

Installation and operating instructions for Thruster with Gear Pump TG

E09.804e



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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 this installation and operating instructions invalidates any product liability or warranty 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.

<p>This is a translation of the German original version!</p>

<p>In case of inconsistencies between the German and English version of this installation and operating instruction, the German version shall prevail.</p>
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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 off the drive unit before performing work on the brake.

Rotating components (e.g. brake disc) must be secured by the operator to prevent accidental contact.

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 could be installed in the springed thrusters of the brake. The 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 pump, 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:

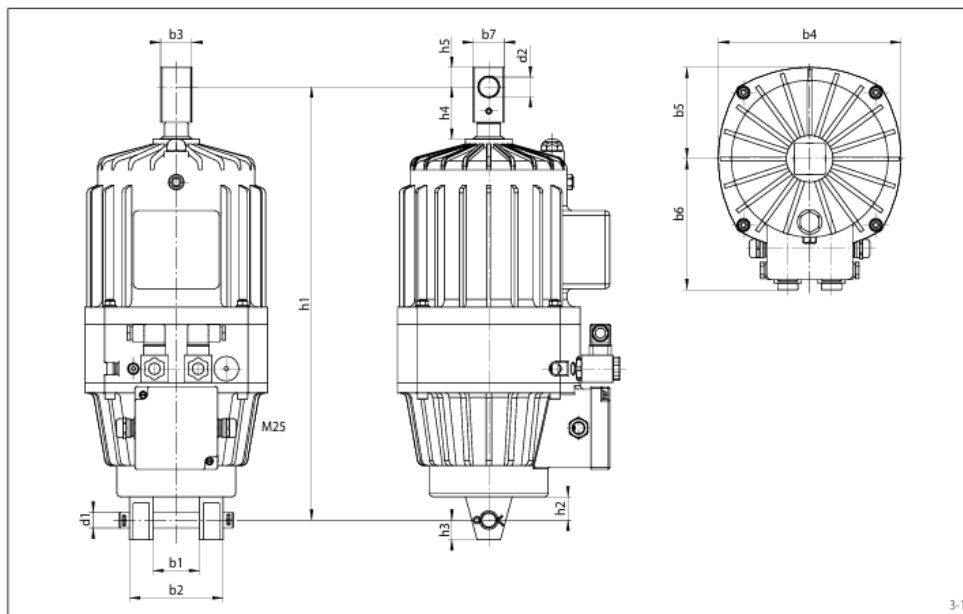
- with hand release lever.
- with design in insulation IP65.
- with rubber hood
- with increased corrosion protection for special environment.
- with longer shackle customer specification.
- With lowering valve

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

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

2.3 Drawings and parts Lists

Overview illustration of thruster with gear pump TG without options.



Dimensions

Thrustor type	Internal code	b1	b2	b3	b4	b5	b6	b7	d1	d2	h1	h2	h3	h4	h5
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
TG 200-06-550	477 C	60	120	30	234	117	168	40	20	20	550	30	25	62	15
TG 550-06-550	477 J	60	120	30	234	117	168	40	20	20	550	30	25	62	15
TG 350-08-555	475 F	60	120	40	234	117	168	40	20	25	555	30	25	67	25
TG 450-08-555	475 H	60	120	40	234	117	168	40	20	25	555	30	25	67	25
TG 550-08-555	475 J	60	120	40	234	117	168	40	20	25	555	30	25	67	25
TG 350-12-595	476 F	60	120	40	234	117	168	40	20	25	595	30	25	67	25

Technical Data

Thrustor type	Internal code	Min. lifting force	Total stroke	Nominal power approx.	Max. current consumption at 400 V, 50 Hz	Oil Volume	Weight with Oil
		N	mm	W	A	l	kg
TG 200-06-550	477 C	2000	60	240	0,5	5,0	31
TG 550-06-550	477 J	5500	60	240	0,5	5,0	31
TG 350-08-555	475 F	3500	80	240	0,5	5,0	31
TG 450-08-555	475 H	4500	80	240	0,5	5,0	31
TG 550-08-555	475 J	5500	80	240	0,5	5,0	31
TG 350-12-595	476 F	3500	120	240	0,5	6,0	35

