SUMMARY



## 1. GENERAL INFORMATION

Before using the product carefully read the information contained in this instruction manual, the manual should be kept for future reference.
Italian is the original language of this instruction manual, this language is the reference language in case of discrepancies in the translations.
This manual is part of the essential safety requirement and must be retained until the product is finally de-commissioned.
The customer, in case of loss, can request a copy of the manual by contacting Calpeda S.p.A. or their agent, specifying the type of product data shown on the label of the machine (see 2.3 Marking)
Any changes, alterations or modifications made to the product or part of it, not authorized by the manufacturer, will revoke the “CE declaration” and warranty.

This appliance should not be operated by children younger than 8 years, people with reduced physical, sensory or mental capacities, or inexperienced people who are not familiar with the product, unless they are given close supervision or instructions on how to use it safely and are made aware by a responsible person of the dangers its use might entail.
Children must not play with the appliance.
It is the user's responsibility to clean and maintain the appliance. Children should never clean or maintain it unless they are given supervision.
Do not use in ponds, tanks or swimming pools or where people may enter or come into contact with the water.
Read carefully the installation section which sets forth:
- The maximum permissible structural working pressure (chapter 3.1).
- The type and section of the power cable (chapter 6.5).
- The type of electrical protection to be installed (chapter 6.5).

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### 1.1. Symbols

To improve the understanding of the manual, below are indicated the symbols used with the related meaning.


Information and warnings that must be observed, otherwise there is a risk that the machine could damage or compromise personnel safety.


The failure to observe electrical information and warnings, could damage the machine or compromise personnel safety.


Notes and warnings for the correct management of the machine and its parts.


Operations that could be performed by the final user. After carefully reading of the instructions, is responsible for maintenance under normal conditions. They are authorized to affect standard maintenance operations.


Operations that must be performed by a qualified electrician. Specialized technician authorised to affect all electrical operations including maintenance. They are able to operate with in the presence of high voltages.


Operations that must be done performed by a qualified technician. Specialized technician able to install the device, under normal conditions, working during “maintenance”, and allowed to do electrical and mechanical interventions for maintenance. They must be capable of executing simple electrical and mechanical operations related to the maintenance of the device.


Indicates that it is mandatory to use individual protection devices.

Operations that must be done with the device switched off and disconnected from the power supply.

Operations that must be done with the device switched on.

### 1.2. Manufacturer name and address

Manufacturer name: Calpeda S.p.A.
Address: Via Roggia di Mezzo, 39
36050 Montorso Vicentino - Vicenza / Italia
www.calpeda.it

### 1.3. Authorized operators

The product is intended for use by expert operators divided into end users and specialized technicians. (see the symbols above).


It’s forbidden, for the end user, carry out operations which must be done only by specialized technicians. The manufacturer declines any liability for damage related to the non-compliance of this warning.

### 1.4. Warranty

For the product warranty refer to the general terms and conditions of sale.


The warranty covers only the replacement and the repair of the defective parts of the goods (recognized by the manufacturer).

The Warranty will not be considered in the following cases:
- Whenever the use of the device does not conform to the instructions and information described in this manual.
- In case of changes or variations made without authorization of the manufacturer.
- In case of technical interventions executed by a non-authorized personnel.
- In case of failing to carry out adequate maintenance.

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### 1.5. Technical assistance
Any further information about the documentation, technical assistance and spare parts, shall be requested from: Calpeda S.p.A. (paragraph 1.2).

## 2. TECHNICAL DESCRIPTION
Variable speed pressure boosting system with integrated control, complete with integrated pressure transducer that allows to maintain the system pressure even with variation of consumption.

For protection of the pump:
- against dry running;
- against the risk of operation without water at the inlet (caused by a lack of water inflow in the inlet pipe under positive suction head, by a non-immersed suction pipe, by excessive suction lift or by air entering the suction pipe);

Version self-priming multistage pumps with AISI 304 pump casing and impellers.

### 2.1. 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.
Liquid temperature from - 0 °C to + 35 °C.

### 2.2. Improper use
The device is designed and built only for the purpose described in paragraph 2.1.

Improper use of the device is forbidden, as is use under conditions other than those indicated in these instructions.

