PUMPS
MOTURS
ELECTROPUMPS

SUBMERSED

EN

# OPERATING INSTRUCTIONS

CE

Rev.0

# INDEX

# INTRODUCTION

## ⚠ ATTENTION ⚠

This manual is especially written for the skilled pump users and for the ordinary maintenance technical personnel; it is therefore necessary to read carefully the whole handbook before undertaking the installation and operation of the pump, as it contains important information concerning the operators' and maintenance personnel's safety.

MANUAL KEEPING
Manual is integral part of the pump and must always follow it, even in case of sale.
It should ever be available within the pump assembly room, so that the users and the maintenance personnel can easily reach and look it up whenever they need.

PLEASE READ CAREFULLY AND REPEATEDLY CHAPTER 3 CONTAINING IMPORTANT INFORMATION AND WARNINGS ON SAFETY INSTRUCTIONS.

The pumps and motors are being designed and built in accordance with:

European directives:
2006/42/CE - 2006/95/CE - 2004/108/CE

SAFETY TECHNICAL REGULATIONS

EN 60034-1, EN 60204-1, EN 61000, UNI EN 809, UNI EN ISO 12100-1, UNI EN ISO 12100-2, UNI EN ISO 14121-1, UNI EN ISO 3744.

Assembly, installation, working, EXTRAORDINARY maintenance, repair, overhaul, handling and dismantling of the pump must be carried out by skilled technicians authorized by the AUTHORIZED MANUFACTURER or DISTRIBUTOR. The manufacturer declines all responsibility for any damage to persons or things due to wrong interventions carried out either by unauthorized personnel or by an improper and incorrect use of the pump.

In order to better understand the language of the present manual, the pump user must be in possession of the necessary qualifications in servicing and maintenance; he must have the necessary knowledge to make out drawings and descriptions of the manual, he must be educated and trained about the general and specific accident prevention measures in force in the country where the pump is installed.
The same criteria are valid for choosing the technical maintenance personnel who, additionally, must have the necessary knowledge of specific and specialized regulations (mechanical and electrical) to safely carry out those interventions described in the manual.

**PACKING, LIFTING, HANDLING, SHIPMENT AND UNPACKING ARE EXCLUSIVELY ENTRUSTED TO EXPERT PERSONNEL WHO KNOWS BOTH THE PUMP AND THE MANUAL. VERY WELL.**

## • PACKING

According to their dimensions, pumps are shipped as follows:
– in a wooden crate (either bigger pumps or pumps with motor).
– in cases made of folding plywood.
– in wooden pallets.

**⚠ ATTENTION!**
Dimensions, net and gross weights are reported on the cases.
*(see Figure 1)*

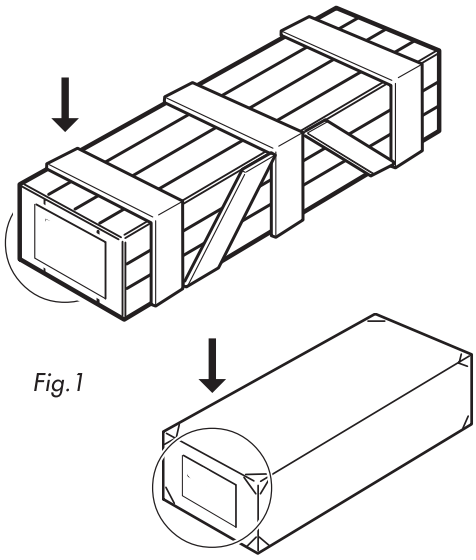


*Fig.1*

## • LIFTING AND HANDLING

Packed pumps can be lifted and transported by fork lift trucks.
*(see Figure 2)*

**⚠ ATTENTION!**
The chosen trucks must be suitable for a safe lifting and handling, considering the dimensions and weights reported on the packing. *(see Figure 1)*

## • STORAGE

Packing must always be kept in covered and protected places with temperatures between –10°C and +40°C, avoiding direct exposure to the sun rays.

*STACKING OF PACKING*
The type of packing being utilized permits the possibility of stacking up to 4 cases on top of each other inside the warehouse, thanks to the kind of packing utilized, provided that they are properly piled and insured against falling.
Inside the truck bodies and in the containers can be stacked up to 5 cases (except for the pallet), **provided that they are well strapped and insured against falling**.

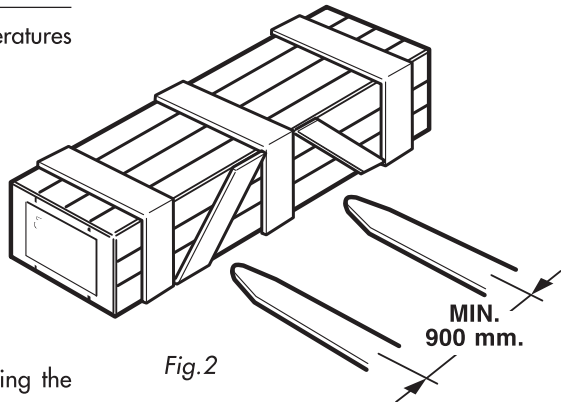
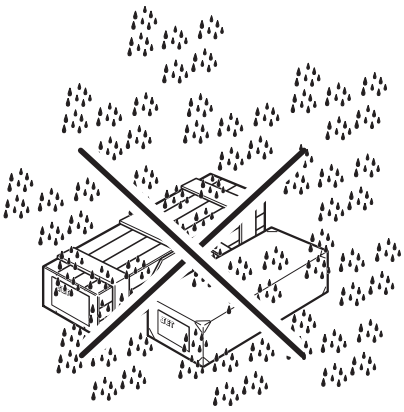
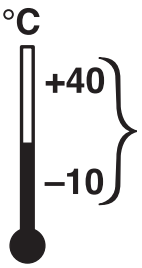


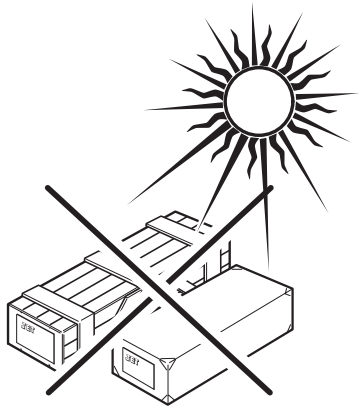

*Fig.2*

*UNPACKING*
When the goods arrive, please check if the parts are not damaged during the transportation and verify every part listed in the delivery note.
Unpack carefully taking all the necessary precautions in order to avoid any damage to persons or pump parts (during the unpacking, please avoid making fall the parts from the crate).

*PACKING DISPOSAL*
The wood of crate or the wood of pallet can be re-used or recycled in accordance with the laws in force in the country where the pump is installed. Other materials like strap, polystyrene and plastic have to be disposed according to the laws enforced in the country.





