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# Installation, Operation and Maintenance Instructions for Electronically Controlled Pressurisation Units



## Micro-S / Micro-S Digital Wall Hung Unit

Please fulfil all listed requirements prior to and during installation and operation of all equipment to prevent invalidation of any warranty given. The installation and operation should also be in accordance with local regulations and accepted codes of good practice.

## **General Installation Introductory notes**

The Micro-S/Micro-S Digital is a single pump unit. The equipment together with the individually sized expansion vessel/s are employed to maintain the ambient cold fill pressure and accommodate the volume changes that occur in sealed heating and chilled water systems.

Each unit/vessel combination is supplied individually – thus any system alterations may require a design or setting change.

The full system should be pressure tested and flushed BEFORE connection to the unit or vessel to prevent any damage from metal particles (dirt etc.) and to eliminate any leaks.

Under no circumstances must any treatment be introduced into the system via any part of this unit.

The unit should not be used to fill the system, only open the unit to the system after total filling has taken place.

Mount the unit using the four fixing lugs incorporated, use suitable fixings for the wall, material and to support the units weight when full of water (i.e. 28kg.).

Care should be taken when screwing back to the wall so as not to distort the cabinet, use washers behind the lugs if required to “space the gaps”. Ensure the unit can be reached for service work and that clearance is allowed to remove the cover and cover screws.

### **Site Location**

The unit location should be undercover, dry and freely ventilated. Protection from frost must be ensured.

The unit is designed to be wall mounted using the side mounting points. A uni-strut frame can be manufactured on site if required if a suitable wall space is not available.

IMPORTANT: Reasonable access to all parts of the set for service work must be provided. It is not practical to carry out service work on a step ladder – avoid installing the unit too high up the wall.

### **Mechanical**

Please refer schematic diagram and please comply with all unions, valves and drain cock requirements.

Connect the cold water mains supply via a stop tap and union connector to the break tank inlet fill valve ( $\frac{1}{2}$ " BSP).

WARNING 1: When tightening exterior pipe-work to the inlet fill valve, ensure that you do NOT rotate this valve as this may cause the shut-off float to foul on the inner wall of the water tank and would result in malfunction.

WARNING 2: Do not use sealing compound, paste, flux or solvent on the inlet fill valve, as there is a risk of debris flushing through the valve. Rubber washers should provide adequate seal. PTFE tape may be used on threads. Do not over tighten plastic nuts.

Arrange the overflow to discharge away to a suitably noticeable position ( $\frac{3}{4}$ " compression).

If the second overflow is used, this would have to be piped separately to waste or linked into a  $\frac{1}{4}$ " header from the two  $\frac{3}{4}$ " outlets.

