



# flowboost<sup>®</sup>

E.H Pump Manual

## OPERATION AND MAINTENANCE MANUAL

First Publication Date: 01/09/2020

Revision:

Revision Date:

## OPERATION & MAINTENANCE

# CONTENTS

General Information	3
Safety Information	4
Safety Warnings & Precautions	5
Customer / Contractor Responsibilities	6
Technical	7
Intended use	7
Improper use	7
Marking	7
Technical data	7
Operating conditions	8
General provisions	8
Transportation	8
Handling	9
Installation Dimensions	9
Unpacking	9
Installation	9
Pipes	9
Suction pipe	10
Delivery pipe	10
Electrical connection	10
Start-up and Operation	11
Maintenance	12
Disposal	12
Spare-parts request	12
Troubleshooting	13

## General Information

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

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

### Definitions of Safety Warnings and Precautions



#### **WARNING!**

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



#### **CAUTION!**

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

## Safety

# Information

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

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

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

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

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

## Safety Warnings &

# Precautions

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



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



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



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



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

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



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



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

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



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

*Observe the regional regulations for electrical installation!*



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



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



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



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

## Customer / Contractor **RESPONSIBILITIES**

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

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

## Technical

Horizontal Multi-Stage Close Coupled Pumps in stainless steel.

## Intended use

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

Liquid temperature from - 15°C to + 110 °C.

## Improper use

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

## Marking

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

1 Type 1	<p>Example plate pump</p>	11
2 Delivery		12
3 Head		8
4 Rated power		9
5 Supply voltage		13
6 Frequency		14
7 Nom. motor current		
8 Rotation speed rpm		
9 Operation Duty		
10 Insul. class		
11 Certifications		
12 Serial number		
13 Weight		
14 Notes		
15 Voltage		
16 % Load		
17 Power factor		
18 Efficiency		
19 Protection		
20 Efficiency Class		

## Technical data

Dimensions and weight (see technical catalogue).

Nominal speed 2900/3450 rpm

Protection IP 54

Supply voltage / Frequency:

up to 240V 1~ 50/60 Hz

up to 480V 3~ 50/60 Hz

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

Sound pressure: < 70 dB (A).

Max. Starts per hour: 30 at regular intervals (15 for 206-406, 20-32-48).

Maximum permissible pressure in the pump casing: 80m (8 bar), 100 m (10 bar) for 20-32-48.

The max. Inlet water pressure: PN (Pa) - Hmax (Pa).

## Operating conditions

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

## General provisions

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 Flowtech or an Authorised 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.

## Safety devices

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

## Residual Risks

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

## Information and Safety signals

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

## Individual protection devices

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

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

Signal individual protection device

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

## Transportation

The product is packed to maintain the content intact.

During transportation avoid to stack excessive weights.

Ensure that during the transportation the box cannot move.



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

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

## Handling

Handle with care, the packages must not receive impacts.

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

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

Raise the pump-motor unit slowly, making sure it does not move from side to side in an uncontrolled way, to avoid the risk of imbalance and tipping up.

## Installation Dimensions

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

### Ambient requirements and installation site dimensions

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

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

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

## Unpacking

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

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

## Installation

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

## 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.

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

Excessive torque may cause damage to the pump.

When the pipe or union coupling is mounted, keep the pump casing connection blocked with a second wrench, making sure the connection is not deformed by excessive tightening.

The pipe diameters must not be smaller than the pump connections.

## Suction pipe

If the suction pipe is longer than 10m, use an internal pipe diameter larger than the pump suction connection.

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) 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, fit an inlet gate valve.

For suction from a storage tank fit an anti-backflow valve. Follow local specifications if increasing network pressure.

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

## Delivery pipe

Fit a gate valve in the delivery pipe to adjust delivery and head.

Install a pressure gauge.

With a geodetic head at outlet over 15m fit a check valve between the pump and the gate valve in order to protect the pump from water hammering.

## Electrical connection

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

The unit must be properly earthed (grounded).

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

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

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

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

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

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

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

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

## Start-up and Operation

### Preliminary checks before start-up of the pump

Do not start-up the device in case of damaged parts.

