



# Operation & Maintenance

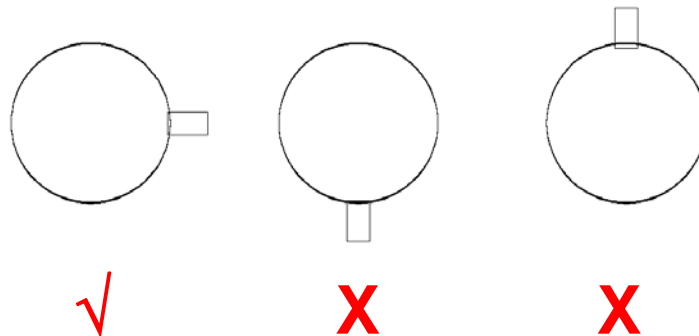
---

## Electronic Control Unit Pressure Step Degasser (PSD)



## Commissioning:

- Remove all covers
- Connect pipe-work and ensure that the connection to the system header is made as below:



**Important: Ingress of debris will prevent this equipment from operating correctly. Reasonable precautions must be taken to prevent debris entering this equipment.**

- Connect mains electricity supply to unit, including provided earth connection (Wiring is detailed separately for each unit)
- System will now display the message Insufficient Vacuum.
- Program the controller as detailed later.
- Open the system isolation valves.
- Verify that the red cap is finger tight.
- Wait for the internal pressure to reach the start pressure (typ 1.0bar).

**Service Engineers Note: To speed up the internal pressure increase remove the coil from the Purge Solenoid and use the Danfoss Solenoid tester 018F0091 to open the valve and quick fill the cylinder.**

- If the final pressure displayed is below the start pressure setting, gently increase the PRV setting to bring the equipment pressure up and online.

## Layout:



Key	Symbol on front panel	Function
1	ACTUAL PRESSURE / SET	Displays pressure value / Set Parameter
2	BUZZER MUTE / RESET / P.1 OVERRIDE	Buzzer mute / Controller reset / Pump 1 override (In Menu Mode)
3	SETUP +	Parameter value increase by 0.1 bar Yes / No toggle
4	SETUP -	Parameter value decrease by 0.1 bar Yes / No toggle

## Mains Power:

Power to the unit is controlled via an on/off switch located to the left of the controller. This is not an integral part. The unit only becomes live once power is supplied through this switch.

## Accessing Programme Parameters And Stored Information:

To enter the program and to set the unit up a password needs to be entered. Press + & - keys simultaneously and hold for 2 seconds. Then release. Then enter the code **2601** using the + & - minus keys again.

+ to count up, - to count down. To index to the next digit press the Set key.



# Operation & Maintenance

---

## On Screen Information:

**'Start Pressure'** appears followed by a number, this shows the minimum internal pressure that must be reached before the pumps will start. By using +/- keys the correct pressure can be entered. (Typically 1.0 Bar). Press and hold P.1 Override button to manually test pump 1 at this menu point (Pump 1 only). By pressing the Set key it accepts the setting and indexes to the next program item;

**'Stop Pressure'** appears followed by a number, this shows the level of vacuum that must be achieved before the pumps will shut off. By using +/- keys the correct pressure can be entered. (Typically -0.6 Bar). By pressing the Set key it accepts the setting and indexes to the next program item;

**'Alarm Pressure'** appears followed by a number, this shows the internal high pressure alarm, this closes the safety solenoid to prevent over pressuring the vacuum cylinder. By using +/- keys the correct pressure can be entered. (Typically 3.0 Bar). By pressing the Set key it accepts the setting and indexes to the next program item;

**'Normal Minutes'** appears followed by a number, this shows the normal interval between pump operation. By using +/- keys the correct time can be entered. (Typically 60 minutes). By pressing the Set key it accepts the setting and indexes to the next program item;

**'Normal Hours'** appears followed by a number, this shows the number of hours that the equipment will run in Turbo mode before switching to the Normal setting (as above). By using +/- keys the correct time can be entered. (Typically 168 hours, which is 1 week). By pressing the Set key it accepts the setting and indexes to the next program item;

**'Timeout Minutes'** appears followed by a number, this shows the maximum interval between pump start and stop or pump stop and start pressure being reached. By using +/- keys the correct time can be entered. (Typically 10 minutes). By pressing the Set key it accepts the setting and indexes to the next program item;



