

# Installation, Operation and Maintenance Instructions

VersaTherm

# OM028

*These operating and maintenance instructions are for standard VersaTherm. Please note that an electronic version of these instructions is available from our website. Please contact our sales office for further information.*

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# 1.0 Standard Unit Information & Description

The Standard Range of VersaTherms is 230 litres to 5000 litres. The VersaTherm package comprises a direct cylinder to store usable hot water, a heat exchanger to heat the water and a pump to pump the water from vessel to heat exchanger and back to the vessel. The VersaTherm needs an external heat source, usually an LTHW boiler.

Standard Materials of Construction	
Vessel Shell	Copper (CS) Copper-Lined Steel (CL) Galvanised Steel (GS) Stainless Steel (SS) Glass-Lined Steel (PL)

Design Data	Shell Side	Tube Side
Maximum Working Pressure	Refer to Vessel Nameplate	Refer to Vessel Nameplate
Hydraulic Test Pressure	Refer to Vessel Nameplate	Refer to Vessel Nameplate
Design Code	Refer to Vessel Nameplate	

Please refer to our brochure for standard connection and dimensional data.

## 2.0 PED Information

GMS VersaTherm vessels are constructed in accordance with the requirements of the Pressure Equipment Directive 2014/68/EU. Vessels classed as SEP in the PED category are not supplied with a CE mark. Units in category 1 and above are CE marked and appropriate markings and certification is supplied with each unit.

It is the responsibility of the user and/or installer to ensure that the unit is installed and operated safely, and in accordance with the instructions supplied within this manual.

## 3.0 EU Directives

From 26/09/2015 the European Eco-design Directive applies to all Hot Water Storage Vessels up to 2000 L volume sold in the European Economic Area. Additionally the European Energy Labelling Directive applies to all Hot Water Storage Vessels up to 500 L sold in the European Economic Area. To ensure that a vessel meets the legal requirements of these directives we strongly recommend that GMS vessels are bought in their complete form, i.e. with factory fitted insulation. GMS will supply uninsulated vessels, if requested, for site insulation by others. In this case, the installer (not GMS) will be responsible for “completing” the vessel by insulating it and for meeting the requirements of the relevant European Eco-design and Energy Labelling Directives. Please check the general assembly drawing in order to identify if insulation is within GMS Thermal’s scope of supply.

Please refer to the general assembly drawing and EC declaration of conformity in relation to the directives supplied with the unit for details regarding the specific heat loss (if the vessel falls within the directives scope).

## 4.0 Installation

**Lifting & Handling:** Ensure adequate lifting and moving equipment and trained personnel are available for lifting and positioning. Support the unit under its steel feet. Do not lift it using the insulation. Straps may crush the insulation. The shell of the vessel is made of relatively light gauge metal and care should be exercised when handling and moving the unit not to damage the shell. Do not allow operatives to stand on the unit.

**Siting:** The unit must be sited indoors on a firm and level base. The environment should be dry and frost free, with ambient temperatures between 4 °C and 40 °C. Ensure enough room exists around and above the unit to gain access to pump, heat exchanger, immersion heater etc. Allow 750 mm clearance for immersion heater removal.

**Remove all packaging**

**Check connections are clear.** Remove any temporary plugs or covers

### **Pipework - general:**

For flanged connections tighten bolts in a diametrically opposite sequence to load the flanges evenly onto the gasket. For screwed HWS connections use a thread sealant approved for use with potable water by the local water authority.

Support pipe-work to prevent loads being transmitted to the vessel. Provide for thermal expansion with bends and expansion joints.

Ensure adequate venting for air removal during filling and operation.

### **Refer to the general assembly drawing of the unit. Check that all components included are available**

**Fit the secondary (HWS) pipe-work.** For an example of unvented kit pipework (if supplied with the package) arrangement please contact the GMS Technical Team and request a schematic diagram. On unvented systems it is necessary at least to fit an expansion vessel, T & P relief valve, anti-vacuum valve, high limit primary cut-out to the VersaTherm. The expansion vessel must be provided with its own isolation and drain valves to allow commissioning and servicing and its own "expansion relief" valve to protect it from over-pressure. On an unvented system we recommend fitting a 3 way flow/vent valve on the HWS flow – this will make draining down easier when servicing the VersaTherm.

We recommend fitting a pressure gauge in the secondary pipework close to the VersaTherm.

Fit a discharge pipe to the safety valve outlet, of same nominal bore as the outlet, to bring any safety valve discharge down to a nearby drain, so that any discharge will be visible.

