	50	135 x 3	275	6"
400	250	280	-	2500	1 1/2"	43	470	150	220	875	1025	105	470	180	500	140	280	300	50	150 x 3	275	6"
450	220	250	-	3000	1 1/2"	50	521	150	230	960	1140	130	521	200	560	160	300	330	60	150 x 3	301	7"
450	280	320	-	3000	1 1/2"	50	521	170	230	960	1140	130	521	200	560	160	300	330	60	170 x 3	301	7"
500	250	280	-	3000	1 1/2"	50	610	170	250	1055	1235	140	610	240	670	190	350	385	60	170 x 3	345	8"
500	320	360	-	3000	1 1/2"	50	610	190	250	1055	1235	140	610	240	670	190	350	385	60	190 x 4	345	8"

# 250 bar GB

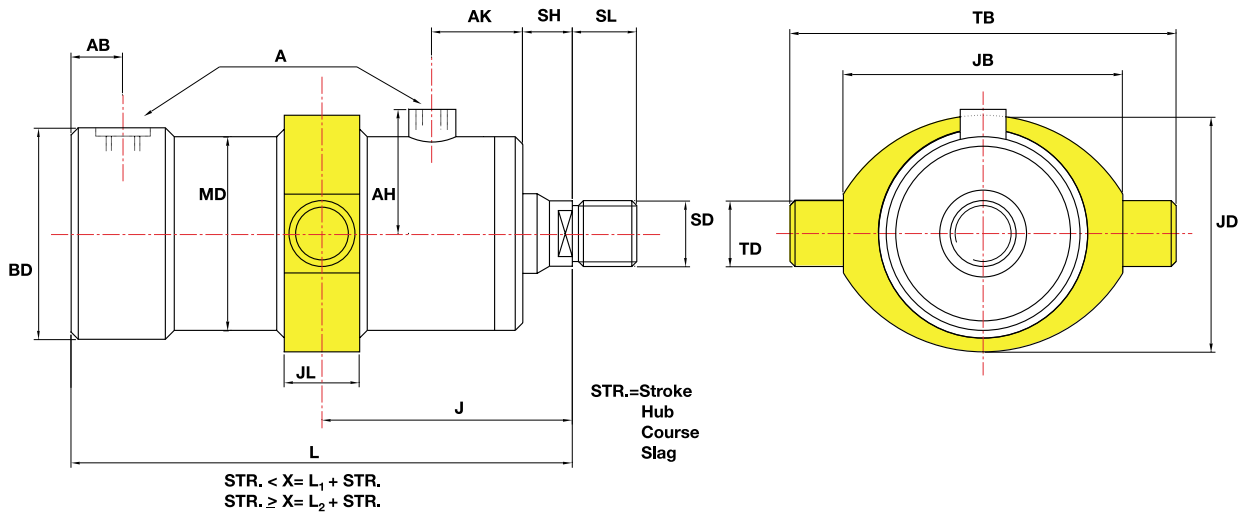
Rear double clevis  
Gabel am Zylinderboden  
Fourche arrière  
Gaffel aan bodem



Piston Kolben Piston Zuiger	Rod Stange Tige Stang			x	A	AB	BD	SL	AK	L <sub>1</sub>	L <sub>2</sub>	MD	GO	GB	GD	GHB	GL	SH	SD	AH	GA
	Ø 1	Ø 2	Ø 3																		
25	16	-	-	-	3/8"	13	35	16	57	180	-	35	20	30	50	35	15	15	16 x 1,5	38	25
32	18	22	-	-	3/8"	13	42	16	60	183	-	42	20	30	50	35	15	15	16 x 1,5	41	25
40	22	28	-	-	3/8"	13	55	16	60	208	-	50	25	40	60	40	20	20	16 x 1,5	45	30
50	28	35	-	-	3/8"	13	65	22	60	213	-	60	30	50	70	45	25	20	22 x 1,5	50	35
65	35	45	-	-	1/2"	15	80	28	64	238	-	80	35	60	80	55	30	20	28 x 1,5	65	40
80	45	55	-	800	1/2"	15	95	35	83	273	308	95	40	80	90	60	35	20	35 x 1,5	73	45
100	60	70	-	800	3/4"	19	120	45	93	332	372	120	50	100	100	85	45	30	45 x 1,5	90	50
125	70	80	90	1200	3/4"	19	150	58	98	382	432	150	60	120	120	105	70	30	58 x 1,5	105	60
140	80	90	100	1200	3/4"	19	165	58	108	398	458	165	60	120	120	105	80	30	58 x 1,5	113	60
160	90	100	110	1500	1"	23	190	65	118	453	523	190	70	140	130	130	90	35	65 x 2	125	65
180	100	110	125	1500	1"	23	220	80	120	505	585	210	80	160	140	145	90	35	80 x 2	135	70
200	110	125	140	1500	1"	23	244	90	130	535	615	244	90	180	155	165	105	35	90 x 2	152	75
220	125	140	160	2000	1 1/4"	28	267	100	145	595	695	267	100	200	165	190	115	35	100 x 2	169	85
250	140	160	180	2000	1 1/4"	28	298	110	145	632	732	298	110	220	180	210	135	35	110 x 2	184	95
280	160	180	200	2000	1 1/4"	28	343	120	165	692	812	343	120	240	215	240	140	35	120 x 2	207	110
320	160	180	-	2500	1 1/2"	40	394	125	190	790	910	394	140	280	250	270	165	40	125 x 3	224	130
320	200	220	-	2500	1 1/2"	40	394	125	190	790	910	394	140	280	250	270	165	40	125 x 3	224	130
360	180	200	-	2500	1 1/2"	43	419	125	200	865	1015	419	160	320	280	305	195	50	125 x 3	250	155
360	220	250	-	2500	1 1/2"	43	419	135	200	865	1015	419	160	320	280	305	195	50	135 x 3	250	155
400	200	220	-	2500	1 1/2"	43	470	135	220	925	1075	470	180	360	310	330	210	50	135 x 3	275	165
400	250	280	-	2500	1 1/2"	43	470	150	220	925	1075	470	180	360	310	330	210	50	150 x 3	275	165
450	220	250	-	3000	1 1/2"	50	521	150	230	1025	1205	521	200	400	350	365	245	60	150 x 3	301	190
450	280	320	-	3000	1 1/2"	50	521	170	230	1025	1205	521	200	400	350	365	245	60	170 x 3	301	190
500	250	280	-	3000	1 1/2"	50	610	170	250	1130	1310	610	240	480	400	425	260	60	170 x 3	345	230
500	320	360	-	3000	1 1/2"	50	610	190	250	1130	1310	610	240	480	400	425	260	60	190 x 4	345	230

Intermediate trunnion mounting  
Schwenkzapfen in Zylindermitte  
Tourillons intermédiaires  
Zwenktappen

250 bar  
ZT



Piston Kolben Piston Zuiger	Rod Stange Tige Stang			x	A	AB	BD	SL	J <sub>min</sub>	J <sub>max</sub> =L-	JB	JD	JL	AK	L <sub>1</sub>	L <sub>2</sub>	MD	SH	SD	AH	TB	TD	STR
	Ø	Ø 1	Ø 2																				
25	16	-	-	-	3/8"	13	35	16	122	65	45	45	30	57	145	-	35	15	16 x 1,5	38	65	18	37
32	18	22	-	-	3/8"	13	42	16	125	67	52	52	30	60	148	-	42	15	16 x 1,5	41	80	22	39
40	22	28	-	-	3/8"	13	55	16	130	67	70	70	30	60	168	-	50	20	16 x 1,5	45	105	25	24
50	28	35	-	-	3/8"	13	65	22	135	72	80	80	40	60	168	-	60	20	22 x 1,5	50	118	30	34
65	35	45	-	-	1/2"	15	80	28	144	83	100	105	40	64	183	-	80	20	28 x 1,5	65	148	35	44
80	45	55	-	800	1/2"	15	95	35	168	86	130	120	50	83	213	248	95	20	35 x 1,5	73	184	45	41
100	60	70	-	800	3/4"	19	120	45	198	100	165	140	60	93	247	287	120	30	45 x 1,5	90	230	55	51
125	70	80	90	1200	3/4"	19	150	58	213	111	185	180	80	98	277	327	150	30	58 x 1,5	105	280	65	47
140	80	90	100	1200	3/4"	19	165	58	233	122	210	195	90	108	293	353	165	30	58 x 1,5	113	320	75	62
160	90	100	110	1500	1"	23	190	65	256	137	235	220	100	118	323	393	190	35	65 x 2	125	360	85	70
180	100	110	125	1500	1"	23	220	80	268	146	260	250	120	120	360	440	210	35	80 x 2	135	390	100	54
200	110	125	140	1500	1"	23	244	90	283	151	300	290	130	130	370	450	244	35	90 x 2	152	440	110	64
220	125	140	160	2000	1 1/4"	28	267	100	315	171	330	325	140	145	405	505	267	35	100 x 2	169	510	120	81
250	140	160	180	2000	1 1/4"	28	298	110	320	176	360	350	150	145	422	522	298	35	110 x 2	184	550	130	74
280	160	180	200	2000	1 1/4"	28	343	120	350	185	420	390	170	165	452	572	343	35	120 x 2	207	640	150	83
320	160	180	-	2500	1 1/2"	40	394	125	398	235	470	420	180	190	520	640	394	40	125 x 3	224	700	160	108
320	200	220	-	2500	1 1/2"	40	394	125	398	235	470	420	180	190	520	640	394	40	125 x 3	224	700	160	108
360	180	200	-	2500	1 1/2"	43	419	125	433	260	510	480	200	200	560	710	419	50	125 x 3	250	740	180	128
360	220	250	-	2500	1 1/2"	43	419	135	433	260	510	480	200	200	560	710	419	50	135 x 3	250	740	180	128
400	200	220	-	2500	1 1/2"	43	470	135	458	270	570	540	220	220	595	745	470	50	135 x 3	275	800	200	133
400	250	280	-	2500	1 1/2"	43	470	150	458	270	570	540	220	220	595	745	470	50	150 x 3	275	800	200	133
450	220	250	-	3000	1 1/2"	50	521	150	533	325	650	580	280	230	660	840	521	60	150 x 3	301	890	250	178
450	280	320	-	3000	1 1/2"	50	521	170	533	325	650	580	280	230	660	840	521	60	170 x 3	301	890	250	178
500	250	280	-	3000	1 1/2"	50	610	170	573	340	750	660	310	250	705	885	610	60	170 x 3	345	1030	280	183
500	320	360	-	3000	1 1/2"	50	610	190	573	340	750	660	310	250	705	885	610	60	190 x 4	345	1030	280	183

