

Advenco Chilled Water Tanks

CWT 500 - 5000 Range

Installation, Operation, and Maintenance Manual



Warnings

This manual should be read and understood prior to installation or operation of any Adveco CWT vessel. Failure to read this manual or follow its printed instructions may lead to personal injury, damage to the vessel and damage to the water heating. 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.

Copyright © 2020 Adveco Ltd. All rights reserved.

No part of this publication may be copied, reproduced, altered and/or published by any means without the prior written approval of Adveco Ltd.

Any brand names mentioned within this publication are registered trademarks of their respective owners.

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 CWT vessels.

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.



Contents

	Page
Product Description	4
Installation Instructions	
1. Responsibilities of the User	5
2. Responsibilities of the Installer / Designer	5
3. Location and Handling	6
4. Tank Connections: General	7
5. Primary Pipework	8
6. Discharge Pipework	9
7. Water Quality	10
Maintenance Operations	11
Technical Specifications	12
Contact Details and Warranty Information	13

Product Description

Adveco CWT Range of Carbon Steel Chilled Water Vessels

The Adveco CWT range has been designed to serve as buffer vessels or thermal storage vessels for use with chilled water within central heating and cooling installations. They feature a carbon steel shell with high and low level flow and return connections.

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

**The Pressure Equipment Directive
97/23/EC Article 3, Paragraph 3, Sound Engineering Practice.**

The scope of 97/23/EC covers standards for the design and manufacture of pressure equipment, including vessels, piping, safety and other accessories, 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 do not feature, CE marking.

The standard range of CWT vessels includes the following models, as identified by the vessel data plate:

CWT 500
CWT 800
CWT 1000
CWT 1500
CWT 2000
CWT 2500
CWT 3000
CWT 4000
CWT 5000



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.

The CWT range of carbon steel vessels are suitable for installation in unvented installations up to a maximum pressure of 6 bar.

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. For tank weight information, consult page 12. 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 is suitable for indoor installation only and must be positioned on a level base capable of supporting the unit when filled to capacity. Floor loading calculations should include the total filled weight, being equivalent to the sum of the empty weight of the vessel plus the water volume in litres of the tank (where 1 litre of water weighs 1 kg).

An installation should provide suitable clearances of no less than 800 mm on at least three sides of the unit in order to give adequate room for pipework. A height clearance of 150mm is required over the top of the vessel to accommodate the installation of an air vent. The vessel should be positioned to provide suitable access for visual inspection and maintenance of all connections, ancillaries, and fittings, as well as eventual replacement of the entire vessel.

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.