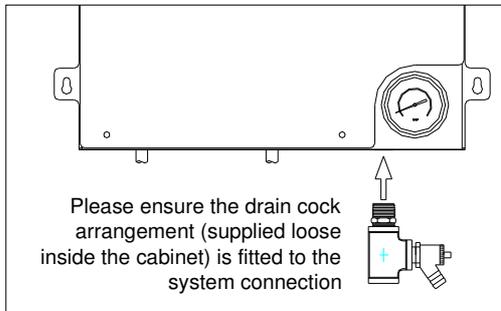
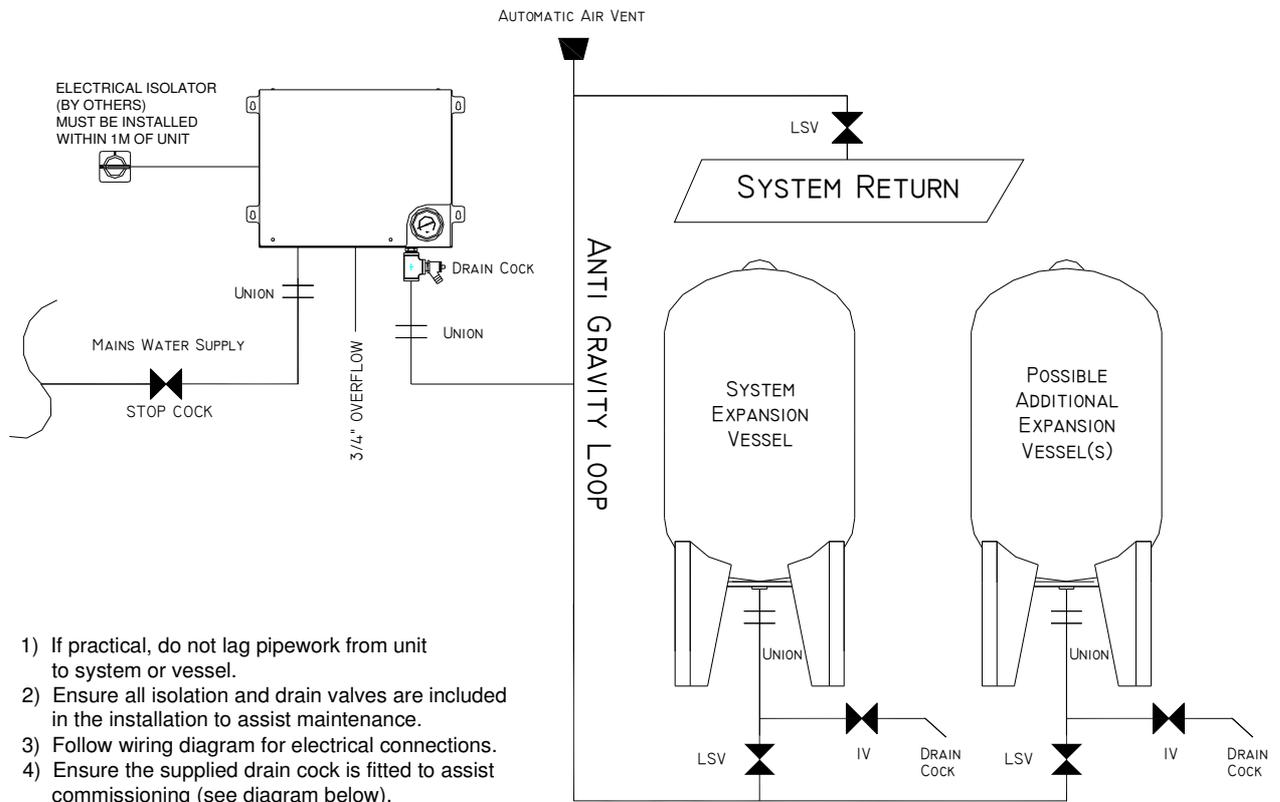
With the  $\frac{1}{2}$ " BSPF outlet, via a union connection, link into the system on the return side of the boiler, and the suction side of the pump incorporating a minimum two metre anti-gravity loop fitted with automatic air vent. A branch should be taken off of the same part of the loop and piped to the expansion vessel or vessels ensuring that each is supplied with a lock shield valve, drain cock and a union connection for any future service work.

Please locate at least one vessel close to the Micro-S (i.e. within 2 metres) to assist the controls of the unit.

All pipe-work links should be suitably sized with a minimum of 22 mm up to 6 metres, and 28 mm for up to 12 metre runs (larger sizes are required above 300 litre vessels or multiples). Please refer to schematic installation diagram.

**ALL MUST BE LEFT UNLAGGED IF PRACTICAL TO PRESERVE VESSEL MEMBRANES FROM  
PREMATURE TEMPERATURE INDUCED AGEING**

# Schematic Installation Diagram Micro-S/Micro-S Digital Pressurisation Unit & Vessel(s)



## Electrical

### Connections to unit

The supply should be brought to the set with suitable trunking or armoured cable, with trunking we recommend that the final metre is converted to flexible conduit to avoid any undue stress or fatigue to the unit.

All supply cables should be sized according to accommodate any voltage drop due to long cable runs.

Due to the small size of the compact unit, we recommend using small control cables where possible.

Voltage at the unit should be single phase, 230 volt, 50 Hz. A neutral supply is required.

The pump rating is 0.37kW and 2.5amps FLC.

The volt free contacts are rated at max 250 volt, 1 Amp free of inductivity.

It is strongly recommended that a local isolator is installed within one metre of the unit incorporating sufficient contacts to isolate both the mains supply and all control cables being used.

The supply fuses should be rated to run the pump.

