

Linear hydraulic motors of the ZH1/2T series

TECHNICAL DESCRIPTION – PRODUCT FUNCTION

The ZH1/2T linear hydraulic motor is the element that converts the pressure energy to the mechanical energy – to the axial power of the piston rod in both directions. They have – by their construction – no special demands for service and maintenance. It is necessary to obey the service and technical conditions for perfect and secure functionality.

ZH2T is a hydraulic motor with non-regulated damping (reduction of the piston rod travel speed) in end positions - however, we may not guarantee the efficiency of damping. If precise damping is required, we must provide a custom design.

A hydraulic motor is assembled from a tube with precisely machined internal diameter, tolerance H8. On the tube there are welded the connection necks for inlet of the pressure oil with internal thread.

The lids for piston rod guidance with the sealing elements are screwed into the tube of cylinder cover from both sides. The piston rod is symmetric (through) and as at the previous types grinded, polished and chromed with the tolerance f7. This type of the piston rod secures constant speed and power ratio during the piston rod travel in both directions.

OPERATING CONDITIONS

The linear hydraulic motors of this kind do not require any special demands for service and maintenance.

- the mounting of LHM must be done under conditions preventing the damage of function parts and which secure the protection of inner space against penetration of impurities
- properly provide the connection of LHM to the pressure source (danger of oil pressure decrease) and the mounting of LHM into the kinematic system of the given machine/device
- the work position of LHM is optional if not otherwise specified
- radial load of the piston rod by external force or its rotations during working time are not allowed
- take care during the work to prevent the mechanical damages of the piston rod
- the hydraulic motor must not be loaded in the end positions by external force or by power of steady mass corresponding to 1.25 multiple of rated pressure
- when mounted into the machine's mechanical parts (or into some device) the possibility of swiveling of hydraulic cylinder body must be secured in transverse direction in the area of allowed swiveling of knuckle bearing
- LHM must not be exposed to any aggressive agents, aggressiveness of which would exceed the guaranteed resistance value for the motor piston rod used. The resistance value is specified in technical conditions.

TECHNICAL CONDITIONS

Work liquid	- hydraulic mineral oil (OH-HM 32, OH-HM 46, OH-HM 64)
Required filtration	- min. 40 µm, we recommend 25 µm
Temperature scope	- liquid -20°C ÷ +80°C - ambient -20°C ÷ +70°C
Climatic stability	- temperate climate WT
Rated pressure	- 20 MPa
Maximum pressure	- 25 MPa
Test pressure	- 32 MPa
Work speed	- maximum 0,5 m·s ⁻¹
The piston rod resistance value in the salt chamber pursuant to ISO 4540	- 120 hours

MARKING

Each hydraulic motor manufactured in our factory is marked with following data:

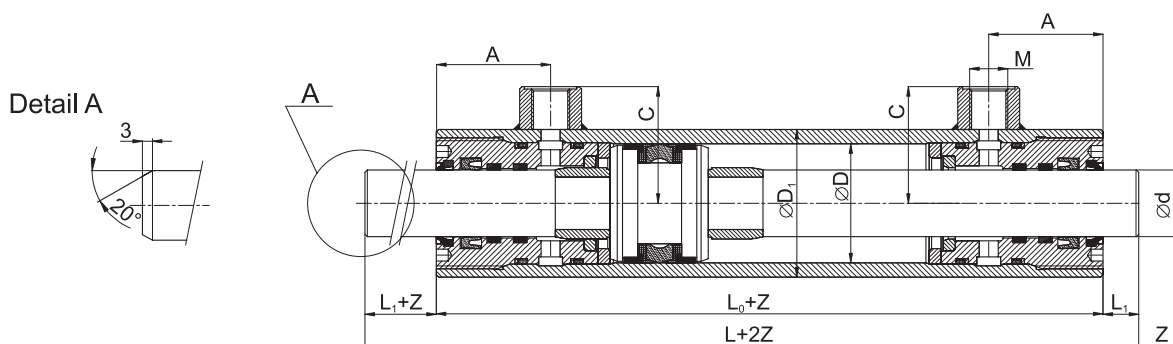
HYDRAULICS SEHRADICE
ZH1/2T D/d x Z R / K /
MAX.OPERATING PRESSURE
SERIAL NUMBER

Part of the item delivery is the accompanying documentation containing

ITEM SAFEGUARD and
QUALITY CERTIFICATE /document details see page no. 97-98/.

