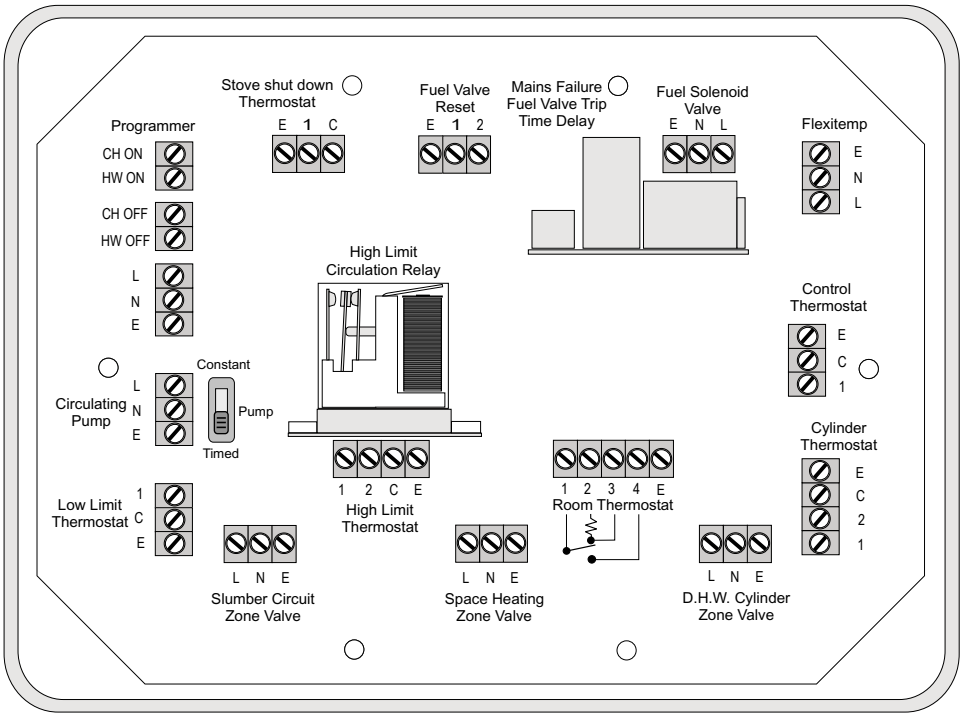
Stove Boiler Management System Centre 1

MS91024 System Centre 1A and MS90125 System Centre 1B



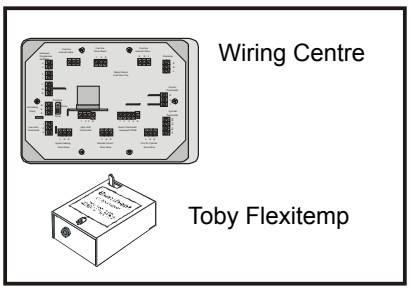
Euroheat Distributors (H.B.S.) Ltd., Unit 2, Court Farm Business Park, Bishops Frome, Worcestershire, WR6 5AY.

Thermic Distribution Europe SA, B-5660 Frasnes-lez-Couvin, Belgium.

Contents

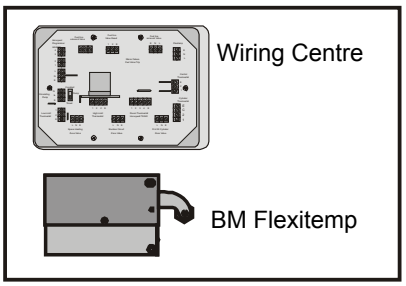
No installation should be undertaken unless the installer is suitably qualified. The complete installation must be carried out with due reference to the British Standards, Codes of Practice and Building Regulations relevant to the fuel type being installed, and the manufacturers installation instructions.

MS91024 System Centre 1A



MS91024 System Centre 1A suitable for Harmony I and II stoves fitted with a Toby oil metering valve.

MS91025 System Centre 1B

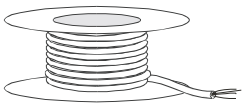


MS91025 System Centre 1B suitable for Harmony/ Coachman stoves fitted with a CI oil metering valve.

MS91026 Electrical components kit

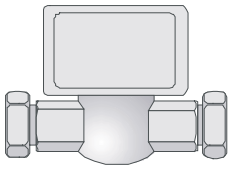
This component pack contains all the necessary electrical components and consists of: -

Central heating programmer Honeywell ST6100A, motorized zone valve V4043B1257 x 3, wax filled surface mounted thermostats x 3, cylinder thermostat x 1, room thermostat T6360, 7 core cable, heat resistent cable and thermal paste.

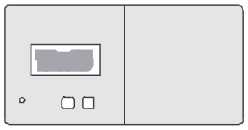


7 Core Cable

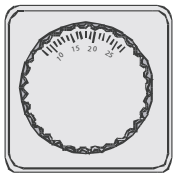
Thermal transfer paster



Zone valves x 3



Programmer



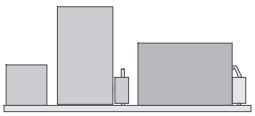
Room thermostat

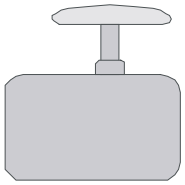
Pipe thermostat x 3

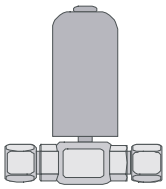
Cylinder thermostat

MS91027 Safety kit

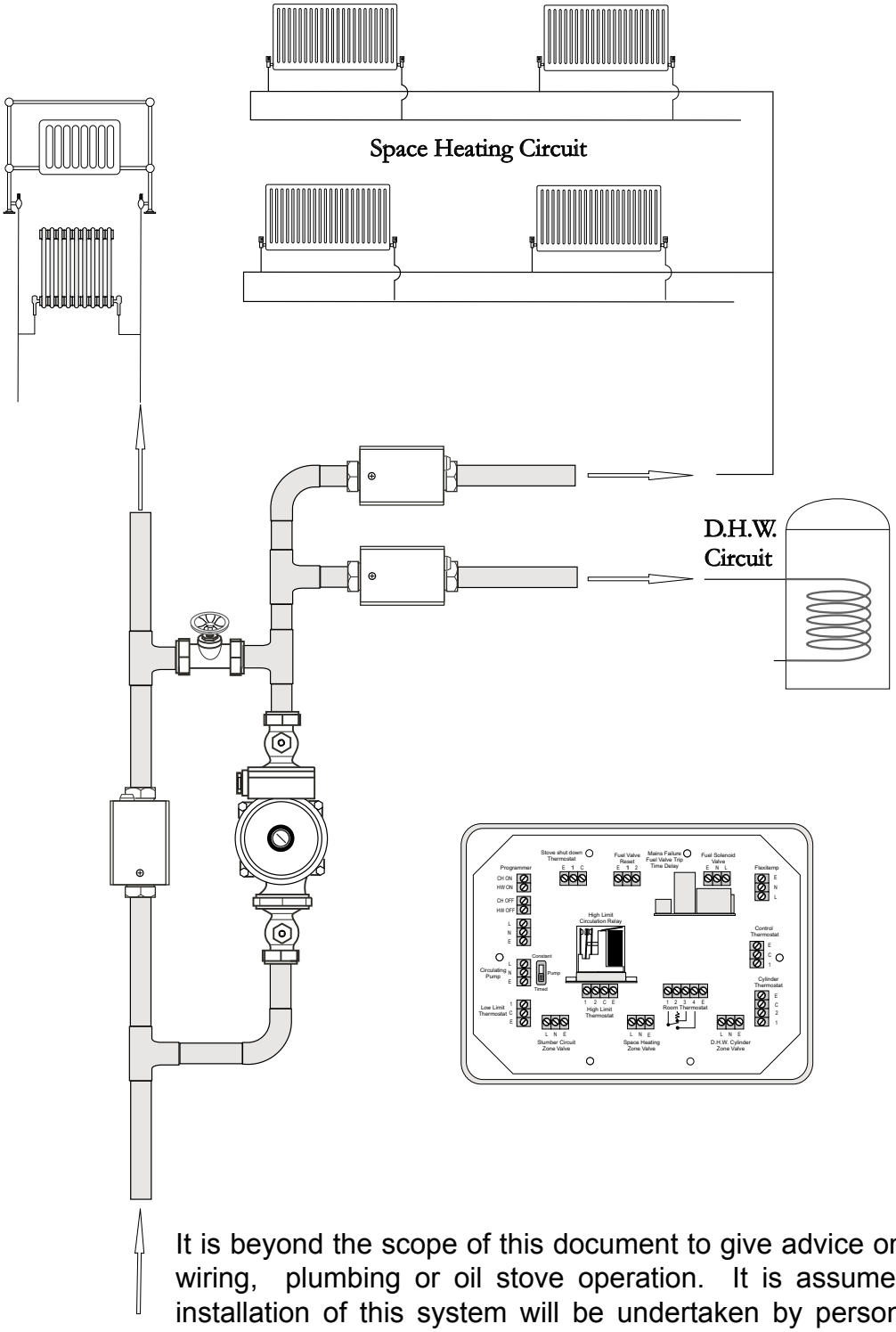
An additional safety kit should be specified for sealed systems or where the installation has no gravity potential in the event of a mains supply failure. The safety kit has an additional overheat thermostat that isolates the fuel supply immediately the stove's boiler safe operating temperature is exceeded. The fuel supply will also be isolated if the mains supply fails for more than several seconds. The fuel supply will require manually resetting whenever a fault has caused the fuel supply to be interrupted.







System Centre 1



It is beyond the scope of this document to give advice on electrical wiring, plumbing or oil stove operation. It is assumed that the installation of this system will be undertaken by persons suitably qualified and the information given in this document is specifically related to the system centre 1 and its operation.

System Centre 1

The System Centre 1 is the optimum control system for oil fuelled boiler stoves, giving complete management of the heating circuits and supervision of the stove. The system is designed to respond to the programmed heating cycles, adjusting the stove's heat output to match the heating load, and to monitor the performance of the slumber circuit when no heating demands are being made, ensuring the stove is running safely and at its highest efficiency at all times.

