

Sirius SAT

Built-in User Modules

R/1 – RP/1 – RS – RSP – R2Z

Installation and Operating Manual



Working towards
a cleaner future

POTTERTON
COMMERCIAL

heating specialists

TO THE OWNER OF THIS POTTERTON COMMERCIAL APPLIANCE

We are confident your new **POTTERTON COMMERCIAL** appliance will meet all your requirements.

All **POTTERTON COMMERCIAL** products have been designed to give you what you are looking for: good performance combined with simple and rational use.

Please do not put away this booklet without reading it first as it contains some useful information which will help you to operate your appliance correctly and efficiently.

Caution: Do not leave any packaging (plastic bags, polystyrene, etc.) within reach of children, as it is a potential source of danger.

POTTERTON COMMERCIAL S.p.A. declares that these models of boiler bear the CE mark in compliance with the basic requirements of the following Directives:

- Gas Directive 90/396/EEC
- Efficiency Directive 92/42/EEC
- Electromagnetic Compatibility Directive 2004/108/EEC
- Low Voltage Directive 2006/95/EC



The instructions shall state the substance of the following:

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 a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

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FOREWORD

The **SIRIUS SAT** user modules make it possible to independently manage heating requirements in centralised systems, meter the heat distributed to each unit (flat or independently managed area) and transmit heat consumption data via radio.

The following notes and instructions are addressed to fitters to allow them to carry out trouble-free installation. The operating instructions are contained in the “Start-up and operating instructions” section of this manual.

ATTENTION:

- Do not leave any packaging (plastic bags, polystyrene, etc.) within the reach of children as they are a potential source of danger.
- **The appliance must be housed in the template casing supplied in a separate pack.**
- **Flush the Domestic Hot Water circuit prior to use.**

1. DESCRIPTION

The **SIRIUS SAT** user modules are available in 6 versions:

SIRIUS SAT	Instantaneous hot water production	Dual zone	Circulation pump	CASING kit
SIRIUS SAT R/1	-	-	-	L = 600
SIRIUS SAT RP/1	-	-	●	L = 600
SIRIUS SAT R2Z	-	●	●	L = 800
SIRIUS SAT RS	●	-	-	L = 600
SIRIUS SAT RSP	●	-	●	L = 600
SIRIUS SAT RS2Z	●	●	●	L = 800

The models with pump separate the circuit from the head generated by the column pump by independently feeding the internal heating circuit.

The models featuring domestic hot water production are fitted with a stainless steel instantaneous plate exchanger and produce hot water at a temperature that can be adjusted using an electronic modulating device.

The dual-zone models can separately manage two heating zones at different temperatures and are ideal for combined central heating systems (underfloor radiant panels at a low temperature with radiators at a high temperature).

2. INSTRUCTIONS PRIOR TO INSTALLATION

These appliances must be inserted in a centralised heating system, especially designed for this purpose, consistently with their performance levels and power outputs.

The fitter must be legally qualified to install heating appliances.

Initial start-up must be performed by a **POTTERTON COMMERCIAL** - authorised Service Engineer, as indicated on the attached sheet. Failure to observe the above will render the guarantee null and void.

Do the following before connecting the appliance:

- Carefully flush all the system pipes in order to remove any residual thread-cutting swarf, solder and solvents in the various heating circuit components.

INSTALLATION INSTRUCTIONS: HYDRAULIC CONNECTIONS

3. CENTRALISED SYSTEM REQUIREMENTS

Some general indications concerning the installation of the centralised heating system are shown below. For these types of plants, a cutting-edge bespoke design is always necessary in order to ensure ideal conditions of comfort, save energy and reduce the environmental impact.

Install the boilers in a cascade arrangement (preferably condensation boilers with low pollutant emissions) of a suitable size to optimise plant performance according to seasonal loads, user demand and Domestic Hot Water demand peaks. The maximum installed power must consider a simultaneous use factor so as not to oversize the generator and consequently reduce operating efficiency.

The centralised plant must service the various floors of the building by means of columns positioned in the stairwells or in utility rooms which should preferably be inspectable.

A hydraulic separator should always be fitted downline from the heat generator as this separates circulation in the generator from circulation in the columns.

The centralised plant must have the following features:

- Automatic filling
- Expansion system sized according to total plant capacity
- Overpressure safety valve sized according to current legislation.

Each suitably sized column must be fitted with a circulator (preferably at variable speed depending on the demand of the modules), on/off valves and a dynamic balancing valve. Automatic air vents must be installed at the top of the columns. The inlet sections must have the same pressure drop in order to allow the system to balance feed to all the user systems. The recommended typology is three columns with a reverse return line.

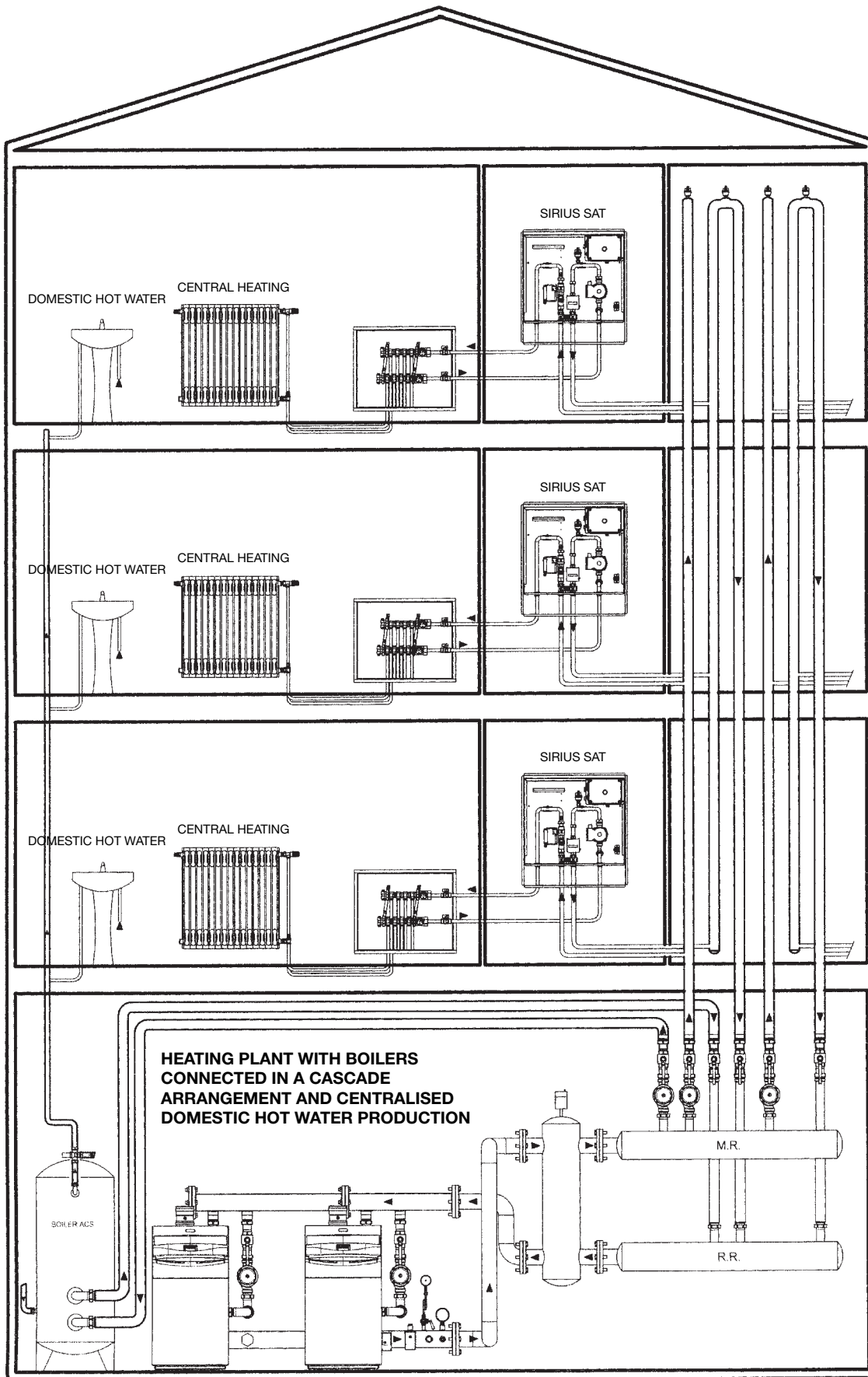
Modules with Domestic Hot Water production require an appropriate centralised plant capacity so as to produce a thermal mass that can limit the instantaneous operation of the generator (column oversizing).

The columns and manifolds must be well lagged.

For models without pump (**R/1 – RS**), the heating circuit pressure drops downline from the user module ($R = 0.3 \text{ KPa/m}$ per linear metre + local pressure drops) and the pressure drop of the module itself must also be considered when calculating the pressure drops.

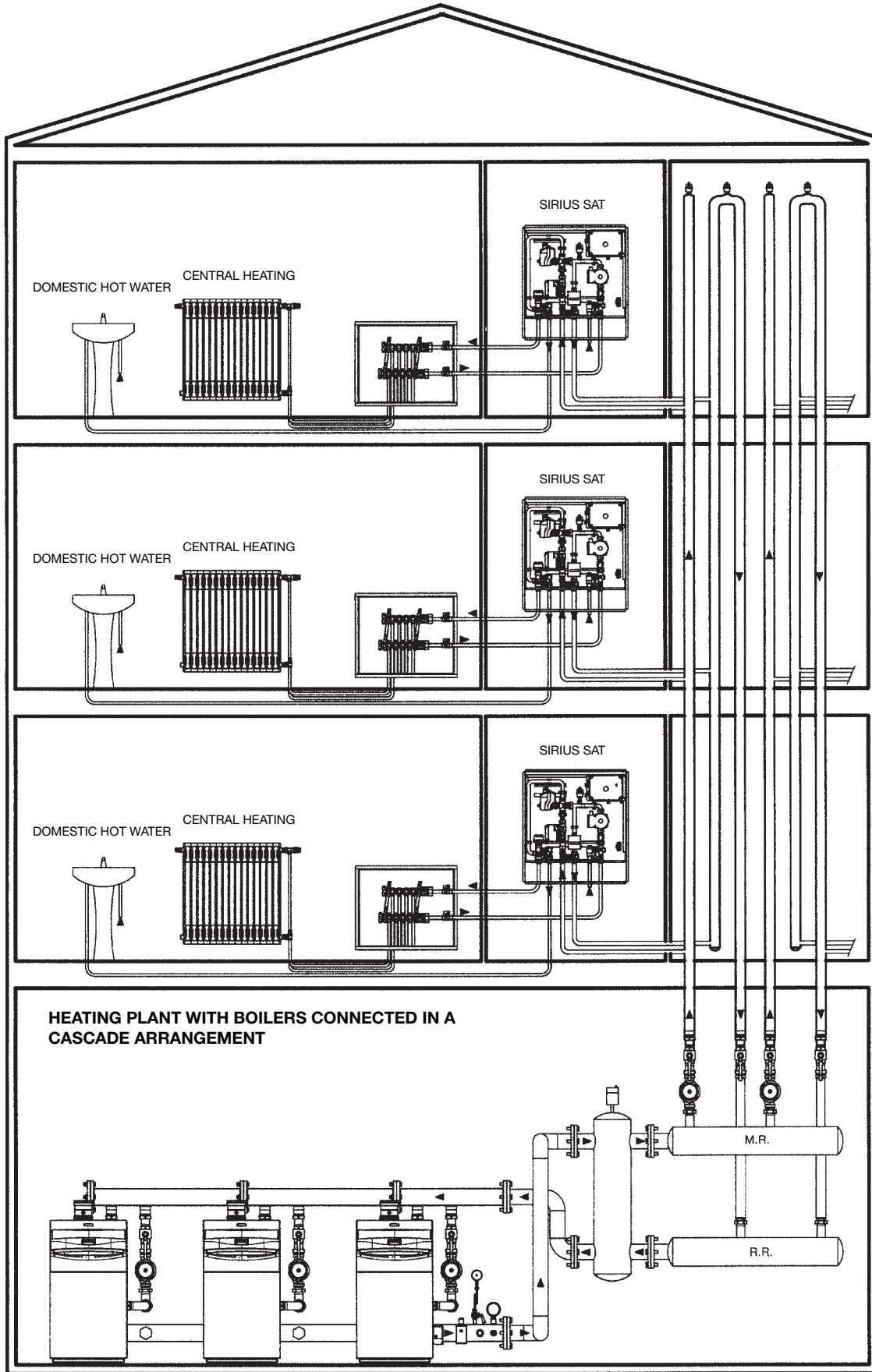
For models with pump (**RP/1 – RSP – R2Z – RS2Z**) make sure that the circuit pressure drops downline from the module ($R = 0,3 \text{ KPa/m}$ per linear metre + local leaks) are compatible with the pump supplied together with the module. In this case, the column pump must offset the circuit pressure drops upline from the module (a residue head is acceptable).

