ARMSTRONG

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Installation, Commissioning and Maintenance

Pulpress Pro Prestige

2.7: 5.5: 8.0 bar Pressurisation Packaged Sets

Introduction

This leaflet contains specific information regarding the safe installation and operation of the packaged set mentioned.

These instructions must be read and understood by anyone responsible for the installation and maintenance of this equipment.

Noise Emissions
This equipment runs at a level lower than 70dBA.

Warning Symbols

Safety instruction where noncompliance would affect safety.

Safety instruction where an electrical hazard is involved.

ATTN Safety instruction relating to safe operation of the equipment. (ATTENTION)

Instructions for Safe Use

General This equipment has been designed for the pressurisation of sealed heating, chilled water and closed-condenser water systems to the operating conditions shown. No installation of this equipment should take place until this leaflet has been studied and understood. Handling, transportation and installation of this equipment should only be undertaken with the proper use of lifting gear.
This equipment must always be stored and installed in a dry frost-free environment.

Installation

1. The Pulpress unit should be sited with good access to the front, top (min. 400mm) and both side panels for ease of maintenance.
2. Connect the expansion pipeline which links vessels to the system on the suction side of the circulating pumps. Quick-fill and isolating valves must also be fitted in this line to ease servicing. See installation schemes (page 3).
3. Extend the ¾" plastic overflow connection pipe from the Pulpress to a position where an overflow will cause a nuisance and be remedied.
4. Connect the Pulpress ball valve ½" BSP to a suitable water supply, incorporating a stop cock.
   Note:
   If the pressure available at the ball valve is below 0.3 bar, fit the low pressure orifice provided (located on the ball-valve arm).
5. Make electrical connections to the Pulpress using a suitably fused supply. Maximum cable size to all terminals 2.5mm^2 except main supply to disconnect switch to be 4mm^2. Check accompanying data sheet/ wiring diagram for electrical details.

Ensure unit is earthed correctly.

Commissioning

1. Fill the system with water via the quick-fill connection, up to the system fill pressure.

ATTN The running time of pumps fitted to this unit should be limited to 4 hours in any one 24 hour period.
Do not use the Pulpress to fill the system.

It is essential that all air in the system is allowed to escape freely via the automatic air vents and radiator cocks etc. Failure to remove all air could result in system malfunction.
(See leaflet on Air Eliminators).

2. Turn on water supply feeding Pulpress Unit, and fill break tank.

Under no circumstances should water treatment crystals/chemicals be introduced into the system via the Pulpress break tank.

3. Check pumps have self-primed by loosening bleed screw on each pump housing. Continue to let water escape until no air is present.
   Re-tighten nuts.
   Never let pumps run dry.

4. With all unit switches in the 'Off' position switch on the power supply to unit.

Operation

Operators must acquaint themselves with the operation of this equipment by studying the Multi-pump Controller Operating Instructions before this equipment is used.
All parameter settings should have been factory set and should not need altering. If necessary these settings can be checked/amended by scrolling through the parameters and checking against data sheet supplied.

Control is achieved by means of a pressure transducer connected to the electronic controller. Each pump can be operated independently of controller status by operation of the test mode (will automatically revert to original mode after time delay) or manual mode, except when a danger of `Low Level' prevails in the break tank. In this event pumps would be locked out.
Note The 'Hand' positions are for commissioning procedures only. Left in this position the system could be overpressurised which might result in pumps overheating. Pumps must be left in the 'Auto' position for normal operation.

Turn the disconnect switch to the 'On' position.
Note All units are supplied with pumps in the 'Off' position, display should read 'System Off'.

Press the scroll button repeatedly until the parameter set up mode is reached, (between button operation there will be a short delay while the display PCB communicates with the mother board to check and register requests). Press 'Enter', select pump One to the 'Auto' position by pressing the 'Up' button.
Press the scroll button to move on to 'Pump Two', repeat as for 'Pump One'. Press the scroll button repeatedly until the front screen is reached, which should now read 'System On Auto' and 'System Pressure'.
Once leaving the parameter setup screen, if the system pressure is below the pump cut-in pressure the pump will automatically start.

