REDRING

POWERSTREAM ASCARI

MODEL N° 45-551860
PSA 12

INSTALLATION GUIDE

Ref. : 1871184 - 11.003

CONTENTS

1 - INSTALLATION & CONFIGURATION

1.1 - Quick reference Guide

1. It is recommended that the boiler be connected to a 10 hour or similar off-peak tariff that provides some daytime off-peak hours.

2. Where the off-peak tariff is restricted a changeover relay should be used to switch power to the boiler when the off-peak supply is not available.

3. Fill the system with water prior to turning on the electrical supply to the boiler.

4. Ensure the system is flushed thoroughly before letting any air/water exit through the pressure relief valve (dirt can prevent the valve closing).

5. Check the system is full by turning the pressure relief valve cap, and check water exits correctly through the discharge pipe.

6. A manual pressure gauge should be used to check the system pressure when cold. The pressure should be set between 1 bar & 1.5 bar. Note all air should be removed from the system before measuring the system pressure.

6a Alternative with the electric supply off, the yellow bridge between terminals 10 and 11 may be removed before filling the system for the final time (this prevents the elements turning on) and the boiler pressure gauge used to set the cold system pressure. Once set to 1-1.5bar, the boiler should be switched off and the yellow bridge returned to its position between terminals 10 & 11.

1.2 - Install Options

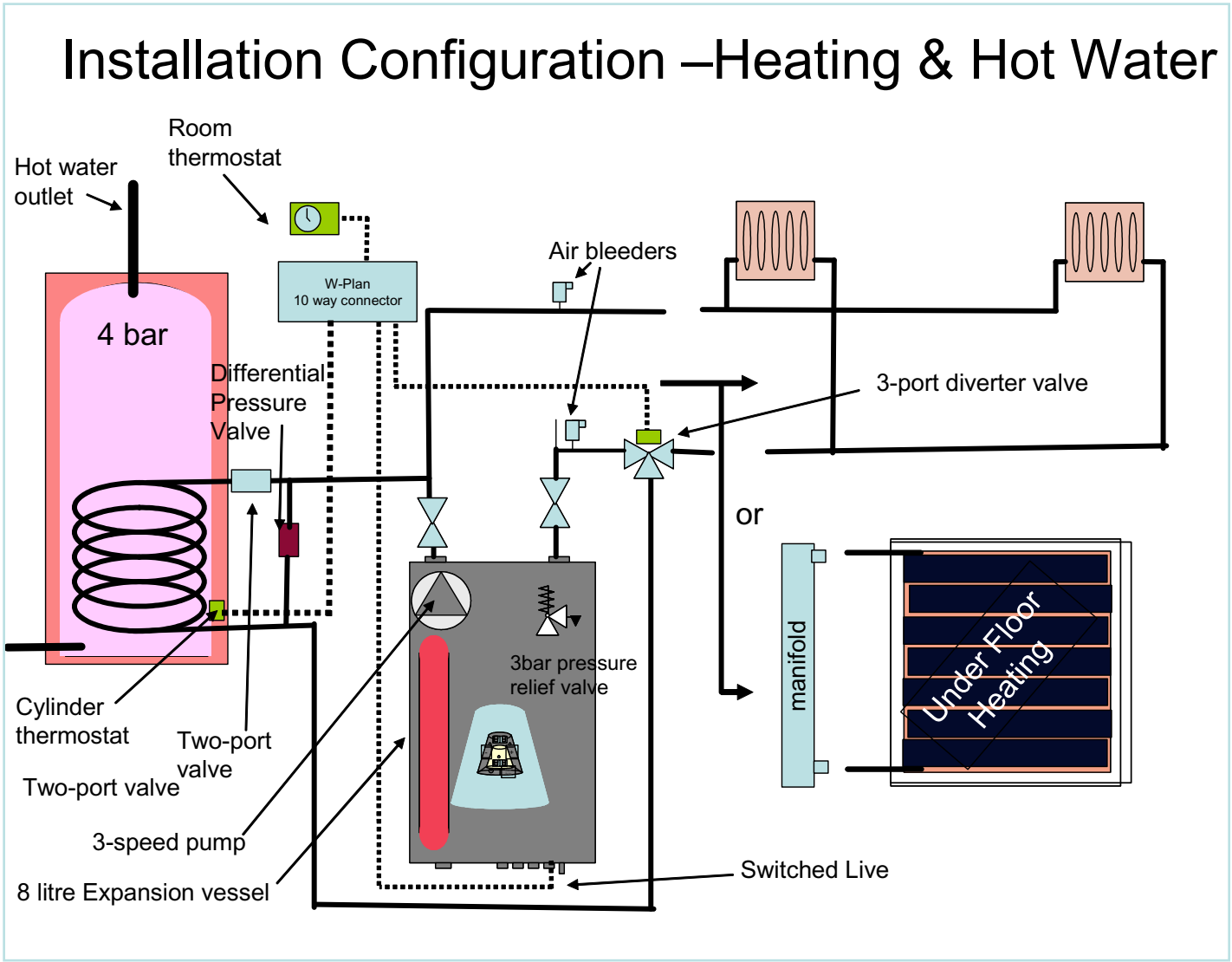
1. SPACE HEATING ONLY (recommended)-direct room thermostat Connection

• The no-volt contacts of the room thermostat should be connected to terminals 1 and 2 of the boiler.

• Menu option 4 should be set to 01 to allow the boiler to be controlled from the room thermostat.

2. OPERATING WITH HOT WATER CYLINDER

Redring recommend to use a direct electric unvented cylinder for the production and storage of the hot water as this is cheaper than an indirect cylinder, requires less plumbing (piping and valves) and is more thermally efficient.



When using the boiler for unvented hot water and heating, the two-port motorised valve should be inserted in the flow from the boiler. A Differential Pressure valve should then be connected between the flow and return at a point between the boiler and the two-port motorised valve.

1.3 - Boiler (serial numbers of 0500151 and over)

Two options are available:

Option 1 - Operating from a Switched Live

Switched Live

1. The switched live from the 10-way connector block should be connected to terminal 25, which is located beside the relay located in top right of the boiler.

2. In the set-up menu, set option 04 to 1

3. Auto-adaptability (option 6 of the set-up menu) should be turned off.

4. The minimum central heating circuit temperature (option 3 of the set-up menu) should be selected to provide central heating and hot water safely.

5. The boiler should be set to operate in **winter mode** (press and hold the radiator key until the snowflake indicator illuminates).

6. All other options in the set-up menu should be set to the Menu options listed below.

Option 2 – Direct Cylinder Thermostat & Room thermostat connections

• The brown wires should be removed from terminals 1 and 2 and be placed into terminals 5 and 6 respectively.

• The room thermostat no-volt Normally Open contacts of the room thermostat should be connected between terminals 1 and 2 of the boiler. In the set-up menu, set option 04 to 1.

• The cylinder thermostat normally open contact (240V) should be connected to terminal 25, which is located beside the relay located in top right of the boiler.

• In the set-up menu, set option 12 to 01
set option 13 to 00

1.4 - Menu Options

The set-up menu should be configured as follows, some of these parameters will be modified by instructions in the previous sections.

Option	Setting	
02	**80°C**	or as required 21-80°C
03	**30°C**	or as required 21°C- maximum temperature set
04	**1**	if operating from a switched live or if a room thermostat installed 0 if not. (Never select 2)
05	**1**	if option 4 set to 1
06	**1**	recommended (unless instructed otherwise)
07	**0**	mandatory
11	**1**	min or user defined 1-6 minutes delay in switching elements.
12	**0**	mandatory
13	**0**	mandatory
14	**n/a**	
15	**0**	mandatory
16	**1**	for 12kW boiler operation for reduced maximum output power see § 2.7.1
17 à 22	**n/a**	
23	**0**	mandatory

Notes: In normal operation press the + button to check if the room thermostat is calling for heat once, a 1 indicates a call for heat. Press the + button a second time and if auto-adaptability has been selected the temperature correction applied will be displayed (Option 06 Auto-adaptability adjusts the temperature of the heating circuit for the most efficient and temperature stable operation.)

1.5 - Summer / Winter Mode

The right-hand snow flake symbol should be illuminated indicating winter mode. If the sunshine symbol is illuminated, select winter mode by pressure and holding the radiator button on the boiler for 3 seconds. In Summer mode the heating circuit is switched off but hot water, if installed, will be still be heated.

1.6 - Underfloor Heating

- For underfloor heating the 60°C internal temperature cut-out should be selected.

- Where underfloor and hot water cylinder are used in the same heating circuit it is necessary to use the 100°C temperature cut-out in the boiler and include a separate 60°C thermal cut-out for the underfloor heating circuit.

2 - INSTALLATION & DEVICING INSTRUCTIONS

Features

- Selectable Water Temperature
  - radiators/ Underfloor (21-80°C)
- 60°C or 100°C thermal cut-out suitable for underfloor heating or radiators
- Room Thermostat operation
- Frost Protection, 5°C minimum temperature
- Pump protection - once a day operation when system is off
- Pump overrun facility
- 4-stage stepped turn on/off
- Weekly alternative switch start-up for prolonged life
- Automatic water temperature variation for 50% on-off cycles (with room thermostat)
- Switch operation counter – monitors switch usage
- System pressure display

Water Heating

It is recommended that the boiler be used for central heating purposes only and hot water be stored and heated by a direct electric hot water cylinder. This allows hot water to be heated over night on an off-peak tariff and reduces heat losses between the boiler and the cylinder.

2.1 - Introduction

The Redring Powerstream Ascari boiler is an all electric domestic central heating boiler suitable for use on a 230V 52A 50Hz supply. The unit is easy to install and requires no flue, making it ideal for apartments or properties in conservation areas.

The unit is supplied ready for operation as a 12kW 230V (13kW 240V) single phase boiler and will automatically modulate down to 10, 8 and 6kW. The maximum output power may also be manually limited to operate at maximum power levels of 10, 8 , 6 or 4 kW with the boiler proportionally modulating to lower power levels.

Finished in a clean white case and with dimensions of 620mm height x 405mm width, the boiler is suitable for installation in a kitchen area. With thermal cut out selectable at 60°C or 100°C the boiler is suitable for standard wet radiator systems or underfloor heating.

There are no specific ventilation requirements associated with the operation of this boiler, however it is recommended that the room is dry and well ventilated.

2.2 - Important Information

Important information

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 they have been given supervision or instruction concerning use of the appliance by responsible for their safety.
Children should be supervised to ensure that they do not play with the appliance.

- The information given in this booklet is a guide only. All installations must follow the current regulations for this type of device and where no information or conflicting information is given in this guide to that of the current regulations, the current regulations will apply.

- Disconnect the Electricity Supply before attempting to remove the cover of the boiler.

- The boiler weighs 38kg and requires two persons to lift and install the product. Please ensure all mounting fixings and the wall onto which it is to be installed are sufficiently strong to take the weight of the unit plus its water contents.

- The heating system must be installed by a competent person and to current regulations in force at the time.

- All wiring should conform to the regulations in force at the time. The appliance is approved to a protection rating of IPX1. Therefore if the appliance is to be installed in a room containing a bath or a shower, any electrical switch or control utilising mains electricity must be so situated that it cannot be touched by a person using the bath or shower. Attention is drawn to the requirements of the current BS 7671 (I.E.E Wiring Regulations) and in Scotland the electrical provisions of the Building Regulations applicable in Scotland.

- Complete all plumbing work before connecting the boiler to the electricity supply.

- This appliance must be earthed!

- The boiler should be permanently connected to the electricity supply, direct from a 63A fused supply on the consumer unit via a double pole linked switch with minimum contact gap of 3mm. No other appliances should be powered from this supply.

- The expansion vessel is pre-charged to 1 bar (0.1MPa). During the installation process and before operating the boiler this should be checked using a suitable pressure gauge.

- A 3 bar (0.3MPa) pressure relief device is incorporated within the product, the cold system pressure should not exceed 1.5bar (0.15MPa).

- When using with radiators fitted with TRV controls the heating system must have a bypass radiator fitted capable of circulating water at 350litres/hour.

- The system should be flushed prior to connecting the boiler to remove all particles from the pipework. Do not use the fitted pressure relief valve to flush the system as particles trapped in the valve will cause incorrect valve operation.

- The outlet of the pressure relief valve should be left open to the atmosphere, any connection to the outlet pipe must be of a minimum diameter of 15mm, should fall continuously and should terminate so that water/steam may visibly and safely discharge. Should any water or steam be seen to be exiting from this outlet the boiler electricity supply should be switched off and the Redring customer service centre contacted.

• A drain cock should be installed at the lowest point in the heating system to allow the water in the heating system to be drained as fully as possible.

• While the boiler and heating system may be filled from the cold mains water supply, the boiler must be isolated from the cold mains water supply by a suitable break in the supply pipe during normal operation.

