DUNSLEY NEUTRALIZER SYSTEM BOILER LINK-UP

INSTALLATION INSTRUCTIONS Incorporating the "C" type or "R" type

Important: This is an open vented system. It must be installed by a competent person, in accordance with all relevant codes of practice, regulations and by-laws.
The electrical wiring must be in accordance with the current IEE regulations.

BOILER CLASSIFICATION

Boilers have been divided into four groups according to their circulation requirements.

Group 1. Solid fuel boilers and cookers, that are not controlled by a water sensing thermostat.

Group 2. Solid fuel boilers, gas, oil and solid fuel cookers that are controlled by a water sensing thermostat.

Group 3. Conventional gas and oil fired boilers, with low resistance heat exchangers.

Group 4. Low water content high resistance gas boilers.

Contact us for further information if the boiler you wish to interlink is not contained within these four groups. For example, Nightstore electric boilers, straw burning boilers etc.

BOILER CIRCULATION

Group 1. boilers: require a 28mm. minimum, gravity circuit to connect them to a circuit neutralizer. Heat leak radiators are not required, but fitting a gravity flow radiator or towel rail in the bathroom is recommended.

Group 2. boilers: require a 28mm. minimum, accelerated gravity circuit to connect them to the circuit neutralizer. Heat leak radiators are essential for solid fuel appliances, and should comply with the boiler manufacturers recommendations.

Two types of accelerated gravity circuit are shown in figs 1 and 1a.

Fig. 1.

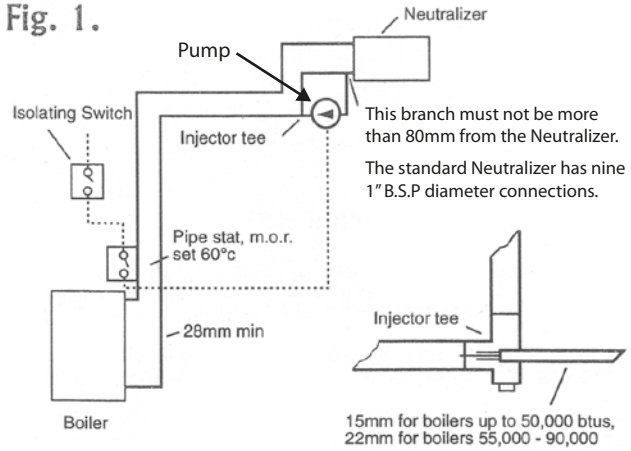
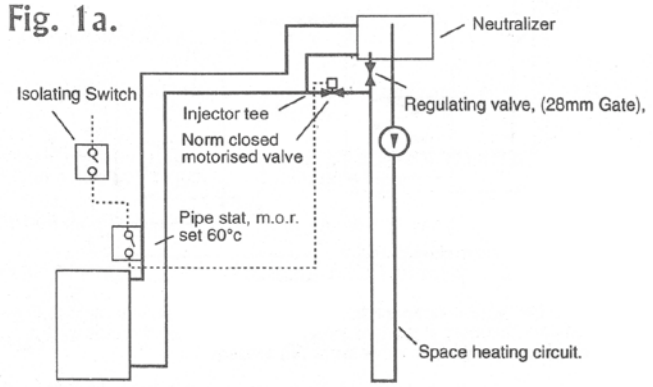


Fig. 1a.



NOTE: Please write down the Serial number of your Dunsley Neutralizer below which is shown on the Label attached to the unit, this will be required should you need to contact Dunsley for any reason including technical information.

Group 3. boilers: require a 22mm minimum pumped circuit to connect them to the circuit neutralizer. The pump must be fitted in the flow pipe if an open safety vent is used, **(see Fig 2)** and in the return pipe if it is not. **(see Fig 2a).**

Fig. 2.

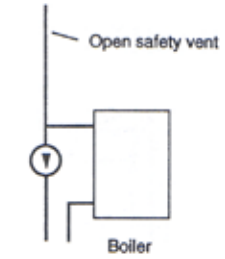
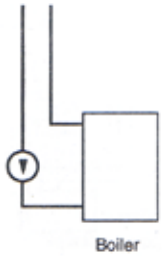


Fig. 2a.



