

Advenco MSB Range

300–5000L Heating Buffer Vessels

Installation, Operation, and Maintenance Manual



Warnings

This manual should be read and understood prior to installation or operation of any Adveco MSB vessel. Failure to read this manual or follow its printed instructions may lead to personal injury, damage to the vessel and damage to the installation. These instructions should be kept in a safe and accessible place near the vessel.

Vessels should be stored in a safe place prior to installation to prevent damage.

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Adveco Ltd. reserves the right to modify specifications in this manual at any time and without notification.

Adveco Ltd. accepts no liability for third party claims arising from unauthorised use and/or use other than as directed within this manual.

How to Use This Manual

All general information, instructions and specifications listed within this manual applies to the full range of MSB tanks.

For any queries or issues not covered by the scope of this manual, please contact the Adveco Technical Department using the contact details provided on page 13.



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Product Description

Adveco MSB Range of Carbon Steel Vessels

The Adveco MSB range of primary system buffer vessels is manufactured from high quality steel and has been designed as a standard solution for a broad range of central heating applications.

The MSB carbon steel buffer range includes a large selection of tanks from 300 to 5,000 litres suitable for use as heating system buffers, thermal inertia tanks, or energy storage vessels. All buffers are provided with a large number of high, low, and mid-level connections to maximise compatibility for system integration, making them a suitable choice for almost any heating application. With 90-degree connection positions, the MSB range is ideal for corner installations to allow the most efficient use of available plant room space.

The MSB 300-2000 range is supplied as standard fitted to a wooden pallet. MSB 3000-5000 vessels are not supplied on a pallet. Insulation jackets are packaged separately for ease of transport, manoeuvring, and installation.

The MSB range is suitable for use with working pressures up to 3 bar and temperatures up to 95°C. Certain vessels built to order on request may be suitable for a working pressure of 6 bar.

The complete MSB range is designed, manufactured, and tested in the EU to the requirements of:

The Pressure Equipment Directive

2014/68/EU Article 4, Point 3, Sound Engineering Practice.

The scope of 2014/68/EU covers standards for the design and manufacture of pressure equipment and assemblies, including vessels, with a maximum allowable pressure greater than 0.5 bar. Vessels classified within the Sound Engineering Practice category of the Pressure Equipment Directive are exempt from, and should not feature CE or UCKA markings.



Installation Instructions

1. Responsibilities of the User

Following the commissioning of a system and in compliance with the procedures and advice contained within this manual, responsibility lies with the building controller to maintain a safe standard of operation and regular maintenance procedures as required by any site risk assessment. This includes ensuring that the unit is not operated at temperatures or pressures in excess of those stated on the vessel data plate. Nor should the vessel be exposed to a full or partial vacuum, such as can be present during draw-off or drainage of the unit while the cold feed or vent are closed or obstructed.

Failure to maintain a minimum of annual maintenance may void any and all warranties. Full maintenance procedures should only be carried out by a suitably qualified person. Basic maintenance regimes, as determined through site risk assessment, should be carried out by the user as directed on page 11.

Adveco Ltd. advise that heating systems in unoccupied premises, or that are subjected to long periods of shutdown, should be drained down according to the procedure on page 11, to remove the risk of failure and/or damage occurring while the system is not being monitored.

2. Responsibilities of the Installer / Designer

In compliance with the procedures and advice contained within this manual, responsibility lies with the installer to ensure that the vessels are correctly and safely installed in line with all local regulations and laws. In all cases, the relevant laws and regulations must take precedence over the instructions contained within this manual.

Installation Instructions

3. Location and Handling

Suitable methods of moving a vessel include the use of a forklift truck where the vessel is securely fixed to a pallet capable of supporting its weight, or by boom crane using adequate textile slings of suitable capacity to lift the weight of the tank. Vessels should not be lifted using the insulation, by chains, or by straps that may damage the insulation, connections, or walls of the tank. Care should be taken when moving or lifting to minimise the risk of damage to the vessel.

