



**MANAGEMENT HANDBOOK  
SUBMERSIBLE PUMPS AND MOTORS**

**X-POWER 3" - 4" - 6" - 8" - 10" SUBMERSIBLE ELECTRIC PUMPS  
X-POWER AMEGA 4" SUBMERSIBLE PUMPS  
3" - 4" - 6" - 8" - 10" SUBMERSIBLE MOTORS  
4" - 5" MONOBLOCK SUBMERSIBLE ELECTRIC PUMPS**

**Details:**

- MAX3 - MAX4 - AMEGA4 - GM4 - MAX6 X - MAX8 X - MAX10 X submersible pumps
- 6C - 8C - 10C submersible motors
- MX - MXW – MXA submersible motors
- VTM monoblock pumps - VORTEX KIT - MAX4 PRESSION
- Max5 monoblock pumps - EUROSUB

[www.xpowerwaterpumps.com](http://www.xpowerwaterpumps.com)



**MA.. X  
+ MAX..C**



**MAX..X**



**6C-8C-10C**



**MX  
MXA  
MXW**



**GM4  
MAX4  
MAX 4 KIT**



**MAX3  
SLM15 KIT  
MAX4 SB  
MAX4 SB KIT  
AMEGA 4 SB  
AMEGA 4 SB KIT**



**VTM  
MAX4 PRESSION**



**EUROSUB  
EUROSUB KIT  
MAX5  
MAX5 KIT**

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## Introduction

These instructions refer to submersible pumps and submersible motors:

Hydraulics (submersible pumps)  
MAX3, SLM15, MAX4, GM4, AMEGA4, MAX6 X, MAX8 X,

Submersible motors  
MX, MXA, MXW, 6C, 8C, 10C

Submersible electric pumps  
MAX3 KIT, SLM15 VORTEX KIT, MAX4 KIT, MAX4 SB KIT, GM4 KIT  
AMEGA4 KIT, EUROSUB, MAX 5

## 1. Symbols used in this manual



### WARNING!

Failure to observe precautions could result in injury to people or damage to property.

To prevent the risk of severe or fatal electrical shock, special precautions must be taken.

### Warning

**Read this manual carefully before installation. For correct operation, always comply with local regulations. Rely only on qualified personnel.**

## 2. Goods storage

### Storing

**Do not unpack the pump before use.**

**Handle the pump carefully.**



If the hydraulics and the motors are supplied in separate units (ex: long pumps), please connect the pumps as described in the "**Pump and motor coupling**" section.

***The identification plate supplied with the pump must be fixed in the installation area.  
Handle the pump carefully.***

### Storage temperature

**Pump: from -20 ° C to +60 ° C.**

**Electric pump: from -20 ° C to +60 ° C.**

**Motor: from -20 ° C to +70 ° C.**

The motors must be stored in dry and ventilated places.

***In case of storage of the MX, MXA, MXW, C series motors it is recommended to periodically check the device.***

***If the motor has been in storage for more than 12 months before its installation, the rotating parts of the motor must be dismantled and its functionality checked before use.***

The pump must not be exposed to direct sunlight. If the pump has been unpacked, it must be placed in an horizontal position and provided with a suitable support, or it must be positioned vertically to avoid misalignment.

Make sure the pump can not roll or fall.

During storage, the pump can be supported as shown in fig. 1.

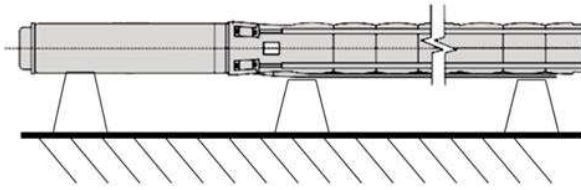


Fig.1

**Pump position during storage.**

**Antifreeze protection**

If the product is to be stored after a period of use, it must be placed in a place where no ice can form. Alternatively, provide a motor liquid antifreeze.

[www.xpowerwaterpumps.com](http://www.xpowerwaterpumps.com)

### 3.Key features of the products

#### motors, pumps and submersible pumps for wells

##### **3 " MAX3 KIT - SLM15 KIT (named Vortex) Submersible electric pump**

**HIGH HYDRAULIC EFFICIENCY.**

**LOW RESISTANCE TO THE SAND (to obtain a long life, the sand must not exceed 80 gr/cu.m).**

Efficient and lasting.

Nominal diameter: 75mm for 3" wells

Heads: made of brass; Covering: made of AISI 304 stainless steel

##### **4" MAX4 KIT - GM4 KIT (named Vortex) Submersible electric pump**

**MEDIUM HYDRAULIC EFFICIENCY**

**HIGH RESISTANCE TO THE SAND (to obtain a high durability, the sand must not exceed 450 gr/cu.m)**

Submersible anti-sand hydraulics

Nominal diameter: 100mm for 4 "wells

Heads and cover in AISI 304 stainless steel

##### **4" AMEGA 4 Hydraulics - 4" MAX4 SB KIT (named Amega) submersible electric pump**

**HIGH HYDRAULIC EFFICIENCY**

**MEDIUM RESISTANCE TO THE SAND (to obtain a long life, the sand must not exceed 150 gr/cu.m)**

High hydraulic efficiency,

Nominal diameter: 100mm for 4 "wells

Brass heads; pump cover in AISI 201 stainless steel; motor cover in AISI 304 stainless steel

##### **4" MAX4 - GM4 Pump - Hydraulics (named Vortex)**

**MEDIUM HYDRAULIC EFFICIENCY**

**HIGH RESISTANCE TO THE SAND (to obtain a high durability, the sand must not exceed 450 gr /cu.m)**

Submersible anti-sand hydraulics

Nominal diameter: 100mm for 4 "wells

Heads and cover in AISI 304 stainless steel

##### **6" MAX 6X Pump (hydraulics)**

**HIGH HYDRAULIC EFFICIENCY**

**MEDIUM RESISTANCE TO THE SAND (to obtain a long life, the sand must not exceed 80 gr/cu.m)**

Submersible pumps with high hydraulic efficiency,

Nominal diameter: 140mm for 6 "wells

Integrally made of AISI 304 stainless steel

##### **8" MAX 8X Pump (hydraulics)**

**HIGH HYDRAULIC EFFICIENCY**

**MEDIUM RESISTANCE TO THE SAND (to obtain a long life, the sand must not exceed 150 gr/cu.m)**

Submersible pumps with high hydraulic efficiency

Nominal diameter: 200 mm for 4 "wells

Integrally made of AISI 304 stainless steel

##### **10" MAX 10X Pump (hydraulics)**

**HIGH HYDRAULIC EFFICIENCY**

**MEDIUM RESISTANCE TO THE SAND (to obtain a long life, the sand must not exceed 150 gr/cu.m)**

Submersible pumps with high hydraulic efficiency

Nominal diameter: 240 mm for 4 "wells

Integrally made of AISI 304 stainless steel

##### **4" MX Submersible Motor**

**HIGH HYDRAULIC EFFICIENCY**

**MEDIUM RESISTANCE TO THE SAND (to obtain a long life, the sand must not exceed 150 gr/cu.m)**

4 "submersible motors with oil-immersed motor (3-pole + earth output) Cover: AISI 201 stainless steel