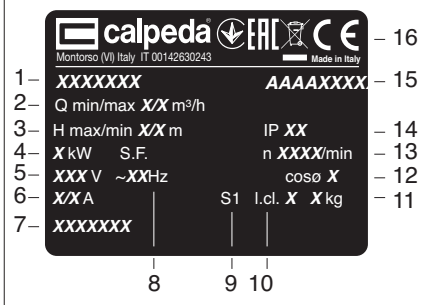
Improper use of the product reduces the safety and the efficiency of the device, Calpeda shall not be responsible for failure or accident due to improper use.

Do not use in ponds, tanks or swimming pools or where people may enter or come into contact with the water.

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

1 Pump type
2 Delivery
3 Head
4 Maximum absorbed power
5 Supply voltage
6 Rated current
7 Notes
8 Frequency
9 Operation Duty
10 Insulation class
11 Weight
12 Power factor
13 Rotation speed rpm
14 Protection
15 AAAA Year of manufacture
15 XXXX Serial number
16 Certifications

Example plate pump




## 3. TECHNICAL FEATURES

### 3.1. Technical data
Dimensions and weight (see technical catalogue).
Nominal speed 4500 rpm
Protection IP X4
Supply voltage / Frequency:
220-240V~50Hz/220V~60Hz
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.
Sound pressure: < 70 dB (A).
Max. starts per hour: 90 at regular intervals.
Maximum permissible pressure in the pump casing: 80 m (8 bar).
The max. inlet water pressure: PN (Pa) - Hmax (Pa) [1bar = 100.000 Pa].

### 3.2. Pushbuttons functions
The user interface is made by a 6 pushbuttons keyboard. Every pushbutton has a specific function described in the following table.


Through this button you can start the pump.

Through this button you can stop the pump.

Through this button you have access to the product programming parameters. If you already are on the programming functions, by pushing this button you go up on the menu

Through this button you have access to programming parameters. If you changed a parameter, by pushing this button you can confirm the indicated value.
Through this button you can reset the errors.

Through this button you can decrease parameters or to change the visualized parameter.

Through this button you can increase parameters or to change the visualized parameter.

### 3.3. Operating conditions
Installation in well ventilated location protected from the weather, with a maximum ambient temperature of 40 °C.

## 4. SAFETY

### 4.1. General provisions
Before using the product it is necessary to know all the safety indications.

Carefully read all operating instructions and the indications defined for the different steps: from transportation to disposal.
The specialized 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 Calpeda S.p.A or from an authorized distributor.

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.

### 4.2. Safety devices
The device has an external case that prevents any contact with internal parts.

### 4.3. Residual risks
The appliance, designed for use, when used in-line with the design and safety rules, doesn't have residual risks.

### 4.4. Information and Safety signals
For this kind of product there will not be any signals on the product.

### 4.5. 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).

## 5. TRANSPORTATION AND HANDLING
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).

### 5.1. 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.

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## 6. INSTALLATION

### 6.1. Dimensions
For the dimensions of the device (see technical catalogue).

### 6.2. 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 fulfill the device requirements (electrical supply, etc...).
The place where the device will be installed must fulfill the requirements in the paragraph 3.2.
It's Absolutely forbidden to install the machine in an environment with potentially explosive atmosphere.

### 6.3. 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.

### 6.4. Installation
See installation examples, par. 14 fig. 1 and 2.
The pumps must be installed with the rotor axis in the horizontal position and with the feet under the pump.
Place the pump as close as possible to the suction source.
Provide space around the pump for motor ventilation, to allow for checking of shaft rota-tion, for filling and draining the pump and to allow for collection of the liquid to be removed.

#### 6.4.1. Pipes
Ensure the insides of pipes are clean and unobstructed before connection.
**ATTENTION: The pipes connected to the pump should be secured to rest clamps so that they do not transmit stress, strain or vibrations to the pump (par. 14 fig. 3).**
Tighten the pipes or union coupling to the extent sufficient to ensure a tight seal.
Excessive torque may cause damage to the pump.
The pipe diameters must not be smaller than the pump connections.

#### 6.4.2. Suction pipe
The suction pipe must be perfectly airtight and be led upwards in order to avoid air pockets.
With a pump located above the water level (suction lift operation, par. 14. fig. 2) fit a foot valve with strainer which must always remain immersed.
If operating with flexible hoses use a reinforced spiral suction hose, in order to avoid the hose narrowing due to suction vacuum.
With the liquid level on the suction side above the pump (inflow under positive suction head, par. 14. fig. 1) fit an inlet gate valve.

