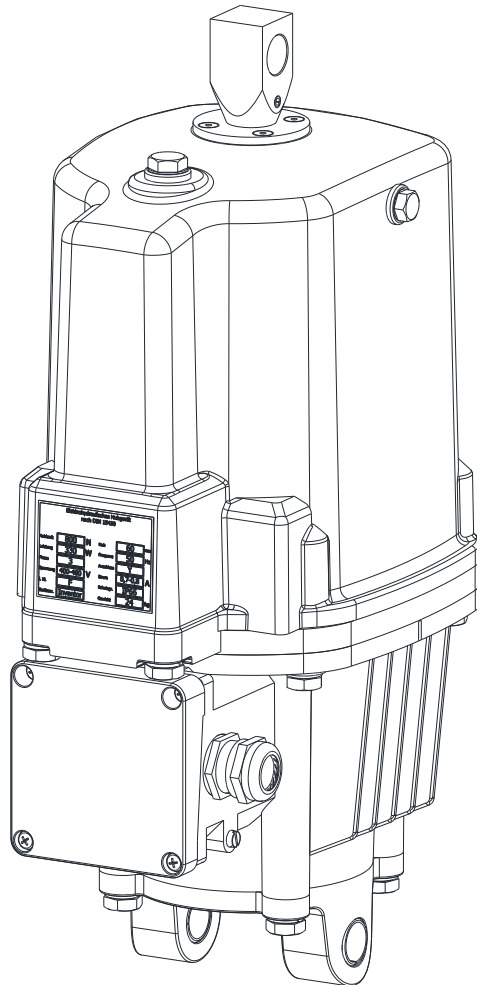




KTR-STOP® TB Thruster acc. to DIN 15430



KTR-STOP® TB Thruster

The KTR-STOP® TB thruster acc. to DIN 15430 is intended for use in general industrial plants serving mainly as a thruster, as an example, in drum and disk brake systems.

