



eco hometec

DUOTANK RANGE OF
**Unvented Mains Pressure
Hot Water Cylinders**

TECHNICAL
MANUAL



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eco hometec has a policy of continuous improvement and reserves the right to change any specification without notice. Your statutory rights are not affected.

eco hometec is committed to design, develop and produce environmentally friendly appliances for both domestic and commercial applications















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1. Why choose eco hometec?

Why choose an unvented mains pressure hot water tank?

1.1 Benefits at a glance

-  Building designs can be more flexible - the unvented cylinder can be located in various places.
-  Roof designs become more flexible - no need for plumbing in the loft.
-  Balanced water pressure can be supplied for multi-bathroom dwellings.
-  In compliance with all current building regulations and water byelaws.
-  A wider choice of terminal fittings can be used.
-  No need for shower pump.
-  Reduced bore pipe sizes can be specified.
-  Quick installation - less pipe work.
-  No cold water cistern – less maintenance – and no freezing pipes.
-  Easy to install - A complete package facilitates on-site installation.
-  Easy access - inspection, service and maintenance.
-  Savings - reduction of fuel bills and possible discounted home insurance.
-  Performance ~ constantly balanced pressure gives simultaneous use of bath, shower and kitchen sink without loss of flow rate.
-  Free help with technical, design and installation issues.

2. Unvented Systems

Un-vented hot water storage systems are rapidly increasing in popularity in the U.K as the many benefits they provide are being recognised. Benefits that millions of homeowners around the world have enjoyed for many years.

What is an un-vented system and what are the benefits?

2.1 Unvented and how it works

This typically consists of a water storage cylinder and a boiler. Via a pressure-reducing device, the cylinder receives water directly from the mains supply. The boiler heats the water via a heat exchanger, using the same principle as the traditional system. Water is replenished to the cylinder direct from the mains as hot water is drawn off to outlets. The system is unvented because a vessel incorporated into the system accommodates expanding water, obviating the need for a vent pipe or feed and expansion tank.

2.2 Direct Unvented Hot Water Supply

This system normally consists of a water storage cylinder and an immersion heater. Water supply is the same as the indirect system with a difference in the method of heating, which is via an electrically powered immersion heater and not by a heat exchanger.

3. Unvented - the benefits

There are many advantages over traditional plumbing systems - for the end user, as well as at the installation and building design project stages.

3.1 For the specifier

Building designs can be more flexible - the unvented cylinder can be located in various places in the building.

Roof designs become more flexible - no need for plumbing in the loft, resulting in a better utilisation of space.

Balanced water pressure can be supplied for multi-bathroom dwellings.

In compliance with all current building regulations and water byelaws.

A wider choice of terminal fittings can be used.

No need for shower pump.

Reduced bore pipe sizes can be specified.

Quick installation - less pipe work.

No cold water cistern.

Easy to install - a complete package facilitates quick on-site installation.

Easy access - inspection, service and maintenance.

3.2 Benefits for the householder

Savings - reduction of fuel bills and possible discounted home insurance.

Performance ~ constantly balanced pressure gives simultaneous use of bath, shower and kitchen sink without loss of flow rate.

A wider choice of terminal fittings.

Obviates frozen pipes and leakages in the roof space.

Potable water at all outlets - the system is sealed to the atmosphere, so the risk of water contamination is reduced.

Low noise - no cistern re-filling.

Available roof space - ideal for loft conversions.

4. Planning An Unvented System

4.1 Building Regulations

All installations must be in compliance with any local byelaws and current building regulations.

4.2 Water Supply

An adequate mains pressure is a prerequisite for any unvented system to perform to its optimum level. (Local water companies, upon request, provide information regarding water pressures).

The length and bore of the service pipe could be an influencing factor on the incoming flow, and the installer too should consider this. The recommended bore of the service pipe is a minimum of 19mm (3/4").

4.3 Siting

It is not critical where the cylinder unit is located, as long as the following are carried out:

The cylinder is not positioned where extreme temperatures may exist.

