



# Cylinder Manual

Incorporating:    **User Instructions**  
                          **Installation Instructions**  
                          **Commissioning Instructions**  
                          **Maintenance Instructions**

## Nero Open Vented Cylinders

**Stainless Steel Water Heaters**

**Products covered by this manual:**

**Twin Coil**      TW200V    TW240V    TW290V

**Triple Coil**    TR240V    TR290V



## **INSTALLATION, COMMISSIONING & SERVICING**

All works to this appliance including installation and commissioning must be conducted as described herein by appropriately certified and competent persons as instructed and in accordance with all applicable current regulations and standards. The Guarantee Registration of the product must be completed and returned to the manufacturer with proof of purchase (e.g. receipts / invoices).

This appliance must be serviced annually by appropriately certified and competent persons, and proof of servicing (e.g. receipts / invoices) retained.

The complete guarantee policy statement is included in Section 9, page 18.

**FAILURE TO COMMISSION, REGISTER AND ANNUALLY SERVICE THIS PRODUCT WILL INVALIDATE ALL GUARANTEES**

## **TECHNICAL, SPARES & GUARANTEE CLAIMS**

For technical advice about the installation, commissioning, servicing or use of this appliance, please contact the Warmflow Customer Care Centre. Please also refer to our website [www.warmflow.co.uk](http://www.warmflow.co.uk).

Should replacement components be required, a list of available spares is provided in Section 8.3, page 16.

In the unlikely event that replacement components might be required within the guarantee period, please notify the Customer Care Centre stating the serial number of the appliance, stating the nature of the fault and the part number of the replacement components required.

### **Warmflow Customer Care Centre**

Warmflow Engineering  
Lissue Industrial Estate  
Moir Road  
Lisburn  
BT28 2RF  
Northern Ireland

#### **Telephone**

United Kingdom: 028 9262 1515

Republic of Ireland: 048 9262 1515

#### **Email**

[technical@warmflow.co.uk](mailto:technical@warmflow.co.uk)

#### **Website**

[www.warmflow.co.uk](http://www.warmflow.co.uk)

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# 1 USER INSTRUCTIONS

## 1.1 User Warnings

Do not remove or adjust any part of this open vented water heater.

If the open vented water heater develops fault, switch the heater off.

In all cases contact a competent installer.

Documented records of annual services must be retained by the user.

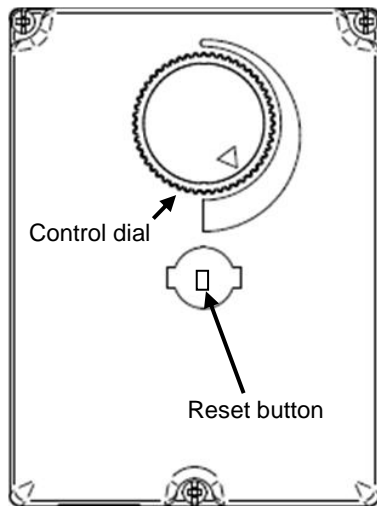
⚠ If very hot water is discharged, **immediately** switch off ALL heat sources (which may include boilers, heat pumps, solar thermal systems and immersion heaters), isolate their electrical supplies and call your installer.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

The recommended storage temperature for indirect cylinders is 60-65°C. In hard water areas consideration should be given to reducing this to 50-55°C. In some applications guidance on Legionella control and safe water delivery temperatures can require a storage temperature of 60 - 65°C, distributing to outlets at 50 - 55°C, using thermostatic mixing valves to control the final outlet temperature. For details consult local regulations applicable to the installation.

When you first fill a basin the water may sometimes appear milky. This is due to air bubbles in the water which will clear very quickly.

## 1.2 Cylinder Thermostat



All cylinders are fitted with cylinder thermostats to control the heat input to the cylinder from a remote heat source, such as a boiler, heat pump or solar thermal installation. The temperature of each cylinder thermostat is adjustable between **nominally** 40°C and 70°C. Turn the control knob clockwise to increase temperature, and anticlockwise to decrease.

Each cylinder thermostat has a built-in manually reset safety thermostat which will 'lock out' in the event of the cylinder overheating and which will need to be reset in order to restore operation. Remove the lock-out cover and depress the red button to reset.

In the event of a lockout situation occurring, it is vital to contact the installer of the appliance to determine and rectify the cause of lock out.

All electrical supplies to the appliance must be isolated before attempting to reset the thermostat.

## 2 INSTALLATION REQUIREMENTS

Prior to installing this open vented hot water cylinder, please confirm that:

- a) The cylinder must be open vented i.e. supplied via an open vented expansion tank and have a vertical vent pipe of at least 19mm internal diameter.
- b) The maximum pressures must not exceed that listed in the data tables (see Section 5).
- c) The mains water supply is from a public source (i.e. not from a private borehole) and that the hardness of the water is less than 200 mg/litre. Where hardness in excess of 200 mg/litre is experienced, a suitable and effective hard water treatment must be installed. The device should be rated for a flow rate of 50 litres per minute in order to maintain maximum performance.
- d) Coils are recommended to be fully pumped, but can use gravity circulation.
- e) The pipework supplying the hot water taps is capable of withstanding a maximum pressure listed in the data tables (see Section 5) at a temperature of 90°C.
- f) The mains water supply does not consistently contain a high proportion of suspended matter.
- g) The mains water supply does not contain chloride levels that exceed 250mg/l.
- h) This appliance must be installed vertically (not on its side) in a frost-free indoor location.
- i) The cylinder will be placed on a floor area that is level and capable of supporting the appliance when full of water.
- j) All serviceable components must be accessible after installation.

The installation of this appliance is subject to the Building Regulations:

England & Wales    Building Regulation G3  
Scotland            The Building Regulations (Scotland)  
Northern Ireland    Building Regulations (Northern Ireland)  
Republic of Ireland    Technical Guidance Document Part L  
IEE Electrical Regulations  
Local Water Regulations

Note: Other regulations may apply for other territories

The appliance and installation must be commissioned as described herein and the Guarantee Registration completed and returned to the manufacturer.