The unit will now maintain the system pressure as set out in the design criteria, and will only operate when the pressure falls below the system fill-pressure, to the pump cut-in pressure.
The pump control pressure generally operates on a 0.2 bar (3 lb.f/in^2) differential. When a pressure drop occurs (due to leakage from the system) water leaves the membrane vessel, whereupon the pressure transducer, via the electronic control, activates the pump to recharge the vessel and the system.

Should the system pressure not rise but continue to fall, then at 0.1 bar (1.5 lb.f./in^2) lower than the duty pump cut-in pressure, the duty pump is assumed to have failed; it is locked out and the standby pump is brought into operation.
When the standby pump has completed its cycle, pressing the 'Reset' button will bring the duty pump back into the normal operating sequence.

Automatic rotation of the duty pump occurs after every operation.
In the event of a pump being tripped, it will be locked out until manually reset; the system will continue to operate on the standby pump.

Operation and system pressure is visually indicated on the door mounted mimic display.

Note If system pressure settings are changed from the factory settings, then the gas fill pressure in the small membrane vessel should be amended accordingly, approximately 0.48 bar below pump cut in pressure.

Remote Inhibit
An external normally-open contact may be used to remotely inhibit the unit operation. This will have the effect of stopping the pumps from running, however, the unit will continue to operate in all other aspects.

Pump Running
The appropriate LED will be illuminated and the volt-free contact operated.

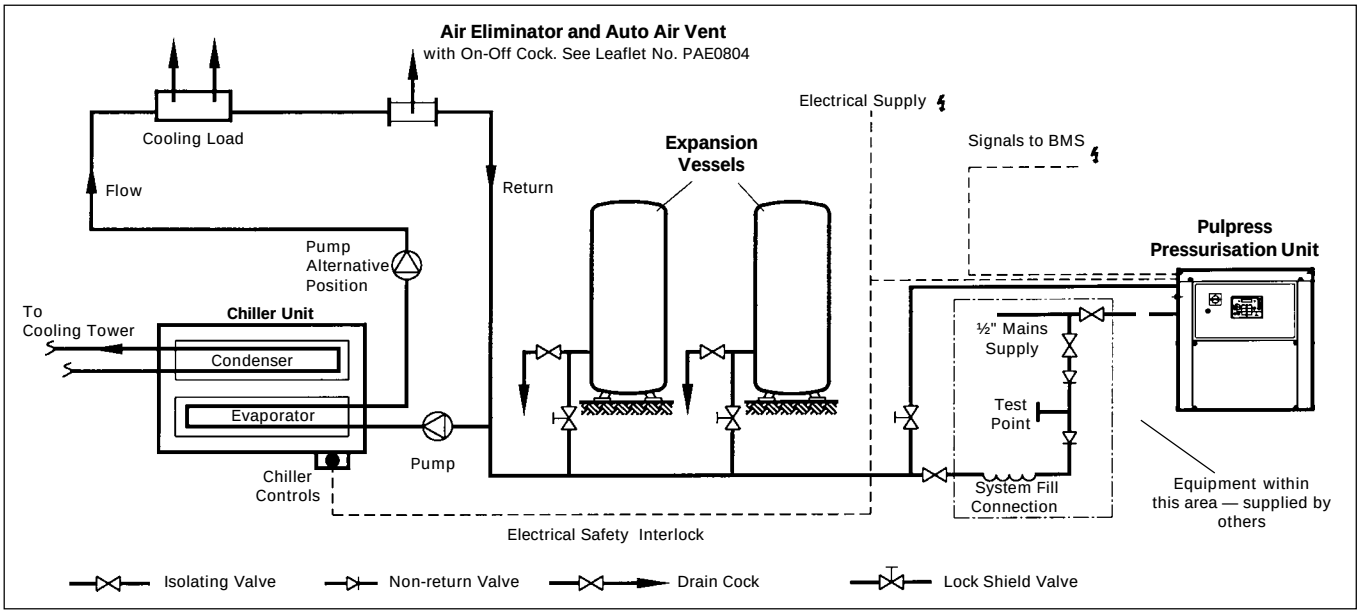
Alarms
In the event of an alarm occurring, the appropriate LED indicator will be illuminated, the common fault LED will flash and the alarm logged in the alarm display window. The 240V fed common audible alarm contact will operate as well as the individual volt free contact. Whilst the alarm is still active, the 'Accept/Mute' button operation will reset the audible alarm contact and bring the Common fault LED to a steady state. If a subsequent alarm takes place the above two conditions would reactivate. When the alarm clears the appropriate LED will be extinguished, the common fault LED (if already accepted) will remain in a steady state until operation of the 'Reset' button which will extinguish the LED and remove the alarm from the alarm window.

