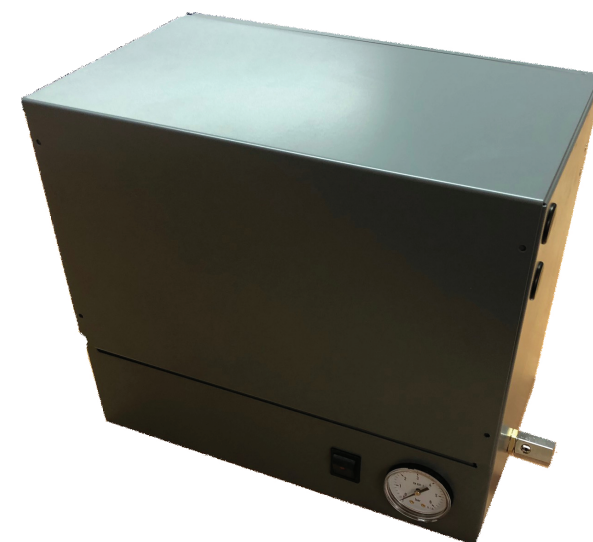




PressTECH NERO-S
Micro Analogue Pressurisation Unit



OPERATION & MAINTENANCE MANUAL

ABOUT THIS MANUAL

This operation & maintenance manual contains all the relevant information to install, commission, operate and maintain the NERO-S.

If you are not fully competent with this type of equipment we recommend that this manual is read in full before carrying out any work.

SYMBOLS USED



DANGER - Very Important safety information to prevent injury and damage to the equipment or system.



CAUTION - Important information to prevent any damage to the equipment or system.



IMPORTANT - Important information to help the equipment function correctly.



USEFUL - Information which is helpful but not critical to the operation of the unit.

FOR MORE INFORMATION

For more information please contact Technical Support on the number below:

EQUIPMENT OVERVIEW

The principle of the NERO-S pressurisation unit is to provide automatically controlled water top up to sealed heating and cooling systems. As system pressure suffers minor losses through slow leaks, air venting etc, the NERO-S unit will compensate for this loss by pumping more water into the system until the desired system pressure is reached. Once installed, the unit can be left unattended for prolonged periods of time with minimal maintenance.

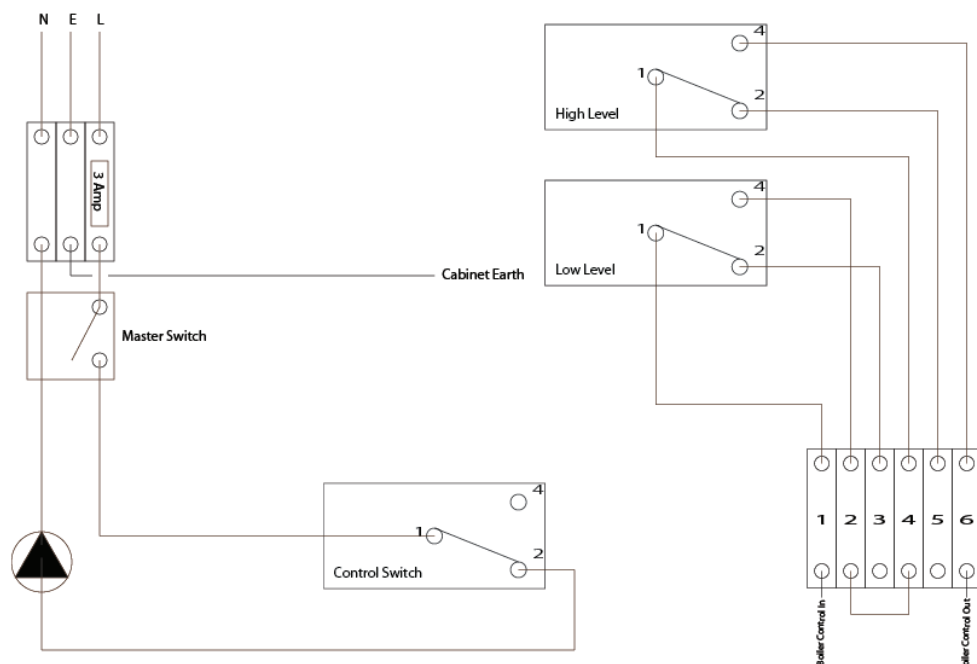


The unit should also be installed alongside an expansion vessel in order for it to work correctly. The vessel size should be calculated relative to the system properties. If in doubt please contact our office where our technical sales engineers can specify the correct vessel to suit the system size and volumes

