



**McDonald**  
**Water Storage**

Hot Water Storage Solutions

**ELECTRAFLOW BOILER  
THERMFLOW THERMAL STORE  
INSTALLATION INSTRUCTIONS**



## 1.0 INTRODUCTION

This document is designed to provide full technical details and installation instructions for the ELECTRA*flow* central heating and domestic hot water heater.

Installers should also see the ELECTRA*flow* – Multi channel timer controller installation manual.

**WHEN INSTALLING A CYLINDER FOR AN OPEN VENTED RADIATOR CIRCUIT, THE FEED AND EXPANSION TANK SHOULD BE 500MM ABOVE THE HIGHEST RADIATOR.  
THE SUPPLIED MIXING VALVE MUST BE FITTED.**

It is recommended that the pipework installation is carried out by an experienced heating engineer/plumber. The electrical installation should be carried out by an approved electrician in accordance with the instructions provided and BS 7671 : 2001 Requirements for Electrical Installations – IEE Wiring Regulations, Current Edition.

**ENSURE THE ELECTRAFLOW CONTROLLER IS FITTED IN AN ADEQUATELY VENTILATED AREA TO AVOID OVERHEATING CUT OUTS.**

Full technical back up and support is available from McDonald Water Storage, Glenrothes, Fife (Telephone No 01592 611 123).

NB – The Installer must ensure that the available electricity supply to the property has sufficient capacity to serve the increased load imposed by the particular ELECTRA*flow* unit selected.

## 2.0 DESCRIPTION

The ELECTRA*flow* THERM*flow* Thermal Store is a unit designed to provide domestic hot water and a wet central heating system from a Thermal Store Cylinder heated by Electric Immersion Elements, all governed by a purpose built controller designed to promote maximum operational efficiency.

A full range of ELECTRA*flow* units is available having a maximum installed capacity of either 12 or 15kW, suitable for a 230V supply. Higher capacity, non standard systems, can also be provided on request to suit particular applications. Up to 5 no. 3kW immersion heaters are incorporated, dependant upon unit selected, which can be split in any configuration to suit the particular heating and domestic hot water loads served.

## 3.0 TECHNICAL SPECIFICATION

See ELECTRA*flow* Controller Installation Instructions and THERM*flow* installation Instructions in section 5.

**NB - WHEN SOLAR OR SOLID FUEL ARE USED IN CONJUNCTION WITH THE ELECTRAFLOW THERMAL STORE TYPE UNIT, THEY MUST BE INSTALLED AS PER THEIR NORMAL RULES, CONTROLS ETC. THE HOUSEHOLDER SHOULD BE AWARE THAT THE ON/OFF TIMES OF THEIR ELECTRIC HOT WATER AND HEATING, SHOULD BE ALTERED IN CONJUNCTION WITH THE OTHER HEAT SOURCE TO ENSURE MOST BENEFIT IS RECEIVED.**

#### 4.0 INSTALLATION (GENERAL)

The following drawings have been prepared by McDonald Water Storage, each of which is provided at the rear of this document to provide typical wiring and pipework hydraulic arrangements.

Figure No	Description
2	Arrangement for where there is an electric shower or other high load
2A	Electrical Supply Arrangements (max 12kW)
2B	Electrical Supply Arrangements (max 15kW)
	Sketch of Particular Supplied Unit
6	
7	
8	

#### 5.0 INSTALLATION THERMAL STORE & PIPEWORK

The ELECTRAflow must be installed by a qualified, competent tradesman who is aware of and will comply with all relevant standards that are applicable: e.g. Building Regulations, the Local Authority Regulations, the Water Supply Regulations and undertaking the relevant British Standards. The system must be flushed in accordance with BS 7593 and in accordance with McDonald Water Storage instructions and drawings to ensure proper operation.

IT IS THE INSTALLERS RESPONSIBILITY TO ENSURE THAT THE INSTALLATION DOES NOT CONTRAVENE THE REQUIREMENTS OF THE WATER SUPPLY REGULATIONS, BUILDING REGULATIONS OR LOCAL AUTHORITY REGULATIONS.

Use standard size pipework. DO NOT SOLDER DIRECTLY ONTO THE BOILER TAILS. Push-on or compression fittings are suitable for connecting directly into the boiler tails.

