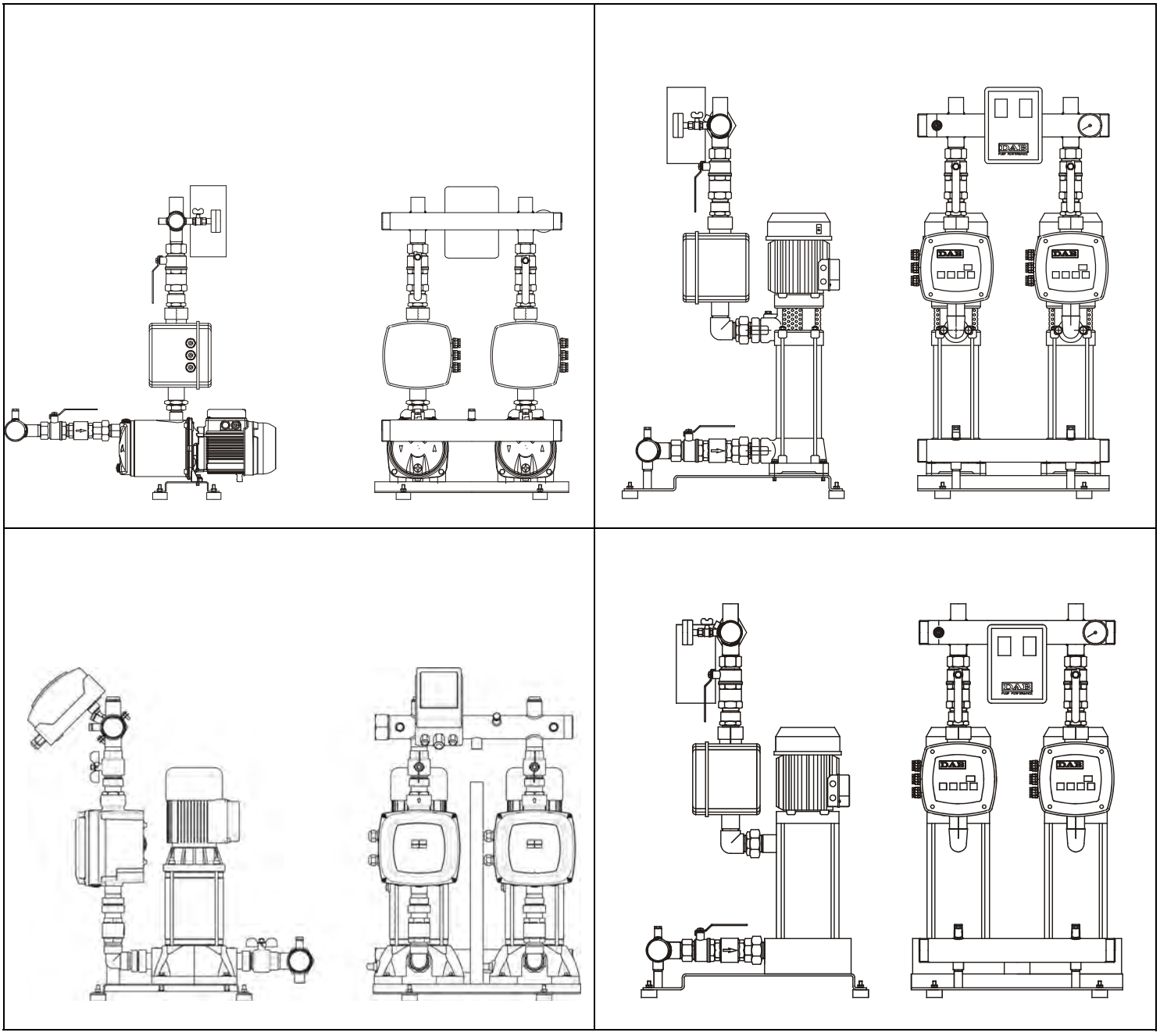
INSTRUCTIONS FOR INSTALLATION AND MAINTENANCE



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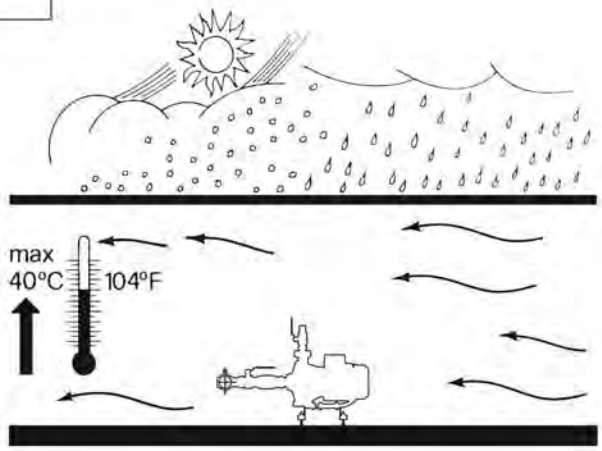

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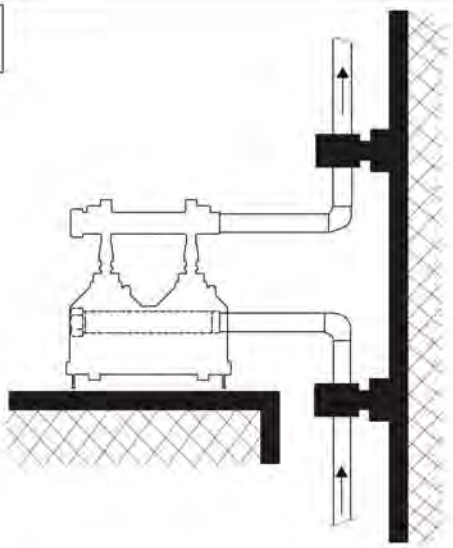

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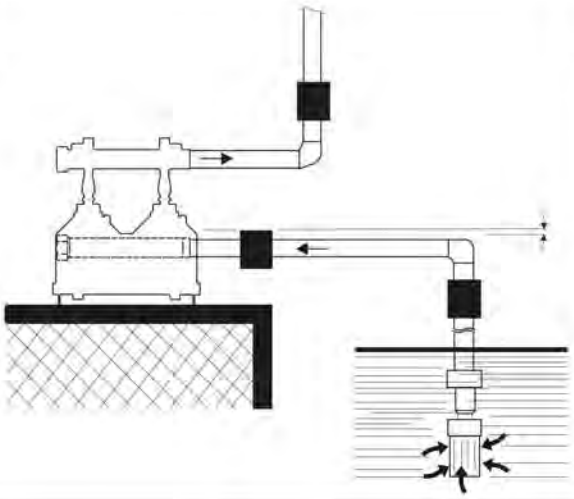