SIRIUS SAT user modules are fitted with an automatic by-pass valve which opens the circulation circuit when the pressure drops exceed 60 kPa (inlet valve closed).



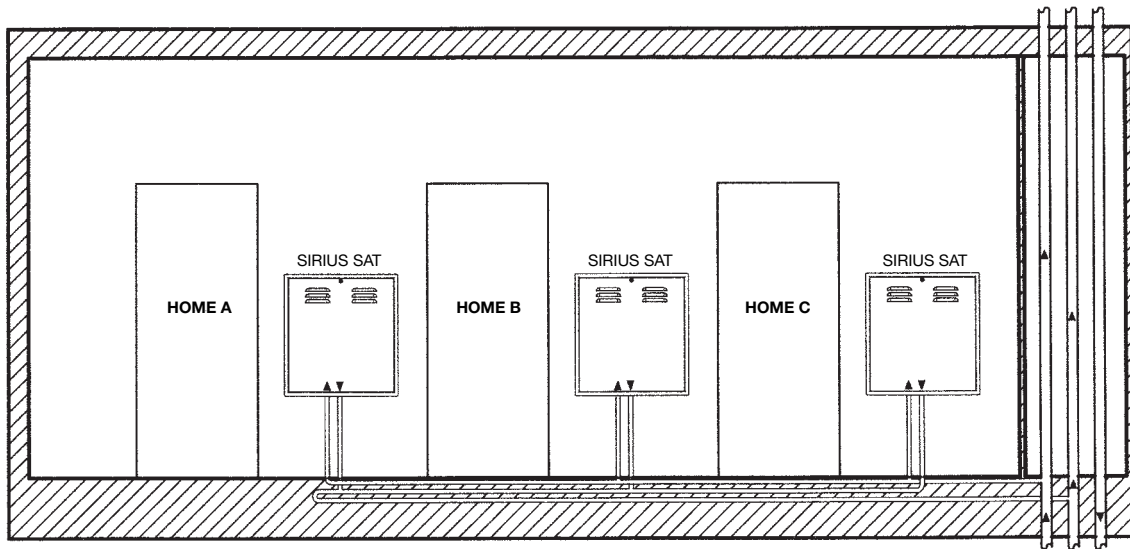
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Figure 1A: Diagram of plant: centralised domestic hot water production



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Figure 1B: Diagram of plant: local domestic hot water production



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Figure 1C: Floor layout

The indicative diagram in figure 1c only illustrates the feed pipes of the individual user modules.

The heating plant inside the zone controlled by the module must be realised by feeding the heating elements according to normal methods.

For models with domestic hot water production, a stub of the hydraulic network must be attached to the Domestic Hot Water inlet connector ES.

The domestic hot water outlet US must feed all the user hot water take-off points.

3.1 GENERAL SIZING DATA

- Campo temperatura acqua impianto centralizzato: 60 - 75 °C
- Water temperature range in centralised plant: 60 - 75 °C
- Maximum water pressure in centralised plant: 4 bar
- Module feed flow rate (nominal): 700 ÷ 1000 l/h for heating only models
1000 ÷ 1500 l/h for models with domestic hot water production

- Maximum recommended speed of heat transfer fluid: 1 ÷ 1.5 m/s
- Pressure drop in module: 20 KPa at 700 l/h (see § 6)

Some purely indicative general sizing data is shown below:

TABLE: HEAT DEMAND – HEATED AREA

Area to heat (m ²)	Heat demand (*) With F1 = 20 W/m ³ (kW)	Heat demand (*) With F2 = 30 W/m ³ (kW)	Heat demand (*) With F3 = 45 W/m ³ (kW)
60	3,6	5,4	8,1
70	4,2	6,3	9,5
80	4,8	7,2	10,8
90	5,4	8,1	12,2
100	6,0	9	13,5
110	6,6	9,9	14,9
120	7,2	10,8	16,2
130	7,8	11,7	17,6
140	8,4	12,6	18,9
150	9,0	13,5	20,3

(*) Volumetric heat load "F": 20 - 30 - 45 W/m³ with Δt = 25 K;

Height of volume to be heated = 3 m

Δt = internal and external temperature difference (internal T = 20 °C, external = - 5°C)

F1 = 20 W/m³ buildings with an excellent level of insulation

F2 = 30 W/m³ buildings with an good level of insulation

F3 = 45 W/m³ buildings with an low level of insulation

**TABLE: HEAT DEMAND – FLOW OF WATER IN HEATING CIRCUIT
DOMESTIC HOT WATER TAKE-OFF FLOW**

Heating domestic water heat capacity (kW)	Flow rate of Heating circuit with $\Delta T1 = 15\text{ K}$ (l/h)	Flow rate of Heating circuit with $\Delta T1 = 20\text{ K}$ (l/h)	Flow rate of domestic water circuit with $\Delta T2 = 35\text{ K}$ (l/min)
7 (R)	401	301	2,9
8 (R)	459	344	3,3
9 (R)	516	387	3,7
10 (R)	573	430	4,1
11 (R)	631	473	4,5
12 (R)	688	516	4,9
13 (R)	745	559	5,3
14 (R)	803	602	5,7
15 (RS)	860	645	6,1
16 (RS)	917	688	6,6
17 (RS)	975	731	7,0
18 (RS)	1032	774	7,4
19 (RS)	1089	817	7,8
20 (RS)	1147	860	8,2
21 (S)	1204	903	8,6
22 (S)	1261	946	9,0
23 (S)	1319	989	9,4
24 (S)	1376	1032	9,8
25 (S)	1433	1075	10,2
26 (S)	1491	1118	10,6
27 (S)	1548	1161	11,1
28 (S)	1605	1204	11,5
29 (S)	1663	1247	11,9
30 (S)	1720	1290	12,3

$\Delta T1$ = Difference between User Module Delivery – Return Temperature

$\Delta T2$ = Difference between hot water outlet – cold water inlet temperature

R = central heating

S = domestic water

4. MOUNTING THE TEMPLATE CASING

CASING/TEMPLATE MODEL	WIDTH	SIRIUS SAT MODELS
SINGLE-ZONE SIRIUS SAT KIT	l = 600 mm	R/1 - RP/1 - RS - RSP
DUAL-ZONE SIRIUS SAT KIT	l = 800 mm	R2Z - R2Z

Install the **SIRIUS SAT** model inside the casing/template supplied in a separate pack.

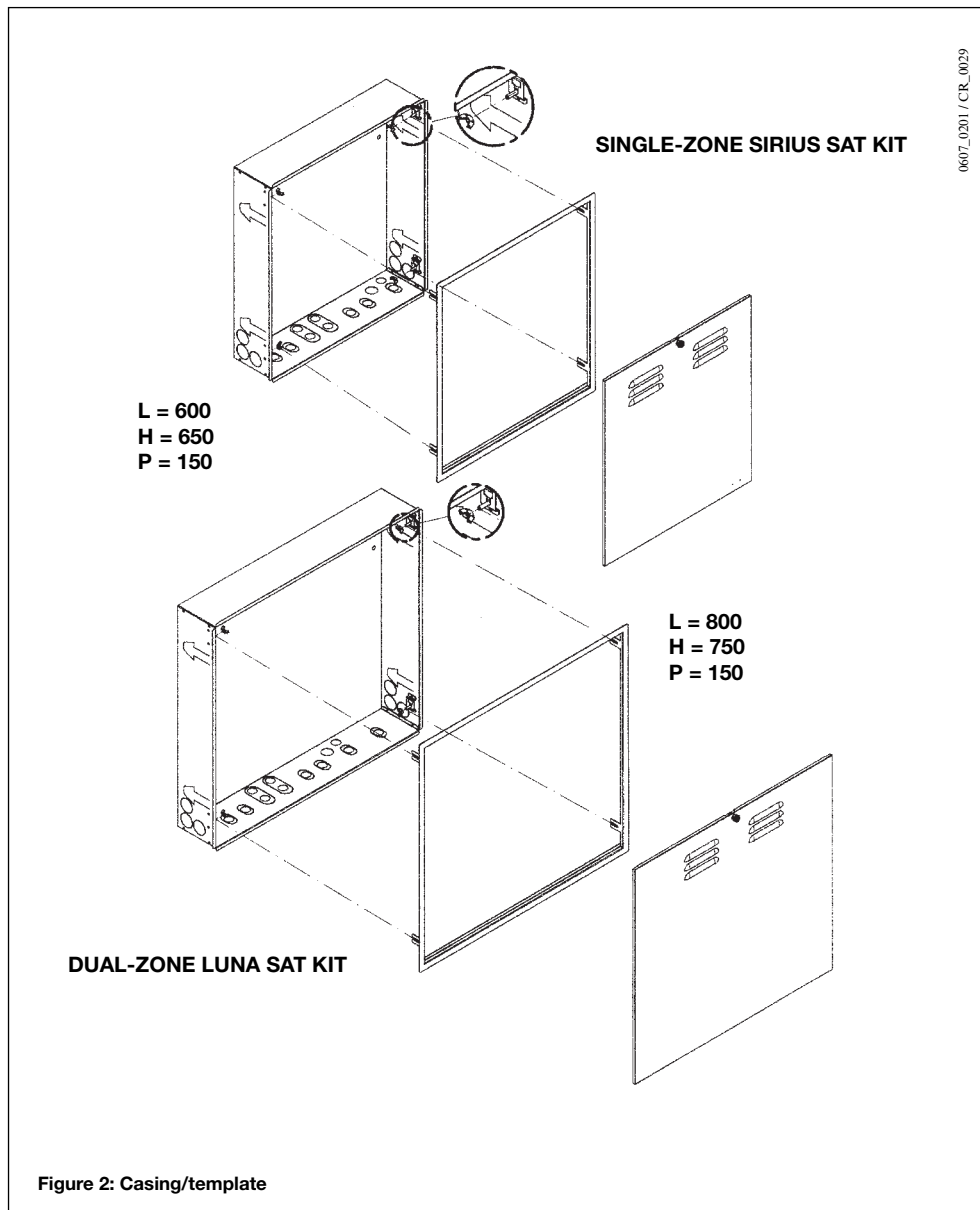
Make sure the template casing model is correct (L= 600 or L=800 mm).

Fit the template/casing in a niche in the wall made for this purpose (dimensions indicated in figures 2 and 3) and secure it with the relative lateral bent pins. Make sure the installation allows easy access for maintenance.

Remove the door and white frame and put back after installation (make sure the casing accessories also include the key for opening the door).

The frame can be depth-adjusted by using the 4 butterfly nuts located in the side guides. It is therefore possible to fit the frame flush against the plaster and remove it when painting the wall.

Assemble the system starting from the position of the water connectors on the lower crossbar of the template (recessed into the casing by 30 cm). Install the casing in the stairwell outside the apartment to heat.



5. MOUNTING THE APPLIANCE

After completing the masonry work, hook the SIRIUS SAT module onto the casing/template and make the hydraulic connections using the supplied telescopic connections (see figure 3).

Before fixing the module, drill holes in the rear wall for the \varnothing 10mm expansion grips (use the holes in the casing/template as a guide). Then secure the module with the supplied screws.

