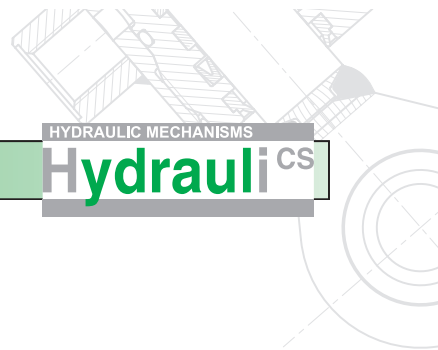


ZH2T



Linear hydraulic motors of the ZH2T series

TECHNICAL DESCRIPTION – PRODUCT FUNCTION

The ZH2T 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. To ensure save and trouble-free operation, operational and technical conditions must be complied with. 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, please, select LHM type ZH2RT or ISO 6022.

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 and the plug together with solid cylinder eye.

Both the cylinder eye and piston rod eye are equipped with the knuckle bearing as standard. The lid for piston rod guidance with the sealing elements is screwed into the tube of cylinder cover. On the grinded – polished and chromed piston rod with the dimension tolerance f7 there is the connection eye welded from one side and the second end is equipped with the piston.

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 radial force, caused by the LHM camber of own weight) 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
ZH2T D/d x Z R / K /
MAX.OPERATING PRESSURE
SERIAL NUMBER

Part of the item delivery is the accompanying documentation containing

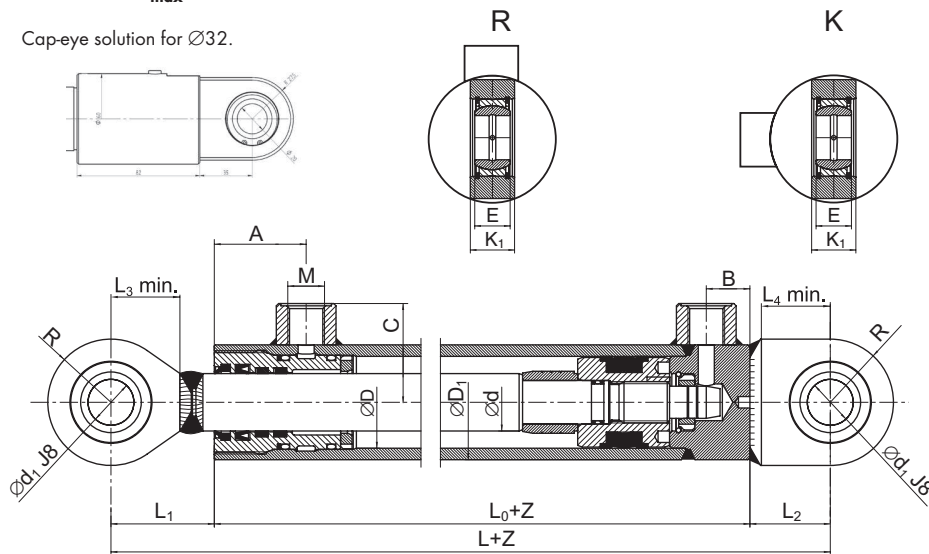
ITEM SAFEGUARD and
QUALITY CERTIFICATE /document details see page no. 97-98/.

ZH2T

ZH2T Series for P_{max} 25 MPa

Position of the screws joint to the swing plane

Cap-eye solution for $\varnothing 32$.