• Filling Loop- this boiler is not fitted with a filling loop. Any filling loop being fitted should comply with the water supply (water fittings) regulations 1999 Section G24.1 and G24.2. A filling loop should be fitted at some point to allow the CH system to be filled.

• The boiler must be installed in an upright position away from nearby objects (see installation section for clearances) in a clean, dry, frost free place.

2.3 - Technical Specification

ELECTRICAL

Supply	12 kW@ 230V 52A 50Hz 13 kW@ 240V 54A 50Hz
Maximum Power Output	12 kW manually convertible to 10, 8, 6 or 4kW
Modulation	Automatic three or four stage reduction in 2kW steps 12 kW - 10-8-6 10 kW - 8-6-4 8 kW - 6-4-2 6 kW - 4-2
Fuse requirements	63Amp
Number and cross-section	3 x 16² (Phase + Neutral + Earth)

PERFORMANCE

Water Pressure		
	Minimum	0.5Bar (0.05MPa)
	Maximum	2.5 Bar (0.25MPa)
	Nominal	2 Bar (0.2MPa)
Water Temperature		
	Minimum	21°C
	Maximum	80°C
Water Flow Rate		
	Minimum	350litres/hour
	Nominal	700litres/hour
	Maximum	1400litres/hour
Thermal Limit		
	100°C	Radiators
	60°C	Underfloor

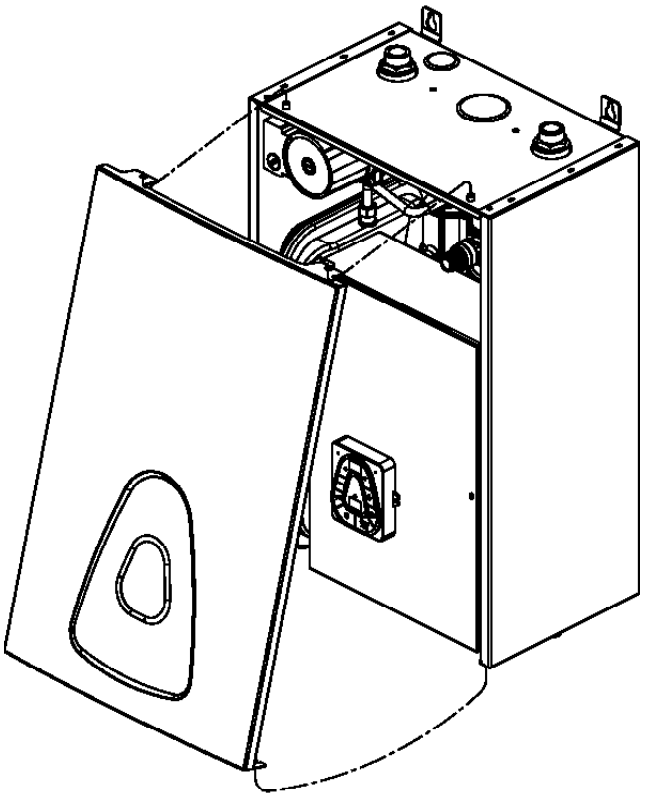
MECHANICAL

Weight	38kg
Dimensions	620mm h x 405mm w x 280mm d
Rating	IPX1
Storage capacity	5 litres
Connections	1"(26/34) female
Heat Exchanger	Cast Iron
Elements	2 heaters comprising 3 x 2kW incoloy elements
Expansion Vessel	8 litres
Pump	3-speed manually selectable
Thermal cut-outs	2 units manually selectable 60°C or 100°C

2.4 - Preparation

2.4.1 - Opening Case

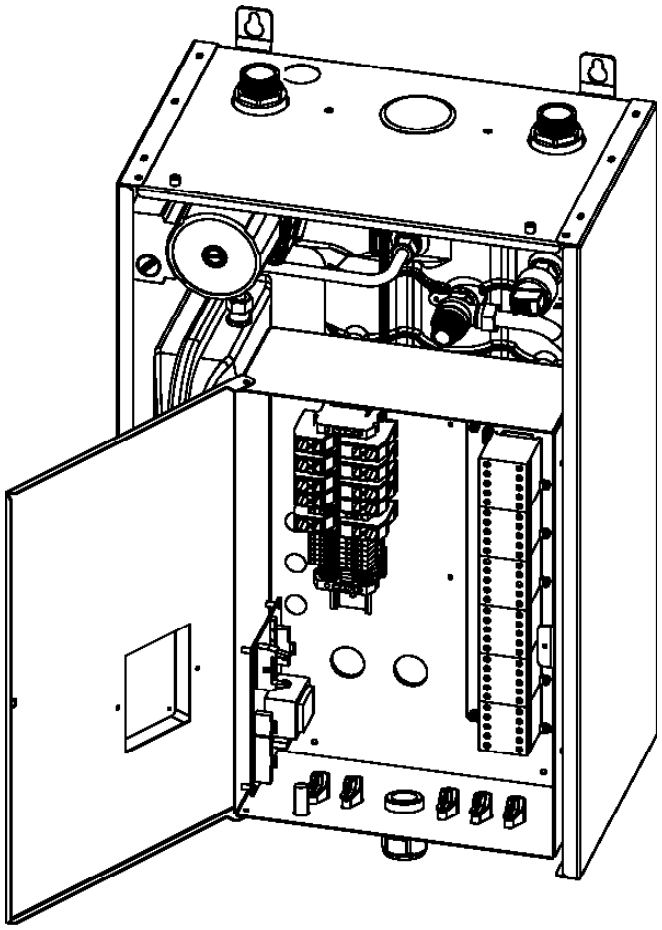
The boiler is opened by unscrewing the bottom two bolts a couple of turns (they do not need to be removed completely). The front cover is then be pulled out from the bottom and lifted off the two top pins.



Switch off the electricity supply to the boiler before opening the internal cover.

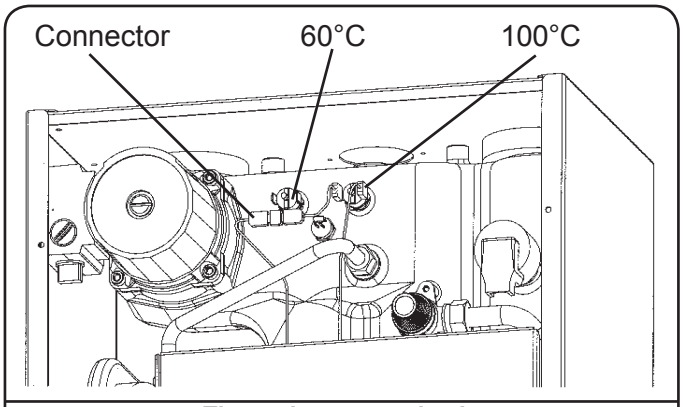
2.4.2 - Electrical Compartment

With the cover removed access to the electrical connections is achieved by undoing the screw of the electric box. Once opened access is gained to the electrical connectors, for easy installation.



2.4.3 - Selecting Thermal cut-out

The thermal cut-outs are situated at the top of the boiler and may be selected during the installation by re-routing the electrical connections. The boiler is factory set with the 100°C cut-out selected for use with radiator heating systems. If the Boiler is to be used with underfloor heating remove the connectors from the 100°C sensor and connect to the 60°C sensor ensuring there is a good connection.

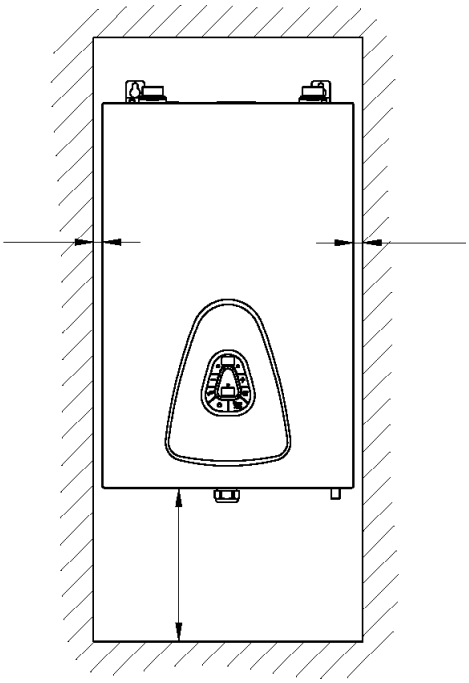


Thermal cut-out selection
(100°C for radiators, 60°C for underfloor)

Where both underfloor and hot water cylinder are used, it is necessary to use the 100°C temperature cut-out in the boiler and include a separate 60°C thermal cut-out for the underfloor heating circuit.

2.5 - Installation Requirements

2.5.1 - Location



- The boiler must be located at least 300mm above any object to allow the elements to be removed. At least 100mm is required at the top of the boiler to allow for connection of pipework.

- 10mm is required at the sides of the unit.

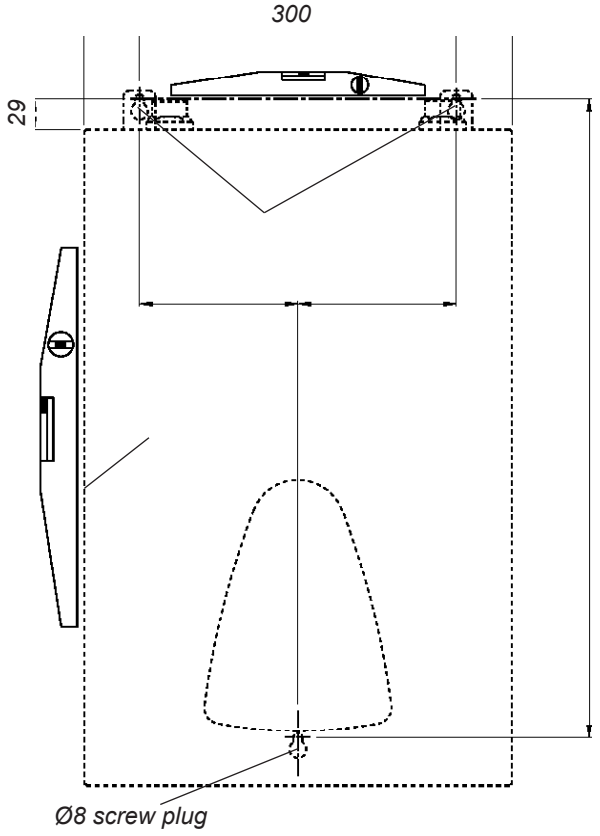
- The boiler must be mounted on an internal solid masonry wall capable of withstanding the weight of the product when full of water.

- Consideration should be given to the routing of electric cables to the product and the wiring to a thermostat (if used).

- The location must be free from frost and excessive moisture.

2.6 - Installation

2.6.1 - Main Unit



- Once the location of the boiler has been selected, mark the hole positions as per figure 6.1 below. Use a spirit-level to ensure the holes are aligned correctly. Access to the bottom screw hole is achieved by removing the bottom element plate.

