

INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

For the Installer and the User



E-Tech S

160 - 240 - 380

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DECLARATION OF CONFORMITY.....

NOTE

This manual contains important information with respect to the installation, the starting up and the maintenance of the appliance.

This manual must be provided to the user, who will read it carefully and keep it in a safe place.

We accept no liability should any damage result from the failure to comply with the instructions contained in this technical manual.

**Essential recommendations for safety**

- It is prohibited to carry out any modifications to the appliance without the manufacturer's prior and written agreement.
- The product must be installed by a qualified engineer, in accordance with applicable local standards and regulations.
- The installation must comply with the instructions contained in this manual and with the standards and regulations applicable to heating systems.
- Failure to comply with the instructions in this manual could result in personal injury or a risk of environmental pollution.
- The manufacturer declines all liability for any damage caused as a result of incorrect installation or in the event of the use of appliances or accessories that are not specified by the manufacturer.

**Essential recommendations for the correct operation of the appliance**

- In order to ensure that the appliance operates correctly, it is essential to have it serviced by a certified installer or maintenance contractor every year.
- In case of anomaly, please call your service engineer.
- Faulty parts may only be replaced by genuine factory parts.

**General remarks**

- The availability of certain models as well as their accessories may vary according to markets.
- The manufacturer reserves the right to change the technical characteristics and features of its products without prior notice.
- In spite of the strict quality standards that ACV applies to its appliances during production, inspection and transport, faults may occur. Please immediately notify your approved installer of any faults.

INSTRUCTIONS FOR THE END USER**Essential recommendations for safety**

- Do not store any corrosive products, paint, solvents, salts, chloride products and other detergent products near the appliance.
- Hot water can cause scalding!
- In the event of small amounts of hot water repeatedly being drawn off, a stratification effect can develop in the tank. The upper hot water layer may then reach very high temperatures.
- Water heated to wash clothes, dishes and for other uses can cause serious burns.
- In order to avoid exposure to extremely hot water that can cause serious burns, never leave children, old people, disabled or handicapped people in the bath or shower alone.
- Never allow young children to turn on the hot water or fill their own bath.
- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge, only if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.
- Children shall not play with the appliance.
- Cleaning and user maintenance shall not be made by children unless they are aged from 8 years and above and supervised.
- The risk of developing bacteria exists, including "Legionella pneumophila", if a minimum temperature of 60°C is not maintained in both the DHW tank and the hot water distribution network.

PERIODIC CHECKS**Essential recommendations for the correct operation of the appliance**

- Check regularly that the system water pressure is at least 1 bar when cold. If the pressure drops below 0.5 bar, the built-in pressure sensor blocks the appliance until the pressure exceeds 0.8 bar.
- If it is required to top up the system to maintain the minimum recommended water pressure, always turn the appliance off and only add small amounts of water at a time. If a large amount of cold water is added in a hot boiler, the boiler can be damaged definitively.
- If the system needs to be refilled repeatedly with water, please contact your installer.
- Regularly check that there is no water on the floor under the boiler. If there is, please call your service engineer.

**General remark**

- Checking the boiler settings can only be carried out by an ACV-trained installer or by ACV's maintenance department.


MODELS : E-TECH S 160 - 240 - 380

This floor electric boiler is available in 4 models :

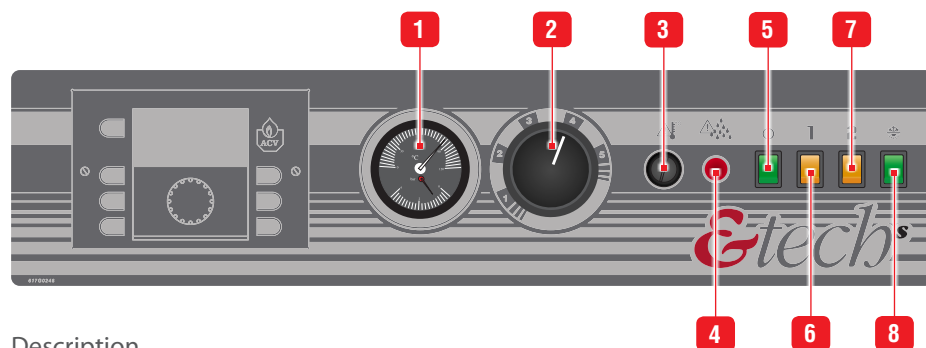
- The E-Tech S 160 single phase model is supplied 230 Volt.
- The E-Tech S 160 / 240 / 380 three-phase models are supplied 400 Volt.

 **The maximum power can be adjusted for all models by acting on the control panel switches.**

Models		Level 1	Level 2
E-Tech S 160 single phase and three-phase	kW	9,6 (66%)	4,8 (33%)
E-Tech S 240 three-phase	kW	14,4 (50%)	14,4 (50%)
E-Tech S 380 three-phase	kW	14,4 (50%)	14,4 (50%)

 **The maximum power can be limited for this model by acting on the terminal bridges S8 or TB2.**

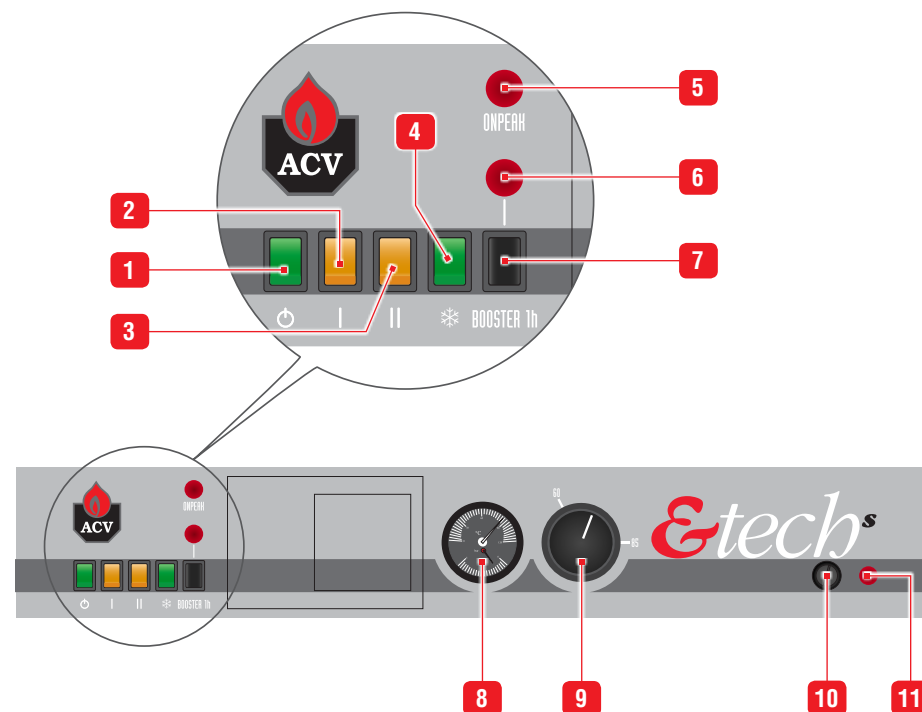
Models		Min	Max
E-Tech S 160 single phase and three-phase	kW	7,2	14,4
E-Tech S 240 three-phase	kW	14,4	28,8
E-Tech S 380 three-phase	kW	7,2	28,8

CONTROL PANEL : E-TECH S 160 - 240**Description**

1. Thermo-manometer
2. Two-stage control thermostat
3. Manual reset high limit thermostat [103°C]
4. Alarm indicator light
5. ON/OFF switch
6. Power switch level 1
7. Power switch level 2
8. Summer/Winter switch

Control thermostat

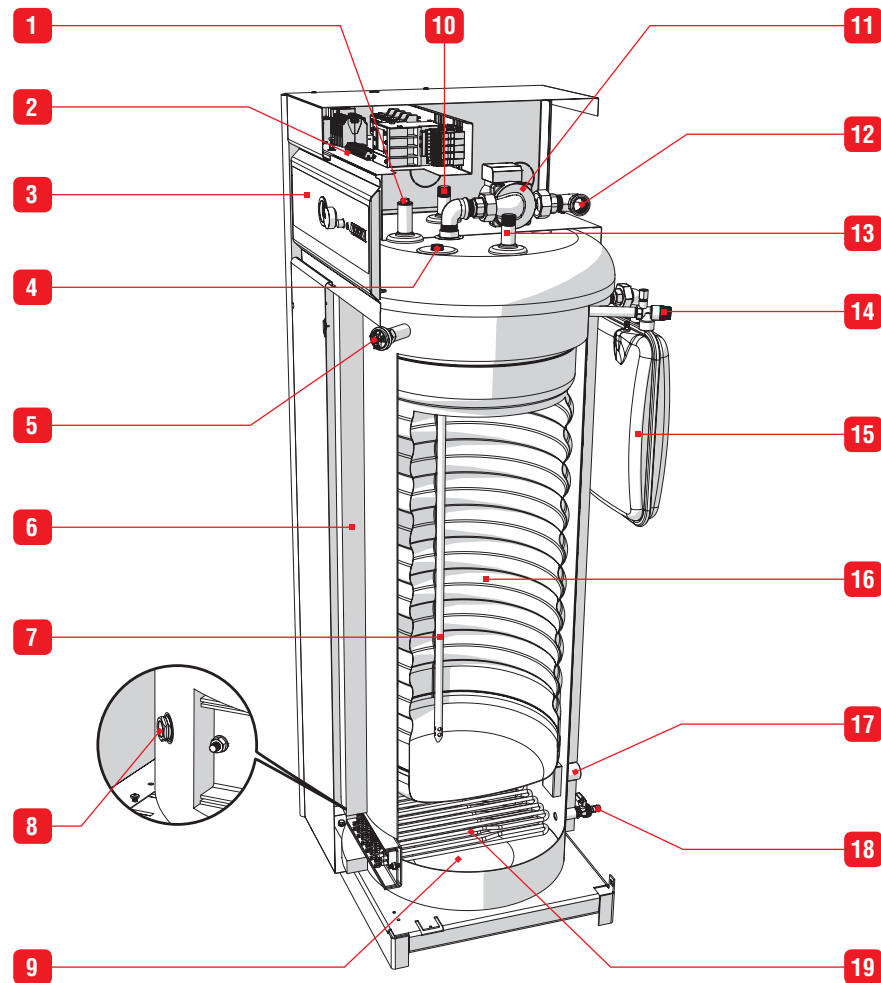
- 1 = 25°C
- 2 = 40°C
- 3 = 55°C
- 4 = 70°C
- 5 = 85°C

CONTROL PANEL : E-TECH S 380**Description**

1. ON/OFF switch
2. Power switch level 1
3. Power switch level 2
4. Summer/Winter switch
5. On peak indicator light
6. Booster indicator light
7. Booster switch
8. Thermo-manometer
9. Two-stage control thermostat adjustable from 60 at 85°C
10. Manual reset high limit thermostat [103°C]
11. Alarm indicator light