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**ATTENTION**: the pump is equipped with a integrated non-return valve into the pump suction, in order to fill the suction pipe it is necessary to prepare a filling system on the suction pipe (par. 14 fig. 4).
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.**

### 6.4.3. Delivery pipe

Fit a gate valve in the delivery pipe to adjust delivery and head.
With a geodetic head at outlet over 15 m fit a check valve between the pump and the gate valve in order to protect the pump from water hammering.
**ATTENTION** It is necessary to check that the restart pressure (subtraction between UP01-UP02) is compatible with the actual pressure of the pump and of the water column of the system.

## 6.5. Electrical connection


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

**Follow all safety standards.**
Make sure the frequency and mains voltage correspond with the name plate data.
For use in swimming pools (not when persons are in the pool), garden ponds and similar places, **a F-type residual current device** with IΔN 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 3 mm in all poles.
The pumps are supplied with incorporated thermal protector and with plug.
Connect the plug to a socket with an earth lead. The motor will stop if overheating is detected. When the windings cool down, the thermal protector enables re-starting.
The pumps are supplied with power supply type H07RN-F with plug and cable section equal to or greater than the value defined in table 1 in paragraph 14.2.
When extension cables are used, make sure the cable wires are of adequate size to avoid voltage drops.

### 6.5.1. Operation with frequency converter

ATTENTION: never feed the pump with a frequency converter.

# 7. PROGRAMMING GUIDE

## 7.1. Parameters

The following information is displayed:
- Parameters of pump status
- Programming parameters
- Alarms

## 7.2. Parameter of pump status

They allow to visualize:
- Initial screen (rUn, OFF, StB, Err)
- Motor Operating Frequency
- Delivery pressure measured by the transducer
- Supply current input
- Supply electrical power input
- Supply voltage

Starting from the basic display by pushing of the directional arrow (plus) or (minus)

## 7.3. Programming parameters

To show the programming parameters, select (menu).
Will be displayed progressively:
UP – User settings: these are the basis settings that the user may change.
AP - Advanced settings: these settings are available only to qualified personnel. To enter password is required (see paragraph 7.6.).
Err - Last 5 alarms. In case of no error, it appears nOnE
AE - You can identify the firmware between the AE menu. Firmware=AE01+AE02+AE03

## 7.4. Parameters

The following parameters are available and programmable:

### 7.4.1. UP – User settings

| Par. | Description | Values | Standard |
|---|---|---|---|
| UP01 | Set-point pressure (bar) | 1,8÷4,7 | 3,5 |
| UP02 | Restart fall pressure set-up (bar) | 0,2÷2 | 0,5 |
| UP03 | Select one of the two dry- run modes available | 0,1 | 0 |

### 7.4.2. AP – Advanced settings

| Par. | Description | Values | Standard |
|---|---|---|---|
| AP01 | Pump suction pressure (bar) | -0.6÷2.3 | 0 |
| AP02 | Reset to factory set-up | nO, yES | nO |
| AP03 | Low Power operating Time Threshold | 0÷60 (minutes) | 0 |
| AP04 | Safe-start mode activation time | 1÷30 (minutes) | 0 |
| AP05 | System dynamic | 0 Standard<br>1 Slow<br>2 Fast | 0 |

## 7.5. Operating modes

The operating mode allows you to keep the system Pressure constant at a setpoint value adjustable with UP01 parameter. The restart pressure can be calculated subtracting UP01 – UP02, the latter defined as pressure hysteresis. The product is equipped with a membrane that works as an expansion vessel.

### 7.5.1. Warning for high number of starts/hour

The TANK symbol will light on, due to a warning for high number of starts and stops, if the pump achieves at least 20 starts in a short time (cycle time less than 5 seconds).
Press (enter) button to reset the warning.
If the pump starts more than 90 times in 1 hours, Er05 will be displayed.

### 7.5.2. Dry-run settings operation and management

In case of pump not primed and without water inside the pump casing:
UP03=0 (default)
In normal operation conditions, i.e. after the first starting (15s), the warning Er01 is displayed so the pump will try to start again every 10 minutes for 5 seconds for maximum 5 times.
In the case that all these attempts fail, Er01 is kept displayed and a manual reset or turn off and back on the pump is required.

