RINGSPANN®
Power Transmission

Installation and operating instructions for Thrustors with Impeller TH

E 09.791e

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Important

Please read these instructions carefully before installing and operating the product. Your particular attention is drawn to the notes on safety.

These installation and operating instructions are valid on condition that the product meets the selection criteria for its proper use. Selection and design of the product is not the subject of these installation and operating instructions.

Disregarding or misinterpreting these installation and operating instructions invalidates any product liability or guarantee by RINGSPANN; the same applies if the product is taken apart or changed.

These installation and operating instructions should be kept in a safe place and should accompany the product if it is passed on to others -either on its own or as part of a machine- to make it accessible to the user.

Safety Notice

- Installation and operation of this product should only be carried out by skilled personnel.
- Repairs may only be carried out by the manufacturer or accredited RINGSPANN agents.
- If a malfunction is indicated, the product or the machine into which it is installed, should be stopped immediately and either RINGSPANN or an accredited RINGSPANN agent should be informed.
- Switch off the power supply before commencing work on electrical components.
- Rotating machine elements must be protected by the purchaser to prevent accidental contact.
- Supplies abroad are subject to the safety laws prevailing in those countries.

This is a translation of the German original version!

In case of inconsistencies between the German and English version of this installation and operating instruction, the German version shall prevail.

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1. General notes

1.1 General safety instructions

Read these installation/operating instructions carefully before putting the thrustor into operation. Consider these instructions as well as the drawings in the individual sections.

All work with and on the thrustor is to be carried out taking into account that "safety is top priority".

Switch the drive unit off before carrying out work on the thrustor.

Rotating parts (e.g. brake disc) must be secured by the operator against unintentional touching.

1.2 Special safety instructions

Life-threatening danger!

When assembling, operating and maintaining the thrustor it is to be ensured that the entire drive train is secured against being switched on unintentionally. Moving parts can cause severe injury. Rotating parts (e.g. brake disc) must be secured by the operator against unintentional touching.

Strongly pre-loaded pressure springs are installed in the springed thrusters of the brake. The springed thruster may only be disassembled by the factory.

2. Design and function / parts list

2.1 Function

The electrohydraulic thrustor combines all the basic elements of a hydraulic system in a coaxial unit: an electric motor, a hydraulic pump and a cylinder with a piston. It is designed to exert a constant linear force for a given stroke. The centrifugal pump impeller, coupled to the motor shaft, builds up hydraulic pressure under the piston which causes an upward movement against the external attenuation spring or against the built-in attenuation spring. When the engine is switched off, the piston moves back via the external attenuation spring or via the built-in attenuation spring. The hydraulic force is almost independent of the piston position of the cylinder. With a lower load, the stroke movement is faster and the downward movement slower.

The hydraulic force of the thrustor is independent of the position of the piston rod. The thrustor cannot be overloaded, even if an external force acts on the piston rod that is greater than the thrust of the thrustor.

2.2 Identification

These operating instructions apply:

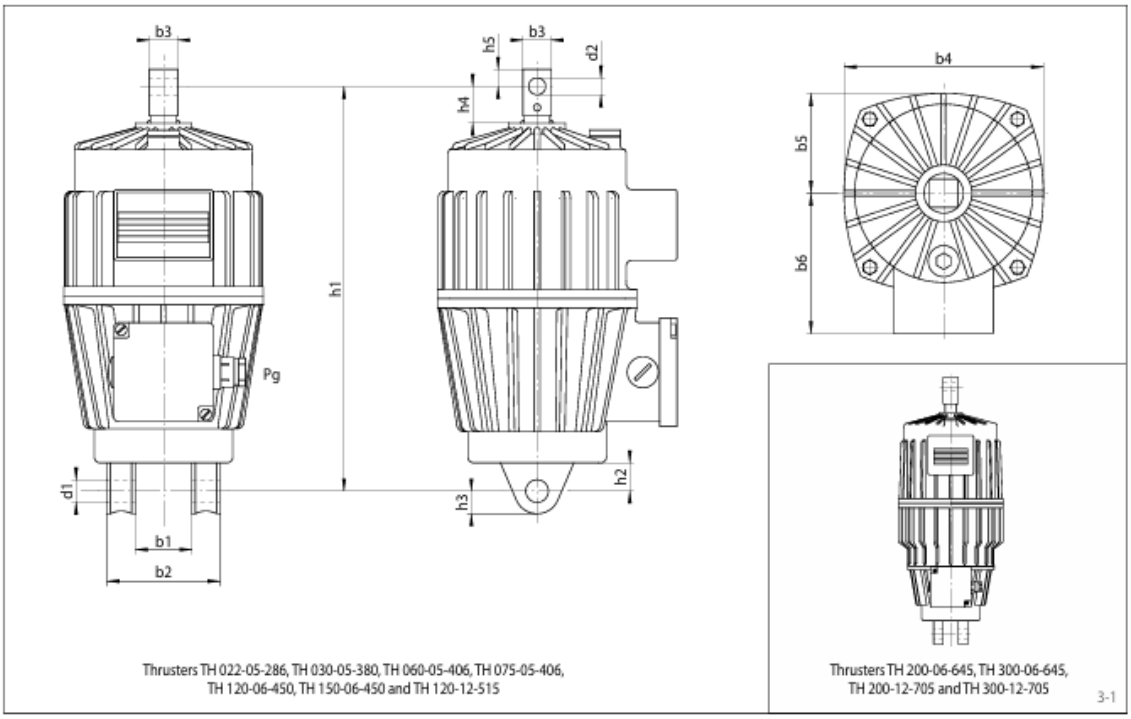
- with hand release lever.
- with lowering valve slows down the lowering of the piston rod.
- with design in insulation IP65.
- with rubber hood
- with non-standard voltage & frequency.
- with increased corrosion protection for special environment.
- with longer shackle customer specification.

