thermo Sphere

Electric heating made easy

Combi Boiler

MADE IN BRITAIN®

Contents

General information

The ThermoSphere Electric Combi Boiler range gives you the heating and hot water adaptability to suit all types of property size and years of trouble-free service. With our Combi boilers the installer can size the heating power to suit the heat loss of the property both heating and hot water. We do not recommend reducing the power below 12kw if using for a shower.

Please follow the instructions as they will assist you in obtaining the best, trouble free performance and most economical settings for your appliance.

ATTENTION: Only qualified engineers and approved service engineers are recommended for comissioning and servicing this product. Unqualified personnel and the use of nonstandard parts can be dangerous and will invalidate the manufacturer's warranty.

Please make sure you have performed all the necessary 'Essential Installer Checks' prior to opening the packaging, as we cannot take the product back if the packaging has been opened and the boiler has been put on the wall.

The installation must be performed in accordance with current IEE Wiring Regulations, Building Regulations, Water Fitting Regulations (England and Wales) or Water Bylaws (Scotland) and all relevant British standards.

It is very important that you have read and fully understood this manual before installation of the ThermoSphere Electric Boilers to ensure their long life. This instruction manual should be kept in a place close to the appliance for easy reference. Please read the whole manual before attempting installation and follow these installation instructions and operating instruction to ensure long life of this ThermoSphere Boiler. These instructions must be conserved and given to any new user.

All ThermoSphere Electric Combi Boilers are guaranteed from manufacturing defects for a full 5 years. To ensure that you are eligible for this guarantee you must register the boiler at www.thermosphere.com within the time specified in the warranty terms and conditions. This can be found at the back of this manual and on the ThermoSphere website. The warranty relates to any manufacturing defects and covers the replacement of any faulty parts. The guarantee does not cover any damage or faults that are a consequence of poor installation or faults caused by leaks within the boiler. It is therefore very important that all connections are thoroughly checked by the installer prior to leaving it with the customer. All work that takes place under the guarantee must be agreed with ThermoSphere prior to commencing the installation.

This appliance must only be used and programmed by an authorised adult. It should not be used by children or anyone who has not read the installation manual. If in doubt, seek expert advice.

Safety

At ThermoSphere we take every precaution to design and manufacture our products to meet all safety requirements, when installed and operated according to the correct procedures. All products are comprehensively examined and tested before despatch.

Under the Consumer Protection Act 1974 it is a requirement to provide information on substances harmful or hazardous to health (COSHH Regulations 1988).

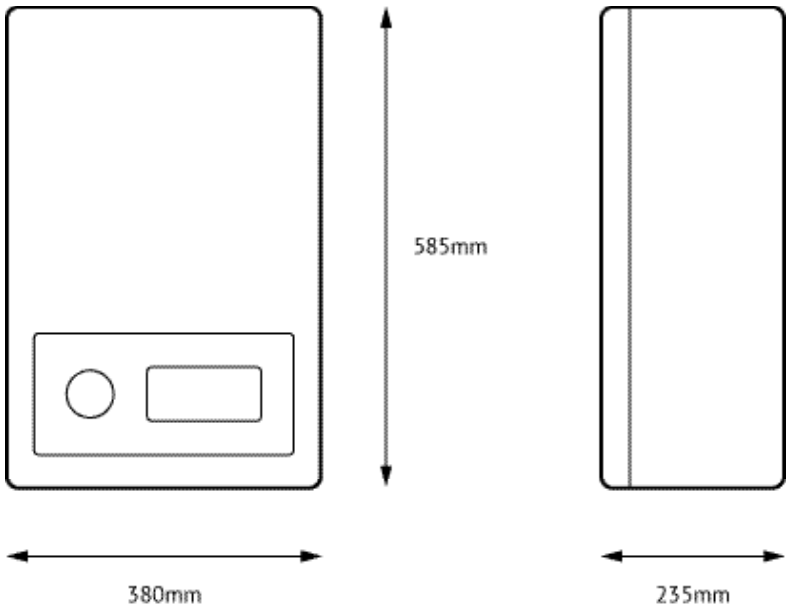
Materials used in the manufacture of this appliance are non-hazardous and do not require any special precautions when fitting or servicing this appliance.

It is the responsibility of the user or engineer to use the correct Personal Protective Equipment and Clothing when installing or working on this appliance.

Specifications

Technical data	
Code	TSFLEX14, TSFLEX 24
Heating power	14kW, 24kW
Function	Heating and hot water
IP rating	IPX1
Hot water flow rate	6, 12
Cable size required	3 x 10 mm^2 , 5 x 6 mm^2
Colour	White
Voltage	240V (14kW). 415V (24kW)
Water pressure	1-3 bar
Net weight	26 (14kW), 35 (24kW)
Gross weight	29 (14kW), 36 (24kW)
Inlet & outlet connection	G1/2
Capacity of expansion tank	5L

Dimensions



Installer checks

Carry out all heat loss calculations on the property and make sure that this boiler is suitable for the installation. ThermoSphere can assist with these calculations. Should you require this service please contact hello@thermosphere.com.	Heat loss calculation done?	☐
For combination boilers you will need to carry out a hot water calculation to ensure that the boiler has a sufficient heat output to provide the correct temperature & flow of water required for the application. This will depend on flow rate required. If you need help calculating this, please contact hello@thermosphere.com.	Hot water calculation done?	☐
Check the mains water pressure - The maximum pressure of the unit is 6 bar, where water pressure is close to or varies around the 6 bar limit, a pressure reducing set should be installed on the mains supply.	Mains water pressure check ok?	☐
Check that the power supply to the premises meets the minimum requirements of the unit being installed.	Premises power supply sufficient?	☐
Carry out a voltage and load test to determine the correct sized cable and breaker is used.	Voltage and load test done? cable size mm? breaker (AMPS)?	☐
Check the central heating design is suitable for the application (Detailed recommendations are provided in BS EN 12828 and BS EN 6700.)	System design compatible with part L of the building regulations	☐
Check that the hot water flow rate from the boiler will be sufficient for the application.	Hot water flow rate of combi boiler sufficient?	☐
When siting the boiler, consider the requirements for servicing the boiler (i.e. space around and in front of the boiler) and ensure that it is fitted in a location that can't be accessed by unauthorised/unqualified people or children.		☐
Make sure that this boiler is not installed in a shower compartment or bathroom.		☐
The boiler must be installed in an upright position.		☐
Check that the boiler will be mounted on a suitable wall that can bare the weight of the boiler.		☐
Ensure that all six fixing points are used when fixing the boiler to the wall.		☐
Please make sure you have performed all the necessary checks above prior to opening the packaging, as we cannot take the product back for a free return if the packaging has been opened.		☐
Finally, you can unpack the boiler from its packaging.		☐

Installation regulations

Installation of the boiler must comply with the following standards:

- The local building regulations.
- UK building regulations.
- BS EN 12828 - Heating systems in buildings: Design for water-based heating systems.
- BS EN 12831 - Heating systems in buildings: Method for calculation of the design heat load.
- BS EN 14336 - Heating systems in buildings: Installation and commissioning of water-based heating systems.
- BS7671 - Requirements for electrical installations. IEE Wiring Regulations. Seventeenth edition.
- BS EN 7593 - Code of practice for treatment of water in heating systems.

Unpacking and installation

These appliances can weigh up to 30kg so please be aware that you will need 2 people to manually move and unpack the appliance.