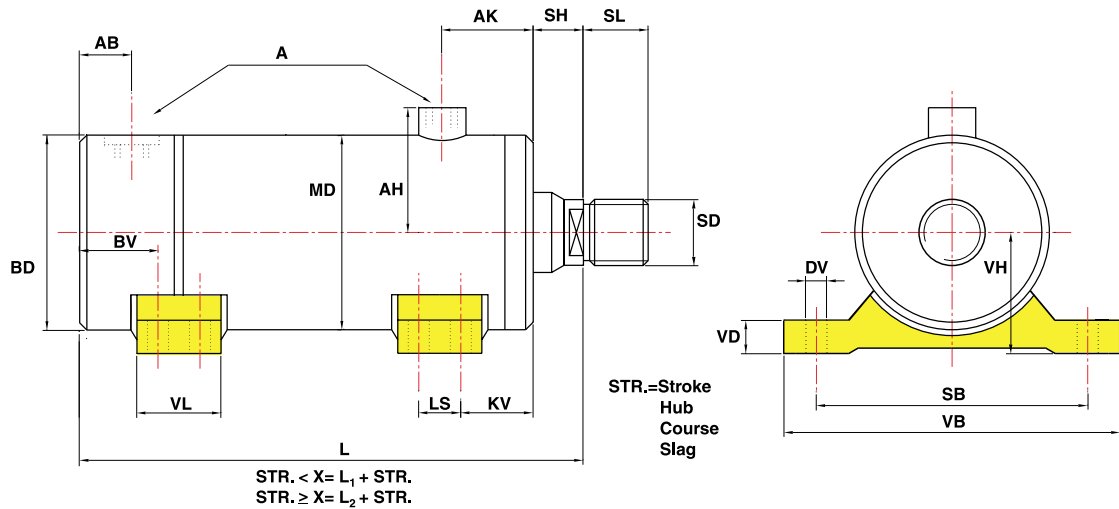
# 250 bar VN

Foot mounting

Fußbefestigung

Fixation par pattes

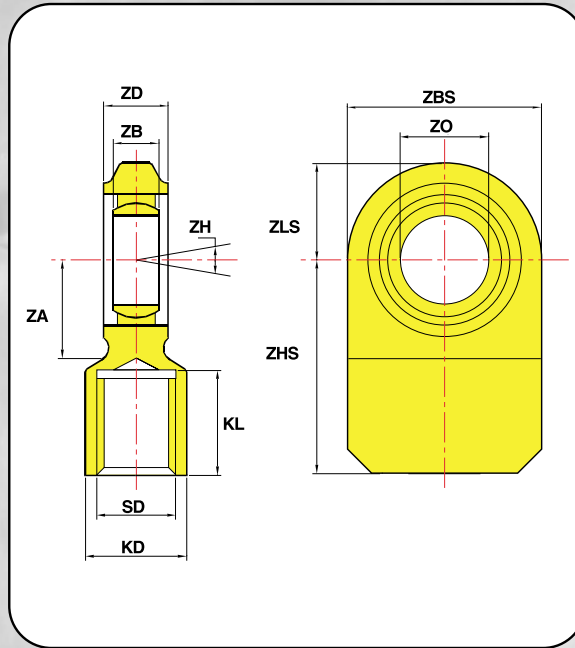
Voeten



Piston Kolben Piston Zuiger	Rod Stange Tige Stang			x	A	AB	BD	SB	BV	DV	SL	AK	KV	L <sub>1</sub>	L <sub>2</sub>	LS	MD	SH	SD	AH	VB	VD	VH	VL
	Ø	Ø 1	Ø 2																					
25	16	-	-	-	3/8"	13	35	60	18	6,6 (8x)	16	57	38	145	-	15	35	15	16 x 1,5	38	80	8	24	30
32	18	22	-	-	3/8"	13	42	70	18	6,6 (8x)	16	60	38	148	-	15	42	15	16 x 1,5	41	90	10	28	30
40	22	28	-	-	3/8"	13	55	80	20	9 (8x)	16	60	40	168	-	20	55	20	16 x 1,5	48	105	10	35	40
50	28	35	-	-	3/8"	13	65	95	20	9 (8x)	22	60	40	168	-	20	65	20	22 x 1,5	53	120	10	40	40
65	35	45	-	-	1/2"	15	80	120	23	11 (8x)	28	64	43	183	-	25	80	20	28 x 1,5	65	150	15	50	50
80	45	55	-	800	1/2"	15	95	135	23	11 (8x)	35	83	38	213	248	25	95	20	35 x 1,5	73	170	20	60	50
100	60	70	-	800	3/4"	19	120	170	30	18 (8x)	45	93	45	247	287	40	120	30	45 x 1,5	90	220	40	85	80
125	70	80	90	1200	3/4"	19	150	210	35	22 (8x)	58	98	50	277	327	50	150	30	58 x 1,5	105	255	40	100	100
140	80	90	100	1200	3/4"	19	165	230	45	22 (8x)	58	108	65	293	353	50	165	30	58 x 1,5	113	280	50	120	100
160	90	100	110	1500	1"	23	190	270	50	26 (8x)	65	118	70	323	393	60	190	35	65 x 2	125	320	60	135	120
180	100	110	125	1500	1"	23	210	275	55	26 (8x)	80	120	70	360	440	60	210	35	80 x 2	135	330	60	145	120

Rod spherical eye mounting  
 Gelenkauge an Kolbenstange  
 Oeillet à rotule sur la tige  
 Zwenklager aan stang

250 bar  
 ZS



Piston Kolben Piston Zuiger Ø	Rod Stange Tige Stang Ø 1    Ø 2    Ø 3			KL	KD Ø	ZB	ZO Ø	ZBS	ZD	ZHS	ZLS	SD M	ZA	ZH max.
25	16	-	-	17	25	16	20	56	19	50	28	16 x 1,5	25	9'
32	18	22	-	17	25	16	20	56	19	50	28	16 x 1,5	25	9'
40	22	28	-	17	25	20	25	56	23	50	28	16 x 1,5	28	7'
50	28	35	-	23	32	22	30	64	28	60	32	22 x 1,5	30	6'
65	35	45	-	29	40	25	35	78	30	70	39	28 x 1,5	38	6'
80	45	55	-	37	55	28	40	94	35	85	55	35 x 1,5	39	7'
100	60	70	-	48	70	35	50	120	40	135	75	45 x 1,5	69	6'
125	70	80	90	61	100	44	60	160	50	160	95	58 x 1,5	74	6'
140	80	90	100	61	100	44	60	160	50	160	95	58 x 1,5	74	6'
160	90	100	110	68	110	49	70	190	55	180	115	65 x 2	87	6'
180	100	110	125	84	130	55	80	220	60	225	130	80 x 2	95	6'
200	110	125	140	94	140	60	90	250	65	245	150	90 x 2	115	5'
220	125	140	160	104	150	70	100	280	70	275	170	100 x 2	125	7'
250	140	160	180	114	160	70	110	310	80	310	190	110 x 2	140	6'
280	160	180	200	125	180	85	120	335	90	320	215	120 x 2	150	6'
320	160	180	-	130	180	90	140	390	110	360	245	125 x 3	170	7'
320	200	220	-	130	180	90	140	390	110	360	245	125 x 3	170	7'
360	180	200	-	130	180	105	160	450	130	370	275	125 x 3	200	8'
360	220	250	-	140	200	105	160	450	130	370	275	135 x 3	200	8'
400	200	220	-	140	200	105	180	500	140	410	300	135 x 3	220	6'
400	250	280	-	155	220	105	180	500	140	410	300	150 x 3	220	6'
450	220	250	-	155	220	130	200	560	160	450	330	150 x 3	240	7'
450	280	320	-	175	260	130	200	560	160	450	330	170 x 3	240	7'
500	250	280	-	175	260	140	240	670	190	490	385	170 x 3	260	8'
500	320	360	-	195	280	140	240	670	190	490	385	190 x 4	260	8'



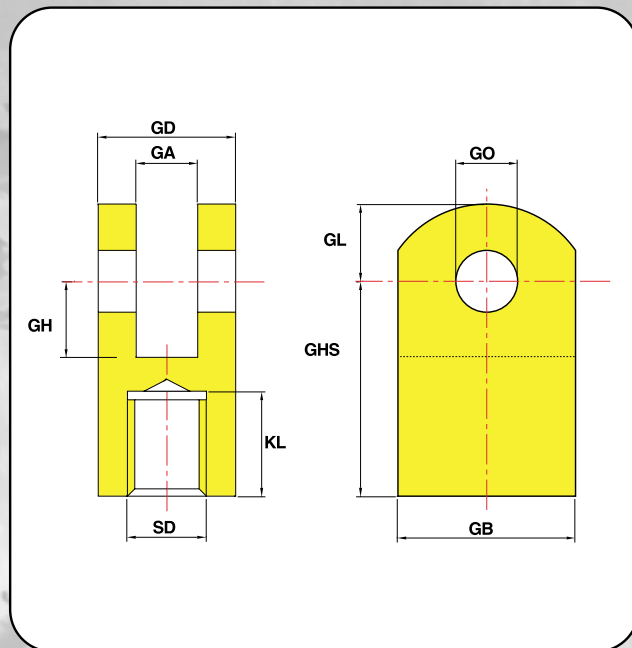
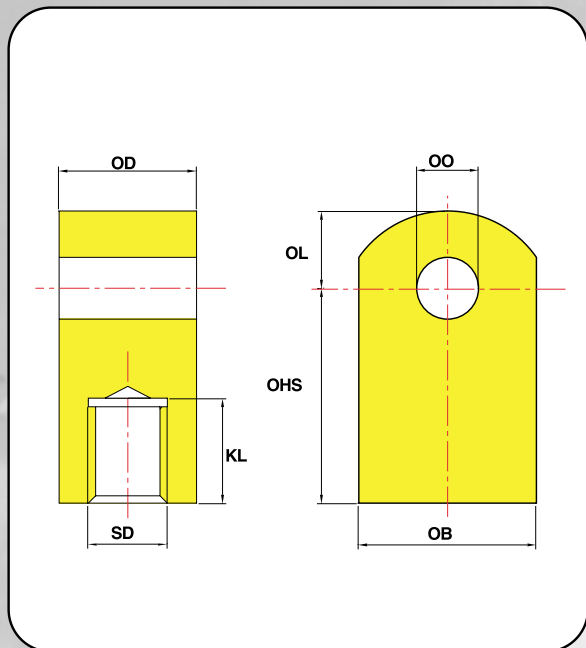
# 250 bar OS / GS

Rod Eye Mounting / Double clevis at rod

Schwenkauge an Kolbenstange / Gabel an Kolbenstange

Oeillet sur la tige / Fourche sur la tige

Oog aan stang / Gaffel aan stang

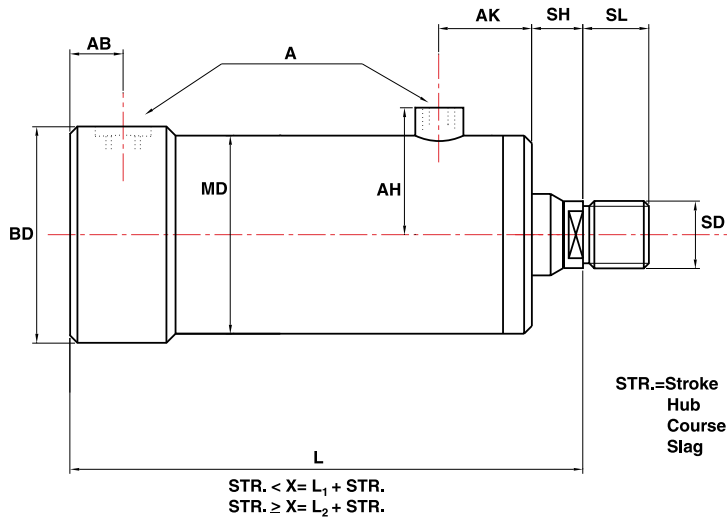


Piston Kolben Piston Zuiger	Rod Stange Tige Stang			KL	OO	OB	OD	OHS	OL	SD
	Ø 1	Ø 2	Ø 3							
Ø	ØE8			M						
25	16	-	-	17	15	30	20	40	15	16 x 1,5
32	18	22	-	17	15	30	20	40	15	16 x 1,5
40	22	28	-	17	20	40	25	45	20	16 x 1,5
50	28	35	-	23	30	50	30	50	25	22 x 1,5
65	35	45	-	29	35	60	40	60	30	28 x 1,5
80	45	55	-	37	40	70	50	70	40	35 x 1,5
100	60	70	-	48	50	90	60	90	45	45 x 1,5
125	70	80	90	61	65	120	80	125	70	58 x 1,5
140	80	90	100	61	70	140	90	130	80	58 x 1,5
160	90	100	110	68	80	160	98	140	90	65 x 2
180	100	110	125	84	90	160	118	160	95	80 x 2
200	110	125	140	94	100	180	118	190	110	90 x 2
220	125	140	160	104	120	200	138	200	130	100 x 2
250	140	160	180	114	130	220	158	230	140	110 x 2
280	160	180	200	125	150	230	176	250	145	120 x 2
320	160	180	-	130	170	270	196	260	165	125 x 3
320	200	220	-	130	170	270	196	260	165	125 x 3
360	180	200	-	130	190	300	216	290	190	125 x 3
360	220	250	-	140	190	300	216	290	190	135 x 3
400	200	220	-	140	210	350	236	320	215	135 x 3
400	250	280	-	155	210	350	236	320	215	150 x 3
450	220	250	-	155	240	390	256	360	235	150 x 3
450	280	320	-	175	240	390	256	360	235	170 x 3
500	250	280	-	175	260	420	296	390	250	170 x 3
500	320	360	-	195	260	420	296	390	250	190 x 4

Piston Kolben Piston Zuiger	Rod Stange Tige Stang			KL	GO	GB	GD	GHS	GL	GA	GH	SD
	Ø 1	Ø 2	Ø 3									
Ø	ØE8			M								
25	16	-	-	17	20	30	50	60	15	25	35	16 x 1,5
32	18	22	-	17	20	30	50	60	15	25	35	16 x 1,5
40	22	28	-	17	25	40	60	65	20	30	40	16 x 1,5
50	28	35	-	23	30	50	70	80	25	35	45	22 x 1,5
65	35	45	-	29	35	60	80	95	30	40	55	28 x 1,5
80	45	55	-	37	40	80	90	110	40	45	60	35 x 1,5
100	60	70	-	48	50	100	100	150	55	50	80	45 x 1,5
125	70	80	90	61	60	120	120	180	70	60	105	58 x 1,5
140	80	90	100	61	60	120	120	180	70	60	105	58 x 1,5
160	90	100	110	68	70	140	130	220	80	65	130	65 x 2
180	100	110	125	84	80	160	140	250	95	70	145	80 x 2
200	110	125	140	94	90	180	155	280	110	80	165	90 x 2
220	125	140	160	104	100	200	165	320	130	85	190	100 x 2
250	140	160	180	114	110	220	180	360	140	95	210	110 x 2
280	160	180	200	125	120	240	215	400	145	110	240	120 x 2
320	160	180	-	130	140	280	250	440	165	130	270	125 x 3
320	200	220	-	130	140	280	250	440	165	130	270	125 x 3
360	180	200	-	130	160	320	280	490	190	150	305	125 x 3
360	220	250	-	140	160	320	280	490	190	150	305	135 x 3
400	200	220	-	140	180	360	310	540	215	170	330	135 x 3
400	250	280	-	155	180	360	310	540	215	170	330	150 x 3
450	220	250	-	155	200	400	350	600	235	190	365	150 x 3
450	280	320	-	175	200	400	350	600	235	190	365	170 x 3
500	250	280	-	175	240	480	400	690	280	230	420	170 x 3
500	320	360	-	195	240	480	400	690	280	230	420	190 x 4

