



# Flamco Pro Range Pressurisation Equipment

Pro PDS                      Combine Pressurisation and Dosing Equipment

## Operation & Maintenance

## Manual

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## Customer Details

Please fill in information future reference:

Company:	<input type="text"/>	Contact:	<input type="text"/>
Address:	<input type="text"/>	Tel No:	<input type="text"/>
		Fax No:	<input type="text"/>
Post Code:	<input type="text"/>	E-mail:	<input type="text"/>

## Equipment Details

Details of model and serial number may be found on the label

Model:	<input type="text"/>	Serial No:	<input type="text"/>
Purchase date:	<input type="text"/>	Purchase From:	<input type="text"/>

### Note:

It is highly recommended to have this equipment commissioned by a Flamco trained engineer. Any damage or loss incurred through incorrect commissioning by an unapproved engineer will not be covered by the warranty. If you wish for Flamco to arrange commissioning or service please contact us.

Telephone: +44 (0)1744 744 744

Email: [service@flamco.co.uk](mailto:service@flamco.co.uk)

### Important:

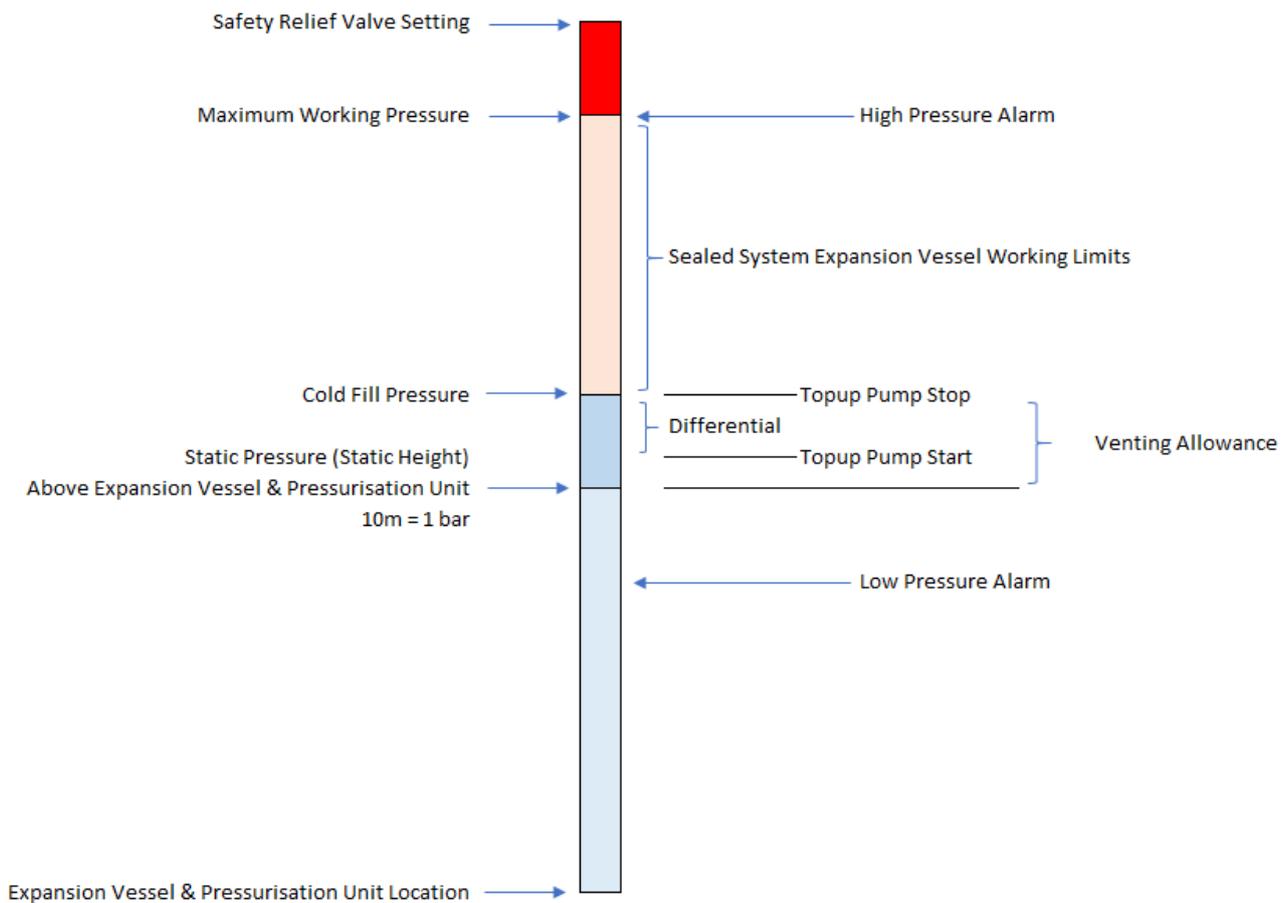
When installing an expansion vessel with the pressurisation unit ensure the expansion vessel gas pre-charge is the same as the required cold fill pressure for the system.

## Commissioning Record

<b>Site Reference</b>					
<b>Model</b>		<b>Date</b>			
<b>Engineer Name</b>			<b>Company</b>		
<b>User PU Settings</b>			<b>Extended PU Engineers Settings</b>		
Cold Fill		Bar	Pumps Number		
High Alarm Setting		Bar	Pump Type		(C/P/R)
High Pressure Warning		Bar	Pump Sense		(Y/N)
Low Pressure Warning		Bar	Periodic Pulse		(Y/N)
Low Alarm Setting		Bar	Topup Sensor Max Pressure		Bar
Differential		Bar	Topup Sensor Min Voltage		(2 for MAmp)
Flood Limit		Minutes	Topup Sensor Max Voltage		(10 for MAmp)
Excessive Start Quantity		(0 to disable)	Slave Unit (SPC)		(Y/N)
Excessive Start Time		Hours	Additive Unit		(Y/N)
<b>Counters &amp; Logs</b>			Overrun		Seconds
Pump 1 Count			Pressure Alarm Auto Reset		(Y/N)
Pump 1 Hours		Hours	All VFC - Failsafe		(Y/N)
Pump 2 Count			Tank Solenoid		(Y/N)
Pump 2 Hours		Hours	Tank Solenoid Overrun		Seconds
Alarm Count			Zero Start		(Y/N)
Power Interrupted			Cascade		(Y/N)
ID Number			Extended Mode		(Y/N)
Service Reminder		(Y/N)			
Expansion Vessel Volume		litres	Gas Pre-Charge		bar
Safety Relief Valve Setting		bar			
Engineers Signature				Date	
Customers Signature				Date	

## Pressures in a sealed system

Below is an overview of how the settings on a pressurisation unit must be considered for normal operation. Close, conflicting or overlapping settings will cause system instability and nuisance alarm conditions. If in any doubt please seek advice from a Sealed System professional.



A typical venting allowance is 0.3 bar, added to the static height to give the cold fill pressure.

The Differential setting represents the allowable pressure loss before the pump activates and restores the cold fill pressure. The Differential setting must not be greater than the system venting allowance. This will ensure that the system remains fully flooded during normal topup conditions.

## About this Manual

This Operation and Maintenance Manual contains all the necessary information to install, commission, operate and maintain Flexfiller pressurisation equipment.

It is recommended to read all parts of this manual before undertaking any work on the equipment.

## Conventions used in this Manual

This manual makes use of symbols to identify key pieces of information. Please take note of the following symbols and their meaning:



**DANGER** – Important safety related information intended to prevent injury and/or damage to the equipment, system or property.



**CAUTION** - Important information intended to prevent damage to the equipment, system or property.



**IMPORTANT** - Important information intended to ensure that the equipment functions correctly.



**USEFUL** – Useful information which may be helpful but is not necessarily required for the unit to function correctly.

## Typography

This manual makes use of different typography to identify different types of information.

<i>Italics</i>	Key words and phrases
(Round Brackets)	Used to identify a button on the digital controller
[Square Brackets]	A parameter on the digital controller
<Inequality Symbols>	A message/fault code displayed on the digital controller

## Where to find more Information

For further information please visit the Flamco Limited Website at the following URL:

<https://flamcogroup.com/uk-en>

Alternatively, please contact the Flamco Limited office using the details below:

Phone: 01744 744 744  
Fax: 01744 744 700  
Email: [info@flamco.co.uk](mailto:info@flamco.co.uk) OR [service@flamco.co.uk](mailto:service@flamco.co.uk)

## Equipment Overview

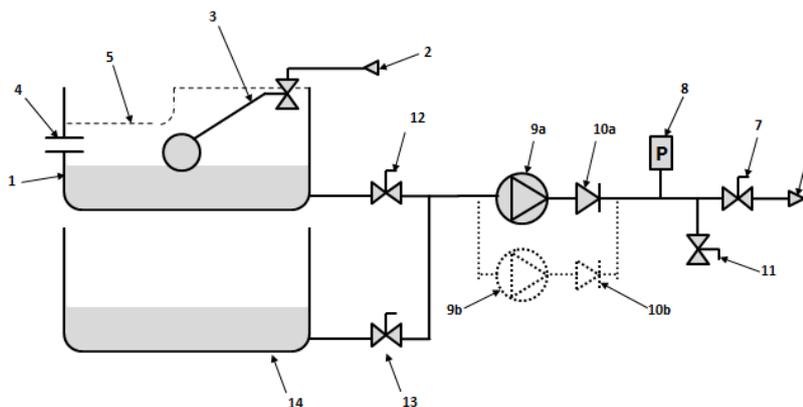
The function of this pressurisation unit is to provide a means of automated water top-up to sealed heating and cooling systems. The equipment is designed to provide periodic water top-up to compensate for minor losses in system pressure (e.g. slow leaks, air venting, etc.).