The system design must ensure that the VersaTherm is not subjected to pressures above design pressure. On some installations a pressure reducing valve will be needed in the incoming cold feed pipe-work.

### **Controls**

The VersaTherm temperature control package is an option.

If the VersaTherm temperature control package has been ordered then:

Controls are located inside the removable cover on the side of the vessel.

### **ISOLATE THE UNIT ELECTRICALLY BEFORE REMOVING THIS COVER**

A three port modulating temperature control valve with spring reserve, bypass pipework, temperature sensors and controller are factory fitted.

A hand reset high temperature cut-out thermostat is fitted

A control panel is fitted which gives extra functionality i.e.

- "Heat required" signal (Volt Free Contact (VFC)) to demand heat from the boiler.
- Second temperature sensor to cut off loading pump and "heat required" signal when vessel is fully heated.
- High temperature cut-out VFC (this should be arranged to cut off the source of heat - either shut off the boiler or shut a separate primary valve)
- Remote Start terminals (240V ac) to allow VersaTherm to be started up by an external VFC switch.

Connect wiring according to the schematic wiring diagram.

If the VersaTherm temperature control package has NOT been ordered then:

Fit a suitable modulating temperature control valve with spring reserve, bypass pipework, temperature sensor and controller. Fit the control temperature sensor in the connection for it in the pipe-work at the heat exchanger outlet

Fit a hand reset high temperature cut-out thermostat to the upper sensor connection in the vessel

A control panel is fitted which gives the following functions:

- Temperature control.

- “Heat required” signal (Volt Free Contact (VFC)) to demand heat from the boiler.
- Second temperature sensor to cut off loading pump and “heat required” signal when vessel is fully heated.
- Remote Start terminals (240V ac) to allow VersaTherm to be started up by an external VFC switch.

Wire up according to the schematic wiring diagram supplied. (This should be arranged to cut off the source of heat - either shut off the boiler or shut a separate primary valve).

The VersaTherm bronze HWS loading pump must be wired to run whenever heat could be supplied to the heat exchanger.

#### **Fit primary pipe-work.**

Primary flowrate and pressure drop are stated on the general arrangement drawing specific to the unit.

We recommend that a primary regulating valve be fitted to set primary flowrate.

A suitable strainer (0.8mm mesh) should be fitted upstream of the VersaTherm

All pipework should be adequately supported to prevent transmission of mechanical stresses (including those from thermal expansion) to the VersaTherm connections.

#### **Immersion Heater (if supplied)**

The immersion heater should be connected to a suitable power supply using contactors. The control and high limit thermostats in the immersion heater are not suitable for switching the full immersion heater current and must be wired instead to a contactor coil.

## **5.0 Commissioning and Operation**

**WARNING:** Do not operate the equipment at pressures or temperatures in excess of those specified on the GMS attached to the unit. Do not subject the equipment to conditions of vacuum or partial vacuum. For example partial vacuum can be caused if the system connections or the vent are restricted during draw off or drain down.

#### **Filling and commissioning the secondary side (HWS)**

First commission any pressure reducing valve and expansion vessel on the cold feed. This procedure assumes water is available at a suitable pressure to the closed cold feed isolation valve only and the remaining secondary pipe-work is empty.

Open the secondary flow valve

Open the secondary return valve

Open the isolating valves on the integral HWS loading pump pipe-work.

Close drain valves

Slowly open the cold feed valve to allow the vessel and secondary pipe-work to fill.

The unit is hydraulically tested at the factory. However positioning and installation work can sometimes loosen joints. If this happens contact GMS for a service engineer to rectify pipework leaks caused during installation (this will be chargeable)

When the unit is full and vented of any air, vent the HWS loading pump.

#### **Filling and commissioning the Primary side**

Slowly open primary isolation valves to allow the heat exchanger and pipe-work to fill.

The unit is hydraulically tested at the factory. However positioning and installation work can sometimes loosen joints. Check for any such leaks in joints and rectify (draining down if necessary). With the VersaTherm three port valve open fully to the heat exchanger (refer to the specific valve instructions) set primary flow-rate to that required using a regulating valve (not included in the VersaTherm package).

### **Commissioning the controls**

If VersaTherm temperature control package has been ordered then:

The controls will have been factory set to the required settings.

Switch on electrical power to the unit.

Observe operation and check that the control valve is regulating temperature correctly.

Refer to the separate instructions for the West 6100+ controller for guidance on its features and functions.

Occasionally settings may need altering on commissioning (set-point, PID settings etc).

When the VersaTherm vessel contents are fully up to temperature the high limit thermostat should be set as follows:

Isolate the unit electrically.

