



Flamco Pro Range Pressurisation Equipment

Pro PU (131, 231, 161, 261, 181, 281)

Pro PUm (131, 231, 161, 261)

Pro PDm (1.0, 1.5, 2.0, 2.5)

Operation & Maintenance Manual

Contents

| | |
|--|----|
| Customer Details | 4 |
| Equipment Details | 4 |
| Commissioning Record | 5 |
| Pressures In A Sealed System | 6 |
| About this Manual | 7 |
| Conventions used in this Manual | 7 |
| Typography | 7 |
| Where to find more Information..... | 7 |
| Equipment Overview | 8 |
| Installation | 9 |
| Pipe Connections | 9 |
| Typical Installation Diagram | 9 |
| Flow Restrictors (Pro PUm & Pro PDm Only) | 10 |
| Pro PU Clearance and Connection Requirements | 11 |
| Pro PUm & Pro PDm Clearance and Connection Requirements | 12 |
| Electrical Power Supply | 13 |
| Micro Controller | 14 |
| Fault contacts | 14 |
| Commissioning | 15 |
| Pre-Commissioning Checklist | 15 |
| Controller Overview | 16 |
| Controller Programming..... | 17 |
| Program Parameter List..... | 18 |
| Hydraulic Commissioning | 21 |
| 1. Float Valve Setting | 21 |
| 2. Bleeding Pumps | 21 |
| 3. Forcing Pumps to Run..... | 23 |
| 4. Initial Start-up | 24 |
| 5. Testing | 25 |
| Quick equipment suitability guide in relation to system expansion vessel | 25 |
| Operation..... | 26 |

Contents

| | |
|--|----|
| Fault Codes | 26 |
| Shutdown procedure | 27 |
| Start-up Procedure | 27 |
| Maintenance | 28 |
| Visual Inspection | 28 |
| Interrogate Controller | 28 |
| Test Unit Operation | 28 |
| Check Float Valve Operation | 29 |
| Check Float Switch Operation | 29 |
| Check Break Tank Water Condition | 29 |
| Check Strainer (Pro PU units only) | 29 |
| Check Expansion Vessel Pre-Charge | 29 |
| Wiring diagram | 30 |
| Spare Parts | 31 |
| Spare kit list – Pro PU | 32 |
| Spare kit list – Pro PUm | 34 |
| Spare kit list – Pro PDm | 35 |
| Troubleshooting | 36 |
| Service Logs | 39 |
| Warranty Details | 40 |
| Conditions of warranty | 40 |
| Contact Details | 40 |
| STATEMENT OF COMPLIANCE | 41 |
| Notes | 42 |

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

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

| | | | |
|-----------------------|--|----------------|--|
| Site Reference | | | |
| Model | | Date | |
| Engineer Name | | Company | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|-----------|----------------|-----|--------------------|--|-----|-----------------------|--|-----|----------------------|--|-----|-------------------|--|-----|--------------|--|-----|-------------|--|---------|--------------------------|--|----------------|----------------------|--|-------|--|--------------|--|--|-----------|--|---------|------------|--|-------|----------------|--|-------|---------------------------|--|-----|--------------------------|--|--------------|--------------------------|--|---------------|------------------|--|-------|---------------|--|-------|---------|--|---------|---------------------------|--|-------|--------------------|--|-------|---------------|--|-------|-----------------------|--|---------|------------|--|-------|---------|--|-------|---------------|--|-------|
| User PU Settings <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Cold Fill</td><td></td><td>Bar</td></tr> <tr><td>High Alarm Setting</td><td></td><td>Bar</td></tr> <tr><td>High Pressure Warning</td><td></td><td>Bar</td></tr> <tr><td>Low Pressure Warning</td><td></td><td>Bar</td></tr> <tr><td>Low Alarm Setting</td><td></td><td>Bar</td></tr> <tr><td>Differential</td><td></td><td>Bar</td></tr> <tr><td>Flood Limit</td><td></td><td>Minutes</td></tr> <tr><td>Excessive Start Quantity</td><td></td><td>(0 to disable)</td></tr> <tr><td>Excessive Start Time</td><td></td><td>Hours</td></tr> </table> | Cold Fill | | Bar | High Alarm Setting | | Bar | High Pressure Warning | | Bar | Low Pressure Warning | | Bar | Low Alarm Setting | | Bar | Differential | | Bar | Flood Limit | | Minutes | Excessive Start Quantity | | (0 to disable) | Excessive Start Time | | Hours | Extended PU Engineers Settings <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Pumps Number</td><td></td><td></td></tr> <tr><td>Pump Type</td><td></td><td>(C/P/R)</td></tr> <tr><td>Pump Sense</td><td></td><td>(Y/N)</td></tr> <tr><td>Periodic Pulse</td><td></td><td>(Y/N)</td></tr> <tr><td>Topup Sensor Max Pressure</td><td></td><td>Bar</td></tr> <tr><td>Topup Sensor Min Voltage</td><td></td><td>(2 for Mamp)</td></tr> <tr><td>Topup Sensor Max Voltage</td><td></td><td>(10 for Mamp)</td></tr> <tr><td>Slave Unit (SPC)</td><td></td><td>(Y/N)</td></tr> <tr><td>Additive Unit</td><td></td><td>(Y/N)</td></tr> <tr><td>Overrun</td><td></td><td>Seconds</td></tr> <tr><td>Pressure Alarm Auto Reset</td><td></td><td>(Y/N)</td></tr> <tr><td>All VFC - Failsafe</td><td></td><td>(Y/N)</td></tr> <tr><td>Tank Solenoid</td><td></td><td>(Y/N)</td></tr> <tr><td>Tank Solenoid Overrun</td><td></td><td>Seconds</td></tr> <tr><td>Zero Start</td><td></td><td>(Y/N)</td></tr> <tr><td>Cascade</td><td></td><td>(Y/N)</td></tr> <tr><td>Extended Mode</td><td></td><td>(Y/N)</td></tr> </table> | Pumps Number | | | Pump Type | | (C/P/R) | Pump Sense | | (Y/N) | Periodic Pulse | | (Y/N) | Topup Sensor Max Pressure | | Bar | Topup Sensor Min Voltage | | (2 for Mamp) | Topup Sensor Max Voltage | | (10 for Mamp) | Slave Unit (SPC) | | (Y/N) | Additive Unit | | (Y/N) | Overrun | | Seconds | Pressure Alarm Auto Reset | | (Y/N) | All VFC - Failsafe | | (Y/N) | Tank Solenoid | | (Y/N) | Tank Solenoid Overrun | | Seconds | Zero Start | | (Y/N) | Cascade | | (Y/N) | Extended Mode | | (Y/N) |
| Cold Fill | | Bar | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| High Alarm Setting | | Bar | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| High Pressure Warning | | Bar | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Low Pressure Warning | | Bar | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Low Alarm Setting | | Bar | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Differential | | Bar | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Flood Limit | | Minutes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Excessive Start Quantity | | (0 to disable) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Excessive Start Time | | Hours | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pumps Number | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pump Type | | (C/P/R) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pump Sense | | (Y/N) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Periodic Pulse | | (Y/N) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Topup Sensor Max Pressure | | Bar | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Topup Sensor Min Voltage | | (2 for Mamp) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Topup Sensor Max Voltage | | (10 for Mamp) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Slave Unit (SPC) | | (Y/N) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Additive Unit | | (Y/N) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Overrun | | Seconds | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pressure Alarm Auto Reset | | (Y/N) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| All VFC - Failsafe | | (Y/N) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tank Solenoid | | (Y/N) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tank Solenoid Overrun | | Seconds | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Zero Start | | (Y/N) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cascade | | (Y/N) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Extended Mode | | (Y/N) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--------------|-------|--|--------------|--|-------|--------------|--|--|--------------|--|-------|-------------|--|--|-------------------|--|--|-----------|--|--|---|------------------|--|-------|
| Counters & Logs <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Pump 1 Count</td><td></td><td></td></tr> <tr><td>Pump 1 Hours</td><td></td><td>Hours</td></tr> <tr><td>Pump 2 Count</td><td></td><td></td></tr> <tr><td>Pump 2 Hours</td><td></td><td>Hours</td></tr> <tr><td>Alarm Count</td><td></td><td></td></tr> <tr><td>Power Interrupted</td><td></td><td></td></tr> <tr><td>ID Number</td><td></td><td></td></tr> </table> | Pump 1 Count | | | Pump 1 Hours | | Hours | Pump 2 Count | | | Pump 2 Hours | | Hours | Alarm Count | | | Power Interrupted | | | ID Number | | | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Service Reminder</td><td></td><td>(Y/N)</td></tr> </table> | Service Reminder | | (Y/N) |
| Pump 1 Count | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pump 1 Hours | | Hours | | | | | | | | | | | | | | | | | | | | | | | |
| Pump 2 Count | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pump 2 Hours | | Hours | | | | | | | | | | | | | | | | | | | | | | | |
| Alarm Count | | | | | | | | | | | | | | | | | | | | | | | | | |
| Power Interrupted | | | | | | | | | | | | | | | | | | | | | | | | | |
| ID Number | | | | | | | | | | | | | | | | | | | | | | | | | |
| Service Reminder | | (Y/N) | | | | | | | | | | | | | | | | | | | | | | | |