Excessive Operation
This alarm will operate if there have been 8 successive starts within a 16 minute period or an accumulation of run times totalling 16 minutes in a 20 minute period. LED indication and volt-free contact operate in the same manner as above.

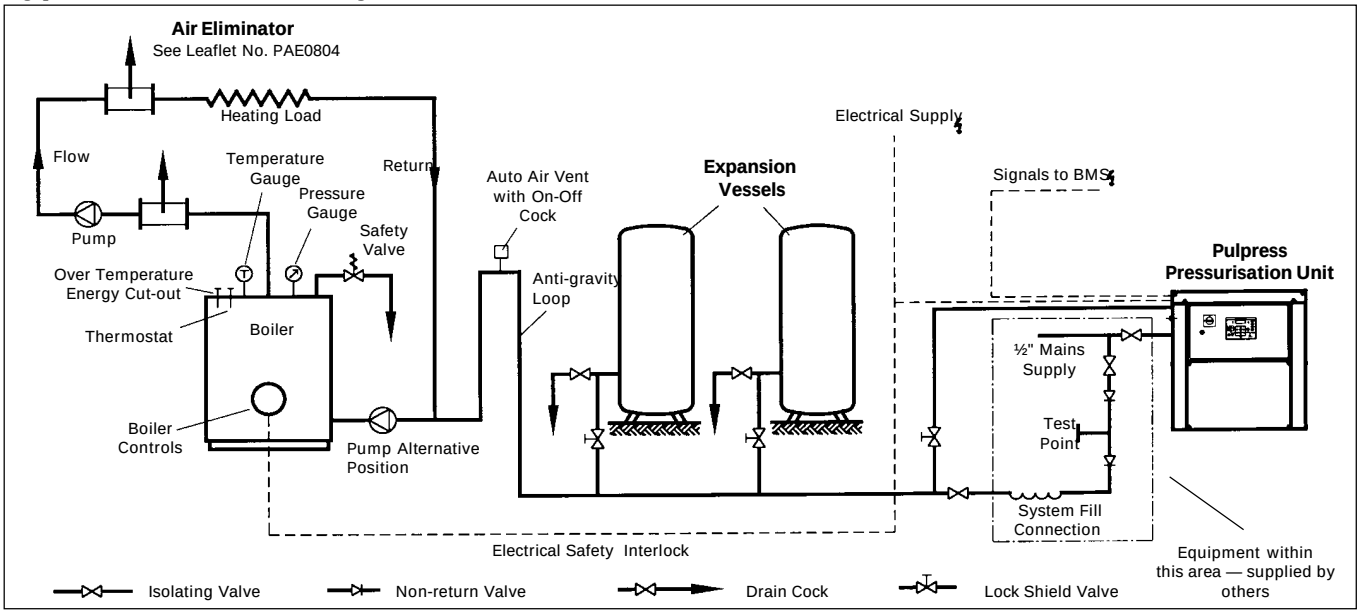
Break Tank
On water level falling from the warning probe, the Warning Level alarm will be activated, and the unit will continue to operate. If the water level continues to fall below the danger probe, the Danger Level alarm will be activated, at this point the unit will be locked out and pumps will no longer operate. When the water level rises to the reset probe (indicated by the Warning Level LED being extinguished) the unit can be reset by operating the 'Reset' button. LED indication and volt-free contacts operate in the same manner as above.

