&tech s 160 - 240 - 380

ACV

EN

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ES

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Installation, Operating and Servicing Instructions

ISO 9001 CERTIFIED VINÇOTTE

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INDEX

INTRODUCTION

PEOPLE WHO SHOULD READ THESE

These instructions should be read by:
- the specifying engineer
- the installing engineer
- the user
- servicing technicians

SYMBOLS

The following symbols are used in these instructions:

Essential to ensure that the system works properly.

Essential for personal safety and environmental protection.

Danger of electrocution

Danger of burns.

WARNINGS

These instructions are an integral part of the equipment to which they refer and the user must be provided with a copy.

The product must be installed and serviced by qualified engineers, in compliance with current standards.

ACV cannot accept liability for any damage resulting from incorrect installation or from the use of components or fittings not specified by ACV

Any failure to follow instructions relating to tests and test procedures may result in personal injury or risks of pollution.

ACV reserves the right to change the technical specifications and components of its products without prior notice.

BOILER ROOM

ACCESSIBILITY

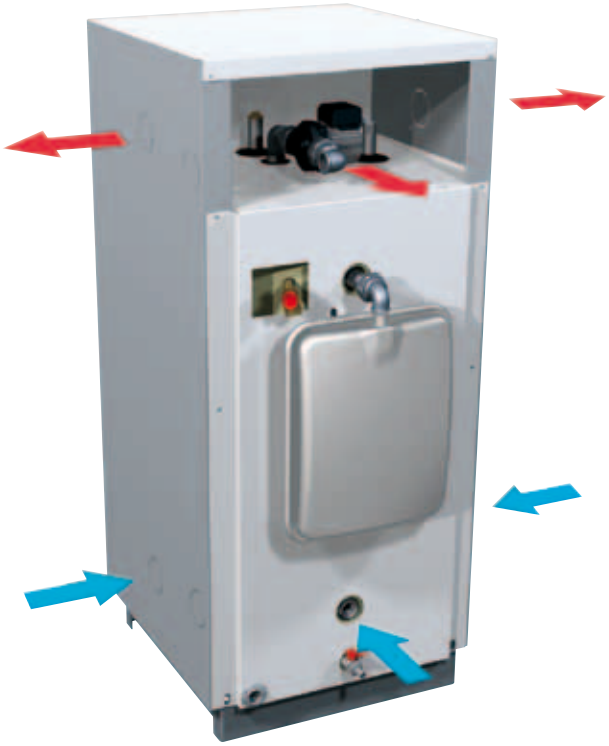
The boiler room must be large enough to allow proper access to the boiler. The following minimum distances around the boiler are required

- at the front:	500 mm
- above:	300 mm
- on the central heating connection side:	150 mm

This boiler can be connected to the central heating circuit in any one of three directions.

BASE

The boiler must be laid on a base made of non-combustible materials.



Hydraulic Connections

CENTRAL HEATING CONNECTION

The drain cock (9) and safety valve (2) must be connected to the waste water disposal system.

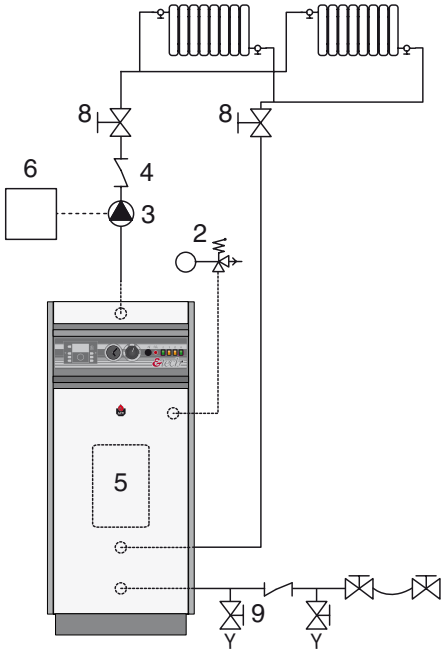
The boiler is fitted with an expansion chamber with a capacity of:

- **12 liter on E-Tech S 160 and 240 models.**
- **2 x 8 liter on E-Tech S 380 models.**

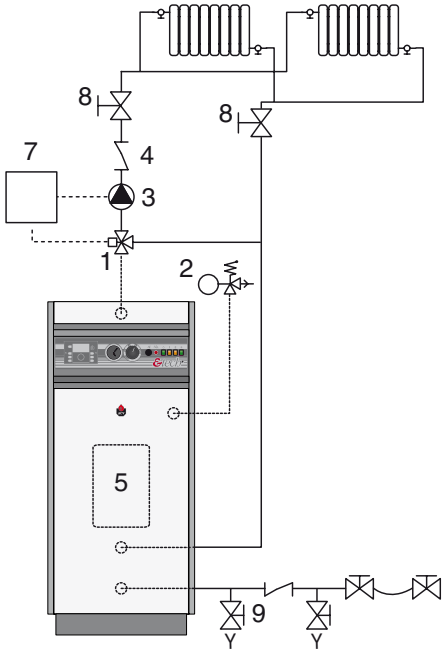
If the expansion volume is not sufficient for your needs then it is possible to install an additional tank.

The boiler is fitted with a safety valve set to 3 bar.

1. Motorised 3-way manual mixer valve
2. Safety valve preset to 3 bar with pressure gauge
3. Circulator
4. Non-return valve
5. Expansion tanks
6. Room thermostat
7. Control Unit controller (in option)
8. Central heating isolation valves
9. Discharge outlet



Hydraulic diagram with circulator controlled by a room thermostat.



Hydraulic diagram with motorised mixer valve

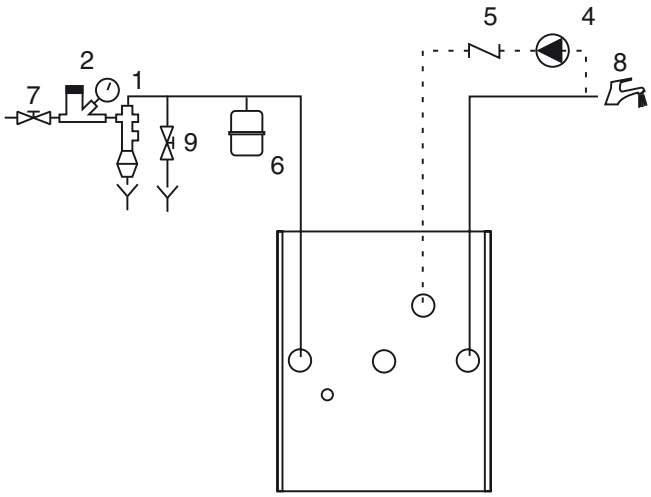
DOMESTIC HOT WATER CONNECTION

Pressure reducer
If the water mains pressure is greater than 6 bar, a pressure reducer calibrated to 4.5 bar must be fitted.

Safety unit
The tank safety unit must be ACV approved and calibrated to 7 bar.
The valve discharge must be connected to the waste water disposal system.

Domestic hot water expansion tank
Installing a domestic hot water expansion tank avoids any risk of overpressure due to pressure surges and also makes sure that there is a always water flowing through the safety unit when refilling the domestic hot water tank.

