

# SOLID FUEL CENTRAL HEATING

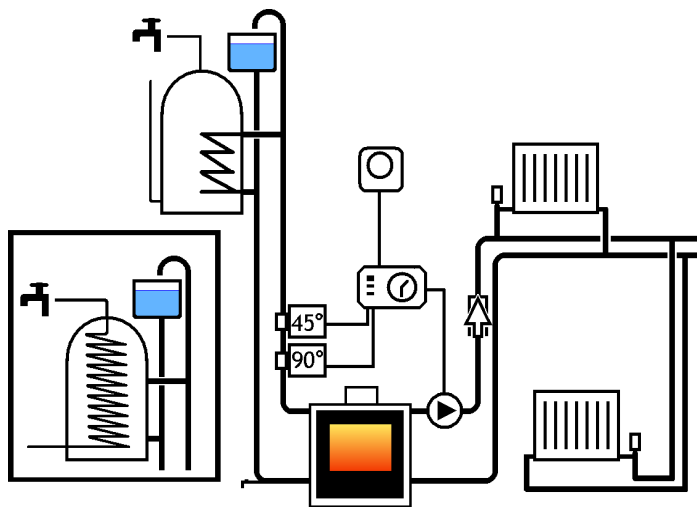
## 'WET' CENTRAL HEATING SYSTEMS...

... with a solid fuel boiler use precisely the same types of pipework and radiators, including underfloor heating, as any other fuel and can have similar automatic heat and time control. But there are two important differences:

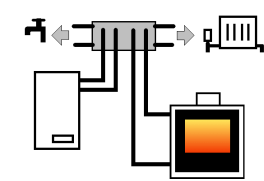
- 1: Most solid fuel boilers control water temperature using internal mechanical thermostats, so controls are applied to the heating circuit, not the boiler.
- 2: Although the fire can close down, it can't *completely* stop combustion - it is essential to supply some infallible means of dissipating surplus heat, such as a permanently connected radiator or hot-water system - in a well-designed system occasional excess heat will be stored, usually in the hot water system, for use later. For this reason open-vented systems are preferred.

A popular system uses two circuits taken from different sides of the boiler. One provides natural gravity circulation to the hot water system, the other pumped central heating. It will include:

- ✓ A room-temperature thermostat and single-circuit time-clock controlling the circulating pump.
- ✓ A pipe thermostat on the gravity flow pipework set to prevent the pump running when boiler flow temperature drops below c45°C. This will prevent heat in stored hot water being dumped if the fire dies down, and prevent cold water circulating through the boiler- a frequent cause of condensation and corrosion.
- ✓ A second pipe thermostat on the gravity flow side set at 90°C to run the pump and dissipate heat in the event of boiler overheating, irrespective of how other controls are set.
- ✓ An open vented gravity circuit to a large hot water cylinder, a useful way of storing surplus heat during 'off' cycles. The inset in the above diagram shows typical connections to a high pressure hot water cylinder.
- ✓ Radiators fitted with thermostatic valves.
- ✓ Means to completely drain water from the system.
- ✓ An 'anti gravity' valve can be included on the flow part of the radiator circuit to prevent natural convection to radiators when the pump is off. However it is often better to allow natural circulation to continue at night, typically giving half-heat to upstairs radiators.



<p><b>OPEN FIRES</b> with back boilers can be surprisingly efficient, some over 70% and up to 10kW output, but they cannot be automatically controlled.</p>	<p><b>COOKERS</b> with outputs up to 20kW are available with thermostatic control</p>	<p><b>STOVES</b> (or 'roomheaters') with boilers, either free-standing or inset into the wall can usually burn a very wide range of fuels. Most have thermostats and a few have automatic feed</p>	<p><b>INDEPENDENT BOILERS</b> Some models are hand-fired, others, using anthracite grains or wood pellets, have automatic feed and can burn for days on one filling.</p>

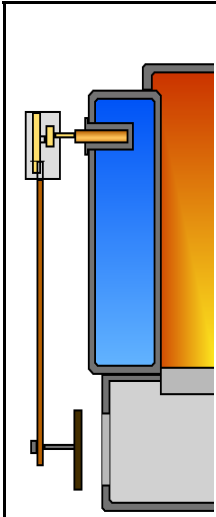


### LINK-UP

It is possible to connect a solid fuel boiler and another fuel boiler to the same system so that, once the solid fuel appliance is lit and hot enough, it can automatically shut-down the main boiler to run the heating on solid fuel. If the fire goes out, the main boiler comes back on, or, if the heat demand is high, both systems can run together. Such installations need very careful planning to ensure that one boiler does not simply heat the other up and that expansion and surplus heat are handled safely. Ready-made link-up equipment is available from, among others, Dunsley ([www.dunsleyheat.co.uk](http://www.dunsleyheat.co.uk)), SystemLink ([www.systemlink.ie](http://www.systemlink.ie)), Esse ([www.esse.com](http://www.esse.com)), Atmos ([www.atmos.cz](http://www.atmos.cz)) and Heating Innovations Limited.

### How do you control a solid fuel stove automatically?

Some solid-fuel appliances, especially automatic-feed types, have electronic feed or air supply fans. But most use a mechanical appliance thermostat with a tiny vial of oil inside the boiler. As the boiler water gets hotter, the oil expands and moves a bellow outward, moving an arm, which closes off air to the fuel and so stops combustion. So, if the timeclock or room thermostat determines that no heat is needed, it stops the circulating pump; without water circulation the boiler begins to get too hot, the oil expands and shuts off air and the fire dies down. If there is demand for heat, colder water enters the boiler, the air-flap opens and the fire blazes up. All that is needed to automatically control a solid fuel boiler is to control the water flow through it- the boiler itself will do the rest



**STAYING HOT:** It is not difficult to make even open fires 'slumber' for ten hours or more on one ordinary filling of hard mineral fuel, while automatic feed appliances can burn for days. With wood logs it is more difficult- one solution is to fit a heat accumulator, a large insulated tank, to store heat while the fire is lit to be drawn on when the fire goes out.

**HOT AIR SYSTEMS:** As well as 'wet' central heating there are systems which heat a whole building by distributing warm air through ducts, commonplace in North America, and gaining popularity in Western Europe.