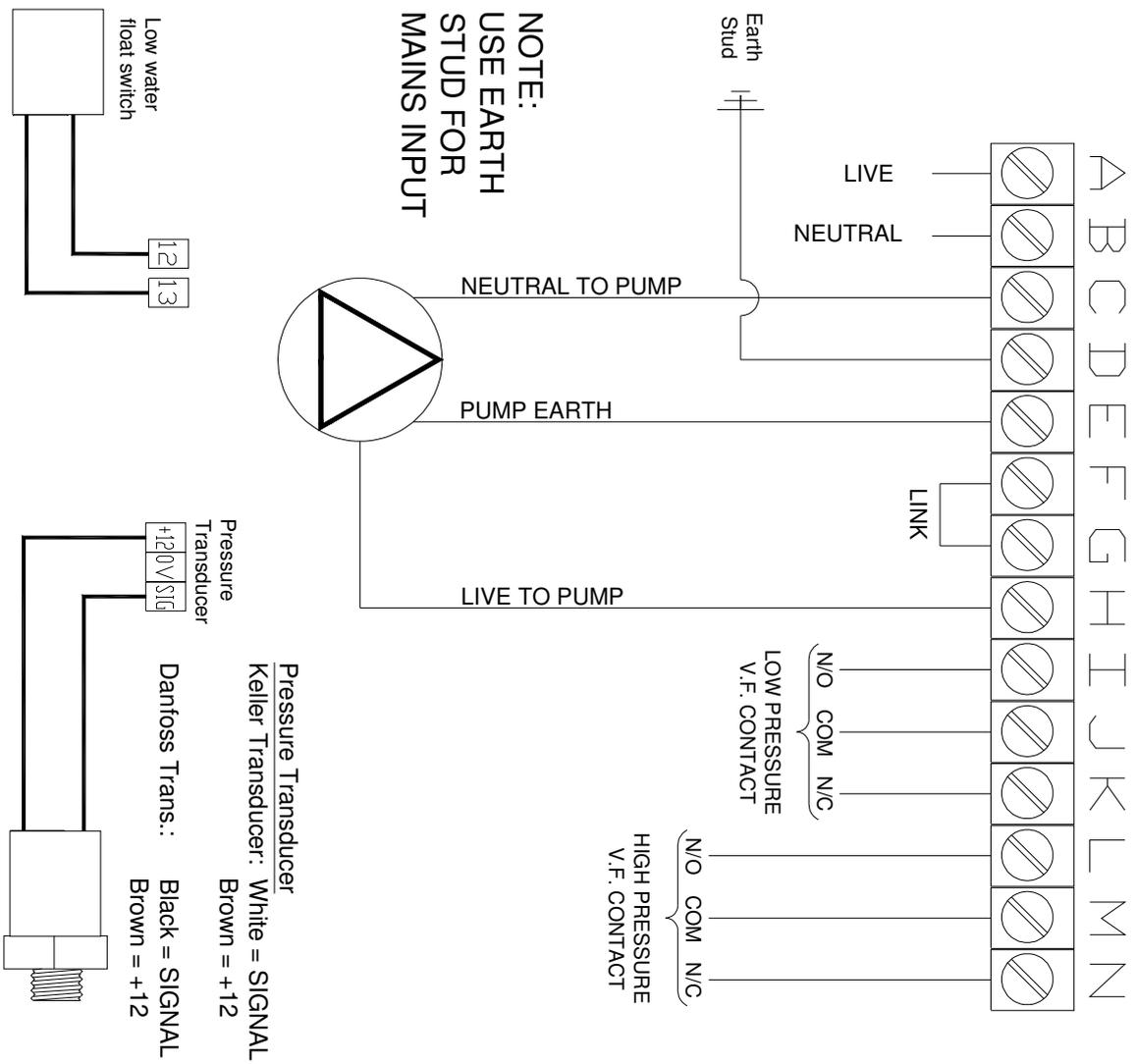
All equipment should be earthed.