There is a type plate on the thrustor with a 16-digit article number. The exact design of the thrustor is defined by this article number only.

As well as these instructions, please also consider the catalogue data for the thrustor at www.ringspann.com and the drawings in the individual sections.

2.3 Drawing and parts list

Overview of Thrustors see catalog data for details and models.
Illustration of Thrustor TH 120-06-450 whitout options see Fig. 2.2.



Dimensions

Thruster type	Internal code	b1	b2	b3	b4	b5	b6	d1	d2	h1	h2	h3	h4	h5	k*	m*	n*	Pg
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
TH 022-05-286	451	40	80	20	142	71	103	16	12	286	20	16	26	13	64	62	32	11
TH 030-05-380	452	40	90	25	168	84	128	16	16	380	25	20	37	16	70	84	65	16
TH 060-05-406	453	60	110	30	192	96	136	20	20	406	30	25	39	18	70	84	65	16
TH 075-05-406	454	60	110	30	192	96	136	20	20	406	30	25	39	18	70	84	65	16
TH 120-06-450	455	60	120	35	234	117	155	20	20	450	30	25	37	20	94	110	60	16
TH 150-06-450	465	60	120	35	234	117	155	20	20	450	30	25	37	20	94	110	60	16
TH 200-06-645	456	40	90	40	274	137	166	25	25	645	35	25	67	25	94	110	60	16
TH 300-06-645	457	40	90	40	274	137	166	25	25	645	35	25	67	25	94	110	60	16
TH 120-12-515	458	60	120	35	234	117	155	20	20	515	30	25	42	20	-	-	-	16
TH 200-12-705	459	40	90	40	274	137	166	25	25	705	35	25	67	25	-	-	-	16
TH 300-12-705	464	40	90	40	274	137	166	25	25	705	35	25	67	25	-	-	-	16

* applies to the option of the external attenuation spring (R) see drawing on page 4

Technical Data

Thruster type	Internal code	Lifting force	Total stroke	Nominal power	Max. current consumption at 400 V, 50 Hz	Oil Volume	Weight with Oil
		N	mm	W	A	l	kg
TH 022-05-286	451	220	50	130	0,3	1,4	8
TH 030-05-380	452	300	50	180	0,4	2,5	13
TH 060-05-406	453	600	50	240	0,5	3,5	15
TH 075-05-406	454	750	50	280	0,6	3,5	15
TH 120-06-450	455	1 200	60	370	0,8	4,5	21
TH 150-06-450	465	1 500	60	400	1,0	4,5	21
TH 200-06-645	456	2 000	60	590	1,2	11,0	47
TH 300-06-645	457	3 000	60	680	1,4	11,0	47
TH 120-12-515	458	1 200	120	370	0,8	6,0	27
TH 200-12-705	459	2 000	120	590	1,2	13,0	52
TH 300-12-705	464	3 000	120	680	1,4	13,0	52

