



**flowtech**<sup>®</sup>  
WATER SOLUTIONS



# flowboost<sup>®</sup>

E.V Pump Manual

## OPERATION AND MAINTENANCE MANUAL

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## OPERATION & MAINTENANCE

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## General Information

These instructions are to assist in the installation of the flowboost E.V Pump please follow them carefully.

If, having read this Operation & Maintenance Manual, there is any doubt about any aspect of the installation please don't hesitate to contact our technical team.

### Definitions of Safety Warnings and Precautions



#### **WARNING!**

**Indicates a potentially hazardous situation which, if not avoided, can result in serious injury or death.**



#### **CAUTION!**

**Indicates a potentially hazardous situation which, if not avoided. Can result in minor to moderate injury, or serious damage to the product.**

## Safety

# Information

It is essential that correct and safe working practices are adhered to at all times when installing, operating and/or maintaining any piece of equipment. Always consult safety data sheets, operating and maintenance manuals, Health & Safety legislation and recommendations and specific requirements of any equipment manufacturer, site controller, building manager or any other persons or organisation relating to the procurement, installation, operation and/or maintenance of any piece of equipment associated or in conjunction with any product provided by **flowtech** Water Solutions.

This document is intended for ALL installers, operators, users and persons carrying out maintenance of this equipment and must be kept with the equipment, for the life of the equipment and made available to all persons at all times. Prior to carrying out any work associated with the set it is essential that the following sheets are read, fully understood and adhered to at all times.

Equipment must only be installed, operated, used, and/or maintained by a competent person. A competent person is someone who is technically competent and familiar with all safety practices and all of the hazards involved.

Any damage caused to any equipment by misapplication, mishandling or misuse could lead to risk of Electrocutation, Burns, Fire, Flooding, death or injury to people and/or damage to property dependent upon the circumstances involved. **flowtech** Water Solutions accepts no responsibility or liability for any damage, losses, injury, fatalities or consequences of any kind due to misapplication, mishandling or misuse of any equipment, or as a result of failure to comply with this manual.

Failure to install, operate, use or maintain the equipment in accordance with the information contained within this document could cause damage to the equipment and any other equipment subsequently connected to it, invalidating any warranties provided by **flowtech** Water Solutions to the buyer.

## Safety Warnings &

# Precautions

These instructions should be read and clearly understood before working on the system. Please read this manual carefully and all of the warning signs attached before installing or operating the equipment keep this manual handy for your reference. This equipment should be installed, adjusted and serviced by trained and qualified personnel. Failure to observe this precaution could result in bodily injury.



**WARNING!** - Install an emergency stop key separately from the isolator. Rotating shafts can be hazardous.



**WARNING!** - This equipment has a high leakage current and must be permanently fixed to earth.



**WARNING!** - Do not attach or remove wiring or connectors when the power is applied. Do not check signals during operation. When the power is turned on and the running command is on, the motor will start rotating. The stop key is only effective when the function is set. If there is a power failure and an operation instruction is given the unit may start automatically when the power is reinstated.



**WARNING!** - Make sure that the input voltage is correct. Be sure to install the unit in a room that is not exposed to direct sunlight and is well ventilated.

Avoid environments which have a high ambient temperature, high humidity or excessive condensation. Avoid dust. Corrosive gas, explosive gas, inflammable gas, grinding-fluid mist and salt damage, etc.



**WARNING!** - Do not connect the power source to any terminals except power connectors.



**WARNING!** - Motor control equipment and electronic controllers are connected to hazardous line voltages. When servicing drives and electronic controllers, you may be exposed to components at or above the line potential. Extreme care should be taken to protect against shock. Dangerous voltage may exist after the power light is off.

*Wait more than 5 minutes after turning off the power supply before performing maintenance or inspection. Hazard of electric shock. Disconnect incoming power before working on this unit.*



**WARNING!** - The inverter should be protected separately against ground fault.

*Observe the regional regulations for electrical installation!*



**CAUTION!** - It is strongly recommended that all electrical equipment conforms to National Electrical Codes and local regulations. Only qualified personnel should perform installation, alignment and maintenance. The manufacturer reserves the right to alter the technical data in order to make improvements or update information.



**CAUTION!** - Failure to observe these rules will render the guarantee invalid. The same applies to repair jobs and/or replacement. Your legal rights are not affected.



**CAUTION!** - The manufacturer declines all responsibility in the event of damage or injury caused as a result of tampering with the equipment.



**CAUTION!** - Do not switch on/off power supply to run/stop the motor/system! Start the unit only by using run button or external run command.