ZH1/2T Series

for P_{max} 25 MPa



$\varnothing D$	$\varnothing d$	$\varnothing D_1$	L	L_0	L_1	M	A	C	Weight under given lift Z
32	18	42	160	140	10	12x1,5	40	39	2,63 + Z x 0,00660
32	20	42	160	140	10	12x1,5	40	39	2,70 + Z x 0,00710
40	22	50	170	150	10	16x1,5	40	44	3,37 + Z x 0,00860
40	25	50	170	150	10	16x1,5	40	44	3,52 + Z x 0,00950
45	25	55	175	155	10	16x1,5	45	45,5	5,29 + Z x 0,01002
45	28	55	175	155	10	16x1,5	45	45,5	5,40 + Z x 0,01010
50	25	62	210	180	15	16x1,5	48	49	6,48 + Z x 0,01214
50	28	62	210	180	15	16x1,5	48	49	6,54 + Z x 0,01312
55	28	70	210	180	15	16x1,5	50	53	7,49 + Z x 0,01640
55	32	70	210	180	15	16x1,5	50	53	7,65 + Z x 0,01787
60	32	75	220	190	15	16x1,5	53	55,5	9,30 + Z x 0,01880
60	36	75	220	190	15	16x1,5	53	55,5	9,51 + Z x 0,02047
63	36	78	230	200	15	16x1,5	55	57	10,59 + Z x 0,02103
63	40	78	230	200	15	16x1,5	55	57	10,80 + Z x 0,02290
65	36	80	240	210	15	22x1,5	58	58	12,45 + Z x 0,02140
65	40	80	240	210	15	22x1,5	58	58	12,90 + Z x 0,02327
70	40	85	260	220	20	22x1,5	60	60,5	15,90 + Z x 0,02420
70	45	85	260	220	20	22x1,5	60	60,5	16,06 + Z x 0,02680
75	40	90	275	235	20	22x1,5	63	63	17,80 + Z x 0,02512
75	45	90	275	235	20	22x1,5	63	63	18,35 + Z x 0,02773
80	45	95	280	240	20	22x1,5	65	65,5	21,40 + Z x 0,02866
80	50	95	280	240	20	22x1,5	65	65,5	22,10 + Z x 0,03160
90	50	105	310	260	25	22x1,5	70	70,5	26,25 + Z x 0,03344
90	55	105	310	260	25	22x1,5	70	70,5	26,71 + Z x 0,03668
100	55	120	340	290	25	27x2	80	82	38,84 + Z x 0,04578
100	63	120	340	290	25	27x2	80	82	39,92 + Z x 0,05160
110	63	130	360	300	30	27x2	85	87	49,06 + Z x 0,05406
110	70	130	360	300	30	27x2	85	87	49,96 + Z x 0,05980

Piston rod lift according to the customer's wish.

Lifts higher than maximum recommended need to be controlled for the ultimate strength.

The standard end of the piston rod is referenced as ending according to detail A.

The weights are informative within scope of $\pm 5\%$ in kg.

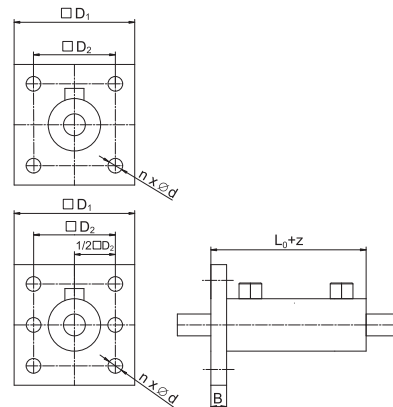
ZH1/2T

Linear hydraulic motors

Linear hydraulic motors ZH1/2T gripping

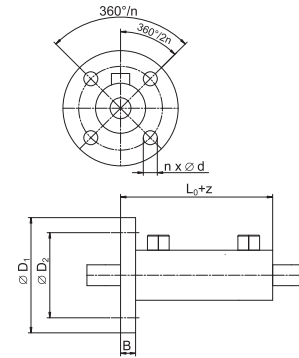
Gripping ZH1/2T - A

Cylinder	D ₁	D ₂	B	∅d	n	L ₀
32	67	50	10	8.4	4	140
40	98	80	12	8.4	6	150
45	103	85	12	10.5	6	155
50	113	95	13	10.5	6	180
55	118	100	13	10.5	6	180
60	128	108	13	10.5	6	190
63	138	115	15	13	6	200
65	138	115	15	13	6	210
70	148	120	15	13	6	220
75	155	130	16	15	6	235
80	168	140	18	15	6	240
90	178	150	20	15	6	260
100	200	170	20	17	6	290
110	210	180	22	17	6	300