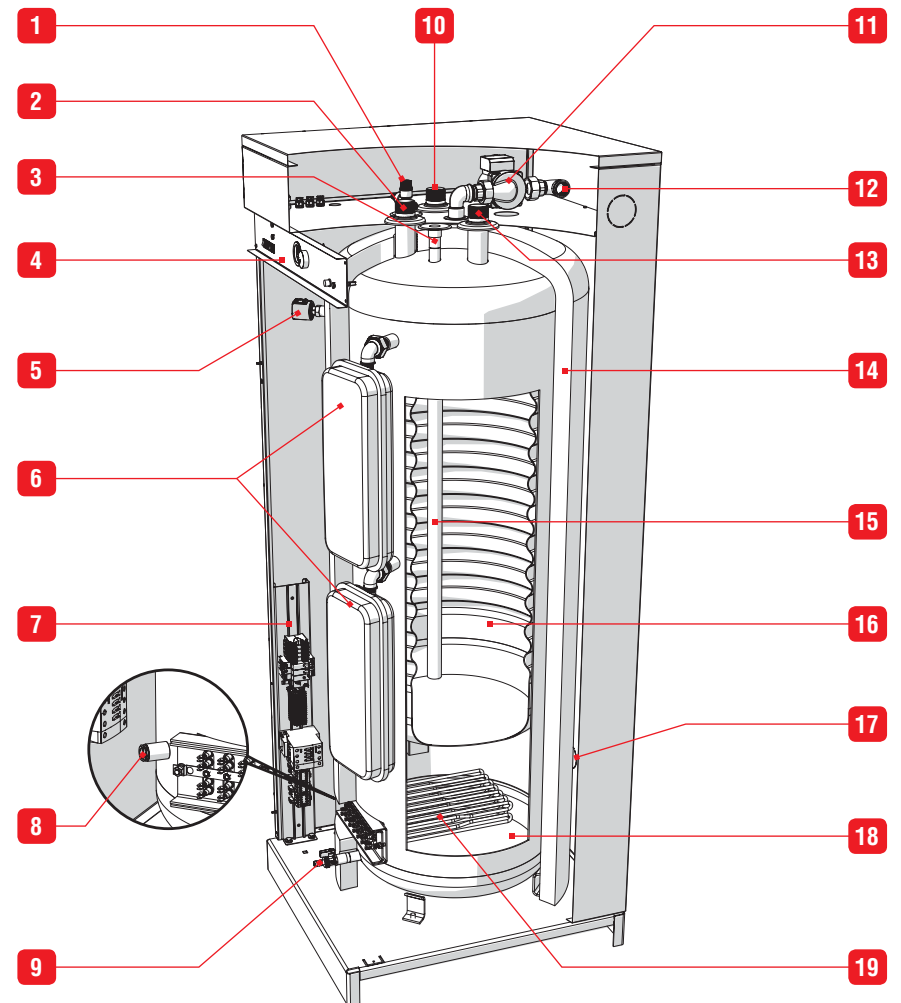
E-Tech S 160 - 240

- | | |
|--|---------------------------------|
| 1. Auxiliary connection DHW or for an optional T&P valve. | 10. Cold water inlet |
| 2. Electrical support | 11. Heating pump |
| 3. Control panel | 12. Heating circuit outlet |
| 4. Dry well for limit thermostats [90°C max] and thermometer bulbs | 13. DHW outlet |
| 5. Low-water pressure switch | 14. Safety valve (3 bar) |
| 6. Thermal insulation | 15. Primary expansion vessel |
| 7. Dip tube | 16. Stainless steel tank [DHW] |
| 8. Dry well for control thermostat, safety thermostat [103°C] and bulbs. | 17. Heating circuit return |
| 9. Primary circuit | 18. Drain valve |
| | 19. Electrical heating elements |



E-Tech S 380

- | | |
|---|---------------------------------|
| 1. Safety valve (3 bar) | 10. Cold water inlet |
| 2. Auxiliary connection DHW or for an optional T&P valve. | 11. Heating pump |
| 3. Dry well for limit thermostats [90°C max] and thermometer bulbs | 12. Heating circuit outlet |
| 4. Control panel | 13. DHW outlet |
| 5. Low-water pressure switch | 14. Thermal insulation |
| 6. Primary expansion vessel | 15. Dip tube |
| 7. Electrical support | 16. Stainless steel tank [DHW] |
| 8. Dry well for control thermostat, safety thermostat [103°C] and night load thermostat [95°C] bulbs. | 17. Heating circuit return |
| 9. Drain valve | 18. Primary circuit |
| | 19. Electrical heating elements |



ELECTRICAL CHARACTERISTICS

Main Characteristics			E-TECH S			
			160		240	380
			Tri	Mono	Tri	Tri
Power	max	kW	14,4	14,4	28,8	28,8
	min	kW	7,2	7,2	14,4	7,2
		A	21	63	42	42
Rated voltage	V		3 x 400 + N	2 x 230	3 x 400 + N	3 x 400 + N
Rated frequency	Hz		50	50	50	50
Ohmic resistance of heating elements	Ohm		22	22	22	22
Heating element type	kW		2 x 2,4	2 x 2,4	2 x 2,4	2 x 2,4
Number of heating elements			6	6	6	7

HYDRAULIC CHARACTERISTICS

Main Characteristics		E-TECH S		
		160	240	380
Capacity (primary)	L	68	86	131
Capacity (DHW)	L	99	164	263
Total capacity	L	167	250	394
Primary circuit expansion vessel volume	L	12	12	2 X 8
Heating connection	Ø	1" [F]	1" [F]	1" [F]
DHW connection	Ø	3/4" [M]	3/4" [M]	1" 1/2 [M]
Auxiliary connection	Ø	3/4" [F]	3/4" [F]	1" 1/2 [M]

DHW PERFORMANCE

Domestic hot water performance (cold drink water at 10°C)			E-TECH S		
Operating conditions at 80 °C			160	240	380
Constant flow at	40 °C [ΔT = 30 K]	L/h	413	827	827
Peak flow at	40 °C [ΔT = 30 K]	L/10'	356	545	875
Peak flow at	40 °C [ΔT = 30 K]	L/60'	700	1234	1564
Tank refill time at 60 °C					
Initial heating time	minutes		36	41	67
After drawing off 140 litres at 45 °C	minutes		16	12	12

MAXIMUM OPERATING CONDITIONS

Maximum Service Pressure

- Primary circuit : 3 bar
- DHW circuit : 8,6 bar
- Recommended pressure relief valve (central heating) : 3 bar
- Recommended pressure relief valve (DHW) : 7 bar

Mains supply pressure

- Max 6 bar, without a pressure reducing valve being required (to avoid discharge of the safety pressure valve)

Maximum Operating Conditions

- Maximum temperature (primary) : 85°C
- Maximum temperature (DHW) : 85°C

Water Quality

See "Recommendations for the Prevention of Corrosion and Scaling in Heating Systems".

RECOMMENDATIONS FOR THE PREVENTION OF CORROSION AND SCALING IN HEATING SYSTEMS

How oxygen and carbonates can affect the heating system

Oxygen and dissolved gasses in the water of the primary circuit contribute to the oxidation and the corrosion of the system components that are made of ordinary steel (radiators, ...). The resulting sludge is then deposited in the boiler.

The combination of carbonates and carbon dioxide in the water results in the formation of scale on the hot surfaces of the installation.

These deposits on the heating element thermally insulate the surface of the which may cause damage elements.

Sources of oxygen and carbonates in the heating circuit

The primary circuit is a closed circuit; the water it contains is therefore isolated from the mains water. When maintaining the system or filling up the circuit, water renewal results in the addition of oxygen and carbonates in the primary circuit. The larger the water volume in the system, the larger the addition.

Hydraulic components without an oxygen barrier (PE pipes and connections) admit oxygen into the system.

Prevention Principles

1. **Clean the existing system before installing a new boiler**
 - Before the system is filled, it must be cleaned in accordance with standard EN14336. Chemical cleaning agents can be used.
 - If the circuit is in bad condition, or the cleaning operation was not efficient, or the volume of water in the installation is substantial (e.g. cascade system), it is recommended to separate the boiler from the heating circuit using a plate-to-plate exchanger or equivalent. In that case, it is recommended to install a hydrocyclone or magnetic filter on the installation side.
2. **Limit the fill frequency**
 - Limit fill operations. In order to check the quantity of water that has been added into the system, a water meter can be installed on the filling line of the primary circuit.
 - Automatic filling systems are not recommended.
 - If your installation requires frequent water refilling, make sure your system is free of water leaks.
 - Inhibitors may be used in accordance with standard EN 14868.
3. **Limit the presence of oxygen and sludge in the water**
 - A deaerator (on the boiler flow line) combined with a dirt separator (upstream of the boiler) must be installed according to the manufacturer's instructions.
 - ACV recommends using additives that keep the oxygen in solution in the water, such as Fernox (www.fernox.com) and Sentinel (www.sentinel-solutions.net) products.
 - The additives must be used in accordance with the instructions issued by the manufacturer of the water treatment product.

4. **Limit the carbonate concentration in the water**
 - The fill water must be softened if its hardness is higher than 20° fH (11,2° dH).
 - Check regularly the water hardness and enter the values in the service log.
 - Water hardness table :

Water hardness	°fH	°dH	mmolCa(HCO3)2 / l
Very soft	0 - 7	0 - 3.9	0 - 0.7
Soft	7 - 15	3.9 - 8.4	0.7 - 1.5
Fairly hard	15 - 25	8.4 - 14	1.5 - 2.5
Hard	25 - 42	14 - 23.5	2.5 - 4.2
Very hard	> 42	> 23.5	> 4.2

5. **Control the water parameters**
 - In addition to the oxygen and the water hardness, other parameters of the water must be checked.
 - Treat the water if the measured values are outside the range.

Acidity	6,6 < pH < 8,5
Conductivity	< 400 µS/cm (at 25°C)
Chlorides	< 125 mg/l
Iron	< 0,5 mg/l
Copper	< 0,1 mg/l

SAFETY INSTRUCTIONS FOR THE INSTALLATION



General remarks

- The connections (electrical, hydraulic) must be carried out in accordance with current standards and regulations in force.
- If the water drawing off point is far from the tank, installing an auxiliary DHW loop can allow to get hot water more quickly at all times.



Essential recommendations for the correct operation of the appliance

- The boiler must be installed in a dry and protected area, with an ambient temperature comprised between 0 and 45°C.
- Install the appliance to ensure easy access at all times.
- To avoid any risk of corrosion, connect the stainless steel DHW production tank directly to the earth.
- Make sure that the mains water used to fill the boiler has a minimum pressure of 1.2 bar.
- Make sure to install a pressure reducing valve set at 4.5 bar if the mains supply pressure is in excess of 6 bar.
- The DHW circuit must be fitted with an approved safety group, comprised of a 7 bar safety valve, a check valve and a shut-off valve.