**IT IS STRONGLY RECOMMENDED THAT ANY SUPPLY FEEDING THE VOLT FREE CONTACTS FOR ALARMS OR CUT OUTS, IS DISCONNECTED BY THE INDEPENDENT ISOLATOR.**

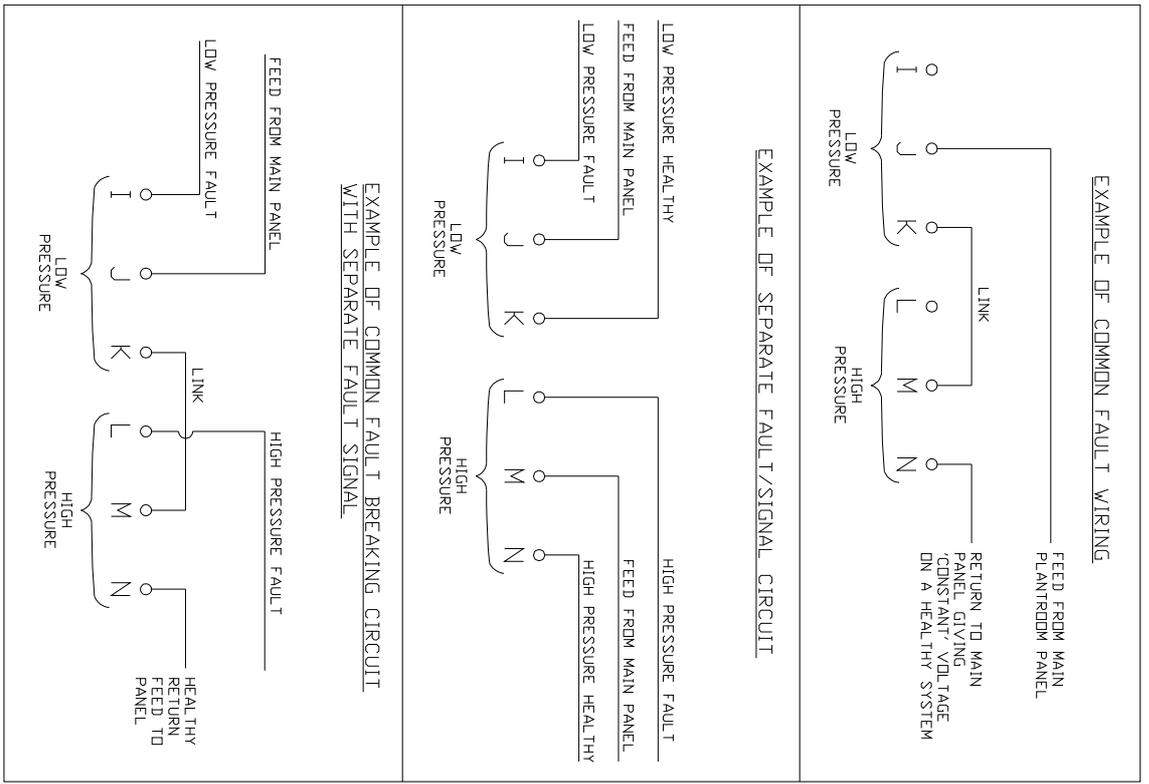
All connections should be performed by a competent electrician conversant with the wiring diagram provided and all current regulations.

**CARE SHOULD BE TAKEN WHEN CONNECTING TO TERMINALS ON THE CIRCUIT BOARD AND EXCESS PRESSURE SHOULD BE AVOIDED ON TERMINALS.**