Fig.2.1

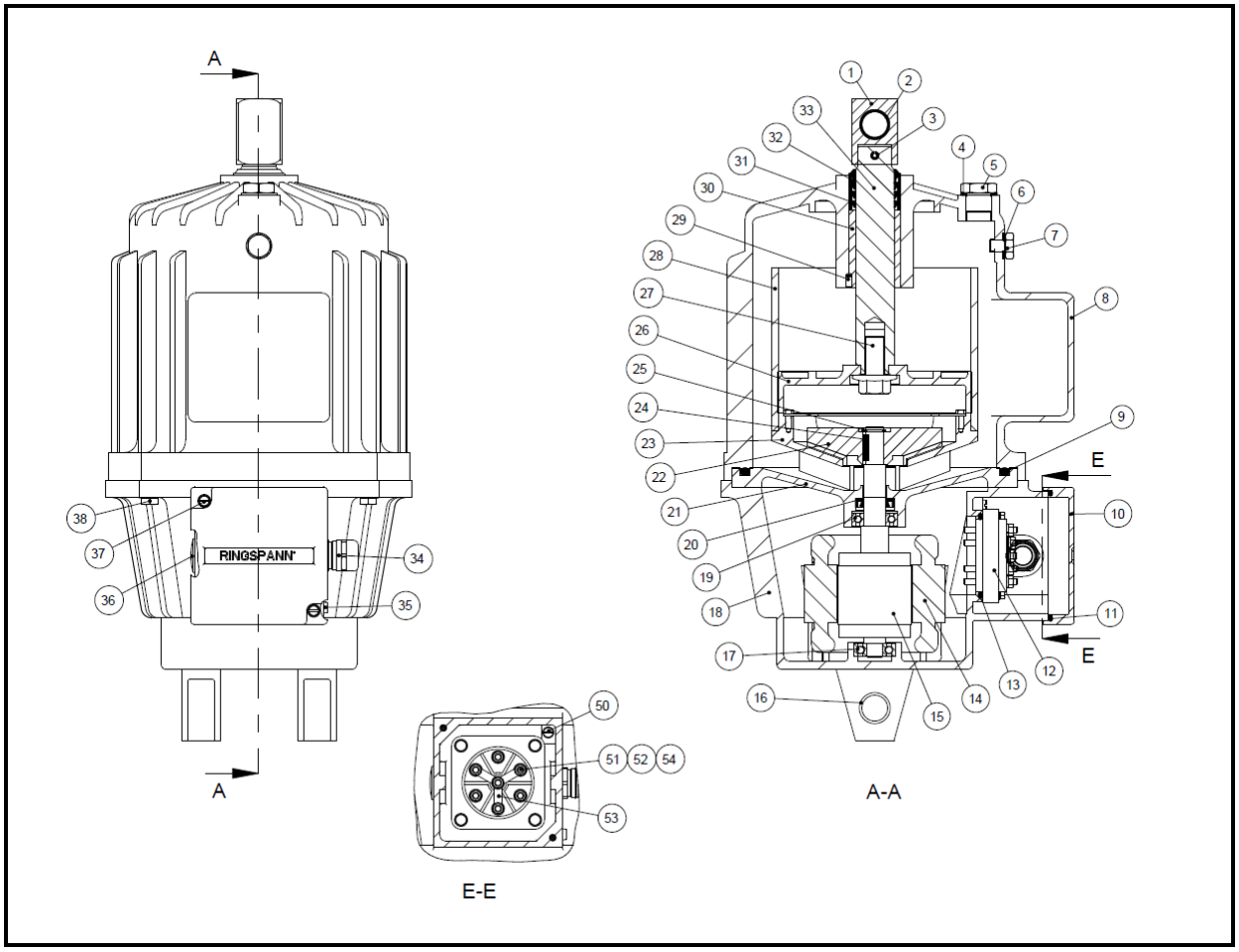


Fig. 2.2

Pos.	Describtion	Quantity
1	shackle	1
2	bushing	1-2
3	Spring pin DIN 1481	1
4	Oil-filling- plug seal	1
5	Oil filling plug	1
6	Oil level control seal	1
7	Hexagon head screw	1
8	Cylinder casing	1
9	O-Ring	1
10	Terminal box cover	1
11	O-Ring	1

12	Terminal board	1
13	O-Ring	1
14	Stator windings	1
15	Rotor-shaft	1
16	Bushing	2
17	Ball bearing	1
18	Motor casing	1
19	Ball bearing	1
20	Gasket seal	1
21	Shield	1
22	Pump impeller	1
23	Krone	0-1
24	Key	1
25	Circlip	1
26	Piston	1
27	Screw tensilock	1
28	Cylindertube	0-1
29	Grub screw	1
30	Sinterbushing	1
31	Gasket seal SC	2-3
32	Rod wiper GC	1
33	Piston rod	1
34	Cable gland	1
35	Screw with cross slot	2
36	Cable gland entry cap	1
37	Cover fastening screws	2
38	Hexagon head screw	4

3. Intended use

The thrustor has been designed for use as a power lifting device IP class 56.
The thrustor is suitable for upright installation.
Use for any other purpose will be deemed improper.

4. Impermissible use

It is not permissible to operate the thrustor with another voltage than prescribed in the technical catalogue data or with other media. Unauthorised constructional changes of the thrustor are also not allowed.

5. Condition as delivered

The thrustor is tested prior to delivery. The thrustor is delivered ready to install. The thrustor is delivered depressurised. Ordered options are already installed.

6. Handling and storage

The technical data of the thrustor such as lifting force, oil volume, dimensions and weight are shown on the catalogue pages for the brake. The current data can also be found on the RINGSPANN website www.ringspann.com.

The thrustor is delivered in preserved condition and can be stored for 12 months in an enclosed and dry place. It is to be made sure that no condensation develops. Damp storage rooms are not suitable. If storing the thrustor for a period longer than 12 months, as well as after any transport, the thrustor must be activated once in order to prevent the seals from getting stuck down.

7. Technical prerequisite for reliable operation

Fastening the thrustor to stable and low-vibration machine parts will ensure quiet braking without creaking.

8. Installing the RINGSPANN thrustor

8.1 General instructions regarding assembly and installation

RINGSPANN thrustors are designed for vertical working position. However, an inclination of up to 15° to the front and to the rear is permissible, see also Fig. 8.1.

Thrustor for horizontal installation are also available on request. However, the various horizontal installation positions must be specified, see Fig. 8.2.

Position A shows the basic version. The other versions also show the terminal box rotated by 90°. As can be seen in Fig. 8.2, for horizontal mounting positions the upper "nose", where the expansion chamber is located, must always point upwards. A ventilation unit designed for a horizontal installation position can also be used perfectly in a vertical installation position.