This equipment is not designed to cope with sudden losses of system pressure (e.g. manual draining) or major water losses (e.g. large leaks). The equipment is also not intended to be used for water boosting applications.

## Principal of Operation

The following schematic shows the internal arrangement of a pressurisation unit:



The PressDS unit is fitted with a break tank (1) which is filled from the mains water supply (2) via a float operated valve (3). The break tank is fitted with an overflow (4) in case the break tank overfills, and a weir overflow (5) in case the primary overflow fails. Also fitted is an additive tank (14). Additive tank is filled with either Additive or additive, to add to the system a required mixture is required. To do these two balancing valves are placed after each of the tanks to control the mixture water (12) and Additive (13). (See Balancing valve settings table)

The pressurisation unit is connected into the heating system (6) via an isolation valve (7).

The pressure sensor (8) monitors the system pressure.

If the pressure sensor detects a drop-in pressure, the pump (9a) will pump water from the break tank into the system. Once the required pressure has been reached, the pump will stop.

On twin pump models, a second pump (9b) is provided. The two pumps will run in a duty/standby configuration (i.e. the active pump will alternate with each pump start).

The pump(s) are fitted with non-return valves (10a, 10b) to prevent backflow.

A drain valve (11) is provided for draining down the unit and for commissioning purposes.

## Installation



This pressurisation unit is not designed to be installed in an outdoor environment. The unit must be installed in a frost free environment, away from precipitation and water sprays/jets. If there is a risk of flooding, the unit must be installed on a raised plinth.



The unit is equipped with a Category 5 Weir overflow arrangement and must not be installed / sited where damage to the local environs can occur on water egress



Please refer to the appropriate datasheet for the maximum working pressure and temperature of the pressurisation unit. The conditions at the point of connection to the system must not exceed these values.

## Pipe Connections



To avoid damaging the float valve, the mains water supply pipe must be flushed before connection to the pressurisation unit.



All pipe connections must be made with appropriate jointing compound/PTFE tape. If PTFE tape is used, care must be taken to ensure that the tape does not obstruct the orifice of the fitting.

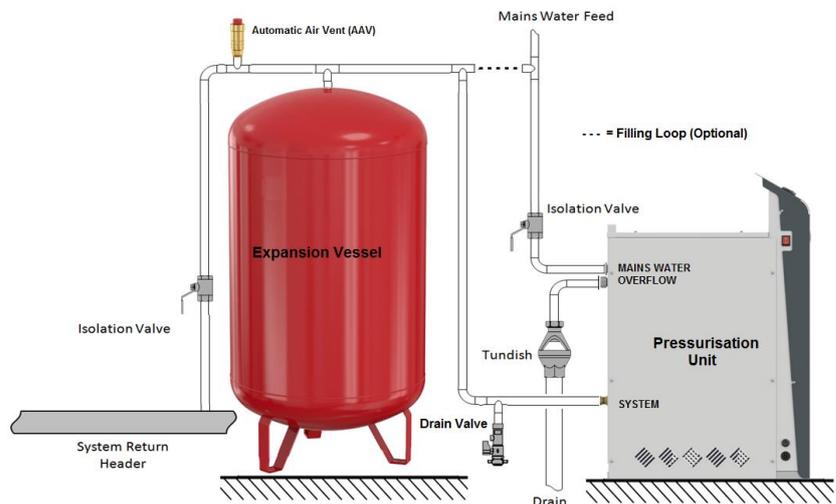


Non-return valves, pressure reducing valves and RPZ valves must not be installed between the pressurisation unit and the heating/cooling system. These devices will prevent the pressure sensor from reading the system pressure.

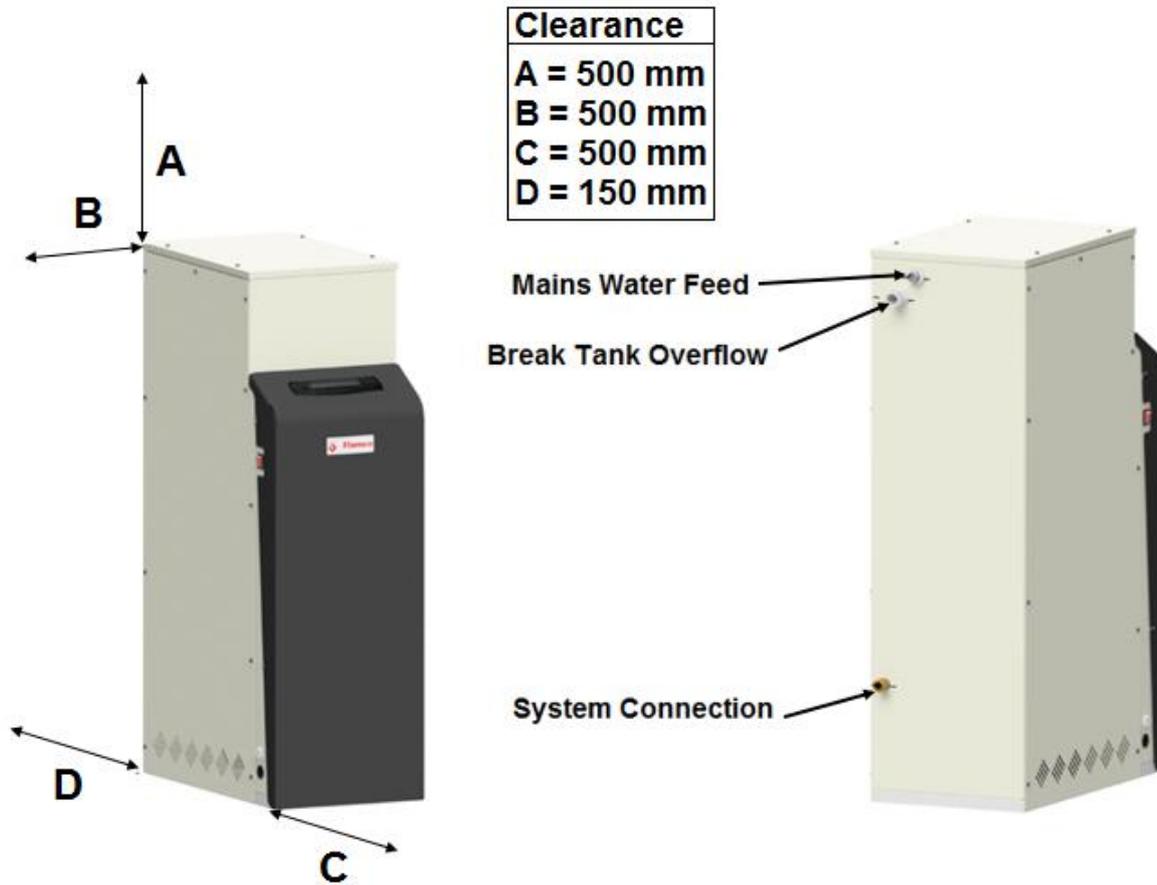


The pressurisation unit and expansion vessel should be connected to the system at the same point, to provide a neutral pressure reading. This point of connection should be in the system return, on the suction side of the circulation pump.

## Typical Installation Diagram



Pro PDS Clearance and Connection Requirements – Floor standing



Connection	Size	Notes
Mains Water Feed	½" BSP M	An isolation valve must be installed on the mains water feed for servicing.
Break Tank Overflow	22 mm	Guidance on drainage requirements should be obtained from the local water authority.
System Connection	½" BSP M / 15mm	<p>The pressurisation unit and expansion vessel should be connected to the system at the same point.</p> <p>The point of connection should be in the system return, on the suction side of the circulation pump.</p> <p>Non-return valves, pressure reducing valves and RPZ valves must not be used.</p>

## Electrical Power Supply

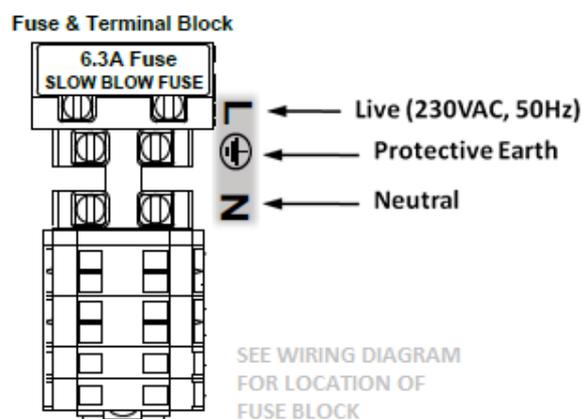


This equipment must be electrically isolated before removing the covers. Cables connected to the volt free contacts may be supplied from another source and may remain live after the unit is isolated. These must be isolated elsewhere.