UP03=1
Alternative operation mode, i.e. after the first attempt (15s), Er01 is displayed and the pump will try to start again every 10 minutes for 5 seconds, after that the pump will try to start again every 24h for 5s (there's no limit of attempts in this case). However, it is still possible to manually reset or restart the pump.
Obviously, manual reset is possible even by switching the pump off and back on.
In case of pump not primed with water inside the pump casing.
The first priming attempt lasts 120s and the next ones last for 30s for maximum 5 times.
If UP03=1 the attempts continue every 24h lasting 30s.

### 7.5.3. Forced start
To avoid any mechanical blocks, if the pump is in stand-by state for more than 24 hours, the pump starts running for a minimum time of 5 seconds, and then until the stop pressure UP01 has been reached. A forced starting does not take place if the pump has been manually turned OFF.

### 7.5.4. Forced stop
By the parameter AP03 it is possible to set a timer that forces the pump to stop if it works in lower power consumption conditions. In this way it is possible to avoid that the pump does not stop when there is no water demand from the final users.
AP03 is disabled by default but values from 5 to 60 minutes can be entered.

### 7.5.5. Enabling safe-start
Safe-start function prevent a peak of pressure in the system pipework. The Safe-start function triggers whenever a supply disconnection occurs.
To enable this function, it is necessary to set the parameter AP04 with a value other than zero (default). At every interruption of the voltage supply, when the voltage supply is restored, the pressure value will reach the 70% of the set-point value (UP01) for a time defined by in the parameter AP04. After that time the pressure assumes the set-point value as in normal mode.

### 7.6. PASSWORD insertion
To enter on a menu with password, four numbers appear on the display, the number to insert is blinking. By pushing buttons (plus) or (minus) you can change the blinking value. If you confirm with (enter) the next number start blinking.
If the password is correct you can enter on the MENU, if the password is wrong the first number restart blinking. To exit the program, push (menu) until you arrive on the basic display, when you are out from the set-up mode the icon disappear.

password 1959

## 8. STARTUP AND OPERATION

### 8.1. Preliminary checks before start-up of the pump
Do not start-up the device in case of damaged parts.

### 8.2. Parameters to be set at the start-up
The electric pump is already set with all the operating parameters, therefore it is not necessary to modify any parameters for operation.

ATTENTION: at the first starting check that with all the taps closed the system stops. If the pump do not stop change the stop pressure (UP01) according with the system needs, check that there are not suction losses and check that there is no air inside the pipes.

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### 8.3. Suction pressure set-up
The system allows the set of pumps suction pressure. To set the pumps suction pressure, parameter AP01 must be changed.
ATTENTION: once the parameter AP01 has been modified it is necessary to modify the parameters UP01 and UP02 so that they are suitable for the application and guarantee the correct start and stop of the system (during programming the product will suggest the values of the first attempt).
ATTENTION: the maximum values that can be set in parameter AP01 are limited in order to never exceed the maximum allowable pressure of the product.

### 8.4. First starting



**ATTENTION: never run the pump dry.** Start the pump after filling it completely with liquidand and regulated the membrane pressure (par. 8.6).
**When the pump is located above the water level** (suction lift operation par. 14 fig. 2) or with a positive suction head which is too low (less than 1 m) to open the non-return valve, fill the pump through the priming hole (par. 14 fig. 4).
ATTENTION: the pump is equipped with a integrated non-return valve into the pump suction, in order to fill the suction pipe it is necessary to prepare a filling system on the suction pipe (par.14 fig.4).
**When the liquid level on the suction side is above the pump** (inflow under positive suction head par. 14 fig. 1), fill the pump by opening the suction gate valve slowly and completely, keeping the delivery gate valve open to release the air.
Before starting, check that the shaft turns by hand. For this purpose use the screwdriver notch on the shaft end on the ventilation side.

### 8.5. Self-priming
(Capability to clear the air in the suction pipe when starting with **the pump located above the water level**).
**Conditions for self-priming:**
- suction pipe with connections perfectly airtight and properly immersed in the water to be lifted;
- allow 0,6 m minimum of straight vertical pipe above the discharge port, before a non-return valve or a bend par. 14 fig. 4.
- **pump casing completely filled with clean cold water berfore starting.**

The pump is not self-priming with liquids containing oil, alcohol or foaming substances.
The integrated check valve prevents reverse siphoning through the pump when the pump is stopped and retains water in the pump for the next start.