ØD	Ød	ØD ₁	Ød ₁	L	L ₀	L ₁	L ₂	L ₃ ±1	L ₄ ±1	M	A	B	C	E	K ₁	R	Maximum recom. lift acc. to selected Ød	Weight under given lift Z
32	18	42	20	205	125	45	35	30	30	12x1,5	42	10	39	16	20	27,5	160	2,00 + Z x 0,00656
32	20	42	20	205	125	45	35	30	30	12x1,5	42	10	39	16	20	27,5	220	2,00 + Z x 0,00703
40	22	50	20	215	135	45	35	30	30	16x1,5	42	15	43	16	20	27,5	200	2,70 + Z x 0,00853
40	25	50	20	215	135	45	35	30	30	16x1,5	42	15	43	16	20	27,5	290	2,90 + Z x 0,00940
45	25	55	25	225	137	50	38	33	33	16x1,5	45	16	45,5	20	25	32,5	240	3,15 + Z x 0,01000
45	28	55	25	225	137	50	38	33	33	16x1,5	45	16	45,5	20	25	32,5	340	3,31 + Z x 0,01100
50	25	62	25	250	162	50	38	33	33	16x1,5	48	16	49	20	25	32,5	200	4,60 + Z x 0,01214
50	28	62	25	250	162	50	38	33	33	16x1,5	48	16	49	20	25	32,5	280	4,70 + Z x 0,01312
55	28	70	25	260	161	57	42	37	36	16x1,5	50	17	53	20	25	35	240	4,39 + Z x 0,01640
55	32	70	25	260	161	57	42	37	36	16x1,5	50	17	53	20	25	35	350	4,57 + Z x 0,01787
60	32	75	25	265	166	57	42	37	36	16x1,5	53	16	55,5	20	25	35	310	5,78 + Z x 0,01880
60	36	75	25	265	166	57	42	37	36	16x1,5	53	16	55,5	20	25	35	420	6,83 + Z x 0,02047
63	36	78	30	285	175	65	45	44	39	16x1,5	58	16	57	22	28	42,5	390	7,35 + Z x 0,02103
63	40	78	30	285	175	65	45	44	39	16x1,5	58	16	57	22	28	42,5	510	7,58 + Z x 0,02290
65	36	80	30	290	180	65	45	44	39	22x1,5	58	22	58	22	28	42,5	370	8,55 + Z x 0,02140
65	40	80	30	290	180	65	45	44	39	22x1,5	58	22	58	22	28	42,5	490	8,66 + Z x 0,02327
70	40	85	30	295	185	65	45	44	39	22x1,5	58	23	60,5	22	28	42,5	440	9,35 + Z x 0,02420
70	45	85	30	295	185	65	45	44	39	22x1,5	58	23	60,5	22	28	42,5	600	9,56 + Z x 0,02680
75	40	90	35	335	205	75	55	53	48	22x1,5	63	23	63	25	30	47,5	380	10,82 + Z x 0,02512
75	45	90	35	335	205	75	55	53	48	22x1,5	63	23	63	25	30	47,5	530	11,03 + Z x 0,02774
80	45	95	35	340	205	80	55	53	48	22x1,5	65	25	65,5	25	30	47,5	480	14,10 + Z x 0,02866
80	50	95	35	340	205	80	55	53	48	22x1,5	65	25	65,5	25	30	47,5	630	15,00 + Z x 0,03160
90	50	105	40	375	230	85	60	57	53	22x1,5	70	28	70,5	28	35	52,5	530	18,50 + Z x 0,03344
90	55	105	40	375	230	85	60	57	53	22x1,5	70	28	70,5	28	35	52,5	680	19,50 + Z x 0,03668
100	55	120	45	410	250	95	65	67	57	27x2	80	30	82	32	38	60	570	27,00 + Z x 0,04578
100	63	120	45	410	250	95	65	67	57	27x2	80	30	82	32	38	60	810	27,50 + Z x 0,05160
110	63	130	50	430	255	105	70	70	62	27x2	85	30	87	35	40	62,5	710	28,88 + Z x 0,05406
110	70	130	50	430	255	105	70	70	62	27x2	85	30	87	35	40	62,5	930	30,50 + Z x 0,05980
125	63	155	60	510	300	120	90	78	75	33x2	104	32	99,5	44	50	80	560	58,50 + Z x 0,07700
125	70	155	60	510	300	120	90	78	75	33x2	104	32	99,5	44	50	80	750	59,50 + Z x 0,08300
140	70	170	70	540	310	130	100	85	85	33x2	110	32	107	49	55	90	630	74,00 + Z x 0,08800
140	80	170	70	540	310	130	100	85	85	33x2	110	32	107	49	55	90	900	75,20 + Z x 0,09600
160	80	190	80	605	345	150	110	100	90	42x2	120	40	120	55	60	100	730	105,50 + Z x 0,10400
160	90	190	80	605	345	150	110	100	90	42x2	120	40	120	55	60	100	1000	107,70 + Z x 0,11500
180	90	210	90	645	365	150	130	110	110	42x2	128	40	130	60	70	110	830	141,00 + Z x 0,12200
180	100	210	90	645	365	150	130	110	110	42x2	128	40	130	60	70	110	1100	143,60 + Z x 0,13400
200	100	245	100	725	415	170	140	120	120	42x2	155	48	147,5	70	75	120	920	207,20 + Z x 0,18500
200	110	245	100	725	415	170	140	120	120	42x2	155	48	147,5	70	75	120	1190	210,00 + Z x 0,19800

Piston rod lift according to the customer's wish.