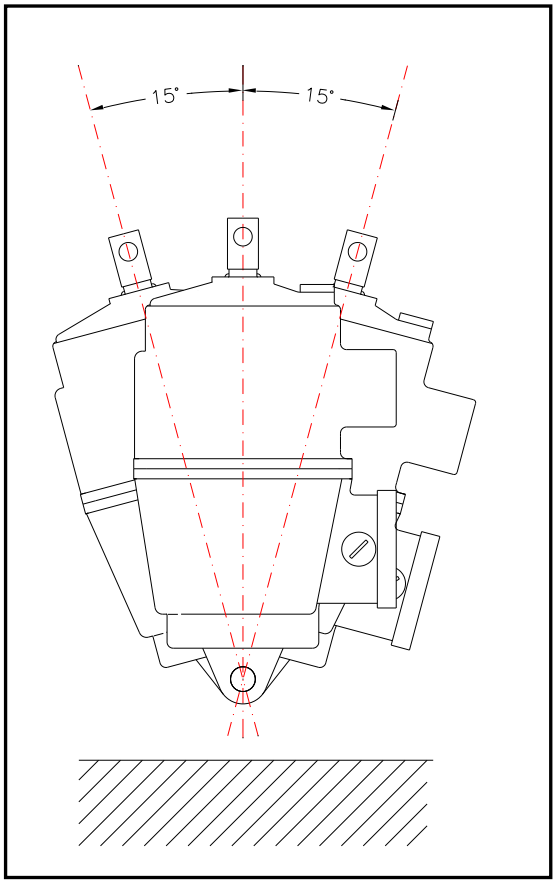


Fig. 8.1

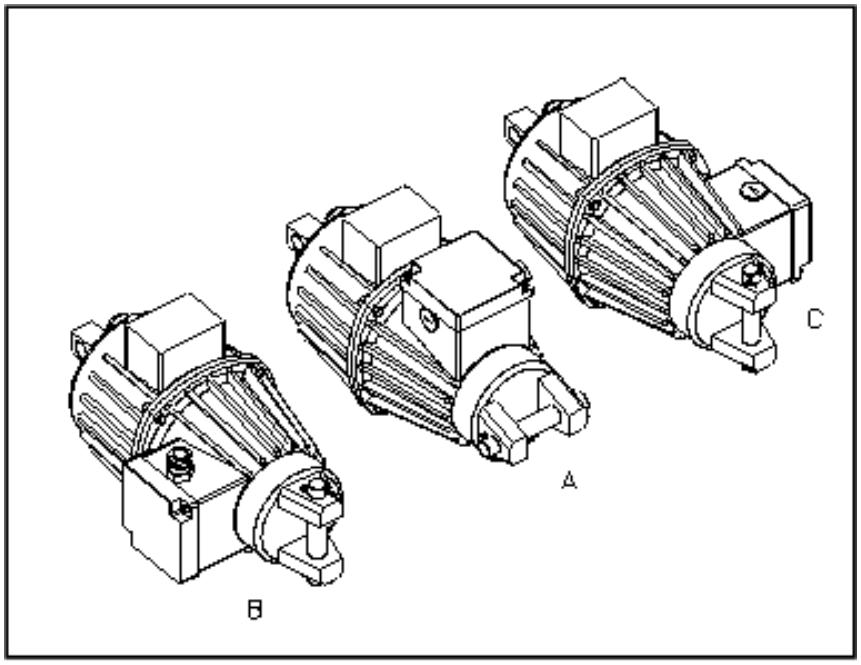
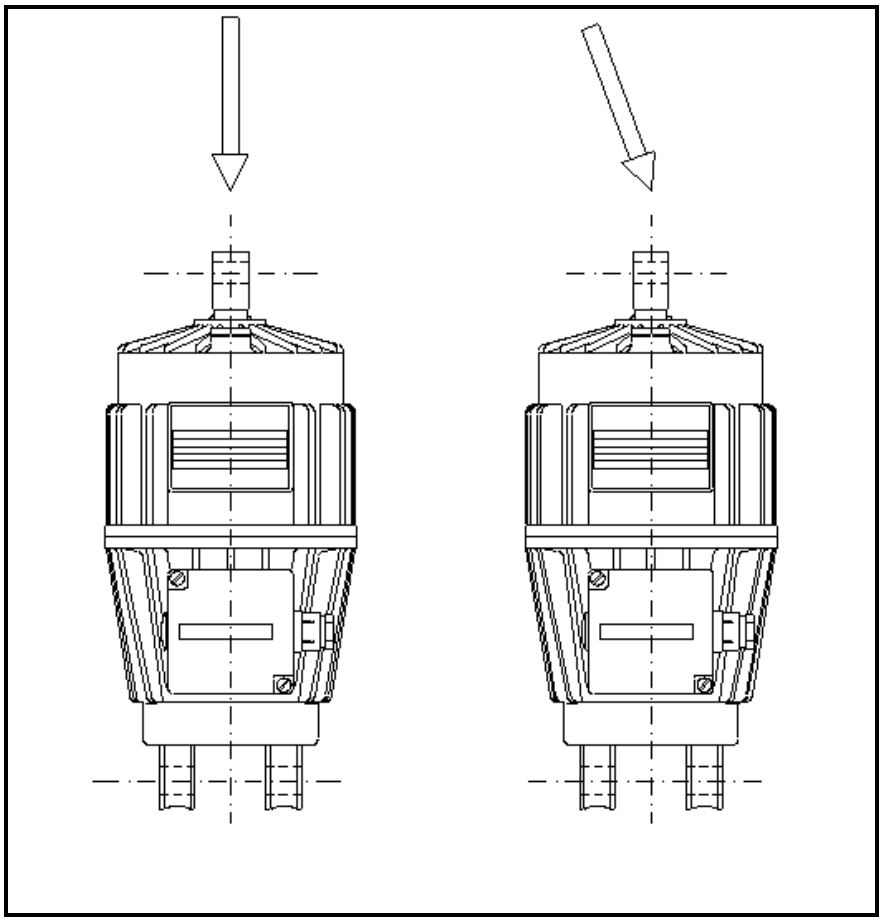


Fig. 8.2

Important!

