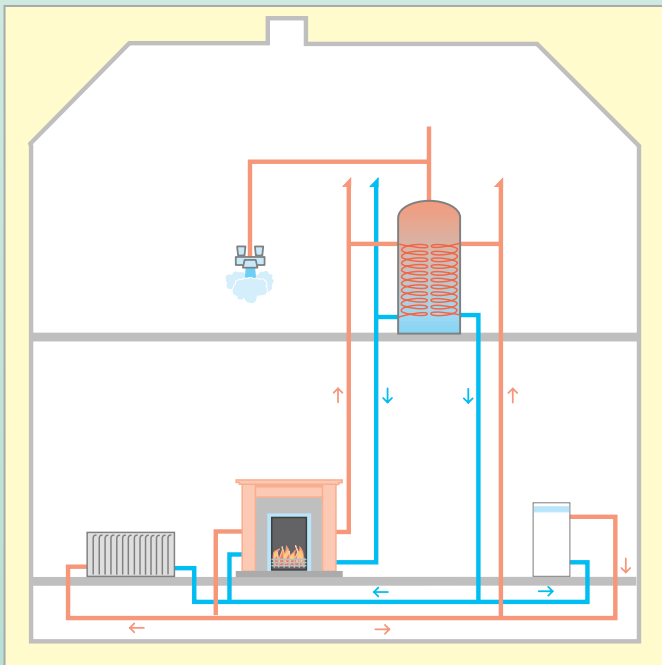


The Guide to Link-Up



For Solid Fuel Boilers with other
Open Vented Systems



INTRODUCTION

Many homes today, have a boiler in the kitchen supplying hot water and radiators to heat the house. The concept of Link-Up allows customers to use the heat from a solid fuel fire fitted with a boiler to supply hot water and/or radiators in conjunction with an alternative heating appliance to give maximum flexibility.

The information in this booklet applies to linking solid fuel (mineral fuel or wood) to either gas, oil or another solid fuel appliance with an open vented system. These methods do not apply to combi or condensing boilers which operate with pressurised systems.



Building Regulations

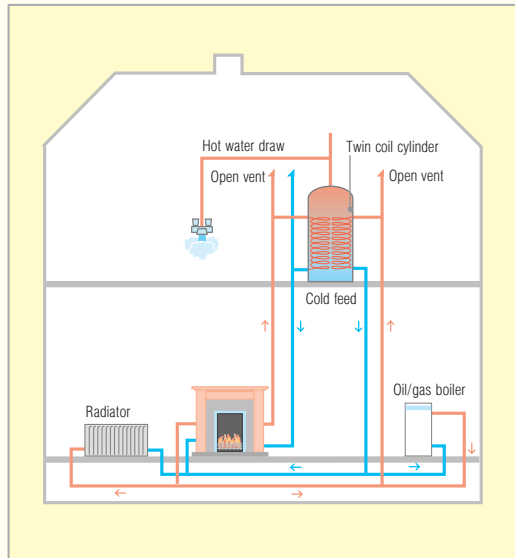
The installation of any heating appliance is subject to Building Regulations. There are separate regulations for Scotland, Northern Ireland and England & Wales. All place constraints on the type of appliance which can be installed, generally relating to minimum efficiencies and CE approval. In designing a link-up system, full regard needs to be taken of the Building Regulations. These cover all aspects of the work, including Electrical work.

Details of sources for further advice are shown on the back cover of this booklet.



How Link-Up works

- An open fire, roomheater or stove fitted with a back-boiler can be linked to an existing or new heating system.
- The existing central heating boiler continues to service the system as and when required.
- The hot water and radiators can be supplied by either or both appliances depending on the heat input needed.
- Link-Up can be installed to link either the hot water only or the hot water and radiators.
- Can be integrated with Solar Panels to maximise efficiency by providing 'free' hot water from the power of the sun.