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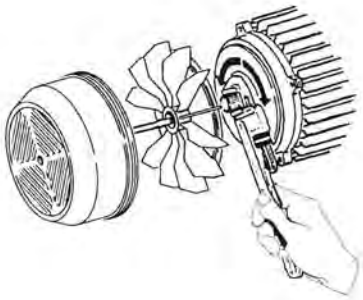

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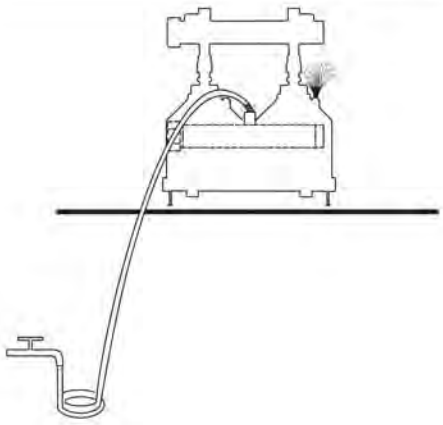

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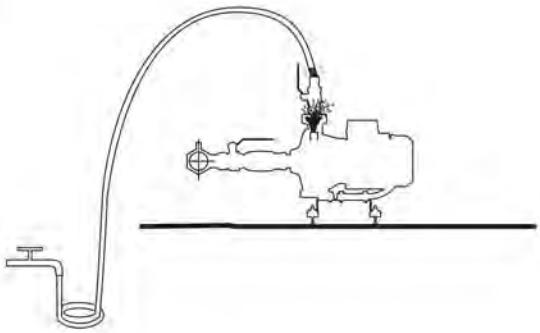