Cut the seals taking care not to penetrate inside the box otherwise this may scratch the appliance.

Fold the box lids back and remove the centre soft polystyrene packing.

With one person at either end, lift the boiler gently out of the box.

Box contents:
- Electric Boiler
- Wall mounting guide
- Expanding wall bolts

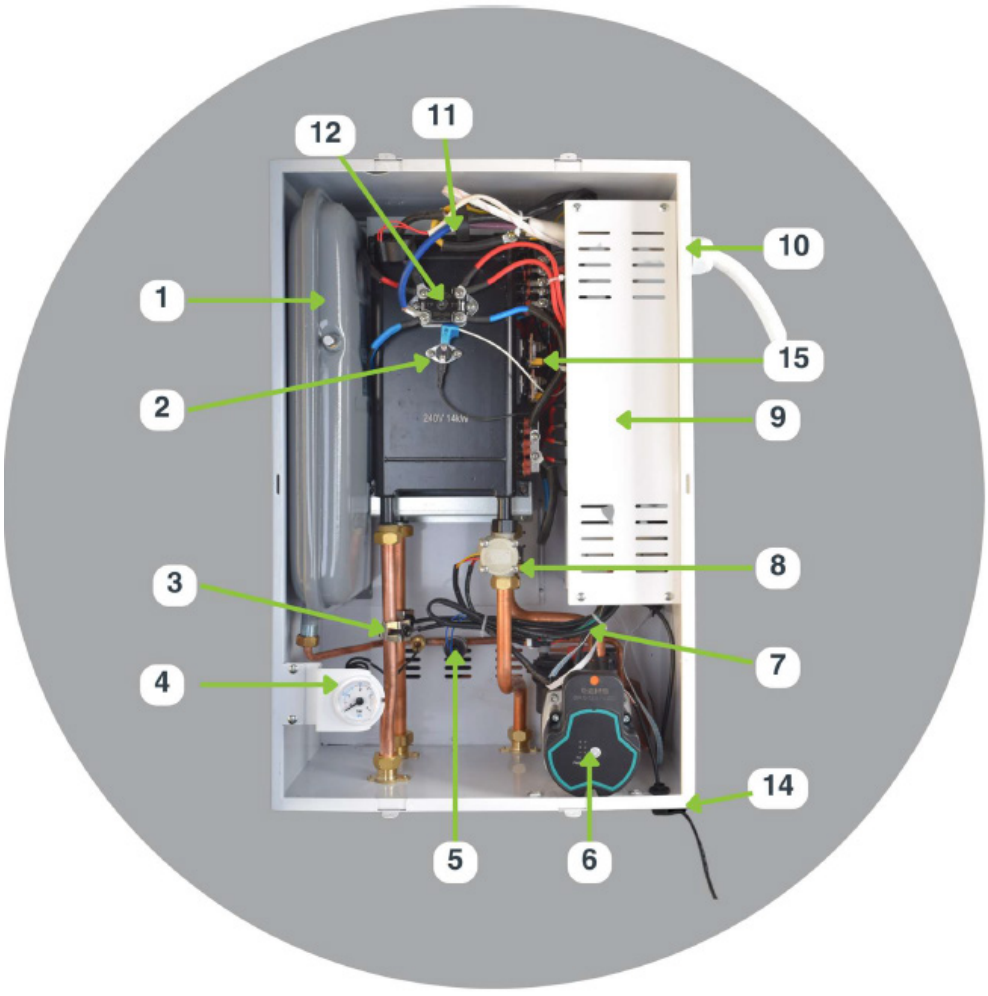
Installation kit (sold seperately)

When you purchase and install a combi boiler with a TSFLEX-KIT and register your installation you get a 2 year warranty extension.

TSFLEX-KIT includes:
- **Sentinal Vortex 250 Magnetic**
- **WRAS approved filling loop**
- **Sentinal X300 system cleaner**
- **Automatic bypass valve**
- **Sentinal X100 inhibitor**
- **EPH combi pack 4 controls**

Electric Boiler Schematics

NO.	Name
1	Expansion vessel
2	High temp sensor
3	Flow temp sensor
4	Pressure gauge
5	Pressure sensor
6	ERP pump
7	3 bar blow off valve
8	Hot water flow sensor
9	Main circuit board
10	Cable gland
11	Current sensor
12	Thermal reset switch
13	Display board (front)
14	0 volt thermostat connection
15	SCR boards for hot water control



Installing the boiler

Positioning and wall mounting the boiler

IMPORTANT:

When choosing a location to mount the boiler it is important that you consider clearance, servicing of the boiler, and safe operation.

The boiler should be fitted out of the reach of children or protected against people without the right skills and qualifications (there is a lock that can be set on the boiler). If there is the possibility that the boiler could be opened without first isolating the electrical supply then you must install it in a fashion that prevents access to the boiler, such as a lockable cupboard.

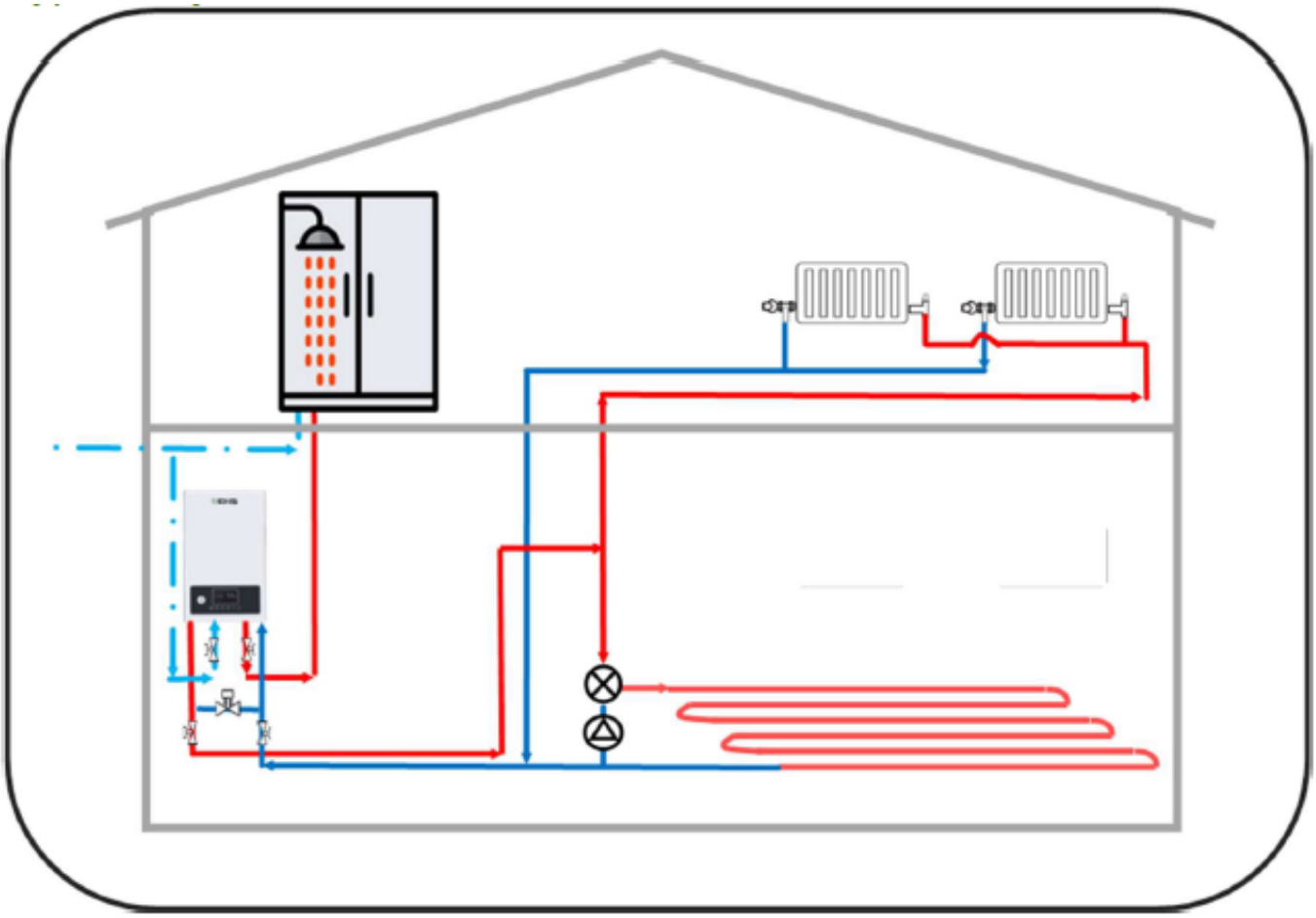
The wall that you choose to mount this boiler on should be strong enough to support the boiler when full.