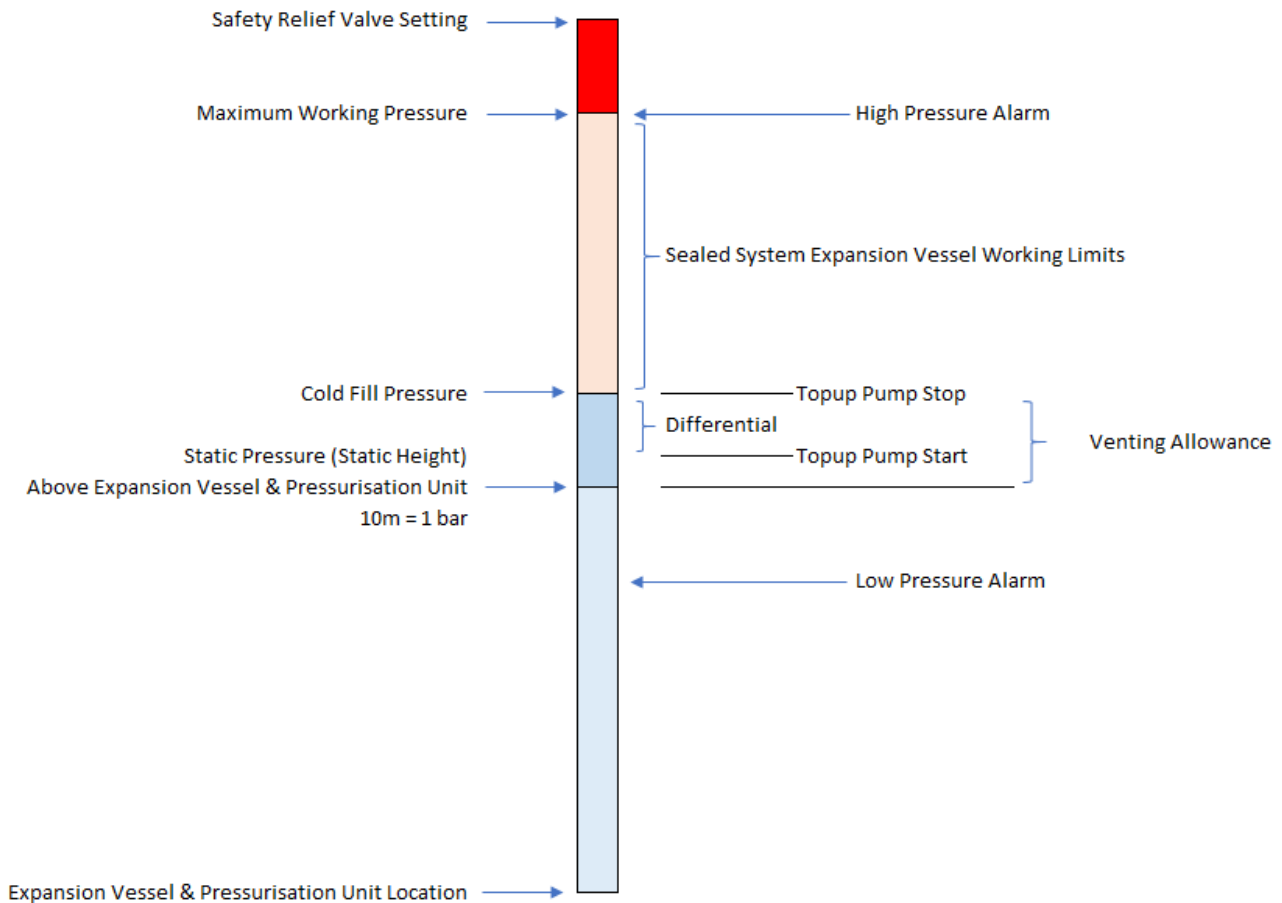
| | | |
|-----------------------------|--|--------|
| Expansion Vessel Volume | | litres |
| Safety Relief Valve Setting | | bar |

| | | |
|----------------|--|-----|
| Gas Pre-Charge | | 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 OR service@flamco.co.uk

Equipment Overview

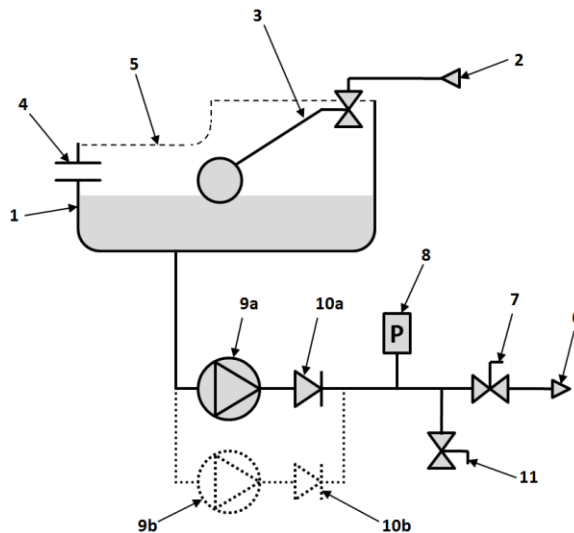
The function of this pressurisation unit is to provide a means of automated water top-up to sealed heating and cooling systems. The equipment is designed to provide periodic water top-up to compensate for minor losses in system pressure (e.g. slow leaks, air venting, etc.).



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 pressurisation 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 a warning overflow (4) in case the break tank overfills, and a weir overflow (5) as the primary backflow protection.

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/automatic changeover 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.