# 2 TECHNICAL SPECIFICATIONS

**In general the submersible pumps are being designed and built for transportation of water in civil, industrial, agricultural sectors and for pressure boosting, water distribution systems, irrigation, washing installations, steam boiler feed and aquaculture.**

## • RADIAL SUBMERSIBLE PUMPS • *RN-RG-R*

These pumps are suitable for capacities up to 2500 l/m., with small dimensions and through the addition of various stages, they can reach very high pressures (max. 680 mt.).
The construction material for each stage of the diffusor is in cast-iron or bronze and the impeller, depending on the model of the pump, can be in pressed brass or casted bronze material.
The shaft, protected by the impellers with a prolonged hub and by the chromate sleeves at its extremeties, is supported by bushings; for pumps with longer length, it inserted with intermediate support and bushings.
Every pump is equipped, at its extremity, with spring non-return valve. *(Figure 3)*.

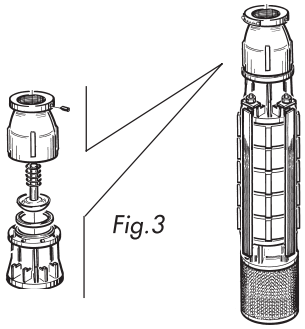


*Fig.3*

## • SEMI-AXIAL SUBMERSIBLE PUMPS • *EN-E*

They are made of several stages, each one of them having a bowl and an impeller of cast-iron or, if requested, in bronze / stainless steel.
In standard execution, the shaft is made of stainless steel and is supported, on each diffuser, by a series of rubber bearings.
Every pump is equipped with spring non-return valve at its extremity. *(Figure 5)*.

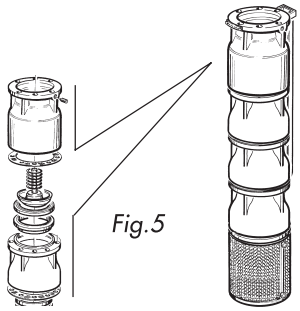


*Fig.5*

## • SUCTION SHROUDS

The above mentioned pumps can be utilized together with suction shrouds application in different solutions *(Figure 6)*:

- Cooling shrouds and protection against sand wear; for a better motor cooling.
- Vertical suction shroud complete with non-return valve for a deeper emptying.
- Shroud for pump installation to increase pressure, e.g. water supply systems.

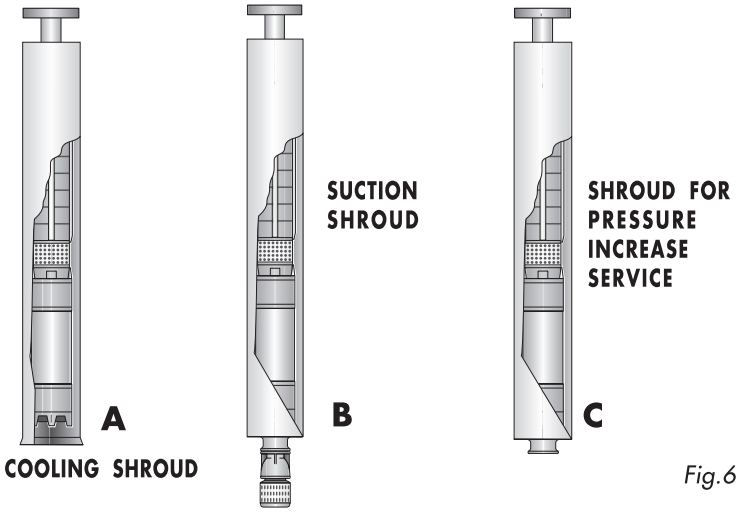


*Fig.6*

## • SUBMERSIBLE MOTORS •

These are asynchronous, three-phase, with squirrel eage rotor. *(Figure 7).*
Windings are made of copperconductors covered by waterproof, insulated and synthetic material.
The motors are filled up with a mixture of water and anti-freeze liquid that besides being used to lubricate the bushings fixed on the ends, it also helps disperse the heat to the outside. The motor axial thrust developed by the pump and by the rotating parts of the motor, is borne by a strong thrust bearing made of oscillating pressure blocks.
A compensation membrane is situated in the lower part of the motor to balance the pressure inside and outside the motor.

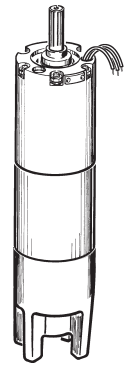


*Fig.7*

Voltage ..... 230-400V threephase
Frequency ..... 50 Hz
N° of poles ..... 2
Speed ..... 2900 RPM
Construction ..... V19 o V3
Insulation class ..... Y *( other classes if requested )*
Tolerances of operating data in accordance with Normes I.E.C. 34-1.

**⚠ ATTENTION!**
**Different tensions or special motors can be supplied on request while ordering.**

The motor supplied is connected to about 4 mtrs. of lead cable.
Electrical connection must be in accordance with electrical tables *(see chap.4).*
The direction of motor rotation has to adapt correctly to the pump rotation.
**⚠ ATTENTION! See indication reported in the rating plate put on the pump.**

**⚠ ATTENTION!**
**The different types of the mentioned pumps with their related letters, components and performance ranges (capacity / head diagram) are described in the Catalogues.**
The main technical characteristics of the pump and motor are described in the manufacturer's rating plate either on the pump or on the motor *(see Figure 8).*

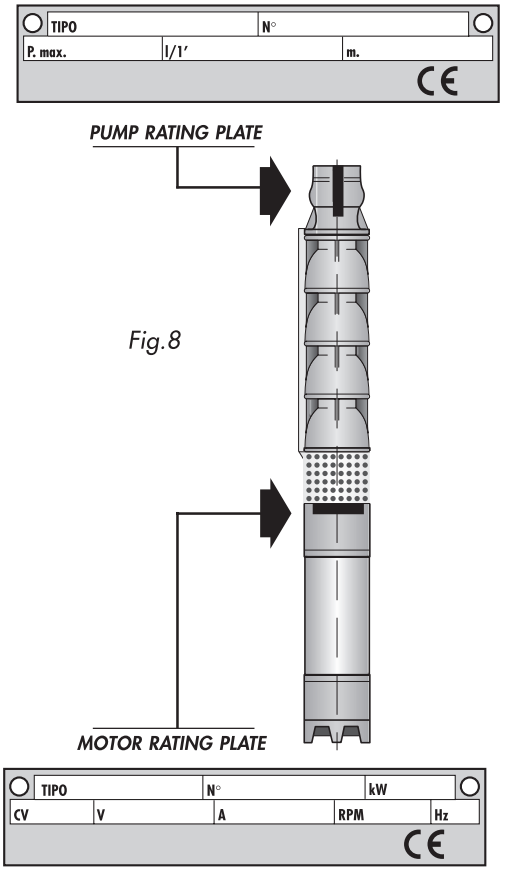



*Fig.8*

## • LIMITATIONS FOR USE OF THE SUBMERSIBLE ELECTROPUMPS

Max. working pressure: **see manufacturer's rating plate on the pump**
Max. content of solid substances: 40 gr./$m^3$
Fluid temperature 25° C *(in detail, see tables Figure 9).*

Max. working time with closed gate-valve: 4 minutes.

**⚠ ATTENTION!**
Pump not suitable for pumping:

- fluids containing abrasives
- fluids containing solid and fibrous substances
- inflammable and explosive fluids
- chemically aggressive fluids

The pump usage with salt water must be specified while ordering.
Other particular usages must be previously requested to the Technical Office.