The thrustor has no function in the standard version if it is installed horizontally. A special option is required for horizontal installation.

It should also be noted that the external load must always act in the longitudinal direction of the piston rod. Pos. 3 in order to prevent lateral forces and to allow free movement of the lifting rod. If transverse forces occur, this could lead to a reduction in performance.



Correct operation

impermissible operation

Fig. 8.3

Important!

To achieve the full performance of the thrustor, the load force must act in the longitudinal direction of the lifting rod.

The heavier the load, the slower is the lifting movement and the faster the lowering movement. If the load to be lifted exceeds the lifting capacity of the thrustor, the piston stops. Mechanical or electrical damage will not occur.

8.2 Assembly description

The thrustor are always supplied with their oil filling and is ready for operation. The oil used at the factory is HL 10 according to DIN 51524. Before commissioning and during maintenance, the correct oil level must be checked. To do this, remove the screws Pos. 5 and Pos. 7. If the oil level is not visible, oil should be added up to approx. the lower edge of the thread of screw Pos. 7, see Fig. 8.4.

For the HR version (high temperature up to 100°C), the oil listed on the type plate of the thrustor must be used.

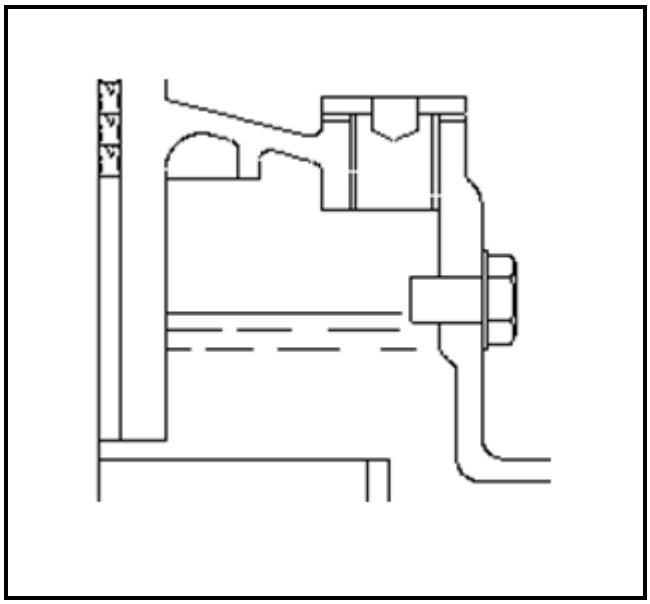


Fig. 8.4

Information!

The service life of the brake system will extend depending on how high the purity of the oil is.

Important!

Leaked oil must be completely removed. Leaks are to be removed immediately!

Caution - danger of injury!

If the voltage shut down, the thrustor can suddenly close!

The connection dimensions for the thrustor must be checked for dimensional accuracy. For this purpose, the connection dimensions must be checked according to the catalogue data sheet or the installation drawing.

Important!

If the brake calliper is manually released, this manual release must be removed again to ensure a functional brake!

8.3 Electrical connection

The cable may entry from both sides of terminal box. The gland size is Pg11 for TH 022-05-286 thruster and Pg16 for all others thruster. Since the sense of rotation doesn't affect the thrustor's function you don't need to respect any sequence by connecting the 3 phases. The electrical connection schould be over separate switches.

Tension swings of ±10%, even small changes in frequency affect the lifting force.
Direct parallel connection with crane motor should be avoided.

Don't switch on before having closed the terminal box cover and having connected the earth wire.

Important!

Don't activate the brake before having closed the terminal box cover and having connected the earth wire!