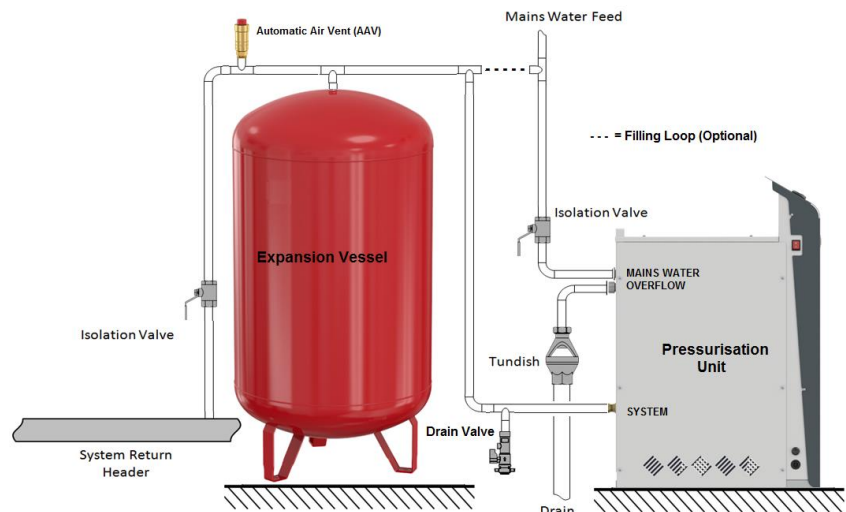


Non-return valves, pressure reducing valves and RPZ valves must not be installed between the pressurisation unit and the heating/cooling system. These devices will prevent the pressure sensor from reading the system pressure.



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



Flow Restrictors (Pro PUm & Pro PDm Only)

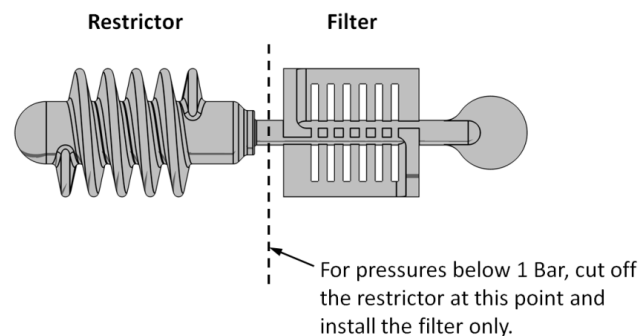


Pressurisation equipment fitted with a plastic, side-entry torbeck valve must be fitted with a filter and – depending on the mains water pressure – a flow restrictor. Failure to do this may result in damage to the equipment.

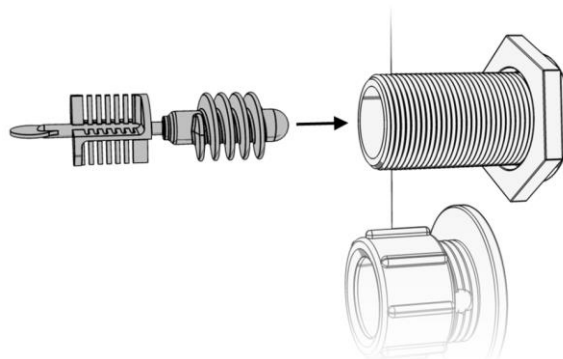
Two different flow restrictors are supplied with the equipment, both of which include an integral filter. The selection of the appropriate flow restrictor is based on the maximum mains water pressure at the point of installation. Please refer to the following table for selection.

| Mains Water Pressure | Requirement |
|----------------------|------------------------------------|
| Below 1 Bar | No Restrictor. Install Filter Only |
| 1 – 4 Bar | Low Pressure Restrictor (coloured) |
| Above 4 Bar | High Pressure Restrictor (white) |

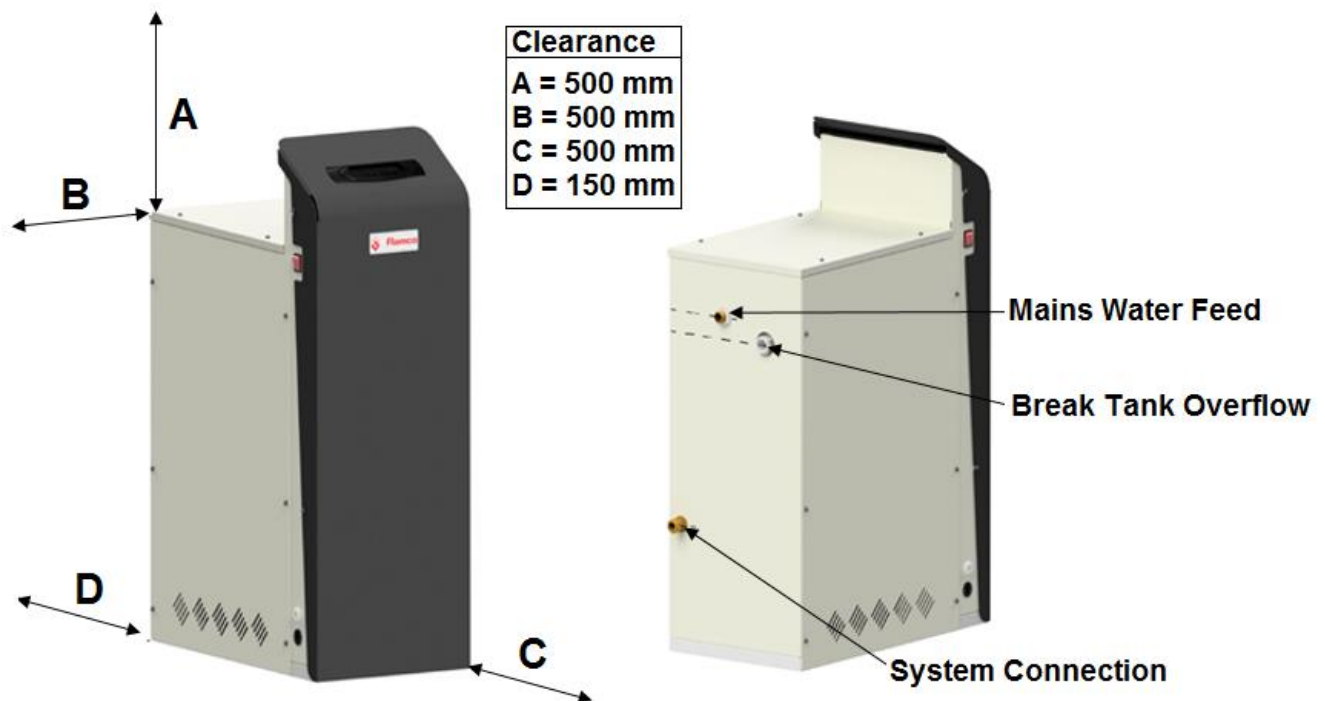
If no restrictor is required, the filter must be removed from one of the restrictors and installed on its own. The following diagram shows how to remove the filter:



To install the flow restrictor/filter, hold it by the tab and push it into the opening of the float valve connection, as shown in the diagram below:

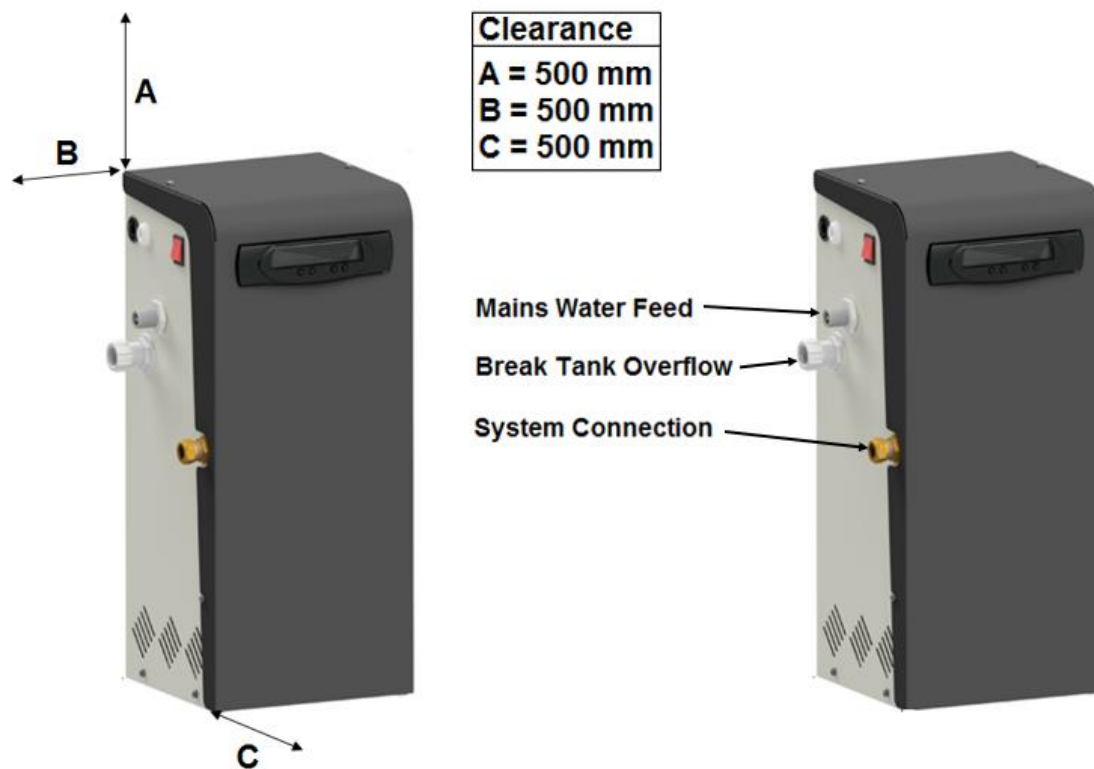


Pro PU Clearance and Connection Requirements – Floor Standing unit



| 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> |

Pro PUm & Pro PDm Clearance and Connection Requirements – Wall mounted



| 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

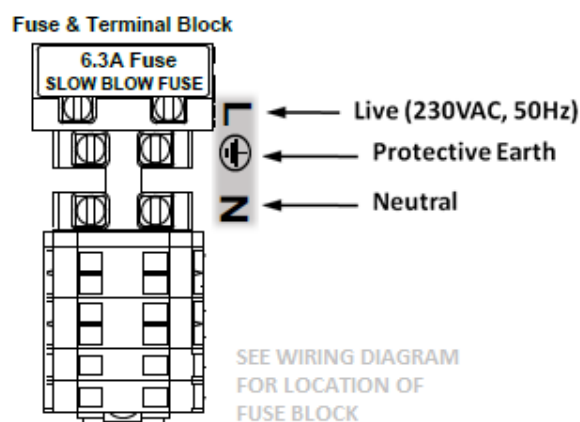


This equipment must be electrically isolated before removing the covers. Cables connected to the volt free contacts may be supplied from another source and may remain live after the unit is isolated. These must be isolated elsewhere.

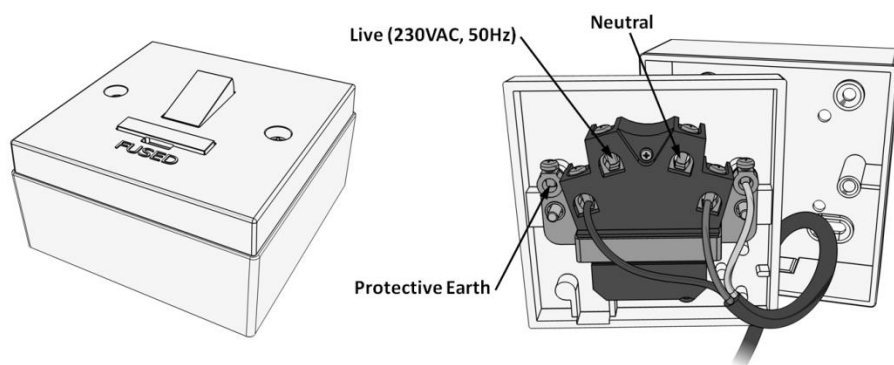


All electrical connections must be carried out by a suitably qualified and competent person.

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.

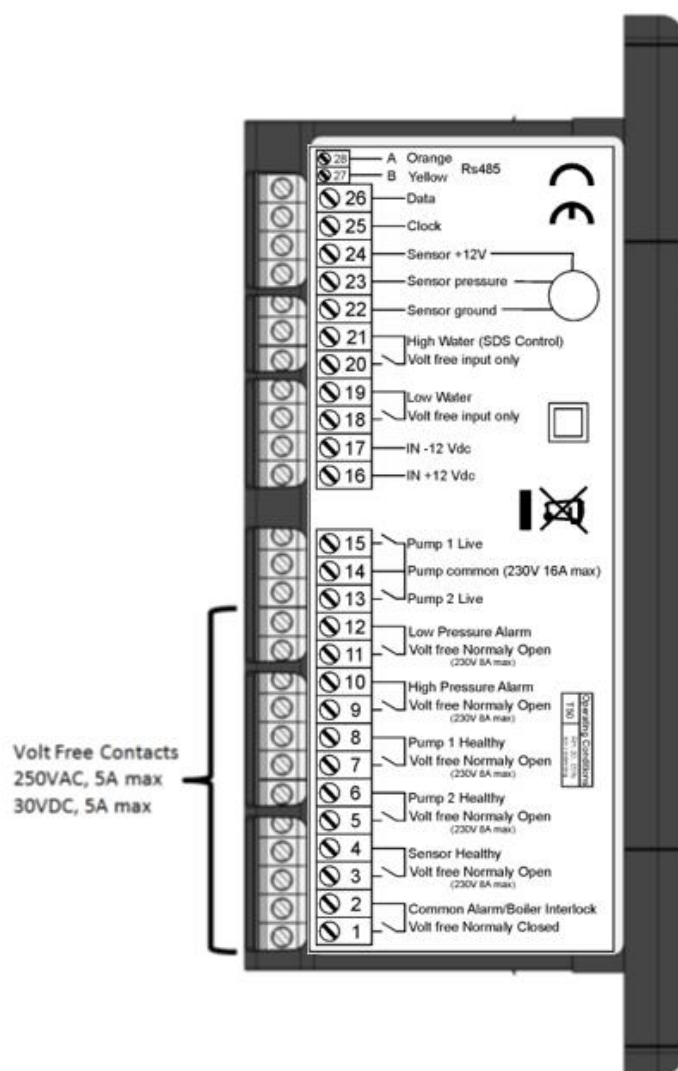


This equipment can be damaged by the high voltages produced by electrical installation testing equipment. When performing electrical installation tests, the equipment must be isolated from the supply.

