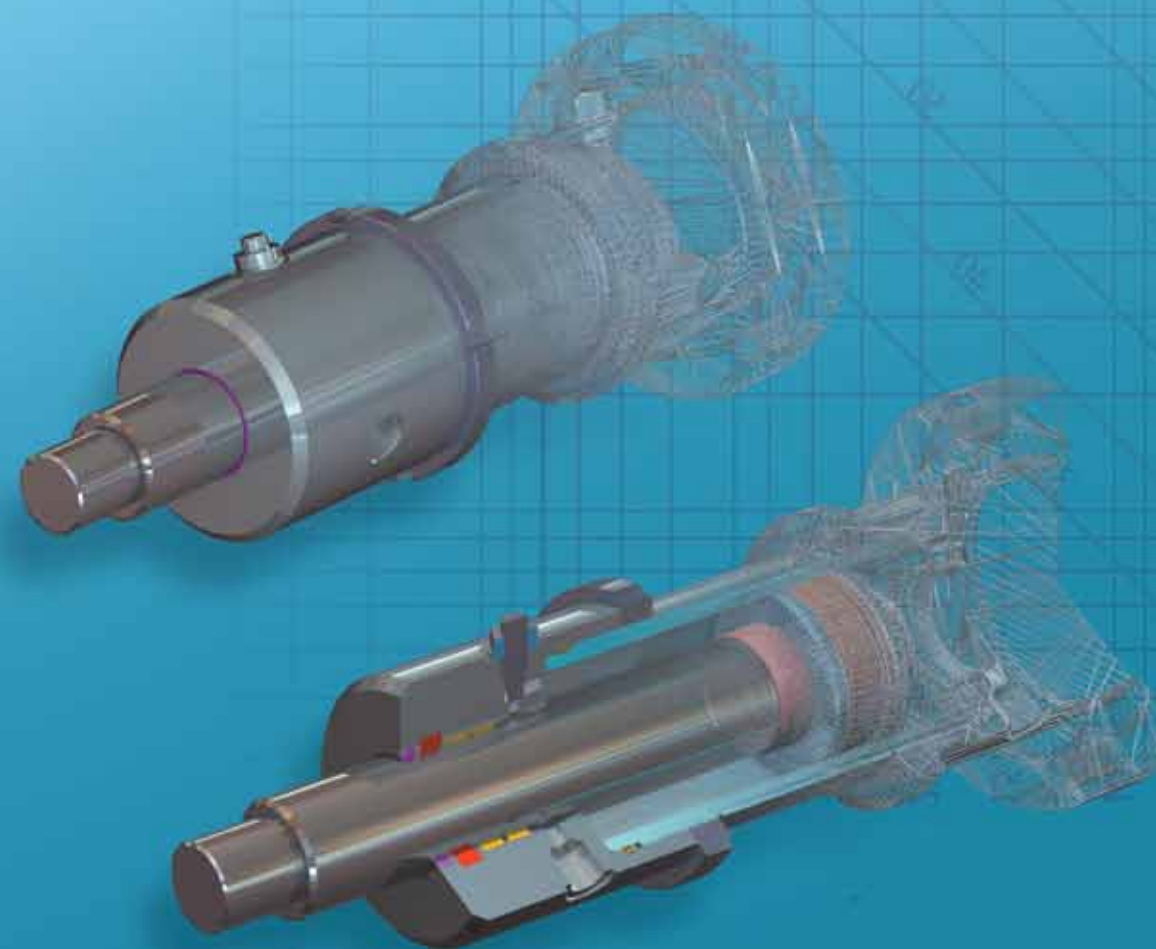




S.G Hydraulics Ltd.

Cylinder Catalog



S.G Hydraulics Ltd.



S.G Hydraulics was established in 1992 and has more than 35 years of experience in the fields of hydraulics, pneumatics and control technology.

The company specializes in planning and manufacturing customized hydraulic systems, thus supplying original solutions for many applications of the industry which revolves around mechanics, from transportation throughout agriculture to special purpose machinery.

The company is ISO 9001-2000 certified, and employs 15 employees.

As a part of the customized service, the company plans and manufactures pistons and hydraulic equipment according to the customer's specific requirements, whether if a serial or an individual production is needed.

Piston repairing services are also available for all piston types.



Our product line features:

- Single and double act pistons.
- Telescopic pistons.
- High pressure (performance) pistons.
- Power units.
- Lifting equipment.
- Hydraulics presses.

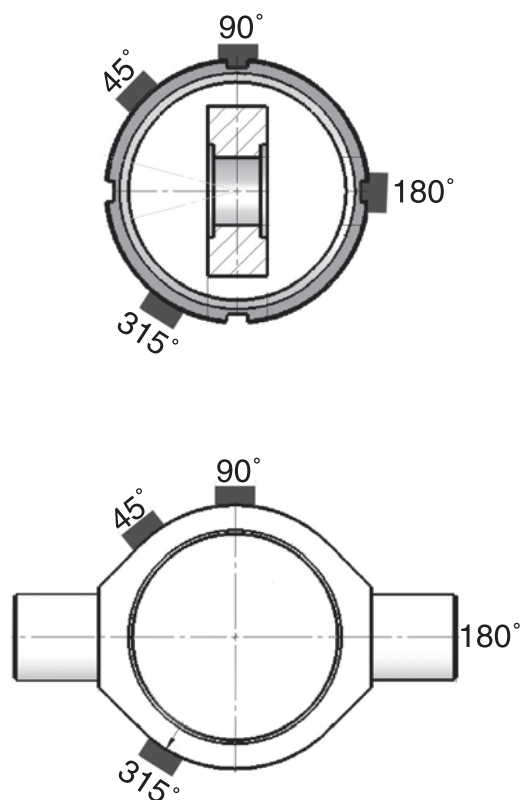
The entire manufacturing process is fully computerized from start to finish, from the stage of design and planning to the production itself by CNC machinery. This process guarantees an efficient production of a top quality reliable product.



How to choose a piston?

	Model	Mounting	Cylinder	Rod diameter	Stroke (mm)	Oil intake location
	MD	C	80	50	120	90°
LS						
LD						
MD						
MS						
			40	25		45°
			50	30		90°
			63	40		180°
			80	50		315°
			100	60		
			120	70		
			140	90		
			160	100		
			180	110		
			200	125		
			220	150		

C	Rear Bearing
P	Front Flange
F	Rear Flange
T	Trunnion



LS Model

- A single action piston, designed to operate on a medium load.
- Working pressure of up to 250 BAR.
- This model is manufactured in 4 default mounting forms.
- Other mounting forms are available by requirement.

LD Model

- A double action piston, designed to operate on a medium load.
- Working pressure of up to 250 BAR.
- This model is manufactured in 4 default mounting forms.
- Other mounting forms are available by requirement.

MD Model

- A double action piston, designed to operate on a heavy load.
- Working pressure of up to 350 BAR.
- This model is manufactured in 4 default mounting forms.
- Other mounting forms are available by requirement.

MS Model

- A double action piston, which includes a braking mechanism on both sides.
- Designed to operate in strenuous conditions.
- Working pressure of up to 350 BAR.
- This model is manufactured in 4 default mounting forms.
- Other mounting forms are available by requirement.



S.G Hydraulics Ltd.

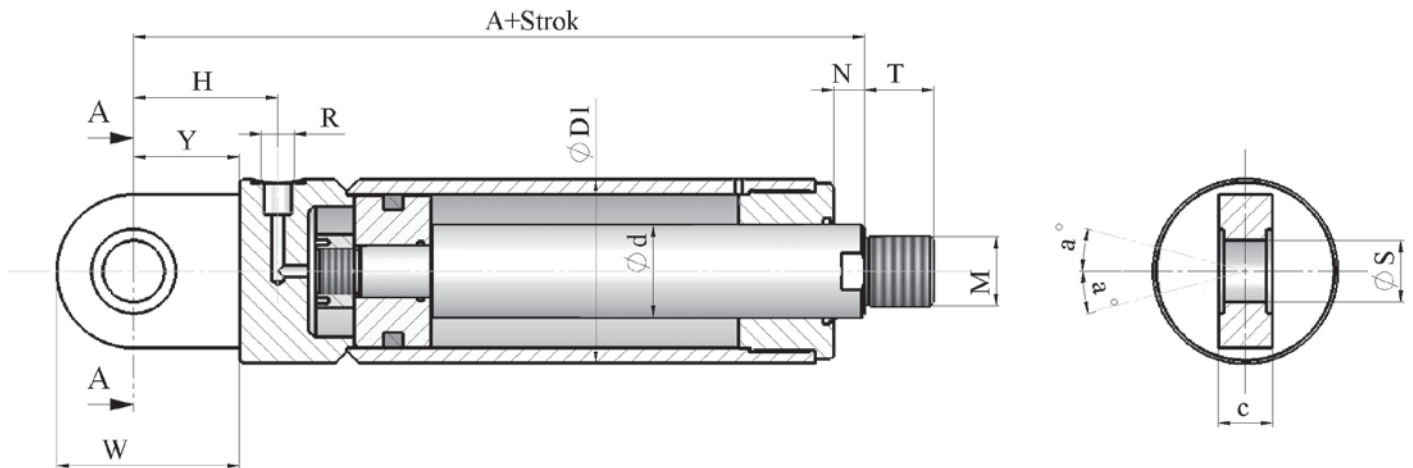
3

LSC



Max. Working pressure: 250 BAR
 Testing pressure: 375 BAR
 Temperature: (-40) – (130) C°
 Max. Speed: 0.5 M/Sec
 Cylinder: TOL – H – DIN 2391 – ST52
 Hard chrome coated rod: TOL – F7 – CK45
 Seals: NBR / Polyester / POM

LSC A single action piston with a rear bearing mounting



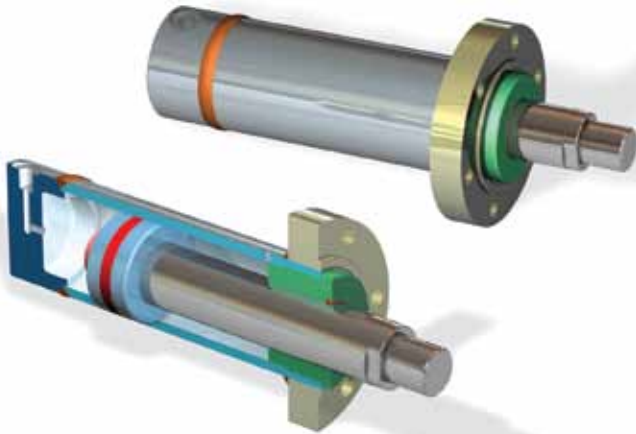
CYLINDER ø	32	40	50	63	80	100	120	140
ROD ø	20	25	30	40	50	60	70	90
cm ² PUSH	8	12.6	19.6	31.2	50.2	78.5	113	154
A+Strok	150	163	183	208	237	284	320	350
S ø	15	20	25	30	35	45	60	70
C	12	19	23	28	30	40	50	55
D1 ø	42	50	62	75	95	120	145	165
H	49	56	63	69	81	102	128	145
M	M16X1.5	M16X1.5	M22X1.5	M28X1.5	M35X1.5	M45X1.5	M58X1.5	M65X1.5
N	10	10	12	12	15	20	20	25
R	1/4BSP	1/4BSP	3/8BSP	1/2BSP	1/2BSP	1/2BSP	3/4BSP	3/4BSP
T	16	16	22	28	35	45	58	65
W	51	63	72	83	102	132	170	197
Y	31	38	45	51	61	77	100	115



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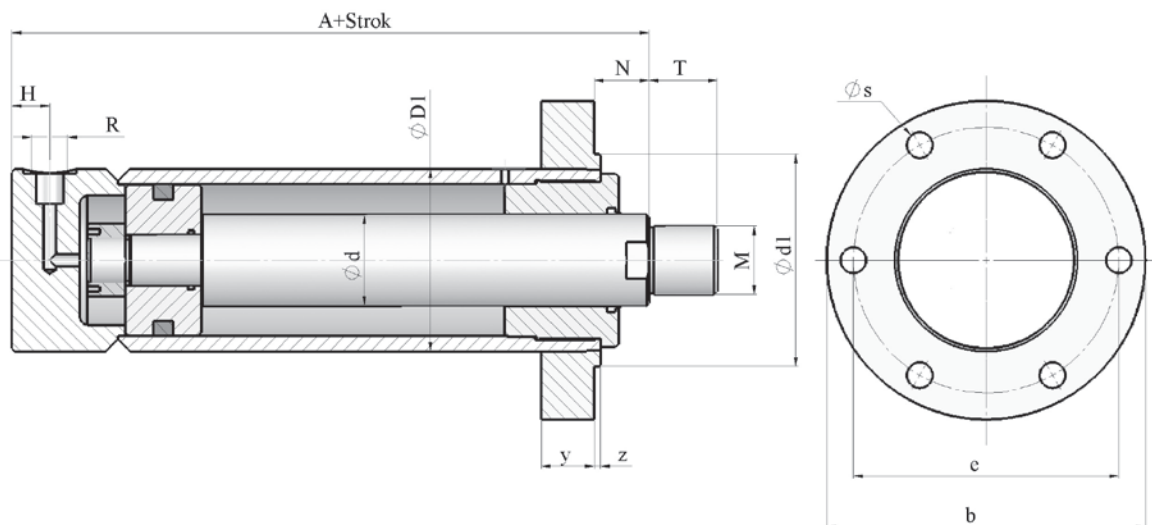
4