Group 4. boilers: require a 22mm minimum. pumped circuit to connect them to the circuit neutralizer. The pump must be fitted in the return pipe. (A by-pass for pump overrun is not required).

Although the arrangement shown in Fig. 2 . is the preferred method for conventional boilers, most manufacturers of gas boilers with high resistance heat exchangers assume that the boiler is to be connected to a conventional heating system, where the neutral point is located near the boiler, and recommend the close-coupled method of connecting the open vent and cold feed pipe before the pump, to prevent air being pulled down the open vent pipe, and to give a positive flow through the boiler. **(see Fig 3).**

The neutral point in a Dunsley neutralizer system is remote from the boiler; this allows the pump to be fitted in the return pipe when the boiler has a high resistance-heat exchanger or low static pressure, to give the positve flow required through the boiler, without the fear of air being pulled into, or water being pumped out of the system. **(see Fig. 3a).**

Fig. 3.

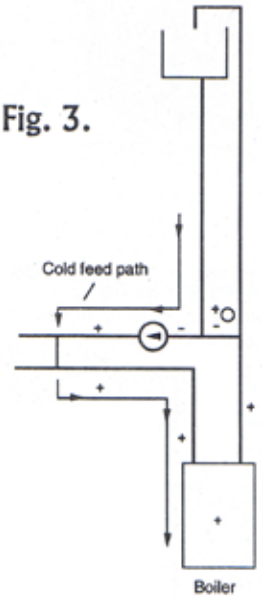
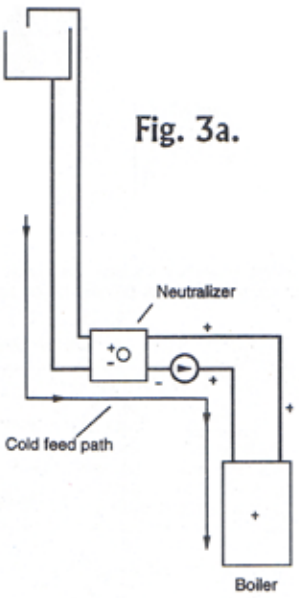


Fig. 3a.



CIRCUIT NEUTRALIZERS

The "R" type neutralizer

The "R" type neutralizer has 9 x 1" BSP connections, and is designed to interlink two boilers. It can be fixed to the wall below or beside the hot water cylinder. **(see Fig 4).**
9 x 1" BSP taper to 28mm compression fittings. Code K611

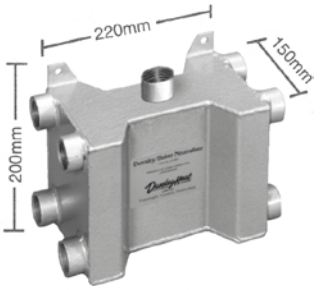
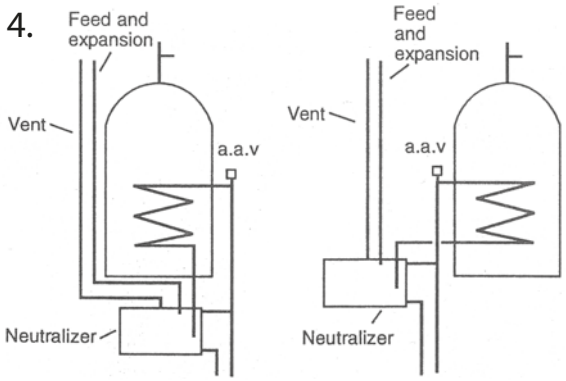


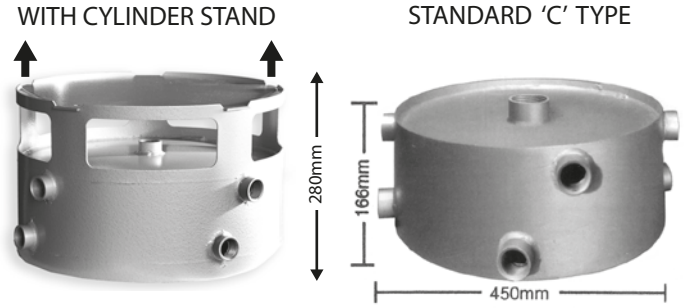
Fig. 4.