Remove the High Limit Thermostat cover

Turn the setting dial down gradually until the thermostat clicks OFF.

Then adjust the dial up by 12 °C on its scale. This gives a high limit cut-out approximately 12 °C above normal operating temperature.

If VersaTherm temperature control package has NOT been ordered then:

Commission the temperature control equipment (as advised by others).

## **6.0 Maintenance**

Annual maintenance should include visual inspection of the inside of the vessel and if necessary cleaning debris from the base of the vessel to comply with guidelines on prevention of legionella bacteria proliferation (in hot water systems). Also the site insurers may require annual inspection of shell condition.

### **To drain the vessel down**

Obtain a complete set of replacement gaskets (if applicable) from GMS Thermal Products Ltd.

It is assumed here that all isolation valves (except drain) are open at the start.

Switch off any dedicated primary pump serving the unit

Close primary isolation valves

Switch off HWS loading pump and any secondary HWS return pump.

Close secondary return isolation valve

Close secondary flow isolation valve

Close the cold feed isolation valve but maintain the connection between the vessel and the expansion vessel.

**WARNING: The vessel will still be at pressure. However careless draining of the vessel could still cause a partial vacuum in the vessel, resulting in vessel collapse.**

Check the vessel pressure gauge is functioning –

Check gauge zero: isolate it at the gauge cock. Unscrew it, check that the indicated pressure drops and note the indicated pressure at atmospheric pressure (it should read 0 bar g.).

Check gauge range: Refit the gauge, open the cock, check that the indicated pressure rises and note the indicated pressure.

Fit a drain hose directed to a suitable drain

**WARNING: The water in the vessel may be hot.**

Start to drain water from the vessel. When the pressure in the vessel is near to atmospheric pressure the flow from the drain will slow down. If a three way vent valve is not fitted to the flow it will be necessary to check that the anti-vacuum valve is working to be sure to prevent vacuum. Close the drain valve temporarily. Ensure that the anti-vacuum valve is not stuck shut by depressing the anti-vacuum valve stem (**warning – hot water may escape under pressure when testing the anti-vacuum valve**) If too much pressure is present drain the vessel some more and try again. When pressure is low enough carefully remove one of the fittings (e.g. thermometer pocket) to create a temporary vent at the top of the vessel if necessary to achieve this.

**(Warning – hot water may escape under pressure when removing the fitting)**

When an adequate vent has been made, the remaining water can be drained.

**Inspecting the inside of the vessel**

A visual inspection should be made using an appropriate opening (e.g. immersion heater connection) and an inspection mirror and light. Vessel drain position may not allow complete drainage and it may be necessary to remove any remaining water using a suction hose. Dislodge any internal debris taking care not to damage the internal surface (e.g. using a hose/plastic brush) and remove debris and water (if necessary with suction hose).

**Re-filling and re-commissioning:**

Fit new gaskets where applicable.

Close drain valve.

Carefully open the cold feed valve until water is present at the temporary vent.

Close off the temporary vent (by re-fitting the thermometer pocket for example)

Slowly open the cold feed valve again until it is fully open

Crack open the HWS flow isolation valve, allow pressures to equalise then open it fully.

Open the secondary return valve

Open the isolating valves on the integral HWS loading pump pipe-work.

Open secondary return isolation valve

Switch on HWS loading pump and any secondary HWS return pump.

Open primary isolation valves

Switch on any primary pump/boiler supplying the unit as necessary.

Check that the unit is operating correctly.

**Heat Exchanger Maintenance:**

The heat exchanger is generally a brazed unit. If heat exchanger performance deteriorates because of scale or fouling, it may be removed for cleaning using chemicals compatible with its materials of construction.

The heat exchanger cannot be dismantled for servicing and if it fails or cannot be adequately cleaned it should be replaced with a new one from GMS Thermal Products Ltd.

**Other Equipment on the unit:**

Separate manuals can be provided upon request covering the other equipment supplied with the unit. Please contact the GMS Technical Team to request additional information.

## **7.0 End of Life Disassembly, Recycling & Disposal**

Please consult the general assembly drawing and product data sheets of the supplied unit for specific information regarding the materials used. Dispose of all material responsibly and in accordance with all local regulations. For further information, please contact the GMS Technical Team on 01457 835 700.

## **8.0 Recommended Spares**

The recommended spares for the VersaTherm package are;

- Inspection Opening Gasket
- Control Valve Actuator
- High Limit Valve Actuator
- Thermostats
- Digital Controller
- Pump Seals Kit
- Control Panel Lamps

Please contact our sales department for recommended spares prices and availability.