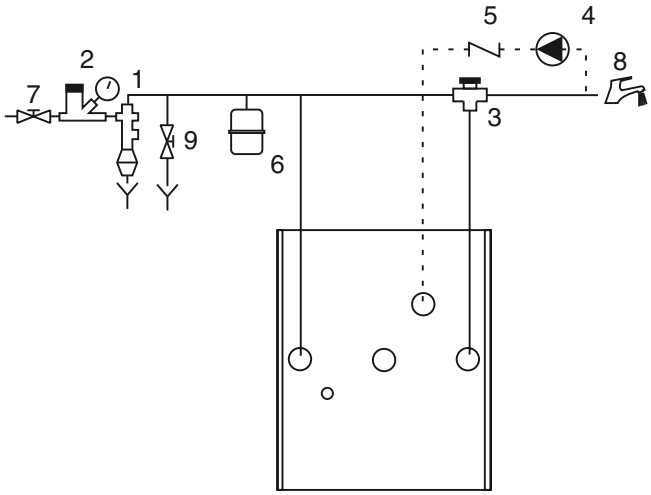
Hot water circulation
If the tank is located a long way from the point of use, then installing a closed recirculation circuit ensures that a faster supply of hot water is always available.



Connection without thermostatic mixing valve

2.2.3.5 *Description*

1. Safety unit
2. Pressure reducer
3. Thermostatic mixing valve
4. Hot water circulator
5. Non-return valve
6. Domestic hot water expansion tank
7. Inlet valve
8. Draw-off valve
9. Bleed valve



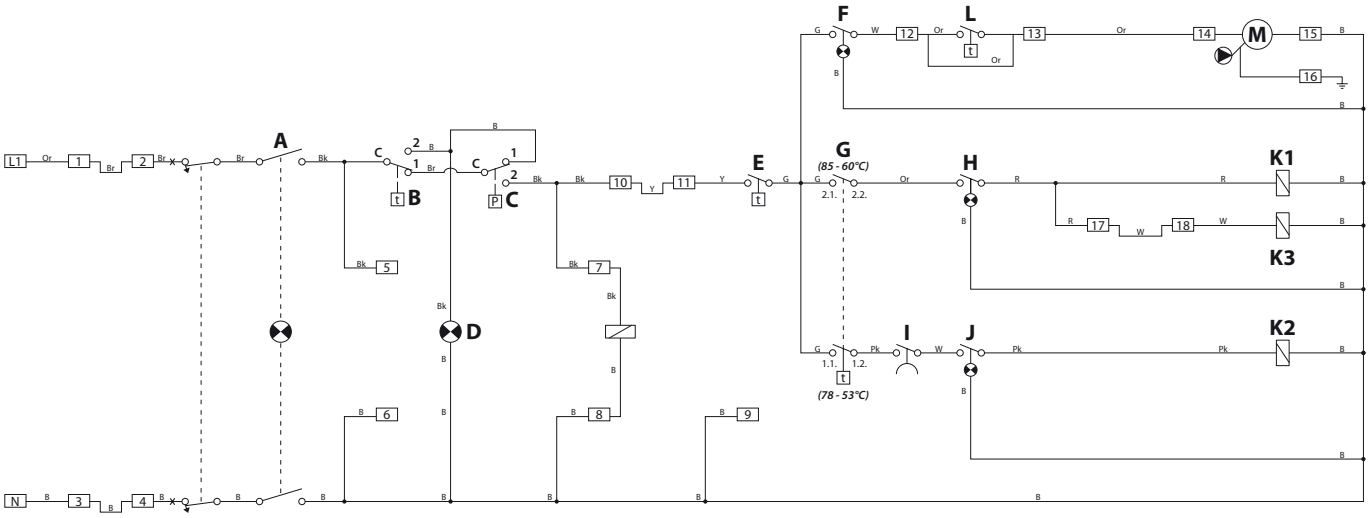
Connection with thermostatic mixing valve

IMPORTANT
As a safety measure against burns, we strongly advise installing a thermostatic mixing valve (recommended temperature: 60° C).

This is available as an optional accessory	
Safety unit	**Ø 3/4"**
Pressure reducer	**Ø 3/4"**
Thermostatic mixing valve	**Ø 3/4"**
Expansion tank	**5 liter**

CONTROL WIRING DIAGRAM : E-TECH S 160

The control circuit is automatically powered from the power circuit.
It is also protected by a 3A magneto-thermal circuit breaker.

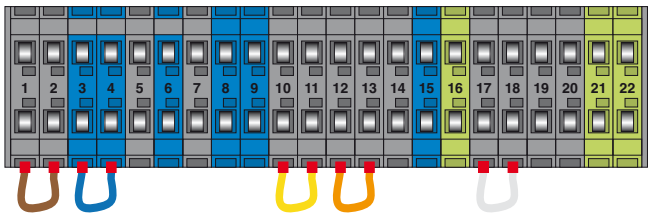


B. Blue
Bk. Black
Br. Brown
G. Grey
Or. Orange
Pk. Pink
R. Red
V. Violet
W. Withe
Y. Yellow

A ON/OFF switch
B Manually reset safety thermostat
C Water pressure switch
D Alarm indicator
E Limit thermostat 95°C
F Summer / Winter switch
G Control thermostat 60 - 85°C
H Power level switch 1
I Timer
J Power level switch 2
K1 Power Relay 1 - Level 1
K2 Power Relay 1 - Level 2
K3 Power Relay 2 - Level 1
L Room thermostat (optional)
M Loading pump

CONNECTING THE ACCESSORIES

The electrical accessories are connected to the numbered terminals on this diagram below.



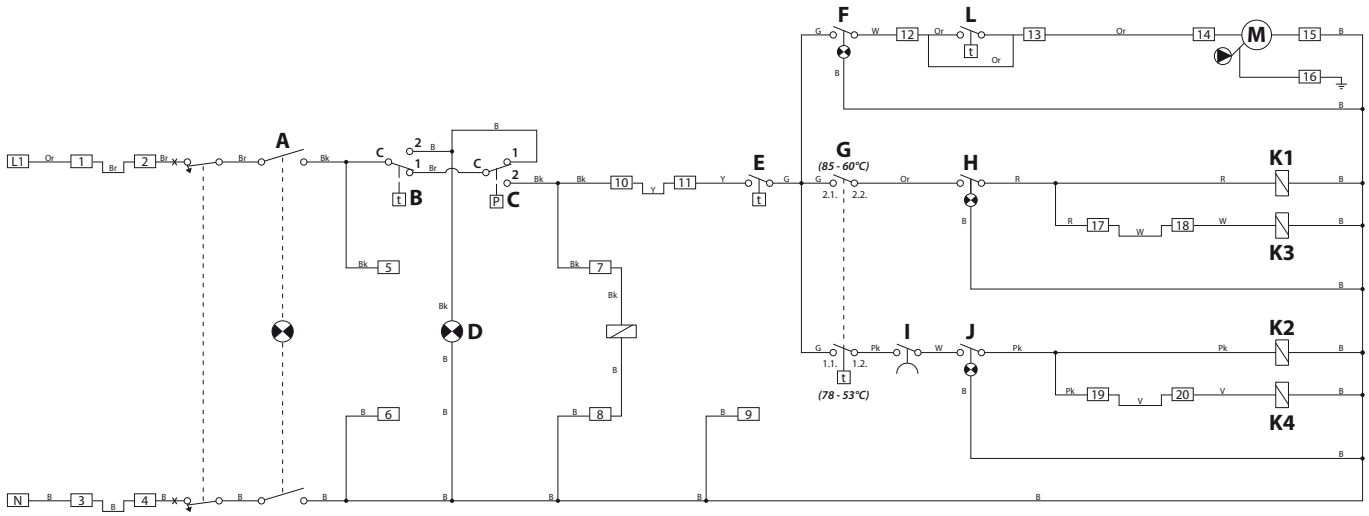
1-2: Life (230V ~ 50Hz)
3-4: Neutral
5-6: Time Clock (optional)
7-8: Safety switch
10-11: Stop Bridge
12-13: Room thermostat (optional)
14-15: Heating pump (optional)
17-18: Relay K3 disactivated

IT IS IMPORTANT TO SWITCH THE BOILER OFF BEFORE CARRYING OUT ANY WORK.