LSP



Max. Working pressure: 250 BAR
 Testing pressure: 375 BAR
 Temperature: (-40) – (130) C°
 Max. Speed: 0.5 M/Sec
 Cylinder: TOL – H – DIN 2391 – ST52
 Hard chrome coated rod: TOL – F7 – CK45
 Seals: NBR / Polyester / POM

LSP A single action piston with a front flange mounting

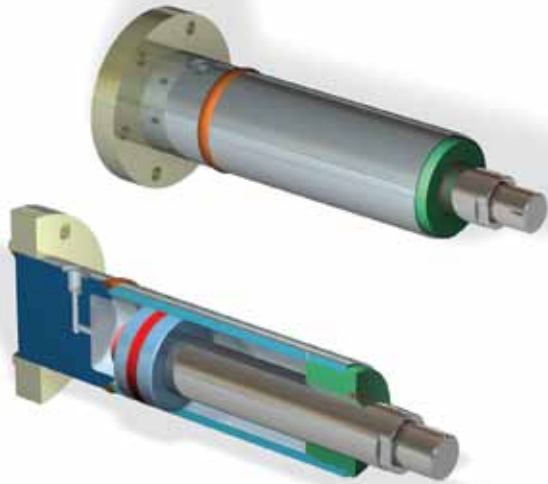


CYLINDER ø	32	40	50	63	80	100	120	140
ROD ø	20	25	30	40	50	60	70	90
cm ² PUSH	8	12.6	19.6	31.2	50.2	78.5	113	154
A +Strok	129	135	147	167	190	220	235	235
b ø	98	110	125	140	180	210	250	280
d1ø	56	65	75	90	115	140	170	190
D1ø	42	50	62	75	95	120	145	165
e ø	78	90	100	115	150	175	210	235
H	18	18	18	18	20	25	28	30
M	M16X1.5	M16X1.5	M22X1.5	M28X1.5	M35X1.5	M45X1.5	M58X1.5	M65X1.5
N	19	21.5	22.5	25.5	29	36	41.5	25
R	1/4BSP	1/4BSP	3/8BSP	1/2BSP	1/2BSP	1/2BSP	3/4BSP	3/4BSP
S ø	8.4	8.4	10.5	13	13	17	22	22
T	16	16	22	28	35	45	58	65
Y	12	15	18	22	25	35	40	65
Z	3	3.5	3.5	3.5	4	4	5	5



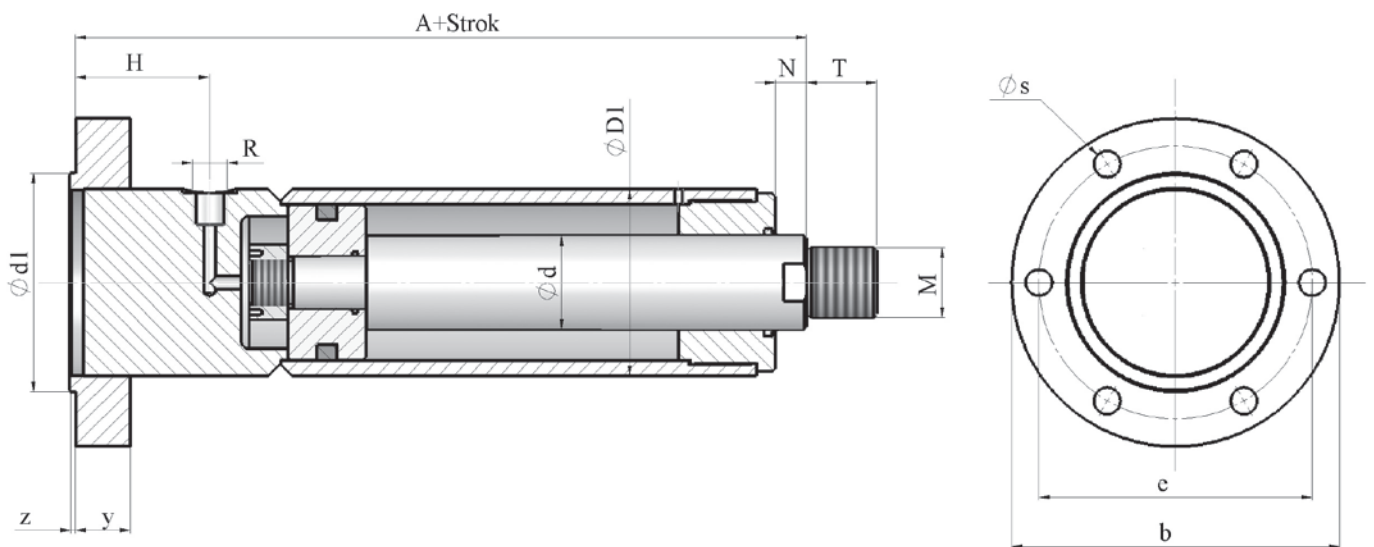
S.G. Hydraulics Ltd.

LSF



Max. Working pressure: 250 BAR
 Testing pressure: 375 BAR
 Temperature: (-40) - (130) C°
 Max. Speed: 0.5 M/Sec
 Cylinder: TOL - H - DIN 2391 - ST52
 Hard chrome coated rod: TOL - F7 - CK45
 Seals: NBR / Polyester / POM

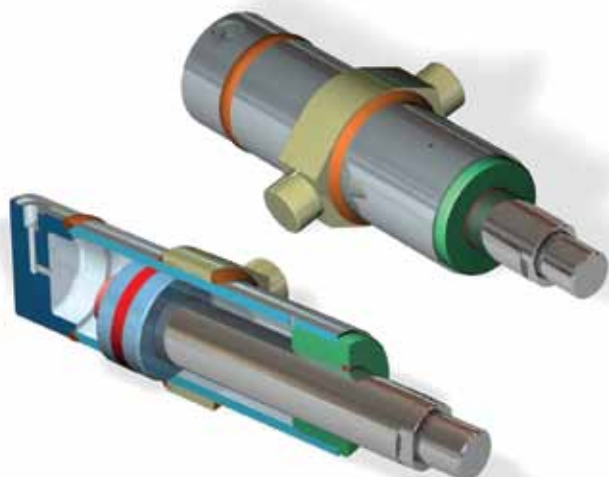
LSF A single action piston with a rear flange mounting



CYLINDER ϕ	32	40	50	63	80	100	120	140
ROD ϕ	20	25	30	40	50	60	70	90
cm ² PUSH	8	12.6	19.6	31.2	50.2	78.5	113	154
A +Strok	137	148	170	195	218	258	290	310
b ϕ	98	110	125	140	180	210	250	280
d 1	56	56	75	90	115	140	170	190
D1 ϕ	42	50	62	75	95	120	145	165
e ϕ	78	90	100	115	150	175	210	235
H	36	41	50	56	62	86	98	120
M	M16X1.5	M16X1.5	M22X1.5	M28X1.5	M35X1.5	M45X1.5	M58X1.5	M65X1.5
N	10	10	12	12	15	20	20	25
R	1/4BSP	1/4BSP	3/8BSP	1/2BSP	1/2BSP	1/2BSP	3/4BSP	3/4BSP
S ϕ	8.5	8.5	10.5	13	13	17	22	22
T	16	16	22	28	35	45	58	65
Y	12	15	18	22	25	35	40	45
Z	3	3.5	3.5	3.5	4	4	5	5

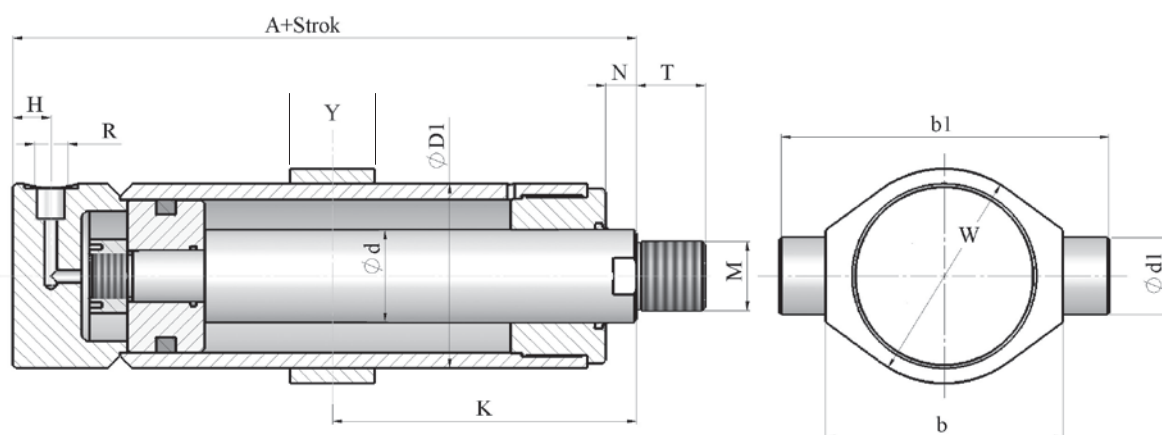

S.G Hydraulics Ltd.

LST



Max. Working pressure: 250 BAR
 Testing pressure: 375 BAR
 Temperature: (-40) – (130) C°
 Max. Speed: 0.5 M/Sec
 Cylinder: TOL – H – DIN 2391 – ST52
 Hard chrome coated rod: TOL – F7 – CK45
 Seals: NBR / Polyester / POM

LST A single action piston with a trunnion mounting.



CYLINDER ϕ	32	40	50	63	80	100	120	140
ROD ϕ	20	25	30	40	50	60	70	90
cm ² PUSH	8	12.6	19.6	31.2	50.2	78.5	113	154
A +Strok	119	125	138	157	176	207	220	235
b ϕ	60	65	85	100	120	155	185	210
b 1	90	100	125	140	170	215	225	290
D1 ϕ	42	50	62	75	95	120	145	165
d 1 ϕ	20	25	30	35	40	50	60	65
H	18	18	18	18	20	25	28	30
K min	50	65	75	85	100	115	125	145
M	M16X1.5	M16X1.5	M22X1.5	M28X1.5	M35X1.5	M45X1.5	M58X1.5	M80X2
N	10	10	12	12	15	20	20	25
R	1/4BSP	1/4BSP	3/8BSP	1/2BSP	1/2BSP	1/2BSP	3/4BSP	3/4BSP
W	55	65	80	90	110	140	165	190
T	16	16	22	28	35	45	58	65
Y	25	30	35	40	45	55	65	70



S.G. Hydraulics Ltd.

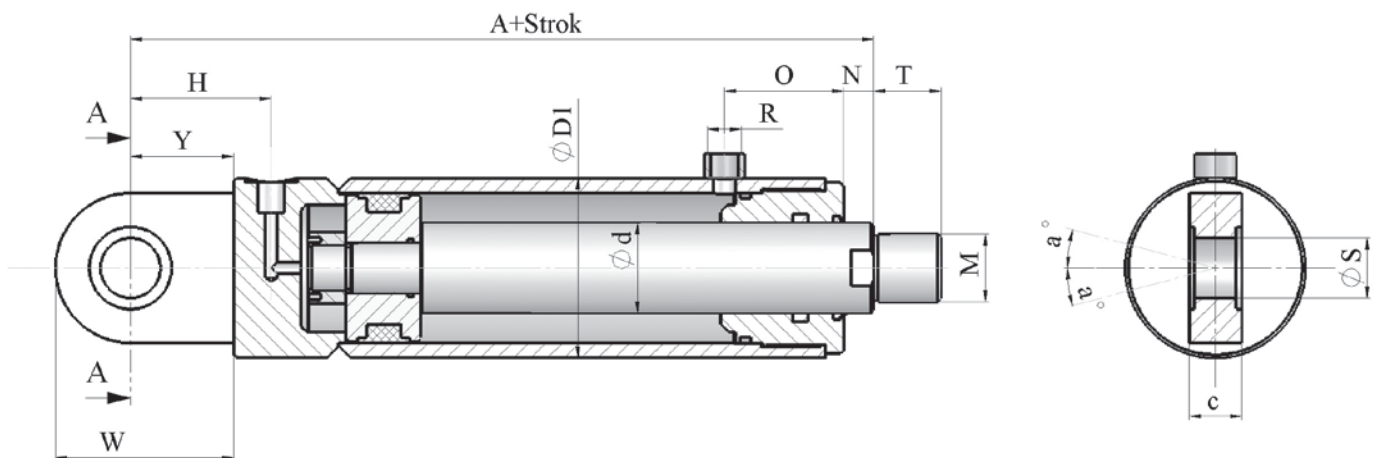
7

LDC



Max. Working pressure: 250 BAR
 Testing pressure: 375 BAR
 Temperature: (-40) – (130) C°
 Max. Speed: 0.5 M/Sec
 Cylinder: TOL – H – DIN 2391 – ST52
 Hard chrome coated rod: TOL – F7 – CK45
 Seals: NBR / Polyester / POM

LDC A double action piston with a rear bearing mounting



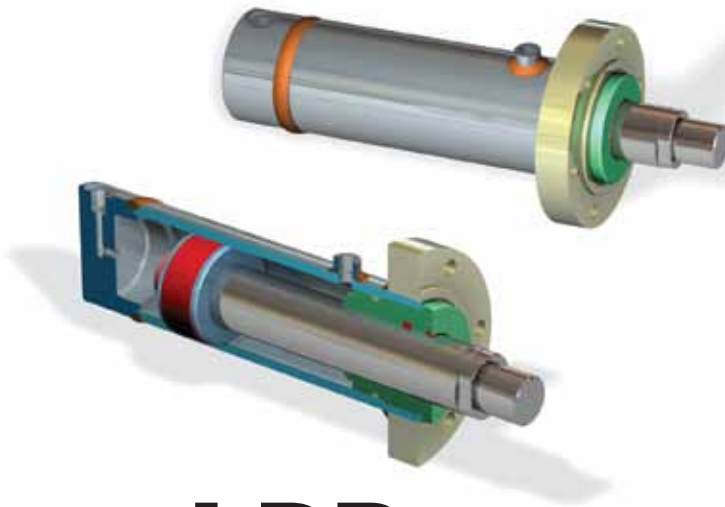
CYLINDER ø	32	40	50	63	80	100	120	140
ROD ø	20	25	30	40	50	60	70	90
cm ² PUSH	8	12.6	19.6	31.2	50.2	78.5	113	154
cm ² PULL	4.9	7.6	12.6	18.6	30.6	50.2	74.5	90.5
A +Strok	156	173	193	218	249	304	339	380
S ø	15	20	25	30	35	45	60	70
C	12	19	23	28	30	40	50	55
D1 ø	42	50	62	75	95	120	145	165
H	49	56	63	69	81	102	128	145
M	M16X1.5	M16X1.5	M22X1.5	M28X1.5	M35X1.5	M45X1.5	M58X1.5	M65X1.5
N	10	10	12	12	15	20	20	25
O	34	42	45	52	63.5	79.5	80.5	102
R	1/4BSP	1/4BSP	3/8BSP	1/2BSP	1/2BSP	1/2BSP	3/4BSP	3/4BSP
T	16	16	22	28	35	45	58	65
W	51	63	72	83	102	132	170	197
Y	31	38	45	51	61	77	100	115



S.G Hydraulics Ltd.