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1 Technical data

Ed 230/50 – Ed 800/60

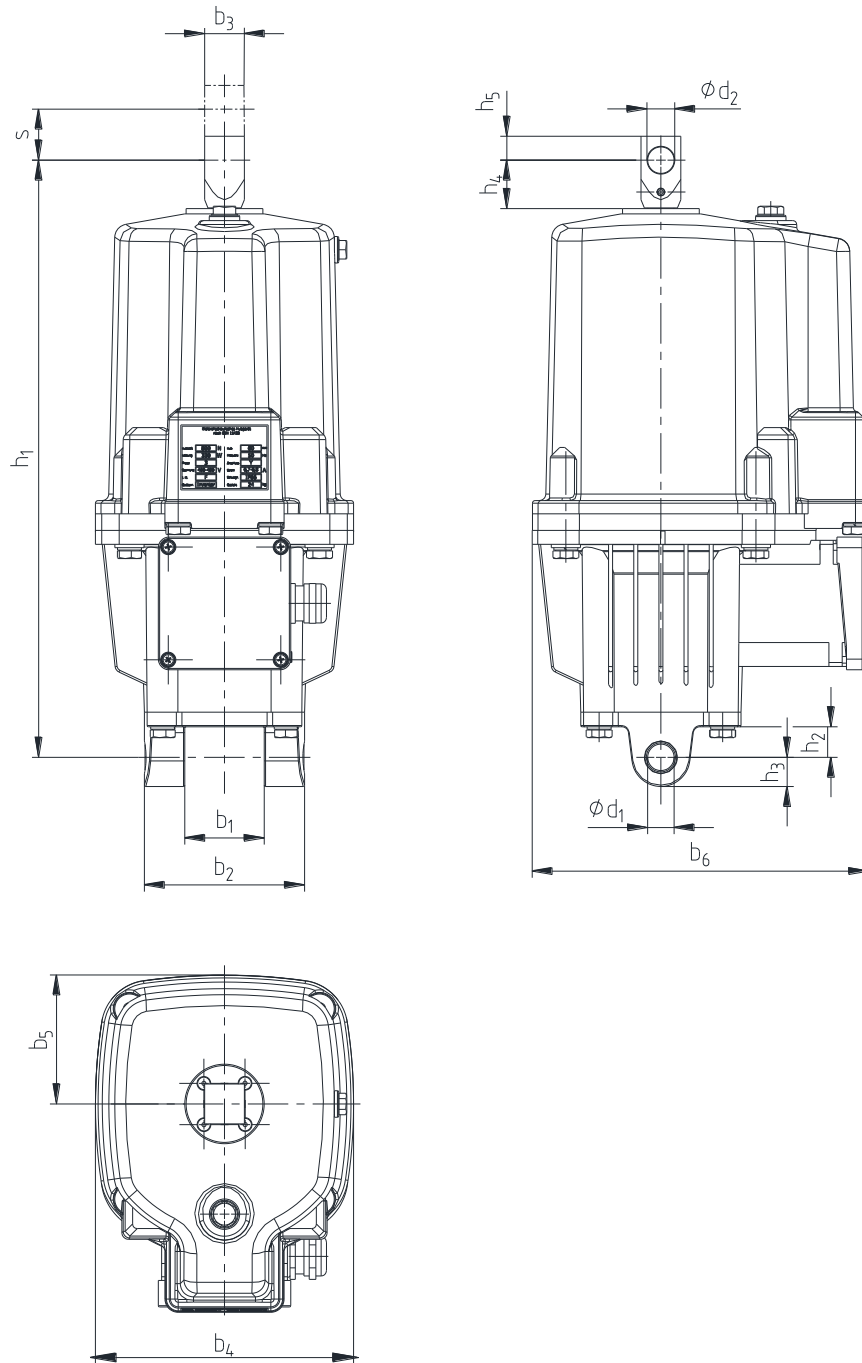


Illustration 1: KTR-STOP® TB Thruster 800/60

KTR-STOP® TB Thruster														
Size	Dimensions [mm]													
	s	b1	b2	b3	b4	b5	b6	d ₁ ²⁾	d ₂ ¹⁾	h1	h2	h3	h4	h5
Ed 230/50	50	40	80	20	160	80	200	16	16	286	20	16	26	12
Ed 300/50	50	40	80	25	160	80	197	16	16	370	18	16	34	15
Ed 500/60	60	60	120	30	195	97	254	20	20	435	23	22	36	18
Ed 800/60	60	60	120	30	195	97	254	20	20	450	23	22	36	18

