DWL

Welded Cylinder 160bar Series

MADE IN GERMANY

Edition 1/2018

ONLINE configurable

AGIROSSI GMBH
INDUSTRIE- & MOBILHYDRAULIK

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Welded cylinder without mounting parts

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Standard dimensions – Heightened end plug _____ B V N O n o 7

Standard dimensions – End plug with inlet port _____ B A N O n o 7

Cylinder mounting parts

Cross hole _____ N B 8

Cross hole with inlet port _____ B A 8

Flange on head end _____ F K 9

Strap _____ N L 9

Ball-joint end GK _____ G K 10

Ball-joint end GF _____ G F 10

Fork _____ N G 11

Cross tube _____ N Q 11

Trunnion _____ N S 12

Rod mounting parts

Outside thread _____ a m 13

Strap _____ n l 13

Weldable ball-joint end _____ g k 14

Threaded ball-joint end _____ g g 14

Threaded fork _____ n g 15

Weldable fork _____ g s 15

Cross tube _____ n q 16

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General Information

The DWL-Series of the double-acitng hydraulic cylinders was designed to perform easy tasks cost-efficiently. The different mounting parts and piston diameters from 25 up to100 mm make a multifunctional purpose of the cylinders possible.
Strokes up to 6,000 mm are possible, the buckling load must be considered. The delivery time for the recommended strokes (50; 100; 150; … 1,000 mm) is often below 3 weeks.

Technical Information

Piston diameters: from 25 up to 100 mm

Stroke: as requested by customer

Rod:	Type:	Ck45 or 20MnV6 (manufacturer choice), 25µm hard-chrome plated
	Diameter tolerance:	ISO f8 up to ø17mm, ISO f7 from ø18mm
	Chromium coating thickness:	min. 10µm up to ø17mm, min. 20µm from ø18mm
	Chromium coating hardness:	63 – 68 HRC
	Surface roughness:	Ra max. 0,25µm
	Corrosion resistance:	min. 40h NSS after ISO 9227, category 9 after ISO 4540
	Straightness:	0,3:1.000mm
	Circularity:	1/3 of the diameter tolerance

Working pressure: min. 10 bar/ max. 160 bar

Test pressure: 210 bar

Speed: max. 0,5m/s

Working temperature: -20°C +80°C

Standard hydraulic fluid: mineral oil DIN51524 (HLP)

Mounting parts: 9 different mounting parts for the cylinder and 7 different mounting parts for the rod

Intended usage: performing a linear pressure in a stroke under observance of the technical data

Safety Instruction:
- the installation may only be conducted by a hydraulic expert
- the operating pressure must be secured by a Relief-Valve
- security norm EN 982 for hydraulic must be observed

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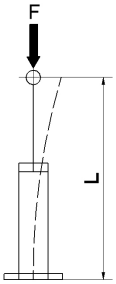
Buckling Load

For hydraulic cylinders, especially for long strokes, exists the possibility of rod buckling.

Calculation of the permitted buckling load

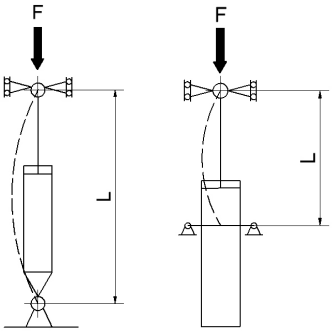
1. Determinate the buckling length SK using the assembly type and the installation length.
2. Determinate the permited buckling load with SK, rod diameter d and the graph.

Euler – Case 1



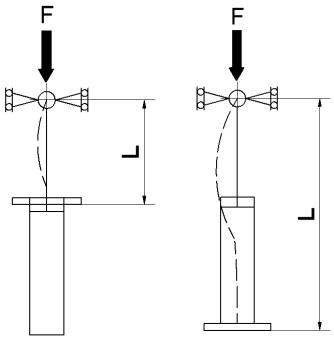
SK=L*2

Euler – Case 2



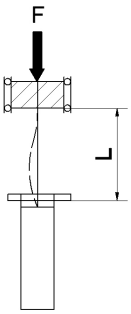
SK=L SK=L

Euler – Case 3

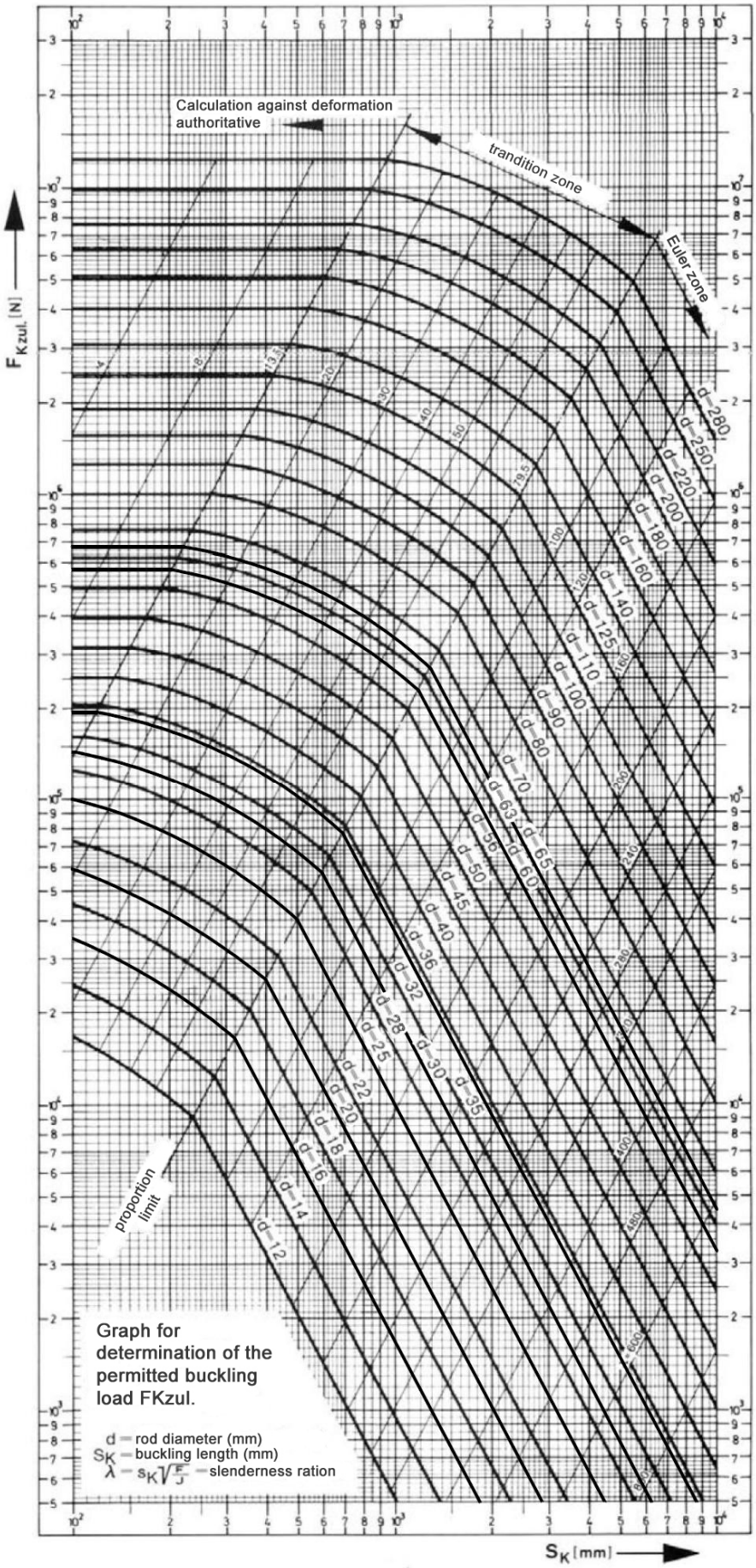


SK=L*0,7 SK=L*0,7

Euler – Case 4



SK=L*0,5



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ORDER SPECIFICATION (ARTICLE CODE)

