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WATER SOLUTIONS

flowpac compact©

311S Pump Manual

OPERATION AND MAINTENANCE MANUAL

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General

Information

These instructions are to assist in the installation of the flowpac compact 311S 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 **flow**tech 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 Electrocution, Burns, Fire, Flooding, death or injury to people and/or damage to property dependent upon the circumstances involved. **flow**tech 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 **flow**tech Water Solutions to the buyer.

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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 he 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.

General Information

Before using the product carefully read the information contained in this instruction manual, the manual should be kept for future reference. This manual is part of the essential safety requirement and must be retained until the product is finally decommissioned.

The customer, in case of loss can request a copy of the manual by contacting Flowtech specifying the type of product data shown on the label of the machine.
Any changes, alterations or modifications made to the product or part of it, not authorised by the manufacturer, will revoke the “CE declaration” and warranty.

This appliance should not be operated by children younger than 8 years, people with reduced physical, sensory or mental capacities, or inexperienced people who are not familiar with the product, unless they are given close supervision or instructions on how to use it safely and are made aware by a responsible person of the dangers its use might entail. Children must not play with the appliance.

It is the user’s responsibility to clean and maintain the appliance. Children should never clean or maintain it unless they are given supervision.

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

Read carefully the installation section which sets forth:

- The maximum permissible structural working pressure.
- The type and section of the power cable.
- The type of electrical protection to be installed.

Authorised operators
The product is intended for use by expert operators divided into end users and specialised technicians. It’s forbidden, for the end user to carry out operations which must be done only by specialised technicians. The manufacturer declines any liability for damage related to the non-compliance of this warning.

Warranty
For the product warranty refer to the general terms and conditions of sale. The warranty covers only the replacement and the repair of the defective parts of the goods.
The Warranty will not be considered in the following cases:

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

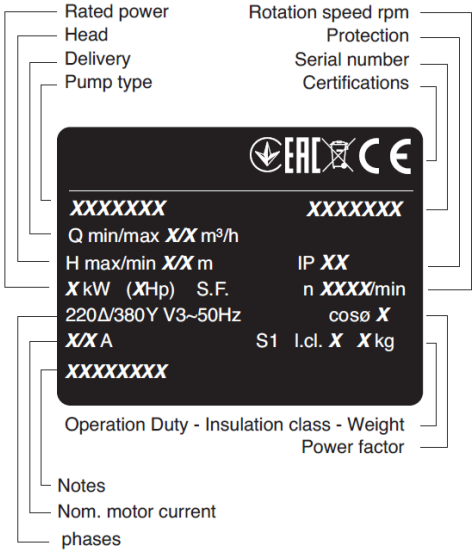
Technical
Close coupled submersible multistage pump. All parts in contact with the fluid both internal and external are in stainless steel AISI 304.

Hydraulics are located below the motor with the motor cooled by the pumped fluid. Safe operation is possible with the motor only partially submerged.
Double shaft seal with interposed oil chamber.
The suction strainer prevents the ingress of solids with diameter larger than 2mm.

Intended use
For water supply from wells, tanks or reservoirs.
For domestic use, for civil and industrial applications, for garden use, irrigation and rain water harvesting systems.

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



Technical data
Dimensions and weight (see technical catalogue).
Nominal speed 2900/3450 rpm
Protection IP X8
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).
The noise is suppressed when the pump is submersed.
Max. Starts per hour: 30 at regular intervals.
Maximum permissible pressure in the pump casing: 120m (12 bar).
The max. Suction pressure: PN (Pa) - Hmax (Pa).

Operating conditions
For clean water with a maximum temperature of 35 °C and maximum sand content of 60 g/m3.
Minimum internal diameter of well: 140 mm.
- Minimum immersion depth: 100 mm.
- Maximum submersion depth: 20 m (with suitable cable length).

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.
Pollution of the liquid could occur due to leakage of lubricants.

Safety devices
The device has an external case made in chromenickel stainless steel that prevents any contact with internal parts.

Protection devices
The device is provided with a double shaft seal with interposed oil chamber, ensuring motor is separated from water, eliminating potential electrical risks, and ensuring protection from accidental dry running.
The product is provided with a screen that avoids the accidental contact with dangerous parts of the impeller.

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
The handling is facilitated by the lift handles placed on the box. 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).