Operation

All stoves are designed to operate continuously, and when fitted with a boiler it is necessary to provide a permanent heat load of sufficient size to dissipate the heat produced by the boiler when running at its minimum output. Traditionally, much of this load was supplied by an uninsulated domestic hot water cylinder which was allowed to reach temperatures which we would now regard as hazardous to anyone washing. With the advent of insulated cylinders, governed to safe temperatures, the cylinder should now be thought of as a separate, and controlled heating circuit, no longer forming part of the permanent heating load. The permanent load is referred to as the "heat leak" or " slumber" circuit and is supervised by the system centre 1, but it must be a circuit capable of dissipating the stove's minimum boiler output at all times and no radiators on this circuit should be fitted with thermostatic valves. When no heating demands are being made the system centre 1 will allow a gravitational flow from the boiler into the slumber circuit by opening the slumber circuit zone valve. If the temperature of the boiler reaches the system's high limit set point the system will respond in one of two ways. Poor gravitational flow will be indicated by the boiler return inlet being below the set limit and in this instance the system centre 1 will cause the circulating pump to start, the slumber valve to close and water will be force circulated around the slumber circuit, routing through the gate valve. Its response to excess temperature, when the return temperature of the boiler is above the low limit, is to additionally open the space heating zone valve to circulate the water through the entire space heating circuit. When the temperature has been lowered the system will revert to a gravity flow to the slumber circuit through the slumber zone valve.

On demand for domestic hot water only, the slumber valve will close and the domestic hot water circuit valve will open, allowing the now energized circulating pump to circulate water to the cylinder circuit. The Flexitemp unit will respond to the heat load by increasing the stove's firing rate whenever the boiler temperature falls below the temperature set on the control thermostat. Water will continue to flow through the slumber circuit at a rate controlled by the gate valve.

On demand for space heating only, the slumber valve will be closed, and the space heating circuit valve will be opened to allow the pump to circulate water through the radiators. The Flexitemp unit will respond to the heat load by increasing the stove's firing rate whenever the boiler temperature falls below the temperature set on the control thermostat. If the return water temperature falls below that set on the low limit thermostat the space heating zone valve will close but the circulating pump will continue to circulate water around the slumber circuit through the gate valve until the return temperature is above the low limit, when the space heating zone valve will open again.

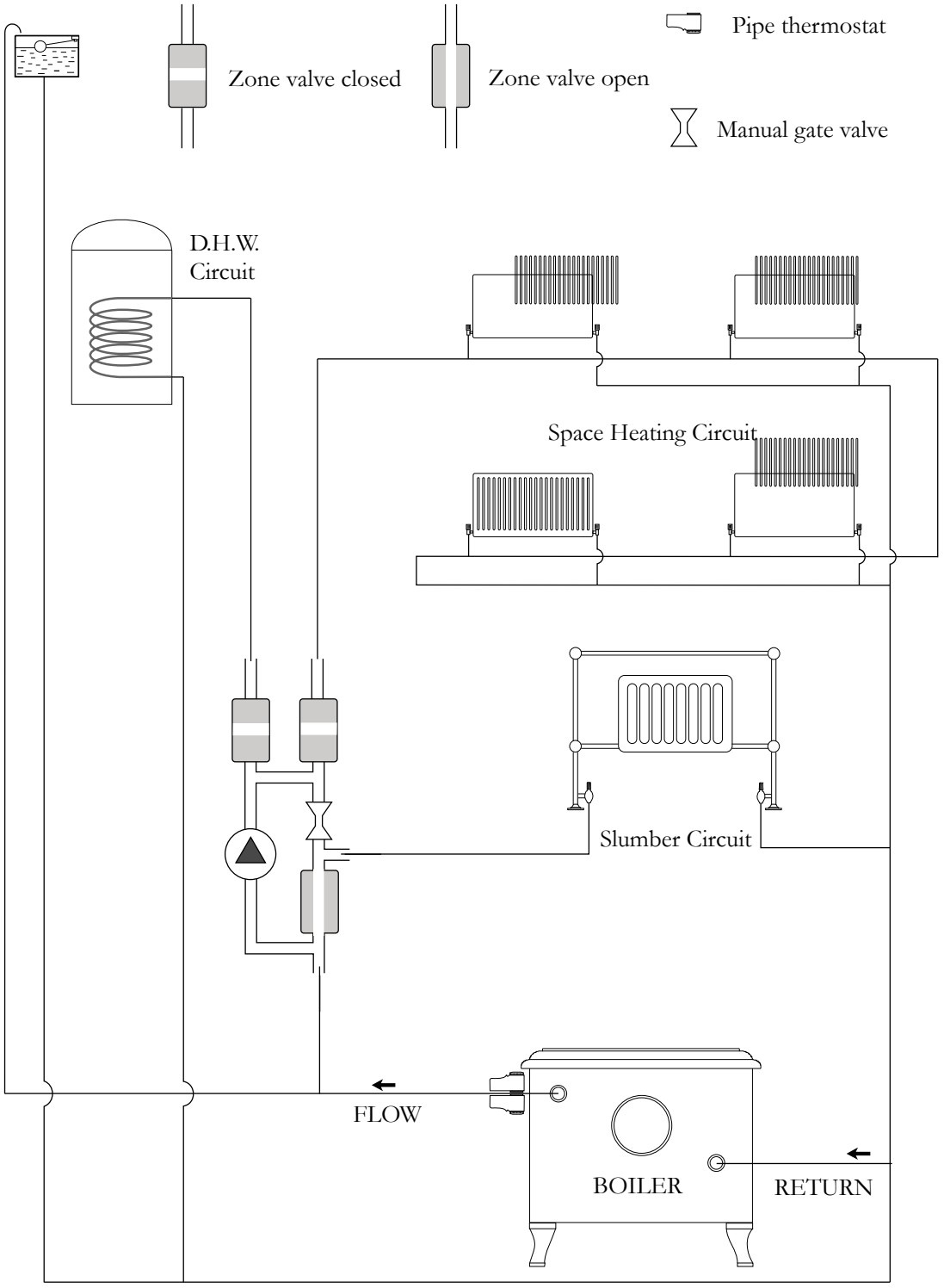
On demand for both space heating and domestic hot water the slumber valve will close and both space heating and domestic hot water valves will open, with the circulation pump running. To prevent the condensation of the flue gasses on the boiler surfaces, when the heating load is large enough to lower the boiler temperature below that set on the low limit thermostat, the thermostat will close the space heating zone valve until the return water temperature rises above the set temperature. Because of the very much smaller heat load of the domestic hot water cylinder circuit, the domestic hot water zone valve will remain open until the tank thermostat reaches its set temperature.

Because the system uses normally open valves they will open in the event of an electrical power failure. This will allow limited heating if the gravitational water flow is sufficient to provide a heating load higher than the stove's minimum heat output. If the installation is such that insufficient gravitational flow exists

and the “safety kit” has been specified, the system has a solenoid valve controlling the supply of oil to the stove which will shut off the supply of oil to the stove in the event of a mains supply failure lasting more that seven seconds. The stove will also have its fuel supply isolated if the shut down thermostat reaches its set temperature for more than seven seconds. After shutting off the fuel supply the system will need to be manually reset, after the cause of the shutdown has been established and the stove has dropped to a safe temperature for re lighting

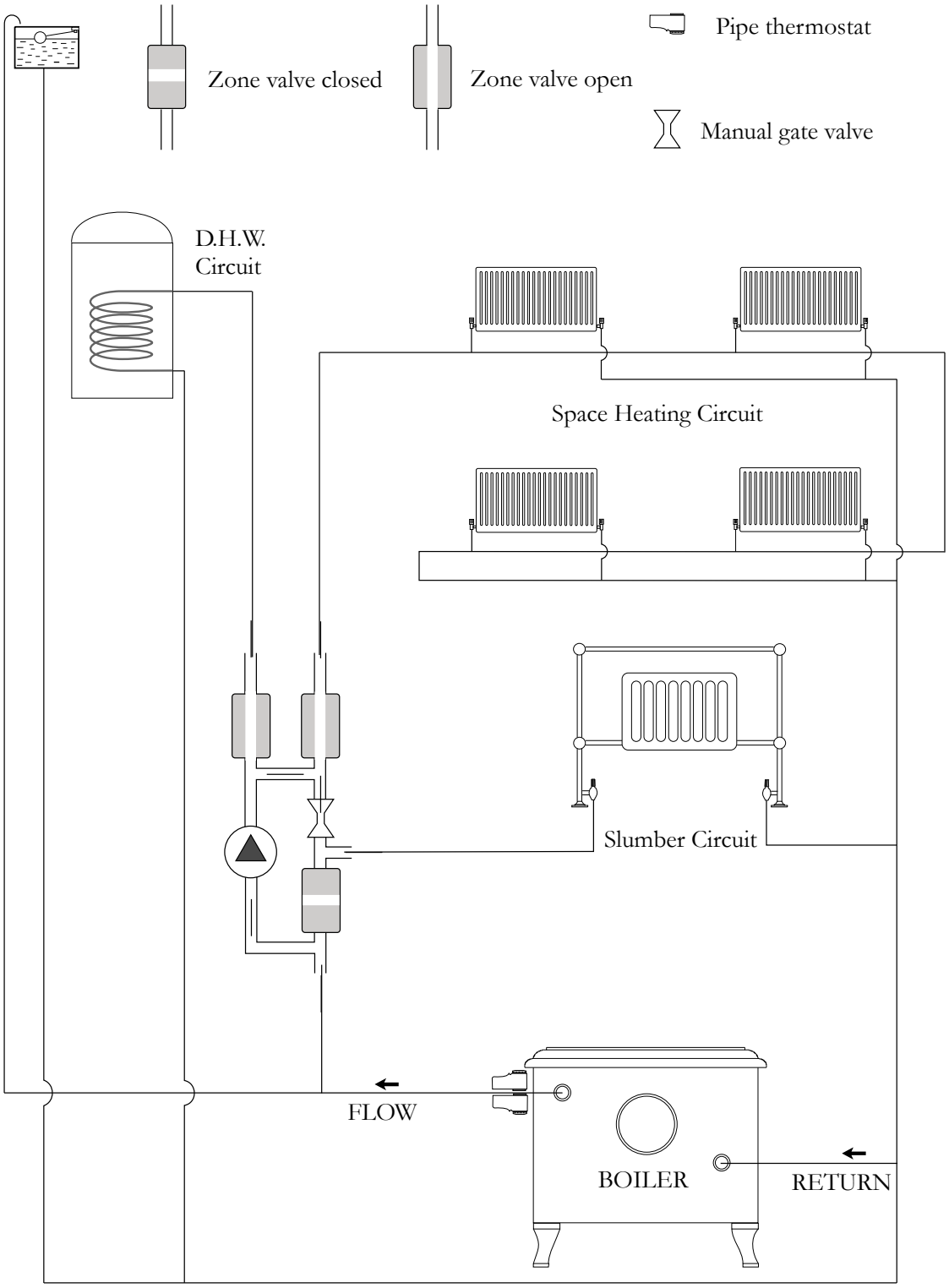
SCHEMATIC PLUMBING DIAGRAM.