1	2	3	4	5	6	7	8	9	10	11	12	13
DWL -		/	-	-	-	/	-	/	-	-	- CH -	

1 Type

Differential cylinder light series

2 Piston- Ø	3 Rod- Ø
25	16
32	20
40	20 / 25
50	25 / 30
60	30 / 35 / 40
63	40
70	35 / 40
80	40 / 50
100	50 / 60

All information in mm

4 Stroke length in mm

Example: 100mm stroke = 0100

5 End plug

B S = Standard end plug

B V = Heightened end plug
(not available for piston-ø 40 and 63)

B A = End plug with inlet port

6 Cylinder mounting parts	7 Art.-Code
N O = Without	- -
N B = Cross hole (not available for piston-ø 63)	- -
B A = Cross hole with inlet port (not available for piston-ø 63)	- -
F K = Flange on head end (not available for piston-ø 63)	- -
N L = Strap	* *
G K = Ball-joint end GK	* *
G F = Ball-joint end GF	* *
N G = Fork	* *
N Q = Cross tube	* *
N S = Trunnion	- -

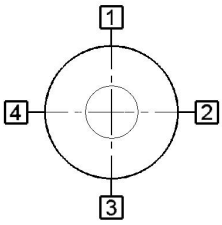
** Take the two-digit art.-code for the diameter dimension from the data sheet of the favored mounting part.

8 Rod mounting parts	9 Art.-Code
n o = Without	- -
a m = Outside thread	* *
n l = Strap	* *
g k = Weldable ball-joint end	* *
g g = Threaded ball-joint end	* *
n g = Threaded fork	* *
g s = Weldable fork	* *
n q = Cross tube	* *

** Take the two-digit art.-code for the diameter dimension from the data sheet of the favored mounting part.

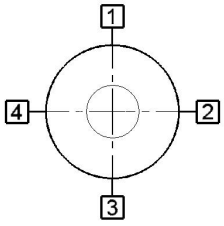
10 Inlet Port

End plug side:
View on rod



11 Inlet port

Rod side:
View on rod



12 Rod type

CH = Hard-chrome plated

13 Further specifications in clear text.....

0 = ...do not follow

1 = ...follow (enclosures needed)

Order example:
DWL-040/20-0150-BS-GF/20-gk/20-1-1-CH-1
Clear text: additionally 50 mm extended guide

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...further details about the online configurator at www.agirossi.de

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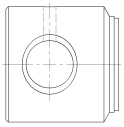
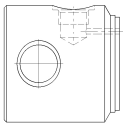
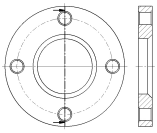
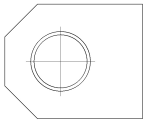
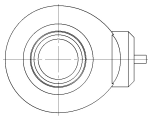
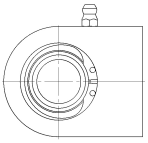
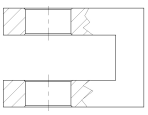
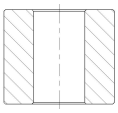
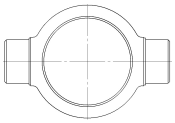
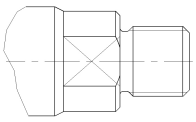
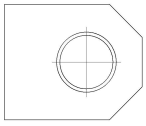
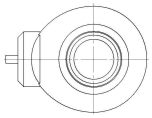
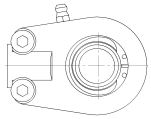
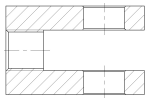
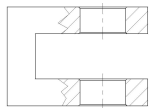
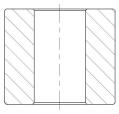
Survey of mounting parts

6 Cylinder mounting parts

Without	NO
Cross hole 	NB
Cross hole with inlet port 	BA
Flange on head end 	FK
Strap 	NL
Ball-joint end GK 	GK
Ball-joint end GF 	GF
Fork 	NG
Cross tube 	NQ
Trunnion 	NS

Rod mounting parts 8

no	Without
am	Outside thread 
nl	Strap 
gk	Weldable ball-join end 
gg	Threaded ball-joint end 
ng	Threaded Fork 
gs	Weldable fork 
nq	Cross tube 

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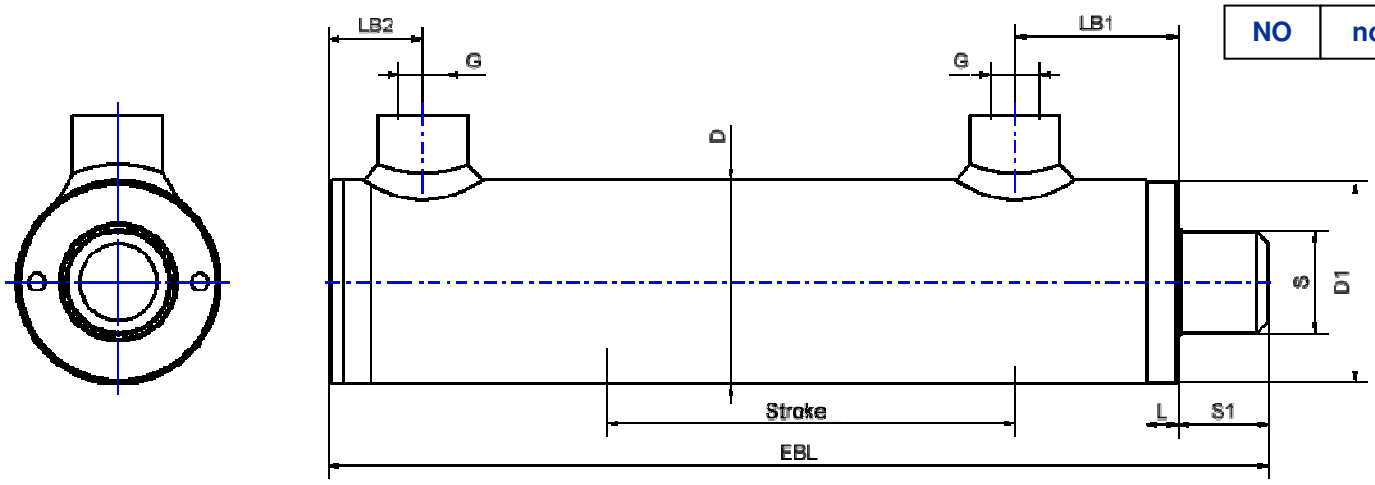
Welded cylinder without mounting parts – standard dimensions – standard end plug

BS

NO | no



Piston-Ø	S Ø	S1	D Ø	D1 Ø	L	LB1	LB2	G	EBL +Stroke
25	16	17	35	35	18	33	15	1/4“	85
32	20	16	42	42	6	33	20	1/4“	105
40	20	22	50	49	8	40	23	1/4“	130
	25								
50	25	22	60	59	8	43	26	3/8“	140
	30								
60	30	23	70	69	10	50	30	3/8“	160
	35								
	40								
63	40	23	73	73	10	50	30	3/8“	160
70	35	23	80	79	10	50	33	3/8“	160
	40								
80	40	25	92	94	10	60	35	1/2“	180
	50								
100	50	25	115	114	12	82	38	1/2“	210
	60								