**ATTENTION: avoid a prolonged operation with unprimed pump, without water delivery from the completely opened outlet. If the pump does not prime in 5 minutes: stop the motor, remove the priming plug and add more water.**

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If necessary, repeat the priming operation after the pump has been first emptied and then completely filled with clean cold water.

ATTENTION: At first priming, once the pump has been primed, it may be necessary to stop the pump, wait a few seconds and then restart it with all taps opened, in order to eliminate the air inside the pump casing completely.

During the self-priming time, if the pump does not prime within 2 minutes, Er07

“not primed” appears. Press the enter button for the reset and the button start to restart the pump.

### 8.6. Vessel pressure

Once the new re-start pressure is entered (parameter UP01-UP02), the tank preloaded pressure must be changed to 0,5 bar lower than re-start pressure (i.e. 2,9 bar re-start pressure, tanks to be preloaded at 2.4 bar) par. 14 fig. 6.
ATTENTION: Do not preload the diaphragm of the tank over 3,5 bar; if an higher pressure is required, install an external tank.
If the pump works for long periods of time with a flow rate of 2 liters/min or lower it is necessary to install a tank of at least 8 liters.

### 8.7. Gate valve regulation

With the gate valve completely open or with an outlet pressure lower than the minimum pressure shown on the name-plate, the pump may be noisy. To reduce noise regulate the delivery gate valve.

### 8.8. Abnormal operation

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.
Prolunged operation with a closed delivery port causes breakage or damage to parts of the pump.
When the water is overheated due to prolonged operation with a closed port, stop the pump before opening the gate valve.
**Do not touch the fluid when its temperature is higher than 60 °C.**
**Do not touch the pump when the surface temperature is higher than 80 °C.**
Wait until the water has cooled inside the pump before starting again or opening the draining and filling plugs.

### 8.9. Switch off of the pump


The appliance must be switch 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 paragraph “6.5 Electrical connection”).

## 9. 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 operations, 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.

During maintenance operations external personnel is not allowed.

Maintenance operations that are not described in this manual must be made only by special personnel authorized by Calpeda S.p.A.
For further technical information regarding the use or the maintenance of the device, contact Calpeda S.p.A.

### 9.1. Routine maintenance


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

In the case of water containing chloride (chlorine, sea water), the risk of corrosion increases in stagnant water condictions (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 and, preferably, dried.**

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

**When the pump remains inactive it must be emptied completely if there is a risk of freezing** (par. 14 **fig. 5).**
Before restarting the unit, check that the shaft is not jammed and fill the pump casing completely with liquid.

### 9.2. Vessel maintenance

Inspect the preloaded pressure of the membrane inside the pump (par. 14 fig. 6)

### 9.3. Dismantling the system

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

## 9.4. Dismantling the pump


Close the suction and delivery gate valves and drain the pump casing before dismantling the pump (par. 14 fig. 5).

## 10. 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.

## 11. SPARE PARTS

### 11.1. 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).
The spare parts request shall be sent to CALPEDA S.p.A. by phone, fax, e-mail.