# Operation & Maintenance

---

**'Purge Seconds'** appears followed by a number, this shows the maximum interval that the purge solenoid is open during the start of the pump cycle. By using +/- keys the correct time can be entered. (Typically 20 seconds, see appendix for suggested settings). By pressing the Set key it accepts the setting and indexes to the next program item;

**'Pump Count'** appears followed by a number. This is the number of times the pumps have run. The display can show 9999 recorded pump runs. By pressing the Set key it indexes to the next program item;

**'Pump Hours'** appears followed by a number. This is the cumulative number of hours the pumps have run. The display can show 999.9 hours. By pressing the Set key it indexes to the next programme item;

**'Alarm Count'** appears followed by a number. This is the cumulative number of alarms registered by the unit. The display can show 9999 recorded alarms. By pressing the Set key it indexes to the next programme item;

**'Power Interrupted'** appears followed by a number. This is the cumulative number of electrical power interruptions registered by the unit. The display can show 9999 recorded power losses. By pressing the Set key it indexes to the next programme item;

**'Turbo Mode'** appears followed by 'n'. This is a y/n option by using +/- keys the value can be changed to 'y' or 'n'. This option will start a Turbo cycle that will run for the set time above before returning to a 'Normal' cycle. By pressing the Set key it indexes to the next programme item;

**'Service'** appears followed by 'n'. This is a y/n option by using +/- keys the value can be changed to 'y' or 'n'. This option will display a service reminder message after 12 months. By pressing the Set key it indexes to the next programme item;

The system is now configured and ready to run. When no specific action is being undertaken by the equipment the system pressure is displayed.



# Operation & Maintenance

---

## Features:

Power supply 12v ac for electronic controller.  
Safe low voltage Relay switching 230v ac 16amp max. current draw for the pumps.  
4 Digit display with scrolling, to display status and alarm modes.  
Internal alarm with mute function.  
Logging for pump run, hours run, power off and general alarm.  
Password protection.  
Visual pressure reading on screen (on button press if message displayed).  
Internal low water protection for pumps.  
Pump trip volt free contacts (Normally open 230v 5amp max.)  
Common alarm volt free contact (Boiler interlock normally closed 230v 5amp max.)  
6 bar safety relief valve and Normally Closed safety solenoid for failsafe protection

## Technical Specification:

<b>Power Requirement:</b>	AC 220/240v 50 Hz 1PH
<b>Pressure Sensor:</b>	-1 to 16 Bar 1-6vdc
<b>Range of Measurements:</b>	-1 to 16 Bar
<b>Full Load Current:</b>	12 Amps
<b>Noise Rating:</b>	75 dBa
<b>Common Alarm / Boiler Interlock:</b>	Normally Closed, AC 230v 5A
<b>Audible Alarm:</b>	Internal Buzzer
<b>Material Of Manufacture:</b>	ABS



# Operation & Maintenance

## Programmer Menu:

Menu Item	Description	Comments
<b>Enter Code</b>	Code Entry	Press the "+" & "-" keys together to display "Enter Code" Enter the code <b>2601</b> using the "+" & "-" keys to alter the flashing number. Press "set" to move to the next number, and to enter the complete code.
<b>Start Pressure</b>	Internal Safe Start Pressure For The Pumps	Using the "+" & "-" keys it is possible to increase or reduce the start pressure. <b>Press "P.1 Override" to test Pump 1 only if required.</b>
<b>Stop Pressure</b>	Internal Stop Pressure For The Pumps	Using the "+" & "-" keys it is possible to increase or reduce the stop pressure. <b>Press "P.1 Override" to test Pump 1 only if required.</b>
<b>Alarm Pressure</b>	Internal High Pressure Alarm Setting	Using the "+" & "-" keys it is possible to increase or reduce the internal high pressure alarm setting.
<b>Normal Minutes</b>	Normal Interval Between Pump Runs	Using the "+" & "-" keys it is possible to increase or reduce the Normal setting.
<b>Turbo Hours</b>	Time Limit For Turbo Mode Before Returning To Normal	Using the "+" & "-" keys it is possible to increase or reduce the Turbo Time Setting
<b>Timeout Minutes</b>	Time Limit For Maximum Pump Run Or Delay For Internal Pressure Build-up	Using the "+" & "-" keys it is possible to increase or reduce the time limit from 10 minutes to 990 minutes.
<b>Purge Seconds</b>	Time Set For Allowing The Internal Fluid To Be Re-circulated Into The Main System	Using the "+" & "-" keys it is possible to increase or reduce the time limit from 10 seconds to 990 seconds.
<b>Pump Count</b>	Pump Activation Counter	System logging
<b>Pump Hours</b>	Pump Cumulative Hours Run Counter	System logging
<b>Alarm Count</b>	Cumulative Alarm Counter	System logging
<b>Power Interrupted</b>	Cumulative Power Off Counter	System logging
<b>Turbo Mode</b>	Activation Option For Turbo Mode	Using the "+" & "-" keys it is possible to toggle between y/n to enable/disable this option
<b>Service</b>	12 Month Service Reminder	Using the "+" & "-" keys it is possible to toggle between y/n to enable/disable this option