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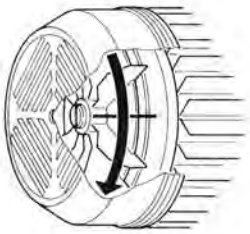

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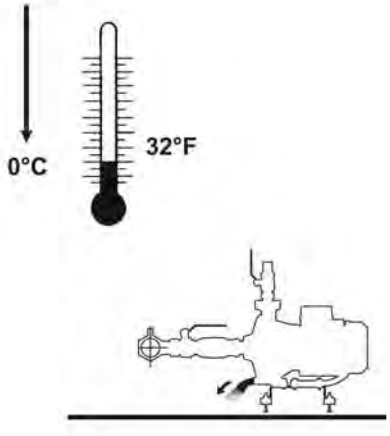

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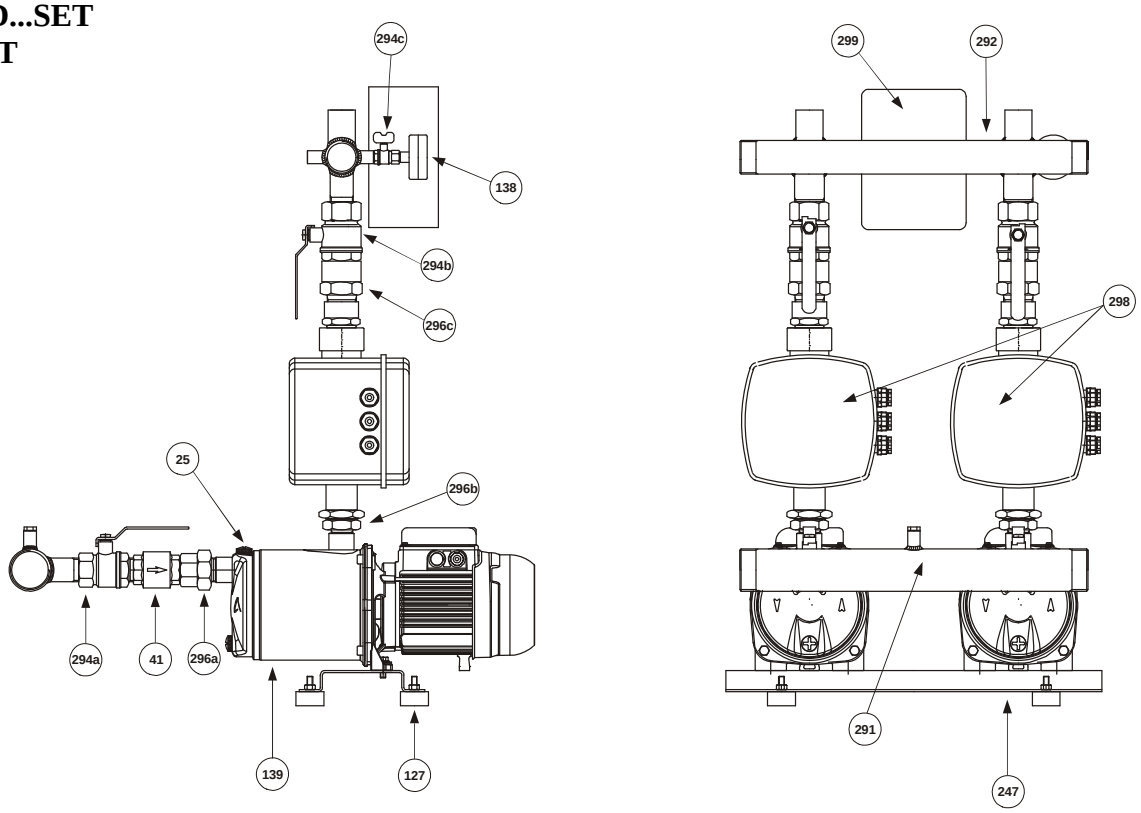