Piston-Ø	S Ø	Move out force at 100 bar (in kN)	Move in force at 100 bar (in kN)	Move out force at 160 bar (in kN)	Move in force at 160 bar (in kN)
25	16	4,91	2,9	7,85	4,64
32	20	8,04	4,9	12,87	7,84
40	20	12,57	9,42	20,11	15,08
	25		7,66		12,25
50	25	19,63	14,73	31,42	23,56
	30		12,57		20,11
60	30	28,27	21,21	45,24	33,93
	35		18,65		29,85
	40		15,71		25,13
63	40	31,17	18,61	49,88	29,77
70	35	38,48	28,86	61,58	46,18
	40		25,92		41,47
80	40	50,24	37,7	80,42	60,32
	50		30,63		49,01
100	50	78,54	58,9	125,66	94,25
	60		50,27		80,42

All force specifications base upon a calculation with a theoretical degree of efficiency of 100%

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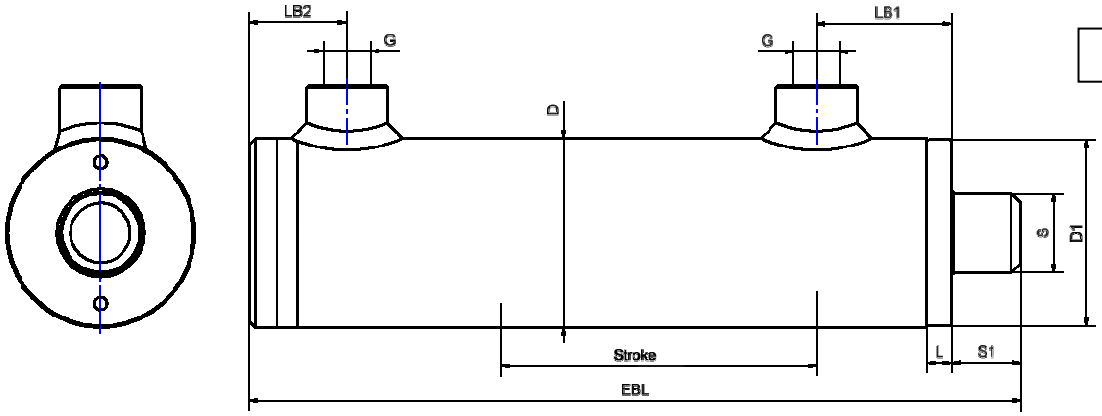
Welded cylinder without mounting parts – standard dimensions – heightened end plug

BV

NO no

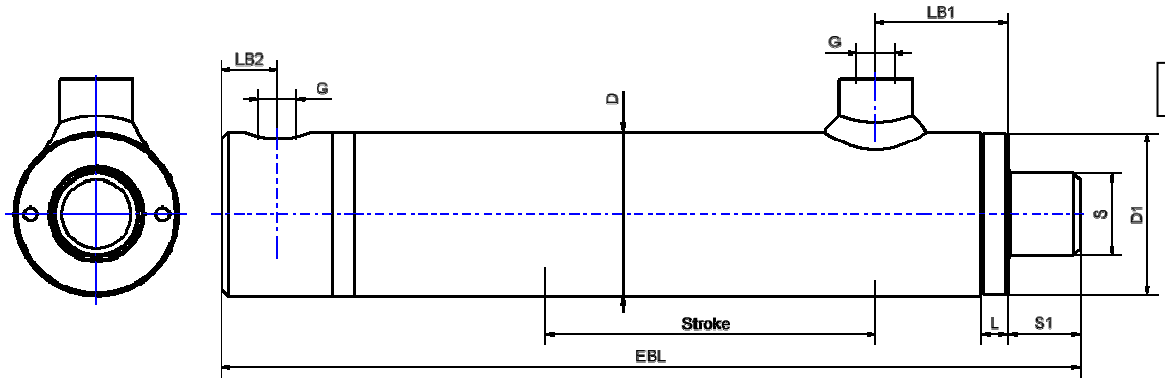


Piston-Ø	S Ø	S1	D Ø	D1 Ø	L	LB1	LB2	G	EBL +Stroke
50	25	22	60	59	8	43	31	3/8“	147
	30								
60	30	23	70	69	10	50	35	3/8“	167
	35								
	40								
70	35	23	80	79	10	50	41	3/8“	170
	40								
80	40	25	95	94	10	60	46	1/2“	193
	50								
100	50	25	115	114	12	82	51	1/2“	225
	60								

Welded cylinder without mounting parts – standard dimensions – end plug with inlet port

BA

NO no



Piston-Ø	S Ø	S1	D Ø	D1 Ø	L	LB1	LB2	G	EBL +Stroke
40	20	22	50	49	8	40	17	1/4“	160
	25								
50	25	22	60	59	8	43	17	3/8“	170
	30								
60	30	23	70	69	10	50	17	3/8“	188
	35								
	40								
63	40	23	73	73	10	50	17	3/8“	188
70	35	23	80	79	10	50	17	3/8“	188
	40								
80	40	25	92	94	10	60	20	1/2“	218
	50								
100	50	25	115	114	12	82	20	1/2“	245
	60								

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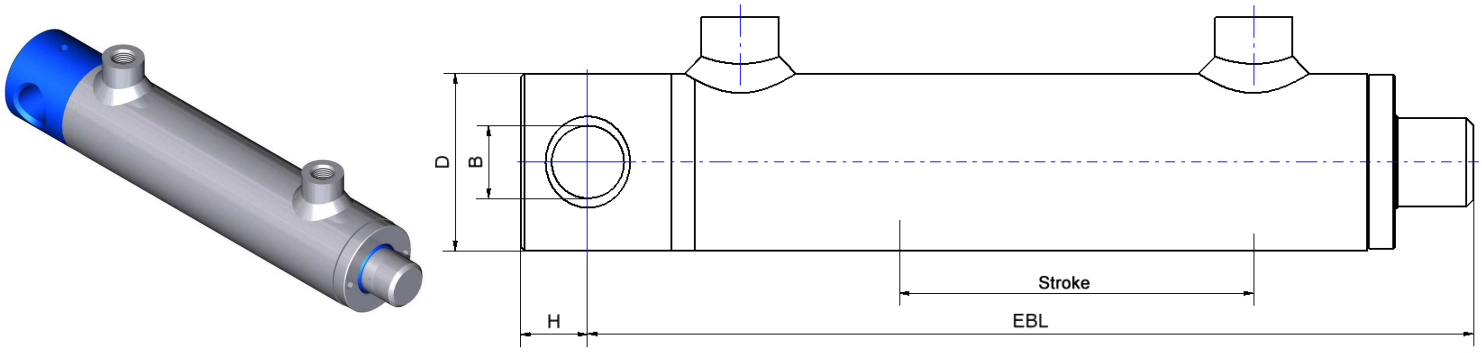
Cylinder mounting part – cross hole