##### **4" MXW watercooled submersible motor**

**HIGH HYDRAULIC EFFICIENCY**

**ALTA RESISTENZA ALLA SABBIA (per ottenere una elevate durata, la sabbia non deve superare 450 gr/cu.m)**

4" Water-cooled submersible motor water-immersed motor (3-pole + earth output)

Cover: AISI 304 stainless steel

##### **4" MXA submersible motor**

**HIGH HYDRAULIC EFFICIENCY**

**MEDIUM RESISTANCE TO THE SAND (to obtain a long life, the sand must not exceed 150 gr/cu.m)**

4" water-cooled submersible motor (2-pole + ground)

Cover: AISI 304 stainless steel

##### **6" 6C - 8" 8C - 10" 10C submersible motors**

**HIGH HYDRAULIC EFFICIENCY**

**MEDIUM RESISTANCE TO THE SAND (to obtain a long life, the sand must not exceed 150 gr/cu.m)**

4" water-cooled submersible motor (2-pole + ground)

Cover: AISI 304 stainless steel

#### 4. Applications

X-Power submersible pumps are very versatile items. They are suitable for water supply, irrigation and technological use.

The X-Power pumps must be installed in such a way that a minimum water head (1 to 2 meters) above the suction pipe is secured.

These pumps can be installed horizontally or vertically.

#### 5. Pumped liquids

These device pump clean, non-explosive liquids without solid particles or fibers. The max sand content must not exceed the quantities reported in this manual.

A higher concentration of sand decreases the life of the pump and increases the risk of blockage.

#### Note:

**If the pump will be used for liquids with a density higher than that of water, it is necessary to use motors with proportionally higher powers.**

#### 6. Sound pressure level (pump and motor)

The sound pressure level is measured in accordance with the EEC Machinery Directive 2006/42 / EC.

#### Submersible pumps

Sound pressure level of the MAX 3 , SLM 15, AMEGA 4, MAX 4, GM 4, MAX 6X, MAX 8X, MAX 10X Pumps

Values are applicable for submersible pumps in water, without external control valve.

#### Sound pressure level of the Max3, SLM15, Amega4, MAX4, GM4 PUMPS

The sound pressure level of the X-Power MAX3, SLM15, AMEGA4, MAX4, GM4 submersible pumps is less than 65 dB (A).

Pump model	$\bar{L}_{pA}$ [dB(A)]
MAX3 - SLM15	< 65
AMEGA4 - MAX4 - GM4	< 65

To consult the noise level of the VTM VORTEX - MAX4 PRESSION - EUROSUB - MAX5 electric pumps, please consult this manual on page 19-

#### Sound pressure level of 6"- 8" - 10 "submersible pumps

The sound pressure level of the X-Power MAX6 X - MAX 8X - MAX 10X submersible pumps is less than 70 dB (A).

Pump model	$\bar{L}_{pA}$ [dB(A)]
MAX6 X	< 70
MAX8 X	< 70
MAX 10X	< 70

#### 7. Preparing for installation

#### Warning:

**Before starting the installation, it is necessary to switch off the power supply. Make sure the power supply can not be accidentally reset.**

#### 8. Check the motor fluid (Motors 6C - 8C - 10C)

The motors are factory filled with a special non-toxic liquid that resists freezing up to -20 °C. Check the motor fluid level and top up it if necessary with clean water. 4" motors do not require liquid control.

#### X-Power MX - MXW – MXA motors

The MX series motors are refrigerated in oil; they do not have top-up screws and do not require special checks.

The MXW and MXA motors are resin-bonded, they do not have topping up screws and do not require special checks.

#### Submersible motors

#### Sound pressure level of the MX – MXW – MXA motors

The sound pressure level of the X-Power 4" submersible motors complies with the Euro directive 2002/49 / CE 06/25/02.

Values are applicable for motors in standard production.

The sound pressure level of the X-Power MX - MXW - MXA motors is less than 60 dB (A).

Motor model	$\bar{L}_{pA}$ [dB(A)]
MX4	< 60
MXW4	< 60
MXA4	< 60

#### Sound pressure level of 6C - 8C - 10C motors

The sound pressure level of the X-Power 6" - 8" - 10" submersible motors complies with the Euro directive 2002/49/CE 06/25/02.

Values are applicable for motors in standard production.

The sound pressure level of the X-Power 6C - 8C - 10C submersible motors is less than 65 dB (A).

Motor model	$\bar{L}_{pA}$ [dB(A)]
6C	< 65
8C	< 65
10C	< 65

## 9. Positioning requirements

### X-Power 6C – 8C – 10C motors (fig.01)

Check and top up the liquid as described below (ref.fig.1):

The filling hole for the motor liquid is located at the top of the device.

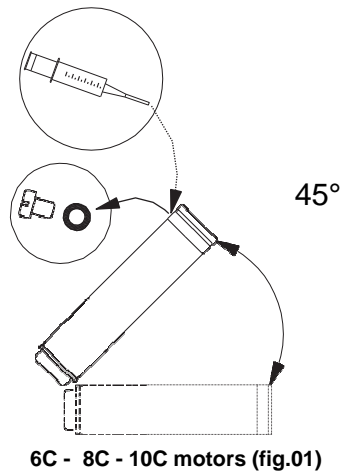
1. Position the submersible pump with the 45° axis as shown in the following figure. The filler screw must be positioned at the top of the motor.
2. Remove the screw from the filling hole.
3. Inject the liquid into the motor with the filling syringe until the liquid comes out of the filling hole.
4. Replace the screw in the filling hole and close the valve well before changing the position of the pump.

### Tightening torque

- 3,2 Nm.

The submersible pump is ready for installation

#### Check the water level for the 6C - 8C - 10C motors



#### Verify that there are no leaks of liquid



MX - MXA - MXW motors (fig.02)

### X-Power MX – MXA - MXW Motors (fig.02)

MX - MXA - MXW motors do not require liquid level controls (ref.fig.2). However, it is necessary to check if the pump has liquid leaks. In case of refrigerant liquid leaks, please contact the customer care immediately.