The "C" type neutralizer

"C" type neutralizers are designed to be installed below the hot water cylinder. The standard unit has 9 x 1" BSP connections to interlink two boilers, **(see Fig. 5).** The neutralizer must be fitted level, on a base that is a minimum of 460mm above the boilers.
Installers interlinking three or more boilers, or installing a system with pipework that is more than 28mm diameter, can be supplied with a "C" type neutralizer with additional connections and capacity.

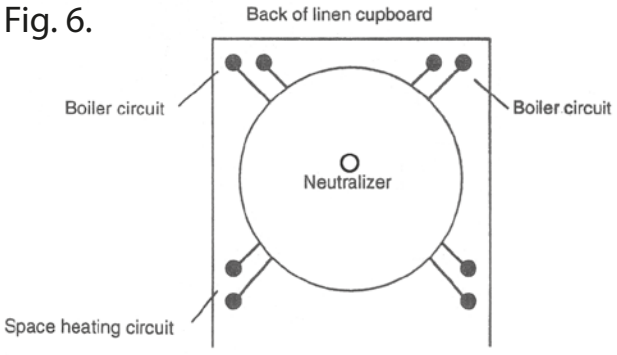
Fig. 5.



C Type with cylinder stand is designed with removable top for access to make vent pipe connection. And safely support the cylinder, with a maximum weight of 250kg which relates to a cylinder size of 450mm Dia x 1500mm high. If for any reason your Neutralizer was recieved damaged do not attempt to repair it or modify it.

Arrange pipework so that the boiler circuits can be connected to the neutralizer before the cylinder is placed in position. **(see Fig 6).**

Fig. 6.



HOT WATER CYLINDERS

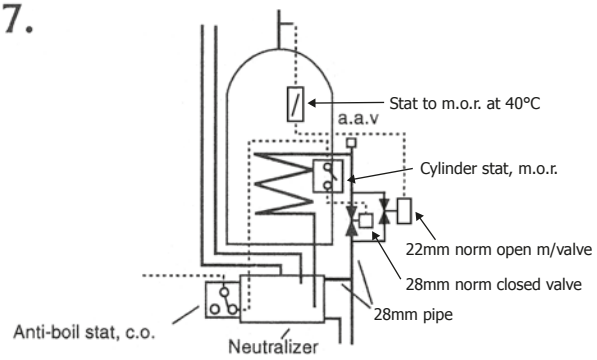
Open vented cylinders.

Hot water cylinders must be of the double feed indirect type. Self priming (single feed) indirect cylinders are not suitable.
Connect cylinders to neutralizers with 28mm minimum pipework. Pipe runs must promote gravity circulation.

Air can trap in cylinder coils, retarding or stopping circulation. To enable this air to be easily removed.
Remove the automatic air vent and attach a hose pipe.
Turn the mains water on to purge air out of the coil into the Neutralizer and out of the vent pipe. Make sure the Honeywell valve on the bypass is also closed.
See Fig. 7.

Control of hot water temperature is by a cylinder thermostat that is connected to a two-port motorised valve.
In the event of electrical or space heating pump failure, the 22mm valve on the bypass must fail open to allow flow through the cylinder. This is accomplished by installing a normally open motorised valve, that is held shut electrically and opens under spring pressure when the electricity supply is cut off by the anti-boil thermostat or electrical failure. **(see Fig. 7).**

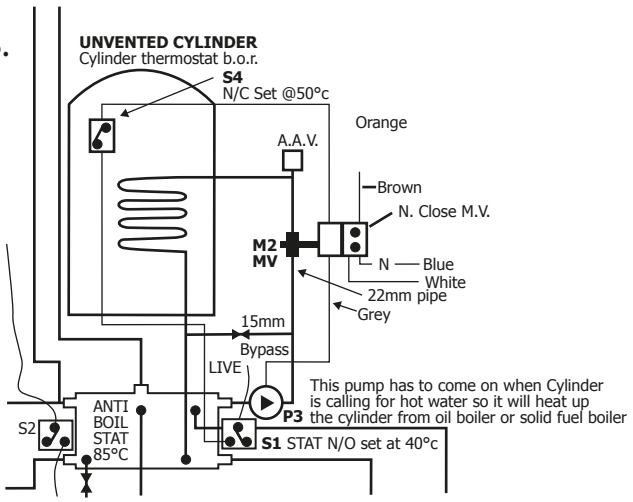
Fig. 7.