**FAILURE TO COMMISSION, REGISTER AND ANNUALLY SERVICE THIS  
PRODUCT WILL INVALIDATE ALL GUARANTEES**

### 3 HANDLING AND STORAGE

Prior to installation this product should be handled with care and stored upright in a dry location and in its original packaging.

### 4 STANDARD EQUIPMENT

Before commencing installation check that all the listed components have been supplied:

1. Control thermostats and pockets
2. Immersion heater

Note: This stainless steel cylinder requires no corrosion protection device e.g. anode.

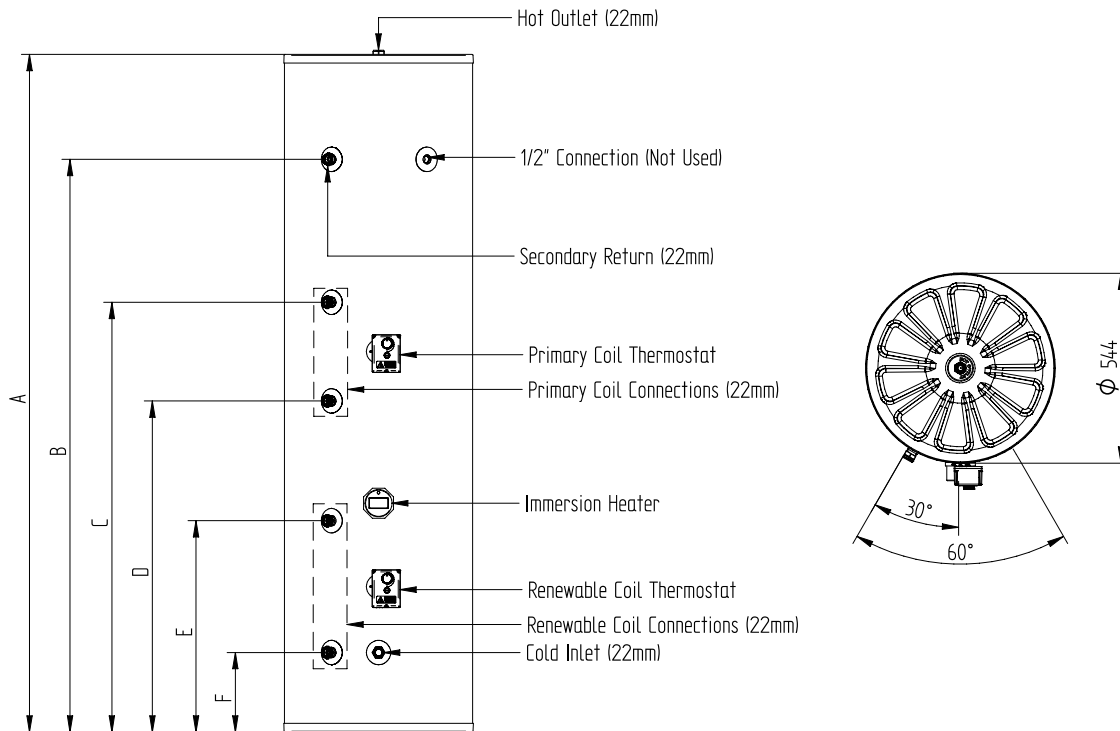
### 5 TECHNICAL DATA

#### 5.1 General

	Twin Coil	Triple Coil
<b>OPERATING DATA</b>		
Operating pressure (bar)	3.0	3.0
Maximum design pressure (bar)	6.0	6.0
<b>SAFETY DEVICE SETTINGS</b>		
Cylinder thermostat limit temperature (°C)	80	80
Immersion thermostat limit temperature (°C)	80	80
<b>HEAT TRANSFER COILS</b>		
Maximum circuit temperature (renewable coil) (°C)	95	95
Maximum circuit temperature (other coils) (°C)	85	85
Maximum circuit pressure (all coils) (bar)	6.0	6.0