## 10. Pipe connection



If there is a possibility of making noise in the building through the pipes, **it is advisable to use plastic pipes.**

When using plastic pipes, the pump must be secured with a safety rope not fully tensioned.



### Warning

**Make sure that the plastic tubes are suitable for the liquid temperature and the pump pressure.**

When using plastic pipes, a compression fitting or UPVC pipe adapter must be used between the pump and the first pipe section.



## 11. Electrical connection (valid for all 3-wire + earth motors and electric pumps)

### Warning

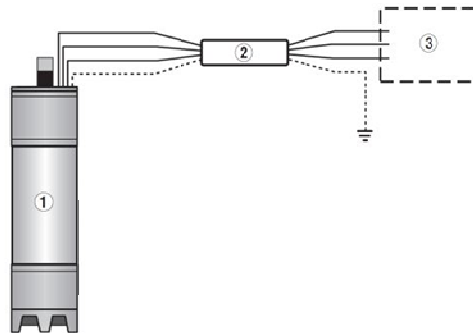


*During electrical installation, make sure that the power supply can not be accidentally switched on.*

### Warning



*Perform a good-Water Tightness ligature. The motor must be connected to the power cable using the connection kit.*



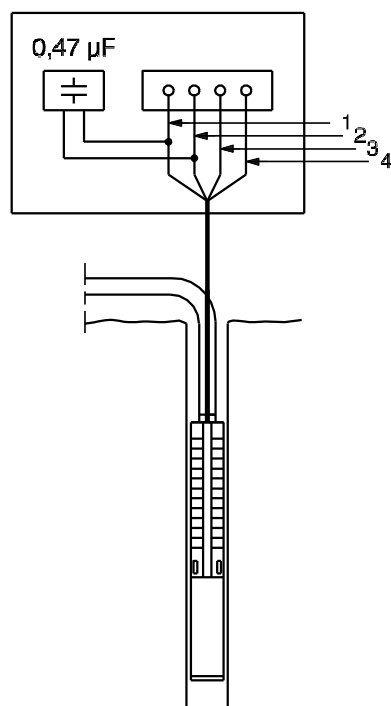
- 1) SUBMERSIBLE PUMPS
- 2) CONNECTION KIT
- 3) ELECTRIC CONTROL PANEL OR ELECTRICAL EQUIPMENT

*Warning valid for all electric pumps and submersible motors.*



*Ground the pump.*

*The pump must be connected to an external main switch with a minimum distance between contacts of 3 mm in all poles.*





**WARNING**

**The electrical installation must be carried out by qualified personnel, in compliance with current regulations.**

The supply voltage and the maximum rated current are expressed on the plate that must be affixed near the place of installation of the product. The required voltage quality for C-series motors is -10% / + 6% of rated voltage during continuous operation (including change in supply voltage and cable losses).

N.B. Verify that there is symmetry of voltage in the power supply lines. E.g. the same voltage difference between the individual phases.

## 12. Operation with frequency converter.

### X-Power MX - MXW – MXA single-phase motors.

The X-Power MX, MXW, MXA, single-phase motors can be powered by a frequency converter with 1x230 single-phase power supply and 1x230 single-phase output.

**When operating with a frequency converter, do not run the motor at frequencies above 60 Hz. During the operation of the pump, never reduce the frequency (and consequently the rotation speed) to a level that can not guarantee the minimum flow for cooling the motor.**

To avoid damage to the pump, the motor must stop when the flow drops below 0.1 nominal flow. Depending on the type of frequency converter, the motor may be exposed to damaging voltage surges.



**Warning**

**The 4 "X-Power motors must be protected against voltage surges greater than 244 V (peak value) between the terminals.**

For more information, please contact the distributor.

### Operation with frequency converter for X-Power MXW - 6C - 8C - 10C motors.

The three-phase X-Power motors can be powered by a frequency converter.

**Only for motors in special version**

**If a motor with a temperature transmitter is powered by a frequency converter, the fuse inside the transmitter will burn out and the transmitter will be irreversibly damaged. The transmitter can not be reactivated. This means that the motor will operate as if the temperature transmitter were not present.**

**For all motors**

**When operating with a frequency converter, do not run the motor at frequencies above 60 Hz. During the operation of the pump, never reduce the frequency (and consequently the rotation speed) to a level that can not guarantee the minimum flow for cooling the motor.**

To avoid damage to the pump, the motor must stop when the flow drops below 0.1 nominal flow. Depending on the type of frequency converter, the motor may be exposed to damaging voltage surges.



**Warning!**

**The "C" series motors for supply voltages up to and including 440 V (see motor nameplate) must be protected against voltage peaks above 650 V (peak value) between the terminals.**

It is recommended to protect all other motors from voltage peaks above 850 V.

The aforementioned disturbance can be avoided by installing an RC filter between the frequency converter and the motor.

Any increase in acoustic noise from the motor can be eliminated by installing an LC filter, which also eliminates voltage peaks from the frequency converter.

We recommend installing an LC filter when using a frequency converter.

For more information, contact the inverter distributor.

## 13. Motor and electrical protection

### Motor protection and single-phase electric pumps

#### X-Power MXA single-phase motors and 2-wire electric pumps

The MXA single-phase motors and the EURLSUB CI pumps already have an integrated thermal switch and do not require additional protections.



#### **Warning!**

**With the motor switched off thermally, the terminals are still powered.  
Once the motor has sufficiently cooled down, it will restart automatically.**

#### X-Power MXW single-phase motors and 3-wire electric pumps

The MXW motors and single-phase electric pumps must be protected. The protective device can be incorporated into the control panel or supplied separately. The MXV X-Power motors and the electric pumps must be connected to a special protection switch.

#### X-Power MX single-phase motors

The MX motors and single-phase electric pumps must be protected. The protective device can be incorporated into the control panel or supplied separately. The MX X-Power motors and the electric pumps must be connected to a special protection switch.

#### MAX 3 - SLM 15 Vortex - VTM Vortex - MAX 4 PRESSION - MAX 4 KIT AMEGA 4 SB KIT - GM4 KIT Vortex - EUROSUB CE - MAX5 KIT monoblock submersible pumps.

The MAX 3 KIT, SLM 15 VORTEX KIT, VTM VORTEX KIT, MAX 4 PRESSION, AMEAG4 SB KIT, GM4 KIT, EUROSUB CE KIT, MAX 4 KIT submersible pumps are supplied with electrical panel complete with condenser, switch and externally resettable thermal protection.

#### Three-phase motor protection

##### X-Power MXW – MXA – MX - 6C – 8C – 10C motors

The following motors must be protected by a protection switch with thermal relay or similar;

MXW – MXA – MX – 6C – 8C – 10C motors.

