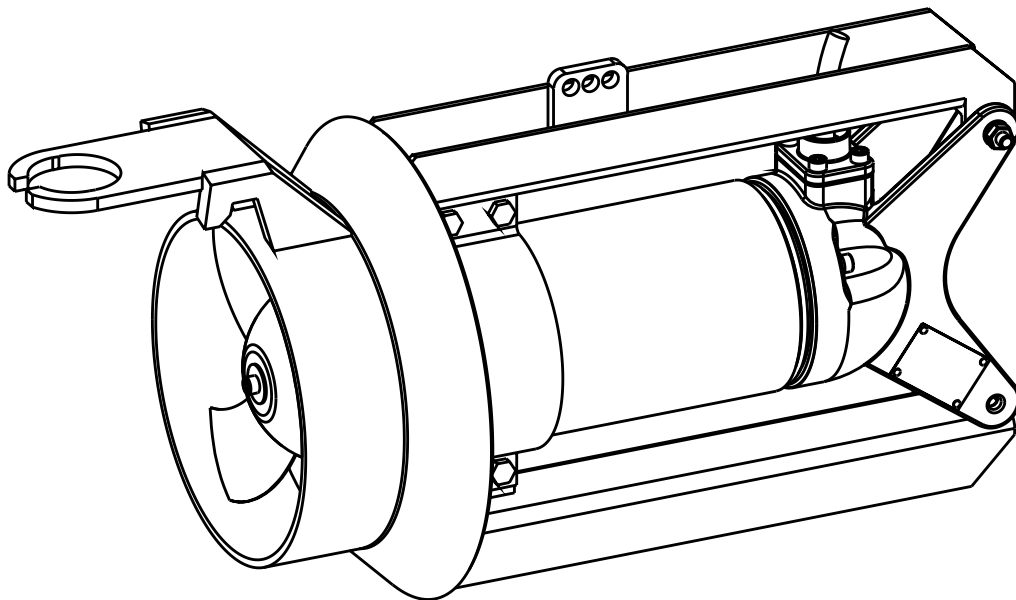

Submersible Recirculation Pump Type ABS RCP 250

1024-00



ABS submersible recirculation pump RCP

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1 General

1.1 Application areas

The Sulzer recirculation pumps with water pressure-tight encapsulated submersible motors are reliable quality products designed for the following applications:

- Pumping and circulation of activated sludge in treatment plants with removal of nitrogen (nitrification/denitrification).
- Pumping of storm or surface water.

1.2 Technical data

Maximum noise level ≤ 70 dB. This may be exceeded in certain circumstances.

1.3 Nameplate

We recommend that you record the data from the original nameplate in the corresponding form below, and maintain it as a source of reference for the ordering of spare parts, repeat orders and general queries.

Always state the pump type, item number and serial number in the field “Nr/SN” in all communications.

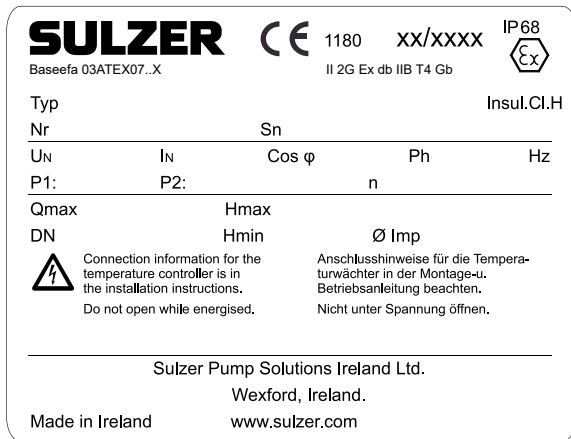


Figure 1: Nameplate Ex Version

Legend

Type	Pump type	
Nr./SN	Item No./Serial No.	
xx/xxxx	Production date (Week/Year)	
UN	Rated Voltage	V
IN	Rated Current	A
	Frequency	Hz
P1N	Rated Input Power	kW
P2N	Rated Output Power	kW
n	Speed	min-1
Qmax	Max. Flow	m ³ /h
Hmax	Max. Head	m
Ø Imp.	Impeller diameter	mm
DN	Discharge diameter	mm
IP68	Protection type	