Essential recommendations for safety

- Install the boiler on base made of non-combustible materials.
- ACV recommends using a pre-set thermostatic mixing valve in order to provide hot water at a maximum of 60°C.
- The DHW circuit must be fitted with an approved safety group, comprised of a 7 bar safety valve, a check valve and a shut-off valve.
- The temperature of the domestic hot water can be adjusted up to 85°C in the boiler. However, the temperature of the domestic hot water at the drawing off point must comply with local regulations. (E.g. in Belgium, the maximum DHW water temperature at a drawing off point must be 75°C for boilers < 70 kW).
- The risk of developing bacteria exists, including "Legionella pneumophila", if a minimum temperature of 60°C is not maintained in both the DHW tank and the hot water distribution network.
- This appliance is not constructed for installation in zone 3.



Essential recommendations for the electrical safety

- Only an approved installer is authorized to carry out the electrical connections.
- Install a 2-way switch and a fuse or circuit breaker of the recommended rating outside the appliance, so as to be able to shut power down when servicing the appliance or before performing any operation on it.
- Isolate the external electrical supply of the appliance before performing any operation on the electrical circuit.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless supervised or unless they have been given instruction concerning the use of the appliance by a person responsible for their safety.

CLEARANCE

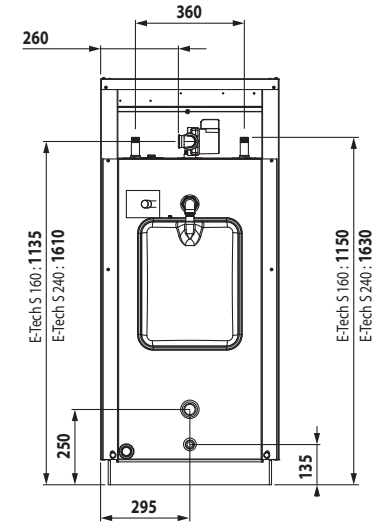
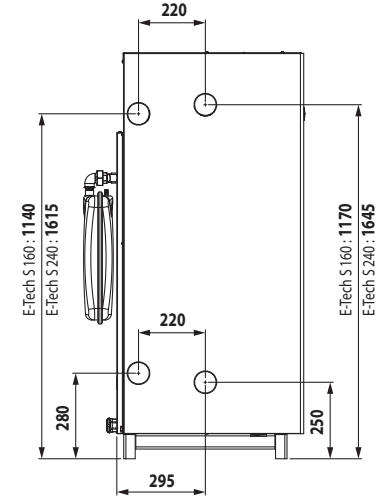
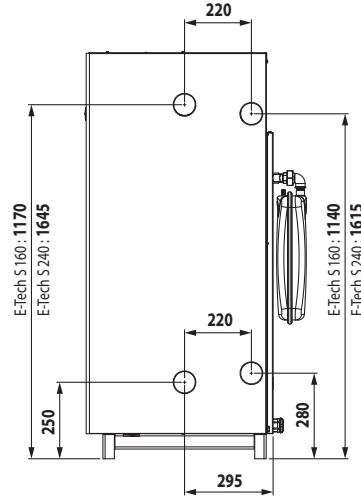
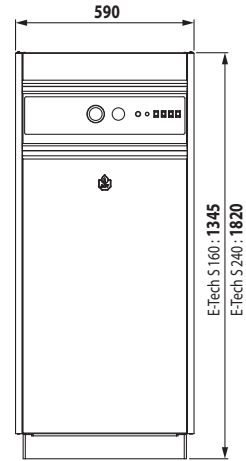
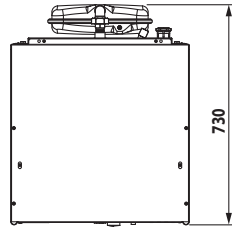
The boiler room must be large enough to allow proper access to the boiler. The following minimum distances around the boiler are required :

At the front	500 mm
Above	300 mm
On the heating circuit connections side	150 mm

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

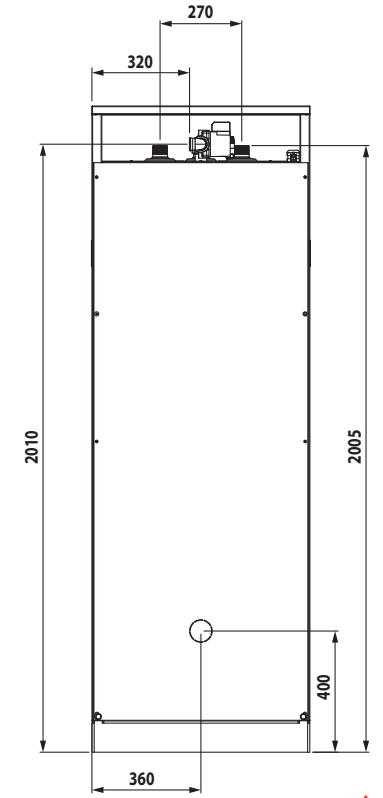
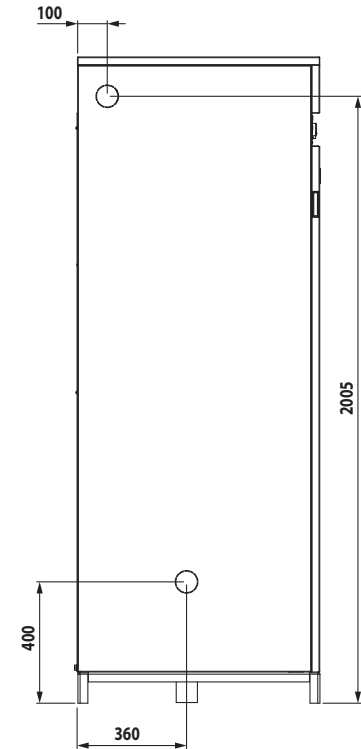
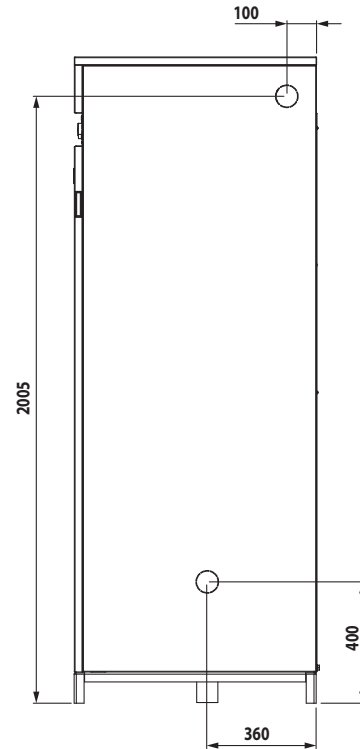
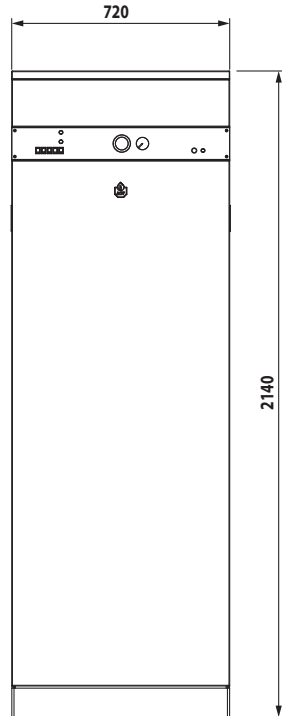
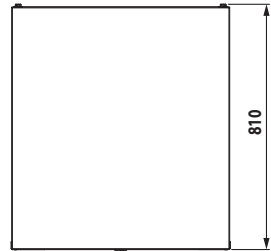


DIMENSIONS : E-TECH S 160 - 240



E-TECH S	160	240
Heating connection [F]	Ø" 1"	1"
DHW connection [M]	Ø" 3/4"	3/4"
Safety valve connection [M]	Ø" 1/2"	1/2"
Drain valve connection [F]	Ø" 1/2"	1/2"
Drained weight	Kg 115	155

DIMENSIONS : E-TECH S 380



E-TECH S	380
Heating connection [F]	Ø" 1"
DHW connection [M]	Ø" 1 1/2"
Safety valve connection [M]	Ø" 1/2"
Drain valve connection [F]	Ø" 1/2"
Drained weight	Kg 230

PACKAGE CONTENTS

The E-Tech S boilers are delivered assembled and packaged.



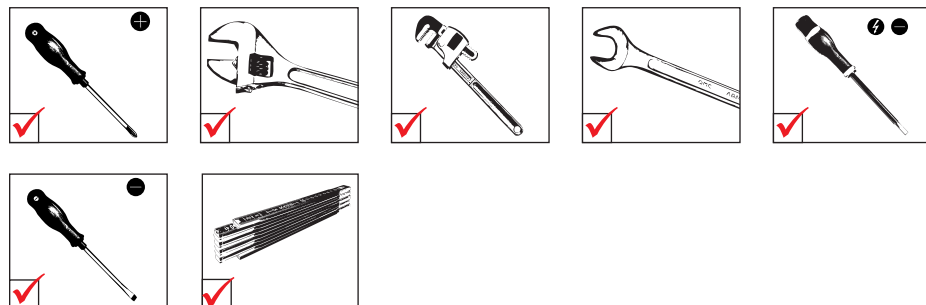
At product reception and after removal of packaging, check the package contents and that the appliance is free of damages.

