



# AQUAMAXX INSTALLATION





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This installation guide is suitable for all DPT models of the AquaMaxx, and AquaMaxx Insulated.

- Product Overview
- Typical Installation
- Installation Guide
- Electrical Connections
- Alarms and Troubleshooting

## Models Covered

Model	Capacity	Pump(s)	AG or AB
AQM(I)*	300L	Single	Both
AQM(I)*	450L	Single	Both
AQM(I)*	550L	Single/Twin	Both
AQM(I)*	750L	Single/Twin	Both
AQM(I)*	800L	Single/Twin	Both
AQM(I)*	1200L	Single/Twin	Both

(\*) Denotes both standard and insulated versions

## Product Overview

The AquaMaxx range is a cold-water booster set with integral water storage chamber and electric motor driven centrifugal pump complete with an automatic inverter control system, consisting of flow switch, pressure switch, pressure vessel and electronic control.

The design of the tank incorporates an AB or AG air gap

## Applications

The AquaMaxx booster set range is designed to meet the total water demand of premises where the existing mains water supply is insufficient.

**Inlet pressures to the chamber and any ambient temperatures must not exceed any of the values provided in the technical documentation.**

## Storage of Equipment

If this product is to be stored prior to installation, ensure that it is stored in a dry, frost and vibration free location in its original packaging. Take care to avoid any exposure to prolonged heat, cold, or any direct sunlight.

## Warnings

This pump set must not be used for any other application without the written consent of Direct Pumps and Tanks Ltd.

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given sufficient supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.

This product should not be used for the supply of water to more than one dwelling (house, flat, or apartment).

The motor casing can become hot under normal operating conditions. Care must always be taken to ensure it cannot be touched during operation.

The electrical installation must be carried out in accordance with the current national electrical regulations.

The electrical installation must be undertaken by a qualified person.

RCDs/ELCBs are not recommended for use with variable speed drives/motors. If an RCD is required or mandatory use type B RCDs.

For single phase sets with inverter motors the earth leakage circuit breaker must trip out when an earth fault currents with DC content (pulsating DC) occur. RCD's suitable for use with variable speed drives/motors are not suitable for personnel protection.

Before starting work on any of the electrical supply connections ensure power supply is isolated.

DO NOT allow the supply cord to come into contact hot surfaces, including the motor shell, pump body or pipework. The cord should be safely routed and secured by cable clips.

This appliance must be earthed via the supply cord, which must be correctly connected to the earth point located in the terminal box.

The supply cord and all internal wiring within the terminal box are routed and secured to ensure compliance with the standard EN 60335-1.

If the supply cord is to be changed or is damaged, it must be replaced with a special cord assembly available from DPT or one of our approved and certified repairers.

Please read installation details carefully as they are intended to ensure this product provides long, trouble free service. Failure to install the system in accordance with the installation instructions will lead to invalidation of the warranty.

## Storage Capacity

The AquaMaxx usable water volume can be found in the technical specification table the length of time the AquaMaxx delivers water will depend on the system usage and refill rates.

## Water Temperature

This unit is designed to pump cold water only which should not exceed the following values:-

The maximum water temperature is 23 C.

The minimum water temperature is 4 C.

## Pipework

Do not drill holes or put fastenings into the tank of the AquaMaxx, this will cause leakage.

System leaks: Ensure the system to be boosted is able to hold pressure and is leak free before you install the AquaMaxx. Failure to do so will cause abnormal operation and damage to the unit.

Secure pipework: Ensure pipework to and from pump is independently supported & clipped to prevent forces being transferred to inlet and outlet branches of pump. Do not secure pipework to the AquaMaxx, this will cause damage and possible leakage.

Pipework design: Care should always be taken in the design of pipework runs to minimize the risk of air locks e.g. use drawn bends rather than 90° bends.

DO NOT introduce solder flux to flexible hose, tank, pump or any parts manufactured from plastic.

DO NOT allow contact with oil or cellulose based paints, paint thinners or strippers, acid descalents or aggressive cleaning agents.