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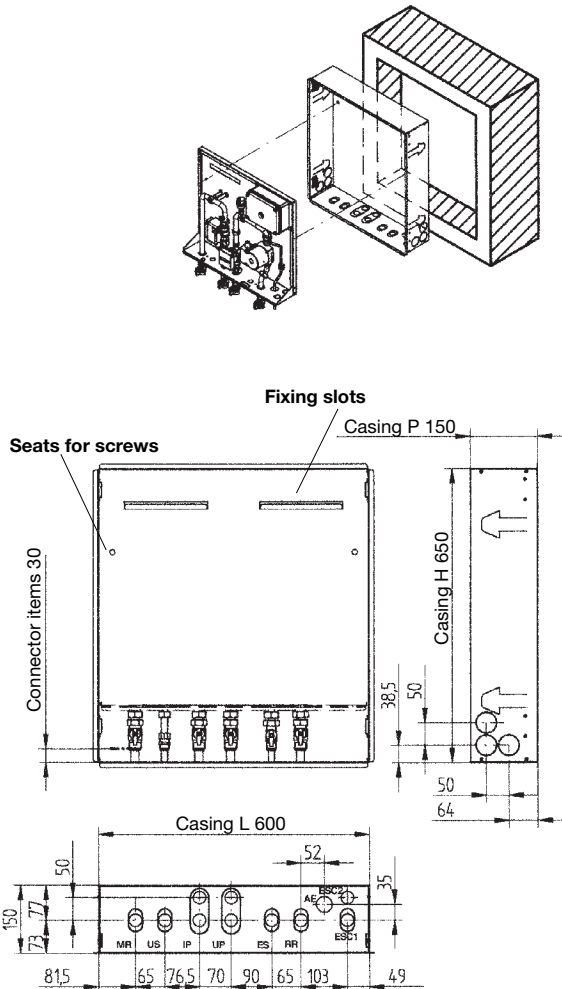


Figure 3 A: Connectors and sizes of SIRIUS SAT R/1 - RP/1 - RS - RSP

Key

CONNECTIONS TO CENTRALISED PLANT

IP: primary inlet from centralised plant G 3/4" M
UP: primary outlet from centralised plant G 3/4" M

HEATING PLANT CONNECTIONS FOR SINGLE-ZONE MODELS

MR: G 3/4" M heating plant delivery
RR: G 3/4" M heating plant return

HEATING PLANT CONNECTIONS FOR DUAL-ZONE MODELS

MRAT: high temperature plant delivery G 3/4" M (Models R2Z and RS2Z)
MRBT: low temperature plant delivery G 3/4" M (Models R2Z and RS2Z)
RRAT: high temperature plant return G 3/4" M (Models R2Z and RS2Z)
RRBT: low temperature plant return G 3/4" M (Models R2Z and RS2Z)

CONNECTIONS TO DOMESTIC WATER PLANT

ES (*): domestic water inlet G 1/2" M (Models RS, RSP, RS2Z)
US: domestic hot water outlet G 1/2" M (Models RS, RSP, RS2Z)

DOMESTIC WATER METER CONNECTIONS

ESC1 (*): domestic water inlet to meter G 3/4" M
ESC2 (*): domestic water inlet to second meter G 3/4" M (Models R, RP, R2Z)

(*): If the meter is installed to measure domestic water consumption (accessory supplied on request), move the domestic water inlet to the hydraulic connector **ESC1** (or **ESC2**)

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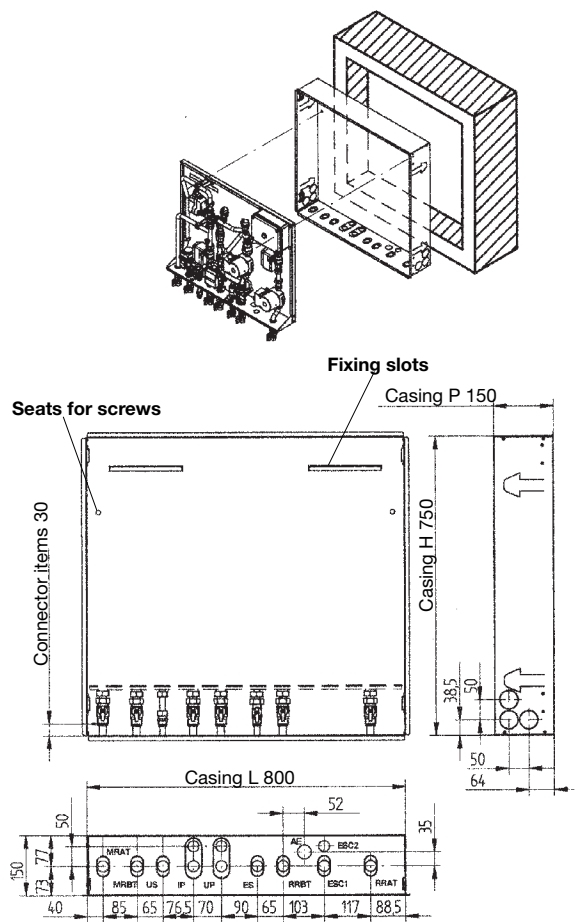


Figure 3 B: Connectors and sizes of SIRIUS SAT R2Z - RS2Z

Items in the SIRIUS SAT user module pack.

- Screws and expansion grips 10 mm
- Tap G 3/4" user module inlet
- Tap G 3/4" return to centralised plant
- Tap G 3/4" heating plant delivery (2 for dual-zone models)
- Tap G 3/4" heating plant return (2 for dual-zone models)
- Tap G 1/2" domestic water inlet (models with domestic hot water production)
- Tap G 1/2" domestic hot water outlet (models with domestic hot water production)
- Seals
- Telescopic joints

6. FLOW RATE/PRESSURE DROP CHARACTERISTICS (models without pump: R/1 – RS)

Models R/1

These models are fitted with a balancing valve (figure 5). This device is used to balance the flow of water circulating in the single module in case of non-optimal distribution in the inlet pipes.

Figure 4 shows the **Flow Rate – Pressure Drop** curve with balancing valve in the wide open position.

Models RS

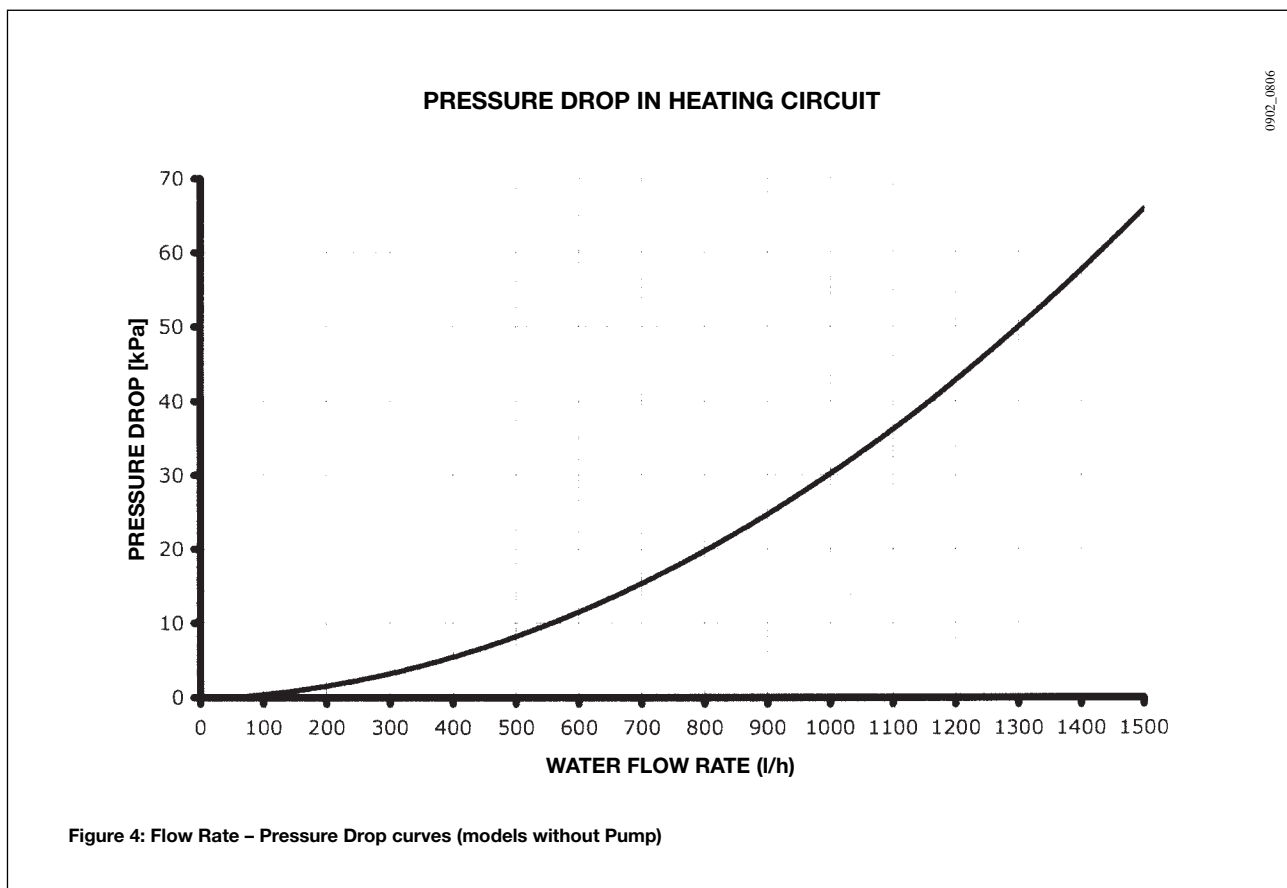
These models are fitted with two balancing devices.

The first device (balancing valve: Figure 5) is used to balance the flow of water circulating in the single module in case of non-optimal distribution in the inlet pipes. **With this device, the flow rate must not fall below 1000 l/h in the domestic water mode** (lower flow rates do not assure sufficient domestic water performance).

The second device (positioned in the brass hydraulic body: Figure 6) must be used if a further pressure drop increase is required (this device only acts on the heating circuit and does not affect domestic water flow).

The circulating flow rate value is shown on the heat meter display (see §17).

Figure 4 shows the **Flow Rate – Pressure Drop** curve with balancing valve in the wide open position.