Contents of the E-Tech S 160 - 240 - 380

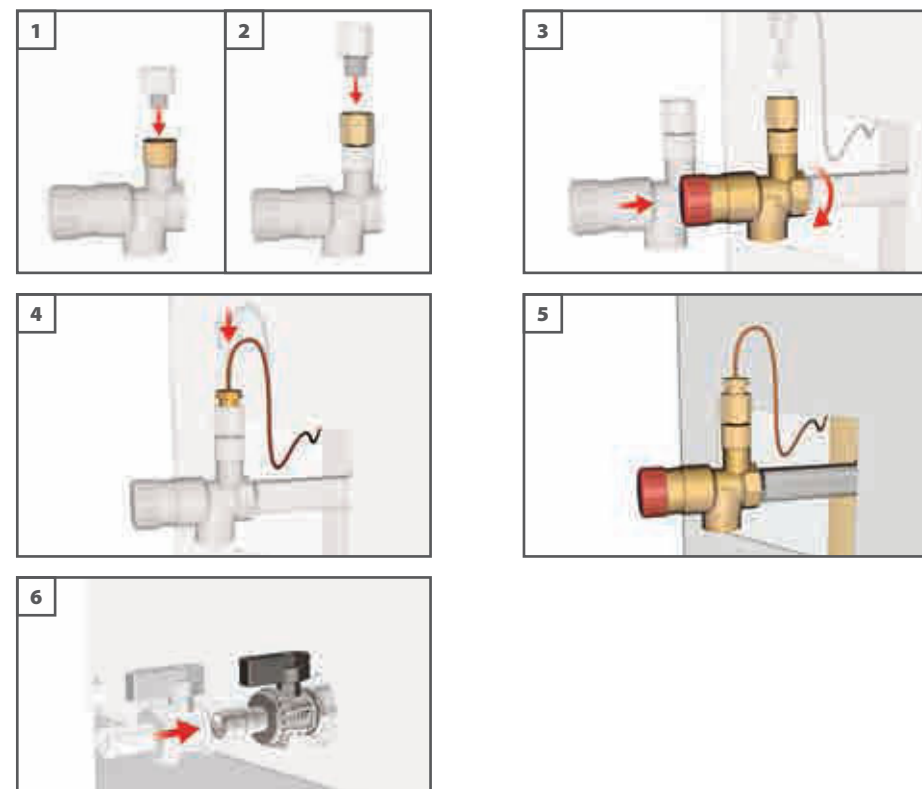
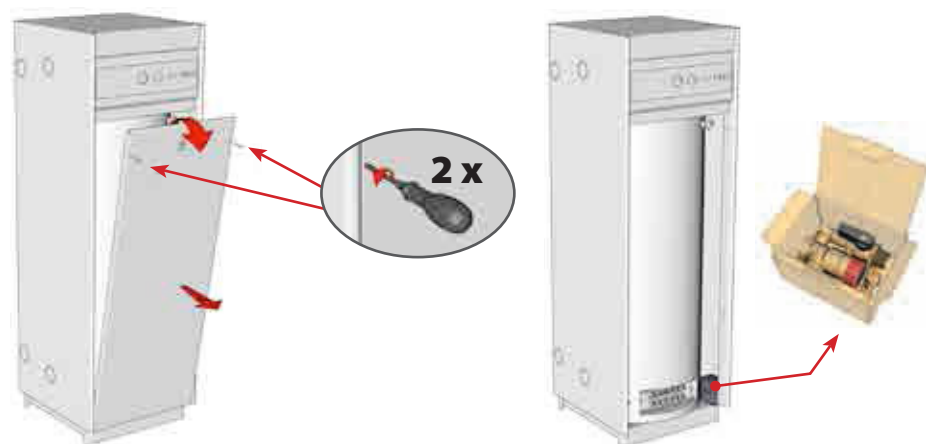
1. Electrical boiler
2. Check valve *
3. Safety valve *
4. Drain valve *
5. Installation, Operation and Maintenance Instructions

** Installed in factory on E-Tech S 380 model*

TOOLS REQUIRED FOR THE INSTALLATION



BOILER PREPARATION BEFORE INSTALLATION : E-TECH S 160 - 240



Essential recommendations for the correct operation of the system

- The drain valve (7) and the safety valve (5) must be connected to the sewer.
- The boiler is fitted with a primary expansion volume of :
- 12 litres for the E-Tech S 160 and 240.
- 2 x 8 litres for the E-Tech S 380.
- If the expansion vessel volume is not sufficient for your needs, it is possible to install an additional expansion vessel.
- The boiler is fitted with a safety valve set to 3 bar.

DHW CONNECTION



General remark

- The circuit illustrations are basic principle diagrams only.



Essential recommendation for safety

- The hot water output may reach temperatures in excess of 60°C, which can cause scalding! It is therefore necessary to install a thermostatic mixing valve after the appliance.
- The installation must be fitted with an approved safety group, comprised of a 7 bar safety valve, a check valve and a shut-off valve.



Essential recommendations for the correct operation of the appliance

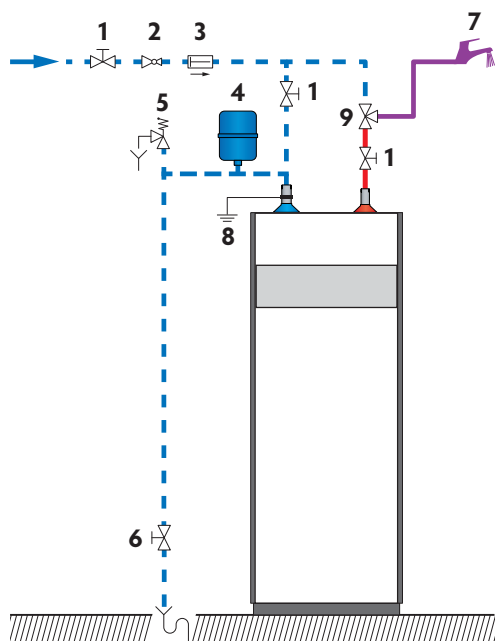
- Flush the system before connecting the domestic hot water circuit. Refer to the installation instructions.
- Make sure to install a pressure reducing valve set at 4.5 bar if the mains supply pressure is in excess of 6 bar.
- It is recommended to install an expansion vessel in the DHW circuit to prevent the safety valve from opening constantly and reduce the water hammer effect in the system.
- If the appliance is used as a domestic hot water preparation tank, a primary expansion vessel of at least 16 litres must be fitted in the heating circuit, if there is no built-in expansion vessel.

Typical installation

Description

- Isolating valve
- Pressure reducing valve
- Check valve
- DHW expansion vessel
- Safety valve
- Drain valve
- Draw-off tap
- Grounding
- Thermostatic mixing valve

--- Cold water
 --- Hot water



OPTIONAL ACCESSORIES

Description	Code
DHW safety valve (7bar) - Ø 3/4" [F]	557A1500
DHW safety group (7bar) - Ø 3/4" [F]	55211400
Thermostatic mixing valve - Ø 3/4" [M]	55212000
DHW expansion vessel - 5 litres - Ø 3/4" [M]	55301300
DHW expansion vessel - 8 litres - Ø 3/4" [M]	55301400
DHW expansion vessel - 12 litres - Ø 3/4" [M]	55301500
DHW expansion vessel - 18 litres - Ø 3/4" [M]	55301600

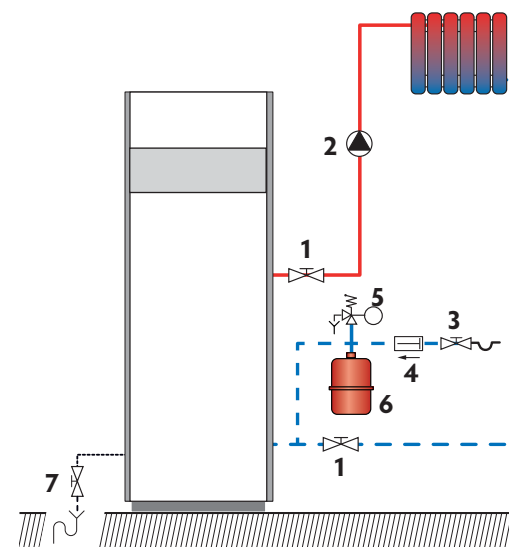
HEATING CONNECTION

Typical connection - high temperature

Description

- Isolating valve
- Heating pump
- Filling valve
- Check valve
- Safety valve
- Expansion vessel
- Drain valve

--- Cold water
 --- Hot water



ELECTRICAL CONNECTION



Essential recommendations for the electrical safety

- The wiring connections must be carried out by a competent person, in accordance with the current IEE Wiring Regulations.
- The boiler must be effectively earthed.
- A box fitted with a magneto-thermal circuit breaker must be fitted on the outside of the boiler to protect the boiler and allow the power supply to be switched off during servicing or other work on the boiler.
- 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.

SIZING OF POWER SUPPLY WIRES

The power supply wires are sized according to the type and current of the main circuit breaker (MCB). The latter is sized according to the nominal current of the boiler. The admissible current of the power supply wires depends on the ambient temperature, the section and length of the wires, the wires insulation, the wiring system construction, the installation type and the environment.

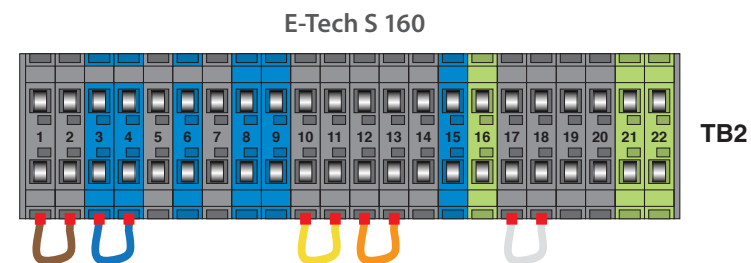
The following values are given for information only, for an ambient temperature of 30°C and a maximum length of 5 meters. In all cases, the system must be set up in accordance with the current IEE Wiring Regulations.

Nominal section (mm)	Nominal current of the MCB (A)
1.5	16
2.5	25
4	32
6	40
10	63
16	80

ELECTRICAL CONNECTION : E-TECH S 160

CONNECTING THE ACCESSORIES

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

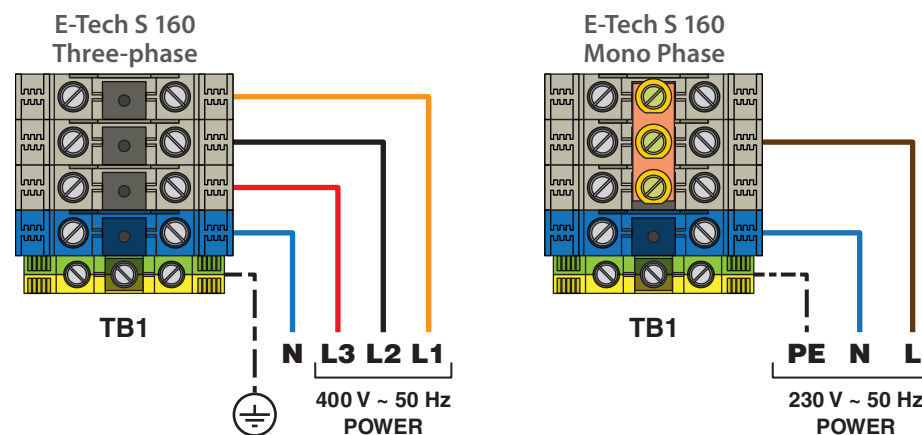


- 1-2 : Phase (230V ~ 50Hz)
- 3-4 : Neutral
- 5-6 : Time clock or controller supply (optional)
- 7-8 : Safety switch
- 10-11 : Stop Bridge or time clock switch control (optional)
- 12-13 : Room thermostat (optional)
- 14-15-16 : Heating pump
- 17-18 : Relay K3 deactivated

CONNECTING THE POWER SUPPLY

E-Tech S 160 Three-phase : the power circuit must be connected using three phases (3 x 400 V) + neutral.

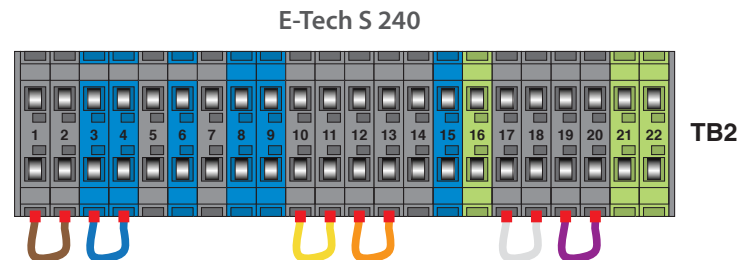
E-Tech S 160 Mono Phase : the power circuit must be connected using one phase (1 x 230 V) + neutral.