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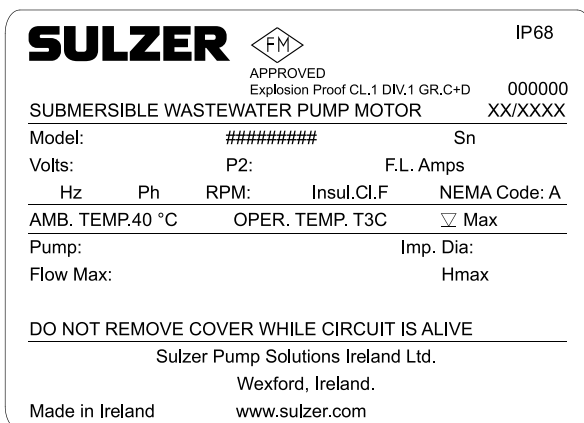


Figure 2: Nameplate FM Version

Legend

Model	Pump type/ Item No.	
SN	Serial No.	
UN	Rated Voltage	
P2	Rated Output Power	HP
F.L.Amps	Full Load Amps	
Hz	Frequency	
Phase	Three/Single Phase	
RPM	Speed	min-1
Imp. dia	Impeller diameter	mm
Max. ∇	Max submersible depth	Ft
Flow Max.	Rated Discharge	GPM
Head Max.	Max. Head	Ft

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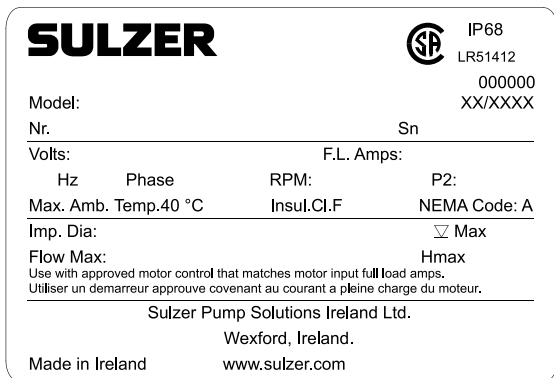


Figure 3: Nameplate Standard Version

Legend

Model	Pump type/ Item No.	
SN	Serial No.	
UN	Rated Voltage	
P2	Rated Output Power	HP
F.L.Amps	Full Load Amps	
Hz	Frequency	
Phase	Three/Single Phase	
RPM	Speed	min-1
Imp. dia	Impeller diameter	mm
Max. ▽	Max submersible depth	Ft
Flow Max.	Rated Discharge	GPM
Head Max.	Max. Head	Ft

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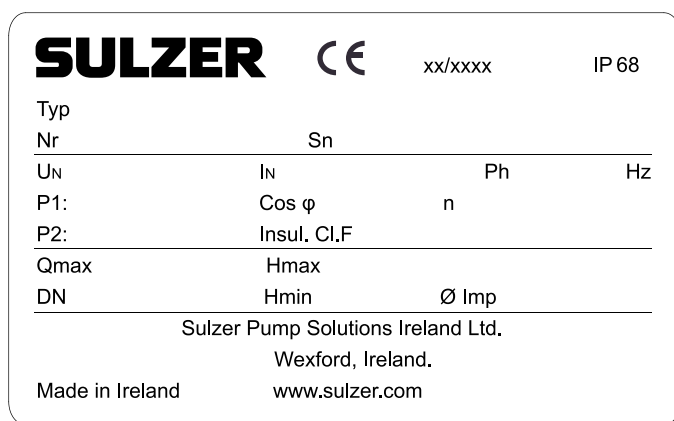


Figure 4: Nameplate Standard Version

Legend

Type	Pump type	
Nr./SN	Item No./Serial No.	
xx/xxxx	Production date (Week/Year)	
UN	Rated Voltage	V
IN	Rated Current	A
	Frequency	Hz
P1N	Rated Input Power	kW
P2N	Rated Output Power	kW
n	Speed	min-1
Qmax	Max. Flow	m ³ /h
Hmax	Max. Head	m
Ø Imp.	Impeller diameter	mm
DN	Discharge diameter	mm
IP68	Protection type	

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2 Safety

The general and specific health and safety guidelines are described in detail in the Safety Instructions for Sulzer Products Type ABS. If anything is not clear or you have any questions as to safety make certain to contact the manufacturer Sulzer.