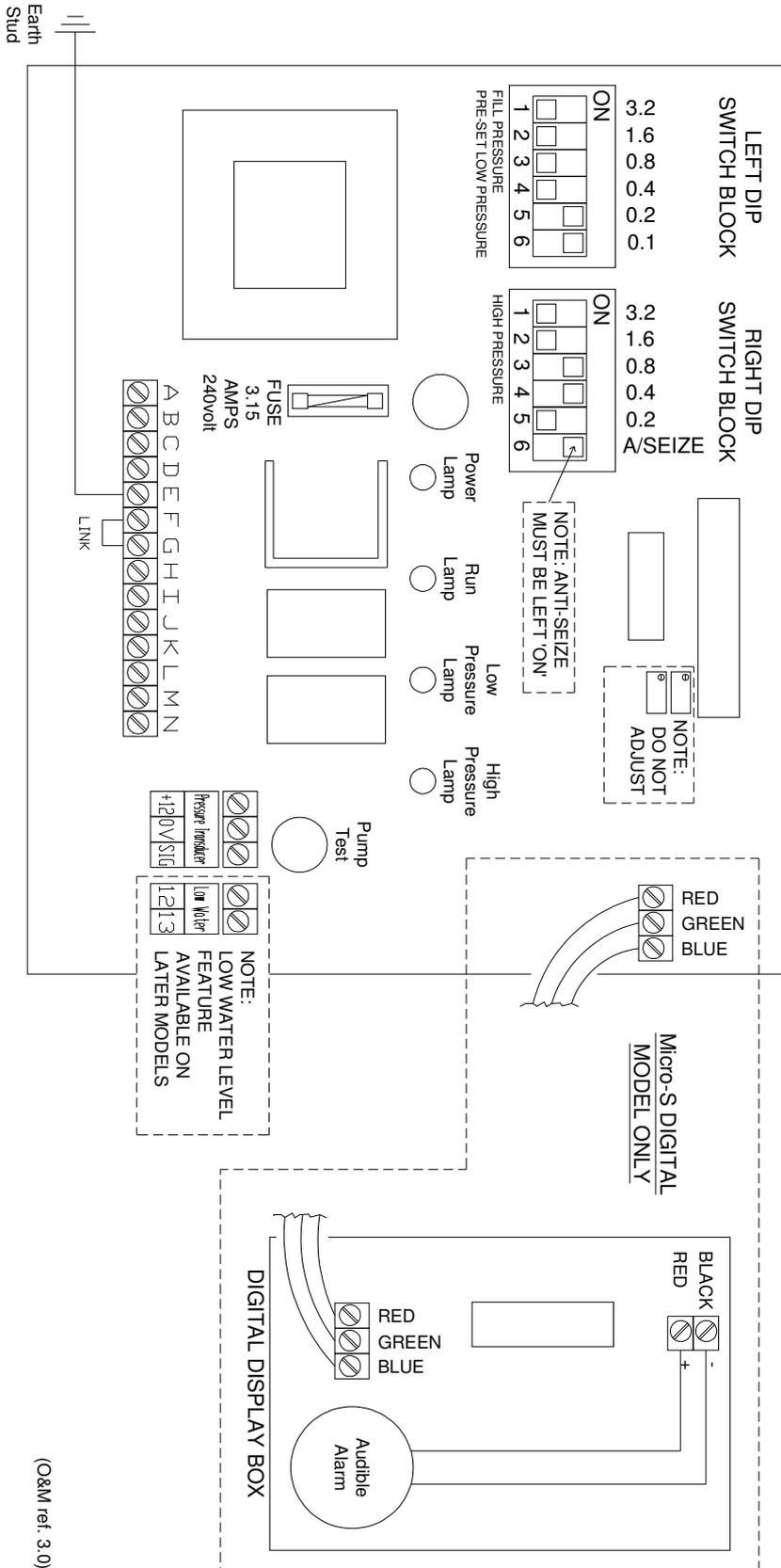
# WIRING DIAGRAM (REF. MIC-S)



## WIRING EXAMPLES



CIRCUIT BOARD LAYOUT - Model: Micro-S / Micro-S Digital



(O&M ref. 3.0)

**NOTE: DIP SWITCHES SHOWN IN FACTORY SET POSITIONS  
(FOR WIRING DETAILS REFER TO DIAGRAM ON PREVIOUS PAGE)**

## Commissioning

These notes are guide lines to engineers who are conversant with sealed systems and pressurisation units. A commissioning service can be provided by us for customers where required (see front page for contact details).

If the unit has been factory set, no adjustments after pump priming should be necessary.

NOTE: The pump must be vented prior to any running using the vent plug (flat screw driver) situated adjacent to the discharge top outlet. Replace the vent plug and tighten after venting.

### Settings

STANDARD UNIT COLD FILL 0.7 UP TO 2.8 BAR

**NOTE: TURN OFF THE UNITS ELECTRICAL SUPPLY BEFORE CHANGING SETTINGS OR ENTERING THE CONTROL BOX**

We base our settings on the following:-

1) The cold fill pressure:

The unit cold fill pressure is the point at which the pump switches off.

The cold fill setting is based on the following:-

The static height of the system from the unit to the highest pipe-work in metres + 4 metres extra.

e.g. 9 metres static + 4 metres = 1.3bar (note: approximate conversion:- 10 metres = 1 bar)

The minimum cold fill setting should be 1.0 bar, this will allow up to 6 metres of pipe-work height.