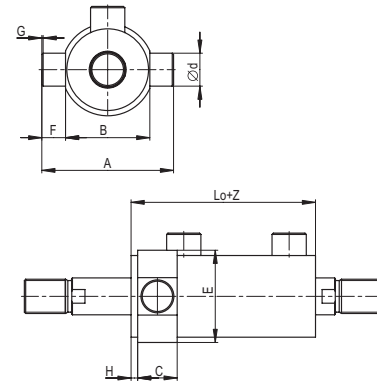
Gripping ZH1/2T - B

Cylinder	∅D ₁	∅D ₂	B	∅d	n	L ₀
32	88	70	10	8.4	4	140
40	98	80	12	8.4	6	150
45	103	85	12	8.4	6	155
50	113	95	13	10.5	6	180
55	118	100	13	10.5	6	180
60	128	108	13	10.5	6	190
63	138	115	15	13	6	200
65	138	115	15	13	6	210
70	148	120	15	13	6	220
75	155	130	16	13	6	235
80	168	140	18	15	6	240
90	178	150	20	15	6	260
100	198	170	20	17	6	290
110	208	180	22	17	6	300



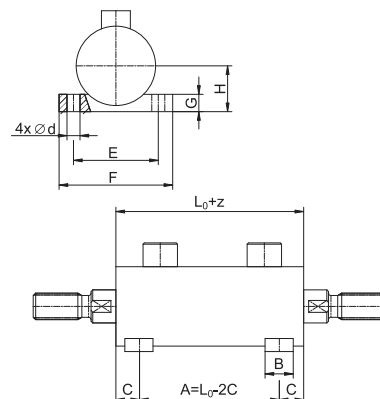
Gripping ZH1/2T - C

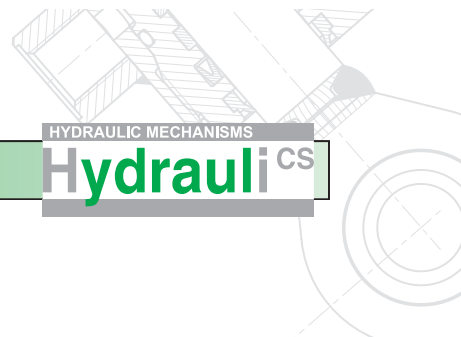
Cylinder	A	B h11	C	∅df8	E	F	Gx45°	H	K	L ₀
32	90	55	28	20	53	17.5	1	5	19	140
40	105	65	28	20	65	20	1	5	19	150
45	110	70	33	25	70	20	1	5	22	155
50	120	80	33	25	80	20	1	5	22	180
55	135	90	35	25	90	22.5	1	5	23	180
60	140	95	35	25	95	22.5	1	7	25	190
63	150	100	40	30	100	25	1.5	7	27	200
65	155	105	40	30	100	25	1.5	7	27	210
70	160	110	40	30	105	25	1.5	7	27	220
75	180	120	45	35	115	30	1.5	7	30	235
80	185	125	45	35	115	30	1.5	8	31	240
90	205	135	50	40	135	35	1.5	8	33	260
100	220	150	55	45	150	35	1.5	10	38	290
110	240	160	60	50	160	40	1.5	10	40	300



Gripping ZH1/2T - D

Cylinder	B h11	C	∅d	E	F	G	H	L ₀
32	20	15	10.5	65	88	10	27	140
40	24	20	10.5	75	100	12	31	150
45	24	20	13	80	105	12	35	155
50	24	20	13	88	110	14	38	180
55	26	20	13	98	123	16	43	180
60	30	25	15	107	135	16	47	190
63	30	25	15	110	138	18	50	200
65	30	25	15	110	138	18	50	210
70	34	27	17	118	150	20	55	220
75	34	27	17	125	158	20	55	235
80	40	30	21	140	180	24	60	240
90	40	30	21	150	190	24	65	260
100	48	34	25	170	215	26	75	290
110	48	34	25	180	230	26	80	300