## Customer / Contractor **RESPONSIBILITIES**

It is the responsibility of the customer and/or the contractor:

- To ensure that anyone working on the equipment is wearing all necessary protective gear and/or clothing.
- Is aware of appropriate health & safety warnings.
- Has read the information in this section of the manual.

## Technical Information

Vertical multi-stage pumps with suction and delivery connections of the same diameter and arranged along the same axis (in-line).

Corrosion-resistant bearing sleeves lubricated by the pumped liquid.

A pump with thrust bearing and sleeve coupling for use of any standard motor with IM V1 construction.

## Intended use

For clean liquids: non-explosive and non-flammable, non-hazardous for health or the environment, non-aggressive for pump materials, not containing abrasives, solid or fibrous particles. With seal rings in EPDM the pump is not suitable for use with oil.

Liquid temperature:

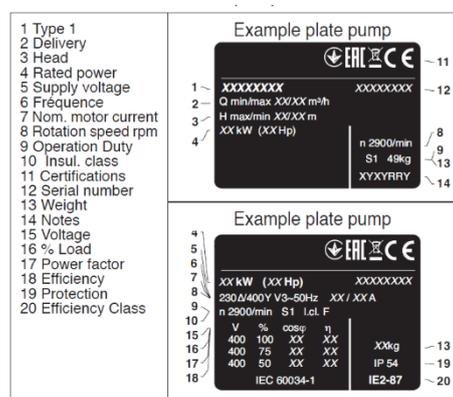
- From -15 °C to +90 °C.

## Improper use

The device is designed and built only for the purpose described. Improper use of the device is forbidden, as is use under conditions other than those indicated in these instructions. Improper use of the product reduces the safety and the efficiency of the device, Flowtech shall not be responsible for failure or accident due to improper use. Do not use in ponds, tanks or swimming pools or where people may enter or come into contact with the water.

## Marking

The following picture is a copy of the name-plate that is on the external case of the pump



## Technical data

Dimensions and weight (see technical catalogue).

Nominal speed 2900/3450 rpm

Protection IP54

Supply voltage / Frequency

up to 240V 1~ 50/60 Hz

up to 480V 3~ 50/60 Hz

Check that the mains frequency and voltage correspond to the electrical characteristics shown on the indicator plate. The electric data marked on the label are referred to the nominal power of the motor.

## Rated motor power

|                           |      |     |    |     |    |
|---------------------------|------|-----|----|-----|----|
| 2900 l/min up to kW:      | 0.75 | 2.2 | 4  | 7.5 | 22 |
| 1450 l/min up to kW:      | 1.1  | 3   |    |     |    |
| Sound Pressure dB(A) Max: | 65   | 65  | 67 | 68  | 82 |
| Starts/hour Max:          | 35   | 30  | 20 | 15  | 15 |

Maximum final pressure in the pump casing:

160 M (16 bar)

Maximum suction pressure: PN (Pa) - Hmax (Pa).

## Operating conditions

Installation in well ventilated location protected from the weather, with a max ambient temperature of 40°C.

## General provisions

The specialised technicians must carefully comply with all applicable standards and laws, including local regulations of the country where the pump is sold.

The device has been built in conformity with the current safety laws. The improper use could damage people, animals and objects.

The manufacturer declines any liability in the event of damage due to improper use or use under conditions other than those indicated on the name-plate and in these instructions.

Follow the routine maintenance schedules and the promptly replace damaged parts, this will allows the device to work in the best conditions.

Use only original spare parts provided from Flowtech.

Don't remove or change the labels placed on the device.

Do not start the device in case of defects or damaged parts.

Maintenance operations, requiring full or partial disassembly of the device, must be done only after disconnection from the supply.

### Safety devices

The device has an external case that prevents any contact with internal parts.

### Residual Risks

The appliance designed for use when inline with the design and safety rules, doesn't have residual risks.

### Information and Safety signals

For this kind of product there will not be any signals on the product.

### Individual protection devices

During installation, starting and maintenance it is suggested to the authorized operators to consider the use of individual protection devices suitable for described activities.

During ordinary and extraordinary maintenance interventions, safety gloves are required.

Signal individual protection device

Hand Protection - Gloves for protection against chemical, thermal and mechanical risks.

## Transportation

The product is packed to maintain the content intact.

During transportation avoid to stack excessive weights.

Ensure that during the transportation the box cannot move.

It is not necessary to use any special vehicle to transport the packaged device.

The transport vehicles must comply, for the weight and dimensions, with the chosen product (see technical catalogue dimensions and weights).