Fig. 2.1

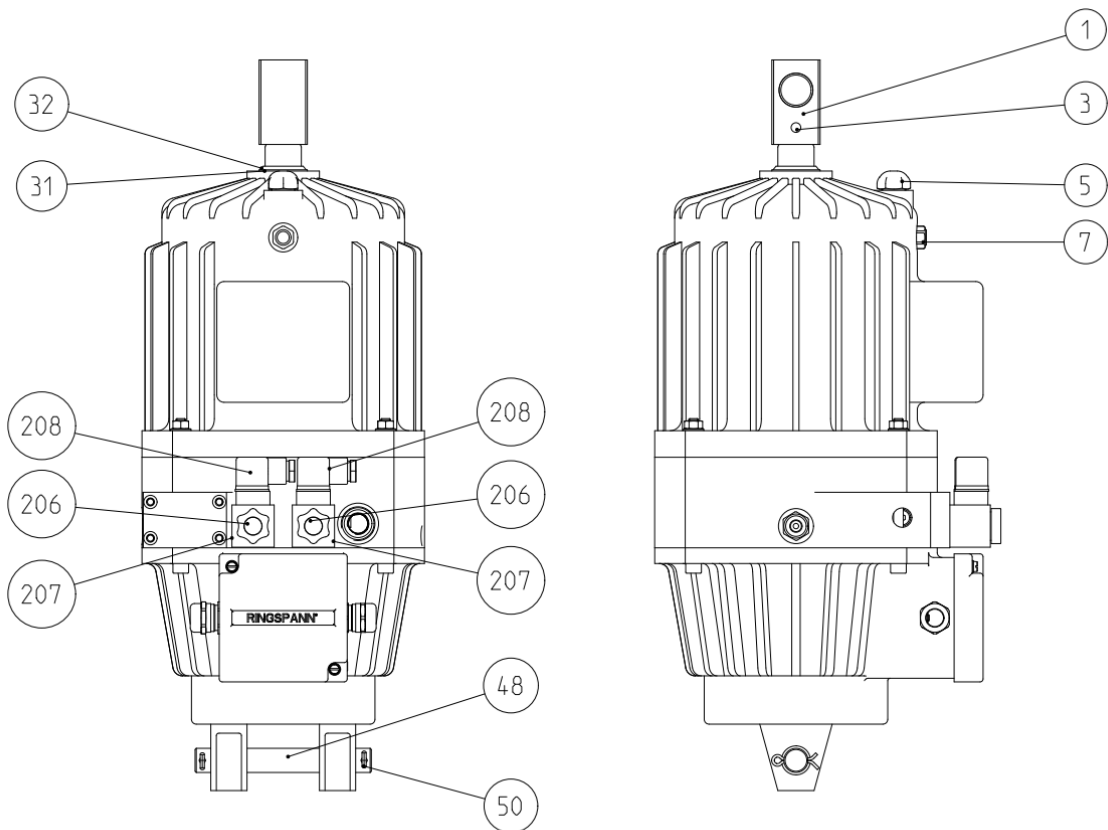


Fig. 2.2

Item Number	Object description	Comp. Qty (CUn)	Component unit
1	Shackle	1	PC
3	Clamping sleeve Ø8x40 DIN 1481 stainless	1	PC
5	Valve	1	PC
7	Visual level	1	PC
31	Gasket seal dim SC Ø30x40 h7 Viton	3	PC
32	Rod wiper GC 30x40 h7/10 Viton	1	PC
48	Pin EI Ø20x146 stainless sttel	1	PC
50	Split pin Ø4,5x30 EN ISO 1234	2	PC
206	2/2 Valve SVSPM22-CB-X5	2	PC
207	Solenoid MDE35/16x40-R230	2	PC
208	Ventilplug Schwarz 7000-29406-0000000	2	PC

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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.