¹⁾ Tolerance: +0.1

²⁾ Tolerance: +0.15/+0.25

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1 Technical data

Ed 1250/60 – Ed4500/120

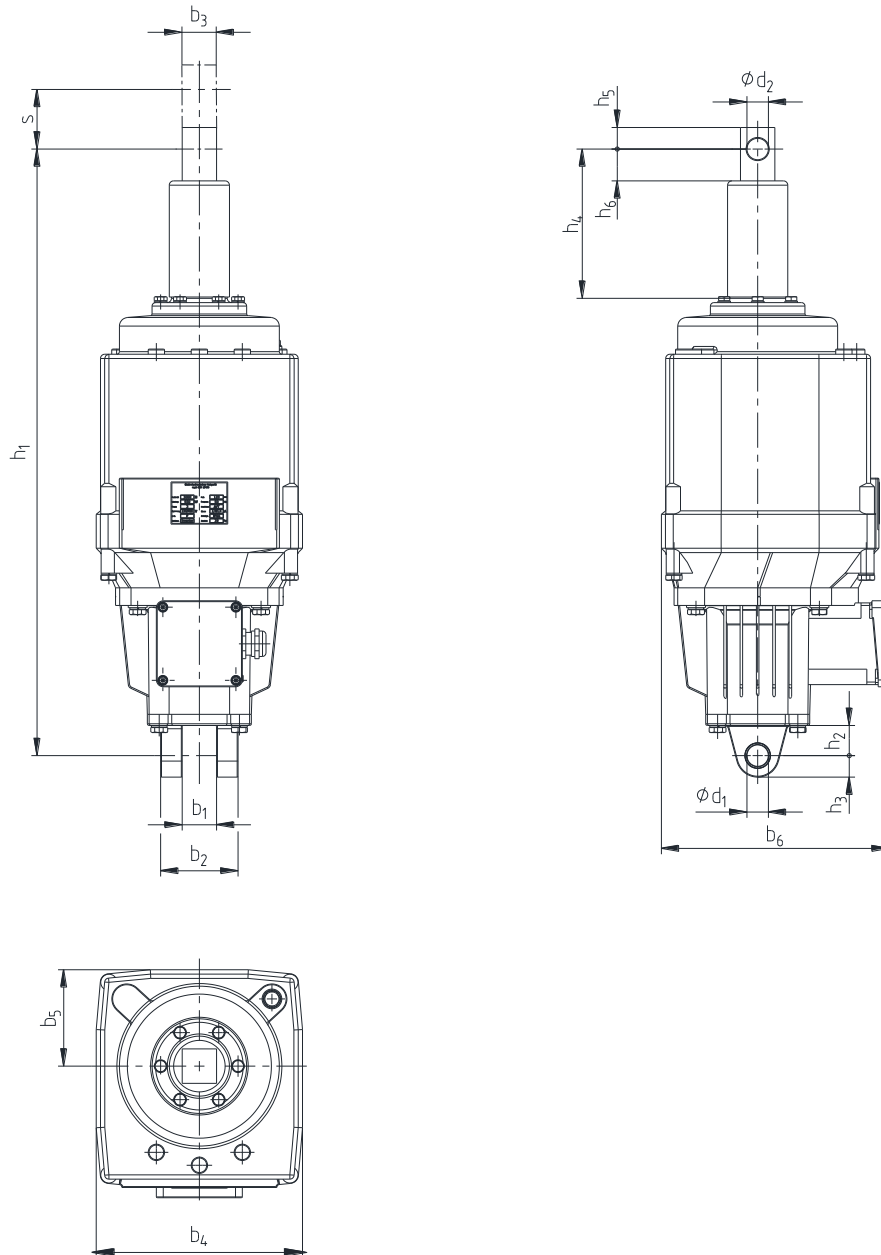


Illustration 2: KTR-STOP® TB Thruster 3000/120

KTR-STOP® TB Thruster															
Size	Dimensions [mm]														
	s	b1	b2	b3	b4	b5	b6	d ₁ ²⁾	d ₂ ¹⁾	h1	h2	h3	h4	h5	h6
Ed 1250/60	60	40	90	40	240	112	260	25	25	645	35	25	117	25	38
Ed 1250/120	120	40	90	40	240	112	260	25	25	705	35	25	177	25	38
Ed 2000/60	60	40	90	40	240	112	260	25	25	645	35	25	117	25	38
Ed 2000/120	120	40	90	40	240	112	260	25	25	705	35	25	177	25	38
Ed 3000/60	60	40	90	40	240	112	260	25	25	645	35	25	117	25	38
Ed 3000/120	120	40	90	40	240	112	260	25	25	705	35	25	177	25	38
Ed 4000/60	60	40	90	40	240	112	260	25	25	645	35	25	117	25	38
Ed 4000/120	120	40	90	40	240	112	260	25	25	705	35	25	177	25	38
Ed 4500/60	60	40	90	40	240	112	260	25	25	645	35	25	117	25	38
Ed 4500/120	120	40	90	40	240	112	260	25	25	705	35	25	177	25	38

¹⁾ Tolerance: +0.1

²⁾ Tolerance: +0.15/+0.25

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1 Technical data

Table 1: Technical data

Type	Power [N]	Stroke [mm]	Rated frequency [Hz]	Rated voltage [V]	Rated current [A]	Rated power [W]	Weight [kg]
Ed 230/50	230	50	50	230/400	0.9 / 0.6	165	10
Ed 300/50	300	50	50	230/400	1.0 / 0.7	200	14
Ed 500/60	500	60	50	230/400	1.0 / 0.7	210	23
Ed 800/60	800	60	50	230/400	2.1 / 1.2	330	24
Ed 1250/60	1250	60	50	230/400	2.1 / 1.2	330	39
Ed 1850/60	1850	60	50	230/400	2.2 / 1.3	450	39
Ed 2000/60	2000	60	50	230/400	2.2 / 1.3	450	39
Ed 3000/60	3000	60	50	230/400	2.4 / 1.4	550	40
Ed 4000/60	4000	60	50	230/400	2.6 / 1.7	650	40
Ed 4500/60	4500	60	50	230/400	2.6 / 1.7	650	40
Ed 1250/120	1250	120	50	230/400	2.1 / 1.2	330	39
Ed 2000/120	2000	120	50	230/400	2.2 / 1.3	450	39
Ed 3000/120	3000	120	50	230/400	2.4 / 1.4	550	40
Ed 4000/120	4000	120	50	230/400	2.6 / 1.7	650	40
Ed 4500/120	4500	120	50	230/400	2.6 / 1.7	650	40
Ed 1850/160	1850	155	50	230/400	2.2 / 1.3	450	40

2 Advice

2.1 General advice

Please read carefully through these operating/assembly instructions before you start up the thruster.
 Please pay special attention to the safety instructions!
 The operating/assembly instructions are part of your product. Please store them carefully.
 The copyright for these operating/assembly instructions remains with KTR.

2.2 Safety and advice symbols



Warning of personal injury

This symbol indicates notes which may contribute to preventing bodily injuries or serious bodily injuries that may result in death.



Warning of product damages

This symbol indicates notes which may contribute to preventing material or machine damage.



General advice

This symbol indicates notes which may contribute to preventing adverse results or conditions.

2.3 General hazard warnings



Assembly and installation operations may only be performed by skilled staff knowing the respective technical provisions and accident prevention regulations!



In case of power failure or when switching off thrusters already installed there is the risk of squeezing caused by components of the plant, since the lifting rod retracts automatically due to internal or external brake spring or weight load by force. Danger of squeezing!

 KTR-Group	KTR-STOP® TB Thruster acc. to DIN 15430 Operating/Assembly instructions	KTR-N 44414 EN Sheet: 6 of 17 Edition: 5
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2 Advice

2.3 General hazard warnings



When handling the thruster the lifting rod must be protected; it must neither be damaged nor subjected to any shear force. Dirt must be avoided as well. As an example, the piston rod seal may be damaged by colour or splashes.



With assembly, operation and maintenance of the thruster it has to be made sure that the entire drive train is secured against accidental switch-on. You may be seriously hurt by rotating parts. Please make absolutely sure to read through and observe the following safety indications.