The ELECTRAflow boiler is suitable for operation in open vented systems or sealed system radiator circuits if a suitable coil has been installed. Sealed System Cylinders are also available to avoid the use on a Primary Feed & Expansion tank. If you are unsure about your application regarding suitability of the unit please do not hesitate to contact McDonald Water Storage.

Ensure there is always an open route for the water to flow in any installation, to meet the required minimum flow rate of the boilers and to allow for the pump over run. If an open route through the heating circuit cannot be guaranteed, then a bypass, fitted with an automatic bypass valve, must be fitted which meets the required minimum flow rate for the boiler.

The bypass must have a minimum of either 2 metres of 22mm continuous pipework, or be routed through a radiator with minimum dimensions of 600 x 600mm. Automatic pressure opening valves must be used with the bypass circuit, ensure they are installed correctly as per the manufacturer's instructions. Gate valves are not suitable.

**ON A SEALED SYSTEM COIL OR CYLINDER - DO NOT FIT AN ISOLATING VALVE BETWEEN THE ELECTRAflow AND THE SAFETY PRESSURE RELIEF VALVE OR EXPANSION VESSEL RELIEF SYSTEM.**

The System Radiator coils are suitable for operating pressures up to a maximum of 3.5 Bar. A Sealed System Cylinder is suitable for 2.5 Bar Working Pressure.

**ENSURE A 3 BAR PRESSURE RELIEF VALVE AND A SUITABLY SIZED EXPANSION VESSEL ARE FITTED TO ALL SEALED SYSTEMS**

With open vented installations, ensure there is a sufficient head of water for the pump to supply the full flow through the radiator circuit – the F & E Tank should be a minimum of 500mm above the highest radiator.

### **THERMflow Installation Instructions**

**THERMflow** is a primary water, thermal storage unit, which supplies mains

pressure hot water at flow rates in accordance with the requirements of BS6700.

Thermostatic mixer showers will give the optimum showering performance and all taps etc. should be checked to ensure they are suitable for mains pressure.

**Ensure the Primary Feed and Expansion Tank is 500mm above the highest point of the primary pipe-work. Cylinder models (requiring a remote Feed & Expansion Tank are available if this is not possible with our Combination model, or alternatively a sealed heating coil or sealed system cylinder should be specified.**

**ENSURE COPPER FLOAT IS SET TO LOWEST LEVEL.**

### **IMPORTANT**

#### **Mains Cold Inlet Pressure and Flow Rates**

A minimum of 2.0 bar incoming pressure is recommended and a pressure reducing valve is required if the pressure is over 3 bar. The mains supply to the unit should be in a minimum of 22mm diameter. The Domestic Hot Supply should also be taken off in 22mm although 15mm spurs can be taken off to other terminal fittings. If the flow rate exceeds 20 Litres/minute at the taps, it should be restricted.

**NOTE: TO COMPLY WITH THE BUILDING REGULATIONS, PART L (PART J IN SCOTLAND), WHEN THE ELECTRAFLOW IS USED FOR CENTRAL HEATING PURPOSES, A ROOM THERMOSTAT MUST BE FITTED TO CONTROL THE BOILER.**

After installation the system must be flushed out in accordance with the current British Standard before adding the inhibitor. Fernox inhibitor is recommended and the **volume of the thermal store must be taken into account for the amount of inhibitor used.**

After flushing, the correct amount of inhibitor must be added before use. The appropriate Fernox product can be used for most water areas, however we recommend you should check with your local water authority to ensure suitability. Check the inhibitor concentration after installation and periodically thereafter to ensure correct protection.

**ENSURE THE THERMAL STORE VOLUME IS TAKEN INTO ACCOUNT WHEN CALCULATING INHIBITOR CONCENTRATION.**

**FAILURE TO FLUSH PROPERLY OR INADEQUATE INHIBITOR IN THE SYSTEM WILL INVALIDATE THE WARRANTY.**

## **6.0 INSTALLATION (ELECTRICAL)**

ALL WIRING MUST BE CARRIED OUT IN ACCORDANCE WITH CURRENT IEE WIRING REGULATIONS.

The ELECTRAflow unit must be installed by a qualified competent approved electrician in accordance with supplied instructions and drawings to ensure correct operation.

Check the main incoming supply to the property to ensure there is sufficient current and voltage for the size of the boiler or boilers to be installed. Remember to also take account of the supply requirements for the rest of the property. Ensure the correct cable size is used to feed the boiler.