#### Required settings of the submersible motor protection switch

For cold motors, the tripping time of the protection switch must be less than 10 seconds at 5 times the maximum current of the motor. Under normal operating conditions, the motor must run at maximum speed in less than 3 seconds.

**N.B. If this requirement is not met, the submersible motor warranty will not be validated.**

#### **Optimal protection (choice of protection thermal setting)**

The protection switch must be installed as follows:

- Set the maximum current of 5% more than the current that normally absorbs the motor
- Start the pump and let it run for half an hour at normal performance.
- Slowly reduce the operating current until the thermal protection start point is reached.
- Increase the setting of 5%.

For motors with a star/delta starting, the protection switch must be set as indicated above. The maximum setting must however correspond to the maximum rated current x 0.58.

The maximum starting time allowed for star-delta starting or auto-transformer start is 2 seconds.

## 14. Protection against lightning

The system can be equipped with a special overvoltage protection device, able to protect the motor from electrical voltage peaks due to lightning.

However, the overvoltage protection device can not protect the motor in the event of a direct lightning strike.

The overvoltage protection device must be installed in the system according to local regulations.

Contact X-Power for lightning protection devices.

The MS 402 motors, however, do not require additional lightning protection because they are well insulated.

## 15. Cable sizing

Make sure that the power cable is always immersed in the liquid at the actual reference temperature of the calculation.

The cross-section (q) of the cable must meet the following characteristics:

1. The submerged cable must be dimensioned according to the maximum rated current (I) of the motor.
2. The section must not cause voltage drops.

So by summarizing it is always necessary to make sure that the maximum rated current does not exceed the current value (I<sub>s</sub>).

When the submersible cable is sized, you need to make sure that the maximum rated current does not exceed the current value (I<sub>s</sub>). For star-delta starting, dimension the cables so that 0.58 the maximum rated current of the motor does not exceed the value of the current (I<sub>s</sub>) of the cables.

q [mm <sup>2</sup> ]	I <sub>s</sub> [A]	q [mm <sup>2</sup> ]	I <sub>s</sub> [A]
1,5	23	50	202
2,5	30	70	250
4	41	95	301
6	53	120	352
10	74	150	404
16	99	185	461
25	131	240	547
35	162	300	633

## Control of single-phase MXA motors



### Warning!

The single-phase MXA motor includes a protection that stops the motor in case of excessive windings temperature.

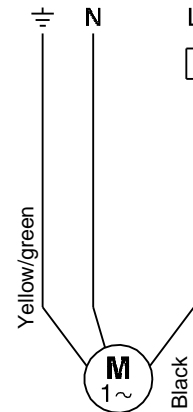
If a compressor with an other filter is included in the control system. The compressor will continue to operate even when the thermal protection has stopped the motor, unless other specific precautions are taken.

## 16. Connection of single-phase motors

Connection of single-phase motors and monoblock pumps with internal condenser

### 2-wire motors (MXA)

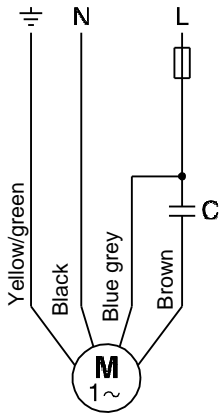
The 2-wire MXA motors incorporate the protection mechanism and a starter and can therefore be connected directly to the power supply.



Connection of MXA (2-wire) and EUROSUB (2-wire) motor  
MAX 5 (2-wire)



The single-phase MXW motors include the appropriate protection and must be connected to the power supply as follows:



**MX - MXW (3-wire) motor connection**

**3-wire motors (MX - MXW - MXA)**

The 3-wire MX and MXW motors must be connected to the mains supply via a control panel and motor protection.

The 3-wire MXA motors include the motor protection and they must be installed with a control panel without motor protection.

**17. Connection of three-phase motors**

**The three-phase motors must be shielded.**

For electrical connection via thermal protection, refer to the separately supplied installation manual.

When using a conventional motor protection switch, the electrical connection must be performed as described below.

**Rotation control**

***The pump should only be started after the suction interconnector has been completely submerged below the water level.***

When the pump has been connected to the power supply, check the direction of rotation:

1. Start the pump and, measure the amount of water and the prevalence.
2. Stop the pump and exchange two phases between them.
3. Start the pump and measure the amount of water and the prevalence.
4. Stop the pump.
5. Compare the two results to each other. The link that provides the largest amount of water and the highest prevalence will be the correct one.

**Motors with direct start-up**

The connection of X-Power motors with direct start-up is shown in the table below.

Power	Cable/connection
	<b>4" and 6" Motors</b>
	PE (yellow/green)
L1	U (brown)
L2	V (black)
L3	W (grey/ light blue)

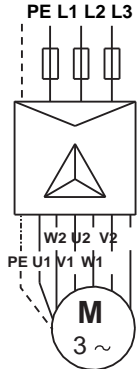
Check the direction of rotation as described in the "Control of rotation of three-phase motor" section.

**X-Power motors - star delta starting**

The connection of the X-Power "C series" star-delta motors is shown in the table below

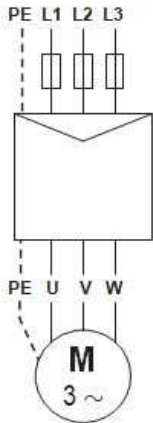
Connection	X-Power da 6" motors
PE	Yellow/green
U1	Brown
V1	Black
W1	Grey
W2	Brown
U2	Black
V2	Grey

Check the direction of rotation as described in the "Control of rotation of three-phase motor" section.



Wrapped motors - star-delta starting

If direct starting is required, the motors must be connected as shown below.



"C Series" X-Power motors wound for direct start-up

**Connection in case of unidentified connection/cable marking**

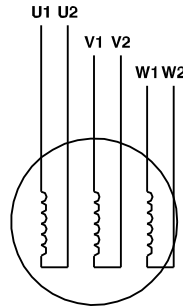
If you do not know exactly where to connect the terminals to the mains supply, to ensure the correct direction of rotation, proceed as follows:

Connect the motor to the mains supply in the way that is considered correct. Check the direction of rotation as described in the section.

**Control towards rotation.**

**Star-delta starter motors**

Determine the motor windings by means of an ohmmeter. Regarding the conductors for the individual windings, refer to the figure below: U1-U2; V1-V2; W1-W2.



If a star-delta starting is required, the terminals must be connected as shown in the figure on the left side, of this page.

Check the direction of rotation as described in the "Check direction of rotation" section

**Soft starter**

X-Power recommends the use of "soft-start" devices. They are equipped with a bypass switch, and they control the voltage across all the three phases. Starting time: Max. 3 seconds.