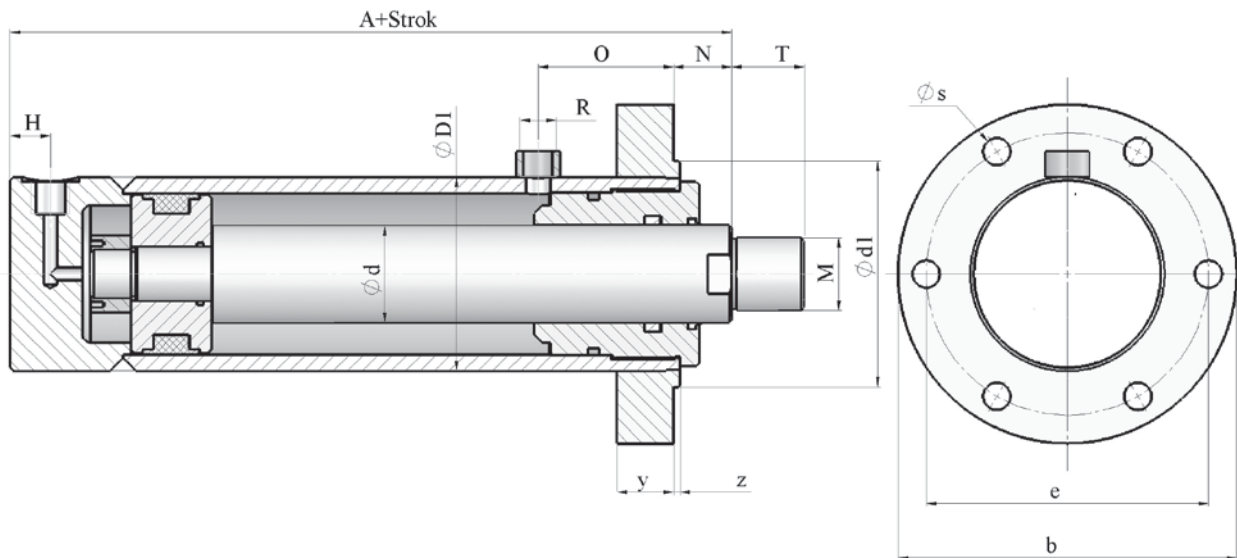
8

LDP



Max. Working pressure: 250 BAR
 Testing pressure: 375 BAR
 Temperature: (-40) – (130) C°
 Max. Speed: 0.5 M/Sec
 Cylinder: TOL – H – DIN 2391 – ST52
 Hard chrome coated rod: TOL – F7 – CK45
 Seals: NBR / Polyester / POM

LDP A double action piston with a front flange mounting



CYLINDER ø	32	40	50	63	80	100	120	140
ROD ø	20	25	30	40	50	60	70	90
cm ² PUSH	8	12.6	19.6	31.2	50.2	78.5	113	154
cm ² PULL	4.9	7.6	12.6	18.6	30.6	50.2	74.5	90.5
A +Strok	145	153	172	193	210	247	276	310
b ø	98	110	125	140	180	210	250	280
d1 ø	56	65	75	90	115	140	170	190
D1 ø	42	50	62	75	95	120	145	165
e ø	78	90	100	115	150	175	210	235
H	18	18	18	18	20	25	28	30
M	M16X1.5	M16X1.5	M22X1.5	M28X1.5	M35X1.5	M45X1.5	M58X1.5	M65X1.5
N	19	21.5	22.5	25.5	29	36	41.5	46
O	44	48.5	58.5	64.5	72	84	98	115
R	1/4BSP	1/4BSP	3/8BSP	1/2BSP	1/2BSP	1/2BSP	3/4BSP	3/4BSP
S ø	8.4	8.4	10.5	13	13	17	22	22
T	16	16	22	28	35	45	58	65
Y	12	15	18	22	25	35	40	45
Z	3	3.5	3.5	3.5	4	4	5	5

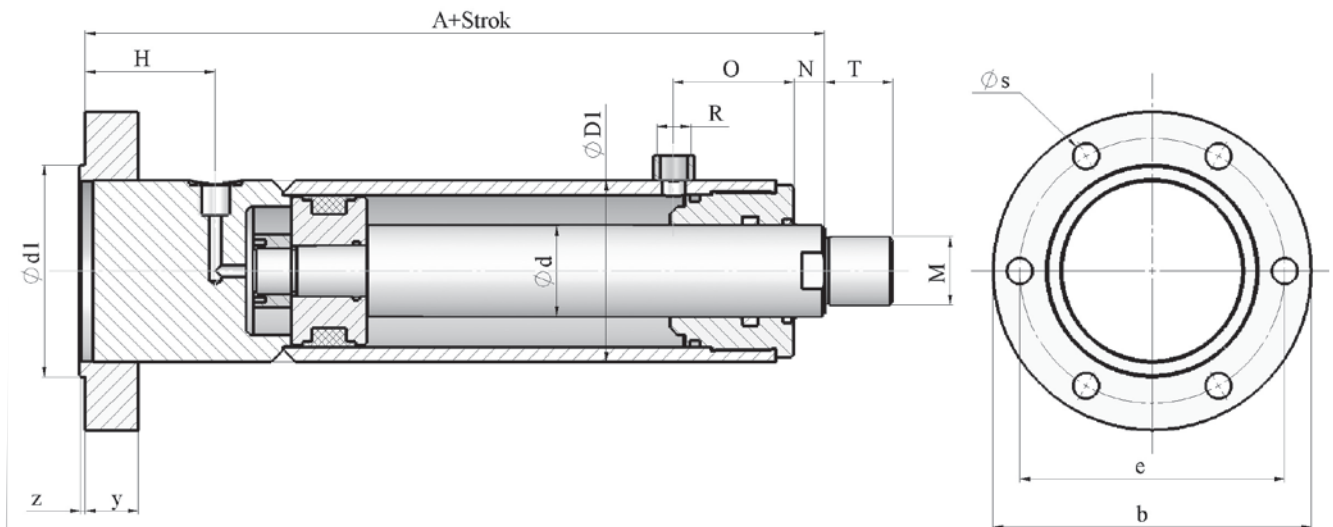

S.G Hydraulics Ltd.

LDF



Max. Working pressure: 250 BAR
 Testing pressure: 375 BAR
 Temperature: (-40) – (130) C°
 Max. Speed: 0.5 M/Sec
 Cylinder: TOL – H – DIN 2391 – ST52
 Hard chrome coated rod: TOL – F7 – CK45
 Seals: NBR / Polyester / POM

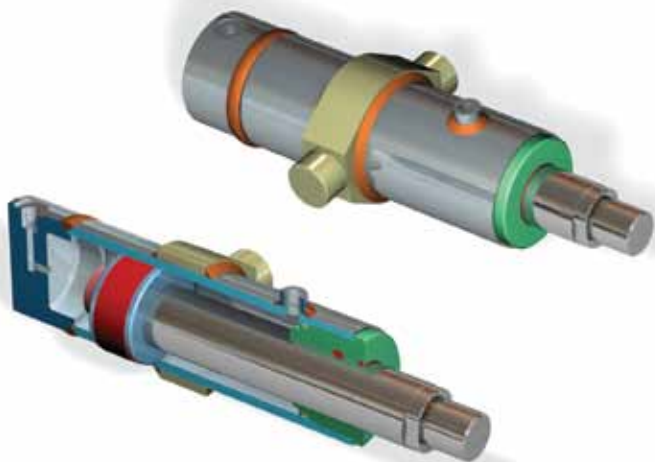
LDF A double action piston with a rear flange mounting



CYLINDER ø	32	40	50	63	80	100	120	140
ROD ø	20	25	30	40	50	60	70	90
cm ² PUSH	8	12.6	19.6	31.2	50.2	78.5	113	154
cm ² PULL	4.9	7.6	12.6	18.6	30.6	50.2	74.5	90.5
A +Strok	143	158	180	205	230	288	309	330
b ø	98	110	125	140	180	210	250	280
d 1	56	56	75	90	115	140	170	190
D1 ø	42	50	62	75	95	120	145	165
e ø	78	90	100	115	150	175	210	235
H	36	41	50	56	62	86	98	110
M	M16X1.5	M16X1.5	M22X1.5	M28X1.5	M35X1.5	M45X1.5	M58X1.5	M65X1.5
N	10	10	12	12	15	20	20	25
O	34	42	45	52	63	79.5	80.5	102
R	1/4BSP	1/4BSP	3/8BSP	1/2BSP	1/2BSP	1/2BSP	3/4BSP	3/4BSP
S ø	8.5	8.5	10.5	13	13	17	22	22
T	16	16	22	28	35	45	58	65
Y	12	15	18	22	25	35	40	45
Z	3	3.5	3.5	3.5	4	4	5	5

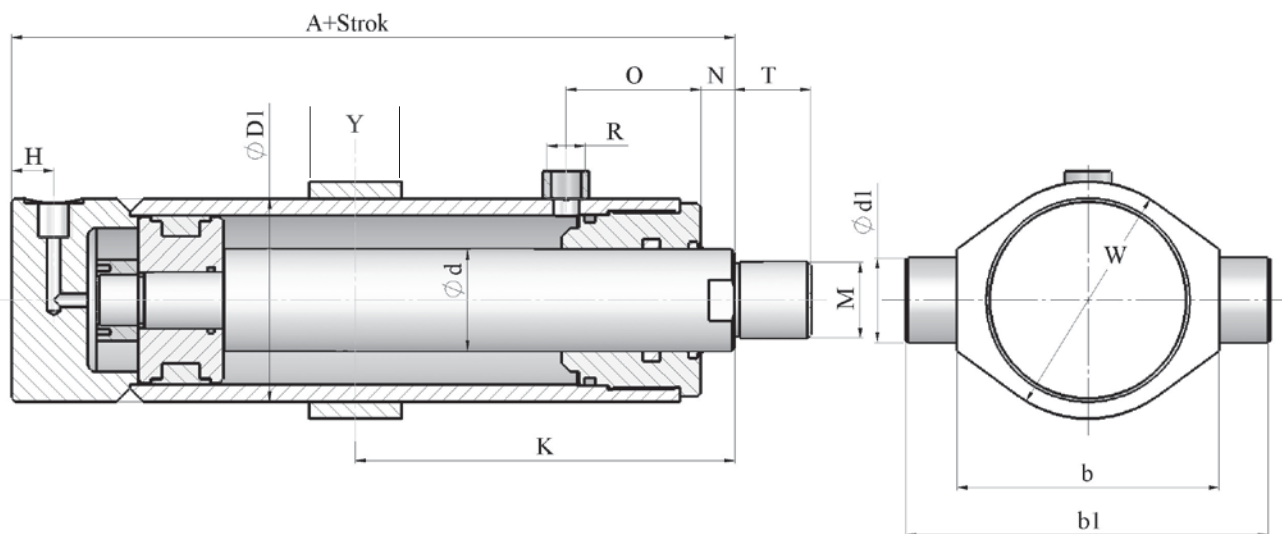

S.G Hydraulics Ltd.