- All operations on and with the thruster have to be performed taking into account "safety first".
- Please make sure to switch off the power pack before you perform your work on the thruster.
- Secure the power pack against accidental switch-on, e. g. by providing warning signs at the place of switch-on or removing the fuse for current supply.
- Do not reach into the operating area of the thruster as long as it is in operation.
- Please secure the thruster against accidental contact. Please provide for the necessary protection devices.

Thrusters are supplied to customers reliably. Unauthorized modifications, mainly those which affect the operational safety, are not permitted. Those modifications are as follows:

- Unscrewing of pins and screw connections
- Removal of additional equipment (e.g. limit switch, protective equipment etc.)
- Treatment through painting, varnish (lacquer) lubricants, preserving agents in assembled condition
- Metal removing, shape-modifying or mechanical treatment of thruster elements
- Mounting of additional elements which may affect one function
- The machine must be closed down as soon as any changes on the thruster are noted during operation, e. g. different operating noise.

2.4 Intended use

You may only assemble, operate and maintain the thruster if you

- have carefully read through the operating/assembly instructions and understood them
- are technically qualified and specifically trained
- are authorized by your company

The thruster may only be used in accordance with the technical data (see chapter 1). Unauthorized modifications on the thruster are not admissible. We will not assume liability for any damage that may arise. In the interest of further development we reserve the right for technical modifications.

The thruster acc. to DIN 15430 described in here corresponds to the technical status at the time of printing of these operating/assembly instructions.

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	Verified: 2023-01-19 Wie/Li	Replaced by:

 KTR KTR-Group	KTR-STOP® TB Thruster acc. to DIN 15430 Operating/Assembly instructions	KTR-N 44414 EN Sheet: 7 of 17 Edition: 5
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2 Advice

2.5 Special safety instructions

Please pay attention to the following safety instructions before mounting and start-up of the thruster:

1. The thruster may solely be used in accordance with the application and mode of mounting specified hereafter in the order or order confirmation.
2. Before assembly and initial start-up the user has to check if the entire thruster unit is in perfect condition.
3. If the mounting dimensions specified cannot be adhered to, please consult with KTR before assembly.
4. The limit switches on the thruster are set by the manufacturing company and their function has to be checked before delivery. The setting of the limit switches by the manufacturer must not be modified without prior agreement by the manufacturer.
5. Make sure to keep the operation area free from any obstacles.



Leakages endanger the perfect or general operation of the thruster. Find out the reason and take the necessary actions for repair. Close down the entire unit, if necessary.

3 Storage, transport and packaging

Upon receipt of delivery inspect the consignment for completeness and potential transport damage. Any missing components and damages should be announced to the manufacturer or sender of the goods by return.

3.1 Storage

The thrusters can be stored in horizontal or upright position. During storage they should be protected against weather effects, though they are generally intended for outside use. With a longer storage period please consider that the seals may lose their elasticity which may affect their operation.

3.2 Transport and packaging



In order to avoid any injuries and any kind of damage please always make use of proper transport and lifting equipment.

The thruster is packed differently each depending on number and kind of transport. Unless otherwise contractually agreed, packaging will follow the in-house packaging specifications of KTR.

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4 KTR-STOP® TB Thruster acc. to DIN 15430

The electrohydraulic thruster (Ed) described in the illustration below corresponds to DIN15430 with regard to release force, stroke, fastening and general dimensions.