FAULT TRACING

PUMP CYCLES ON/OFF RAPIDLY	Drain the Expansion vessel and check that the air charge is set to the recommended level. Any substantial variance will affect the frequency of pump operation.
PUMP WILL NOT RUN	Check the power supply to the fuse/switch and that the correct 5amp fuse is fitted and has not blown. Check that the system is not already up to pressure. Check that the feed tank level is adequate. Check that the pressure switch is functioning by operating it manually.
PUMP WILL NOT STOP	Check that the switch off pressure is being reached on the pressure gauge. Check that the pressure switch is functioning by operating it manually.
HIGH PRESSURE FAULT	The expansion vessel air cushion pressure is too low or too high. Drain the expansion vessel and check the air cushion pressure is set to the recommended level. Heating/Cooling system temperature is too high. System has been manually filled to an excessively high pressure.
LOW PRESSURE FAULT	NERO-S unit is not switched on. Spur fuse has blown.

WIRING DIAGRAM:



Nero-S Additional Information:

Nero-S Models are fitted with additional pressure switches which are pre-wired to a volt-free terminal. This provides high & low pressure lockout of the boilers or chillers under abnormal pressure conditions in over or under designed parameters of the system.

These switches are for connection to the boiler/chiller control circuit or the BMS system to ensure safe operation. On these models a safety valve of recommended size and rating should be fitted as advised by the manufacturers.

INSTALLATION:

FIXING & PIPING



This unit is not designed to be installed outside and open to the elements. If there is no room inside the building it must be installed inside a suitable enclosure with necessary frost protection.

NERO-S is a wall mounted unit, therefore the location chosen should allow adequate access to all parts and be as close as possible to the system expansion vessel. The unit and the system expansion vessel should be located and fixed side by side, if possible.

The heating/cooling system should be connected primarily to the expansion vessel using a minimum of 1" (28mm) diameter expansion pipe. For LPHW heating systems the pipe should incorporate an anti-gravity loop approximately 2 metres high with an air vent at its highest point which is then connected into the system return (on the suction side of any circulating pumps).

This expansion pipe should also be fitted with a lockable or otherwise tamperproof isolation valve with a drain cock fitted to the expansion tank side of the isolation valve, this is to facilitate commissioning and future servicing of the equipment.

A minimum of 3/4" (22mm) diameter delivery pipe from the NERO-S unit, fitted with a further lockshield / isolation valve, should then be run to 'tee' into the 1" expansion pipe on the expansion tank side of the system isolation valve.

A 15mm diameter cold water supply pipe should be connected to the 1/2" ball float valve on the unit feed water tank.



Take care to ensure that all pipework is adequately supported to prevent any undue strain on the connections and prevent the ball float valve from 'bouncing'.



All pipe connections should incorporate a suitable joining compound or PTFE tape.



ELECTRICAL SUPPLY



The unit must be completely electrically isolated before removing any covers. Cables connected to any volt free contacts may be supplied from another source and remain live, these must be isolated elsewhere.



All electrical work must only be carried out by a qualified electrician, engineer or competent person.

The NERO-S is supplied with 1m of single phase cable pre-connected connected to the switch/fuse on the NERO-S unit. The mains connection should preferably be fed from a contactor starter having a motor overload set appropriately (2.8 amps). When no starter is incorporated on the supply, the power supply should not be interrupted by any time lock which may be used to control the boiler or chiller.