Installation Schemes

Typical Chilled Water System



Typical LTHW Sealed System max. 100°C



Boiler/Chiller Interlock

An independent normally-closed circuit is provided for this function, which consists of a Warning Low WaterLevel contact, High System Pressure contact and a Low System Pressure contact, any of which operating, will open the boiler/chiller circuit. If the High Pressure contact is not required, with chiller application, it can be omitted by adding a wire link. See wiring diagram for details.

Pump Trips

In the event of a pump tripping out , it will automatically be locked out of the rotation sequence and the unit will continue to operate on the remaining pump.

When the cause for the pump tripping has been rectified the tripped pump may be reset by switching off the disconnect switch and resetting the appropriate MCB within the control cubicle.

NOTE:

Powering down will automatically remove all previously logged alarms.

LED indication and volt-free contact operate in the same manner as above.

Typical Sealed System (MTHW) max. 120°C

This arrangement is similar to the LTHW system, shown in the schematic above, with the following addition:-

An intermediate vessel, which accommodates expanded hot water from the system, is installed between the System and the Pullen expansion vessel. Expanded water entering the Pullen expansion vessel from the intermediate vessel will be cooler.

WARNING NOTES:

Packed-gland circulating pump MUST NOT be used on sealed systems.

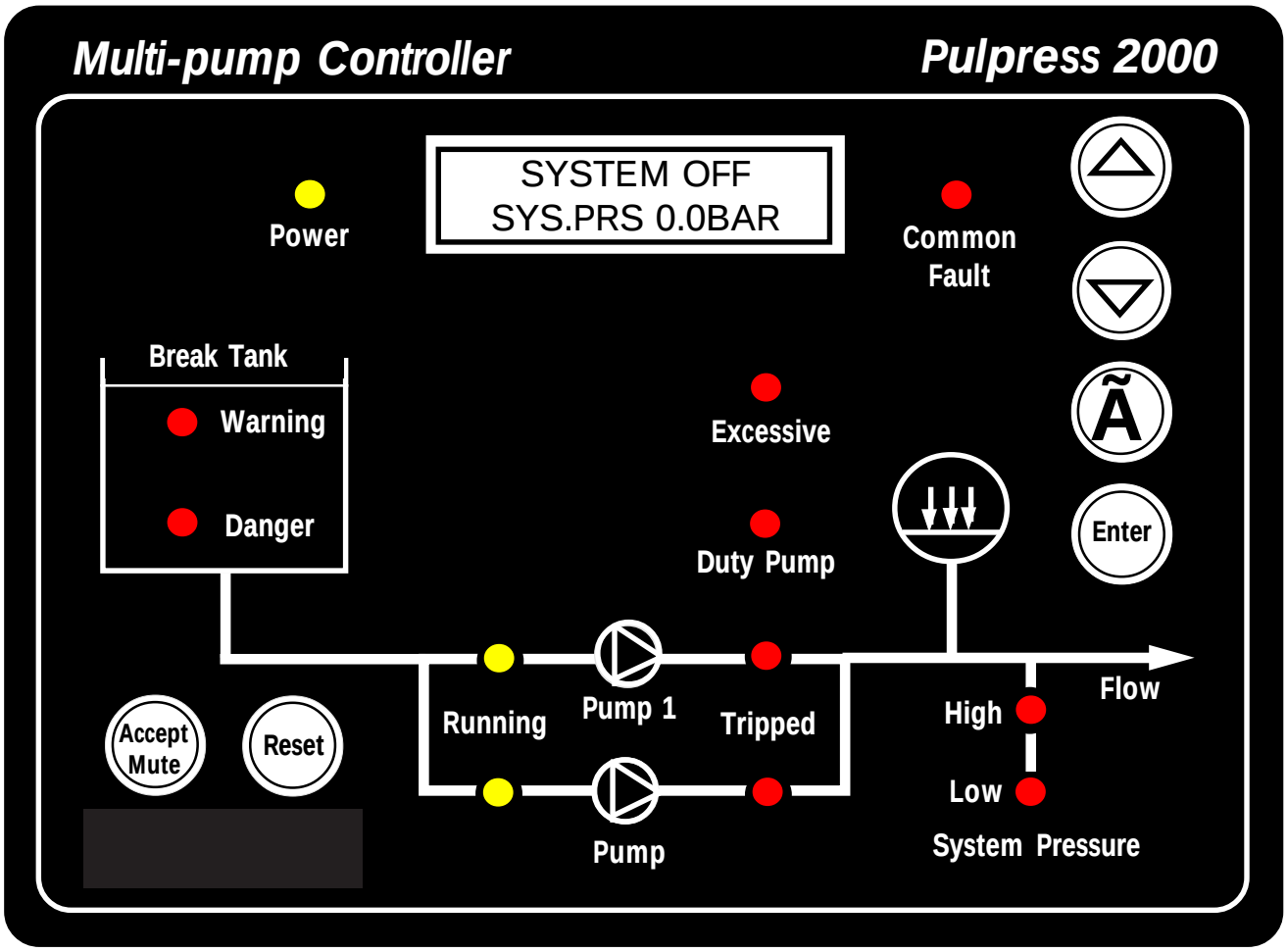
No part of the set, expansion vessel, intermediate vessel or connecting pipe is to be lagged.

