



**COPPERFORM**  
TOTAL HOT WATER SOLUTIONS

# **thermaflow**<sup>TM</sup>

fitting instructions

## CONTENTS

1. Safety Regulations
2. Description
3. Specification and selection Guide
4. Water Supply
5. System Design
6. Installation Procedure
7. Electrical Installation
8. Commissioning
9. Fault Finding
10. Annual Maintenance

## 1. SAFETY REGULATIONS

These instructions should read in conjunction with those from the boiler manufacturer and other system components.

Thermaflo may be installed in accordance with relevant requirements of the Local Building Regulations, Building Standards (Scotland) Regulations, current IEE Wiring Regulations, Health and Safety Document 635 "The Electricity At Work Regulations 1989, Local Water Byelaws BS6700 and BS5449"

## 2. DESCRIPTION

Thermaflo is a primary water thermal storage unit that supplies mains pressure domestic hot water at good flow rates in accordance with the requirements of BS 6700.

NHBC and the Water Heater Manufacturers Association Specification.

The thermaflo system facilitates easy installation without the requirements for building control or BBA approval and is readily incorporated into traditional or modern central heating systems. NO MORE NEED FOR COLD WATER STORAGE TANK IN YOUR ATTIC.



A good quality phosphate dosing device can inhibit scale build up, they are most effective when fitted immediately before the Thermaflow but if you intend to fit it in the same compartment as the Thermaflow care must be taken to ensure that the dosing unit is not subject to high ambient temperatures as excessive heat will impair performance. Section 6 gives advice of prevention of excessive cupboard temperatures.

In hard water areas it is also recommended that anti-scalent is added to the primary system during commissioning and allowance should be made for the full volume of primary water. Consult BS7593 and boiler manufacturers instructions.

## 5. SYSTEM DESIGN

### CHOICE OF BOILER

Thermaflow is designed to be used with high output boilers minimum 24 kilowatts.

### BOILER SIZING

When calculating the space heating requirements in accordance with BS5449, no additional allowance requires to be made for hot water.

## 6. INSTALLATION PROCEDURE

### OPEN VENTED PRIMARY SYSTEM

The Thermaflow can be installed into an open vented primary system providing there is an adequate feed and expansion pipe fitted in the existing or new central heating system as per the boiler manufacturer's instructions.

### SEALED PRIMARY SYSTEM

When installed into a sealed central heating system, an adequate expansion vessel must be installed into the primary system to suit the size of Thermaflow.

### LOCATION

Ensure that the selected location will accommodate the chosen unit, whilst still allowing access for all the plumbing connections and components.

The unit should be sited on a flat base capable of supporting the weight when full, this will range from 120-200Kg

Where immersion heaters are fitted care must be taken to ensure that they can be withdrawn from servicing.

### PIPE CONNECTIONS

This section should be used in conjunction with the diagram in (fig 1).

22mm flow and return primaries from the boiler.

Part 1. of the latest building regulations requires that all hot water pipe work within 1 metre of the cylinder is insulated.

We recommend that all the primary pipe work in the airing cupboard should be insulated to reduce the standing heat losses and prevent high cupboard temperatures.

Mains water supply should be 22mm OD copper pipe.

Hot water supply should be 22mm OD copper pipe to bath taps and 15mm or smaller to wash basin, sink units etc.

A 3 bar pressure relief valve must be fitted and relief pipe from it must have true fall to the atmosphere if the Thermaflow is installed into a sealed central heating system.

An adequate bypass valve must be fitted between the primary flow and return after the pump and before the zone valves.

## 7. ELECTRICAL INSTALLATION

### HOW TO COMPLETE THE ELECTRICAL INSTALLATION

The Thermaflow must be wired in accordance with the following wiring diagram (fig2) and the boiler manufacturers instructions.

Mount the wiring centre next to the central heating boiler near to the zone valves, this will allow the cable from the zone valves to be con-

nected into the wiring centre without the need to lengthen their cables. Ensure it's location cannot be affected by pipe work leaks.

The electrical supply to the wiring centre should be fused to 3 amp.

A 2 channel programmer should be used, one which can be used for gravity hot water and pumped central heating. The internal switch on the programmer should be placed in the gravity position.

If a frost thermostat is to be installed, connect the terminals between live and switched live at the boiler.

If a room thermostat is fitted to the central heating system, the call for heat should be wired to terminal three on the wiring centre.

If a conventional boiler is fitted the pump must be wired directly into the boiler if the boiler has a pump overrun.

Disregard the orange and grey wire on the central heating zone valve.

(LEAVE BOTH WIRES IN A SAFE MANNER).

## 8. COMMISSIONING

Prior to turning on the hot water to the secondary system check that the pressure in the expansion vessel is approximately 3.5 bar (50PSI)

Add inhibitor and where necessary anti-scalant to the system in accordance with the manufacturers instructions.

Add inhibitor to the system when refilling after cleansing and checking for system soundness.