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 | 2601 |
| Engineer Code | Full set of options | 4706 |

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 THEN 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 | |

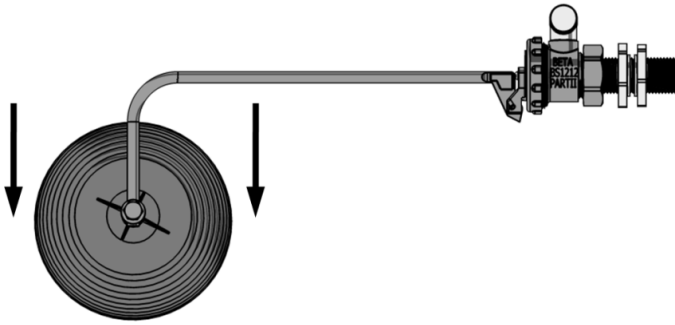
| | | | | | |
|----|------------------------------|---|-----|---------|-----------------|
| 11 | Pump Number | | 1 | | STANDARD OPTION |
| 12 | Pump Type | Pump Type C (current monitored centrifugal pump) | C | | |
| | | Pump Type P (current monitored Piston pump) | | | |
| | | Pump Type R (Not Current 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) | N | | |
| 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 | | | |

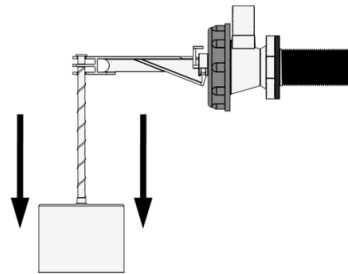
Hydraulic Commissioning

1. Float Valve Setting

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



Pro PU Units



Pro PUm & Pro PDm 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.



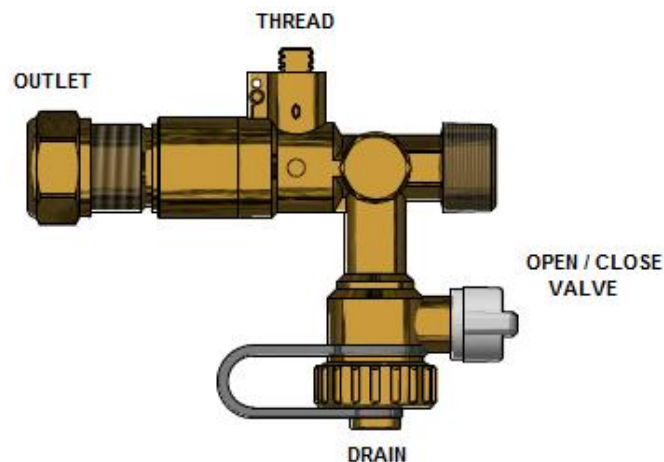
When the float valve operates for the first time, it may not close immediately, causing the break tank to overfill. Once the internals of the valve have been fully wetted this should not occur again.

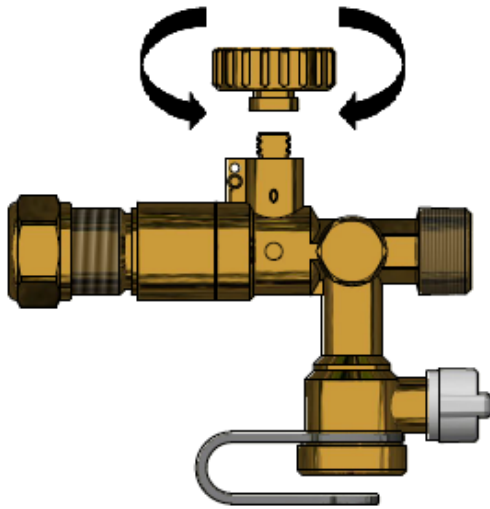
2. Bleeding Pumps

This step is only necessary for Pro PU / PUm / PDm 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.

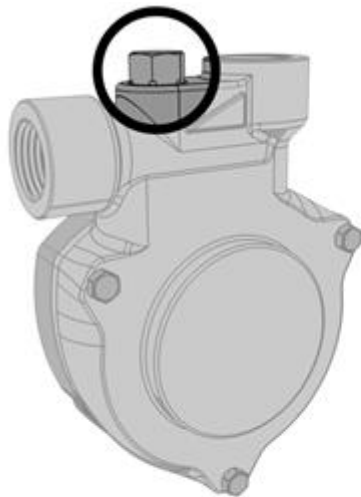




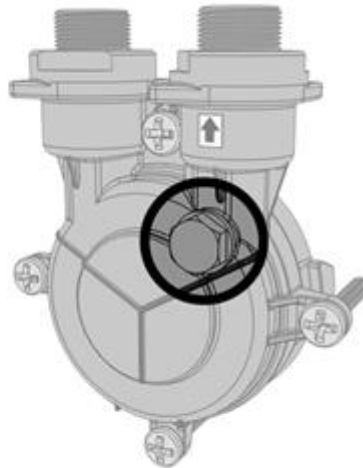
Procedure:

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



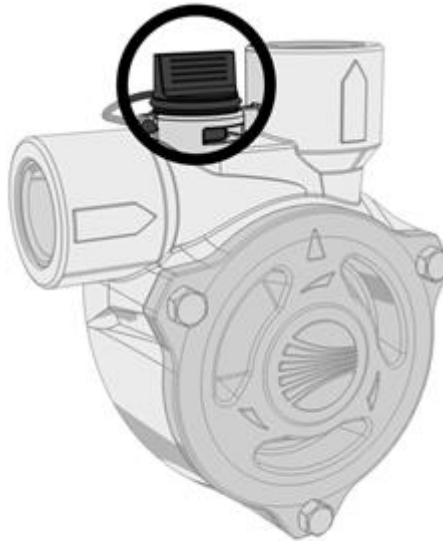
Flamco-003



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. Turn the plastic cap $\frac{1}{4}$ Anti-clockwise and lift the plug above the gap. Once water slip out push back cap by $\frac{1}{4}$ turn clockwise.



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. Initial Start-up

Open the isolation valve. Once the isolation valve is open, the pressure sensor will be able to read the system pressure.

Turn on the power supply to the pressurisation unit. Depending on the current system pressure, the unit will respond in one of the following ways:



If the system pressure is below the low pressure alarm setting, the controller will display a “LOW PRESSURE” fault and the pumps will not run. To clear this fault, either increase the system pressure using a filling loop, or enable the system fill option on the pressurisation unit.



If the system pressure is above the high pressure alarm setting, the controller will display a “HIGH PRESSURE” fault. To clear this fault, use a suitable drain point to remove water from the system until the system pressure equals the cold fill pressure.



If the system pressure is above the low pressure alarm setting, but below the cold fill setting (by an amount equal to the differential setting), the pumps will start. Once the system pressure has reached the cold fill pressure, the pump will stop.

Once the required system pressure has been reached, the controller will display the current system pressure. The unit is now in normal operation.

5. 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 PU | 4 x 1000 |
| Pro PUm & Pro PDm | 800 |

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 |

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 (Pro PU units only)

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.