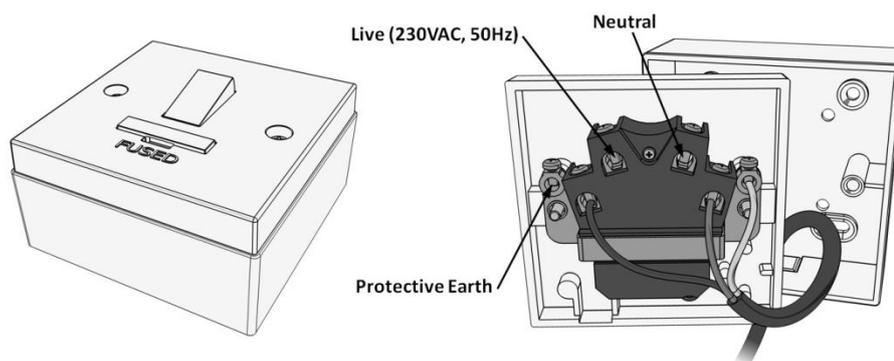


All electrical connections must be carried out by a suitably qualified and competent person.

The mains power supply to the pressurisation unit must be connected into the fused terminal block as shown below:



On some larger models, the fused terminal block is replaced by a fused spur. If this is the case, the power supply must be connected into the fused spur, as shown below:



It is recommended to supply power to the pressurisation unit via a lockable isolator. This should be installed within 2 m of the equipment.

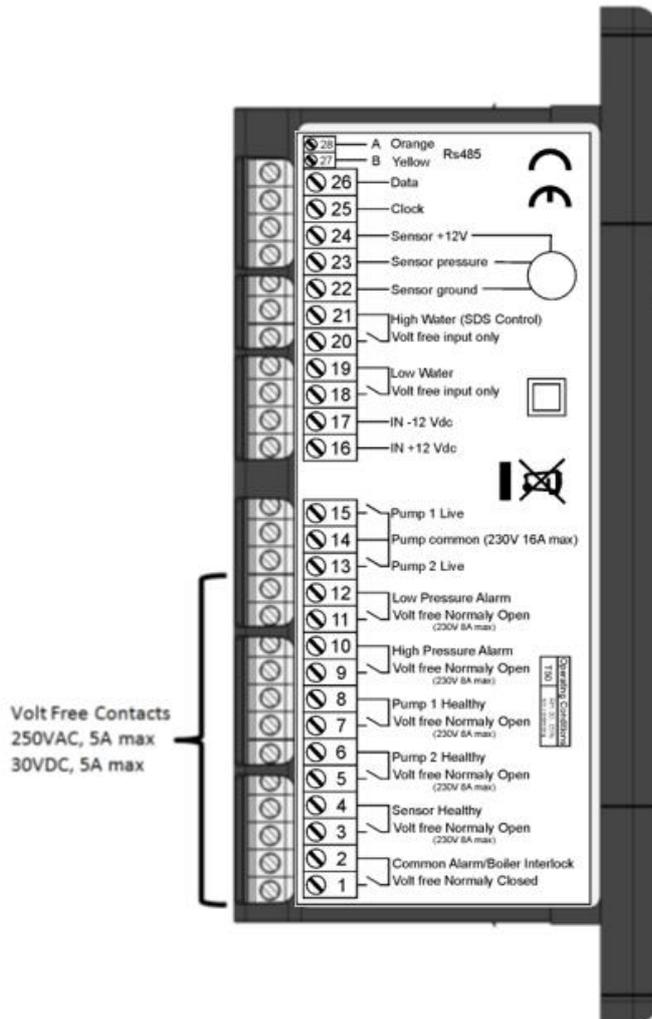


This equipment can be damaged by the high voltages produced by electrical installation testing equipment. When performing electrical installation tests, the equipment must be isolated from the supply.

## Micro Controller

### Fault contacts

There are 6 volt free fault contacts which can be used for connection to a BMS system, located on terminals 1-12 on the digital controller.



With the exception of the Common Alarm, it is possible to convert all other fault contacts to normally closed. For further information please refer to the commissioning section of this manual.

The other volt free contacts can be connected to the BMS and when the alarm is triggered this is shown on the Pressurisation unit and the BMS.

## Commissioning



It is highly recommended to have this equipment commissioned by a Flamco approved engineer. Any damage or loss incurred through incorrect commissioning by an unapproved engineer will not be covered by the warranty.

## Pre-Commissioning Checklist



The following conditions must be met before starting the commissioning process. Failure to meet these conditions may result in injury or damage to the equipment, system and property.

Equipment is sited in a frost free area, away from precipitation and water sprays/jets

All necessary pipe/electrical connections have been made to a satisfactory standard

The temperature and pressure at the point of connection are within the operating limits of the pressurisation unit.

The heating/cooling system is fitted with a safety valve and expansion vessel



The following conditions must be met for the pressurisation unit and heating/cooling system to function correctly. If these conditions have not been met, it is not advisable to proceed with the commissioning process.

The system connection has been made into the system return header / pump suction

There are no non-return valves, pressure reducing valves or RPZ valves installed between the pressurisation unit and the heating/cooling system

The expansion vessel is pre-charged to the correct pressure (equal to PU cold fill pressure)



It is advisable to fill the heating/cooling system prior to commissioning. If this is not possible, the pressurisation unit can be used to fill the system after commissioning (Not possible with Mini Units). Depending on the size of the system, this may take a considerable amount of time.

The heating/cooling system is filled and pressurised to the required cold fill pressure, with the water at ambient temperature (approximately).

## Controller Overview

The following image shows the front of the pressurisation unit digital controller. 4 buttons are provided for programming, and an LED display which shows scrolling messages.



When the controller is first powered up, it will display the controller version number. This manual relates to controller version >10.0. If the controller is of a different version, there may be differences in the menu items available.

When in normal operation, the controller will display the current system pressure. If a fault occurs, the controller will display a fault code and produce an audible alarm.

In normal operation, the functions of the buttons are as follows:

Button	Function	
	Press	Hold
SET	-	Show Current System Pressure
MUTE	Mute Audible Alarm	Reset Unit
+	-	Enter Programming Menu
-	-	Enter Programming Menu

## Controller Programming



Do not alter any settings without first understanding the implications of doing so. Incorrect settings may cause damage to the equipment, wider system or property.

To enter the programming menu, hold the (+) button until “enter code” appears on the screen, followed by “9999” with a flashing cursor after the first digit.

To gain access to the programming menu, one of the following codes must be entered:

Standard Code	Standard set of options	<b>2601</b>
Engineer Code	Full set of options	<b>4706</b>

To enter the code, change the first digit with the (+) and (-) buttons, then press (SET) to move onto the next digit. Repeat for all digits, then once the correct code is shown on the display, press (SET) to enter the programming menu.

Once a correct code has been entered, the first option PR00 – **Language** will appear select E and then press and hold (SET) & (+) to move to next menu.

Once in the menu, the value of the current menu item can be changed using the (+) and (-) buttons. Once the current value has been set, pressing the (SET) & (+) buttons together to move to the next option or (SET) & (-) buttons together to move back an option is you made an error.

Once the programming is complete press and hold the (SET) button for few seconds to save the settings.



If the controller loses power while in the programming menu, all changes made up to that point will be erased. To confirm all changes, the end of the menu must be reached, and press and hold the (SET) button for few seconds to save the settings

### Key:

**(SET) & (+) = Move to next menu**

**(SET) & (-) = Move back to pervious next menu**

**Hold down (SET) = Hold (SET) button down for few seconds saves the menu**

## Program Parameter List

The table below gives details of all menu items, in the order that they will appear:

PR No	Customer Code - 2601	Notes	Default	Unit
0	Language	E=English I=Italian D=Deutsch F=French N=Netherland	E	
2	Low Pressure Alarm	0.5 bar less than Fill Pressure	0.5	Bar
3	Low Pressure Warning	0.6 Bar less than Fill Pressure	0.6	Bar
4	Differential	'cut-in' and 'cut-out' between pumps	0.2	Bar
5	Fill Pressure	System pressure + 0.3 venting allowance	1	Bar
6	High Pressure Warning	High pressure alarm – 0.1 Bar	2.6	Bar
7	High Pressure Alarm	System safety valve - 10%	2.7	Bar
8	Flood Limit		10	minutes
9	Excessive Start Quantity		0	
10	Excessive Start Time		8	hours
28	Fill system		N	
45	Service Reminder Y/N		N	
48	ID Number	MODBUS ID number	1	
49	Review Logs		N	
50 (*)		Counter for P1 used for Topup		
51 (*)		Hours Run for P1 Topup		
52 (*)		Counter for P2 used for Topup		
53 (*)		Hours Run for P2 Topup		
54 (*)		Total Hours run P1 (inc Degassing)		
55 (*)		Total Hours run P2 (inc Degassing)		
56 (*)		Alarm Counter		
57 (*)		Power interrupted counter		

STANDARD OPTION

(\*) IF REVIEW LOG IS YES THEM PR NUMBER 50 - 57 WILL BE ACTIVE

This menu only brings up standard option for the pressurisation equipment, to set up the degasser option of the equipment then you need to put in **4706** code and follow the menu list on the next pages.