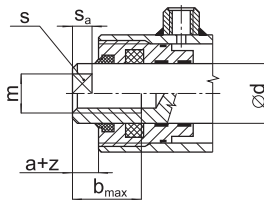




Linear hydraulic motors

Piston rod end for hydraulic motors ZH1/2, ZH1/2T

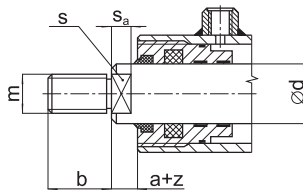
Variant: no. 2, 3 - we recommend to design according to lifting eyes (page 75÷90)



internal thread

variant 2

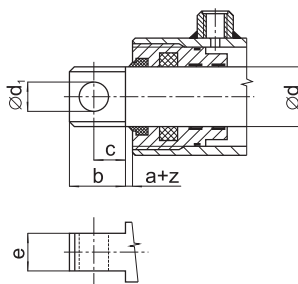
$\varnothing d$	20	22	25	28	32	36	40	45	50	55	63	70
m	14x1.5	16x1.5	18x1.5	20x1.5	24x1.5	24x1.5	27x2	27x2	30x2	36x2	42x2	42x2
a	12	12	15	17	17	20	20	20	25	25	30	30
b_{max}	40	40	56	56	60	70	70	70	80	90	90	100
s	18	19	22	24	28	30	36	38	41	46	55	60
Sa	8	8	10	12	12	15	15	15	18	18	20	20



external thread

variant 3

$\varnothing d$	18	20	22	25	28	32	36	40	45	50	55	63	70
m	16x1.5	16x1.5	16x1.5	18x1.5	20x1.5	24x1.5	24x1.5	27x2	27x2	30x2	36x2	42x2	42x2
a	12	12	12	15	17	17	20	20	20	25	25	30	30
b	20	20	20	30	30	34	40	40	40	45	50	60	60
s	16	18	19	22	24	30	32	36	41	46	50	60	65
Sa	8	8	8	10	12	12	15	15	15	18	18	20	20



neck hole

variant 4

$\varnothing d$	18	20	22	25	28	32	36	40	45	50	55	63	70
$\varnothing d_1$	10	12	12	14	15	17	20	22	26	28	30	40	50
a	6	6	8	8	8	10	10	12	12	15	15	18	18
b	25	30	35	40	45	50	60	70	80	95	100	120	135
c	15	18	22	25	29	31	36	43	50	59	64	80	85
e	13	15	16	18	20	24	26	28	32	34	38	40	46

$\varnothing d_1$ - max. hole for $p = 25$ MPa

The highlighted dimensions are default.

Linear hydraulic motors

Ordering code

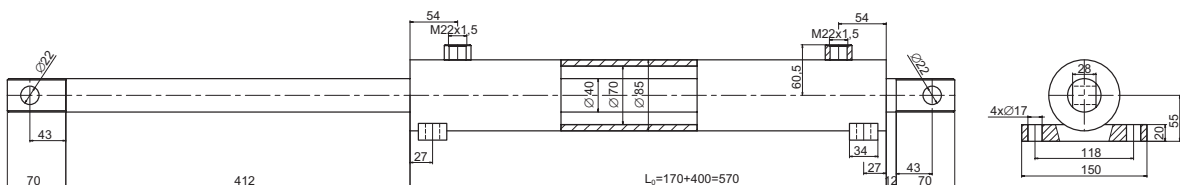
For standard linear hydraulic motors
ZH1/2 a ZH1/2T Series
 Acc. to the table on page 45, 49.

And for linear hydraulic motors using the construction module L_0 and another then standard piston rods ends and connection eyes ends.