**⚠ ATTENTION!** In case of pressure boosting application, it is necessary to check the max. incoming pressure of the pump in order to avoid any over-pressurization.

## • NOISE LEVEL

Radial and semi-axial pumps have noise levels depending on their kind of application.
In normal conditions, the sound level is < 75 dB at about 1 mt. from the set.
In case of pump application with a motor not supplied by PENTAXX, check the noise level before using.

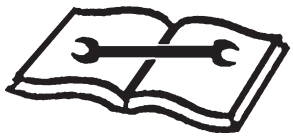
**⚠ ATTENTION!**
The electropumps with application of shroud for pressure increase service have a noise level which changes depending on the type of installation; it is therefore necessary to carry out a noise test after the complete installation, in conformity with the normes in force in the country.

| Motor type | Starts/hour max | Water temp. °C | Motor type | Starts/hour max | Water temp. °C |
|---|---|---|---|---|---|
| 6B(I)3 | 10 | 30° | 8B(I)60 | 8 | 25° |
| 6B(I)4 | | | 8B(I)75 | | |
| 6B(I)5 | | | 8B(I)90 | | |
| 6B(I)7 | | | 8B(I)100 | | |
| 6B(I)10 | | | 8B(I)125 | | |
| 6B(I)12 | | | 10B(I)90 | | |
| 6B(I)15 | | | 10B(I)100 | | |
| 6B(I)20 | | 25° | 10B(I)125 | 5 | 20° |
| 6B(I)25 | | | 10B(I)150 | | 15° |
| 6B(I)30 | | | 10B(I)180 | | |
| 6B(I)35 | | | 10B(I)200 | | |
| 6B(I)40 | | | 10B(I)225 | | |
| 6B(I)50 | | | 10B(I)250 | 4 | |
| 8B(I)25 | 8 | | 10B(I)275 | | |
| 8B(I)30 | | | 10B(I)300 | | |
| 8B(I)40 | | | | | |
| 8B(I)50 | | | | | |

*Fig.9*

# SAFETY

Read this chapter and all its paragraphs very carefully as it contains important information about the hazards both the user and the maintenance personnel can refer to in case the pump is being used wrongly.



**⚠ ATTENTION!**
In general the submersible pumps are being designed and built for transportation of water in civil, industrial, agricultural sectors, for pressure boosting, water distribution systems and irrigation. **Any other different use is not allowed**.
Limitations for pump usage are indicated in chapter **2** ***"TECHNICAL SPECIFICATIONS"***.

**THE MANUFACTURER DECLINES ALL RESPONSIBILITY FOR ANY DAMAGE TO PERSONS OR THINGS DUE TO EITHER WRONG OR NOT ALLOWED INTERVENTIONS ON THE PUMPS NOT ALLOWED.**

## • GENERAL PRECAUTIONS

**⚠ ATTENTION!**
**The user and the maintenance personnel are obliged to carefully follow the regulations referred to laws and accident prevention normes in force in the country where the pump is installed.**
Furthermore they are obliged to:
- Neither remove nor defuse mechanical and electrical protections or other;
- Pay attention to the warnings reported in the rating plates put on the pump and on the manual.
- Always use individual protection measures like accident prevention shoes and gloves

Safety warnings will be evidenced as follows:

**DANGER**: ..... Warns of an imminent danger harmful for persons (serious lesions, even death).
**ATTENTION**: .... Warns of situations and/or risky attitudes harmful for persons (more or less serious lesions, and/or death).
**CAUTION**: ..... Warns of risky situations and/or attitudes less harmful for persons and/or things.

## • HAZARDS AND PROTECTIONS

In detail a list of hazards the user or the maintenance personnel can refer to during assembly or maintenance, and a list of the protection measures the manufacturer has taken up to reduce these hazards at minimum.

**⚠ ATTENTION!**
**The purchaser has to verify the usage conformity of the pump and the compliance with safety measures according to the place of installation.**

• **DIRECT HAZARDS TO PERSONS**
In this paragraph there will be illustrated some hazards the user, the maintenance personnel and the personnel working in the pump area can refer to because of an incorrect use of the pump.

**⚠ ATTENTION!**
Connection with piping and its respective system must be always carried out by qualified personnel according with the laws of the country where the pump is installed.

• **COLLISION HAZARD**
Due to the pump parts as high as the user.

• **SLIPPING HAZARD**
Due to wet or oily areas of the floor.
In order to avoid slipping risk, it is advisable taking individual measures (accident prevention shoes).

• **ELECTRIC SHOCK HAZARD:**
It's a particular safety warning reported in a label on the pump electric panel , only where the risk of electric shock is very high. *(Figure 11)*
Keep any water flushings, steam jets (of steam washers), solvents or paints off the pump parts with electrical wires, especially nearby the panel.
Always switch off the pump before any maintenance servicing.

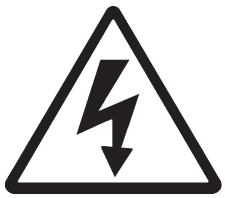
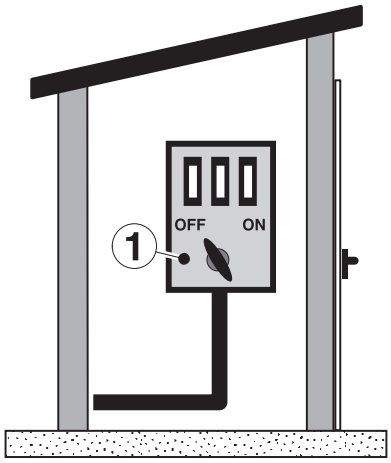


*Fig.10*




**1)Panel**

• **BREAKDOWN / EXPLOSION HAZARD**
Use the pump always in accordance with the performance range reported in the rating plate.
⚠ Be careful with accidental losses: please call in immediately the maintenance personnel.
While starting up, remember to prime the pump and to open the delivery valve: **Overheating danger**.

• **HAZARD DUE TO IMPROPER LIGHTING** (where applicable)
The user and the maintenance personnel have to check that every part of the pump is uniformly lit, in accordance with the regulations in force in the country where the pump is installed.

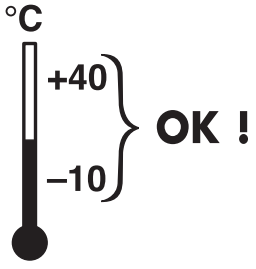
• **HAZARD OF COMPONENT FAILURE DURING OPERATION**
Even if the manufacturer utilized suitable materials and followed suitable design/ building procedures for a safe equipment, it is however necessary to comply either with the use of the set design purpose (pump/motor) or with suggested inspections and maintenance as per chapter **6 *"MAINTENANCE"***.

• **CRUSH HAZARD**
During every step of the handling, assembly and maintenance, always utilize individual protection equipment, such as gloves, accident prevention shoes and everything as per the laws in force in the country.