The vessel must be located inside the building and positioned on a stable, level, fireproof base capable of supporting the unit when full. Floor loading calculations should include the total filled weight, being equivalent to the sum of the empty weight of the vessel and the weight of any installed pipework or fittings, plus the water volume in litres (where 1 litre of water weighs 1 kg). For tank dry masses, please consult page 7.

The vessel should be positioned to provide suitable clearances to permit access for visual inspection and for the connection and maintenance of all pipework, connections, valves, and fittings. Advenco recommend a clearance of at least 500mm on all sides of the vessel and a minimum of 150mm above the vessel. Consideration should be given to the inspection, removal and future replacement of any flanges, ancillaries, thermostats, and safety valves present, as well as replacement of the entire vessel and surrounding pipework.

Any water storage vessel requires some provision against damage to surrounding infrastructure, electronics, and equipment in the event of a leak, damage, or vessel failure. Acceptable methods of protection include suitable bunding, gulley, drainage, or a leak detection and warning system. Additional precautions must be taken when the tank is installed in unheated spaces to prevent the risk of freezing.

All tanks are provided with an insulation jacket as standard, which may be shipped separately or be removed as necessary to manoeuvre vessels into location. Insulation jackets and plastic cosmetic rosettes over connection points must be fitted and secure prior to the connection of any pipework or fittings.

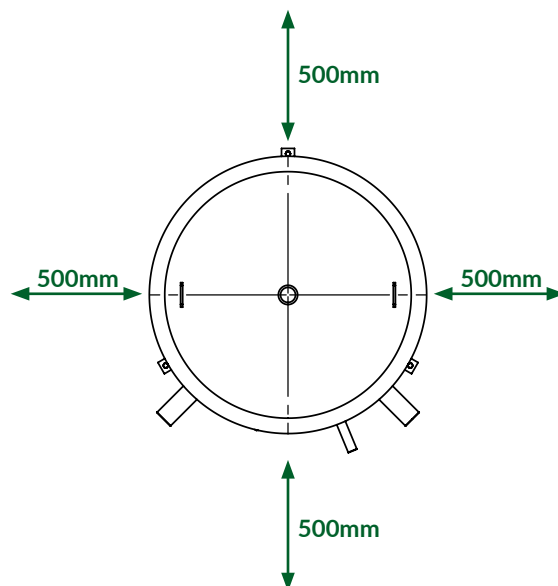
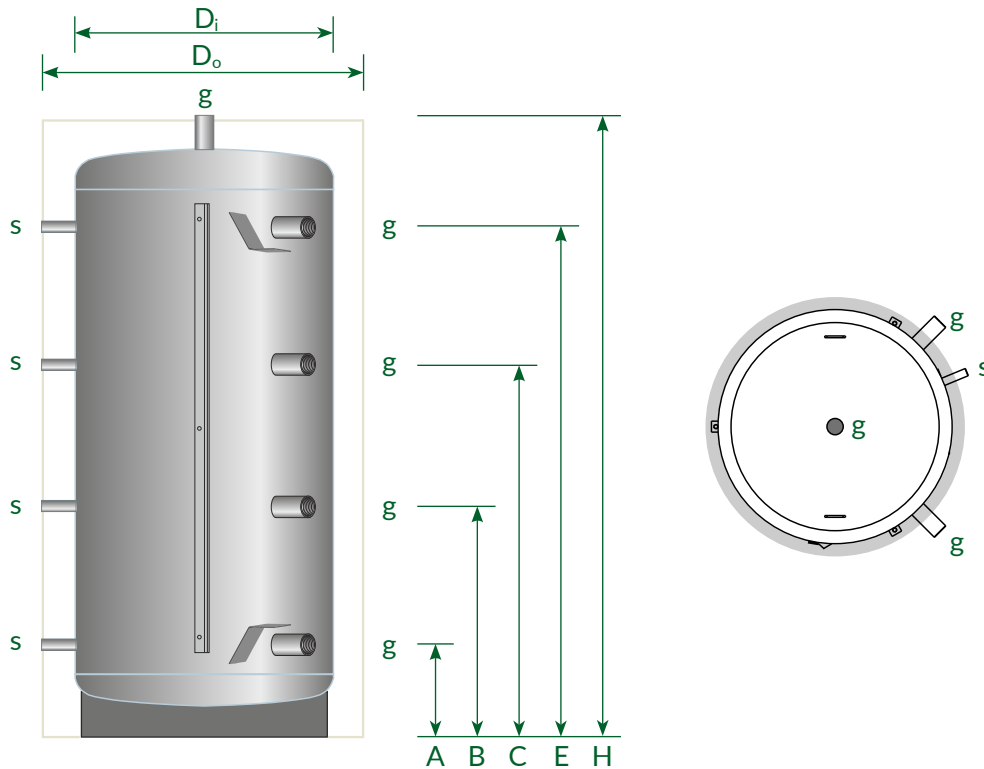