DO NOT feed other header or gravity tanks with AquaMaxx. It is acceptable to feed toilet cisterns provided the toilet fill valve operates correctly and is leak free.

## Plumbing Regulation

The plumbing installation must comply with the current water and building regulations.

The plumbing installation must be installed by a qualified person.

## Pressure Vessels

The AquaMaxx pressure vessel is pre-charged at the factory during testing and must be correctly set during installation.

## Protection

The AquaMaxx must be located in a dry, frost-free area. The AquaMaxx must not be installed in a loft space.

## Ventilation

Ensure an adequate air flow to cool the AquaMaxx. Separate the AquaMaxx from other appliances that generate heat.

## Water Retention

Site the unit in a location where in the unlikely event of a water leak, any spillage is contained or routed to avoid electrics or areas sensitive to water damage.

## Inlet Pressure

The water supply inlet pressure must be lower than 7 bar; lower supply inlet pressures will reduce the tank fill rate and reduce the time the AquaMaxx will run at higher flow rates before running out of stored water.

## Static Outlet Pressure

The static outlet pressure must also be within the maximum requirement of 15 metres (vertically above the appliance).

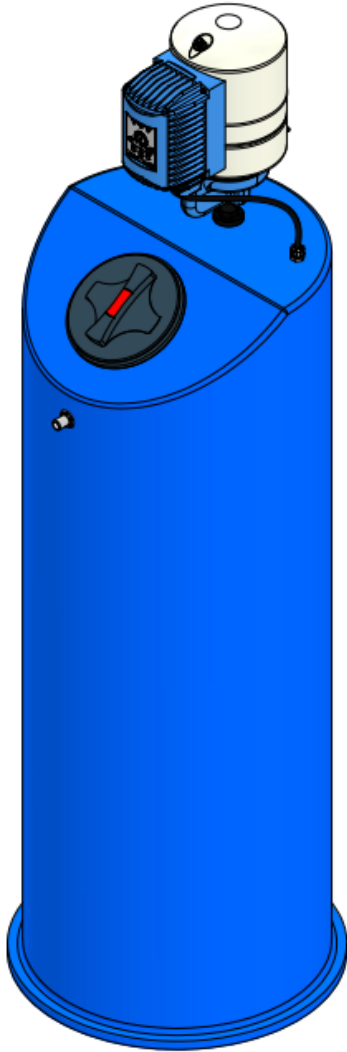
## Isolating Valves

Separate system isolating valves (non restrictive) must be fitted to allow easy pump service. Isolating valves must be mounted where specified to allow the system isolation and removal of the AquaMaxx if needed.

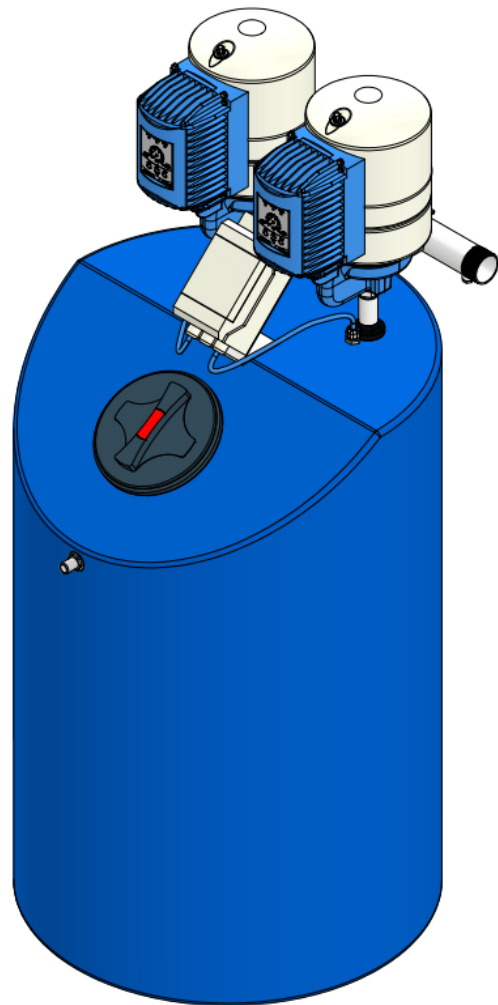
### Delivery

Upon delivery the Unit must be checked for any damage that has occurred during transit. If any damage is found it must be reported to DPT within 24 hours of receipt.