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

The articulated bearing is designed also for lubrication with the pin.

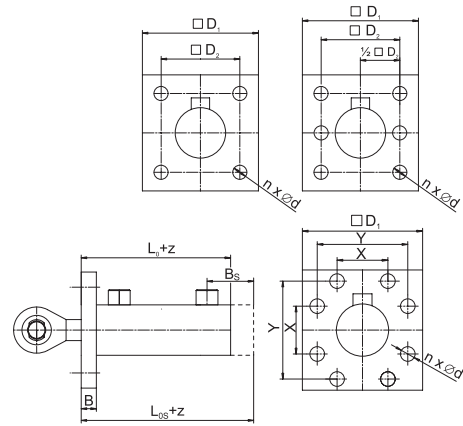
The weights are informative within scope of ± 5% in kg.

ZH2T Series hydraulic motors gripping

Gripping ZH2T-A

ZH2T-AS

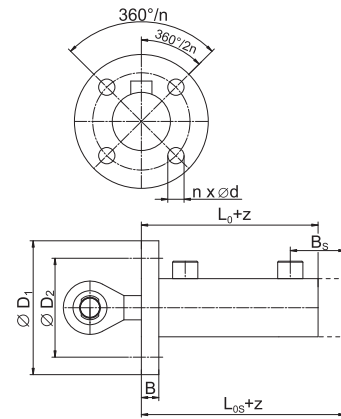
Cylinder	D ₁	D ₂	B	Ød	X	Y	n	L ₀	L _{0s}	B _s
32	67	50	10	8,4			4		125	10
40	98	80	12	8,4			6	135	164	40
45	103	85	12	10,5			6	137	169	44
50	113	95	13	10,5			6	162	192	49
55	118	100	13	10,5			6	161	195	52
60	128	108	13	10,5			6	166	204	53
63	138	115	15	13			6	175	215	55
65	138	115	15	13			6	180	215	55
70	148	120	15	13			6	185	221	58
75	155	130	16	15			6	205	242	62
80	168	140	18	15			6	205	242	62
90	178	150	20	15			6	230	277	72
100	200	170	20	17			6	250	296	77
110	210	180	22	17			6	255	310	83
125	240		25	17	90	180	8	300	392	122
140	265		28	21	90	210	8	310	405	125
160	280		28	25	120	230	8	345	437	136
180	295		35	25	130	250	8	365	464	143
200	350		35	31	150	290	8	415	526	143



Gripping ZH2T-B

ZH2T-BS

Cylinder	ØD ₁	ØD ₂	B	d	n	L ₀	L _{0s}	B _s
32	88	70	10	8,4	4		125	10
40	98	80	12	8,4	6	135	164	40
45	103	85	12	8,4	6	137	169	44
50	113	95	13	10,5	6	162	192	49
55	118	100	13	10,5	6	161	195	52
60	128	108	13	10,5	6	166	204	53
63	138	115	15	13	6	175	215	55
65	138	115	15	13	6	180	215	55
70	148	120	15	13	6	185	221	58
75	155	130	16	13	6	205	242	62
80	168	140	18	15	6	205	242	62
90	178	150	20	15	6	230	277	72
100	198	170	20	17	6	250	296	77
110	208	180	22	17	6	255	310	83
125	237	205	25	17	8	300	392	122
140	267	230	28	21	8	310	405	125
160	305	260	28	25	8	345	437	136
180	330	285	35	25	8	365	464	143
200	380	330	35	31	8	415	526	143