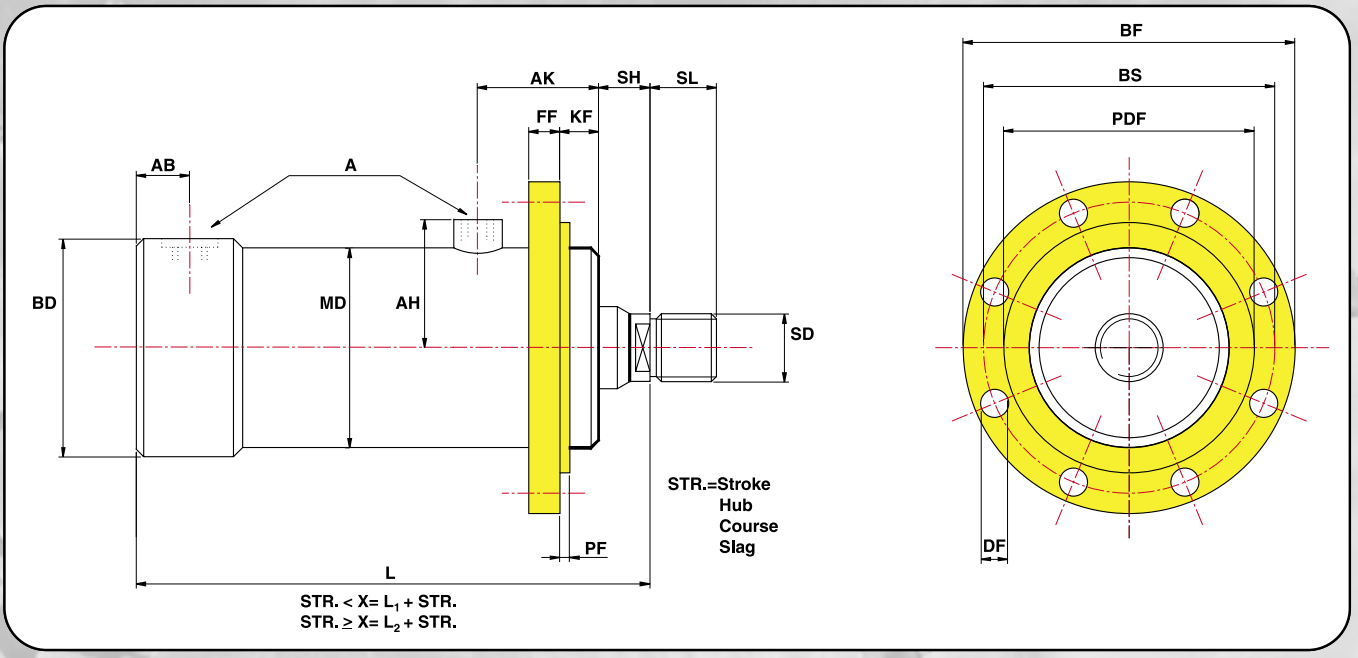


● Hydraulic ship arresting installation.

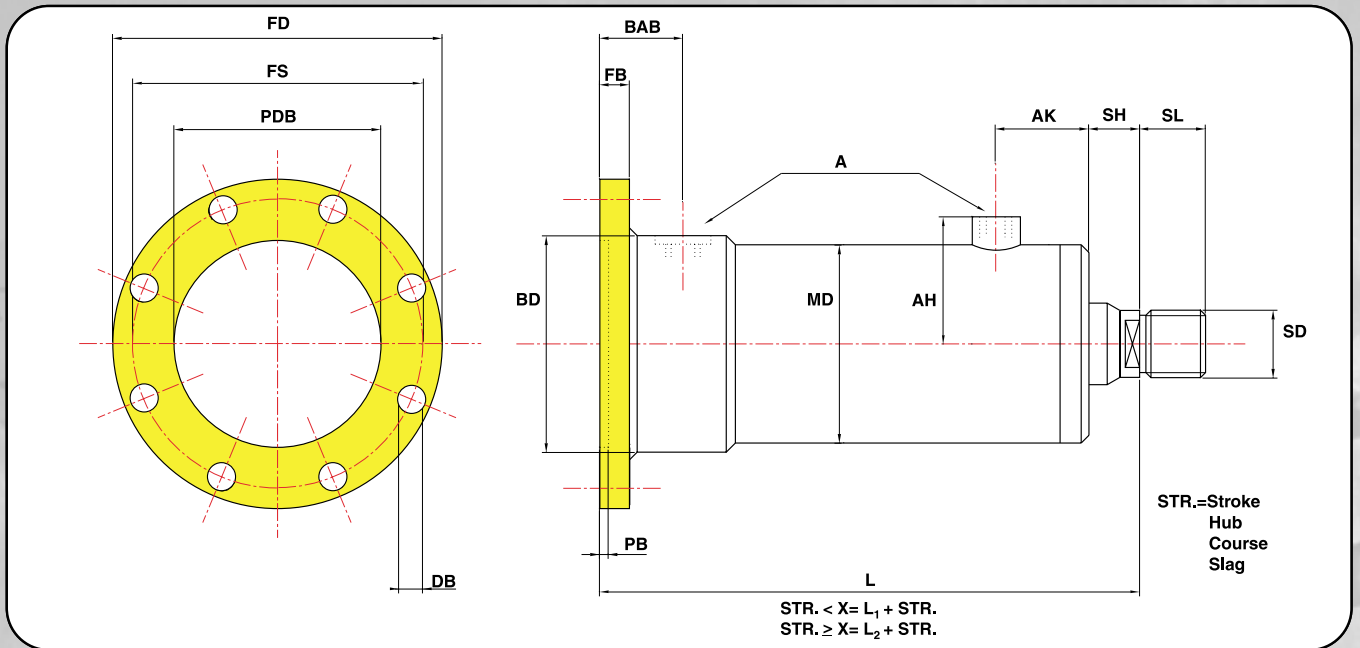


Piston Kolben Piston Zuiger	Rod Stange Tige Stang			x	A	AB	BD	SL	AK	L <sub>1</sub>	L <sub>2</sub>	MD	SH	SD	AH
Ø	Ø 1	Ø 2	Ø 3		G/BSP	Ø	Ø	M	M	M	M	Ø	M	M	M
25	16	-	-	-	3/8"	13	35	16	57	145	-	35	15	16 x 1,5	38
32	18	22	-	-	3/8"	13	42	16	60	148	-	42	15	16 x 1,5	41
40	22	28	-	-	3/8"	13	55	16	60	168	-	55	20	16 x 1,5	48
50	28	35	-	-	3/8"	13	65	22	60	168	-	65	20	22 x 1,5	53
65	35	45	-	-	1/2"	15	80	35	64	183	-	80	20	35 x 1,5	65
80	45	55	-	800	1/2"	15	95	45	83	213	248	100	20	45 x 1,5	75
100	60	70	-	800	3/4"	19	120	58	93	247	287	120	30	58 x 1,5	90
125	70	80	90	1200	3/4"	19	150	58	98	277	327	150	30	58 x 1,5	105
140	80	90	100	1200	3/4"	19	165	65	108	293	353	170	30	65 x 2	115
160	90	100	110	1500	1"	23	190	80	118	323	393	200	35	80 x 2	130
180	100	110	125	1500	1"	23	220	90	120	360	440	220	35	90 x 2	140
200	110	125	140	1500	1"	23	254	100	130	370	450	254	35	100 x 2	157
220	125	140	160	2000	1 1/4"	28	273	110	145	405	505	273	35	110 x 2	172
250	140	160	180	2000	1 1/4"	28	323	120	145	422	522	323	35	120 x 2	197
280	160	180	200	2000	1 1/4"	28	355	125	165	452	572	355	35	125 x 3	213
320	160	180	-	2500	1 1/2"	40	406	125	205	535	655	406	40	125 x 3	243
320	200	220	-	2500	1 1/2"	40	406	135	205	535	655	406	40	135 x 3	243
360	180	200	-	2500	1 1/2"	43	445	135	220	580	730	445	50	135 x 3	263
360	220	250	-	2500	1 1/2"	43	445	150	220	580	730	445	50	150 x 3	263
400	200	220	-	2500	1 1/2"	43	508	150	235	610	760	508	50	150 x 3	294
400	250	280	-	2500	1 1/2"	43	508	170	235	610	760	508	50	170 x 3	294
450	220	250	-	3000	1 1/2"	50	559	170	250	680	860	559	60	170 x 3	320
450	280	320	-	3000	1 1/2"	50	559	190	250	680	860	559	60	190 x 4	320
500	250	280	-	3000	1 1/2"	50	622	190	270	725	905	622	60	190 x 4	351
500	320	360	-	3000	1 1/2"	50	622	240	270	725	905	622	60	240 x 4	351

Front flange **320 bar**  
**FF**  
 Bride avant  
 Frontflens

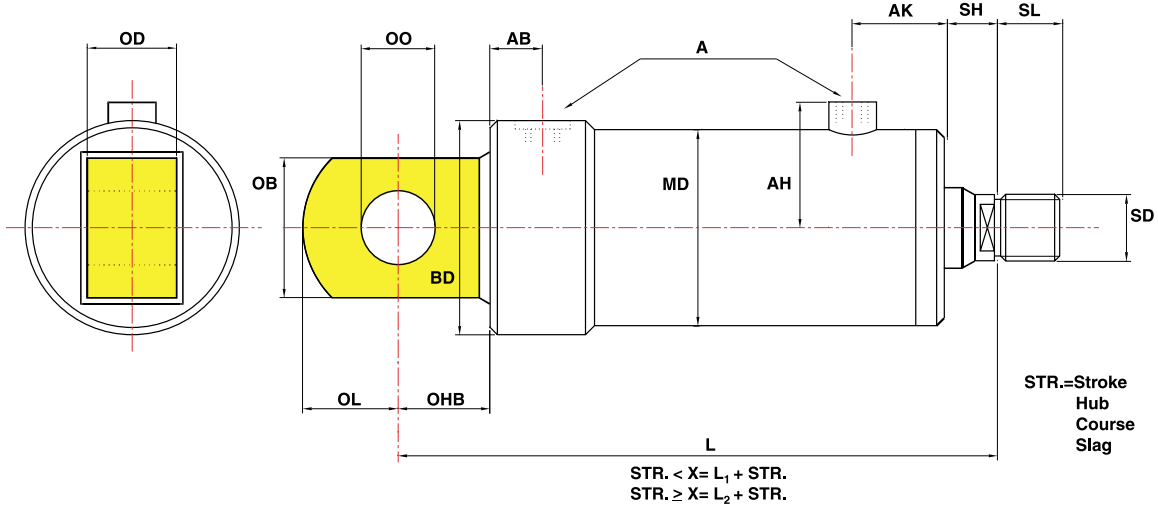


Piston Kolben Piston Zuiger	Rod Stange Tige Stang			x	A	AB	BD	DF	SL	FF	BF	KF	AK	L <sub>1</sub>	L <sub>2</sub>	MD	PF	PDF	SH	SD	AH	BS
	Ø 1	Ø 2	Ø 3																			
25	16	-	-	-	3/8"	13	35	6,6 (4x)	16	12	90	23	57	145	-	35	3	50	15	16 x 1,5	38	70
32	18	22	-	-	3/8"	13	42	9 (4x)	16	15	110	23	60	148	-	42	3	60	15	16 x 1,5	41	80
40	22	28	-	-	3/8"	13	55	11 (4x)	16	15	130	23	60	168	-	55	3	70	20	16 x 1,5	48	100
50	28	35	-	-	3/8"	13	65	14 (4x)	22	18	140	24	60	168	-	65	4	80	20	22 x 1,5	53	110
65	35	45	-	-	1/2"	15	80	14 (8x)	35	22	165	24	64	183	-	80	4	100	20	35 x 1,5	65	130
80	45	55	-	800	1/2"	15	95	18 (8x)	45	31	200	19	83	213	248	100	4	120	20	45 x 1,5	75	160
100	60	70	-	800	3/4"	19	120	22 (8x)	58	32	215	20	93	247	287	120	5	135	30	58 x 1,5	90	175
125	70	80	90	1200	3/4"	19	150	22 (8x)	58	40	245	20	98	277	327	150	5	165	30	58 x 1,5	105	205
140	80	90	100	1200	3/4"	19	165	26 (8x)	65	40	290	25	108	293	353	170	5	180	30	65 x 2	115	235
160	90	100	110	1500	1"	23	190	26 (8x)	80	40	340	25	118	323	393	200	5	220	35	80 x 2	130	280
180	100	110	125	1500	1"	23	220	33 (8x)	90	50	370	30	120	360	440	220	5	240	35	90 x 2	140	310
200	110	125	140	1500	1"	23	254	33 (8x)	100	50	410	30	130	370	450	254	5	290	35	100 x 2	163	350
220	125	140	160	2000	1 1/4"	28	273	39 (8x)	110	60	430	33	145	405	505	273	8	290	35	110 x 2	172	360
250	140	160	180	2000	1 1/4"	28	323	39 (8x)	120	60	480	33	145	422	522	323	8	340	35	120 x 2	197	410
280	160	180	200	2000	1 1/4"	28	355	39 (12x)	125	60	530	33	165	452	572	355	8	370	35	125 x 3	213	460
320	160	180	-	2500	1 1/2"	40	406	39 (16x)	125	85	580	38	205	535	655	406	8	420	40	125 x 3	243	500
320	200	220	-	2500	1 1/2"	40	406	39 (16x)	135	85	580	38	205	535	655	406	8	420	40	135 x 3	243	500
360	180	200	-	2500	1 1/2"	43	445	39 (16x)	135	100	660	38	220	580	730	445	8	480	50	135 x 3	263	570
360	220	250	-	2500	1 1/2"	43	445	39 (16x)	150	100	660	38	220	580	730	445	8	480	50	150 x 3	263	570
400	200	220	-	2500	1 1/2"	43	508	39 (20x)	150	110	700	38	235	610	760	508	8	540	50	150 x 3	294	620
400	250	280	-	2500	1 1/2"	43	508	39 (20x)	170	110	700	38	235	610	760	508	8	540	50	170 x 3	294	620
450	220	250	-	3000	1 1/2"	50	559	45 (20x)	170	125	780	43	250	680	860	559	8	600	60	170 x 3	320	690
450	280	320	-	3000	1 1/2"	50	559	45 (20x)	190	125	780	43	250	680	860	559	8	600	60	190 x 4	320	690
500	250	280	-	3000	1 1/2"	50	622	45 (24x)	190	140	820	47	270	725	905	622	12	650	60	190 x 4	351	740
500	320	360	-	3000	1 1/2"	50	622	45 (24x)	240	140	820	47	270	725	905	622	12	650	60	240 x 4	351	740