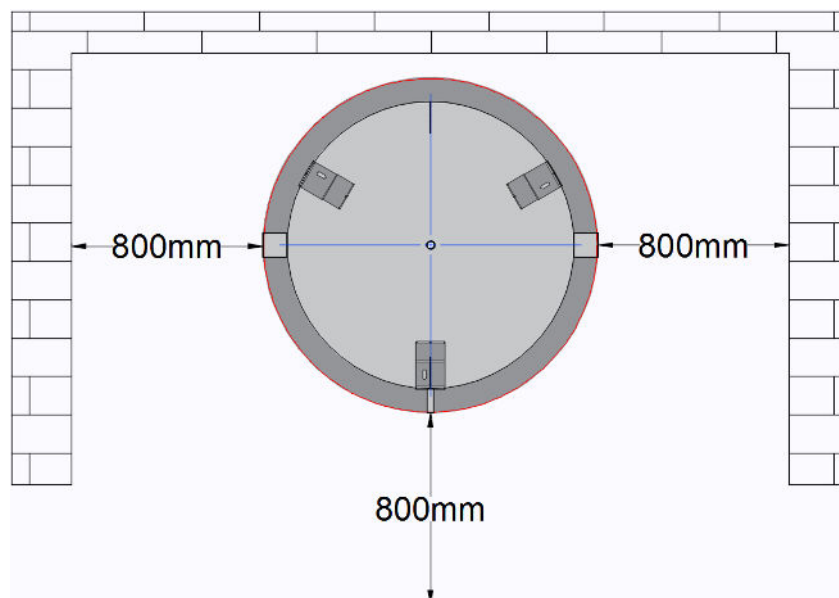


Figure 1: Recommended working clearances

Installation Instructions

4. Tank Connections: All Vessels

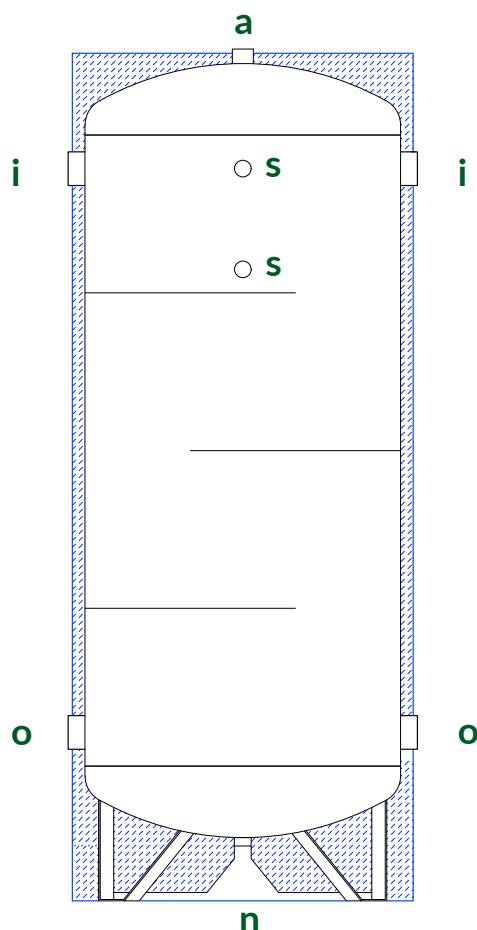


Figure 2: CWT general connection positions

Connections and sizes

Model CWT		500	800	1000	1500	2000	2500	3000	4000	5000	Units
Port	Purpose										
i	Water inlet	3.00	3.00	3.00	3.00	3.00	4.00	4.00	4.00	4.00	inch
o	Water outlet	3.00	3.00	3.00	3.00	3.00	4.00	4.00	4.00	4.00	inch
a	Automatic air vent	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	inch
s	Sensor pockets	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	inch
n	Drain connection	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	inch

For connection heights and vessel dimensions consult pages 13-14.

Installation Instructions

6. 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 and 12. 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 CWT 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 Adveco 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.



Installation Instructions

7. Discharge Pipework

Discharge from relief valves

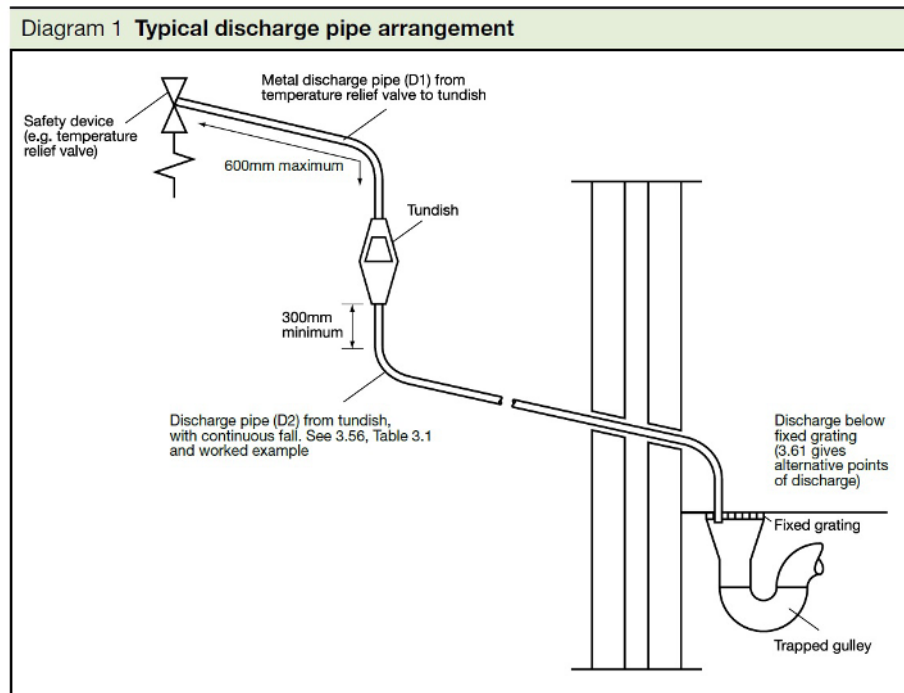


Figure 5: Discharge pipework diagram (as found in Building Regulations Part G)

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 a CWT 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 $\mu\text{S}/\text{cm}$.
- 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 system appliance 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 system appliance manufacturer's literature.
- 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.