This menu is for setup combine unit in order the menu will appear:

PR No	Engineers Code - 4706	Notes	Default	Unit
-	Language	E=English I=Italian D=Deutsch F=French N=Netherland	E	

1	Topup Required Y/N		Y		TOP-UP MENU
2	Low Pressure Alarm	Dependent on sensor range data	0.5	Bar	
3	Low Pressure Warning	Dependent on sensor range data	0.6	Bar	
4	Differential	+/- of cold fill pressure	0.2	Bar	
5	Fill Pressure	system pressure + 0.3 vent allowance	1	Bar	
6	High Pressure Warning	set 0.4 below the safety valve on installation	2.6	Bar	
7	High Pressure Alarm	Set 0.3 below the safety valve on installation	2.7	Bar	
8	Flood Limit		10	minutes	
9	Excessive Start Quantity		0		
10	Excessive Start Time		8	hours	

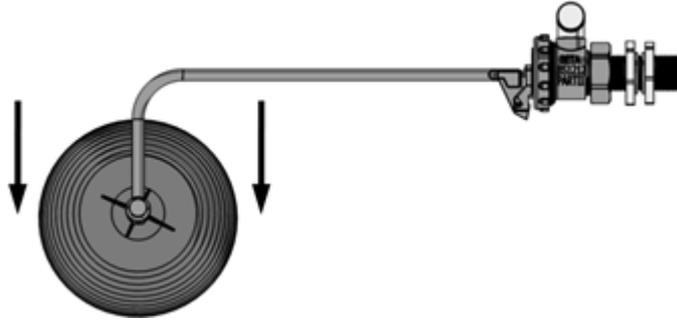
11	Pump Number		1		STANDARD OPTION
12	Pump Type	Pump Type C (current monitored centrifugal pump)	C		
		Pump Type P (current monitored Piston pump)			
		Pump Type R (Not Current Monitored, larger pump/motor contactor etc)			
13	Pump Current Min Level		0.2	mA	
14	Current Sense		Y		
15	Periodic Pulse		Y		
16	Pressure Sensor Max Pressure		10	Bar	
17	Pressure Sensor Min Voltage		1	Volts	
18	Pressure Sensor Max Voltage		6	Volts	
19	Slave Unit	SPC Mode, high water switch activates pumps	N		
20	Additive Unit	Changes High Water Message if not in (Slave/SPC mode)	Y		
21	Overrun	Pump Overrun after achieving set pressure (or Slave/SPC command is deactivated)	5	Seconds	

PR No	Engineers Code - 4706	Notes	Default	Unit	
22	Pressure Alarm Auto Reset	Toggles High/Low Alarm from being automatic reset to manual reset/critical stop	Y		STANDARD OPTION
23	All VFC Fail Safe	Toggles all VFC alarms to be energised, normally closed. Break/open on fault	N		
24	Tank Solenoid	Uses High Water contact to activate a tank topup solenoid	N		
25	Tank Solenoid Overrun	Overrun command for filling solenoid	5	Seconds	
26	Zero Start	Allows topup unit to start immediately if switched on and seeing 0 bar (formerly boost option)	N		
27	Cascade	Delay start time for activating both pumps together [note 0 means that the pumps will NOT run together, but operates as duty/standby/auto change over	0	Seconds {disabled}	
28	Fill system		N		
29	Extended Mode		N		
30	not used		N		
31	Degassing Required Y/N		N		
45	Service Reminder Y/N		N		
46	Pump1 Max Hours Run	Alarm to change Pump (when set to 0 the alarm is disabled)	9000		Pump
47	Pump 2 Max Hours Run	Alarm to change Pump (when set to 0 the alarm is disabled)	9000		
48	ID Number	MODBUS ID number	1		
49	Review Logs		N		REVIEW LOG MENU
50 (*)	P1 Topup Count	Counter for P1 used for Topup			
51 (*)	P1 Topup Hours	Hours Run for P1 Topup			
52 (*)	P2 Topup Count	Counter for P2 used for Topup			
53 (*)	P2 Topup Hours	Hours Run for P2 Topup			
54 (*)	P1 Total Hours	Total Hours run P1 (inc Degassing)			
55 (*)	P2 Total Hours	Total Hours run P2 (inc Degassing)			
56 (*)	Alarm Count	Alarm Counter			
57 (*)	Power Interrupted Count	Power interrupted counter			

## Hydraulic Commissioning

### 1. Float Valve Setting

Ensure that the break tank float valve is set to its lowest position:



*Pro PDS Units*

If a drain valve is fitted to the break tank, ensure that it is closed. Then, turn on the mains water supply and allow the break tank to fill.



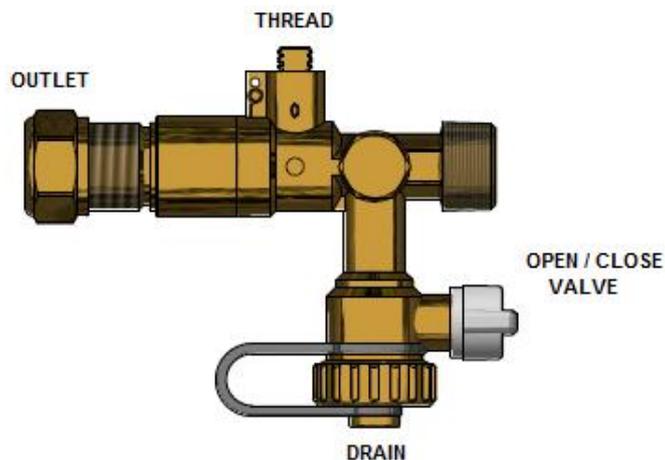
When the float valve operates for the first time, it may not close immediately, causing the break tank to overflow. Once the internals of the valve have been fully wetted this should not occur again.

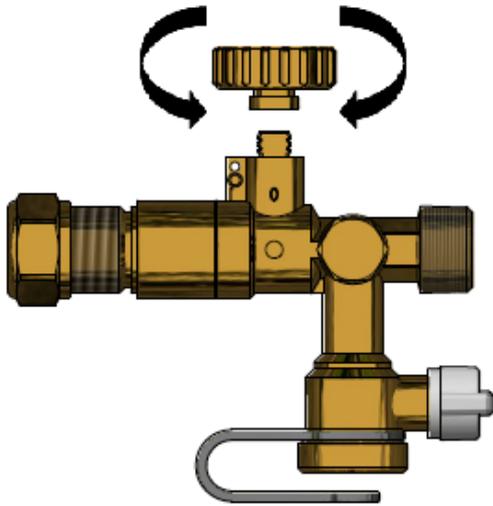
### 2. Bleeding Pumps

This step is only necessary for Pro PDS units.



Make sure that the internal isolation valve within the pressurisation unit is closed. Failure to do this may cause injury or damage to the equipment, system or property.

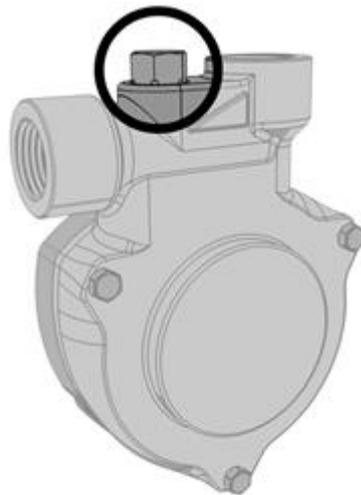




**Procedure:**

1. Unscrew cap from the drain valve
2. Place cap on thread
3. Twist cap clockwise to close valve from system
4. Place a hose over the drain connection
5. Open the valve to drain
6. Close the drain valve
7. Take off hose from drain valve
- 6 Twist cap anti-clockwise to open valve to system
7. Place cap back on the drain connection

Locate the bleed screw on the pump. The following diagrams show examples of typical bleed screw locations for most pumps:



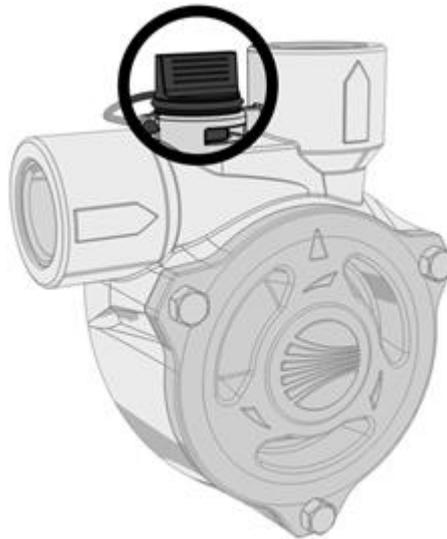
**Pedrollo PQAm 60 / PQ-81Bs**



Do not use excessive force when tightening the bleed screw as this may damage the pump casing.