### AquaMaxx Single



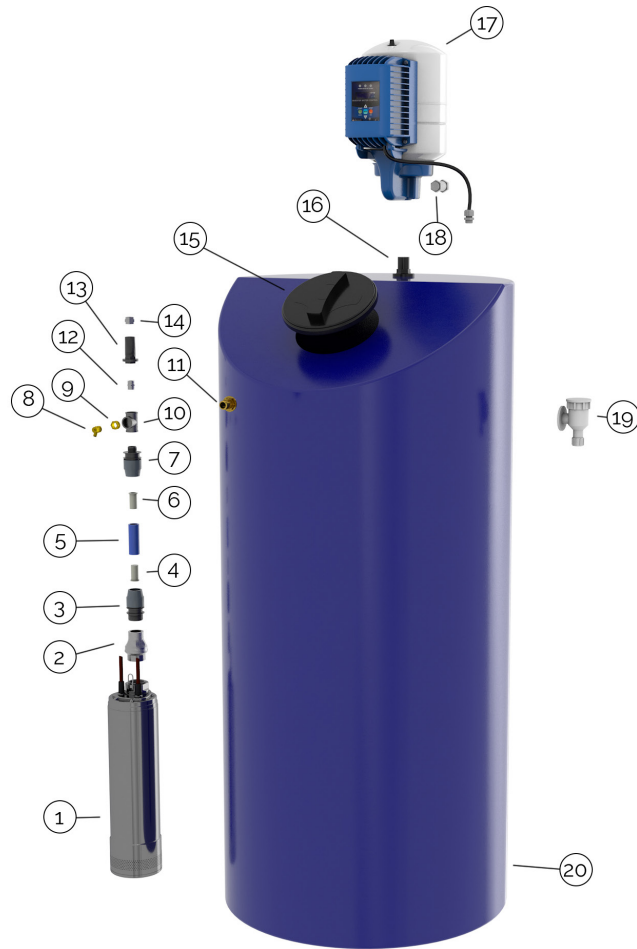
### AquaMaxx Twin



### Package Contents

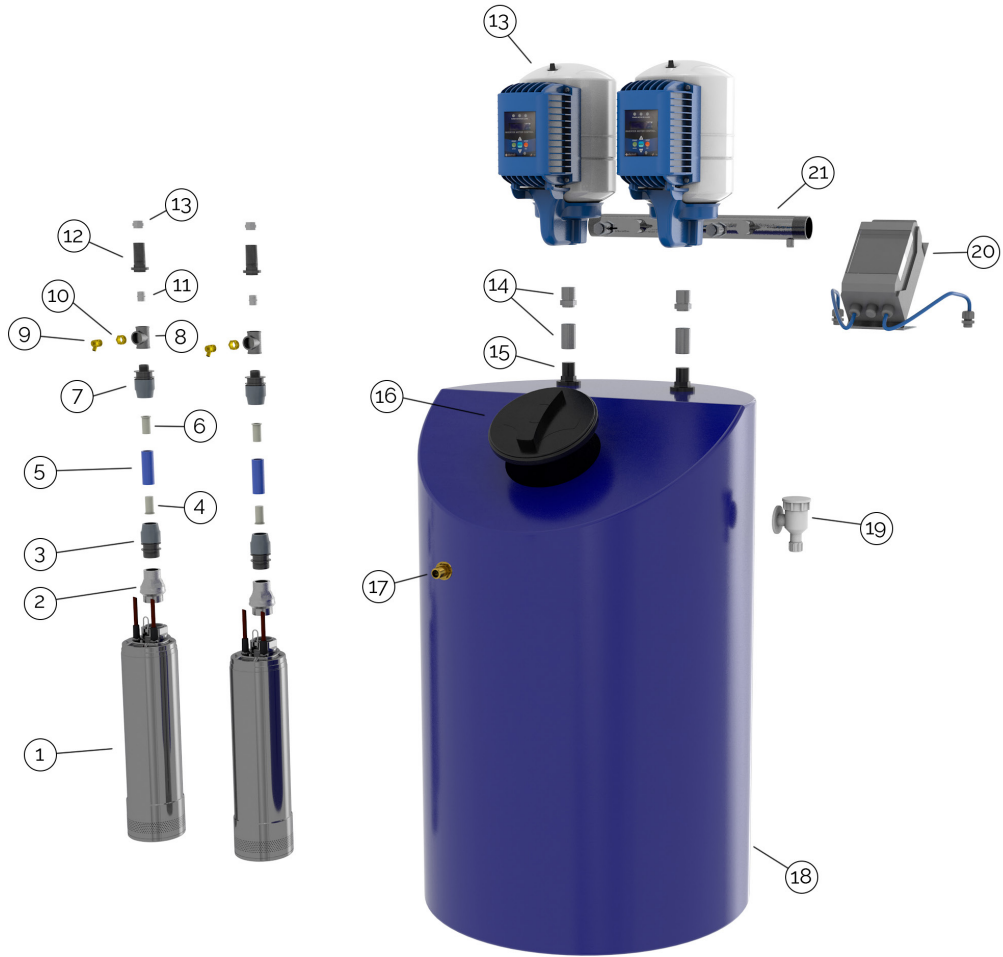
Each AquaMaxx booster set will come with all components as well as an included installation guide and product brochure.