### First starting

#### **ATTENTION: never run the pump dry.**

Start the pump after filling it completely with liquid.

#### **When the pump is located above the water level**

Suction lift operation or with a positive suction head which is too low (less than 1m) to open the non-return valve, fill the pump through the priming hole.

#### **When the liquid level on the suction side is above the pump**

(inflow under positive suction head, 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.

#### **When starting, with a three-phase motor, check that the direction of rotation**

Is as shown by the arrows on the lantern bracket.

Otherwise, disconnect electrical power and reverse the connections of two phases.

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

If a priming loss occurs (interruption of delivery flow) or if a pressure oscillation is indicated by the pressure gauge, make sure all the suction pipe couplings are perfectly sealed and tighten the two sealed plugs on the pump casing.

#### **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.

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

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

If the water is overheated on account of prolonged operation with a non-primed or insufficiently filled pump (suction lift operation), wait until cool before opening the draining and filling plugs.

Care must be taken when the pumped fluid has a high temperature. Do not touch the fluid when its temperature is higher than 60°C. Do not touch the pump when the surface temperature is higher than 80°C.

## 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 Electrical connection).

## Maintenance

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

Every maintenance 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 Flowtech.

For further technical information regarding the use or the maintenance of the device, contact Flowtech.

### 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 conditions (also with an increase in temperature and decrease of pH value). In these cases, if the pump remains inactive for long periods, it must be emptied completely 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.

Before restarting the unit, check that the shaft is not jammed and fill the pump casing completely with liquid.

### Dismantling the pump

Close the suction and delivery gate valves and drain the pump casing before dismantling the pump. For dismantling and re-assembly see construction in the cross section drawing. By removing the screws and the square nuts (2,4,8) the motor can be taken out complete, with all internal parts of the pump, without removing the pump casing and the pipes.

## Disposal

The final disposal of the device must be done by specialised company. Make sure the company follows the classification of the material parts for the separation.

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

## Spare-parts request

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

# Troubleshooting

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

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

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

<b>Problem</b>	<b>Probable Causes</b>	<b>Possible Remedies</b>
The motor does not start	<p>1a. Unsuitable power supply</p> <p>1b. Incorrect electrical connections</p> <p>1c. Engine overload protective device cuts in</p> <p>1d. Blown or defective fuses</p> <p>1e. Shaft blocked</p> <p>1f. If the above causes have already been checked the engine may be malfunctioning</p>	<p>1a. Check that the mains frequency and voltage correspond to the electrical characteristics shown on the indicator plate</p> <p>1b. Connect the power supply cable to the terminal board correctly. Check that the thermal overload protection is set correctly (see data on the engine indicator plate) and make sure that the fuse board up line of the engine has been properly connected</p> <p>1c. Check the power supply and make sure that the pump shaft is turning freely. Check that the thermal overload protection has been set correctly (see engine indicator plate)</p> <p>1d. Replace the fuses, check the electric power supply and points a) and c)</p> <p>1e. Remove the cause of blockage as indicated in the “Blocked pump” instruction booklet</p> <p>1f. Repair or replace the engine by applying to an authorised service center</p>
Pump blocked	<p>2a. Prolonged periods of inactivity with formation of rust inside the pump</p> <p>2b. Presence of solid bodies in the pump rotor</p> <p>2c. Bearings seized</p>	<p>2a. Rotation may be started directly from the pump shaft or from the joint (remember to turn off the electricity supply first ) or contact an authorised service centre</p> <p>2b. If possible, dismantle the pump casing and remove any solid foreign bodies inside the rotor, if necessary contact an authorised service centre</p> <p>2c. If the bearings are damaged replace them or if necessary contact an authorised service centre</p>
The pump functions but no water comes out	<p>3a. Possible infiltration of air from suction tube connections, drain plugs or filling of pump or from the gaskets of the suction pipe</p> <p>3b. Foot valve blocked or suction pipe not fully immersed in liquid</p> <p>3c. Suction filter blocked</p>	<p>3a. Check which part is not tight and seal the connection adequately</p> <p>3b. Clean or replace the bottom valve and use a suction pipe suitable for the application</p> <p>3c. Clean the filter, if necessary, replace it. See point 2a) also.</p>