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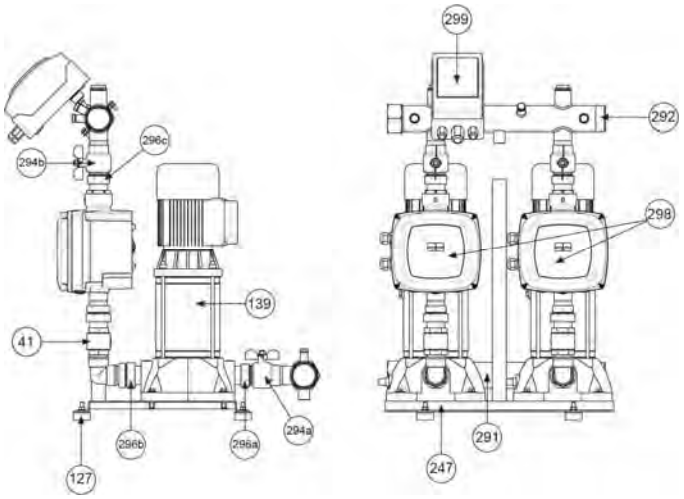

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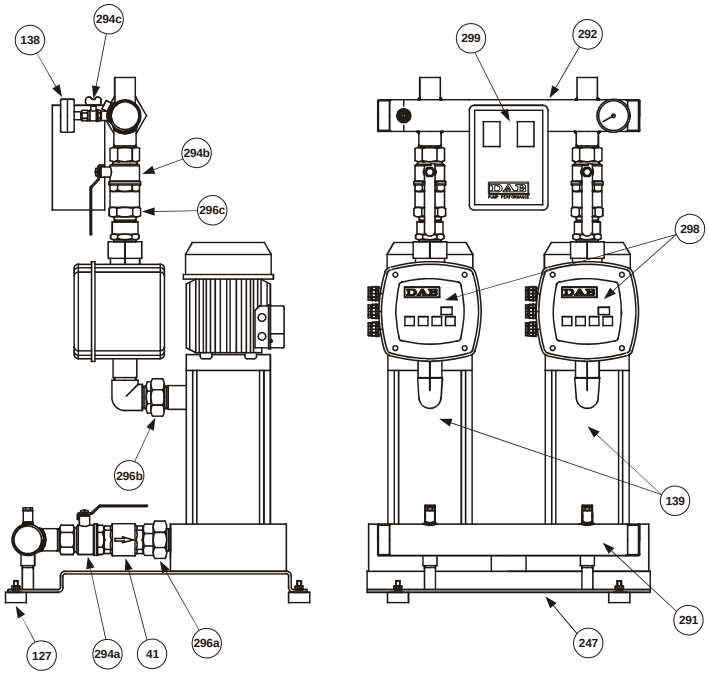
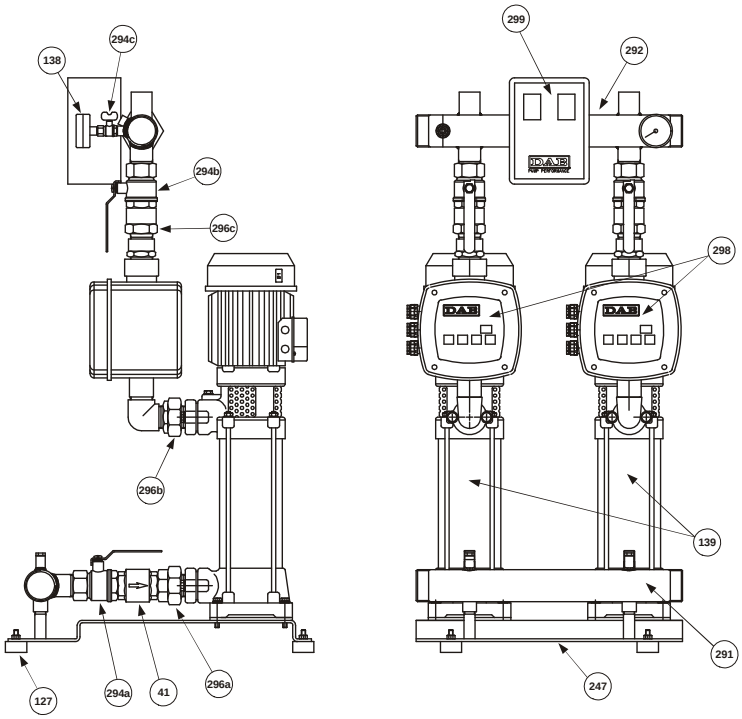
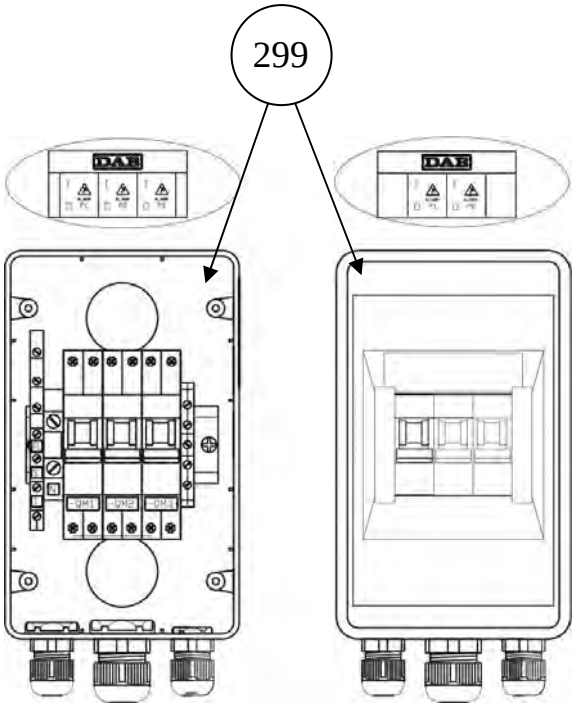