2) The low pressure:

Setting is to be set 0.4 below cold fill pressure

e.g. cold fill 1.5 bar, LP = 1.1 bar.

3) The high pressure:

Setting should be set at 0.3 bar below the system safety valve setting

e.g. safety valve set at 4.0 bar, HP = 3.7 bar.

Note: there is a minimum differential above the cold fill setting of 0.4bar.

To program the unit if it has not been factory set, proceed as follow:-

### DIP SWITCHES (SEE CIRCUIT BOARD LAYOUT)

This unit has two blocks of dip switches, the left block sets the cold fill pressure and the right block sets the high pressure and also turns on and off the anti seize feature (dip switch No.6).

#### Setting the Cold Fill

The basic setting with no dip switches on gives a 0.7 bar cold fill, as standard we send the unit out with a 1.0 bar cold fill setting, to change the settings use a combination of the dip switches to obtain the required setting.

The switches have values of 0.1, 0.2, 0.4, 0.8, 1.6, 3.2. Therefore, the standard 1.0 cold fill = The base 0.7 bar plus the 0.1 and 0.2 switches turned on to give the 1.0 bar required.

#### Low Pressure

The unit has a fixed low pressure setting of 0.4 bar below any cold fill pressure which is set.

#### High Pressure

Automatically the high pressure is set at least 0.4 bar above the cold fill setting, if a higher pressure is required please select using a combination of the 0.2, 0.4, 0.8, 1.6, and 3.2 dip switches and add these to the cold fill and fill and + 0.4 bar already set.

e.g HP req'd = 3.0 bar, cold fill=1.0 bar + 0.4 + the 1.6 dip switch.

Please note:

*(continued overleaf)*

*(continued from previous page)*

1) Because there is no 0.1 bar dip switch on the high pressure dip switch block it prevents setting an exact setting of some pressures. If this case is found, set the high pressure 0.1 bar below requirement.

2) Always leave dip switch No.6 on the right hand block in the on position, this allows the pump to perform it's anti-seize function very day, if you turn this off the pump could seize due to the low requirement for it to run.

### Low Water Level Switch (available on later models)

There is no adjustment on this switch. If the switch falls it will lock out the pump through lack of water. As the water tank starts to fill again, and the float rises, this activates a timer which must then exceed 30 seconds before the control board allows the pump to start again.

### Vessel Air Pressure

If not factory set, the vessel air pressure must be set to 0.1 bar below the cold fill pressure (e.g. cold fill of 1.0 bar, vessel pressure 0.9 bar).

Note: The air charge should never exceed 5.0 bar as a maximum.

All vessels have to be empty of all water prior to setting the air pressure. Isolate and drain down first.

The air valve for the vessel is located below the black cap, which should be replaced after checking/adjusting the air pressure.

Use an oil free compressor or foot pump (smaller vessels) to add air as required. A tyre gauge should be used to finally check the required pressure.

**IMPORTANT:** Please remember to open the vessel isolation valves after checking the air charge.

## Switching on the Unit

1. To switch on the unit for the first time (or after service work etc.) first ensure the valve from the water tank to the pump, and the valve on the pipe-work leaving the base of the unit, are both open.
2. Vent the pump as described in the commissioning section.
3. Turn on the unit at the local electrical isolation switch (not supplied). The unit will power up and should operate as required. Depending on the system pressure, the pump may or may not run at this period. On the **Micro-S Digital** model, on power up, the audible alarm will sound due to the system filling up and pressurising – simply press the INFO/MUTE ALARM button to silence the alarm.
4. The valve above the pump discharge with the screwdriver slot operation is adjusted in the works to provide back-pressure for the pump and is set at approximately 50%. This valve should not be opened, closed or adjusted.

### Micro-S Digital model only

On power up, the audible alarm will sound due to the system filling up and pressurising – simply press the INFO/MUTE ALARM button to silence the alarm.