## Handling

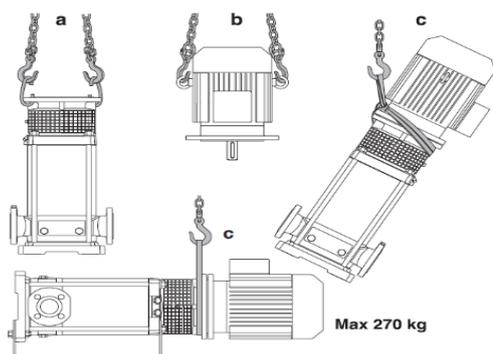
Handle with care, the packages must not receive impacts.

Avoid to impact onto the package materials that could damage the pump.

If the weight exceeds 25 Kg the package must be handled by two person at the same time.

Raise and transport the pump and pump-motor unit (without packaging) as indicated in fig. 1, (Only for model 50, before moving the pump, fix the clamps with the screws to the flange.

Raise the pump-motor unit slowly (fig.1c), making sure it does not move from side to side in an uncontrolled way, to avoid the risk of imbalance and tipping up. For horizontal raising, brace the pump in a sling close to the centre of gravity.



a. Raising pump without the motor

b. Raising motor without the pump

c. Raising pump with motor

## Installation Dimensions

For the dimensions of the device (see technical catalogue).

### Ambient requirements and installation site dimensions

The customer has to prepare the installation site in order to guarantee the right installation and in order to fulfil the device requirements (electrical supply, etc.).

The place where the device will be installed must fulfil the requirements.

It's absolutely forbidden to install the machine in an environment with potentially explosive atmosphere.

### Unpacking

Inspect the device in order to check any damages which may have occurred during transportation.

Package material, once removed, must be discarded/recycled according to local laws of the destination country.

## Installation

The standard version pumps must be installed with the rotor axis in the vertical position and with the base under the pump.

The 50, 65 and 80 models can be installed in horizontal position, using the appropriate support feet, which are supplied on request.

Install the pump as close as possible to the suction source (with consideration given to the NPSH value).

Provide space around the pump for motor ventilation, to allow for checking of shaft rotation, for filling and draining the pump and to allow for collection of the liquid to be removed (especially for draining liquids which are harmful or have to be removed at temperatures higher than 60°C).

Make sure prolonged accidental leakage of liquid does not cause damage to persons or property.

Leakage may develop as a result of surge pressure or water hammer, erroneous operations (such as failing to close a plug or valve) or other functional disorders. Allow for the possibility of channelling away any leaked liquid or for an automatic drainage system against flooding.

Mount the pump on a flat horizontal surface (using a level gauge) such as a solid cement base or a rigid supporting structure in metal. To ensure stability, insert, if necessary, small pieces of calibrated metal plate next to the 4 anchoring screws.

### Connecting the motor

The pumps are designed for use with standard electric motors with (IEC 34-7) IM V1 construction form and dimensions and output ratings in accordance with IEC 72.

If a pump is supplied without the motor, check the rated power and rpm indicated on the name plate and technical data given in the data sheet.

**ATTENTION:** the motors must have two lifting points in diametrically opposite positions for vertical lifting with the shaft end downwards.

Before installation clean the motor shaft extension, the key and contact surfaces of the flanges to remove any protective paint, dirt or oxidation. Lubricate the motor shaft extension with a graphite base, drip free, anti-friction product.

Do not use oil as it can harm the mechanical seal below.

With the pump in the vertical position, insert the motor shaft in the coupling, aligning the key with the key slot and resting the motor flange on the lantern flange.

Turn the motor, adjusting the position of the terminal box as required and aligning the holes on the flanges.

**ATTENTION:** The 4 flange screws with nut must be uniformly tightened with alternated crossover tightening procedure in diametrically opposite positions.

Before and after tightening the screws, make sure the coupling with pump shaft and motor shaft can be freely turned by hand (remove and then replace the guard).

**ATTENTION:** for removing or replacing the motor

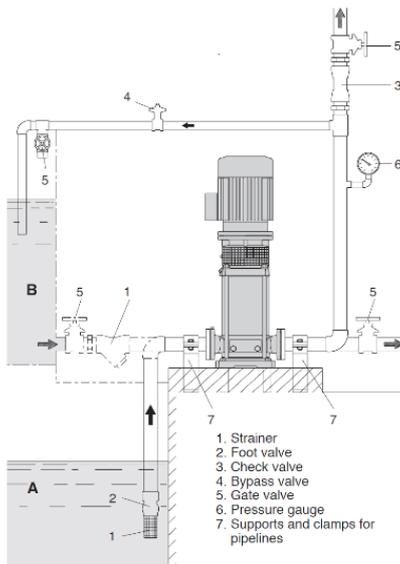
## Pipes

Provide a diameter assuring a liquid flow velocity not higher than 1.5 m/s for suction, and 3 m/s for delivery.