3 Transport



During transport the unit should not be dropped or thrown.



The unit should never be raised or lowered by the power cable.

The unit is fitted with a lifting device to which a chain and shackle may be attached for transport purposes.



Any hoist used must be adequately dimensioned for the weight of the unit.

All relevant safety regulators as well as general good technical practice must be complied with.

4 Mounting and installation

NOTE *We recommend that original Sulzer installation accessories be used for mounting and installation of the pump.*



Particular attention must be paid to the safety regulations covering work in closed areas in sewage plants as well as good general technical practices.

4.1 Installation example

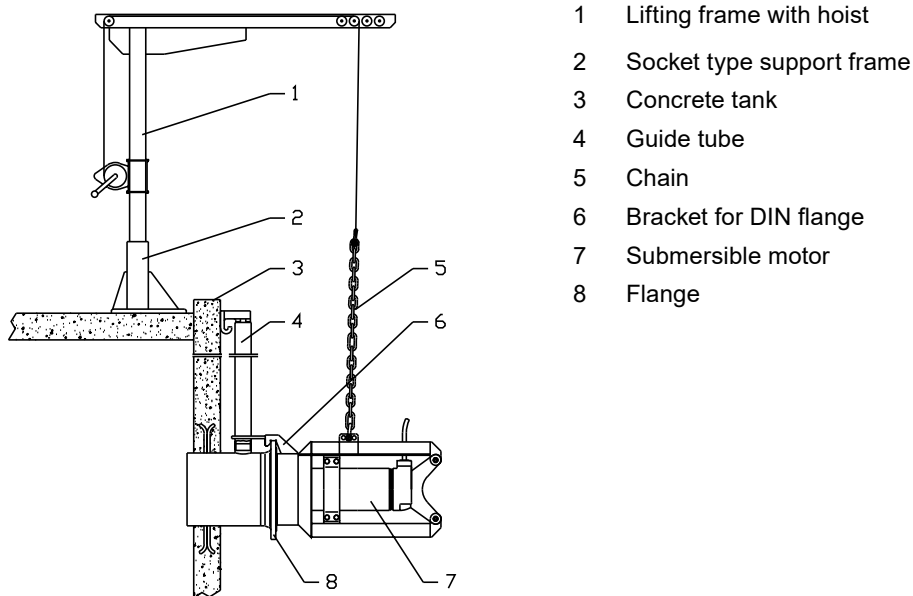


Figure 5: Installation example

4.2 Installation of the guide tube

ATTENTION *The discharge line as well as the required flange should be installed on site before commencing the installation of the guide tube. The flange should be installed in such a manner that the flange holes are symmetrically on either side of the vertical axis of the flange, i.e. a vertical line should not pass through any of the holes. Care should be taken that the flange is adequately fastened to the concrete.*

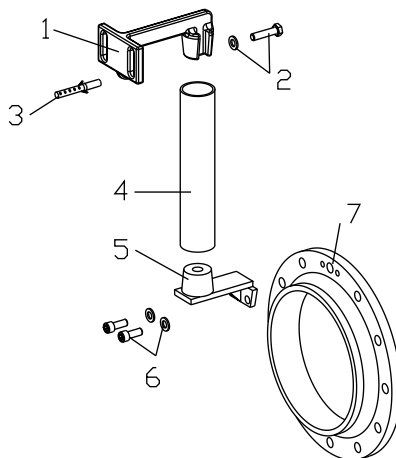


Figure 6: Installation of guide tube

Place bracket (5) at the flange and determine final position. Drill and tap two M12 holes in flange. Again, place bracket (5) at flange and fasten tightly using cylinder bolts (6) including washers.