ELECTRICAL CONNECTION : E-TECH S 240

CONNECTING THE ACCESSORIES

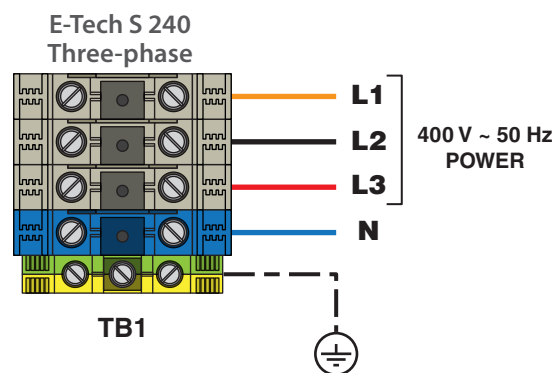
The electrical accessories are connected to the numbered terminals shown on the diagram below.



- 1-2 : Phase (230V ~ 50Hz)
- 3-4 : Neutral
- 5-6 : Time clock or controller supply (optional)
- 7-8 : Safety switch
- 10-11 : Stop Bridge or time clock switch control (optional)
- 12-13 : Room thermostat (optional)
- 14-15-16 : Heating pump
- 17-18 : Relay K3 deactivated
- 19-20 : Relay K4 deactivated

CONNECTING THE POWER SUPPLY

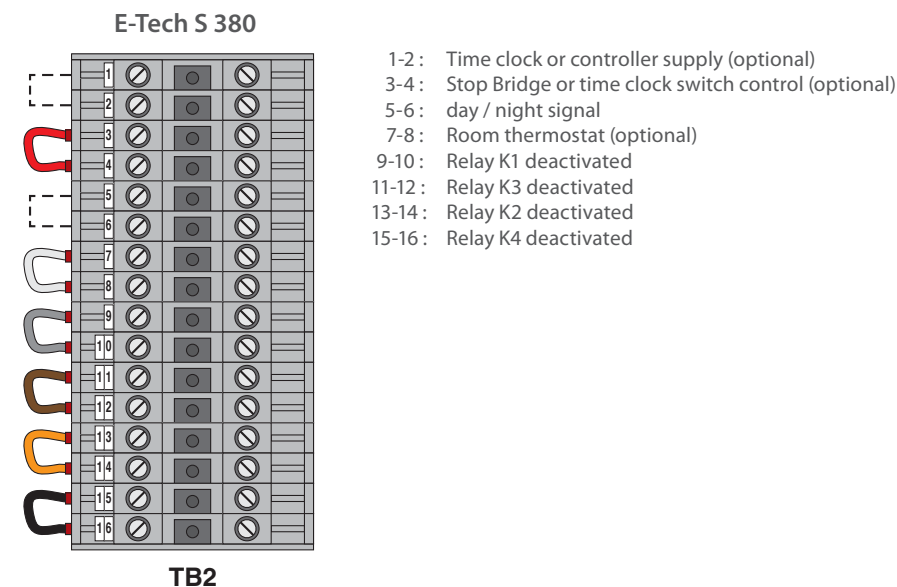
E-Tech S 240 Three-phase : the power circuit must be connected using three phase (3 x 400 V) + neutral.



ELECTRICAL CONNECTION : E-TECH S 380

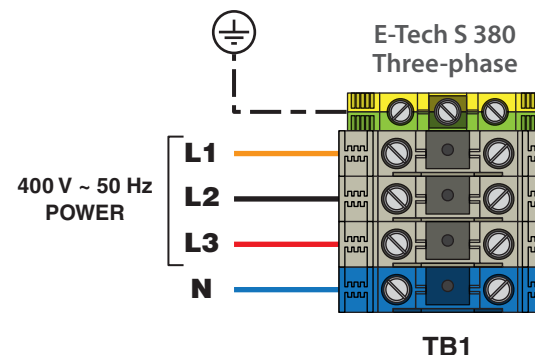
CONNECTING THE ACCESSORIES

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

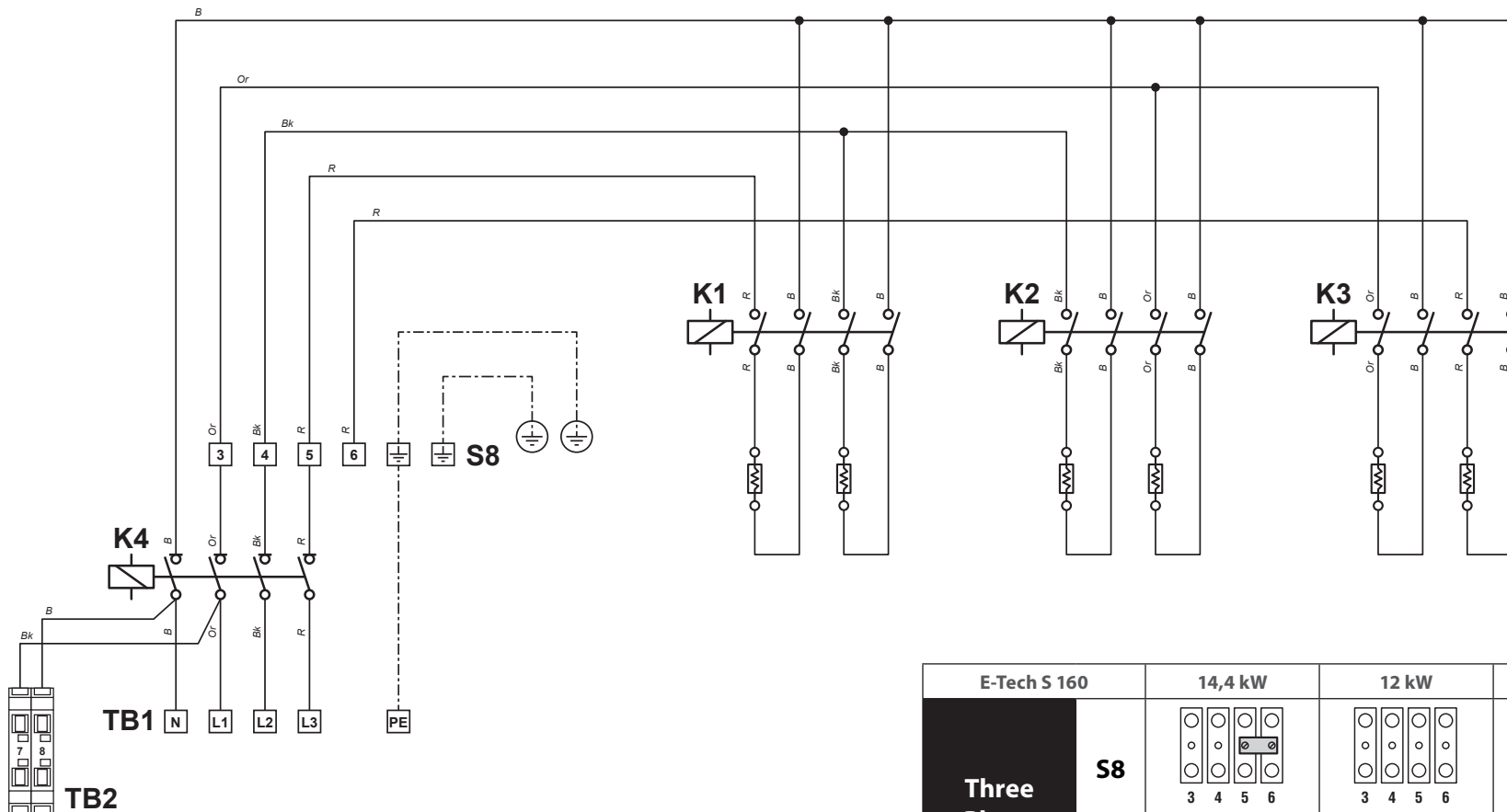


CONNECTING THE POWER SUPPLY

E-Tech S 380 Three-phase : the power circuit must be connected using three phases (3 x 400 V) + neutral.



POWER SUPPLY WIRING DIAGRAM : E-TECH S 160



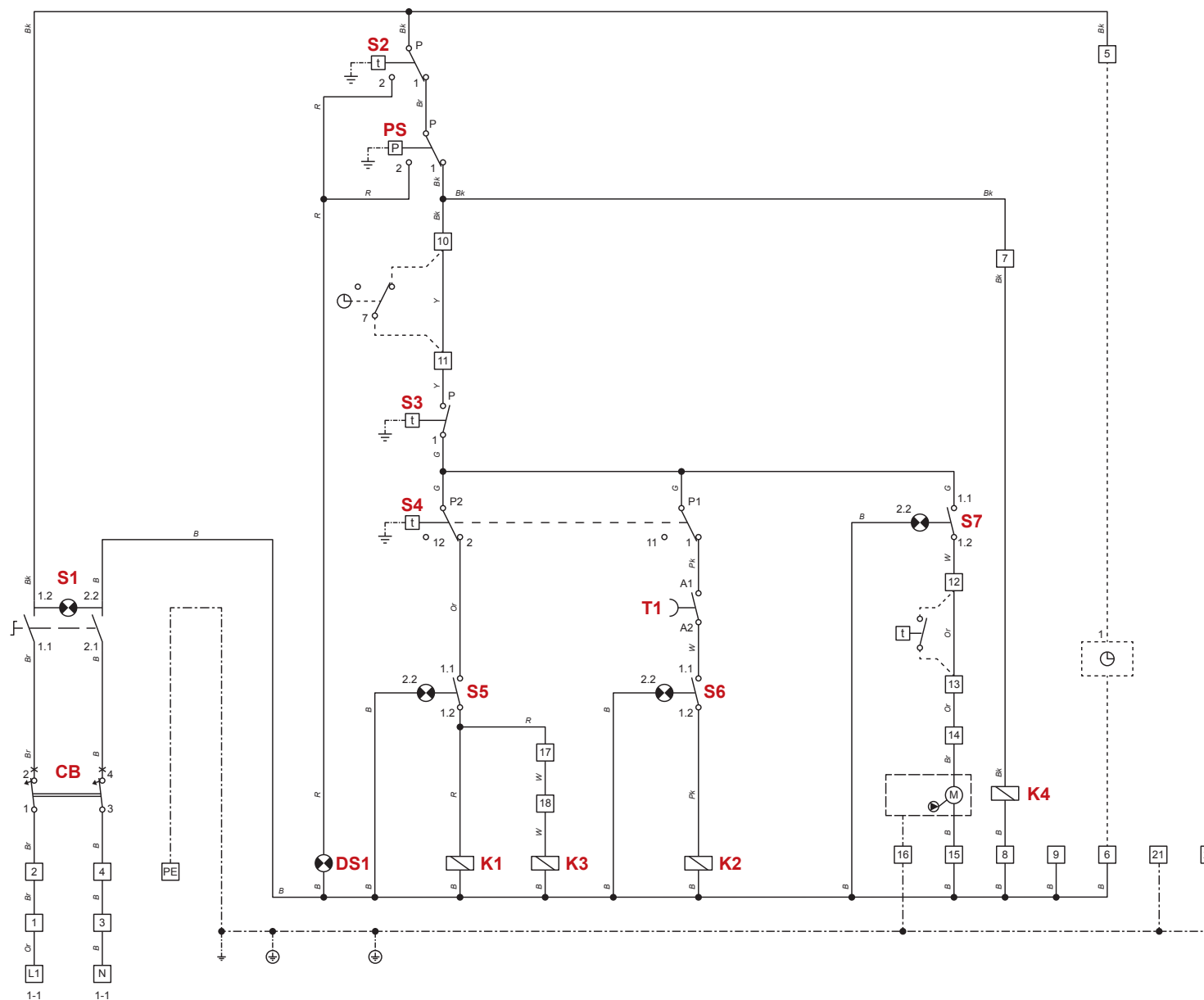
E-Tech S 160		14,4 kW	12 kW	9,6 kW	7,2 kW
Three Phase	S8				
	TB2				