**Table 1: General data**

## 5.2 Twin Coil Cylinders

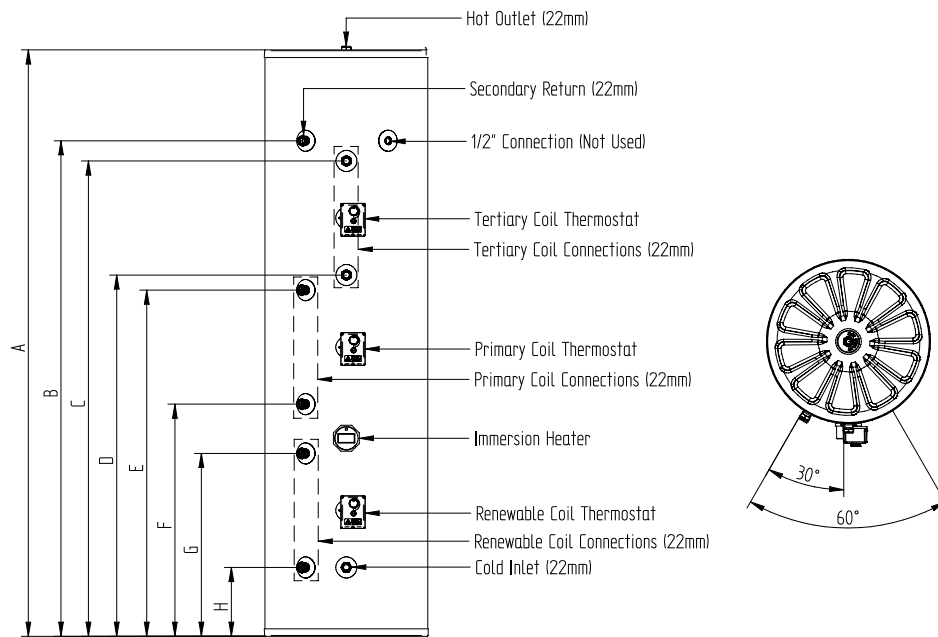


**Figure 1: Twin Coil cylinders components & dimensions**

	TW200V	TW240V	TW290V
<b>DIMENSIONS</b>			
(A) Height (mm)	1380	1655	1940
(B) Secondary return connection (mm)	1080	1355	1640
(C) Primary coil upper connection (mm)	988	1088	1231
(D) Primary coil lower connection (mm)	705	806	948
(E) Renewable coil upper connection (mm)	605	605	605
(F) Cold inlet connection / Renewable coil lower connection (mm)	228	228	228
<b>OPERATING DATA</b>			
Cold water capacity (litres)	194	233	281
Weight when full (kg)	240	290	350
Standing heat loss (kWh/24h)	1.97	2.12	2.26
V40 Hot water volume (litres)	253	341	434
<b>COIL PERFORMANCE (EN12897)</b>			
Primary coil rating @ 15L/min (kW)	14.35	14.28	14.64
Primary coil pressure drop @ 15L/min (mbar)	63	63	63
Heat up time by primary coil @ 15L/min (mins)	22	29	35
Renewable coil rating @ 15L/min (kW)	16.62	16.47	15.82
Renewable coil pressure drop @ 15L/min (mbar)	60	60	60
Dedicated renewable volume (litres)	97	117	141
<b>FICHE DATA</b>			
Supplier Name	Warmflow		
Supplier Model Identifier	TW200V	TW240V	TW290V
Energy Efficiency Class	C	C	C
Standing Loss (W)	82	88	94
Storage Volume (litres)	194	233	281

**Table 2: Twin Coil cylinder data**

### 5.3 Triple Coil Cylinders



**Figure 2: Triple Coil cylinders components & dimensions**

	TR240V	TR290V
<b>DIMENSIONS</b>		
(A) Height (mm)	1655	1940
(B) Secondary return connection (mm)	1355	1640
(C) Tertiary coil upper connection (mm)	1290	1573
(D) Tertiary coil lower connection (mm)	1008	1195
(E) Primary coil upper connection (mm)	988	1145
(F) Primary coil lower connection (mm)	705	768
(G) Renewable coil upper connection (mm)	605	605
(H) Cold inlet connection / Renewable coil lower connection (mm)	228	228
<b>OPERATING DATA</b>		
Cold water capacity (litres)	233	281
Weight when full (kg)	290	350
Standing heat loss (kWh/24h)	2.16	2.30
V40 Hot water volume (litres)	332	393
<b>COIL PERFORMANCE (EN12897)</b>		
Primary coil rating @ 15L/min (kW)	14.36	17.68
Primary coil pressure drop @ 15L/min (mbar)	63	60
Heat up time by primary coil @ 15L/min (mins)	33	34
Renewable coil rating @ 15L/min (kW)	16.42	15.43
Renewable coil pressure drop @ 15L/min (mbar)	60	60
Tertiary coil rating @ 15L/min (kW)	14.44	18.67
Tertiary coil pressure drop @ 15L/min (mbar)	63	60
Dedicated renewable volume (litres)	96	107
<b>FICHE DATA</b>		
Supplier Name	Warmflow	
Supplier Model Identifier	TR240V	TR290V
Energy Efficiency Class	C	C
Standing Loss (W)	90	96
Storage Volume (litres)	233	281

**Table 3: Triple Coil cylinder data**



## 6 INSTALLATION

### 6.1 Cylinder Location

The unit must be located in a frost-free, indoor location. The unit must be located where it can be supplied from an expansion tank / cistern above the cylinder. A vertical vent pipe of at least 19mm internal diameter must be connected to the hot outlet.

The unit can be fitted into a conventional airing cupboard and does not require any additional ventilation. To maximise efficiency of the installation, surfaces of potential heat loss must be insulated. Valves and manifolds can be insulated using manufacturer approved covers.

When selecting a location, consideration should be given to the routing of all discharge pipework and to the relative location of the heat sources (solar panels, heat pumps or boilers) as well as to the domestic hot water outlets – pipe runs should be kept as short as possible for maximum efficiency of the installation.

Ensure the cylinder is positioned such that future servicing and part replacement if necessary is possible. The installation must not prevent items such as thermostats and immersion heaters from being removed for service or replacement.

### 6.2 Hot & Cold Water Connections

All connections to the cylinder must be made using compression fittings. Mains supply pipework must be a minimum of 22mm diameter to provide adequate flow rate.

#### ⚠ Inlet Pressure

The maximum head of inlet pressure must not exceed the values in Table 1.

#### ⚠ Stop cock & drain

Install a full bore stop cock or ball valve (not supplied) before the inlet, so the unit can be isolated when required. A full bore drain cock (not supplied) must be fitted to the supply pipework, between the cylinder and the inlet, at as low a level as possible. An air break must be provided at the point of drainage. (see Figure 3).

#### ⚠ Distribution pipework

The pipework supplying the hot water taps should be run in 22mm throughout the property. Only short lengths (max 1 metre) of 15mm should be used to connect baths, showers and basin taps. If using a secondary / pumped return circuit, all pipework must be well insulated. The circulator (bronze pump) should be time and/or temperature controlled to reduce energy consumption.

#### ⚠ Taps & fittings pressure rating

All taps and fittings incorporated into the system should have a rated operating pressure suitable for the installation (see Section 5).

### 6.3 Primary, Renewable & Tertiary Circuits

The working pressure and temperature for all heat exchanger coils is given in Table 1. All connection to the cylinder must be made using compression fittings.

Coils are recommended to be fully pumped, but can use gravity circulation.

Ensure that the correct concentration and type of corrosion inhibitor is used for the system circuits heating the coils / heat exchanger. This must be checked concentrations adjusted as required during annual service.