During the time when neither space heating or domestic hot water heating is required the respective zone valves are energized to close and the slumber valve opens to provide a gravity circuit to the slumber radiator.



SCHEMATIC PLUMBING DIAGRAM.

When heating is required for space heating or domestic hot water the respective zone valves are de-energized to open and the slumber valve closes. The slumber radiator continues to be heated with the water flow from the circulating pump and the flow rate may be balanced by adjusting the manual gate valve.



Installation
Please take the time necessary to read these instructions before installing the system centre 1. The system is not complicated, but many aspects of it may be unfamiliar to you because the system centre 1 is controlling three circuits, and a boiler which is running continuously, it therefore has more control and more controlled elements than most central heating installations Without correct installation its reliability and correct functioning will not be assured.

Pipe Thermostats
All pipe thermostats used must be fluid filled devices, bimetallic thermostats respond too slowly and they must be installed onto clean pipes with a generous application of thermal conductive paste between their mating surfaces. All pipe thermostats are monitoring temperatures at the boiler inlet or outlet and so should be as close to the boiler as possible, with the low limit thermostat on the return inlet and all other thermostats on the flow outlet. Ensure the thermostats are securely mounted and that all wiring to thermostats is protected from the stove body.

Cylinder Thermostat
It is acceptable to use a bimetallic thermostat for the cylinder, but it must be mounted directly onto the tank wall with thermal conductive paste between the mating surfaces. The response of this thermostat will not only be governed by good contact with the tank but also its position relative to the height of the tank. Positioned low on the tank will cause it to needlessly call for heat whenever a small amount of hot water is drawn off, and positioned too high will allow the tank to be virtually drained of hot water before the thermostat will detect a temperature drop. The cylinder thermostat must be set to a lower temperature than the control thermostat.

Room Thermostat
The stove is producing heat at all times and therefore the room thermostat should be positioned where it will monitor the overall house temperature, and is not influenced by heat from the stove rather than the radiators. Do not use an existing room thermostat if it is in the same room as the stove.

Zone Valves
The system centre one is designed to operate **normally open valves** which are energized to close; **the system will not operate, nor can it be adapted to operate normally closed valves.** The drawings within this document show the zone valves in a specific configuration to aid explanation of their operation only, they can be mounted on the relevant pipe circuits to wherever is convenient, with the proviso that the manufacturers limitations for their orientation are followed. The slumber circuit should be capable of at least some gravitational flow and be routed to have the minimum horizontal runs and direction changes possible to maximise the flow possible.

Manual Gate Valve
The manual valve will need to be adjusted when the system is commissioned to balance the flow through the slumber circuit when the slumber zone valve is closed and the circulating pump is operating. Allowing more flow than necessary to the slumber circuit will limit the flow available to other circuits, too little will not maintain the slumber circuit temperature, and restrict the effectiveness of the slumber circuit in maintaining a steady boiler temperature when initial heating demands are made.

Radiator Valves
Thermostatic valves must not be fitted to any radiator on the slumber circuit; they may be fitted to all but two of the radiators on the space heating circuit. The two radiators without thermostatic valves should

provide an adequate heat load for the dissipation of heat in the event of the system overheating. Care should be taken to ensure that a room thermostat will not be conflicting with the heating demands of any rooms whose heating is controlled by radiator thermostatic valves.

Saftey Shut Off

If the system has the optional safety shut-off facility the oil solenoid must be in addition to any temperature sensitive oil shut off valve. The control panel has the facility to wire a remote reset button which must be a normally open momentary switch, in a housing clearly identified with the buttons purpose.

Programmer

The clock programmer should be positioned to allow ready access and visibility to the controls and display.

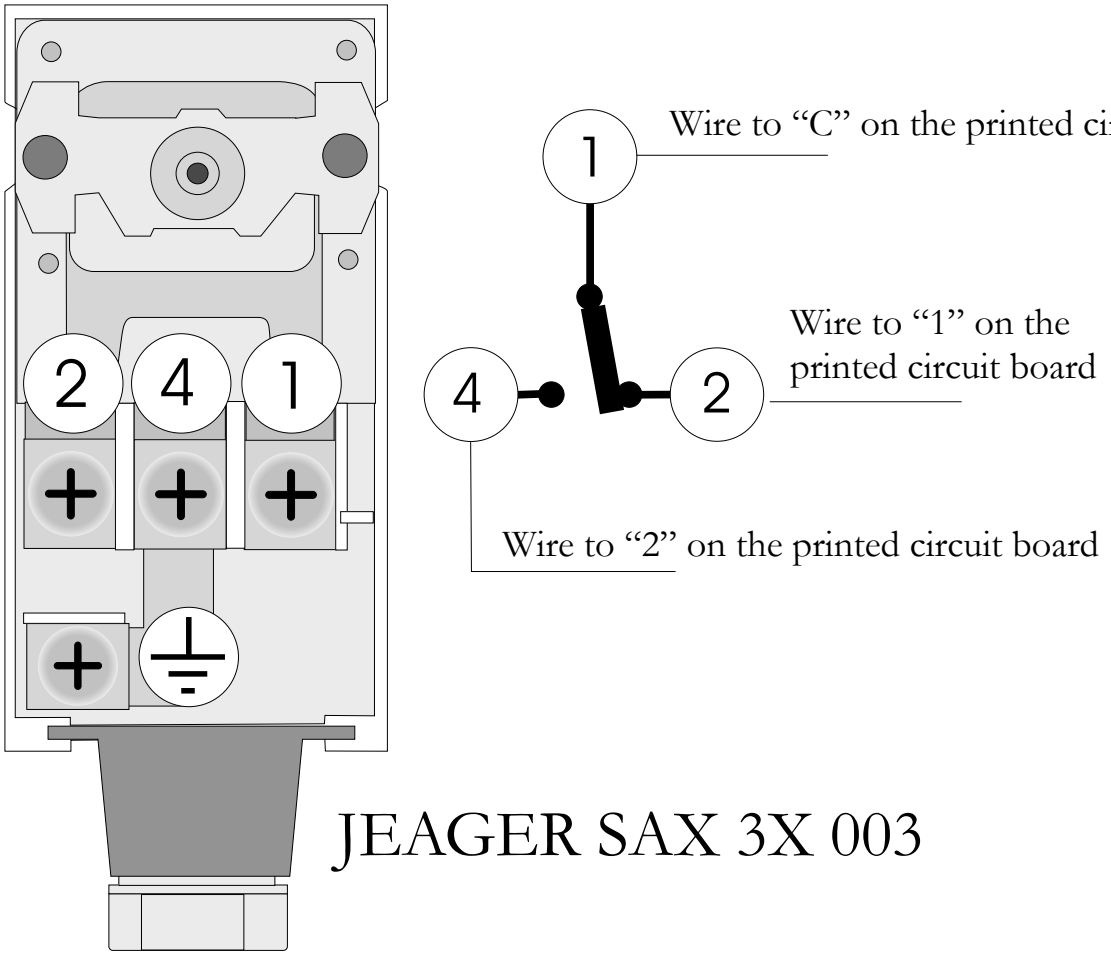
Thermostats

Thermostat manufacturers have differing coding for their switching contacts. The identification on the printed circuit board is-

"C" for the common or pole of the switch.
"1" for the contact made when below the set temperature.
"2" for the contact made when above the set temperature.

Reference should be made to the instructions supplied with the thermostats you have chosen to use with your system to ensure they are wired to the printed circuit terminals correctly.

If you were supplied with the Jaeger SAX 3X 003 thermostats the connections are as detailed below.



Control Panel

The control panel can be mounted in any convenient place. If it does not have the safety kit or has a remote reset there is no need to assume frequent access will be required

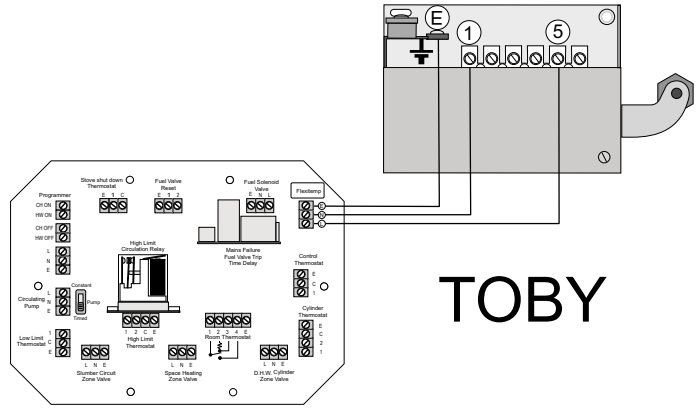
Mains Supply

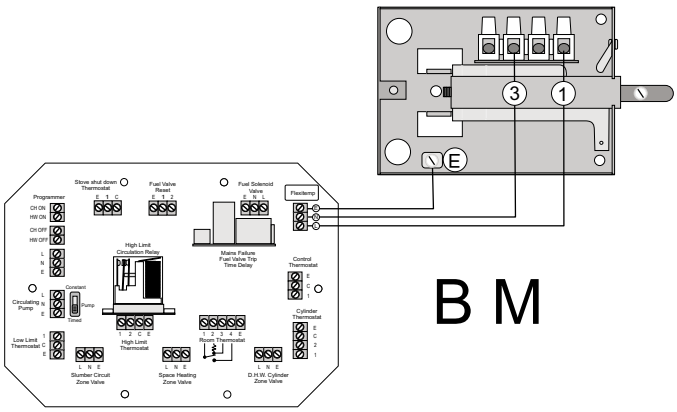
The system centre 1 requires a mains supply from a switched spur outlet protected with a 3 Amp fuse.