In addition, wiring connections should be made from the boiler/chiller control circuit to separate the PS1 high & low pressure fault switches to interrupt boiler/chiller operation in the event of a pressure fault.

SET UP

With the NERO-S discharge valve open and drain hose still in place and with the expansion tank drain cock open, switch on the pump at the switch/fuse, the pressure should then begin to rise on the pressure gauge and water should run from the drain hose. Depending on the resistance through the drain hose, the pump may build up sufficient pressure to switch itself off briefly before re-starting again, but in any event allow it to run for approximately 1 minute to clear any remaining air. Finally check the pump pressure switch setting by slowly closing the NERO-S discharge isolation valve and observing the pump switching pressures. With the discharge valve slightly open the pump will start at approximately 0.9 bar, run for a few seconds and stop at approximately 1.1 bar. If the cold fill pressure does not correspond with your requirements, refer to 'Adjusting Cold Fill Pressure' in this document.

When satisfied with the pressure setting the expansion tank drain cock can be closed and the NERO-S discharge isolation valve opened, the pump will then probably start and run for somewhat longer than previously before building up pressure and stopping.

ADJUSTING COLD FILL PRESSURE

Unless otherwise requested, all NERO-S units are pre-set and tested to our factory settings for a nominal cold fill pressure of 1.0 bar.

Should it be necessary to make any adjustment to the factory setting, please proceed as follows:

1. Switch off the NERO-S pump at the switch.
2. With the expansion pipe isolated from the heating/cooling system, open the drain cock to allow any water stored in the expansion vessel to empty. Do this until the pressure gauge reaches zero.
3. On the pump control switch, set the range (RH) scale to the desired cold fill pressure.
4. With the drain cock still open and the NERO-S discharge isolation valve slightly open, switch on the switch/fuse and observe at what pressure the pump starts and stops. Set at 0.1 bar either side of the required cold fill pressure.

SYSTEM FILLING

The system boiler/chiller and pipework must be completely filled with water before running the circulating pumps. Normally this can be done by back filling using a hose connection with an approved double check valve. The unit pump is continuously rated and may be used to assist with this process as desired; however this may prove to be slower. If a hose is used the system should be filled until a pressure approximately 0.2 bar below the desired cold fill pressure has been reached. The expansion pipe system isolation valve to the unit can then be opened to allow the pump to top up the system. All pipework high points should be vented to remove as much air as possible; the unit will ensure that the system is kept topped up.

STARTING UP

Once the foregoing procedures have been carried out it is permissible to start the heating/cooling system circulating pump. Since it is almost certain that some air will still be present in the pipework, it must be released from system high points either manually or by using automatic air vents and occasionally stopping the circulating pump. The pressurisation unit is now functional.

OPERATION - NORMAL RUNNING

The unit should always be left powered up and supplied with water, it can then operate at any time to ensure that system pressure never drops below the minimum cold fill pressure setting.

Expansion and contraction of the water within the heating/cooling system is accommodated by the expansion vessel. As the system water temperature rises it is displaced into the expansion vessel, resulting in a general system pressure rise. The extent of this rise will vary with expansion vessel size and operating temperature but any working pressure between 1.5 times and 2 times the cold fill pressure can be considered normal.

The expanded pressure can be seen on the pressure gauge of the unit, it should be noted however that the pressure indicated on the system circulating pump delivery gauge will be somewhat higher than this.

MAINTENANCE

VISUAL CHECK

The pump requires no lubrication but a visual check should be made for any signs or leakage or any unusual sounds when running.

ABSENT AIR CUSHION PRESSURE

Normally after draining the expansion vessel, the air cushion pressures will only be slightly below the correct level, unless this check has been neglected for some time.

If the air cushion is found to be very low a further check should be made on all vessel connections for possible air leaks. This is best carried out using soap/water solution or leak detector after reflation. Any leaks can then be identified and either repaired or the vessel replaced.

If the air cushion is totally absent and particularly if air discharges from the drain valve whilst reflatting or the Schrader Valve discharges water then a diaphragm failure has occurred. A new diaphragm or new vessel will be required.

