

P R E S T R E S S E D
C O N C R E T E
T E C H N O L O G Y



Hydraulic Cylinders

for prestressing force
transmission (detensioning)
in prestressed
concrete production

The single-acting heavy-duty hydraulic cylinders are made of high-quality materials with the following features:

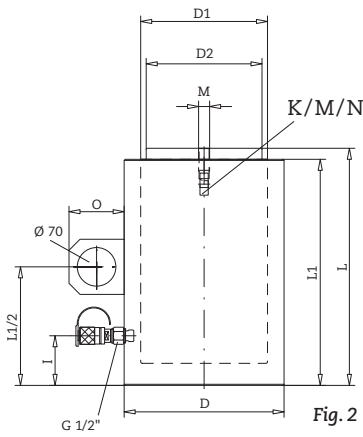
- Piston hardened to a depth of 1-2 mm to 60-65 HRc (700-850 HV)
- Piston hard-chrome plated and superfinished ($R_a = 0.1-0.3 \mu\text{m}$)
- Protection against dirt by highly effective scraper rings
- Cylinder and bottom made of one piece

The hydraulic cylinders are available with a load capacity of 200-10000 kN. Standard stroke lengths are 225 and 350 mm (also 270 and 400 mm, etc.). The piston is provided with a bleed hole that limits the stroke. To prevent oil escaping from the bleed hole, the rated stroke should never be exceeded!

Fig. 1: 4 x 8000 kN casting beds with 8 x 4000 kN/225 mm stroke hydraulic cylinders (79-061.10) and 40 support sleeves 4000 kN, 40 mm height (79-020.34)



T E C H N I C A L D A T A



Oil outlet: G 1/2
 I: up to 5000 kN: 80 mm
 from 6000 kN: 125 mm

Lifting eye
 O: up to 1500 kN: 100 mm
 from 2000 kN: 120 mm

Holder
 K: 200-1500 kN
 M: 2000-6000 kN
 N: 7000-10000 kN
 Ma: Stroke 225 mm: 110 mm
 Stroke 350-400 mm: 115 mm