25 – Electropump filling cap
41 – Non return valve
127 – Vibration-damping foot
138 – Pressure gauge
139 – Electropump
247 – Base
291 – Suction manifold
292 – Delivery manifold
294a/294b/294c – Interception valve
296a/296b/296c – Coupling
298 – Active Driver
299 – Protection control unit

KV A.D ... SET





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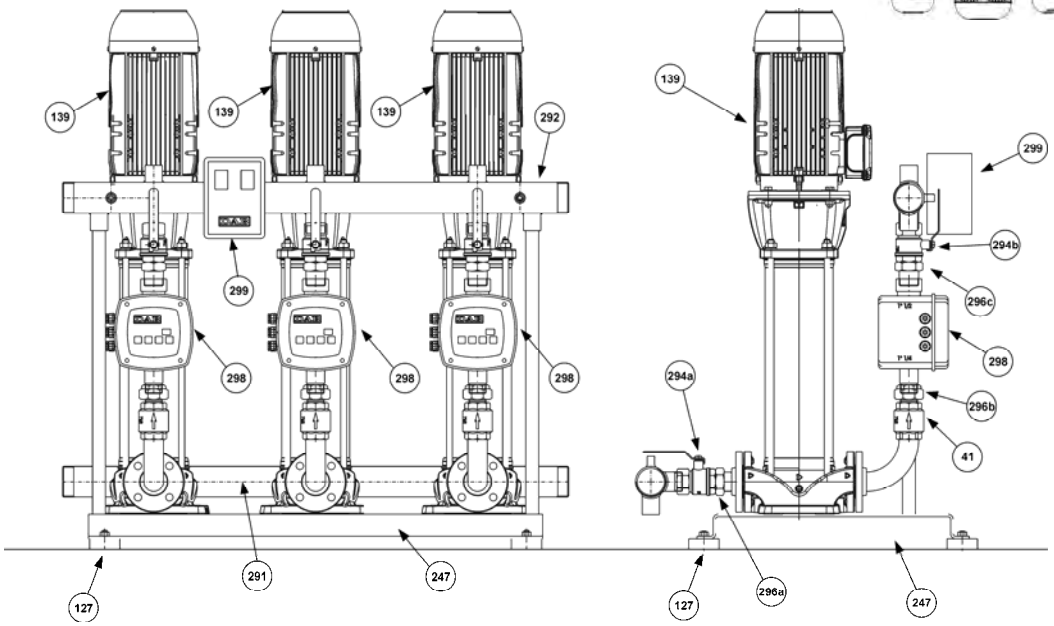

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1. GENERAL

Read this documentation carefully before installation. Installation and functioning must comply with the safety regulations in force in the country in which the product is installed. The entire operation must be carried out in a workmanlike manner and exclusively by skilled technical personnel (paragraph 2.1.) in possession of the qualifications requested by the regulations in force. Failure to comply with the safety regulations not only causes risk to personal safety and damage to the equipment, but invalidates every right to assistance under guarantee.
Keep this manual with care for further consultation even after the first installation.