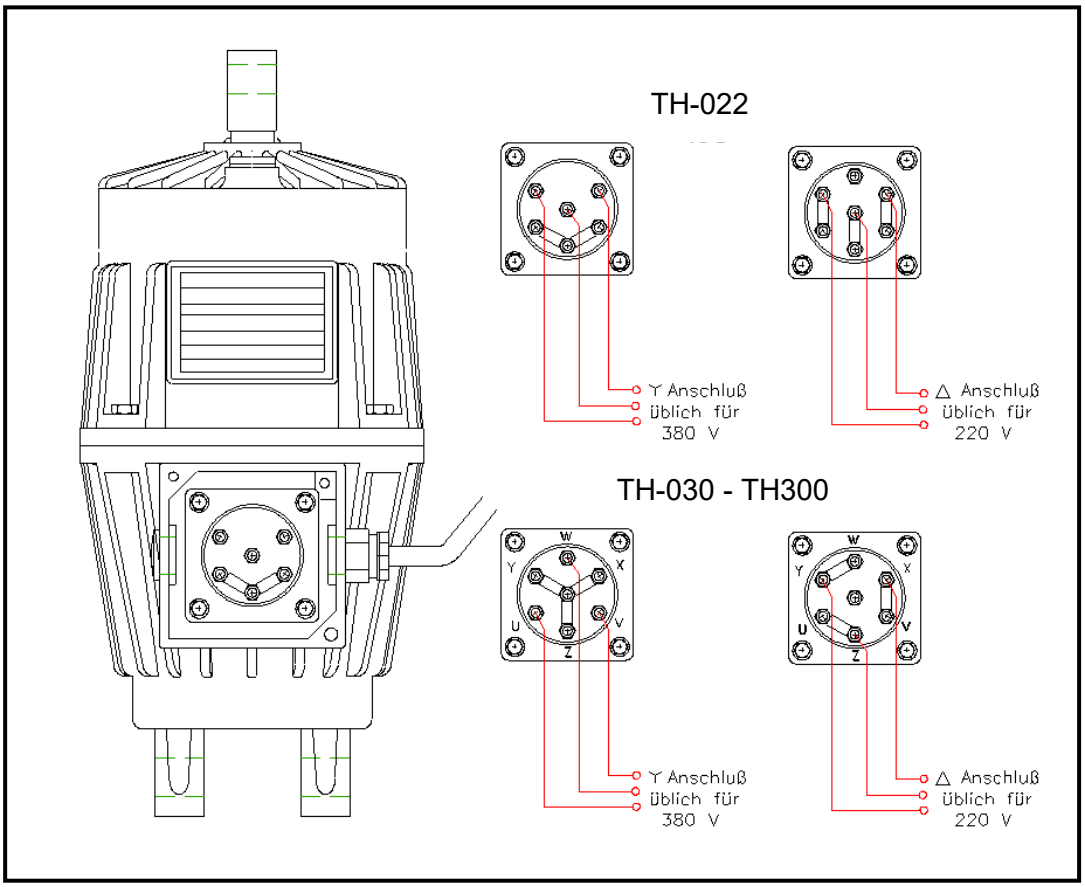


Fig. 8.5

9. Start-up

After the electrical connection has been made, function tests should be carried out to check the correct lifting function.

10. Disassembling the thrustor

The thrustor can be dismantled after removing the splint pin and the two bolts.

Life-threatening danger!

Work on the thrustors may only be carried out by qualified personnel. If the thrustor has a built-in spring, the thrustor and the cylinder housing are under mechanical tension. The screws holding the cylinder housing halves together must not be dismantled without taking appropriate measures.

Please note that maintenance work may only be carried out when the system or the working machine is at a standstill!

10.1 Replacing the lifting rod seals

The following steps are necessary for a replacement of the cylinder seals and an engine replacement:
Drive out pin Pos. 3 with mandrel and shackle Pos. 1.

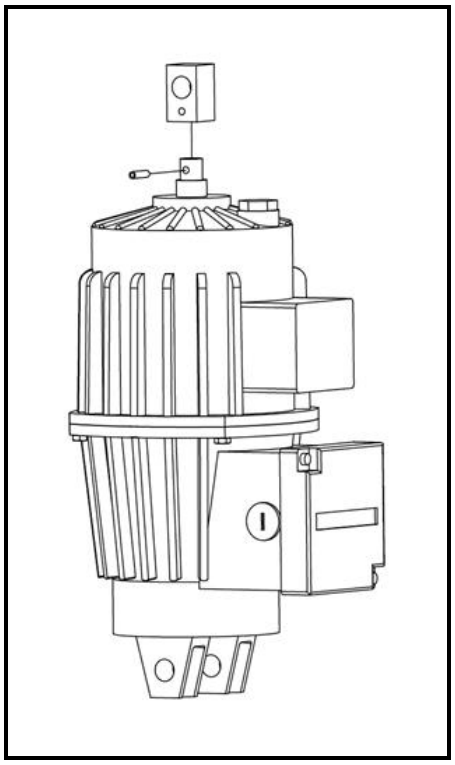


Fig. 10.1

The oil can be drained after disassembling screw Pos. 5.

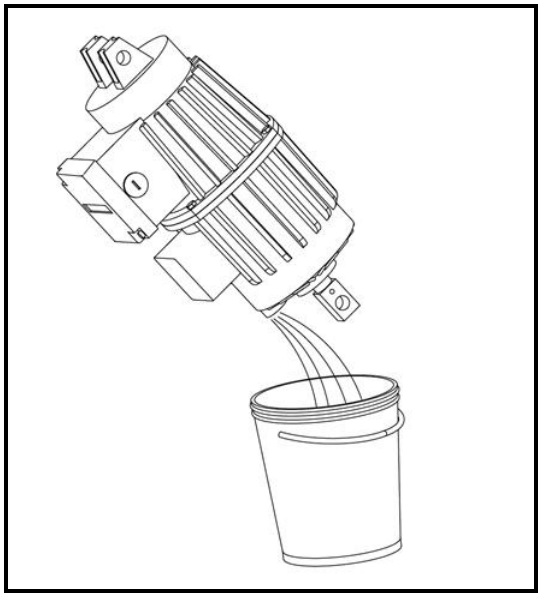


Fig. 10.2

Separate the cylinder housing Pos. 8 from the motor housing Pos. 18. Please note that if the thrustor has a built-in spring, you should take appropriate measures to prevent the cylinder housing Pos. 8 from being struck by the spring when loosening the screws Pos. 38.

