AquaTech Pressmain

INSTRUCTIONS FOR

GENERAL SAFETY INFORMATION, WARNINGS & CAUTIONS, INSTALLATION, OPERATION & MAINTENANCE.

SA10 SERIES PRESSURISATION UNITS WITH PRESSURE SWITCH CONTROL

MODELS: SA10

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Head Office: AGM House, London Rd, Copford, Colchester, Essex. CO6 1GT UK
Tel: 01206 215121 Fax: 01206 215131

Manchester Office: Dolphin House, 130 Princess Road, Manchester M16 7BY
Tel: 0161 226 4727 Fax: 0161 226 5848

AGM
group member

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0.0 GENERAL SAFETY INFORMATION

- These instructions are intended for the installer/operator/user/maintenance of this equipment and must be kept with the equipment, for the life of the equipment and made available to all persons. Please read GENERAL SAFETY INFORMATION 0.0, WARNINGS 0.1 and CAUTIONS 0.2, 0.3 & 0.4 before doing anything else, and then follow them carefully.
- The unit must only be installed/operated/used/maintained by a competent person; *A competent person is someone who is technically competent and familiar with safety practices and the hazards involved*.
- Hydraulic Accumulators/Expansion Vessels installed as part of/in conjunction with this equipment, with Pressure x Volume above 250 Bar-litres, require regular formal inspection by a *competent person.* This is a Legal Requirement under the "Pressure Systems Safety Regulations" (PSSR) and the Owner/User should be made aware of their responsibility for this. (see section 3. Servicing).
- Failure to install/operate/use/maintain the equipment as recommended below could cause damage to the equipment any anything subsequently connected to it, and invalidate the warranty provided by AquaTech-Pressmain to the buyer.
- Any damage caused to the equipment by misapplication, mishandling or misuse could lead to risk of **Electrocution, Burns, Fire, Flooding or injury to people or property** dependent upon the circumstances involved.
- This equipment contains moving/rotating parts that must remain guarded. Removal of or missing guards could lead to serious personal injury.
- This equipment automatically restarts after a power interruption.
- We accept no responsibility or liability for any consequences or damage/losses due to misapplication, mishandling or misuse of the equipment.
- It should be noted that the assembly of pressure equipment on site under the responsibility of the user (or his representative) is not subject to the Pressure Equipment Directive 97/23/EC. (National legislation covering assembly on site will apply)
- The latest version of this instruction manual with up to date safety information can be downloaded from our website at www.aquatechpressmain.co.uk

0.1 WARNINGS

0.1.1 Do not touch any live parts for at least 5 minutes after switching off the electricity supply. Failure to observe this will constitute a severe Electric shock and/or Burns hazard and may be lethal.

0.1.2 The equipment is only suitable for earth referenced supplies and must be permanently earthed to avoid Electric shock hazard.

0.1.3 With equipment isolator OFF, mains voltage may still be present from BMS system. This constitutes an Electric shock hazard.

0.1.4 Emergency stop button does not remove dangerous voltages from control panel/pump motor assemblies. This constitutes an Electric shock hazard.

0.1.5 Metal parts (e.g. heat sinks) may reach temperatures of 90 degrees centigrade and will constitute a Burns hazard.

0.1.6 Some equipment is designed to operate with liquid temperatures up to 150 degrees centigrade and will constitute a Burns/scalding hazard.

0.1.7 The equipment must not be pressurised beyond the maximum working pressure as stated on pumps/pipework/vessels/control panel otherwise serious mechanical damage/destruction could occur causing injury to people or property.

0.1.8 The equipment must not be heated/chilled beyond the maximum/minimum working temperature as stated on pumps/pipework/vessels/control panel otherwise serious mechanical damage/destruction could occur causing injury to people or property.

0.1.9 Any damage to equipment, pumpset, vessels, pipework or system components caused by misapplication, mishandling or misuse could lead to Electric shock hazard, Burns hazard, Fire hazard, Flooding hazard or cause injury to people or property.

0.1.10 This equipment may contain moving/rotating parts that must remain guarded. Removal of or missing guards could lead to serious personal injury.