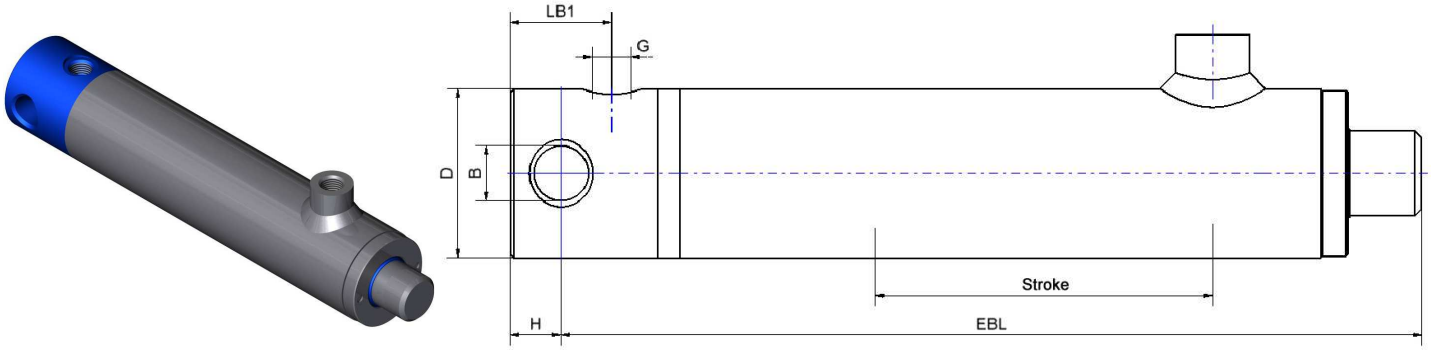
NB



Piston-Ø	S Ø	D Ø	B Ø	H	EBL +Stroke
25	16	35	12,1	12	96
32	20	40	16,0	17	120
40	20/ 25	50	20,5	19	150
50	25/ 30	60	25,5	25	175
60	30/35/40	70	25,5	25	175
70	35/ 40	80	30,5	25	185
80	40/ 50	90	30,5	25	205
100	50/ 60	115	30,5	34	231

Cylinder mounting part – cross hole with inlet port

BA



Piston-Ø	S Ø	D Ø	B Ø	H	LB1	G	EBL +Stroke
40	20/ 25	50	16,2	15	30	1/4“	155
50	25/ 30	60	20,25	20	38	3/8“	170
60	30/35/40	70	25,25	23	38	3/8“	185
70	35/ 40	80	25,25	23	38	3/8“	185
80	40/ 50	95	30,25	25	47	1/2“	218
100	50/ 60	115	35,25	30	47	1/2“	240

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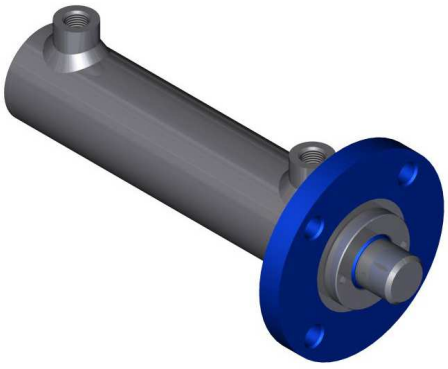
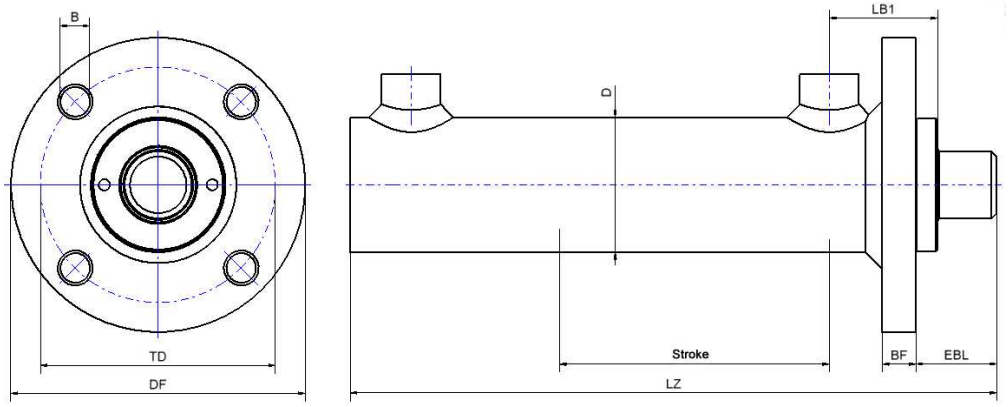
Cylinder mounting part – flange on head end

FK

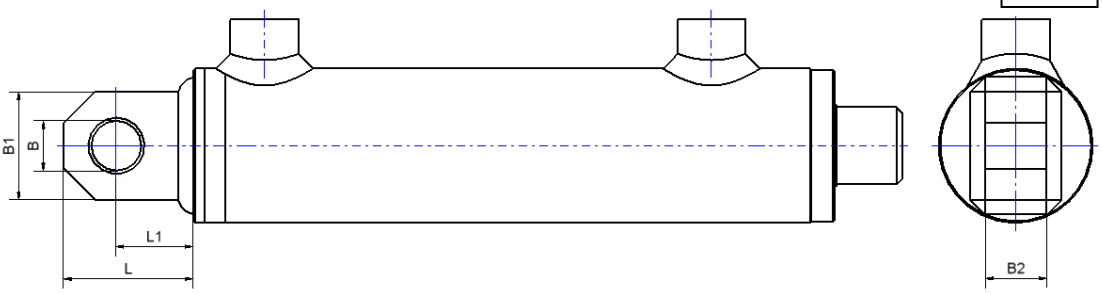




Piston- Ø	S Ø	D Ø	DF Ø	TD Ø	B Ø	BF	LB1	EBL	LZ +Stroke
40	20/ 25	50	109	87	4 x 11	12,5	40	30	130
50	25/ 30	60	128	105	4 x 13	14,5	43	30	140
60	30/35/40	70	142	117	4 x 13	16,5	50	33	160
70	35/ 40	80	162	127	4 x 15	16,5	50	33	160
80	40/ 50	95	181	149	6 x 17	18,5	60	35	180
100	50/ 60	115	194	162	6 x 17	24,5	82	37	210

Cylinder mounting part – strap

NL



Piston Ø	B Ø
25	16,20/ 20,25
32	16,20/ 20,25/ 25,25
40	16,20/ 20,25/ 25,25/ 30,25
50	20,25/ 25,25/ 30,25/ 35,25
60	25,25/ 30,25/ 35,25
63	25,25/ 30,25/ 35,25
70	25,25/ 30,25/ 35,25
80	25,25/ 30,25/ 35,25
100	30,25/ 35,25

B Ø	B1	B2	L	L1	Art.-Code
16,20	35	20	42	25	16
20,25	45	25	50	30	20
25,25	50	30	60	35	25
30,25	60	35	75	45	30
35,25	70	40	90	55	35

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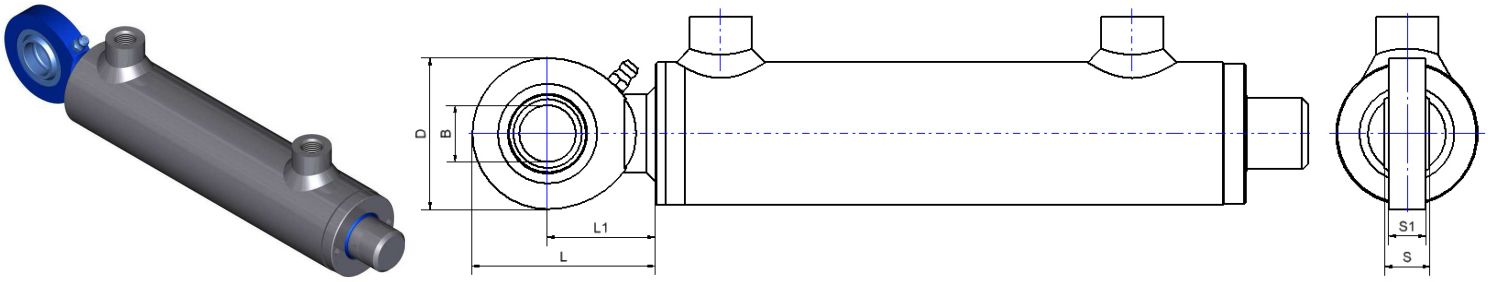
Cylinder mounting part – ball-joint end GK