• **NOISE HAZARD**
The pump or the electropump supplied have noise values which are reported in chap. **2**.
In case the pump is used with another motor, or is installed within the pump room, it is necessary to check the whole noise level in accordance with the laws in force in the country.
⚠ **Be careful with possible anomalous noises while the pump is working**.

• **HAZARD FOR NOT ALLOWED USAGE**
Every pump usage differing from the usage for which the pump was designed, can be seriously harmful for those who are working near the pump.
It is extremely important to follow carefully all the instructions concerning usage, maintenance and safety described in this handbook.

• **HIGH TEMPERATURE HAZARD**
Pump dimensions and protections allow the temperature of mechanical parts to be within the normative limitations.
⚠ Be careful with pump disassembling after its working:
**danger of high temperature in some areas of the pump.**



# 4 INSTALLATION

THESE INTERVENTIONS MUST BE EXCLUSIVELY ENTRUSTED TO SKILLED TECHNICIANS; IF THEY ARE CARRIED OUT BY OTHER PERSONS, THERE CAN BE DANGEROUS SITUATIONS AND SERIOUS DAMAGES TO PERSONS AND/OR TO THE PUMP.

### • CHECK OF REQUIREMENTS FOR INSTALLATION

Pump is built to be used in closed and protected places.
The chosen working place must be far from the painting room, from storerooms containing solvents or paints, from places with danger of explosion.

### • CHECK OF PLACE SUITABILITY AND SAFETY DISTANCE - if applicable

The pump must be installed in compliance with the safety distance from the walls, pillars or other machines, etc..according to the eventual regulations of the law in force in the country where the pump is installed.
Check in particular ( where applicable ):

hight: ..... minimum 3000 mm,
distance from the walls: ..... minimum 500 mm,
working space: ..... minimum 500 mm,
panel space,
maintenance space, entry and exit ways in case of emergency,
position related to the other machines,
possibility to perform electrical connection.

### • CHECK OF THE WELL CLEANING

When the pump is to be installed in a well, for its correct working, it is necessary to verify if the well has been drained before.

### • LIGHTING

Every pump part must be lit uniformly and as much as to guarantee adjustement and maintenance in accordance with the manual, avoiding shades, reflections, dazzlings and sight weariness.
Lighting must comply with the present rule in force in the country where the pump is installed (under the responsibility of lighting installation personnel).

### • FLOOR - only for shrouded pumps

The pump must be installed on a horizontal foundation with adequate resistance, made of batched concrete or realized by strong supports.
Furthermore the floor must be flat and good levelled (10 mm. of tolerance on the levelling.)
In case of particular applications, please contact the manufacturer.

### • ELECTRICAL CONNECTION

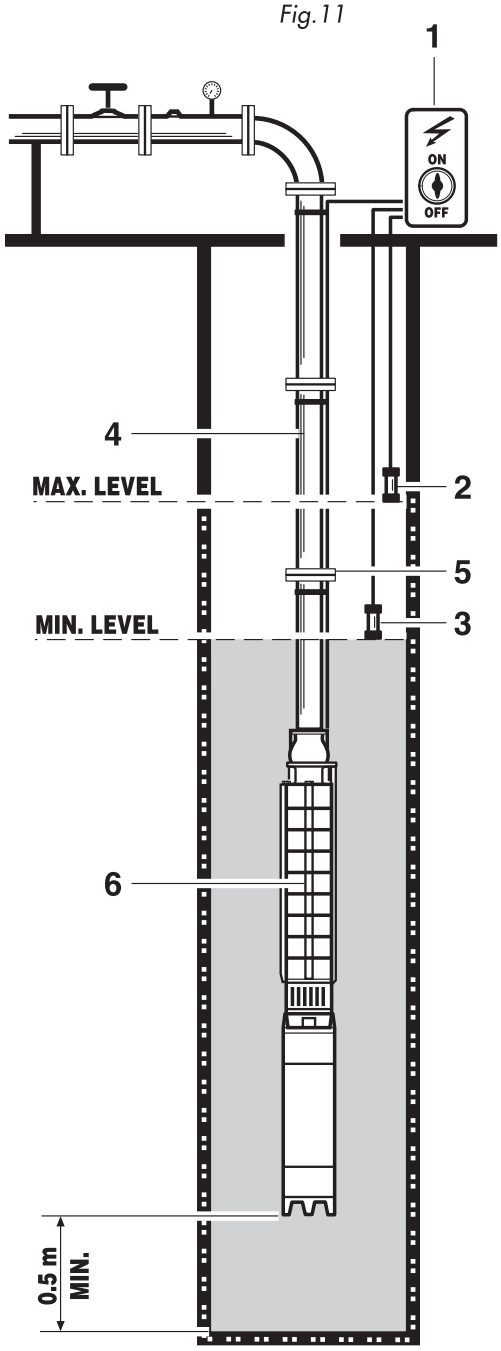
**⚠ ATTENTION!**
Before electrical connection, check what follows:

- the pump feeding system must be protected in accordance with the normes in force in the country where it is installed
- the supply line must be suitable for required power and tension of the pump (check data in the motor rating plate).

Every electrical connection of power and drive unit depend on the terminal block in the panel.
Proceed with electrical connections following the installation table.

Motor and pump body are normally shipped in separate cases.
If requested by the contract, motor and pump are assembled in the factory and shipped in a single case, where, on request, the electrical cable can be packed as well.

*Fig.11*




1) **Panel.**
2) **Max. level switch.**
3) **Min. level switch.**
4) **Delivery piping.**
5) **Cable clips.**
6) **Submersible set (pump+motor).**

## • PUMP BODY ASSEMBLY TO THE MOTOR

In case pump and motor are shipped separately, it is necessary to follow the instructions below:

– Open the case.
– Lift the motor with a suitable lifting equipment (crane or other) using a clamp hooked to the bolting (equipment provided by the assembler).
– Place the motor in vertical position, keeping it fixed by a wooden block or similar, in order to avoid possible falls and prevent motor rotation.
– Check motor's filling by unscrewing the upper plugs and, if necessary, by filling water up to the total motor filling (please check that water does not contain any soild substance, or other impurities). Screw tight the plugs.
– Connect the motor to the main.
⚠ **ATTENTION:** connection must be carried out by a skilled electrician.
– Check the rotation sense of the motor confronting it with the arrow shown on the pump.
– Screw inside the valve body a threaded coupling equipped with a clip in its upper part (equipment in charge of the assembler) *see Figure 12a.*
– Hoist the pump body with a suitable lifting equipment hoocked to the coupling.
– Remove the strain and the cable protective guard.
– Lower slowly the pump body till the shaft end slips into the coupling *(see sequence of Figure 12-12b).*
– Screw the 4 locking bolts.
– Position the cable and fix it with a cable protective guard.
– Then mount the suction strainer.