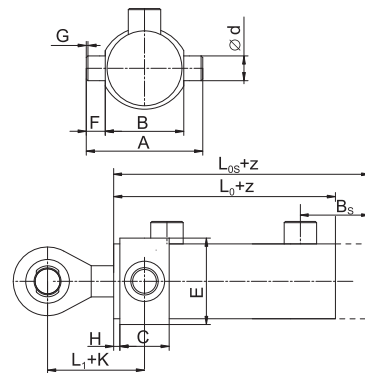


ZH2T

Gripping ZH2T-C

ZH2T-CS

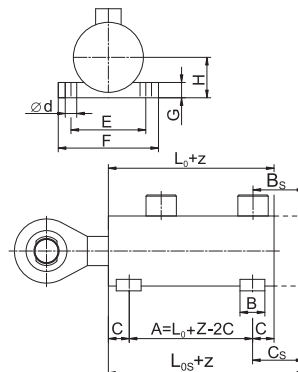
Cylinder	A	B h11	C	d f8	E	F	Gx45°	H	K	L ₀	L _{0s}	B _s
32	90	55	28	20	53	17,5	1	5	19		125	10
40	105	65	28	20	65	20	1	5	19	135	164	40
45	110	70	33	25	70	20	1	5	22	137	169	44
50	120	80	33	25	80	20	1	5	22	162	192	49
55	135	90	35	25	90	22,5	1	5	23	161	195	52
60	140	95	35	25	95	22,5	1	7	25	166	204	53
63	150	100	40	30	100	25	1,5	7	27	175	215	55
65	155	105	40	30	100	25	1,5	7	27	180	215	55
70	160	110	40	30	105	25	1,5	7	27	185	221	58
75	180	120	45	35	115	30	1,5	7	30	205	242	62
80	185	125	45	35	115	30	1,5	8	31	205	242	62
90	205	135	50	40	135	35	1,5	8	33	230	277	72
100	220	150	55	45	150	35	1,5	10	38	250	296	77
110	240	160	60	50	160	40	1,5	10	40	255	310	83
125	295	195	80	60	195	60	2	10	50	300	392	122
140	335	215	90	70	215	60	2	15	60	310	405	125
160	380	240	100	80	240	70	2	18	68	345	437	136
180	420	260	110	90	260	80	2	20	75	365	464	143
200	480	300	120	100	300	90	2	25	85	415	526	143



Gripping ZH2T-D

ZH2T-DS

Cylinder	B	C	Ød	E	F	G	H	L ₀	L _{0s}	C _s	B _s
32	20	15	10,5	65	88	10	36		125	15	10
40	24	20	10,5	75	100	12	31	135	164	49	40
45	24	20	13	80	105	12	35	137	169	52	44
50	24	20	13	88	110	14	38	162	192	50	49
55	26	20	13	98	123	16	43	161	195	54	52
60	30	25	15	107	135	16	47	166	204	63	53
63	30	25	15	110	138	18	50	175	215	65	55
65	30	25	15	110	138	18	50	180	215	60	55
70	34	27	17	118	150	20	55	185	221	63	58
75	34	27	17	125	158	20	55	205	242	64	62
80	40	30	21	140	180	24	60	205	242	67	62
90	40	30	21	150	190	24	65	230	277	77	72
100	48	34	25	170	215	26	75	250	296	80	77
110	48	34	25	180	230	26	80	255	310	89	83



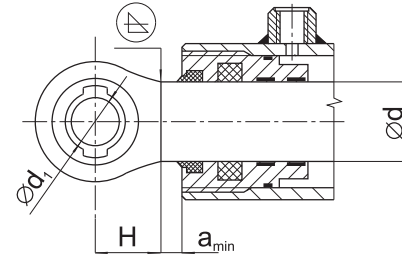
Dimensions LOS, BS and CS apply to the LHM design with a screwed plug.

Variants of piston rod end

Connection eye welded **version 1**

∅d	18	20	22	25	28	32	36	40	45	50	55	63	70	80	90	100	110
a _{min}	10	10	10	12	12	15	15	15	15	20	20	20	25	30	30	30	30

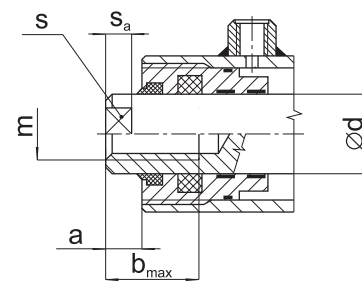
∅d₁ H - choose according to connection eye offer sheet (page 75+90)