Figure 1: Recommended working clearances

Installation Instructions

4. Tank Connections and Dimensions



MSB Model	300	500	800	1000	1500	2000	3000	4000	5000
Volume (L)	325	465	727	920	1426	2122	2960	3820	5022
Maximum working pressure (bar)	3	3	3	3	3	3	3	3	3
Maximum working temperature (°C)	95	95	95	95	95	95	95	95	95
Insulation thickness (mm)	100	100	100	100	100	100	100	100	100
Energy Efficiency Class (EU 812/2013)	C	C	C	C	C	C	--	--	--
Standing Losses (W)	99	112	131	142	167	2122	--	--	--
Empty Mass (kg)	65	85	110	130	200	285	345	410	480
g - System connections (inch) BSP Female	1.5"	1.5"	1.5"	1.5"	1.5"	1.5"	2"	2"	2.5"
s - Sensor connections (inch) BSP Female	0.5"	0.5"	0.5"	0.5"	0.5"	0.5"	0.5"	0.5"	0.5"
Insulated diameter D_o (mm)	700	850	990	990	1200	1400	1450	1600	1800
Inner Diameter D_i (mm)	500	650	790	790	1000	1200	1250	1400	1600
Dimension A (mm)	200	230	320	320	320	365	380	445	475
Dimension B (mm)	670	610	670	800	785	830	1010	1075	1090
Dimension C (mm)	1115	995	1015	1290	1255	1300	1635	1690	1705
Dimension E (mm)	1585	1375	1365	1770	1720	1765	2265	2320	2320
Height H (mm)	1805	1600	1690	2100	2050	2140	2660	2765	2815

Installation Instructions

5. Primary Installation Procedure

Prior to the connection of primary pipework and ancillaries, the vessel should first be manoeuvred into its final position in accordance with the guidance on page 6.

Isolation valves should be fitted to the vessel (except on connections to the vent or any pressure relief valves) prior to installation of any pipework connections. Connections to the vessel should be made according to the locations and sizes denoted on page 7. All pipework should be of an appropriate, non-corrosive material, and should be supported outside the vessel to prevent excessive load bearing upon the tank connection points. Pipework should be arranged to facilitate suitable access to system components. Any flanged connections to the vessel must be tightened in a diametrically opposed sequence to prevent uneven loads across the connection.

The MSS range requires a top-mounted automatic air vent designed to facilitate the release of air from sealed systems during filling and standard operation. A manual air vent should be installed in addition to this feature. Discharge pipework from pressure relief valves should follow the regulations defined on page 9.

Expansion vessels must be positioned on the return side of a system, and should be appropriately sized to accommodate approximately 10% of the total heating system volume. The Advenco Application Design Department can provide a detailed expansion calculation upon request to verify the required size of expansion vessels, or for systems operating at specific pressures.

A drain should be installed on the lowest connection to the cylinder, as identified on page 7. The drain valve should be of suitable size to allow draining of the tank in a reasonable amount of time. It is recommended that a quarter-turn lever valve and plug or cap are used and that the valve size be one size smaller than the return feed connection size. A suitable drain or gulley should be provided to allow safe draining of the tank.

x02 Vessels

The MSS x02 range of vessels feature two separate steel heat exchange coils. When used with two heat sources, the lower grade heat source should be piped into the bottom heating coil, and the higher grade or more reliable heat source should be piped into the top coil. The two coils may alternatively be used as heat outputs, in which case the high level coil should be used for a high temperature output, and the low level coil should be used as a low temperature output.