ThermoSphere recommend at least 100mm clearance from all fixed obstructions on all sides of the boiler. Allow plenty of space at the base of the boiler for fitting the hot and cold-water pipes and isolation valves.

1. Drill 5 holes as per the included wall mounting diagram. The upper 3 holes should be Ø8mm diameter, and the lower 2 holes Ø6mm.
2. Secure the 3 Ø8mm expansion bolts into the top three holes.
3. Hang the boiler from the top three bolts before securing the boiler to the wall using standard fastenings at the bottom. Screw 3 x screws into 3 upper expansion screw bolts.
4. Hang the boiler on the 3 fixed screws. Then drill 2 screws into 2 under expansion screws

Installing the boiler - Layout

Typical layout for combination boiler



The layout illustrated above is for guidance only. Please ensure that the boiler is fitted by a qualified plumber in line with current legislation.

System plumbing layout design

Design considerations

As for a system boiler, it must be installed by a qualified heating engineer and a qualified electrician. The installation must be designed to meet the current building and Iee regulations. ThermoSphere Limited are not responsible for faulty installations or installations that are undertaken by unqualified people.

14kw Combi boilers are suitable for properties with a single shower. We do not recommend them for properties with baths as the flowrates of approx. 6ltr/min will not suffice to fill a bath quickly enough.

24kw 3 Phase Combi Boilers are suitable for properties with baths but not many properties in the UK have a 3 Phase supply.

A property with a bath would ideally have a system boiler and a hot water cylinder.

HEATING SYSTEM – The heating system should be designed as per the SYSTEM BOILER Layout design in the previous chapter.

FLOW RESTRICTION - The Flex combi boilers have a heat exchanger with a maximum power of 14kW to heat the hot water. As the boilers are range rateable the maximum power can be adjusted lower to suit the requirements. We do not recommend it being adjusted any lower than 12kw if you have a shower in the property. At full power of 14kw the boiler will raise the temperature of the incoming water by 30°C at a flow rate of 6.5 litres per minute. This means that the flowrate of the incoming mains must be restricted to between 5 and 6 litres per minute to ensure that it delivers water hot enough for showers (39°C is a normal shower temp) when the incoming mains temp is low.

The best way to restrict the flow of water to the boiler is with a set flow restrictor of 5 or 6 litres per minute. We supply a 5l/min flow restrictor with our Installers kit that ensures there is always hot water even on the coldest days.

Flush and fill boiler

Flushing - The primary Heating circuit must be flushed according to BS7593. The system must be flushed with 10% of mains PPM or lower to ensure there is no debris trapped in the heating system, which would be detrimental to the lifespan of the boiler.

Heating system fill - A WRAS approved filling loop must be used in such a way that it never becomes a permanent connection between the mains water and the heating system.

Proceed as below:

1. Open the isolation valves that you have fitted to the flow and return of the heating system near the boiler.
2. Connect the filling loop.
3. Open filling loop so that it fills through the boiler (to remove air from the boiler) and fill the system slowly checking for leaks on the connections as you do. Fill until the pressure on the pressure gauge reads between 1 and 1.5bar, then close the filling loop connection.
4. Vent the air out of the system and repeat the stage above
5. Check the system (including the inside of the boiler) for leaks. Please allow at least an hour of normal operation to confirm all fittings are leak free.
6. Where the boiler is the highest point in a system, it is a good idea to fit a vertical automatic air vent (AAV) on a horizontal return pipe from the heating system and possibly even a drain valve on the flow side of the boiler so that the boiler can be flushed through to remove air from the heat exchanger.

Electrical connections

All electrical connections to the boiler must be made by a fully qualified electrician. Improper electrical connections made by unqualified people may cause failure of critical components of the boiler and will invalidate the warranty.

DANGER! Electric Shock Risk

Make sure to isolate the main power supply before starting work inside the boiler. Secure the main energy supply to prevent from turning on while working on the boiler.

!! IMPORTANT NOTICE !!

UNDER NO CIRCUMSTANCES MUST THIS BOILER BE CONNECTED TO THE MAINS POWER WHILST THE BOILER IS DRY. THE BOILER MUST BE FILLED WITH WATER AND PRESSURE TESTED PRIOR TO ELECTRICAL CONNECTION. FAILURE TO DO SO WILL INVALIDATE THE WARRANTY

Electricity connection precautions

We recommend that a voltage and load check is carried out when installing electric boilers. All electrical connections must be made by a fully qualified electrician. All wiring must be carried out in accordance with current IEE BS7671 wiring regulations. The supply cable to the boiler should be of sufficient size to carry the load capacity required. We recommend a high temperature multi strand flexible cable.

Rated Boiler Output	7kW	9kW	12kW	14kW
Single/Three Phase	Single	Single	Single	Single
Rated Voltage	230VAC	230VAC	230VAC	230VAC
Current (A) @ Rated Volatage	26	34	52	61
Minimum MCB/RCB (A)	32	40	63	63
Minimum Cable Size (mm^2)	6	6	10	10

An upgrade to the main fuse of the property may be required. As well as the boiler being properly earthed, this appliance requires supplementary earth bonding across all pipes connected to the boiler.

Surge protection devices must be installed within the installation in-line with regulation 443 of BS7671. We recommend fitting an appropriately sized external RCD near to the boiler.

Electrical supply connections

There is a 650mm cable supplied with the boiler. The connections are already made within the boiler so there is no need to remove the cover to connect to the mains supply. We recommend fitting an appropriately sized RCD next to the boiler so that it can be easily isolated if any work needs to be completed inside the boiler.

Thermostat connections

The boiler cannot control external temperature and therefore an external thermostat and programmer should be used to control the boiler to schedule the hot water and heating. This is a ZERO VOLT connection, so DO NOT connect any power to the thermostat cable from the boiler.