Schematic diagram

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Flexible heating

The real advantage of Link-Up is its flexibility. Whilst you are enjoying the comfort of your solid fuel fire, it can automatically take over all or part of the heating load to conserve your consumption of alternative fuels. When you are not using the fire, the central heating operates as normal.

TECHNICAL DETAIL

Link-Up can be achieved in a number of different ways and the method chosen will depend on your existing system, if there is one, and the output of the appliances being linked.

Whichever method of interlinking is chosen, it is very important to ensure the solid fuel appliance has an unrestricted open vent and separate cold feed. To further increase safety, and reduce the possibility of boiling in the event of a power or pump failure, any motorised valves fitted to the solid fuel circuit should be of the powered closed type.

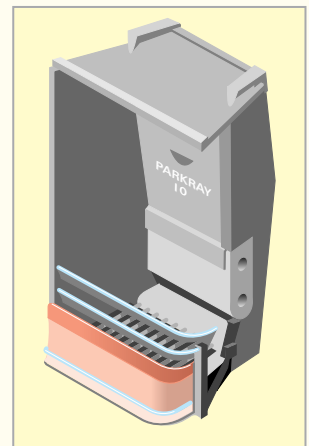
It is possible to design a custom Link-Up to suit almost any combination of boilers which operate with open vented systems but will require a full understanding of the appliances, the hydraulics of the system and all the electrical controls being employed. To make matters easier, a number of companies have produced products which enable Link-Up to be installed by following the diagrams and instructions provided by them. In addition, it is recommended you employ a qualified installer who is a member of one of the recognised Competent Persons Schemes, such as HETAS Ltd.

Simple Link-Up

Link-Up can be very simple and inexpensive if only a limited additional benefit is required. In many cases a simple Link-Up is most cost effective

with an existing system to which you wish to add an open fire. By using a boiler flue-set with domestic hot water back-boiler it is possible to improve the efficiency of the fire and generate free hot water!

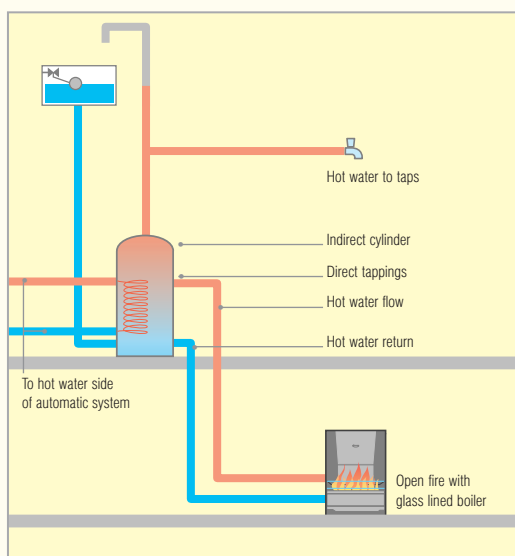
fig 3



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Simple Direct Link-Up

Where a glass lined or similar rust proof boiler is fitted to an open fire or stove, the boiler is connected directly to the domestic hot water cylinder. This is the type of system used years ago for the production of hot water from solid fuel appliances and is still valid today.



Layout 1

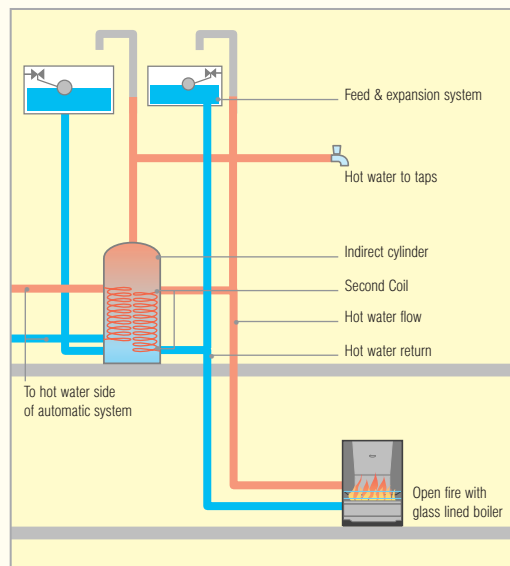
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Layout 1 shows a typical system layout for this type of Link-Up. It can be seen that the solid fuel appliance uses the domestic hot water feed and vent and heats the water in the cylinder directly by passing it through the boiler.