ATTN

Precautions should be taken to ensure that Lock Shield Valves are protected against unauthorised closure.

Water treatment chemicals MUST NOT be added to the system via the Pulpress break tank.

Pulpress Pro Prestige
Multi-pump Controller



Fascia Plate for the Pulpress Contoller

Preface

The Pullen microprocessor controllers are designed for ease of setting and operation. Access to information, and setting the parameters has been made quick and simple by dividing the main menu into four segments ALARMS, HOURS RUN, PUMP TESTS and PARAMETER SET UP.

All Pullen packaged pump systems are pre-wired and fully tested, both hydraulically and electrically prior to dispatch.

All parameter data has been entered into the controller in accordance with system criteria. Once on-site connections have been made, and all pre-checks carried out the system is ready to operate.

If during commissioning system conditions are found to vary from those set out in the design criteria, the parameters can be easily changed.
(See section on parameter set up).
These Multi-pump Controller Operating Instructions describe the ease of pump-set operation and adjustment for PULPRESS® 2000 pressurisation systems.

Introduction

When a pump set leaves the factory, it will be set so all pumps are in the 'OFF' position on initial power up.

Prior to power being applied, it is essential that all pre-commissioning procedures are carried out in full.

Operating and maintenance instructions for the Pulpress 2000 should be read in conjunction with these Multi-pump Controller Operating Instructions.

Operators and installers must familiarise themselves with the operation and controls of the equipment, with special attention being paid to the Hand, Off, Auto section before power up.

The electronic controller consists of a mother board which is mounted on the internal base plate of the electrical cubicle and a display board which is mounted on the cubicle door. Communication between the two boards is via an RS232 coms link. Information being transmitted between the two boards is checked many times for errors, therefore to avoid instructions being ignored, successive button operations should not be too rapid.

In the unlikely event of the coms. link becoming disconnected, and communications being lost between the two boards, the unit **will continue to operate and maintain the system pressure as set out in the parameters before communication was lost,** however all visual displays will be lost until the link is restored.

Pressure Transducer

Should an open circuit fault occur in the transducer circuitry, the digital display will read full scale i.e. (above 250psi). This will cause the high pressure alarm to activate and stop further pump operation.