			X																
<p>ZH1/2, ZH1/2 - A, ZH1/2 - B, ZH1/2 - C, ZH1/2 - D, ZH1/2T, ZH1/2T - A, ZH1/2T - B, ZH1/2T - C, ZH1/2T - D,</p>								<p>Cylinder cover eye marking - (in case of not employing any eye from our catalogue fill in 0 to the code) - page 75÷90.</p> <p>Piston rod eye marking - (in case of not employing any eye from our catalogue fill in 0 to the code) - page 75÷90.</p> <p>Piston rod end - (for single solution without rod eye the highlighted dimensions are valid. In case of not employing any eye from our catalogue fill in 0 to the code) - page 51.</p> <p>Lift - due to Your actual need - it is necessary to check the maximal possible lift because of the ultimate strength - the diagram of ultimate strength can be helpful according to Euler page 93.</p>											
				<p>Piston rod diameter</p> <table border="1" style="display: inline-table; border-collapse: collapse;"> <thead> <tr> <th>$\varnothing D$</th> <th>$\varnothing d$</th> <th>$\varnothing D_1$</th> <th>L</th> </tr> </thead> <tbody> <tr> <td>32</td> <td>18</td> <td>42</td> <td>130</td> </tr> <tr> <td>40</td> <td>22</td> <td>50</td> <td>140</td> </tr> </tbody> </table>				$\varnothing D$	$\varnothing d$	$\varnothing D_1$	L	32	18	42	130	40	22	50	140
$\varnothing D$	$\varnothing d$	$\varnothing D_1$	L																
32	18	42	130																
40	22	50	140																
				<p>Rated diameter of cylinder</p> <table border="1" style="display: inline-table; border-collapse: collapse;"> <thead> <tr> <th>$\varnothing D$</th> <th>$\varnothing d$</th> <th>$\varnothing D_1$</th> <th>L</th> </tr> </thead> <tbody> <tr> <td>32</td> <td>18</td> <td>42</td> <td>130</td> </tr> <tr> <td>40</td> <td>22</td> <td>50</td> <td>140</td> </tr> </tbody> </table>				$\varnothing D$	$\varnothing d$	$\varnothing D_1$	L	32	18	42	130	40	22	50	140
$\varnothing D$	$\varnothing d$	$\varnothing D_1$	L																
32	18	42	130																
40	22	50	140																

Example:

ZH1/2-D-70/40x400-4-0-0



Customer's form

CUSTOMER'S FORM

Company ID
 Contact person tel/fax/e-mail

Linear hydraulic motor: piston diameter / rod diameter / lift

Plunger - without guided piston - with piston rod pull-out end stop in cylinder
 - with guided piston - without end stop (with piston rod pull-out end stop on the construction)

-piston rod return movement - mechanically - by external force
 - by spring in the plunger

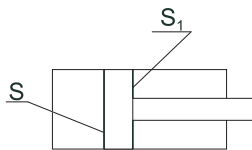
Single acting linear hydraulic motor - it is exactly double acting linear hydraulic motor where the pressure oil is in one chamber only - the second one is filled with air.

Double acting linear hydraulic motor

Double acting linear hydraulic motor - with continuous piston rod

- damping at end positions - no - yes

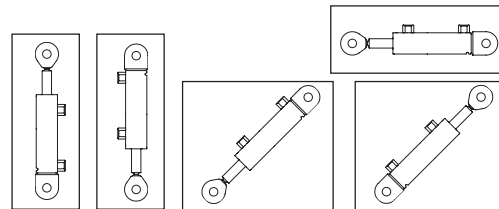
without regulation
 regulation of both positions
 regulation on piston rod pull-out - S_1
 regulation on piston rod pull-in - S



Operating parameters

Pressure min. S_1 MPa
 Pressure min. S MPa
 Operating pressure S_1 MPa
 Operating pressure S MPa
 Pressure max. S_1 MPa
 Pressure max. S MPa
 Pressure peak S_1 MPa
 Pressure peak S MPa

Piston rod pull-out speed m/s
 Piston rod pull-in speed m/s
 Oil temperature °C
 Ambient temperature °C
 Working medium
 Working position of the hydraulic motor



Operating conditions

Type of device
 Function of the hydraulic motor
 Work intensity (cycles/hour, min, sec, ...)
 Provoz occasional one-working two-working three-working continual

Operating environment

Weather conditions Dust Clear Water chem. corrosive Other

Hydraulic motor drawing

Technical parameters of used materials

Commonly used types

CYLINDER COVER - the tube welded and calibrated within the inner diameter allowance
H9 - Rm = 570 MPa - DIN 2393

- the tube cold-drawn and rolled or honed within the inner diameter allowance
H8 - Rm = 570 MPa - DIN 2391

BAR

- 20MnV6 - bar with a chrome layer 20-30 μm - Rm = 500 MPa

- 42CrMo4V - bar with a chrome layer 20-30 μm - Rm = 900 MPa

- HIPERCHOM 200 - material 20MnV6 - bar with a chrome layer c. 50 μm -
Rm = 500 MPa - resistance in soil chamber 200 hours to defined damage

- NiCr 350 - material 20MnV6 - common bar with a chrome and nickel layers -
Rm = 500 MPa - resistance in soil chamber 350 hours to defined damage

- Ck 45 or C50 - surface-hardened bar with a chrome layer 20-30 μm - Rm = 500 MPa

- 42CrMo4V - IH - surface-hardened bar with a chrome layer 20-30 μm - Rm = 900 MPa

- stainless steel rod with hardened chrome surface finish 20-30 μm