#### ⚠ Safety thermostat

Each heat exchanger coil has an associated combined control & safety thermostat. These can be used as part of system controls on fully pumped circuits only. Suggested S-Plan and Y-Plan system schematics are given in Section 6.5.

Controls devices (e.g. motorised valves) **must not be used on gravity circuits.**

#### ⚠ Solar Installations

If connecting a solar thermal installation, for example, to the renewable coil of a Twin Coil or Triple Coil cylinder, the controls must be wired in series with the combined control & safety thermostat.

Refer to the solar appliance manufacturer's instructions and to Building Control for further guidance.

## 6.4 Pipework configurations

HOT OUTLET & VERTICAL  
VENT PIPE (19mm min. I.D.)

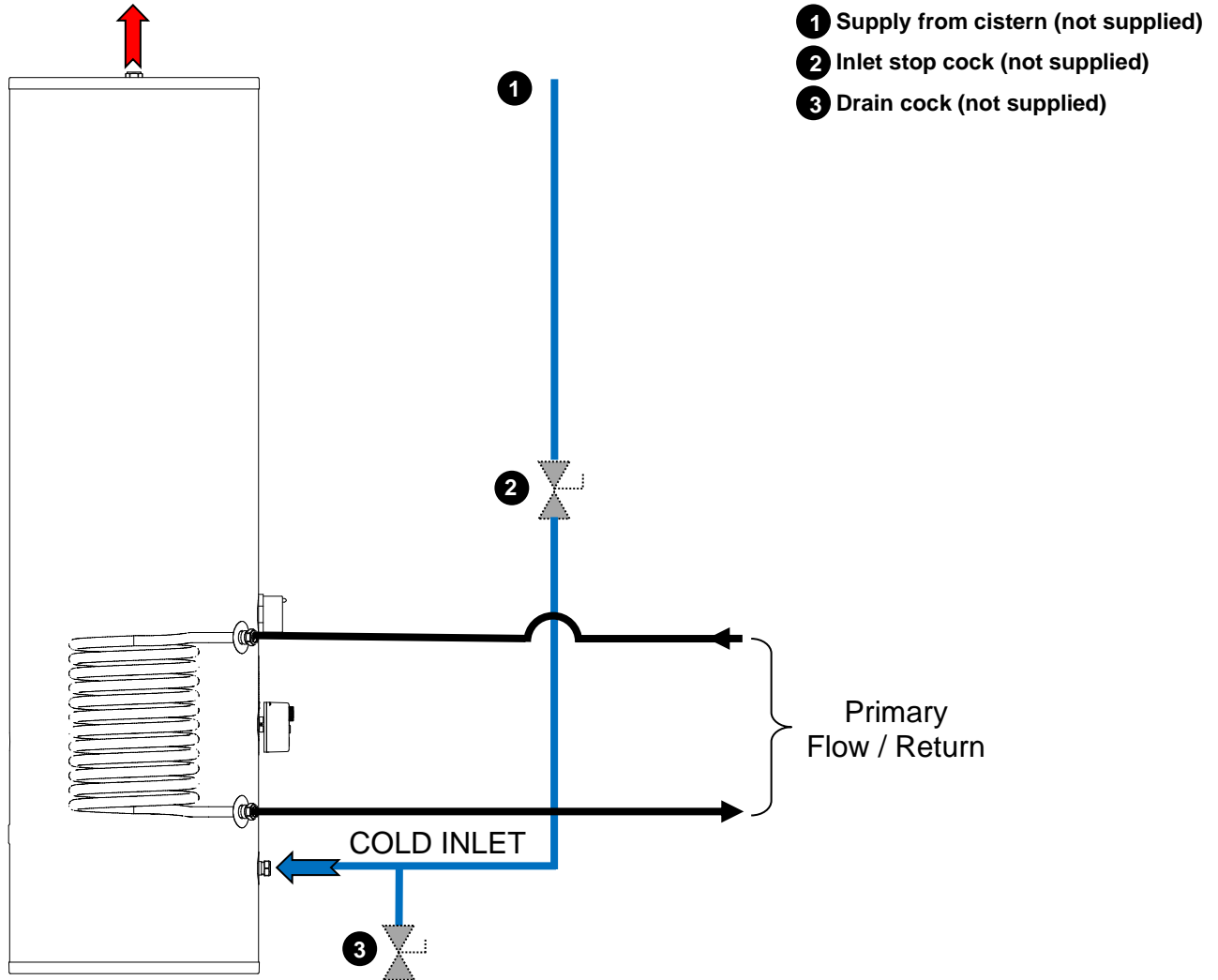


Figure 3: Typical pipework configuration

## 6.5 Electrical Installation

**Note: All wiring activities described in the following sections should only be undertaken by trained persons having an appropriate level of competency/qualification.**

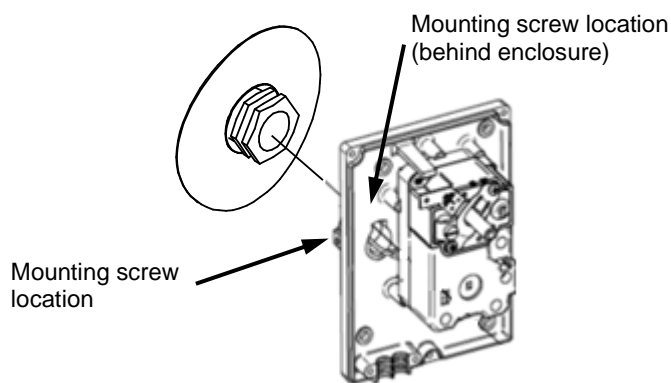
**Before proceeding, ensure all electrical supplies to the appliance are verified as isolated and prevented from accidental reconnection.**

220 – 240V. 1PH, 50Hz

The Immersion heater(s), thermostats and other external electrical equipment should be wired with correctly rated heat resistant cable, isolating switches and fusing.