Fix the position of the pipe retainer (1) vertically above the bracket (5) and fit using masonry plugs (3). Do not yet fully tighten screws (2).

Place guide tube (4) alongside the support cone on the bracket (5) and determine the final guide tube length.

The measurement is taken to the upper edge of the cone on the pipe retainer (1).

Shorten guide tube (4) to the correct length and place on the cone on the bracket (5).

Press pipe retainer (1) upwards into the guide tube (4) so that there is no play in a vertical direction. Tighten hex screws (2) including spring washers.

4.3 Fitting and removal of the recirculation pump



The lifting device must be adequately dimensioned to suit the weight of the recirculation pump. The safety regulations as well as general good technical practice should be observed.

4.4 Lowering of the recirculation pump along the guide tube

The recirculation pump together with guide piece is connected into the guide tube as shown in Figure 8, and lowered along it until it automatically sits in its final position.

When doing this feed the power cable downwards at the same time.

To ensure the RCP will tilt enough to lower correctly on the guide tube, the angle of the pump created by the lifting hook when suspended by the hoist has to be checked prior to lowering. For this purpose, begin lifting the pump from a horizontal surface and check that the rear end of the fixing support rises 2- to 4- cm from the floor before the front end begins to lift clear (see drawing below).

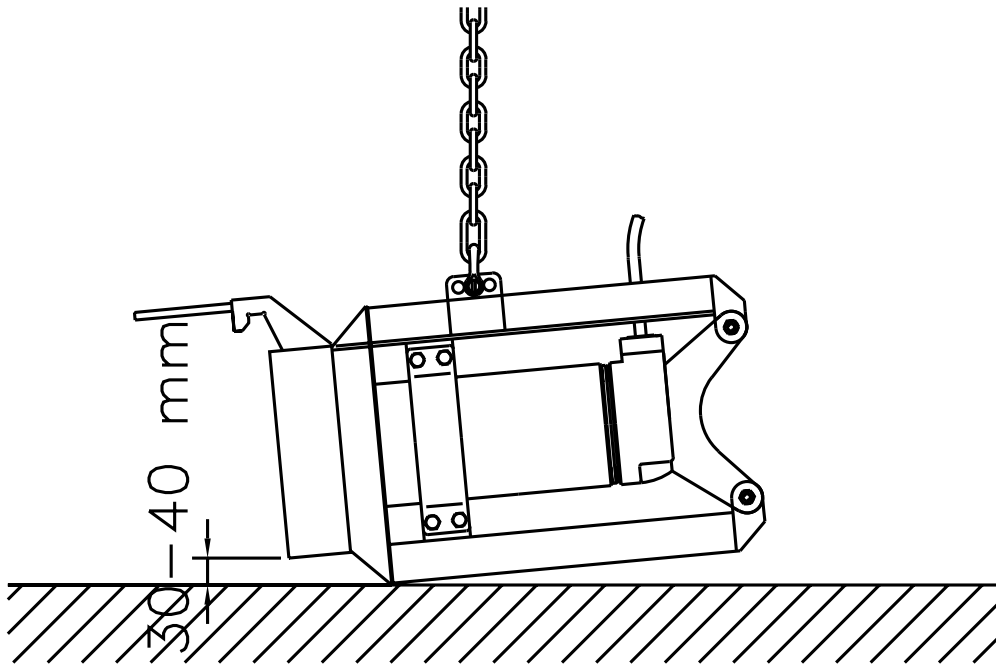
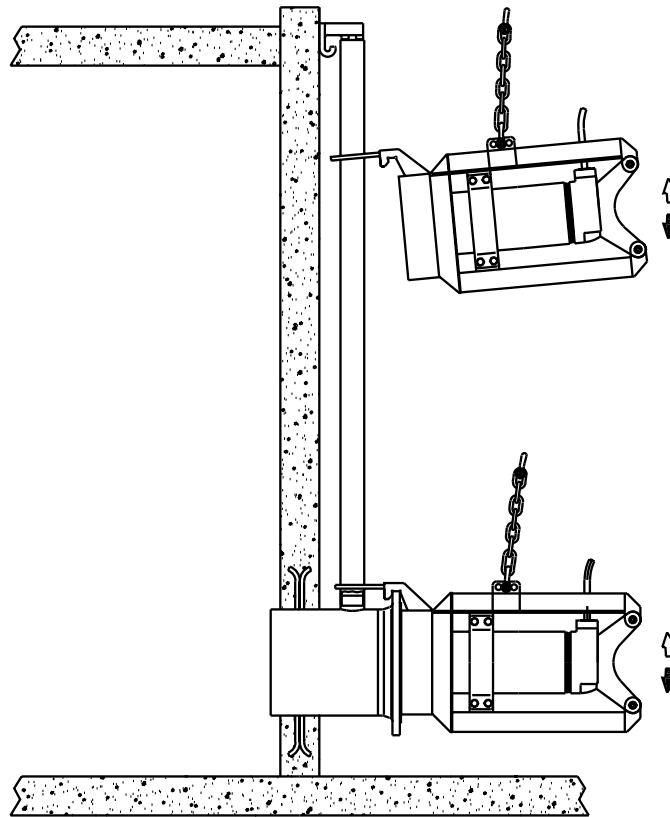