Single System Breakdown



Item	Qty	Description	Item	Qty	Description
1*	1	Pump	11	1	Inlet Valve
2	1	Non-Return Valve	12	1	1" Nipple
3	1	MDPE 23mm Connector	13	1	1" Tank Connector
4	1	Pipe Insert	14	1	Stainless Steel Union
5	1	MDPE Pipe	15	1	Vented Tank Lid
6	1	Pipe Insert	16	1	Tank Connector
7	1	23mm -32mm Connector	17	1	FlyVar Inverter
8	1	Drain Down Valve	18	1	Outlet
9	1	Reducing Bush	19	1	Screened Overflow
10	1	Stainless T-Connector	20	1	Water Chamber

**Twin System Breakdown**



Item	Qty	Description	Item	Qty	Description
*1	2	Pumps	12	2	Tank Connector
2	2	Non-Return Valve	13	2	Stainless Steel Union
3	2	MDPE 32mm Connector	14	2	Connecting Valves
4	2	Pipe Insert	15	2	Tank Connector
5	2	MDPE Pipe	16	1	Vented Tank Lid
6	2	Pipe Insert	17	1	Inlet Valve
7	2	25mm - 32mm Connector	18	1	Water Chamber
8	2	Stainless T-Connector	19	1	Screened Overflow
9	2	Drain Down Valve	20	1	Consumer Box
10	2	Reducing Bush	21	2	FlyVar Inverter
11	2	1" Nipple			



## Installation Instructions

The AquaMaxx is to be permanently connected to the building mains water supply using rigid pipe or suitably sized and rated flexible hose to comply with all current building and plumbing regulations.

The water tank fill valve has a threaded fitting, when tightening ensure the fill valve within the tank is not rotated. If the valve is rotated it may not function correctly with the risk of flooding.

Ensure there is a demountable joint in the pipe to allow the removal of the AquaMaxx if needed.

## Water Outlet Pipework

All internal pipework is supplied assembled and is fully wet and pressure tested prior to leaving the facility.

Manifolds and inverters are disconnected from the main chamber for safe delivery and will need final connection.

## Connection to Overflow

An overflow bylaw kit is supplied loose for fitting in the correct position in line with your specific site requirements.

## Installation Instructions

The AquaMaxx is intended to be installed as a free-standing unit with its back to a wall.

Slide the AquaMaxx into position in front of the services leaving approximately 20 mm gap between the AquaMaxx and the wall behind.