E-Tech S 160		14,4 kW	12 kW	9,6 kW	7,2 kW
Mono Phase	S8				
	TB2				

- TB1 : Terminal of power supply
- TB2 : Terminal of control circuit
- S8 : Power selector
- K1 : Power relay 1 - level 1
- K2 : Power relay 1 - level 2
- K3 : Power relay 2 - level 1
- K4 : Safety switch

- B : Blue
- Bk : Black
- Or : Orange
- R : Red

CONTROL WIRING DIAGRAM : E-TECH S 160

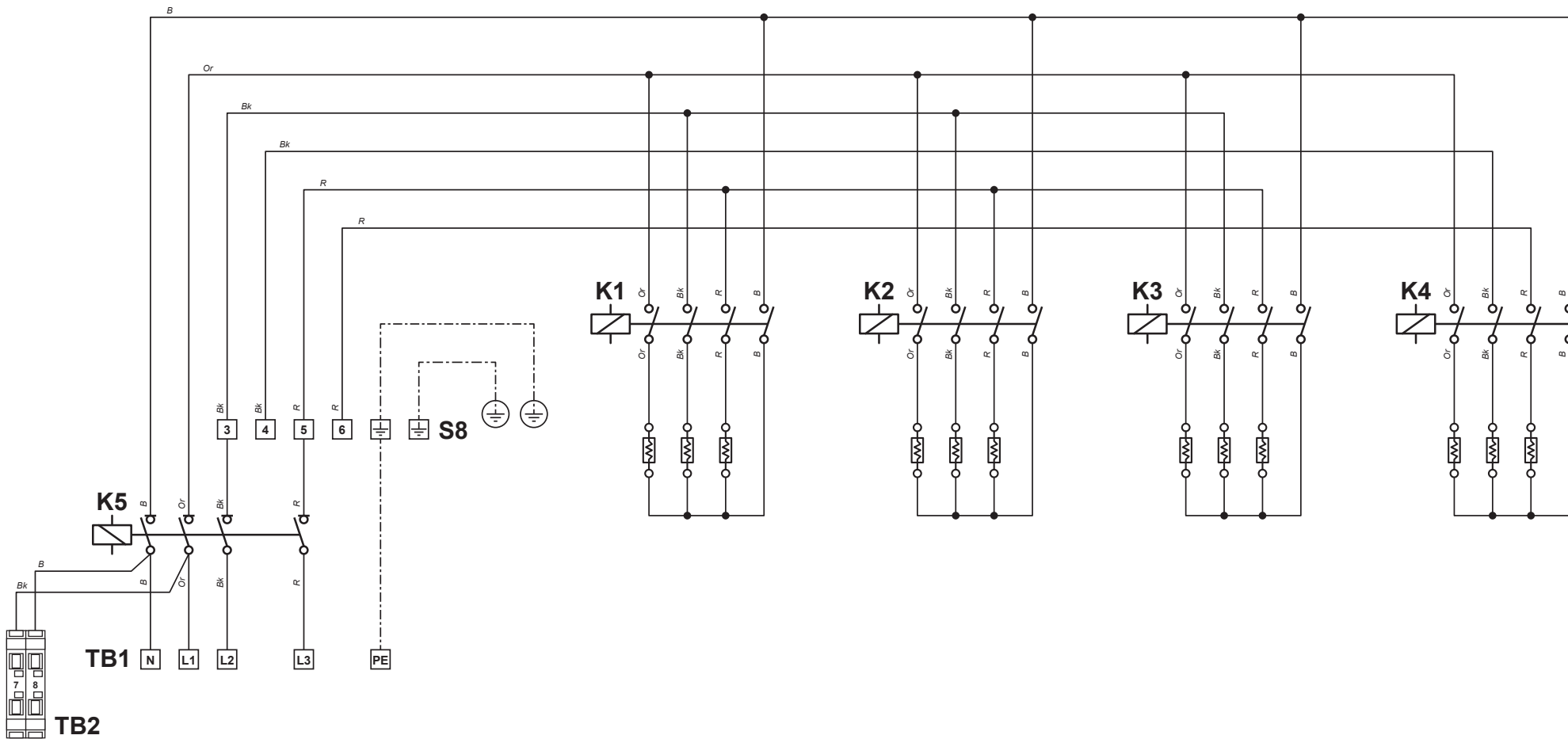


- CB : Circuit breaker
- S1 : ON/OFF switch + lamp
- S2 : Manual reset safety thermostat [103°C max.]
- PS : Low-water pressure switch
- DS1 : Alarm indicator light
- S3 : Limit thermostat [90°C max.]
- S4 : Two-stage control thermostat [15-22°C / 78-85°C]
- S5 : Power switch level 1 + lamp
- K1 : Power relay 1 - level 1
- K3 : Power relay 2 - level 1
- T1 : Timer
- S6 : Power switch level 2 + lamp
- K2 : Power relay 1 - level 2
- S7 : Summer / winter switch + lamp
- K4 : Safety switch

- 1-2 : Phase
- 3-4 : Neutral
- 5-6 : Time clock or controller supply (optional)
- 7-8 : Safety switch power supply
- 10-11 : Stop Bridge or time clock switch control (optional)
- 12-13 : Room thermostat (optional)
- 14-15 : Heating pump
- 17-18 : Relay K3 deactivated

- B : Blue
- Bk : Black
- Br : Brown
- G : Grey
- Or : Orange
- Pk : Pink
- R : Red
- V : Violet
- W : White
- Y : Yellow

POWER SUPPLY WIRING DIAGRAM : E-TECH S 240

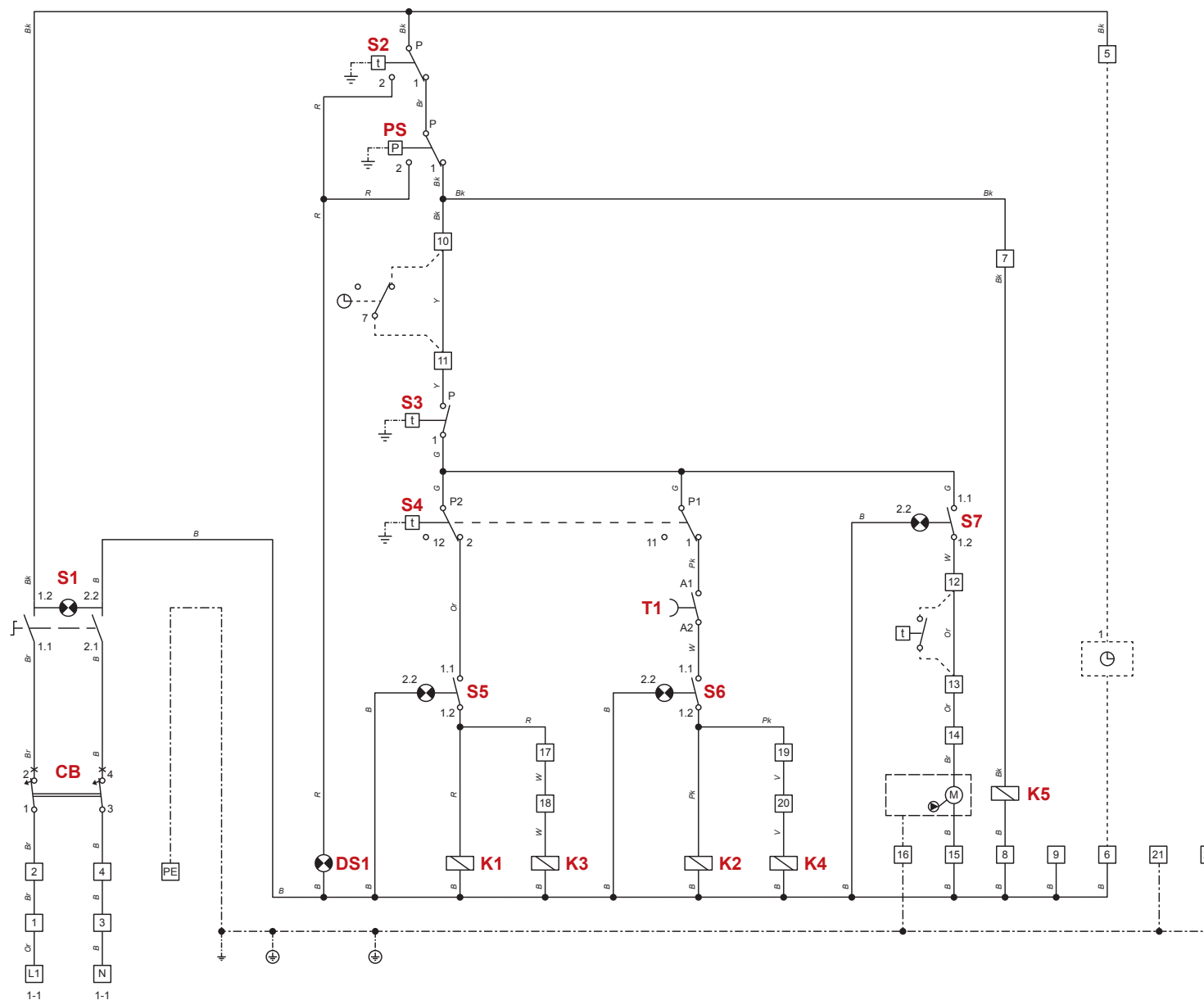


- TB1 : Terminal of power supply
- TB2 : Terminal of control circuit
- S8 : Power selector
- K1 : Power relay 1 - level 1
- K2 : Power relay 1 - level 2
- K3 : Power relay 2 - level 1
- K4 : Power relay 2 - level 2
- K5 : Safety switch