For more information, please contact the soft-start device vendor or the X-Power.

**Operation with frequency converter**

The three-phase "C Series" motors can be connected to a frequency converter.

Permissible frequency ranges: 30-50 Hz and 30-60 Hz.

Starting time: Max. 3 seconds.

Depending on the model, the frequency converter can cause an increase in motor noise. Furthermore, it could expose the motor to damaging voltage surges. Voltage peaks can be limited by simply installing an LC filter between the frequency converter and the motor.

For more information, please contact the frequency device vendor or the X-Power.

info@xpowerwaterpumps.com

## 18. Installation

First of all, it is advisable to install a 50 cm long tube on the pump to facilitate handling during installation.

**Place the pump in an upright position before removing it from the wooden box.**



Place the pump in vertical position.

**Make sure that the coupling between the pump and the motor does not show any anomalies.**

Raise the pump and couple it to the motor carefully. An incorrect coupling can seriously damage the electric pump.

**A mismatched coupling can cause a break in the crankshaft.**



Place the pump in vertical position

1. Place the pump on top of the motor.
2. Position and tighten the nuts. (See table below).

**Make sure that the coupling between the pump and the motor does not show any anomalies.**

The bolts and nuts that secure the tie rods to the pump must be tightened in a crisscross pattern:

Bolts/nuts	Tightening torque [Nm]
M8	18
M10	35
M12	45
M16	120

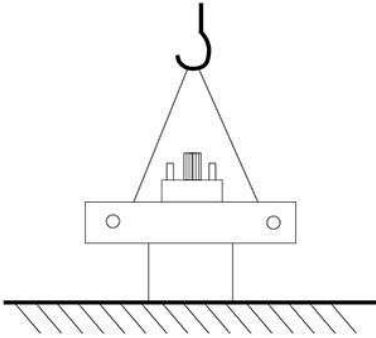
Join the motor to the pump and tighten the nuts in a crisscross pattern

Diameter of the tie rod	Tightening torque [Nm]
3/8	18
1/2	50
M8	18
M12	70
M16	150
M20	280

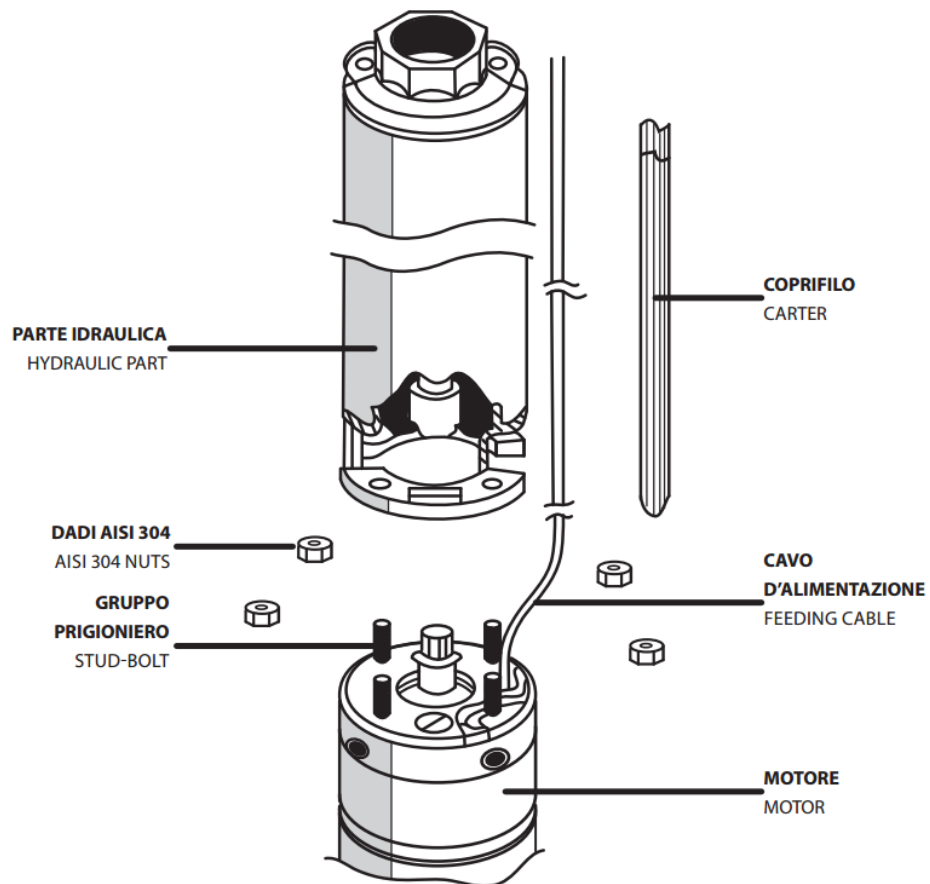
## 19. Pump and motor coupling

When pump and motor are supplied in separately (as in the case of particularly long pumps), join the pump and motor as follows:

- When handling the motor, use the hose clamps.
- Place the motor in a vertical position in the well. See figure below



Coupling of the MAX4 and AMEGA submersible pumps and of the MX - MXW – MXA motors.





## 20. Submersible cable connection

Before connecting the submerged cable to the motor, make sure the outlet is dry and clean.

To facilitate cable assembly, lubricate the rubber parts of the plug with a non-conductive silicone adhesive.

Tighten the screws that support the cable to these tightening torques [Nm]:

HP 4 : 20=10

HP 25 : 50=16

## 21. Riser pipe

To connect the discharge pipe to the pump, use a chain wrench that tightens the pump only on the discharge chamber.

The threaded joints on the riser pipe must all be well cut and installed to prevent them from loosening.

The thread on the first section of the riser tube to be screwed onto the pump must not be longer than the threads on the pump.

To avoid building noise caused by pipes, it is advisable to use plastic pipes. If you have to connect plastic pipes, a compression fitting must be used between the pump and the first part of the pipe.

When using flanged pipes, it is necessary to make a slot in the flanges that allows the passage of the submerged cable (and in case it is installed, also of the water indicator tube)

## 22. Maximum installation depth

below the water level [m]

SLM 15 Kit 3": 120 mt

Max3 Kit 3": 120 mt

VTM Kit 4": 100 mt

MAX Pression Kit 4": 100 mt

Eurosub - Eurosub Kit 5": 20 mt

Max5 5" - Max5 Kit 5": 20 mt

Aomega4 Kit 4": 120 mt

GM4 Kit 4": 150 mt

MX series 4":125 mt

MXW series 4":150 mt

MXA series 4":150 mt

C series 6": 150 mt

C series 8": 150 mt

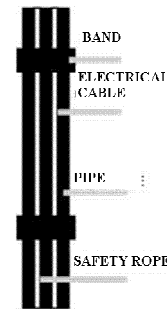
C series 10":150 mt

## 23. Binding

### Fix the components of the delivery pipe

It is necessary to avoid that the recoils of the submersible pump can cause dangerous displacements of the delivery pipe components. The electric cable and any safety rope must be effectively interlocked with each other by means of safety ropes.

