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Operating Instruction

for Submersible Electropumps
CT

Please keep your Operating Instruction in a safe place! Translation of the original operating instructions!

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Contents

Translation
When shipping to EEA Countries, the operating instructions are to be translated into the respective language of the country where the device is to be used. In the event that discrepancies arise in the translated text, the original operating instructions (German) are to be consulted or the manufacturer is to be contacted in order to clarify the discrepancy.

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1 General information

The most important operating data can be found on the identification plate. **It must be ensured that the pump type and all technical data correspond to the system / machine project data.**

The pumps may not be commissioned until the following points have been observed / ensured:

- Inappropriate physical and mental strain placed upon the operation staff must be reduced to an absolute minimum level by taking ergonomic principles in to account.
- A safe working environment must be guaranteed. Controls are to be designed and constructed in such a manner that no hazardous situations can occur. Furthermore, such situations may not occur even in the event of faults / breakdown of the control. In particular, the pump may not be unintentionally started. It must also be the case that the supply / discharge lines to and from the pump can also be closed.
- It must be guaranteed that the pump can be safety stopped. Irrespective of the type of operation, the EMERGENCY STOP function must be available and ready for operation at all times. In doing so, it must be taken into consideration that equipment connected to the pump can also be stopped in the event that a hazard can occur if such equipment continues to be operated.
- The supply / discharge lines must be able to withstand the possible internal and external pressure loads.
- By implementing suitable precautions, it must be the ensured that no injuries can occur by touching the pumps, e.g. with regards to extreme temperatures

2 Description

2.1 Genral Description

Electropumps types CT are all similar from the functional and constructive point of view; the only differences are the following:

- power
- flow rate
- head
- electric power supply (single-phase or three-phase)
- weight
- dimensions

Elektropumps types CT are used for handling water, even at high temperatures. Thanks to their small bulk and ease of transport, they may be used for fixed or temporary installations, with or without automatic start.

2.2 Intended Use

The motor-driven pumps can be used for:

- handling clear water
- pumping water out of garages, cellars, basements, tanks, reservoirs, fountains, rainwater drains
- flood irrigation of vegetable patches and gardens and oxygenating water.
- The CT 75 - CT300 series can also be used to drain rainwater drains, cesspits and septic tanks, and trenches etc.

Only use CT75-300 series motor-driven pumps for continuous duty if they are fully submersed.

Do not use CT75-300 series motor-driven pumps with the motor out of water for more than 15 minutes.

2.3 Pump Specification

	ME	CT 2-5	CT 75-300
Max. temperature of liquid pumped	°C	35	40
Max. size of solids in suspension	mm	10	50
Max. immersion depth	m	See motor-driven pump rating plate	
Delivery diameter	*	G1 ½“	G2“ or DN50 flange

2.4 Motor

	CT 2-5 + CT 75-300
Type	Submersible
Max. Starts per hour	20
Ratings	See motor-driven pump rating plate
Overload Protection	SINGLE PHASE: thermal cutout w/automatic reset THREE PHASE: by installer

The conveying of liquids that may chemically corrode the pump material or that contain abrasive components will destroy the pumps. The conveyed material must be suitable for use with the pump material.

The power consumption of the pump proportionally changes based upon the density of the conveyed material. The densities must correspond to the order data in order to avoid excess strain being placed upon the pump and motor.

2.5 Operating

The pump unit must be freely accessible for the purpose of supervision, servicing, maintenance, mounting and dismounting.
Avoid using it in corrosive and very dusty surroundings.
The limiting values of the electric drive unit with regard to the insulation material class and the types of protection must be observed.
For other drive units supplied, see the enclosed separate operating instructions.

3 Security

This operating manual gives basic instructions which are to be observed during installation, operation and maintenance of the pump. it is therefore imperative that this manual be read by the responsible personnel/operator prior to assembly and commissioning. It is always to be kept available at the installation site.
It is not only the general safety instructions contained under this main heading safety that are to be observed but also the specific information provided under the other main headings.

3.1 Identification of Safety Instructions in the Operating Manual

Safety instructions given in this manual non-compliance with which would affect safety are identified by the following symbol

see DIN 4844-W9

or where electrical safety is involved, with

see DIN 4844-W8

Instructions non-compliance with which would give rise to malfunctioning of the machinery are identify by the word

CAUTION

It is imperative that signs affixed to the machine, e. g.

- arrow indicating the direction of rotation
- symbols indicating fluid connections

be observed and kept legible.