<p>Insufficient flow</p>	<p>4a. Pipes and accessories with diameter too small causing excessive loss of head          4b. Presence of deposits or solid bodies in the internal passages of the rotor          4c. Rotor deteriorated          4d. Worn rotor and pump case          4e. Excessive viscosity of the liquid pumped (if other than water)          4f. Incorrect direction of rotation          4g. Suction head excessive in relation to the suction capacity of pump          4h. Suction pipe too long</p>	<p>4a. Use pipes and accessories suitable for the specific application          4b. Clean the rotor and install a suction filter to prevent other foreign bodies from entering          4c. Replace the rotor, contact Flowtech          4d. Replace the rotor and the pump casing          4e. The pump is unsuitable          4f. Invert the electrical connections on the terminal board or control panel          4g. Try to close the feeder gate partially and/or reduce the difference in level of the pump and the liquid being aspirated          4h. Bring the pump closer to the suction tank so as to use a shorter pipe. If necessary use a pipe of a wider diameter</p>
<p>Noise and vibrations from the pump</p>	<p>5a. Rotating part unbalanced          5b. Worn bearings          5c. Pump and pipes not firmly attached          5d. Flow too strong for the diameter of the delivery pipe          5e. Functioning in cavitation          5f. Unbalanced power supply          5g. Incorrect alignment of pump-motor unit</p>	<p>5a. Check that no solid bodies are obstructing the rotor          5b. Replace the bearings          5c. Anchor the delivery and suction piping as needed          5d. Use bigger diameters or reduce the pump flow          5e. Reduce the flow by adjusting the feeder gate and/or using pipes with a bigger internal diameter. See point 4g) too          5f. Check that the mains voltage is right          5g. If necessary, the unit must be re-aligned</p>
<p>Leakage from the mechanical seal</p>	<p>6a. The mechanical seal has functioned when dry or has stuck          6b. Mechanical seal scored by presence of abrasive parts in the liquid pumped          6c. Mechanical seal unsuitable for the type of application          6d. Slight initial drip during filling or on first start-up</p>	<p>6a. Make sure that the pump casing (and the suction pipe if the pump is not self-priming) are full of liquid and that all the air has been expelled. See point 5 e) too.          6b. Install a suction filter and use a seal suited to the characteristics of the liquid being pumped.          6c. Choose a seal with characteristics suitable for the specific application          6d. Wait for the seal to adjust to the rotation of the shaft. If the problem persists, see points 6a), 6b) or 6c) or contact an authorised service center.</p>
<p>In cases 6a), 6b) and 6c), replace the seal, if necessary contact an authorised service center</p>		

12.3. Installation examples

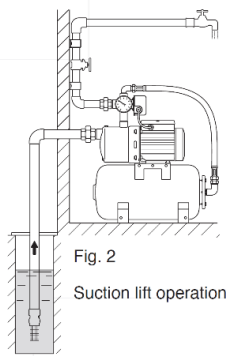
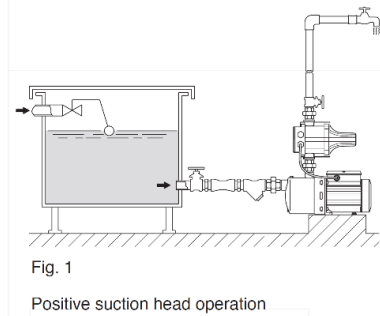