- Position the strips along the submersible cable as shown in the figure below



- Wrap tightly the band around the wire and cord.
- With large submersible cables, it will be necessary to wrap the strips several times.
- If plastic pipes are used, it is necessary to leave some space between a band and the tube, because the plastic pipes expand when they are under pressure.
- If flanged pipes are used, the strips must be applied above and below each joint.

## 24. Well pump installation

### Put the pump down the well

Before lowering the pump into the well or into the tank, it is advisable to inspect the housing with an internal gauge to ensure that the passage is not obstructed.

Lower the pump into the well, slowly, taking care not to damage the motor cable and the submerged cable.

#### **CAUTION**

***Never lower or lift the pump using the motor cable.***

### Depth of installation

The dynamic water level must always be above the pump suction connector.

The minimum inlet pressure is indicated in the NPSH curve of the pump.

The minimum safety margin must be 1 m. To allow the motor to cool properly, it must be positioned above the well filter.

When the pump has been installed at the required depth, the installation must be completed by closing the wellhead.

Loosen the safety rope so that it is not taut and lock it on the wellhead using the appropriate latches.

***In pumps connected to plastic pipes, the expansion of the pipes under load should be considered when establishing the installation depth.***

## 25. Starting and operation

### Starting

When the pump has been connected correctly installed, it must be started with the drain valve closed at approximately 1/3.

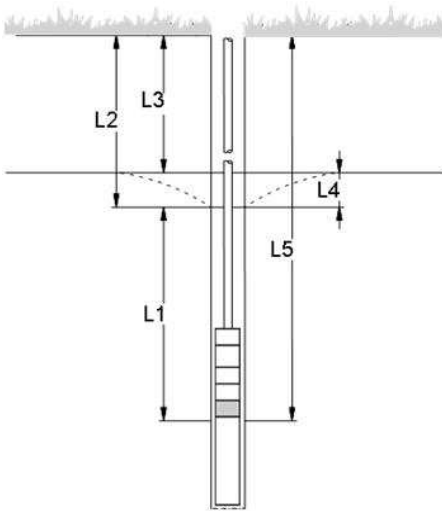
Check the direction of rotation as described in the "**Check direction of rotation**" section.

With impurities in the water, the valve must be opened gradually to get all impurities out. The pump must not be stopped until the water is completely clean to avoid blocking the non-return valve.

With the valve open, check the lowering of the water level to make sure that the pump is always submerged.

The dynamic water level must always be above the pump suction connection.

## 26. Water Level



### CAUTION: AVOID THAT SUBMERSED MOTOR OR PUMP WORK WITHOUT WATER

(see warnings listed below)

#### Comparison of different water levels:

L1: Minimum level of installation depth below the water level. It is recommend at least 1 meter.

L2: The depth compared to the dynamic level of water.

L3: The depth compared to the static water level.

L4: Lowering of the water level. This is the difference between the dynamic and static levels of water.

L5: Depth of installation.

If the pump has a higher flow than the shaft, it is advisable to install a dry-running protection.

If no electrodes or level switches are installed, the water level may drop too much, and the pump will draw in air.



**A prolonged operation with water containing air can irreparably damage the submerged pump.**

## Running

### Minimum flow

The flow rate of the pump must never be set at such levels as to not be able to meet the motor cooling requirements (which are indicated in the pumped liquid section).

Never exceed the maximum recommended starting frequency in the following general table:

#### Frequency of starts and stops

Motors	Number of direct starts
MXA - MX	Min. 1 per year.
	Max. 50 per hour. Max. 280 per day.
MXW	Min. 1 per year.
	Max. 60 per hour. Max. 300 per day.
6C	Min. 1 per year.
	Max. 30 per hour. Max. 200 per day.
8C	Min. 1 per year.
	Max. 20 per hour. Max. 150 per day.
10C	Min. 1 per year.
	Max. 15 per hour. Max. 100 per day.

## 27. Maintenance and assistance

Maintenance can be performed at authorized service centers.



### Warning

**If a pump has been used for a liquid that is harmful to health or toxic, it will be classified as contaminated**

If the pump is sent to the repair service centre, details of the pumped liquid and other relevant information must be provided. Never disassemble the product under warranty, unless expressly authorized.

If not, the service centre may refuse to repair the submersible pump.

Any shipping costs of the pump will be charged to the customer.



### Warning

**Never run dry the submersible motor or the submersible pump.**

## 28. Cable assembly

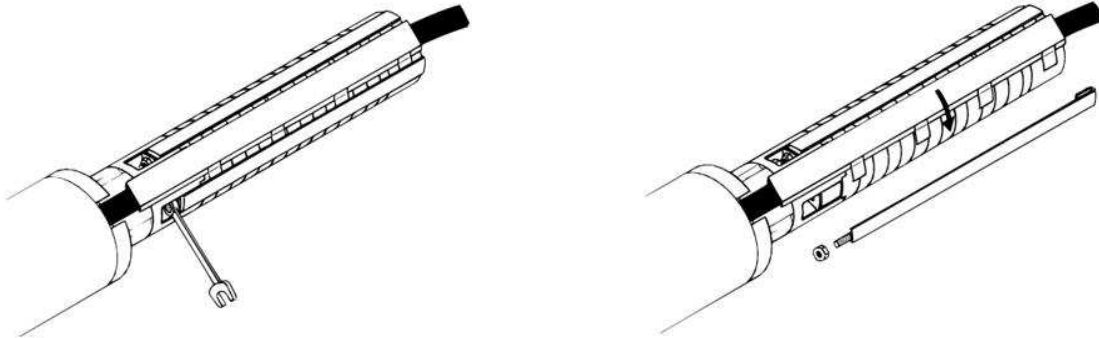
### MAX X submersible pumps

#### Assembly of the cable

MAX 6X + 4C/6C

MAX 8X + 6C/8C

MAX 10X + 8C/10C



Loosen the tie rods of the pump and place the protective cable cover between the pump and the tie rods. Tighten the tie rods again. **Failure to follow this note may result in damage to the power cord.**

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## 29. Electric pumps KITS

Read this manual carefully before proceeding with the installation.  
Installation and operation must comply with the Country's safety regulations.

Failure to comply with the safety regulations, as well as creating a danger to the safety of persons and damage to the equipment, will void any warranty claims. Keep this manual with care for any further consultation even after first installation.