The two heating coils may be combined for use with a larger capacity system with a single high grade heat source, by connecting the outlet of the top coil to the inlet of the bottom coil by external pipework. To estimate the kW capacity of the combined coil arrangement based for an 80/60°C primary flow and return temperature, sum the kW capacity of the top coil at 80°C and the kW capacity of the bottom coil at 70°C. For further technical details on coil capacities at 70°C, at different temperatures, or if a more accurate calculation is required, please consult the Advenco Application Design Department using the details provided on page 13.



Installation Instructions

7. Discharge Pipework

Discharge from relief valves

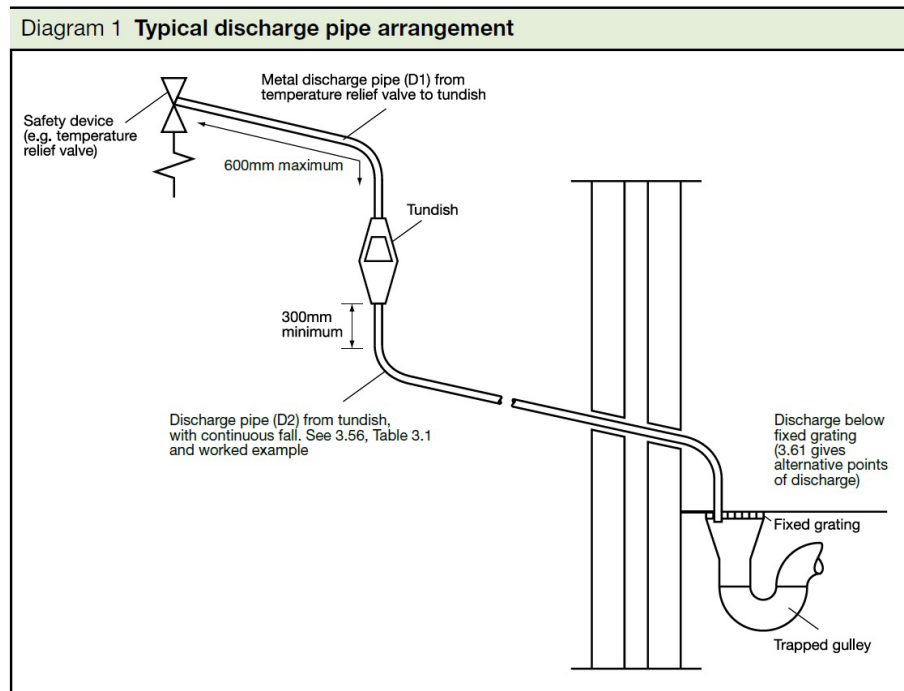


Figure 5: Discharge pipework diagram (as found in Building Regulations Part G)

Discharge pipework requirements for the UK are found in Building Regulations Part G. They are summarised here but it is recommended to read the regulations in full at <http://www.planningportal.gov.uk/buildingregulations/approveddocuments/partg/approved>

D1, the pipe from the relief valve to the air break, must have the same diameter as the valve, must be metal, and must be no longer than 600mm. An airbreak, such as a tundish or a funnel, must be installed at the end of D1.

D2, the pipe from the air break to termination, must be at least one size larger than D1, must have at least 300mm vertical drop before a bend, and must have a continuous fall. It should typically be metal, but PP is acceptable (note: PP is push-fit plastic. ABS and PVC solvent welded plastics are not suitable).

If D2 is longer than 9m total equivalent length (based on 1.4m per bend), then its diameter must be increased. Please refer to Building Regulation G3 at <http://www.planningportal.gov.uk/buildingregulations/>. If a number of D2 pipes are combined, the diameter of the common pipe should be one size larger than the biggest D2 pipe.

D2 should be terminated in one of the following ways:

- Into a soil stack, suitable for the temperature, with a mechanical seal, and with no sanitary appliances on it and a warning not to use the pipe for sanitary appliances.
- Into a trapped gulley with the pipe end below the grate but above the water seal.
- Terminating at low level to a suitable external ground level surface with a guard around the pipe end and that end within 100mm of the ground
- At high level into a suitable hopper or onto a roof that can withstand the temperature and does not have plastic guttering within 3m of the discharge and does not create a risk to people below.