0.1.11 Pressure vessels must never be disassembled whilst in use, they contain high pressure air/gas charge which could cause injury to people or property.

0.1.12 Pump motors with lifting eyes; the lifting eyes are only suitable for lifting motors NOT the entire pump assembly. This could cause injury to people or property.

0.1.13 Ensure the base/foundation/plinth/wall to which the equipment is to be attached is sufficiently strong enough to carry the entire mass of the equipment including the water that it will contain under worst-case fault conditions. E.g. fully saturated pressure vessel with no air charge, break tank full to overflowing, etc. Failure to observe this could cause serious mechanical damage/destruction resulting in injury to people or property.

0.2 CAUTIONS FOR INSTALLATION

0.2.1 READ GENERAL SAFETY INFORMATION 0.0, WARNINGS 0.1 and CAUTIONS 0.2, 0.3 & 0.4

0.2.2 The unit should only be installed/operated by a competent person; *A competent person is someone who is technically competent and familiar with safety practices and the hazards involved.*

0.2.3 Do not lift the pumpset by pipework. Lift the pumpset by the container pallet using a pallet/forklift or crane by passing strops underneath the skid using a spreader bar. Failure to utilise these facilities will result in damage to the pumpset.

0.2.4 Store in a dry place to avoid damp conditions deteriorating the equipment.

0.2.5 Protect against dirt, damage and frost. It is absolutely essential that no foreign matter such as pipe thread swarf, welding slag, grit or stones are allowed to enter the equipment. Debris of this type can cause severe damage to the mechanical seals, diaphragms and impeller. Frost/freezing will damage pumps/pipework and control panel components.

0.2.6 The equipment is only suitable for installation in a clean, dust free indoor environment, with adequate protection from heat and frost, and sufficient ventilation to ensure cooling of the motors. Ambient air temperature should be between 5 and 40 degrees centigrade, non-condensating. Operation outside of these conditions could seriously damage the equipment.

0.2.7 If the equipment were to be stored or taken out of service for a period of time (e.g. 1 week or more), then we would recommend draining the equipment of all water/liquid (with due regard to any local regulations) to prevent frost damage to components. When restarting is required we would recommend commissioning by our authorised service agent.

0.2.8 Ensure the base/foundation/plinth/wall to which the equipment is to be attached has sufficient mass compared to the equipment, in order to avoid noise/vibration transmission. E.g. the mass of the base should be at least five times the mass of the equipment.

0.2.9 Ensure the electrical supply is the correct voltage, current, frequency and type for the equipment supplied and that suitable circuit protection equipment is installed in the supply. Incorrect electrical installation could be an electric shock/burns/fire hazard.

0.2.10 When accessing the control panel to make electrical connections adopt anti-static procedures e.g. wear anti-static earthed wristband, to avoid risk of damaging the controller.

0.2.11 All products that are packaged to include Pressure vessel(s)/Hydraulic Accumulator(s)/Expansion Vessel(s) are classed as “Assemblies” under the Pressure Equipment Directive (PED). Where units are despatched with “Loose” vessel(s) for assembly on site it is absolutely essential that they be installed as detailed in the instructions using the

fittings provided where appropriate. Failure to observe this will nullify compliance with the PED and may present a safety hazard. Your warranty may also be affected.

0.2.12 Where Hydraulic Accumulator(s)/Expansion Vessel(s) are supplied as a loose item, they must be installed/connected correctly before operating the equipment, otherwise serious damage from over-pressure/pump overheating could occur.

0.2.13 Do not operate this equipment/pumpset prior to commissioning. This could cause irreparable damage to equipment/pumpset/pipework/system components.

0.2.14 Isolate the equipment/pumpset before pressure testing system. Excess pressure could irreparably damage the pressure switches and the diaphragms of pressure vessel/hydraulic accumulators.

0.2.15 It is the installers' responsibility to ensure subsequent pipework etc can accept the pressures generated by the equipment/pumpset and to install an overpressure safety device into the system with due respect to the suction pressure present on the pumpset, the pump closed valve pressure stated on the pump, the maximum working pressure stated on any of the attached pressure vessels and any other device connected to the system e.g. boilers, calorifiers etc.