The pipe diameters must never be smaller than the pump connection ports.

The arrows on the pump casing indicate the inlet (suction) and outlet (delivery) ports.

Ensure the internal pipe surface is clean before connection.



Secure all pipes to their rests close to the pump and connect them so that they are not subjected to stress and do not transmit vibration or flexion strain to the pump (see fig.3).

Provide for the possibility of draining the pump without having to drain the entire system.

Install correctly any compensators for absorption of expansion or impeding noise transmission.

Make sure gaskets do not protrude inside the pipes for the pump types 25, 32, 40 screw the union couplings or the flanges into the threaded ports (ISO 228) by inserting in the joint a suitable sealing material.

Tighten the pipes or union couplings only to the extent sufficient to ensure a tight seal.

Excessive torque may damage the pump.

With flanged ports make sure the gaskets do not protrude inside the pipes.

Fig. 3 Systems diagram

A = Suction lift operation

B = Positive suction head operation

### Suction pipe

When a pump is located above the water level (suction lift operation, fig. 3 A), fit a foot valve with a strainer, which must always remain immersed.

The suction pipe must be perfectly airtight and be led upwards in order to avoid air pockets.

When the liquid level on the suction side is above the pump (inflow under positive suction head, fig. 3 B), fit a gate valve.

Follow local specifications if increasing network pressure.

Install a strainer on the suction side of the pump to prevent foreign particles from entering the pump.

### Delivery pipe

Install a gate valve in the delivery pipe to regulate flowrate, head and absorbed power.

Install a pressure gauge between the pump and the gate valve.

**ATTENTION:** install a check valve between the pump and the gate valve in order to avoid reverse flow after switching off the pump unit and to protect the pump from water hammering.

With servo-operated shut-off devices, provide an air vessel or other protection device against surge of pressure in the case of sudden changes of flow rate.

## Electrical connection

Electrical connection must be carried out only by a qualified electrician in accordance with local regulations. Follow all safety standards.

The unit must be properly earthed (grounded).

Connect the earthing (grounding) conductor to the terminal with the marking.

Compare the frequency and mains voltage with the name-plate data and connect the supply conductors to the terminals in accordance with the appropriate diagram inside the terminal box cover.

**ATTENTION: never allow washers or other metal parts to fall into the internal cable opening between the terminal box and stator.**

If this occurs, dismantle the motor to recover the object which has fallen inside.

**ATTENTION:** with motor power rating  $\geq 5.5$  kW avoid direct starting. Provide a control panel with star-delta starting or an other starting device.

If the terminal box is provided with an inlet gland, use a flexible power supply cord of the H07 RN-F type. If the terminal box is provided with an inlet bushing, connect the power supply cord through a conduit. For use in swimming pools (not when persons are in the pool), garden ponds and similar places, a residual current device with  $I_{\Delta N}$  not exceeding 30 mA must be installed in the supply circuit.

Install a device for disconnection from the mains (switch) with a contact separation of at least 3mm in all poles.

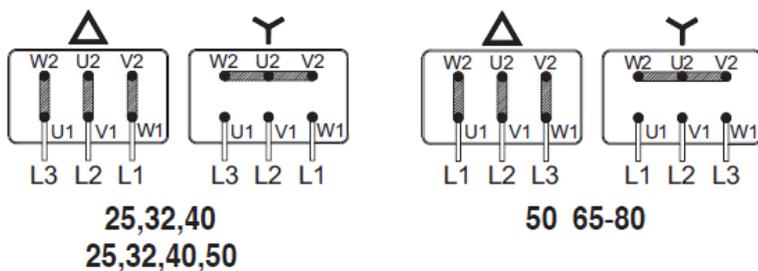
With a three-phase motor install an overload protection device with curve D appropriate for the rated current of the pump.

With a three-phase motor install an overload protection device with curve D appropriate for the rated current of the pump.

Single-phase are supplied with a capacitor connected to the terminals and (for 220-240 V - 50 Hz) with an incorporated thermal protector.

**ATTENTION:** When the pump is fed by a frequency converter, the minimum frequency should not fall below 25Hz and in any case the total head of the pump should never be lower than 3m.

## Electrical diagram



Refer to any other instructions (if supplied) for use of the motor.

**ATTENTION:** When the pump is fed by a frequency converter, the minimum frequency should not fall below 25Hz and in any case the total head of the pump should never be lower than 3 m.