Operating and Setting procedure

1. Switch disconnect switch to the 'ON' position. Display will show:
   UNIT STARTING.
2. After 5 seconds the display will show UNIT PRESSURISATION.
3. After a further 5 seconds display will show SYSTEM OFF and SYS PRESSURE 0.0BAR.
   Unless the unit is in the remote inhibit mode, the display will then show REMOTE OFF and SYS. PRES. 0.0BAR

Note:
In this position all parameters can be accessed with the exception of the pump test and pump Man/Auto section. To access all parameters ensure unit is not in the inhibited mode.

To access parameter set up

1. Press ↵ once and the alarm status display will be shown. Press ↵ once more and the pump 'Hours Run' screen will be displayed. Press ↵ once more and the pump 'Test' screen will be displayed. Press ↵ once more and the parameter screen will be displayed.
2. Press the 'Enter' button and display will show Pump 1, select OFF.
   Press 'Up' button to select 'Auto' or 'Down' button to select 'Manual'.

Note:
If pump 1 is selected to 'Manual', pump 2 will automatically be switched to the OFF position and vice versa, only one pump can be operated at a time.

3. After a pump has been selected to 'Manual', care should be taken to ensure that when it is returned to the 'Auto' position, the opposite pump parameter also has its pump returned to the 'Auto' position.
   The 'Manual' position is for commissioning purposes only. Left in this position, the system could be over-pressurised and the pump become overheated.
   (Where possible the 'Pump Test' section should be used for commissioning purposes.) Both pumps should be left in the 'Auto' position for normal operation.
4. Press ↵ once and the display will show pump 2

select, operate as pump 1.

5. Press ⏎ once and the display will show duty pump cut-in pressure. Press the 'Up' button to increase or 'Down' button to decrease figure. This is normally set at 0.2 bar below the fill pressure.
6. Press ⏎ once and the display will show Standby pump cut-in pressure. This is normally set at 0.1 bar below the duty pump cut-in pressure, to change setting press 'Up' or 'Down' button.
7. Press ⏎ once and the display will show pump cut-out pressure. This should be set to the system fill pressure. To change setting press 'Up' or 'Down' button.
8. Press ⏎ once and the display will show HIGH pressure alarm operates at, this is normally set at 0.2 bar above final system pressure. To change setting press 'Up' or 'Down' button.
9. Press ⏎ once and the display will show HIGH pressure alarm resets at. This should be set at 0.2 bar below the high pressure alarm operating point. To change setting press 'Up' or 'Down' button.
10. Press ⏎ once and the display will show LOW pressure alarm operates at. This should be set at 0.1 bar below the standby pump cut-in pressure. To change setting press 'Up' or 'Down' button.

11. Press ⏎ once and the display will show LOW pressure alarm resets at, this should be set at 0.1 bar above the low pressure alarm operating point. To change setting press 'Up' or 'Down' button.

12. Press ⏎ once more to return to the system status display screen.

To access Logged Alarms

1. Press ⏎ once from the system status display screen and the display will now show alarm status.
2. To access logged alarms press 'Enter'. If no alarms exist the system status display screen will once again be displayed. If an alarm has been logged, the display will show which individual alarm has been activated. If more than one alarm is logged press ⏎ once to view each alarm.
3. Once all alarms have been viewed pressing the 'Scroll' button (⏎) will automatically revert back to the system status display screen.

Note:
Pressing the 'Reset' button will remove all alarms that are no longer active from the window and from memory.

To access Pump Hours Run

1. Press ⏎ once and the alarm status display will be shown.
2. Press ⏎ once more and the Pump Hours Run screen will be displayed.
3. Press the 'Enter' button and pump 1 Hours Run will be displayed.
4. Press ⏎ once and pump 2 'Hours Run' will be displayed.
5. Press ⏎ once more and the system status display screen will automatically be displayed again.