ZH1

internal thread **version 2**

∅d	20	22	25	28	32	36	40	45	50	55	63	70	80	90	100	110
m	14x1.5	16x1.5	18x1.5	20x1.5	24x1.5	24x1.5	27x2	27x2	30x2	36x2	42x2	42x2	60x2	68x2	75x2	75x2
a	12	12	15	17	17	20	20	20	25	25	30	30	35	40	45	45
b _{max}	40	40	56	56	60	70	70	70	80	90	90	100	100	110	110	110
s	18	19	22	24	28	30	36	38	41	46	55	60	70	80	90	100
S _a	8	8	10	12	12	15	15	15	18	18	20	20	25	30	35	35

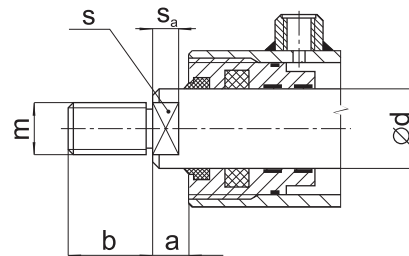


ZH2

ZH2T

external thread **version 3**

∅d	18	20	22	25	28	32	36	40	45	50	55	63	70	80	90	100	110
m	16x1.5	16x1.5	16x1.5	18x1.5	20x1.5	24x1.5	24x1.5	27x2	27x2	30x2	36x2	42x2	42x2	60x2	68x2	75x2	75x2
a	12	12	12	15	17	17	20	20	20	25	25	30	30	35	40	40	45
b	20	20	20	30	30	34	40	40	40	45	50	60	60	70	70	70	70
s	16	18	19	22	24	30	32	36	41	46	50	60	65	70	80	90	100
S _a	8	8	8	10	12	12	15	15	15	18	18	20	20	25	30	35	35

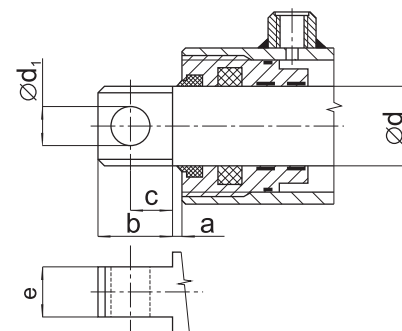


ZH2RT

neck hole **version 4**

∅d	18	20	22	25	28	32	36	40	45	50	55	63	70
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

The highlighted dimensions are default.



Linear hydraulic motors

Ordering code

For standard linear hydraulic motors
ZH1, ZH1 - A až ZH2RT - D Series
 Acc. to the table on page 15, 19, 23, 27.

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

Cylinder cover eye marking
 - (in case of not employing any eye from our catalogue fill in 0 to the code)
 - page 75÷90.

Piston rod eye marking
 - (in case of not employing any eye from our catalogue fill in 0 to the code) - page 75÷90.

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 29.

The position of pressure inputs to welded-on eye on cylinder surface (valid only for ZH1, ZH2, ZH2T, ZH2RT)
 - according to herein stated drawings.

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.

Piston rod diameter

$\varnothing D$	$\varnothing d$	$\varnothing D_1$	$\varnothing d_1$	L
25	14	35	12	142
25	12	35.1	12	142

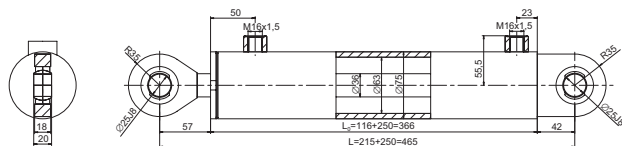
Rated diameter of cylinder

$\varnothing D$	$\varnothing d$	$\varnothing D_1$	$\varnothing d_1$	L
25	14	35	12	142
25	12	35.1	12	142

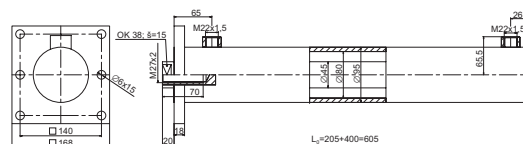
ZH1, ZH1-A, ZH1-AS
 ZH1-B, ZH1-BS
 ZH1-C, ZH1-CS
 ZH1-D, ZH1-DS
 ZH2, ZH2-A, ZH2-AS
 ZH2-B, ZH2-BS
 ZH2-C, ZH2-CS
 ZH2-D, ZH2-DS
 ZH2T, ZH2T-A, ZH2T-AS
 ZH2T-B, ZH2T-BS
 ZH2T-C, ZH2T-CS
 ZH2T-D, ZH2T-DS
 ZH2RT, ZH2RT-A,
 ZH2RT-AS
 ZH2RT-B, ZH2RT-BS
 ZH2RT-C, ZH2RT-CS
 ZH2RT-D, ZH2RT-DS