# Start-up and Operation

## Preliminary checks before start-up of the pump

- Do not start-up the device in case of damaged parts.
- Make sure the coupling with the pump shaft turns freely when rotated by hand.
- Make sure the screws of the coupling are tightened.
- Make sure the coupling guard is fastened on the lantern bracket.
- Make sure the shaft turns freely when rotated by hand.
- For this purpose use the screwdriver notch on the shaft end ventilation side.

## First starting

**ATTENTION:** never run the pump dry, not even for a short trial run.

Start the pump after filling it completely with liquid.

When the pump is located above the water level (suction lift operation, fig. 3A) or with a positive suction head which is too low (less than 1 m) to open the non return valve, fill the suction pipe and the pump through the priming hole (1) (fig. 4).

To facilitate this operation use a flexible tube (or elbow) and a funnel.

### 25-32-48

During filling, the needle screw in the drainage plug must be kept loose so as to allow a free passage between the pressure chamber and the suction chamber (Fig.4a).

In case of horizontal installation (only for 50), arrange the screw upwards. The screw is both used for filling and as air vent.

### 25-32-40-50

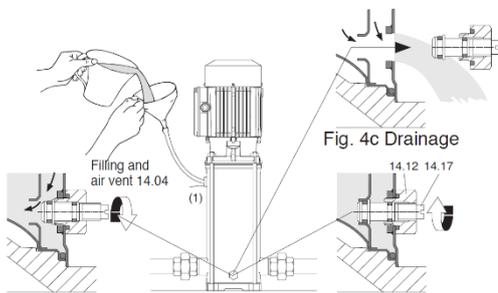


Fig. 4a Filling: internal passage open      Fig. 4b Operating: internal passage closed

### 50-65-80

In the case of vertical installation, remove the plug (2) during the filling operation to vent the suction side.

After the liquid has been released, replace the plug (2). Proceed with filling until the liquid spills out of the venting hole (1) in the upper cover. Top up until the pump is completely vented before replacing the plugs (1). In the case of horizontal installation, fill and vent through the holes (1) in the pump casing.

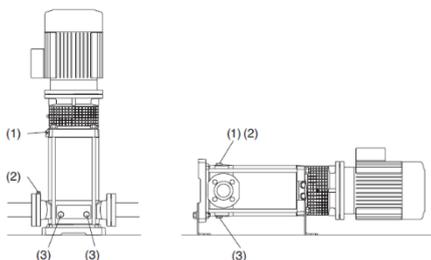


Fig. 4 (1) Filling and air vent  
(2) Suction side air vent  
(3) Draining

**When the liquid level on the suction side is above the pump** (inflow under positive suction head, fig. 3B), fill the pump by slowly and completely opening the inflow gate valve while keeping the delivery gate valve and air vent holes open to release the air.

During filling, keep the air vent holes open only if the inflowing liquid presents no possible danger on account of its nature, temperature or pressure.

Only for 50-65-80, if necessary, install joints with a tap/valve device to holes 1 and 2, to control the outflow of the liquid and its direction of flow.

With a delivery pipe arranged horizontally, or lower than the pump, keep the delivery gate valve closed during the filling operation.

## Starting and checking operations

Close the air vent holes (fig.4), 25-32-40 Tighten the needle screw in the drainage plug (fig. 4b) and close the air vent hole. Start the pump with the delivery gate valve closed and with the suction gate valve fully open. Immediately afterwards, gradually open the delivery gate valve, adjusting the point of operation within the limits indicated on the name plate.

When starting, with a three-phase motor, check if the direction of rotation is as shown by the arrows on the lantern bracket. Otherwise disconnect electrical power and reverse the connections of two phases.

Check that the pump works within its field of performance and that the absorbed current shown on the name-plate is not exceeded. Otherwise adjust the delivery gate valve or the setting of any pressure switches.

If a priming loss occurs (interruption of delivery flow, despite opened gate valves) or if a pressure oscillation is indicated on the pressure gauge, repeat the venting operation on the suction side (2), make sure all the suction pipe couplings are perfectly sealed and tighten the air vent plug (2) and the draining plugs (3) on the suction side (fig.4).

**ATTENTION:** when the pump is located above the water level (suction lift operation, fig. 3A), after a long idle period, before restarting the unit, check that the pump is still filled with liquid and vented. Otherwise, check for proper operation (opening and closing) of the foot valve and fill the pump with liquid.

Never run the pump for more than five minutes with a closed gate valve. Prolonged operation without a change of water in the pump causes dangerous increases of temperature and pressure. In systems in which it may be possible to operate with a closed delivery gate valve, install a bypass valve (fig. 3) to ensure a minimum flow.