Piston Kolben Piston Zuiger	Rod Stange Tige Stang			x	A	BAB	BD	DB	SL	FB	FD	AK	L <sub>1</sub>	L <sub>2</sub>	MD	PB	PDB	SH	SD	AH	FS
	∅	∅ 1	∅ 2																		
25	16	-	-	-	3/8"	35	35	6,6 (4x)	16	12	90	57	167	-	35	3	50	15	16 x 1,5	38	70
32	18	22	-	-	3/8"	38	42	9 (4x)	16	15	110	60	173	-	42	3	60	15	16 x 1,5	41	80
40	22	28	-	-	3/8"	38	55	11 (4x)	16	15	130	60	193	-	55	3	70	20	16 x 1,5	48	100
50	28	35	-	-	3/8"	41	65	14 (4x)	22	18	140	60	196	-	65	4	80	20	22 x 1,5	53	110
65	35	45	-	-	1/2"	47	80	14 (8x)	35	22	165	64	215	-	80	4	100	20	35 x 1,5	65	130
80	45	55	-	800	1/2"	53	95	18 (8x)	45	28	200	83	251	286	100	4	120	20	45 x 1,5	75	160
100	60	70	-	800	3/4"	61	120	22 (8x)	58	32	215	93	289	329	120	5	135	30	58 x 1,5	90	175
125	70	80	90	1200	3/4"	67	150	22 (8x)	58	38	245	98	325	375	150	5	165	30	58 x 1,5	105	205
140	80	90	100	1200	3/4"	67	165	26 (8x)	65	38	290	108	341	401	170	5	180	30	65 x 2	115	235
160	90	100	110	1500	1"	71	190	26 (8x)	80	38	340	118	371	441	200	5	220	35	80 x 2	130	280
180	100	110	125	1500	1"	81	220	33 (8x)	90	48	370	120	418	498	220	5	240	35	90 x 2	140	310
200	110	125	140	1500	1"	81	254	33 (8x)	100	48	410	130	428	508	254	5	290	35	100 x 2	157	350
220	125	140	160	2000	1 1/4"	96	273	33 (8x)	110	58	430	145	473	573	273	8	290	35	110 x 2	172	360
250	140	160	180	2000	1 1/4"	96	323	39 (8x)	120	58	480	145	490	590	323	8	340	35	120 x 2	197	410
280	160	180	200	2000	1 1/4"	96	355	39 (8x)	125	58	530	165	520	640	355	8	370	35	125 x 3	213	460
320	160	180	-	2500	1 1/2"	115	406	39 (12x)	125	85	580	205	630	750	406	8	420	40	125 x 3	243	500
320	200	220	-	2500	1 1/2"	115	406	39 (12x)	135	85	580	205	630	750	406	8	420	40	135 x 3	243	500
360	180	200	-	2500	1 1/2"	133	445	39 (16x)	135	100	660	220	695	845	445	8	480	50	135 x 3	263	570
360	220	250	-	2500	1 1/2"	133	445	39 (16x)	150	100	660	220	695	845	445	8	480	50	150 x 3	263	570
400	200	220	-	2500	1 1/2"	148	508	39 (16x)	150	110	700	235	740	860	508	8	540	50	150 x 3	294	620
400	250	280	-	2500	1 1/2"	148	508	39 (16x)	170	110	700	235	740	860	508	8	540	50	170 x 3	294	620
450	220	250	-	3000	1 1/2"	165	559	39 (20x)	170	125	760	250	825	1005	559	8	590	60	170 x 3	320	680
450	280	320	-	3000	1 1/2"	165	559	39 (20x)	190	125	760	250	825	1005	559	8	590	60	190 x 4	320	680
500	250	280	-	3000	1 1/2"	180	622	39 (24x)	190	140	820	270	885	1065	622	12	650	60	190 x 4	351	740
500	320	360	-	3000	1 1/2"	180	622	39 (24x)	240	140	820	270	885	1065	622	12	650	60	240 x 4	351	740

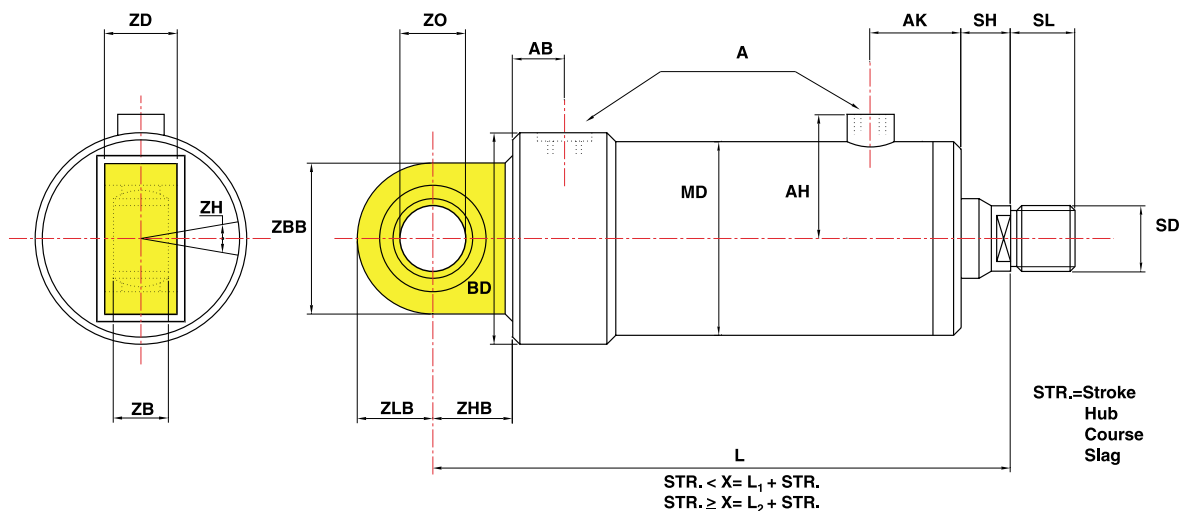




Piston Kolben Piston Zuiger	Rod Stange Tige Stang			x	A	AB	BD	SL	AK	L <sub>1</sub>	L <sub>2</sub>	MD	OO	OB	OD	OHB	OL	SH	SD	AH
	Ø 1	Ø 2	Ø 3																	
25	16	-	-	-	3/8"	13	35	16	57	185	-	35	15	30	20	40	15	15	16 x 1,5	38
32	18	22	-	-	3/8"	13	42	16	60	188	-	42	15	30	20	40	15	15	16 x 1,5	41
40	22	28	-	-	3/8"	13	55	16	60	208	-	55	20	40	25	40	20	20	16 x 1,5	48
50	28	35	-	-	3/8"	13	65	22	60	213	-	65	30	50	30	45	30	20	22 x 1,5	53
65	35	45	-	-	1/2"	15	80	35	64	243	-	80	40	70	40	60	40	20	35 x 1,5	65
80	45	55	-	800	1/2"	15	95	45	83	283	318	100	50	80	50	70	45	20	45 x 1,5	75
100	60	70	-	800	3/4"	19	120	58	93	327	367	120	60	100	70	80	55	30	58 x 1,5	90
125	70	80	90	1200	3/4"	19	150	58	98	382	432	150	70	120	80	105	65	30	58 x 1,5	105
140	80	90	100	1200	3/4"	19	165	65	108	413	473	170	80	140	98	120	75	30	65 x 2	115
160	90	100	110	1500	1"	23	190	80	118	458	528	200	90	160	108	135	85	35	80 x 2	130
180	100	110	125	1500	1"	23	220	90	120	510	590	220	100	180	118	150	100	35	90 x 2	140
200	110	125	140	1500	1"	23	254	100	130	530	610	254	120	200	138	160	110	35	100 x 2	157
220	125	140	160	2000	1 1/4"	28	273	110	145	595	695	273	130	220	158	190	125	35	110 x 2	172
250	140	160	180	2000	1 1/4"	28	323	120	145	612	712	323	150	230	176	190	135	35	120 x 2	197
280	160	180	200	2000	1 1/4"	28	355	125	165	682	802	355	170	270	196	230	160	35	125 x 3	213
320	160	180	-	2500	1 1/2"	40	406	125	205	795	915	406	190	300	216	260	190	40	125 x 3	243
320	200	220	-	2500	1 1/2"	40	406	135	205	795	915	406	190	300	216	260	190	40	135 x 3	243
360	180	200	-	2500	1 1/2"	43	445	135	220	860	1010	445	210	320	236	280	210	50	135 x 3	263
360	220	250	-	2500	1 1/2"	43	445	150	220	860	1010	445	210	320	236	280	210	50	150 x 3	263
400	200	220	-	2500	1 1/2"	43	508	150	235	910	1060	508	240	380	256	300	250	50	150 x 3	294
400	250	280	-	2500	1 1/2"	43	508	170	235	910	1060	508	240	380	256	300	250	50	170 x 3	294
450	220	250	-	3000	1 1/2"	50	559	170	250	1030	1210	559	260	420	296	350	270	60	170 x 3	320
450	280	320	-	3000	1 1/2"	50	559	190	250	1030	1210	559	260	420	296	350	270	60	190 x 4	320
500	250	280	-	3000	1 1/2"	50	622	190	270	1105	1285	622	300	460	316	380	290	60	190 x 4	351
500	320	360	-	3000	1 1/2"	50	622	240	270	1105	1285	622	300	460	316	380	290	60	240 x 4	351

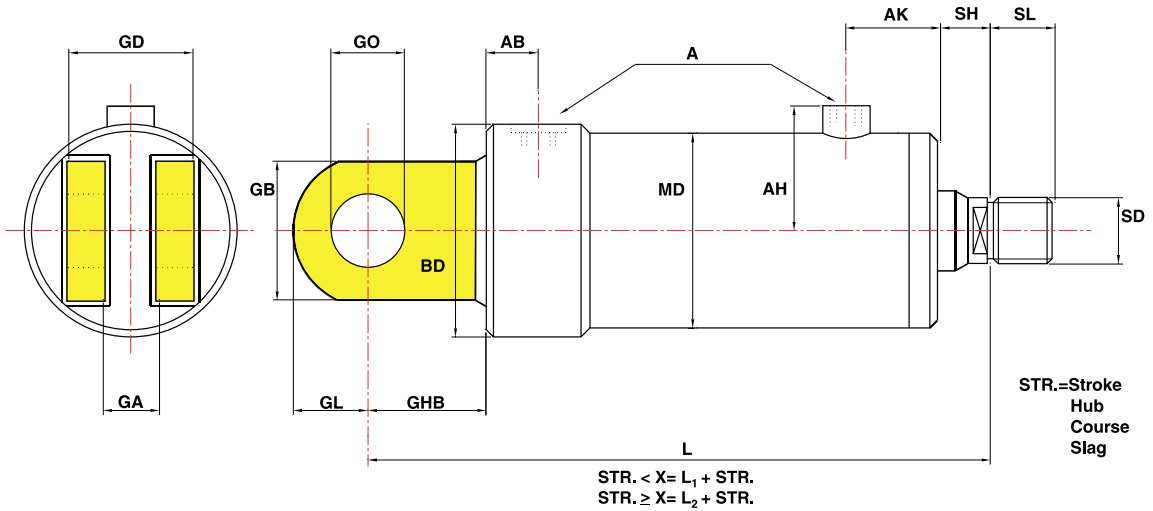
# 320 bar ZB

Rod spherical eye mounting  
Gelenkauge an Kolbenstange  
Oeillet à rotule sur la tige  
Zwenklager aan bodem