GK

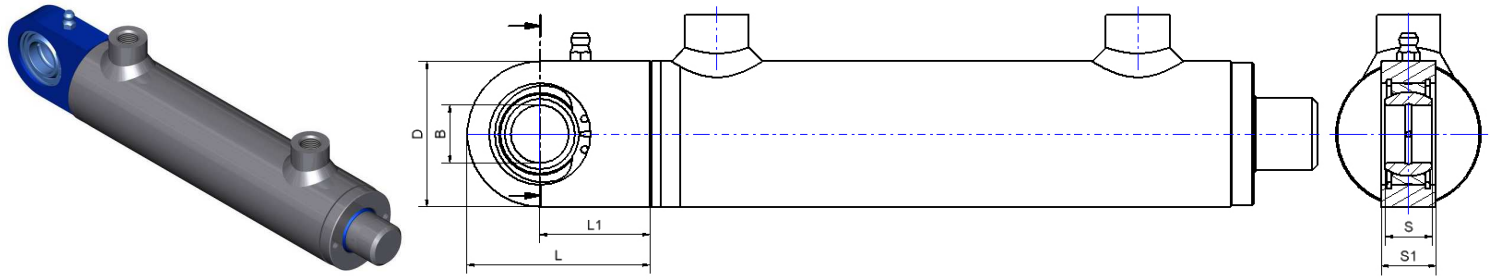


Piston Ø	B Ø
25	10/ 12
32	12/ 15/ 17/ 20
40	12/ 15/ 17/ 20/ 25
50	17/ 20/ 25/ 30
60	25/ 30/ 35/ 40
63	30/ 35/ 40
70	30/ 35/ 40
80	30/ 35/ 40/ 50
100	40/ 50/ 60

B Ø	D	S	S1	L	L1	Art.-Code
10	29	9	6,5	38,5	24	10
12	36	10	8	44	27	12
15	40	12	10	51	31	15
17	47	14	11	58	35	17
20	53	16	13	64,5	38	20
25	64	20	17	77	45	25
30	73	22	19	87,5	51	30
35	82	25	21	102	61	35
40	92	28	23	115	69	40
50	112	35	30	144	88	50
60	137	44	38	167,5	100	60

Cylinder mounting part – ball-joint end GF

GF



Piston Ø	B Ø
32	20
40	20/ 25
50	20/ 25/ 30
60	25/ 30/ 35/ 40
63	30/ 35/ 40
70	30/ 35/ 40
80	30/ 35/ 40/ 50
100	40/ 50/ 60

B Ø	D	S	S1	L	L1	Art.-Code
20	50	16	19	63	38	20
25	55	20	23	72,5	45	25
30	65	22	28	83,5	51	30
35	83	25	30	102,5	61	35
40	101	28	35	119	69	40
50	123	35	40	149,5	88	50
60	140	44	50	170	100	60

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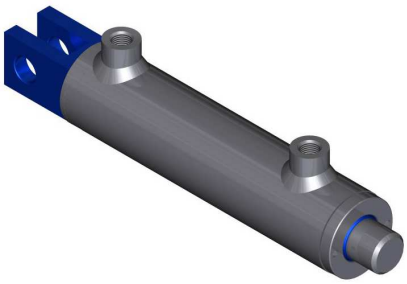
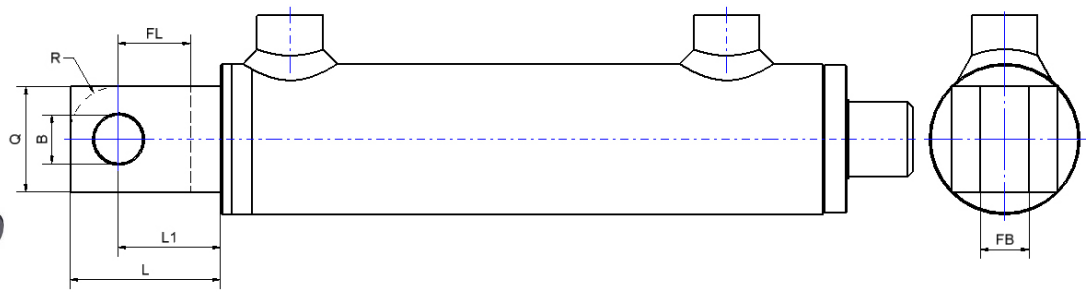
Cylinder mounting part – fork

NG



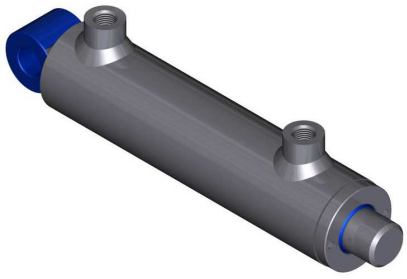


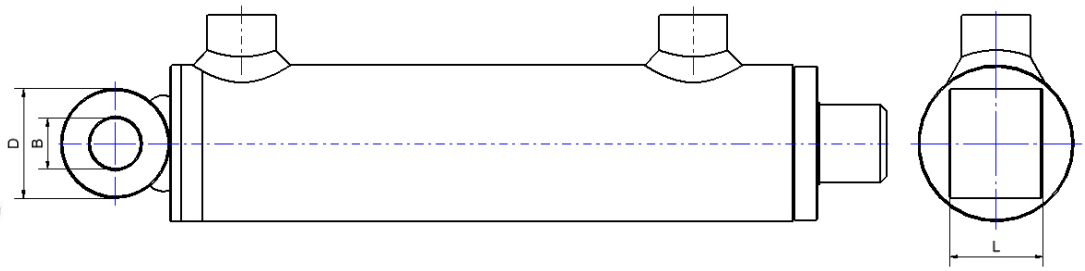
Piston Ø	B Ø
25	16,20
32	16,20
40	16,20/ 20,25
50	20,25/ 25,25/ 30,25
60	25,25/ 30,25/ 35,25
63	25,25/ 30,25/ 35,25
70	25,25/ 30,25/ 35,25
80	25,25/ 30,25/ 35,25
100	30,25/ 35,25

B Ø	Q □	FB	FL	L	L1	R	Art.-Code
16,20	35	16	24	50	34	-	16
20,25	40	20	30	60	40	-	20
25,25	50	25	30	70	45	-	25
30,25	60	30	35	80	50	30	30
35,25	70	35	40	90	55	35	35

Cylinder mounting part – cross tube

NQ





Piston Ø	B Ø
25	12,1
32	16,25/ 20,25
40	16,25/ 20,25/ 25,25
50	20,25/ 25,25/ 30,25
60	25,25/ 30,25/ 40,25
63	25,25/ 30,25/ 40,25
70	25,25/ 30,25/ 40,25
80	30,25/ 40,25
100	40,25

B Ø	D Ø	L	Art.-Code
12,1	25	25	12
16,25	35	30	13
		60	16
20,25	40	40	24
		70	27
25,25	50	50	25
		80	28
		90	29
30,25	60	60	36
		110	31
40,25	70	70	47
		130	41