Figure 7: Checking installation angle of pump

ATTENTION *The power cable should be connected to the chain or wire rope in such a manner that it cannot become entangled in the propeller and that it is not subjected to any strain.*

After lowering of the recirculation pump the chain or wire rope should have the tension released.

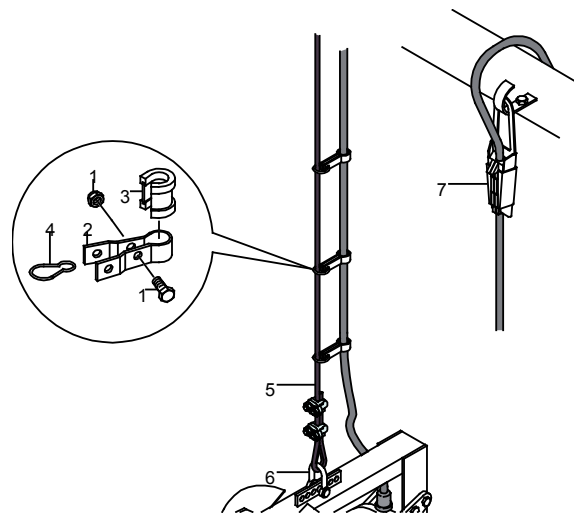


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Figure 8: Lowering into position

4.5 Laying of the power cables

NOTE *The cable brackets here are not supplied as standard with the recirculation pump.*



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Figure 9: Laying of power cable

Place cable holder (2) with rubber sleeve (3) a short distance above the recirculation pump on the connection cable and tighten using hex bolt (1).

Connect the snap hook (4) to the cable holder (2) and chain or wire rope (5).



The connection cable should be laid in such a manner that it cannot become entangled in the propeller and is not subjected to strain.

Locate a second cable holder directly above the shackle (6) in a similar manner.

Mount the other cable holders in a similar manner. As the distance from the pump increases it is possible to increase the distance between the cable holders.

Suspend the cable by means of strain relief (7) to the cable hook.



The electrical connection is carried out in accordance with Section 3.7.

4.6 Electrical connection



Before commissioning, an expert should check that one of the necessary electrical protective devices is available. Earthing, neutral, earth leakage circuit breakers, etc. must comply with the regulations of the local electricity supply authority and a qualified person should check that these are in perfect order.

ATTENTION ***The power supply system on site must comply with VDE or other local regulations with regard to cross-sectional area and maximum voltage drop. The voltage stated on the nameplate of the pump must correspond to that of the mains.***

The power supply cable must be protected by an adequately dimensioned slow-blow fuse corresponding to the rated power of the pump.



The incoming power supply as well as the connection of the pump itself to the terminals on the control panel must comply with the circuit diagram of the control panel as well as the motor connection diagrams and must be carried out by a qualified person.

All relevant safety regulators as well as general good technical practice must be complied with.