No excessive pressure drops across bends or fittings.

The unit should be sited to ensure minimum 'dead-leg' distances. Consider installing a secondary return for long hot water pipe runs. Please call eco hometec technical department for advice on secondary returns.

A flat and level base for the unit should be chosen, and it should also be capable of supporting the weight of the unit when full.

There should be suitable access to the unit for periodic inspection.

5. The Duotank Range

The domestic hot water is heated and stored in a stainless steel vessel, which is immersed within a primary tank – a principal known as a tank within a tank. This method provides not only exceptional efficiency, but ensures thorough and even heating of domestic hot water.

The eco hometec Duotank range of high performance hot water tanks are ideally suited for providing volume hot water for a

variety of domestic, and commercial applications.

The principal of design and the quality and type of material used, creates a product, which offers not only exceptional performance, but also with the important advantage of long-term reliability, internal hygiene and virtually maintenance free operation.

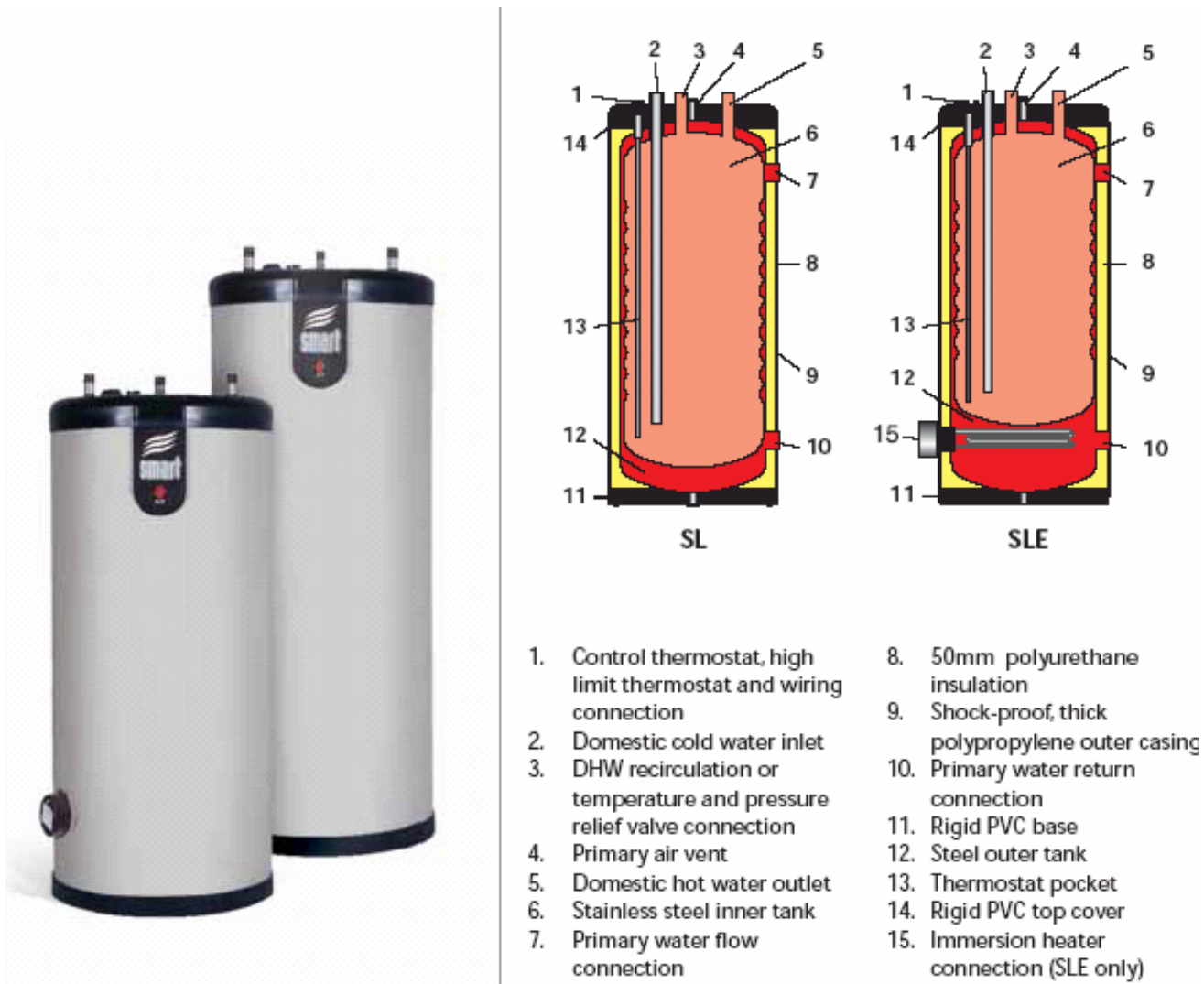
The Duotank range of hot water tanks are listed in the Water Byelaws Scheme's Water Fittings and Materials Directory and are approved for installation.