# Operation & Maintenance

## On Screen Messages:

Screen Message	Comments
<b>Err. 1 Manual Reset</b>	Transducer failure. Turn electrical power off and back on or press "reset" button for 3 seconds.
<b>Error</b>	Incorrect password (Code) entered.
<b>Enter Code</b>	Scrolls before code entry screen appears.
<b>High Pressure</b>	High system pressure, audible alarm sounds. The Safety Solenoid closes. This alarm will self reset when the system pressure returns to normal, audible alarm can be silenced by pressing "mute".
<b>Insufficient Vacuum</b>	The low water switch has been activated, either a leak has occurred or the air non return valve has failed or is missing.
<b>Pump FAIL Manual Reset</b>	Pumps have failed, the pump failure relay closes. The boiler interlock opens, the audible alarm sounds.
<b>Purge</b>	The Purge Cycle is running.
<b>Pump Run</b>	Pump 2 is running.
<b>Pump Timeout</b>	Either the pumps have run for too long or the pressure has not reached the required start pressure for the pump within the time limit. Check the internal filter on the PRV and the solenoid valves for obstruction.
<b>Service</b>	The unit has been in service for 12 months and a routine inspection is due (User option in menu).
<b>System Pressure</b>	System operating normally, no intervention required.

## Environment:

- It is not anticipated that this equipment will be exposed to adverse environmental conditions without additional protection.
- Site the equipment in a frost free area.
- Ensure that 100mm of clear access is available around the equipment with 500mm clear access at the front.
- Flush the mains water supply pipe before connection to this equipment.
- An inline filter must be fitted to the inlet of the equipment if the mains water supply is suspected to contain debris.





# Operation & Maintenance

---

## Safety:

- Electrical installation must be carried out by a competent person
- WARNING – LIVE TERMINALS WITHIN THIS EQUIPMENT
- Isolate the equipment before removing any covers
- **Do Not** make any electrical adjustments to the equipment unless it is isolated from the mains electrical supply
- **Do Not** operate with the electrical covers removed
- **Do Not** alter any internal pipe-work, this equipment is tested prior to Dispatch.

## Warranty:

This equipment is covered against manufacturing defects for 12 months from date of purchase from BSS.

**This warranty covers the replacement of parts or products, verified as having a manufacturing defect, when inspected at the St Helens factory.**

BSS reserves the right to inspect an installation to verify that the equipment has been installed in accordance with the written instructions.

**Any** modifications to the supplied equipment must be approved in writing by BSS, failure to do so will invalidate the warranty.

## Site Visit:

Before requesting a site visit, the following information must be made available to the BSS sales team.

- Serial number of the equipment.
- A purchase order to cover the work in the event that no manufacturing defect is found. (This must be the direct customer of BSS).
- A site contact name and number
- A **FULL** description of the alleged fault.

## Liability:

BSS can only respond to warranty queries from its direct customer. If in doubt, please contact your installer to establish the supply chain.