ATTENTION ***For use in the open air, the following VDE regulations apply:***

Submersible pumps/recirculators used outdoors must be fitted with a power cable of at least 10 m length. Other regulations may apply in different countries.

Pumps for use in swimming pools, garden ponds and similar, must comply with European Standard 60335, Part 2, protection class I.

NOTE ***Please consult your electrician.***

4.7 Wiring diagram

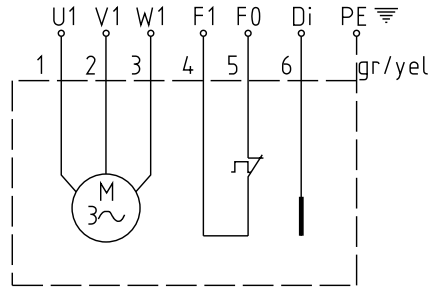


Figure 10: Wiring diagram

Legend

U1, V1, W1	=	Live	F1/FO	=	Thermal sensor
PE	=	Earth	S	=	Start
Gr/Yel	=	Green/Yellow	R	=	Run
Di	=	Seal Monitor	C	=	Neutral (common)

4.7.1 Checking direction of rotation



The safety hints in the previous sections must be observed!

When three phase units are being commissioned for the first time and also when used on a new site, the direction of rotation must be carefully checked by a qualified person.



When checking the direction of rotation, the unit should be secured in such a manner that no danger to personnel is caused by the rotating impeller, or by the resulting air flow. Do not place your hand into the hydraulic system!



The direction of rotation should only be altered by a qualified person.



When carrying out the direction of rotation check as well as when starting the unit pay attention to the **START REACTION** as this can be very powerful

ATTENTION

The direction of rotation is correct if the propeller rotates in a clockwise manner when viewing down from the top of the placed unit.



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ATTENTION

The start reaction is anti-clockwise.

Figure 11: Rotor rotation

NOTE

If a number of units are connected to a single control panel then each unit must be individually checked.

ATTENTION

The mains supply to the control panel should have a clockwise rotation. If the leads are connected in accordance with the circuit diagram and lead designations, the direction of rotation will be correct.

4.7.2 Changing direction of rotation



The safety hints in the previous sections must be observed!



The direction of rotation should only be altered by a qualified person.

If the direction of rotation is incorrect then this is altered by changing over two phases of the power supply cable in the control panel. The direction of rotation should then be rechecked.

NOTE *The direction of rotation measuring device monitors the direction of rotation of the mains supply or that of an emergency generator.*

4.8 Connection of the seal monitor

In order to integrate the seal monitor into a control panel supplied by the customer it is necessary to use an ABS DI-module and connect this in accordance with the circuit diagrams below.

NOTE *DI-modules are available for the voltages 110V, 220V, 380V, and 440V. DI-modules are not supplied as standard.*

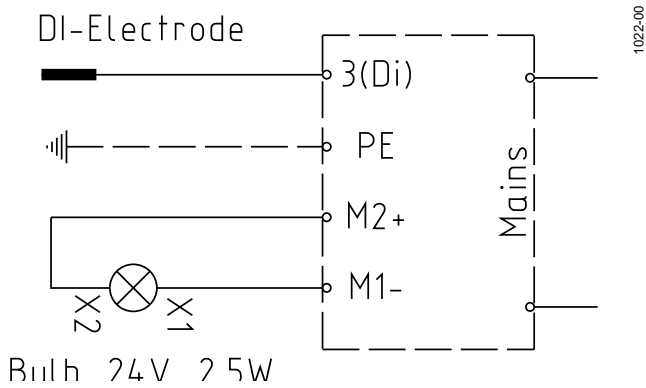


Figure 12: DI Module (connection of neon bulb)