*Fig.12a*

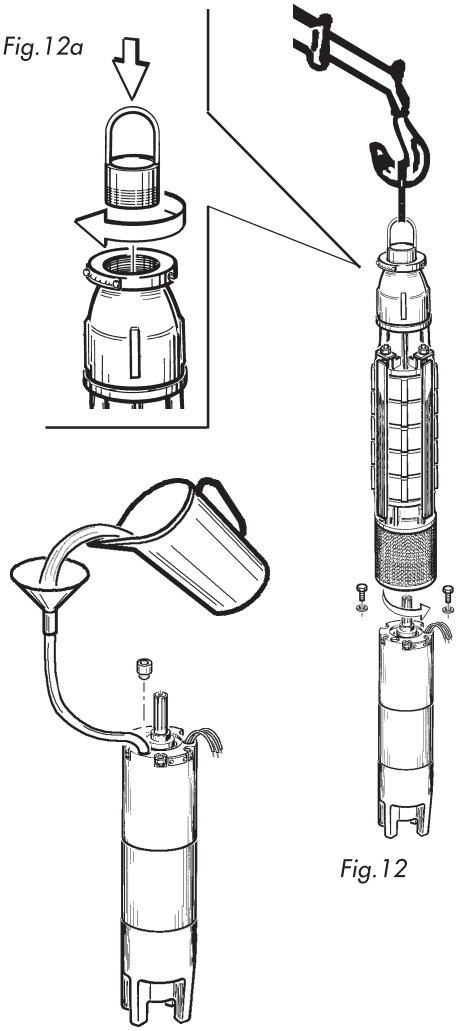


*Fig.12*

⚠ **ATTENTION!**
Lifting equipment must bear the weights of pump parts and the weights of pipeline as well (see parts shown in the crates).

⚠ **ATTENTION!**
Check the motor rotation direction after assembling and while working, as it brings with it failure hazards / faults to the pump.

⚠ **ATTENTION!**
All the motors, before shipping, are filled by a mixture of water and antifreeze gel.

In case the filling is effected with empty motor (for ex. after a repair), you have to wait for 30 minutes before screwing the plugs, in order to allow the water to penetrate the holes and the airbubbles come to the surface.
Afterwards complete the motor filling.

**ATTENTION!**
**IN CASE YOU BUY ONLY THE PUMP AND YOU COUPLE IT TO A DIFFERENT MANUFACTURE MOTOR, YOU HAVE TO COMPLY WITH ALL THE SAFETY MEASURES.**

The electropump can be installed in different ways:
we mention here below the most frequent ones.

⚠ **ATTENTION!**
**In case of special applications, please always contact the manufacturer before installing.**

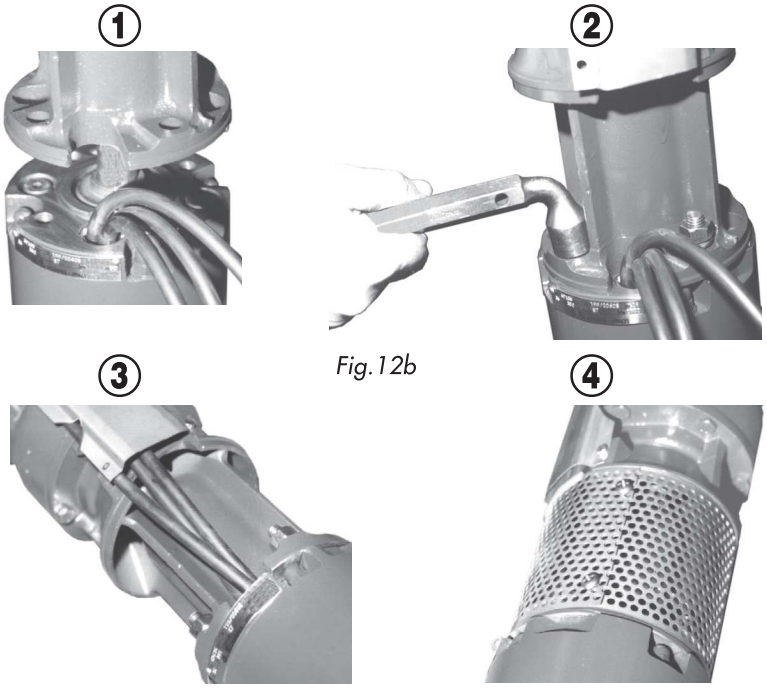



*Fig.12b*

## • 1 - PUMP ASSEMBLY IN THE WELL - *Figure 11 14*

Before assembly, make sure:
- The real diameter and depth dimensions of the well are suitable.
- There is a minimum distance of 2 mtrs. between the pump ends and the well bottom in order to avoid any mud infiltrations in the pump.
- There are the necessary hoists.
- The vertical delivery pipeline can bear the weight of the set.
- In the pump-pipeline connection, if the flange is required, there are very sturdy bolts, type min. 8.8 .
- It is arranged with a rigid support made of stainless steel or cement to fasten the pump pipeline-set.

Once the above mentioned conditions are arranged, hoist the set and place it vertically in the well; put its end on the support with a suitable support equipment (if requested, it can be supplied together with the pump) *see Figure 13*.

**DANGER!** For pump lifting and handling, tight the set safely. Connection between power supply cable and motor must be performed by a skilled electrician (for connection and type of cable see elecrical system pg. 12).
⚠ **ATTENTION!** Avoid using joints with taping or unsuitable connections as they can cause damages to the motor.
Couple the various pipelines through flanged or threaded ends and place them in the well; if they are flanged, tight the bolts with the respective necessary load torque.
Fasten the electric power supply cable every 3 mtrs. of pipe by means of clips.
When the set has been installed at the right depth, fasten everything to the main support through the bolts (lock the bolts using a dynamometric key).
⚠ **ATTENTION!** All these operations have to comply with the safety normes in force.
In order to avoid that the minimum dynamic level sinks more than 1 meter above the delivery of the pump, it is necessary to provide with the application of level electrodes.
⚠ **ATTENTION!** In case water sinks at the suction port level because of a too much high capacity value of the pump or due to the seasonal lowering of the water beds, there can be motor overheatings or the seizure of bronze bushing for lack of lubrication.
**After the connection, check again the insulation degree of the cable to make sure it has not been damaged during the assembly.**
**Electrical insulation has to comply with electrical regulations in force.**