### VTM MONOBLOCK PUMP KIT - MAX 4 PRESSION KIT - EUROSUB CI - MAX5 CI

#### Sound pressure level of submersible pumps

The sound pressure level of these submersible pumps is less than 70 dB (A).

Pump model	$\bar{L}_{pA}$ [dB(A)]
EUROSUB - MAX 5I	< 65
VTM KIT – MAX 4 PRESSION	< 65

KJ

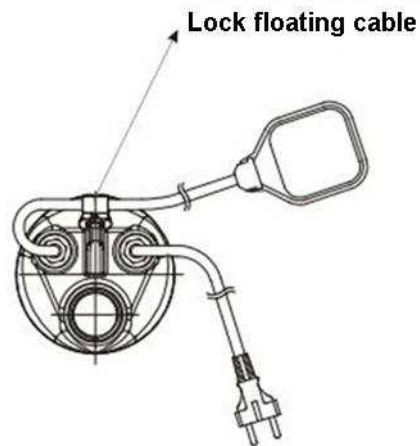
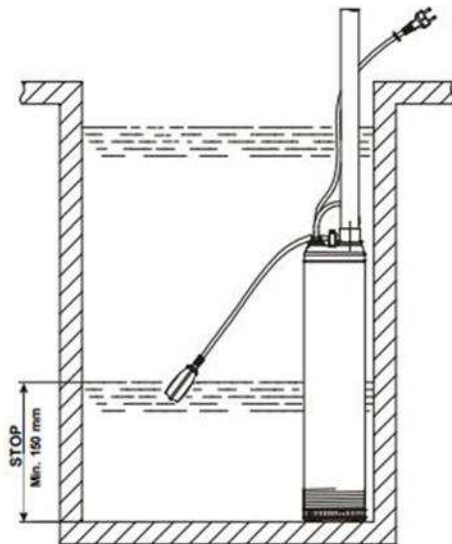
#### Limitations of use:

Liquid temperature range: from 0 ° C to + 40 ° C – Immersion depth: 20 m – Storage temperature: from -10°C to +40°C  
Noise: the noise level is within the limits set by EC Directive 89/392 / EEC and the following modifications (REF. POINT 10.).  
Motor construction: according to CEI 2-3 - CEI 61-69 (EN 60335-2-41) regulations.

## 30. Monoblock electric pump installation

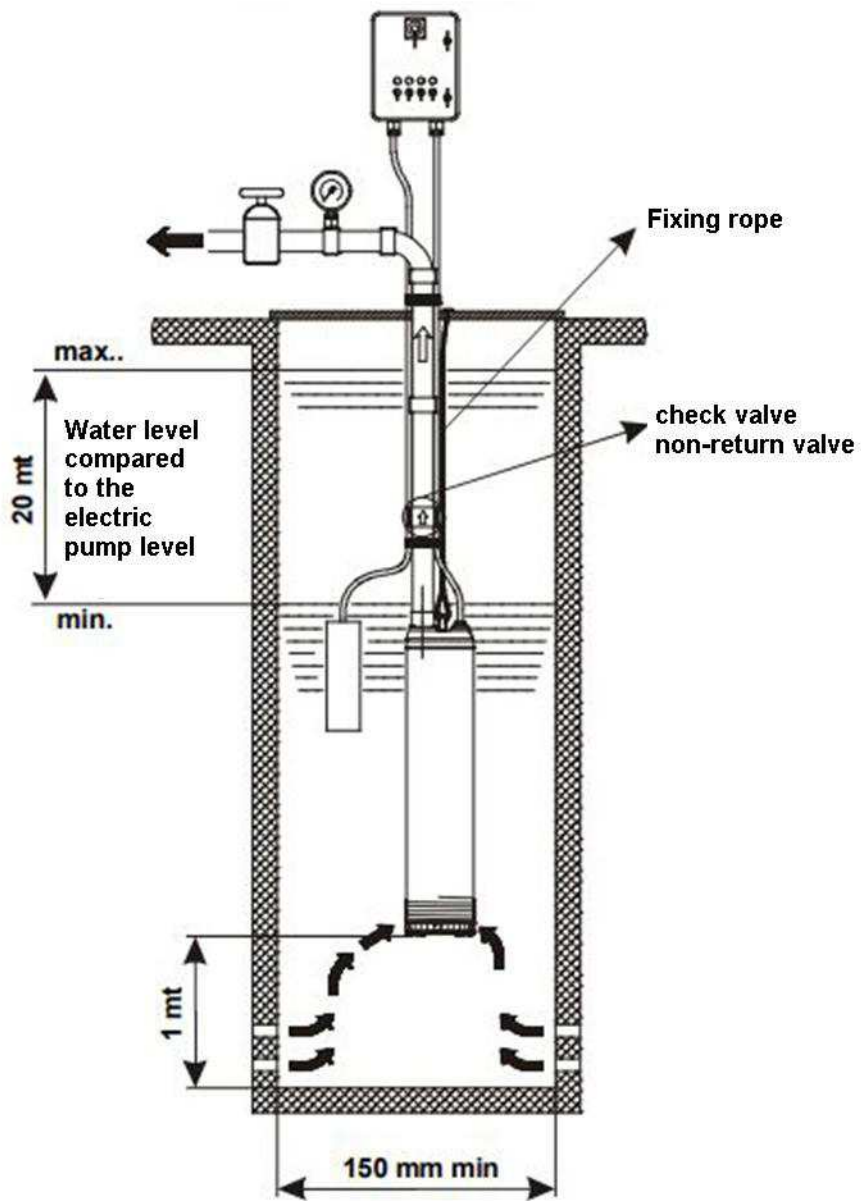
Monoblock electric pump installation without electrical panel

### Electric pumps with built-in condenser EUROSUB CI - MAX5 CI



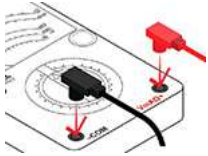
# Monoblock electric pumps installation with electrical panel

Pump with condenser in the electrical panel  
VTM VORTEX KIT - MAX4 PRESSION KIT - EUROSUB CE KIT - MAX5 5 KIT



## 31. Motor and cable control

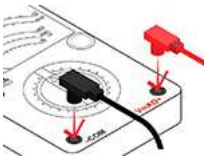
### 1. Supply voltage



Measure the voltage between phases using a voltmeter. With single-phase motors, measure between phase and neutral or between the two phases. Connect the voltmeter to the motor protection switch terminals.

When the engine is under load, the voltage should be within the indicated limits. The engine can burn if there are larger voltage variations. Large variations in voltage indicate poor power supply.