Connect the services using isolation valves and demountable fittings (push-fit or compression). The positioning of these fittings should allow the AquaMaxx to be removed without cutting pipes or draining the system.

## Drinking Water Tap

It is recommended that one drinking water tap is connected into the un-pumped building mains water supply (typically a kitchen sink), so the water supply is maintained in the event of a failure of the pumped supply.

## Earthing

This appliance must be earthed via the supply cord, which must be correctly connected to the earth point located in the terminal box. (Twin Only)

## Pipework

Copper or metallic pipework must have correct supplementary earth bonding where continuity has been broken by flexible hoses or any plastic components.

## Additional Earthing

Some certain AquaMaxx installations may require additional earthing arrangements. Always refer to the relevant regulations concerning this subject to ensure compliance.

## Connections

The pump must be permanently connected to the fixed wiring of the mains supply using the factory fitted supply cord, via a double pole switched (with a minimum of 3 mm contact separation) fused spur off the ring main and NOT connected to the boiler or the immersion heater circuits.

The electrical connection must be made adjacent to (not behind) the AquaMaxx to allow any and all disconnection of the electrical supply should the pump module need to be removed for service or maintenance.

## Wiring of The AquaMaxx

**WARNING: This appliance must be earthed.**

The wires in the mains lead (supply cord) are coloured in accordance with the following code:

**Green and Yellow: Earth**

**Blue: Neutral**

**Brown: Live**

As the colours of the wires in the mains lead of this AquaMaxx appliance may not correspond with the coloured markings identifying the terminals in your connection unit proceed as follows (Twin only):

The wire which is coloured green and yellow must be connected to the terminal in the connection unit which is marked with the letter E or by the earth symbol: © or coloured green or green and yellow.

The wire which is blue must be connected to the terminal which is marked with the letter N or coloured black.

The wire which is brown must be connected to the terminal which is marked with the letter L or coloured red.

## Priming the System

Use the bleed down valves, (see image below) to remove the air from the system during first fill, this will allow the inverter to start the pump and run to reach target pressure and switch off once reached.

Any air in the system can be purged out of the line with the below valve, make sure this is tightened once installation has been completed.



## Check Pump Stop to Output Closed

When first installing open the output on the pump flow, press START, then wait for a few seconds for the system pressure set, then close the output flow (slowly) and make sure that the motor stops and shows on display "MINIMUM FLOW".

In case the motor doesn't stop you must select MOTOR DATA / POWER STOP and set a higher value than the default (102%) set by the inverter.

The absolute stop power value is presented at regular times on display at the top-central position (see fig. 17).

## Check Pump Dry Working

After installing, if possible, close the suction/intake line to simulate a dry run situation of the pump and check that after approximately 40 seconds the pump stops and the display shows the message WORKING".

If the pump does not stop, you must enter into the "motor data" and set a higher value of "dry working stop pressure".

Otherwise enter "advanced functions" - "pressure control" and set a higher value of the parameter "cosfi limit" (by default set to 0.50). The save data after modifying.



## Check Pump Dry Working

In case it is necessary to change damaged cables, pressure transducer you need to open the Inverter case.

The operations of a component for the inverter must be performed only by experienced personnel qualified by the manufacturer, using only original spare parts supplied by the manufacturer.

**Control Panel Commands**

Command	Description
FUN	The main functions menu
START/ENTER	Pump start and modify the values  This allows you to scroll the items on the menu or make positive or negative changes in pressure values. After any changes press ENTER to confirm changes.
STOP/ESC	Pump stop / Exit menu
LED	Description
Power ON	Green fixed: input voltage supply ON
Motor ON	Green fixed: Motor running; Green flashing: before stopping for minimum flow
Alarm	Red fixed: Requires manual restart.  Red flashing high frequency: Target pressure reached, turn off imminent.  Red flashing low frequency: Problem with pressure sensor, pump will turn off.