To access Pump Test

1. Press ⏎ once and the alarm status display will be shown.
2. Press ⏎ once more and the pump 'Hours Run' screen will be displayed.
3. Press ⏎ once more and the pump 'Test' screen will be displayed.
4. Press the 'Enter' button and the display will show pump 1 'Test Off'.
5. To turn pump on, press 'Up' button once and pump 1 will now run. After 30 seconds the pump will automatically turn off and display will revert to the standard front screen.
6. To turn pump off before 30 seconds have elapsed press the 'Down' button and pump will be switched off.
7. Press ⏎ once to move on to pump 2 'Test'. To operate press 'Up' or 'Down' buttons as for pump1.
8. Press ⏎ once more to return to the system status display screen.

Parameter Presets

Access to this parameter is restricted to authorised service personnel only.

Accept/Mute Button

In the event of an alarm occuring, the Accept/Mute button can be operated to silence the external audible alarm (if fitted) and bring the flashing Common Fault LED to a steady state. If a subsequent alarm operates, the audible alarm will be sounded again and the Common Fault LED will re-flash.

Reset Button

Once the alarm has been accepted and is no longer active, the reset button can be operated to clear the now steady Common Fault LED and remove alarms that have been logged.

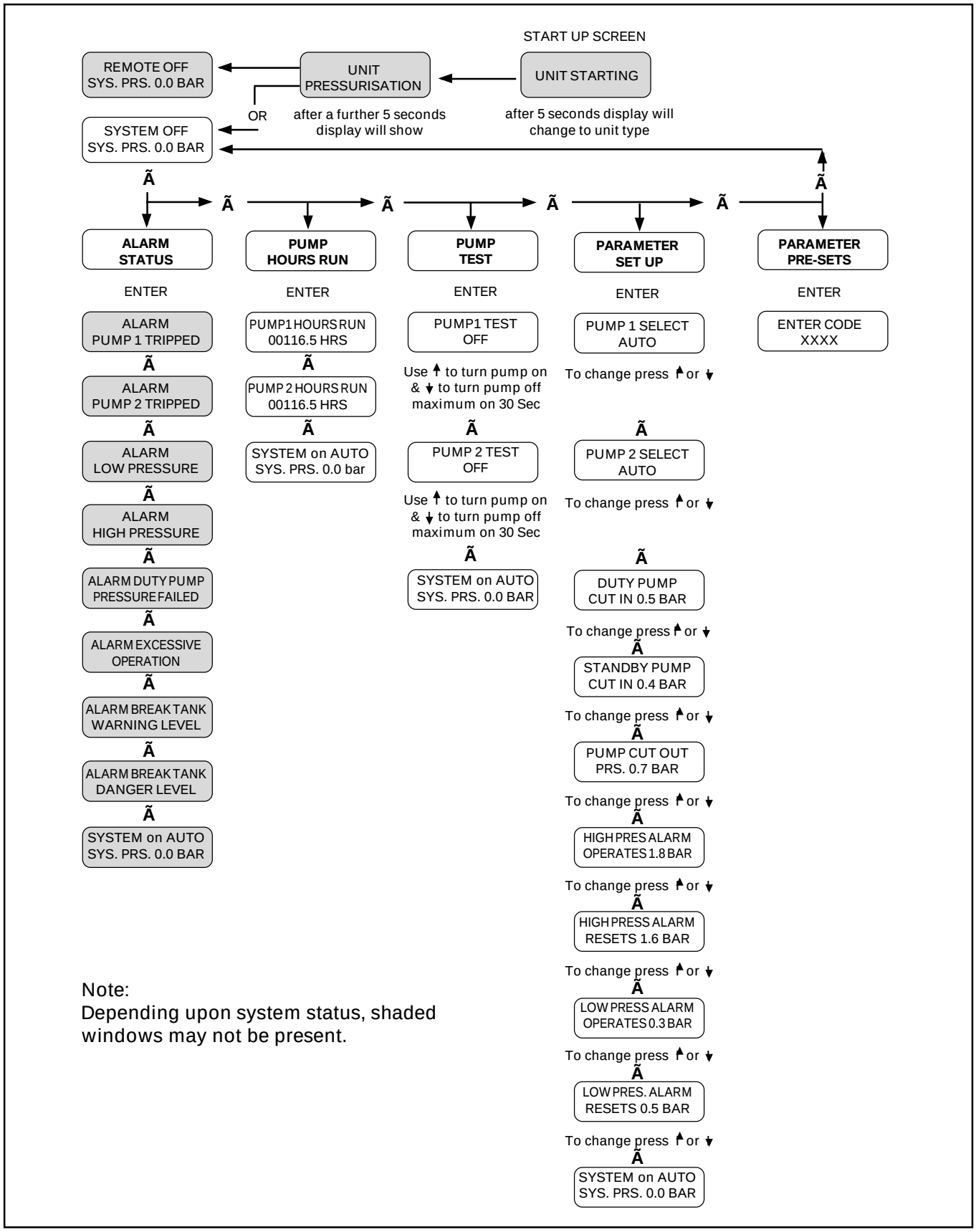
Note:
In the event of a danger warning level occurring in the break tank, pumps will have been locked out. Once the water level has been restored, the 'Reset' button must be operated before the pumps will operate again.