2. WARNINGS

2.1. Skilled technical personnel

It is indispensable that installation be carried out by competent, skilled personnel in possession of the technical qualifications required by the specific legislation in force.
The term **skilled personnel** means persons whose training, experience and instruction, as well as their knowledge of the respective standards and requirements for accident prevention and working conditions, have been approved by the person in charge of plant safety, authorizing them to perform all the necessary activities, during which they are able to recognize and avoid all dangers. (Definition for technical personnel IEC 60634).
The appliance is not intendend for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsable for their safety. Children should be supervised to ensure that they do not play with the appliance.

2.2. Safety

Use is allowed only if the electric system is in possession of safety precautions in accordance with the regulations in force in the country where the product is installed (for Italy, CEI 64/2).

2.3. Responsibility

The Manufacturer does not vouch for correct operation of the set or for any damage that it may cause if it has been tampered with, modified and/or run outside the recommended work range or without the aid of our control and protection panels.

The Manufacturer declines all responsibility for possible errors in this instructions manual, if due to misprints or errors in copying. The company reserves the right to make any modifications to products that it may consider necessary or useful, without affecting the essential characteristics.

3. INSTALLATION

3.1.

The set must be fitted in a well ventilated place, protected from unfavourable weather conditions and with an environment temperature not exceeding 40°C (fig.1).
When handling the set, lift it by the base.
Do not lift the set by the delivery manifold: risk of damage to the Active Driver modules!
Position the set in such a way that any maintenance jobs can be carried out without difficulty.

3.2. Ensure that the system pipes are independently supported and do not weigh down on the set manifolds so as to avoid deformation or breaking of any of its components (fig.2).

It is also advisable to insert vibration-damping couplings on the system manifolds.

3.3. Make the intake section following all the precautions necessary to keep load losses to a minimum and to avoid the formation of air pockets, for example:

a) Position the set as close as possible to the power supply source.
b) Consider a suction pipe diameter never smaller than that of the manifold.
c) Lay the suction pipe horizontally or sloping slightly upwards towards the set. (fig.3).
d) Avoid using elbows or couplings that cause sudden changes in direction. If necessary, use bends with a wide radius.
e)

Avoid the "siphon" effect at intake: it risks unpriming the pumps!

4. ELECTRICAL CONNECTION

CAUTION! ALWAYS FOLLOW THE SAFETY REGULATIONS!

4.1. **The electrical installation must be carried out by a qualified, skilled electrician (see point 2.1.) in compliance with the Safety Regulations in force in the country where the product is installed.**

4.2. Before connecting the power cables to the terminals of the protection control unit, check that the supply voltage corresponds to the value indicated on the technical data table of the control unit (230 V single-phase, 400 V three-phase + Neutral, 400 V three-phase).
For sets with one pump it is sufficient to insert the plug of the Active Driver module.

For information on the Active Driver module, see the enclosed documentation.

4.3. Connect the power cable to the terminal board of the control unit, **giving priority to the earth lead.**

4.4. To supply the pump set use class A differential switches, with adjustable dispersion current 300mA, selective and protected against slow tripping (tripping delay 0.5 seconds).

5. STARTING

To start the set correctly, perform the procedure below following the sequence indicated:

5.1. **Perform the following operation without switching on the power to the panel.**

Check that the moving parts turn freely. To do this, remove the fan cover and, if necessary, the fan; then turn the shaft with a suitable tool (screw driver, offset adjustable spanner, etc.). (fig. 4)
If it is blocked, tap lightly with a hammer on the end of the tool, then try to turn the shaft again.