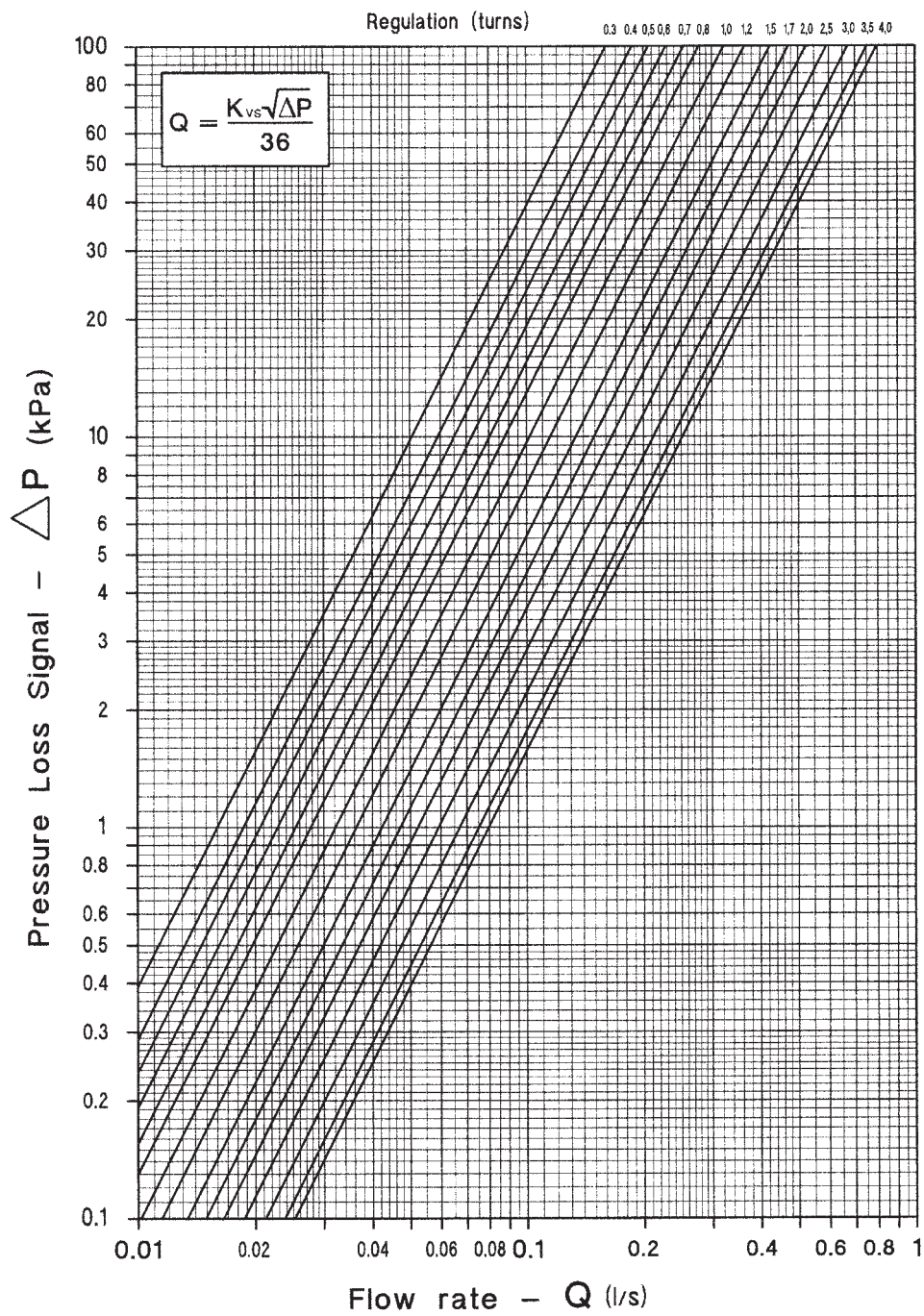
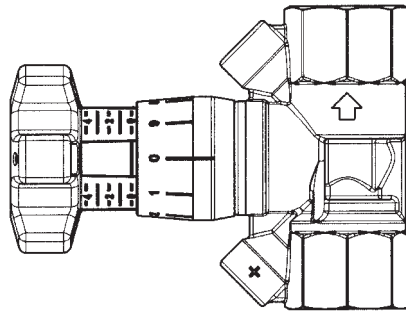


Figure 5: Balancing valve (models without Pump)

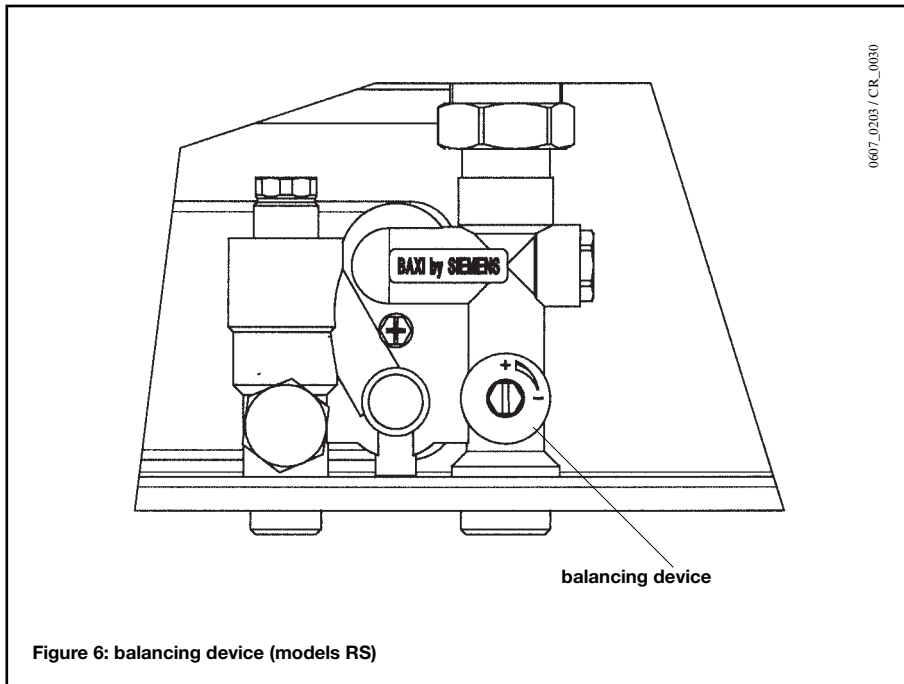


Figure 6: balancing device (models RS)

7. OUTPUT/PUMP HEAD PERFORMANCE (only for models with pump: RP/1 - RSP - R2Z - RS2Z)

These models are fitted with a circulation pump.

This silent-running high-head pump is suitable for use on any type of heating system.

The pump, mounted inside the appliance, is fitted out for operation at maximum speed (III). Speed I should not be used as flow rate/head performance does not satisfy normal operating conditions.

make sure the circuit pressure drops downline from the module are compatible with the supplied pump. In this case, the column pump must only offset the circuit pressure losses upline from the module (a residue head is acceptable).

The circulating flow rate value is shown on the heat meter display (see §17).

A device for balancing the load circulating in the heating plant is located in the brass body of the hydraulic assembly (figure 6). For these models, check that the lever of this device is wide open.

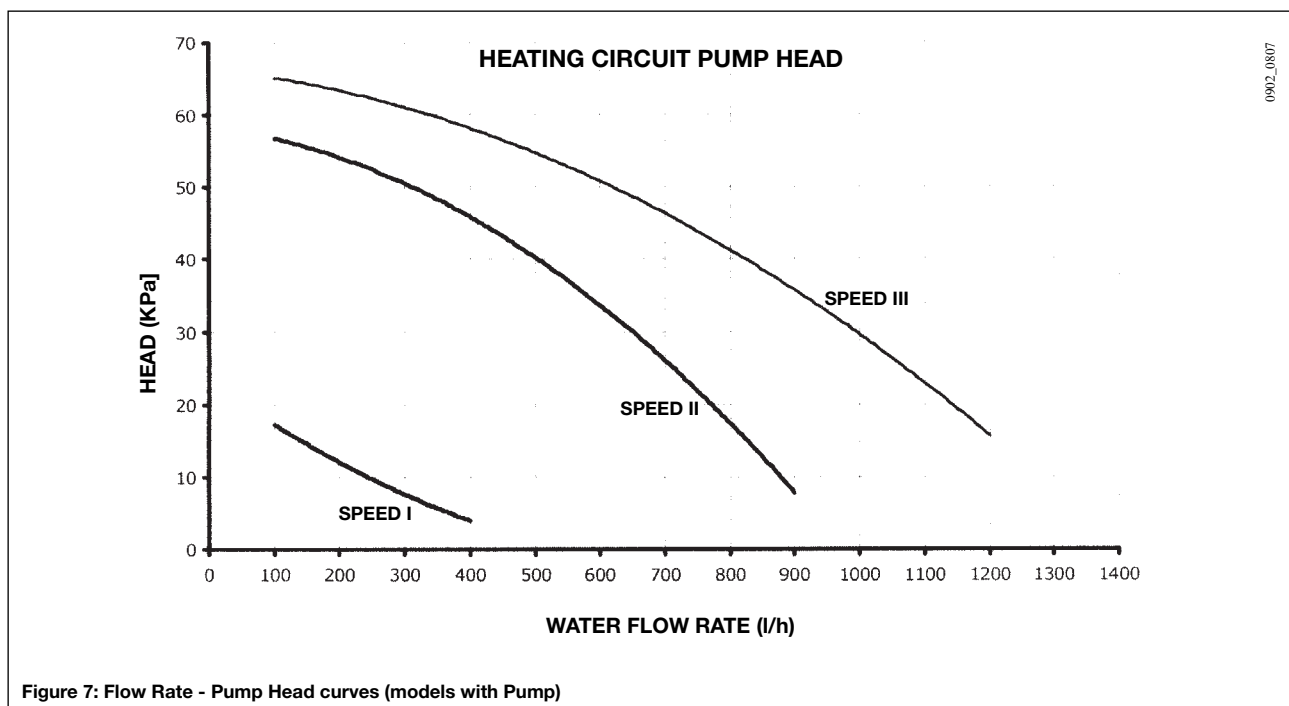


Figure 7: Flow Rate - Pump Head curves (models with Pump)

8. DOMESTIC HOT WATER PRODUCTION (models : RS – RSP – RS2Z)

The models with domestic hot water production are fitted with an instantaneous plate exchanger in stainless steel sized for a heat exchange of 35 kW with inlet water at 75 °C.

The heat exchange surface offers suitable domestic hot water performance also with water at 60 °C.

Table: Domestic hot water production according to inlet temperature

Temperature of water in centralised plant circuit (°C)	Heat exchange capacity (kW)	Domestic water flow rate with $\Delta T_s = 35$ K (l/min)
75	35	14,3
70	31	12,7
65	28	11,4
60	26	10,6

ΔT_s = temperature difference between hot water outlet and cold water inlet

Temperatures greater than 75 °C are not recommended in order to prevent damaging scale deposits that can clog the exchanger, reduce performance and shorten maintenance intervals.

Maximum pressure in the hydraulic circuit: 8 bar

Minimum dynamic pressure in the hydraulic circuit: 0,2 bar

9. DOMESTIC WATER METER (available on request)

The following meter kits for measuring water consumption are available as accessories.

- Domestic water meter KIT for models: RS – RSP – RS2Z
- Domestic water meter KIT for models: R/1 – RP/1 – R2Z
- Second domestic water meter KIT for models: RP/1
- Second domestic water meter KIT for models: R/1 – R2Z

Models R/1 – RP/1 – R2Z can house a meter for measuring the consumption of hot water from a centralised storage system and another meter for measuring the consumption of cold domestic water of each user.