Figure 1 The Duotank Range

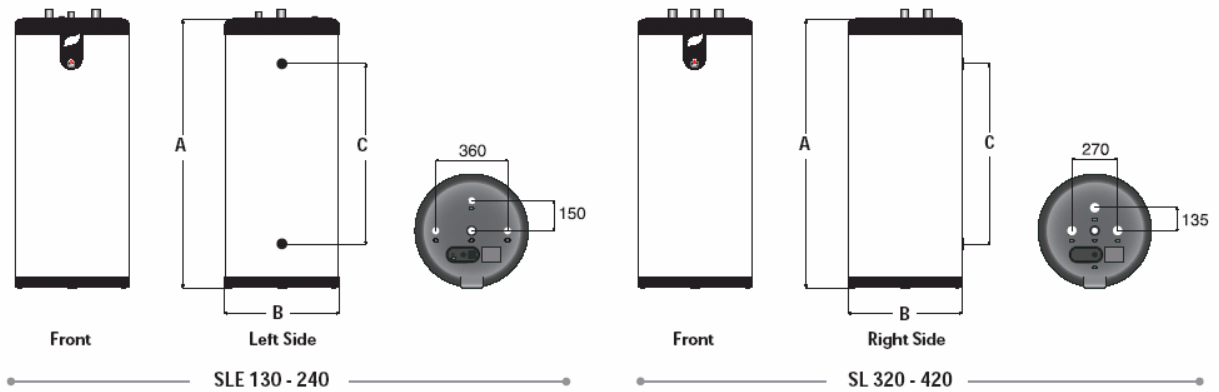


6. Duotank Features

- Utilises Duotank Tank-in-Tank technology for fast heat up and rapid recovery
- Two different models available : SLE and SL
- SLE includes 3kW immersion heater, located in the bottom of tank in the primary water
- 6 models of 130, 160, 210, and 240 litres (SLE), 320 and 420 litres (SL)
- High quality 50mm polyurethane insulation
- Low heat loss (only 8.6°C over 24 hours for the SLE240)
- Hard-wearing polypropylene finish
- Stainless steel construction - no need for sacrificial anodes
- Vented or unvented use, with mains pressure SystemPak available
- Large heating surface area means reduced boiler cycling
- Domestic or commercial use