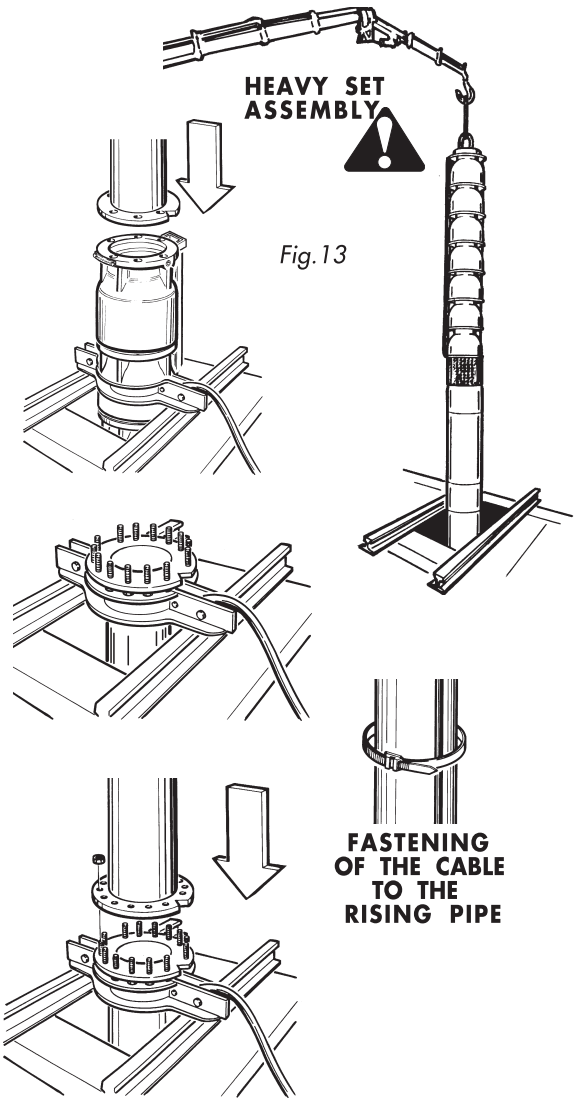


*Fig.13*

## • 2 - HORIZONTAL INSTALLATION IN THE TANK - *Figure 14*

It is advised to use a shrouded electropump to obtain a water flow on the motor and a suitable cooling.
In this case, when the electropump is supplied, it is already equipped with the shroud and with 2 fastening supports to the concrete floor of the tank bottom.
The tank has to be either open top or equipped as to place the set trough a lifting equipment (see weights on the crates).

This has to be fixed to the floor through fastening anchorsuitable for the hole type of the shroud support (use GM Fischer type reinforcements or equivalent).
The pipeline shall be connected to the shroud through the bolts.

⚠ **ATTENTION!** The electric system supplier has to follow the safety instructions to keep the pump ever sunk in the water.
**DANGER** of pump failure and motor overheating.

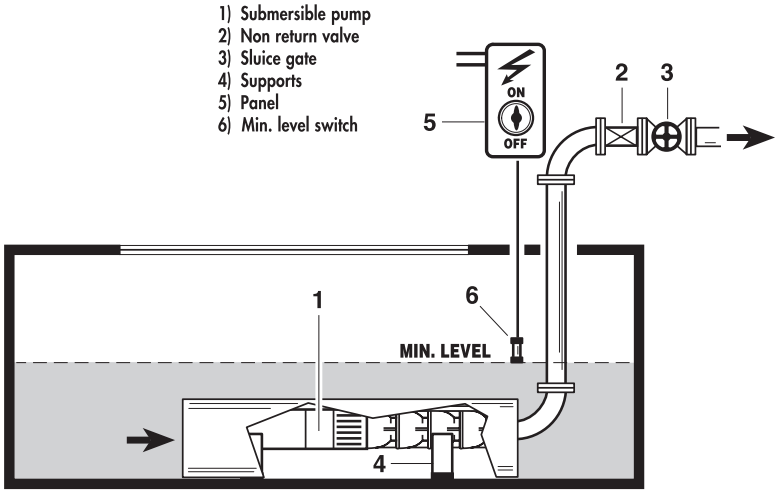


*Fig.14*

### • 3 - HORIZONTAL INSTALLATION IN SHROUD FOR PRESSURE INCREASE - *Figure 15*

In this case, when the electropump is supplied by the manufacturer, it is already assembled with the shroud; it is a seal pipe with, at its ends, 2 bolted flanges for the connection to the pipelines.
The pump is fixed to the inner part of the flange trough the bolts; the motor has to stand in suspension and is radially secured by 3 adjustable nuts at 120°C.
The shroud is equipped with 2 welded 4-hole-supports to be fastened to the concrete floor through Fischer GM type anchors, or equivalents, suitable for the hole of the shroud support (if hole has Ø 18, then use M12 anchors).
The set handling has always to be carried out by lifting equipment having a suitable capacity for the set itself (see weights on the cases).
If the pump has large dimensions and has to be installed near residential property, you are advised to insulate the pump from the pipeline by means of pieces of antivibration pipes on the suction and on the delivery of the pump (provided by the installation's manufacturer).
Proceed with cable connection outgoing from the pump and with electrical system finishing.

### • DELIVERY AND SUCTION PIPES

⚠ **ATTENTION!** Always ensure that the pipes can withstand the maximum working pressure of the pump (see rating plate). **DANGER OF EXPLOSION!** Pipes must be completely sealed and sized according to the usage conditions. Use wide curves in order to avoid sudden head losses.

### • ELECTRICAL SYSTEM

Motor connection and its related electrical system has to be executed by a skilled and qualified personnel in accordance with the electrical normes in force.
The power supply cable must be sized according to the input of the motor and to the length of the cable itself ( please refer to the tables in our technical catalogues ).
The connection between the motor cable and the power supply cable must be performed according to the instructions described in *Figure 16 - 17*.

⚠ **ATTENTION!** Connect the earth cable
⚠ **ATTENTION!** ELECTRIC SHOCK HAZARD !
⚠ **ATTENTION!** The motor must always be protected against overloads through a set thermic relay according to the current of the motor rating plate.

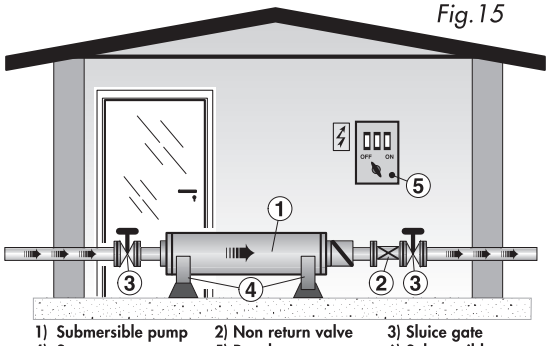
### • STARTERS FOR ELECTRIC MOTOR

In case the starters are not supplied by the manufacturer, it advisable to use suitable equipments.
Direct starters are advised up to a 7,5 Kw. power; for higher powers we recommend to use impedance, resistence, either with autotransformer or star-delta starters.
In any case the electric installator has to comply with the normes of the country where they are installed and with the characteristics of feeder mains.

In any case the motors must be protected against:
- Overload
- Lack of phase
- Voltage drop

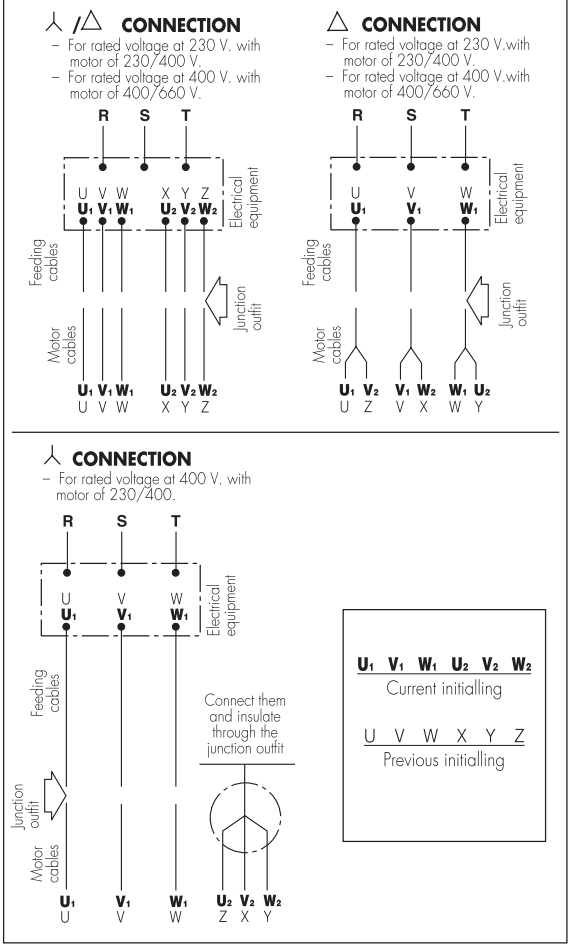
⚠ **ATTENTION! The personnel is obliged and responsible to carry out final tests in accordance with the regulations, tests for input and insulating grade of the motor with its respective installation. He must then draw up Declaration of Conformity concerning the electric system.**