LDT



Max. Working pressure: 250 BAR
 Testing pressure: 375 BAR
 Temperature: (-40) – (130) C°
 Max. Speed: 0.5 M/Sec
 Cylinder: TOL – H – DIN 2391 – ST52
 Hard chrome coated rod: TOL – F7 – CK45
 Seals: NBR / Polyester / POM

LDT A double action piston with a trunnion mounting



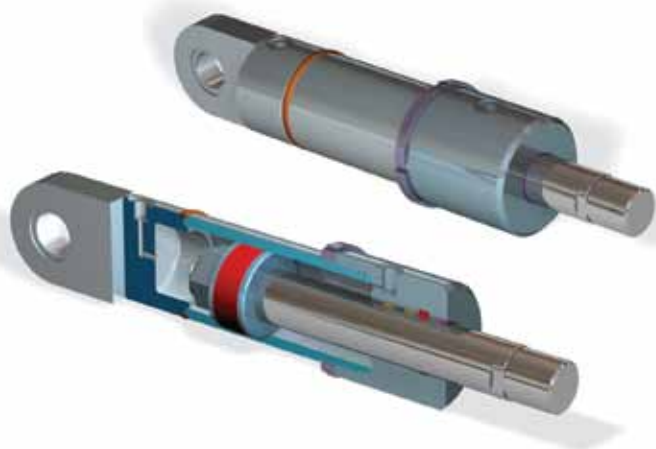
CYLINDER ø	32	40	50	63	80	100	120	140
ROD ø	20	25	30	40	50	60	70	90
cm ² PUSH	8	12.6	19.6	31.2	50.2	78.5	113	154
cm ² PULL	4.9	7.6	12.6	18.6	30.6	50.2	74.5	90.5
A +Strok	126	135	148	167	188	227	239	265
b	60	65	85	100	120	155	185	210
b1 ø	90	100	125	140	170	215	225	290
D1 ø	42	50	62	75	95	120	145	165
d1 ø	20	25	30	35	40	50	60	65
H	18	18	18	18	20	25	28	30
K min	85	95	105	115	130	155	165	185
M	M16X1.5	M16X1.5	M22X1.5	M28X1.5	M35X1.5	M45X1.5	M58X1.5	M65X1.5
N	10	10	12	12	15	20	20	25
O	34	42	45	52	63.5	79.5	80.5	102
R	1/4BSP	1/4BSP	3/8BSP	1/2BSP	1/2BSP	1/2BSP	3/4BSP	3/4BSP
W	55	65	80	90	110	140	165	190
T	16	16	22	28	35	45	58	65
Y	25	30	35	40	45	55	65	70



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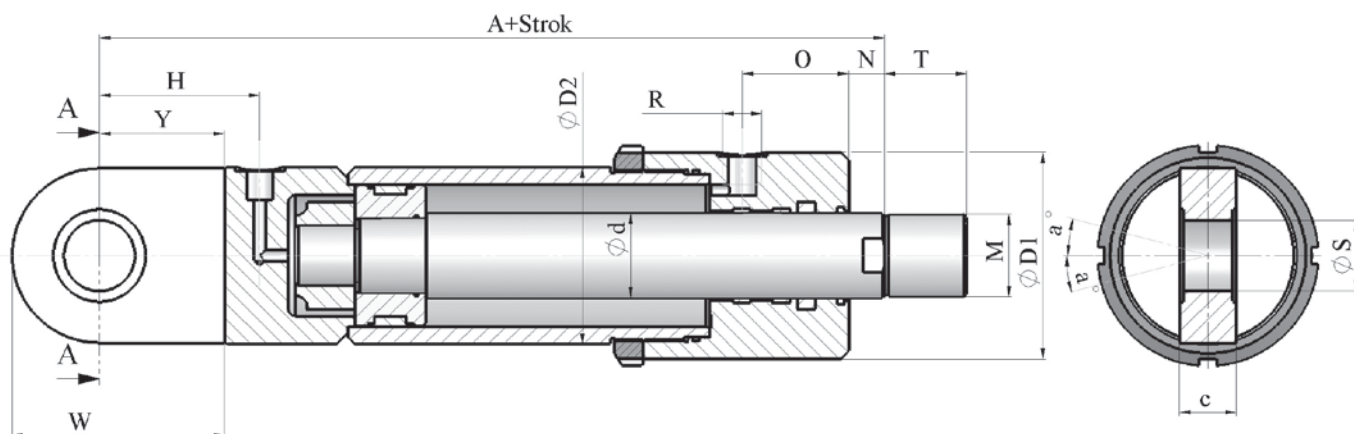
11

MDC



Max. Working pressure: 250 BAR
 Testing pressure: 375 BAR
 Temperature: (-40) - (130) C°
 Max. Speed: 0.5 M/Sec
 Cylinder: TOL - H - DIN 2391 - ST52
 Hard chrome coated rod: TOL - F7 - CK45
 Seals: NBR / Polyester / POM

MDC A double action piston with a rear bearing mounting



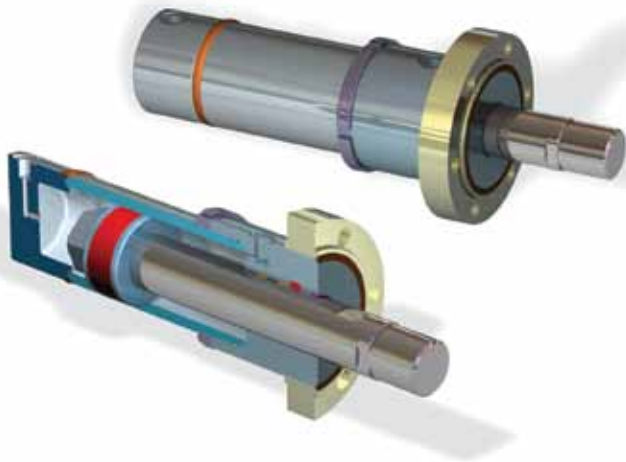
CYLINDER ø	40	50	63	80	100	120	140	160	180	200	220
ROD ø	25	30	40	50	60	70	90	100	110	125	150
cm ² PUSH	12.6	19.6	31.2	50.2	78.5	113	153.8	201	254	314	380
cm ² PULL	7.6	12.6	18.6	30.6	50.2	74.5	90.2	122.5	159	191.3	203.4
A +Strok	178	191	226	264	309	383	397	460	507	533	585
S ø	20	25	30	40	50	60	70	80	90	100	100
C	19	23	28	35	40	50	55	60	65	70	70
D1 ø	63	78	94	116	146	172	196	220	265	270	300
D2 ø	50	62	78	100	125	150	175	200	230	245	273
H	56	63	69	89	113	128	149	175	188	208	210
M	M22X1.5	M28X1.5	M35X1.5	M45X1.5	M58X1.5	M65X1.5	M80X2	M90X2	M100X2	M110X2	M120X3
N	13	16	16	20	25	25	30	30	30	30	30
O	43	48	55	63	75	85	84	95	102	97	120
R	1/4BSP	3/8BSP	1/2BSP	1/2BSP	1/2BSP	3/4BSP	3/4BSP	3/4BSP	3/4BSP	"1""BSP"	11/4BSP
T	22	28	35	45	58	65	80	90	100	110	120
U											
W	63	72	83	119	150	170	197	231	263	295	295
Y	38	45	51	69	88	100	115	141	150	170	170



S.G. Hydraulics Ltd.

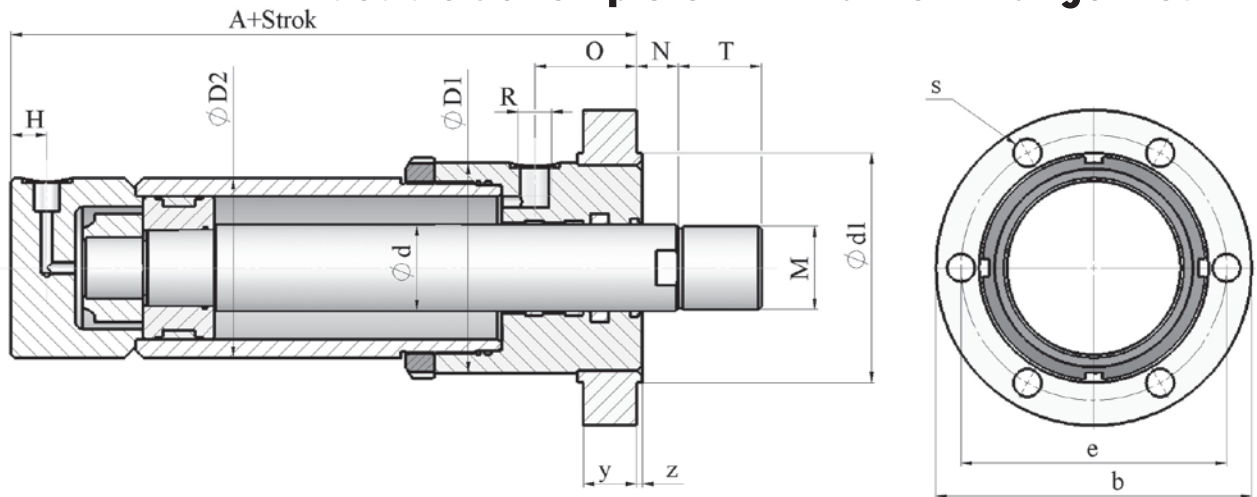
12

MDP



Max. Working pressure: 350 BAR
 Testing pressure: 525 BAR
 Temperature: (-40) – (130) C°
 Max. Speed: 0.5 M/Sec
 Cylinder: TOL – H – DIN 2391 – ST52
 Hard chrome coated rod: TOL – F7 – CK45
 Seals: NBR + Fabric / POM

MDP A double action piston with a front flange mounting



CYLINDER ø	40	50	63	80	100	120	140	160	180	200	220
ROD ø	25	30	40	50	60	70	90	100	110	125	150
cm ² PUSH	12.6	19.6	31.2	50.2	78.5	113	153.8	201	254	314	380
cm ² PULL	7.6	12.6	18.6	30.6	50.2	74.5	90.2	122.5	159	191.3	203.4
A +Strok	140	153	181	213	240	295	309	360	392	392	435
b ø	120	140	160	190	220	270	290	330	360	390	450
d 1 ø	80	90	100	130	160	180	200	230	250	280	320
D1 ø	63	78	94	116	146	172	196	220	265	270	300
D2 ø	50	62	78	100	125	150	175	200	230	245	273
e ø	100	115	135	160	185	220	245	280	305	340	380
H	18	18	18	20	25	28	34	34	38	38	40
M	M22X1.5	M28X1.5	M35X1.5	M45X1.5	M58X1.5	M65X1.5	M80X2	M90X2	M100X2	M110X2	M120X3
N	13	16	16	20	25	25	30	30	30	30	30
O	43	48	61	63	75	85	84	95	102	97	120
R	1/4BSP	3/8BSP	1/2BSP	1/2BSP	1/2BSP	3/4BSP	3/4BSP	3/4BSP	3/4BSP	"1" BSP	1 1/4BSP
s ø	8.5	10.5	13	16	19	22	24	30	33	36	36
T	22	28	35	45	58	65	80	90	100	110	120
y	18	18	23	32	35	50	50	60	64	70	80
z	3	3	3	5	5	5	5	5	4	5	5



S.G. Hydraulics Ltd.

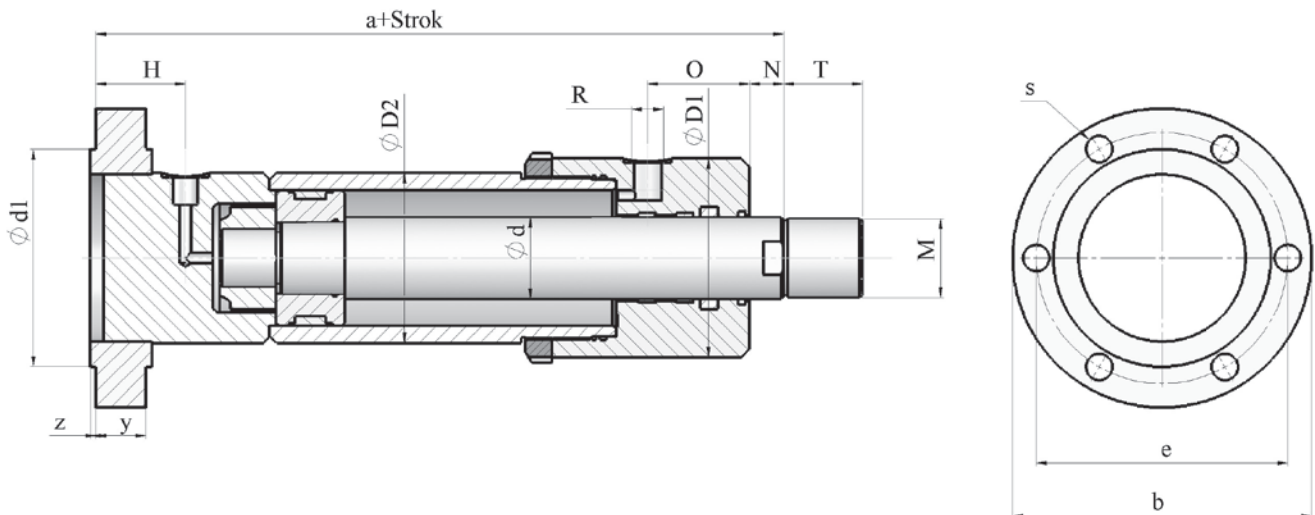
13

MDF



Max. Working pressure: 350 BAR
 Testing pressure: 525 BAR
 Temperature: (-40) – (130) C°
 Max. Speed: 0.5 M/Sec
 Cylinder: TOL – H – DIN 2391 – ST52
 Hard chrome coated rod: TOL – F7 – CK45
 Seals: NBR + Fabric / POM