- B : Blue
- Bk : Black
- Or : Orange
- R : Red

E-Tech S 240		28,8 kW	26,4 kW	24 kW	21,6 kW	14,4 kW
Three Phase	S8					
	TB2					

CONTROL WIRING DIAGRAM : E-TECH S 240

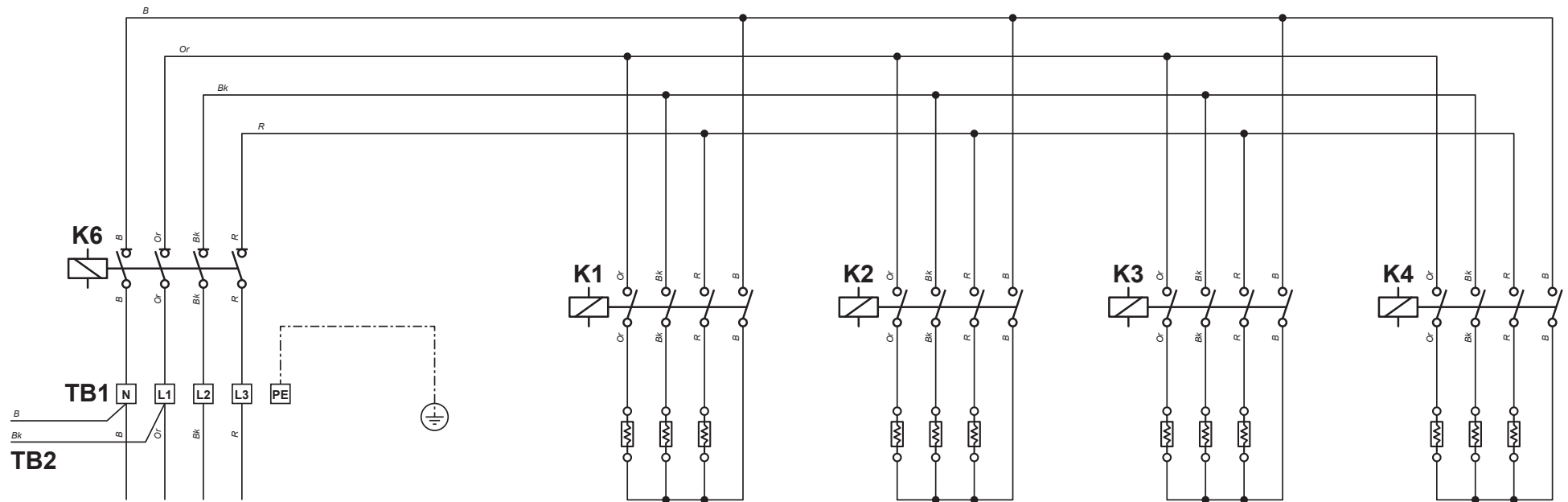


- CB : Circuit breaker
- S1 : ON/OFF switch + lamp
- S2 : Manual reset safety thermostat [103°C max.]
- PS : Low-water pressure switch
- DS1 : Alarm indicator light
- S3 : Limit thermostat [90°C max.]
- S4 : Two-stage control thermostat [15-22°C / 78-85°C]
- S5 : Power switch level 1 + lamp
- K1 : Power relay 1 - level 1
- K3 : Power relay 2 - level 1
- T1 : Timer
- S6 : Power switch level 2 + lamp
- K2 : Power relay 1 - level 2
- K4 : Power relay 2 - level 2
- S7 : Summer / winter switch + lamp
- K5 : Safety switch

- 1-2 : Phase
- 3-4 : Neutral
- 5-6 : Time clock or controller supply (optional)
- 7-8 : Safety switch power supply
- 10-11 : Stop Bridge or time clock switch control (optional)
- 12-13 : Room thermostat (optional)
- 14-15 : Heating pump
- 17-18 : Relay K3 deactivated
- 19-20 : Relay K4 deactivated

- B : Blue
- Bk : Black
- Br : Brown
- G : Grey
- Or : Orange
- Pk : Pink
- R : Red
- V : Violet
- W : White
- Y : Yellow

POWER SUPPLY WIRING DIAGRAM : E-TECH S 380



TB1 : Terminal of power supply

TB2 : Terminal of control circuit

K1 : Power relay 1 - level 1

K2 : Power relay 1 - level 2

K3 : Power relay 2 - level 1

K4 : Power relay 2 - level 2

K6 : Safety switch

B : Blue

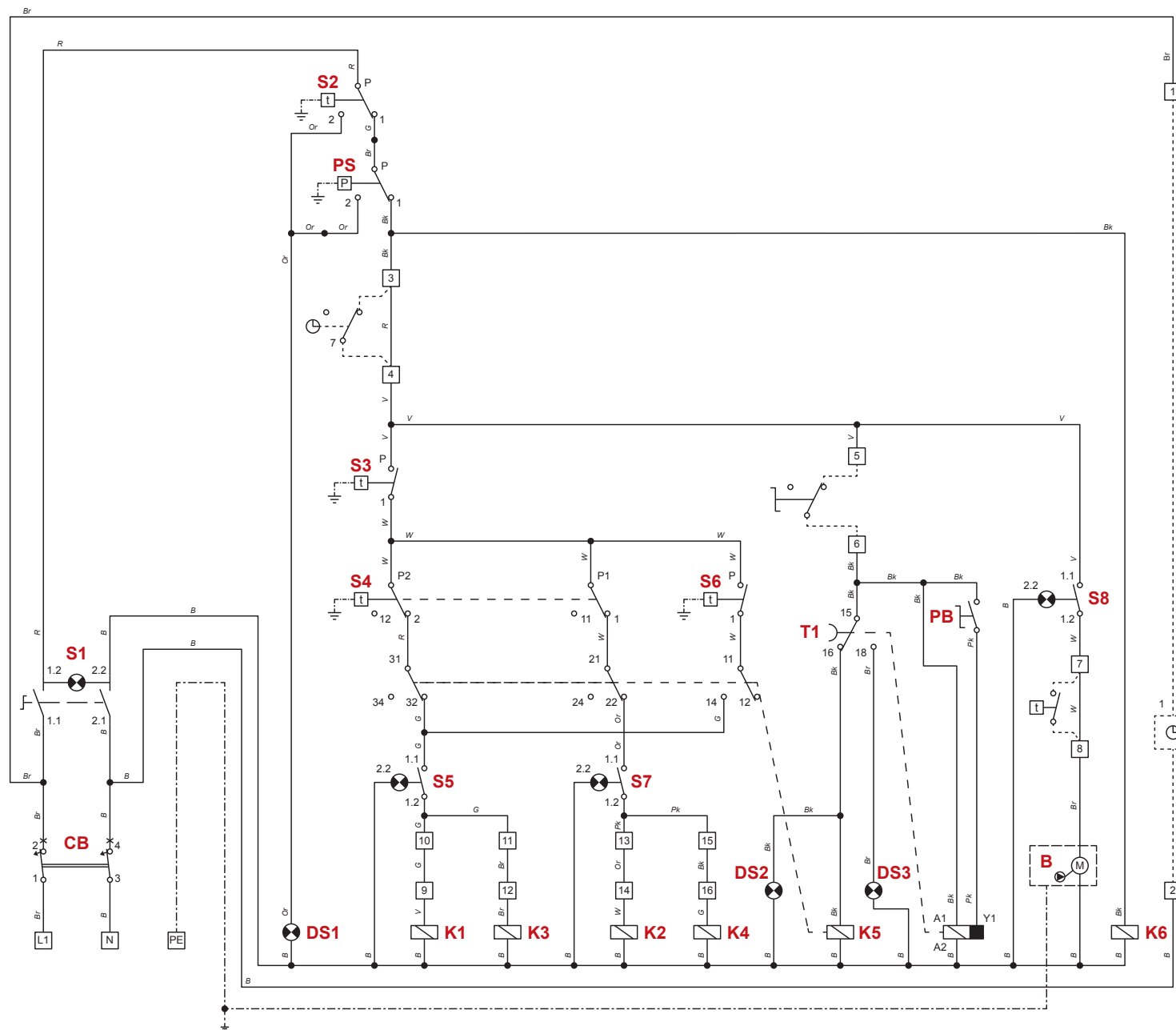
Bk : Black

Or : Orange

R : Red

E-Tech S 380		28,8 kW	21,6 kW	14 kW	7,2 kW
Three Phase	TB2				

CONTROL WIRING DIAGRAM : E-TECH S 380



- CB : Circuit breaker
- S1 : ON/OFF switch + lamp
- S2 : Manual reset safety thermostat [103°C max.]
- PS : Low-water pressure switch
- DS1 : Alarm indicator light
- S3 : Limit thermostat [90°C max.]
- S4 : Two-stage control thermostat [15-22°C / 78-85°C]
- S5 : Power switch level 1 + lamp
- K1 : Power relay 1 - level 1
- K3 : Power relay 2 - level 1
- S6 : Night load thermostat [95°C max.]
- S7 : Power switch level 2 + lamp
- K2 : Power relay 1 - level 2
- K4 : Power relay 2 - level 2
- T1 : Booster timer preset at one hour
- K5 : Reverse current relay
- DS2 : On Peak indicator light
- DS3 : Booster indicator light
- PB : Booster switch
- S8 : Summer / winter switch + lamp
- B : Heating pump
- K6 : Safety switch

- 1-2 : Time clock or controller supply (optional)
- 3-4 : Stop Bridge or Time clock switch control (optional)
- 5-6 : Day / night signal
- 7-8 : Room thermostat (optional)
- 9-10 : Relay K1 deactivated
- 11-12 : Relay K3 deactivated
- 13-14 : Relay K2 deactivated
- 15-16 : Relay K4 deactivated

- B : Blue
- Bk : Black
- Br : Brown
- G : Grey
- Or : Orange
- Pk : Pink
- R : Red
- V : Violet
- W : White

SAFETY INSTRUCTIONS FOR STARTING UP

Essential recommendations for safety

- The components inside the control panel may only be accessed by an approved installer.
- Set the water temperature in accordance with usage and local plumbing codes.

TOOLS REQUIRED FOR STARTING UP



CHECKS BEFORE STARTING UP

Essential recommendation for the correct operation of the appliance

- Control the tightness of the hydraulic circuit connections.

FILLING THE SYSTEM

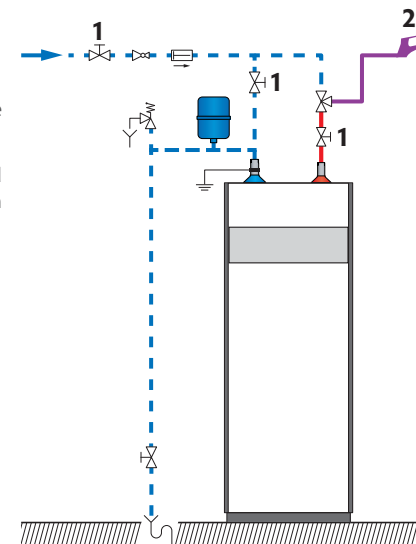


First put the DHW tank under pressure before pressurizing the heating (primary) circuit.