INSTALLATION

CONTROL WIRING DIAGRAM : E-TECH S 240

The control circuit is automatically powered from the power circuit.
It is also protected by a 3A magneto-thermal circuit breaker.

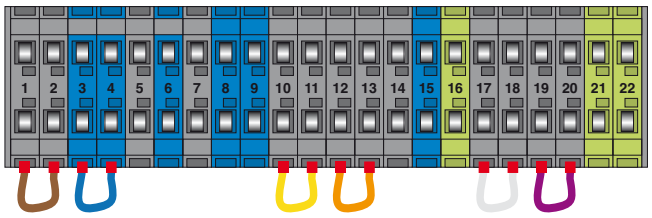


B. Blue
Bk. Black
Br. Brown
G. Grey
Or. Orange
Pk. Pink
R. Red
V. Violet
W. Withe
Y. Yellow

A ON/OFF switch
B Manually reset safety thermostat
C Water pressure switch
D Alarm indicator
E Limit thermostat 95°C
F Summer / Winter switch
G Control thermostat 60 - 85°C
H Power level switch 1
I Timer
J Power level switch 2
K1 Power Relay 1 - Level 1
K2 Power Relay 1 - Level 2
K3 Power Relay 2 - Level 1
K4 Power Relay 2 - Level 2
L Room thermostat (optional)
M Loading pump

CONNECTING THE ACCESSORIES

The electrical accessories are connected to the numbered terminals on this diagram below.

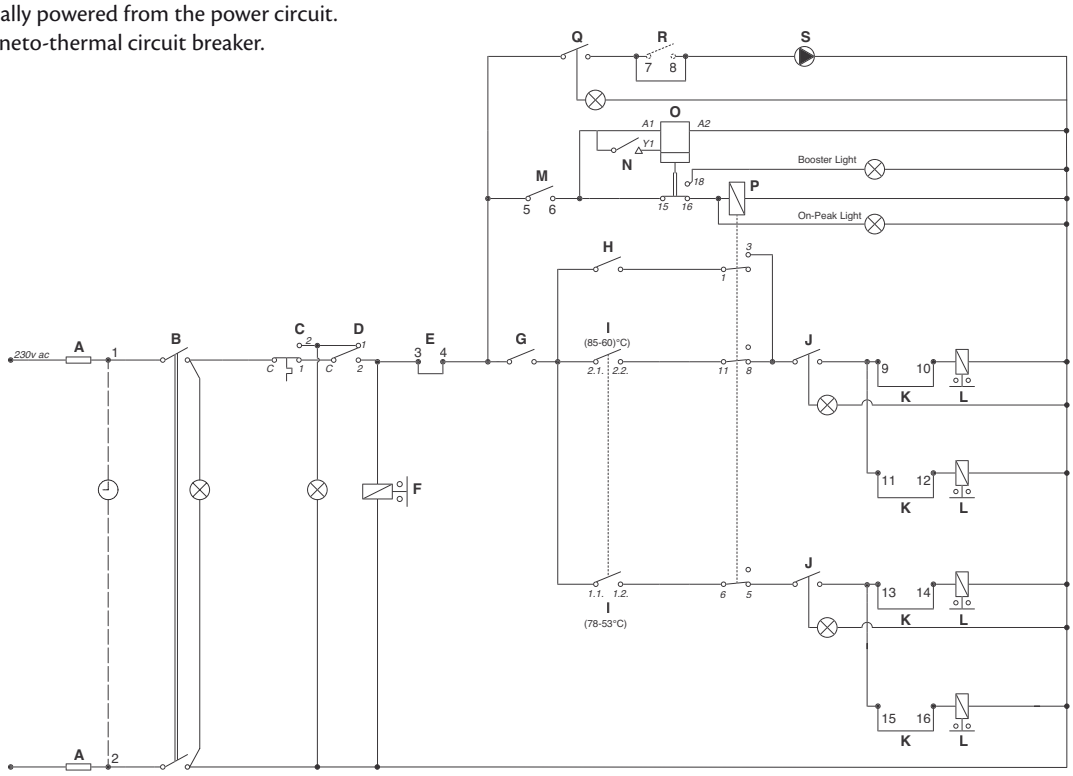


1-2: Life (230V ~ 50Hz)
3-4: Neutral
5-6: Time Clock (optional)
7-8: Safety switch
10-11: Stop Bridge
12-13: Room thermostat (optional)
14-15: Heating pump (optional)
17-18: Relay K3 disactivated
19-20: Relay K4 disactivated

IT IS IMPORTANT TO SWITCH THE BOILER OFF BEFORE CARRYING OUT ANY WORK.

CONTROL WIRING DIAGRAM : E-TECH S 380

The control circuit is automatically powered from the power circuit.
It is also protected by a 3A magneto-thermal circuit breaker.

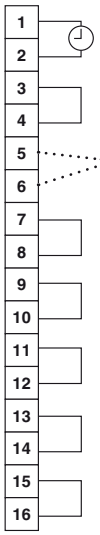


B. Blue
Bk. Black
Br. Brown
G. Grey
Or. Orange
Pk. Pink
R. Red
V. Violet
W. Withe
Y. Yellow

A. Bipolar magneto-thermal circuit breaker
B. ON/OFF switch
C. Manually reset safety thermostat
D. Water pressure switch
E. General shutdown bridge
F. Neutral safety switch
G. Automatically reset 95° C cut-off thermostat
H. Minimum thermostat
I. Two-stage control thermostat
J. Power limitation switch
K. Shutdown bridges for the various stages
L. Power relays
M. Day / night signal
N. Booster pushbutton
O. Calibrator relay preset for a period of one hour
P. Reverse current relay
Q. Summer / winter selector switch
R. Room thermostat (optional)
S. Circulation pump

CONNECTING THE ACCESSORIES FOR THE E-TECH S 380

The electrical accessories are connected to the numbered terminals on this diagram below.