#### To Check Settings:-

Press and hold the INFO button for **5 SECONDS**

**COLD FILL:** The display flashes between “CF” and the value of the Cold Fill setting.

*Note: After 30 seconds the display will automatically move on to the next setting or you can skip straight to the next setting by pressing the INFO button.*

**LOW PRESSURE:** The display flashes between “LP” and the value of the Low Pressure setting.

*Either wait 30 seconds or press INFO to move on.*

**HIGH PRESSURE:** The display flashes between “HP” and the value of the High Pressure setting.

*Either wait 30 seconds or press INFO to move on.*

As long as the system has filled up to the required cold fill pressure, the display will then switch to auto display mode (i.e. constant display of the System Pressure)

#### Fault Alarms:-

<b>LP</b>	<b>LOW PRESSURE:</b> If the system pressure drops too low, the alarm will sound and the display will flash between “LP” and the actual system pressure. Press the INFO/ALARM MUTE button to mute the alarm and investigate the cause of the low pressure.
<b>HP</b>	<b>HIGH PRESSURE:</b> If the system pressure rises too high, the alarm will sound and the display will flash between “HP” and the actual system pressure. Press the INFO/ALARM MUTE button to mute the alarm and investigate the cause of the high pressure.
<b>LL</b>	<b>LOW LEVEL:</b> If the water tank level falls to a dangerous level, the pump(s) will be stopped and the display will flash between “LL” and the system pressure. Press the INFO/ALARM MUTE button to mute the alarm and investigate the shortage of water.

## To switch off the unit

Use the electrical isolation switch (not supplied) near to the unit.

**DO NOT ENTER THE ELECTRICAL CONTROL BOX OR THE PUMP TERMINAL BOX WITH THE ELECTRICITY ON. ONLY QUALIFIED PERSONS SHOULD WORK ON THESE UNITS.**

Please Note:

These units should be left on at all times to allow the pump pulsing feature to operate. Do not turn off in the summer as this may cause the pump to seize.

Should you need to turn the unit off because of a fault please contact the service department as soon as possible to get this repaired.

If you find the pump has gone tight during storage or transportation, ensure the power is off and then using a flat screwdriver positioned into the central shaft of the pump through the left hand side slots turn the pump by hand until free. Once this has been achieved remove the screwdriver and proceed with the "Switching on the unit" instructions.

**Note: We are able to provide a full commissioning service if you require.  
Please contact the sales office or service department.**

## Description of operation

After the pump has been vented, the system filled and the unit set the equipment operates as follows.

The system is turned on at the local isolation switch (not supplied) once the unit is energized it monitor's the system pressure constantly via the feed back it receives from the 4-10ma transducer which is installed in the pipe work. As this transducer signal changes. It tells the unit to start the pump if water is required when a drop in pressure occurs and when to stop the pump when the system is back to the pre-start pressure.

The high and low pressure alarm points are also monitored via the transducer and should the system reach either of these points the LP or HP relay will activate to provide an alarm back to the boiler or main control panel. The pump is supplied with water from the rear mounted water tank which has its water supplied through the single or twin floats, an overflow is provided should a fault occur with the valve/s.

This tank has an "AB" air gap which provides protection up to category 5 as described in the water supply (water fittings) regulations 1999 for back contamination of the main water supply.

The pump is controlled via the electrical controller to run when required to pressure the system and to pulse on a timed basis every day to prevent seizing during low usage times.