Piston Kolben Piston Zuiger	Rod Stange Tige Stang			x	A	AB	BD	SL	AK	L <sub>1</sub>	L <sub>2</sub>	ZB	MD	ZO	ZBB	ZD	ZHB	ZLB	SH	SD	AH	ZH
	Ø 1	Ø 2	Ø 3																			
25	16	-	-	-	3/8"	13	35	16	57	183	-	16	35	20	50	19	38	25	15	16 x 1,5	38	9"
32	18	22	-	-	3/8"	13	42	16	60	186	-	16	42	20	50	19	38	25	15	16 x 1,5	41	9"
40	22	28	-	-	3/8"	13	55	16	60	213	-	20	55	25	55	23	45	28	20	16 x 1,5	48	7"
50	28	35	-	-	3/8"	13	65	22	60	219	-	22	65	30	65	28	51	33	20	22 x 1,5	53	6"
65	35	45	-	-	1/2"	15	80	35	64	252	-	28	80	40	94	35	69	55	20	35 x 1,5	65	7"
80	45	55	-	800	1/2"	15	95	45	83	301	336	35	100	50	120	40	88	75	20	45 x 1,5	75	6"
100	60	70	-	800	3/4"	19	120	58	93	347	387	44	120	60	160	50	100	95	30	58 x 1,5	90	6"
125	70	80	90	1200	3/4"	19	150	58	98	377	427	44	150	60	160	50	100	95	30	58 x 1,5	105	6"
140	80	90	100	1200	3/4"	19	165	65	108	408	468	49	170	70	190	55	115	115	30	65 x 2	115	6"
160	90	100	110	1500	1"	23	190	80	118	464	534	55	200	80	220	60	141	130	35	80 x 2	130	6"
180	100	110	125	1500	1"	23	220	90	120	510	590	60	220	90	250	65	150	150	35	90 x 2	140	5"
200	110	125	140	1500	1"	23	254	100	130	535	615	70	254	100	280	70	165	170	35	100 x 2	157	7"
220	125	140	160	2000	1 1/4"	28	273	110	145	590	690	70	273	110	310	80	185	190	35	110 x 2	172	6"
250	140	160	180	2000	1 1/4"	28	323	120	145	622	722	85	323	120	335	90	200	215	35	120 x 2	197	6"
280	160	180	200	2000	1 1/4"	28	355	125	165	682	802	90	355	140	390	110	230	245	35	125 x 3	213	7"
320	160	180	-	2500	1 1/2"	40	406	125	205	795	915	105	406	160	450	130	260	275	40	125 x 3	243	8"
320	200	220	-	2500	1 1/2"	40	406	135	205	795	915	105	406	160	450	130	260	275	40	135 x 3	243	8"
360	180	200	-	2500	1 1/2"	43	445	135	220	860	1010	105	445	180	500	140	280	300	50	135 x 3	263	6"
360	220	250	-	2500	1 1/2"	43	445	150	220	860	1010	105	445	180	500	140	280	300	50	150 x 3	263	6"
400	200	220	-	2500	1 1/2"	43	508	150	235	910	1060	130	508	200	560	160	300	330	50	150 x 3	294	7"
400	250	280	-	2500	1 1/2"	43	508	170	235	910	1060	130	508	200	560	160	300	330	50	170 x 3	294	7"
450	220	250	-	3000	1 1/2"	50	559	170	250	1030	1210	140	559	240	670	190	350	385	60	170 x 3	320	8"
450	280	320	-	3000	1 1/2"	50	559	190	250	1030	1210	140	559	240	670	190	350	385	60	190 x 4	320	8"
500	250	280	-	3000	1 1/2"	50	622	190	270	1105	1285	150	622	260	730	200	380	415	60	190 x 4	351	7"
500	320	360	-	3000	1 1/2"	50	622	240	270	1105	1285	150	622	260	730	200	380	415	60	240 x 4	351	7"

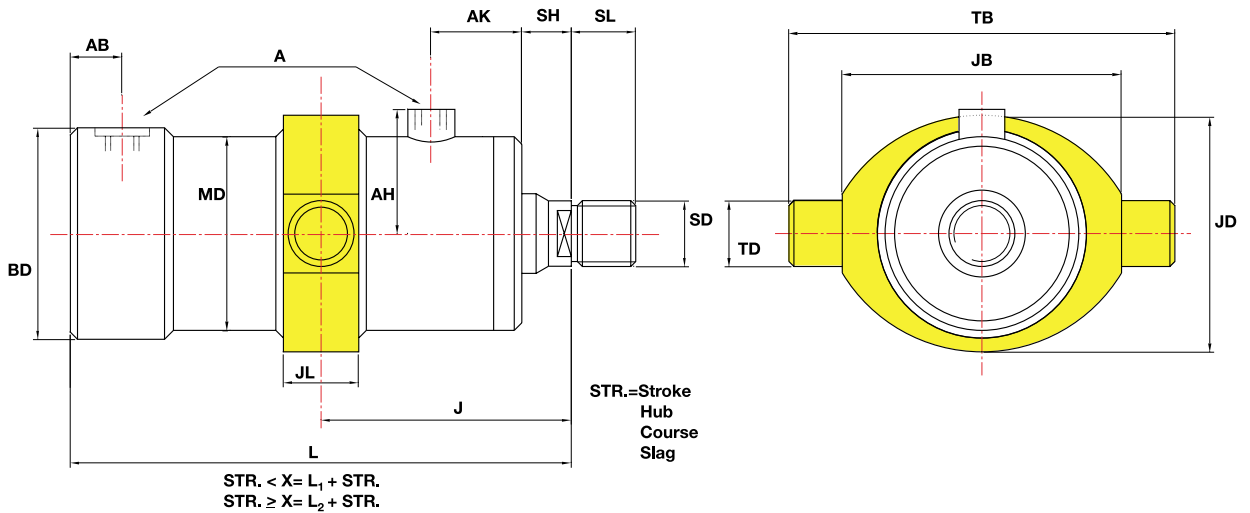
Rear double clevis **320 bar**  
 Gabel am Zylinderboden  
**GB**  
 Fourche arrière  
 Gaffel aan bodem



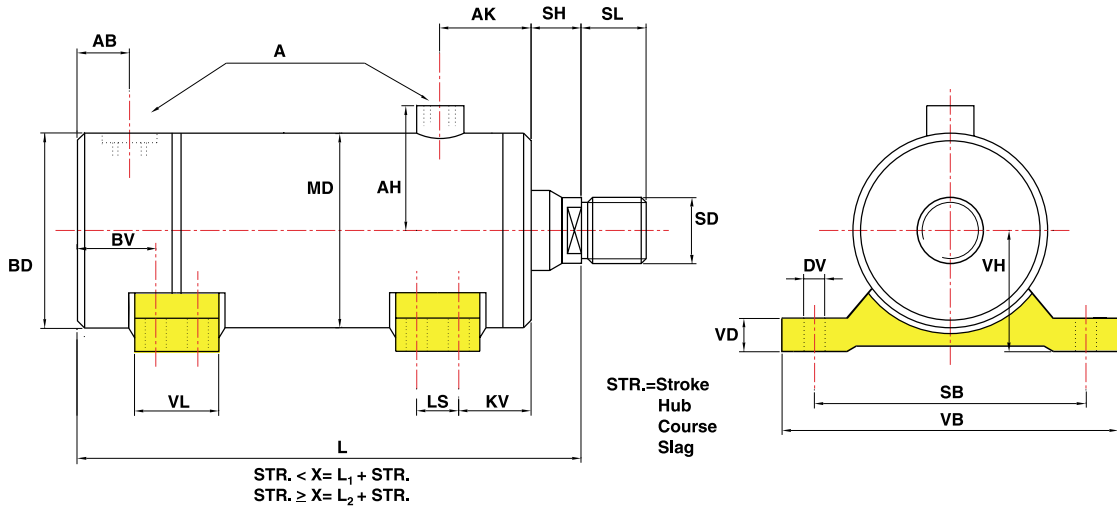
Piston Kolben Piston Zuiger	Rod Stange Tige Stang			x	A G/BSP	AB Ø	BD Ø	SL	AK	L <sub>1</sub>	L <sub>2</sub>	MD Ø	GO ØE8	GB	GD	GHB	GL	SH	SD M	AH	GA
	Ø 1	Ø 2	Ø 3																		
25	16	-	-	-	3/8"	13	35	16	57	180	-	35	20	40	50	35	20	15	16 x 1,5	38	25
32	18	22	-	-	3/8"	13	42	16	60	183	-	42	20	40	50	35	20	15	16 x 1,5	41	25
40	22	28	-	-	3/8"	13	55	16	60	208	-	55	25	50	60	40	25	20	16 x 1,5	48	30
50	28	35	-	-	3/8"	13	65	22	60	213	-	65	30	60	70	45	30	20	22 x 1,5	53	35
65	35	45	-	-	1/2"	15	80	35	64	248	-	80	40	80	90	60	40	20	35 x 1,5	65	45
80	45	55	-	800	1/2"	15	95	45	83	298	333	100	50	100	100	85	55	20	45 x 1,5	75	50
100	60	70	-	800	3/4"	19	120	58	93	352	392	120	60	120	120	105	70	30	58 x 1,5	90	60
125	70	80	90	1200	3/4"	19	150	58	98	382	432	150	60	120	120	105	70	30	58 x 1,5	105	60
140	80	90	100	1200	3/4"	19	165	65	108	423	483	170	70	140	130	130	85	30	65 x 2	115	65
160	90	100	110	1500	1"	23	190	80	118	468	538	200	80	160	140	145	95	35	80 x 2	130	70
180	100	110	125	1500	1"	23	220	90	120	525	605	220	90	180	155	165	110	35	90 x 2	140	80
200	110	125	140	1500	1"	23	254	100	130	560	640	254	100	200	165	190	130	35	100 x 2	157	85
220	125	140	160	2000	1 1/4"	28	273	110	145	615	715	273	110	220	180	210	140	35	110 x 2	172	95
250	140	160	180	2000	1 1/4"	28	323	120	145	637	737	323	120	240	215	240	145	35	120 x 2	197	110
280	160	180	200	2000	1 1/4"	28	355	125	165	697	817	355	140	280	250	270	165	35	125 x 3	213	130
320	160	180	-	2500	1 1/2"	40	406	125	205	840	960	406	160	320	280	305	190	40	125 x 3	243	150
320	200	220	-	2500	1 1/2"	40	406	135	205	840	960	406	160	320	280	305	190	40	135 x 3	243	150
360	180	200	-	2500	1 1/2"	43	445	135	220	910	1060	445	180	360	310	330	215	50	135 x 3	263	175
360	220	250	-	2500	1 1/2"	43	445	150	220	910	1060	445	180	360	310	330	215	50	150 x 3	263	175
400	200	220	-	2500	1 1/2"	43	508	150	235	975	1125	508	200	400	350	365	235	50	150 x 3	294	190
400	250	280	-	2500	1 1/2"	43	508	170	235	975	1125	508	200	400	350	365	235	50	170 x 3	294	190
450	220	250	-	3000	1 1/2"	50	559	170	250	1105	1285	559	240	480	400	425	280	60	170 x 3	320	230
450	280	320	-	3000	1 1/2"	50	559	190	250	1105	1285	559	240	480	400	425	280	60	190 x 4	320	230
500	250	280	-	3000	1 1/2"	50	622	190	270	1180	1360	622	260	520	440	455	300	60	190 x 4	351	245
500	320	360	-	3000	1 1/2"	50	622	240	270	1180	1360	622	260	520	440	455	300	60	240 x 4	351	245

# 320 bar ZT

Intermediate trunnion mounting  
Schwenzapfen in Zylindermitte  
Tourillons intermédiaires  
Zwenktappen