It should be wired into the programmer with the supplies to all components being through the seven core cable.

The Flexitemp

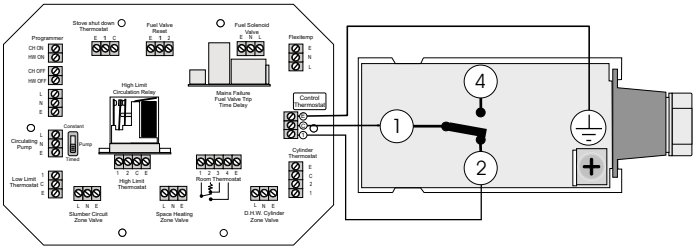
The flexitemp controls the fuel valve flow rate electrically. When not energized it holds the valve at its minimum setting, and when energized by the control thermostat, it allows the valve to deliver the fuel at the rate set by the oil valve's control knob. It operates by having a small electrical heating element which causes the mechanical operating rod to expand and lift the actuating arm. Although the oil valve's flow pin moves only one millimetre to achieve its complete range of oil flow rates, the flexitemp moves so slowly it takes approximately one minute for the flow rate change to occur. This allows time for the flue draught to adjust to the changed requirement. Please note that two models of flexitemp exist to accommodate differing oil valves. Because the units can be wired directly to a mains supply and be controlled by a remote thermostat, the units may contain drawings not applicable to the system centre 1. The units must be wired as illustrated in this document. Full fitting instructions for the relevant flexitemp unit to the oil valve are given in a different section of this document.





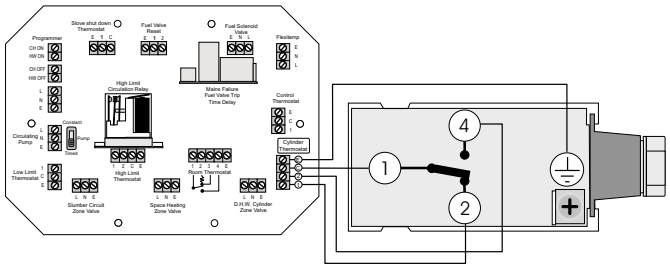
The Control Thermostat

The control thermostat energizes the flexitemp unit to raise the firing rate of the stove whenever the boiler falls below its set temperature. The thermostat should be mounted on the flow pipe as close to the boiler as possible using thermal conducting paste to monitor this temperature accurately. The thermostat is operational whenever the programmer is calling for heat and is enabled or disabled by the cylinder thermostat and the room thermostat.



Domestic Hot Water Cylinder Thermostat

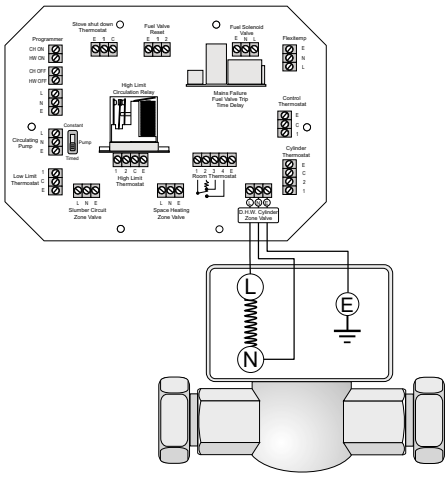
The cylinder thermostat is operational when the programmer domestic hot water is “on”. When the thermostat is below its set point it de-energizes the domestic hot water zone valve, allowing it to open, energizes the water circulating pump, if it is operating in the “timed” mode and the control thermostat to maintain boiler temperature. When the cylinder thermostat reaches its set temperature it energizes the zone valve to close the water circuit and removes its electrical supply from the control thermostat and the circulating pump.

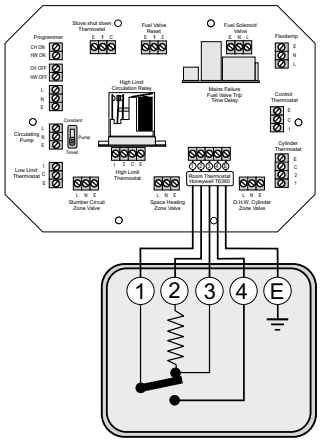


Domestic Hot Water Zone Valve

This valve controls the water flow from the boiler to the cylinder heating coil.

When the programmer and the cylinder thermostat are calling for heat, the valve is de-energized to open and allows the pump to circulate water from the boiler through the tank’s heating coil. The valve will be energized and closed when the cylinder thermostat reaches its set temperature to prevent the cylinder overheating and will be closed when the water heating programme is off, to limit heat losses from the tank by any gravitational flow. In the event of an electrical failure the valve will open to allow a continuous gravitational flow but the effectiveness of this will be dependant upon the routing of the relevant pipework



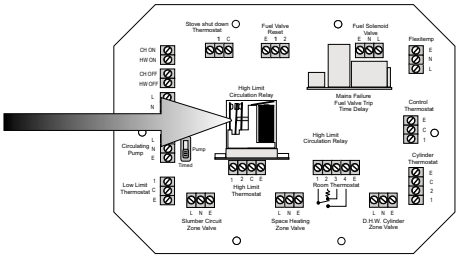


Room Thermostat

The room thermostat is operational when the programmer is set for space heating, “central heating on”. When the thermostat is below its set point it de-energizes the space heating zone valve allowing it to open, energizes the water circulating pump, if it is operating in the “timed” mode and the control thermostat to maintain boiler temperature. When the room thermostat reaches its set temperature it energizes the zone valve to close the water circuit and removes its electrical supply from the control thermostat and the circulating pump.

High Limit Circulation Relay

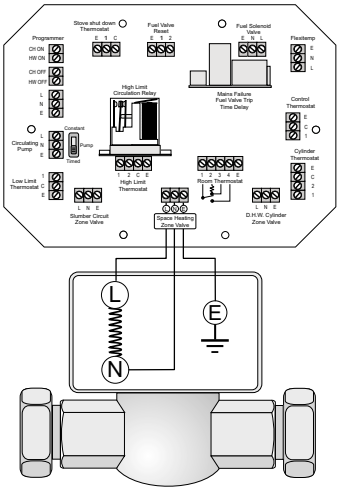
This relay is energized by the high limit thermostat if the boiler reaches its high limit. This isolates the flexitemp from the normally common circuit to the circulating pump.



Space Heating Zone Valve

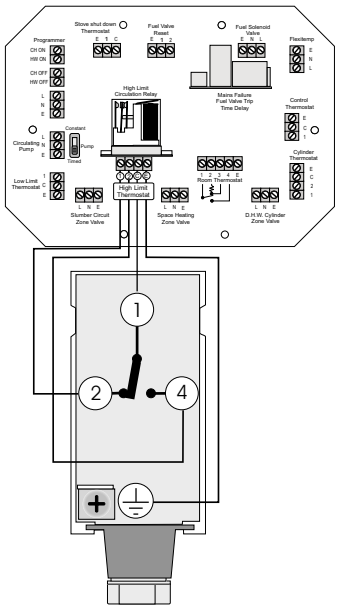
This valve controls the water flow from the boiler to the space heating radiators. When the programmer and the room thermostat are calling for heat, the valve is de-energized to open, allowing the pump to circulate water from the boiler through the radiator circuits. The valve will be energized and closed when the room thermostat reaches its set temperature and will be closed when the space heating programme is off.

If the boiler temperature falls below the low limit, the low limit thermostat will energize and close the zone valve until the boiler increases its temperature to exceed the low limit.



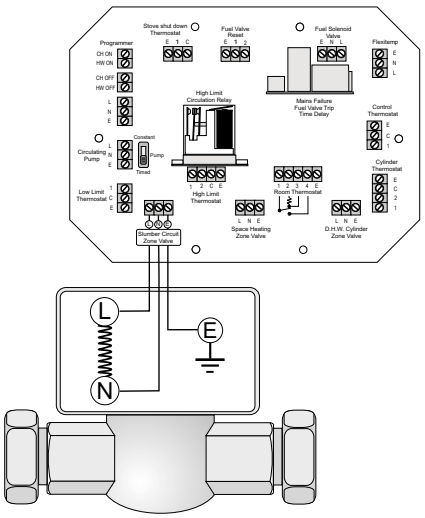
The High Limit Thermostat

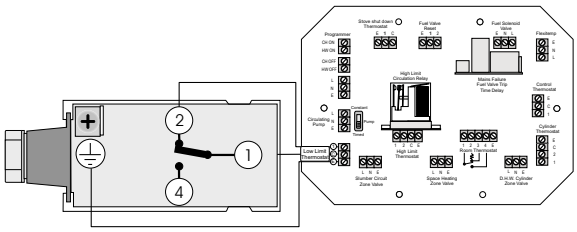
When below its set temperature the high limit thermostat provides the path for the programmer to energize the space heating zone valve to close, when the space heating is in the “off”mode”. It also provides the path for the room thermostat to close the space heating valve when the room thermostat is satisfied and the space heating is in the “on” mode. If the high limit thermostat reaches its set point when the programmer is not calling for any heating it will de-energize the space heating zone valve to open it and energize the high limit circulation relay to energize the circulating pump and slumber zone valve without energizing the flexitemp. In certain circumstances, where the gravity flow is poor, the boiler may reach its high limit with the boiler return flow below its low limit, and in this instance the space heating valve will be held closed by the low limit thermostat and the pump will only circulate water around the slumber circuit through the balancing gate valve. The high limit thermostat will also operate periodically when the heating demands are met and whilst the stove reduces its firing rate to minimum.