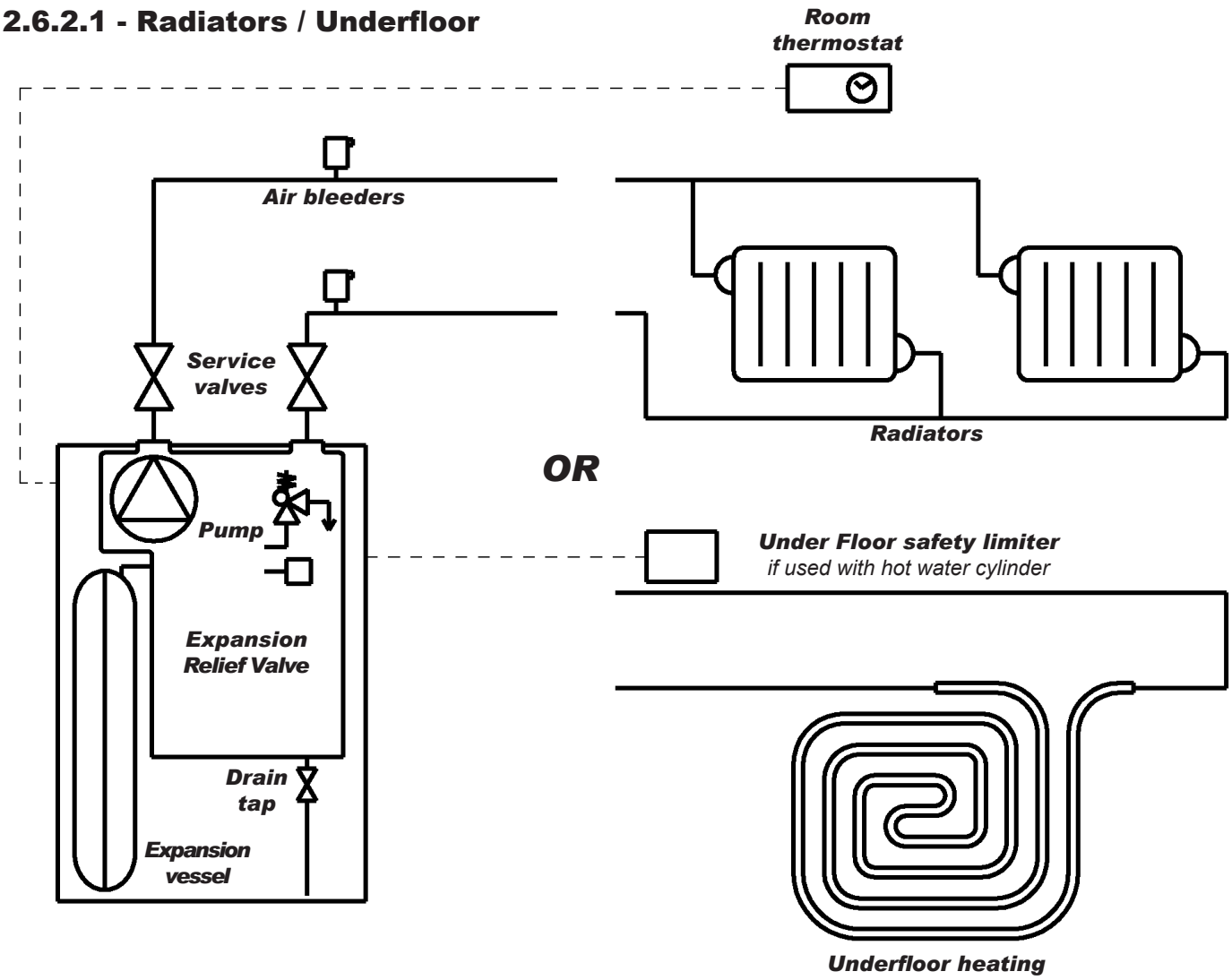
- Once marked out, drill 8mm diameter holes and plug with masonry plugs. Screw in high strength screws to a depth that allows the inner face of the screw head to protrude from the wall a distance to allow the mounting plates at the rear of the boiler to engage (approx 5mm).

- With suitable equipment or an assistant raise the boiler to the fixing point and ensure each screw has engaged into the mounting slots. Tighten the screws to secure the boiler to the wall.

- Once fixed to the wall the boiler may be plumbed into the central heating system.

2.6.2 - Plumbing

2.6.2.1 - Radiators / Underfloor



- Install the heating system bringing the flow and returns to the boiler location.
- The system should be flushed prior to connecting the boiler to remove all particles from the pipework. Do not use the fitted pressure relief valve to flush the system as particles trapped in the valve will cause incorrect valve operation.
- At least one air bleeding device should also be connected to the highest point of the plumbing system to remove trapped air and ensure silent running of the heating system.
- If using radiators with Thermostatic Radiator Valves a bypass radiator must be fitted with lockshield valves that will allow a flow of 350 litres/ hour.
- Service valves should be connected to the inlet and outlet of the boiler for easy maintenance.
- Although the boiler can operate without a room thermostat this is required for automatic adjustment of boiler output temperature.
- Where underfloor heating is being used without hot water cylinder, the 60°C thermal cut-out must connected in place of the factory selected 100°C device– see section 4.3.
- A drain cock is required to be fitted in the lowest part of the heating system to allow the system fluid to be drained fully.

- A filling loop must be installed that isolates from the cold mains water supply from the heating system and complies with the current building and water regulations in force at the time.

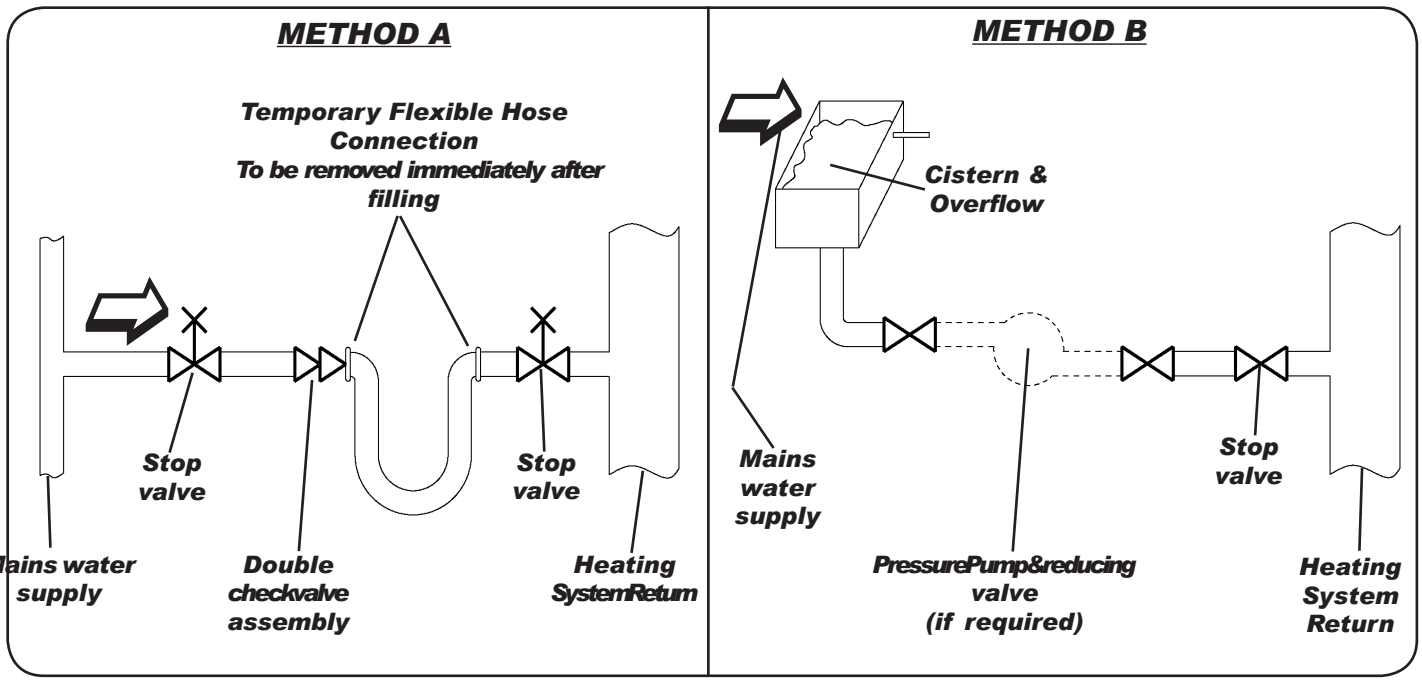
- The boiler incorporates an 8-litre expansion vessel which is suitable for heating systems as follows:

Initial System Pressure (bar)	0,50	0,75	1,00	1,50
Total Water in heating system (litres)	96	84	73	50
For larger systems Multiply the volume of water by these factors	0,0833	0,0930	0,1090	0,1560

2.6.3 - Filling Loop

This boiler is not fitted with a filling loop. Any filling loop being fitted should comply with the water supply (water fittings) regulations 1999 Section G24.1 and G24.2. A filling loop should be fitted at some point to allow the CH system to be filled.

Two types are shown below:



Recommended and approved method for filling closed circuits in a house (R24-2a Water Regulations Guide)

2.7 - Electrical

- Wiring external to the appliance must be in accordance with the current I.E.E Wiring regulations (BS 7671) for electrical installation and any local regulations, which apply.

- With the boiler plumbed in, the electrical connections can be made to the boiler.

- This appliance must be earthed!

- The Ascari boiler comes with cage-clamp connectors. These are operated using a 2.5mm x 0.4mm blade screwdriver for accessory terminals and 3.5mm x 0.5mm blade screwdriver for power terminals.

- The boiler should be permanently connected to the electricity supply, direct from a 63A fused supply on the consumer unit via a double pole linked switch with minimum contact gap of 3mm. No other appliances should be powered from this supply.

- The number and cross-section of connector is mandatory 3 x 16² (phase + neutral + earth) (see § 2.15 "connection to the electricity supply")

- To connect a wire, insert the blade of the screwdriver into the opening located just above or below the central mark of the terminal block and pivot the blade towards the centre. The wire may then be inserted into the cage and the screwdriver blade removed (see § 2.14 "Power terminal").

- ROOM THERMOSTAT - The **no voltage connections** of a room thermostat may be connected to terminals 1 (common contact) and 2 (Normally Open contact) of the boiler (please check compatibility with thermostat manufacturers installation instructions), routing the cable through the smaller cable entry points. If using a non-programmable room thermostat it is recommended that the no-voltage switched contacts of a separate timer / programmer be connect in series with the room thermostat to terminal 2 of the boiler. **WARNING- a switched live must not be connected to the boiler terminals.**

- If used the cylinder thermostat normally open contact (240V) should be connected to terminal 25 of the boiler's electrical connectors (see section Boiler electrical connections)

- The power supply cable (3x16²) should be routed through the large cable entry point at the bottom of the boiler. If desired the cable entry may be moved to the top of the boiler by removing the self sealing nut from the bottom to the top entry point.

- The Earth wire should be connected to the top terminal marked with the Earth symbol.

- The Neutral wire should be connected to the large terminal marked 'N'.

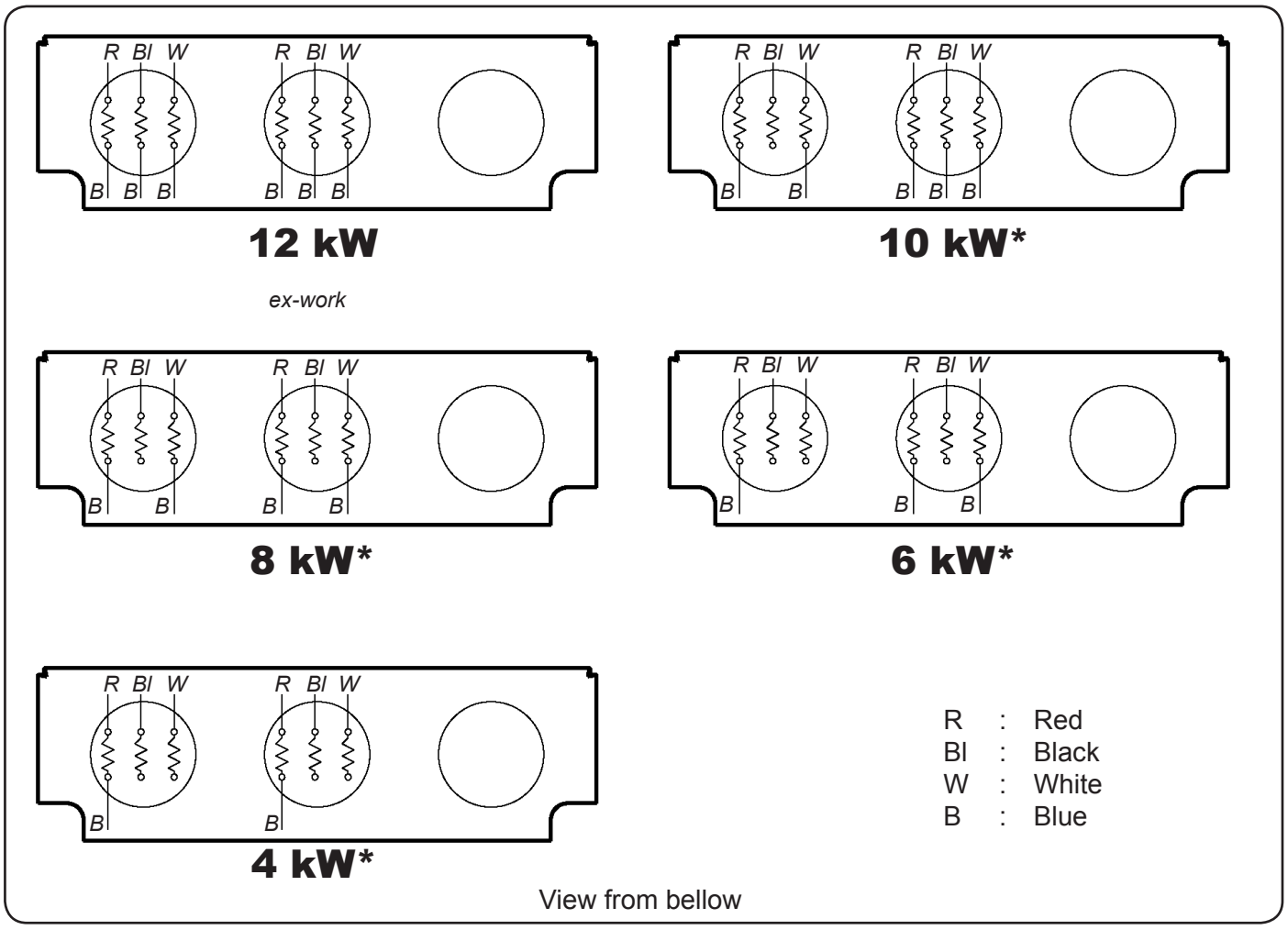
- The live wire to the large terminal labelled PH.