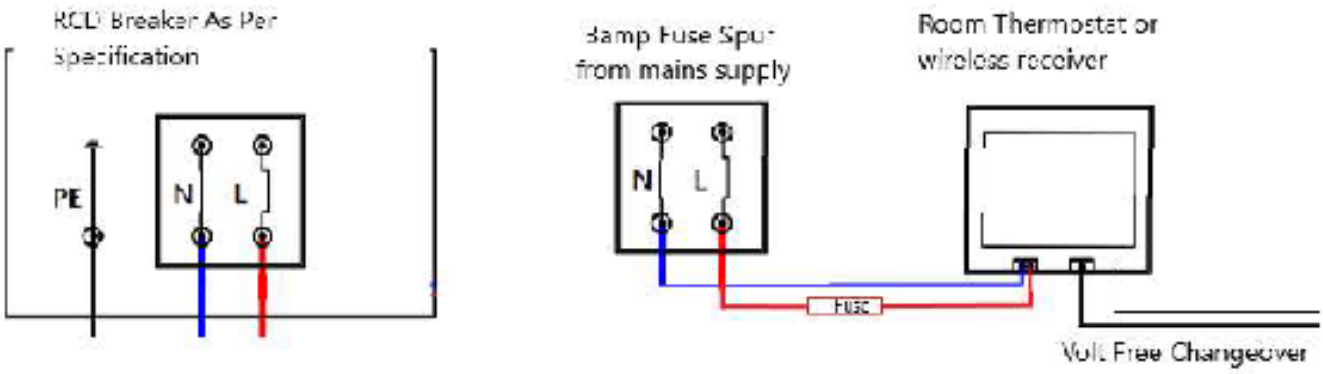
Thermostats can be fitted as a single programable thermostat or as an individual programmer and thermostat.

Thermostats must be fitted by a competent person, and installation must comply with the guidance provided in the current editions of BS767 (IEE wiring regulations) and part "P" of the building regulations.

There is a 230V 3amp Auxiliary live supply available within the boiler or the thermostat can be supplied by and external fused spur with either a 6amp or 3amp fuse depending on your thermostat.

Please see wiring diagrams and pictures in appendix for the boiler auxiliary supply and typical wiring centre connections for S Plan system.

The Zero volt thermostat connection to the boiler is provided externally on the bottom right of the boiler. Do Not supply any power to this connection.



Powering on the boiler and setting the parameters

Before any power is turned on to the boiler it is important that it is checked for any loose connections. Check all connections including the factory-made ones as these can come loose in transit.

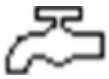
Prior to turning the boiler on for the first time, please make sure you have completed the following:

- All steps in the manual so far have been completed as instructed. The boiler must have been filled with water and isolating valves must be in the open position.
- The boiler casing is closed and secured.
- Set the thermostat to the off position or lowest possible temperature.
- By activating the appropriate RCD breaker in the consumer unit (or preferably next to the boiler) external to the boiler, this will put the boiler into standby mode. Don't press the power on button yet but leave it in standby mode until the system parameters can be configured.

Operating functions

Icon	Description	Function
	On/Off	Press and hold for 3s to turn on/ turn off. In the 'Engineer Codes' setting state, it isused as the confirm and exit key. Press to clear the fault state.
	Ok/Enter	When in parameter setting, this switches from the parameter to the data values When in timer setting, this switches between "mins" and "hours". Hold press 5s to reset boiler in error state.
	Mode	Toggles between Winter and Summer Modes.
	Up	When temperature is flashing, press and hold for 3s to quickly adjust the temperature of the heating outlet water up.
	Time	Hold press to enter the timing setting.
	Down	Hold press 3s to quickly adjust the temperature of the heating outlet water down Short press to set temperature.

Screen symbols description

Symbol	Description	Symbol	Description
	When Lit means boiler is in Winter Mode Heating and Hot Water are active. Flashing means entering frost protection state.		Radiator central heating mode. Temp 30-80°C.
	When lit the boiler is in summer mode i.e. no heating, hot water only.		Underfloor heating mode. Temp 30-60°C.
	Timer heating.		Error mode - error code should be visible.
	Pump working.		Current time.
	Flame and semicircle are lit when the boilers heating elements are on and heating the water.		Displays the current heating water temperature under normal conditions. When adjusting the temperatures it will show the set temperature but revert to the actual tempearture.
	Hot water flow rate.		24hr timer.
	When lit: No call for heating (the room thermostat is off, or there is no call for heat or it is not connected). When not lit : Call for heat from thermostat or thermostat wires are linked together to force the boiler to fire.		Hot water mode is activated. This signals that the flow sensor is working and is measuring a flow above 3l/m in the hot water circuit. This activates the Hot water to fire (Combi boiler only).
	Days of the week.		Frost protection mode.
	Boiler lock - when lit the boiler controls will not work. Press tick button to remove lock.		

Key operating instructions

Call us on 01622689440 or email support@thermosphere.com for power rating adjustment instructions.

To set and remove the boiler child lock

When the boiler Lock symbol is showing, the boiler cannot be operated via the control panel until the lock is removed. This can be set and removed by pressing the up or down buttons at the same time until LP OF shows where the digital clock is. Press the TICK button until OF is flashing. Press up to button to change to on. Do the same to turn off.

Purge air out of the heating system

With the boiler in standby mode (OF should be showing on the main screen) press and hold the ON/OFF button and the Menu button together for 3 seconds. The pump symbol should be lit showing that the pump is running. Run the pump for 20 mins to clear the air from the system. If F6 shows you have NO FLOW in the heating system which is usually caused by a closed valve or an airlock. Vent all radiators and refill the system.

Limiting the maximum power used on heating

Our boilers are supplied with a Maximum heating output of 14kW at 230°V for the single phase boilers and 24kW for the 3 phase boilers. The output can be rated below this maximum to match the heat load required at the property in order to reduce cycling and save money. Output must only be rated by a professional electrican.

Rated boiler output	2.3kW	4.6kW	7kW	9.3kW	11.7kW	14kW
Single / three phase	Single	Single	Single	Single	Single	Single
Rated voltage	230VAC	230VAC	230VAC	230VAC	230VAC	230VAC
Current (A) @ rated voltage	10.4	20.9	31	42	52.2	62.6
Minimum MCB/RCB (A)	32	32	32	50	63	63
Minimum cable size (mm^2)	2.5	4	6	10	10	10

Limiting the maximum power used on hot water

The maximum power used for the hot water can be limited down. We don't recommend lowering the power past 12kw for properties with showers due to flow rate restrictions or 10kw for properties with just wash hand basins. Ensure the boiler thermostat wires are apart and there is no call for heat or hot water. Output must only be rated by a professional electrican.

Rated boiler output	2.3kW	4.6kW	7kW	9.3kW	11.7kW	14kW
Boiler UH parameter setting	01	02	03	04	05	06
Single / three phase	Single	Single	Single	Single	Single	Single
Rated voltage	230VAC	230VAC	230VAC	230VAC	230VAC	230VAC
Current (A) @ rated voltage	10.4	20.9	31	42	52.2	62.6
Minimum MCB/RCB (A)	32	32	32	50	63	63
Minimum cable size (mm^2)	2.5	4	6	10	10	10

Key operating instructions continued

Setting the time

Turn on the boiler. Temperature should be solid and not flashing, Press up and hold for 3s to enter the timer setting .You should see the hours flashing on the clock. Adjust the hours by pressing up or down as required, Press OK/ENTER to switch between 'min - hour – day of week", press UP/DOWN to adjust each accordingly. After the setting is completed, it will automatically save and exit after 10s, or press the power button to save and exit.