0.2.16 When chlorination of the system is carried out, ensure that any residual chlorine is removed by thorough flushing as detailed in the HSE approved code of practice L8, to avoid damaging the equipment/pumpset. The normal level of chlorination is up to 2 parts per million (ppm), but shock dosing for sterilization purposes, at 25-50 ppm for 24-48 hours is acceptable as long as all chlorine is removed once the process is complete. Chlorination beyond these limits could seriously damage pumpset components and WILL NOT be covered by the warranty.

0.2.17 The installer/user is responsible for the installation of the correct earthing and protection according to valid national and local standards. All operations must be carried out by a suitably qualified person.

0.2.18 The equipment is only suitable for earth referenced supplies and must be permanently earthed to avoid electric shock hazard.

0.2.19 The equipment must be permanently earthed with appropriate sized Earthing.

0.2.20 Never perform high voltage resistance tests on control panels, variable speed drives/motors without first disconnecting the panel/drive/motor from the circuit being tested as this will damage the built in electronic components.

0.2.21 Metal parts (e.g. heat sinks) may reach temperatures of 90 degrees centigrade.

0.2.22 Do not use the "Pressurisation unit" for filling the system pipework. These types of equipment are only suitable for topping up small losses/leaks in the system. A separate means of filling e.g. a quick fill loop (check with local water regulations first!) should be used instead, with the system connection valve to the equipment closed.

0.2.23 Where "Expansion vessels" are used on LTHW heating system pressurisation units, the temperature of the fluid returning to the vessels should not exceed 70 degrees Centigrade as this could damage the vessel diaphragm. Where the temperature exceeds 70C an intermediate cooling vessel should be fitted.

0.2.24 For MTHW and HTHW pressurisation units use a Nitrogen vessel suitable for the system conditions. Please contact AquaTech-Pressmain for further information.

0.2.25 Do not use the "Pressurisation unit" for dosing the system with chemicals. Only allow clean cold water into the break tank. Anything other than clean cold water could damage the pumps/pipework components.

0.2.26 Drain cocks/valves and air bleed screws must not be left open as this could cause flooding.

0.3  CAUTIONS FOR OPERATION/USER

0.3.1 READ GENERAL SAFETY INFORMATION 0.0, WARNINGS 0.1 and CAUTIONS 0.2, 0.3 & 0.4

0.3.2 The unit should only be operated/used by a competent person; *A competent person is someone who is technically competent and familiar with safety practices and the hazards involved.*

0.3.3 The Owner/User of this equipment has a Legal Responsibility to ensure that it is subject to regular formal inspections. See Servicing, for details.

0.3.4 Where Hydraulic Accumulator(s)/Expansion Vessel(s) are supplied as a loose item, they must be installed/connected correctly before operating the equipment; otherwise serious damage from over-pressure could occur.

0.3.5 The equipment must not be run until commissioned by an authorised AquaTech-Pressmain agent, this could irreparably damage the pump equipment and/or system components/pipework connected to it.

0.3.6 The pumpset should be left switched ON with the pumps switched to AUTO for normal operation.

0.3.7 The pumpset should not be left in “Hand” operation for more than 1 minute. This could lead to severe damage of pumpset components and/or pipework system from over-pressure and/or overheating.

0.3.8 Ensure pumpset has an adequate water supply at all times to prevent dry running causing pump seal damage and water leakage.

0.3.9 Do no attempt to start pumps without liquid in volutes (pumps must be fully primed); mechanical seals must have a film of liquid between faces for proper operation and to prevent damage.

0.3.10 Portable telephones or other electro-magnetic equipment must not be used near the equipment to avoid corruption of program and unpredictable operation of unit.

0.3.11 For Pressurisation units utilising Nitrogen Vessels (generally HTHW units) ensure there is an adequate supply of Nitrogen at all times to avoid mis-operation of the equipment.