1-2: Power supply for optional clock (230 Volt ac)
3-4: General shutdown bridge
5-6: Contact for day / night signal connection
7-8: Room thermostat connection
9-10: Load shedding for the 1st power stage
11-12: Load shedding for the 2nd power stage
13-14: Load shedding for the 3rd power stage
15-16: Load shedding for the 4th power stage

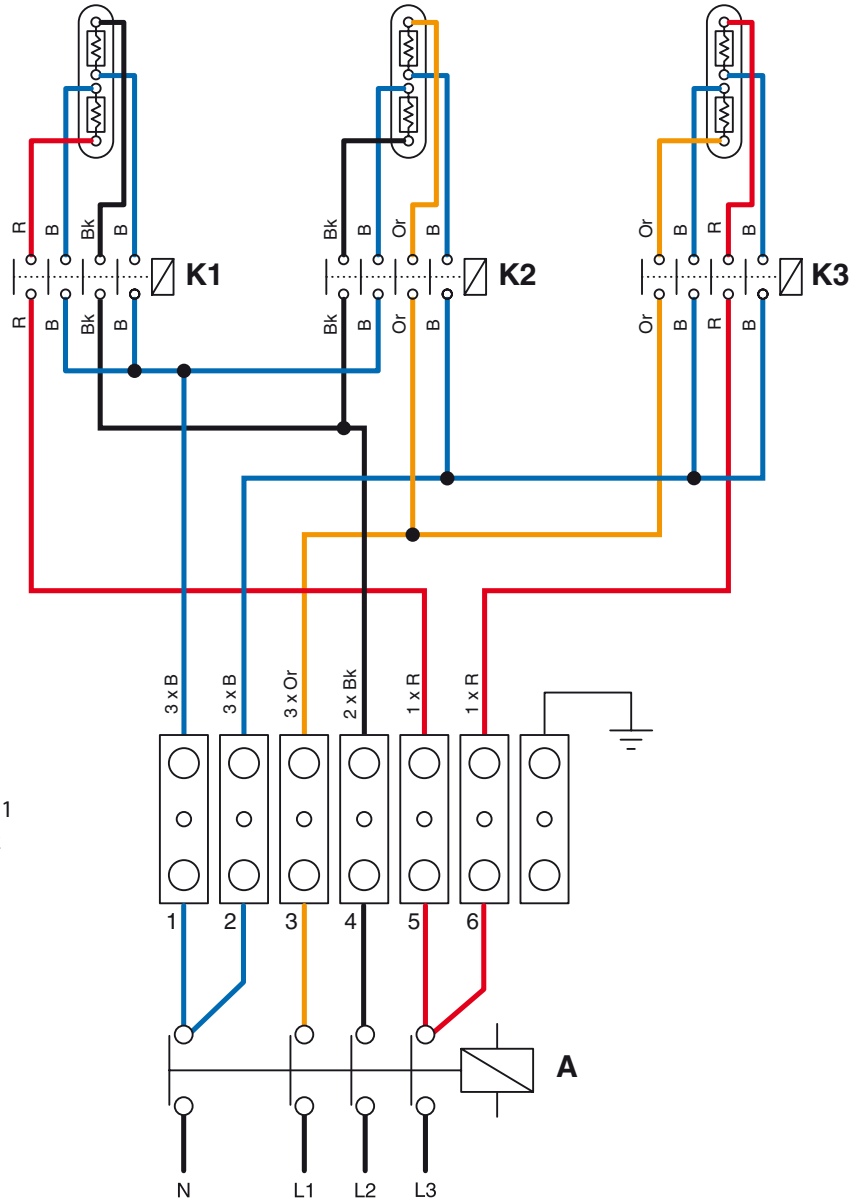
IT IS IMPORTANT TO SWITCH THE BOILER OFF BEFORE CARRYING OUT ANY WORK.

INSTALLATION

POWER WIRING DIAGRAM : E-TECH S 160

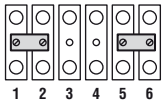
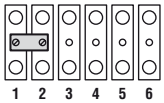
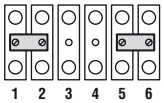
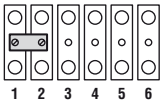
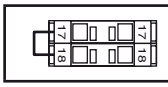
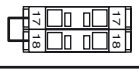
POWER CIRCUIT POWER SUPPLY
The power circuit must be connected using three phase 3 x 400 V + Neutral.

- **This appliance must be permanently connected to fixed wiring and must be earthed.**
- **The wiring must be carried out by a competent person and in accordance with the current IEE Wiring Regulations.**



A Safety switch
K1 Level 1 - power relay 1
K2 Level 2 - power raelay 1
K3 Level 1 - power relay 2

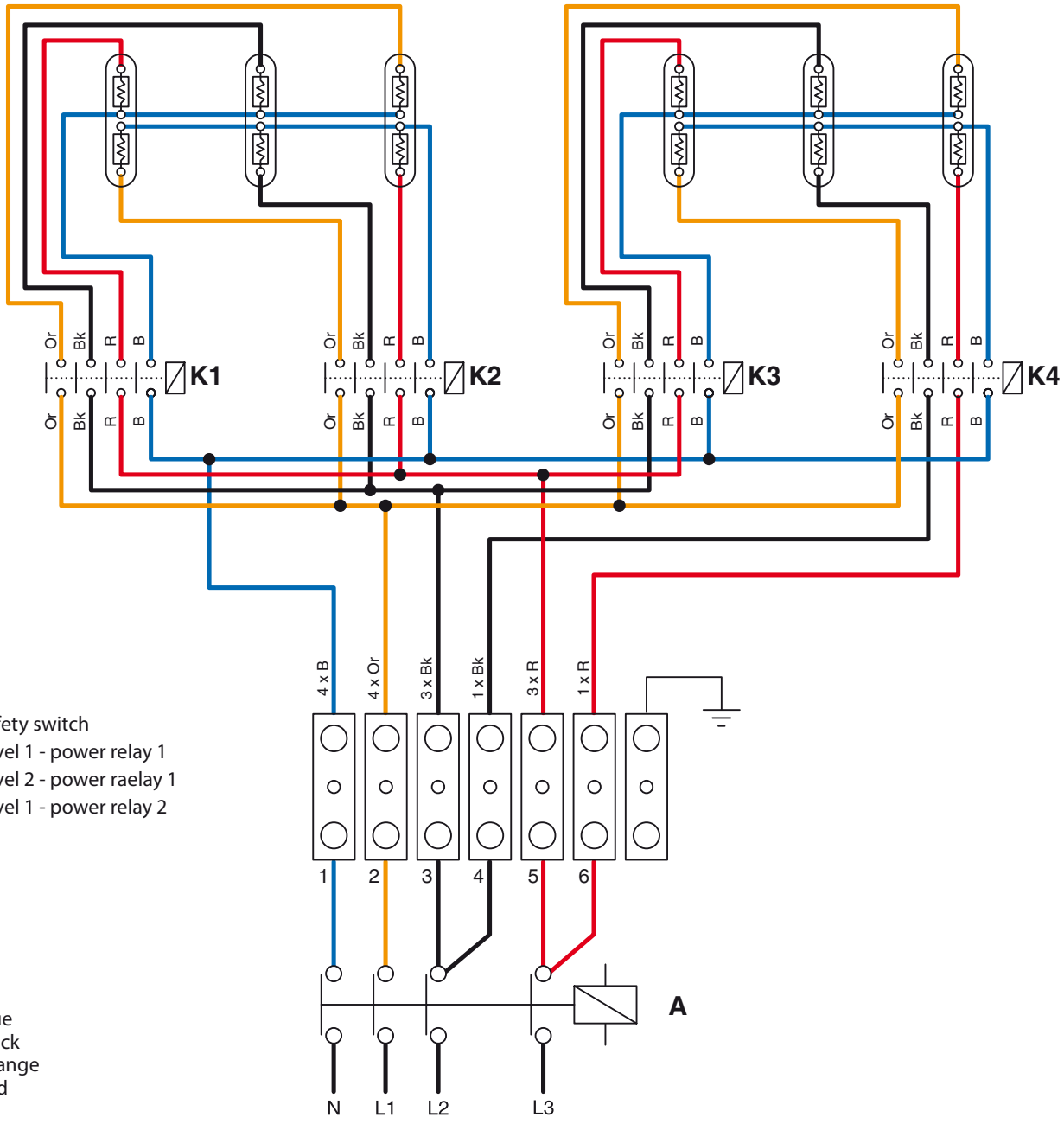
B. Blue
Bk. Black
Or. Orange
R. Red

E-Tech S 160	14,4 kW	12 kW	9,6 kW	7,2 kW
TRI PHASE				
				

POWER WIRING DIAGRAM : E-TECH S 240

POWER CIRCUIT POWER SUPPLY
The power circuit must be connected using three phase
3 x 400 V + Neutral.