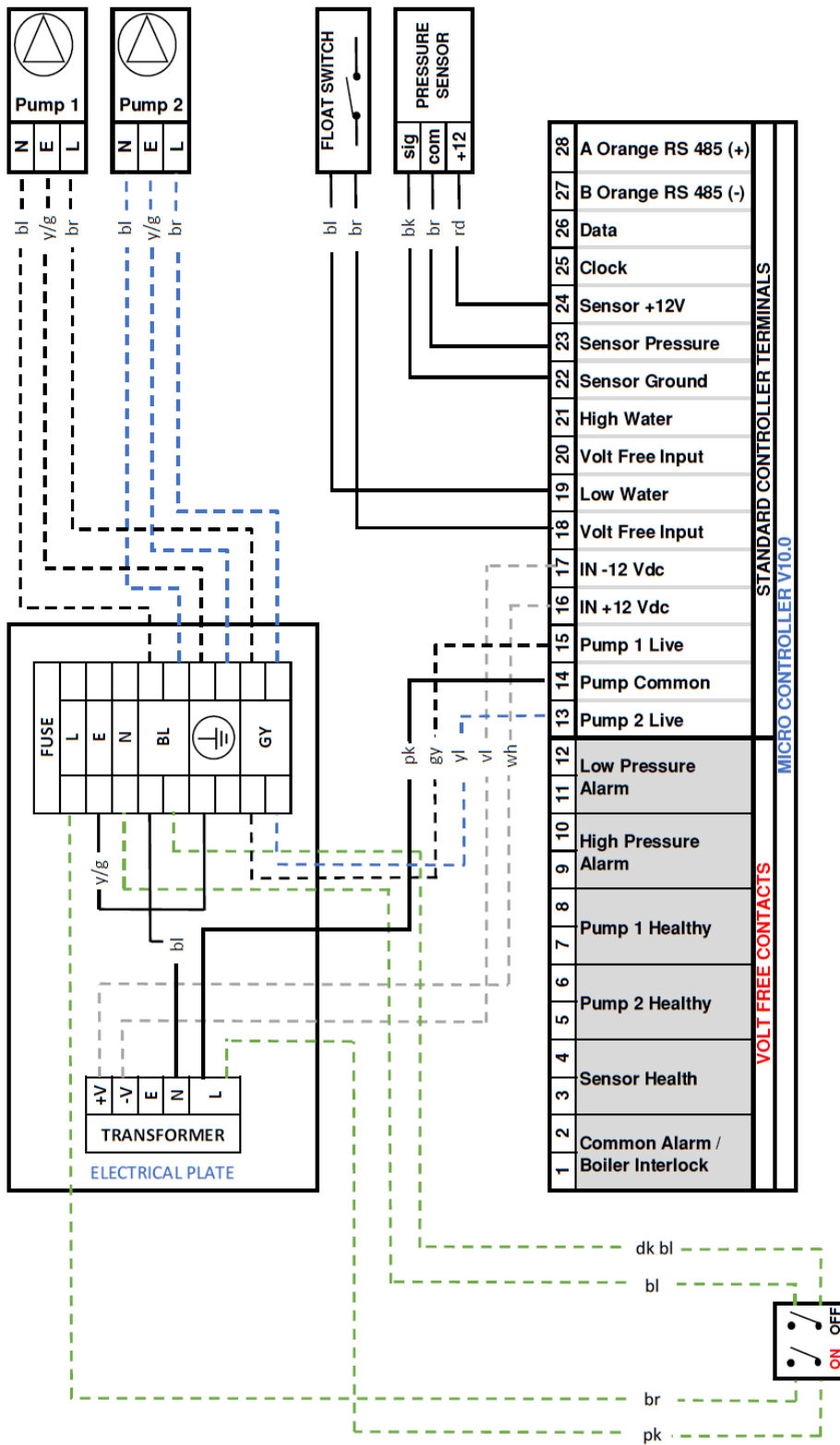
To perform this test, the expansion vessel must first be isolated and drained of water, then a gauge can be connected to the Schrader valve on the vessel to measure the pre-charge pressure. The pre-charge should be equal to the [COLD FILL] pressure setting.