When the water is overheated due to prolonged operation with a closed port, stop the pump before opening the gate valve.

To avoid any risk of danger to users and the creation of harmful thermal stress in the pump and system due to large temperature differentials, wait until the water has cooled inside the pump before starting again or before opening the drainage and filling plugs.

Care must be taken when the pumped fluid has a high temperature. Do not touch the fluid when its temperature is higher than 60 °C.

Do not touch the pump or motor when their surface temperature is higher than 80 °C.

## Switch off of the pump

The appliance must be switched off every time there are faults. (See troubleshooting).

The product is designed for a continuous duty, the switch off is performed by disconnecting the power supply by means the expected disconnecting devices. (See Electrical connection).

## Maintenance

Before any operations it's necessary to disconnect the power supply. If required ask to an electrician or to an expert technician.

Every maintenance operation, cleaning or reparation executed with the electrical system under voltage, it could cause serious injuries to people.

If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

In case of extraordinary maintenance, or maintenance operations that require part-removing, the operator must be a qualified technician able to read schemes and drawings. It is suggest to register all maintenance operation executed.

During maintenance keep particular attention in order to avoid the introduction of small external parts that could compromise the device safety.

It is forbidden to execute any operations with the direct use of hands. Use water-resistant, anti-cut gloves to disassemble and clean the filter or in other particular cases.

Maintenance operations that are not described in this manual must be made only by special personnel authorized by Flowtech.

### Routine maintenance

Before every maintenance operations disconnect the power supply and make sure that the device could not accidentally operate.

Under normal operating conditions the pump-motor unit will not require maintenance. Conduct routine inspection on the pump and connected parts to check for a perfect seal.

Check the seal on the shaft from the outside through the coupling guard.

The special funnel-shaped upper cover is designed to contain any small initial leaks.

Keep the pump and surrounding part clean so as to be able to immediately detect any outward leakage.

Clean the filter in the suction pipe and/or foot valve at regular intervals; check performance and absorbed current.

The ball bearings in the motor and the ball bearing in the pump have permanent lubrication.

No regreasing is necessary. See the operating instructions of the motor (if supplied).

Remove any excess grease expelled from the ball bearing after the first period of operation.

In the case of water containing chloride (chlorine or sea water) the risk of corrosion increases in stagnant water conditions (also with an increase in temperature and decrease of pH value). In these cases, if the pump remains inactive for long periods, it must be emptied completely.

For good measure, as for temporary operation with dirty liquids, run the pump briefly with clean water to remove deposits.

Or, after draining, perform the washing operation, inserting clean water (at least 40 litres) into the filling hole (1) on the delivery side and allowing it to come out of the draining hole (3) on the suction side (fig.4).

When the pump remains inactive it must be emptied completely if there is a risk of freezing.

Before starting the motor again fill the pump completely with liquid (see section 7.2.) and make sure the shaft is not jammed by encrustation, sticking of the faces of the mechanical seal or other causes. In the event that the shaft cannot be moved by hand, the pump has to be dismantled and cleaned.

Disconnect electrical power before any servicing operation and make sure the pump cannot be accidentally switched on.

## Dismantling the system

Close the suction and delivery gate valves and drain the pump casing before dismantling the pump.

### Dismantling the pump

Before dismantling, disconnect the power cable from the terminal box, close the gate valves in the suction and delivery pipes and empty the pump casing (fig. 4).

For dismantling and re-assembly refer to the drawing.

Dismantling and inspection of all internal parts can be carried out without removing the pump casing from the pipeline.

By removing the nuts from the tie bolts the motor can be taken out complete, with all internal parts of the pump without removing the pump casing from the pipeline.

**ATTENTION:** to avoid compressing the spring of the mechanical seal because of axial shifting of the shaft, we recommend to loosen the screws of the coupling even only for removing or replacing the motor.

Afterward reposition the shaft.

Remove the screws with the nuts and remove the motor from the coupling. For the 50 pumps use the threaded holes M10 of the clamp to remove the motor

#### **For 25-32-40:**

Remove the nuts from the tie bolts.

Remove the lantern bracket, complete with bearing and coupling from the shaft and from the external jacket.

Once the lantern bracket has been removed, all the internal parts can be extracted with the shaft from the external jacket.

Remove the upper cover with the O-ring and then the delivery casing.

#### **For 65-80:**

Remove the screws and remove the lantern bracket, complete with bearing and coupling from the upper cover and from the shaft (fig.5a).

Remove the nuts and washers from the tie bolts.