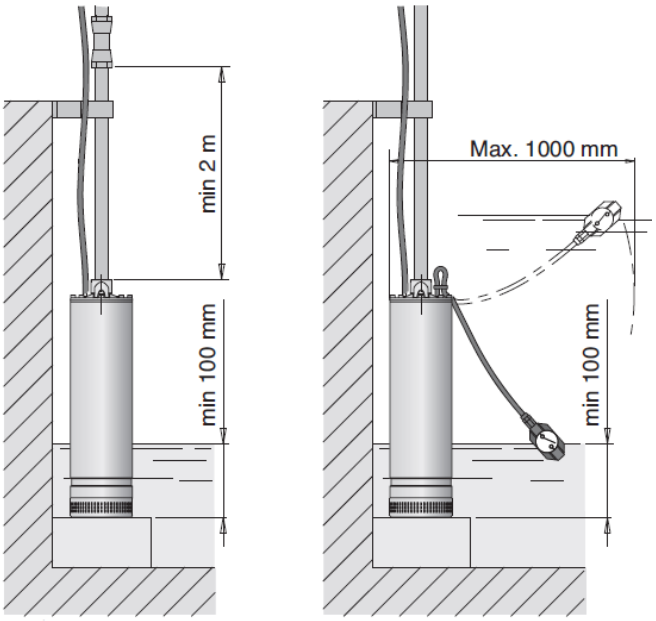
Ambient requirements and installation site dimensions
The customer has to prepare the installation site in order to guarantee the right installation and in order to fulfil the device requirements (electrical supply, etc.).
The place where the device will be installed must fulfil the requirements.
It's 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.
It's absolutely forbidden to handle the product by means of the electric power cable. It is recommended to lift the pump from the motor end and place it vertically on the filter, then lower it down in the place chosen.

Installation

The internal diameter of the delivery pipe must never be smaller than the diameter of the pump connection port: G 11/4 (DN 32) and with a free vertical segment of at least 2 m before the non return valve.
The pump must be installed in the vertical position with the delivery connection facing upwards.
The pump can be installed immersed (min 100mm) or submersed (max 20 m) either standing on a bottom surface or suspended.

Pump in the standing position

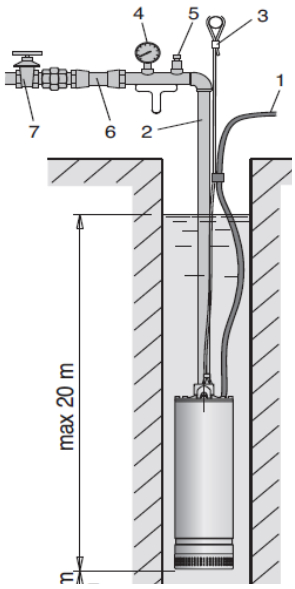


Construction without float switch

Construction with float switch

The pump can be rested on the flat bottom surface of a tank. When sand or slime deposits are expected to form, mount the pump on a surface raised from the bottom level so that abrasive matter is not lifted.

Pump in the suspended position



1. Electric power cable
2. Delivery pipe
3. Safety rope
4. Pressure gauge
5. Air vent valve
6. Check valve
7. Gate valve

The pump can be held in a suspended position by the metal delivery pipe. Tighten the threaded pipe joints firmly to avoid loosening during operation.
Position the pump at a distance of at least 0.5m from the bottom of a well so that sand is not lifted.
A safety rope or chain of non-perishable material should always be used to secure a suspended pump.
When a plastic or flexible delivery pipe is used, the safety rope or chain should be utilized for lowering, securing and raising the pump.

Never use the electric power cable to suspend the pump.
Attach the power supply cable to the delivery pipe and to the safety rope with cable clamps at intervals of about 3m. The power cable should not be taut: allow for a certain degree of slackness between the clamps to avoid the risk of strain caused by expansion of the pipe during operation.

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 always earthed, also with a non-metallic delivery pipework.

ATTENTION: in the case of water containing chloride (or salt water), the earthing (grounding) conductor is useful also to reduce the risk of galvanic corrosion due to electrolytic action, especially with non-metallic delivery pipe and safety rope.

Make sure the frequency and mains voltage correspond with the name plate data.
For use in swimming pools (not when people are in the pool), garden ponds and similar places, a residual current device with IΔN not exceeding 30 mA must be installed in the supply circuit. Install a device for disconnection from the mains (switch) with a contact separation of at least 3mm on all poles. When the water level is not under direct visible control, install a float switch or electrodes to protect the pump against dry running and to set the water levels to stop and automatically start the pump.
The pumps are supplied with power cable type H07-RN8-F type with section of cable not less than 11 TAB IEC 60335-1.
When extension cables are used, make sure the cable wires are of adequate size to avoid voltage drops. For connection of cables in a well, use thermo-shrinking sheathes or other methods for submersed cables.

ATTENTION:
When the pump is fed by a frequency converter, the minimum frequency should not fall below 25 Hz and in any case the total head of the pump should never be lower than 2m.

Three-phase pumps
Install in the control box an overload-protective device in accordance curve type D with the nameplate current.

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
With a three-phase power supply make sure the direction of rotation is correct.
To check this close the discharge valve and measure the closed valve pressure with a pressure gauge mounted between the valve and the pump discharge, or visually check the flow-rate.
Switch off power, invert the connections of two phases on the control panel, re-start and check the pressure or flow rate capacity again.
The correct direction of rotation will provide a considerably greater and easily distinguishable pressure and delivery capacity.
Make sure the pump is operating within its range of rated performance and that the absorbed current indicated on the name-plate is not exceeded.

Otherwise, adjust the delivery gate valve or the setting of pressure switches if installed.
ATTENTION: never allow the pump to run for more than five minutes with a closed discharge valve.
ATTENTION: never run the pump dry, not even for a short trial run.
Never start the pump before it has been immersed to a depth of at least 100 mm.