Example:

ZH1 - 63/36 x 250 - R



ZH2T -A-80/45x400-2-0-0



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)

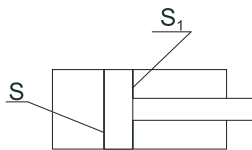
-piston rod return movement - mechanically - by external force
 - by spring in the plunger

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

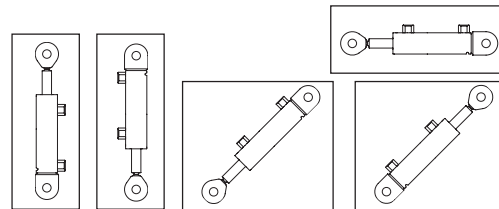
Double acting linear hydraulic motor - with continuous piston rod
 - damping at end positions - no - yes

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	<input type="text"/> MPa	Piston rod pull-out speed	<input type="text"/> m/s
Pressure min. S	<input type="text"/> MPa	Piston rod pull-in speed	<input type="text"/> m/s
Operating pressure S_1	<input type="text"/> MPa	Oil temperature	<input type="text"/> °C
Operating pressure S	<input type="text"/> MPa	Ambient temperature	<input type="text"/> °C
Pressure max. S_1	<input type="text"/> MPa	Working medium	<input type="text"/>
Pressure max. S	<input type="text"/> MPa	Working position of the hydraulic motor	
Pressure peak S_1	<input type="text"/> MPa		
Pressure peak S	<input type="text"/> MPa		



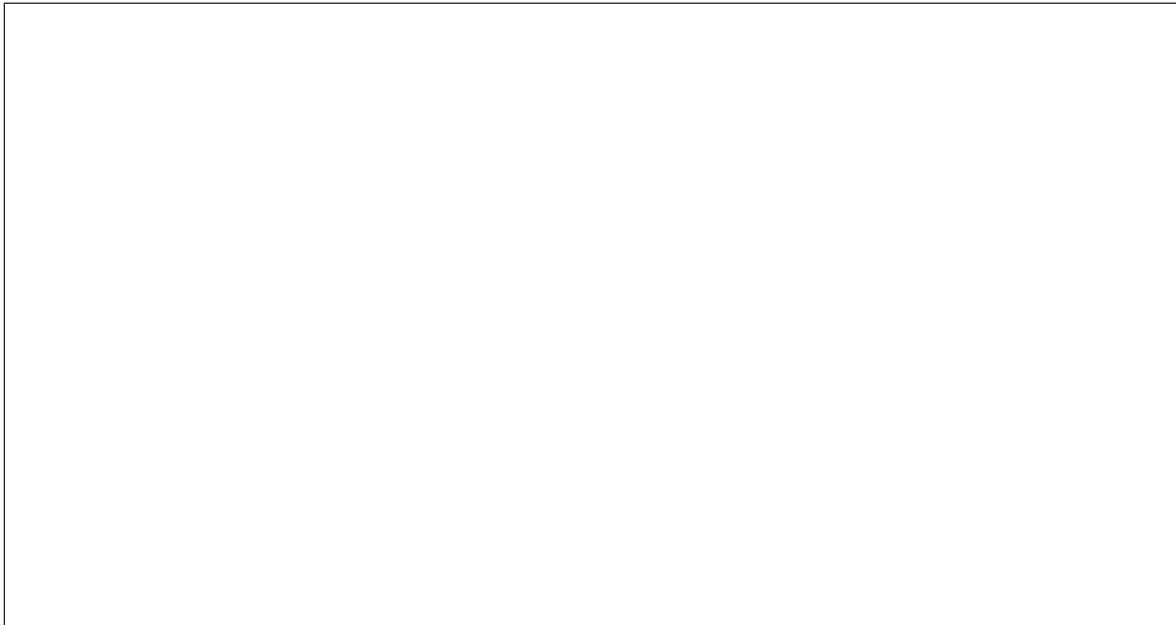
Operating conditions

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