Remove the upper cover from the shaft and from the external jacket - or with the external jacket from the pump casing - with the aid of a mallet or lever, exercising pressure in alternate operations, from diametrically opposite positions.

Once the upper cover has been removed, all the internal parts can be extracted from the pump casing.

#### **For 50-15 and 50-20:**

Remove the screws and remove the pump flange with the bearing and the coupling (for pump with motor upper than 4 kW remove the coupling) from the lantern bracket and from shaft (fig.5b).

For removing the cartridge seal remove the screws and screwed up the screws to the cover plate for seal.

Remove the nuts from the tie bolts.

Remove the lantern bracket from the shaft and from the external jacket with the aid of a mallet or lever, exercising pressure in alternate operations, from diametrically opposite positions. Once the upper cover has been removed, all the internal parts can be extracted from the external jacket.

# Remounting

To remount the components follow the dismantling procedure in inverse order.

Check the state of the O-rings and replace them if they are damaged. Make sure that the O-rings are correctly inserted on their seats on the pump casing and upper cover. Lubricate the seal rings with clean water or any other compatible lubricant.

## Tightening torque

| Type                                  | 25-32-40-50 |
|---------------------------------------|-------------|
| Impeller Nuts (28.04)                 | 8 Nm        |
| Nuts (61.04) on tie-bolts             | 50Nm        |
| Screws (64.25) in the coupling        | -           |
| Screws (70.18) with nuts (70.19)      | -           |
| Type                                  | 50          |
| impeller nuts (28.04)                 | 30 Nm       |
| nuts (61.04) on tie-bolts             | 50 Nm       |
| screws (61.07) lantern upp. cov       | -           |
| screws (32.74) lantern upp. cov       | 25 Nm       |
| screws (32.04) flange for seal        | 4 Nm        |
| screws (64.25) in the coupling        | 40 Nm       |
| screws (64.25) in the coupling flange | 40 Nm       |
| screws (70.18) with nuts (70.19)      | 40 Nm       |

When tightening the nuts, be careful not to scratch the shaft with the second wrench used on the opposite side.

**ATTENTION:** the nuts on the tie-bolts, the screws on the upper cover and the screws with the nuts on the lantern bracket must be uniformly tightened with alternated crossover tightening procedure in diametrically opposite positions.

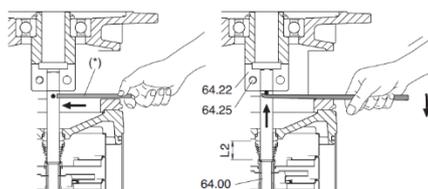


Fig. 6a  
Rotor rested, with shaft not locked in the coupling.  
(\*) Pin for raising the shaft.

Fig. 6b  
Rotor raised, position for locking the shaft in the coupling.

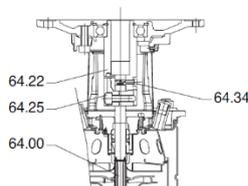


Fig. 6c

## Axial position of the pump rotor

In the vertical position and from the resting position (fig.6a), raise the rotor, levering on a pin inserted in the hole in the shaft, until the pin can be rested under the coupling. In this position (fig. 6b), by tightening the screws uniformly, the shaft is locked tight in the coupling. Remove the pin.

Only for 50, in the vertical position from the resting position screw up the screws without blocking the shaft, so screw up the screw (fig.6c) in the coupling until the screw is supported. In this position, by tightening the screws uniformly, the shaft is locked tight in the coupling.

Mount the motor.

## Disposal

European Directive 2012/19/EU (WEEE)

The final disposal of the device must be done by specialized company.

Make sure the specialized company follows the classification of the material parts for the separation.

Observe the local regulations and dispose the device accordingly with the international rules for environment protection.

## Spare-parts request

When ordering spare parts, please quote their designation, position number in the cross section drawing and rated data from the pump name plate (type, date and serial number).

## Troubleshooting

**WARNING:** Turn off the power supply before performing any operations.

Do not allow the pump or motor to run when dry even for a short period.