Construction with float switch
The float switch, connected directly to the pump, controls starting and stopping. Check that the float switch is free from any obstacle. If necessary, adjust the float-switch cable. Excessive cable length may cause the motor to overheat and the pump to run dry.

Construction without float Switch
If there is no air vent valve in systems with a check valve, the minimum immersion depth at first start-up must be 300mm.
An air vent valve must be used in systems with an immersed delivery outlet.
Do not start the pump with a completely closed shutoff gate valve.
Never take the pump out of the water while the pump is still operating.

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.
A possible replacement of the cable or the level switch must be carried out by an authorised service workshop.
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.

Cleaning
Check externally that the pump is not encrusted with debris, particularly in the filter area (ref. 1 picture 6). The cleaning consists of the removal of the obstructing material. In case of mud incrustations, use a sharp tool that allows the removal of the material.
Clean the external part of the pump with a cloth and clean water to remove the remaining traces.

Disposal
The final disposal of the device must be done by specialised company.
Make sure the specialized company follows the classification of the material parts for the separation.
Separate the components using water resistant anti-cut gloves.
Reuse or a differential dismantling is preferred.
The device must be disposed in a different way from urban disposals.
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.

Problem	Probable Causes	Possible Remedies
1. The motor does not start	1a. Unsuitable power supply	1a. Check that the mains frequency and voltage correspond to the electrical characteristics shown on the indicator plate. Make sure that the cross section of the cable is compatible with the length of cable and with the motor power.
	1b. Incorrect electrical connections	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.
	1c. Engine overload protective device cuts in	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)
	1d. Blown or defective fuses	1d. Replace the fuses, check the electric power supply and points a) and c)
	1e. Shaft blocked	1e. Remove the cause of blockage as indicated in the “Blocked pump” instruction booklet
	1f. If the above causes have already been checked the engine may be malfunctioning	1f. Repair or replace the engine by applying to an authorised service center
2. Pump blocked	2a. Presence of solid bodies in the pump rotor	2a. If possible, dismantle the pump casing and remove any solid foreign bodies inside the rotor, if necessary contact an authorised service center.
	2b. Bearings blocked	2b. If the bearings are damaged replace them or if necessary contact an authorised service center
3. The pump functions but no water comes out	3a. Check that the valves are open and not blocked	3a. Dismantle the check valve on the delivery pipe and release the valve, if necessary replace it.
	3b. Suction valve closed	3b. Open the suction valve
	3c. Pump suction filter obstructed	3c. Extract the pump, remove and clean the suction filter and if necessary replace it.
	3d. Pump installed above the surface of the liquid (dry functioning)	3d. Increase the depth of installation of the pump as far as compatible with pump performance. Do the same if the problem is due to a lowering of the water table
	3e. Direction of rotation incorrect	3e. Invert the electrical connections from the motor to the power supply terminal

4. Insufficient flow	4a. Pipes and accessories with diameter too small causing excessive loss of head	4a. Use pipes and accessories suitable for the specific application
	4b. Presence of deposits or solid bodies in the internal passages of the rotor and/or in the diffusers	4b. Extract the pump and contact an authorised service center
	4c. Rotor deteriorated	4c. To replace the rotors contact an authorised service center
	4d. Worn rotor and diffusers	4d. Contact an authorised service center to replace the rotors and the sealing rings of the diffusers, or diffusers themselves if worn
	4e. Excessive lowering of the dynamic level of the well	4e. Increase the depth of immersion of the pump as far as compatible with pump characteristics, reduce the flow requested by narrowing the suction valve. Pump too big for the dynamic level of the well
	4f. Incorrect direction of rotation	4f. See 2e)
	4g. Leaking from delivery pipe	4g. Locate the points in which the delivery pipe is leaking, if located in the vertical section of the well, extract the pump and repair the pipe as needed.
	4h. Presence of dissolved gases in the water	4h. Contact an authorised service center.
5. Noise and vibrations from the pump	5a. Rotating part unbalanced	5a. Check that no solid bodies are obstructing the rotor
	5b. Worn bearings	5b. Replace the bearings
	5c. Pump and pipes not firmly attached	5c. Anchor the delivery and suction piping as needed
	5d. Flow too strong for the diameter of the delivery pipe	5d. Use bigger diameters or reduce the pump flow
	5e. Functioning in cavitation	5e. Reduce the flow by adjusting the feeder gate and/or using pipes with a bigger internal diameter. See point 4g) too
	5f. Unbalanced power supply	5f. Check that the mains voltage is right
6. Leakage from the mechanical seal	6a. The mechanical seal has functioned when dry or has stuck	6a. Make sure that the pump casing is full of liquid and that all the air has been expelled.
	6b. Mechanical seal scored by presence of abrasive parts in the liquid pumped	6b. Use a seal suited to the characteristics of the liquid being pumped.
In cases 6a), and 6b), replace the seal, if necessary contact an authorised service center		

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MEMBERS AREA

This section of the **flow**tech© 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©
AFTER SALES SERVICE

At **flow**tech© 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.

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