*Fig.15*




1) Submersible pump 2) Non return valve 3) Sluice gate
4) Supports 5) Panel 6) Submersible pump-motor set.

**ELECTRICAL CONNECTION TABLE OF THE THREE-PHASE MOTORS FOR Y Δ STARTING**




**ELECTRICAL CONNECTION TABLE OF THE SINGLE-PHASE MOTORS**

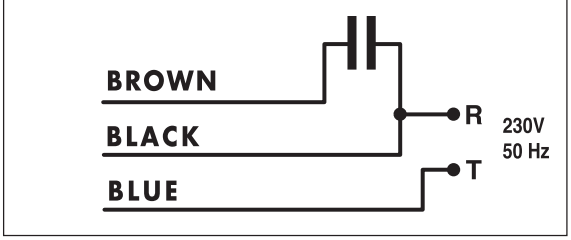



*Fig.16*

# WORKING AND USAGE

The first start must be carried out with half-open gate-valve in order to reduce to a minimum any suction of sand or lime.

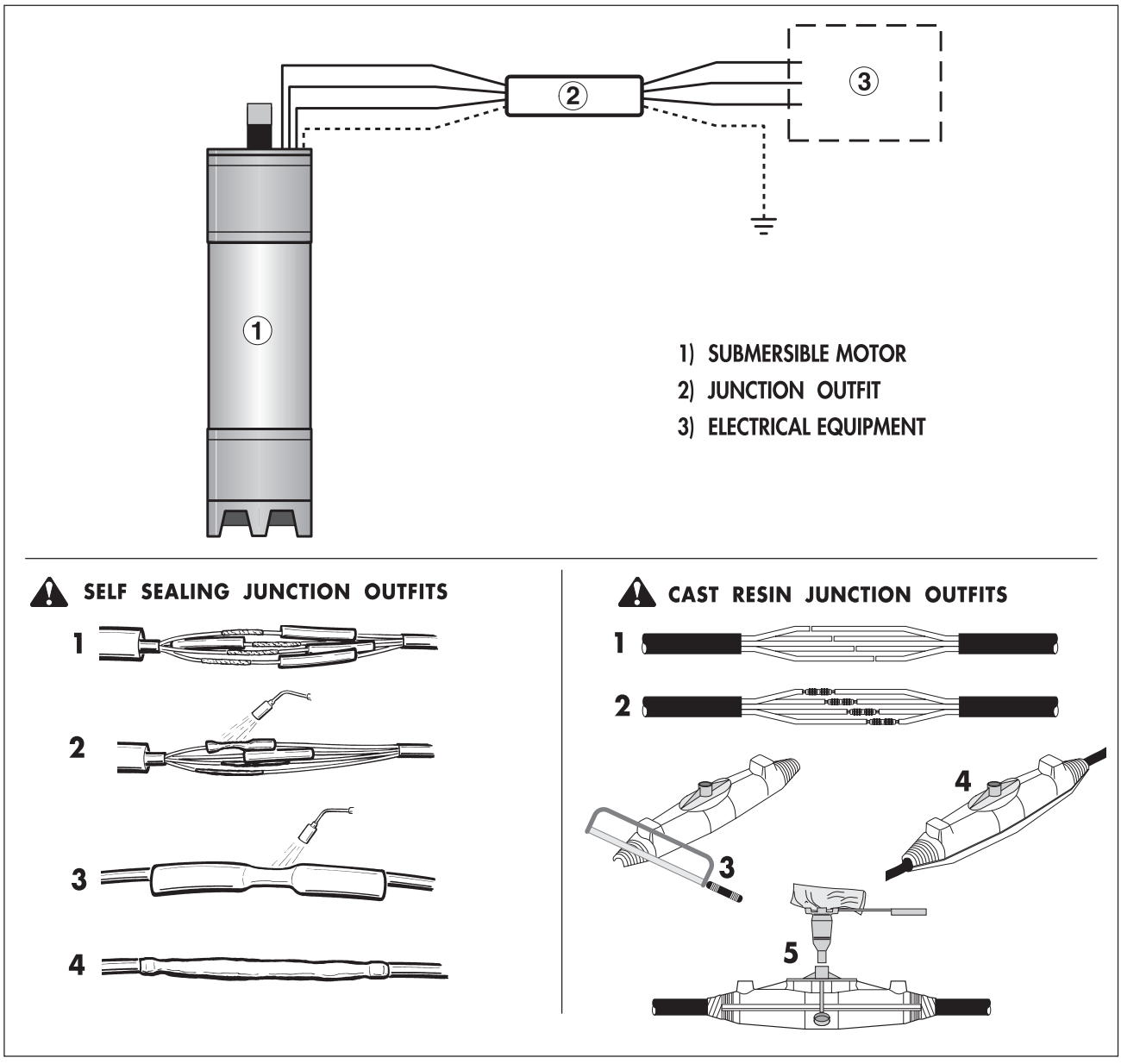
In case sand percentage is very high, it is necessary to further close the gate-valve until the water becomes clear.

The opening will be gradual, considering that the percentage of solid substances aloowed must not exceed 40 grams per $m^3$.

Besides ensure that the maximum input of the set is not higher than the value indicated on the motor rating plate.

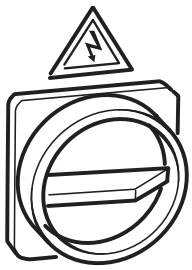
While keeping the pump running regularly, it is necessary to set the thermal relay according to the pump input.

*Fig.17*



⚠ **ATTENTION!**
Maintenance must be entrusted **EXCLUSIVELY EXECUTED BY SKILLED PERSONNEL WHO KNOWS THE ELECTROPUMP VERY WELL**.

During pump maintenance, all the necessary measures must be taken in order to avoid **THE ACCIDENTAL START UP OF THE SET**.



The general switch on the panel must be **locked at " 0 " position**.
The key of the padlock must be kept by the maintenance personnel during the whole intervention.
Consider all the main possible hazards and the safety instructions as per chap. **3 "SAFETY"**.