⚠ The appliance must be effectively earthed and all external wiring should comply with current IEE Regulations.

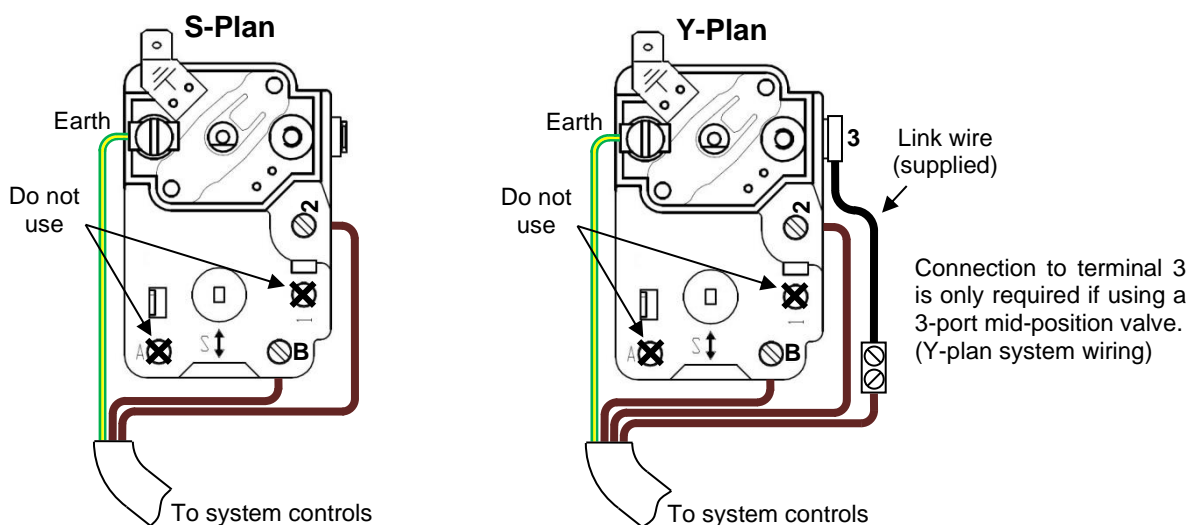
Mount the cylinder thermostat by carefully inserting the capillary sensors into the appropriate pocket, then secure the thermostat base to the pocket using the provided screws.



### 6.5.1 Cylinder Thermostat Wiring

Typical S and Y plan wiring examples are shown in section 6.5.4.

Thermostats must be earthed.

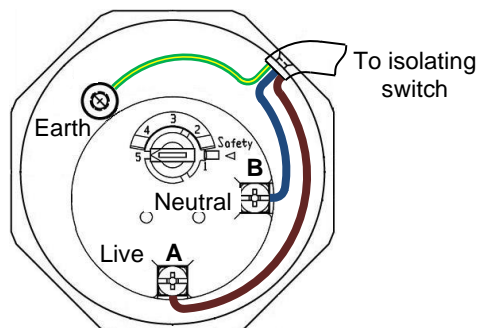


**Figure 4: Control thermostat wiring**

## 6.5.2 Immersion Heater

**⚠ The Immersion heater must be Earthed.**

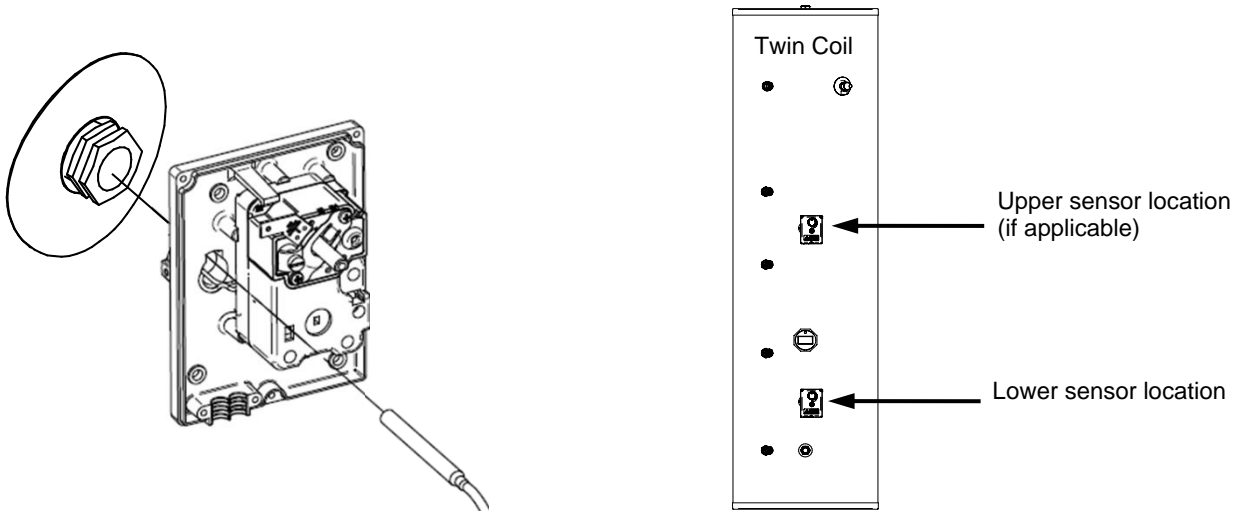
Ensure to use correctly rated cable and isolation methods. Refer to current IEEE guidance for details.