Following standard installation procedures, air should be bled from the top of the Thermaflow, the radiators and high points in the pipe work.

### COMMISSIONING BOILER MODELS

If the boiler has a range of outputs it should be set to maximum output.

The boiler thermostat should be set to maximum. This will ensure Thermaflow operates at maximum efficiency.

In order to ensure optimum performance without boiler cycling the Thermaflow store thermostat must be set 8-10 degrees centigrade below the setting of the boiler thermostat.

The following procedure is the best way of achieving this critical setting.

### THERMAFLOW STORE SETTING PROCEDURE

Check the boiler thermostat is set to maximum (82°C)

Set the store thermostat to 72-74°C no higher. When the store temperature is satisfied, check that the hot water zone valve moves into the closed position and the central heating zone valve moves into the open position. If this is not the case, make sure the boiler thermostat is set to maximum. If it is, turn the store thermostat down slowly until you hear a click and leave it set in this position.

### SETTING THE PROGRAMME

You have two options, set the hot water to constant (24hr) Alternatively you can set the hot water to come on 30 minutes before the central heating is programmed to come on.

## 9. FAULT FINDING

It is important to bear in mind that the Thermaflow system effectively works in reverse to conventional systems:

The primary water is in the storage vessel. Unlike a conventional system, hot water draw off temperature will be flow dependant and this factor must be taken into account when assessing system performance. Systems and likely causes to investigate.

### STORE NOT HOT

1. Check programmer operation
2. Check boiler is firing
3. Check if there is 240v AC at the common terminal on the store thermostat. If not check if the programmer is sending current to the thermostat.
4. Check if there is 240V AC at terminal 1 on the store thermostat when the store is calling for heat. Turn p and down, if there is not 240V AC at terminal 1, replace thermostat. (Must be insertion type)

5. Check if there is 240 V AC at the brown wire on the hot water zone valve. If there is 240V AC at the brown wire, then check the orange wire on the valve. If there is not 240 V AC at the orange wire, replace motor on zone valve or complete valve.

### NO CENTRAL HEATING

1. Check boiler is firing
2. Check programmer operation
3. Check boiler thermostat is set to maximum (82°C)
4. Check store thermostat is set to 72°C
5. When the store has reached 72°C the hot water zone valve should move into the closed position and the central heating zone valve should move into the open position.
6. Turn the thermostat down to a lower setting and listen closely for a small click, this is the point at which the hot water zone valve should close and the central heating zone valve should open.

7. Check if there is 240 V AC at the brown wire on the central heating zone valve, if there is then the valve should be in the open position, replace the valve motor or the complete valve.

Remove the black cover of the thermostatic blending valve and adjust to suit the customers desired hot water temperature. Ensure the cover is refitted after adjustment is complete.

#### **STORE HOT BUT HOT WATER PERFORMANCE HAS DETERIORATED**

IF the hot water performance deteriorates suddenly (over less than a month) then this points to a problem with the thermostatic blender. A broken blender is usually linked to a loss of pressure in the portable expansion vessel. The expansion vessel protects the blender from damage as well as the water in the coil expands as the water reheats after water is drawn off.

Check the pressure in the expansion vessel as detailed in the annual maintenance section. If it wont hold pressure, it will need replacing along with the blender.

If the performance has deteriorated slowly, check for scale build up as follows:

1. Isolate the water supply to the unit and open a hot tap to release the pressure.

2. Isolate the water supply to the cold port of the blender. A 22mm gate valve or similar can be inserted into the pipework to do this.

3. Remove the brass screw securing the plastic cap from the blender. Undo the largest nut beneath.

4. Take out the sensing element from the blender and replace the largest nut seal to the top of the blender once more.

5. With the blender effectively removed from the circuit the water will be forced through the heat exchanger alone. This will show you exactly what the unit can produce.

If the performance improves considerably then this confirms that the blender is broken. If the performance is largely unimproved then it is likely that the scale has built up inside the coil.

The scale can be removed with the Thermaflow in situ by a qualified technician using a high pressure de-scaling pump and a suitable acidic chemical such as fernox DS3. The Thermaflow must be cooled to between 30-40°C before commencing the de-scaling. This is not a job to DIY because of the specialist equipment needed. There is usually a plumbing firm who specialise in this work in your area.

## **10. ANNUAL MAINTENANCE**

1. Checking the pressure in the domestic portable expansion vessel.  
The expansion vessel is the small oval shaped silver vessel with the car type valve that is fitted on the cold water inlet pipe on the thermal store.

Its function is to take up expansion in the hot water pipe work and so protect the blender from damage.

The pressure can only be accurately checked with the pressure relieved on the other side of the diaphragm. To do this isolate the water supply to the Thermaflow and open a hot tap. water will run for a few seconds then stop.

The pressure should be about 3.5 bar (50PSI)

2. Checking the concentration of corrosion inhibitor. The maintenance of sufficient concentration inhibitor in your Thermaflow system is vital to prevent corrosion. we would recommend Sentimel X100 or Fernox MBI. When your unit is part of a central heating system add an extra 100 litres to the volume of your Thermaflow and dose appropriately.