Electrical Data

For information on supply voltages, contact ratings and fuse values refer to product wiring diagram and data sheet.

Schematic flow chart

showing all possible display messages



Note:
Depending upon system status, shaded windows may not be present.

Fault Finding Guide

Ensure that unit is isolated from all electrical supplies, and pressure is released from the unit before any maintenance work is carried out.

Fault	Possible Cause	Possible Remedy
The unit will not power up	1 No power supply 2. Control circuit breaker tripped 3. External connections to the unit have not been made correctly.	1. Restore supply 2. Investigate cause and reset 3. Check wire connections have been made to the correct terminals in accordance with the appropriate wiring diagram
Power light on but pumps will not run	1. Pumps selected to the Off position 2. System inhibited from remote source 3. Incorrect pressure settings on pump control circuit 4. Pump circuit breaker tripped	1. Set pumps to the Auto position 2. Switch remote inhibit off 3. Check the settings are in accordance with data sheet 4. Investigate cause and reset
Pumps will not alternate	1. One of the pumps is switched to the Off position 2. Duty pump failed and locked out	1. Enter parameter mode and set both pumps to Auto 2. Press Reset button
Pumps run but will not develop adequate pressure	1. Break tank empty 2. Air in pump housing 3. System pressure setting valve left in Open position 4. Break in system pipework	1. Reinstate water supply to break tank 2. Vent pump and remove air 3. Return valve to the Closed position 4. Repair break in pipework
Pumps switch on and off rapidly (bounce)	1. System vessel has incorrect pre-charge 2. Pump control pressure settings have been set with differential too small 3. Air in control lines to transducer	1. Check pre-charge of vessel is in accordance with data sheet 2. Check pressure settings are in accordance with data sheet 3. Evacuate all air from control lines
Break tank overflowing	1. Leaking ball valve 2. Pump non-return valve not seating correctly 3. Pressure setting valve left in the OPEN position	1. Replace ball valve-washer/seal 2. Clean/replace non-return valve 3. Close pressure setting valve

Maintenance

Regular Checks (every 3 months).

1. Check that the pump is developing the correct pressure and is not noisy or vibrating.
2. Check that the mechanical seal is not leaking.
3. Check that the motor is not overheating.

At 6-monthly Intervals:-

1. Check the gas fill pressure in the small membrane vessel. This can be effected by isolating the Pulpress Unit from the system and draining water from the vessel via the drain valve (see G.A. drawing). Check vessel gas charge with a tyre gauge and recharge as necessary with Nitrogen or dry air. The main expansion vessel/s should be checked in a similar manner.
2. Check the electrical installation thoroughly for defects. Ensure that the earth connections are making good contact.
3. Check that the make-up cistern is clean.
4. Check the operation of high/low pressure switch.

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