### 11.2. DESIGNATION OF PARTS

| Nr. | Designation |
|---|---|
| 14.00 | Pump casing |
| 14.04 | Plug |
| 14.06 | O-ring |
| 14.12 | Plug |
| 14.16 | O-ring |
| 14.20 | O-ring |
| 14.24 | Screw |
| 14.47 | O-ring |
| 14.64 | Valve, set |
| 14.66 | Washer / Retaining ring |
| 16.00 | Suction casing |
| 16.14 | Plunger |
| 16.15 | Spring |
| 16.16 | O-ring |
| 16.17 | Valve |
| 17.00 | Membrane |
| 17.04 | Valve casing |
| 17.06 | Nut |
| 17.08 | Valve casing plug |
| 17.10 | Tank cover |
| 20.00 | Delivery casing |
| 22.00 | Ejector |
| 22.12 | O-ring |
| 22.16 | O-ring |
| 25.01 | First stage casing |
| 25.02 | Stage casing (complete) |
| 25.05 | Last stage casing |
| 25.10 | Washer for missing impeller |
| 25.11 | First stage spacer |
| 26.00 | Diffuser |
| 26.06 | O-ring |
| 28.00 | Impeller |
| 28.04 | Impeller nut |
| 28.08 | Washer |
| 28.12 | Circlip |
| 34.00 | Casing cover |
| 36.00 | Mechanical seal |
| 36.51 | Retaining ring, split |
| 36.52 | Shoulder ring |
| 36.54 | Spacer sleeve |
| 46.00 | Deflector |
| 64.13 | Spacer sleeve |
| 64.15 | Spacer sleeve |
| 70.00 | Lantern bracket |
| 73.00 | Ball bearing |
| 76.00 | Motor casing with winding |
| 76.06 | Nut |
| 76.16 | Support |
| 76.54 | Terminal box, set |
| 78.00 | Shaft with rotor packet |
| 81.00 | Ball bearing |
| 82.00 | Motor end shield |
| 82.04 | Compensating spring |
| 88.00 | Motor fan |
| 90.00 | Fan cover |
| 90.04 | Screw |
| 92.00 | Tie-bolt |
| 96.02 | Cable with plug |
| 98.00 | Terminal box cover |
| 98.04 | Screw |
| 98.08 | Gasket |
| 98.20 | Screw |
| 98.51 | Transducer |
| 98.52 | Signals cable |
| 98.54 | Display cable |
| 98.55 | Terminal box cover / board |
| 98.56 | Transducer stop fork |
| 98.60 | Control board + Input signal board |
| 98.63 | Power board |
| 98.70 | Screw |

## 12. ALARMS

Error reset can be automatic or manual, depending on the error that occurs. Manual reset is carried out using the enter button and then start to restart the pump.

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| Code | Description | Reset ERR | Causes |
|---|---|---|---|
| Er01 | Blockage due to no water | MAN | The device is in failure due to no water.<br>The system try to restart automatically and make one attempt every 10 minutes for 5 times. |
| Er02 | Faulty pressure sensor – Max. ressure exceeded | MAN | Faulty pressure sensor |
| Er03 | Blockage due to low supply voltage | AUT | Supply voltage lower than 185V.<br>- The system automatically restart when the clamp voltage is higher than 190V. |
| Er04 | Blockage due to high rectified voltage | AUT | Supply voltage higher than 255V.<br>- The system automatically restart when the clamp voltage is lower than 250V. |
| Er05 | Blockage due to exceeded of number of starts | MAN | The system has started more than 90 times in 1 hour |
| Er06 | Blockage due to overcurrent in the electro pump motor | MAN | The system try to restart automatically and make one attempt every 10 seconds for 3 times. |
| Er07 | Pump not fully primed | MAN | The system try to restart automatically and make one attempt every 10 minutes for 5 times |
| Er08 | Blockage due to internal overheating | AUT | Overtemperature detected on the board. |
| Er09 | Blockage due to overpressure | MAN | Pressure greater than 7.8 bar. |
| Er10 | Thermal-protector intervention detected | MAN | Motor overheating |
| Er11 | Blockage due to presence of air | MAN | Presence of air inside the pump casing. |
| From Er26 to Er31 | Internal hardware error | MAN | |

In case of internal hardware error contact an authorised service center.

## 13. WARNING

The Warning remains active until the input cause is no longer effective. In Warning status the pump could still operate normally but advising that it is working nearby the limits of an Error status.

| Code | Symbol | Causes | Possible remedies |
|---|---|---|---|
| W1 |  | 20 restarts with stand-by time less than 5s | Check the membrane pressure, if necessary install a tank of at least 8 liters |
| W2 |  | The pump is not properly primed or there is air inside the pump casing. The pump restarts whenever the system pressure is under the restart pressure threshold. | Make sure that the pump casing is full of liquid and that all the air has been expelled. |
| W3 |  | 20 restarts with pump RUN time less than 10s | Check if there are small leaks in the system |
| W4 |  | The power is under the switch-off attempt threshold for 60s with set-point pressure reached | |
| W5 |  | The pump is at the limit of the allowed power input and the pressure is less than 1.5bar for 20s | |