0.4  CAUTIONS FOR MAINTENANCE

0.4.1 READ GENERAL SAFETY INFORMATION 0.0, WARNINGS 0.1 and CAUTIONS 0.2, 0.3 & 0.4

0.4.2 The unit should only be operated/maintained by a competent person; *A competent person is someone who is technically competent and familiar with safety practices and the hazards involved.*

0.4.3 Where the pumpset is fitted with Building Management Services (BMS) interconnections, notify the appropriate persons before switching OFF for maintenance or adjustments, to avoid unnecessary alarm conditions occurring. WARNING: With pumpset isolator OFF, mains voltage may still be present from BMS system. This constitutes an Electric shock hazard.

0.4.4 To prevent seizing, pumpsets must not be left unused for long periods (e.g. 1 week).

0.4.5 The pumps must be run regularly to avoid stagnation of water in the pumps/pipework (e.g. daily).

0.4.6 Do not vent air from air valves on vessels. These are for adjustment of pre-set cushion pressures. If wrongly adjusted this will lead to incorrect operation of the pumpset and possible damage to pumps, pipework and system components from overheating and over-pressure.

0.4.7 Switch OFF pumpset before accessing pumps and/or control panel.

1.0 Installation

The unit should be position on a firm level base which should be no less than 75mm above floor level.

The atmosphere should be dust free, and ambient temperature must not fall below 4°C (40°F). Standard units are supplied in two pieces the control module and spill tank combined as one piece, and the pressure vessel as a separate item. The pressure vessel screws into the fitting provided on the top of the spill tank framework. The pressure vessel has been pre-charged with nitrogen to the correct pressure for the system.

There are only three pipe work connections to the unit as follows: -

1.1 The ball valve should be connected with pipe work sized not less than the valve itself. Minimum water pressure to this valve is 20 p.s.i.g., if it is less than this contact Pressmain**.**

1.2 An overflow connection suitably sized is provided

1.3 The ¾" BSP Gate valve is connected to the return header to the system (boiler inlet).

If the run of pipe work is excessive or many bends are installed, it may be necessary to increase the size of pipe work accordingly.

Where the system has not been washed out, the possibility of dirt, solids, swarf exists; an inline strainer should be fitted on the system side of the ¾" Gate valve.

It is essential that no strain is placed on the units pipe work and at least one air vent should be fitted to the system.

2.0 Commissioning

The equipment should be fully checked to ensure all connections are made, electrical supplies are correctly rated, voltage fuse size etc.

The system once back filled to 10 p.s.i.g. below the working pressure of the system should then vented.

DO NOT use the pump/s on the pressure unit to fill the system,

There is a valve situated just above the pump discharge port **DO NOT** interfere with this valve. The valve has been pre-set at the factory and locked off in the correct position to ensure the pump operate to the correct efficiency of the unit.

On ensuring the spill tank is clean internally, the water supply to the ball valve should be opened, and left until the water level has risen to close the ball valve. The ball valve has been factory set to ensure the correct water level of mains cold water is maintained, any interference with this setting could result in the tank overflowing when expansion from the system takes place. When the ball valve closes the equipment is now ready to operate.

Ensure the system valve is shut. The equipment is now ready for switching on, electrically.

The equipment is fully tested and pre-set for the individual systems it is designed for.

The electrical supply should be switched on (in the case of 3 phase motors check the rotation is correct as marked on the pumps; reverse mains if incorrect).

With the pump operating, the pressure will rise until the pump stops at a pre-determined set point. (It may be necessary to open the system valve for a short period whilst the pump is running, to purge the pump/s of air). A purge plug is fitted on top of the pumps.

The equipment is fitted with high and low pressure switches. Until the pressure is near the cut-out point of the pump/s, the low pressure switch will be open circuit.

Once it is determined that the pump is running correctly and in the correct rotation and that the air in the pump has been purged, the unit system valve may now be opened slowly, the pump will again operate until the system pressure is equal to that of the unit.

The system is now ready for operation.