If the pump has a plastic bleed screw like the one shown below, do not use excessive force or attempt to use any tools to turn it as this may damage the pump casing.



Pedrollo PQAm 90

### 3. Forcing Pumps to Run



Turn on the power supply to the digital controller and wait for the system pressure to appear on the display. Then, enter the code 2601, Language menu will appear as default [E]. Press and hold (MUTE) & (+) for pump 1 to run and Press and hold (MUTE) & (-) for pump 2 to run

Key: (MUTE) & (+) = Pump 1 Run  
(MUTE) & (-) = Pump 2 Run



To bleed the pumps, the pumps must be started. Then while the pump is running, the bleed screw must be opened until all the air has been removed and only water is being discharged. The bleed screw can then be closed.



Failure to bleed the pumps may result in damage to the equipment, system and property.



After bleeding the pumps, close the drain valve and remove the hose from the hose tail

## 4. Testing

To test the operation of the pressurisation unit while connected to the system, the system pressure must be lowered slowly to simulate a minor leak.

This can be achieved by using a drain point on the system, the drain point on the pressurisation unit, or by manually opening the safety relief valve.



Care must be taken not to let the pressure drop too quickly. If the system pressure falls below the low pressure set point, a low pressure fault will be displayed and the pumps will not run. The pressurisation unit is not designed to cope with a sudden loss of system pressure, which would be symptomatic of a catastrophic failure such as a burst pipe.

Once the system pressure has fallen below the cold fill setting (by an amount equal to the differential setting), the pump should start refilling the system. The pump will continue to run until the cold fill pressure has been reached.

This test demonstrates the primary function of the pressurisation unit. This test may be repeated at any time to confirm the operation of the pressurisation unit.

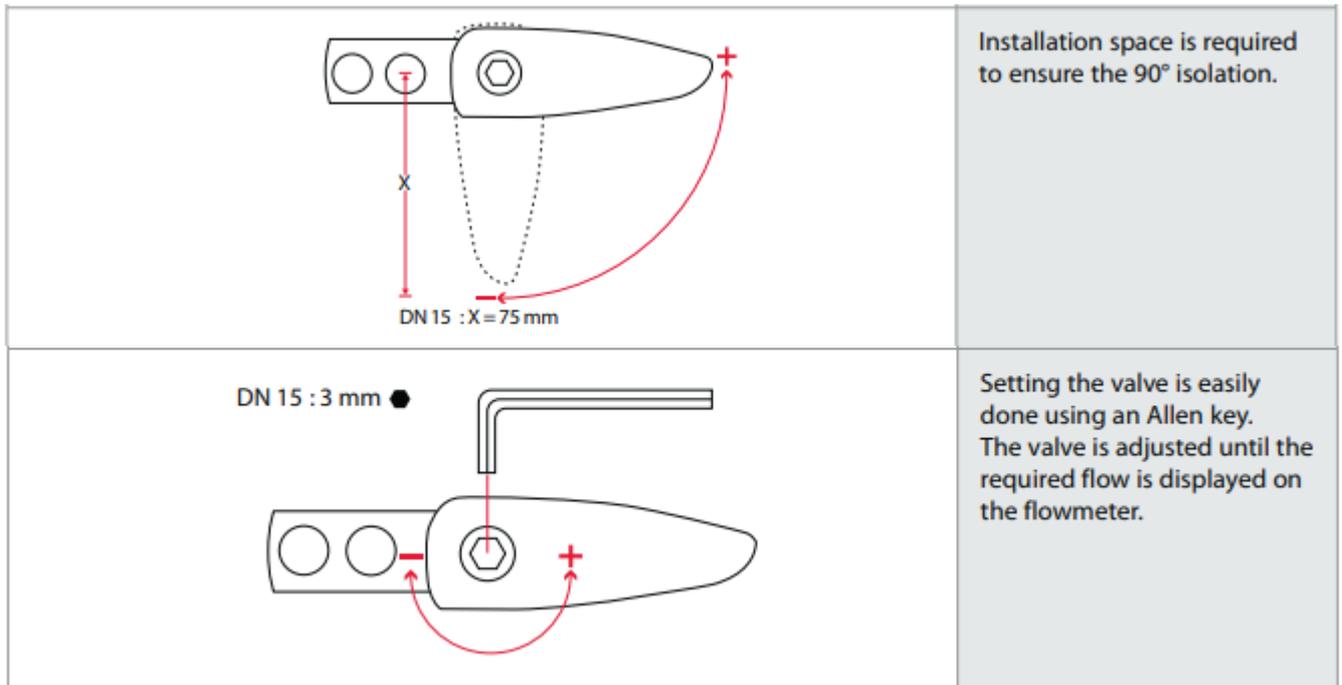
## Quick equipment suitability guide in relation to system expansion vessel

Type of unit	Vessel size (Litres)
Pro PDS	4 x 1000

All Flamco vessels are set to a nominal pre-charge at the Factory for testing. In order for the vessel to work properly with the pressurisation unit, and wider system, the gas charge needs to be set to the desired cold fill pressure prior to installation. Remember to check vessel pressure before commissioning the pressurisation unit.

Vessel Type	Size Range	Standard Pre-charge (Bar)
Flexcon 6 bar	2 - 25	0.5
	35 - 1000	1.5
Flexcon 10 bar	110 - 1000	1.5
Airfix P 10 Bar	2 - 1000	2.7
Airfix DE 10 Bar	100 - 3000	6
Airfix DE 16 Bar	50 - 3000	6
Airfix DEB 10 Bar	1600 - 3000	6
Airfix DEB 16 Bar	50 - 3000	6

## Balancing Valve Setting



The following table shows the valve settings required to achieve a given Additive concentration.

Additive %	Total Top-up Rate	H <sub>2</sub> O Valve	Additive Valve
1	6 Litres	9.1	0.0
10	6 Litres	9.1	0.0
15	6 Litres	9.1	0.0
20	6 Litres	9.1	0.6
25	8 Litres	8.6	2.6
30	8 Litres	8.1	4.8
35	8 Litres	7.8	4.1
40	8 Litres	6.8	5.3
45	8 Litres	6.6	5.4
50	8 Litres	6.4	4.7

## Operation

Once commissioned, the pressurisation unit should operate without any user intervention.

Under normal operating conditions, the display will show the current system pressure in Bar.

While the unit is filling, the display will show <PUMP 1 RUN> or <PUMP 2 RUN> depending on which pump is currently running.

If the unit identifies a fault, the display will show the relevant fault code.



If the pressurisation unit is showing a fault code on the display, holding down the [SET] button will cause the current system pressure to be temporarily shown on the display.

## Fault Codes

The following table gives the meanings of all fault codes used on the digital controller:

Fault Code	Description	Auto/Manual Reset
LOW PRESSURE	The system pressure is below the [LOW PRESSURE] set point.	User Defined
HIGH PRESSURE	The system pressure is above the [HIGH PRESSURE] set point.	User Defined
LOW H2O	The break-tank low level float switch has been activated	Auto Reset
HIGH H2O	The break-tank high level float switch has been activated	Auto Reset
P1 FAIL	The controller has detected a fault (incorrect current draw) on the respective pump	Manual Reset
P2 FAIL		
P1 FLOOD LIMIT	The respective pump has run for longer than the [FLOOD LIMIT] period	Manual Reset
P2 FLOOD LIMIT		
ERR. 1	The signal from the pressure sensor is out of range	Manual Reset
EXCESSIVE DEMAND	There have been 4 pump starts within an 8 hour period	Manual Reset
SERVICE	The pressurisation unit is due an annual service	Manual Reset



For practical guidance on diagnosing and rectifying faults, please refer to the Troubleshooting section of this manual.

## Shutdown procedure



The pressurisation unit must be shut-down during any of the following scenarios:

- Work is being carried out on the system.
- Work is being carried out on the pressurisation unit
- The heating/cooling system is being flushed

To shut down the pressurisation unit, please follow the steps below:

1. Isolate the electrical power supply to the pressurisation unit
2. Isolate the mains water supply to the pressurisation unit
3. Isolate the pressurisation unit from the system using the isolation valve
4. If it is anticipated that the unit will be out of commission for more than 24 hours, it is advisable to drain the water from the break tank.

## Start-up Procedure



Attention – This procedure is for restarting the unit after being shutdown (as described above). For initial start-up and commissioning procedures, please refer to the Commissioning section of this manual.

To restart the pressurisation unit, please follow the steps below:

1. Perform a visual inspection of the unit and installation to check for signs of damage
2. Check the break-tank for debris/deposits and remove if necessary
3. Turn on the mains water supply to the pressurisation unit and allow the break tank to fill
4. Open the isolation valve
5. Turn on the mains power supply and wait for the controller to start
6. Depending on the conditions in the system, the unit may display one or more fault codes at this point. If this happens, please refer to the Troubleshooting section of this manual for guidance.