3.2 Qualification and Training of Operation Personnel

The personnel responsible for operation, maintenance, inspection and assembly must be adequately qualified. Scope of responsibility and supervision of the personnel must be exactly defined by the plant operator. If the staff does not have the necessary knowledge, they must be trained and instructed, which may be performed by the machine manufacturer or supplier on behalf of the plant operator. Moreover the plant operator is to make sure that the contents of the operating manual are fully understood by the personnel.

3.3 Hazards in the Event of Non-Compliance with the Safety Instructions

Non-compliance with the safety instructions may produce a risk to the personnel as well as to the environment and the machine and results in a loss of any right to claim damages.

For example, non-compliance may involve the following hazards:

- Failure of important functions of the machine/plant
- Failure of specified procedures of maintenance and repair
- Exposure of people to electrical, mechanical and chemical hazards
- Endangering the environment owing to hazardous substances being released.

Injuries to hands can occur during maintenance and repair works. Ensure that all safety instructions are observed.

Danger areas on the pump

During maintenance and cleaning work, an area measuring approximately 1 m around the pump will serve as a danger area. This area may also be increased in size in the event of faults. The operating area is only located at the operation elements.

3.4 Compliance with Regulations Pertaining to Safety at Work

When operating the pump, the safety instructions contained in this manual, the relevant national accident prevention regulations and any other service and safety instructions issued by the plant operator are to be observed.

3.5 Safety Instructions relevant for Operation

a) The user must absolutely comply with all the accidentprevention regulations in force in the country in which the pump is being used.

b) If the electropump is being used in a swimming pool, there must be no people in the pool.

c) During electropump repairs or mainte nance, remove the plug from the socket and/or switch off the switch (if provided), thus interrupting the supply of electric power to the electropump. This will prevent accidental starting which could cause dam age to persons and/or things.

d) All maintenance operations, installations or shifting of electro pump with the electric system live may cause severe and even mortal accidents.

e) During operation, avoid moving or shifting the electropump.

f) Before using the electropump, always check that the cable and all the electric devices are efficient.

g) Never start the electropump (by inserting the plug in the socket and/or switching on the switch) with bare feet or, worse with your feet in the water, or with wet hands.

h) The user must not carry out under his own initiative any operations or jobs not contem plated in this manual.

The pump is to be secured against being unintentionally switched on during maintenance and cleaning work. Work may only be carried out provided that the system / pump is in a pressure-free condition.

3.6 General Safety Warnings

Electro pumps are designed in such a way that all the moving parts are rendered inoffensive by the use of casings. The manufacturer declines all responsibility in the event of damage caused as a result of tempering with these devices.

Each lead or live part is electrically insulated to earth; there is also a further safety device in that the accessible conductive parts are connected to an earth lead so that the parts within reach cannot become dangerous in the event of failure of the principal insulation.

3.7 Safety Instructions relevant for Maintenance, Inspection and Assembly Work

It shall be the plant operator's responsibility to ensure that all maintenance, inspection and assembly work is performed by authorized and qualified personnel who have adequately familiarized themselves with the subject matter by studying this manual in detail.

Any work on the machine shall only be performed when it is at a standstill, it being imperative that the procedure for shutting down the machine described in this manual be followed.

Replacement parts that have not been supplied by the manufacturer are not tested and not approved for use. The installation and usage of such replacement parts can have a negative impact upon the pump characteristics.

The manufacturer is not liable for any damages caused by the usage of non-original parts.
On completion of work all safety and protective facilities must be re-installed and made operative again.

Prior to restarting the machine, the instructions listed under initial commissioning are to be observed.

3.8 Unauthorized Alterations and Production of Spare Parts

Any modifications may be made to the machine only after consultation with the manufacturer. Using spare parts and accessories authorised by the manufacturer is in the interest of safety. Use of other parts may exempt the manufacturer from any liability.

3.9 Unauthorized Modes of Operation

The reliability of the machine delivered will be only guaranteed if it is used in the manner intended, in accordance with our order documentation, especially with the order confirmation.
The limit values specified in the data sheet must under no circumstances be exceeded. The pump may only be operated in the authorised curve range.

4 Use for which Pumps are not designed

The pumps **cannot** be used to handle:

- water containing acids or bases, and corrosive liquids in general
- water with a temperature over the temperature limit given in chap. 2.3.
- seawater
- flammable liquids and hazardous liquids in general
- cannot be used in swimming pools (according to EN 60335-2-41)
- pumps with a cable less than 10m long cannot be used outdoors.

5 Handling and Transport

5.1 Unpacking

Check that there are no breakages or severe dents in the packing; if there are, pint this out immediately to the person who delivers the material.