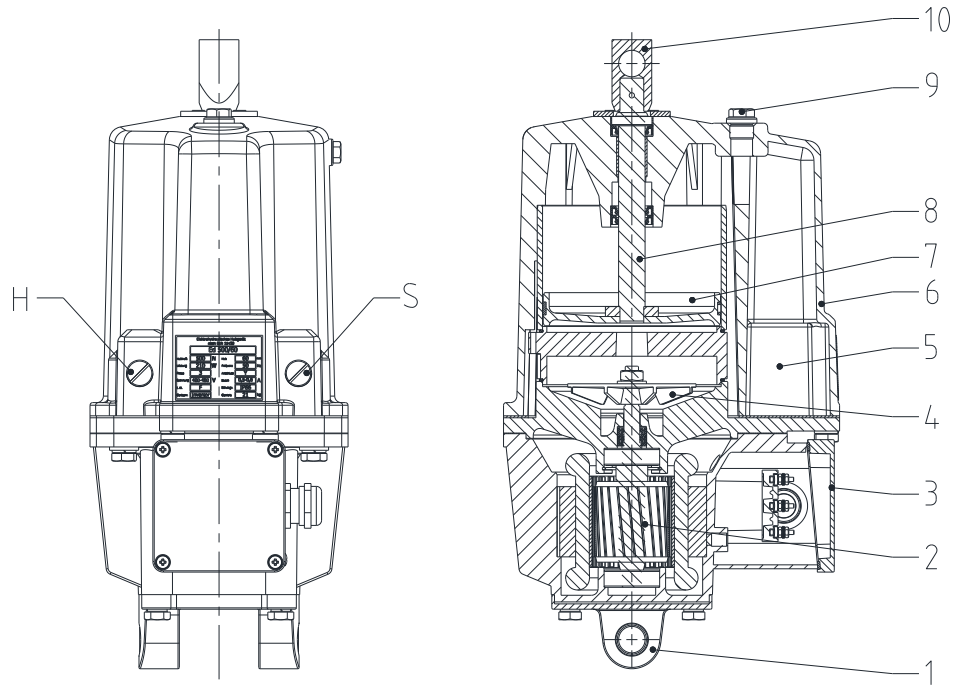


Illustration 3: Electrohydraulic thruster

4.1 Components of the thruster

Component/ subassembly	Quantity	Description
1	1	Fork-type base
2	1	Electric motor
3	1	Terminal box
4	1	Pump wheel
5	1	Tank
6	1	Housing
7	1	Piston
8	1	Piston rod
9	1	Oil filler hole
10	1	Piston rod head
S	1	Lowering valve
H	1	Globe valve

4.2 Operating description of thruster acc. to DIN 15430

Electrohydraulic thrusters are compact systems sealed externally that mainly consist of an electric motor and a hydraulic unit. When turned on the electric motor (component 2) in the lower section of the housing is driving the pump wheel (component 4) of the hydraulic pump on top. The hydrodynamic pressure generated takes effect on a piston (component 7) extending the piston rod (component 8) to the end-of-stroke position.

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4 KTR-STOP® TB Thruster acc. to DIN 15430

4.2 Operating description of thruster acc. to DIN 15430

When switching off the current or in the event of power failure the pump stops pumping and the piston rod returns into its original position.

If used as a brake thruster either the brake spring (c-spring) installed in the thruster or an external force such as a braked weight or brake spring support the return stroke. Please consider with the application that the usable lifting force is defined by the difference of the hydrodynamic force on the piston rod generated in the thruster and the counteracting brake force.

The lifting and lowering times depend on the load and the temperature-related viscosity of the hydraulic oil. They can be set with devices having an integrated lowering or global valve.

If the standard lowering time of the lifting piston is not sufficient, the standard lowering time can be reduced by parallel operation of three capacitors. This arrangement of capacitors reduces the deceleration time when turning off the motor resulting in particularly quick reduction of the oil pressure. In this case the thruster must be triggered by a separate contactor.

The hydraulic unit of the tank (component 5) is located in a closed housing (component 6). The oil level can be inspected and filled up externally through the oil filler hole (component 9). Electrohydraulic thrusters are supplied ready for assembly and painted and are provided with oil filling. They have to be fastened in the bores of the fork-type base (component 1) and the piston rod head (component 10) via pins.

The electrical connection is made in the terminal box (component 3). Devices from type 1250 to 4500 have a dust cover on top of the piston rod serving as additional protection against dirt and damage.

5 Mechanical version

As described above, the thruster comprises a three-phase asynchronous motor, a closed hydraulic system and a work cylinder with piston and lifting rod in a housing.

5.1 Installation position

Mounting can be made in upright position (piston rod faces upward) or with sizes 50 and 60 mm in horizontal position (terminal box and tank face upward) and in any intermediate position. Types with a stroke of 120 mm can only be installed vertically. The fork-type base (component 1) along with the terminal box can be turned by 90° to the right or left (please specify in your order), the piston rod is turnable.

5.2 Unit temperature and ambient temperatures



**The surface temperature can rise to more than 100 °C.
Danger of burning!**

The operation can be performed with ambient temperatures from -20 °C to +50 °C. For any other temperature conditions please consult with KTR.

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6 Electrical version

Electrohydraulic thrusters are driven by a three-phase motor (component 2). All units are protected according to IP 66 (DIN EN 60529 (VDE 0470-1)). The motor winding is insulated for use in the tropics, insulation class F.

6.1 Connections

All types have a terminal box (component 3) with a six-pole terminal board (nine-pole as a special type), lead connection M4, protective conductor terminal M5 and a waterproof cable gland M25x1.5 on the right. The motors are connected via star connection (Y).

6.2 Operating voltage

The standard voltage is for example:

- 400 V, 50 Hz, 3~
- 460 V, 60 Hz, 3~
- 500 V, 50 Hz, 3~
- 690 V, 50 Hz, 3~.

Different voltage and frequencies are available on request.

6.3 Operation mode

The units are suitable for continuous operation S1 (100 %) and intermittent duty S3 (60 % ED) with up to 2000 switches per hour. Deviations of the operating voltage by a maximum of ±5 % do not have any effect on the performance of the units.

7 Special versions

A supplement will be charged for all thrusters with special equipment:

7.1 Globe and/or lowering valve

The positioning times of the units can be extended by installing a globe or lowering valve. The valves are installed over the terminal box in the hydraulic space and must be set externally. The positioning times can be extended twentyfold at the minimum, setting is made continuously- see chapter 10.