- Do not switch on the electricity supply until asked to do so in the Commissioning and Testing section.

- As a minimum it is recommended that a room thermostat be installed to control the appliance. Thermostatic radiator valves may be fitted to the system, however they must not be fitted in the room where the room thermostat is fitted. There must be at least one radiator installed with lock shield valves that should not be closed and will allow 350litre/hr circulation. Further guidance can be obtained from the Domestic Heating and Hot Water Guide to the building regulations.

2.7.1 Power selection

The boiler is supplied as a 12kW modulating boiler but can be reduced to 10, 8, 6 or 4kW by disconnecting individual elements.



* Remove blue connectors between power terminal and elements according to drawing.

2.8 - Commissioning & Testing

Water Treatment, Cleansing and Flushing the Heating System

NOTE: *British Standard BS7593: 1992 stresses the importance of cleansing and flushing of the system to ensure it continues to run efficiently with the minimum of maintenance necessary. Redring fully supports this professional approach and recommends that the system is cleansed with an effective chemical cleanser and protected long term with a suitable inhibitor. Such products are available from Fernox and Sentinal.*

- Check the pressure of the expansion vessel, this should be factory set to 1bar (0.1MPa).
- The heating system should be filled using the approved installed filling loop. Ensure all radiator valves are open. The initial system pressure when cold should be between 1.0 (0.lMPa) and 1.5bar (0.15MPa).
- Once filled check the system for leaks.
- Open the drain cock and drain the system fully.

- Refill the system from the filling loop, to a pressure between 1-1.5bar (0.1-0.15MPa) and operate the pressure relief valve manually to check that water runs away correctly, and that the valve closes correctly.

- When boiler is in stand by mode, help the air bleeding of installation by starting a forced circulation for 2 minutes (press )

- Top up the system to 1.0bar (0.1MPa).

- Disconnect the system from the filling loop.

- **Important! Check tightness of all internal electrical connections.**

- Check that all covers etc. have been replaced. Turn on the electricity supply to the boiler and allow the unit to do its self diagnosis. Refer to § 2.24 if a fault is displayed.

- Use ethylene glycol only with incorporated corrosion inhibitor. Glycol ratia must be under 10%.

2.9 - Boiler Configuration

Once the boiler has initialised the feature options can be selected (see quick reference guide for options):

Press – and + together for 3 seconds to enter the selection menu. With reference to § 2.21 the top display should show a flashing 01. Use the +/- keys to select the parameter to be changed and the tap or radiator keys to change the setting of any selected parameter:

02 Select the maximum temperature of the water circulating in the heating circuit.

03 Select the minimum temperature of the water circulating in the heating circuit.

04 Select 1 if operating from a switched live or if of room thermostat is installed and connected to the boiler (Never select 2).

05 If 04 has been set to 1 this setting should also be set to 1.

06 If 04 has been set to 1 the boiler can automatically adjust the water temperature in the heating circuit according to actual heat-up times of the property, overriding the minimum and maximum water temperature settings. If this facility is required select 1, otherwise set 0.

07 This option should be set to 0.

08 n/a

09 n/a

10 n/a

11 The boiler can delay the switching on and off of the elements to provide a smooth power on-off gradient and the number of on-off cycles in a short period. The delay between switches operating can be set from 1 to 6 minutes. (default is 2 min)

12 This setting should always be set to 0.

13 This setting should always be set to 0.

14 n/a

15 This setting should always be set to 0

16 This setting should always be set to 1

17 à 22 n/a

23 This setting should always be set to 0

Press **+** & **-** together for 3 seconds to exit the set-up menu.

2.9.1 Automatic/ Manual Operation

The boiler must be set to Manual operation as follows:
Press and hold the Auto/Man button. The display will show **Au** or **Man,** press the Auto/Man button again for a short period to toggle the display so that it shows **Man.** With the correct display showing, press and hold Auto/ Man for 3 seconds to return to normal operating mode.

2.10 - Pump Speed

The boiler is factory set at pump speed 3, for lower pump speeds the selector in the centre of the pump may be turned to 1 or 2 using a large flat bladed screwdriver.

2.11 - Troubleshooting

The boiler has many selectable options. Please ensure the correct selections are made for the type of installation you have made. If you have selected the use of a room thermostat, or hot water cylinder, the boiler will not operate until these devices are connected.

- The boiler indicates a boiler fault by flashing  in front of the symbol "°C", and  or  in front of the symbol "bar"
  Please call the Redring Customer Service department – see Servicing section.

-  FLASHING SEGMENTS in front of bar – indicate the system pressure has fallen below the minimum operating pressure.

- check if water has discharged from the pressure relief valve. If so call a Redring service agent.
- check for leakage in the system.

Once the fault has been cleared the boiler will turn on again if the system is filled and pressurised to over 0.5 bar.

2.12 - Servicing

It is recommended that the Boiler be installed and serviced regularly by a REDRING service agent to ensure continual trouble-free operation. For details of service agents in your area please contact:

Applied Energy Products Ltd.

Morley Way, Woodston
Peterborough PE2 9JJ
United Kingdom

Registered Office : Peterborough PE2 9JJ
Registered in England No. 306008
VAT Reg. No. GB 287 1315 50 038

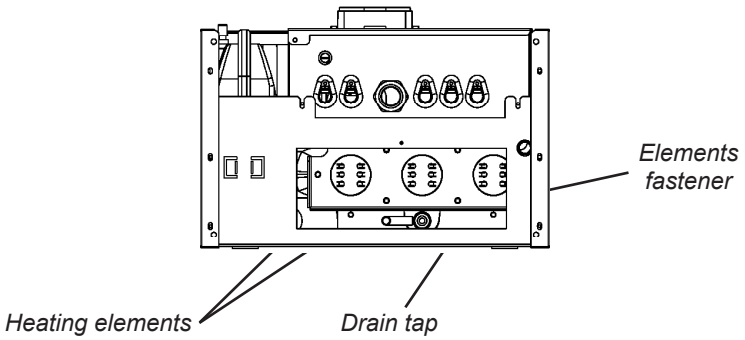
Telephone Applied Energy technical service on 0844 3727766
or contact on techfax 0844 3727767.

2.13 - Dimensions - Hydraulic connections

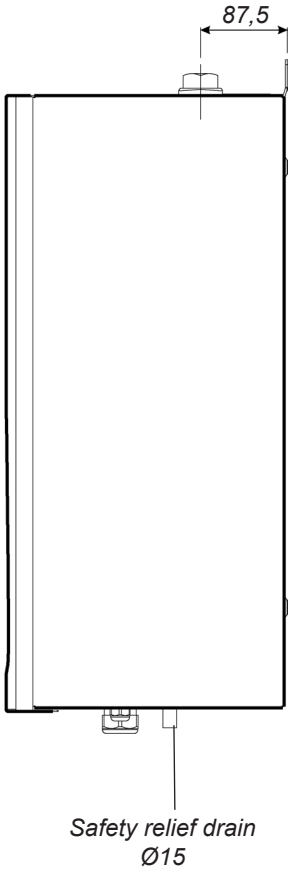
Decoding

1 - 3 speed pump
2 - 8 litres expansion vessel
3 - 3 bar safety relief bleeder
4 - Lack of water sensor
6 - 60°C safety limitator
7 - 100°C safety limitator
8 - Boiler's sensor
9 - Control pannel
11 - Fuse

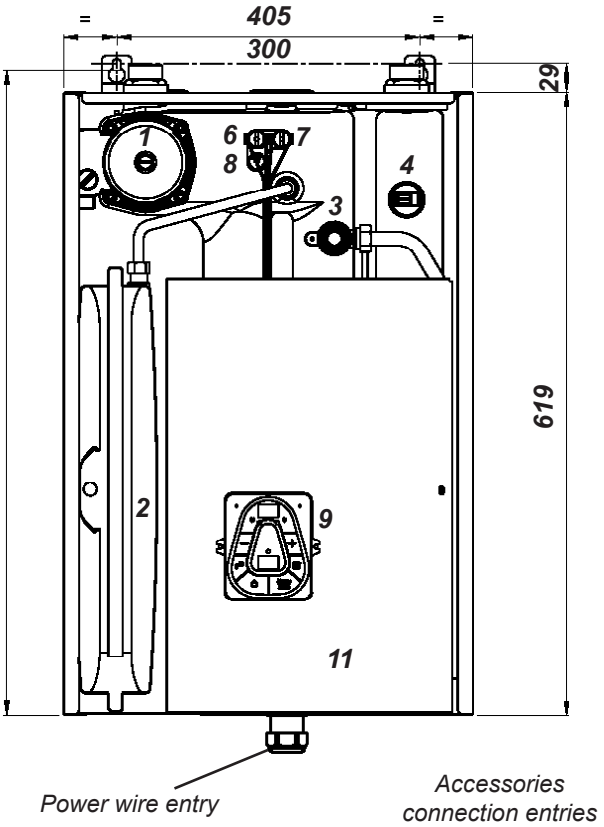
Bottom view
(Trapdoor to access elements removed)



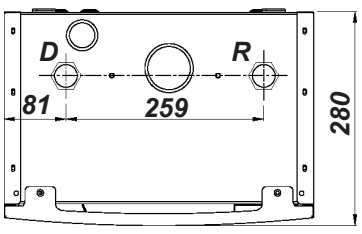
Side view



Front view



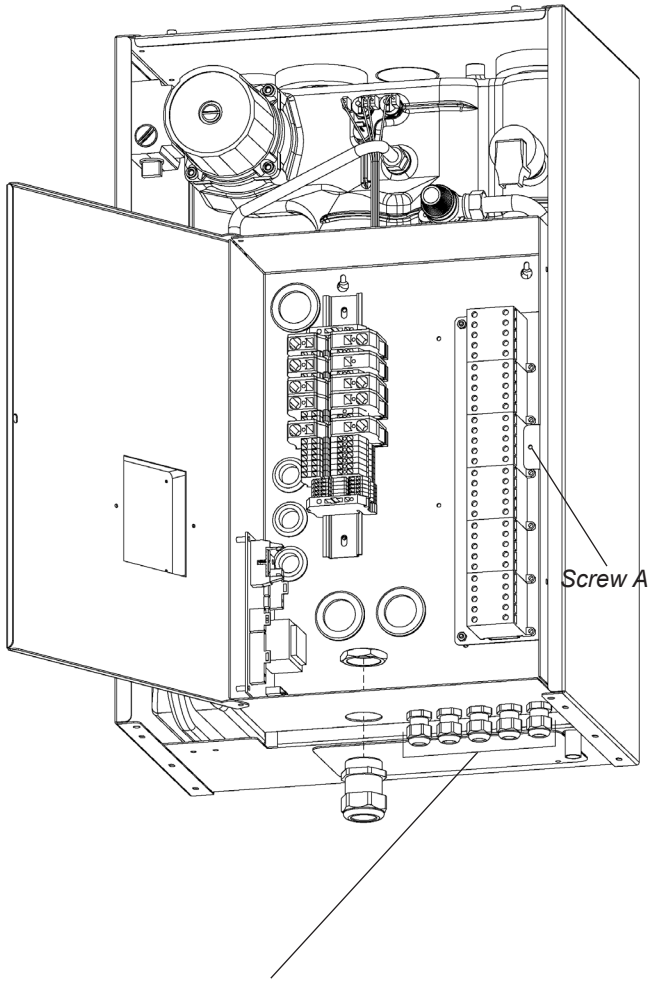
Top view



D = Heating outflow 1" female nut (26/34)
R = Heating backflow 1" female nut (26/34)

2.14 - Power terminal

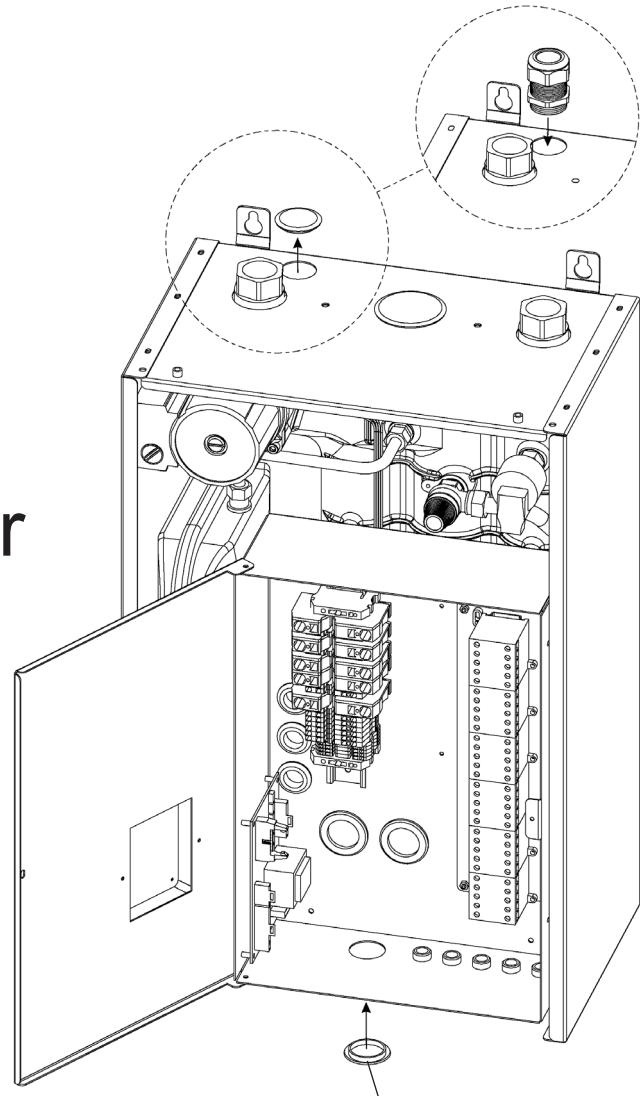
Put the self-sealing nut (supplied with the boiler) for connection to mains from the bottom of the casing.