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 system expansion vessel pressure is equal to the 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 system is correctly dosed with appropriate inhibitors.

Cleaning:

All filters should be cleaned.

Drainage Procedure:

Turn off all heating or chilling 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.

Technical Specifications: All Vessels

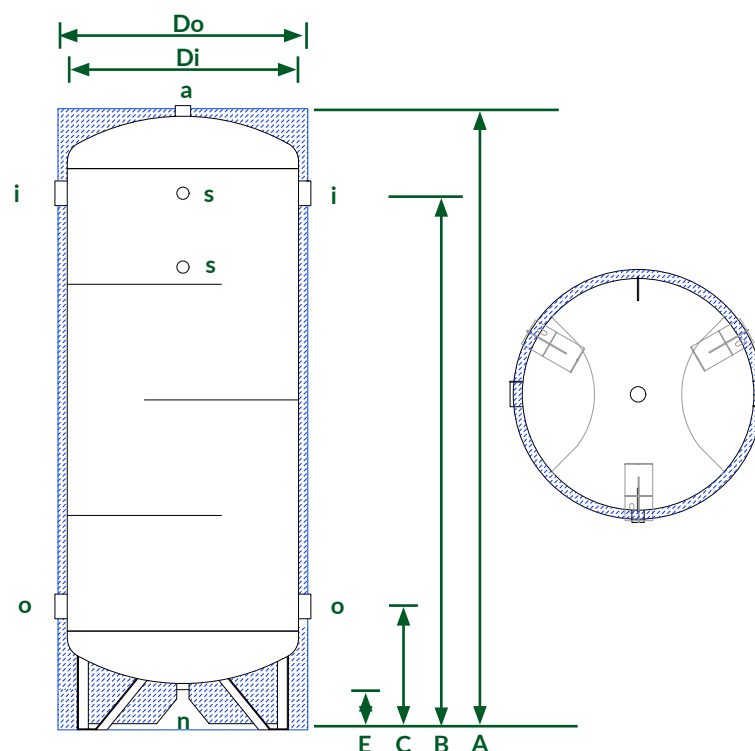


Figure 6: CWT general vessel dimensions

Dimensions

Model	CWT 500	CWT 800	CWT 1000	CWT 1500	CWT 2000	CWT 2500	CWT 3000	CWT 4000	CWT 5000
Do	720	860	920	1120	1220	1320	1370	1520	1720
Di	660	800	860	1020	1120	1220	1270	1420	1620
A	1710	1741	2026	2163	2483	2563	2778	2848	2888
B	1435	1445	1710	1800	2105	2155	2365	2390	2400
C	385	395	410	500	505	555	565	590	600
E	135	125	120	165	155	175	180	160	140

All dimensions shown in mm. For connection descriptions and sizes, consult page 7.

Vessel Specifications

Model	CWT 500	CWT 800	CWT 1000	CWT 1500	CWT 2000	CWT 2500	CWT 3000	CWT 4000	CWT 5000
Litres	500	800	1000	1500	2000	2500	3000	4000	5000
Maximum working pressure (bar)	6	6	6	6	6	6	6	6	6
Working temperature range (°C)	-10 to 95	-10 to 95	-10 to 95	-10 to 95	-10 to 95	-10 to 95	-10 to 95	-10 to 95	-10 to 95
Dry mass (kg)	91	122	149	208	282	307	356	519	621

Contact Details

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

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

T: 01252 551 540
enquiries@adveco.co
www.adveco.co

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:

- Bespoke system design
 - Maintenance and service packages
 - Buffer tanks
 - Indirect and direct hot water systems
 - Off-site manufacturing of skids and plant rooms
 - Controls systems
 - Packaged plate heat exchangers
 - Solar thermal systems
 - Gas fired heating systems
 - Air source heat pump systems
-



Adveco Ltd. Unit 7&8 Armstrong Mall, Southwood Business Park, Farnborough, Hampshire GU14 0NR
Company Reg : 09493966 T : 01252 551 540 E : enquiries@adveco.co I : www.adveco.co

EXPERTLY ENGINEERED FOR YOU