- **This appliance must be permanently connected to fixed wiring and must be earthed.**
- **The wiring must be carried out by a competent person and in accordance with the current IEE Wiring Regulations.**



A Safety switch
K1 Level 1 - power relay 1
K2 Level 2 - power raelay 1
K3 Level 1 - power relay 2

B. Blue
Bk. Black
Or. Orange
R. Red

E-Tech S 240	28,8 kW	26,4 kW	24 kW	21,6 kW
TRI PHASE	1 2 3 4 5 6 N L1 L2 L3	1 2 3 4 5 6 N L1 L2 L3	1 2 3 4 5 6 N L1 L2 L3	1 2 3 4 5 6 N L1 L2 L3
	19 20	19 20	19 20	19 20

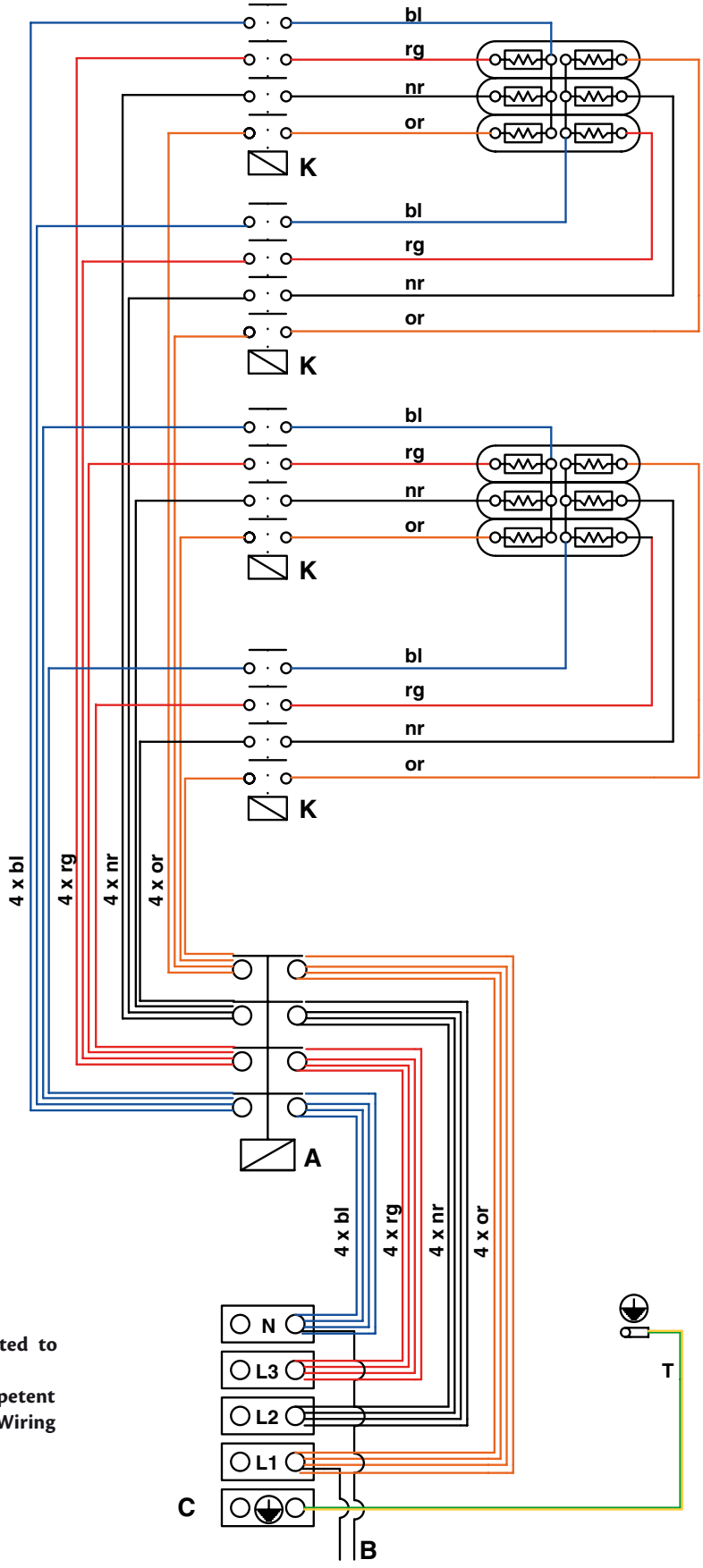
POWER WIRING DIAGRAM : E-TECH S 380

The E-tech S 380 model have an unused resistor.

POWER CIRCUIT POWER SUPPLY
The power circuit must be connected using three phase
3 x 400 V + Neutral.

A Control circuit power supply
B Safety switch
C Power terminal block
K Power relays

bl. Blue
nr. Black
or. Orange
rg. Red
T. Green and yellow



- **This appliance must be permanently connected to fixed wiring and must be earthed.**
- **The wiring must be carried out by a competent person and in accordance with the current IEE Wiring Regulations.**

INSTALLATION

ELECTRICAL SAFETY DEVICES

- The boiler must be effectively earthed.
- A box fitted with a magneto-thermal circuit breaker must be fitted on the outside of the boiler. This is to protect the boiler and allow the power supply to be switched off during servicing or other work on the boiler.

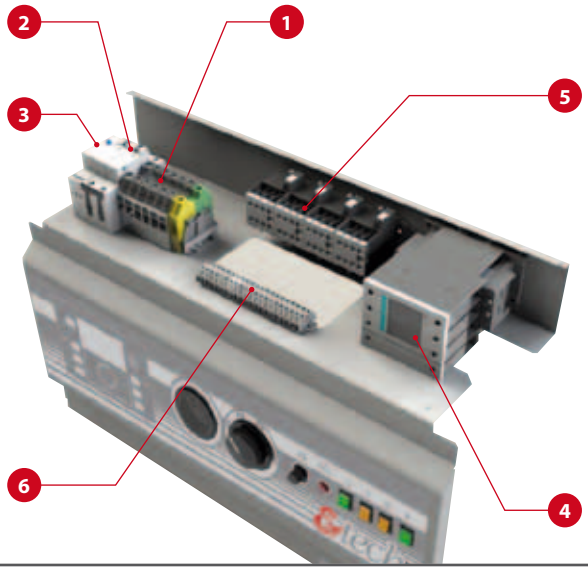
First make sure that the system complies with all current standards.