**Figure 5: Typical Immersion heater wiring**

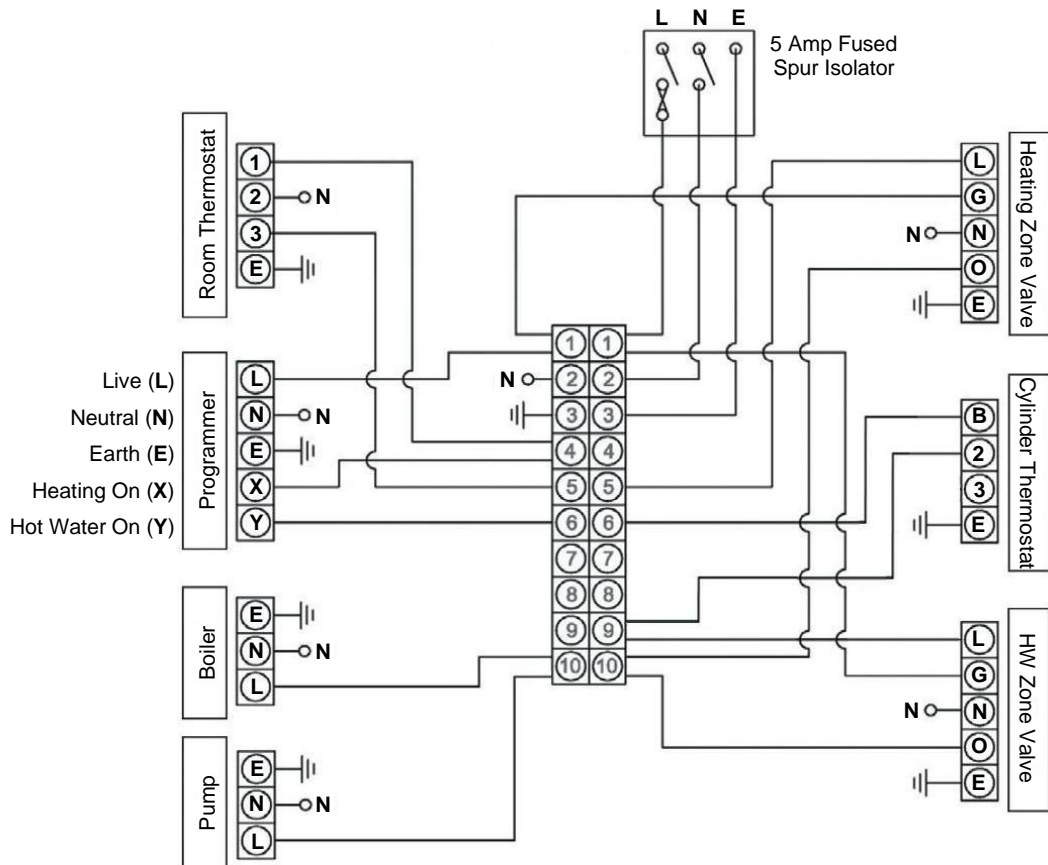
### 6.5.3 Supplementary Temperature Sensors

Supplementary temperature sensors should be located in the pocket(s) behind the cylinder thermostat(s). Remove the thermostat cover and base. Pass the sensor through the base then insert into the pocket as shown in Figure 6. Anchor the cable using the clamp provided.