Slumber Circuit Zone Valve

This valve controls the water flow from the boiler to the slumber radiator circuit. When no heating demands are being made this valve opens to allow the heat still being generated to gravitate around the slumber circuit. If the gravitational flow is insufficient the circulating pump will operate to increase the flow whenever the boiler temperature reaches the high limit. The slumber valve will then close to allow the water to be pumped through the bye-pass valve. The valve will close whenever other heating circuits are operating.



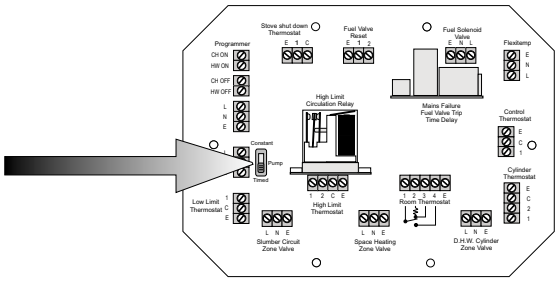


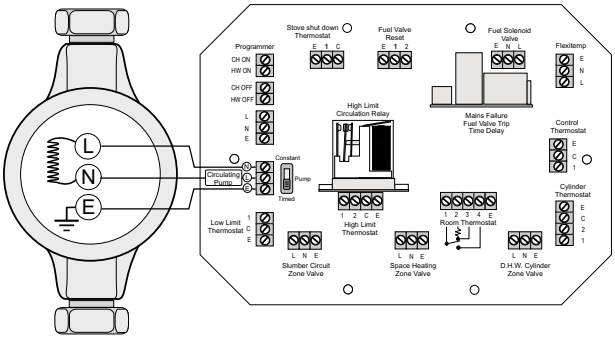
The Low Limit Thermostat

The low limit thermostat has a permanent supply and it energizes to hold closed the space heating zone valve whenever the water temperature of the boiler return falls below the low limit temperature. Because the low limit thermostat has a permanent supply it operates independently of all other controls.

The Circulating Pump Mode Switch

The switch allows the pump to be energized by the systems control elements or permanently for testing purposes. If there is insufficient gravity flow within the slumber circuit it is acceptable, although not ideal, to set the switch for continuous running.



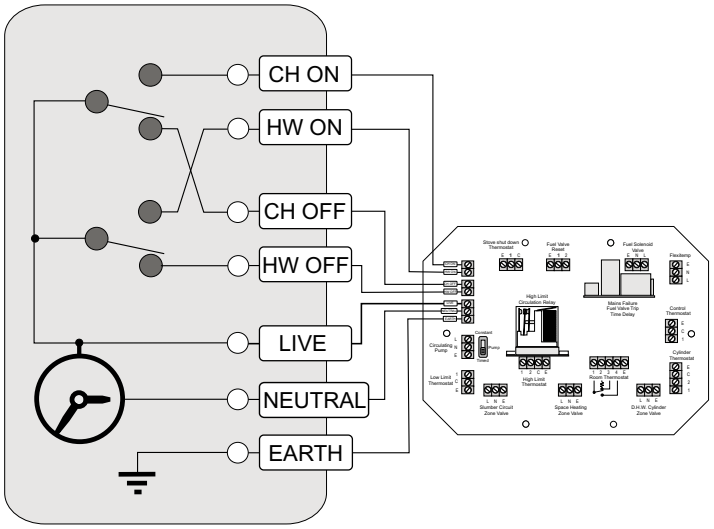


Circulating Pump

The circulating pump operates whenever the heating circuits are calling for heat and whenever the system needs to dissipate excess heat.

Programmer

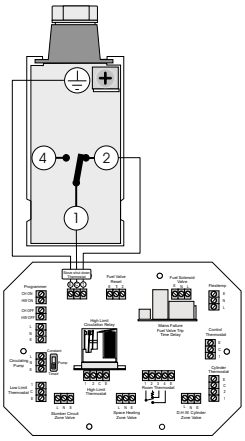
The programmer provides the signals to initiate or shut down heating cycles at specific times but even when not calling for heat the boiler remains under the control of the high and safety thermostats. For further details of your programmer please consult the instructions supplied by the manufacturer of the programmer.

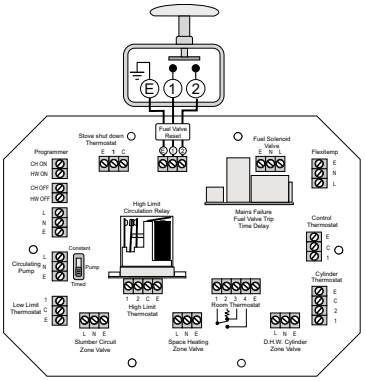


Safety Kit

Shut-Down Thermostat

The shut-down thermostat is the final safety thermostat and shuts off the fuel supply to the stove if the boiler's temperature continues despite the overheat controls operating. It operates independently of all other settings and controls.



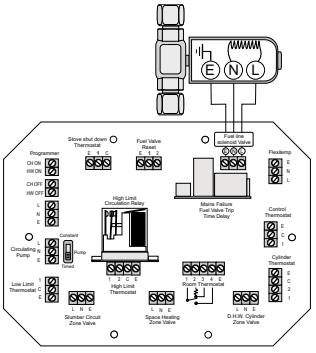


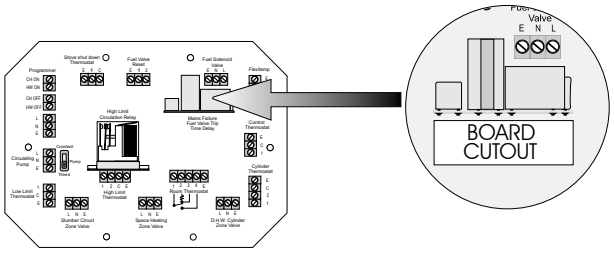
Fuel Valve Reset

The fuel valve reset terminals can be wired to a remote switch to reset the electrical supply to the fuel valve if it has been tripped out, by either the shut down thermostat or by a mains failure. Before operating the reset the stove must be cold, the fuel metering valve must be in the "OFF" position. The cause of the fault established and rectified before resetting.

Oil Solenoid.

The oil solenoid is fitted into the pipe supplying the fuel to the stove and isolates the fuel supply in the event of a fault being detected in the heating system. It should be fitted as an addition to any other safety supply shut-off valves.

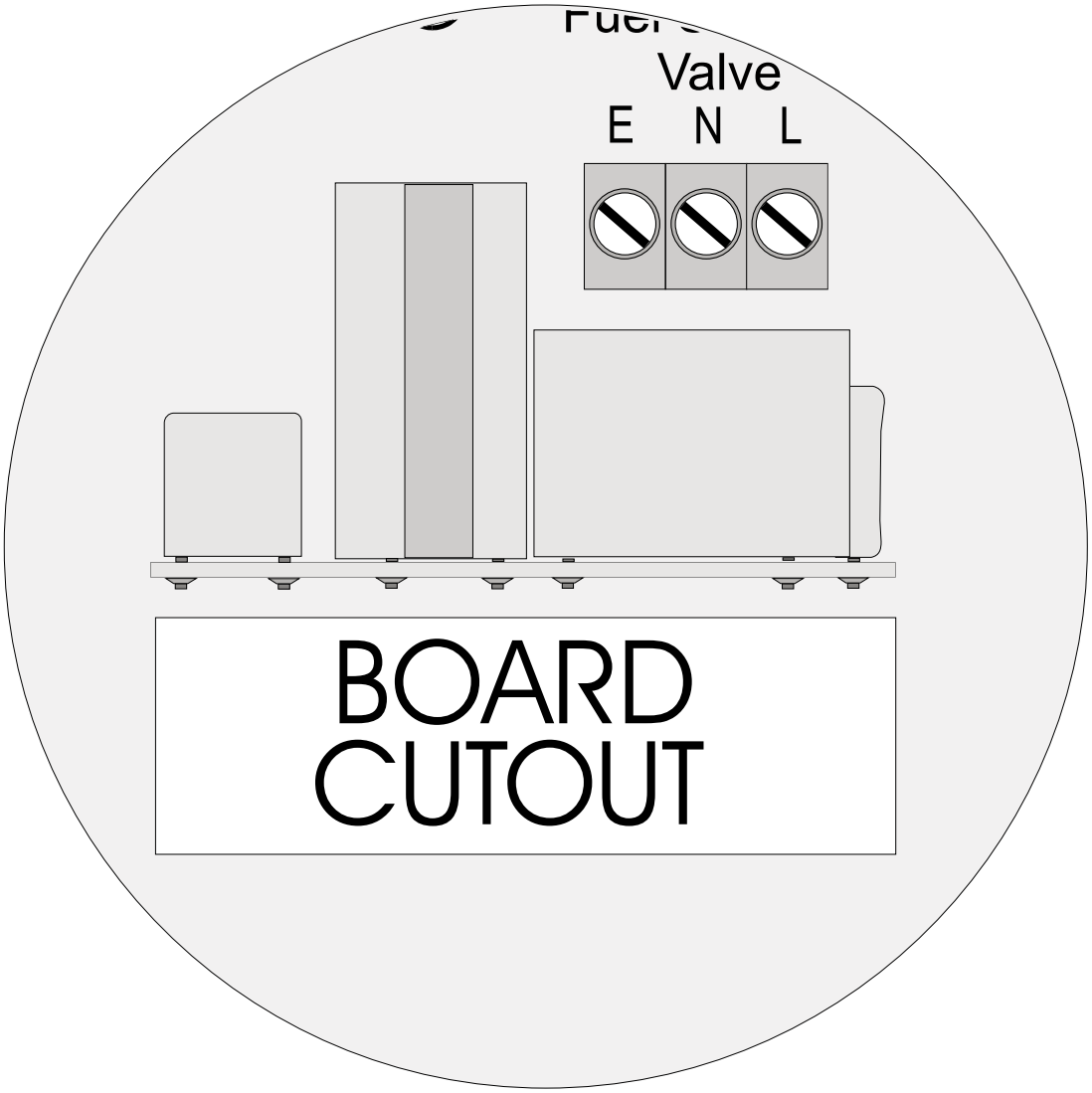




Time Delay

To prevent nuisance shut down when the mains electrical supply fails momentarily, a delay of four seconds is incorporated into the fuel isolation system. This allows the fuel solenoid to be re-energized if the failure has been for less than four seconds or the temperature within the boiler has been reduced within this time.