Simple Indirect Link-Up

In this instance, a standard boiler is used and the water in the cylinder is heated indirectly via a coil. It requires the fitting of an additional cold feed and expansion tank to service the new system and allows the use of a standard boiler. In the strictest sense of the word this is not a Link-Up as the two appliances have a separate system and heat the same cylinder which is fitted with two coils (see layout 2).

If your house is fitted with solar panels the heat generated can be used to indirectly supply a twin coil hot water cylinder. In this way you can have hot water all year by using the power of the sun backed up by



Layout 2

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your solid fuel boiler during the cooler months. Some equipment manufacturers offer fully integrated systems for this purpose.

In both the above cases, the Link-Up will only provide hot water and will not assist with heating the radiators.

Full Link-Up

A full Link-Up system enables more than one appliance to contribute heat to the central heating system as well as the domestic hot water.

In the past there have been problems associated with linking two dissimilar heating appliances into the same heating system, especially when the appliances are located remotely from each other. These problems have included loss of heat through the unlit appliance, loss of stored hot water when the heating is on, inefficient use of the heat generated when both appliances are in operation and excessive heat produced when both appliances are operating.

There are now products on the market which enable Link-Up to be carried out successfully between any two appliances and can give different levels of control and automation to meet the customer's requirements.

Neutralizer systems

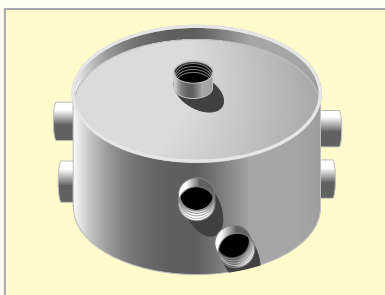
The use of a neutralizer offers a neat solution to the problems of Link-Up. The description "Circuit Neutralizer" (also referred to as a neutralizing vessel or chamber) is intended to convey the fact that the neutralizer fixes the neutral point location within the system. The cold feed and open vent are both connected to the system at the neutralizing chamber. Provided both boilers are only connected through this point, then pumped or gravity circuits connected to the chamber can have no hydraulic interaction (see layouts 3 & 4).

This means the pumped circuit from a gas or oil boiler will not induce flow through a solid fuel boiler via its gravity circuit. The solid fuel boiler will however feed hot water into the system, thus achieving the desired objective.

It must be pointed out that whilst two boilers connected as above is the most common arrangement the neutralizer system can cope with a greater number of appliances if required.

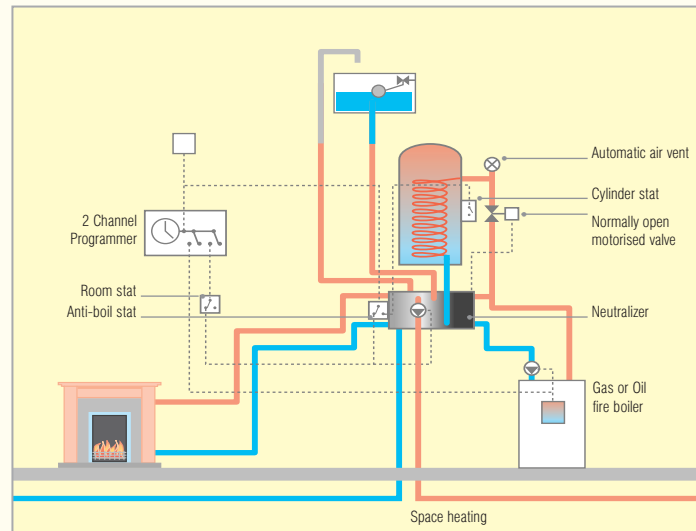
Two comments with reference to location:

- In converting an existing system to accommodate a neutralizer most of the work takes place in the airing cupboard, thus avoiding general disruption within the home.
- Where the solid fuel appliances are on the same floor level as the neutralizing vessel, elevation of the neutralizer and hot water cylinder is recommended. This elevation is to achieve gravity circulation and venting of the system. For further details contact the neutralizer manufacturer.



Dunsley Neutralizer LU.CN.F4.D.98.3481

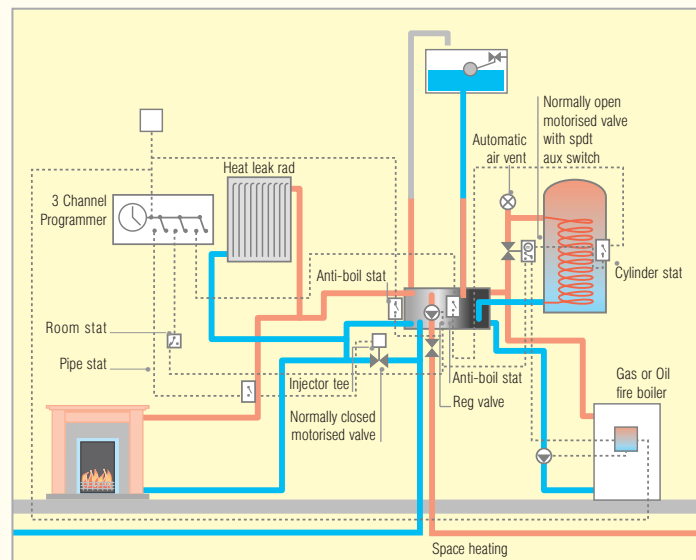
Layouts 3 & 4 show two of the many arrangements for using a neutralizer in a Link-Up system along with an indication of suitable control systems. For details of further system layouts, including solar panels, contact Dunsley Heat Ltd on 01484 682635.



Layout 3 Link-Up of non thermostatically controlled Solid Fuel boiler to gas or oil.

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Layout 4 Link-Up of thermostatically controlled Solid Fuel appliance to gas or oil.



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Electronically controlled Link-Up

Heating Innovations Ltd have produced a control system called H2 which operates in conjunction with any solid fuel appliance with a boiler together with an existing open vented automatic central heating system. This system can also be incorporated as part of a new system to enable Link-Up to take place. Installation of the H2 unit has been made as straightforward as possible by having the electrics pre-wired therefore leaving only external connections to be made. Details of the various layout options, including Link-Up incorporating high efficiency gas and oil boilers and solar, can be obtained from Heating Innovations Ltd on 01354 653854.

The basic principle

The solid fuel appliance is piped into the existing central heating system via the H2 control panel, normally located in the airing cupboard. The H2 then allows the fire to set its own regime of control and circulation by operating a series of pre-wired and pre-set thermostats and motorised valves.

For example, with an outside temperature of 8°-10°C the fire may contribute 90%+ of the total heating requirement. As the outside temperature falls the two systems will operate together; the solid fuel contributing up to its full output to be topped up by the automatic boiler as required to maintain the desired temperature.

Detailed explanation

H2 has four main functions that work either individually or together with an existing heating system.

function 1

With the solid fuel appliance not lit and the programmer set for hot water only, the automatic boiler heats the water in the cylinder until it reaches the required temperature. At this point the whole system switches off.