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 |

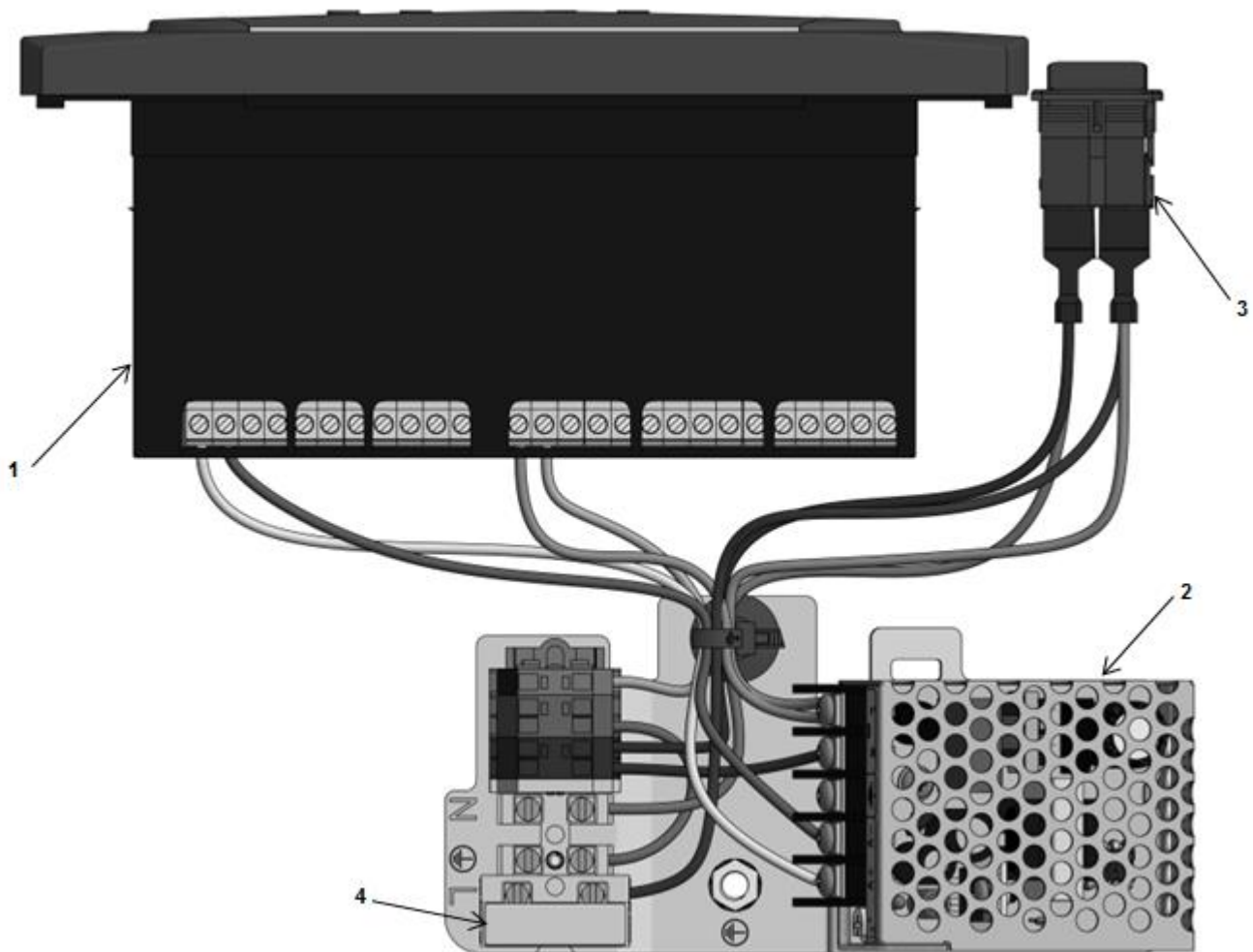
█ = Volt free contacts

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

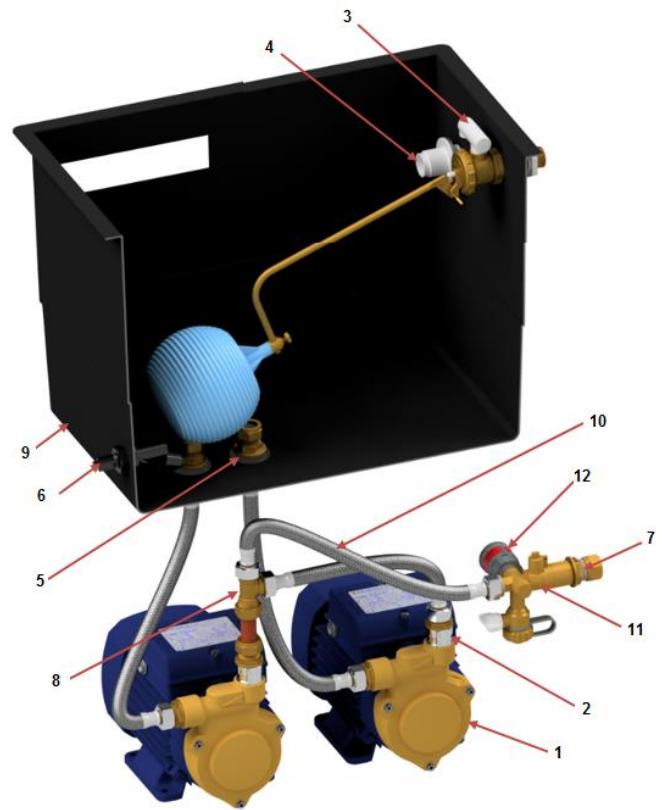
| Kit No | Kit Description | ID | Part Description | Qty |
|----------|---|----|---------------------------|-----|
| STA12503 | Controller Std Pressurisation Unit | 1 | CONTROLLER v10.0 | 1 |
| STA12500 | Power Supply and Switch | 3 | ON/OFF SWITCH | 1 |
| | | 2 | ELECTRICAL PLATE TWO PUMP | 1 |

ID Number (4) is included with part of Electrical plate as standard, this rated at 6.3 Amp. (131/231) 10.0 Amp

Pro PU (131, 231, 161, 261, 181, 281)

Part List

| ID | Description |
|----|---|
| 1 | Model 131 & 231 (Pedrollo PQA60) |
| | Model 161 & 261 (Pedrollo PQ81B) |
| | Model 181 & 281 (Pedrollo PQA90) |
| 2 | ½" Non-Return Valve |
| 3 | Float Valve |
| 4 | Overflow Connection |
| 5 | ½" Tank connector |
| 6 | Float Switch |
| 7 | ½" x 15 mm Compression Coupling |
| 8 | ½" Brass Tee (Twin pump only) |
| 9 | Break Tank 18L (c/w wier overflow) |
| 10 | Braided Hose |
| 11 | Combined Isolation & Drain Valve |
| 12 | Pressure Transducer (0-10 Bar, 1-6V) |
| | Pressure Transducer (0-16 Bar, 1-6V) (181, 281) |



Spare kit list – Pro PU

| Kit No | Kit Description | ID | Part Description | Qty |
|----------|-------------------------------|----|-------------------------------|------|
| STA12505 | Pump Flamco PQAm60 | 1 | PQA60 PUMP | 1 |
| | | * | RING CRIMP | 1 |
| | | * | 0.75 mm CABLE BLACK | 1.03 |
| | | 2 | 1/2 NON-RETURN VALVE | 1 |
| | | 7 | 15 mm x ½ BSP C X Mi Coupling | 2 |
| | | * | 15 mm x ½ BSP C X Mi Elbow | 1 |
| STA12506 | Pump Flamco PQm81-BS | 1 | PQ81B PUMP | 1 |
| | | * | RING CRIMP | 1 |
| | | * | 0.75 mm CABLE BLACK | 1.03 |
| | | 2 | 1/2 NON-RETURN VALVE | 1 |
| | | 7 | 15 mm x ½ BSP C X Mi Coupling | 2 |
| | | * | 15 mm x ½ BSP C X Mi Elbow | 1 |

| Kit No | Kit Description | ID | Part Description | Qty |
|----------|---------------------------------------|----|--------------------------------|------|
| STA12507 | Pump Flamco PQA90 | 1 | PQA90 PUMP | 1 |
| | | * | RING CRIMP | 1 |
| | | * | 0.75 mm CABLE BLACK | 1.03 |
| | | 2 | 1/2 NON-RETURN VALVE (PN16) | 1 |
| | | 7 | COUPLING 15 mm x ½ BSPT 61055K | 2 |
| | | * | ELBOW 15 mm x ½ BSPT M 61155K | 1 |
| STA12511 | Pump Pedrollo PQ3000 | 1 | PQ3000 PUMP 3 PHASE | 1 |
| | | * | RING CRIMP | 1 |
| | | * | 0.75 mm CABLE BLACK | 1.03 |
| | | 2 | 1/2 NON-RETURN VALVE (PN16) | 1 |
| | | 7 | COUPLING 15mm x ½ BSPT 61055K | 2 |
| | | * | ELBOW 15mm x ½ BSPT M 61155K | 1 |
| STA12518 | Pump Fitting Kit 1/2"bsp 0-10b | 7 | 15 mm x ½ BSP C X Mi Coupling | 2 |
| | | * | 15 mm x ½ BSP C X Mi Elbow | 1 |
| | | 10 | Flexible Hose | 2 |
| | | 2 | Non-return valve | 1 |
| STA12515 | Pressure Transducer 1-6v 0-10b | 12 | TRANSDUCER 10 bar | 1 |
| STA12516 | Pressure Transducer 1-6v 0-16b | 12 | TRANSDUCER 16 bar | 1 |
| STA12514 | Mains Inlet Kit 18L tanks | 3 | WATER INLET BALLVALVE/FLOAT | 1 |
| | | 6 | LOW LEVEL FLOAT SWITCH | 1 |

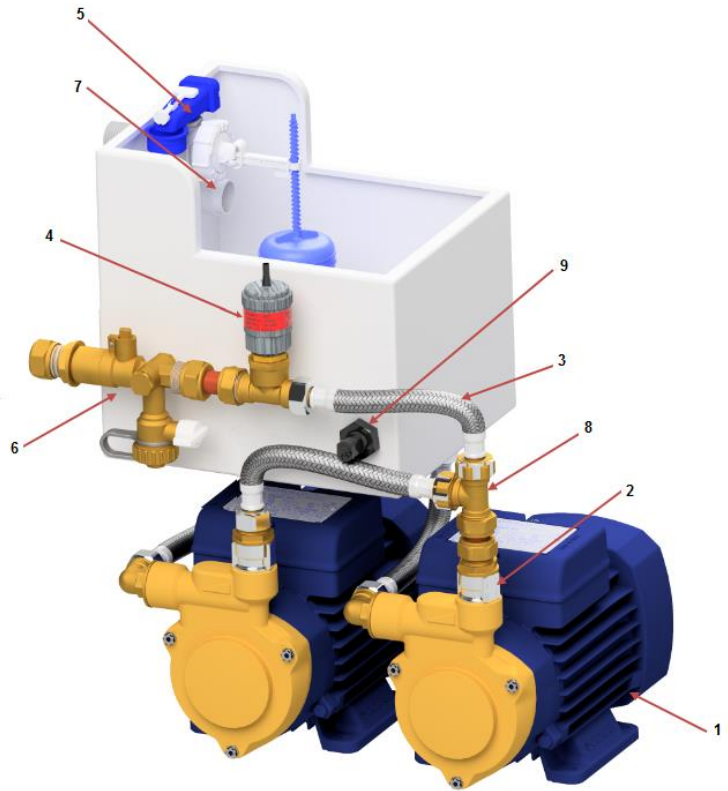
(*) these parts are not shown

Pro PUm (131, 231, 161, 261)