MDF A double action piston with a rear flange mounting



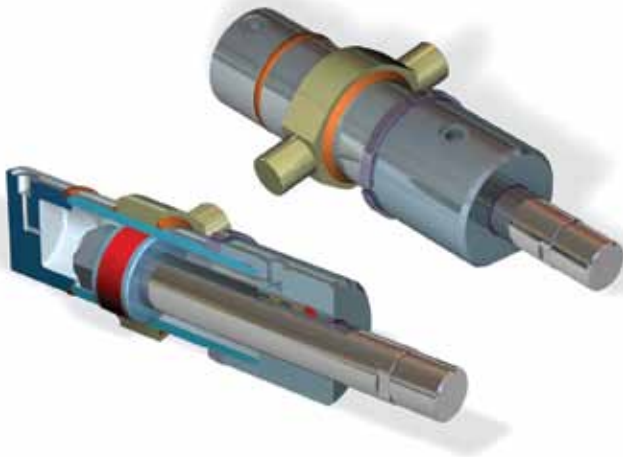
CYLINDER ø	40	50	63	80	100	120	140	160	180	200	220
ROD ø	25	30	40	50	60	70	90	100	110	125	150
A +Strok	167	185	218	256	288	355	369	430	464	464	517
cm ² PUSH	12.6	19.6	31.2	50.2	78.5	113	153.8	201	254	314	380
cm ² PULL	7.6	12.6	18.6	30.6	50.2	74.5	90.2	122.5	159	191.3	203.4
b ø	120	140	160	190	220	270	290	330	360	390	450
d 1ø	80	90	100	130	160	180	200	230	250	280	320
D1 ø	63	78	94	116	146	172	196	220	265	270	300
D2 ø	50	62	78	100	125	150	175	200	230	245	273
e ø	100	115	135	160	185	220	245	280	305	340	380
H	41.5	46.5	51.5	59	69	83	84	99	104	104	116
M	M22X1.5	M28X1.5	M35X1.5	M45X1.5	M58X1.5	M65X1.5	M80X2	M90X2	M100X2	M110X2	M120X3
N	13	16	16	20	25	25	30	30	30	30	30
O	43	48	55	63	75	85	84	95	102	102	120
R	1/4BSP	3/8BSP	1/2BSP	1/2BSP	1/2BSP	3/4BSP	3/4BSP	3/4BSP	3/4BSP	"1" BSP	1 1/4BSP
s ø	8.5	10.5	13	16	19	22	24	30	33	36	36
T	22	28	35	45	58	65	80	90	100	110	120
y	18	18	23	32	35	50	50	60	64	70	80
z	3	3	3	5	5	5	5	5	4	5	5



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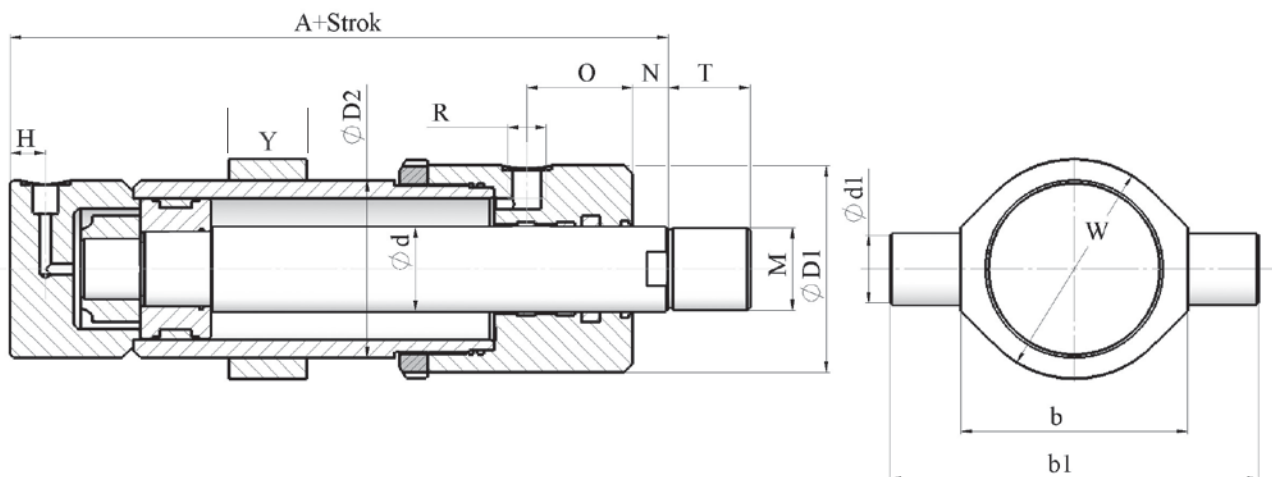
14

MDT

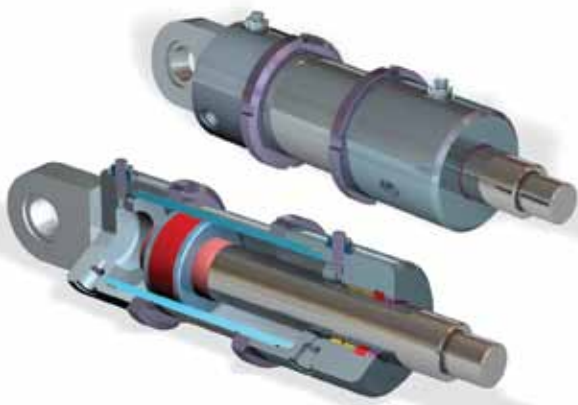


Max. Working pressure: 350 BAR
 Testing pressure: 525 BAR
 Temperature: (-40) – (130) C°
 Max. Speed: 0.5 M/Sec
 Cylinder: TOL – H – DIN 2391 – ST52
 Hard chrome coated rod: TOL – F7 – CK45
 Seals: NBR + Fabric / POM

MDT A double action piston with a trunnion mounting

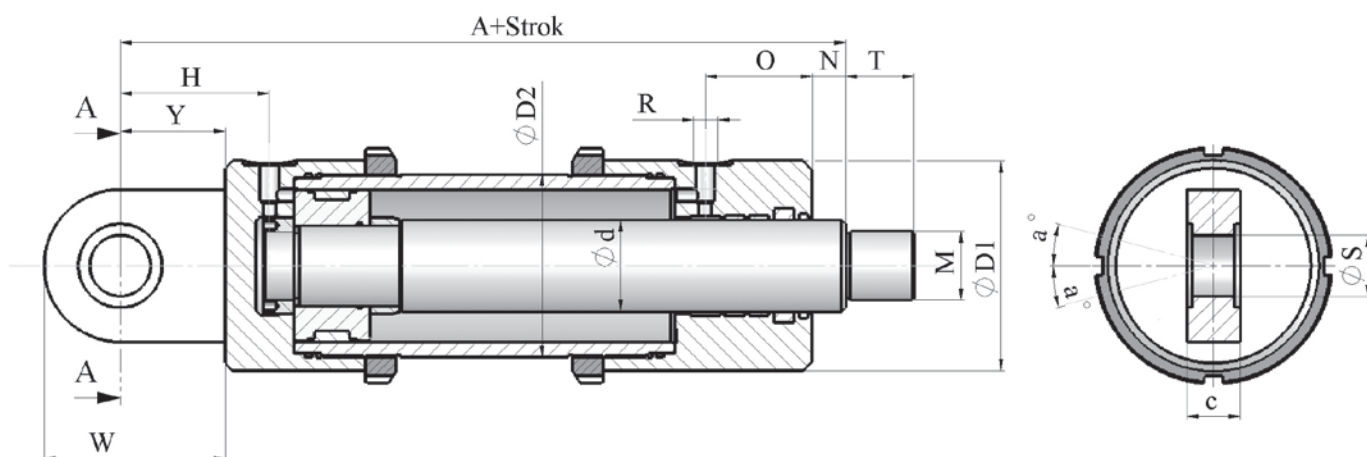


CYLINDER ø	40	50	63	80	100	120	140	160	180	200	220
ROD ø	25	30	40	50	60	70	90	100	110	125	150
cm ² PUSH	12.6	19.6	31.2	50.2	78.5	113	153.8	201	254	314	380
CM ² PULL	7.6	12.6	18.6	30.6	50.2	74.5	90.2	122.5	159	191.3	203.4
A +Strok	178	191	226	264	309	383	397	460	507	533	585
b	70	85	105	130	160	200	230	280	300	330	360
b1	120	145	170	210	260	320	370	420	480	530	570
d1	25	30	35	40	50	60	75	85	95	110	120
D1 ø	63	78	94	116	146	172	196	220	265	270	300
D2 ø	50	62	78	100	125	150	175	200	230	245	273
H	56	63	69	89	113	128	149	175	188	208	210
K min	130	150	165	185	210	245	270	300	345	365	410
M	M22X1.5	M28X1.5	M35X1.5	M45X1.5	M58X1.5	M65X1.5	M80X2	M90X2	M100X2	M110X2	M120X3
N	13	16	16	20	25	25	30	30	30	30	30
O	43	48	55	63	75	85	84	95	102	102	120
R	1/4BSP	3/8BSP	1/2BSP	1/2BSP	1/2BSP	3/4BSP	3/4BSP	3/4BSP	3/4BSP	"1" BSP"	1 1/4BSP
T	22	28	35	45	58	65	80	90	100	110	120
W	63	72	83	119	150	170	197	231	263	295	295
Y	30	35	40	45	55	65	80	100	100	120	130


S.G. Hydraulics Ltd.
MSC


Max. Working pressure: 250 BAR
 Testing pressure: 375 BAR
 Temperature: (-40) – (130) C°
 Max. Speed: 0.5 M/Sec
 Cylinder: TOL – H – DIN 2391 – ST52
 Hard chrome coated rod: TOL – F7 – CK45
 Seals: NBR + Fabric / POM

MSC A double action piston with braking mechanisms and a rear bearing mounting



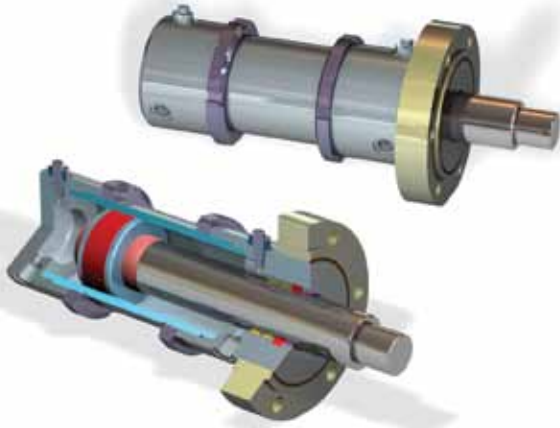
CYLINDER ø	40	50	63	80	100	125	140	160	180	200
ROD ø	25	30	40	50	60	70	90	100	110	125
cm ² PUSH	12.6	19.6	31.2	50.2	78.5	122.6	153.8	201	254	314
cm ² PUSH	12.6	19.6	31.2	50.2	78.5	122.6	153.8	201	254	314
A +Strok	171	199	213	253	287	371	377	430	485	518
S ø	15	20	25	30	40	50	50	60	70	80
C ø	12	16	21	28	35	40	40	50	55	60
D1 ø	63	78	88	108	138	163	188	213	238	268
D2 ø	50	62	75	95	120	145	165	190	220	245
H	49.5	60	66	75	98	123	123	135	155	181
M ø	M16X1.5	M22X1.5	M28X1.5	M35X1.5	M45X1.5	M58X1.5	M65X1.5	M80X2	M100X2	M110X2
N	10	11	12	15	20	20	22	25	30	32
O	50	57	63	77	80	98	102	110	115	120
R	1/4BSP	3/8BSP	1/2BSP	1/2BSP	1/2BSP	3/4BSP	3/4BSP	3/4BSP	3/4BSP	"1" BSP"
T	16	22	28	35	45	58	65	80	100	110
W	51	63	72.5	83.5	119	150	150	170	197	231
Y	31	38	45	51	69	88	88	100	115	141



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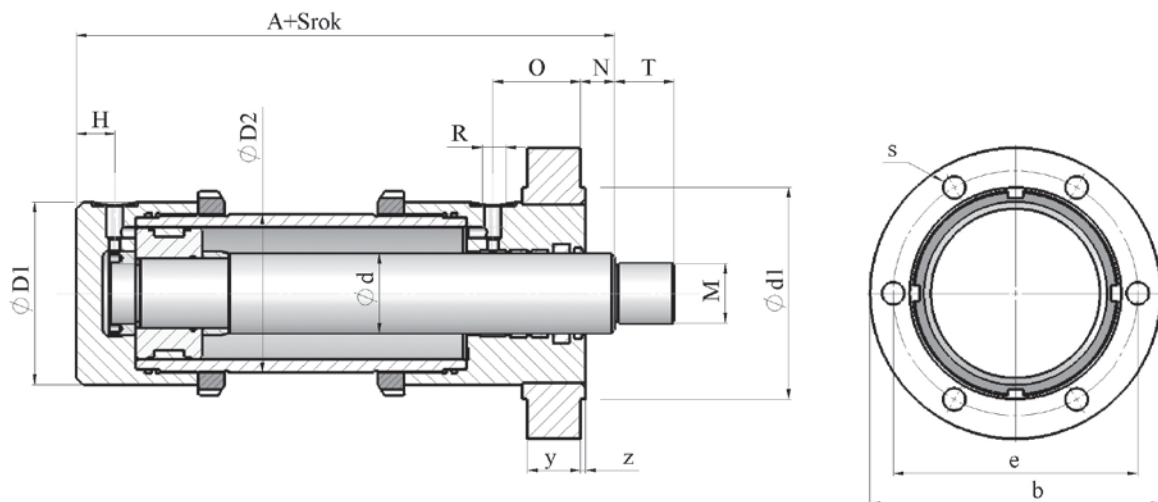
16