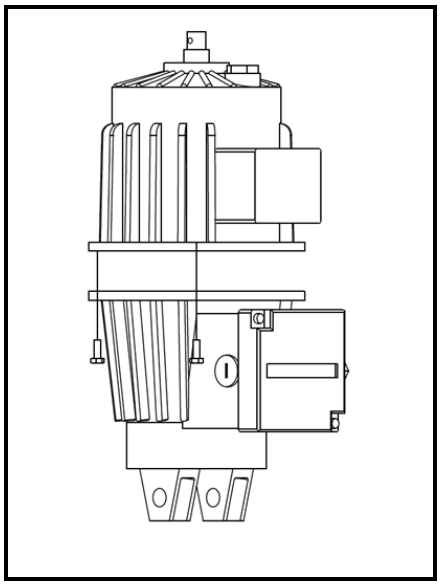


Fig. 10.3

Pull out piston Pos. 26 and dismantle the seals.

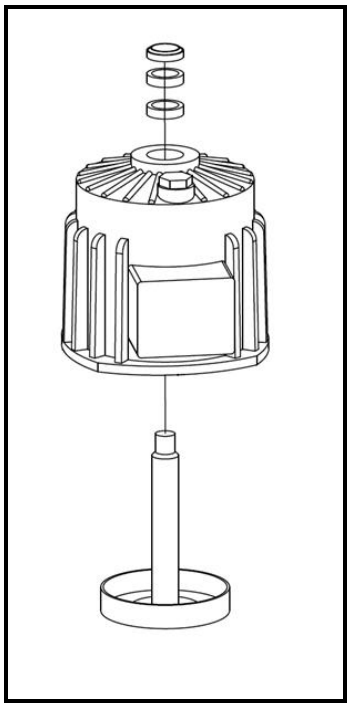


Fig. 10.4

The installation of the new seals and the assembly is done in the reverse direction. If you also want to replace the motor, you can proceed directly with chapter 10.2.

10.2 Motor replacement

To replace the motor, the terminal box, Pos. 12, must be dismantled. Please note the arrangement of the terminals and the switching bridges before dismantling.

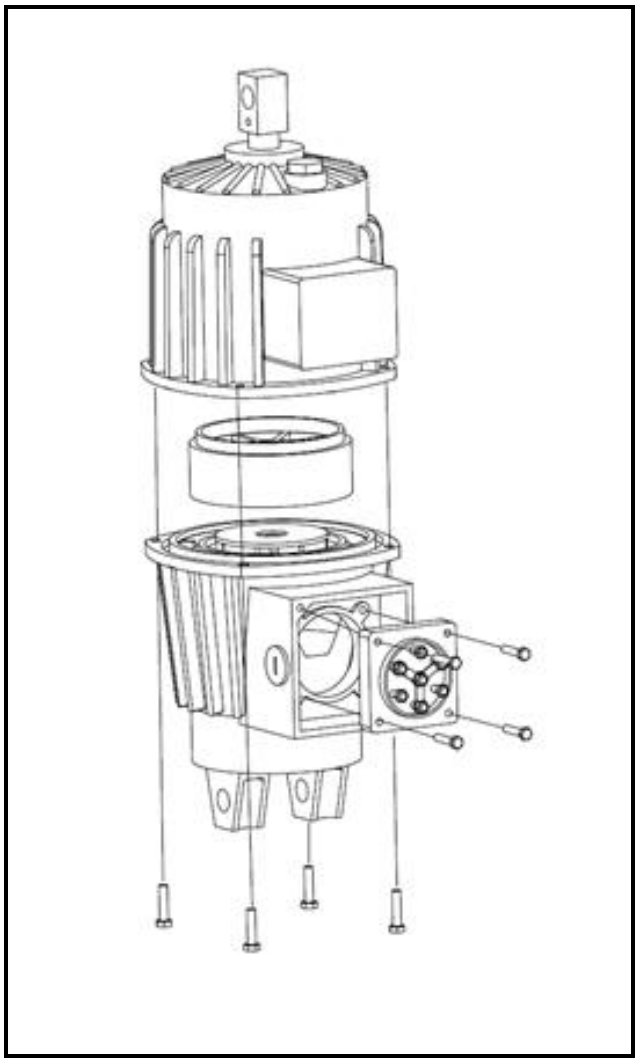


Fig. 10.5

Warming up the motor housing is necessary for dismantling the motor.

Important!

Warming up the motor housing is necessary for dismantling the motor.

After heating the motor housing, pull out the motor shaft including the bearing shield and remove the 2 screws that hold the stator in place (the screws are not present in the TH 022-05-286 thrustor unit).

The motor housing should be heated again all around so that the stator with winding can be easily removed.