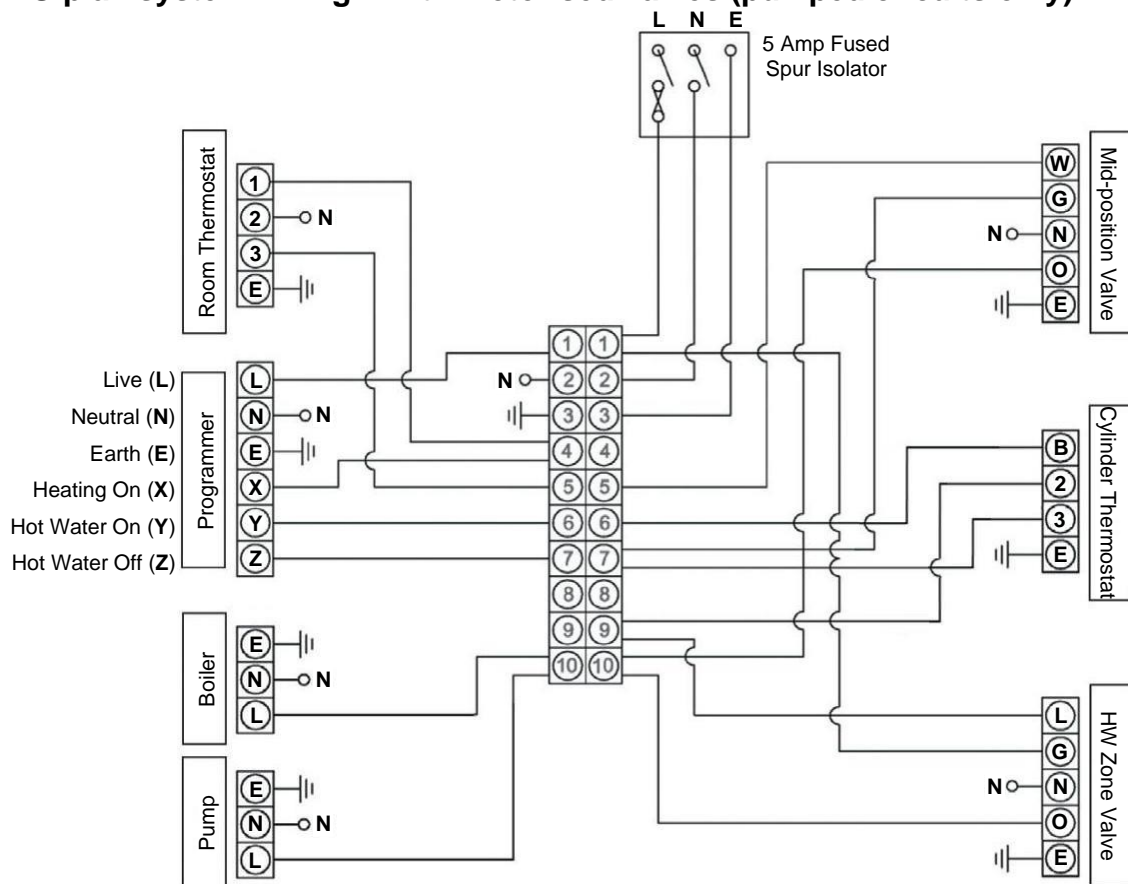


**Figure 6: Supplementary temperature sensor installation**

## 6.5.4 System controls



**Figure 7: S-plan system wiring – with motorised valves (pumped circuits only)**



**Figure 8: Y-plan system wiring – with motorised valves (pumped circuits only)**

## 7 COMMISSIONING

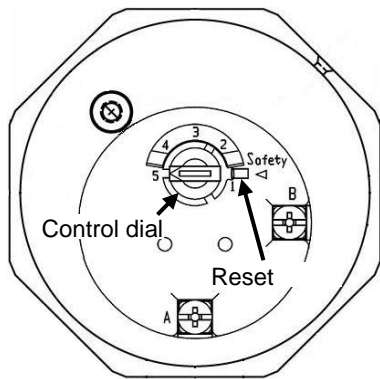
The appliance and installation must be commissioned as described below and registered with the manufacturer along with proof of purchase.

### FAILURE TO COMMISSION, REGISTER AND ANNUALLY SERVICE THIS PRODUCT WILL INVALIDATE ALL GUARANTEES

#### 7.1 Adjustment of Immersion Thermostat



Isolate ALL electrical supplies to the appliance before removing the immersion cover.



Typical Immersion heater thermostat shown.

All cylinders are supplied with one or more immersion heaters to allow the cylinder to be heated electrically. Each immersion heater has an immersion thermostat, the temperature of which is adjustable between **nominally** 20°C and 70°C. Remove the immersion heater cover and turn the control dial anticlockwise to increase temperature, and clockwise to decrease.

Each immersion thermostat also has a built-in manually reset safety thermostat which will 'lock out' in the event of the cylinder overheating and which will need to be reset in order to restore operation. Remove the immersion heater cover and depress the reset button to restore operation.

In the event of a lockout situation occurring, it is vital to determine and rectify the cause of lock out.

#### 7.2 Commissioning



Isolate all electrical supplies until otherwise instructed during the commissioning process.

- 1 Check that all connections are tight and correctly configured.
- 2 Fill the cylinder and system as follows:
  - Open the main stopcock and fill the cylinder.
  - Open successive hot taps to remove trapped air.
  - Leave each tap open for a few minutes in order to flush out air and debris.
  - Close all taps.
  - Check all strainers for obstructions.
- 3 Drain the cylinder as described in Section 7.3.
- 4 Refill the cylinder as above, closing each tap when water flows freely.
- 5 Check all joints for leaks and rectify as necessary.
- 6 Check that all immersion and control thermostats are set to the desired temperature.
- 7 Commission each primary circuit as follows
  - Fill each primary circuit (e.g. boiler, heat pump or solar circuits) following each heat source manufacturers' instructions.
  - Check for leaks in each primary circuit and rectify as necessary.
  - Commission each heat source in accordance with the manufacturer's instructions activating the system controls as required.



- 8 Activate each heat source to confirm that the system controls function correctly.
- 9 Check that, while the cylinder is heating up, no water exits from the vent pipe and that the system controls deactivate all heat sources when the cylinder is up to temperature.

### 7.3 Draining



Isolate all electrical supplies before draining the cylinder / secondary (hot water) circuit.

- 1 Close the inlet stopcock.
- 2 Connect hose to the drain cock and route to a suitable discharge.
- 3 Open the drain cock.
- 4 Open the hot water tap nearest the cylinder.
- 5 Allow the system to drain fully then close the drain cock when complete.

## 8 MAINTENANCE



Isolate all electrical supplies before removing any components for inspection or repair, or before draining the cylinder or heat source circuits.

### 8.1 Regular Maintenance

This appliance must be serviced annually to ensure continued safe operation and to maintain the guarantee. Servicing must be undertaken by a competent person i.e. qualified professional.

- 1 Check and service all hard water treatment devices (if fitted) in accordance with each device manufacturer's instructions.
- 2 Check that all connections are tight and correctly configured.
- 3 Check all joints for leaks and rectify as necessary.
- 4 Check that all immersion and control thermostats are appropriately set.
- 5 Activate each heat source to confirm that the system controls function correctly.
- 6 Check that, while the cylinder is heating up, no water exits from the vent pipe and that the system controls deactivate all heat sources when the cylinder is up to temperature.

### 8.2 Inspection Access

Where necessary, the internal components of the cylinder can be inspected by means of the immersion heater boss (1 $\frac{3}{4}$ " ) using an appropriate inspection tool e.g. borescope.

### 8.3 Replacement Parts

<b>Part description</b>	<b>Code</b>
Cylinder thermostat	WDS7
Immersion heater c/w stat (1 $\frac{3}{4}$ " )	3602

## 8.4 Fault Finding

Symptom	Possible cause	Possible remedy
<b>Little / no hot water flow</b>	Mains water supply isolated	Open stopcock.
<b>Water from hot taps is cold</b>	Boiler programmer or immersion timer not calling for hot water	Set programmer / timer to call.
	Cylinder thermostat high limit tripped or immersion thermostat high limit tripped	Check and reset (refer to Section 1).
	Heat source malfunction (e.g. boiler / immersion heater / etc)	Check heat source – if faulty, refer to heat source manufacturer's instructions.
	Motorised valve malfunction	Manually activate motorised valve. If cylinder begins to heat, replace valve.
	Pump malfunction	Check wiring and/or plumbing connections to pump.
<b>Water discharge from vent pipe</b>	Controls malfunction – continuous heating	Isolate all heat sources, call installer
<b>Water from hot taps extremely hot</b>	Controls malfunction	Isolate all heat sources, call installer

## 9 GUARANTEE

Warmflow Open Vented cylinders are supplied with the following guarantees from the date of purchase:

- (a) A 25 year guarantee on the duplex stainless steel cylinder body against defects of material.
  - (b) A 2 year guarantee on all parts and components as well as any defects that may have occurred from time to time during the normal manufacturing process of the cylinder as carried out by those exercising all relevant skill and experience and complying with all relevant legislation, regulations and codes of practice relating to the manufacturing process.
1. The guarantees provided are from the date of purchase and are conditional upon:
    - 1.1 the unit being installed and commissioned by competent persons in accordance with the manufacturer's instructions and relevant legislation, regulations and codes of practice in force at the time;
    - 1.2 the product being registered with Warmflow within 30 days of installation and the guarantee registration completed and returned to Warmflow along with evidence of the date of purchase;
    - 1.3 the unit not being modified in any way, or misused or subject to neglect;
    - 1.4 the unit being serviced annually by competent persons in accordance with the manufacturer's instructions and all regulations and codes of practice in force at the time;
    - 1.5 each service record being completed and proof of purchase and servicing being retained and made available to Warmflow in respect of any claim;
    - 1.6 the unit being used solely for the purpose of heating potable water that complies at all times with EU standards and not fed from a private source.

Failure to comply with any of the conditions outlined in this clause will invalidate the warranty in its entirety.

2. The guarantee is not transferable and excludes:
  - 2.1 labour costs associated with the replacement of the unit or its components;
  - 2.2 any defects that appear after the customer makes any modification or alteration to the unit;
  - 2.3 defects caused by the improper use or storage of the unit and in particular (but without limitation) Warmflow shall not be liable in the case of defects arising from normal deterioration or improper or faulty handling or processing of the unit by the customer;
  - 2.4 consequential losses however caused.
3. If within the 2 year guaranteed period, as set out at (b) above, a material defect is discovered in the Unit:
  - 3.1 the customer must send written notification following discovery giving particulars and either at its own expense and risk shall return the unit to Warmflow within 2 weeks of written notice being provided by Warmflow; or (at Warmflow's sole option) shall permit Warmflow to inspect same; and
  - 3.2 if such defect has arisen from faulty materials employed or workmanship carried out by Warmflow and is existing but not reasonably discoverable upon inspection at the time of receipt then Warmflow shall supply such part(s) free of charge along with the costs of transporting same to the customer.
  - 3.3 The replacement parts must be fitted in accordance with the terms of the guarantee set out above.
  - 3.4 The replacement parts shall be covered under this guarantee for the remainder of the unexpired term of two years.
  - 3.5 Invoices for call out and/or repair by any third party or parts supplied by a third party will not be accepted unless previously authorised by Warmflow in writing.
- 4 Warmflow's liability for defective units is limited in all circumstances to delivery of parts for the defective unit and the customer shall accept same as fulfilment of Warmflow's obligations.
- 5 Warmflow disclaims all other warranties whether express, implied or statutory. Your statutory rights are not affected.
- 6 This guarantee applies to Warmflow cylinders installed on the UK mainland (excluding Scottish Isles), Isle of Man, Channel Islands, Northern Ireland and Republic of Ireland only. Provision of in warranty cover elsewhere is subject to the agreement in writing of Warmflow.

## **10 END-OF-LIFE INFORMATION**

Warmflow Open Vented Cylinders must be disposed of according to local regulations by using a public or private waste collection service.

### **10.1 Safety Risks**

Prior to disassembly, the appliance should be electrically isolated and disconnected.

Any fluids within the appliance must be drained, and disposed of in-line with local regulations.

Care should be taken when handling the appliance due to weight, use appropriate PPE and lifting aids.

Polyisocyanurate foam insulation – suitable PPE should be used for respiration protection, and to avoid skin or eye contact.

### **10.2 Disassembly of the Product**

The main materials of the components are:

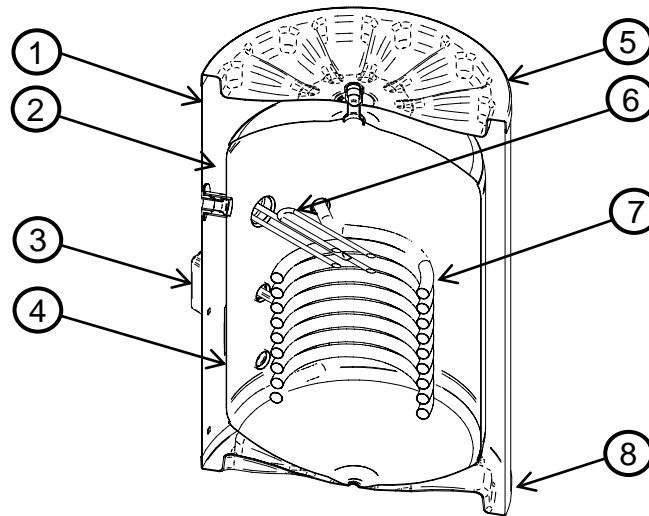
- Mild Steel
- Stainless Steel
- Polyisocyanurate Foam
- Plastic Components
- Electronic Components

These may be recycled – depending on the local recycling facilities available.

The appliance is assembled by using mechanical fasteners and can be disassembled with standard tools.

The components of a typical appliance are shown below (not all components may be fitted, depending on appliance specification)

### 10.3 Casing and key components



**Figure 8: Key Component Diagram**

Item	Description	Main Materials	Special Notes
1	Casing	Coated Galvanised Steel	
2	Foam Insulation	Polyisocyanurate Foam	Wear Appropriate PPE
3	Thermostat & Housing	Plastic, Copper, Electronic Components	
4	Storage Tank	Stainless Steel	
5	Casing Top	Plastic	
6	Immersion Heater	Plastic, Brass, Incoloy, Electronic Components	Consult Component Manufacturer
7	Heating Coil (s)	Stainless Steel	
8	Casing Base	Plastic	

Various other brackets, fasteners and components may be used, with up to 5% of appliance weight.



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