Other uses are improper and incompatible with the specified purpose. RINGSPANN assumes no liability for damages resulting from improper use. The risk is assumed by the user alone.

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 thrustor or if the thrustor is customized than order designation. 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. Installation the RINGSPANN thrustor

8.1 General instructions for 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.

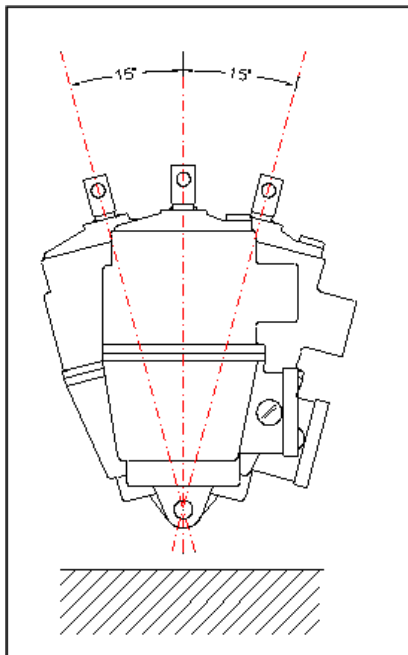


Fig. 8.1

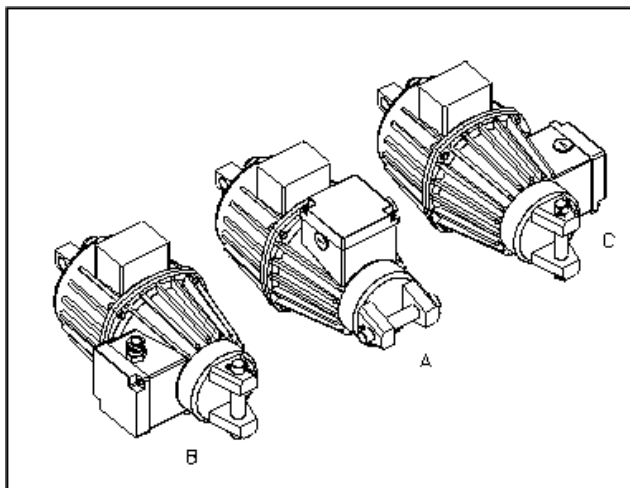


Fig. 8.2



Important!

The thruster 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. see Fig. 8.3 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.