7. Technical Specifications



Maximum Operating Pressure

Primary: 3 bar - SLE
4 bar - SL
Secondary: 10 bar

Factory Test Pressure

Primary: 4.5 bar - SLE
6.0 bar - SL
Secondary: 13 bar

Maximum Operating Temperature

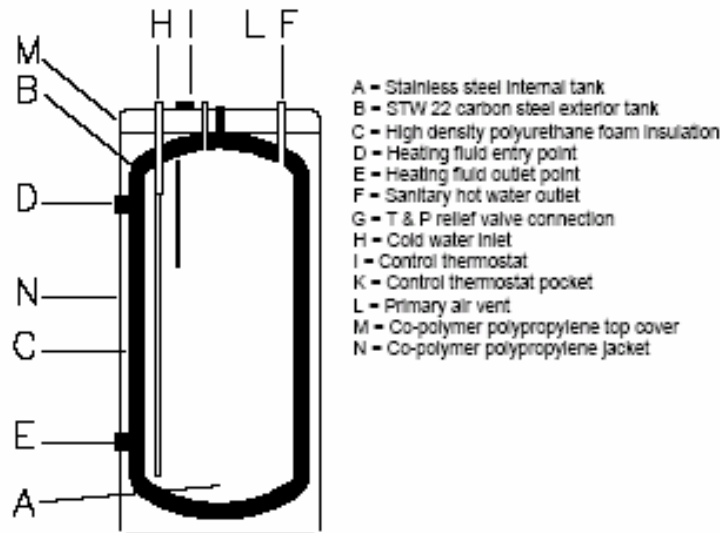
90°C

		Duo	Duo	Duo	Duo	Duo	Duo
		130	160	210	240	320	420
Total capacity	L	130	161	203	242	318	413
Primary capacity	L	55	62	77	78	55	55
Heating surface area	m ²	1.03	1.26	1.54	1.94	2.65	3.24
Primary pressure drop	mbar	17	22	37	45	90	95
Primary flow rate	L/h	2100	2600	3500	4200	6200	6400
Maximum useable input from boiler	kW	23	31	39	53	73	88.5
Primary connections (female BSP)	Ø	1"	1"	1"	1"	1½"	1½"
Hot water connections (male BSP)	Ø	1"	1"	1"	1"	1½"	1½"
Immersion heater connection	Ø	1½"	1½"	1½"	1½"	n/a	n/a
Dimensions A	mm	960	1160	1435	1680	1550	1975
Dimensions B	mm	555	555	555	555	660	660
Dimensions C	mm	525	725	997	1244	1030	1455
Weight empty	Kg	55	65	75	87	141	167
Weight full	Kg	185	226	278	329	459	580

		Duo	Duo	Duo	Duo	Duo	Duo
		130	160	210	240	320	420
Peak flow 40°C	L/10'	236	321	406	547	922	1195
Peak flow 45°C	L/10'	202	275	348	469	790	1012
Peak flow 60°C	L/10'	117	161	209	272	504	620
Peak flow 1st hour 40°C	L/60'	784	1063	1349	1820	2666	3151
Peak flow 1st hour 45°C	L/60'	672	911	1156	1560	2285	2608
Peak flow 1st hour 60°C	L/60'	384	549	689	913	1368	1513
Continuous flow 40°C	L/h	658	890	1132	1527	2093	2536
Continuous flow 45°C	L/h	564	763	970	1309	1794	2058
Continuous flow 60°C	L/h	320	465	576	769	1037	1153
Initial heat up time from 10 to 85°C	min	22	22	20	20	23	24

Note: The above performances are based on a primary flow temperature of 85°C and a domestic cold water inlet of 10°C, without the use of a thermostatic mixing valve on the domestic hot water outlet.

1. OPERATION



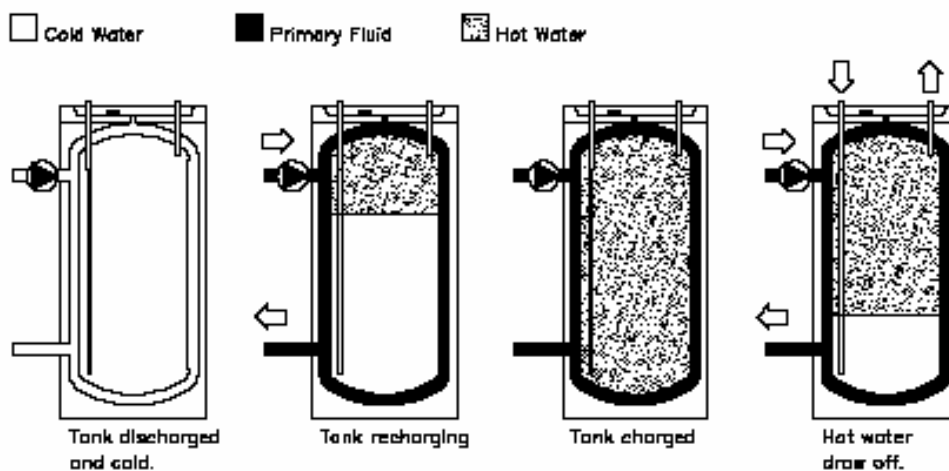
Principle:

ACV Tanks (tank in tank) comprise of two concentric water cylinders. Tank (A) is manufactured in solid stainless steel and contains the domestic water for use at the sanitary hot water outlets. The exterior tank (B) is manufactured from STW 22 carbon steel, this tank holds the primary heating fluid which is circulated from the boiler, as the primary fluid passes between the two tanks the heat is transferred to the domestic water.

Operation:

When the thermostat (I) calls for heat the primary pump is activated (or motorised valve is opened) and primary fluid is circulated in the outer tank and transfers its heat to the domestic water. Once the thermostat set temperature is achieved it will open and deactivate the primary pump (or close the motorised valve). Initial heating from cold will take between 10 and 20 minutes (depending on tank size and boiler output) – when operating temperature is achieved the recovery becomes faster.

Operational Cycle:



8. Duotank Key Points

8.1 Corrosion Resistance

The domestic hot water storage vessel is constructed from AISI 316 Ti stainless steel, which provides excellent resistance to corrosion and high temperatures. All welding is carried out in an inert atmosphere, followed by through cleaning and sand blasting to remove all oxide residues. No additional anodes are required.

8.2 High Performance

The domestic hot water vessel provides a large surface area further increased by corrugated walls and this, combined with a high interference to primary water flow between the outer and inner tank walls, creates a large and efficient heat exchanger, producing fast recovery and excellent performance.

8.3 No Stratification or Cool Zones

The principal of domestic hot water being heated and contained in a vessel, which is immersed concentrically with a primary heated vessel (tank in tank), ensures that heat is transferred into the domestic hot water leaving no cool areas.

The corrugated wall of the stainless domestic inner vessel create gentle eddy curves during heat up, causing stirring of the domestic hot water, preventing stratification, thus ensuring a through and even heating.

8.4 Self Cleaning

The corrugated walls of the domestic inner vessel allow significant flexing movement to take place, which prevents the adherence of performance reducing scale deposits.

8.5 Hygienic

The thorough and even heat working principal of the Duotank range will assist with the prevention of bacteria such as legionella within domestic hot water systems, making the product ideally suited for all applications.

8.6 Low Maintenance

The self- cleaning nature of the product plus the absence of sacrificial anodes, significantly reduces the maintenance to just a periodic check.

8.7 Guarantee

The Duotank carries a five-year guarantee on the vessel against materials or manufacturing defect.

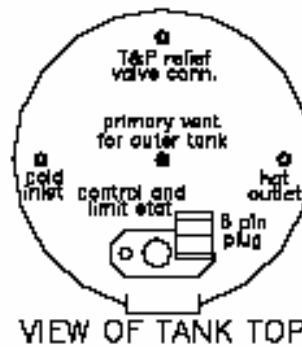
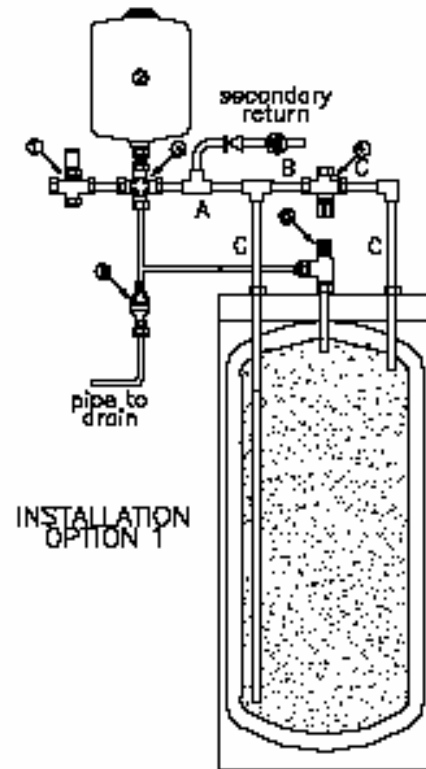
9. Specification