5.2 Handling and Disinstalling

Failure to follow these instructions may cause the Electropump to fall, suffering severe damage.

Absolutly do not use the power cable to lift or drag the Electropump.

To handle or disinstall the electropump you must:

- Remove the plug from the power socket and/or switch off the switch, if provided.
- Roll up and hold the electric power cable in your hand.
- Lift the electro pump and the delivery pipe with the handle provided.

If the electropump is set up for fixed applications, perform the following operations before handling it:

- Remove the plug from the power socket and/or switch off the switch, if provided.
- Unscrew any clamps and remove the delivery pipe.

- Roll up and hold the electric power cable in your hand.
- Lift the electro pump and the delivery pipe with the handle provided.

Never use the pump to the electric cables and / or float lift switch. The motor can be damaged and have a shock result.

5.3 Transport

Transport presents no problems.
The pump unit must be transported in a level or horizontal manner.

A pump that is insufficiently secured can lead to persons being seriously injured.

Use a rope fastened around the handle to lift or lower the motor-driven pump: never pull the power cable and/or float cable and switch (fig.12).

6 Installation

To lift or lower the Electropump, use the handle or hold it with both hands; never use the electric power cable.

6.1 Fixed Installation

The electropump must be placed on a lever surface.

a) When positoning the electropump, observe the minimum required distances (fig. 3+5) from walls, from the sides of the drain or other location, so as to allow functioning, use and maintenance operations in safe conditions.

b) It is recommend to use G1½ flexible pipes, with couplings of the same size if required.

c) It is recommend to fit a no-return valve on the delivery side.

6.2 Temporary Installation (For temporary use)

a) The electropump must be placed on a lever surface

b) When positioning the electropump, observe the minimum required distances (fig. 3+5) from walls, from the sides of the drain or other location, so as to allow functioning.

c) It is recommend to use G1½ flexible pipes, with couplings of the same size if required.

d) It is recommend to fit a no-return valve on the delivery side.

7 Assembly and Disassembly

The electropump has no separate accessories, so no assembly is required for installation.
If the centrifugal pump has to be disassembled (due to breakage or any other reason), the user must apply to the deler or to the assistance service.

8 Preparation for use

CAUTION Failure to comply with this Rule renders the Guarantee invalid.

On three-phase electropumps type CT, check the direction of rotation of the motor. The impeller must turn in a clockwise direction when viewing the centrifugal pump from above (see the arrow on the pump).
As it is not possible to check the direction of rotation of the impeller visually, proceed as follows; before anchoring the centrifugal pump in the system and without the pipes, connect the power cables to the electric panel and switch on the main switch for a moment. The electropump will start up immediately with a recoil. If the pump is turning in the right direction, the recoil will be anti-clockwise, viewing the pump from the top.

A rotating impeller can cut or crush hands and arms. Do not reach into the pressure or suction sockets of the pump housing. Secure the pump appropriately when carrying out a rotational direction check.

The dry operation of the pump destroys / damages the mechanical seal and leads to leakage and the discharge of the conveyed material. Ensure that the pump is switched off again immediately after the warm-up phase.

The incorrect rotational direction of the pump destroys / damages the mechanical seal and leads to leakage and the discharge of the conveyed material.

8.1 Electric Connection

a) For connection to the power mains, the electropump is provided with 10m cable complying with IEC standards, when connecting, consider the installed power (0,55-1,5kW), the mains voltage and the number of phases.
b) The mains must have an efficient earth system complying with the electrical standards in force in the user's country; the installer is responsible for checking this.
c) The single-phase version has a plug compling with double earth contact; earthing is provided by the plug itself when it is inserted in the socked.
d) The three-phase version has a power cable with a yellow/green lead; connect the yellow/green lead in the power cable to an efficient earth system which complieswith the electrical standards in force in the user´s country.
The three-phase version has no internal motor protector, so overload protection must be provided by the user. The electropump must be fed by means of an electric panel with a switch, fuses and a magnetothermal switch set at the current absorbed by the eletropumps. The electric panel must be prepared by a skilled technician.
The electric connection must be carried out by a skilled technician.

The pump must be connected according to international national requirements as well as according to the requirements of the local mains system. Voltage and frequency must correspond to the winding of the electric drive. For details of the respective winding, see the type label. The motor must not be operated without motor protection facility.

For motors with explosion protection, the range of temperature of the motor indicated on the type label must correspond to the range of the fuel gas.

CAUTION An overload protection system (e.g. motor protection switch, etc.) must be in place in order to protect the pump and the motor.

9 Starting

New pumps may feature a small amount of oil (the food kind), which does not present a source of health risk.