5 self-sealing nuts for accessories connections (Ambience thermostat, outside and/or Domestic Hot Water sensor and remote cut-out)

or

Put the self-sealing nut (supplied with the boiler) for connection to mains from the top of the casing. In this case remove the plastic cap and close the hole below casing using same.



Plastic cap moved from top to bottom

Connections are cage-clamp terminals, to be used as to follow :

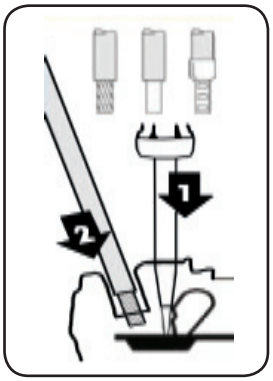
- For accessories terminals use a 3.5 x 0.5mm blade screwdriver

- For power terminal use a 5.5 x 0.8mm blade screwdriver.

1 : Introduce the blade of the driver into the opening located just above or bellow the mark.

2 : Introduce the connector's terminal inside the cage.

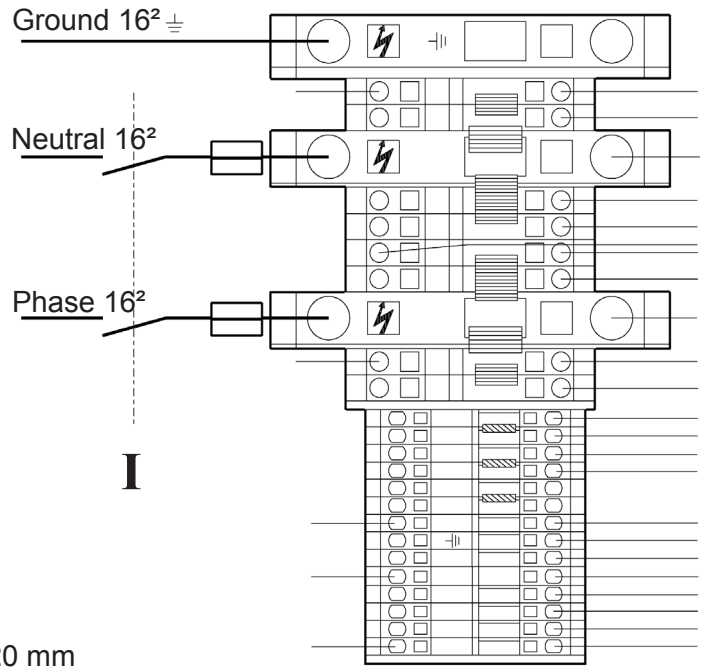
3 : Remove the screwdriver



Note : Stripped length of wires must range :
- within 10 and 12 mm for control terminals in 2.5^2
- within 17 and 20 mm for main power terminals.

2.15 - Connection to the electricity supply

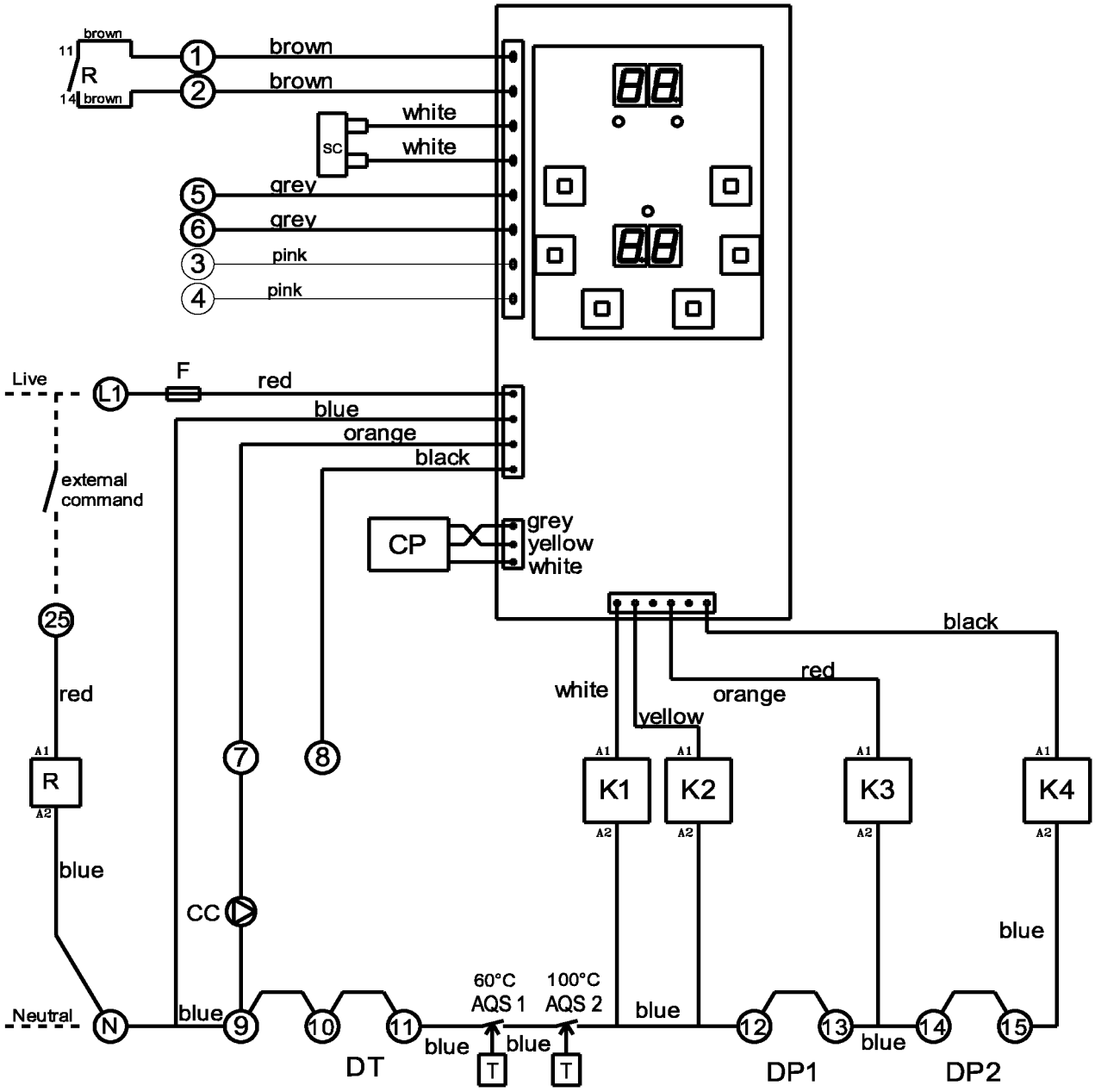
I: 63A fused supply on the consumer unit via a double pole limited switch with minimum contact gap of 3mm.



NOTE : Stripped length of wires between 17 and 20 mm

2.16 - Regulation circuit drawing

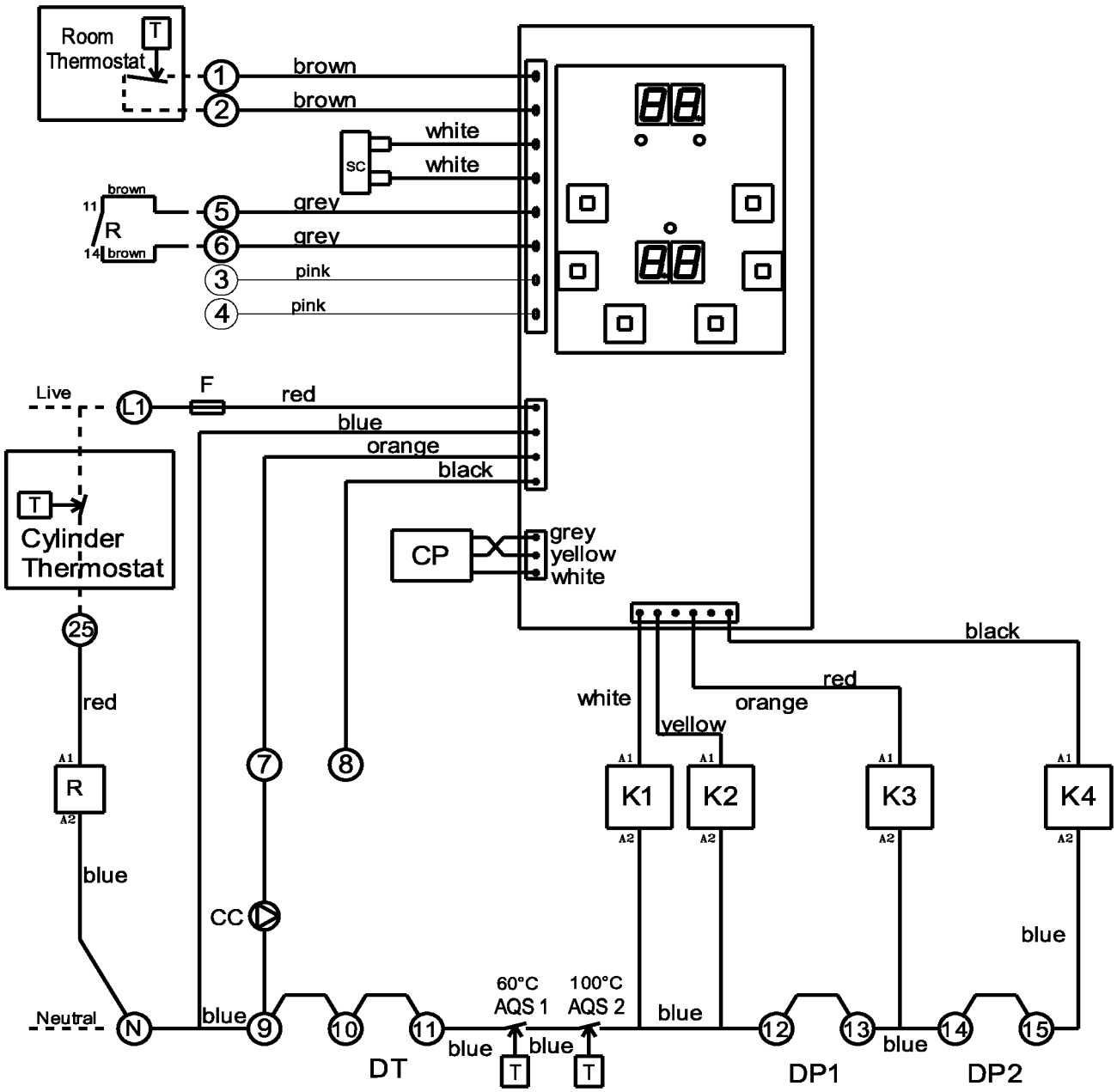
2.16.1 - Operating from a switched live



Key :

L1	:	Live
N	:	Neutral
F	:	4A fuse size 5 x 20
C1	:	Electronic card with display
CC	:	3 speed pump
SC	:	Boiler's sensor
AQS1	:	60°C safety limitator with manual reset
AQS2	:	100°C safety limitator with manual reset
K1 to K4	:	20A power breakers
DT	:	Total cut-out (remove the bridge)
DP1 & DP2	:	Partial cut-out (remove the bridge)
R	:	External command relay