9.1 Vessel

The Duotank is constructed from two concentric stainless steel cylindrical tanks (no need for sacrificial anodes) with 50mm polyurethane insulation finished in a polypropylene hard-wearing jacket.

Figure 2 Mains pressure installation

Domestic:

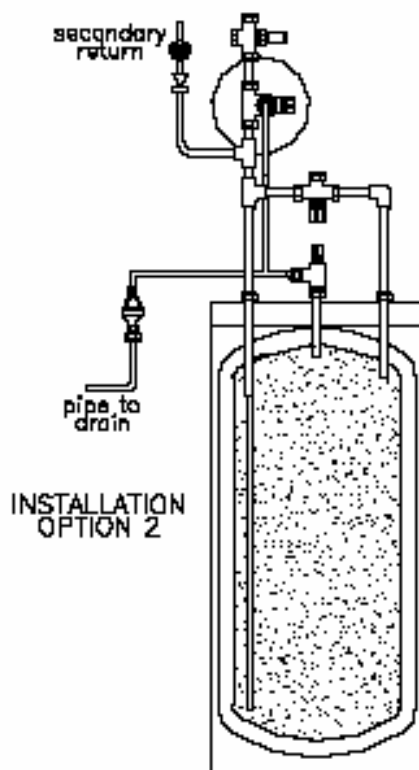


Parts List.

1. Pressure control valve 3.5bar.
 2. Expansion vessel 3.5bar.
 3. Check/Expansion valve assembly 6bar.
 4. Thermostatic mixing valve.
 5. Temperature & pressure relief valve 7bar.
 6. Tundish.
 - 1 in No. 22mm equal tee.
 - 1 in No. 22mm elbow.
 - 2 in No. 22mm x 1" FI BSP Adaptors.
 - 5 lengths 22mm Copper tube (A to C on drawing).
- Note: Secondary return pipework and fittings are not included in the kit.

Guidance for Installation.

1. Connect 22mm x 1" FI BSP adaptors to cold water inlet (blue) and hot water outlet (red) connections on tank.
 2. Assemble labelled pipework as shown on drawing ensuring mixing valve is installed correctly, cold/hot inlet ports are marked on body, i.e. hot to H cold to C outlet to MIX.
- Note:- discharge pipework to tundish is not supplied.
3. Orientate mixing valve hot water outlet to desired position and tighten.
 4. Connect Check/Expansion valve to cold water inlet pipe (A) and orientate Expansion vessel connection to suit installation.
 5. Connect Pressure Reducing Valve to Check/Expansion valve (a light smear of jointing compound to PTFE ring will ease assembly) and orientate to ensure balanced cold water take-off faces either front or rear (blank supplied if take-off is not to be used).
 6. Remove 3/4" black plastic plug from Check/Expansion valve and fit Expansion Vessel (seal with PTFE tape).
 7. Connect Temperature and Pressure relief valve to 1/2" connection and orientate into position. Do not run drain discharge pipework across top of tank.
 8. Connect both Temperature and Pressure relief valve/Expansion valve drain pipework to discharge into tundish in a visible position. Do not run drain discharge pipework across top of tank.
 9. Install Tundish outlet pipework as per Building regulation G3 (for further guidance refer to controls installation and maintenance instructions). Flush pipework and commission.