## Maintenance

Due to variations in operating conditions, and the varying loads placed on pressurisation units, it is not feasible to provide accurate predictions of component lifespan. The most effective method of maintenance is to inspect the pressurisation unit for early signs of component failure and take action accordingly.

The following maintenance procedures should be performed at least once a year:

### Visual Inspection

A basic visual inspection will highlight the majority of potential faults on a pressurisation unit. It is recommended to perform a visual inspection annually. However, due to the simplicity of performing these checks, frequent inspections are encouraged.

- Check the digital display for fault codes
- Check for signs of leakage (e.g. water, mineral deposits, corroded components/cabinet)
- Check the break tank overflow for signs of water discharge
- Check flexible hoses for signs of degradation (e.g. cracks)
- Check that the pressure reading on the digital display corresponds to the actual system pressure (read off another gauge)

### Interrogate Controller

The digital controller keeps a log of the number of pump starts and total hours run for each pump, as well as the number of alarm activations and power interruptions. It is advisable to take a note of these figures when servicing the unit, as they may be helpful in diagnosing potential issues. Fields are provided in the service log for these figures.

It is advisable to scroll through all the settings (including engineers setting) and check them against the figures on the commissioning report. If there are any discrepancies, check first with on-site staff to see if the changes are deliberate. If not, reconfigure appropriately.



If settings are persistently becoming corrupted, a power filter may be required. Please refer to the Installation section of this manual for more information.

### Test Unit Operation

The best way to test the operation of the pressurisation unit is to drain water from the system, allowing the pressure to drop slowly. Once the pressure falls below the pump cut-in pressure ([COLD FILL] – [DIFFERENTIAL]) the pump should start. As soon as the pump starts, close the drain point and allow the system pressure to rise. Once the [COLD FILL] pressure is reached, the pump should stop.

If the unit is a twin pump model, this test should be repeated until both pumps have run and successfully re-pressurised the system.

### Check Float Valve Operation

To test the operation of the break tank float valve, first ensure that the break tank overflow has a suitable path to drain.

Gently push down on the arm of the float valve until it starts to discharge water, then release the float valve arm. Once the arm has been released, the flow of water should stop within a few seconds.

### Check Float Switch Operation

To test the operation of the break tank low level float switch, reach into the break tank and gently push the float switch down into the horizontal position.

The digital controller should now display a <LOW H2O> fault.

Release the float switch and observe the display. The fault should clear after a delay of a few seconds.

### Check Break Tank Water Condition

Perform a visual check of the water in the break tank. If there is any dirt or debris in the water, or deposits on the sides of the tank, the tank should be drained down and cleaned.

### Check Strainer

Flexfiller pressurisation units are fitted with a mesh strainer in the connection at the bottom of the break tank. This should be removed and inspected. Depending on the condition, this part may need to be cleaned or replaced.

### Check Expansion Vessel Pre-Charge

Many of the problems experienced with pressurisation equipment can be traced back to the expansion vessel.

The expansion vessel pre-charge pressure must be checked after 2 years and annually thereafter.

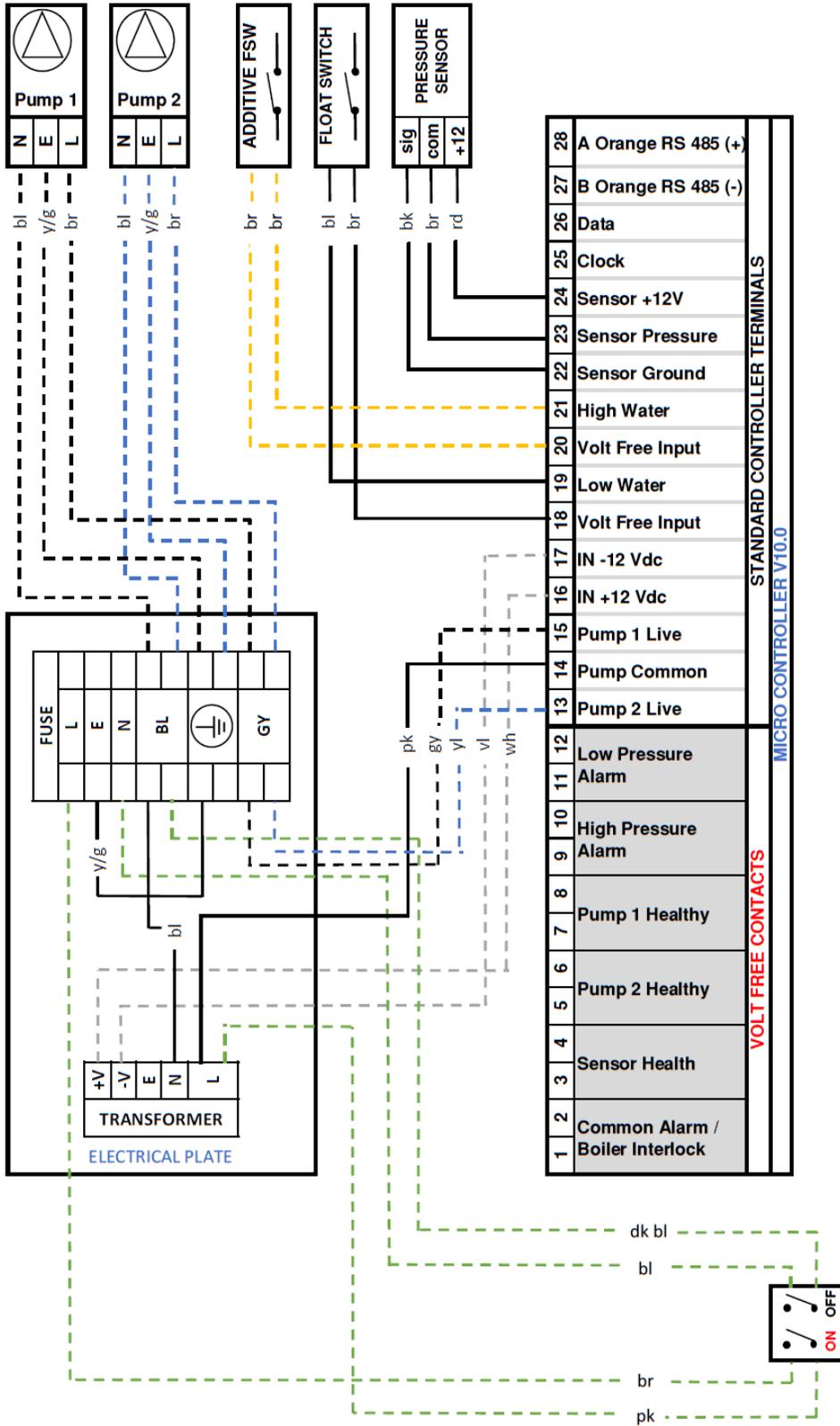
To perform this test, the expansion vessel must first be isolated and drained of water, then a gauge can be connected to the Schrader valve on the vessel to measure the pre-charge pressure. The pre-charge should be equal to the [COLD FILL] pressure setting.

The pressure can be increased using a foot pump, air compressor or pressurised air/nitrogen cylinder.



If any faults are identified during these checks, please refer to the Troubleshooting section of this manual. If replacement parts are required, please refer to the Spares section for part codes.

## Wiring diagram



Wiring line Type:	
	Pump 1
	Pump 2
	12V Live & Neutral
	On/Off Switch

Colour code List	
White	wh
Violet	bl
Black	bk
Brown	br
Yellow / Green	y/g
Yellow	yl
Pink	pk
Blue	bl
Dark Blue	dk bl
Grey	gy
LIVE	L
EARTH	E
NEUTRAL	N

