

# Installation, Operation and Maintenance Instructions

Direct Storage Cylinder

## OM003

*The operating and maintenance instructions contained within this package are for standard indirect storage cylinders. (Vessels fitted with a fixed internal copper coil). Please refer to separate instructions for storage calorifiers with U-tube batteries and direct cylinders. Please note that an electronic version of these instructions is available from our website. Please contact our sales office for further information.*

Rev	Date	By	Details
C	01/07/2016	Natasha Bennett	Updated PED Code
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# 1.0 Standard Unit Information & Description

Standard sizes range from 230 litres to 10,000 litres, with other sizes available to order. These are used to store water which has been heated externally to the vessel. The vessel may include an internal electric heater for backup purposes. These vessels are not suitable for storage of gases and appropriate arrangements must be made by the installer to ensure venting (via pipework or other means) of any air or other gases from the vessel. The vessels are designed for the storage of Domestic Hot Water but other applications, with different water temperatures, may also be permitted if specifically agreed by us for a given vessel. A choice of materials of construction is available.

Depending on the scope of the order the unit may be supplied complete with Ancillary Mountings (Thermometer, Altitude Gauge, Steam Pressure Gauge (if applicable), Safety Valve & Drain Valve). Some or all of these items may be supplied loose with the unit to be fitted on site.

Units with copper -lined steel vessels will always be supplied with an anti-vacuum valve connection. This is an essential safe-guard. Vacuum will damage the thin copper lining.

The General Assembly drawing specific to each unit gives details. In any case some or all of the above items must be fitted to give safe and satisfactory operation.

Standard Material Options Schedule	
Shell	Copper (CS) Copper-Lined Steel (CL) Galvanised Steel (GS) Stainless Steel (SS)
(Other materials on request)	

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

The standard range of Indirect Storage Cylinders are designed in accordance with the requirements of the Pressure Equipment Directive 2014/68/EU. Units classed as SEP in the PED category are not supplied with a CE mark. Units in category 1 & above are CE marked. 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, 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 Products Ltd’s scope of supply.

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

## 4.0 Installation

**Lifting & Handling:** Use lifting eyes where fitted. Do not lift a Cylinder using the insulation (if fitted). Straps may crush the insulation. The shell of the Cylinder may be made of relatively light gauge metal and care should be exercised when handling and moving the unit not to damage the shell. Do not lift the Cylinder using chains directly in contact with the shell. Do not allow operatives to stand on the Cylinder.

**Siting:** Unless specifically ordered for outside siting the Cylinder must be sited indoors. Foundations must be firm and level to prevent settling, pipe strain or distortion of the Cylinder. Unless specifically ordered differently, the Cylinder should be installed in a level position. For Cylinders with inspection openings ensure enough room exists to gain access to the opening.

**Installation:** Protective covers/plugs may be fitted to connections to protect them in transit. These must be removed prior to use. If a connection is not required seal it appropriately. Check for and remove any foreign material which may have got into the vessel. Pipe-work connected to the Cylinder should be supported to prevent loads being transmitted to the Cylinder. Provide for thermal expansion with bends and expansion joints. To avoid corrosion do not use copper pipework with galvanised steel calorifiers or vice-versa. Fit isolation valves prior to Cylinder connections to facilitate servicing (NOT TO THE VENT). For flanged connections tighten bolts in a diametrically opposite sequence to load the flanges evenly onto the gasket. For screwed connections use a thread sealant approved for use with potable water by the local water authority.

The vent must not be blocked so, if the unit may need to be isolated from the vent, fit a 3-way vent valve. Ensure adequate venting for air removal during filling and operation. Fit a suitable Pressure Relief Valve (“Safety Valve”) to prevent overpressure. It is recommended to fit suitable pressure and temperature gauges.

#### **De-stratification Pumpsets**

To avoid damage in transit the pipe-work and pump of a de-stratification set (if included) may be supplied loose for fitting on site. The pump should be installed to circulate water from the top of the cylinder to the bottom. To ensure that the anti-stratification pump does not adversely affect performance of the Cylinder during peak demand periods the power supply to the pump should be timed to come on during periods of low demand if possible, but often enough to guarantee heating the Cylinder contents fully for a period of at least 1 hour per day. The unit should be flushed thoroughly with clean water prior to operation.

#### **Vessels on Unvented Systems.**

Special arrangements are required to prevent excessive pressure and temperature and formation of vacuum. This will include supplying and fitting suitable Pressure Relief Valve, Temperature Relief Valve, Expansion Vessel, Anti-Vacuum Valve, Control Thermostat, High Temperature Cut-Out and associated equipment and also other equipment, if required such as a pressure regulating valve. The arrangements required are detailed in UK building and water regulations.

## **5.0 Commissioning and Operation**

Do not operate the equipment at pressures or temperatures in excess of those specified on the GMS nameplate. 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. Open the system isolation valves carefully to avoid pressure surges. Check that all gaskets are effective when the unit is operating - some bolt tightening may be necessary after the unit has been first pressurised and subsequently from time to time. Following installation and commissioning it is advisable to remove, clean and re-assemble any strainers. All fluids must be drained when the unit is out of operation to prevent freezing or possible corrosion.

## **6.0 Maintenance**

Annual maintenance should include cleaning debris from the base of the Cylinder to comply with guidelines on prevention of legionella bacteria proliferation. Also the site insurers may require annual inspection of shell condition.

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

Obtain a complete set of replacement gaskets from GMS Thermal Products Ltd.

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

For copper-lined steel vessels, ensure that the anti-vacuum valve is not stuck shut - also ensure that a vent is available at the top of the Cylinder of flow area at least one half the flow area of the drain connection. Partial vacuum, caused by inadequate venting of copper-lined cylinders during drain-down, will cause damage to the thin copper lining.

If the vessel is open vented and shares a vent with other cylinder, isolate it from the common vent using the 3-way valve (it will now vent to atmosphere). Isolate power to any backup immersion heater.

Pipe the drain to a drain point and open the drain valve to fully drain the unit. Some vessels have a drain connection a short distance up the side and a small volume of water may need to be pumped out through the inspection opening. The shells internal condition can be inspected by removing the inspection cover to allow visual examination. The vessel is a confined space – take suitable precautions if working inside it.

Re-fit new gaskets and re-fill the Cylinder according to the commissioning instructions above.

### **Sacrificial Anodes**

Some vessels are fitted with sacrificial anodes to reduce corrosion. The anode corrodes instead of the vessel metal. The anodes need to be replaced periodically to ensure protection is continuous, the anode should be checked after 6 months operation then periodically depending on rate of corrosion. It should be replaced when thickness has been reduced by 40% from the original.

## **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. If You require additional information on this, please contact our Technical Team on 01457 835700.

## **8.0 Recommended Spares**

The recommended spares for the Indirect Storage Cylinder are;

- Inspection Opening Gasket
- Sacrificial Anode (if supplied on the original unit)

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