Piston Kolben Piston Zuiger	Rod Stange Tige Stang			x	A	AB	BD	SL	J <sub>min</sub>	J <sub>max</sub>	JB	JD	JL	AK	L <sub>1</sub>	L <sub>2</sub>	MD	SH	SD	AH	TB	TD	STR
	Ø 1	Ø 2	Ø 3																				
25	16	-	-	-	3/8"	13	35	16	122	65	45	45	30	57	145	-	35	15	16 x 1,5	38	65	18	37
32	18	22	-	-	3/8"	13	42	16	125	67	52	52	30	60	148	-	42	15	16 x 1,5	41	80	22	39
40	22	28	-	-	3/8"	13	55	16	130	67	70	70	30	60	168	-	55	20	16 x 1,5	48	105	25	24
50	28	35	-	-	3/8"	13	65	22	135	72	80	80	40	60	168	-	65	20	22 x 1,5	53	118	30	34
65	35	45	-	-	1/2"	15	80	35	144	83	100	105	40	64	183	-	80	20	35 x 1,5	65	148	35	44
80	45	55	-	800	1/2"	15	95	45	168	86	130	120	50	83	213	248	100	20	45 x 1,5	75	184	45	41
100	60	70	-	800	3/4"	19	120	58	198	100	165	140	60	93	247	287	120	30	58 x 1,5	90	230	55	51
125	70	80	90	1200	3/4"	19	150	58	213	111	185	180	80	98	277	327	150	30	58 x 1,5	105	280	65	47
140	80	90	100	1200	3/4"	19	165	65	233	122	210	195	90	108	293	353	170	30	65 x 2	115	320	75	62
160	90	100	110	1500	1"	23	190	80	256	137	235	220	100	118	323	393	200	35	80 x 2	130	360	85	70
180	100	110	125	1500	1"	23	220	90	268	146	260	250	120	120	360	440	220	35	90 x 2	140	390	100	54
200	110	125	140	1500	1"	23	254	100	283	151	320	300	130	130	370	450	254	35	100 x 2	157	460	110	64
220	125	140	160	2000	1 1/4"	28	273	110	320	176	340	325	150	145	405	505	273	35	110 x 2	172	530	130	91
250	140	160	180	2000	1 1/4"	28	323	120	320	176	390	370	150	145	422	522	323	35	120 x 2	197	590	130	74
280	160	180	200	2000	1 1/4"	28	355	125	350	185	430	410	170	165	452	572	355	35	125 x 3	213	650	140	83
320	160	180	-	2500	1 1/2"	40	406	125	408	245	500	450	200	205	535	655	406	40	125 x 3	243	730	180	128
320	200	220	-	2500	1 1/2"	40	406	135	408	245	500	450	200	205	535	655	406	40	135 x 3	243	730	180	128
360	180	200	-	2500	1 1/2"	43	445	135	443	270	550	540	220	220	580	730	445	50	135 x 3	263	800	200	148
360	220	250	-	2500	1 1/2"	43	445	150	443	270	550	540	220	220	580	730	445	50	150 x 3	263	800	200	148
400	200	220	-	2500	1 1/2"	43	508	150	478	290	630	560	260	235	610	760	508	50	150 x 3	294	930	240	173
400	250	280	-	2500	1 1/2"	43	508	170	478	290	630	560	260	235	610	760	508	50	170 x 3	294	930	240	173
450	220	250	-	3000	1 1/2"	50	559	170	548	340	700	620	310	250	680	860	559	60	170 x 3	320	980	280	208
450	280	320	-	3000	1 1/2"	50	559	190	548	340	700	620	310	250	680	860	559	60	190 x 4	320	980	280	208
500	250	280	-	3000	1 1/2"	50	622	190	593	360	780	680	350	270	725	905	622	60	190 x 4	351	1090	320	223
500	320	360	-	3000	1 1/2"	50	622	240	593	360	780	680	350	270	725	905	622	60	240 x 4	351	1090	320	223



Piston Kolben Piston Zuiger	Rod Stange Tige Stang				x	A	AB	BD	SB	BV	DV	SL	AK	KV	L <sub>1</sub>	L <sub>2</sub>	LS	MD	SH	SD	AH	VB	VD	VH	VL
	Ø 1	Ø 2	Ø 3	G/BSP																					
25	16	-	-	-	3/8"	13	35	60	18	6,6 (8x)	16	57	38	145	-	15	35	15	16 x 1,5	38	80	8	24	30	
32	18	22	-	-	3/8"	13	42	70	18	6,6 (8x)	16	60	38	148	-	15	42	15	16 x 1,5	41	90	10	28	30	
40	22	28	-	-	3/8"	13	55	80	20	9 (8x)	16	60	40	168	-	20	55	20	16 x 1,5	48	105	10	35	40	
50	28	35	-	-	3/8"	13	65	95	20	9 (8x)	22	60	40	168	-	20	65	20	22 x 1,5	53	120	20	46	40	
65	35	45	-	-	1/2"	15	80	125	25	14 (8x)	35	64	45	183	-	30	80	20	35 x 1,5	65	160	20	54	60	
80	45	55	-	800	1/2"	15	100	150	30	18 (8x)	45	83	45	213	248	40	100	20	45 x 1,5	73	200	30	68	80	
100	60	70	-	800	3/4"	19	120	170	40	18 (8x)	58	93	55	247	287	40	120	30	58 x 1,5	90	220	40	85	80	
125	70	80	90	1200	3/4"	19	150	210	45	22 (8x)	58	98	60	277	327	50	150	30	58 x 1,5	105	255	40	100	100	
140	80	90	100	1200	3/4"	19	170	230	50	26 (8x)	65	108	70	293	353	60	170	30	65 x 2	113	280	50	115	120	
160	90	100	110	1500	1"	23	200	270	50	26 (8x)	80	118	70	323	393	60	200	35	80 x 2	125	320	60	135	120	
180	100	110	125	1500	1"	23	220	300	60	33 (8x)	90	120	80	360	440	70	220	35	90 x 2	140	360	60	150	140	



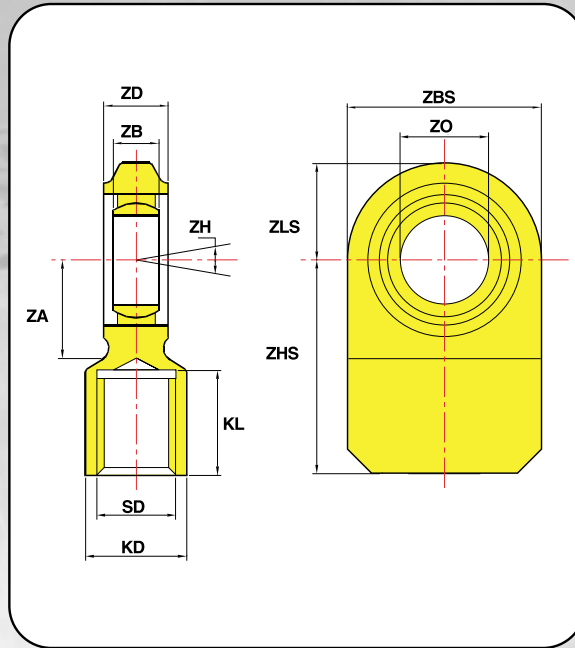
# 320 bar ZS

Rod spherical eye mounting

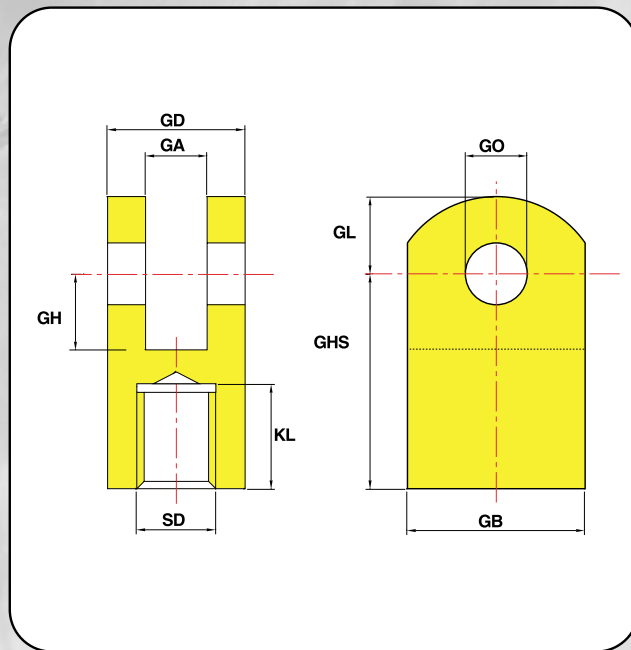
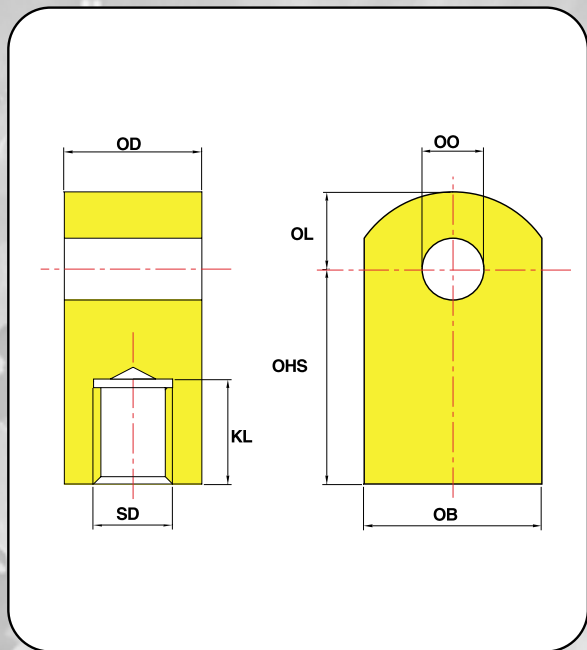
Gelenkauge an Kolbenstange

Oeillet à rotule sur la tige

Zwenklager aan stang



Piston Kolben Piston Zuiger	Rod Stange Tige Stang			KL	KD Ø	ZB	ZO Ø	ZBS	ZD	ZHS	ZLS	SD M	ZA	ZH max.
	Ø	Ø 1	Ø 2											
25	16	-	-	17	25	16	20	56	19	50	28	16 x 1,5	25	9'
32	18	22	-	17	25	16	20	56	19	50	28	16 x 1,5	25	9'
40	22	28	-	17	25	20	25	56	23	50	28	16 x 1,5	28	7'
50	28	35	-	23	32	22	30	64	28	60	32	22 x 1,5	30	6'
65	35	45	-	37	55	28	40	94	35	85	55	35 x 1,5	39	7'
80	45	55	-	48	70	35	50	120	40	135	75	45 x 1,5	69	6'
100	60	70	-	61	100	44	60	160	50	160	95	58 x 1,5	74	6'
125	70	80	90	61	100	44	60	160	50	160	95	58 x 1,5	74	6'
140	80	90	100	68	110	49	70	190	55	180	115	65 x 2	87	6'
160	90	100	110	84	130	55	80	220	60	225	130	80 x 2	95	6'
180	100	110	125	94	140	60	90	250	65	245	150	90 x 2	115	5'
200	110	125	140	104	150	70	100	280	70	275	170	100 x 2	125	7'
220	125	140	160	114	160	70	110	310	80	310	190	110 x 2	140	6'
250	140	160	180	125	180	85	120	335	90	320	215	120 x 2	150	6'
280	160	180	200	130	180	90	140	390	110	360	245	125 x 3	170	7'
320	160	180	-	130	180	105	160	450	130	370	275	125 x 3	200	8'
320	200	220	-	140	200	105	160	450	130	370	275	135 x 3	200	8'
360	180	200	-	140	200	105	180	500	140	410	300	135 x 3	220	6'
360	220	250	-	155	220	105	180	500	140	410	300	150 x 3	220	6'
400	200	220	-	155	220	130	200	560	160	450	330	150 x 3	240	7'
400	250	280	-	175	260	130	200	560	160	450	330	170 x 3	240	7'
450	220	250	-	175	260	140	240	670	190	490	385	170 x 3	260	8'
450	280	320	-	195	280	140	240	670	190	490	385	190 x 4	260	8'
500	250	280	-	195	280	150	260	730	200	570	415	190 x 4	290	7'
500	320	360	-	245	360	150	260	730	200	570	415	240 x 4	290	7'



Piston Kolben Piston Zuiger	Rod Stange Tige Stang			KL	OO	OB	OD	OHS	OL	SD
	Ø 1	Ø 2	Ø 3							
Ø	ØE8			M						
25	16	-	-	17	15	30	20	40	15	16 x 1,5
32	18	22	-	17	15	30	20	40	15	16 x 1,5
40	22	28	-	17	20	40	25	45	20	16 x 1,5
50	28	35	-	23	30	50	30	50	30	22 x 1,5
65	35	45	-	37	40	70	40	70	40	35 x 1,5
80	45	55	-	48	50	80	50	90	45	45 x 1,5
100	60	70	-	61	60	100	70	110	60	58 x 1,5
125	70	80	90	61	70	120	80	130	80	58 x 1,5
140	80	90	100	68	80	140	98	140	90	65 x 2
160	90	100	110	84	90	160	108	160	95	80 x 2
180	100	110	125	94	100	180	118	190	110	90 x 2
200	110	125	140	104	120	200	138	200	130	100 x 2
220	125	140	160	114	130	220	158	230	140	110 x 2
250	140	160	180	125	150	230	176	250	145	120 x 2
280	160	180	200	130	170	270	196	260	165	125 x 3
320	160	180	-	130	190	300	216	290	190	125 x 3
320	200	220	-	140	190	300	216	290	190	135 x 3
360	180	200	-	140	210	350	236	320	215	135 x 3
360	220	250	-	155	210	350	236	320	215	150 x 3
400	200	220	-	155	240	390	256	360	235	150 x 3
400	250	280	-	175	240	390	256	360	235	170 x 3
450	220	250	-	175	260	420	296	390	250	170 x 3
450	280	320	-	195	260	420	296	390	250	190 x 4
500	250	280	-	195	300	460	316	480	280	190 x 4
500	320	360	-	245	300	460	316	480	280	240 x 4