Brakes with lowering valve must not be used in a hoist.

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7 Special equipment

7.2 Rapid lowering control

A parallel connection of three capacitors allows to reduce the standard lowering time. The arrangement of capacitors reduces the deceleration time when turning off the motor so that the oil pressure decreased particularly fast. In this case the thruster must be controlled by a separate contactor.

7.3 Limit switch

For indicating the operating position of the piston rod the thrusters can be equipped with mechanical or inductive limit switches on request.

7.4 Standstill heating

Temperature range
-45 °C to +50 °C

Operating liquid
Castrol Aero HF 585 B

Technical statement

If the devices are in cold condition lifting times may extend up to four times the lifting times specified with minus temperature range. The lowering times remain unchanged.

below -25°C ¹⁾

special low-temperature oil

¹⁾ With ambient temperatures below -20°C the statements for vertical operating position apply.

The thrusters can be provided with standstill heating. It consists of heating tapes installed in the winding serving to heat a motor with low ambient temperatures.

The standstill heating must be activated with ambient temperatures below -20°C. It must be active while the thruster is turned off. With the motor turned on the heating must be deactivated.

Electrical data

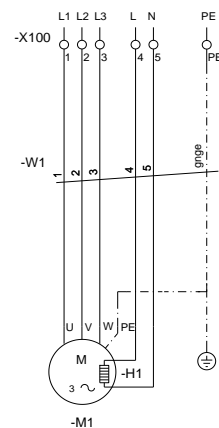
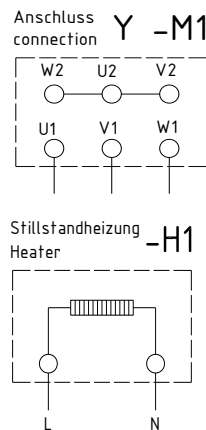
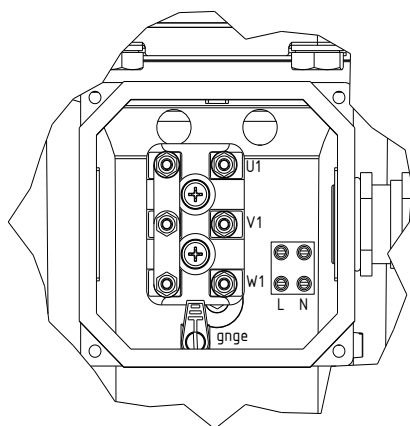


Illustration 4

Please observe protection note ISO 16016.	Drawn: 2023-01-19 Wie	Replacing: KTR-N dated 2020-11-02
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**7 Special equipment****7.4 Standstill heating**

Connection is made on an auxiliary terminal strip in the terminal box.

[220-230V, 50Hz]

Type	Rated power W
------	------------------

Ed 230

up to 25

Ed 4500

8 Hydraulic liquid and lubricants as well as operating behaviour

The oil quantities given in table 2 are average quantities. They will decrease in case of thruster types with valves and/or springs.

Ed-thrusters are filled with hydraulic oil, grade HL 10 DIN 51524 for temperature range from -20°C to +50°C. For different temperature ranges special oils are required.

This "long-life" filling is not subjected to any wear or dirt during operation as long as the unit is in perfect condition.

With refilling after repair any other brands than used for initial filling of category HL 10 DIN 51524 can be used. All bearing positions in the Ed thruster have an initial grease lubrication which means that Ed thrusters are mainly maintenance-free.

Exceptions:

Thrusters as a firedamp-proof type are filled with flame retardant hydraulic liquid according to the provisions of the German Mining Authority.

Table 2: Fill volumes for Ed thrusters 230/50 to Ed 3000/120, basic versions

Thruster-type	Fill volumes [L]
Ed 230-50	1.6
Ed 300-50	1.9
Ed 500-60	4.2
Ed 500-120	5.5
Ed 800-60	4.2
Ed 800-120	5.5
Ed 1250-60	9.4
Ed 1250-120	9.4

Thruster-type	Fill volumes [L]
Ed 2000-60	9.4
Ed 2000-120	9.4
Ed 3000-60	9.2
Ed 3000-120	9.2
Ed 4000-60	9.1
Ed 4000-120	9.1
Ed 4500-60	9.1
Ed 4500-120	9.1

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8 Hydraulic liquid and lubricants as well as operating behaviour

8.1 Inspection of liquid level



Excess pressure is generated in the cylinder space of thrusters with operating temperature. That is why there is the danger of burning with hot operating liquid when opening the filling screws! Danger of burning!
Operating liquid (hydraulic oil) may only be inspected, refilled or drained in a deactivated and cold state!

The thruster is filled functionally if the level of the operating liquid in vertical position with the lifting rod retracted comes up to the lower edge within the filling hole.