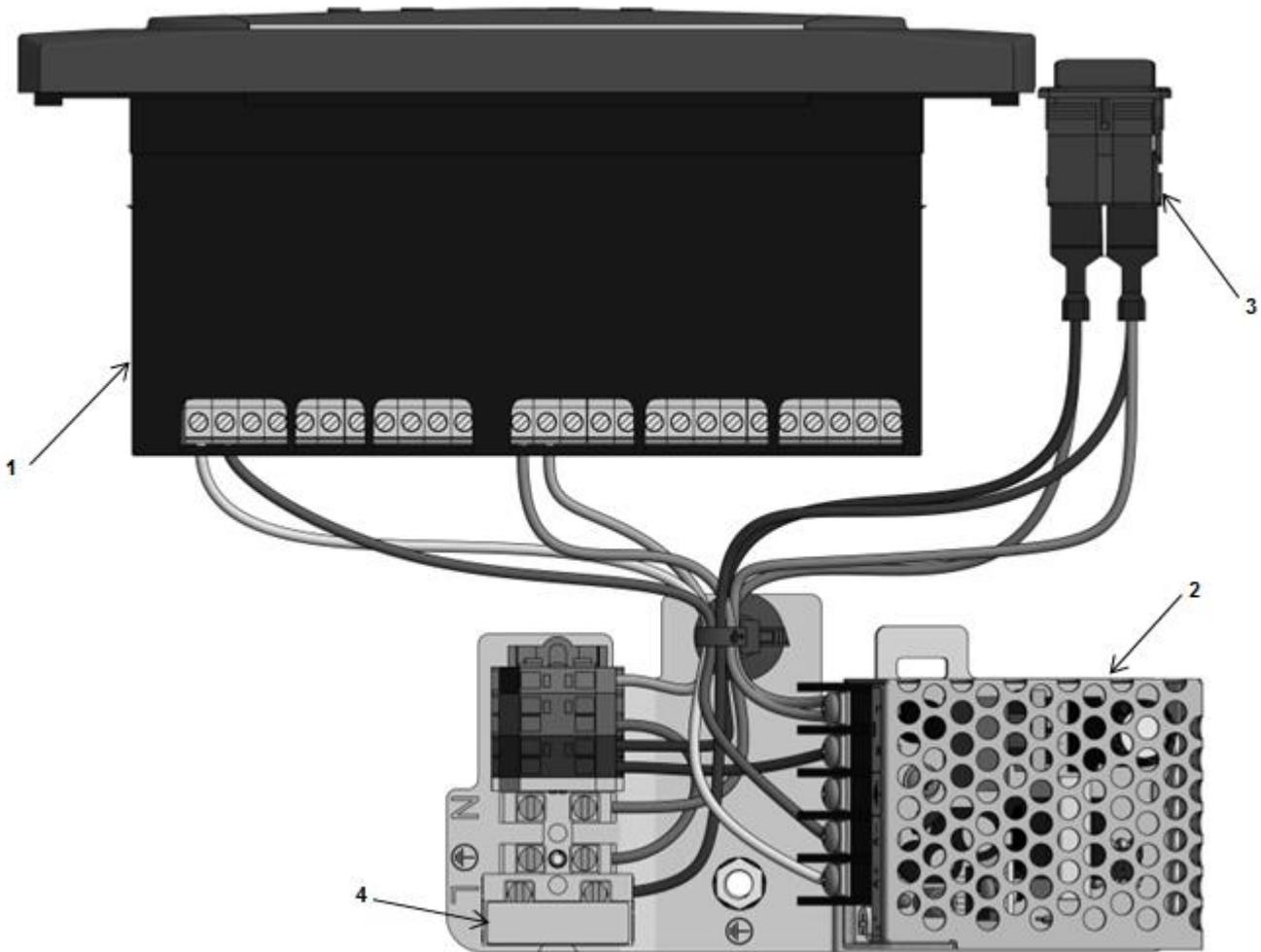
= Volt free contacts

Note: NL: 240v AC 50Hz supply connection.

## Spare Parts



The drawings on the following pages show the internal components for a range of pressurisation equipment. Due to continuing development and minor design changes, some components may be changed without notice. Therefore, the drawings may not accurately reflect the current production design. If in any doubt about the compatibility of replacement parts, please contact Flamco.



\*Image for indication only

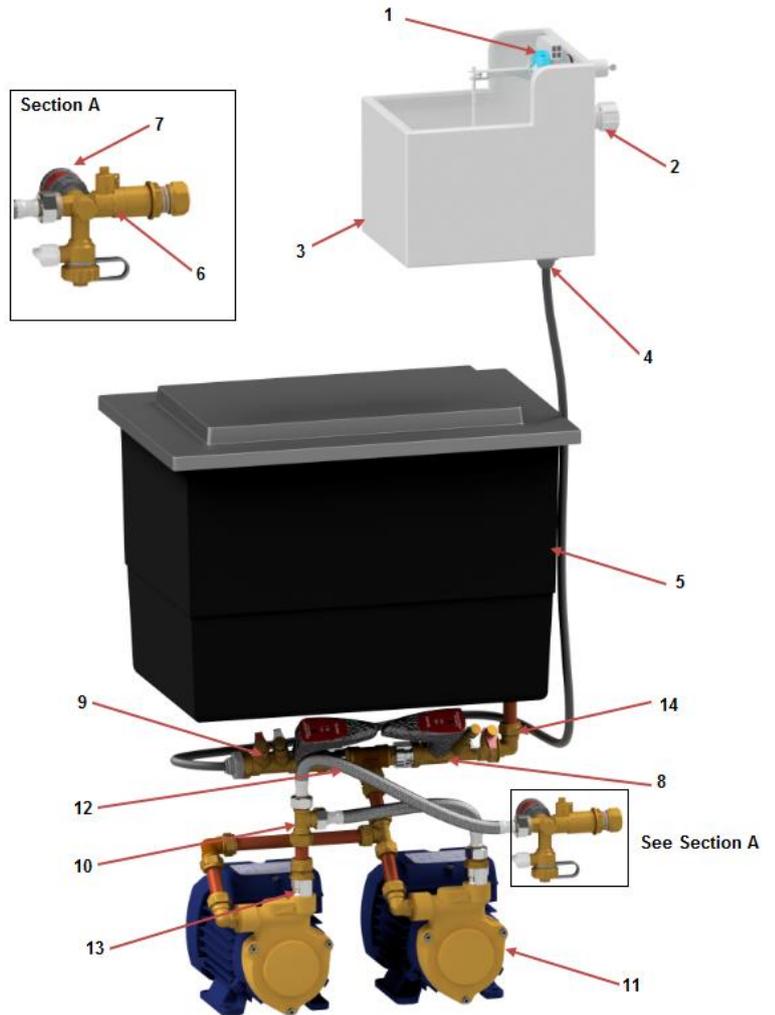
Kit No	Kit Description	ID	Part Description	Qty
STA12503	<b>Controller v10</b>	*	Micro Controller v10	1
STA12500	<b>Power Supply and Switch</b>	*	ON/OFF SWITCH	1
		*	ELECTRICAL PLATE TWO PUMP	1

## Pro PDS (231, 261, 281)

\*Image for indication only

### Part List

ID	Description
1	Mini Float Valve
2	Overflow Connection
3	Midi single Break Tank (Water)
4	¼" BSP M x 8mm Push-Fit
5	Additive Break Tank (18 Litres)
6	Combined Isolation & Drain Valve
7	Pressure Transducer (0-10 Bar, 1-6V)
8	DN15 Venturi Balancing Valve - Additive
9	DN15 Venturi Balancing Valve – Water
10	½" Tee Brass
11	PressDS 225 (Pedrollo PQA60)
	PressDS 250 (Pedrollo PQ81B)
	PressDS 280 (Pedrollo PQA90)
12	Braided Hose
13	½" Non-Return Valve
14	½" x 15mm MI Elbow



### Spare Kit list – Pro PDS

Kit No	Kit Description	Material Description	Quantity
STA12505	Pump   Flamco PQA60	PQA60 PUMP	1
		RING CRIMP	1
		0.75MM CABLE BLACK	1.03
		1/2BSP non return valve	1
		15mm x 1/2BSP C X Mi Coupling	2
		15mm x 1/2BSP C X Mi Elbow	1
STA12506	Pump   Flamco PQm81-BS	PQ81B PUMP	1
		RING CRIMP	1
		0.75MM CABLE BLACK	1.03
		1/2BSP non return valve	1
		15mm x 1/2BSP C X Mi Coupling	2
		15mm x 1/2BSP C X Mi Elbow	1

Kit No	Kit Description	Material Description	Quantity
STA12507	Pump   Flamco PQA90	PQA90 PUMP	1
		RING CRIMP	1
		0.75 MM CABLE BLACK	1.03
		½ BSP non-return valve PN16	1
		Coupling 15 mm x ½ bspt Kuterlite 61055K	2
		Elbow 15 mm x ½ bspt M Kuterlite 61155K	1
STA12518	Pump Fitting Kit 1/2"bsp 0-10b	15 mm x ½ BSP C X Mi Coupling	2
		15 mm x ½ BSP C X Mi Elbow	1
		Flexible Hose	2
		Non-return valve	1
STA12514	Mains Inlet Kit 18L tanks	WATER INLET BALLVALVE/FLOAT	1
		LOW LEVEL FLOAT SWITCH	1
STA12528	Press DS Balancing Valve Kit	1/2 " BSP M TO 10 MM PLASTIC PUSHFIT	1
		1/2 NON-RETURN VALVE	1
		1/2 X 15MM MALE COUPLING	1
		1/2 X 15MM MALE ELBOW	1
		10 MM PLASTIC TUBE	2 MTR
		1/2 BALANCING VALVE DN15	1
STA12515	Pressure Transducer 1-6v 0-10b	Transducer 10bar	1
STA12516	Pressure Transducer 1-6v 0-16b	Transducer 16bar	1

(\*) these parts are not shown

## Troubleshooting

If for any reason the pressurisation unit does not seem to be functioning correctly, please refer to the table below for a list of solutions to known problems.



If the pressurisation unit is showing a fault code on the display, holding down the [SET] button will cause the current system pressure to be temporarily shown on the display.