Strictly follow the user instructions and if necessary contact an authorised service centre.

| Problem                  | Probable Causes  | Possible Remedies  |
|--------------------------|--|--|
| The motor does not start | 1a. Unsuitable power supply  | 1a. Check that the mains frequency and voltage correspond to the electrical characteristics shown on the indicator plate   |
|                          | 1b. Incorrect electrical connections   | 1b. Connect the power supply cable to the terminal board correctly. Check that the thermal overload protection is set correctly (see data on the engine indicator plate) and make sure that the fuse board up line of the engine has been properly connected |
|                          | 1c. Engine overload protective device cuts in                                      | 1c. Check the power supply and make sure that the pump shaft is turning freely. Check that the thermal overload protection has been set correctly (see engine indicator plate)   |
|                          | 1d. Blown or defective fuses   | 1d. Replace the fuses, check the electric power supply and points a) and c)  |
|                          | 1e. Shaft blocked  | 1e. Remove the cause of blockage as indicated in the "Blocked pump" instruction booklet  |
|                          | 1f. If the above causes have already been checked the engine may be malfunctioning | 1f. Repair or replace the engine by applying to an authorised service center   |

|   |  |   |
|---|--|---|
| Pump blocked                              | 2a. Prolonged periods of inactivity with formation of rust inside the pump   | 2a. Rotation may be started directly from the pump shaft or from the joint (remember to turn off the electricity supply first ) or contact an authorised service centre |
|   | 2b. Presence of solid bodies in the pump rotor   | 2b. If possible, dismantle the pump casing and remove any solid foreign bodies inside the rotor, if necessary contact an authorised service centre                      |
|   | 2c. Bearings seized  | 2c. If the bearings are damaged replace them or if necessary contact an authorised service centre   |
| The pump functions but no water comes out | 3a. Possible infiltration of air from suction tube connections, drain plugs or filling of pump or from the gaskets of the suction pipe | 3a. Check which part is not tight and seal the connection adequately  |
|   | 3b. Foot valve blocked or suction pipe not fully immersed in liquid  | 3b. Clean or replace the bottom valve and use a suction pipe suitable for the application   |
|   | 3c. Suction filter blocked   | 3c. Clean the filter, if necessary, replace it. See point 2a) also.   |
| Insufficient flow                         | 4a. Pipes and accessories with diameter too small causing excessive loss of head   | 4a. Use pipes and accessories suitable for the specific application   |
|   | 4b. Presence of deposits or solid bodies in the internal passages of the rotor   | 4b. Clean the rotor and install a suction filter to prevent other foreign bodies from entering  |
|   | 4c. Rotor deteriorated   | 4c. Replace the rotor, if necessary, contact an authorised service center   |
|   | 4d. Worn rotor and pump case   | 4d. Replace the rotor and the pump casing   |
|   | 4e. Excessive viscosity of the liquid pumped (if other than water)   | 4e. The pump is unsuitable  |
|   | 4f. Incorrect direction of rotation  | 4f. Invert the electrical connections on the terminal board or control panel  |
|   | 4g. Suction head excessive in relation to the suction capacity of pump   | 4g. Try to close the feeder gate partially and/or reduce the difference in level of the pump and the liquid being aspirated   |
|   | 4h. Suction pipe too long  | 4h. Bring the pump closer to the suction tank so as to use a shorter pipe. If necessary use a pipe of a wider diameter  |

|  |   |  |
|--|---|--|
| Noise and vibrations from the pump   | 5a. Rotating part unbalanced  | 5a. Check that no solid bodies are obstructing the rotor   |
|  | 5b. Worn bearings   | 5b. Replace the bearings   |
|  | 5c. Pump and pipes not firmly attached  | 5c. Anchor the delivery and suction piping as needed   |
|  | 5d. Flow too strong for the diameter of the delivery pipe                     | 5d. Use bigger diameters or reduce the pump flow   |
|  | 5e. Functioning in cavitation   | 5e. Reduce the flow by adjusting the feeder gate and/or using pipes with a bigger internal diameter. See point 4g) too   |
|  | 5f. Unbalanced power supply   | 5f. Check that the mains voltage is right  |
|  | 5g. Incorrect alignment of pump-motor unit                                    | 5g. If necessary, the unit must be re-aligned  |
| Leakage from the mechanical seal   | 6a. The mechanical seal has functioned when dry or has stuck                  | 6a. Make sure that the pump casing (and the suction pipe if the pump is not self-priming) are full of liquid and that all the air has been expelled. See point 5 e) too. |
|  | 6b. Mechanical seal scored by presence of abrasive parts in the liquid pumped | 6b. Install a suction filter and use a seal suited to the characteristics of the liquid being pumped.  |
|  | 6c. Mechanical seal unsuitable for the type of application                    | 6c. Choose a seal with characteristics suitable for the specific application   |
|  | 6d. Slight initial drip during filling or on first start-up                   | 6d. Wait for the seal to adjust to the rotation of the shaft. If the problem persists, see points 6a), 6b) or 6c) or contact an authorised service center.               |
| In cases 6a), 6b) and 6c), replace the seal, if necessary contact an authorised service center |   |  |



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FOR FURTHER INFORMATION OR ASSISTANCE

## contact us

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