3.0 Operation

Pressure is maintained on the system by the pump/s controlled from a pressure switch, thus contraction or loss of water from the system will bring the pump into operation. As the boiler burners start firing and temperature increases, the pressure will slowly rise,

Initially expansion from the system will be taken up by the nitrogen charged diaphragm pressure vessel, after which the expansion solenoid which is controlled by a pressure switch will open at a pre-set pressure. Water will discharge from the system into the spill tank. This will continue until the pressure falls 3-4 p.s.i.g, when the solenoid will close. This transfer cycle will continue until the system temperature is stabilised.

When the system temperature is falling, the unit pump/s will operate at 8-10 p.s.i.g, below the maximum working pressure that the unit has been set at.

3.1 High And Low Pressure Switches

These switches are already fitted to the equipment and for convenience they have been pre-set and tested at our factory. There are terminals for interlocking the heat source or fail safe valve on the primary circuit of the calorifiers in the event of a high or low pressure. These are all marked on the electrical drawing provided with the equipment.

3.2 Two Pumps Units

The advantage of these units being that where a pump failure could be detrimental to the operation of the building or where equipment is situated in plant rooms with little or no maintenance.

The equipment is designed to give maximum efficiency.

With both pumps running on rising pressure, one pump would cut out at a pre-determined pressure setting, approximately two p.s.i.g above this the second pump would cut out.

The equipment is fitted with an electronic automatic pump changeover unit. This cycles the duty pump operation from one pump to the other, e.g. on falling pressure, No. 1 would cut in and run up to pressure. The next time the pressure falls; No. 2 pump would cut in run up to pressure, then back to No. 1 and so on. This eliminates the problem of pumps seizing up through lack of use, and als the wear and tear to both pumps.

4.0 Spares, Maintenance and Emergency Assist.

The Aquatech-Pressmain equipment that is described in this instruction booklet has been manufactured to the highest standards of design and quality. It will give trouble free operation over many years provided it is maintained regularly from when it is commissioned.

To keep it operating efficiently in a safe, economical and environmentally friendly condition, regular maintenance is an essential part and the following checks should be made;

4.1 Check the Nitrogen/Air supply in the Pressurisation Units control vessel and in the systems expansion vessel(s), which should be recharged as per the data sheet

4.2 Ensuring that the tank spill is kept clear of debris which may foul the pump suction parts. If the equipment has been out of use for some time, through storage or ‘Summer shut down’, make sure that the pump has not seized by removing the fan cover and rotating the pump

4.3 If the equipment has been idle for a period of time check that the pumps rotate before switching the unit back on

4.4 All electrical control gear connections should be tightened, and starter contacts examined, (where applicable).

Our Engineer’s are able to service and maintain all the leading types of pumping, pressurisation and booster equipment. The team already provides this service for many leading construction companies, facilities organisations and end users in the U.K. and Europe.

To discuss how we can help you with your maintenance and spares requirements please call 0161 226 4727

5.0 DISPOSAL

Disposal of this product or parts of it must be carried out in accordance with the following guidelines:

5.1 Use the local public or private recycling/waste collection service.

5.2 In case such a recycling/waste collection service does not exist or cannot handle the materials used in this product, please deliver the product or any hazardous material from it to your nearest AquaTech-Pressmain office.

EC Declaration of Conformity

We, AquaTech-Pressmain Limited, declare this Pressure Equipment Assembly:

PRESSURISATION UNIT
MODEL : SA10

meets the requirements of EEC Directive:
Pressure Equipment Directive 97/23/EC (PED)

PED Conformity Assessment Modules : B + D
Notified Body : BSI Product Services,
Maylands Avenue
Hemel Hempstead
Hertfordshire
HP2 4SQ

Type Examination Certificate Ref. CE95657

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I.D.Taylor, I.Eng. MIET, Director, AquaTech-Pressmain Limited.

AquaTech-Pressmain Limited
AGM House, London Rd, Copford, Colchester, Essex CO6 1GT UK
Telephone: 01206 215121 Fax: 01206 215131
130 Princess Road, Manchester. M16 7BY UK
Telephone: 0161 226 4727 Fax: 0161 226 5848