9.1 Version with Float (see Figure)

Plug into the power mains and/or turn on with the switch: the motor-driven pump starts working. Once the pump has sucked in enough water to reach the minimum level ("OFF" level), regulated by the fl oat, it will turn off automatically. The fl oat's working position is factory set so as to assure a minimum immersion level in the "OFF" position. NB: If the liquid is overly contaminated, the operation of the magnetic-type fl oat (MS versions) may be compromised, meaning it needs to be cleaned on a regular basis. Moreover, do not use in liquids polluted with iron dust or magnetic material as this would compromise the operation of the float.

9.2 Version without Float

Plug into the power mains and/or turn on with the switch: the motor-driven pump starts working. Once the pump has sucked in enough water to reach the minimum level, unplug from the power mains and/or turn off with the switch.

9.3 CT 75-300 Pumps

a) There is a vent hole on the side of the pump casing of CT versions for priming. During operation, there will be a small recycling jet from it.
b) The three-phase version of the CT pumps features a 3-wire + earth power cord with the addition of two white and grey wires with a smaller cross-section connected to the thermal overload protector inside the motor (fig.13).
- Connect the power cord's yellow/green wire to an efficient earthing system, which must be in compliance with the regulations in force in the user's country;

- overload protection and use of the signal provided by the thermal overload protector are the user's responsibility;
- overload trip units must have suitable thermal-magnetic devices set appropriately for the motor-driven pump installed;
- for the heat sensor, the two white and grey wires must be connected to an electrical circuit that can cut power to the motor-driven pump.

10 Maintenance and Repairs

CAUTION Before carrying out any maintenance operations disconnect the Plug and/or switch off. The Electropump must be dismantled only by skilled technicians.

To maintain the motor-driven pumps properly and ensure their long service life, the filter and/or suction port must not be clogged and the impeller must be clean.
During maintenance work on the motor-driven pumps, disconnect the power supply.

10.1 CT2-5 Motor-Driven Pumps (Fig.9)

To reach the impeller, proceed as follows:
- wear work gloves to avoid cutting your hands;
- unscrew the three screws (1) securing the filter;
- remove the filter (2);
- unscrew the three spacers (4) and three nuts (5) and remove the distancing plate (3);
- using all small straight screwdriver, remove the nylon washers (6) and replace them before reassembling the unit as they break when the volute is removed
- take care not to damage the o-ring (7).

10.2 CT75-300 Motor-Driven Pump (Fig.11)

a) If the suction port is clogged, you must clean it, remembering to wear work gloves at all times to avoid cutting your hands;
b) If the impeller is dirty, proceed as follows:
   - wear work gloves to avoid cutting your hands;
   - unscrew the six screws (1) keeping the pump casing closed (not the nut as it is welded to the pump casing);
   - remove the pump casing, pulling it off (2);
   - remove the o-ring (3);
   - take care not to damage the o-ring (3);
   - make sure the space between the impeller and casing is also clean.

10.3 Reassembly

To reassemble, repeat the procedure given in reverse order.

10.4 Troubleshooting

The pump does not work (the motor does not turn over)

Cause	Remedy
No electric power	Check the contactor on the electric line
Plug not inserted	Check power connection to the line
Float blocked	Check that the float reaches ON level
Impeller blocked	Check cause of blockage
Thermal protection has tripped (single-phase)	This resets automatically (single-phase only)
Protection fuses are burnt out (three-phase)	Refuse the fuses with others of the same type
Faulty motor or capacitor	Contact the manufacturer

The pump works at a low flow rate

Cause	Remedy
Dirty impeller, grid or delivery pipes	Clean them
No-return valve blocked	Clean the valve and check ist operation
Water level too low	Switch off the pump
Wrong direction or rotation	Check the direction of rotation (three-phase only)

The pump stops after brief periods of operation (tripping of the thermal protection)

Cause	Remedy
Impeller blocked by foreign bodies	Remove the foreign bodies
Internal defect	Contact the manufacturer.