Setting the 24hr timer

We do not recommend using the boilers internal timer as this will confuse any programmable room thermostat that is fitted to the heating system, If, however, you have a system that does not need an external thermostat, then you can use the boilers own internal clock to control when the boiler is ON and when it is OFF. This function does not have separate controls for hot water and heating and will still be dependent on a control on the thermostat to demand heat.

Switch the boiler on. Press the timer key until the hour timer starts flashing. Press up and down to choose the hour (01 is 1am etc). Press the OK/ENTER and then set ON or OF by pressing the up and down keys. Once you have set your timing schedule press to save the settings.

Switch on heating (winter mode)

Ensure you have between 1-1.5bar of pressure on the central heating system pressure dial, on the main panel and you have purged the heating system of air (as above). Turn the boiler on by pressing the ON/OFF button for 3 seconds.

A temperature will appear on the front panel. This is the current heating flow temperature that the boiler is measuring. Switch between winter (Heating and Hot Water) and summer (Hot water Only) modes by pressing .

For heating the boiler must be in winter mode . When this is lit and there is a demand for heat, the pump will start running . The boiler will now check for flow in the heating system before firing the heating elements. If there is no flow in the heating system an F6 error will occur. Please check the system for closed vales, airlocks and vent all radiators again. When the boiler senses flow and confirms the current flow temperature is below the set temperature the heating elements will be powered on and the heating symbol will start working. The boiler will show the current flow water temperature . The target or set flow temperature can be changed by pressing either the up or the down keys.

If you want to stop the heating then you can turn the boiler off but this will also stop the Hot water. It would be better to put the boiler into summer mode.

Underfloor heating mode is accessed via the engineers control panel. When the boiler is in underfloor heating mode the temperature is set between 30 and 60°C. When the boiler is set in radiator mode the heating system can operate between 30 and 80°C. To enter the engineers panel press the button 8 times. - CS 01 will show – this is the under floor or radiator system setting. CS will be flashing. Press button again and it will move so the 01 is flashing. Press up or the down keys to toggle between 01 and 00. You should see the symbol and the symbol change at the same time. Once set press to save the setting.

Frost protection function

First level of frost protection - When the boiler is off but there is still power to it, it monitors the internal temperature. If this drops between 6C≤X≤10°C, the boiler will enter the first-level frost protection state and the water pump will turn on, until the heating outlet temp.≥11°C. After that the pump continues to run for 1min and it will exit the first-level frost protection.

Second level of frost protection - If the first level of frost protection does not work and the temperature drops between 2°C≤X≤5°C, the boiler will enter the second-level of frost protection where the system turns on the power to control the heat exchanger, when there is no fault until the heating outlet temp≥15°C . After the heating system continues to heat for 1min, it will exit the secondary frost protection state.

Set pump speed and purge air

The boiler should still be in standby mode.

Please check the following before proceeding:

- The boiler parameters have been set as detailed on pg. 12.
- The air vent on the pump is open (dust cap is moving freely).
- Set the pump to speed 1.

Turn on the boiler

Press and hold the power button until the boiler bleeps and exits standby mode. The front panel should now be showing a flashing thermostat symbol (if you have set your thermostat to off or its lowest setting) and signals that the thermostat is not demanding any heating.

Set the thermostat

Turn the thermostat on and set to a temperature that would require heat. The thermostat symbol should now be solidly lit. The pump will start and a few seconds later the ignition symbol will appear lit on the boiler display showing that the boiler has started to heat the water.

Purge air from the system

With the pump running start to purge all air from the system by bleeding all radiators and air vents. Once bled the system should run with very little noise coming from the boiler or pump.

Set pump speed

Set this by adjusting the pump speed to achieve a 15 ~ 20°C differential between the flow and return temperatures.

Set automatic bypass valve (ABV)

Set all TRVs to the open position (i.e. maximum temp). Now set the ABV to 'just closed'. To confirm this is correctly set, close one of the TRV's and that should allow a small amount of flow past the ABV.

Check system pressure and top up as required

The system pressure should be set to between 1-1.5 Bar. Once this is set disconnect the filling loop and ensure that all connections are capped to avoid leaks.

Set domestic hot water flow & temperature

In order to get hot water from the combination boiler at the required temperature you must set the flow rate of the cold water coming into the boiler. This should be done by installing a flow restricting valve to the cold water supply for the boiler. The recommended flow rate is 5lPM. The flow rate is based on a 30°C rise in temperature of incoming to outgoing water.

To set the hot water temperature

1. Open a hot tap and let it run.
2. With the hot water tap open and running the temperature of the hot water outlet can now be set on the boiler by using the up and down button. The temperature cannot be adjusted without a hot tap being open. Remember this setting does not guarantee the output, it only sets the maximum possible output, the output temperature will rely on the flow rate going into the boiler as above.
3. Adjust the flow rate of the incoming cold water until the desired hot water temperature is acheived.

Final installation checks

Finally check heating and hot water is working correctly.

Heating check

1. Turn the thermostat to a temperature to 5 degrees above current room temperature and check that the boiler starts heating the pump runs. This is confirmed by the ignition symbol, temperature symbol, pump symbol being solidly lit.
2. Let the boiler run for a few minutes and then check that the radiators are starting to heat up.
3. After 15 minutes check the temperature difference between the flow and return is between 15 to 20°C. If not adjust pump speed accordingly.
4. Wait until the thermostat reaches the set temperature and deactivates the boiler. The pump will stop after a short run on period.
5. Again set the thermostat another 5 degrees higher and wait for a few minutes to check that the boiler successfully starts heating again.
6. If it does, the testing is complete. Set the thermostat to normal operating temperature.

Common heating start up issues

If the pump symbol does not come on when your thermostat is calling for heat, firstly check that it is in winter mode (and not summer mode) and check you have the correct zero-volt connections on the boiler wire in the thermostat receiver. To check, remove the boiler thermostat cable from the receiver and twist the two wires together. This will force the boiler to fire. If the pump comes on you have the wrong connections in the thermostat. Please read the manufacturer's instructions.

If the pump continues to cycle and then gives an F6 error, the boiler is protecting itself as it is not detecting any flow in the heating system. This is generally caused by air locks, a closed isolation valve or no ABV (automatic bypass valve) being fitted.

Hot water check

1. Open a hot water tap and ensure that the boiler starts heating.
2. Give the boiler a few minutes to reach temperature.
3. Check that the tap is outputting water at the correct temperature.
4. Close the hot water taps to complete testing.

Common hot water start up issues

Water not hot enough – In this case the water flow to the boiler is too high. Reduce water flow to the boiler as detailed in above in hot water

Shower temperature fluctuating to cold and back on – In this case the cold water flow rate is too high on the cold side of the shower or the set temp of the hot water is too high. Reduce hot water set temp and try again. Also try reducing the flow rate of the cold side to the shower.

Plumber's checklist

Company name						
Plumber's name						
Company address						
Company telephone						
Date of installation			Product code			
Was this an existing install or a new install?	Existing	☐	New install			☐
How many heating zones are installed?	1	☐	2	☐	3+	☐
Has the filling loop been removed & capped off?	Yes	☐	No	☐		☐
Was an ABV fitted? At what setting?	Yes	☐	No		Setting	☐
What is the heating pressure set at?	Bar					
What is the incoming mains pressure?	Bar					
What has the boiler flow temperature been set at?	°C					
What has the boiler differential temperature been set at?	°C					
What pump speed has been set on the boiler?						