Fastening thread
 M: up to 2000 kN: M20x1.5
 from 3000 kN: M26x1.5

Reducer
 M26x1.5-M20x1.5
 Order No. W-182.21

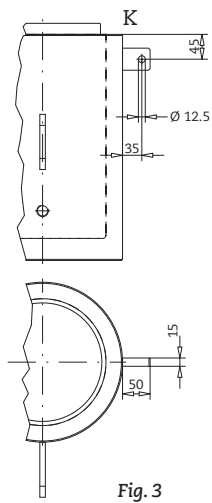


Fig. 3

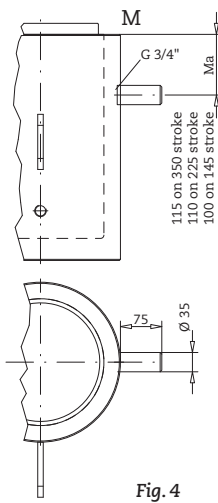


Fig. 4

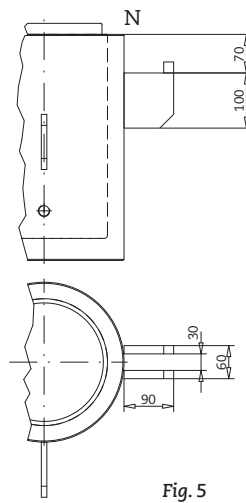


Fig. 5

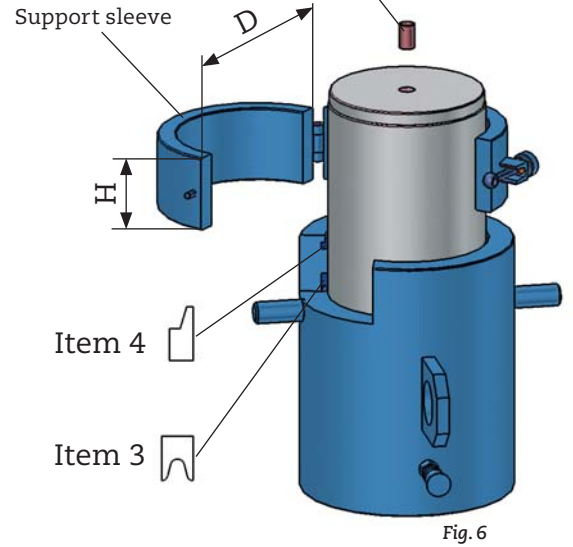


Fig. 6

Load capacity may be exceeded by max. 10%! Ensure safety against overturning, see operating instructions. Eccentricity ±15% of D1	Detensifying cylinder										
	Load capacity kN	Pressure bar	Stroke mm	Piston area cm ²	Capacity ltr.	Diameter (mm)		Overall length (mm) retracted		Weight kg	Order No.
						Outside D. D	Piston D1	L	L1		
200	353	225	56.7	1.3	130	85	350	340	37	79-061.02	
		350		2.0			475	465	50	79-061.25	
350	446	225	78.5	1.8	150	100	355	345	49	79-061.03	
		350		2.7			480	470	66	79-061.26	
500	407	225	122.7	2.8	180	125	380	365	75	79-061.04	
		350		4.3			505	490	100	79-061.27	
700	424	225	165.1	3.7	200	145	390	375	95	79-061.05	
		350		5.8			515	500	125	79-061.28	
1000	393	225	254.5	5.7	250	180	400	385	152	79-061.06	
		350		8.9			545	530	207	79-061.29	
1500	413	225	363.1	8.2	290	215	430	410	219	79-061.07	
		350		12.7			580	560	295	79-061.23	
2000	407	225	490.9	11.0	340	250	430	410	300	79-061.08	
		350		17.2			585	565	410	79-061.30	
		400		19.6			635	615	445	79-061.39	
3000	424	225	706.9	15.9	400	300	455	435	441	79-061.09	
		350		24.7			610	590	590	79-061.31	
		400		28.3			660	640	590	79-061.44	
4000	441	225	907.9	20.4	450	340	480	460	590	79-061.10	
		350		31.8			640	620	790	79-061.32	
5000	441	225	1134.1	25.5	510	380	510	490	800	79-061.11	
		350		39.7			675	655	1060	79-061.33	
		400		45.4			725	705	1150	79-061.38	
6000	413	225	1452.2	32.7	580	430	550	530	1130	79-061.37	
7000	440	270	1590.4	42.9	600	450	625	605	1370	79-061.34	
		400		63.6			780	760	1710	79-061.36	
10000	453	270	2206.2	59.6	710	530	695	675	2135	79-061.35	
		400		88.3			855	835	2632	79-061.42	

Hydraulic pump units

The hydraulic cylinders are operated from PAUL motor pump units that are available with single or double tanks (useful oil capacity: 50, 80, 100 or 160 ltr.).



Fig. 7: Hydraulic pump unit with four 1500 kN detensioning cylinders

Support sleeves

The support sleeves are in the form of rings that are divided, hinged at one side and provided with a quick acting closure on the other. During production, the transverse anchor plate rests against the support sleeves that are supported in turn against the hydraulic cylinders. During this period the cylinders are relieved of pressure.

Stroke (mm)	Number of support sleeves
225	2 x 100 mm or 5 x 40 mm
270	2 x 100 mm, 1 x 40 mm or 7 x 40 mm
350	3 x 100 mm or 8 x 40 mm
400	3 x 100 mm, 1 x 40 mm or 10 x 40 mm

Hydraulic couplings

Straight or angled couplings can be used. The connector plugs are fitted to the hoses.



Fig. 8

	Order No.
Coupling sleeve SVM 3/8"	13-069.30
Angled coupling sleeve SVM 3/8"	13-069.33

Hydraulic hoses

See brochure "Hydraulic Pump Unit"
PAUL-Info B 130.01/1

Load capacity kN	Seals		Support sleeves 100 mm				Support sleeves 40 mm			
	Collar Item 3	Scraper ring Item 4	D mm	H mm	Weight kg	Order No.	D mm	H mm	Weight kg	Order No.
	Order No. (Dimensions)	Order No. (Dimensions)								
200	25-270.18 (85x105x14.5)	25-266.23 (85x97x12)	114	110	3.0	11-324.40	114	40	1.0	79-020.13
350	25-272.02 (100x120x14.5)	25-271.03 (100x112x12)	133	110	4.5	11-324.41	133	40	1.5	79-020.14
500	25-272.13 (125x145x14.5)	25-272.11 (125x140x16)	159	115	5.5	11-324.42	159	40	2.0	79-020.15
700	25-274.15 (145x165x15)	25-274.12 (145x160x16)	178	115	7.0	11-324.43	178	40	2.5	79-020.16
1000	25-277.04 (180x200x15)	25-277.03 (180x200x18)	229	115	12.0	11-324.44	229	40	4.5	79-020.17
1500	25-301.25 (215x235x25)	25-301.23 (215x235x18)	267	120	16.0	11-324.45	267	40	5.5	79-020.18
2000	25-303.07 (250x270x25)	25-303.03 (250x270x18)	318	120	24.5	11-324.46	318	40	8.5	79-020.19
3000	25-303.21 (300x320x25)	25-303.20 (300x320x18)	368	120	29.5	79-020.12	368	40	10.0	79-020.20
4000	25-303.26 (340x356x11)	25-303.25 (340x360x18)	-	-	-	-	419	40	13.0	79-020.34
5000	25-303.31 (380x396x11)	25-303.30 (380x410x25)	-	-	-	-	470	40	16.5	79-020.35
6000	25-304.43 (430x453x15)	25-304.44 (430x455x20)	-	-	-	-	521	40	20.0	79-020.57
7000	25-304.36 (450x473x15)	25-304.35 (450x470x18)	-	-	-	-	546	40	22.0	79-020.53
10000	25-304.38 (530x553x15)	25-304.37 (530x550x18)	-	-	-	-	622	40	24.0	79-020.54