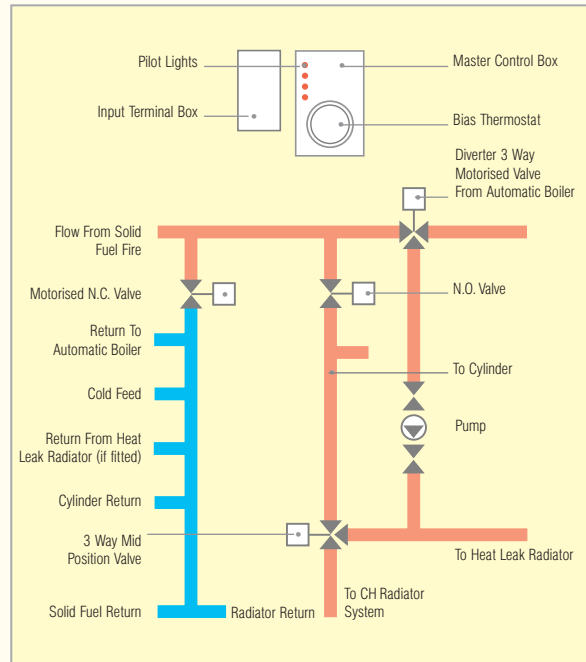


fig 5

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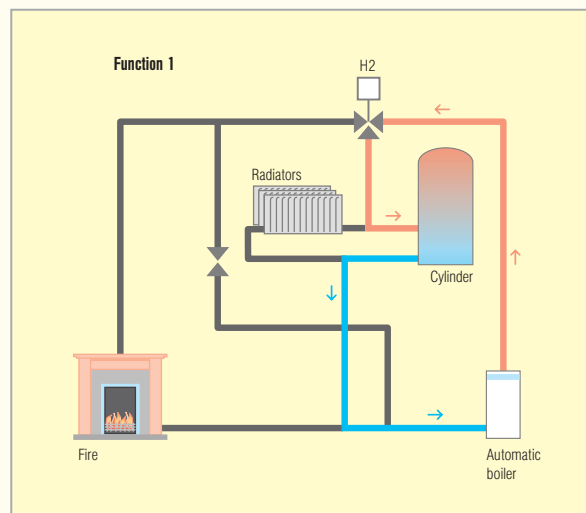
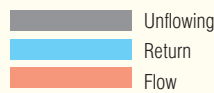


fig 6

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function 2

With the programmer set for hot water and central heating, the automatic boiler brings both up to the required temperature and switches the system off until required again. In both modes the solid fuel circuit is shut to avoid wasting heat.

function 3

With the programmer in the off position and the solid fuel fire alight, the heated water circulates, by gravity, until the H2 senses the rise in temperature and switches the pump on. The hot water is then pumped around the cylinder and any heat leak radiator fitted. The cylinder is under its own temperature control and once the set temperature is reached the H2 diverts the heat around the radiator circuit to make maximum use of the fuel consumed.

function 4

If the solid fuel fire is lit when the programmer switches on either the hot water or the heating circuit (or both), the heat will be diverted to where it is needed. At this point the flow will be allowed through the automatic boiler and if the temperature of the water in the system is insufficient it will be topped up to the required level by this unit. In a situation where the solid fuel appliance is producing as much heat as is needed the flow from the automatic boiler is stopped to avoid wasting heat.

General details

The above descriptions are only basic and will need adapting for the site conditions and the appliances concerned. It is possible to link two solid fuel appliances such as a gravity feed independent boiler with a stove, roomheater or cooker. If this is to be done, further advice should be sought from the manufacturer of the system that suits your requirement or from the Solid Fuel Association.

To ensure a satisfactory Link-up the following factors must be taken into account.

1. The priority of any design must be safety. There must be no possible danger to persons or property arising from the way a householder may use the system, even if this is unorthodox, unreasonable or ill advised.
2. Ensure separate and suitable flues exist for each appliance in use.
3. All components of the linked system must conform to all relevant Water By-Laws, Building Regulations, British and European Standards and Codes of Practice..
4. Since much of the pipework of an existing system will be concealed, it must all be located and correctly identified by whoever carries out the installation.
5. Any solid fuel appliance must always have a separate cold feed and vent which must be permanently open and unobstructed at all times without valves. Many modern gas and oil condensing boilers installed today operate with sealed and pressurised systems which are not suitable for linking to an open vented system. Some manufacturers produce 'system boilers' which are capable of operating in a condensing mode whilst connected to an open vented system.
6. The float valve in the feed and expansion cistern and the overflow pipes must be made of copper.