Installation Instructions

8. Water Quality

If the system includes a pressurisation unit, then a water meter is also required.

In order to prevent material corrosion within a central heating installation, the quality of input water must be taken into consideration. All filling water must meet the specifications outlined below. Water that does not meet these specifications should be sufficiently treated to the extent that it does. Failure to comply with water quality requirements may invalidate warranties on any or all components within an MSB vessel installation.

- The system should only be filled using potable or softened water. Groundwater and demineralised (demi- or distilled) water should not be used.
- For systems containing aluminium, the water pH level must be between 7.5 and 8.5. The ideal pH is 8.3.
- For mixed-metal systems not containing aluminium, the water pH level should be between 9.0 and 10.0. The ideal pH is 9.8.
- System water should have a maximum conductivity at 20°C of 2500 µS/cm.
- System water should have a maximum iron content of 0.2 ppm.
- In hard water areas, consideration should be given to filling the system with softened water to prevent scale build-up. Refer to the boiler manufacturer's literature for limits on hardness.
- There must be no capacity for oxygen diffusion into the system during operation.
- The system should be cleared of debris and dirt before use. This can be achieved by installation of a filter, or if this is not possible, by flushing with suitable water. No solid substances or residues should be present in the system water.
- Annual input of fresh water should not exceed 5% of the total system volume. This includes requirements of water input during maintenance, such as the recharging of expansion vessels.
- The addition of chemicals to the water should only be considered after reviewing the manufacturer's literature for any connected heat sources.
- The addition of antifreeze and/or other additives necessitates the need for regular water quality checks, to meet the requirements imposed by the additive supplier(s). Advenco Ltd. recommends that records are kept of any additions to the system water and of water quality checks performed. Further advice on suggested corrosion inhibitors, anti-freeze or system cleaner additives is available by contacting the Advenco Technical Department using the details on page 13.



Maintenance Operations

While full maintenance and cleaning of vessels should only be carried out by a qualified operative, there is regular system maintenance that must be carried out more frequently and can be done by the building controller's nominated person.

The more involved maintenance regime of a tank will vary from site to site depending on water conditions and use. Maintenance must take place at least yearly, but more frequent visits may be required depending on the condition of the unit after one year. The maintenance of a tank involves checking the system and cleaning the tank.

Checks to carry out:

Any thermostats present are functional and properly calibrated.

All relief valves operate and discharge correctly.

The heating system expansion vessel pressure is equal to the heating system pressure (checked when there is no pressure on the water side of the diaphragm). Recharge as appropriate.

All valves have free travel.

The system has no leaks. Particular attention should be paid to tank connections and air relief valves.

The heating system is correctly dosed with inhibitors according to the system inhibitor log book.

Cleaning:

All filters should be cleaned.

Drainage Procedure:

Turn off all heat sources connected to the vessel.

Turn off any system pumps and isolate all connections to and from the vessel.

Ensure that the vessel drain connection is connected to, or positioned over, a drain or gully. Open the drain valve connection to release the pressure within the vessel.

Open a safety valve or remove automatic air vent connection to allow air into the unit and prevent negative pressure build-up during drainage.

Allow the vessel to fully drain via the drain valve connection.

It may also be required to drain any coils within the vessel. This should be done using a drain point located on the connecting pipework.