- To avoid any risk of electrocution, the electrical circuit must be fitted with a differential circuit breaker.
- The control circuit is protected by a 3A magneto-thermal circuit breaker.
- The boiler is protected against overheating even if one or more power switches malfunction by means of a magnetic power switch placed in series with the power switches.

COMPLIANCE

The installation must be carried out in accordance with the current local technical standards and legislation.

1. Power terminal block
2. Magneto-thermal circuit breakere
3. Calibrator relay
4. Safety switch
5. Contacteurs de puissance
6. Control terminal block



Electrical terminal block

STARTING UP

FILLING THE HEATING AND DOMESTIC HOT WATER CIRCUITS

1. Fill the domestic hot water circuit and bring it up to pressure.

IMPORTANT
The hot water tank must be pressurised before the heating circuit is filled.

2. Fill the central heating circuit making sure that any air in the upper part of the boiler and any air in the system is bled.

3. Remove the front of the boiler.

4. Check the electrical connections paying particular attention to the quality of the connections on the power circuit terminals.

5. Set all the switches on the control panel to the **OFF** position and set the internal magneto-thermal circuit breaker to **ON**. Replace the front of the boiler.

6. Switch the boiler on from the external box.

7. Set the ON/OFF switch to the **ON** position and the summer/winter selector switch to the winter position.

8 After allowing the circulator to work for a few minutes, set the ON/OFF switch to the **OFF** position, bleed the circulation pump and make sure that both the boiler and the system are properly bled. Adjust the pressure to the static pressure **(1 bar = 10 m – 1.5 bar = 15 m) + 0.5 bar.**

9. The boiler is now ready to operate. Set the ON/OFF switch to the **ON** position, the summer/winter selector, the half and full power switches and the control thermostat all to the desired positions.

After a few days in operation we advise you to check the quality of the electrical connections and also make sure there is no air in either the boiler or the system.

Switch the power supply off from the outside box before carrying out any work.

SERVICING

SERVICING THE BOILER

1. Set the on/off switch on the control panel to the OFF position and switch the power off from the external box.
2. Remove the top panel and the front and carry out a visual inspection of the boiler looking out for any leaking water.
3. Inspect the wiring looking for any sign of overheating.
4. Check that the screws on the connection terminal block are properly tightened.
5. Replace the front and the top panel.
6. Switch the boiler back on again.

SERVICING THE SAFETY DEVICES

1. Check that the thermostats and safety devices are working properly.
2. Check the safety valves on both the central heating and the hot water circuits.

EMPTYING

EMPTYING THE PRIMARY CIRCUIT *(CENTRAL HEATING)*:

1. Switch the power to the boiler off at the mains switch installed by the electrician.
2. Close the boiler system's isolating valves (1).
3. Connect a hose to the drain cock (2) and make sure that it is properly connected.
4. Open the drain cock and allow hot water to flow out into the waste water disposal system, check that air is being taken into the system, by opening the air vent, for instance.
5. Once you have finished, put the drain cocks back into their original positions and adjust the pressure to the static pressure + 0.5 bar.

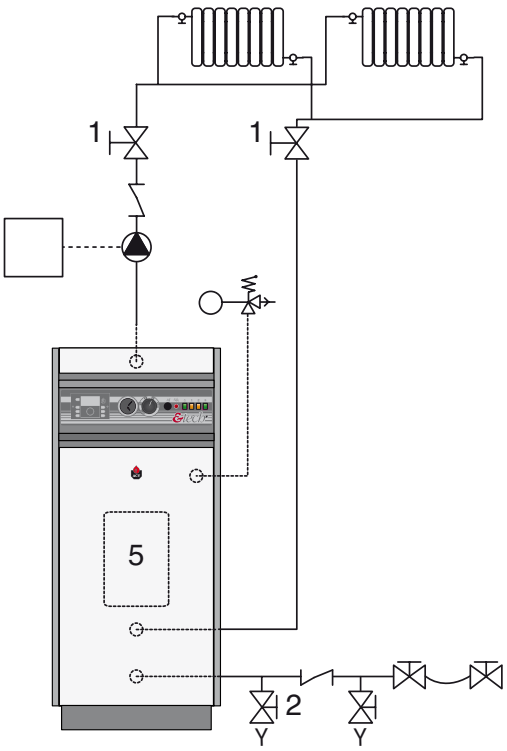
EMPTYING THE DOMESTIC HOT WATER TANK:

1. Switch the mains power to the boiler off at the external switch installed by the electrician.
2. Close valves (A) and (B).
3. Open valves (C) and (D) (first C then D).
4. Let the water drain away.
5. When you have finished, return the valves to their initial positions.

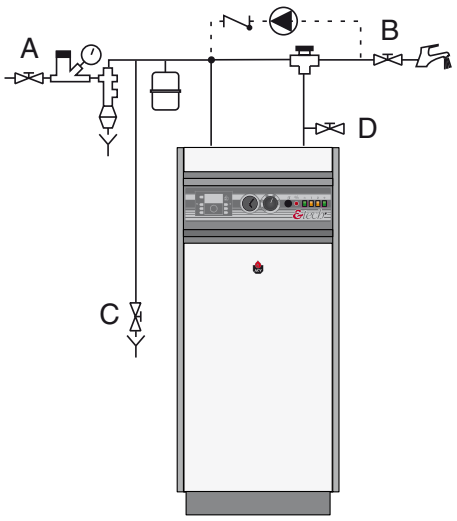
To allow the tank to be emptied, valve (C) must be situated at ground level.

There is a risk of burns from hot water!

Primary Draining



Domestic Hot Water Draining



RECOMMENDATION

ACV recommend that boilers should be serviced at least once a year. This servicing work should be carried out by a competent technician.

OVERVIEW

- Combination boiler (central heating and domestic hot water).
- **Tank-in-Tank** indirect storage type domestic hot water production.
- The central heating connections are designed so that they can be connected in all three directions, this means that the boiler can be installed against a wall or in a corner without having to leave any free space .
- Internal two-stage temperature control thermostat, which allows the power to be adapted according to actual heat requirements.
- The day/night function allows you to store up a volume of water at a high temperature during cheap rate periods (at night) and use the energy stored up in this way at peak rate times (during the day).
- The boiler is fitted with expansion tanks, a safety valve, a manothermometer, a water low safety device (pressure switch) and a circulation pump.
- **E-Tech S** boilers have an effective output of 14.4 kW for the **160** model and 28.8 kW for the **240** and **380** models. These outputs can be adjusted either using the power limiting switch on the boiler's control panel or by removing the bridges from the control terminal block.

Stainless steel domestic hot water tank

DESCRIPTION OF OPERATION

THE TANK-IN-TANK CONCEPT

The Etech's series differs from traditional hot water producers in that it has a tank immersed in the primary fluid contained in the outer body.

When there is a temperature drop in the boiler because the central heating system or the domestic hot water circuit needs hot water, the internal thermostat starts up the power on the immersed electrical resistors. The heating elements quickly heat up the primary fluid, thus creating a natural circulation around the tank.

INDIRECTLY HEATING DOMESTIC HOT WATER

This circulation allows easier heat exchange between the primary fluid and the domestic water, all over the tank surface. The corrugations on the outer shell of the tank increase the area of heat exchange still further and thus speed up the process of heating the domestic water.