TIMER



THE TIMER MUST BE FITTED TO THE MAIN BOARD WITH THE COMPONENTS ON THE TIMER BOARD FACING AWAY FROM THE CUTOUT IN THE MAIN BOARD AS SHOWN

Commissioning The System

1. Is the plumbing system filled and free of leaks?
2. Have all the pipe thermostats been fitted using heat conducting paste and set to the correct temperature?
3. Is the electrical supply protected with a 3 Amp fuse?
4. The Low Limit thermostat should be set to 45 degrees C.
5. The control thermostat should be set to 75 degrees C. This may, after a period of use, be found to need resetting to a different temperature to suit the heating requirements of a specific system.
6. The High Limit thermostat should be set to 90 degrees C.
7. The Safety thermostat, if fitted, should be set to 98 degrees C.

The hot water tank thermostat should be set to 65 degrees C.

It is important to note that pipe thermostats are not normally calibrated to switch accurately below 30 degrees C. If the ambient temperature is not above 25 degrees C. attempting to test that a thermostat switches by turning it to its minimum setting will not give a reliable result. Water thermostats should be tested only with an accurate temperature measuring device and a heat source above 40 degrees C.

9. Have all electrical connections been made and all component covers replaced?
10. Are you conversant with setting the programmer to call for heating?
11. The room thermostat should be set to its highest setting.

The pump switch on the system centre 1 control panel should be switched to “Timed” and the clock set to be “OFF” for both heating modes before establishing a mains supply to the control panel.

If the safety kit is fitted, the reset button should be pressed to energize the fuel supply solenoid.
The mains supply to the system centre 1 should be turned off for five seconds then re-instated; the system should not need resetting. The mains supply should now be turned off for ten seconds and then reinstated; the system should not reset automatically and will need manually resetting.
The stove should now be turned on and the burner, or burners, ignited.
The stove should remain on its low firing rate regardless of the control knob settings. The control knob or knobs should be set to their highest settings, because the flexitemp unit will not be being energized.
The slumber circuit should begin warming but the other circuits remain cold.
The stove should be left running for at least ten minutes to allow the flue and slumber circuit to warm.
The gate valve should be adjusted to be almost closed.
The programmer should be set to heat the domestic hot water.
With this operation the slumber zone valve should close, the domestic hot water zone valve open and the circulating pump run. After a short while the burner or burners should begin to increase their firing rate.

If your programmer allows you to set the domestic hot water and central heating independently, turn the central heating switch to “on” and the domestic hot water to “off”. If the programmer does not have this facility the domestic hot water will remain on when the central heating is turned to on.

With this operation the circulating pump will be running, the slumber zone valve closed and the flexitemp unit causing the stove to increase its firing rate to maximum. If domestic hot water is being called for the domestic hot water zone valve will be open. The position of the space heating zone valve will be dictated by the boiler return temperature. The space heating valve will remain closed or will close whenever the return temperature falls below the set low limit.

If the system has operated correctly to this point, the room thermostat should be set to the required temperature, the programmer set to call for both domestic hot water and space heating and the system allowed to run until all the heating demands are satisfied whilst the operation of the valves and stove are monitored.

When the hot water cylinder reaches its set temperature the domestic hot water zone valve should close. If the space heating remains unsatisfied the circulating pump will continue to run and the stove maintain its high firing rate. If the space heating is satisfied the zone valve will close but the circulating pump will continue to run and the stove's firing rate remain high if the hot water tank has not reached its set temperature.

When all heating demands are satisfied the domestic hot water and space heating zone valves will close, the circulating pump will stop and the slumber zone valve will open and the stoves firing rate will slowly be reduced to minimum. Whilst the burner turns down, the circulating pump will be energized and the space heating zone valve will be opened by the high limit thermostat in cycles to dissipate the residual heat When the stove has settled to its minimum setting the performance of the slumber circuit can be monitored, by noting the frequency with which the high limit thermostat causes the circulation pump to be energized.

If the safety kit has been fitted, the safety thermostat should be turned to minimum until the fuel supply solenoid closes. If the thermostat is reset before the seven second nuisance timing has elapsed the system should re-energize the fuel solenoid. If the thermostat is not reset within this time the system will require resetting manually.

Fault Finding

Before trying to identify a fault please read the following:-

Fault finding should only be undertaken by somebody suitably qualified with understanding of both plumbing and electrical controls. It will require suitable test instruments. Before attempting to identify a fault with the operation of the system it is important to understand that the zone valves are powered to close and that the electrical circuits have to be read with the knowledge that de-energized circuits are as important as energized circuits for the system to be operating correctly. Do not attempt to find electrical faults without isolating the system from the electrical supply. Trace isolated circuits with a continuity meter.

The system uses valves which are normally open and closed when energized.
This is of little significance whilst the system is operating normally and is of operational importance only when an electrical supply failure occurs, but this operating method becomes of vital importance if the system appears to malfunction at any time. Because the electrical circuits isolate rather than energize to open the zone valves it is important to understand that more than one circuit may be holding a valve closed and all possible circuits need to be examined if incorrectly identifying faulty components is to be avoided. The electrical schematic drawing of the system's control should be used to identify the circuits which are seeming to be at fault.

All water thermostats must be fitted using heat conducting paste.
The paste ensures accurate and reliable transfer of water temperature to the thermostat. Failure to use the paste will inevitably result in inaccurate temperature monitoring and the system not responding to changes in temperatures correctly. The pipe thermostats must be positioned as close to the boiler as possible to ensure the system is monitoring its temperature and not that of remote pipe runs.
Water thermostats are not calibrated to switch accurately below 30 degrees C.

The Low Limit thermostat will prevent the space heating circuit from operating.
If the boiler temperature falls below the temperature set on the low limit thermostat the space heating zone valve will be prevented from opening to protect the boiler from moisture, present in the products of combustion, condensing onto its surface. If the heating load is high, the space heating zone valve may

close periodically even though the programmer is calling for heat until the boiler temperature stabilizes above that of the low limit. This additional control of the zone valve is most active when both the stove and heating circuits are being brought up to temperature from cold.
The gate valve must be adjusted to maintain the temperature of the slumber circuit.
The gate valve must be adjusted to give the minimum water flow rate to maintain the slumber circuit temperature. Unless this flow is balanced other heating circuits will not receive the necessary water flow and they will not achieve operating temperature, whatever temperature the boiler is operating at.

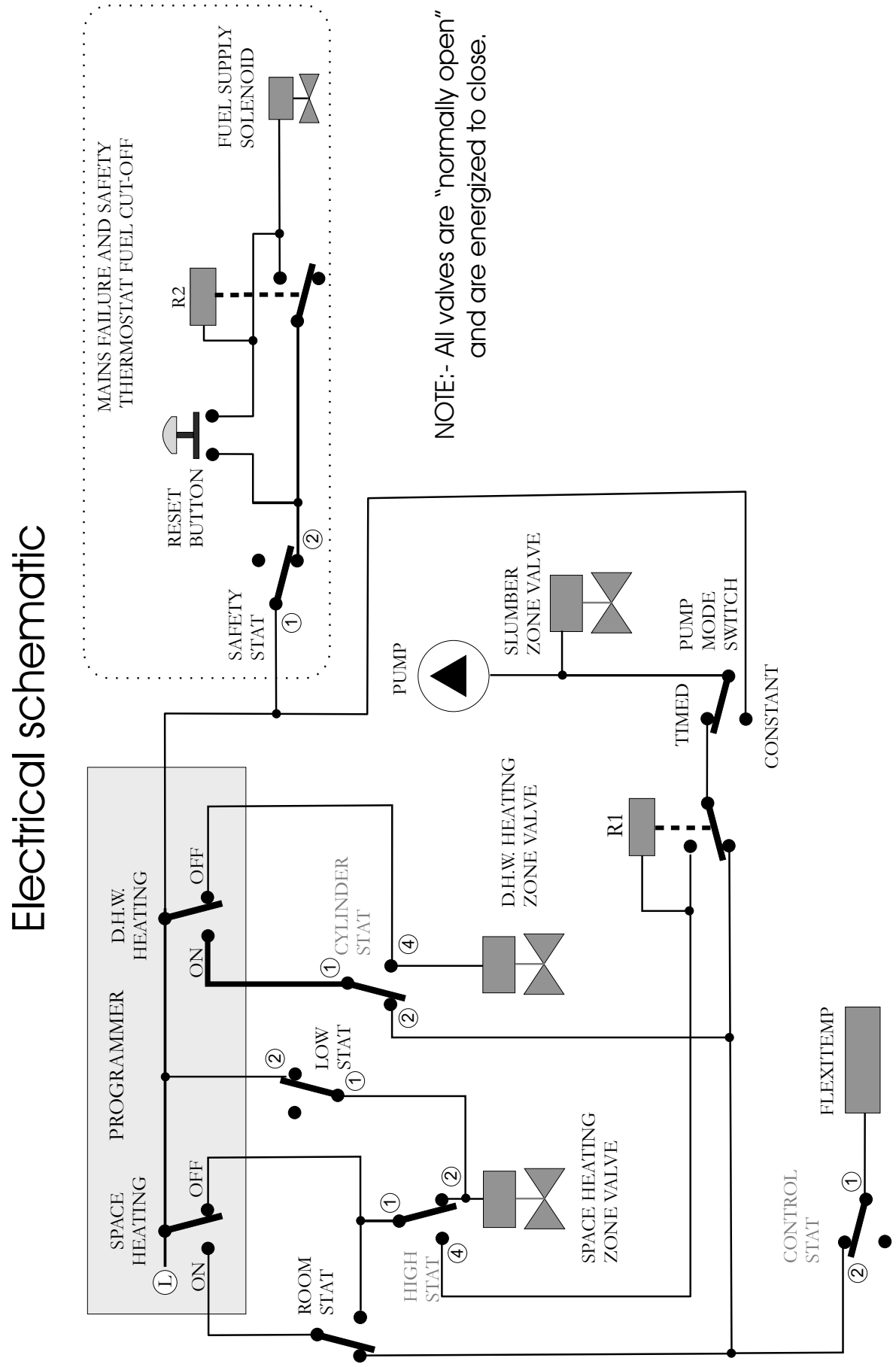
The system has blown its fuse.
If the system is new, all wiring should be checked to determine that the fault is not caused by crossed connections or whiskers of wire causing short circuits at terminations.
If the system is new and ran for a period before blowing a fuse, identifying which operation caused the fuse to blow will limit the number of components or electrical circuit that could be causing the problem.
Do not replace a blown fuse without identifying and rectifying the fault, the fuse is designed to prevent further damage to components, fault finding by guesswork and repeatedly replacing fuses is both dangerous and will cause damage to components.