2.16.2 - Direct room thermostat connections and direct cylinder thermostat

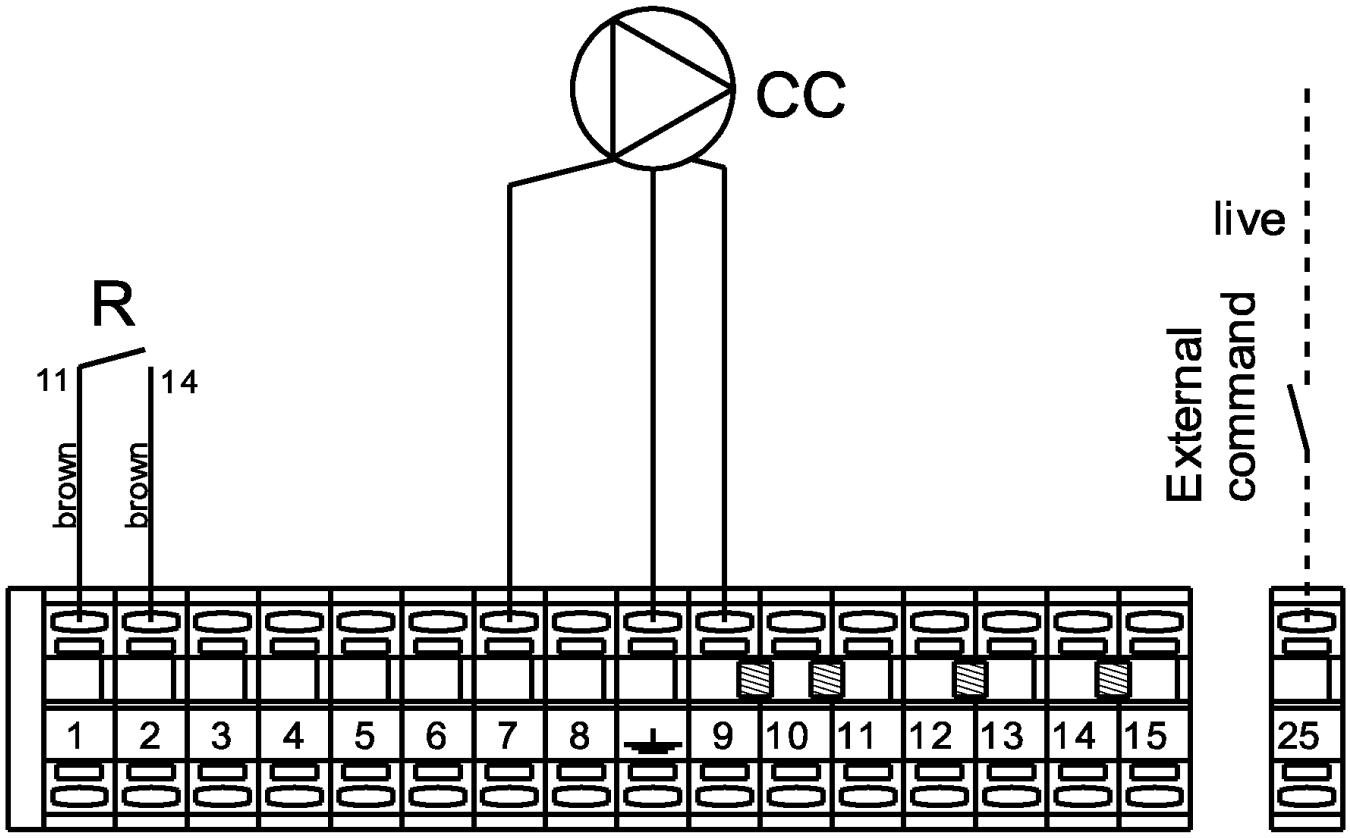


Key :

L1	: Live	DT	: Total cut-out (remove the bridge)
N	: Neutral		
F	: 4A fuse size 5 x 20	DP1 & DP2	: Partial cut-out (remove the bridge)
C1	: Electronic card with display		
CC	: 3 speed pump	R	: External command relay
SC	: Boiler's sensor	Room thermostat	: Direct room thermostat no-volt normally open contacts
AQS1	: 60°C safety limitator with manual reset	Cylinder thermostat	: External command from direct cylinder thermostat (normally open contact 240V)
AQS2	: 100°C safety limitator with manual reset		
K1 to K4	: 20A power breakers		

2.17 - Control accessories wiring

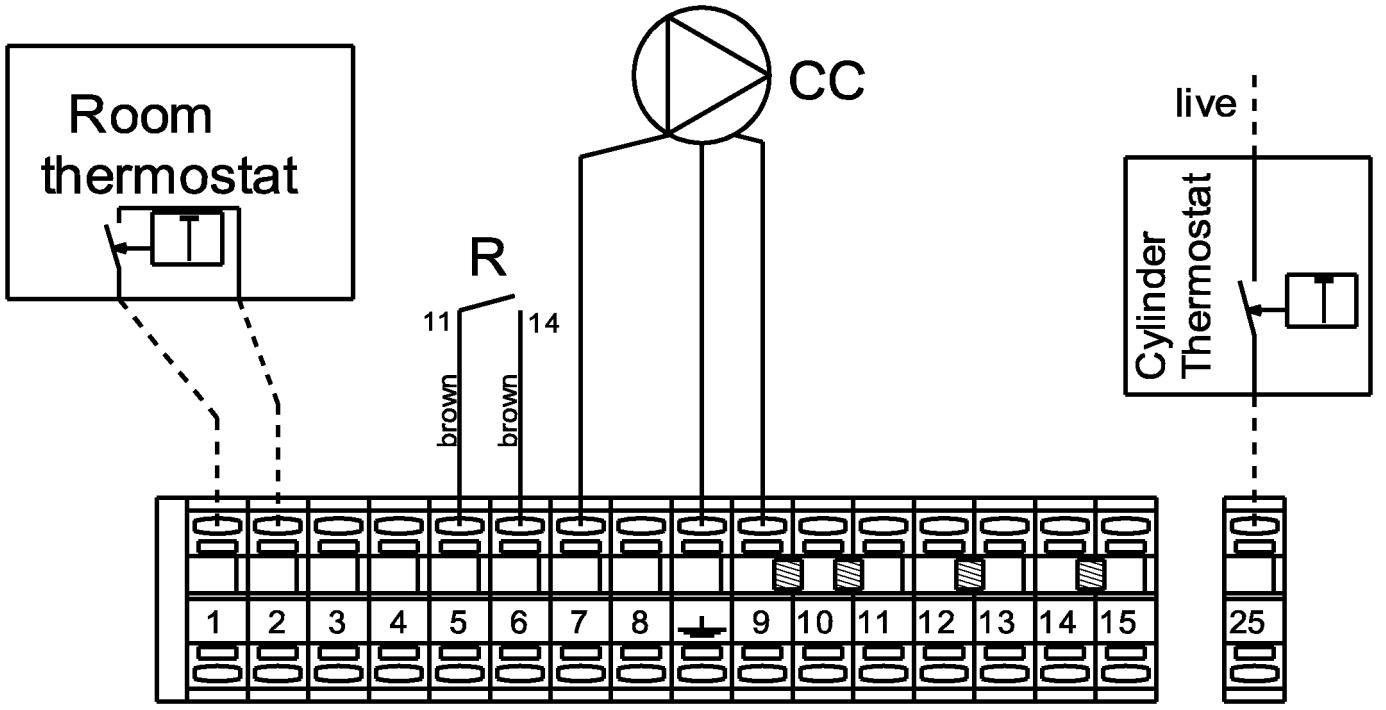
2.17.1 - Operating from a switched live



1 - 2	:	External command relay contact
3 - 4	:	n/a
5 - 6	:	n/a
10 - 11	:	Total cut-out DT (remove the bridge) and / or 65°C heating floor safety limitator (mandatory) with manual reset. See § 1.3.1.
12 - 13	:	Partial cut-out DP1 (remove the bridge)
14 - 15	:	Partial cut-out DP2 (remove the bridge)
25	:	External command of switched live (use phase 230V common to the boiler on pin L1)

- Connectors will be of electrolytic quality brass (no corrosion of stripped ends at connection).
- Never use telephone wire (cross-section of sub-connectors too thin and easy breakable at connections points).
- Cross-section of connectors must be between 0.5 and 1mm².

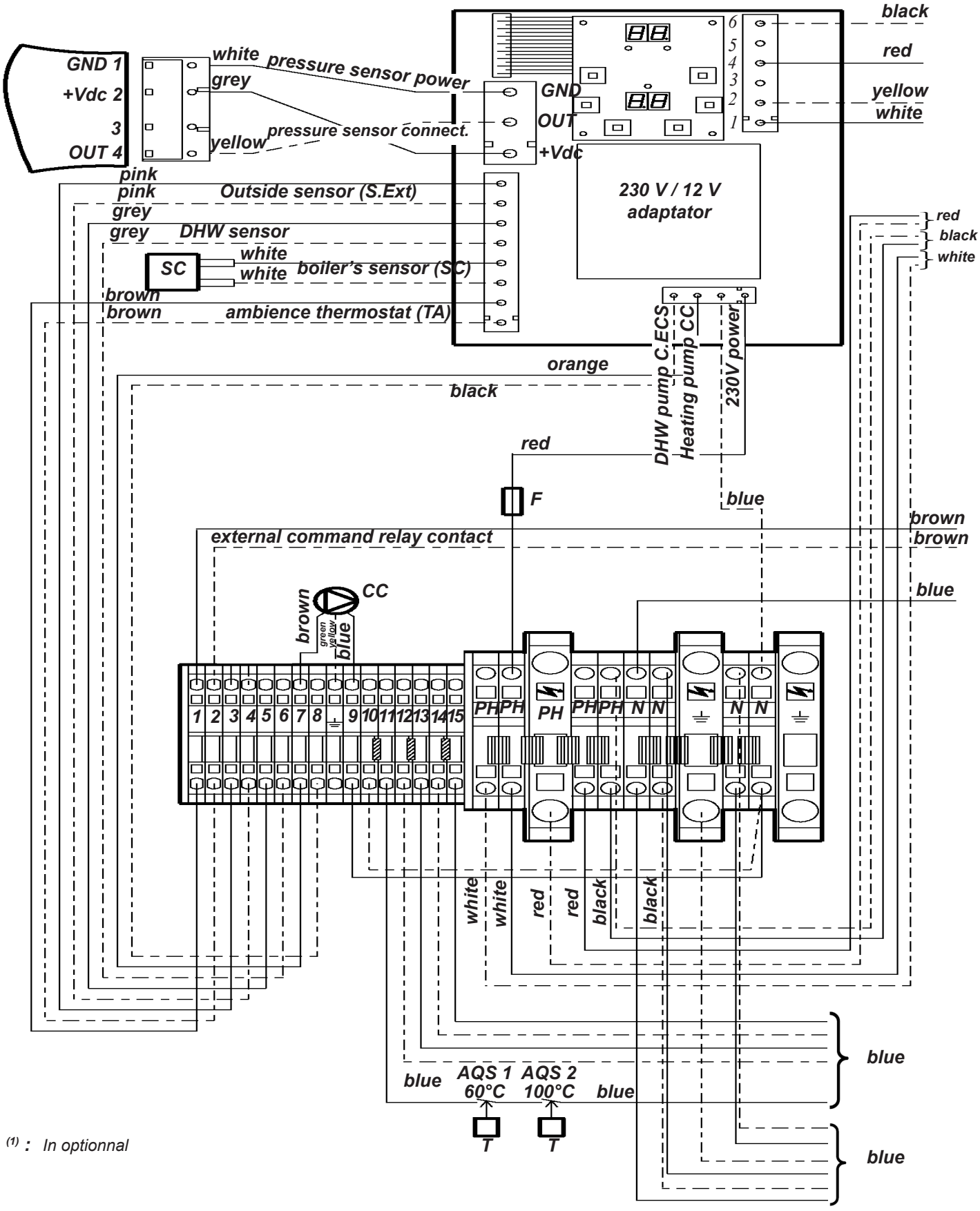
2.17.2 - Direct room thermostat connections and direct cylinder thermostat



1 - 2	:	Direct room thermostat connections
3 - 4	:	n/a
5 - 6	:	The brown wires should be removed from terminals 1 and 2 and be placed into terminals 5 ans 6 respectively
10 - 11	:	Total cut-out DT (remove the bridge) and / or 65°C heating floor safety limitator (mandatory) with manual reset. See § 1.3.1.
12 - 13	:	Partial cut-out DP1 (remove the bridge)
14 - 15	:	Partial cut-out DP2 (remove the bridge)
25	:	External command from direct cylinder thermostat (use phase 230V common to the boiler on pin L1)

- Connectors will be of electrolytic quality brass (no corrosion of stripped ends at connection).
- Never use telephone wire (cross-section of sub-connectors too thin and easy breakable at connections points).
- Cross-section of connectors must be between 0.5 and 1mm².