5.2. **Perform the following operation without switching on the power to the panel.**

Prime the set as follows:

a) Slowly pour in clean water through a sleeve of the suction manifold, keeping open the filling cap (ref.25) of one of the electropumps to allow the air inside to get out, until the manifold is filled (fig.5/I).
b) Slowly pour clean water through a coupling of the delivery manifold until water comes out of the loading cap, removed previously. (fig.5/II)
For sets with KVCX pumps with IN-LINE apertures, unscrew the pin of the loading cap as far as it can go, then slowly pour clean water through a coupling of the delivery manifold until water comes out of the loading cap, removed previously. (fig.5/II)
The sets with Pulsar Dry pumps are supplied with Active Driver, valves and delivery manifold dismantled to facilitate the operation of priming the pumps. Prime each pump, slowly pouring clean water through the delivery manifold, located at the top of the pump, until the pumps are filled. After this operation fix the Active Driver, complete with valves and delivery manifold, to the delivery sleeves of the pumps and secure the couplings.

5.3. In most cases, the set does not need diaphragm expansion vessels. If it should be necessary to have a store of pressurised water, it is possible to fit the vessel supplied with the set as follows:

1) preload the vessel at a pressure 0.3 bar lower than the starting pressure of the pumps;
2) fit the vessel onto the 1" couplings of the delivery manifold.

For sets with one pump, screw the T coupling, supplied with the set, into the delivery valve, then fit the tank onto the 1" connector of the T coupling. If fitting the expansion vessel, set the Od parameter of the Active Driver at "2".

For information on the Active Driver module, see the enclosed documentation.

5.4. SET OPERATING LOGIC

The operating logic of the pump set you have bought is to supply **Constant Pressure as the water flow rate required by the system varies**. This is made possible by the Active Driver module fitted on each pump.

It is advisable to set all the pumps at the same desired pressure value. At the first fall of pressure in the system, due to water being drawn, the first pump starts. When the required flow rate rises, the second and/or the third pump starts in cascade. The pumps stop in inverse order, after the decrease of the water flow rate.

At the second fall of pressure in the system, thanks to an alternating system in the starting of the pumps, the second pump starts. When the required flow rate rises, the first and/or third pump starts in cascade. The pumps stop in inverse order, after the decrease of the water flow rate.

For further information on the methods of alternation in the starting of the pumps, see the documentation enclosed with the Active Driver module.

5.5. CALIBRATION OF THE PRESSURE OF THE SET

a) Switch on the pump 1 by means of the switch on the protection control unit (for sets with one pump it is sufficient to insert the plug of the Active Driver module).
   The display shows "**GO**" during operation and "**Sb**" when stopping.
b) Press the **MODE / SET** keys simultaneously for a few seconds.
c) The letters "**SP**" appear on the display, check whether the pressure value already set corresponds to the desired value; otherwise change it, pressing the **+** or **–** keys (range 1.0 / 9.0 bar).
d) Press SET to return to normal operating status.
e) Partly turn on the supply and check on the display or pressure gauge that the pressure remains constant when the water supply increases or decreases (remaining within the limits of the pump's performance).
f) Repeat the procedure described in points a), b), c), d) e) for pump 2 and pump 3.

By pressing only the MODE key it is possible to view the following parameters:
Fr = pump operation frequency;
UP = instantaneous pressure (bar);
C1 = current absorbed by the pump (A).

For other operating parameters see the documentation enclosed with the Active Driver module.

5.6. STOPPING OF THE PUMPS DUE TO AN ALARM

The pumps are stopped automatically in the following conditions:

1. Lack of water at pump intake (dry running) for a time higher than 10 seconds (adjustable).
2. Low supply voltage.
3. Overheating of the internal components of the Active Driver.
4. Excess current in the pump.

The pumps start again automatically when the conditions described above cease.

For further information see the documentation enclosed with the Active Driver module.

5.7. If it should be necessary to stop the pumps when a certain pressure is exceeded, it is possible to install a pressure switch on the delivery manifold, calibrated in such a way that it indicates when the pressure has been exceeded.

The contact of the pressure switch must be connected to the terminal board J22 of the Active Driver (inlet I3).

For further information see the documentation enclosed with the Active Driver module.

6. INSTRUCTIONS FOR RUNNING THE SET

6.1. 

When the set remains inactive for long periods at a temperature below 0°C, it must be drained completely. (fig.7)

7 MAINTENANCE

7.1. To dismantle the Active Driver module:

a) switch off the power supply and wait a few minutes;
b) close the interception valves upstream and downstream from the module;
c) drain off the water by means of the drainage cap on the rear of the Active Driver;
d) slacken the unions upstream and downstream and extract the module.