Unvented hot water cylinders

Unvented hot water cylinders must only be installed in systems that have a section of the space heating that will operate by gravity flow, in the event of pump or electrical failure to dissipate the heat generated by a Group 1 or 2 boiler.

Fig. 8.



Control of hot water temperature is by a cylinder thermostat that is connected to a two-port motorised valve, and pump **The valve must fail closed.**

8A. For layout 1/SP unvented cylinder

Control equipment

Two channel programmer: Horstmann H27 XL
Motorised valve spring closed with auxilliary switch.
Type Drayton / Honeywell with 5 wires. 2 port m/valve V4043H N/closed on bypass.
2 port m/valve V4043H Normal closed on by pass

Anti-boil thermostats: Honeywell L641B1012

Room thermostats: Honeywell T6360

Pipe/cylinder thermostats: Honeywell L641A 1039

Feed and expansion tank

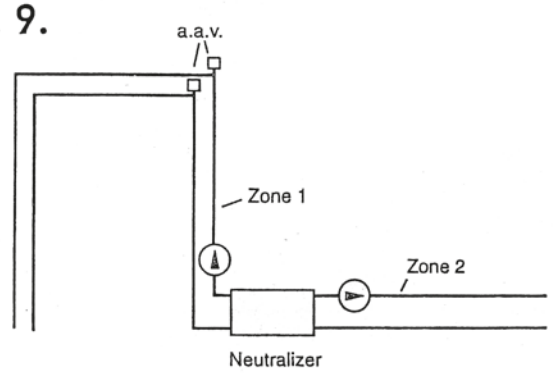
The feed and expansion tank, lid, ball valve and overflow must comply with solid fuel regulations.

Space heating circuit

The space heating circuit can be a one or two pipe arrangement. Size the pump and pipework to the total space heating load.
Position the pump in the flow pipe to avoid air being drawn into the system through micro leaks.

Air temperature is best controlled with a room thermostat controlling the operation of the pump, as it can be easily overidden with the anti-boil stat.
The "C" type neutralizer can be supplied with additional connections to accommodate more than one space heating circuit for zone control. **(see Fig 9).**

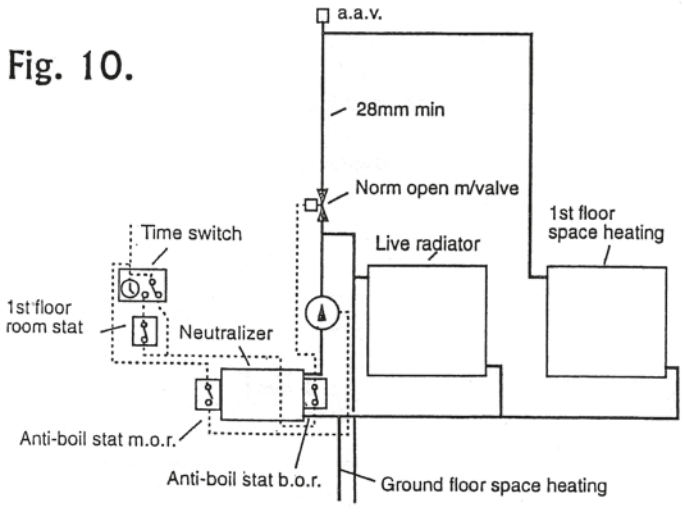
Fig. 9.



Space heating only systems

Space heating only systems, must have a section that will operate by gravity flow in addition to the heat leak radiator, to dissipate the heat generated by the solid fuel boiler in the event of pump or electrical failure. **(see Fig 10).**

Fig. 10.



Important: Do not fit control valves to the radiators on this circuit.

Fig. 11 layout 2.

In some instances the gas boiler will require a permanent electrical supply to cool the heat exchanger. When it is switched off at the programmer. However should the solid fuel boiler supplying hot water to the neutralizer this will prevent the pump switching off.
To over come this we now show a 3 port valve on a bypass. When de-energised port B will open and port A will close. This is best placed as far away from the gas boiler as possible.