Symptom	Problem	Solution
LOW PRESSURE fault is displayed and the pumps do not run	The internal isolation valve within the unit is closed	Open the internal isolation valve
	The system pressure has fallen below the LOW PRESSURE set point	Increase system pressure using a filling loop, or enable the SYSTEM FILL option
	The SPC CONTROLLER option is enabled	Disable the SPC CONTROLLER option
	The LOW PRESSURE set point is too high	Review the system specifications
HIGH PRESSURE fault is displayed	The internal isolation valve within the unit is closed	Open the internal isolation valve
	The system pressure has risen above the HIGH PRESSURE set point	Decrease system pressure using a suitable drain point
	The expansion vessel has failed or lost its pre-charge	Check the expansion vessel pre-charge and re-charge if necessary
	The expansion vessel is undersized	Review the expansion vessel selection
	The HIGH PRESSURE set point is too low	Review the system specifications
P1 and/or P2 FLOOD LIMIT is displayed	A large amount of water has been lost from the system	Investigate cause
	The relevant pump is air-locked and not pumping water	Bleed the pump
	The unit is undersized for the system	Review unit selection
	The FLOOD LIMIT time is too short.	Consult Flamco

Symptom	Problem	Solution
P1 and/or P2 FAIL is displayed	The PUMP TYPE option is set incorrectly.	Review PUMP TYPE setting
	The relevant pump has failed	Replace pump
P2 FAIL is displayed but the unit is a single pump model	The PUMPS NUMBER option is incorrectly set to 2	Set PUMPS NUMBER to 1
LOW H2O fault is displayed	The mains water supply to the unit has been isolated	Turn on the mains water supply
	The mains pressure is poor	The fault will clear once the break tank has been re-filled
	A non-standard electrical connection has been made into terminals 19 & 20	Remove all non-standard electrical connections
	The low water float switch has failed	Replace low water float switch
	The digital controller has failed	Replace digital controller
HIGH H2O fault is displayed	A non-standard electrical connection has been made into terminals 21 & 22	Remove all non-standard electrical connections
	The digital controller has failed	Replace digital controller
Pressure reading does not match actual system pressure.	The internal isolation valve within the unit is closed	Open the internal isolation valve
	The SENSOR TYPE option is set incorrectly	Review SENSOR TYPE setting
	A non-return valve has been installed between the unit and the system	Remove non-return valve
	The pressure sensor has failed	Replace pressure sensor
ERROR 1 fault is displayed	The SENSOR TYPE option is set incorrectly	Review SENSOR TYPE setting
	The pressure sensor has failed	Replace pressure sensor
Pump runs but does not make up pressure	The pump is air-locked and not pumping water	Bleed the pump
The pump is persistently becoming air-locked	The wrong/no flow restrictor is installed in the float valve (mini and midi units only)	Check float valve flow restrictor selection (mini and midi units only)

Symptom	Problem	Solution
The break tank is overflowing and discharging water to drain or over the weir	The wrong/no flow restrictor is installed in the float valve (mini and midi units only)	Check float valve flow restrictor selection (mini and midi units only)
	The float valve position is set incorrectly	Set the float valve to its lowest possible position
	The float valve has failed	Replace float valve
	A pump non-return valve has failed	Replace non-return valve
The pump is repeatedly running in short bursts	The internal isolation valve within the unit is partially closed	Fully open the internal isolation valve
	The restriction in the connecting pipe work is too great	Increase bore/ reduce number of bends/ reduce length of connecting pipe work
	A pump non-return valve has failed	Replace non-return valve
	The expansion vessel has failed or lost its pre-charge	Check the expansion vessel pre-charge and re-charge if necessary
	The point of connection of the unit is too far away from the expansion vessel	Move unit/expansion vessel connection points closer together.
The buttons on the digital controller do not respond	The plastic housing of the digital controller has come apart and the PCB has moved	Reassemble the digital controller housing and ensure that the PCB is properly seated
The digital controller parameters are being corrupted	The controller is being subject to power spikes	Fit a suitable power filter
The digital controller does not power up when the unit is switched on	The fuse has blown	Replace the fuse
	The mains power supply is at an incorrect voltage or frequency	Check mains power supply
	The 12V transformer has failed	Replace Transformer
	The digital controller has failed	Replace digital controller
SERVICE is displayed on the screen	The unit is due an annual service	Contact service engineer

## Maintenance Schedule

Maintenance schedule is based on the operation of the equipment and these the recommended to be taken place during the period of operation to maintain a healthy equipment.

Key:

 Check     
  Service     
  Clean

Task	Conditions			Interval
<b>Check for leaks</b> - Fittings - Valves - Pumps				Annually
<b>Check Electrical</b> - Wiring - Pressure sensor				Annually
<b>Check Digital controller settings</b> - Top-up controller				Depend on system operation

## Service Logs

This service log should be completed by the service engineer after each annual service.

<b>Date</b>		<b>P1 COUNT</b>	
<b>Engineers Name</b>		<b>P1 HOURS</b>	
<b>Company</b>		<b>P2 COUNT</b>	
<b>Contact Number</b>		<b>P2 HOURS</b>	
		<b>ALARM COUNT</b>	
		<b>POWER INTERRUPTIONS</b>	
<b>Comments</b>			

<b>Date</b>		<b>P1 COUNT</b>	
<b>Engineers Name</b>		<b>P1 HOURS</b>	
<b>Company</b>		<b>P2 COUNT</b>	
<b>Contact Number</b>		<b>P2 HOURS</b>	
		<b>ALARM COUNT</b>	
		<b>POWER INTERRUPTIONS</b>	
<b>Comments</b>			

<b>Date</b>		<b>P1 COUNT</b>	
<b>Engineers Name</b>		<b>P1 HOURS</b>	
<b>Company</b>		<b>P2 COUNT</b>	
<b>Contact Number</b>		<b>P2 HOURS</b>	
		<b>ALARM COUNT</b>	
		<b>POWER INTERRUPTIONS</b>	
<b>Comments</b>			

<b>Date</b>		<b>P1 COUNT</b>	
<b>Engineers Name</b>		<b>P1 HOURS</b>	
<b>Company</b>		<b>P2 COUNT</b>	
<b>Contact Number</b>		<b>P2 HOURS</b>	
		<b>ALARM COUNT</b>	
		<b>POWER INTERRUPTIONS</b>	
<b>Comments</b>			

## Warranty Details

### Warranty - What Is Covered?

The Flamco warranty on equipment supplied to distribution and OEM covers manufacturing defects, under our standard terms and conditions of sale.

If the unit is identified with a manufacturing defect then no charge is made for correcting the defect.

The Flamco equipment is manufactured to order and is clearly marked, where applicable, with a unique serial number, allowing traceability to both individual model configuration and the engineer or site responsible for the build and test.

### Warranty - What Is Not Covered?

If a defect or problem has arisen as a direct result of the connected system, misuse, incorrect handling, incorrect installation or incorrect commissioning then any service visit is chargeable.

If a defect is identified as a manufacturing defect it will be addressed as described above, additional remedial works as a result of misuse, incorrect handling, incorrect installation or incorrect commissioning then the additional work is chargeable.

Installation costs and/or consequential losses are not covered by this agreement.

## Conditions of warranty

DOS - Date Of Supply

DOC - Date Of Commissioning

Equipment	Conditions	Timescale
Flamco Pressurisation Equipment	That there is an appropriate safety valve on the system protecting the equipment. That the equipment is undamaged at the time of installation. That the equipment is not exposed to adverse environmental conditions. That the equipment is stored and installed in a frost free area. That the operating and maintenance instructions are followed. That the equipment is used for the purpose for which it was designed.	18 months DOS 24 months DOC

## Contact Details

Please send form back this form using the address below, if you any queries please use contact below.

Phone: +44 (0)1744 744 744

Fax: +44 (0)1744 744 700

Email: [info@flamco.co.uk](mailto:info@flamco.co.uk) (General Enquires)

Email: [service@flamco.co.uk](mailto:service@flamco.co.uk) (Service Enquires)

## STATEMENT OF COMPLIANCE

**Manufacturer:** Flamco Limited  
Washway Lane  
St Helens  
Merseyside  
WA10 6PB  
United Kingdom

**Product:** Flamco Pressurisation Equipment and branded Derivatives

**Description:** Sealed system pressurisation equipment, dosing equipment and combinations thereof.

**Statement:**

The above-mentioned products are manufactured in The UK and comply with the essential requirements of the applicable directives, including but not limited to:

Pressure Equipment Directive	2014/68/EU
Sound Engineering Practice	
RoHS Compliance	

**Additional Information:**

All appropriate components bear the CE mark prior to assembly, and are bound by their individual applicable directives including but not limited to:

Pressure Equipment Directive	2014/68/EU
Low Voltage Directive	2014/35/EU
Electromagnetic Compatibility Directive	2014/30/EU
Machinery Directive	2006/42/EC

**CE Marking:**

Under the regulations and guidelines CE marking of the assembled pressurisation unit is not permitted.



Rob Clemson BEng Hons MIET Chartered Engineer  
Technical Director  
Flamco Limited



**Flamco Limited**

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