**Alarm List**

Alarm	Alarm Type	Description
1	Current Peak	Immediately stop probably caused by short circuit Automatic re-start; final stop after 10 consecutive events
2	Over Voltage	Normally caused by over voltage peak supply. Automatic re-start; final stop after 10 consecutive events
3	Inverter Temperature	Over temperature IGBT protection (900C) Automatic re-start; final stop after 10 consecutive events
4	Thermal Protection	Motor thermal protection related to nominal current set, for motor Insulations saving at high temperatures. Automatic re-start; final stop after 10 consecutive events
5	Dry Operating	Null input flow or air presence; Automatic re-start; final stop after 5 Consecutive events
6	Pressure Sensor Problem	Pressure sensor output problem. Automatic re-start; final stop after 10 consecutive events
7	Under Voltage	Input voltage under the minimum working limit. Automatic re-start; final stop after 10 consecutive events
8	Enable OFF	Open contact between EN e C (figure 14-15-16): stop the motor; the motor restart when the contact will close again
9	Over Current IGBT	Over current on the IGBT, overtaking a current limit value setting Automatic re-start; final stop after 10 consecutive events (for models with AW04 El. Board)

**Alarm List Continued**

Alarm	Alarm Type	Description
10	INPUT OUTPUT inverted	Connection mistake: Voltage supply connected on the output and Motor cable connected on the entrance: reverse in order to enable the motor.
11	Fault IGBT 0-1	IGBT 0-1 problem. Automatic re-start; final stop after 10 consecutive events.
12	Fault IGBT 2-3	IGBT 2-3 problem. Automatic re-start; final stop after 10 consecutive events.
13	Minimum Flow	The pump stops for minimum flow limit achievement. It's a normal working condition of the system (no demand of water on the delivery)
14	Max Pressure	The pump stops for maximum limit of pressure.  Caution!!! The pressure limit is the one set in the control parameters and refers to the Set Point pressure value. Automatic re-start; final stop after 20 consecutive events.*Alarm no 14 only for IMMP1.1/1.8/2.2 models, board.

**Troubleshooting Guide**

Number	Possible Problem	Possible Solution
1	Pressing start button the motor don't start or start and stop after few seconds and the inverter shows Over Current alarm or Current Peak alarm.	Check if the input/output of the inverter are correctly connected between line and motor, without inversion (Warning: input/output inversion can damage the electronic board of the inverter). Check the correct connection of the pump (star/delta):  possible mistake. Check if all the three wires to the motor are connected good and the three current are balanced. Check if the motor power size is not so high on respect to the inverter size. Check if the inverter is not on Master-Slave condition (Advanced Functions -> Group Functioning) set to slave, without the Master inverter connected and switched on
2	Pressing start button the motor don't start or start and stop immediately and the inverter shows Under Voltage alarm	Check that all the input voltage supply wires are connected good on the entrance of the inverter: if the inverter input is three-phases but on the connection there are only two, the inverter switch on and can start the motor, but haven't enough power to supply it.  Check that before the inverter the supply line wires size are good to have a limited voltage drop, then a sufficient voltage
3	During working at the maximum power the Inverter reduce continuously the output power to the motor then stop the motor and the inverter show Over Temperature IGBT alarm / inverter Temperature	Temperature of the electronic board of the inverter is too high and the inverter must remain stop for few minutes to reduce the internal temperature before the automatic restart.  For wall mounting type be sure that the inverter stand on a wall, in vertical position, protected from directly sunlight, and the air flow is totally free; for motor mounting type check that the air flow from the motor fan is good to limit the aluminum temperature of the inverter case under 600C; the inverter cannot work continuously at the maximum power with a ambient temperature higher than 400C and with high temperature can reduce automatically the output