Hydraulic-cylinder mounting

Order No.	X mm	Y mm	Z mm	W mm	C mm	G mm	Hydr. Cylinder from to kN
79-040.00	340	1200	270	45	1000	M16	200-1500
79-041.00	355	1200	270	45	1000	M16	200-1500
79-041.03	375	1200	270	45	1000	M16	200-1500
79-041.04	475	1500	270	45	1300	M16	200-1500
79-042.00	355	1200	270	100	1000	M16	2000-6000
79-042.03	375	1200	270	100	1000	M16	2000-6000
79-042.04	475	1500	270	100	1300	M16	2000-6000
79-060.08	-	-	505	70	-	M26x1.5	7000-10000

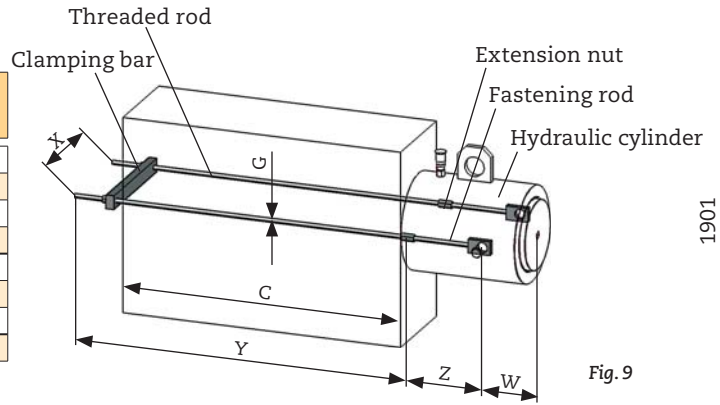


Fig. 9

Turnbuckle sets (set = 2 pieces) for welding on

Order No.	for cylinder
88-053.03	200-1500 kN
88-053.13	2000-6000 kN
79-060.08	7000-10000 kN

Extension (set = 2 pieces) for 350 mm stroke cyl.

Order No.	for cylinder
88-053.32	up to 1500 kN
88-053.33	from 2000 kN

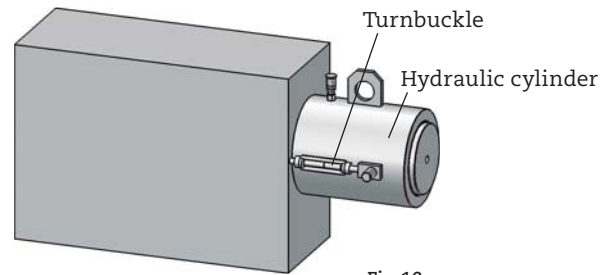


Fig. 10

Support stands for sliding mould production

U-shaped support sleeves are primarily used in conjunction with detensioning anchors. They are only suitable if the object to be supported is sufficiently stable.

Type kN	Order No.	H mm	Weight kg
700	79-020.38	115	12
1000	79-020.39	115	17
1500	79-020.40	115	20
2000	79-020.56	115	22

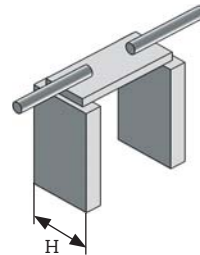


Fig. 11

Special cylinders

PAUL supplies special cylinders of all types on inquiry, e.g. double-acting cylinders, special double-acting cylinders with threaded piston and adjusting nut, synchronized stressing cylinders with measuring device, etc.

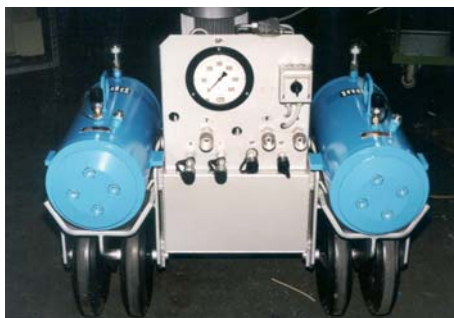


Fig. 12: 1500 kN/350 mm stroke double-acting detensioning cylinders with hydraulic pump unit



Fig. 13: 1500 kN/1300 mm stroke synchronized detensioning cylinders with automatically tightened adjusting ring nut



Fig. 14: 4000 kN/300 mm stroke threaded-piston cylinder, double acting