MSP



Max. Working pressure: 250 BAR
 Testing pressure: 375 BAR
 Temperature: (-40) – (130) C°
 Max. Speed: 0.5 M/Sec
 Cylinder: TOL – H – DIN 2391 – ST52
 Hard chrome coated rod: TOL – F7 – CK45
 Seals: NBR / Polyester / POM

MSP A double action piston with braking mechanisms and a front flange mounting



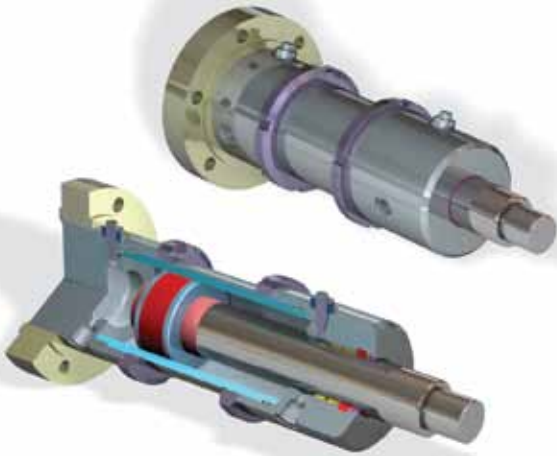
CYLINDER ø	40	50	63	80	100	125	140	160	180	200
ROD ø	25	30	40	50	60	70	90	100	110	125
cm ² PUSH	12.6	19.6	31.2	50.2	78.5	122.6	153.8	201	254	314
cm ² PULL	7.6	12.6	18.6	30.6	50.2	84	90.2	122.5	159	191.3
A+Srok	140	161	172	203	218	287	294	340	385	397
B ø	120	140	160	190	220	270	290	320	360	390
d 1 ø	80	90	100	130	160	180	200	230	250	280
D1 ø	63	78	88	108	138	163	188	213	238	268
D2 ø	50	62	75	95	120	145	165	190	220	245
e ø	100	115	135	160	185	220	245	270	305	340
H	18.5	22	25	25	29	35	35	35	40	40
M ø	M16X1.5	M22X1.5	M28X1.5	M35X1.5	M45X1.5	M58X1.5	M65X1.5	M80X2	M100X2	M110X2
N	10	11	12	15	20	20	22	25	30	32
O	50	57	63	77	80	98	102	110	115	120
R	1/4BSP	3/8BSP	1/2BSP	1/2BSP	1/2BSP	3/4BSP	3/4BSP	3/4BSP	3/4BSP	"1" BSP"
S ø	8.5	10.5	13	13	17	22	22	30	33	33
T	16	22	28	35	45	58	65	80	100	110
Y	27	32	37	43	48	60	60	70	72	72
Z	3.5	3.5	3.5	4	4	5	5	5	6	6



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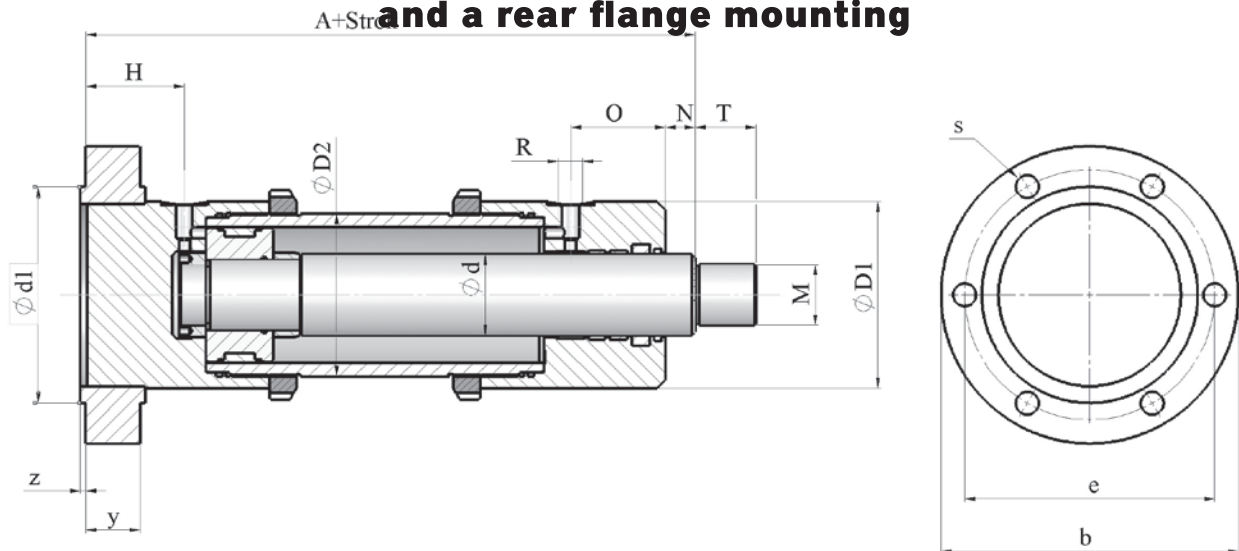
17

MSF



Max. Working pressure: 250 BAR
 Testing pressure: 375 BAR
 Temperature: (-40) – (130) C°
 Max. Speed: 0.5 M/Sec
 Cylinder: TOL – H – DIN 2391 – ST52
 Hard chrome coated rod: TOL – F7 – CK45
 Seals: NBR / Polyester / POM

MSF A double action piston with braking mechanisms and a rear flange mounting



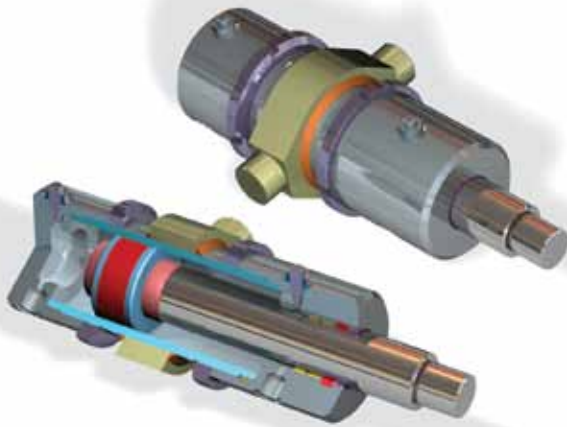
CYLINDER ø	40	50	63	80	100	125	140	160	180	200
ROD ø	25	30	40	50	60	70	90	100	110	125
cm ² PUSH	12.6	19.6	31.2	50.2	78.5	122.6	153.8	201	254	314
cm ² PULL	7.6	12.6	18.6	30.6	50.2	84	90.2	122.5	159	191.3
A +Strok	159	185	201	238.5	262.5	338	344	395	436	443
b ø	120	140	160	190	220	270	290	320	360	390
d1 ø	80	90	100	130	160	180	200	220	250	280
D1ø	63	78	88	108	138	163	188	213	238	268
D2 ø	50	62	75	95	120	145	165	190	220	245
e ø	100	115	135	160	185	220	245	270	305	340
H	41.5	46	54.5	63.5	73	90	90	100	106	106
M	M16X1.5	M22X1.5	M28X1.5	M35X1.5	M45X1.5	M58X1.5	M65X1.5	M80X2	M100X2	M110X2
N	10	11	12	15	20	20	22	25	30	32
O	52.5	57	63	77	80	98	102	110	115	120
R	1/4BSP	3/8BSP	1/2BSP	1/2BSP	1/2BSP	3/4BSP	3/4BSP	3/4BSP	3/4BSP	"1" BSP"
S ø	8.4	10.5	13	13	17	22	22	30	33	33
T	16	22	28	35	45	58	65	80	100	110
Y	20	25	30	43	48	50	50	60	60	60
Z	3.5	3.5	3.5	4	4	5	5	5	6	6



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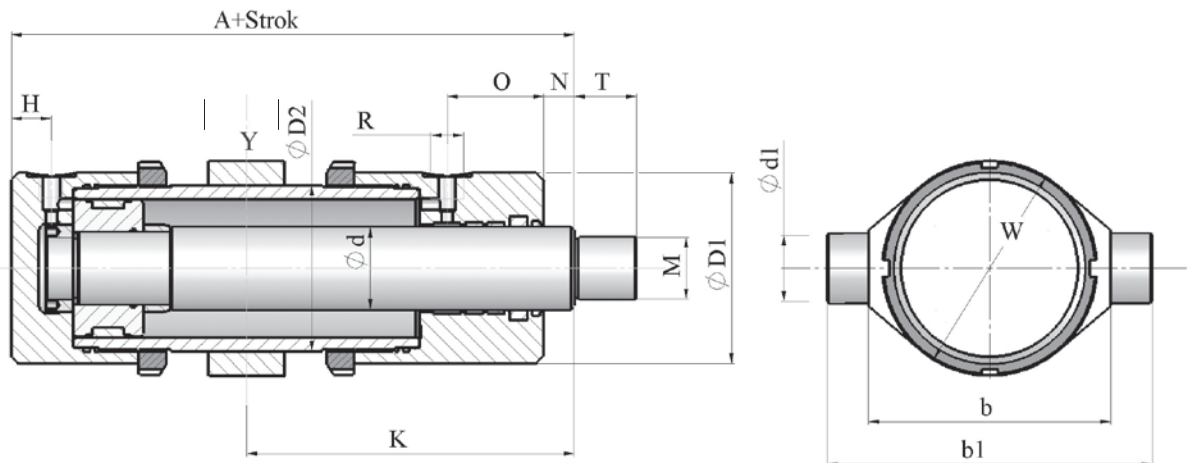
MST



Max. Working pressure: 250 BAR
 Testing pressure: 375 BAR
 Temperature: (-40) – (130) C°
 Max. Speed: 0.5 M/Sec
 Cylinder: TOL – H – DIN 2391 – ST52
 Hard chrome coated rod: TOL – F7 – CK45
 Seals: NBR / Polyester / POM

MST

A double action piston with braking mechanisms and a trunnion mounting

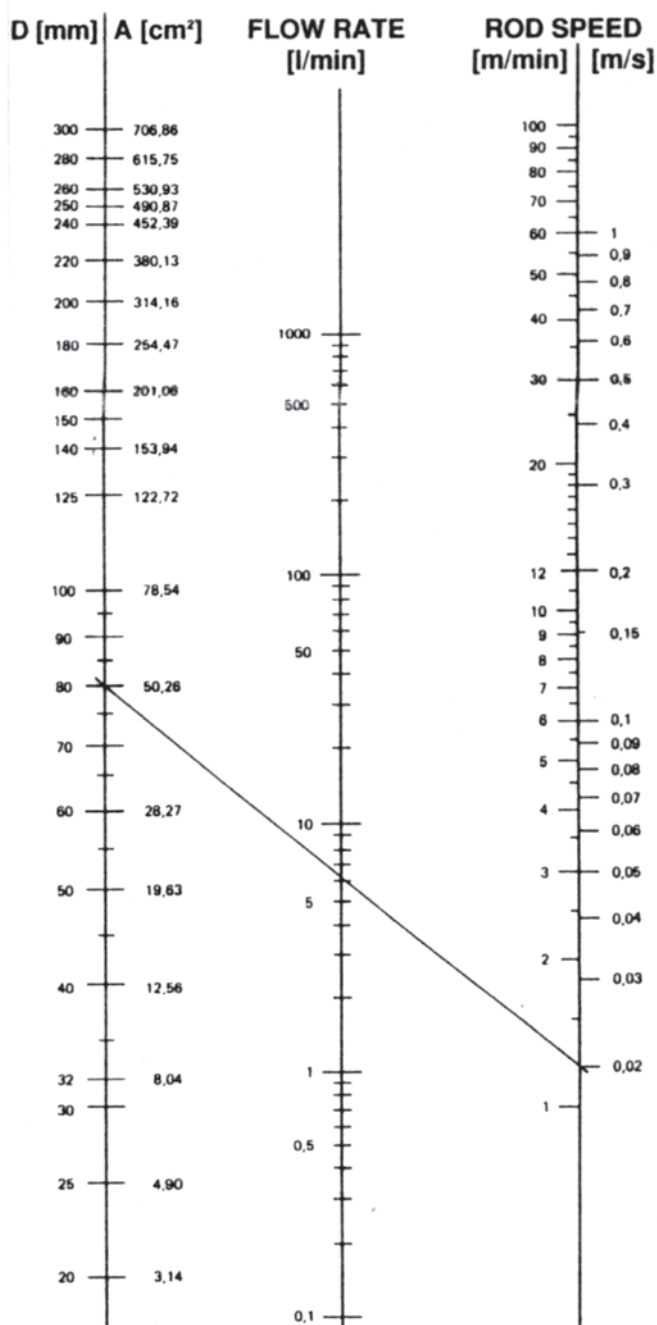


CYLINDER ø	40	50	63	80	100	125	140	160	180	200
ROD ø	25	30	40	50	60	70	90	100	110	125
cm² PUSH	12.6	19.6	31.2	50.2	78.5	122.6	153.8	201	254	314
cm² PULL	7.6	12.6	18.6	30.6	50.2	84	90.2	122.5	159	191.3
A+Strok	140	161	168	202	218	283	289	330	370	377
B	95	115	130	145	175	210	230	275	300	320
b 1 ø	135	155	170	195	235	290	315	380	410	430
d 1 ø	30	30	35	40	50	60	65	75	85	90
D1 ø	63	78	88	108	138	163	188	213	238	268
D2 ø	50	62	75	95	120	145	165	190	220	245
H	18.5	22	21	24	29	35	35	35	40	40
K min	130	150	165	185	210	245	270	300	345	365
M	M16X1.5	M22X1.5	M28X1.5	M35X1.5	M45X1.5	M58X1.5	M65X1.5	M80X2	M100X2	M110X2
N	10	11	12	15	20	20	22	25	30	32
O	50	57	63	77	80	98	102	110	115	120
R	1/4BSP	3/8BSP	1/2BSP	1/2 BSP	1/2BSP	3/4BSP	3/4BSP	3/4BSP	3/4BSP	"1" BSP"
W	70	85	105	130	155	190	210	240	270	300
T	16	22	28	35	45	58	65	80	100	110
Y	35	35	40	45	55	65	70	80	95	95