## BOTTOM INLET VALVE INSTRUCTIONS

### MAINTENANCE

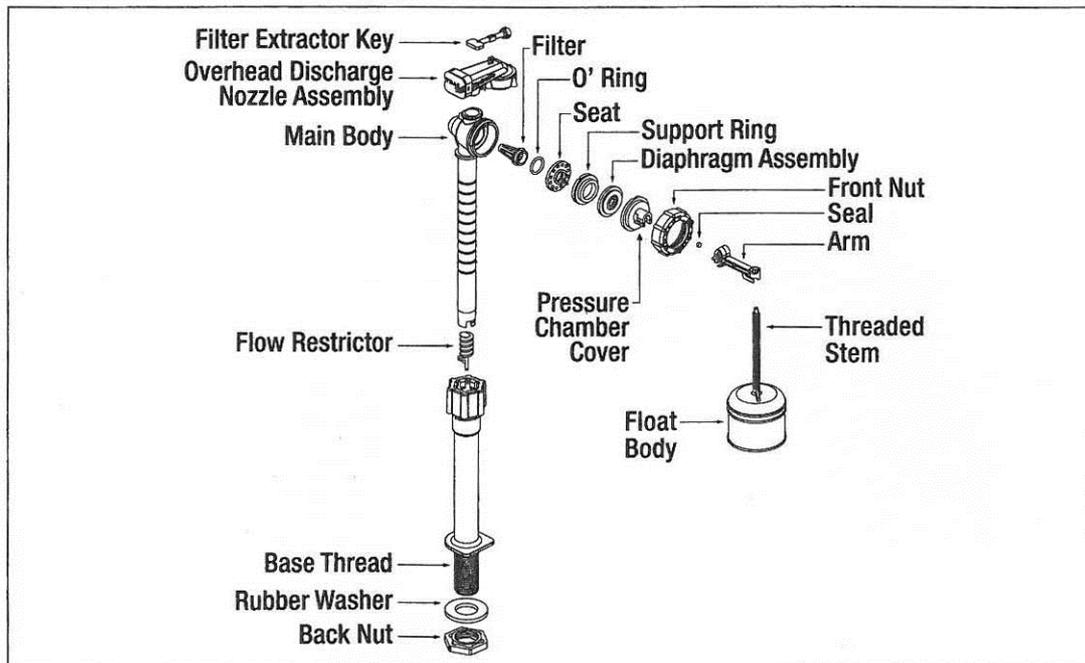
The Hydroflo valve is fitted with a filter which may need cleaning occasionally to ensure that optimum water flow is maintained. The procedure for maintaining the valve is as follows:

- Turn off the water supply to valve. Unscrew the front nut and remove arm and pressure chamber cover. Remove diaphragm. Remove the filter extractor key from the overhead discharge nozzle assy. Insert the key through the centre of the support ring and seat, then rotate key until it locks behind the seat. Pull key - the support ring, seat and filter will become free from the main body. Remove filter from seat. Wash filter in clean water removing any debris that has been caught. Generally clean the inside of the valve body with clean water.

- Re-assemble in reverse order ensuring that the filter is pushed fully home in the seat. Make sure the monitoring pin in the diaphragm is free to move. Refit the pressure chamber assembly making sure the locating lug is positioned in the mating slot in the main body. Slide front nut over arm on to the main body and hand tighten. If the arm is removed for any reason, when refitting make sure that the small black seal is securely in place and that both location pegs are snapped into position.
- Turn on the water supply and ensure the valve operates correctly.
- Reset the float height to the required water level and follow final checklist.

### FINAL CHECKLIST

**1.** Check all moving components operate freely and that the inlet valve shuts off correctly. **2.** Check connections are tightened correctly. **3.** Check carefully for leaks. **4.** If water continues to flow from the overhead discharge nozzle assembly once filling of the cistern is complete, check that the front nut is fitted tightly. If loose, it should be secured at least hand tight (between 2 and 2.5 Newton metres). Do not over tighten. **5.** If overflowing or poor filling occurs: Check float and arm move up and down freely and that water level is correct. Check that the filter is free from debris.



### WARNING:

Do not use sealing compound, paste, flux or solvent on the inlet valve, as there is a risk of debris flushing through the valve. Rubber washers should provide adequate seal. PTFE tape may be used on threads. Do not over tighten plastic nuts.

## Maintenance

Six monthly checks should be made on the expansion vessels. The air charge should be checked after the vessel is isolated and drained using the local valve and drain cock.

Note: You cannot check these vessels unless drained. Use an oil free compressor or foot pump to inflate and check with a good quality gauge for the air pressure.

The filter on the incoming mains water supply should be checked and cleaned if necessary.

Yearly checks should proceed as above followed by running the pumps to check operation, mechanical seals and electronic controls. This can be performed by isolating the system, connecting a hose from the vessel drain cock and placing the other hose end back into the units' water tank. As you open the drain cock the pressure should fall and start the pump, this can be run for 5-10 minutes after which you should close the drain cock allowing the unit to build pressure and stop.

**After maintenance, ensure you open the unit back up to the system.**

Other checks consist of testing for noisy bearings, operation of float valve, electrical connections and general operation and condition of the unit.

All maintenance should be carried out by a competent person conversant with sealed system pressurisation units.

**A full maintenance programme is available on request –  
Please contact our Service Department (details on front page)**

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