### 2. Current absorption



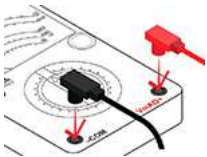
Measure the amps of each phase while the pump operates at a constant supply pressure (motor performance under stress).

For maximum operating current, refer to the nameplate.

With three-phase motors, the difference between the current in the phase with the highest absorption and the current in the phase with the lowest absorption must not exceed 5%. In this case or if the voltage exceeds the rated current, the following failures may occur:

1. The contacts of the motor protection switch are burned out. Replace contacts or control panel for single-phase operation.
2. Incorrect connection to the terminals, perhaps due to the junction of the cable. See point 3.
3. Supply voltage too high or too low. See point 1.
4. The motor windings are partially short-circuited. See point 3.
5. Damaged pump is causing motor overload. Remove the pump from the well for a technical check.
6. The resistance value of the motor windings deviates too much (three-phase). Move the phases in order for a more uniform load.

When the electrical voltage and current consumption are normal, measurement is not necessary.



Disconnect the submersible cable from the motor protection switch. Measure the winding resistance between the immersion cable clamps.

For three-phase motors, the difference between the maximum and minimum values should not exceed 10%.

If the difference is higher, remove the pump. Measure the parameters of the motor, the motor cable and the immersion cable separately, then repair or replace the damaged parts.

**Note:** For single-phase 3-wire motors, the winding will have the least resistance.



Disconnect the submersible cable from the motor protection switch. Measure the insulation resistance from each phase to earth. Ensure that the earth connection has been made accurately.

If the insulation resistance is less than 0.5 MΩ, the pump must be removed to repair the motor or cable. Local regulations may indicate different insulation resistance values.

## 32. Waste Disposal

The disposal of these products or part of them must be carried out respecting the environmental rules.

1. Use local, public or private waste collection systems.
2. If this is not possible, contact the nearest authorized distributor or the customer care.

### 33. Possible failures/problems

Problem	Cause	Solution
1. The pump does not work.	a) The fuses are burned.	Replace the burned fuses. If the new ones should also burn, it is necessary to check the electrical system and the submerged cable.
	b) The differential switch (ELCB) turns on.	Reset the switch.
	c) No power supply.	Contact the electricity supplier.
	d) The motor protection switch has tripped.	Reset the motor protection switch (automatically or manually). If the motor protection switch trips again, check the voltage. If the voltage is correct, see points 1e-1h.
	e) The motor protection counter/switch is faulty.	Replace the motor protection counter/switch.
	f) The starting device is faulty.	Repair or replace the starter.
	g) The control circuit has been interrupted or has failed.	Check the electrical system.
	h) The dry running protection has interrupted the power supply to the pump due to the low water level	Check the water level. If it is correct, check the transducers / water level switch.
	i) The pump or submerged cable are damaged.	Repair or replace the cable / pump
2. The pump work but does not provide water.	a) The discharge valve is closed.	Open the valve.
	b) There is no water in the well or the level is too low.	See point 3a.
	c) The non-return valve is blocked or closed.	Pull out the pump and clean (or change) the valve.
	d) The delivery filter is blocked.	Pull out the pump and clean the filter.
	e) The pump is faulty.	Repair or replace the pump.
3. The pump works with reduced flow.	a) The lowering of the dynamic level of the well is higher than expected.	Increase the installation depth of the pump. Or to partialize the valve on the delivery side. Or replace the pump with a model with a lower flow rate.
	b) Wrong direction of rotation.	Reverse a phase
	c) The delivery pipe valves are partially closed/ locked.	Clean or replace the valves.
	d) The delivery manifold is partially obstructed by impurities (ferrous oxides).	Clean or replace the manifold.
	e) The pump non-return valve is partly blocked.	Remove the pump and clean or replace the valve.
	f) The pump and the riser tube are partly obstructed by impurities (ferrous oxides).	Remove the pump and clean it or replace it. Clean the pipes.
	g) The pump is faulty.	Repair or replace the pump.
	h) Water leakage in the pipes.	Check and repair the pipes.
	i) The riser tube is faulty.	Change the tube.
4. Frequent starts and stops.	a) The pressure switch differential between the start and stop pressures is too low.	Increase the differential switch. The stop pressure must never exceed the operating pressure of the pressure tank. The starting pressure must be high enough to ensure a sufficient supply of water.
	b) The Water level transducers or level switches have not been correctly installed.	Adjust the ranges of the transducers/level switches to ensure that sufficient time elapses between the insertion and disconnection of the pump. See the installation and operating instructions for the transducers/level switches. If the time intervals between start and stop can not be changed, the flow rate of the pump can be reduced by partitioning the valve on the supply side.
	c) The check-valve in blocked or it stops in the middle of the opening.	Pull out the pump and clean or replace the valve.
	d) The tank preload pressure is too low.	Adjust the pressure by following the installation and use instructions.
	e) The tank is too small.	Increase the capacity of the tank by replacing it.
	f) The tank membrane is faulty.	Please control the tank and its membrane.

# DECLARATION OF CONFORMITY



The company SC Pippohydro srl based in:  
Sat. Opriseni, Tutora Judet Iasi - RO

As attested by the manufacturer,

## DECLARES

### That the following models:

MAX 6X 6" SUBMERSIBLE PUMPS  
MAX 8X 8" SUBMERSIBLE PUMPS  
MAX 10X 10" SUBMERSIBLE PUMPS  
6C 6" SUBMERSIBLE MOTORS  
8C 8" SUBMERSIBLE MOTORS  
10C 10" SUBMERSIBLE MOTORS  
MX MXW MXA DA 4" SUBMERSIBLE MOTORS  
VTM - MAX PRESSION MONOBLOCK ELECTRIC PUMPS  
EUROSUB - MAX 5 ELECTRIC PUMPS

### They comply with the following standards:

EN ISO 12100:2010, EN 809:1998+A1:2009+AC:2010,  
EN 60204-1:2006+A1:2009+AC:2010,  
EN 60335-1:2012+AC:2014, EN 62233:2008+AC:2008,  
EN 60335-2-41:2003+A1:2004+A2:2010,  
EN 60034-1:2010+AC:2010,  
EN 55014-1:2006+A1:2009+A2:2011,  
EN 55014-2:1997+A1:2001+A2:2008,  
EN 61000-3-2:2014, EN 61000-3-3:2013

### Responding to the EC Directives:

2006/42/EC (Machinery)  
2014/35/EU (Low Voltage)  
2014/30/EU (Electromagnetic Compatibility)

SC Pippohydro srl

A handwritten signature in black ink, appearing to read 'Janotti'.



[www.xpowerwaterpumps.com](http://www.xpowerwaterpumps.com)