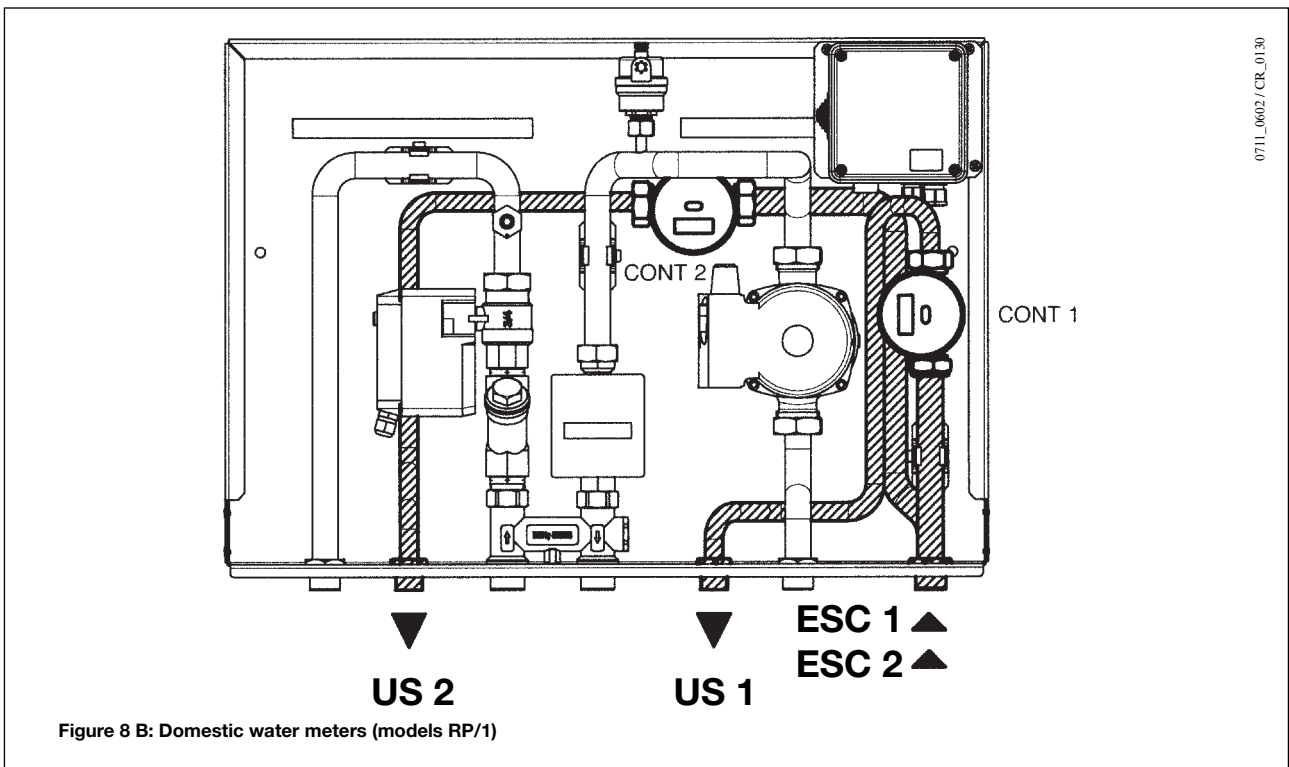
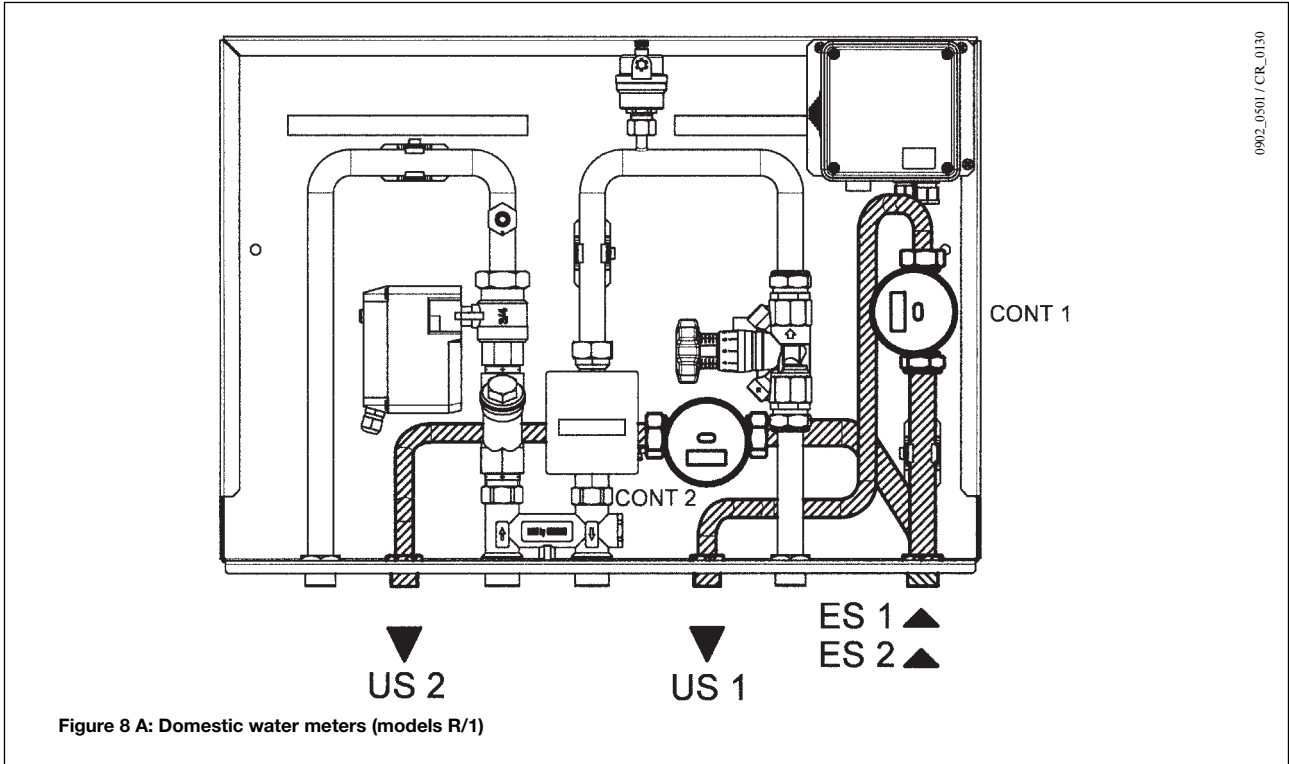
Models RS – RSP – RS2Z can house a meter for measuring the consumption of domestic hot water or total domestic water consumption (hot water + cold water).

In the first case, the blind cap on the hydraulic assembly must be moved from the lateral connector to the cold water inlet (ES). In the second case, the cap must be removed.

The kits comprise a SIEMENS WFH36 electronic volumetric meter with display and radio data transmission (featuring the same characteristics as the heat meter: see §17) and two connection pipes housed inside the frame of the user module in the holes made for that purpose.

For further information on the meter, see the supplied SIEMENS instructions.

9.1 DOMESTIC WATER METER: R/1 - RP/1 - R2Z



1st meter (models R/1 – RP/1 – R2Z)

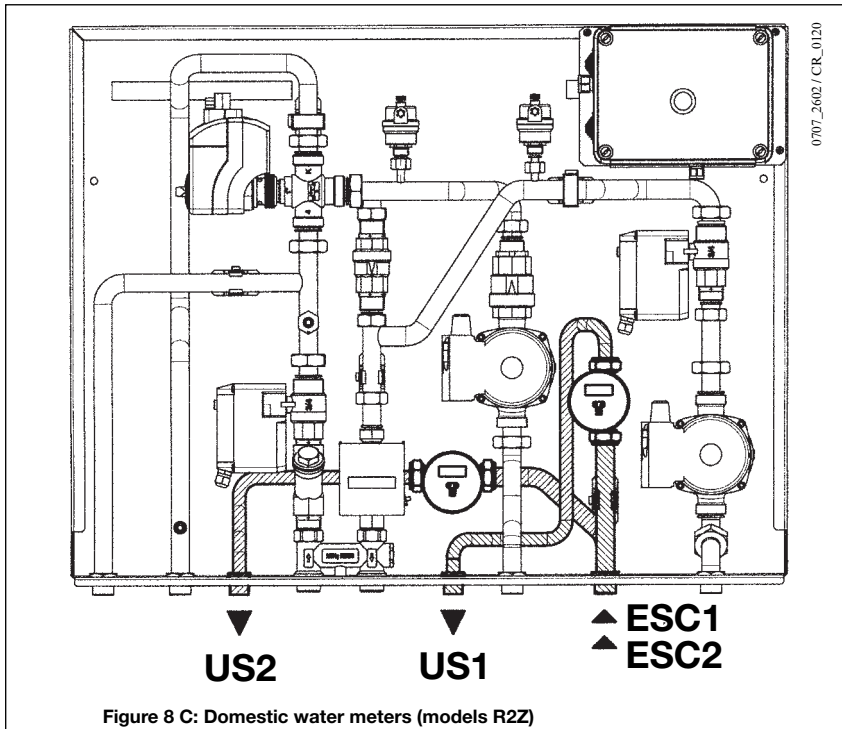
Domestic water metering inlet: hydraulic connector **ESC1** (G 3/4")

Domestic water metering outlet: hydraulic connector **ES** (G 1/2") - **US1**

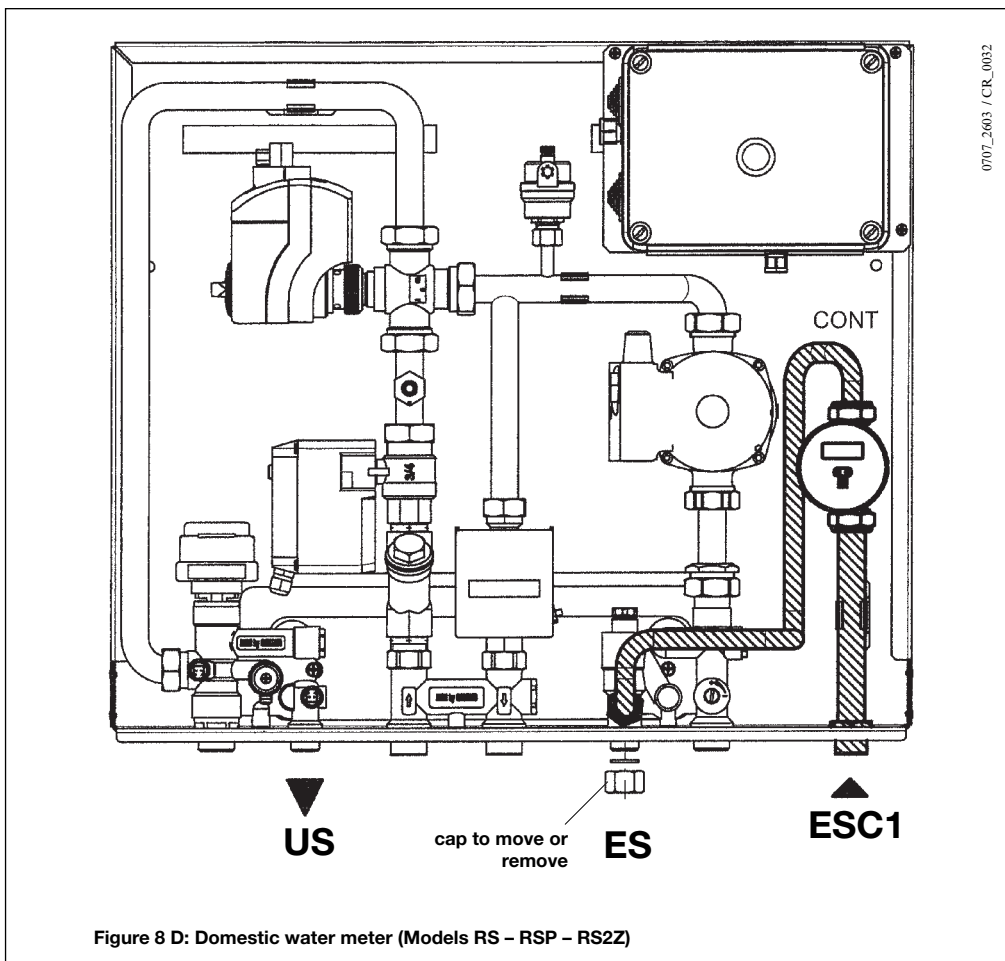
2nd meter (models R/1 – R2Z o RP/1)

Domestic water metering inlet: hydraulic connector **ESC2** (G 3/4")

Domestic water metering outlet: hydraulic connector **US** (G 1/2") - **US2**



9.2 DOMESTIC WATER METER: RS - RSP - RS2Z



1st meter (models RS - RSP - RS2Z)

Domestic water metering inlet: hydraulic connector **ESC1** (G 3/4")

Domestic water metering outlet: hydraulic connector **US** (G 1/2")

Domestic cold water metering outlet: hydraulic connector **ES** (G 1/2")

INSTALLATION INSTRUCTIONS: ELECTRICAL CONNECTIONS

10. ELECTRICAL CONNECTIONS

The appliance is sold complete with electrical connections and power cable.

This machine is only electrically safe if it is correctly connected to an efficient earth system in compliance with current safety regulations.

Connect the appliance to a 230V single-phase earthed power supply using the supplied three-pin cable, observing correct LIVE (L) - NEUTRAL (N) polarity.

Use a double-pole switch with a contact separation of at least 3mm.


When replacing the power supply cable, fit a harmonised HAR H05 VV-F' 3x1 mm² cable with a maximum diameter of 8 mm.