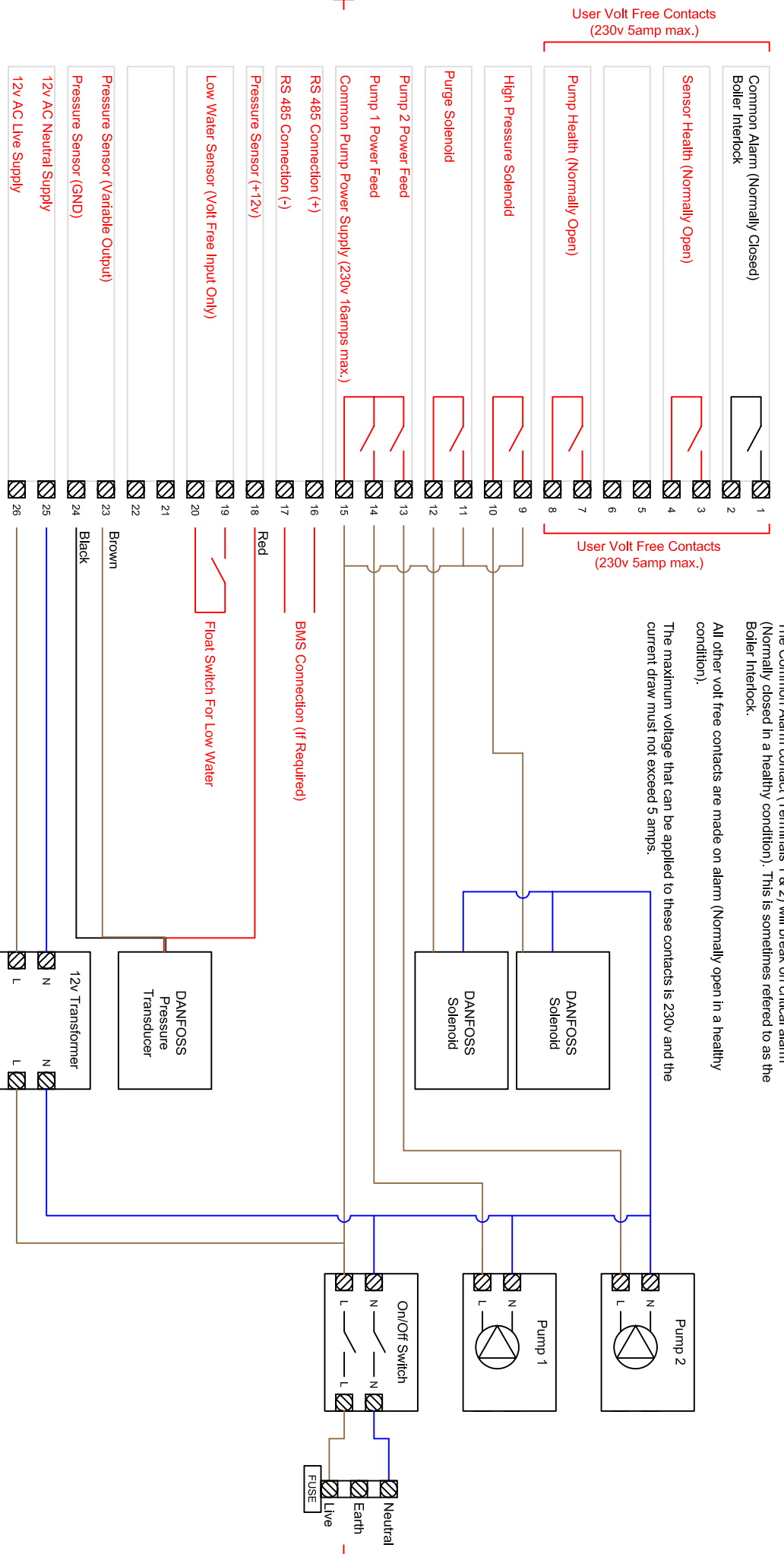
## Appendix:

### Suggested Settings

Start Pressure	1.0 bar
Stop Pressure	-0.6 bar
Alarm Pressure	3.0 bar
Normal Minutes	45 minutes
Turbo Hours	168 hours (1 week)
Timeout	10 minutes
Purge Seconds	as below

### Purge Seconds Reference Times

Main System Pressure	Purge Time
1.0 to 3.5 bar	20 seconds
3.5 to 5.0 bar	30 seconds
5.0 to 6.0 bar	40 seconds
6.0 to 7.0 bar	60 seconds
7.0 to 8.0 bar	120 seconds



Item	Quantity	Description	Notes
Drawn by Rob Clemson		Checked By Nick North	Approved by - date RJAC 10-09-2007

### PSD Wiring

PSD-0001	Scale N/A	Issue 1
----------	--------------	------------