## 14. 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.

EN

| PROBLEM | PROBABLE CAUSES | POSSIBLE REMEDIES |
|---|---|---|
| 1)<br>The motor does not start | 1a) Unsuitable power supply<br>1b) Shaft blocked<br>1c) If the above causes have already been checked, the engine may be malfunctioning | 1a) Check that the mains frequency and voltage correspond to the electrical characteristics shown on the indicator plate<br>1b) Remove the cause of blockage as indicated in the “Blocked pump” instruction booklet<br>1c) Repair or replace the engine by applying to an authorised service centre |
| 2)<br>Pump blocked | 2a) Prolonged periods of inactivity with formation of rust inside the pump<br>2b) Presence of solid bodies in the pump rotor<br>2c) Bearings siezed | 2a) Unblock the pump by using a screw driver to turn the relevant notch on the back of the shaft (remember to turn off the electricity supply first ) or contact an authorised service centre<br>2b) If possible, dismantle the pump casing and remove any solid foreign bodies inside the rotor, if necessary contact an authorised service centre<br>2c) If the bearings are damaged replace them or if necessary contact an authorised service centre |
| 3)<br>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<br>3b) Foot valve blocked or suction pipe not fully immersed in liquid<br>3c) Suction filter blocked<br>3d) Non-return valve blocked | 3a) Check which part is not tight and seal the connection adequately<br>3b) Clean or replace the bottom valve and use a suction pipe suitable for the application<br>3c) Clean the filter, if necessary, replace it . See point 2a) also.<br>3d) Verify that the integrated non-return valve is working properly. |
| 4)<br>The pump does not stop | 4a) Non-return valve broken, blocked or clogged with solid parts.<br>4b) Stop pressure (parameter UP01) too high.<br>4c) Insufficient pump performance<br>4d) Incorrect membrane pressure, empty or broken membrane | 4a) Check the function of the integrated check valve and remove the solid parts present in the valve.<br>4b) Check the value of parameter UP01 and if necessary reduce it.<br>4c) Contact an authorised service center.<br>4d) Check the membrane pressure, if necessary install a tank of at least 8 liters. |
| 5)<br>Insufficient flow | 5a) Pipes and accessories with diameter too small causing excessive loss of head<br>5b) Presence of deposits or solid bodies in the internal passages of the rotor<br>5c) Rotor deteriorated<br>5d) Worn rotor and pump case<br>5e) Excessive viscosity of the liquid pumped (if other than water)<br>5f) Suction head excessive in relation to the suction capacity of pump<br>5g) Suction pipe too long | 5a) Use pipes and accessories suitable for the specific application<br>5b) Clean the rotor and install a suction filter to prevent other foreign bodies from entering<br>5c) Replace the rotor, if necessary, contact an authorised service centre<br>5d) Replace the rotor and the pump casing<br>5e) The pump is unsuitable<br>5f) Try to close the feeder gate partially and/or reduce the difference in level of the pump and the liquid being aspirated<br>5g) Bring the pump closer to the suction tank so as to use a shorter pipe. If necessary use a pipe of a wider diameter |
| 6)<br>Noise and vibrations from the pump | 6a) Rotating part unbalanced<br>6b) Worn bearings<br>6c) Pump and pipes not firmly attached<br>6d) Flow too strong for the diameter of the delivery pipe<br>6e) Functioning in cavitation<br>6f) Unbalanced power supply | 6a) Check that no solid bodies are obstructing the rotor<br>6b) Replace the bearings<br>6c) Anchor the delivery and suction piping as needed<br>6d) Use bigger diameters or reduce the pump flow<br>6e) Reduce the flow by adjusting the feeder gate and/or using pipes with a bigger internal diameter. See point 5g) too<br>6f) Check that the mains voltage is right |
| 7)<br>Leakage from the mechanical seal | 7a) The mechanical seal has functioned when dry or has stuck<br>7b) Mechanical seal scored by presence of abrasive parts in the liquid pumped<br>7c) Mechanical seal unsuitable for the type of application<br>7d) Slight initial drip during filling or on first start-up | In cases 7a), 7b) and 7c), replace the seal, if necessary contact an authorised service centre<br>7a) 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 6e) too.<br>7b) Install a suction filter and use a seal suited to the characteristics of the liquid being pumped.<br>7c) Choose a seal with characteristics suitable for the specific application<br>7d) Wait for the seal to adjust to the rotation of the shaft. If the problem persists, see points 7a), 7b) or 7c) or contact an authorised service centre. |

Changes reserved.