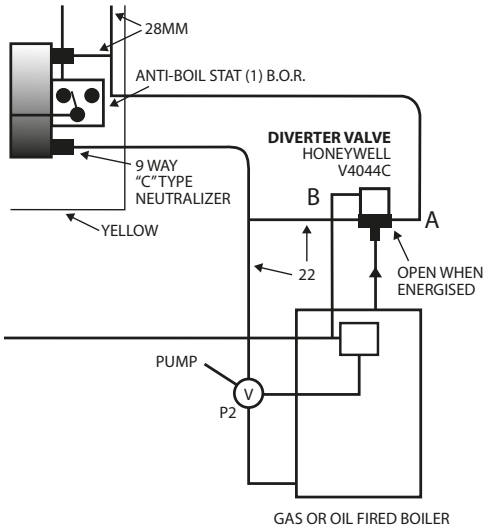
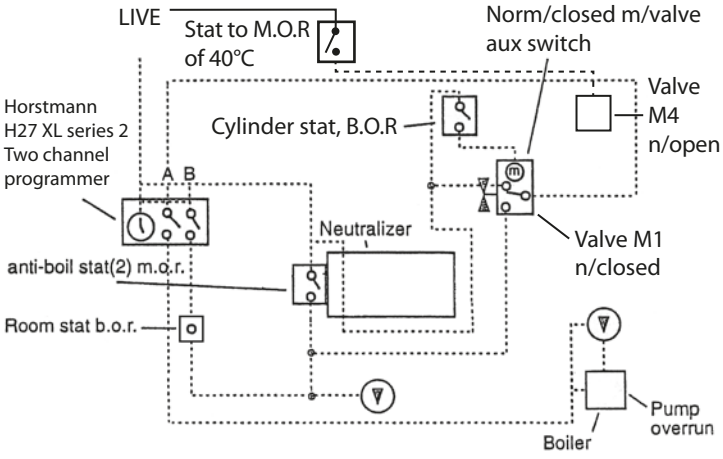


Fig. 12 Open vent cylinder



Control operation

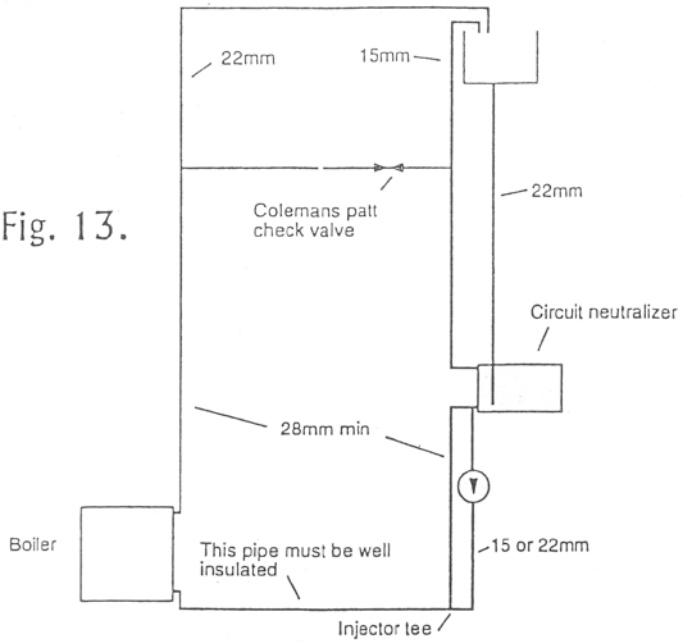
Hot water only. Set the programmer to (A) on. (B) off.
The boiler and 1st stage pump will operate until the cylinder thermostat opens and shuts off the motorised valve. The aux switch will change over from the n/c to the n/o position, thereby switching off the boiler and 1st stage pump.
Hot water and heating. Set the programmer to (A) on. (B) on.
The boiler, 1st stage pump and space heating pump will operate until the cylinder thermostat opens and shuts off the motorised valve. The aux switch will change over from n/c to the n/o position, thereby allowing the room thermostat to energize the boiler and 1st stage pump as well as the space heating pump until the room thermostat breaks and switches them off.

In the event of an overheat situation developing, anti-boil thermostat (2) set at 85°C will make and switch on the space heating pump. If there is a pump or electrical failure, anti-boil thermostat S3 set at 40°C will break and open the motorised valve to allow gravity circulation to the cylinder through the 22mm bypass.