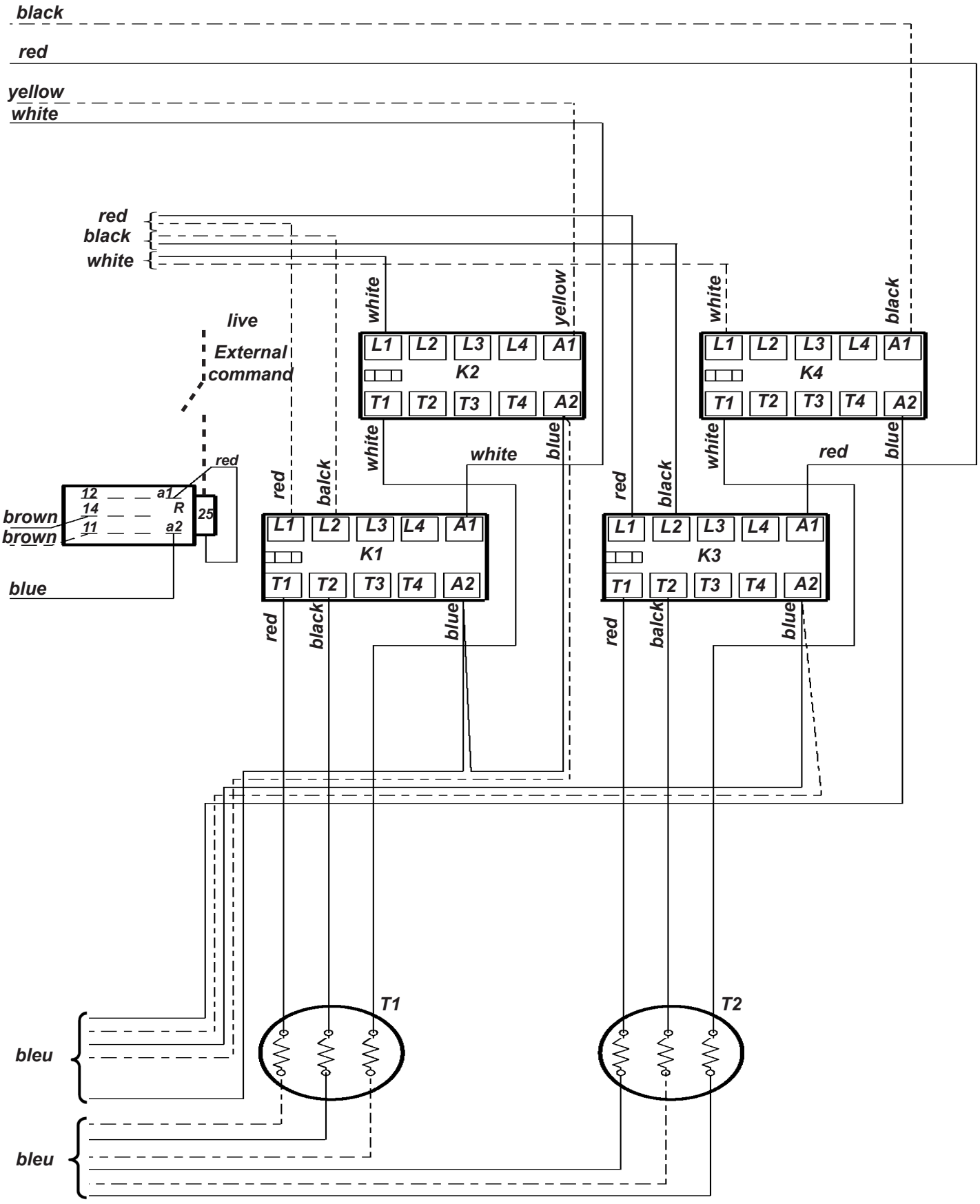
2.18 - Wiring diagrams



(1) : *In optionnal*

Key :

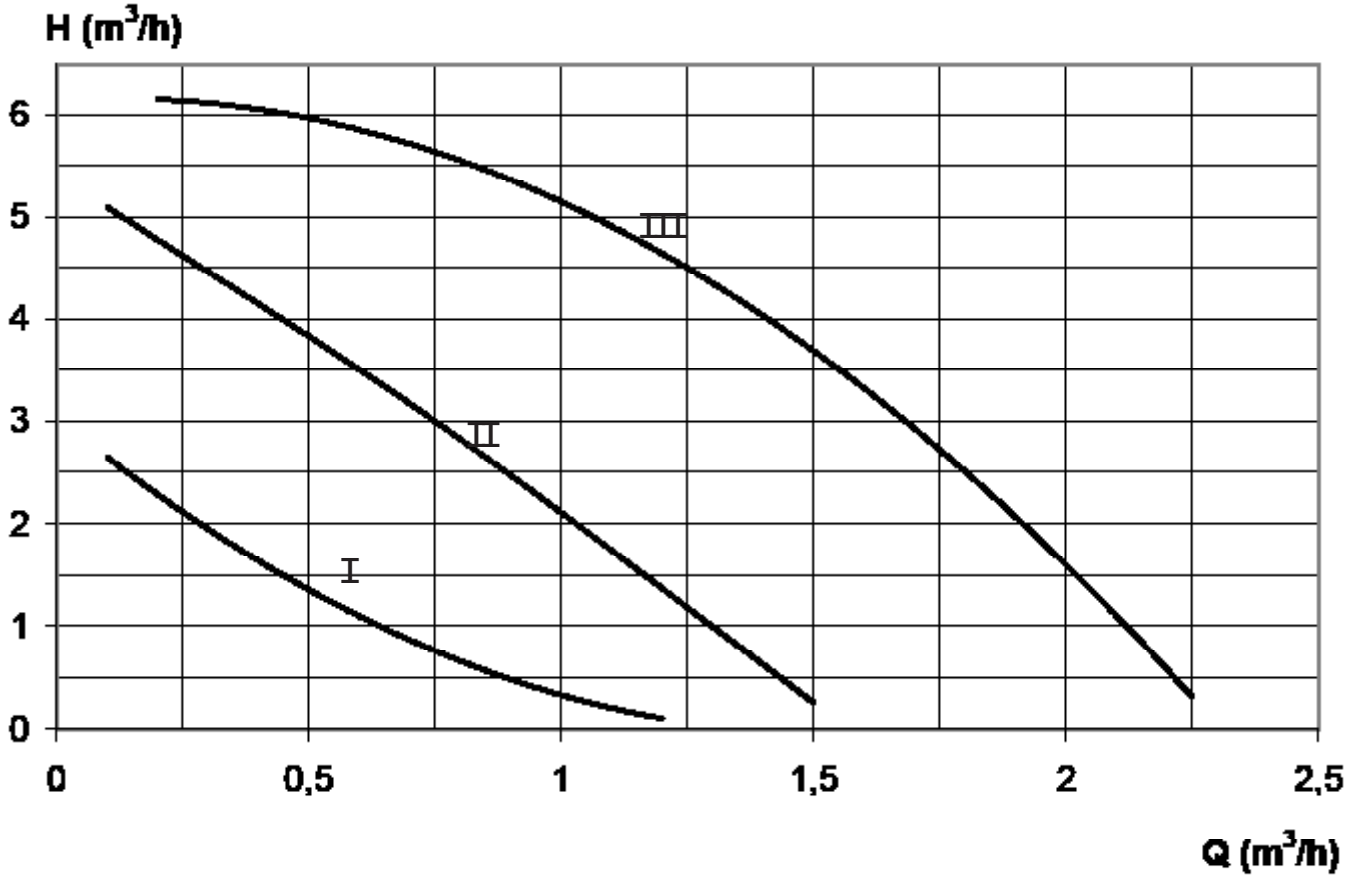
PH	:	Phase	CC	:	3-speed pump
N	:	Neutral	DHW sensor	:	Domestic Hot Water Safety limitor
F	:	4A fuse size 5 x 20	SC	:	Boiler's sensor
C1	:	Electronic card with display			



Key :

AQS1	:	60°C Safety limitor with manual reset	K1 to K4 :	20A power breakers
AQS2	:	100°C safety limitor with manual reset	T1 & T2 :	6kW heating elements

2.19 - 3 Speed water pump



3 speed (I, II and III) water pump for adjustment to operating needs, depending on insulation and circuit

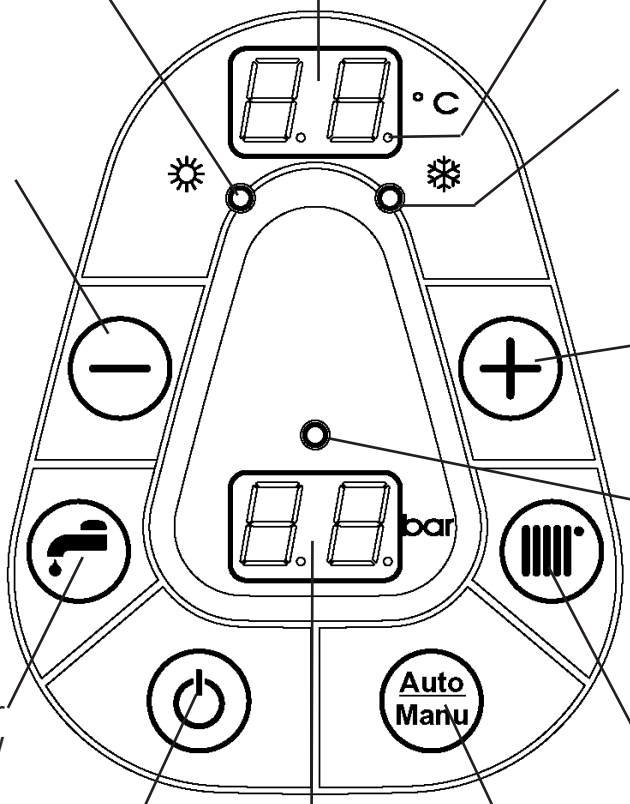
The boiler is factory set at pump speed 3, for lower pump speeds the selector in the centre of the pump may be turned to 1 or 2 using a large flat bladed screwdriver.

Electrical data

Speed	Nominal output (W)	Nominal intensity (A)
III	90	0,40
II	67	0,30
I	47	0,20

2.20 - Control pannel description

Usual operating functions



Boiler's temperature display in °C.
When the boiler is off and the two middle horizontal LEDs on, antifrost protection is operating.
(flashing in case of sensor failure)

Summer mode green LED

(Lit • displays normal operating)

Winter mode green LED

Used to decrease temperature during settings (instant touch) or cancel (press 3 sec)

Used to increase temperature during settings (instant touch)

Operating display red LED

Hot Water selection (n/a) or start the spring mode DHW (press 3 sec.)

Used to enter requested heating temperature menu (instant touch) or start the winter mode (heating and DHW) (press 3 sec.)

On/Off switch (with automatic anti frost protection for DHW and heating circuits) (instant touch)

Pressure display in bar.
Boiler stops automatically below 0.3 bar with automatic reset over 0.5 bar.
(0.2 flashing displays a pressure loss - other value flashing displays a pressure sensor failure)

Must be set to manual
Used to choice manual or automatic operating (see §2.9.1)

2.21 - Regulation settings

For fitter's use only.

The regulation must be adjusted according the use of the boiler.

• Press  and  (3 sec) to start setting menu for 4 minutes.

• Parameter #  starts flashing in front of "°C"

• Press  or  (instant touch) to select next parameter, i.e  °C, ... until  °C

• To start setting the displayed parameter press  or  (instant touch).

• The parameter value, i.e  starts flashing in front of "bar".

• Press  or  (instant touch) to change setting.

• Press  or  (instant touch) to confirm setting and return to setting menu.

• Press  and  (3 sec) any time to exit the setting menu.

PARAMETERS LISTING

Press ⊖ and ⊕ during 3 sec to access parameters menu.