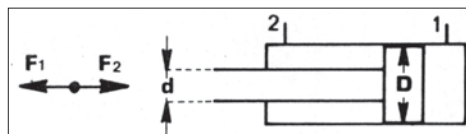


Piston types

CYLINDER SPEED



Graphic symbol	Item	Description
	Single-acting Cylinder	Return Stroke By External Force
		Return Stroke Through A Spring
	Double-acting Cylinder	Single Rod
		Double Rod
	Cylinder With Fixed Stroke End Cushioning	Cushioning On One Side
		Cushioning On Both Sides
	Cylinder With Adjustable Stroke End Cushioning	Cushioning On One Side
		Cushioning On Both Sides
	Telescopic Cylinder	Single-acting
		Double-acting



Cylinders:

force exerted when pushing

$$F_1 = (p_1 \cdot A_1 - p_2 \cdot A_2) \cdot 9,81$$

force exerted when pulling

$$F_2 = (p_2 \cdot A_2 - p_1 \cdot A_1) \cdot 9,81$$

cylinder speed when pushig

$$V_1 = \frac{10 \cdot Q}{A_1 \cdot 60} \quad V_2 = \frac{10 \cdot Q}{A_2 \cdot 60}$$

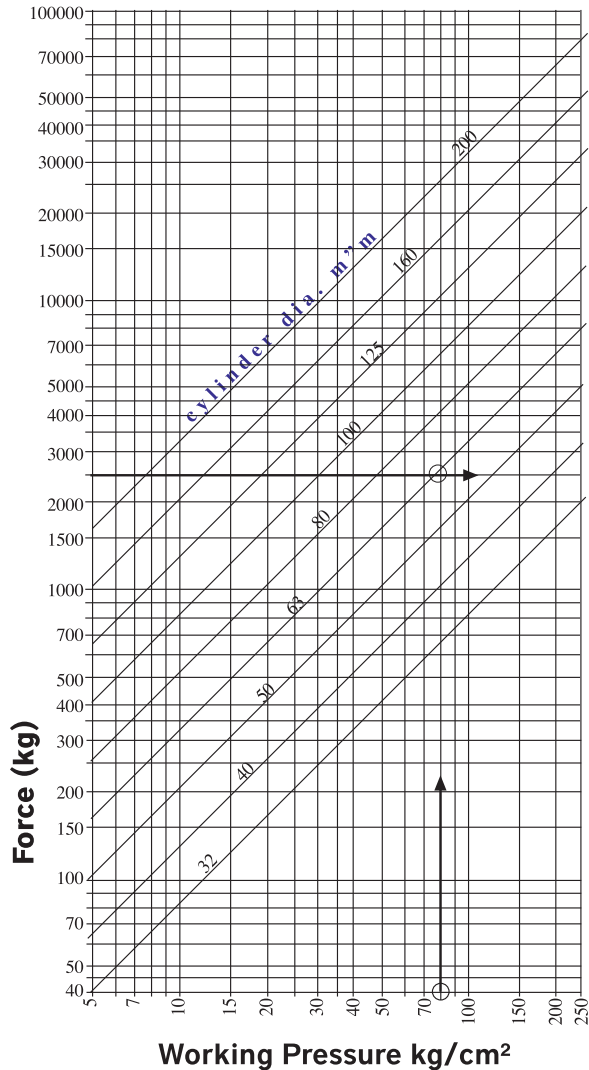
Where

$$A_1 = \frac{\pi \cdot D^2}{4 \cdot 100} \quad A_2 = \frac{\pi \cdot (D^2 - d^2)}{4 \cdot 100} \text{ [cm}^2\text{]}$$

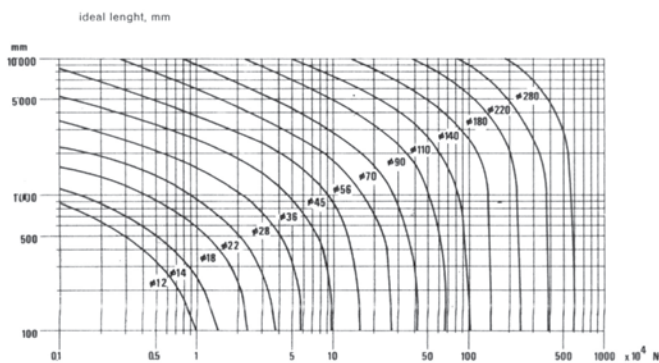
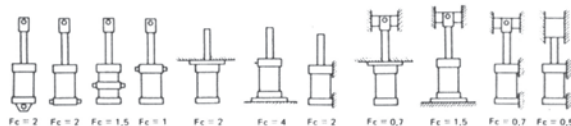
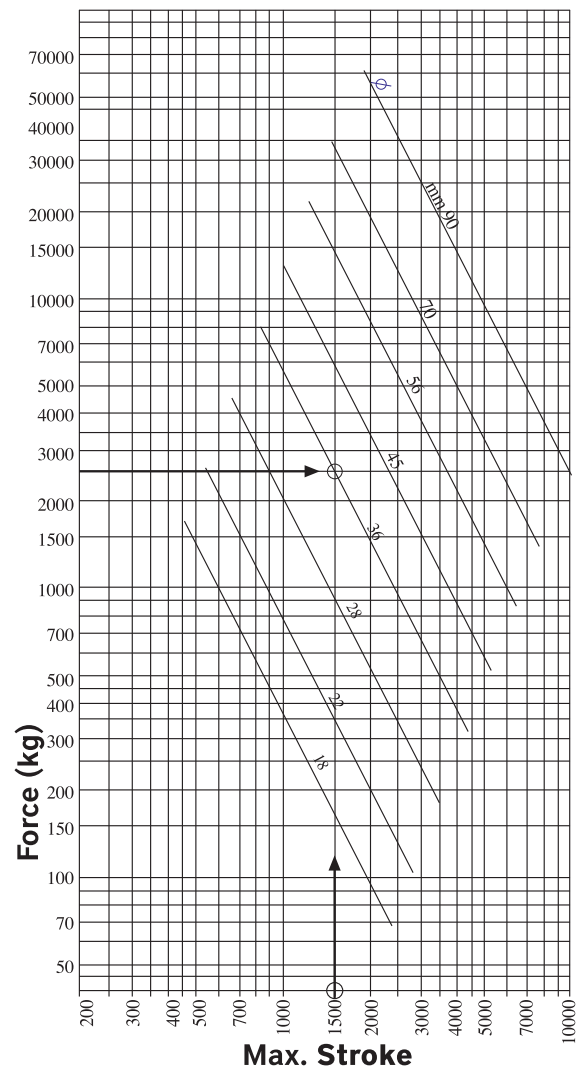
Units	Symbols	
Force	dan	F
Pressure	bar	p
Area	cm ²	A
Piston and bore diameter	mm	D
Rod diameter	mm	d
Flow rate	l/min	Q
Speed	m/sec	V



Determining Cylinder Size (Cylinder ID)



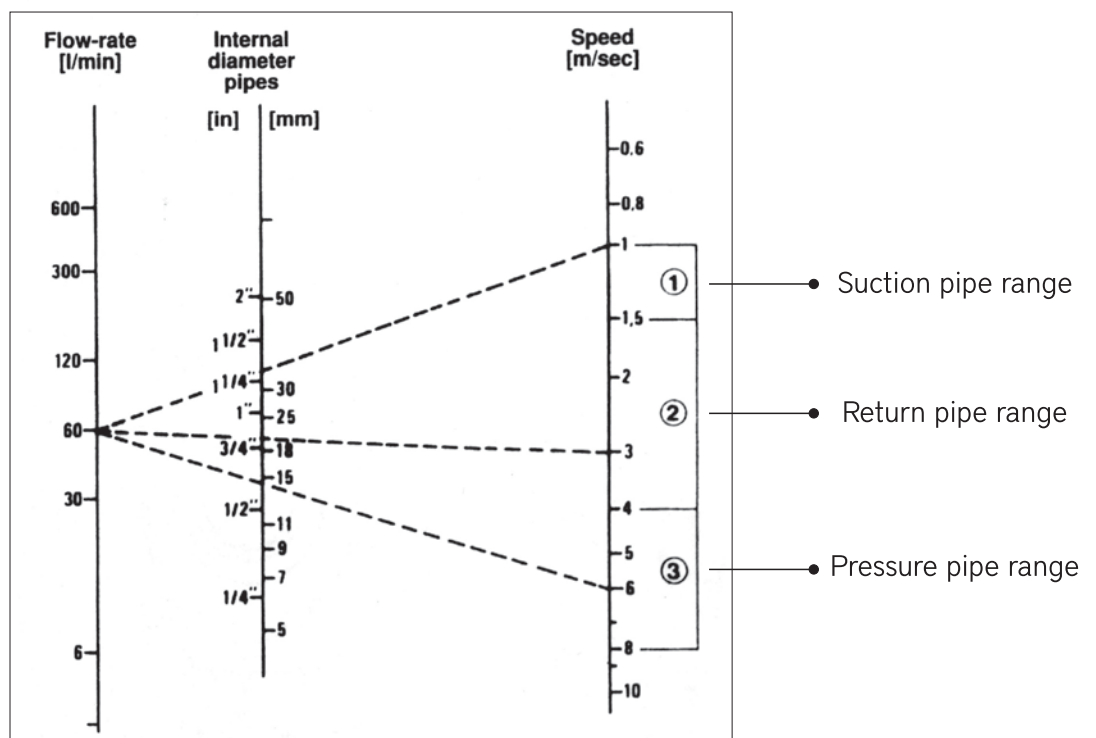
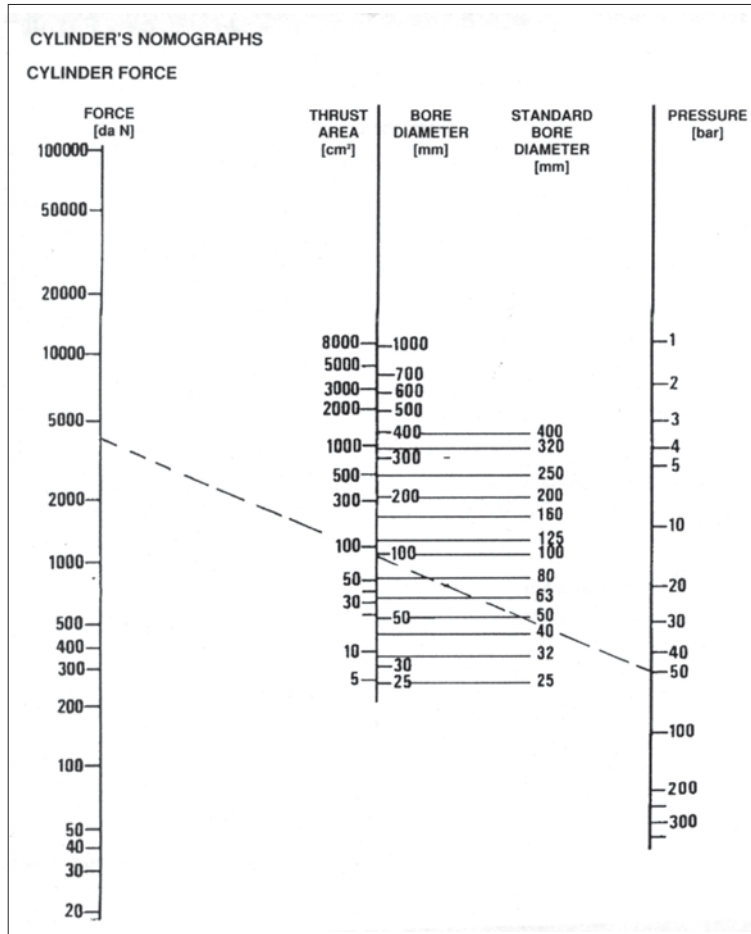
Determining Rod Size (Piston rod diameter)

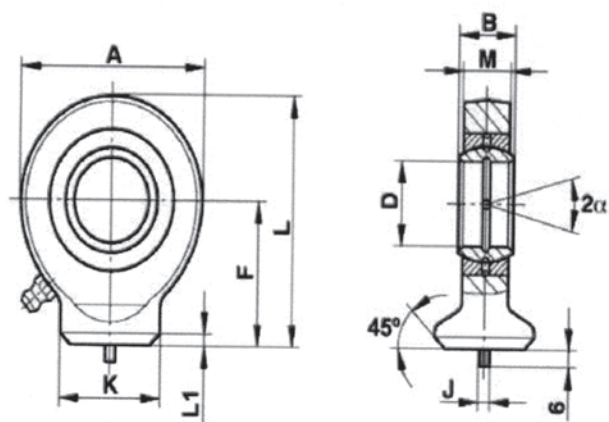


- 1) Determine maximum thrust on rod.
- 2) Determine the mounting factor.
- 3) Calculate the effective length.
- 4) Check the appropriate curve regarding the specific rod diameter to see that the point corresponding to thrust load vs effective length falls underneath it.