The safety kit timer does not energize the solenoid.
Is the solenoid energized when the reset button is held?
If yes, has the reset button been pressed and have you held the button depressed for several seconds to allow the relay holding circuit to charge?
If no, ensure there is continuity from the incoming live supply terminal passing through the safety thermostat, to the reset push button.
If the reset button energizes the solenoid, but the solenoid releases when the button is released after two seconds the timer may be faulty or the timer board connections to the master board may not be pushed fully home.

When calling for heat the stove does not increase its burning rate.
The flexitemp unit drives the oil valve to the firing rate set by the stove's control knob when energized.
Firstly check that the stove's control is not set to minimum.
If the clock is calling for domestic hot water check that the cylinder is not at the temperature set on the cylinder thermostat.
If the clock is calling for space heating ensure that the room thermostat is set to a higher temperature than the ambient temperature.
Ensure the control thermostat is set to a higher temperature than the boiler temperature.
Ensure all pipe and cylinder thermostats are in contact with the relevant plumbing fitting.
Observe the flexitemp unit to determine the position of the operating arm. If it is in the "up" position and clear of the valve pin examine the oil valve to discover why the oil supply rate has not been increased. If it is in the "down" position, isolate the electrical supply to the system and test for continuity at the control panel terminals as follows:-
D.H.W. From the terminal "HW ON" to "cylinder thermostat C" to "cylinder thermostat 1" to "control thermostat C" to" control thermostat 1" to "flexitemp L".
Space Heating. From the terminal "CH ON" to "room thermostat 1" to " room thermostat 3" to "control thermostat C" to "control thermostat 1" to "flexitemp L".
If this continuity test fails to identify the fault confirm the wiring to the flexitemp unit, both for continuity and terminal positions. The flexitemp unit operates with a simple heating element which is extremely reliable and should be suspected only as a last resort

The circulating pump fails to operate.
Isolate the electrical supply to the system, set the circulating pump switch to “constant”, reinstate the electrical supply.

Electrical Schematic



If the pump still does not operate, isolate the electrical supply to the system and check for continuity between the pump terminals and the control panel then check for continuity of the pump motor.
Circulating pumps commonly fail to rotate if they have not been operated for a long period and the water has not been treated to inhibit corrosion. Isolate the supply of both electricity and water to the pump, remove from the system, clean and replace. The practice of hitting a seized pump with a hammer is not recommended.
If the pump operates with the switch in the "Constant" position, isolate the electrical supply, set the switch to "timed" and carry out the following continuity check:-
For failure when calling for D.H.W. Check "H.W ON" to "cylinder thermostat C" to the extreme right hand linking pin on the relay board, then to the extreme left hand linking pin on the relay board. The relay should be removed and examined if there is no continuity.

The space heating circuit does not heat, but the circulating pump operates and the stove firing rate increases.
The space heating zone valve remains energized and closed until the low limit thermostat is above its set temperature. When space heating is initially called for, the return temperature to the boiler return temperature will inevitably fall below the low limit temperature and the space heating zone valve will be closed until the water circulated by the pump through the boiler and slumber circuit reaches the low limit temperature, when the space heating zone valve will be de-energized and open again. This cycling will continue until the stove's increased firing rate balances the heating load. If the space heating zone valve does not open the low limit thermostat should be examined to ensure it is monitoring the return temperature correctly and is switching, then the system should be isolated from the electrical supply and the following continuity test carried out between these pins.
For failure when space heating is called for check "CH ON" to "room thermostat 1" to " room thermostat 3" to the extreme right hand linking pin on the relay board, then to the extreme left hand linking pin on the relay board. The relay should be removed and examined if there is no continuity between these pins.

The slumber circuit reduces temperature when heating is called for.
The slumber circuit is gravitational through the open Slumber zone valve when the circulating pump is not operating.The slumber zone valve is closed and pumped flow is through the manually adjusted gate valve. If this valve is not opened no pumped flow will circulate through the slumber circuit. It is important not to have this valve open more than the minimum necessary to maintain the slumber circuit temperature or the other circuits will be short circuited.

Slumber circuit reduces temperature significantly when system is in slumber mode.
The stove will reduce its operating temperature when the programmer is not calling for heat but if the temperature falls significantly with an unproven system, the design of the gravitational circuit should be assessed. Firstly ensure the heat load is not substantially higher than the stove's minimum output, and secondly, to ensure that its routing allows for a satisfactory water flow. Note whether the circulating pump is operating when the programmer is not calling for heat. The circulating pump and the slumber valve are electrically linked by the control panel and if the pump is operating the slumber valve will be energized to close. It will open when the circulating pump circuit is de-energized. If the system has operated satisfactorily previously, the slumber valve should be suspected of not opening because the electrical supply is not being removed from it. The system should be isolated from the electrical supply and a continuity check made to determine that the slumber zone valve is not receiving an electrical supply as follows:-
Check that the slumber zone valve has been wired into the slumber valve terminals on the control panel. Check that the circulating pump has been wired into the circulating pump terminals on the control panel, and check correct continuity between "slumber circuit zone valve L" to "circulating pump L" , if this is proven and the pump is not running during slumber mode, the valve is isolated from the supply and may be seized in the closed position. Consult the valve manufacturer's instructions for further details.

The water cylinder does not heat, but the circulating pump operates and the stove firing rate increases.

The low limit thermostat does not influence the control of the D.H.W. zone valve. The D.H.W. zone valve opens when the cylinder thermostat is below its set point and the supply to the D.H.W. zone valve is isolated by switching the programmer's supply from the D.H.W. zone valve to the circulating pump and flexitemp.

Check that the cylinder is below the temperature set on the cylinder thermostat.

Turn off the stove, isolate the system from all electrical supplies and check for continuity:-

From the programmer "D.H.W. on" to cylinder thermostat "C" to cylinder thermostat "1" No continuity to cylinder thermostat "2". If this is correct the D.H.W zone valve is isolated from the supply and may be seized in the closed position. Consult the valve manufacturer's instructions for further details.

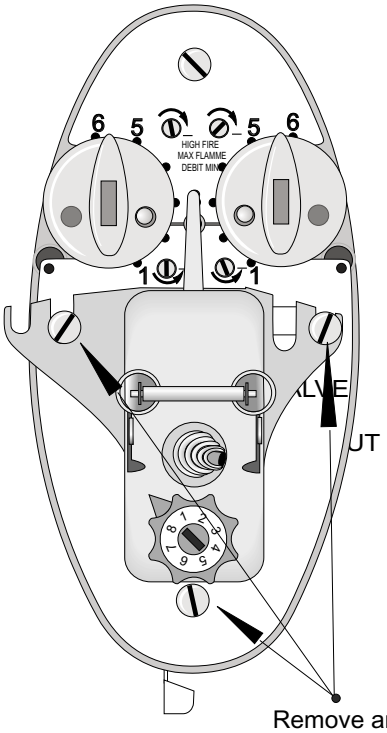
The space heating circuit does not heat, but the circulating pump operates and the stove firing rate increases.

The space heating zone valve remains energized and closed until the low limit thermostat is above its set temperature. When space heating is initially called for, the return temperature to the boiler return temperature will inevitably fall below the low limit temperature and the space heating zone valve will be closed until the water circulated by the pump through the boiler and slumber circuit reaches the low limit temperature, when the space heating zone valve will be de-energized and open again. This cycling will continue until the stove's increased firing rate balances the heating load. If the space heating zone valve does not open the low limit thermostat should be examined to ensure it is monitoring the return temperature correctly and is switching, then the system should be isolated from the electrical supply and the following continuity test carried out:-

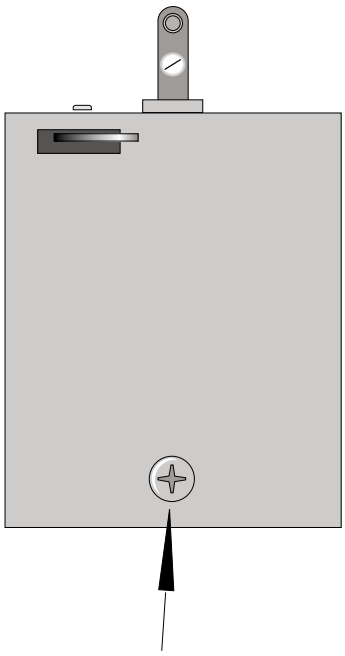
From the programmer " C.H. On" to "Room thermostat 1" there should be continuity. There should be no continuity between the programmer "C.H. On" to high limit thermostat "1" or "2". If this is correct the D.H.W zone valve is isolated from the supply and may be seized in the closed position. Consult the valve manufacturer's instructions for further details.