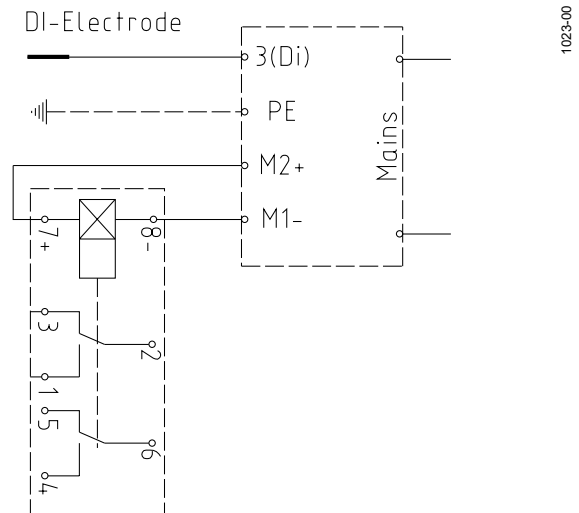


Figure 13: DI Module with relay for individual signaling

ATTENTION *Maximum relay contact loading: 2 Ampere*

5 Commissioning



In explosive zones care must be taken that during switching on and operation of the pumps the pump section is filled with water (dry running) or alternatively is submerged or under water (wet installation). Ensure in this case that the minimum submergence given in the data sheet is observed, Other types of operation e.g. snore operation or dry running are not allowed.



The safety hints in the previous sections must be observed!

Before commissioning, the unit should be checked and a functional test carried out. Particular attention should be paid to the following:

- Have the electrical connections been carried out in accordance with regulations?
- Have the thermal sensors been connected?
- Is the seal monitoring device (where fitted) correctly installed?
- Is the motor overload switch correctly set?
- Have the power and control circuit cables been correctly fitted?
- Was the sump cleaned out?
- Have the inflow and outflows of the pump station been cleaned and checked?
- Is the direction of rotation correct - even if run via an emergency generator?
- Are the level controls functioning correctly?
- Do the non-return valves (where fitted) function easily?
- Have the hydraulics been vented in the case of dry installed pumps?

6 Types of operation

Recirculation pumps may only be operated fully submerged.

ATTENTION ***The minimum water cover above the unit must be at least 1 m. During operation no air must be drawn in by the propeller. A quiet flowing action in the medium must occur. The unit must not vibrate excessively.***

7 Maintenance



Before commencing any maintenance work the unit should be completely disconnected from the mains by a qualified person and care should be taken that it cannot be inadvertently switched back on.



When carrying out any repair or maintenance work, the safety regulations covering work in enclosed areas of sewage installations as well as good general technical practices should be followed.

NOTE ***The maintenance hints given here are not designed for “do-it-yourself” repairs as special technical knowledge is required.***

NOTE ***A maintenance contract with our Service Department will guarantee you the best technical service under all circumstances.***

7.1 General maintenance hints

Sulzer submersible recirculation pumps are reliable quality products each being subjected to careful final inspection. Lubricated-for-life ball bearings together with monitoring devices ensure optimum pump reliability provided that the pump has been connected and operated in accordance with the operating instructions.

Should, nevertheless, a malfunction occur, do not improvise but ask your Sulzer Customer Service Department for assistance.

This applies particularly if the unit is continually switched off by the current overload in the control panel, by the thermal sensors of the thermo-control system or by the seal monitoring system (DI).

Regular inspection and care is recommended to ensure a long service life.

NOTE *The Sulzer Service Organisation would be pleased to advise you on any applications you may have and to assist you in solving your pumping problems.*

NOTE *The Sulzer warranty conditions are only valid provided that any repair work has been carried out in Sulzer approved workshop and where original Sulzer spare parts have been used.*

7.2 Oil filling and changing

Waste oil must be disposed of in the proper manner.

7.3 Filling oil into the oil chamber

The recirculation pumps have been filled at manufacture with oil. These oils are not injurious to the environment. An oil change is only necessary if a fault occurs.

When carrying out repairs only original spare parts, supplied by the manufacturer, should be used.

7.4 Cleaning

ATTENTION *Make certain the propeller has completely stopped rotating before approaching the pump.*

If the recirculation pump is to be taken out of commission then it should be cleaned by hosing it down with clear water. If the unit is to remain out of service for a prolonged period then it should be stored in a dry and frost-proof location.

If the unit is to be reinstalled after a prolonged period out of use then proceed as per Section 4.