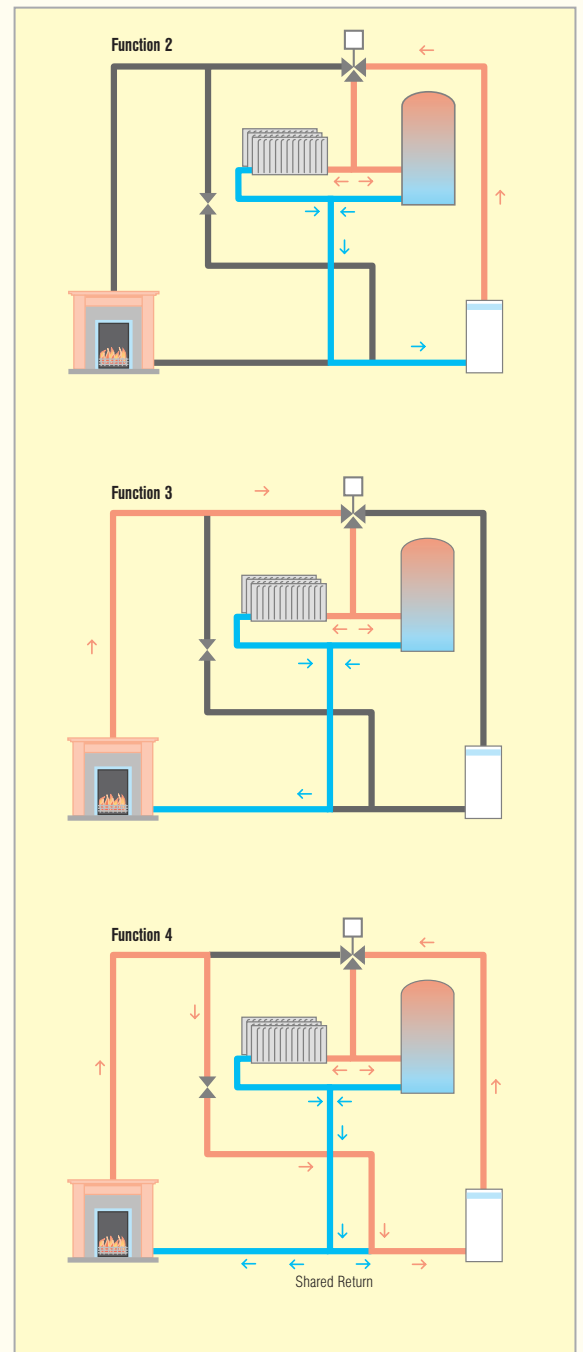


fig 7

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SOURCES OF FURTHER INFORMATION AND USEFUL CONTACTS:

Heating Innovations Ltd. 01354 653854 and www.h2panel.co.uk

Dunsley Heat Ltd. 01484 682635 and www.dunsleyheat.co.uk

Visit the **SFA** website on www.solidfuel.co.uk for further information. In addition there are various links to solid fuel and wood fuel appliance manufacturers and other associated organisations.

The following selection of Guides can be downloaded from the SFA website:

Guide to Designing Solid Fuel into the Home

A Customer's Guide to Current Building Regulations – England & Wales

Fuels Guide

Curing Chimney Problems

Lining Old Chimneys

HETAS Ltd is the registration body for solid fuel appliances, fuels and installers. A complete list of installers is available on their website www.HETAS.co.uk .



SOLID FUEL ASSOCIATION

www.solidfuel.co.uk

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