Condition	Parameter #	Description	Available settings	Ex-work settings
Manufacturer	01	Output level number	2 ; 3 ; 4 ; 5 or 6	Depending to the boiler Output
	02 (1)	Maximum requested boiler's temperature (TCMA)	21 to 80°C	75°C
	03 (1)	Minimum requested boiler's temperature (TCMI)	21 to TCMA °C	50°C
	04	Ambience thermostat connected (no = 0 ; thermostat = 1 ; sensor = 2)	0 ; 1 or 2	1
If 04 = 1 or 2	05	Heating circuit pump monitored by ambience thermostat (no = O ; yes = 1)	0 or 1	1
if 04 = 1 or 2	06	Autoadaptability or automatic correction of the heating diagram or the requested temperature (no = O ; yes = 1)	0 or 1 (2)	1
	07	Outside sensor (no = O ; yes = 1)	0 or 1	0 mandatory
if 07 = 1	08 (1)	Maximum outside temperature (TEMA)	11 to 25°C	20°C
if 07 = 1	09 (1)	Minimum outside temperature (TEMI)	-30 to +10°C	-5°C
if 07 = 1	10	Automatic summer switch (no = O ; yes = 1)	0 or 1	0
	11	Delay between 2 steps activation and deactivation	1 to 6 min (3)	2 min.
	12	Domestic Hot Water production (no = 0 ; yes = 1)	0 or 1	0
if 12 = 1	13	Domestic Hot Water probe (no = 0 ; yes = 1)	0 or 1 (4)	0 mandatory
if 13 = 1	14	Legionnaires disease free mode (no = 0 ; yes = 1)	0 or 1 (5)	0
If 01 = 4 or 6	15	Power levels peering	0 or 1	0 mandatory
	16	Connection of 6 power steps (no = 0 ; yes = 1)	0 or 1	1
if 16 = 0	17	Connection of power step 1 (no = 0 ; yes = 1)	0 or 1	1
if 16 = 0	18	Connection of power step 2 (no = 0 ; yes = 1)	0 or 1	1
if 16 = 0	19	Connection of power step 3 (no = 0 ; yes = 1)	0 or 1	1
if 16 = 0	20	Connection of power step 4 (no = 0 ; yes = 1)	0 or 1	1
if 16 = 0	21	Connection of power step 5 (no = 0 ; yes = 1)	0 or 1	1
if 16 = 0	22	Connection of power step 6 (no = 0 ; yes = 1)	0 or 1	1
	23	Timer input allocation (no = 0 ; Lowering of Eco boiler requested temperature = 1 ; Lowering of frost protection boiler requested temperature = 2 DHW autorisation = 3)	0 ; 1 ; 2 or 3	0 mandatory
Manufacturer	24	Water pressure sensor	0 or 1	1

(1) : See § 7 to set the heating diagram according to 4 paremeters (TCMA, TCMI, TEMA and TEMI)

(2) : Prohibited when using a scheduled external command

(3) : Depending on water flow rate and volume inside the heating circuit, the boiler might start at very short intervals with wear and tear resulting. To reduce the number of cycles, increase delay.

NOTE : To reset autoadaptability, zero parameter # 06 , then set value to 1.

2.22 - Operating

Display – – in front of symbol "°C" means the boiler is off, connected to power supply, with anti frost protection operating (boiler starts automatically when the boiler's temperature or the Domestic Hot Water temperature turns below 5°C).

Press ⏻ to turn the boiler On or Off.

2.22.1 - Automatic / Manual Operation

The boiler must be set to Manual operation as follows :

Press the Auto/Man button. The display will show Au or Man, press the Auto/Man button again for a short period to toggle the display so that it shows Man. With the correct display showing, press and hold Auto/Man for 3 seconds to return to normal operating mode.

2.22.2 - Requested heating temperature setting in manual mode

Press ♨ to display the requested temperature flashing in front of symbol "°C".

Press ⊖ **or** ⊕ to increase or decrease the requested temperature between TCMI and TCMA. (see § 2.21).

Press ♨ to confirm setting.

2.22.3 - Summer / Winter shift (Available in manual mode only (see § 2.22.1 above)

Press 🚿 during 3 sec to start the summertime mode and lit Summertime LED;

Press ♨ during 3 sec to start the wintertime mode and lit the Wintertime LED.

2.22.4 - Programming the maximum output setting of the boiler

The boiler is delivered with a maximum output of 12kW (parameter 16 = 1).

♦Set the parameter 16 = 0

♦Set parameters of 17 to 22 to requested value according following tables to adjust the maximum output of the boiler :

Power stage #		1	2	3	4	5	6
Power stage value		4 kW	2 kW	0 kW	4 kW	0 kW	2 kW
Parameter number		17	18	19	20	21	22
Parameter value to obtain the requested maximum output (0 = no ; 1 = yes)	12 kw	1	1	0	1	0	1
	10 kW	1	0	0	1	0	1
	8 kW	1	0	0	1	0	0
	6 kW	1	0	0	0	0	1
	4 kW	0	1	0	0	0	1

2.22.5 - Temperatures display

During normal operating the boiler's temperature, i.e : 50 is on display in front of symbol "°C".

• 1st pressure on ⊕ displays the ambience sensor display.

tA is displayed in front of symbol "°C"

external command status is on display in front of "bar" : 00 for boiler's run not requested
01 for boiler's run requested

• 2nd pressure (or 1st if no external command) on ⊕ displays boiler setting in °C

Parameter # CC is displayed in front of symbol "°C"
Parameter # 60 is displayed in front of symbol "bar"

• 3st pressure (or 2nd if no external command) displays the temperature correction in°K (parameter # Au in front of symbol "°C" (see § 2.21 to zero this correction).

Temperature correction can be read on bottom display i.e. 05. with a lit LED down right of the display if a negative value (-5°C in this example).

• 4st pressure displays the domestic hot water sensor display tS is displayed in font of symbol "°C"
Domestic hot water sensor status is on display in front of "bar" :

00 for boiler's run not requested

01 for boiler's run requested

2.23 - Counters

The regulation is equiped with 6 counters to count heating cycles (the unit is 100 cycles).

Press ⊖ and ⊕ during 3 sec.

The setting menu starts (see § 6.3).

Press ⊕ during 3 sec. : [C1]°C will be on display for counter #1, alternating with [09]°C and [99] bar, meaning power breaker #1 K1 is totalling more than 0999 x 100 = 99.900 cycles.

Press ⊕ to shift to counter #2. Conversely press ⊖ to return to previous counter.

Starting this menu will automatically restore the weekly shift of the 6 power stages starting sequence back to the 1 to 6 order, but will not zero the counters.

Press ⊖ and ⊕ during 3 sec. to exit the counters menu.

2.24 - Failures display

The boiler has many selectable options. Please ensure the correct selections are made for the type of installation you have made. If you have selected the use of a room thermostat, or hot water cylinder, the boiler will not operate until these devices are connected.

The boiler indicates a boiler fault by flashing on the display.

In case of faulty pressure sensor, [E] is flashing in front of symbol "°C". [00] is flashing in front of symbol "bar". Boiler is automatically switched to stand by.

In case of boiler's temperature failure, [E] in front of symbol "°C" is flashing. [01] is flashing in front of symbol "bar". The boiler is off, the water pump still running.

In case of outside temperature sensor failure (if parameter [07] = 1 or if used to automatic operation -see § 2.20-), [E] in front of "°C" is flashing, [02] is flashing in front of symbol "bar". The boiler is restricted to heating.

In case of Domestic Hot Water sensor failure (if parameter [13] = 1), [E] in front of symbol "°C" is flashing, [03] is flashing in front of symbol "bar". The boiler is automatically restricted to heating.

Please call the Redring Customer Service department -see Servicing section-

Pressure FLASHING in front of bar (for example [0.2]) -indicate the system pressure has fallen below the minimum operating pressure.

- Check if water has discharged from the pressure relief valve. If so call a Redring service agent.
- Check for leakage in the system.

Once the fault has been cleared the boiler will turn on again if the system is filled and pressurised to over 0.5 bar.

2.25 - Maintenance

Once a year we recommend to have the boiler checked by a qualified technician.

- Pressure inside the heating circuit needs to be controlled on a regular basis (pressure when cold will have to remain over 1 bar).

- **Important : A few days after installation, and then at least once a year, check tightness of the electric connections of the heating elements and power supply.**

2.26 - Overheating and replacement of heating elements

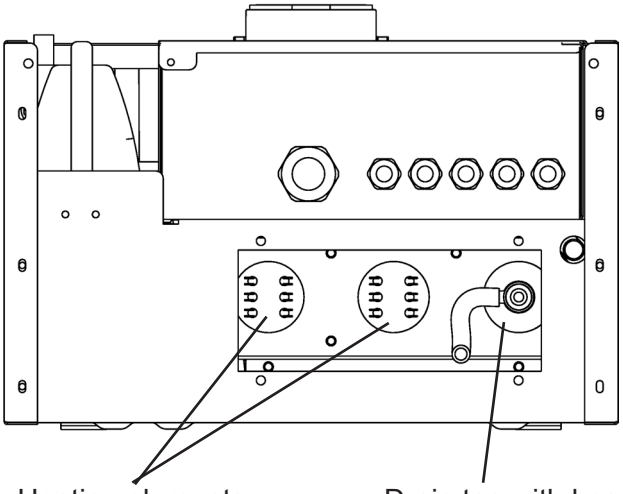
- Floor heating: In case of overheat the temperature limitator (60°C) will cut power supply to heating elements .

- Radiators: The limitator (100°C) also cuts power to heating elements.

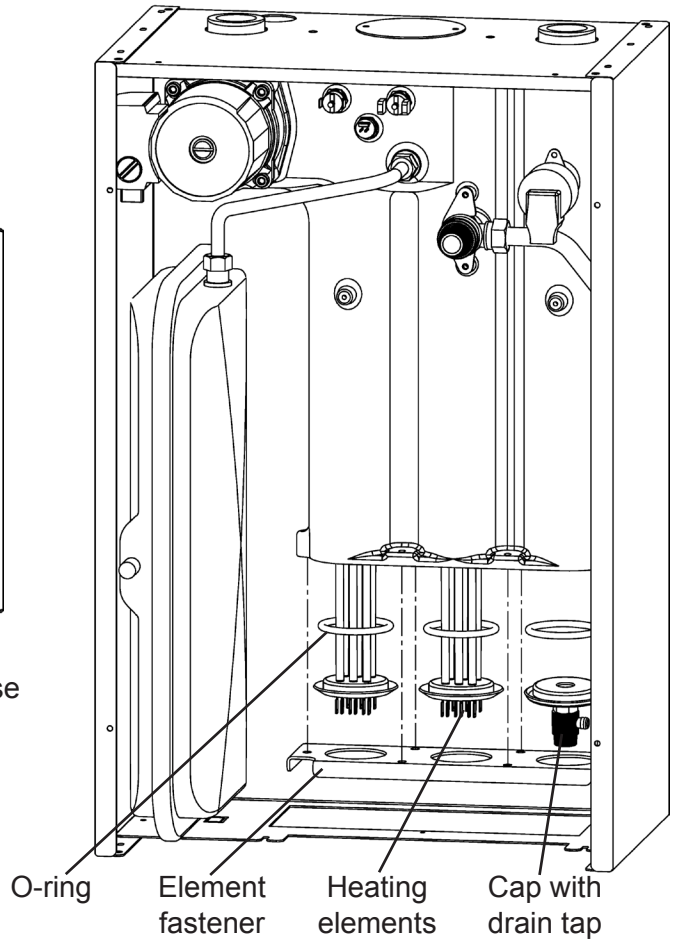
- After solving the failure, reset the boiler by pressing the small red button in the middle of the sensor's head. (see §1.3.1).

- A lack of power may be due to a defective heating element.
  To change a heating element :
  Cut the power supply, drain by using drain tap, disconnect elements, remove elements fastener and remove/ replace damaged element(s). (seer § 1.2 to access heating elements).

View from below
(Access trap-door to elements removed)

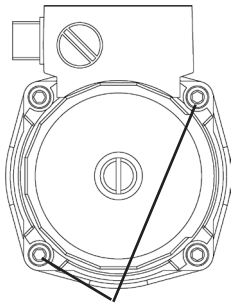


Front view
(electric box removed)

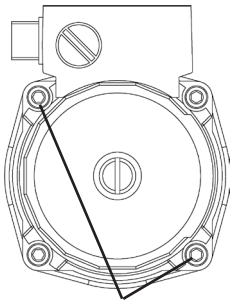


➠ Fastening the pump

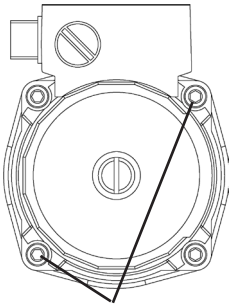
If the pump is producing some abnormal noise, slightly unscrew without creating leakage, then screw again following instructions below.



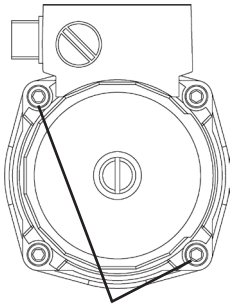
1 - Tighten the two opposite screws to a torque of 3 Nm.



2 - Tighten the other two opposite screws to a torque of 3 Nm



3 - Tighten the first two opposite screws to a torque of 5 Nm.



4 - Tighten the last two opposite screws to a torque of 5 Nm.

SPARE PARTS LIST

Designation	Reference	PSA 12
Side casing	EB06001	1
Front casing	EB06002	1
Control pannel	EB06003	1
Pump	EB06004	1
Klixon 60°C	EB06005	1
Klixon 100°C	EB06006	1
3 bar relief valve	EB06007	1
8L expansion vessel	EB06008	1
Water sensor	EB06009	1
6 kW heating element	EB06010	2
Heating element gasket	EB06011	3
20A tetrapole switch	EB06012	4
Fuse holder	EB06013	1
4A fuse size 5x20	EB06014	1
Control PCB, electronic card	EB06016	1
Water temperature sensor	EB06017	1
Drain Valve	EB06018	1
Drain Tube	EB06019	1

NOTE

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