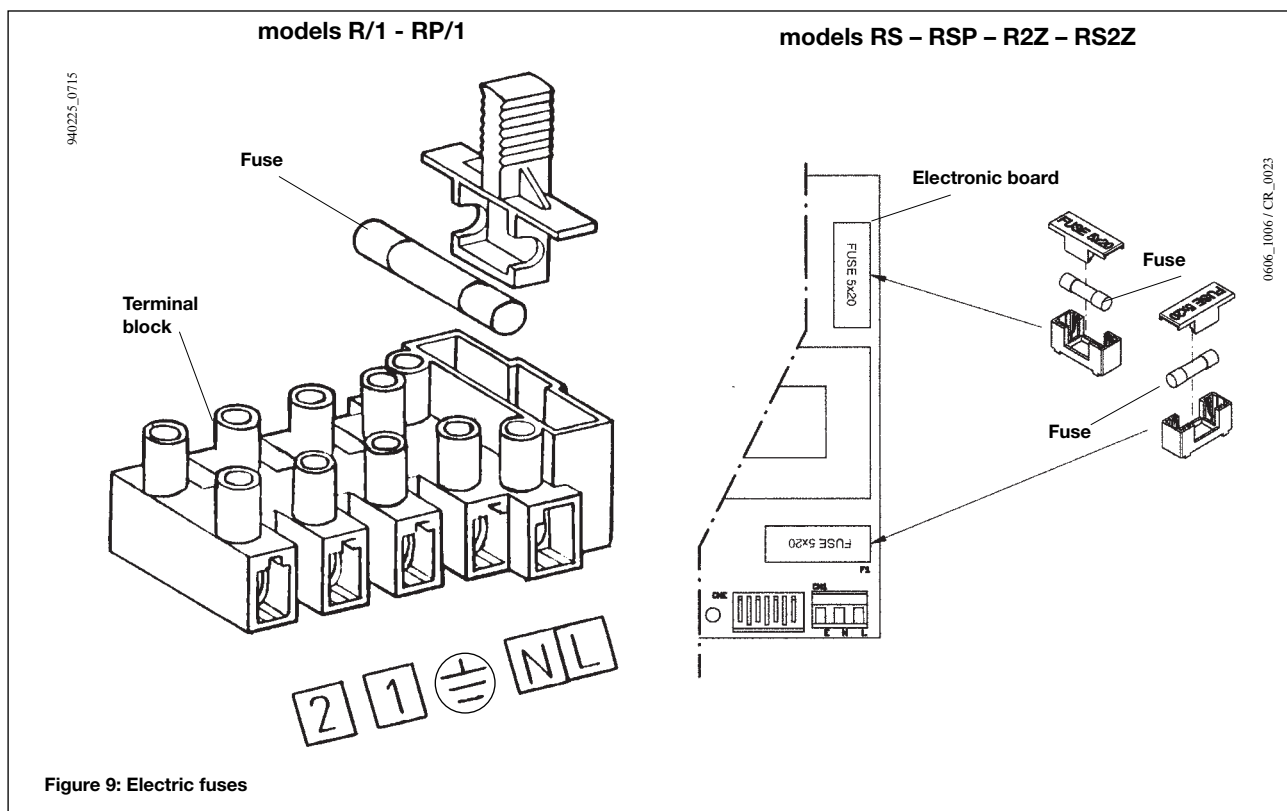
10.1 ACCESS TO THE POWER SUPPLY TERMINAL BLOCK

- Disconnect the appliance from the mains power supply using the two-pole switch;
- Remove the door of the casing using the supplied square key.
- Make sure that the switch indicator light is off.
- Loosen the screws on the cover of the electrical box and remove it.
- The 2A rapid fuse is incorporated in the power terminal block (models R/1 and RP/1) or in the electronic board (models RS, RSP, R2Z, RS2Z).