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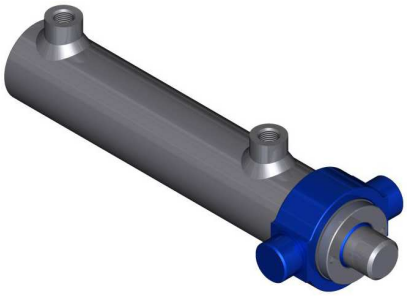
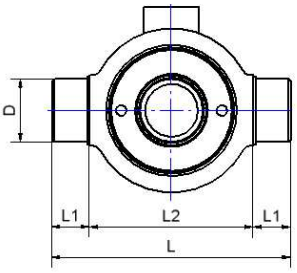
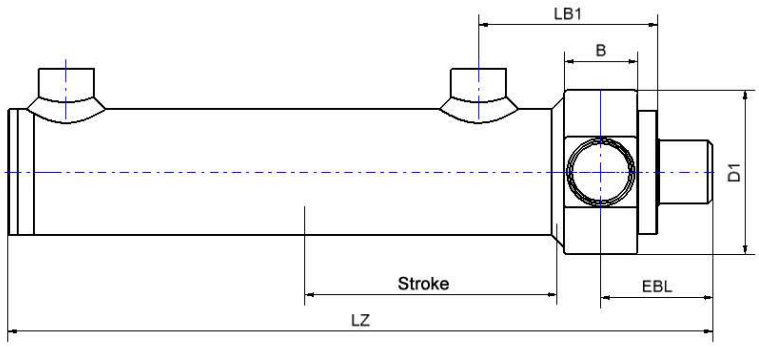
Cylinder mounting part – trunnion

NS







Piston- Ø	S Ø	L	L1	L2	D Ø	D1 Ø	B	LB1	EBL	LZ +Stroke
40	20/ 25	95	15	65	25	65	29	73	44,5	180
50	25/ 30	115	20	75	30	75	34	85	47	205
60	30/35/40	130	20	90	30	90	34	93	50	225
63	40	145	25	95	35	95	44	97	55	230
70	35/ 40	150	25	100	35	100	44	97	55	230
80	40/ 50	195	40	115	40	115	55	110	62,5	255
100	50/ 60	225	40	145	50	145	68	125	71	295

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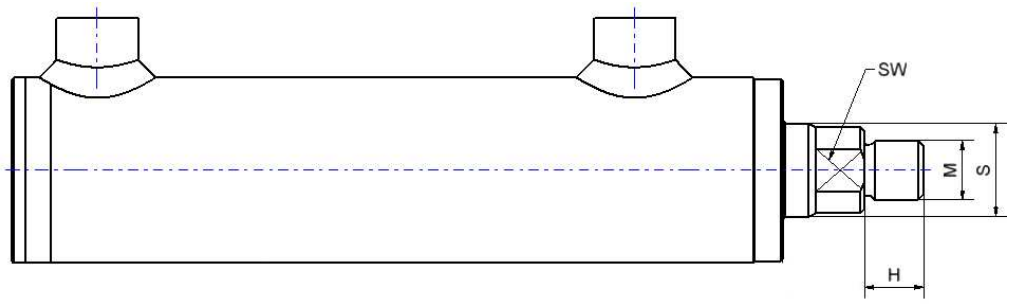
Rod mounting part – outside thread

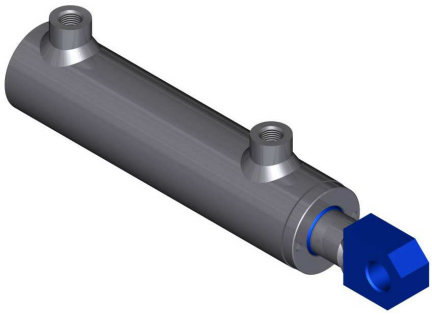
am

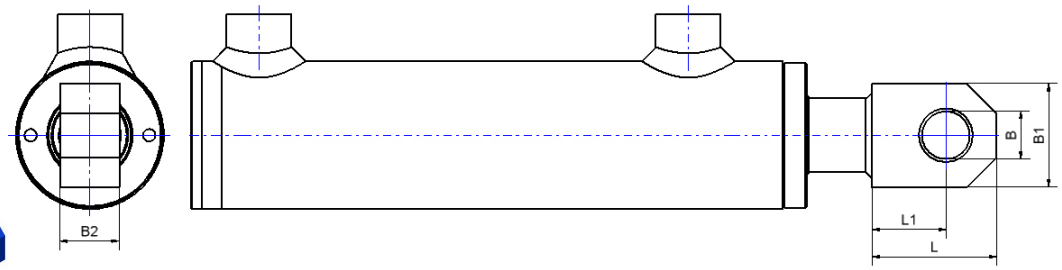


S Ø	SW	M	H	Art.-Code
16	14	M12x1,5	12	12
20	17	M16x1,5	16	16
25	22	M16x1,5	16	16
		M22x1,5	22	22
30	25	M22x1,5	22	22
35	30	M28x1,5	28	28
40	34	M28x1,5	28	28
		M35x1,5	35	35
50	41	M35x1,5	35	35
		M45x1,5	45	45
60	50	M45x1,5	45	45

Rod mounting part – strap

n l





Rod Ø	B Ø
16	16,20/ 20,25
20	16,20/ 20,25/ 25,25
25	20,25/ 25,25/ 30,25
30	25,25/ 30,25/ 35,25
35	30,25/ 35,25
40	35,25

B Ø	B1	B2	L	L1	Art.-Code
16,20	35	20	42	25	16
20,25	45	25	50	30	20
25,25	50	30	60	35	25
30,25	60	35	75	45	30
35,25	70	40	90	55	35

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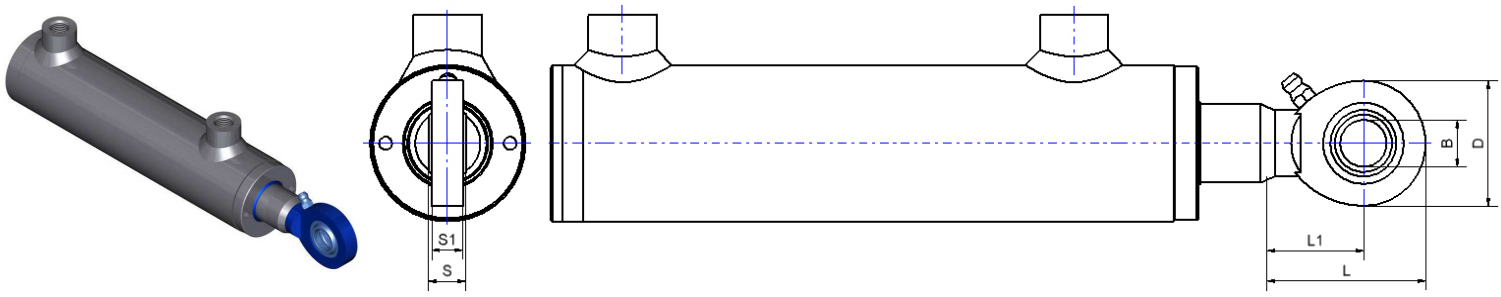
Rod mounting part – weldable ball-joint end

gk

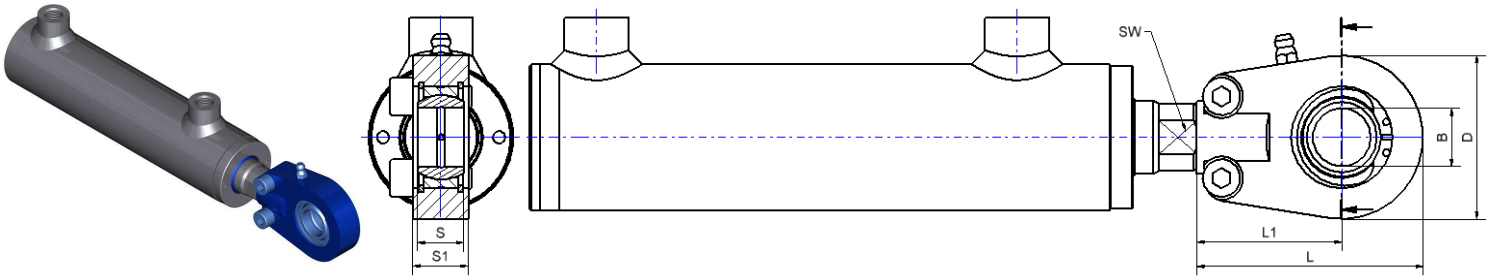


Rod Ø	B Ø
16	10/ 12
20	12/ 15/ 17/ 20
25	17/ 20/ 25
30	25
35	30
40	30/ 35/ 40
50	40
60	50/ 60