Piston Kolben Piston Zuiger	Rod Stange Tige Stang			KL	GO	GB	GD	GHS	GL	GA	GH	SD
	Ø 1	Ø 2	Ø 3									
Ø	ØE8			M								
25	16	-	-	17	20	40	50	60	20	25	35	16 x 1,5
32	18	22	-	17	20	40	50	60	20	25	35	16 x 1,5
40	22	28	-	17	25	50	60	65	25	30	40	16 x 1,5
50	28	35	-	23	30	60	70	80	30	35	45	22 x 1,5
65	35	45	-	37	40	80	90	110	40	45	60	35 x 1,5
80	45	55	-	48	50	100	100	150	55	50	85	45 x 1,5
100	60	70	-	61	60	120	120	180	70	60	105	58 x 1,5
125	70	80	90	61	60	120	120	180	70	60	105	58 x 1,5
140	80	90	100	68	70	140	130	220	85	65	130	65 x 2
160	90	100	110	84	80	160	140	250	95	70	145	80 x 2
180	100	110	125	94	90	180	155	280	110	80	165	90 x 2
200	110	125	140	104	100	200	165	320	130	85	190	100 x 2
220	125	140	160	114	110	220	180	360	140	95	210	110 x 2
250	140	160	180	125	120	240	215	400	145	110	240	120 x 2
280	160	180	200	130	140	280	250	440	165	130	270	125 x 3
320	160	180	-	130	160	320	280	490	190	150	305	125 x 3
320	200	220	-	140	160	320	280	490	190	150	305	135 x 3
360	180	200	-	140	180	360	310	540	215	170	330	135 x 3
360	220	250	-	155	180	360	310	540	215	170	330	150 x 3
400	200	220	-	155	200	400	350	600	235	190	365	150 x 3
400	250	280	-	175	200	400	350	600	235	190	365	170 x 3
450	220	250	-	175	240	480	400	690	280	230	420	170 x 3
450	280	320	-	195	240	480	400	690	280	230	420	190 x 4
500	250	280	-	195	260	520	440	780	300	245	450	190 x 4
500	320	360	-	245	260	520	440	780	300	245	450	240 x 4



● HL - Semi Submersible Drilling Rig - Stena tay.

size		surface			$\varphi$	speed at oil flow $Q = 10 \text{ L/min.}$			theoretical forces ( at mechanical efficiency = 100%)														
$\varnothing$ piston	$\varnothing$ piston rod	piston area	rod area	annulus area	piston area annulus area	push function	pull function	regenerative function	push					pull					differential force				
									at operating pressure:					at operating pressure:					at operating pressure:				
mm	mm	cm <sup>2</sup>	cm <sup>2</sup>	cm <sup>2</sup>	-	cm/s	cm/s	cm/s	100 bar	150 bar	200 bar	250 bar	320 bar	100 bar	150 bar	200 bar	250 bar	320 bar	100 bar	150 bar	200 bar	250 bar	320 bar
25	16	4,91	2,01	2,90	1,69	34	57,5	82,9	4,91	7,36	9,82	12,3	15,7	2,90	4,35	5,80	7,25	9,27	2,01	3,02	4,02	5,03	6,43
32	18	8,042	2,54	5,50	1,46	20,7	30,3	65,5	8,04	12,1	16,1	20,1	25,7	5,50	8,25	11,0	13,7	17,6	2,54	3,82	5,09	6,36	8,14
			3,80	4,24	1,90		39,3	43,8						4,24	6,36	8,48	10,6	13,6	3,80	5,70	7,60	9,50	12,2
40	22	12,57	3,80	8,77	1,43	13,3	19,0	43,8	12,6	18,8	25,1	31,4	40,2	8,77	13,1	17,5	21,9	28,0	3,80	5,70	7,60	9,50	12,2
			6,16	6,41	1,96		26,0	27,1						6,41	9,61	12,8	16,0	20,0	6,16	9,24	12,3	15,4	19,7
50	28	19,63	6,16	13,48	1,46	8,49	12,4	27,1	19,6	29,5	39,3	49,1	62,8	13,5	20,2	27,0	33,7	43,1	6,16	9,24	12,3	15,4	19,7
			9,62	10,01	1,96		16,6	17,3						10,0	15,0	20,0	25,0	32,0	9,62	14,4	19,2	24,1	30,8
65	35	33,18	9,62	23,56	1,41	5,02	7,07	17,3	33,2	49,8	66,4	83,0	106	23,6	35,3	47,1	58,9	75,4	9,62	14,4	19,2	24,1	30,8
			15,90	17,28	1,92		9,65	10,5						17,3	25,9	34,6	43,2	55,3	15,9	23,9	31,8	39,8	50,9
80	45	50,27	15,90	34,36	1,46	3,32	4,85	10,5	50,3	75,4	101	126	161	34,4	51,5	68,7	85,9	110	15,9	23,9	31,8	39,8	50,9
			23,76	26,51	1,90		6,29	7,02						26,5	39,8	53,0	66,3	84,8	23,8	35,6	47,5	59,4	76,0
100	60	78,54	28,27	50,27	1,56	2,12	3,32	5,89	78,5	118	157	196	251	50,3	75,4	101	126	161	28,3	42,4	56,5	70,7	90,5
			38,48	40,06	1,96		4,16	4,33						40,1	60,1	80,1	100	128	38,5	57,7	77,0	96,2	123
125	70	122,7	38,48	84,23	1,46	1,36	1,98	4,33	123	184	245	307	393	84,2	126	168	211	270	38,5	57,7	77,0	96,2	123
			50,27	72,45	1,69		2,30	3,32						72,5	109	145	181	232	50,3	75,4	101	126	161
140	80	153,9	63,62	59,10	2,08	1,08	2,82	2,62	154	231	308	385	493	59,1	88,7	118	148	189	63,6	95,4	127	159	204
			50,27	103,7	1,48		1,61	3,32						104	156	207	259	332	50,3	75,4	101	126	161
160	90	201,1	63,62	75,40	2,04	0,83	2,21	2,12	154	231	308	385	493	90,3	135	181	226	289	63,6	95,4	127	159	204
			78,54	137,4	1,46		1,21	2,62						137	206	275	344	440	63,6	95,4	127	159	204
180	100	254,5	78,54	106,0	1,90	0,65	1,57	1,75	201	302	402	503	643	123	184	245	306	392	78,5	118	157	196	251
			95,03	175,9	1,45		0,95	2,12						106	159	212	265	339	95,0	143	190	238	304
200	110	314,2	78,54	159,4	1,60	0,53	1,05	1,75	254	382	509	636	814	176	264	352	440	563	78,5	118	157	196	251
			122,7	131,8	1,93		1,27	1,36						132	198	264	329	422	123	184	245	307	393
220	125	380,1	95,03	219,1	1,43	0,44	0,76	1,75	314	471	628	785	1005	219	329	438	548	701	95,0	143	190	238	304
			122,7	160,2	1,96		0,65	1,36						191	287	383	479	613	123	184	245	307	393
250	140	490,9	153,9	257,4	1,48	0,34	0,87	1,36	380	570	760	950	1216	160	240	320	401	513	154	231	308	385	493
			122,7	191,4	1,64		0,74	1,08						257	386	515	644	824	123	184	245	307	393
280	160	615,8	153,9	336,9	1,46	0,27	0,93	0,83	491	736	982	1227	1571	179	269	358	448	573	201	302	402	503	643
			201,1	289,8	1,69		0,58	0,83						337	505	674	842	1078	154	231	308	385	493
320	180	804,2	201,1	414,7	1,48	0,21	0,40	0,65	616	924	1232	1539	1970	236	355	473	591	756	254	382	509	636	814
			254,5	361,3	1,70		0,46	0,65						415	622	829	1037	1327	201	302	402	503	643
360	200	1018	314,2	301,6	2,04	0,16	0,55	0,53	804	1206	1608	2011	2574	302	452	603	754	965	314	471	628	785	1005
			201,1	603,2	1,33		0,28	0,83						603	905	1206	1508	1930	201	302	402	503	643
400	220	1257	254,5	549,8	1,46	0,13	0,30	0,65	1018	1527	2036	2545	3257	550	825	1100	1374	1759	254	382	509	636	814
			314,2	490,1	1,64		0,34	0,53						490	735	980	1225	1568	314	471	628	785	1005
450	250	1590	380,1	424,1	1,90	0,1	0,39	0,44	1257	1885	2513	3142	4021	424	636	848	1060	1357	380	570	760	950	1216
			254,5	763,4	1,33		0,22	0,65						763	1145	1527	1909	2443	254	382	509	636	814
500	280	1963	314,2	703,7	1,45	0,08	0,24	0,53	1590	2386	3181	3976	5089	704	1056	1407	1759	2252	314	471	628	785	1005
			380,1	637,7	1,60		0,26	0,44						638	957	1275	1594	2041	380	570	760	950	1216
500	320	1963	490,9	527,0	1,93	0,08	0,32	0,34	1963	2945	3927	4909	6283	527	791	1054	1318	1686	491	736	982	1227	1571
			314,2	942,5	1,33		0,18	0,53						942	1414	1885	2356	3016	314	471	628	785	1005
500	360	1963	380,1	876,5	1,43	0,08	0,19	0,44	1963	2945	3927	4909	6283	877	1315	1753	2191	2805	380	570	760	950	1216
			490,9	765,8	1,64		0,22	0,34						766	1149	1532	1914	2450	491	736	982	1227	1571
500	360	1963	615,8	640,9	1,96	0,08	0,26	0,27	1963	2945	3927	4909	6283	641	961	1282	1602	2051	616	924	1232	1539	1970
			380,1	1210	1,31		0,14	0,44						1210	1815	2421	3026	3873	380	570	760	950	1216
500	360	1963	490,9	1100	1,45	0,08	0,15	0,34	1963	2945	3927	4909	6283	1100	1649	2199	2749	3519	491	736	982	1227	1571
			615,8	974,7	1,63		0,17	0,27						975	1462	1949	2437	3119	616	924	1232	1539	1970
500	360	1963	804,2	786,2	2,02	0,08	0,21	0,21	1963	2945	3927	4909	6283	786	1179	1572	1965	2516	804	1206	1608	2011	2574
			490,9	1473	1,33		0,11	0,34						1473	2209	2945	3682	4712	491	736	982	1227	1571
500	360	1963	615,8	1348	1,46	0,08	0,12	0,27	1963	2945	3927	4909	6283	1348	2022	2695	3369	4313	616	924	1232	1539	1970
			804,2	1159	1,69		0,14	0,21						1159	1739	2318	2898	3710	804	1206	1608	2011	2574
500	360	1963	1018	945,6	2,08	0,08	0,18	0,16	1963	2945	3927	4909	6283	946	1418	1891	2364	3026	1018	1527	2036	2545	3257



# Buckling diagram

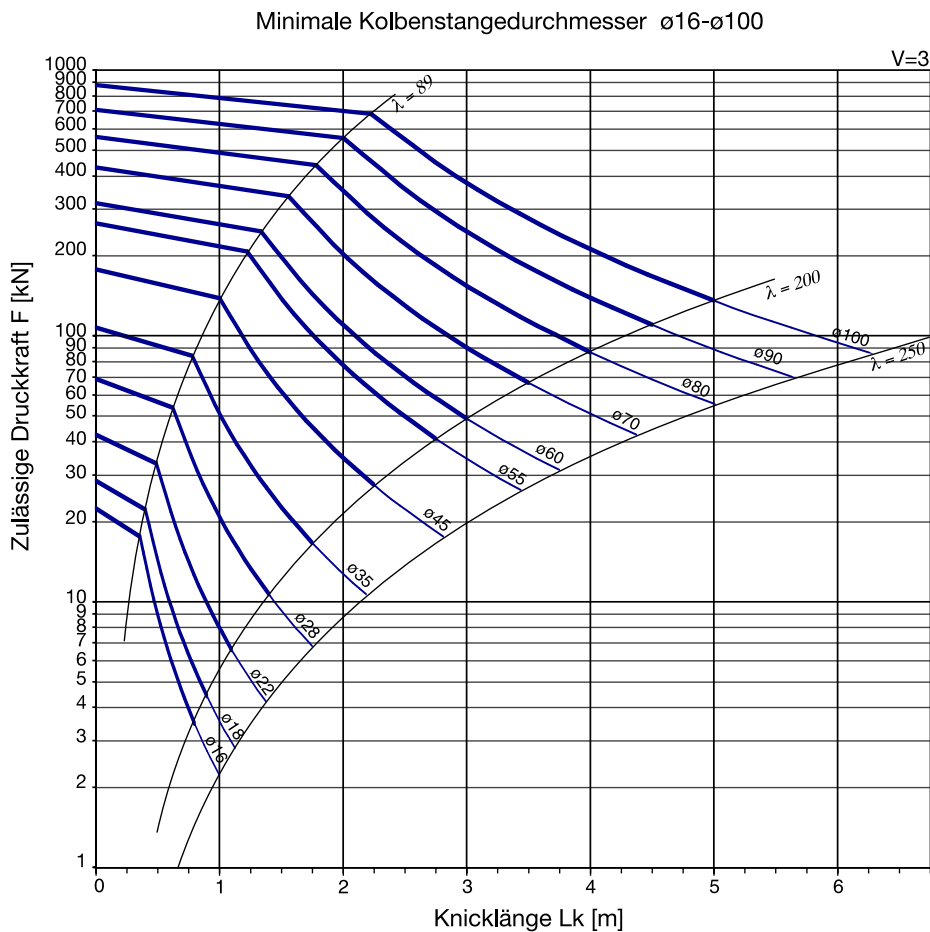
## BUCKLING

The charts on page 38 and 39 show the allowable axial pushing force  $F$  as the function of the free buckling length  $L_k$ , for the existing standard rod diameters.