*Image for indication only

Part List

| ID | Description |
|----|--------------------------------------|
| 1 | Model 131 & 231 (Pedrollo PQA60) |
| | Model 161 & 261 (Pedrollo PQ81B) |
| 2 | ½" Non-Return Valve |
| 3 | Braided Hose |
| 4 | Pressure Transducer (0-10 Bar, 1-6V) |
| 5 | Mini Float Valve |
| 6 | Combined Isolation & Drain Valve |
| 7 | Overflow Connection |
| 8 | ½" Brass Tee |
| 9 | Float Switch |



Spare kit list – Pro PUm

| Kit No | Kit Description | ID | Part Description | Qty |
|----------|---------------------------------------|----|-------------------------------|------|
| STA12505 | Pump Flamco PQAm60 | 1 | PQA60 PUMP | 1 |
| | | * | RING CRIMP | 1 |
| | | * | 0.75 mm CABLE BLACK | 1.03 |
| | | 2 | 1/2 NON-RETURN VALVE (PN16) | 1 |
| | | | 15 mm x ½ BSP C X Mi Coupling | 2 |
| | | * | 15 mm x ½ BSP C X Mi Elbow | 1 |
| STA12506 | Pump Flamco PQm81-BS | 1 | PQ81B PUMP | 1 |
| | | * | RING CRIMP | 1 |
| | | * | 0.75 mm CABLE BLACK | 1.03 |
| | | 2 | 1/2 NON-RETURN VALVE (PN16) | 1 |
| | | | 15 mm x ½ BSP C X Mi Coupling | 2 |
| | | * | 15 mm x ½ BSP C X Mi Elbow | 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 |
| | | 3 | Flexible Hose | 2 |
| | | 2 | ½ BSP NON-RETURN VALVE | 1 |

| Kit No | Kit Description | ID | Part Description | Qty |
|----------|--------------------------------|----|-------------------|-----|
| STA12515 | Pressure Transducer 1-6v 0-10b | 12 | TRANSDUCER 10 bar | 1 |

| | | | | |
|----------|----------------------------|---|---------------------------|---|
| STA12513 | Mains Inlet Kit 4-6L tanks | 7 | TORBECK WATER INLET VALVE | 1 |
| | | 9 | LOW LEVEL FLOAT SWITCH | 1 |

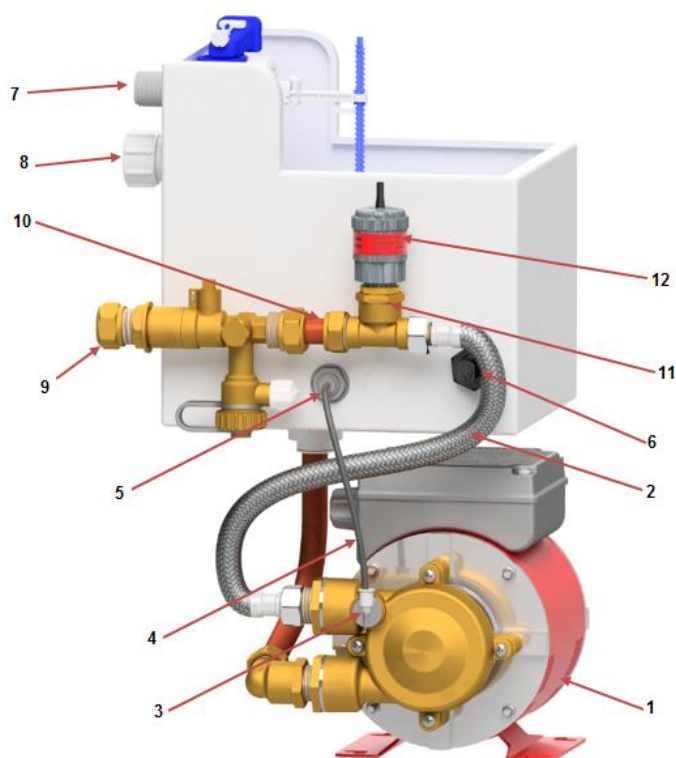
(*) these parts are not shown

Pro PDm (1.0, 1.5, 2.0, 2.5)

*Image for indication only

Part List

| ID | Description |
|----|------------------------------|
| 1 | FLAMCO 003 PUMP |
| 2 | FLEXIBLE HOSE |
| 3 | 4 MM ELBOW |
| 4 | 4 MM NYLON TUBE |
| 5 | 4 MM BULKHEAD |
| 6 | Float Switch |
| 7 | FLOAT VALVE |
| 8 | OVERFLOW CONNECTION |
| 9 | COMBINED ISOLATION AND DRAIN |
| 10 | 15 MM COPPER TUBE |
| 11 | 15 X 15 X 1/2 TEE |
| 12 | TRANSDUCER |



Spare kit list – Pro PDm

| Kit No | Kit Description | ID | Part Description | Qty |
|----------|-------------------|----|---------------------|--------|
| STA12508 | Pump Flamco 003 | 1 | FLAMCO 003 | 1 |
| | | * | RING CRIMP | 1 |
| | | * | 0.75 mm CABLE BLACK | 1.03 |
| | | 3 | 4 mm ELBOW | 1 |
| | | 4 | 4 MM NYLON TUBE | 100 MM |
| | | 5 | 4 mm BULKHEAD | 1 |

| | | | | |
|----------|--------------------------------|----|-------------------|---|
| STA12515 | Pressure Transducer 1-6v 0-10b | 12 | TRANSDUCER 10 bar | 1 |
|----------|--------------------------------|----|-------------------|---|

| | | | | |
|----------|----------------------------|---|---------------------------|---|
| STA12513 | Mains Inlet Kit 4-6L tanks | 7 | TORBECK WATER INLET VALVE | 1 |
| | | 9 | LOW LEVEL FLOAT SWITCH | 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 overfilling 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 |

Service Logs

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

| | | | |
|----------------|--|---------------------|--|
| Date | | P1 COUNT | |
| Engineers Name | | P1 HOURS | |
| Company | | P2 COUNT | |
| Contact Number | | P2 HOURS | |
| | | ALARM COUNT | |
| | | POWER INTERRUPTIONS | |
| Comments | | | |
| | | | |
| | | | |
| | | | |

| | | | |
|----------------|--|---------------------|--|
| Date | | P1 COUNT | |
| Engineers Name | | P1 HOURS | |
| Company | | P2 COUNT | |
| Contact Number | | P2 HOURS | |
| | | ALARM COUNT | |
| | | POWER INTERRUPTIONS | |
| Comments | | | |
| | | | |
| | | | |
| | | | |

| | | | |
|----------------|--|---------------------|--|
| Date | | P1 COUNT | |
| Engineers Name | | P1 HOURS | |
| Company | | P2 COUNT | |
| Contact Number | | P2 HOURS | |
| | | ALARM COUNT | |
| | | POWER INTERRUPTIONS | |
| Comments | | | |
| | | | |
| | | | |
| | | | |

| | | | |
|----------------|--|---------------------|--|
| Date | | P1 COUNT | |
| Engineers Name | | P1 HOURS | |
| Company | | P2 COUNT | |
| Contact Number | | P2 HOURS | |
| | | ALARM COUNT | |
| | | POWER INTERRUPTIONS | |
| Comments | | | |
| | | | |
| | | | |
| | | | |

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 (General Enquires)
 Email: 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

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[illegible]

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