(L) = LIVE brown

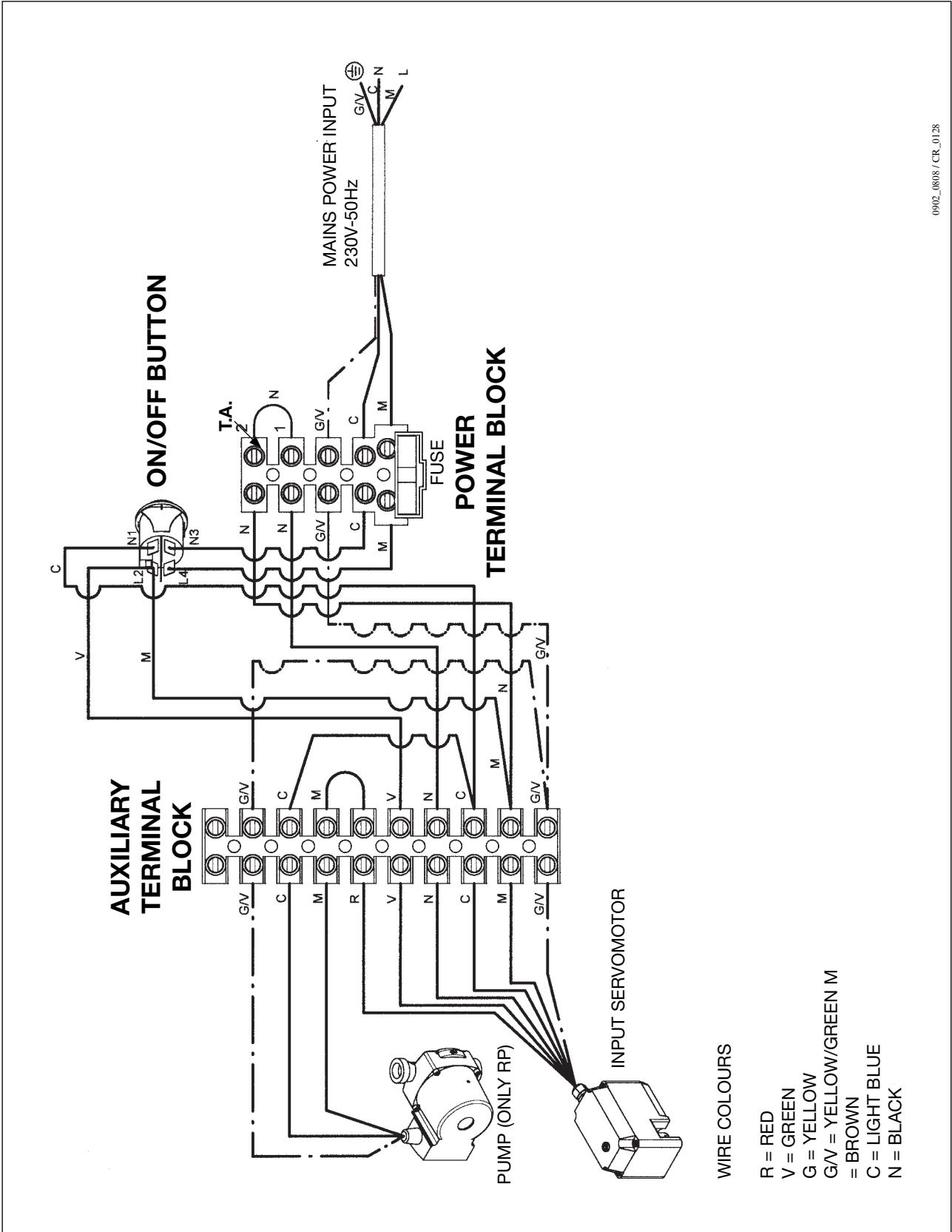
(N) = NEUTRAL blue

 = EARTH yellow-green



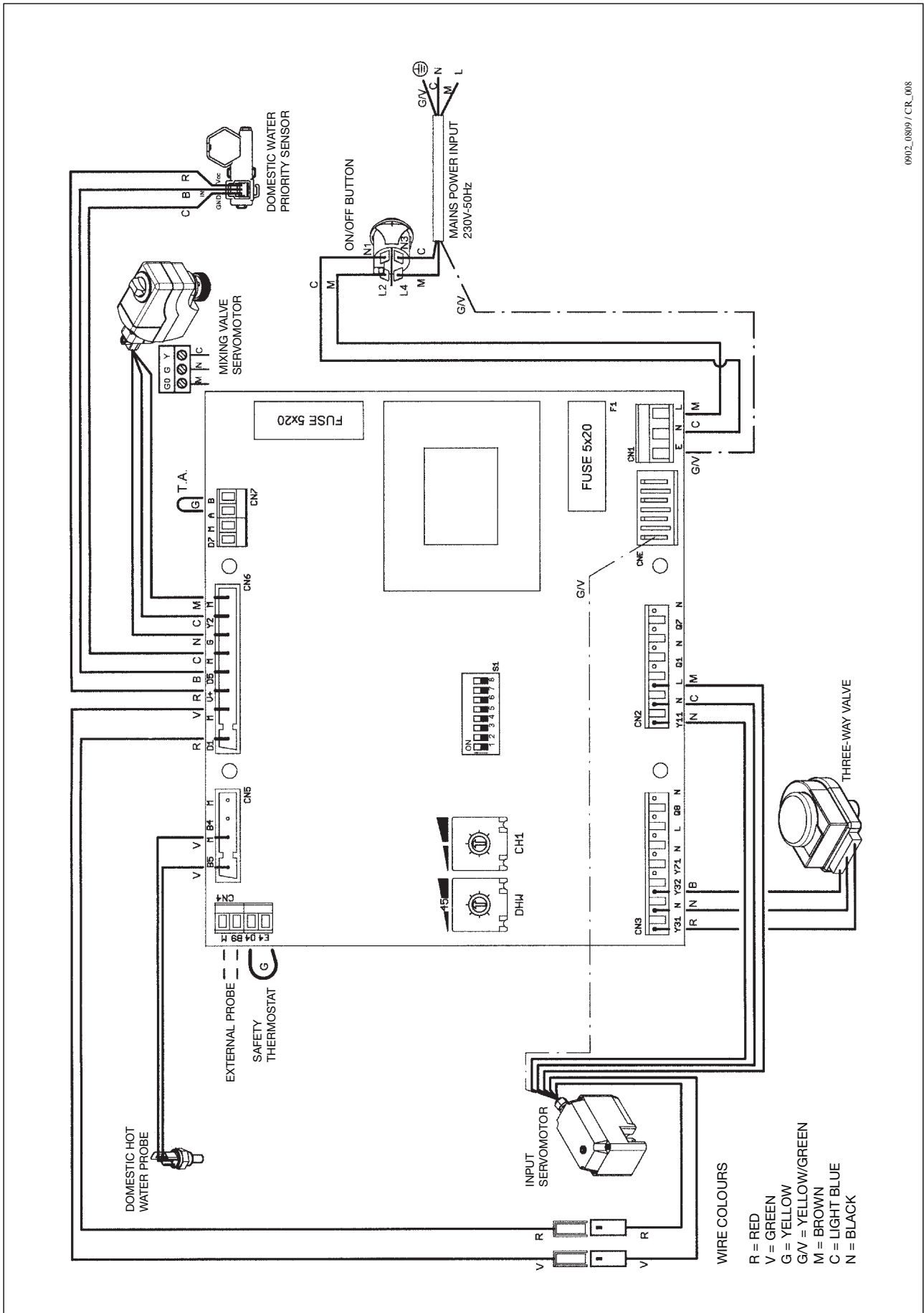
11. WIRING DIAGRAMS

11.1 MODELS R/1 E RP/1



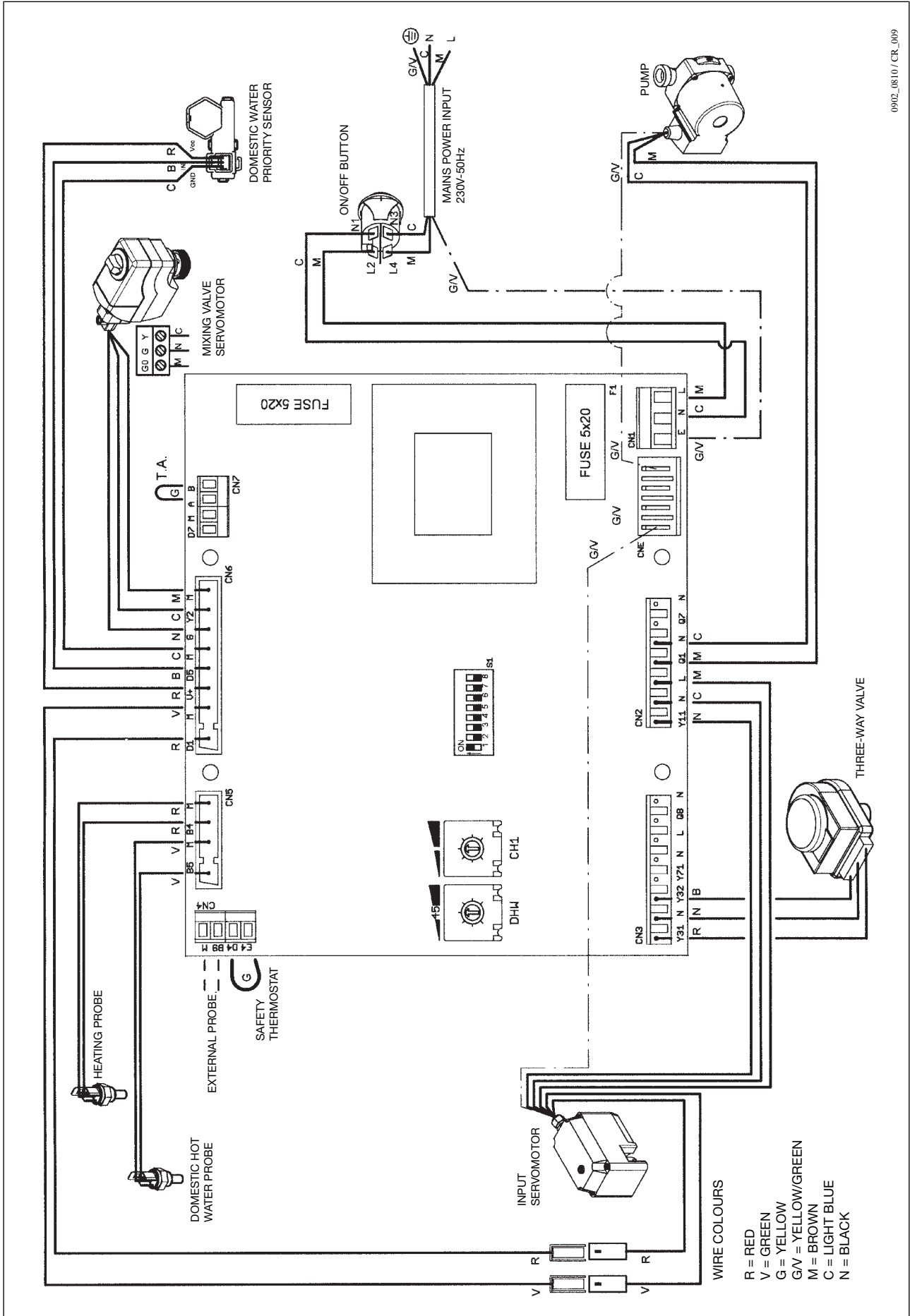
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11.2 MODELS RS



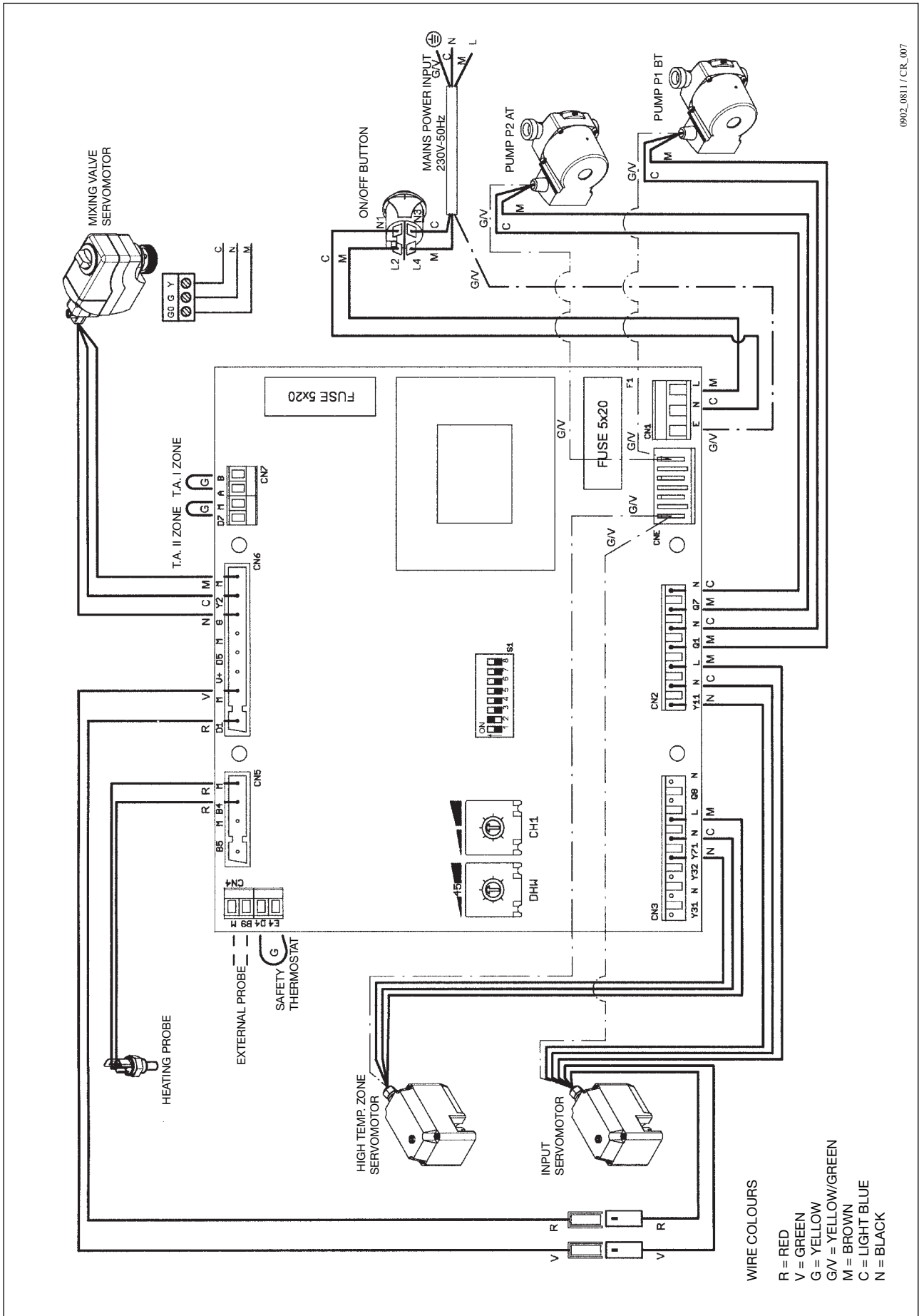
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11.3 MODELS RSP



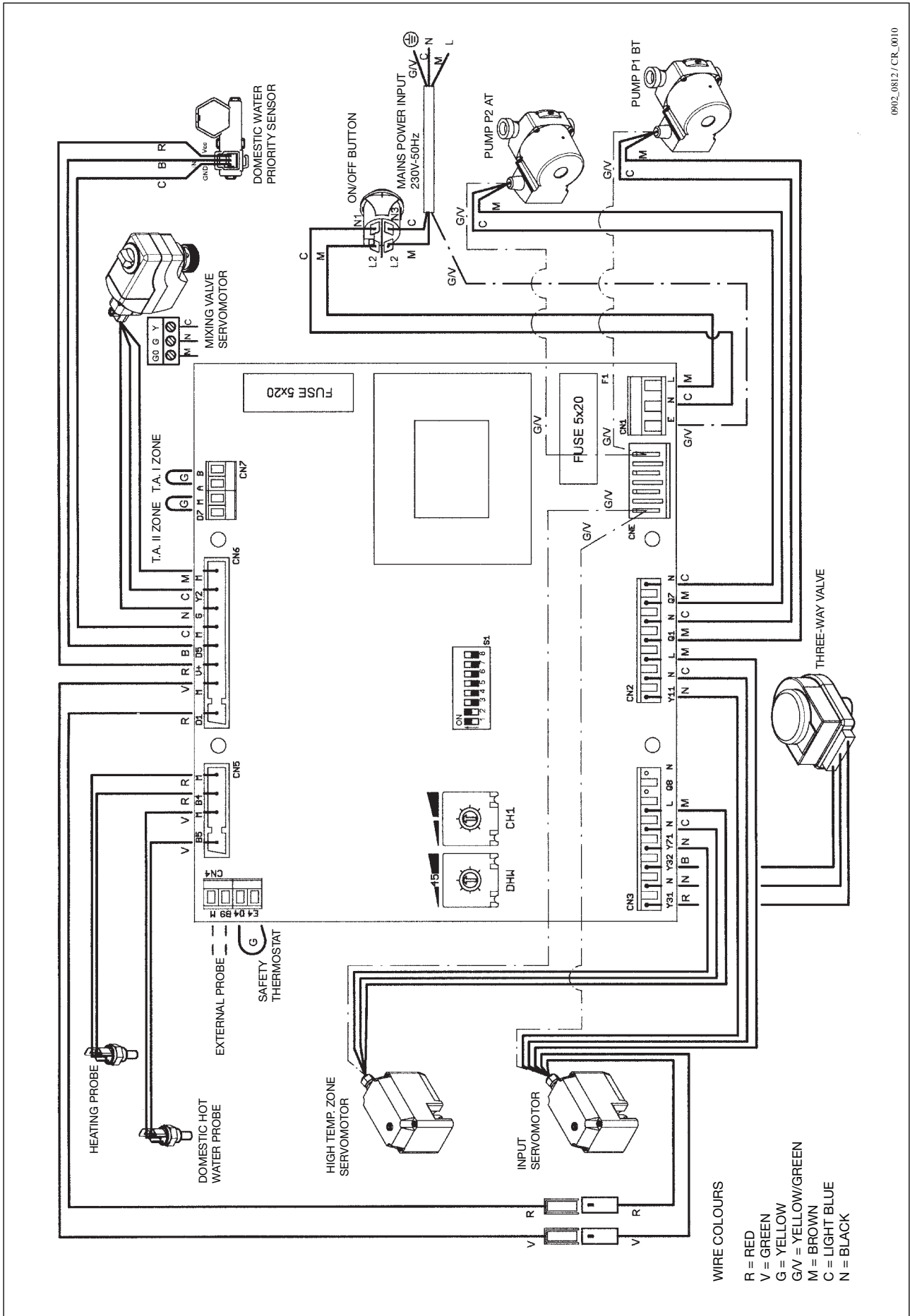
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11.4 MODELS R2Z



0902_0811 / CR_007

11.5 MODELS RS2Z



12. CONNECTING THE AMBIENT THERMOSTAT

The system must be fitted with an ambient thermostat in order to control room temperature. To connect this device, proceed as follows:

12.1 SINGLE-ZONE MODELS: R/1 – RP/1

Access the electrical components as described in section 10.1.

Remove the jumper on terminals (1) and (2) of the main terminal block (R/1, RP/1) (see wiring diagrams in § 11).

Thread the two-wire cable through the grommets of the electrical box and connect it to these two terminals using a harmonised cable “HAR H05 VV-F” 2 x 0.75 mm² with a maximum diameter of 8 mm.

12.2 SINGLE-ZONE MODELS: RS – RSP

Access the electrical components as described in section 10.1.