After reassembling the module, fix the unions, open the interception valves again and prime the set as in points 5.2 a) and b).

The Active Driver must be calibrated as in the enclosed instruction manual.

7.2. **All our sets are subjected to strict testing of both the electrical and the hydraulic part.**
It is unusual for malfunctions to occur, unless due to external or completely accidental causes.

7.3. Below is a table with some suggestions on regulating the set in the event of irregularities in operation.

FAULTS	POSSIBLE CAUSES	REMEDIES
THE SET DOES NOT PRIME.	1. Suction pipe with insufficient diameter; excessive us of couplings which cause sudden variations in direction of the suction pipe; siphon effect. 2. Suction pipe clogged. 3. Air infiltrations in the suction pipe of the set. 4. Foot valve clogged or blocked. 5. Water recycling between the pumps in the set. 6. Interception valves on suction of each pump partly closed.	1. Check that the suction pipe is correctly made, as indicated in the paragraph on "Installation". 2. Clean it or change it. 3. Testing under pressure, check the perfect seal in the couplings, the joins and the pipes. 4. Clean it or change it. 5. Check correct operation of the non return valves on suction of each pipe. 6. Open them completely.
THE SET DOES NOT START.	1. Under-voltage or excess voltage. 2. Incorrect value of the rated current set in the electropump. 3. The circuit in the Active Driver is interrupted.	1. Check the voltage. 2. Set the correct current value*. 3. Look for the point of interruption.
THE SET DOES NOT STOP.	1. Important water leaks in the system.	1. Check the joins, couplings and pipes.
THE SET DOES NOT SUPPLY THE REQUIRED CHARACTERISTICS.	1. The set chosen is undersized for the characteristics of the system. 2. Excessive water consumption for the flow rate of the well (set above head) or of the first collection tank (set below head or above head). 3. One or more pumps clogged. 4. Pipes clogged. 5. Foot valve clogged or blocked (set above head). 6. Water recycling between the pumps in the set. 7. Interception valves at suction and delivery of each pump partly closed. 8. Air infiltrations in the suction pipe of the set.	1. Change it, consulting the Technical Catalogue. 2. Increase the flow rate that can be supplied by the well or by the first collection tank. 3. Dismantle them and clean the pump body and the impellers, ensuring that they are in good condition. 4. Clean them or change them. 5. Clean it or change it. 6. Check correct operation of the non return valves at suction of each pump. 7. Open them completely. 8. Testing under pressure, check the perfect seal in the couplings, the joins and the pipes.

FAULTS	POSSIBLE CAUSES	REMEDIES
ONE OR MORE PUMPS IN THE SET, WHEN STOPPED, TURN IN THE OPPOSITE DIRECTION.	1. The respective non return or foot valves do not close well or are blocked. 2. The respective suction pipe is not hermetically sealed.	1. Check its seal and correct operation. 2. Testing under pressure, check the seal.
THE MOTOR OF A PUMP IN THE SET IS VIBRATING.	1. Pump blocked. 2. Worn bearings. 3. Electric cables interrupted.	1. Release the pump. 2. Change the bearings. 3. Change the cables.
WATER HAMMER IN THE SYSTEM.	1. Water hammer during operation of the set. 2. Water hammer when turning off the flow.	1. Check the non return valve of the hot water distribution mains. 2. Install other aquaboxes or water hammer deadening devices at the end of the pipe where the phenomenon occurs.
A PUMP IN THE SET STOPS AND DOES NOT START AGAIN.	1. The protection of the Active Driver has tripped. 2. Electropump blocked. 3. Presence of faults in the Active Driver.	1. Check the absorption of the electropump. 2. Release the electropump. 3. Check the errors in the Active Driver*. If necessary, change the Active Driver.
GREAT PRESSURE OSCILLATIONS IN THE SYSTEM.	1. Suction pipe too long. 2. GP and GI parameters need regulating.	1. Check suction. 2. Set a new value for GP and GI. If necessary add a diaphragm expansion tank on the delivery manifold and set "**2**" in the **Od** parameter of the Active Driver*.

* To regulate / check the parameters, see the documentation enclosed with the Active Driver module.