Filling the domestic hot water circuit

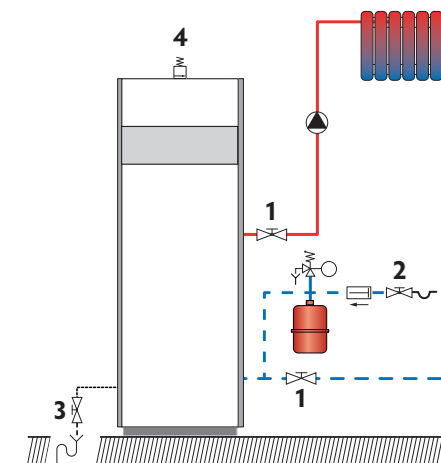
1. Open the isolating valves (1) and the draw-off tap (2).
2. Once the water flow rate has stabilized and the air is totally evacuated from the system, close the draw-off tap (2).
3. Check all the connections for leaks.

— — — — — Cold water
 — — — — — Hot water



Filling of the heating circuit

1. Open the isolating valves (1).
2. Make sure that the drain valve (3) is tightly closed.
3. Open the filling valve (2).
4. Open the air bleed valve (4).
5. Once the system is bled from air, bring the pressure to the static pressure + 0.5 bar: 1.5 bar = 10m - 2 bar = 15m



STARTING UP THE BOILER



Essential recommendations for the electrical safety

- Only an approved installer is authorized to carry out the electrical connections.
- Install a 2-way switch and a fuse or circuit breaker of the recommended rating outside the appliance, so as to be able to shut power down when servicing the appliance or before performing any operation on it.
- Isolate the external electrical supply of the appliance before performing any operation on the electrical circuit.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless supervised or unless they have been given instruction concerning the use of the appliance by a person responsible for their safety.

Set-up conditions

- All electric connections made.
- Power supply.
- DHW and heating circuits full of water.

Procedure

1. Place the ON/OFF master switch on the ON position (⏻).
2. If a room thermostat is installed, possibly increase the temperature set-point to generate a demand.



If the boiler heating pump does not work, the boiler can be damaged and its life reduced.

3. Set the central heating and domestic hot water temperatures to the required values using the control panel.
4. After 5 minutes of operation, bleed the heating circuit until all air is evacuated and restore a 1.5 bar pressure.
5. Bleed the central heating circuit once again and top it up with water to get the required pressure, if necessary.
6. Make sure that the central heating system is properly balanced and, if needed, adjust the valves to prevent certain circuits or radiators from getting a flow rate that is far above or below the set rate.

Follow-up tasks

7. Check that there are no leaks.
8. Check all electric connections.

SAFETY INSTRUCTIONS FOR THE BOILER MAINTENANCE



Essential recommendation for the electrical safety

- Isolate the external power supply of the appliance before performing any operation, unless it is required to take measurements or perform system setup.



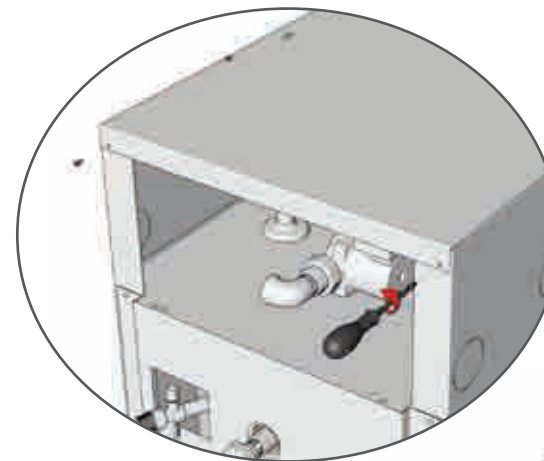
Essential recommendation for safety

- Water flowing out of the drain valve may be extremely hot and could cause severe scalding.

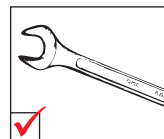
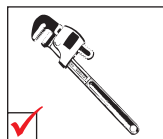
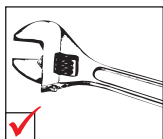


Essential recommendations for the correct operation of the appliance

- It is recommended to have the boiler serviced at least once a year. More frequent servicing may be required depending on boiler use. Please consult your installer for advice.
- The boiler maintenance will be carried out by a qualified engineer, and the defective parts may only be replaced by genuine factory parts.
- Control the tightness of the hydraulic circuit connections.
- Make sure to replace the gaskets of the removed items before reinstalling them.

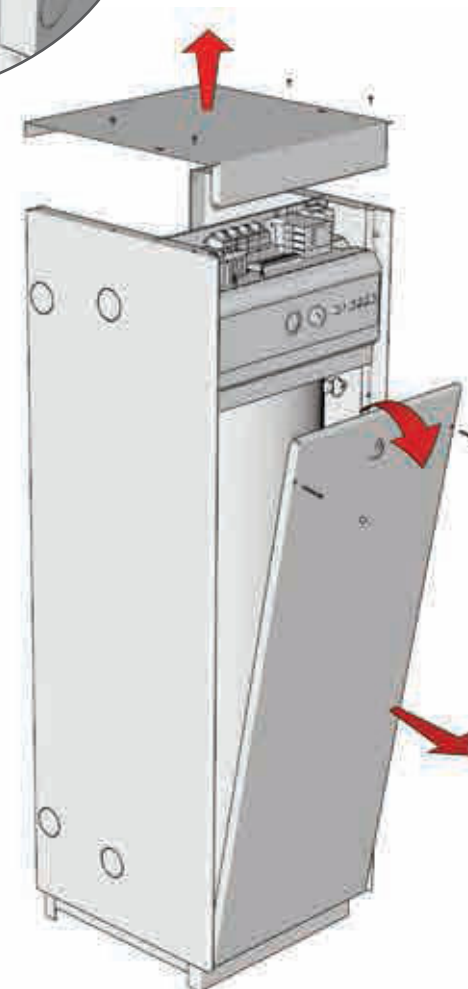


TOOLS REQUIRED FOR MAINTENANCE



BOILER SHUT DOWN FOR MAINTENANCE

1. Switch the boiler off using the ON/OFF master switch and isolate the external power supply.
2. Remove the front panel and the top cover of the boiler.



PERIODIC BOILER MAINTENANCE TASKS

Tasks	Frequency	
	Periodic inspection	1 year
	End-user	Professional
1. Make sure that the system water pressure is at least 1 bar when cold. Top up the system if necessary, adding small quantities of water at a time. In case of repeated fills, call your installer.	X	X
2. Check that there is no water on the floor next to the boiler. Call your installer if there is.	X	X
3. Check that the thermostats and safety devices are working properly.		X
4. Check that all hydraulic connections are correctly fastened and tight.		X
5. Inspect the wiring and the heating elements looking for any sign of overheating.		X
6. Check that the screws on the connection terminal block are properly tightened.		X
7. Check visually the heating body: no evidence of corrosion, overheating or damages. Carry out all required cleaning tasks, repairs and replacements that might be required.		X

RESTARTING AFTER MAINTENANCE

Set-up conditions

- All removed components reinstalled
- All connections made
- Power supply
- DHW and heating circuits full of water

Procedure

1. Switch the appliance on using the ON/OFF master switch.
2. Check the correct operation of the charging pump.

DRAINING THE BOILER



Essential recommendations for safety

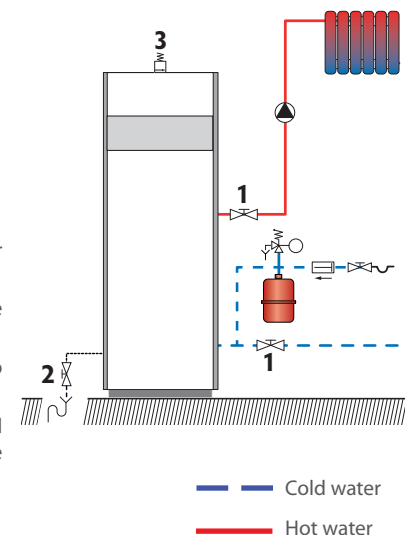
- Before draining the DHW tank, drain the heating (primary) circuit or bring its pressure to 0 bar.
- Water flowing out of the drain valve may be extremely hot and could cause severe scalding. Keep people away from the hot water discharge.

Set-up conditions

- Boiler switched off using the ON/OFF master switch.
- Power supply isolated from the external electrical box.

Heating circuit draining procedure

1. Close the isolating valves (1).
2. Connect the drain valve (2) to the sewer with a hose.
3. Open the drain valve (2) to empty the heating circuit of the boiler.
4. Open the circuit air bleed valve (3) to accelerate the draining process.
5. Close the drain valve (2) and the air bleed valve (3) once the heating circuit of the boiler is empty.

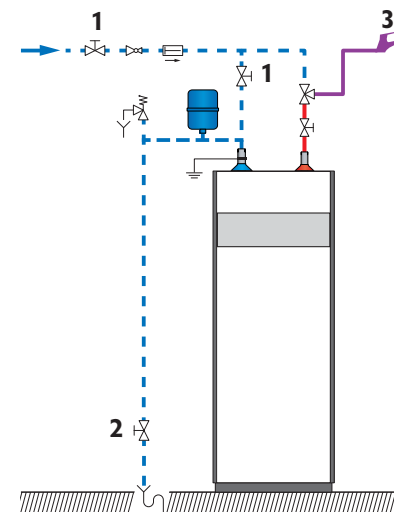


DHW circuit draining procedure



Before draining the DHW tank, make sure that the heating (primary) circuit pressure is null.

1. Open fully a draw-off tap (3) for about 60 minutes to make sure that the DHW tank has cooled down.
2. Close the isolating valves (1).
3. Connect the drain valve (2) to the sewer with a hose.
4. Open the drain valve (2) and drain the DHW tank water to the sewer.
5. Open the draw-off tap (3) to accelerate the draining process. If it is located lower than the tank connection, open a draw-off tap located higher in the system.
6. Close the drain valve (2) and the draw-off tap (3) once the DHW tank of the boiler is empty.





excellence in hot water



DECLARATION OF CONFORMITY - CE

1/1

Name and address of manufacturer: **ACV International SA / NV**
Oude Vijverweg, 6
B-1653 Dworp

Description of product type: **Electric combination boiler**

Models: **E-Tech S 160**
E-Tech S 240
E-Tech S 380

We declare hereby that the appliance specified above is conform to the type model described in the CE certificate of conformity to the following directives:

Directives	Description	Date
2006/95/EC	Voltage Limits Directive	12.12.2006
2004/108/EC	Electromagnetic Compatibility Directive	15.12.2004

We declare under our sole responsibility that the product **E-Tech S** complies with the following standards:

EN 60335-1
 EN 60335-2-35

Dworp, 16/06/2015

Date


 Director R & D
 Marco Croon

Series of horizontal dotted lines for additional information or notes.