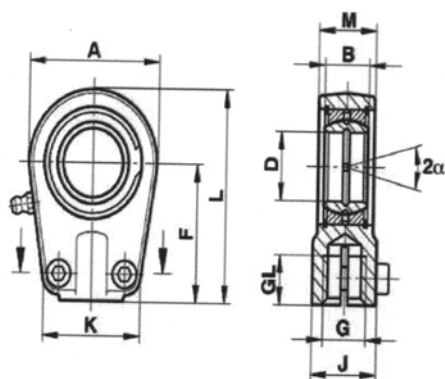
A thrust load of 5000 Kgf is foreseen for the cylinder but from the curve chart it is seen that the point corresponding to 1200 mm, as ordinate, and 5000 Kgf as abscissa falls just above the limit curve for a 36 mm diameter rod. To insure stable operation, therefore, the rod diameter must be 45 mm.

Ex. Consider a cylinder with a fwd flange and stroke 600 mm. The stroke factor is 2. Therefore, the effective length, L_e , is $C \times F_c = 600 \times 2$ or 1200 mm.

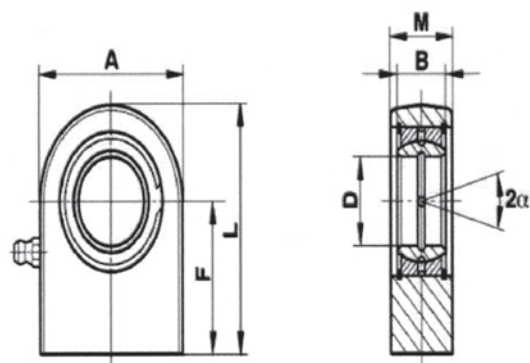


**FS..C**

Size (D)	B	M	A	F	L	L1	K	J	Static Load C ₀ kN	Dynamic Load C kN	Pivoting angle α	Weight g
10	9	7	29	24	38,5	2,0	15,0	3	15,6	8,1	12	40
12	10	8	34	27	44,0	2,0	17,5	3	21,6	10,8	11	65
15	12	10	40	31	51,0	2,5	21,0	4	32,0	71,0	8	120
17	14	11	46	35	58,0	3,0	24,0	4	40,0	21,2	10	180
20	16	13	53	38	64,5	3,0	27,5	4	54,0	30,0	9	250
25	20	17	64	45	77,0	4,0	33,5	4	72,0	48,0	7	450
30	22	19	73	51	87,5	4,0	40,0	4	95,0	62,0	6	675
35	25	21	82	61	102,0	4,0	47,0	4	125,0	80,0	6	950
40	28	23	92	69	115,0	5,0	52,0	4	156,0	100,0	7	1400
45	32	27	102	77	128,0	5,0	58,0	6	208,0	127,0	7	1910
50	35	30	112	88	144,0	6,0	62,0	6	250,0	156,0	6	2650
60	44	38	135	100	167,5	8,0	70,0	6	390,0	245,0	6	4600
70	49	42	160	115	195,0	10,0	80,0	6	510,0	315,0	6	7000
80	55	47	180	141	231,0	10,0	85,0	6	620,0	400,0	6	10800

**FPR**

Size (D)	B	M	M1	A	F	L	K	J	G	GL	Torque Nm	Static Load C ₀ kN	Dynamic Load C kN	Pivoting angle α	Weight g
20	16	19	21	56	50	80,0	46	25	M16x1,5	17	25	72	30	9	400
25	20	23	21	56	50	80,0	46	25	M16x1,5	17	25	72	45	7	475
30	22	28	26	64	60	94,0	50	32	M22x1,5	23	25	105	62	6	700
35	25	30	28	78	70	112,0	66	40	M28x1,5	29	49	153	80	6	1150
40	28	35	33	94	85	135,0	76	49	M35x1,5	36	49	250	100	7	2075
50	35	40	37	116	105	168,0	90	61	M45x1,5	46	86	365	156	6	3575
60	44	50	46	130	130	200,0	120	75	M58X1,5	59	210	400	245	6	6200
70	49	55	51	154	150	232,0	130	86	M65X1,5	66	210	540	315	6	9200
80	55	60	55	176	170	265,0	160	105	M80X1,5	81	410	670	400	6	13200
90	60	65	60	206	210	323,0	180	124	M100X2	101	410	980	490	5	19600
100	70	70	65	231	235	360,7	200	138	M110X2	111	710	1120	610	7	26310
110	70	80	74	265	265	408,2	220	152	M120X3	125	710	1700	655	6	39200
120	85	90	84	340	310	490,0	300	172	M130X3	135	710	2900	950	6	78000

**FS..N**

Size (D)	B	M	A	F	L	Static Load C ₀ kN	Dynamic Load C kN	Pivoting angle α	Weight g
20	16	19	50	38	63,0	67,0	30	9	325
25	20	23	55	45	72,5	69,5	48	7	500
30	22	28	65	51	83,5	118,0	62	6	825
35	25	30	83	61	102,5	196,0	80	6	1475
40	28	35	100	69	119,0	300,0	100	7	2480
45	32	40	110	77	132,0	380,0	127	7	3450
50	35	40	123	88	149,5	440,0	156	6	4450
60	44	50	140	100	170,0	570,0	245	6	7130
70	49	55	164	115	197,0	695,0	315	6	10700
80	55	60	180	141	231,0	780,0	400	6	15100
90	60	65	226	150	263,0	1340,0	490	5	23400
100	70	70	250	170	295,0	1500,0	610	7	33100
110	70	80	295	185	332,5	2160,0	655	6	48500
120	85	90	360	210	390,0	3250,0	950	6	79500



Material Type	Working Temperature	Description
Nitrile Rubber (NBR)	(-40)°c – 140°c	Standard material, suitable for grease and mineral oils.
Viton	(-40)°c – 250°c	Preserves resistance to deformation, suitable for high temperatures, acids, harsh weather, ozone, oxygen, oils, grease and fuels.
Silicon	(-60)°c – 230°c	Suitable for extreme temperatures, air and gases.
Ethylene propylene EPDM	(-40)°c – 160°c	Good resistance to temperature, weather and ozone. Skydrol and organic fluids durable. Not suitable for mineral oils.

O-RINGS SIZES

2-0xx Sizes: Cross-section d ₂ = 1.78 mm											
Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm
2-001*	0.74	2-010	6.07	2-019	20.35	2-028	34.65	2-037	63.22	2-046	107.67
2-002*	1.07	2-011	7.65	2-020	21.95	2-029	37.82	2-038	66.40	2-047	114.02
2-003*	1.42	2-012	9.25	2-021	23.52	2-030	41.00	2-039	69.57	2-048	120.37
2-004	1.78	2-013	10.82	2-022	25.12	2-031	44.17	2-040	72.75	2-049	126.72
2-005	2.57	2-014	12.42	2-023	26.70	2-032	47.35	2-041	75.92	2-050	133.07
2-006	2.90	2-015	14.00	2-024	28.30	2-033	50.52	2-042	82.27		
2-007	3.68	2-016	15.60	2-025	29.87	2-034	53.70	2-043	88.62		
2-008	4.47	2-017	17.17	2-026	31.47	2-035	56.87	2-044	94.97		
2-009	5.28	2-018	18.77	2-027	33.05	2-036	60.05	2-045	101.32		

2-1xx Sizes: Cross-section d ₂ = 2.62 mm											
Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm
2-102	1.24	2-115	17.12	2-128	37.77	2-141	58.42	2-154	94.92	2-167	177.47
2-103	2.06	2-116	18.72	2-129	39.34	2-142	59.99	2-155	101.27	2-168	183.82
2-104	2.84	2-117	20.29	2-130	40.94	2-143	61.60	2-156	107.62	2-169	190.17
2-105	3.63	2-118	21.89	2-131	42.52	2-144	63.17	2-157	113.97	2-170	196.52
2-106	4.42	2-119	23.47	2-132	44.12	2-145	64.77	2-158	120.32	2-171	202.87
2-107	5.23	2-120	25.07	2-133	45.69	2-146	66.34	2-159	126.67	2-172	209.22
2-108	6.02	2-121	26.64	2-134	47.29	2-147	67.95	2-160	133.02	2-173	215.57
2-109	7.59	2-122	28.24	2-135	48.90	2-148	69.52	2-161	139.37	2-174	221.92
2-110	9.19	2-123	29.82	2-136	50.47	2-149	71.12	2-162	145.72	2-175	228.27
2-111	10.77	2-124	31.42	2-137	52.07	2-150	72.69	2-163	152.07	2-176	234.62
2-112	12.37	2-125	32.99	2-138	53.64	2-151	75.87	2-164	158.42	2-177	240.97
2-113	13.94	2-126	34.59	2-139	55.25	2-152	82.22	2-165	164.77	2-178	247.32
2-114	15.54	2-127	36.17	2-140	56.82	2-153	88.57	2-166	171.12		



O-RINGS SIZES

2-2xx Sizes: Cross-section $d_2 = 3.53$ mm

Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm
2-201	4.34	2-215	26.57	2-229	59.92	2-243	104.37	2-257	148.82	2-271	234.54
2-202	5.94	2-216	28.17	2-230	63.09	2-244	107.54	2-258	151.99	2-272	240.89
2-203	7.52	2-217	29.74	2-231	66.27	2-245	110.72	2-259	158.34	2-273	247.24
2-204	9.12	2-218	31.34	2-232	69.44	2-246	113.89	2-260	164.69	2-274	253.59
2-205	10.69	2-219	32.92	2-233	72.62	2-247	117.07	2-261	171.04	2-275	266.29
2-206	12.29	2-220	34.52	2-234	75.79	2-248	120.24	2-262	177.39	2-276	278.99
2-207	13.87	2-221	36.09	2-235	78.97	2-249	123.42	2-263	183.74	2-277	291.69
2-208	15.47	2-222	37.69	2-236	82.14	2-250	126.59	2-264	190.09	2-278	304.39
2-209	17.04	2-223	40.87	2-237	85.32	2-251	129.77	2-265	196.44	2-279	329.79
2-210	18.64	2-224	44.04	2-238	88.49	2-252	132.94	2-266	202.79	2-280	355.19
2-211	20.22	2-225	47.22	2-239	91.67	2-253	136.12	2-267	209.14	2-281	380.59
2-212	21.82	2-226	50.39	2-240	94.84	2-254	139.29	2-268	215.49	2-282	405.26
2-213	23.39	2-227	53.57	2-241	98.02	2-255	142.47	2-269	221.84	2-283	430.66
2-214	24.99	2-228	56.74	2-242	101.19	2-256	145.64	2-270	228.19	2-284	456.06

2-3xx Sizes: Cross-section $d_2 = 5.33$ mm

Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm
2-309	10.46	2-324	34.29	2-339	81.92	2-354	129.54	2-369	202.57	2-384	380.37
2-310	12.07	2-325	37.47	2-340	85.09	2-355	132.72	2-370	208.92	2-385	405.26
2-311	13.64	2-326	40.64	2-341	88.27	2-356	135.89	2-371	215.27	2-386	430.66
2-312	15.24	2-327	43.82	2-342	91.44	2-357	139.07	2-372	221.62	2-387	456.06
2-313	16.81	2-328	46.99	2-343	94.62	2-358	142.24	2-373	227.97	2-388	481.41
2-314	18.42	2-329	50.17	2-344	97.79	2-359	145.42	2-374	234.32	2-389	506.81
2-315	19.99	2-330	53.34	2-345	100.97	2-360	148.59	2-375	240.67	2-390	532.21
2-316	21.59	2-331	56.52	2-346	104.14	2-361	151.77	2-376	247.02	2-391	557.61
2-317	23.16	2-332	59.69	2-347	107.32	2-362	158.12	2-377	253.37	2-392	582.68
2-318	24.77	2-333	62.87	2-348	110.49	2-363	164.47	2-378	266.07	2-393	608.08
2-319	26.34	2-334	66.04	2-349	113.67	2-364	170.82	2-379	278.77	2-394	633.48
2-320	27.94	2-335	69.22	2-350	116.84	2-365	177.17	2-380	291.47	2-395	658.88
2-321	29.51	2-336	72.39	2-351	120.02	2-366	183.52	2-381	304.17		
2-322	31.12	2-337	75.57	2-352	123.19	2-367	189.87	2-382	329.57		
2-323	32.69	2-338	78.74	2-353	126.37	2-368	196.22	2-383	354.97		

2-4xx Sizes: Cross-section $d_2 = 6.99$ mm

Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm	Parker Nr.	Inside diameter mm
2-425	113.67	2-434	142.24	2-443	189.87	2-452	291.47	2-461	405.26	2-470	532.26
2-426	116.84	2-435	145.42	2-444	196.22	2-453	304.17	2-462	417.96	2-471	557.66
2-427	120.02	2-436	148.59	2-445	202.57	2-454	316.87	2-463	430.66	2-472	582.68
2-428	123.19	2-437	151.77	2-446	215.27	2-455	329.57	2-464	443.36	2-473	608.08
2-429	126.37	2-438	158.12	2-447	227.97	2-456	342.27	2-465	456.06	2-474	633.48
2-430	129.54	2-439	164.47	2-448	240.67	2-457	354.97	2-466	468.76	2-475	658.88
2-431	132.72	2-440	170.82	2-449	253.37	2-458	367.67	2-467	481.46		
2-432	135.89	2-441	177.17	2-450	266.07	2-459	380.37	2-468	494.16		
2-433	139.07	2-442	183.52	2-451	278.77	2-460	393.07	2-469	506.86		