The pump does not work (the motor turns over)

Cause	Remedy
Intake filter blocked	Clean the filter
No-return valve blocked	Clean the valve an check its operation

11 Installation and Disassembly Diagram

11.1 CT 2-5

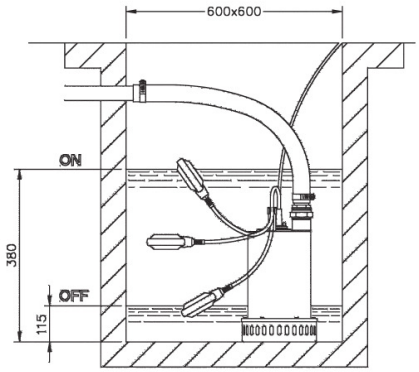
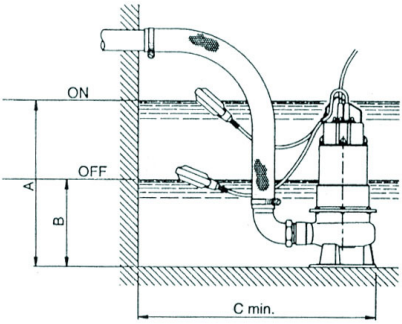


Fig.3

11.2 CT 75-300



Dimensions in mm

A	600
B	250
C	500

Fig. 5

12 Dismantling scheme

12.1 CT 2-5

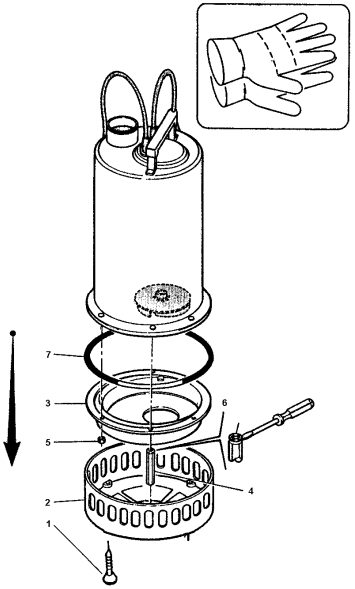


Fig.9

12.2 CT 75-300

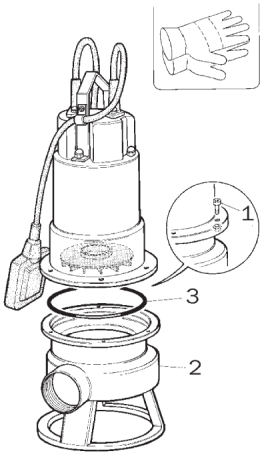


Fig.11

13 Connection scheme 3-phase motor (Fig. 13)

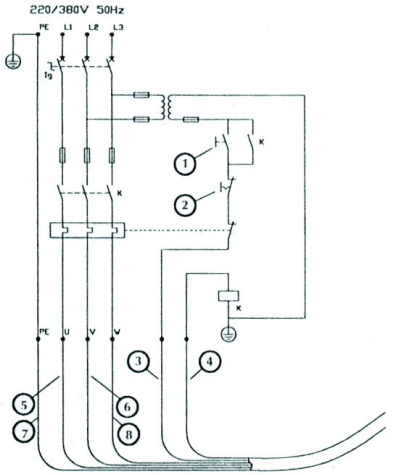


Fig.13

1)	winding	5)	brown
2)	--	6)	blue
3)	gray	7)	yellow/green
4)	white	8)	black

14 Information on Air-Borne Noise

The weighted sound pressure level A produced by the centrifugal pump does not exceed the value of 70 dB(A).

Fig.12

Never pull on the power cord or swim. This can cause damage on the engine and an electric shock.

EG Declaration of Conformity
In accordance with EC Machinery Directive 2006/42 EC, Appendix II, 1 A

We, EDUR Pumpenfabrik Eduard Redlien GmbH & Co. KG
Edisonstraße 33
D-24145 Kiel

hereby declare that the compact design rotary pump – see cover sheet for information regarding pump model,

conforms to all of the relevant regulations of EC Machinery Directive 2006/42/EC. The protection objectives of the low voltage directive were observed in accordance with Appendix I, No. 1.5.1 of the machinery directive. The following harmonised standards applied:

DIN EN 12100-1 DIN EN 809
DIN EN 12100-2 DIN EN 14121

Person responsible for the documentation: Mr. T. Kaeding

Declaration of Incorporation
In accordance with EC Machinery Directive 2006/42/EC, Appendix II, 1 B

We, EDUR Pumpenfabrik Eduard Redlien GmbH & Co. KG
Edisonstraße 33
D-24145 Kiel

hereby declare that the incomplete compact design rotary pump – see cover sheet for information regarding pump model – supplied without motor conforms to the following essential requirements of EC Machinery Directive 2006/42/EC, Appendix I: 1.1.1.; 1.1.2.; 1.1.3.; 1.1.5.

The following harmonised standards applied:

DIN EN 12100-1 DIN EN 809
DIN EN 12100-2 DIN EN 14121

This incomplete machine may only be put into operation after it has been determined that the machine into which this incomplete machine is to be installed, conforms to the regulations of the machinery directive.

Person responsible for the documentation: Mr. T. Kaeding