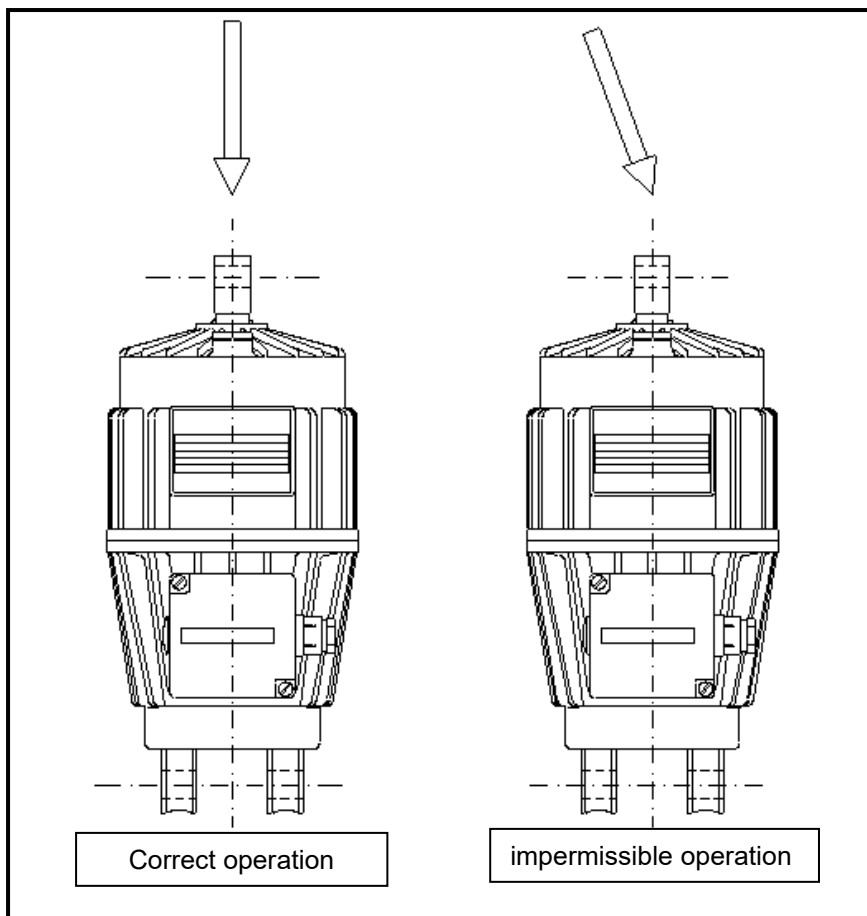



Fig. 8.3

	<p>Important!</p> <p>To achieve the full performance of the thruster, the load force must act in the longitudinal direction of the lifting rod.</p>
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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 thruster, the piston stops. Mechanical or electrical damage will not occur.

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8.2 Assembly and installation

The thruster are always supplied with their oil filling and is ready for operation. The oil used at the factory of the standard thruster is HLP 46 according to DIN 51525. 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 and see Fig. 2.2.

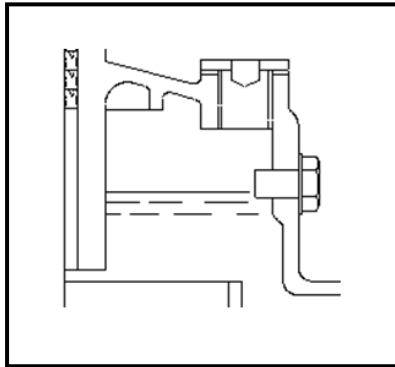


Fig. 8.4



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 thruster can suddenly close!

The connection dimensions for the thruster 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 thrustor

The cable may entry from right sides of terminal box. The gland size is Pg25 for thruster. The sense of rotation for the thruster's function you have to respect sequence by electrical connecting the 3 phases. The electrical connection should be switch over separate switches.

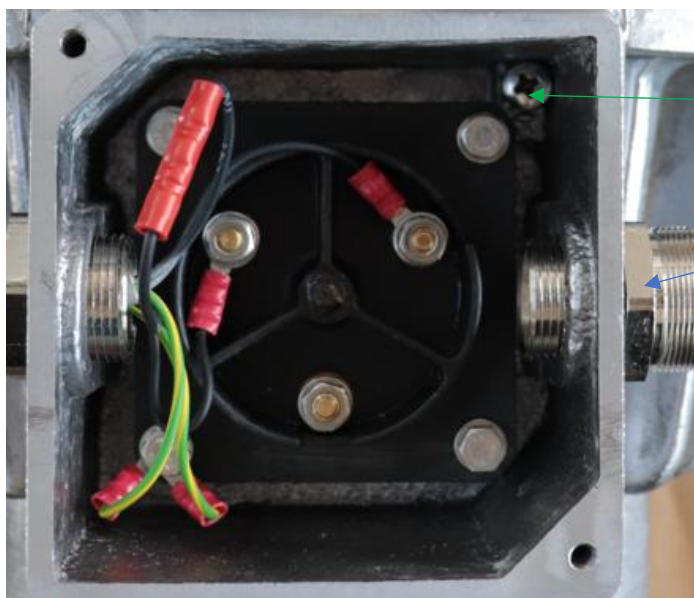
Tension swings of $\pm 10\%$, even small changes in frequency affect the lifting force. Direct parallel connection with crane motor should be avoided.

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



Important!