The thrusters Ed 300/50, Ed 500/60 and Ed 800/60 must be filled to the overflow screw.

With too low filling the unit does not generate the full lifting force. With excessive filling an impermissibly high internal pressure is generated in the unit.

8.2 Refilling

If refilled locally the unit must be filled in vertical position to the overflow screw or filling limit of the filling screw depending on the type.

To avoid potential air inclusions, several lifting motions must be performed. Afterwards the filling level must be reinspected and refilled, if necessary.

Finally the filling screws and overflow screws (if existing) must be firmly tightened.

8.3 Operating behaviour depending on ambient temperature

Temperature range	Operating liquid	Technical statement
-20 °C to +50 °C	HL 10, DIN 51524, component 1	If the devices are in cold condition lifting times may extend up to four times the lifting times specified with minus temperature range. The lowering times remain unchanged.
above +50°C	special oil	Do contact the manufacturer
below -25°C ¹⁾	special low-temperature oil	

¹⁾ With ambient temperatures below -20°C the statements for vertical operating position apply.

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9 Installation

9.1 Assembly

The thruster can be tilted vertically up to 15° in the direction of the terminal box or installed horizontally, while the terminal box must be on top for proper operation. The same applies for the type with bottom eyes offset by 90°.

If a different mounting position is required, the device must be redesigned by the manufacturer.



With the majority of applications the thruster serves as a safety element. That is why opening or disassembling the thruster may only be done by specialized staff of the manufacturer and usually in the manufacturing plant only!



Lightly grease the fastening pins each of the device base and lifting rod bores to avoid seizing and protect reliably against axial displacement!



Please observe the following KTR operating/assembly instructions:
KTR-N 44410 KTR-STOP® TB T Thruster brake
KTR-N 44411 KTR-STOP® TB S disk brake

9.2 Electrical connection



Before connecting make sure that the mains voltage and mains frequency correspond to the details indicated in the type label!



Make sure with all cable connections that the swivelling motion of the thruster during operation is not affected!

With normal delivery condition the three-phase motors are wired as a star connection. A wire cross-section of 1.5 mm² is sufficient for all sizes. The terminals always have to be kept clean. The cover of the terminal box must be sealed by a perfect seal.

10 Initial start-up

The following items have to be reviewed:

- Inspection of oil level: The screw plug must be opened with the thruster in vertical position. The housing must be filled to the lower edge of the filling hole of the opening (component 9). The thrusters Ed 300/50, Ed 500/60 and Ed 800/60 must be filled to the overflow screw.
- The electrical connection must correspond to the details indicated in the type label.
- The oil filling screw, the terminal box cover and all screws and pins must be fastened properly.
- All components mounted must be properly aligned. Free swivelling of the unit must be ensured. Shear forces must not affect the piston rod.

If the thruster is provided with valves, they are set as follows – see illustration 5.

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10 Initial start-up

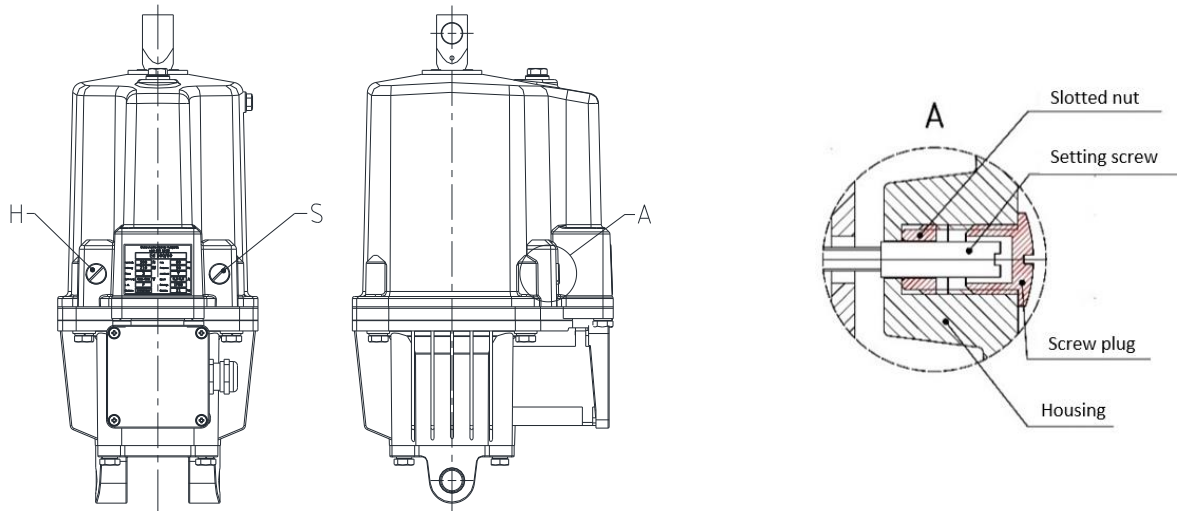


Illustration 5: Setting of globe (H) and lowering (S) valve

- The screw plug must be unscrewed by means of a suitable screwdriver.
- The globe valve (component H) or the lowering valve (component S) can be set via the setting screw until the requested positioning time has been achieved. The thruster must be switched on and off several times during setting.