B Ø	D	S	S1	L	L1	Art.-Code
10	29	9	6,5	38,5	24	10
12	36	10	8	44	27	12
15	40	12	10	51	31	15
17	47	14	11	58	35	17
20	53	16	13	64,5	38	20
25	64	20	17	77	45	25
30	73	22	19	87,5	51	30
35	82	25	21	102	61	35
40	92	28	23	115	69	40
50	112	35	30	144	88	50
60	137	44	38	167,5	100	60

Rod mounting part – threaded ball-joint end

gg



Rod Ø	SW	B Ø
20	17	20/ 25
25	22	20/ 25/ 30
30	25	25/ 30
35	30	35
40	34	35/ 40
50	41	40/ 50
60	50	50

B Ø	D	S	S1	L	L1	Art.-Code
20	56	16	19	80	50	20
25	56	20	23	80	50	25
30	64	22	28	94	60	30
35	78	25	30	112	70	35
40	94	28	35	135	85	40
50	116	35	40	168	105	50

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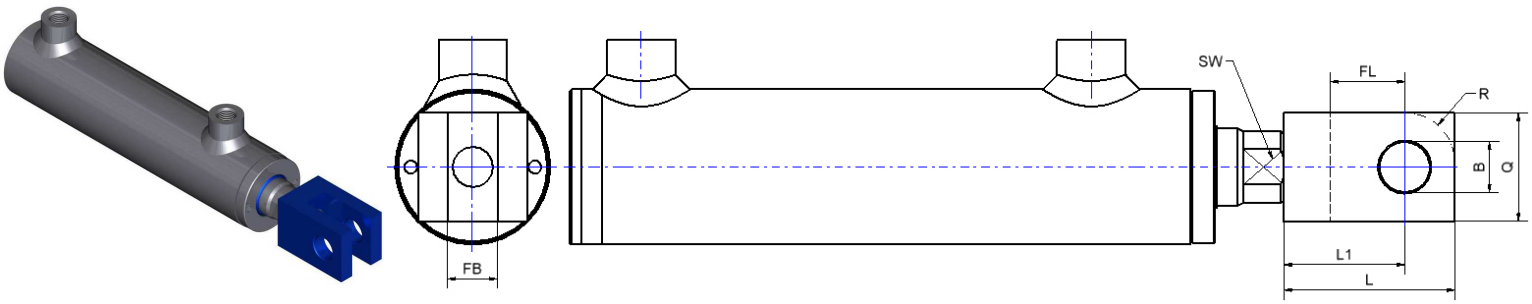
Rod mounting part – threaded fork

ng

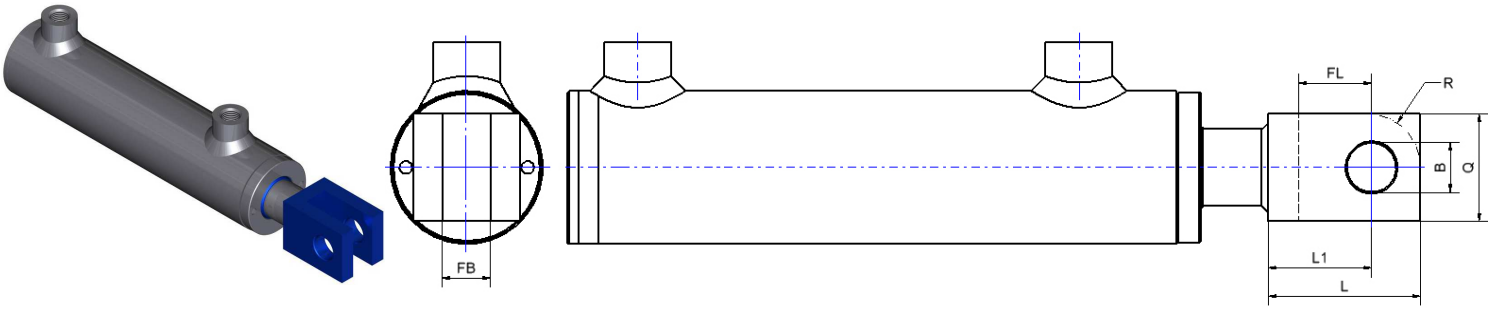


Rod Ø	SW	B Ø
20	17	16,20
25	22	20,25
30	25	20,25/ 25,25
35	30	25,25
40	34	25,25/ 30,25
50	41	30,25/ 35,25
60	50	35,25

B Ø	Q □	L	L1	FL	FB	R	Art.- Code
16,20	35	55	39	24	16	-	16
20,25	40	65	45	30	20	-	20
25,25	50	75	50	30	25	-	25
30,25	60	95	65	35	30	30	30
35,25	70	110	75	40	35	35	35

Rod mounting part – welded fork

gs



Rod Ø	B Ø
16	16,20
20	16,20
25	20,25
30	20,25/ 25,25
35	25,25
40	25,25/ 30,25
50	30,25/ 35,25
60	35,25

B Ø	Q □	L	L1	FL	FB	R	Art.- Code
16,20	35	50	34	24	16	-	16
20,25	40	60	40	30	20	-	20
25,25	50	70	45	30	25	-	25
30,25	60	80	50	35	30	30	30
35,25	70	90	55	40	35	35	35

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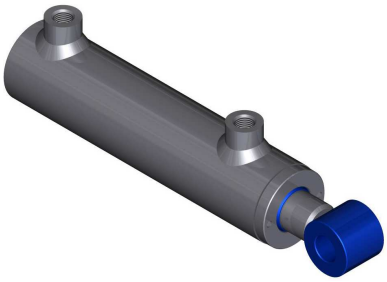
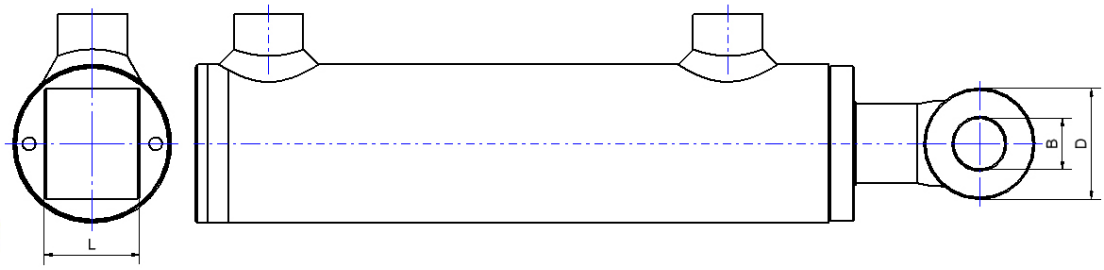
Rod mounting part – cross tube

nq





Rod Ø	B Ø	B Ø	D Ø	L	Art.-Code
16	12,1	12,1	25	25	12
20	16,25/ 20,25	16,25	35	30	13
				60	16
25	20,25/ 25,25	20,25	40	40	24
				70	27
30	25,25/ 30,25	25,25	50	50	25
				80	28
				90	29
35	25,25/ 30,25	30,25	60	60	36
				110	31
40	30,25/ 40,25	40,25	70	70	47
				130	41
50	40,25				

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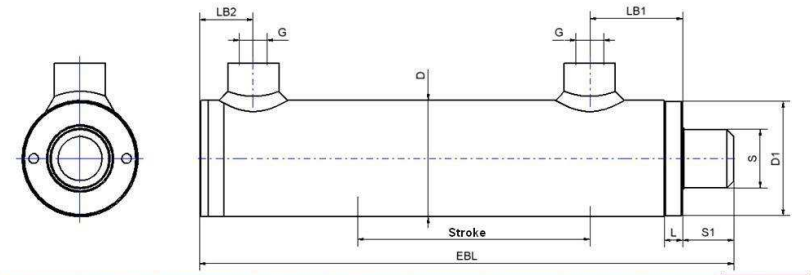
Installation length EBL calculation

Order example: DWL-040/20-0150-BS-GF/20-gk/20-1-1-CH-1

1. Take the EBL dimension from the chart with the standard dimensions. Which chart to use – BS, BV or BA – depends on which piston diameter and which end plug were chosen.