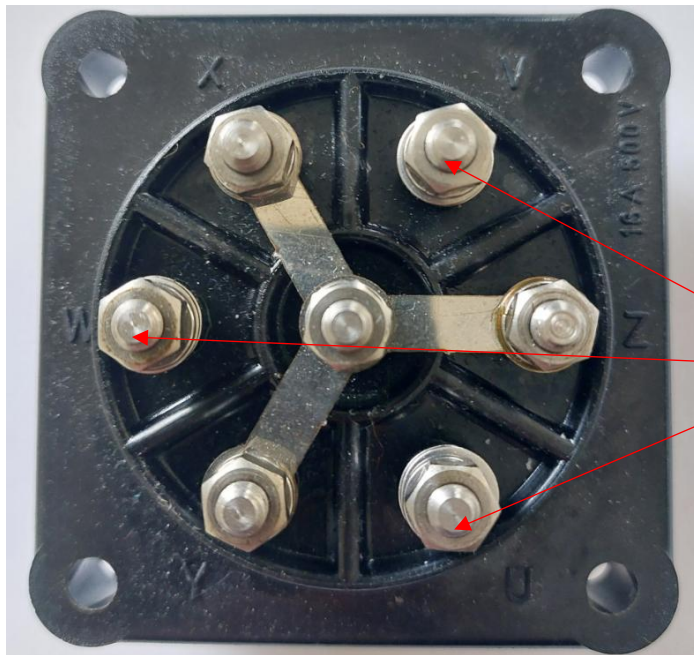
Don't activate the brake before having closed the terminal box cover and having connected the earth wire!



Earth connection

Cable entry PG 25

Fig. 8.5



Y electrical connection
 Standard 400VAC +/-10%
 Special voltage like 460VAC
 Is done with a third solenoid on
 the thrustor. The connection
 can be like the standard
 connection.

Fig. 8.6

8.4 Electrical connection valves

The electrical connection of the redundancy valve is done during factory assembly. It is nothing to do at customer side.

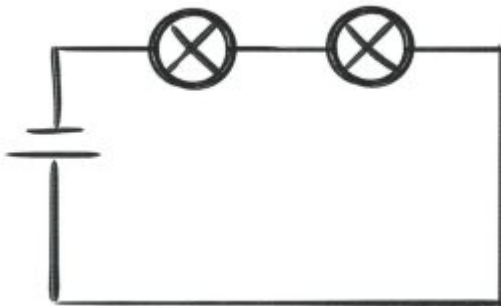


Fig. 8.7

For information: The solenoid coils of the valves are connected between two phases in an electrical series connection circuit in one line see Fig. 8.7.

If one of the solenoids are not working than the thrustor piston rod cannot moves forward in this case please change the defect solenoid the correct ohm value of an new solenoid is 5-8Ω.