Turning the setting screw to the right increases the positioning respectively reset time.



Turning the setting screw left reduces the positioning respectively reset time.



The setting screw may be unscrewed to the housing edge at the maximum! The slotted nut must not be untightened in any case due to the risk of leakages!

- Do not untighten the slotted nut during this process!
- Reinstall the screw plug.



**The positioning times depend on temperature and must be set on the thruster with operating temperature!
 Correct the setting regularly, especially when the ambient temperature changes (e.g. summer – winter).**



**Please observe the following KTR operating/assembly instructions:
 KTR-N 44410 KTR-STOP® TB T Thruster brake
 KTR-N 44411 KTR-STOP® TB S disk brake**



11 Disposal

In respect of environmental protection we would ask you to dispose of the products on termination of their service life in accordance with the legal regulations and standards that apply, respectively.

- **Metal**
Any metal components have to be cleaned and disposed of by scrap metal.
- **Gaskets**
Gaskets can be disposed of by residual waste.
- **Electrical components**
Electric components have to be treated as electric waste.
- **Hydraulic oil**
Hydraulic oils have to be collected in suitable tanks and disposed of by a waste disposal company.

12 Maintenance



If the thruster needs to be disassembled for purpose of maintenance work, preparations have to be made for retaining the weight of up to 40 kg.

The maintenance of thrusters is limited to a regular function and oil inspection. With normal operating conditions it should be performed every six months. The intervals of oil change depend on the conditions of application. If the oil shows significant modifications in viscosity or has become significantly darker, it must be changed as follows:

- The dismantled thruster must be positioned horizontally with the oil filling hole at the bottom..
- After opening of the oil filling screw (component 9) the oil must drain.
- For a complete discharge the unit has to be held with the piston rod pointing vertically to the bottom.
- Hold the unit with the piston rod pointing upwards and wait until the remaining oil has run out of the cylinder, afterwards hold the unit pointing upwards. Repeat this process several times.
- Afterwards wash the housing with some clean oil.
- With the unit being in vertical position oil must be filled in either to the overflow screw or the filling limit of the filling screw, each depending on the type. The hydraulic oil HL 10 DIN 51524 should be used here.
- Now some lifting motions should be made to fill the air chambers. The oil level should be corrected, if necessary.
- The oil filling screw (component 9) must be retightened.
- The thruster can be mounted and put into operation.

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	Verified: 2023-01-19 Wie/Li	Replaced by:



13 Trouble shooting

Any trouble that cannot be sorted out by the measures specified in table 3 requires repair by specialist staff. For this purpose it is necessary to observe the assembly, setting and testing instructions of the manufacturer. Non-compliance with such instructions may cause damages and loss of warranty. That is why any repairs on the thruster should be made by staff trained by the manufacturer only.

Table 3: Examples of malfunction and rectification

Breakdowns	Causes	Elimination
Trouble: motor is not running (piston rod is not extended)	Interruption of supply	Search for and sort out interruption
	Turn off by trigger unit (motor protection switch)	Inspect motor protection switch and safety elements
	Bad contact on the terminals (corroded terminals)	Clean contacts
	Rotor is jammed in the stator, the bearings or in the range of the impeller (pump)	Replace unit and send to KTR for repair
	Unit is overloaded: Sum of brake spring and weight load is too high	Reduce load following the data of the unit
	Lack of operating liquid	Refill operating liquid
	Piston rod jams by external effect	Search for cause of jamming in the components of the unit and remove trouble – possibly inspect unit and machine when disengaged (secure unit and remove pins on the rod head)
Trouble: thruster lifts slowly or by jerks	See „unit overloaded“, „lack of operating liquid“ and „piston rod jammed“	See above
	Interruption of supply (two-phase system)	Search for and sort out interruption
	Air in the pump circuit	Activate the unit in upright position several times and refill operating liquid, if necessary
Operating liquid escapes	On the piston rod seal	Replace unit and send to KTR for repair
	On the filling screw	Inspect seal, fasten the screw
	On the connection between lower part (motor housing) and upper part	Tighten the screw connection at a maximum of 49 Nm
	Operating liquid in the terminal box	Replace unit and send to KTR for repair
Metallic noise	Bearing damaged	Replace unit and send to KTR for repair
Activating the safety elements (motor protection switch)	Short circuit of winding, phases or contact voltage	Replace unit and send to KTR for repair
Increased current consumption	Between two phases (short circuit of winding)	Measuring the resistance –replace unit and send to KTR for repair, if necessary
	Between all phases (rotor loops or is stuck)	Replace unit and send to KTR for repair