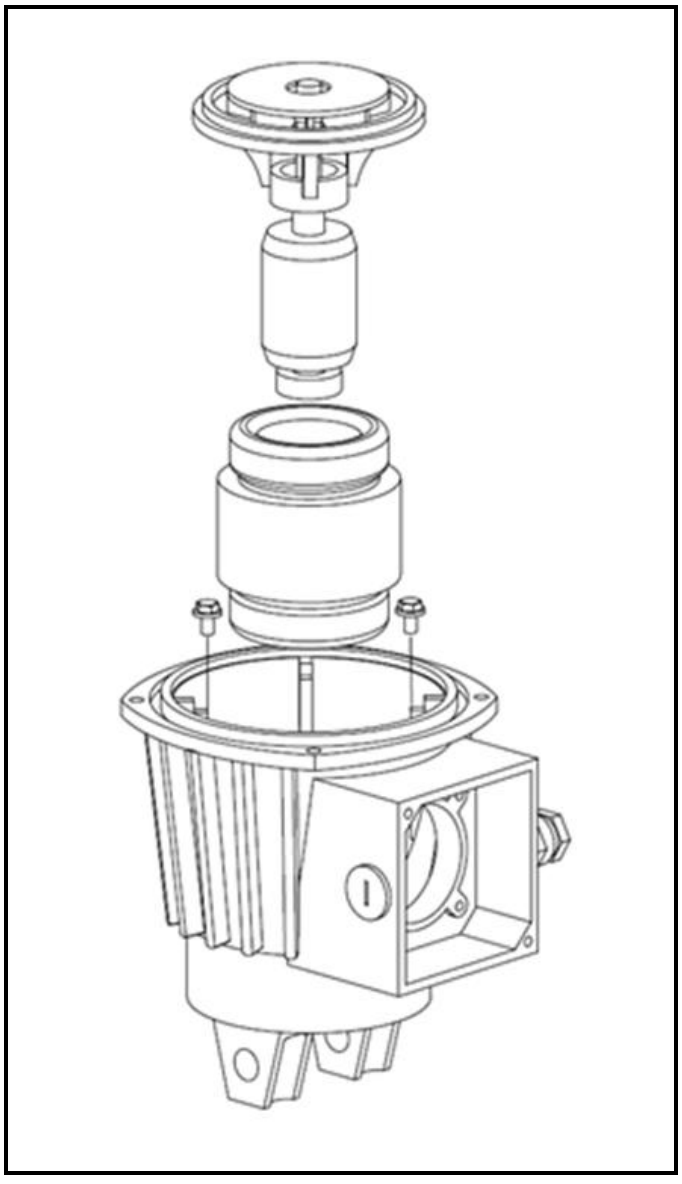


Fig. 10.6

After replacing the motor and other parts such as the bearing shield, pump impeller or even the ball bearings, reassembly is carried out in the reverse order to disassembly.

11. Maintenance

Maintenance of the thrustor must be carried out at intervals of 6 months, depending on the operating use.

The following points must be checked every 6th month during maintenance:

- Check for leaks, eliminate any leaks and repair any leaks.
- Check the oil level via the oil sight screw and top up with oil if necessary
- Clean the bearing and sliding points.
- Oil or grease the bearing and sliding points.

To ensure perfect functionality of the thrustor, it is recommended to replace the following components every 5 years:

- Seals Pos. (4,6,9,11,13,20,31,32)
- Dust protection seal Pos. 2
- Ball bearing pos. 17, Pos. 19
- Oil filling

Oil filling

The electrohydraulic thrustor is supplied with oil filling.
For normal operating conditions, hydraulic oil HL 10 to DIN 51524 is used.
The most commonly used type of oil is IP Hydrus Oil 10.
Following other types may also be used:

- ESSO: Spinesstic 10
- ERG: Hydro 10
- SHELL: Spindle oil 10
- CHEVRON: Spindle 10
- TEXACO: Spindura 10
- ARAL: Vitam GF10
- BP: Energol HP10
- ELF: Spinelf 10
- CASTROL: Hyspin AVS10

For HR version, the oil grade specified on the type plate must be used.

Life-threatening danger!

Please note that maintenance work may only be carried out when the system or the working machine is at a standstill!

12. Troubleshooting

NATURE	VERIFICATION	SOLUTION
Thrustor does not lift	- Check the current [A] in the 3 phases and compare the current [A] with the values printed on the typeplate.	- If there is no current in one phase, check the electrical supply system.
Thrustor does not lift	- Check the current [A] in the 3 phases if one phases is interrupt.	- Change the stator coil.
Thrustor does not lift	- Check the current [A] in the 3 phases and compare the current [A] with the values printed on the typeplate if the current [A] is higher.	- No further attempts should be made. The thrustor unit must be disassembled and checked for internal damage that prevents the motor from circulating freely.
Thrustor does not lift	- Check the oil level.	- Fill oil in the thrustor up to the maximum level.
Thrustor does not lift	- Check the lifting force.	- The maximum allowed lifting force must not be exeeded.
Thrustor does not lift	- Is there an external force/stop that restricts the lifting function of the thrustor.	- Eliminate external force/stop for correct function.
Unusual noises	- If the unusal noises not clear disassemble the thrustor and activate multible the thrustor alone if the unusual noises still there.	- Change the bearing in the thrustor. During the changes of the bearing clean all parts in the thrustor very well.
Oil leakage via the piston rod	- Clean the piston rod and operate it multible if oil still escapes.	- Replace the seals in the thrustor.