EASY TO SET AND TOTALLY SAFE

With a single command, the water temperature of both the primary circuit and the domestic hot water circuit can be set by the adjustable thermostat situated underneath the tank in the primary circuit.

A cut-off thermostat, placed on the top of the boiler, automatically switches off the power when the temperature of the water in the primary circuit reaches 95° C. A manually reset safety thermostat switches off the system if the temperature reaches 103° C.

BUILD FEATURES

OUTER BODY

The outer body containing the primary fluid is made of thick STW 22 steel.

TANK-IN-TANK TYPE EXCHANGER ACCUMULATOR

The internal tank which has a large heating surface for the production of domestic hot water is made of Chrome/Nickel 18/10 stainless steel. It is corrugated all the way up using an exclusive manufacturing process and is entirely argon arc welded using the TIG (Tungsten Inert Gas) process.

INSULATION

The boiler body is fully insulated by rigid polyurethane foam, with a thickness of 70mm, with a high thermal insulation coefficient. This is sprayed onto the tank without using any CFCs.

JACKET

The boiler is covered by a steel jacket which has been scoured and phosphated before being stove finished at 220° C.

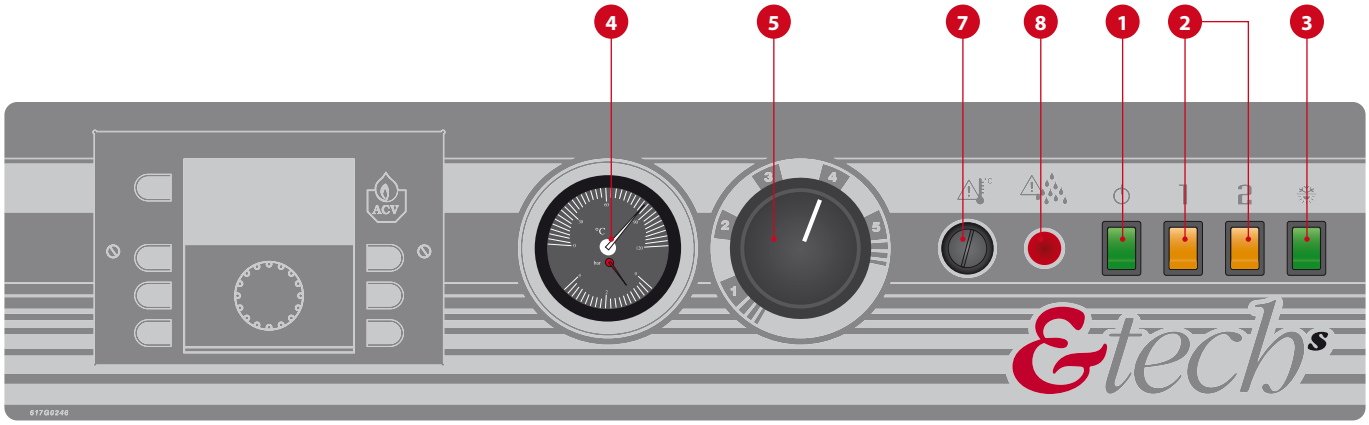
HEATING ELEMENTS

nding on the model, the boiler is fitted with either six or seven detachable stainless steel AISI 304L immersion heaters.

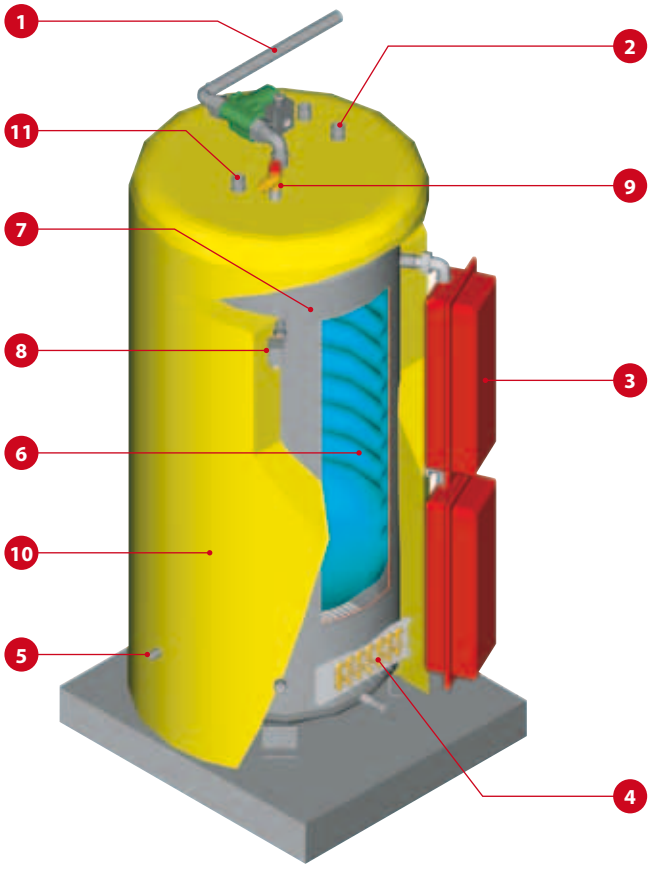
DESCRIPTION

CONTROL PANEL

1 - ON/OFFswitch
2 - Power selection switch
3 - Summer/Winter selector switch
4 - Mano-thermometer
5 - Thermostat adjustable between 60 and 85 °C
6 - Safety thermostat:
7 - Safety indicator light
8 - Control Unit (optional)



Control panel



Cutaway boiler

1. Central heating flow pipe
2. Domestic hot water connections
3. Expansion tank
4. Heating resistors
5. Central heating return
6. Internal stainless steel tank
7. Primary tank
8. Water low safety device
9. Primary safety valve (3bar)
10. Rigid polyurethane foam insulation (70 mm)
11. Cold water inlet

TECHNICAL SPECIFICATIONS

DIMENSIONS

Units are shipped fully assembled, tested and packed on a timber base with shockproof edges and protected by a heat-shrunk plastic film.
On reception and after unpacking, check the equipment for any damage. For transportation purposes, please see the weights and dimensions shown (see table of dimensions).

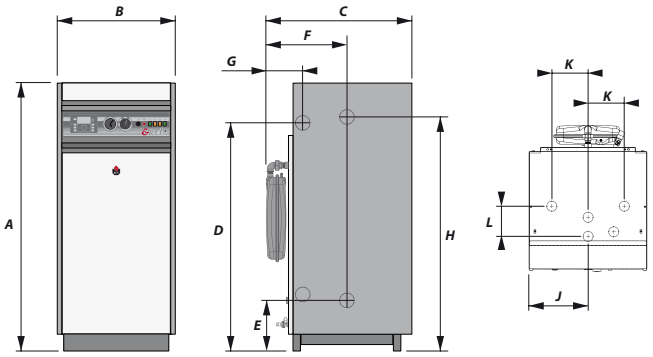
		E-Tech S 160	E-Tech S 240	E-Tech S 280
A	**mm**	1342	1818	2134
B	**mm**	590	590	720
C	**mm**	728	728	800
D	**mm**	928	1403	1985
E	**mm**	249	249	300
F	**mm**	402	402	92
G	**mm**	181	181	265
H	**mm**	958	1433	435
J	**mm**	295	295	360
K	**mm**	180	180	135
L	**mm**	150	150	135