Refer to McDonald Engineer's Typical Wiring Diagrams Fig 2A (12kW) and Fig 2B (15kW) for detailed power wiring arrangements.

Refer to McDonald Water Storage Wiring Diagram Fig 2 for drop out contactor details where an existing or new electric shower is incorporated also the Multichannel Programmer Installation instructions for control system wiring.

Check that all electrical power connections are tight. Loose connections can cause a fire and will invalidate the warranty.

**WARNING: THIS APPLIANCE MUST BE EARTHED.**

All exposed pipework must be earthed in accordance with IEE Regulations.

After installation, preliminary electrical supply, ensure the system is full of water and set to the correct pressure (sealed systems), check for leaks. It is essential that the air is purged from the system. Only then can the supply be switched on.

On completion of the works the installation must be tested to IEE Regulations and an NICEIC Inspection and Completion Certificate must be issued.

Please take note of the installation conformation. If in doubt please contact McDonald Water Storage.

## **7.0 COMMISSIONING**

Prior to turning power ON carry out the following

- a) Fill the Thermal Store and Radiator Circuit through the Feed and Expansion Tank (or filling loop if a Sealed System Cylinder) – check all associated distribution pipe-work. If the unit has a Sealed System Heating Coil, fill this in the normal way and ensure a suitable relief valve and primary expansion vessel are fitted. Test this circuit to 1.5 x normal working pressure for 30 minutes and check for leaks. Open the Secondary Cold Mains and check all associated pipe-work for leaks
- b) Thoroughly flush through hot water system opening each hot tap on a rotating basis until water runs clear and easy.
- c) Thoroughly flush through the central heating system and treat with proprietary corrosion inhibitor in accordance with BS 7593 requirements (ensure the volume of the Thermal Store, is taken into account if NO sealed system heating coil is fitted). Bleed all radiators to remove air. .

- d) Ensure that electricity supply is adequate and wiring is in accordance with the appropriate wiring diagrams and Multichannel time switch controller installation instructions. Ensure all electrical tests have been completed and satisfactory results obtained.
- e) Ensure that the Primary Feed and Expansion Tank is fitted with a suitable overflow and the float is set at its lowest level – ensure any feed and expansion pipe routes are clear, or for sealed systems, pressures are at correct levels.
- f) **Set Immersions Heaters Thermostats –**  
ELECTRAflow Control Stats @ 75-80°C and Hi Limit at 95°C
- g) Activate heating and hot water systems. Carry out visual inspection.
- h) Once the unit reaches 75-80°C on the thermometer, ensure the temperature of hot water at hot taps is suitable – fitting individual thermostatic mixing valves as per current legislation. Open hot taps on a rotational basis, run for a few minutes to ensure hot water is discharged and system pipework is fully sterilized.
- i) Heating Pump – ensure minimum flow rates are being obtained..
 

3kW	0.065litres/sec
6kW	0.13litres/sec
9kW	0.195litres/sec
12kW	0.26litres/sec
- i) Commissioning Engineer to check supply tariff and agree with house owners any changes to pre set operating regimes. He/she should then run through all settings, fully demonstrating same to householders and ensuring they know how to operate the controls. Ensure householders receive a copy of the programmer’s “Users Manual”.
- j) All pressure test and electrical test certificates to be provided.

## 8.0 FAULT FINDING

Contact McDonald Water Storage on 01592 611123 with any queries or faults.

### USER OPERATION.

The cylinder is designed to work best when the store temperature is at or approaching 80°C.

The cylinder can provide hot water at lower store temperatures but available flow rates and volume will be reduced.

### TROUBLESHOOTING:

#### **Symptom:**

The water at the tap is luke-warm or the heating is cool.

#### **Remedy:**

1. Check that the store is at or approaching 75-80°C. (The temperature is shown on the thermometer) . If not, ensure that the Controller is On. The unit must be allowed sufficient time for the store to reach working temperature. If Economy 2000 is used the unit will be heated during the next off peak tariff period.
2. If the store is at or approaching 80°C, check that the Thermostatic mixing valve is turned to hot. The maximum temperature of water from this valve is 55°C.
3. If the valve is turned fully to hot, check that the flow rate at the tap does not exceed 20 Litres per minute. If the flow rate is above this, then turn the tap down slightly.

**The temperature of the water at the taps depends on the flow rate. This means that the faster the water flows, the cooler the water will be. Too high a flow rate will result in luke-warm water.**

If any problems arise not covered by this document please contact the installer.