Fig. 3  
Supports and clamps for pipelines

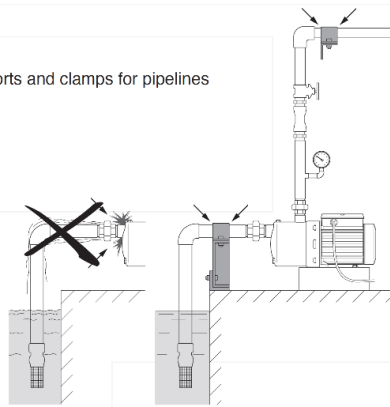


Fig. 4  
Filling

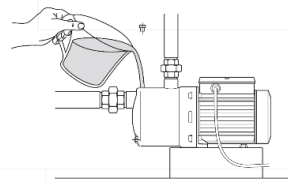


Fig. 5  
Draining

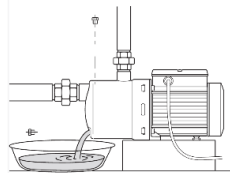


Fig. 6

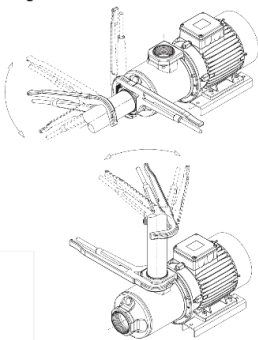


Fig. 7  
Raising the pump

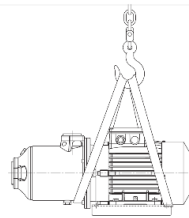


Fig. 8  
Victaulic ports

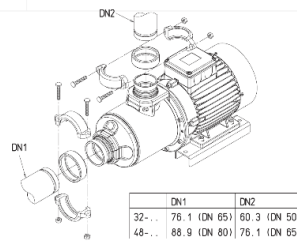
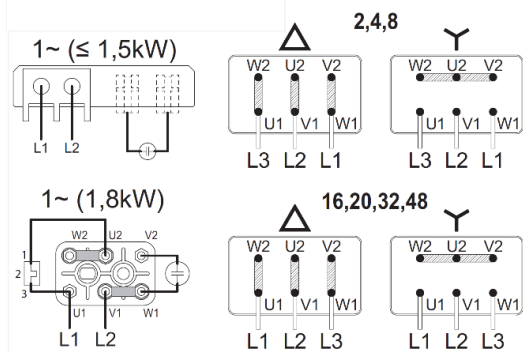


Fig. 9  
Electrical diagram

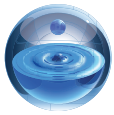


12.5. Minimum cross-sectional area of conductors

Tab. 1

Rated current of appliance		Nominal cross-sectional area
A		mm <sup>2</sup>
>3	+ ≤6	0,75
>6	+ ≤10	1,0
>10	+ ≤16	1,5
>16	+ ≤25	2,5
>25	+ ≤32	4
>32	+ ≤40	6
>40	+ ≤63	10





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

# flowzone<sup>®</sup>

MEMBERS AREA

This section of the **flowtech**<sup>®</sup> website holds information exclusively for members. Members will need to log in to gain access to these pages.

Our member's will be granted exclusive access to our technical resource library. Within this resource is a wide range of product information including data sheets, technical drawings, O&M Manuals and training videos



# flowcare<sup>®</sup>

AFTER SALES SERVICE

At **flowtech**<sup>®</sup> we operate a network of Service Engineers located throughout the UK who are supported by our offices located in and Greater Manchester. The distribution of engineers means that in the majority of cases we are less than 4 hours away from attending a customer call out.

We place great emphasis on providing technical back up to support our Service Engineers in resolving some difficult operational and technical issues. We pride ourselves on completing a project on time, within budget and never leaving a problem unresolved, or a customer waiting. This quality of service has made us the first choice for our customers.

FOR FURTHER INFORMATION OR ASSISTANCE

## contact us

Flowtech Water Solutions are experts in water services and water booster sets. We have continuously supplied a wide range of standard and custom products since being founded in 1996.

### MANUFACTURE & SUPPLY

TELEPHONE : 0333 200 1756

EMAIL: [info@flowtech.org.uk](mailto:info@flowtech.org.uk)

### SERVICE & MAINTENANCE

TELEPHONE : 0333 200 1813

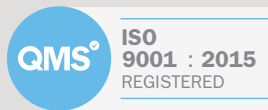
EMAIL: [service@flowtech.org.uk](mailto:service@flowtech.org.uk)

WEBSITE: [www.flowtech.org.uk](http://www.flowtech.org.uk)

ADDRESS : Unit 1 Lock Flight Buildings, Wheatlea Industrial Estate,  
Wigan, Greater Manchester WN3 6XP United Kingdom



Membership No. 700106



Certificate No. 185352020