MAXIMUM OPERATING CONDITIONS

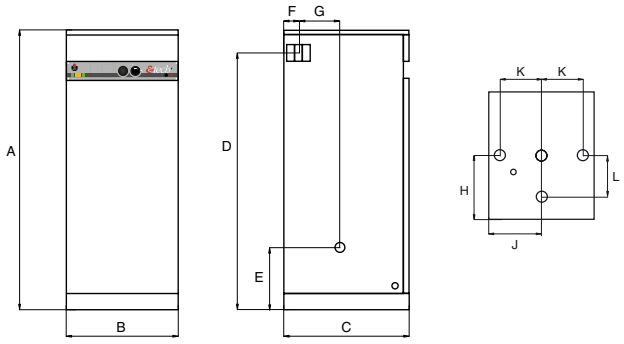
Maximum operating pressure ***(tank full of water)***
- Primary circuit: 3 bar
- Secondary circuit: 10 bar

Test pressure ***(tank full of water)***
- Primary circuit: 4,5 bar
- Secondary circuit: 13 bar

Operating temperature
- Maximum temperature: 85° C



Dimensions E-Tech S 160 & 240



Dimensions E-Tech S 380

DOMESTIC HOT WATER PERFORMANCE

			E-Tech S 160	E-Tech S 240	E-Tech S 380
Operating at 80°C					
Peak flow at 40 °C	(ΔT = 30 °C)	**liter /10'**	356	545	875
Peak flow at 40 °C	(ΔT = 30 °C)	**liter /60'**	700	1234	1564
Continuous flow at 40 °C	(ΔT = 30 °C)	**liter /h**	413	827	827
Tank reffill time at 60 °C					
Initial heating time		**minutes**	36	41	67
After drawing off 140 liters at 45 °C		**minutes**	16	12	12

BOILER SPECIFICATIONS

		E-Tech S 160	E-Tech S 240	E-Tech S 380
Output	**kW**	14,4	28,8	28,8
Operating voltage	**Volt**	3 x 400 + N	3 x 400 + N	3 x 400 + N
Heating elements		6 x 2	6 x 2	7 x 2
Total capacity	**liter**	167	250	394
Primary circuit capacity	**liter**	68	86	131
Heating connection	**Ø**	1"	1"	1"
Domestic hot water connection	**Ø**	3/4"	3/4"	1"1/2
Hot water tank heat exchange surface	**m^2**	1,26	1,94	2,65
Expansion vessel		1 x 12 litres	1 x 12 litres	2 x 8 litres
Weight empty	**kg**	115	155	230

USING THE BOILER

LEARNING YOUR WAY AROUND THE CONTROL PANEL

Before carrying out any work on the boiler, switch the power off at the mains switch fitted in the boiler room by the electrician.

1 - ON/OFF switch
This must be used to switch the boiler off before carrying out any work on it.

2 - Power selection switches
The control panel is fitted with two switches allowing the user to select the boiler power according to his needs.
When only the first switch is pressed down, the boiler power is limited to the first stage using +/- half of the power (ideal in summer). In order for the boiler to run at full power, both of the switches must be pressed down.

3 - Summer/Winter selector switch
"Winter" position: provides both domestic hot water and central heating functions. "Summer" position: The central heating circulator is switched off. Only the domestic hot water function is provided. If there is not enough hot water available, we recommend setting the thermostat (9) to a higher
value. When the weather turns cold again, simply select "Winter" to reactivate the heating system..

4 - Mano-thermometer
Reads the boiler primary circuit (central heating) temperature andpressure directly.

5 - Thermostat adjustable between 60 and 85° C
Central heating systems are generally designed to operate at a maximum of 80° C. When used at lower temperatures, a 3-way mixer valve installed on the heating flow pipeallows the temperature to be set manually or, if you decide to install a regulator, automatically.
We recommend that you set the thermostat to the maximum values to get the best out of the domestic hot water system.

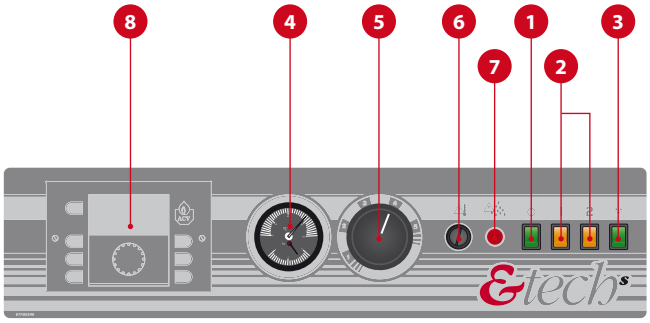
There is a risk of burns from hot water!

The water stored in the domestic hot water tank in the boiler can be at a very high temperature.
In all cases, install the thermostatic mixer on the domestic hot water flow pipe which must not exceed 60° C.
A mixer or mixing valve at each point of use is recommended.

6 - Safety thermometer
When the temperature in the boiler exceeds 103°C, the manually reset safety thermostat is started up.

7 - Boiler shutdown indicator light
This light is lit when the safety thermostat starts up or when the water pressure in the boiler is too low.

8 - Control Unit
Please see the enclosed instructions if you have chosen this option.



Control panel

CENTRAL HEATING SYSTEM GAUGE PRESSURE

Your boiler is fitted with a central heating safety valve, set to 3 bar, and with a pressure gauge.

First make sure that the water in the system is still pressurised. When cold and after the air in the system has been bled, the pressure gauge should show a pressure of between 1 and 2, depending on the height of the building: (1 bar = 5m / 1.5 bar = 10 m and 2 bar = 15 m).
To add water, open the filling valve.
Make sure that the drain cock is properly closed after filling and isolate the filling circuit from the central heating circuits. Bleed the air in the system to get an accurate water pressure reading.

SAFETY VALVE (CENTRAL HEATING)

A monthly inspection is recommended:
Lift the lever on the emptying device for a few seconds to ensure that the safety valve is working properly

The water which may flow out of the safety valve is very hot and may cause serious burns.
The pipe discharging into the waste water disposal system should be open to the atmosphere.
Make sure there is nobody near the flow of hot water.

If you notice anything unusual after this short trial, please inform the installing engineer.

SAFETY UNIT (DOMESTIC HOT WATER)

A monthly inspection is recommended:
Lift the lever on the emptying device for a few seconds to ensure that the safety valve is working properly.

The water flowing out of the safety unit may be extremely hot.
The pipe discharging into the waste water disposal system should be open to the atmosphere.
Make sure there is nobody near the flow of hot water.

If you notice anything unusual after this short trial, please inform the installing engineer.

BOILER SHUTDOWN

If the red light on the control panel lights up, this indicates an operating fault.

1. Check the boiler pressure, it should be between 1 and 2 bar depending on the height of the building.
2. Once you have checked the pressure, wait until the boiler has cooled down before resetting the safety thermostat.
3. Unscrew the safety thermostat's protective cap.
4. Restart the thermostat using a blade end.
5. If the system shuts down again, please inform the installing engineer.

To ensure your system operates properly, have it professionally serviced once a year before the cold weather starts.

BOILER ROOM

- Keep vents free at all times.
- Do not store any inflammable products in the boiler room.
- Take care not to store any corrosive products, such as paints, solvents, chlorine, salt, soap and other cleaning products, near the boiler.