What is the inoming cold water temp (°C) ?

What is the flow rate ta the hot outlet (LPM) ?

Notes:

By signing you agree that you have installed the boiler in accordance with this manual and that the boiler is working as intended without any leaks and all installer made and factory-made connections have been checked.

SIGNED:..... **DATE:**.....

Electrican's checklist

Company name	
Electrican's name	
Company address	
Company telephone	
Date of installation	
What is the incoming mains voltage at the fuse board?	VAC
What is the incoming mains voltage at the appliance?	VAC
What size breaker has been fitted for the boiler?	AMPS
What is the draw of the appliance for heating?	AMPS
What is the draw of the appliance for hot water?	AMPS
What size cable was installed to the appliance?	mm^2
What is the approximate cable run to the boiler?	m
What type of cable has been used?	

Notes:

By signing you agree that you have connected to the electrical supply, the boiler in accordance with this manual and that the boiler is working as intended and factory-made connections have been checked.

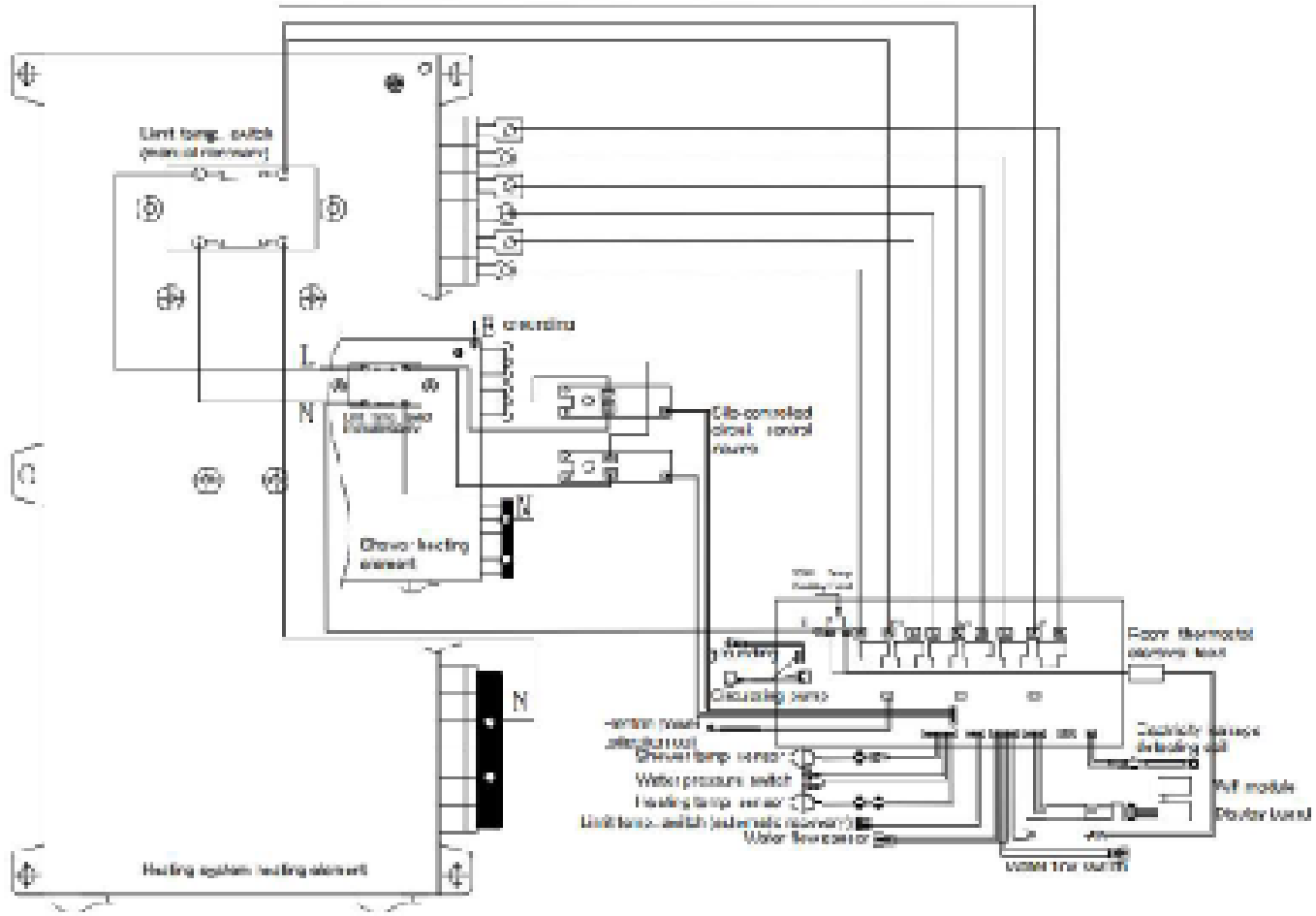
SIGNED:..... **DATE:**.....