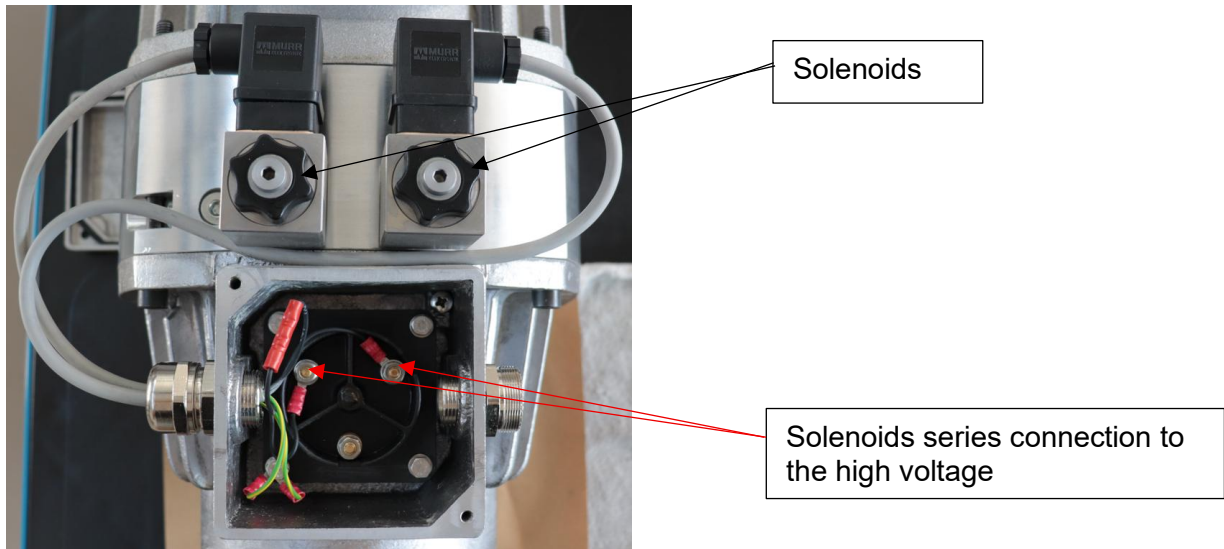


Fig. 8.8

For special voltage more then 440VAC a third solenoid is necessary but this is done during assembly it is nothing to do at customer side see Fig. 8.8.

For information: The solenoid coils of the valves also with 3 solenoid coils are connected between two main phases in an electrical series connection circuit in one line see Fig. 8.9.

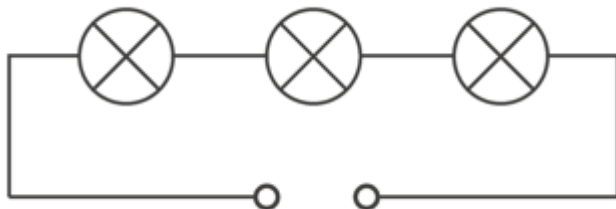


Fig 8.9



Life-threatening danger!

When assembling, operating and maintaining the thruster 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.

There is high voltage at the solenoids and in the thruster all work has to be made by skilled personnel.

8.5 Option lowering valve (SV)

With the option lowering valve (SV) can the slow down of the thruster by an adjustment knob adjusted. The lowering valve is helpful to adjusted the speed of slow down.

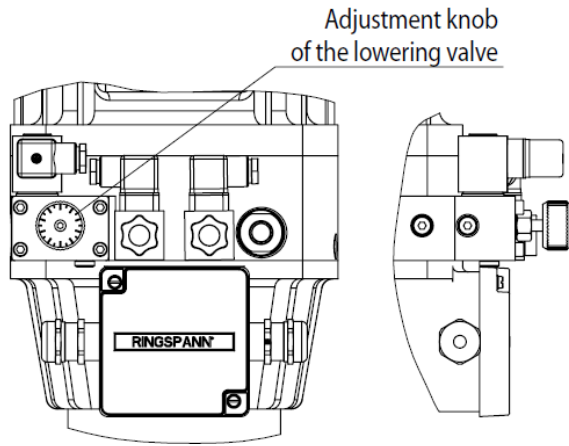


Fig. 8.10

Details of the lowering valve (SV)

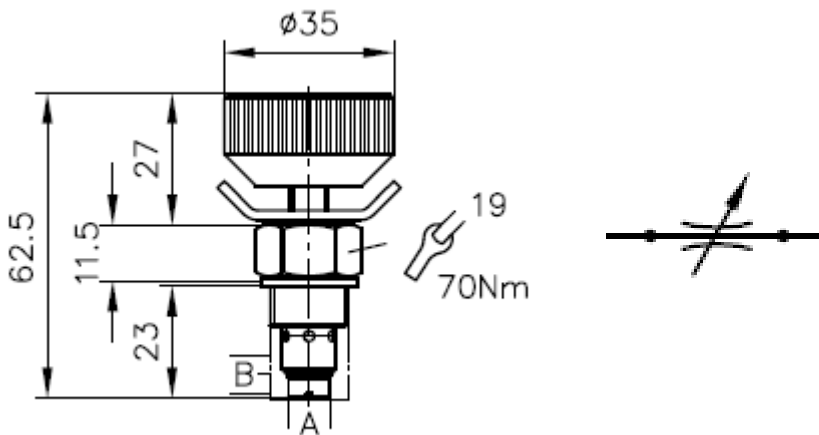


Fig. 8.11

Revolution	Flow rate (lpm)
0.5	0.15
1.0	0.45
1.5	0.75
2.0	0.9
2.5	1.3
3.0	1.95
3.5	3.6
4.0	5.6
4.5	8.35
Open	10.3

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8.6 Option handrelease lever (LS)

The option handrelease lever (LS) is for the manually drive out the piston rod in a de-energised state (brake release) turn the handrelease 180° state (brake release). For proper work the manually handrelease lever has to be turn back in working place see Fig. 8.12.