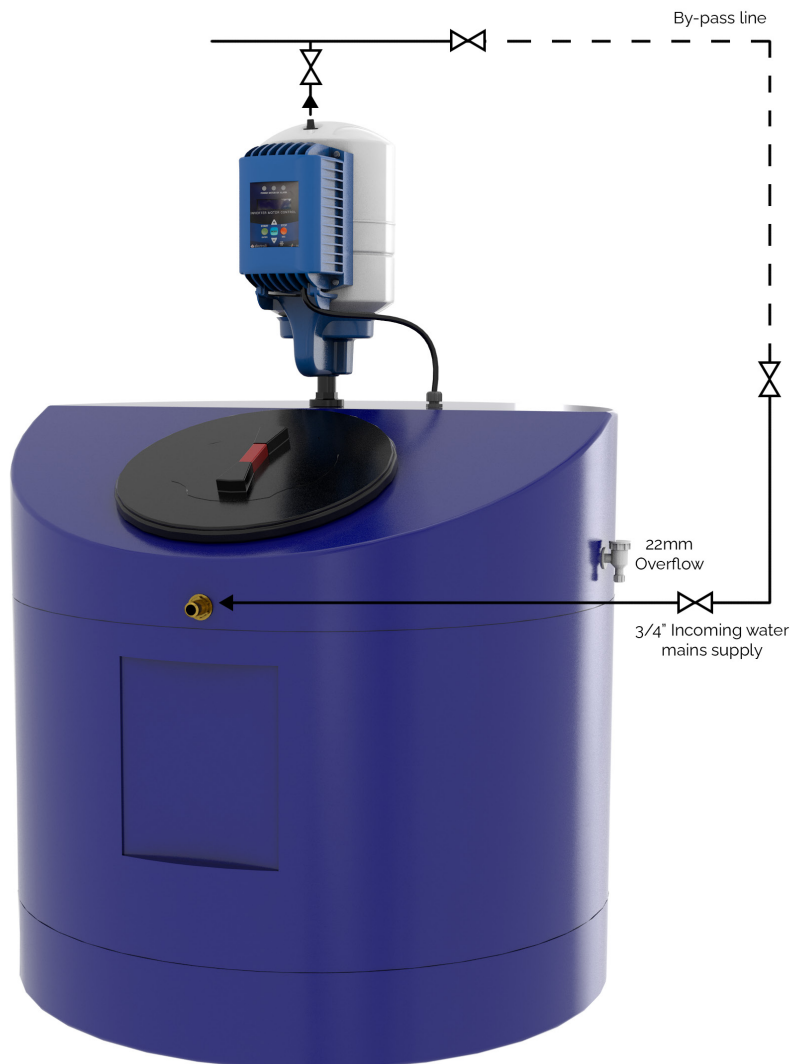
Number	Possible Problem	Possible Solution
4	Pressure Transducer does'nt measure the correct pressure value (error > 1 Bar)	Check if the pressure transducer is connected on the delivery of the pump on a correct position, not so close to the impellers and before the valve to close the flow.
5	Pressure Transducer measures a pressure too high when the motor is running then the Inverter reduce the motor velocity at the minimum value (low frequency)	<p>Check that the pressure cable is separated from the motor cable, that is a source of noise; specially when the cable of the pressure transducer is too long (long distance between inverter and motor) it's very important to use a shielded type two wire cable, as far as possible to the motor supply cable.</p> <p>Connect the shield to ground only on one terminal, if possible connect it directly on a metal screw to ground near the motor.</p>
6	<p>The Inverter cannot work because it remains in Pressure.</p> <p>Transducer Problem alarm condition</p>	<p>Check if the wires of the pressure transducer are correctly connected brown on +, white on S contact on the board.</p> <p>Check wiring connection on the cable of the pressure transducer.</p> <p>Warning: In case you need to cut the pressure transducer cable to add a longer cable be sure to switch off the inverter at least 1 minute before to cut this cable, otherwise you can cause a short circuit on the transducer input of the electronic board (damage) if the internal capacitors are not totally discharged.</p>
7	The distance between Pressure transducer and Pump is high (long pipe) and the pressure continuously go up and down	You must reduce the velocity of the feedback control reducing the Proportional factor and the Integral factor (Advanced Functions -> P.I.D. Factors). Try to set these values to half and test the system, then, if not enough, reduce more and test again until the pressure control remain stable.
8	The Inverter stop the motor for Minimum Flow with a high flow condition and then re-start and stop again, continuously	<p>A small water membrane Tank charged with 1.5-2 Bar air pressure is required for a correct working; check it.</p> <p>The condition may also caused by a not correct pump curve saving during the automatic check: possibly the delivery was not totally closed and the Inverter checked a higher curve of the pump; repeat the automatic check (Pump data -&gt; check ON, then exit to the menu and press START) closing totally the outlet and try again the functioning.</p> <p>Verify if there is a no-return inlet valve on the pump and if it's working good without loses. It's possible to reduce the flow before stopping reducing the parameter F1 It's possible to reduce the flow before stopping reducing the parameter Minimum Flow Power stop % on Motor Data.</p>