10. Wiring Requirements

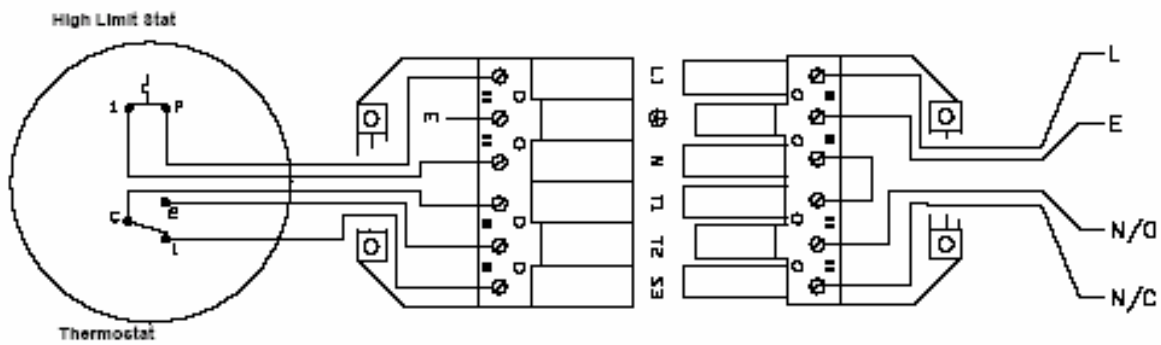
TECHNICAL AND INSTALLATION

Wiring the thermostat:

To comply with 'The Building Regulation 1991 G3.6' the manual reset high limit thermostat must be wired to a self-closing motorised valve or some other suitable device to shut off the primary flow to the cylinder.

The thermostatic controller should be used to regulate the temperature of the tank by controlling the heating pump or zone valve supplying the unit (note that a spring return valve must be connected to the high limit stat for normal operation, i.e. the valve will be energised to open by the thermostat and then spring closed when the circuit is broken). The switch wire from the pump or valve can be wired to the tank controls via the 6 pin plug. See diagram below.

Thermostat wiring schematic.



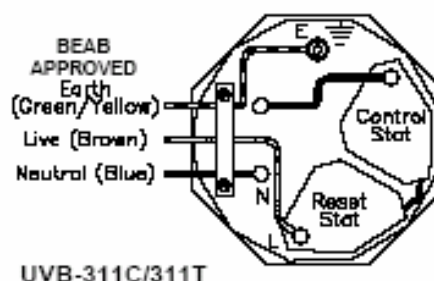
Please note N is a switched LIVE not NEUTRAL.

Immersion Heater

The SmartLineE range of tanks have the facility for fitting a 3 or 6kW immersion heater for back-up emergency use when the primary heating fails not as a permanent form of summer time heating, this heater must be wired to its own 13 Amp fused spur and as described in the installation instructions for Thermtec immersion heaters.

Installation Instructions for Thermtec Immersion Heaters Series AF, BF, CF, AD, BD, CD.

1. Ensure mains voltage corresponds to the voltage rating of the heater as shown on the rating label on the terminal cover.
2. Install the heater into the water tank, using the gasket or 'O' ring supplied (the use of sealing compounds is not recommended). Use a shaped spanner to tighten (stillsons should not be used).
3. It is essential that water fully covers the heating element to a depth of at least 100mm. Under no circumstances must the heater be permitted to run dry – serious damage may result to the heater in addition to danger of personal injury and damage to property.
4. Check for possible leakage before wiring.
5. Wire the heater in accordance with the diagram below. The heater should be wired through a double pole isolating switch or controller, having contact separation of at least 3mm using 1.5sqmm flexible cable, 85°C rubber insulated HOFR sheathed, complying with BS6141 Table 8. It must be fully earthed. Ensure all terminals are securely made, however do not use excessive force when tightening.
6. BEAB approval will only apply to this heater if rod type control thermostats Sunvic VKL or Diamond H WT and resettable thermostats Sunvic VKL or Thermtec SK are used.
7. In the event of the manually resettable cut out operating, isolate the heater from the mains, investigate and identify the cause of cut out, rectify before resetting and then re-energise the heater. Replace the terminal cover securely before reenergizing.
8. All heaters conform to EEC directive 76/889 for radio interference and comply with BS 800:1977.



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