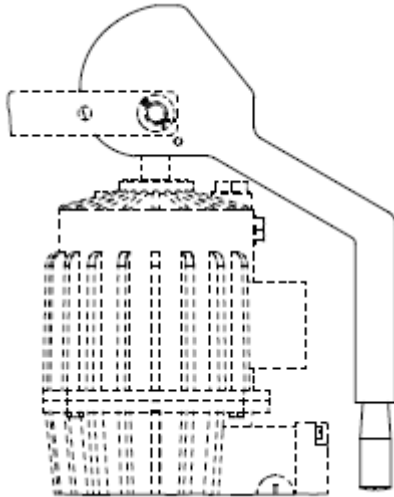


Fig. 8.12

9. Start-up

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

If the lifting function is not working than you need to switch rotation direction of the pump. The electrical connection for sense of rotation need to be refferse for the pump rotation direction.



Caution!

If the thrustor are not working than switch the electrical connection for reverse the sense of rotation.

10. Disassembling the thrustors

The thrustor can be dismantled from the brake after removing the splint pins and the two bolts see datasheet of the brake.

If the thrustor is not working very well than it would be the best way send the thrustor to RINGSPANN for checking and repairs.

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Life-threatening danger!

Work on the thrusters 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 pins Pos. 3 with mandrel and shackle Pos. 1.

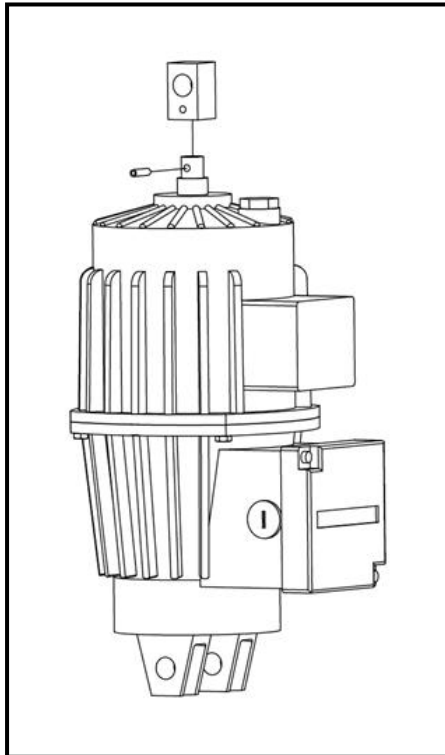


Fig. 10.1

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

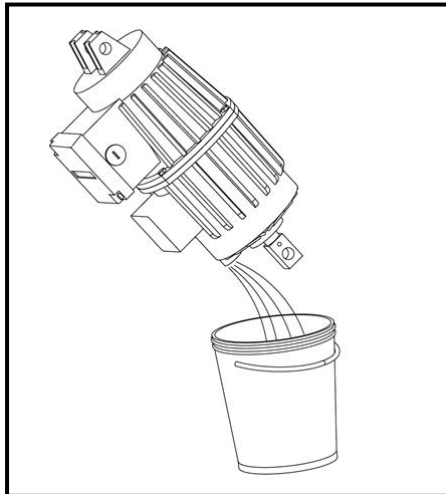


Fig. 10.2

Separate the cylinder housing top part from the motor housing down part. Please note that if the thruster has a built-in spring, you should take appropriate measures to prevent the cylinder housing from being struck by the spring when loosening the screws between the housings see Fig. 10.3.