Spares and Ancillaries Information

Ancillaries

Item Description	Product Code
Buffer Installation Kit	1.0": MB0017
Includes AAV and valves for buffer vessel on primary side; valves and flow measurement device for pump commissioning; 2x T&P gauges for building flow and return.	1.5": MB0018
	2.0": MB0019

Spares

Item Description	Product Code
Control Thermostat	
0-70°C Thermostat supplied with 0.5" pocket	E0008
Overheat Thermostat	
95°C Thermostat supplied with 0.5" pocket	E0009
95°C Capillary thermostat suitable for multiple pocket	E0011
Single Pocket 0.5"	E0009.1
Multiple Pocket Long 0.5"	E0009.4
Temperature & Pressure Gauge	
0-6 bar and 0-120°C; 80 mm dial. Self-sealing 0.5" wet pocket	M0011
0-10 bar pressure gauge only, 63mm dial, 0.25" rear connection	M0179
Expansion / Safety Relief Valve	
Expansion relief valve 3 bar with 0.75" connection	U0055/3
Expansion relief valve 6 bar with 0.75" connection	U0055
Expansion relief valve 10 bar with 0.75" connection	U0055/10
Automatic Air Vent 0.5"	P0022
Tundish 0.75"	U0014
Further valves and spares available from Adveco upon request	



Contact Details and Warranty Information

The Adveco MSB range, this manual, and all information contained within, are supplied by Adveco Ltd.

Adveco Ltd.
Unit 7&8 Armstrong Mall,
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Farnborough,
Hampshire,
GU14 0NR

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enquiries@adveco.co
www.adveco.co

The Adveco MSB range is provided with a 5 year vessel warranty reliant upon the following conditions:

- The vessel is correctly and safely stored, installed, and used as instructed by this manual.
- The vessel is used exclusively with water that satisfies the quality conditions as described on page 10 of this manual, or an approved glycol solution.
- The heating system is kept in a good condition and is suitably maintained, inclusive of maintenance of the vessel as directed on page 11 of this manual.
- The vessel has not been altered, tampered with, and has not been subjected to damage from frost, vacuum, or external influence.

Exclusions to warranty conditions:

- Consequential damage arising from malfunction, failure, or leaks associated with the MSB vessel.
- Failure or damage of the vessel or heating system arising from the build up of excessive scale.
- Any parts and labour charges associated with maintenance, repair, or replacement of the vessel.

For further information and warranty claims, please contact Adveco Ltd. through the details listed on this page.

Adveco Sales Department
T: 01252 551 540 Option 1
E: Sales@adveco.co

Adveco Spares Department
T: 01252 551 540 Option 3
E: Spares@adveco.co

Adveco Technical Department
T: 01252 551 540 Option 4
E: Technical@adveco.co

Adveco Design Department
T: 01252 551 540 Option 5
E: Technical@adveco.co

Adveco Service & Commissioning Department
T: 01252 551 540 Option 6
E: Service@adveco.co

Adveco also offer the following products and services:

- Indirect and direct hot water systems
 - Electric hot water systems
 - Air Source Heat Pumps
 - Solar thermal systems
 - Hybrid hot water systems
 - Gas fired heating systems
 - Bespoke system design
 - Buffer tanks
 - Controls Systems
 - Off-site manufacturing of skids and plant rooms
 - Maintenance and service packages
-



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HOT WATER SPECIALISTS

Appendix A: Product Fiche

In accordance with regulations EU 812/2013 and 814/2013 - Volgens verordeningen EU 812/2013 en 814/2013 - Selon règlements EU 812/2013 et 814/2013.

Category	Trademark	Model identifier	Energy efficiency class	Standing Losses	Storage Volume	Assembly, installation, or maintenance precautions
Categorie	Handelsmerk	Typeaanduiding	Energie-efficiëntieklasse	Staande verliezen	Opslagvolume	Voorzorgsmaatregelen tijdens montage, installatie of onderhoud
Catégorie	Marque commerciale	Modèle	Classe d'efficacité énergétique	Pertes debout	Volume de stockage	Précautions à prendre pendant l'assemblage, l'installation ou l'entretien
Unit Eenheid / Unité	-	-	-	W	Litres	-
Appliance Information Omschrijving Informations	Adveco Ltd.	MSB 300	C	99	325	Consult product installation, operation, and maintenance manual Zie Installatie, Gebruikers en Service handleiding van het product Voir Manuel d'installation, d'emploi et d'entretien du produit
		MSB 500	C	112	465	
		MSB 800	C	131	727	
		MSB 1000	C	142	920	
		MSB 1500	C	167	1426	
		MSB 2000	C	193	2122	



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HOT WATER SPECIALISTS