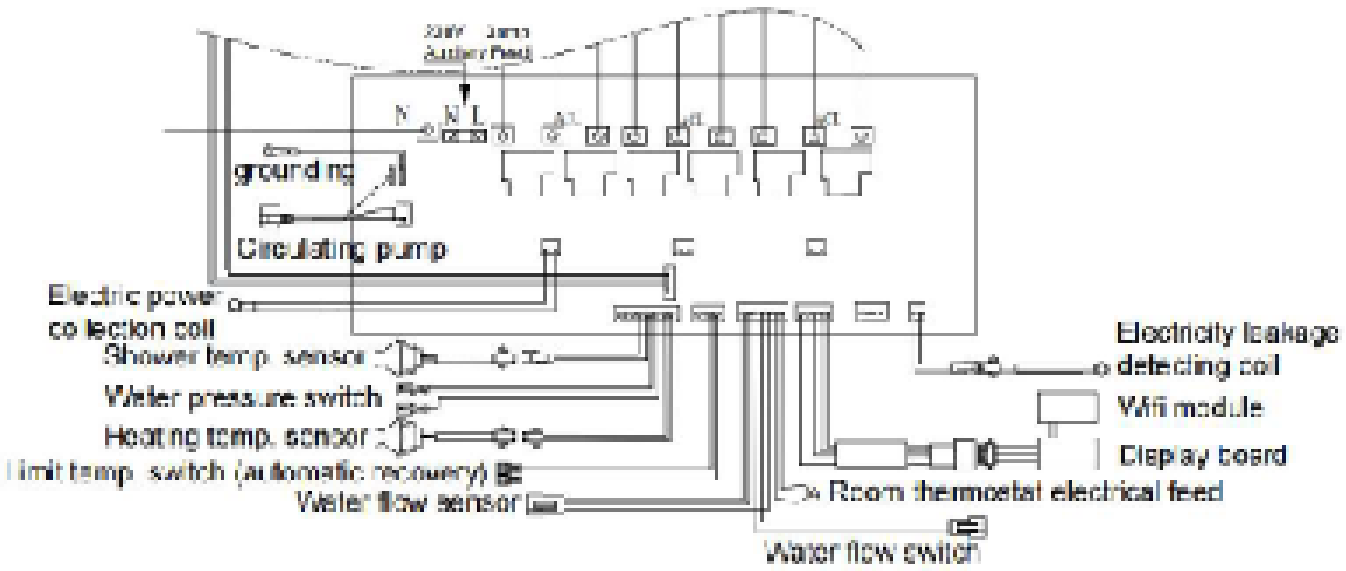
Troubleshooting

Error code	Protection function	Potential cause	Potential solution
E2	Electric leakage on system	Check whether the external power supply has leakage or whether there is condensation or water leakage on the main circuit board.	1. Switch off the boiler. 2. Qualified engineer to open cover and dry/inspect circuit board.
E3	Heating water temperature sensor broken/loose	Sensor is in short circuit or open circuit.	1. Check if the sensor connection is loose or not. 2. If broken contact ThermoSphere customer service to replace sensor.
E5	Domestic hot water temperature sensor broken	Sensor is in short circuit or open circuit.	1. Check if the sensor connection is loose or not. 2. If broken contact ThermoSphere customer service to replace sensor.
E9	Antifreeze fault	Heating water temperature is too low.	1. If the heating pipework is frozen, the boiler will not be able to work. 2. Clean pipeline, refill the water then switch on.
EC	Display disconnected from PCB	Display disconnected from PCB.	1. Check whether the connection between the cable and the PCB is broken or loosen. 2. If broken contact ThermoSphere customer service to replace cable/PCB.
F1	Heat exchanger temperature sensor is reading over 90°C or is in open circuit (broken/disconnected). Heating is immediately stopped until exchanger has cooled.	Very low water flow in heat exchanger. Air trapped in heat exchanger. Airlock in heating system. Broken wire on sensor.	1. Check whether the water flow circuit is ok or not. 2. Check ABV is fitted correctly 3. Check Isolating valves are open. 4. Fill system and vent all high areas 5. Fit auto vents in potential airtrap areas 6. Press and hold ⏲ key for 6 seconds to reset
F2	Heat too fast error	If rises ≥ 15°C in 3s continuously	1. Pipe blocked, the heat can't take away due to reduced water flow. **Solution**: clear pipeline blockage 2. Pump block or stuck. 3. The "DU" parameter too low
F4	Water pressure fault	System is low on water	1. Fill to correct pressure with filling loop 2. Check whether the water pressure of the system drops and check for leaks. 3. Check whether the pressure switch is blocked, or it has fault.
E6	Neutral wires not well connected	No heating	1. Check whether the neutral wire of the machine has false connection. 2. Check whether the neutral wire end of the leakage protection switch is damaged. 3. Measure whether the voltage between the neutral wire and the live wire is 220 v. 4.Contact the customer after sales to replace the motherboard.

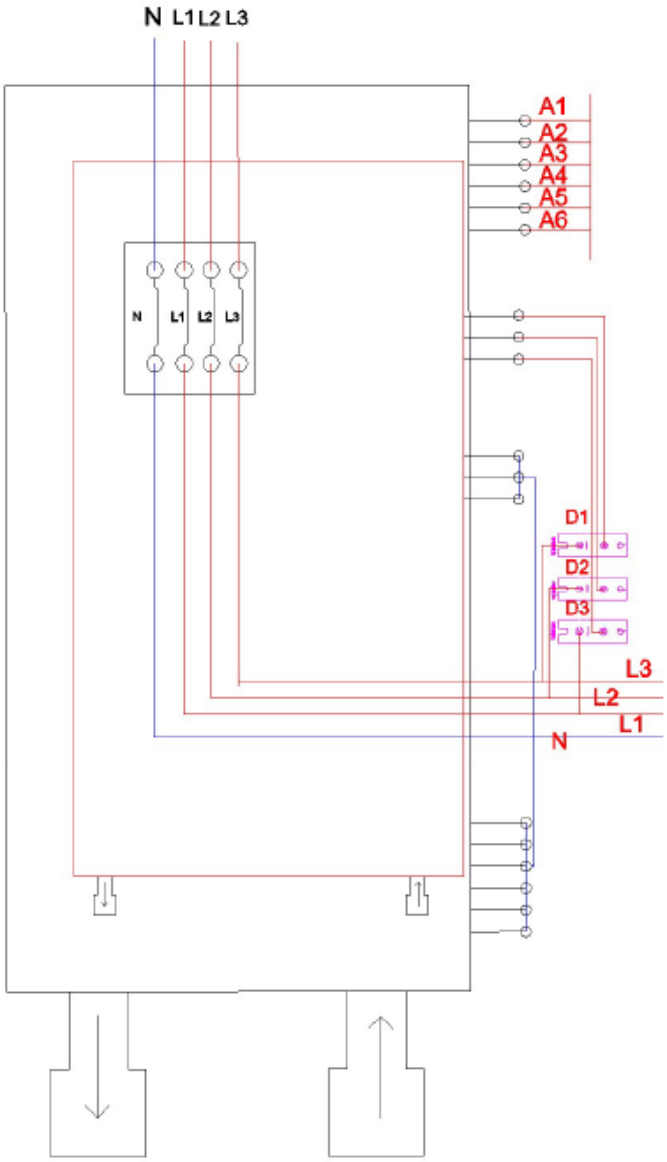
Error Code	Protection Function	Potential Cause	Potential Solution
No power on display screen	Thermal Trip on heating system heat exchanger activated. (Heat exchanger has reached 110C and bi-metallic thermal trip has activated).	Low or no water flow in the heating system. Before resetting the trip, solve the problem.	1. Has the automatic bypass valve been fitted correctly and does it point from flow to return? 2. Check all system filters and clean. 3. Vent the system and install automatic air. vents in the highest points of the return system. 4. Check the flow of water pump.
No power on display screen	External leakage protector tripped	1. Incorrect trip switch installed or loose connection in trip switch or wrong size cable used	Get an electrician to check the system for correct installation and fault find.
	No heating	Equipment temperature does NOT rise.	1. Water temperature setting too low. 2. Differential temperature set too high. 3. Timing and opening. 4. Indoor temperature controller setting incorrect or set too low.
	No heating	Thermal trip on heat exchanger activated or flow too low or faulty flow sensor or flow too high.	1. Electrician to check thermal trip 2. Installer to check wiring and connections are good for Flow sensor 3. Check flow is set to 6litres per minute