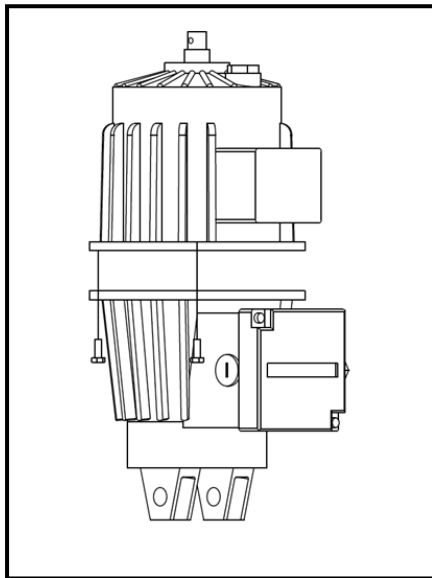


Fig. 10.3

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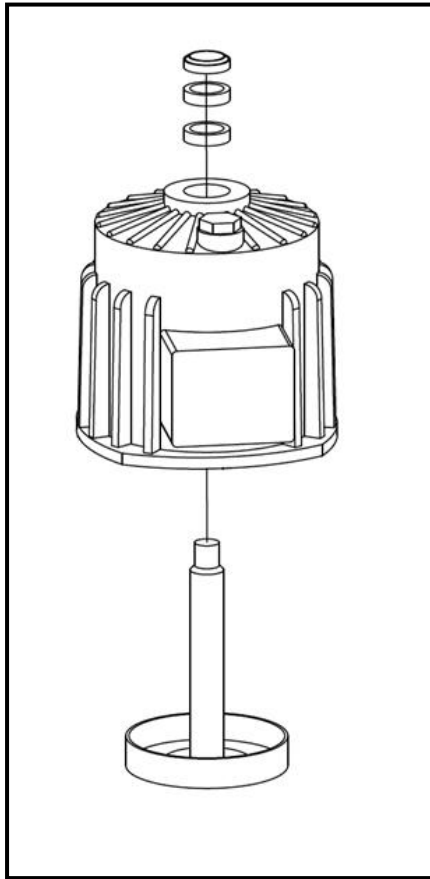


Fig. 10.4

The installation of the new seals and the assembly is done in the reverse direction.

11. Maintenance

Maintenance of the thruster 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 sliding points.
- Oil or grease sliding points.

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

- Seals, wiper, o-rings,
- Bearings, valves, solenoid, check valve, safety valve, pressureless valve
- Dust protection, filters
- Oil filling

Oil filling

The electrohydraulic thrustor is supplied with oil filling.
For normal operating conditions, hydraulic oil HL 46 DIN 51525 is used.
The most commonly used type of oil is HLP 46 oil.

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

- brake housing to the stop point and ensure that it is centred.

Maintenance of the thrustor after 5 years in operation can be made at the RINGSPANN factories, depending on the operating use.

12. Troubleshooting

NATURE	VERIFICATION	SOLUTION
Thrustor does not lift	Pump work in the wrong direction. Check the current [A] in the 3 phases	Change the electrical connection phases to reverse the direction of rotation for the pump. The pump has only one rotation working direction.
Thrustor does not lift	Check the electrical connection of the solenoids chapter 8.4	Measure the resistance of the solenoids if it is out of 5-8 ohm range than change the solenoids.
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 phase is interrupted.	The thrustor needs maintenance at the stator send the thrustor to RINGSPANN for repair.
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 send the thrustor to RINGSPANN for repair.

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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 exceeded.
Thrustor does not lift	Check the lifting force if the lifting force is correct.	The maximum allowed lifting force must not be exceeded if the thrustor has low force than you can increase by the M8 screw the lifting force of the thrustor.
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 unusual noises not clear disassemble the thrustor and activate multiple the thrustor alone if the unusual noises still there.	The thrustor need maintenance at the pump, stator or bearings send the thrustor to RINGSPANN for repair.
Oil leakage via the piston rod	Clean the piston rod and operate it multiple if oil still escapes.	Replace the seals in the thrustor.