

AquaTech Pressmain

INSTRUCTIONS FOR

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

AF SERIES PRESSURISATION UNITS WITH PRESSURE SWITCH CONTROL

MODELS: AF1, AF2








ISSUE: 5 18/03/10

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

CONTENTS

0.0 GENERAL SAFETY INFORMATION		..... 3
0.1	 WARNINGS	..... 3
0.2	 CAUTIONS FOR INSTALLATION	..... 4
0.3	 CAUTIONS FOR OPERATION/USER	..... 5
0.4	 CAUTIONS FOR MAINTENANCE	..... 6
1.0 INSTALLATION		..... 7
2.0 COMMISSIONING		..... 7
3.0 SPARES, MAINTENANCE AND EMERGENCY ASSIST.		..... 7
4.0 DISPOSAL		..... 8
<u>EC DECLARATION OF CONFORMITY</u>		..... 8



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 situated, as far as possible in a dry, dust free atmosphere.

Position the unit on a firm level base, and connect the mechanical pipe work connections as follows: -

The make up tanks ball valve(s) 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 this is less, then consult AquaTech Pressmain.

The make up tanks should have an overflow connection, suitably sized which is provided.

The system gate valve is connected to the return header of the system, if the pipe work run is excessive or numerous bends are installed it may be necessary to increase the size of the pipe work accordingly. Where the system has not been washed out, and the possibility of dirt, solids, swarf exists, an in-line strainer should be fitted together with a system isolation valve (Lockshield).

Between the pressurisation unit and the system return header the expansion vessel/s will have to be connected into the pipe work. Each vessel is to be fitted with an isolating valve and drain valve (for maintenance purposes)

At least one air vent should be fitted to the system pipe work adjacent to the pressure unit and consideration should be made to fit a suitably sized air separator.

The electrical supply for the unit is 230V. The mains supply to the control panel should be sized correctly for the size of pump motors supplied with the pressurisation unit. (This may vary with different working pressures).

2.0 Commissioning

The system should be back-filled to a pressure of ONE BAR. We would not advise the use of the pressurisation unit pumps to fill the system.

Ensure the water make-up tank is full and the ball valve isolation valve is open.

Ensure that the pump(s) have been vented and primed

Switch on the electrical power; slowly open the pressurisation unit system valve. At this point one or both pumps may start, they will continue to run until the boost pump cuts out. The duty pump will then continue to run until the pressure reaches the cold fill pressure of the system.

At this point both pumps should be off unless the system pressure falls down again. If this happens check for water leaks or air in the system. Once the system is pressurised the heat source can be switched on.

3.0 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;

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

If the equipment has been idle for the summer months check that the pumps rotate before switching the unit back on.

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

4.0 DISPOSAL

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

- 4.1 Use the local public or private recycling/waste collection service.
- 4.2 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 : AF**

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



7.4.2009

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