**ELECTRO SHOCK HAZARD**

**IT IS FORBIDDEN TO CARRY OUT MAINTENANCE SERVICING ON MACHINES WHILE WORKING.**

AFTER EACH MAINTENANCE SERVICING, THE PUMP AND ITS RESPECTIVE INSTALLATION, INCLUDED PROTECTIONS AND DISASSEMBLED SECURITY DEVICES, MUST BE BROUGHT BACK TO THE INITIAL STATE.

For a good maintenance you are advised to :
- Use only suitable equipments and original spare parts.
- Check immediately the causes of possible faults (too much noise, overheating, liquid leakage, etc.)
- Pay particular attention to security devices
- Look up all the available documentation supplied by the manufacturer (manual, electric tables and system, etc..).

## • PERIODICAL MAINTENANCE

**NOTE:**
Those electropumps which are assembled according to the instructions, can work for several years and do not need disassembling.

**1 MONTH AFTER** the installation, make sure that the fastening anchor is are correctly locked to the base (where is possible) and also the suitability of connecting bolts to the flanges.

**EVERY 12 MONTH ...**
- Check visually every component to ensure that there are neither faults nor problems.
- Electrician must check the electric system, included the motor, cables, levels, electric contacts and panel.
- It is advisable a practical check of the well.
- Check the well / tank for a possible cleaning (by qualified personnel).

⚠ **ATTENTION! In case of long non-working periods, it necessary to start up the set once a month to avoid the blocking of the rotating part.**

Overhaul or repair of the electropump must be carried out by the manufacturer or by his authorized workshop, according to assembly and disassembly manuals and respective lists of spare parts.

# 7 PROBLEMS,PROBABLE CAUSES AND POSSIBLE SOLUTIONS

**• TABLE FOR SEEKING FAILURES**

The search for the failures and for the possible repair interventions must comply with ALL THE SAFETY PRECAUTIONS reported in chapt. **6** ***"MAINTENANCE"*** and in chapter **3** ***"SAFETY"***.

| PROBLEMS | PROBABLE CAUSES | POSSIBLE SOLUTIONS |
|---|---|---|
| **1** - The electropump does not start. ..... | **A)** - No mains voltage. .....<br>**B1)** - Fuses blown. .....<br>- Inadequate fuses.<br>**B2)** - Motor or power supply cable are damaged.<br>**C)** - Overload protection previously cut in . | **A)** - Provide electric input.<br>**B1)** - Replace the fuses with suitable ones.<br>**B2)** - Repair the motor or replace the cable *(please call in the electrician).*<br>**C)** - Reset the protection. *(If it cuts in again, see point 2).* |
| **2** - The overload protection cuts in: | | |
| **2.1)** - Accidentally. ..... | **A)** - Foreign bodies between fixed and rotating parts.<br>**B)** - Lack of a phase on the mains. ..... | **A)** - Clean inside the pump body.<br>**B)** - Reset the correct electric connection *(please call in the electrician).* |
| **2.2)** - Sistematically. ..... | **C)** - Incorrect setting. .....<br>**D)** - Rotor locked. .....<br>**E)** - Low input voltage. ..... | **C)** - Check the setting amperes.<br>**D)** - Check the input; if too high, contact the manufacturer.<br>**E)** - Ask for technical-electric service. |
| **3** - The electropump delivers no water. ... | **A)** - The dynamic level descends below the strainer *(water coming out can be intermittent).*<br>**B)** - Impellers and bowls occluded by sand or other solids.<br>**C)** - Jammed chack-valve. .....<br>**D)** - Breaking of the shaft. ..... | **A)** - Reduce the capacity by closing the gate-valve *(install the level switch).*<br>**B)** - Send the set to the Factory and have it overhauled.<br>**C)** - Disassemble the valve housing and unlock.<br>**D)** - Send the set to the Factory and have it overhauled. |
| **4** - The pump delivers a poor capacity. ... | **A)** - The strainer is partially occluded.<br>**B)** - The motor turns in the contrary direction.<br>**C)** - Line-voltage too low. .....<br>**D)** - Worn out electropump. .....<br>**E)** - Volumetric losses of water in the pipeline | **A)** - Remove the set and clean the well.<br>**B)** - Reverse the phase.<br>**C)** - Ask for a technical-electric intervention.<br>**D)** - Send the set to the Factory and have it overhauled.<br>**E)** - Remove the set and check. |
| **5** - The electropump vibrates and is noisy. | **A)** - The dynamic level descends below the strainer *(water coming out can be intermittent).*<br>**B)** - Water with a high gas content.<br>**C)** - Bronze bushings and bearings worn out.<br>**D)** - Dynamic water level of the well lower than suction outlet of the pump.<br>**E)** - Foreign bodies between fixed and rotating parts. | **A)** - Reduce the capacity by closing the gate-valve *(install the level probes).*<br>**B)** - Increase the water level on the pump.<br>**C)** - Send the set to the manufacturer for the overhaul.<br>**D)** - Verify the water level and low the pump.<br>**E)** - Clean. |
| **6** - The electropump rotates in reverse when it is stopped. | **A)** - Faulty check valve. ..... | **A)** - Replace or repair foot valve. |

# SET DISMANTLING 8

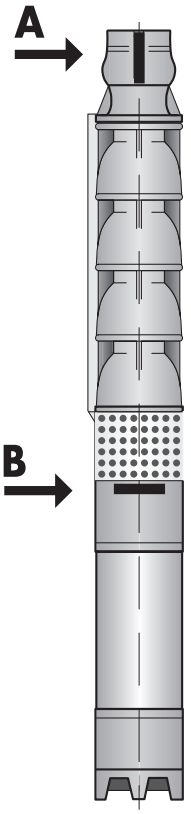
**ATTENTION!**
**SET DISMANTLING MUST BE IN COMPLIANCE WITH ALL THE SAFETY PRECAUTIONS SHOWN IN CHAPTER 3 RELATED TO ASSEMBLY.**

Pump dismantling must be carried out by skilled and authorized technicians, as for the assembly.
Metallic parts can be disposed as scrap iron.
In any case, all the materials rising from the disposal must be disposed in compliance with the norme in force in the country where the the pump is installed.

# SPARE PARTS 9

Overhaul and repair of the pump must be carried out by the manufacturer or by his authorized workshop refering to the assembling and disassembling manuals and to the spare part lists.

Spare parts replacement and repair interventions must be in accordance with **ALL THE SAFETY PRECAUTIONS** indicated in chap, **6** ***"MAINTENANCE"*** and chap. **3** ***"SAFETY"***.




## • PROCEDURE FOR SPARE PART ORDER

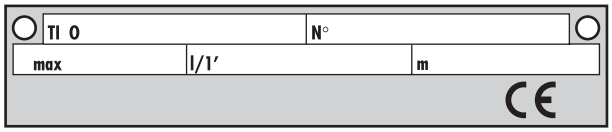
To order the spare parts it is necessary to:

- specify the series number and the manufacture year both of the motor and of the respective pump;
- specify the required part code reference
  *(see tables in the techncial catalogues or in the exploded views).*
- specify the required quantity.

Enquiry must be addressed to the Manufacturer or to the authorized Distributor.

*Fig.18*

**A** ***PUMP RATING PLATE***




**B** ***MOTOR RATING PLATE***