3. Check there is no accumulation of air in the Thermaflow by bleeding the manual air vent at the top of the cylinder. this is not necessary if an automatic air eliminator is fitted.

4. Check the operation of the insertion thermostat. Adjust up and down listening for the click at what you think is the temperature of the store. Check for leaks down the thermostat probe pocket. Any replacement cylinder thermostat must be of the insertion type to ensure that the core temperature of the store is measured and optimum system control and efficiency maintained.

5. Check the operation of the zone valves. Turn the cylinder thermostat up and down and check that as one of the valves close, the other opens and vice versa. If this is not the case see the fault finder.

6. Only COPPERFORM replacement spares can be used otherwise this may affect your guarantee.

## HOW THERMAFLOW WORKS

Thermaflow differs from conventional cylinders in that the water stored in the Thermaflow is not the same water that comes from your taps. It should be thought of as a store of heat. This heat store is typically maintained at 70-80°C dependent on model.

A 50mm thick layer of CFC free foam insulation keeps the heat loss to a minimum. Inside every Thermaflow is a heat exchange coil which uses specifically designed finned copper tubing. Mains pressure cold water is heated instantaneously as it passes through this coil.

Hot water can leave this coil at over 60°C. A thermostatic mixing valve (Factory set at 55°C but user adjustable) ensures water is delivered at a safe temperature. The store can be vented via a feed and expansion tank or incorporated into a sealed central system with the addition of an adequate expansion vessel and associated equipment.

Thermaflow is heated by gas or oil boilers to provide mains pressure hot water.

They are the perfect partner for gas or oil boilers

## 3. SPECIFICATION AND SELECTION GUIDE

THERMAFLOW MODEL	HEIGHT	TYPICAL DIAMETER	TYPICAL FLOWRATE	REHEAT TIME
80	600mm	450mm	20(l/min)	10 mins
120	900mm	450mm	25(l/min)	15 mins
160	1200mm	450mm	30(l/min)	20 mins

### ADD 100mm TO DIAMETER SHOWN FOR INSULATION

The flow rate and reheat figures are based on a typical 28kn Combi, Conventional or System Boiler.

## THERMAFLOW MODELS

Thermaflow 80	2-3 Bedrooms	Bath + Ensuite
Thermaflow 120	3-4 Bedrooms	Bath + Ensuite
Thermaflow 160	4-5 Bedrooms	Up to 2 standard baths

### All Thermaflow units come with a kit of parts to aid installation:

2 x 22mm compression 2 port zone valves c/w aux switch.

22mm compression high flowrate thermostatic blender.

2 litre portable (drinking) water expansion vessel.

A insertion (probe type) thermostat for accurate temperature control.

A 12 way wiring box

11" immersion heater with thermal cut out.

## 4. WATER SUPPLY

It is essential that the mains water supply pressure and flow availability is capable of meeting hot and cold water services demand. Thermaflow is capable of delivering up to 30 litres / min of hot water with an inlet pressure of 2 bar.

Where the mains pressure is in excess of 5 bar, pressure reduction to between 2 and 3 bar is recommended.

Thermaflow is not recommended for use where the mains pressure is below 1.0 bar.

Unless consistently high mains pressure is available, it is unlikely that a mains service pipe of less than 22mm OD or 25mm OD (blue MDPE) will provide an adequate flow rate to the system.

A full bore isolating valve (e.g. gate valve or quarter turn valve) should be fitted in the supply before, but adjacent to the unit it is recommended that a 22mm draw off is provided to the bath hot tap. 15mm or smaller pipes can then be used to supply hot water services to the other individual terminations to give a balanced distribution system.

### TERMINAL WATER FITTINGS

**Taps:** Ensure that all terminal fittings will withstand mains pressure

**Showers:** Because of the draw off profile, thermostatic shower mixers are recommended to optimise performance; these must be suitable for mains pressure.

Where it is possible for a flexible shower handset to reach below the bath spill over level compliance with the Water By-laws is essential.

### USE IN HARD WATER AREAS

In areas where temporary hardness exceeds 200 mg/l, treatment of the mains water supplied to the appliance is recommended to maintain its performance. An inline scale reducer (conditioner) or ion-exchange softener will be most effective when fitted immediately before the unit.

It is essential to flush the complete system thoroughly to remove any contamination from the pipework and the Thermaflow.

Corrosion inhibitor is required in all the Thermaflow models. Sentinel x100, Fernox MBI or an equivalent should be added to the primary system.



Brunswick House • Units 1&2 New Brunswick Street • Off Thornes Lane • Wakefield • West Yorkshire • WF1 5QR

**Telephone: 01924 203020 • Fax: 01924 203021 • [www.copperform.co.uk](http://www.copperform.co.uk) • Email: [sales@copperform.co.uk](mailto:sales@copperform.co.uk)**