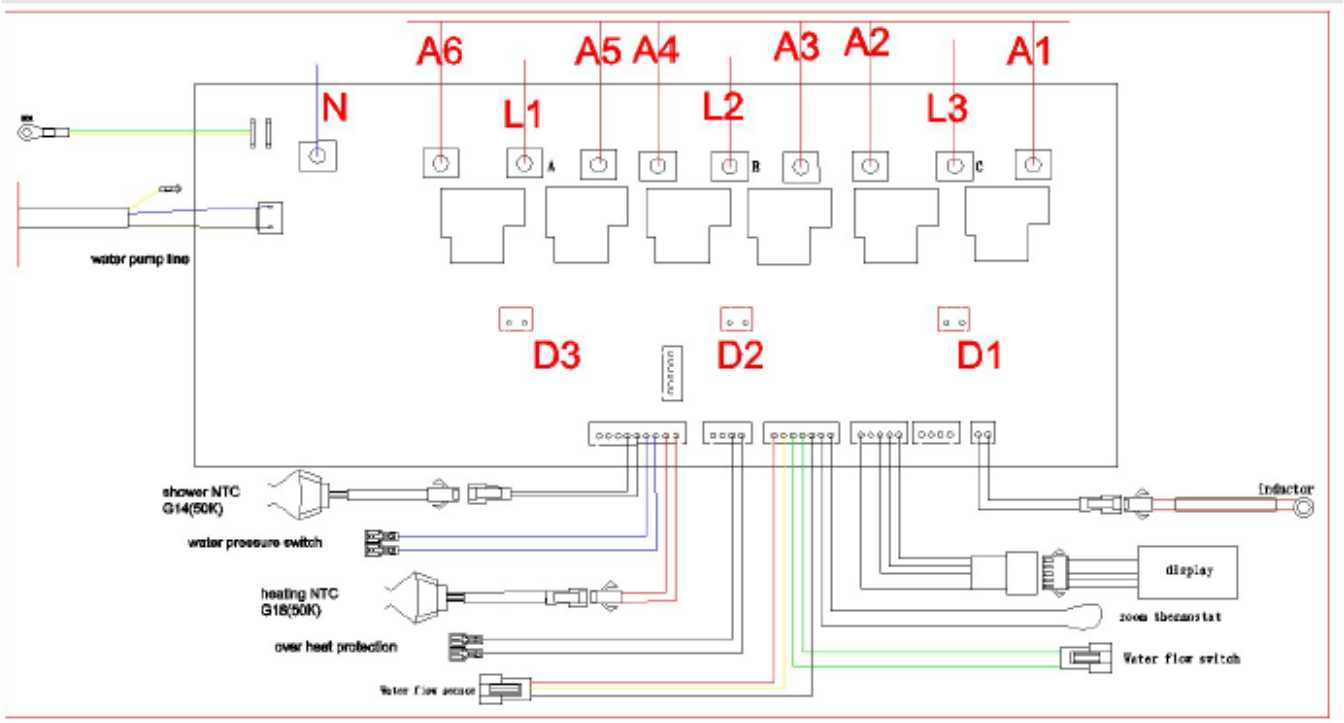
Electrical circuit diagrams





Wiring diagram





Boiler maintenance

Electric combi boilers do not require regular maintenance like a gas boiler, other than the following:

The heating system must be filled and maintained when the water is cold, between a pressure of 1 – 3 Bar. Frequent refilling of the system can cause scaling, corrosion and damage to a heating system and should be avoided wherever possible. Regular pressure loss could be indicative of a leak within the system and should be investigated.

UNDER NO CIRCUMSTANCES SHOULD THE BOILER BE SWITCHED ON WHEN THE SYSTEM IS DRY.

The boiler contains an installed frost-protection program. For this to operate, power must be always supplied to the boiler.

Anti-freeze can be added to the heating system (no more than 20% by volume) if the boiler is going to be stood unused for long periods of time. Otherwise, the boiler must be disconnected from the electricity supply and the system fully drained to avoid any frost damage.

Heating cirucits must be dilated with an inhibitor. Follow manufacturer guidelines.

Warranty information

All ThermoSphere products are supplied in accordance with standard Terms & Conditions (available on request or via our website). This Policy also applies in addition to our terms and conditions to any ThermoSphere Electric Boilers and by fitting this product you are agreeing to be bound by these Terms & Conditions and this Policy. This Policy sets out the Warranty Period and exclusions which apply to Electric Boilers, for other products please see our website or their corresponding manuals. This Policy is subject to our Standard Terms and Conditions and should be read in conjunction with those terms. We reserve the right to amend this policy at any time.

Warranty details

Warranty and liabilities

The installer must be suitably qualified to install products and all Commissioning Sheets & Annual Servicing Sheets required to be made available to us when requested.

The product must be installed as per the installation instructions.

The warranty must be registered with ThermoSphere by either the Installer or the Householder, within 30 days of the boiler being installed. Failure to do so will reset the Warranty Period to 1 Year for Parts and Labour only.

For products registered within the stated time frame, the 5 Year Warranty will compromise of 2 Years Parts and Labour with a further 3 years Parts only.

To comply with our warranty terms the product must be serviced each year as outlined in the product installation manual. The service must be carried out by a suitably qualified engineer and a record of that service kept by the owner. The service can be within a 30 day period of the anniversary of the last service, without invalidating the warranty.

If the service is not carried out in accordance with the guidelines within the product installation manual, the warranty cover will become void.

During the warranty period, we will replace parts which were faulty from the date of purchase, at our discretion free of charge. Reasonable Labour costs will only be paid where the value has been pre-agreed and authorised by ThermoSphere prior to the repair.

This warranty is limited to the purchased product only and does not include any connected products or systems.

If the product breaks down or is showing a fault and requires an engineer to visit, we may ask you to pay a deposit prior to the repair visit. We will return the deposit in full if we find a fault that is covered by the Warranty. We may keep the deposit if we cannot access your property at the agreed visit time or conditions mentioned above in this Warranty have not been met. A responsible adult must be at the property to provide access to the engineer.

Any repair carried out under the terms of this warranty does not extend the warranty beyond its original period.

The warranty only applies to products bought and used in the United Kingdom.

For products installed in the Channel Islands and Isle of Man only a 2 Year Parts & Labour Warranty is applicable.

Engineers will not carry out repairs if they think accessing the product would be a risk to health and safety. We will not be liable for any costs if there is a health and safety issue.

There must be sufficient room for the engineer to work (the minimum area is set out in the installation instructions). We will not accept responsibility for removing cupboards, kitchen units, trims etc to gain access for repairs.

This warranty does not in any way affect your statutory or legal rights.

A central heating inhibitor (Fernox or equivalent) is required to be added to the system during installation and thereafter at regular intervals using the correct dosage.

A magnetic filter requires to be installed on the return of every boiler. This must be cleaned at every yearly service.

Existing systems require to be pressure flushed correctly and final TDS reading recorded on the commissioning paperwork.

Warranty details

This warranty does not cover the following:

- Parts which fail due to system debris, contamination and/or water quality issues,
- Boilers installed within mobile leisure accommodation. e.g. Boats, mobile caravans etc.
- Any extra costs incurred whilst undertaking a repair due to incorrect installation
- Products that have been moved from their original place of installation.
- Costs of each annual service, including consumable parts such as seals and chemical treatments (inhibitor etc.)
- Any repair that is needed because of anything other than a fault to the boiler or failure of the boiler itself.
- Any 3rd party damage, whether accidental, negligent, malicious or otherwise.
- Theft or attempted theft.
- Any fault or failure in the heating system to which the boiler is connected.
- Any other costs or expenses caused by or arising because of a repair.
- Any damage caused by hard water scale deposits or sludge resulting from corrosion.
- Any problems caused by inadequate supply of services such as electricity or water to the property including loss of power.

Boilers where:

- ThermoSphere Genuine Parts have not been used in any service or repair or
- Boilers that have not been installed and set up strictly in line with the installation instructions supplied with them (including the requirement to clean the system and add corrosion inhibitor in line with BS7593:1992).
- They have not been maintained strictly in line with the maintenance instructions supplied with them.

Notes

ThermoSphere
Bridge House
Pattenden Lane
Marden
Kent
TN12 9QJ
UNITED KINGDOM

www.ThermoSphere.com
hello@ThermoSphere.com
+44 (0) 800 019 5899

Find us on LinkedIn
Search “ThermoSphere”

Check out our Youtube channel
Search “ThermoSphere underfloor heating”

Find us on Instagram
Search “ThermoSphere”

ThermoSphere manufactures underfloor heating products in Marden, Kent. However, some accessory products are imported from trusted sources. To make it easy to tell where a product is from you’ll find the country of origin stated on all product data sheets. Please visit our website for more information.