**Troubleshooting Continued**

Number	Possible Problem	Possible Solution
9	The inverter doesn't switch off the pump when the valve on delivery is totally closed	Probably check was done with pump not perfectly filled up; remake the check procedure after a complete filling of the pump and try again if pump switch off correctly in minimum flow condition. If the problem remain, try to grow up the function: Advanced Functions -> Motor data -> Minimum flow power stop, upgrading 2% every time and testing pump, till find the correct working.
10	The hydraulic system have a big tank (>40 l) and, after check did correctly with closed delivery, the pump stop for minimum flow with a high flow, and then re-start and stop again,	Probably during the automatic check there was a flow of water to full up the big tank, for that the pump curve saved by the inverter is not the correct curve (with null flow and maximum pressure).  Maintain full of water the tank (pressure near maximum value); repeat the automatic check (Pump data -> check ON, then exit to the menu and press START). When the check finish try to work again testing the minimum flow stop condition of the motor that must be with a small flow
11	The Inverter stop the motor for Dry Working condition	Sometimes the problem is caused by the same Automatic Check error that previous point (see possible solution like above)
12	The pump doesn't switch off for dry working when the inlet pipe and the pumps are empty	In normal working condition, with pump and pipes filled up, remake a check procedure (Pump data -> Check=ON) and try again. If the problem remain grow up the parameter: Motor Data -> Dry Working power stop, from 80% default value doing 10% steps, testing every time the pump. If the problem cannot disappear also with Dry working power stop more than 100%, verify that pump haven't any defect (fault seal, impellers, etc) that can cause a big power absorbing also without water, in dry condition.
13	A group of two or more inverters cannot communicate between each other in Master-Slave mode	For the BC inverters type read on left. For the RS type check the correct connection RS485 by a two wires cable (A to A and B to B).  Verify the communication set to Master-Slave on Advanced Functions -> Group Functioning (code 0 for the inverter Master, code 1, 2, etc for all the others Inverters Slave)
14	The Inverter conduct on the input voltage supply line electromagnetic noises that disturb other electronic devices	Check Ground cable connections (Ground system must be radial type, with resistance less than 10 Ohm). All the Inverters have an internal Input EMC filtering stadium, but is available also an additional EMC Input filter (various types, contact the service) for bigger noise suppression with sensitive devices connected on the line.
15	With a long cable between Inverter and Motor sometimes the inverter stop the motor in Pick Current alarm	The motor can have high pick voltage value caused by the high frequency of the PWM combined with the high capacitance to ground of the long cable: we suggest to use an additional inverter output filter for cable longer than 40 meters connecting it directly on the Inverter output. Available various types of output filters, contact the service to receive informations

Number	Possible Problem	Possible Solution
16	The Differential Circuit Breaker on the line sometimes switch off the inverter	Check the Ground system resistance (must be less than 10 Ohm). Use only differential circuit breaker type A (specific for Inverters).
17	Magneto-Thermal Circuit Breaker on the line switch off the inverter when the pump run at the maximum power	All the inverters may have a high pick value of the sinusoidal caused by the harmonics (5th , 7th , 11th, etc.) and depending by the resistance of the line, but this condition don't increase the energy absorbing value depending by the area under this current curve. Only you need to use a Magneto-Thermal Circuit Breaker with a higher Current value than the value that you can use for the direct pump controlled. Usually it's enough a switch one step higher than the switch useful for the simple motor (see table of the Magneto-Thermal protection suggested on the handbook).

**Typical Installation**



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