These forces can be calculated using the following formulas and variables

- |   |  |
|---|--|
| 1) Euler formula :  | A) Safety factor : $V = 3$ ( for these graphs )                        |
| $F = \frac{\pi^2 \cdot E \cdot I}{v \cdot L_k^2} \quad [\text{kN}] \quad \{\lambda > \lambda_0\}$                         | B) Modulus of elasticity : $E_{\text{St,52}} = 210.000 \text{ N/mm}^2$ |
| 2) Tetmajer formula :   | C) Buckling length: $L_k$ [mm]   |
| $F = \frac{\pi \cdot d^2 \cdot (335 - 0,62 \cdot \lambda)}{4 \cdot v} \quad [\text{kN}] \quad \{\lambda \leq \lambda_0\}$ | This value depends on the mountingform, see figure 1,2,3.              |
| 3) Moment of inertia :  | D) Piston rod diameter: $d$ [mm]                                       |
| $I = \frac{\pi \cdot d^4}{64} \quad [\text{mm}^4]$  | E) Slenderness limit: $\lambda_0 = 89$                                 |
| 4) Slenderness :  |  |
| $\lambda = \frac{4 \cdot L_k}{d} \quad [-]$   |  |

The figures in the chart apply only to cylinders which have no radial force on the end of the rod.



Buckling length  
 $L_k = 0,7 \times H$

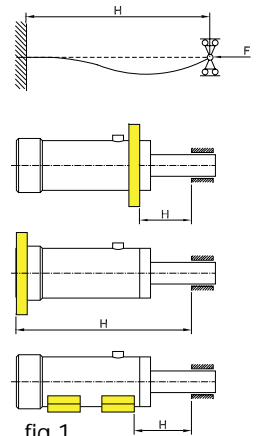


fig.1

Buckling length  
 $L_k = H$

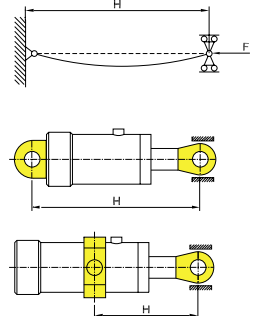


fig.2



## EXAMPLE: CALCULATIONS FOR A PISTON ROD.

A double-action cylinder, mounted by a rear flange on the bottomside and with a rod spherical eye-mounting on the rodside, must exert power measuring 90 kN at a maximum operating pressure of 320 bar and a maximum stroke length ( $L_{max}$ ) of 1750 mm.

Figure 1. shows what the buckling length  $L_k$ :  $0.7 \times H$  is when  $H \approx 2 \times L_{max}$ .  
 $L_k \approx 2450$  mm.

The chart on page 38 shows that a piston rod diameter of  $\varnothing 70$  is sufficient.

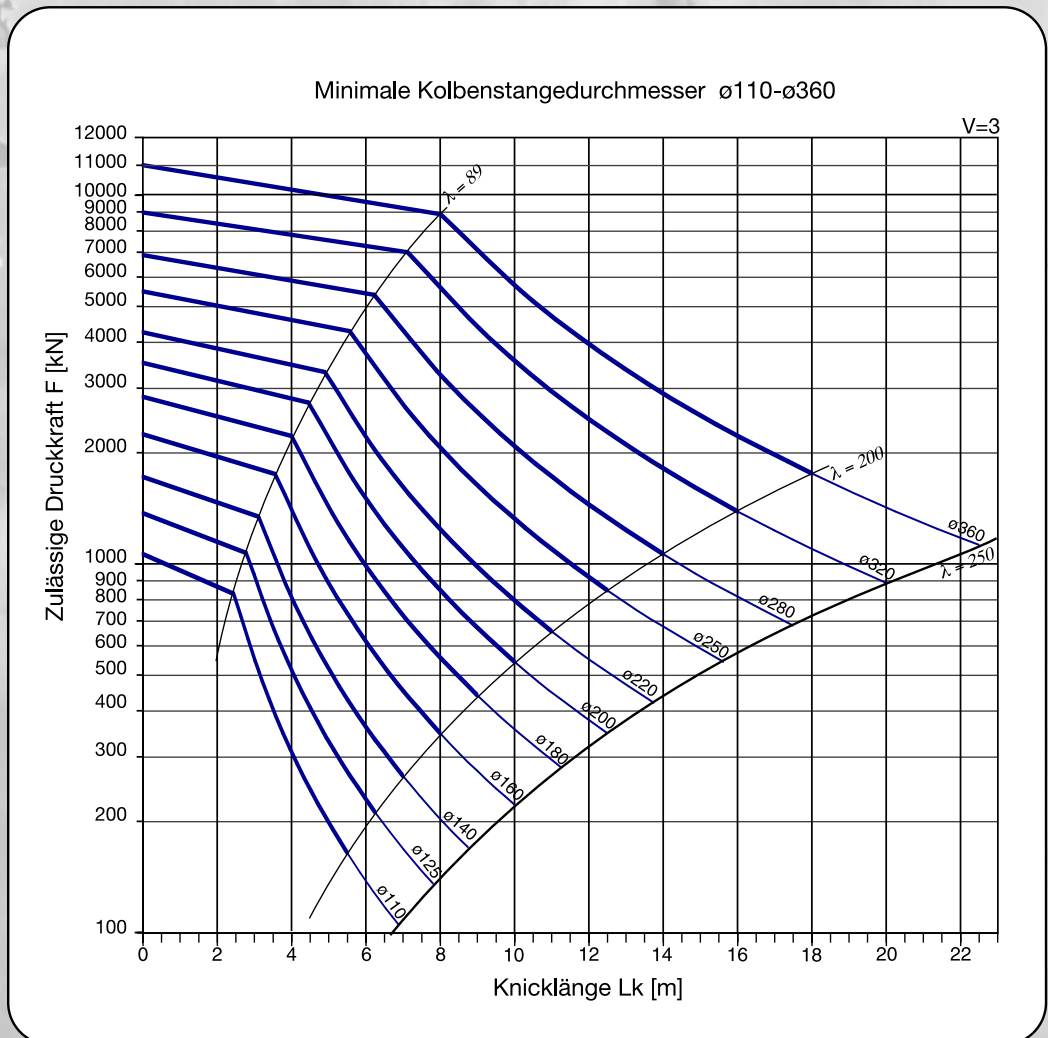
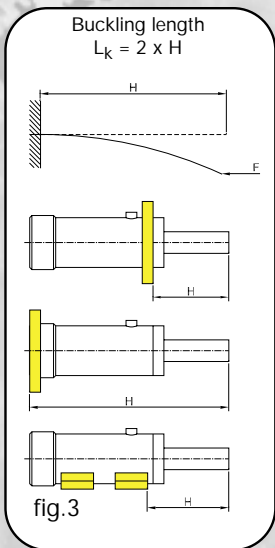
The table of forces on page 37 indicates that the appropriate bore diameter for 320 bar is  $\varnothing 125$  mm.

The actual value for the buckling length can be read from the dimension tables on page 38-39.

$H = L_2 + \text{stroke} + ZHS + \text{stroke} = 375 + 1750 + 160 + 1750 = 4035$  mm.

$L_k = 0.7 \times H = 2824$  mm.

Now the chart on page 38 indicates that a piston rod diameter of  $\varnothing 70$  is sufficient and can provide the required force.



# Type Code

	Bore diameter			Rod diameter			Stroke	Mounting body		Mounting rod		Operating pressure	Cylinder function	Seals	Rod material	Endcushioning	Features		
Position numbers	A	-	B	-	C	/	D	-	E	-	F	-	G	-	H	I	J	/	K
Example	125	-	70	-	400	/	BA	-	OS	-	20	-	DB	-	1	A	3	/	.....

A	Bore diameter	mm
---	---------------	----

B	Rod diameter	mm
---	--------------	----

C	Stroke length	mm
---	---------------	----

D Mounting cylinder body	
BASIC	BA
FRONT FLANGE	FF
REAR FLANGE	BF
EYE REAR	OB
SPHERICAL EYE REAR	ZB
DOUBLE CLEVIS REAR	GB
INTERMEDIATE TRUNNION	ZT
FOOT	VN

E Mounting rodside	
THREAD AT ROD	SS
ROD EYE	OS
SPHERICAL EYE ROD	ZS
DOUBLE CLEVIS AT ROD	GS

F Operating pressure (testing pressure) in Mpa	
200 BAR (250 BAR)	20
250 BAR (320 BAR)	25
320 BAR (360 BAR)	32
..... BAR	....

G Cylinder function		
*S	DOUBLE ACTING	DB
	SINGLE ACTING PUSH	ED
	SINGLE ACTING PULL	ET
	DOUBLE ROD	DD

H Seals		
*S	STANDARD	1
	LOW-FRICTION	2
	SPECIAL	3

I Rod material		
*S	ST.52 25 µm HARD CROME	A
	ST.52 60/40 µm NICKEL/CROME	B
	STLSS.STL 431	C
	STLSS.STL 431 25 µm HARD CROME	D
	ST.52 ALTI0X® 300	E
	18MnV5 40/20 µm NICKEL/CROME	F

J Endcushioning		
*S	NONE	3
	BOTH SIDES	4
	RODSIDE	5
	BOTTOMSIDE	6

\*S = Standard

K Description features **	
Example: The cylinder must have high-temperature seals	
Example: The rodmaterial must have a layer of 50 µm hard crome instead of 25 µm	
Example: Provided with Hypos® stroke-measurement system.	
**When the cylinder body mounting is "intermediate trunnion", please specify the J-dimension separately.	

Example	
A double acting cylinder with a bore diameter of ø125, a rod diameter of ø70mm and a stroke of 400mm has to function at 200 bar.	
For a specific application a basic mounting at the cylinder-body is desirable. At the rod side, an eye has to be mounted. Furthermore the cylinder is equipped with standard parts. The Hydrowa typecode is in this case:	
125-70-400/BA-OS-20-DB-1A3 (Also see the example on top of this page.)	

## APPLICATION FORM

Company : _____	Country : _____
Contactperson : _____	Email : _____
Phoneno. : _____	Faxno. : _____

1. Function: :  Normal DB / ED / ET / DD / Plunger  
                   :  Telescope DB / ED / ET / Plunger  
                   :  Differential
  2. Dimensions : (bore) \_\_\_\_\_ x (rod) \_\_\_\_\_ x (stroke) \_\_\_\_\_
  3. Mounting : bottomside: \_\_\_\_\_ rodside: \_\_\_\_\_
  4. Position cylinder : retracted: \_\_\_\_\_ extended: \_\_\_\_\_
  5. Construction :  fully standard  special \_\_\_\_\_
  6. Mounting length : \_\_\_\_\_ mm
  7. Connections :  Type \_\_\_\_\_ (bottomside) \_\_\_\_\_ (rodside)
  8. Endcushioning :  None  bottomside: fixed / adjustable  rodside: fixed / adjustable
  9. Bearing :  standard  with spacer  extra bearing
  10. Pressure : operating pressure: \_\_\_\_\_ bar (bottomside) \_\_\_\_\_ bar (rodside)  
                   peak pressure: \_\_\_\_\_ bar (bottomside) \_\_\_\_\_ bar (rodside)  
                   testing pressure: \_\_\_\_\_ bar (bottomside) \_\_\_\_\_ bar (rodside)
  11. Load : pulling force: \_\_\_\_\_ kN (retracted) \_\_\_\_\_ kN (extended)  
                   pushing force: \_\_\_\_\_ kN (retracted) \_\_\_\_\_ kN (extended)
  12. Seals :  standard \_\_\_\_\_  special: \_\_\_\_\_  
                    double rod seal: with leak-chamber / connection  
                    special scraper: \_\_\_\_\_  
                    rod seal / scraper / both removable without removing cylinderhead  
                   piston speed: out \_\_\_\_\_ m/s, in \_\_\_\_\_ m/s  
                   temperature: \_\_\_\_\_ °C, special fluid: \_\_\_\_\_, holdfunction: \_\_\_\_\_ hour
  13. Materials : pistonrod: \_\_\_\_\_, special coating \_\_\_\_\_  
                   special materials other parts: \_\_\_\_\_  
                    material certificates: \_\_\_\_\_
  14. Oil ports :  standard  other \_\_\_\_\_
  15. Stroke-measurement :  none  Hypos  other \_\_\_\_\_
  16. Testing :  special test: \_\_\_\_\_  with testcertificate  
                    witnessed by: \_\_\_\_\_
  17. Painting :  not blasted; covered with 1 layer primer  
                    special \_\_\_\_\_
  18. Piping/Valves :  valve / manifold type: \_\_\_\_\_
  19. Exchangeable : with cylinder (type/brand): \_\_\_\_\_
  20. Attachments :  specification \_\_\_\_\_  
                    sketches \_\_\_\_\_  
                    other \_\_\_\_\_
- Type code : 

- - / - - - - /
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## Hydrowa B.V.

Hoppenkuil 6, 5626 DD

P.O.BOX 9707, 5602 LS

Eindhoven, The Netherlands

tel.: + 31-(0)40-2629900

fax: + 31-(0)40-2623325

Email: [info@hydrowa.com](mailto:info@hydrowa.com)

URL: <http://www.hydrowa.com>

## U.S.A. Hydrowa B.V.

1112 Brooks st., S.E.

P.O. BOX 2068

Decatur, Alabama 35602-2068

U.S.A.

tel.: +1-256-309-5748

fax: +1-256-351-1264

Email: [info@hydrowa.com](mailto:info@hydrowa.com)

URL: <http://www.hydrowa.com>