   In our example we have a standard end plug BS. The installation length for a cylinder without mounting parts is 130 mm.

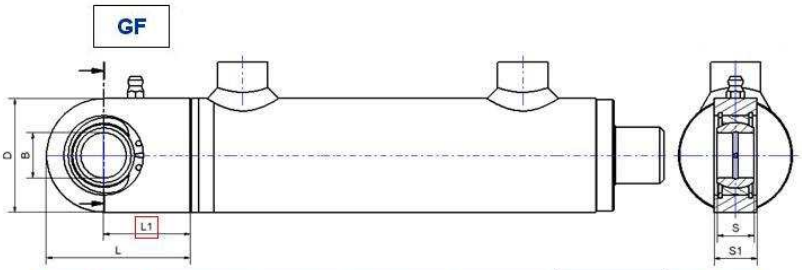


Piston-Ø	S Ø	S1	D Ø	D1 Ø	L	LB1	LB2	G	EBL +Stroke
40	20 25	22	50	49	8	40	23	1/4"	130

Attention!!! EBL dimensions for the mounting parts trunnion NS, flange FK, cross hole NB and cross hole with inlet port BA differ from the standard dimensions, but are declared in the chart of the particular mounting part and must be taken from there.

2. If the installation length EBL is not given for the **cylinder mounting part**, then take the length from end plug to the middle of the bore of the mounting.

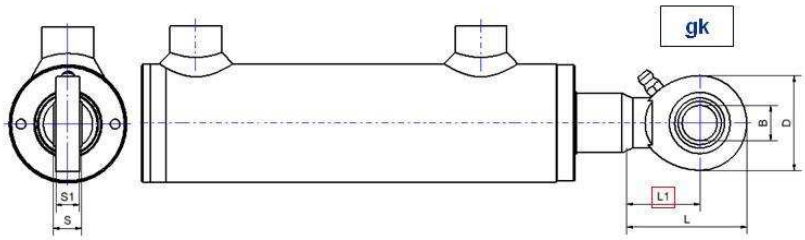
   We have no EBL for the mounting GF, so we have to take the dimension L1. For a bore with a diameter of 20 is L1 38 mm.



B Ø	D	S	S1	L	L1	Art.-Code
20	50	16	19	63	38	20

3. Take the dimension to the middle of the bore for **rod mounting parts** too.
   If the mounting is an outside thread (am) then leave this step out and use only step 1 and step 2 for the calculation.

   For the mounting GK and a bore diameter of 20 is L1 38 mm.



B Ø	D	S	S1	L	L1	Art.-Code
20	53	16	13	64,5	38	20

4. Add all selected dimensions for the installation length.

   For our example cylinder we get an installation length of EBL 206 (130+38+38) mm + stroke 150 mm = 356 mm.

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General operating- and maintenance instruction

I. GENERAL

The following instructions and supporting hints should be strictly adhered to for catalogue products as well as for special cylinders (if present). This applies also for system-/ and telescope-cylinders.

II. Safety instruction

A hydraulic cylinder has two properties – it either serves as a pressure tank during operation or in its main function serves as a motional device. Therefore the following instructions must be STRICTLY followed:

- the installation may only be conducted by a hydraulic expert.
- the operating pressure must be secured by a Relief-Valve.
- security norm EN 982 for hydraulic must be observed.

III. Installation and assembling

Assembling: When assembling hydraulic cylinders the following instructions apply:

- All screws and connecting elements for securing the cylinder (including its attachments) should comply with stability class 8.8 (recommended 10.9) in accordance with DIN / ISO 898 T1.
- Pay attention to a clean surrounding as well as to all parts to be assembled.
- The hydraulic cylinder must be deaerated before starting operation.
- The sealing material must be compatible with the used hydraulic media. Sealing materials such as hemp, cementing composition or plastic sealing tape may not be used.
- All pipes and containers must be thoroughly cleaned of dirt, dust, sand, spunk, cuttings and shreds etc..
- All pipes that are either welted or have been warm bended must be pickled, rinsed and oiled afterwards.
- All cleaning must be performed with fibreless rugs or with special paper.

Installation: When selecting or installing a hydraulic cylinder the following instructions must be obeyed:

- The pressure within the hydraulic cylinder may never exceed the maximum pressure recommended.
- When selecting a hydraulic cylinder the maximum operating length recommended must be taken into account and strictly adhered to. The same applies to the recommended place of the installation, the recommended way of operation (vertical or horizontal), and the maximum operating pressure.
- The hydraulic cylinder must be installed tensionless. Neither a diagonal nor transverse force may occur or apply to the hydraulic cylinders base or to its moving parts.

We strictly advise against using the product in any other way then recommended.
In case of uncertainty please call our technical office. For further inquiries we are glad to be of assistance.

IV. INITIAL STARTING INSTRUCTION

Deaering: Before the hydraulic cylinder is taken into operation for the first time, it must be deaerated. During idle operating pressure the special deaerating valve must be opened. This valve may only be closed after the upcoming oil contains no air bubbles any more. The valve must then be tightened again.

Pressure Media:

- All Agirossi-Cylinders are build to be used with HLP Mineral Oil iaw DIN 51524 as well as with Bio-Oil (such as Panolin).
- Please check whether the pressure media of the machine is compatible with the recommended pressure media of the hydraulic cylinder.
- Before use of other pressure media please consult our technical office!
- The recommended maximum operating temperature of the pressure media may not be exceeded. To ascertain a continuos and dependable performance, we recommend to keep the pressure media constant (+/-5° C.

Filter: The live expectancy of the hydraulic cylinder may be increased by the use of reliable filtering. Please take notice of the recommendations of the maximum rate of contamination of the pressure media in accordance with NAS 1638. We advocate to use hydraulic filtering with electrical contamination meter.

V. ELECTRICAL INSTALLATION

The installation of the electricity supply should be taken from the respective catalogue.

VI. MAINTENANCE

- Generally regular maintenance of hydraulic cylinders is not necessary. However joints and ball-bearings should be greased in regular intervals.
- The tightness of the hydraulic cylinder should be checked in short intervals.

Change of seals: Seals are inclined to wear out after a certain period of time. In case of obvious leakage we recommend to replace the complete set of seals or to send the hydraulic cylinder to our maintenance plant. When replacing the seals we also check all parts of the hydraulic cylinder.

VII. REQUIREMENTS OF THE STORAGE MEDIA

- Hydraulic cylinders should be stored in locations that are dry, free of dust, free of acids or other corrosive liquids or gas.
- In case of storage of longer than six months the hydraulic cylinder must be filled with conservation oil or must already be ordered for longer storage periods.
- In case of longer periods of storage the hydraulic cylinder must be stored whenever possible vertically.

IX. SPARE PARTS

Complete sets of seals can be ordered by using the number of the hydraulic cylinder with the attachment of "**S**" (for example Art #: "6909201" for the hydraulic cylinder, "6909201S" for the complete set of seals).

Please order other spare parts by using the number of the requested item – or the serial number.

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