Up and under circuits

The circulating pressure in an up and under gravity is very small, due to the retarding influence of the dip in the return pipe.
Therefore, the circuit will have to be accelerated to carry the output of a group 1. or group 2. boiler.
This circuit also encourages back circulation that has to be checked.
The featherweight Colemans patt check valve is the only reflux valve that we recommend for this purpose. **(see Fig. 13).**

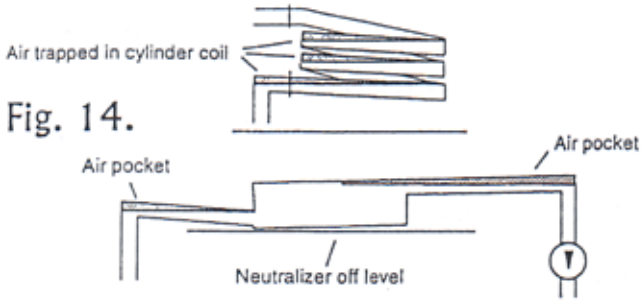
Fig. 13.



Retarding influences

Air can retard or stop circulation.
Careful pipework installation is important.

Fig. 14.



Commissioning and testing

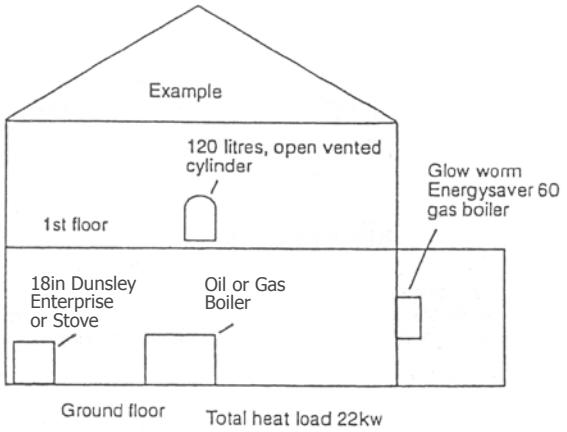
1. Fill and vent the system.
2. Purge air from cylinder coil.
3. Switch on the group 3. or group 4. boiler at the programmer, and set the boiler control stat to 77 C.
4. Adjust the 1st stage pump to the temperature differential specified by the boiler manufacturer.
5. Switch on the space heating accelerator at the programmer and balance the space heating with the radiator regulating valves.
6. Switch off the boiler and space heating at the programmer and run off the domestic hot water from the cylinder.
7. Light the group 1 or group 2 boiler.
   Ensure that the primary hot water circuit is not retarded, and that the anti-boil stat switches on the space heating pump when the flow temperature reaches 85 C.
8. Switch on the accelerator of a group 2. boiler and regulate the temperature difference across the boiler.
   The minimum flow rate through the boiler must be sufficient to stop boiler kettling.
9. Switch on the group 3 or 4 boiler.
10. Check the operation of all controls.
11. Instruct the user in the operation of the system.

Questionnaire:

To help us to supply information on system design, we require a rough sketch of the dwelling (not an isometric drawing) and the following information.

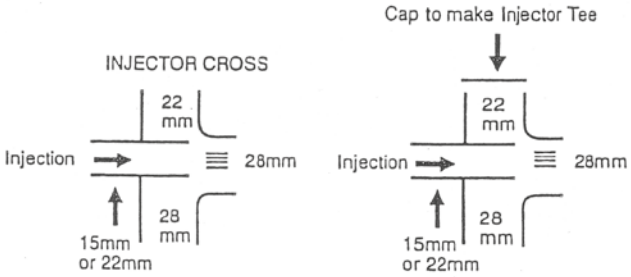
1. Numbers of floors
2. Proposed position, type and output to water of boilers or cookers.
3. Proposed position, number and size of hot water cylinders.
4. The total heat load.

Fig. 15.



Injector Cross

The injector cross can be made into an injector tee by capping the 22mm branch. See below.



ABBREVIATIONS

SPST	Single Pole Single Throw.	BOR	Break on Rise
SPDT	Single Pole Double Throw.	AAV	Automatic Air Vent
MOR	Make on Rise	CO	Change over

DUNSLEY NEUTRALIZER SYSTEM

DunsleyHeat YORKSHIRE

Designers and Manufacturers of Heat Exchangers for over 50 years

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