Installing the B.M. Flexitemp to C.I. Valve

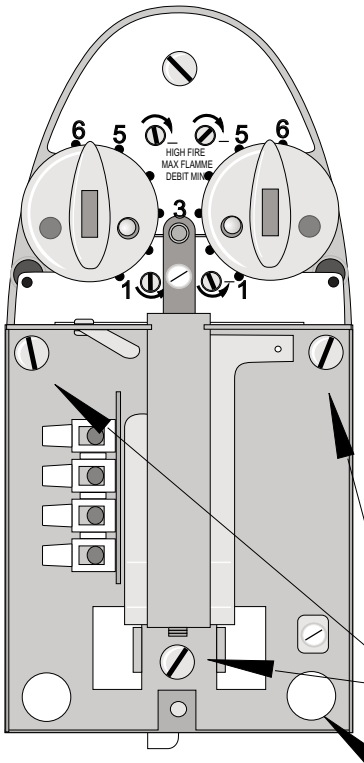
Isolate all electrical supplies before working on the stove or its controls.



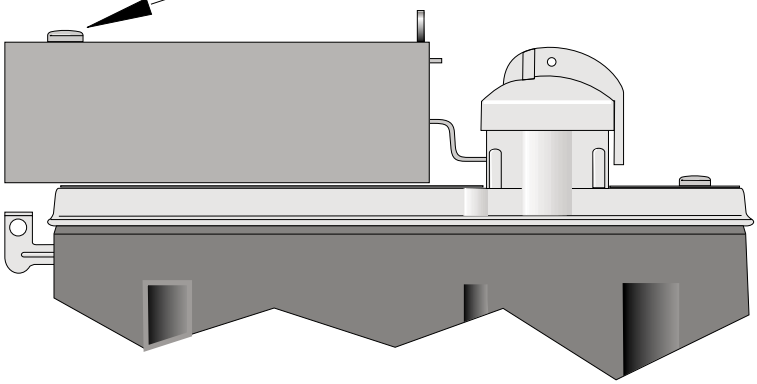
Remove and retain these three screws.



Remove and retain this screw.



Replace Flexitemp cover and its fixing screw.

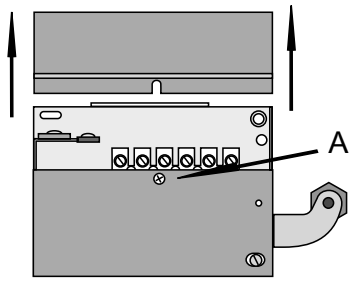


Attach the Flexitemp unit using the three screws removed from the valve.

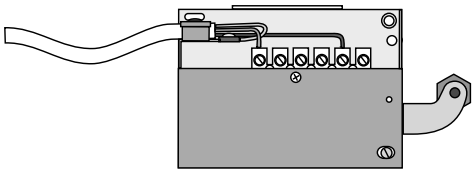
Use this cable entry.

Installing the Flexitemp to Toby Valve

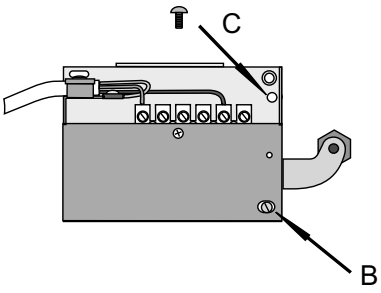
Isolate all electrical supplies before working on the stove or its controls.



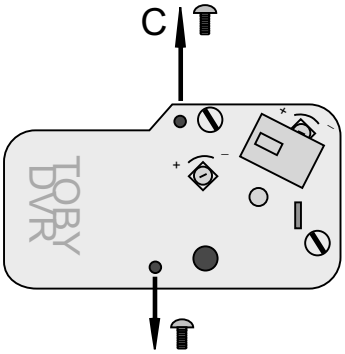
Loosen screw "A" and slide off terminal cover.



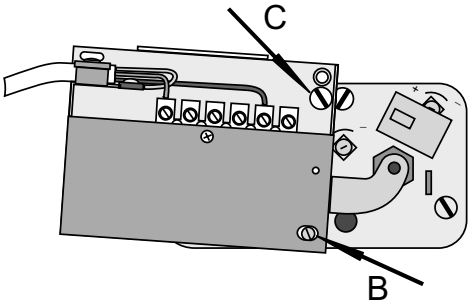
Wire in cable, or cables to Flexitemp unit, ensuring you are wiring to the correct terminals for your control system, and the earth wires are connected to the earthing terminal of the metal body. Cables must be secured by the cable clamp tightened onto the outer sheaths.



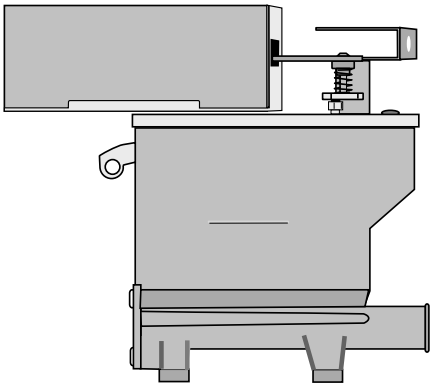
The Flexitemp is attached to the Toby valve with two screws.The screw passing through the Flexitemp body "B" is captive, the other, "C" is taken from the valve.



Remove these two screws from the Toby valve, one screw, "C" is re-used to mount the Flexitemp unit.



Mount Flexitemp using the captive screw "B"and the screw "C" in the hole shown. These should be screwed into the fixing points on the valve vacated by the two screws removed.
Note:- The Flexitemp is offset when mounted.



Ensure the Flexitemp sits flat on the valve body. Re-fit terminal cover.

Operation of the Valve with the Flexitemp

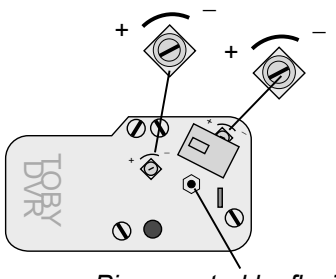
The valve contains and controls a reservoir of oil, maintained at the height marked on the valve body. The delivery rate of the valve is governed by a slotted barrel at the valve's exit port being raised or lowered within a sleeve to expose more or less of this slot to the reservoir of oil. The position of the barrel is controlled by a cam, in the form of an adjustable track, attached to the control knob shaft. When the valve is in the "off " position the track causes the barrel to be pushed down within the sleeve so that none of the slot is exposed and so no oil flows out from the valve. As the control knob turns from the "off" position to position "6" the track rotates over the barrel allowing the barrel to raise progressively to expose the full length of its slot. The final calibration of the valve's flow rate is made by adjustment of the two screws holding the ends of the track, so that the height of the track and the position of the barrel, when the control knob is at position "1" and "6", is determined.

The barrel movement necessary to give the flow rates from low to high flow is approximately one mm.

Above the flow regulating barrel is a pin, which protrudes through the valve cover plate, and it is this pin that the flexitemp arm operates. When the flexitemp unit is not energized the arm pushes down the pin and lowers the barrel to position "1". When energized, the flexitemp arm lifts clear of the pin to allow the barrel to rise to whatever position is set on the control knob. The flexitemp arm is actuated by heating an expanding metal rod which causes the arm to lift or lower very slowly, about three minutes. This slow operation allows more time for the flue draught to stabilize as the stove's firing rate changes.

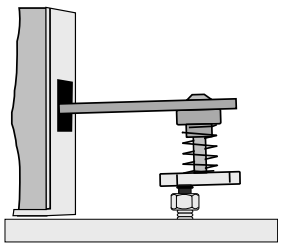
Minimum flow rate adjustment screw.

Maximum flow rate adjustment screw.

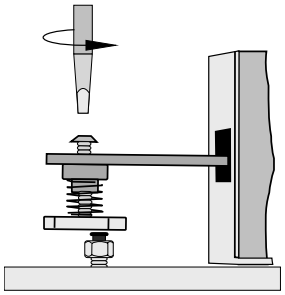


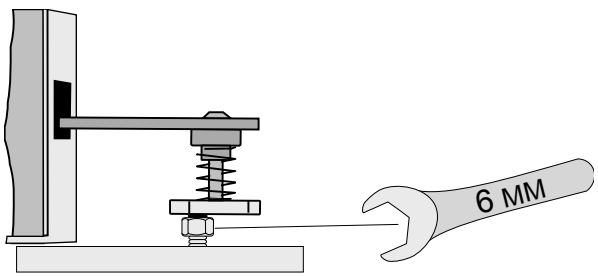
Pin operated by flexitemp.

NOTE:- All valves are supplied pre-calibrated; if it is necessary to re-calibrate, all adjustmentst of the flow rate screws should be in incrementsof no more than a quarter of a turn at a time. Allow at least four minutes for stabilizing after each adjustment.



If the flexitemp arm does not lift clear of the pin when energized and the valve control setting is at "6", the hexagon pad should be screwed higher into the operating arm.





The pin is located within a tube nut. If the flexitemp pushes the pin to give a lower fuel rate than "position 1", the nut should be turned anti-clockwise to provide a higher stop for the flexitemp.

If the minimum flow setting has been adjusted, this adjustment will be necessary

Euroheat, Efel and Nestor Martin have a policy of continual research and development and reserve the right to modify its appliances without prior notice.

We make every effort to ensure that the information provided in this document is correct and accurate at the time of printing. Continued updates occur to adapt documents to customer requirements and appliance changes. For the latest editions of all Euroheat documentation visit our web site

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The Euroheat Technical Team