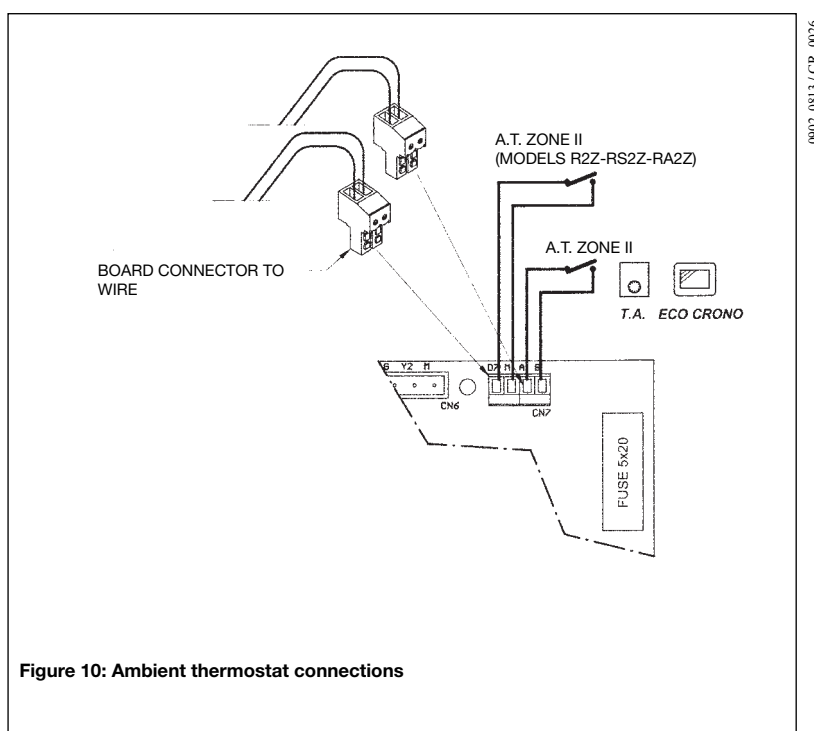
Remove the jumper on the electronic board terminals (CN7: A - B) (see wiring diagrams in § 11 and Figure 10).

Thread the two-wire cable through the grommets of the electrical box and connect it to these two terminals using a harmonised cable “HAR H05 VV-F” 2 x 0.75 mm² with a maximum diameter of 8 mm.

12.3 DUAL-ZONE MODELS: R2Z – RS2Z

These models are fitted for two ambient thermostats in order to provide independent management of two zones at different temperatures.

- Access the electrical components as described in section 10.1.
- Remove the jumper on the electronic board terminals (CN7: A - B) and (CN7: D7 - M) (see wiring diagrams in § 11 and Figure 10).
- Thread 2 two-wire cables through the grommets of the electrical box and connect them to the two terminals using harmonised cables “HAR H05 VV-F” 2 x 0.75 mm² with a maximum diameter of 8 mm.



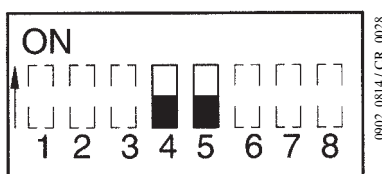
13. CONNECTING THE FLOOR OVERHEATING THERMOSTAT (MODELS RSP, R2Z AND RS2Z)

When connecting the user module to a system operating at low temperature, install an off-the-shelf manually resettable contact thermostat (calibrated to 50°C) in order to protect the floor system from elevated temperatures due to possible faults in the adjustment system. Mount the thermostat on the low temperature delivery line upline from the distribution manifold to the various loops and distant from the user module delivery connector (> 1m).

Caution: Make sure low temperature operation is enabled. Electronic board switches 4 and 5 (climate curve switches) must be OFF.

SWITCH 4 = OFF
SWITCH 5 = OFF

Low climate curve



This selection allows central heating temperature to be adjusted by turning the heating water adjustment potentiometer (**TCH**) on the electronic board. The temperature range is 25 ÷ 40 °C.

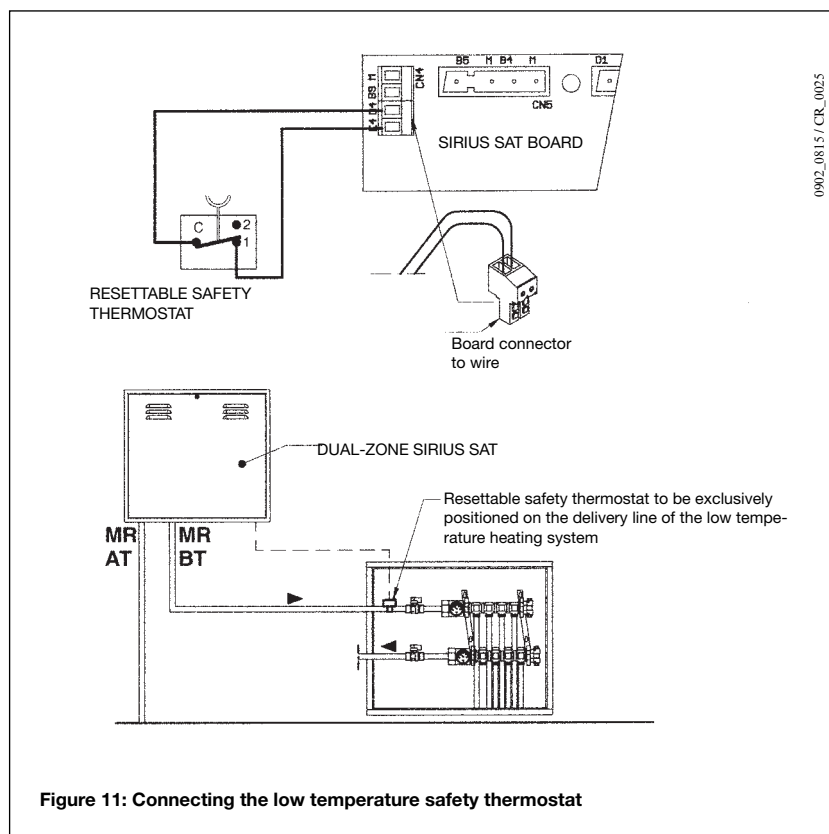
Electrical connection of thermostat

- Access the electrical components as described in section 10.1.
- Remove the jumper on the electronic board terminals (CN4: E4 - D4) (see wiring diagrams in § 11 and Figure 11).
- Thread the two-wire cable from the thermostat terminals through the grommets of the electrical box and connect it to these two terminals (use a harmonised cable "HAR H05VV-F" 2x 0.75 mm² with a maximum diameter of 8 mm).

Safety thermostat tripping

If the safety thermostat trips due to a fault in the adjustment system, the user module stops for safety reasons and the **red LED DL12** shines on the electronic board (see § 22).

After checking the reason for the overheating, restart the system by pressing the safety thermostat reset device and momentarily disconnecting the power supply from the module (this operation is required in order to cancel the block from the board memory: the red LED DL12 flashes).



14. INSTALLING AND CONNECTING THE EXTERNAL PROBE

(accessory available on request for models RS, RSP, R2Z, RS2Z)

The appliance is fitted for connection to an external probe, available on request, which independently adjusts delivery temperature depending on the external temperature and the chosen curve.

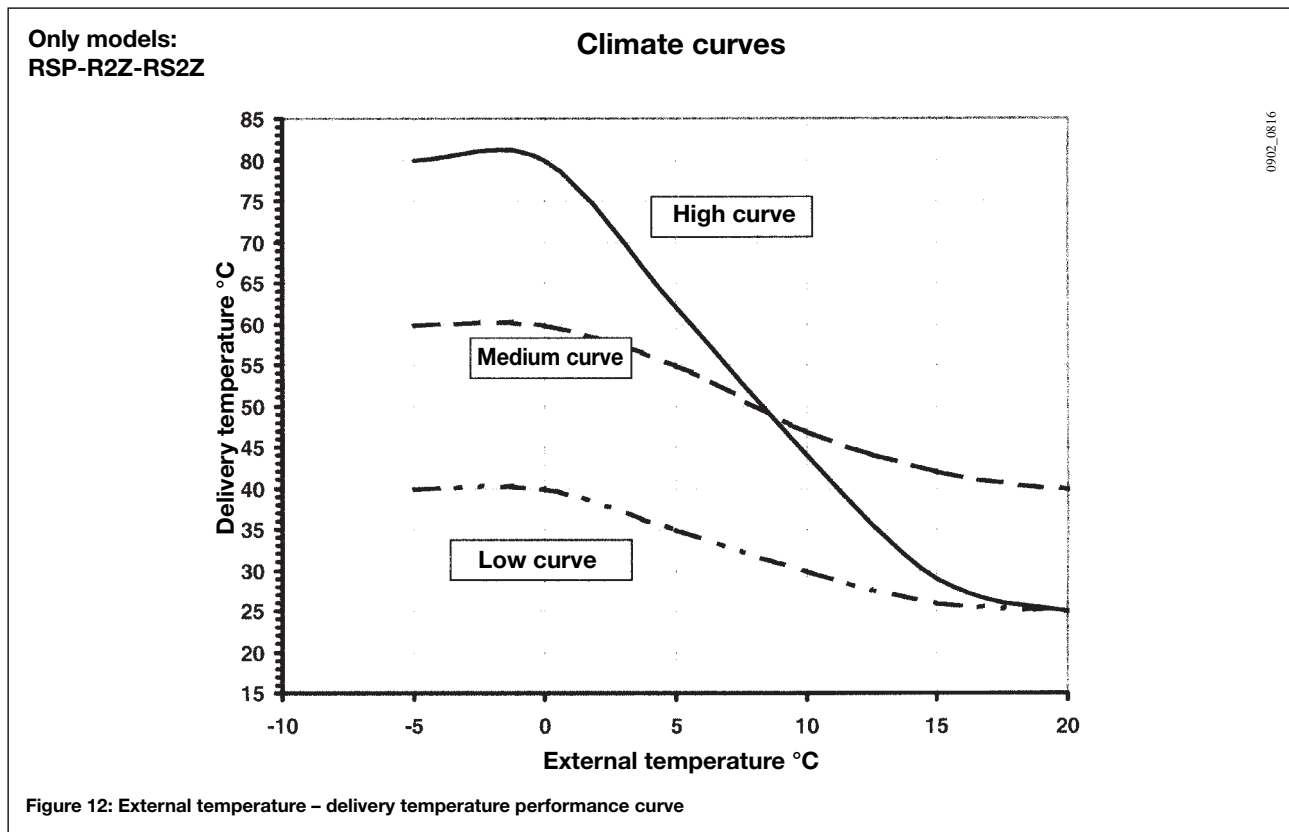
To mount and electrically connect this accessory, see the figure below and the instructions supplied with the external probe.

The external probe must be installed on a wall outside the building as follows:

- Install on a wall facing north-north/east and protected from direct sunlight.
- Do not install on walls affected by humidity and mould.
- Make sure the wall is sufficiently insulated.
- Do not install near fans, steam outlets or chimneys.

Attach to the wall using the two supplied expansion grips, following the technical instructions supplied with the accessory. Make electrical connections to the probe using two wires with a minimum cross-section of 0.5 mm² and a maximum length of 20 m (polarity is unimportant).

Fix one end of the Module-Probe connection cable to the probe terminal block, securing it with the relative sealed grommet, and the other end to the screw connector (CN4: B9 - M) on the electronic board (to access the electrical components see section 10.1). Use a harmonised cable "HAR H05 VV-F" 2 x 0.75 mm² with a maximum diameter of 8 mm.



With the external probe, the **TCH potentiometer** on the electronic board limits maximum heating temperature.

Attention: With the external probe connected, switch 6 on the electronic board must be turned **ON**.

SELECTOR 6 = ON

External probe



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15. CONNECTING THE CLIMATE ADJUSTOR: ECO CRONO

(accessory available on request: models RS – RSP – R2Z – RS2Z)

The **LUNASAT** module can be remote controlled using the **ECO CRONO** climate adjustor.

Connect the ECO CRONO climate adjustor to the ambient thermostat 1 terminals on the electronic board, as described below:

- Access the electrical components as described in section 10.1.
- Remove the jumper on the electronic board terminals (CN7: A - B) (see wiring diagrams in § 11).
- Connect a two-wire cable to the ECO CRONO terminals (J4:OT). Use a harmonised cable "HAR H05 VV-F" 2 x 0.75 mm² with a maximum diameter of 8 mm.
- Introduce the two-wire cable through the grommets of the electrical box and connect it to the electronic board terminals (CN7: A-B). Also consult the manual supplied with the ECO CRONO.

With this device connected, the **GREEN LED DL2** on the electronic board flashes at 5s intervals.

The instructions supplied with the ECO CRONO climate adjustor also include the information required to:

- programme user-settable parameters;
- programme fitter-settable parameters;
- install the device.

16. ELECTRONIC BOARD ADJUSTMENT

(models RS – RSP – R2Z – RS2Z)

Caution: only make adjustments to the electronic board after disconnecting the power supply (see §10: access to live components)

These adjustment can be made on electronically controlled models (apart from model RS):

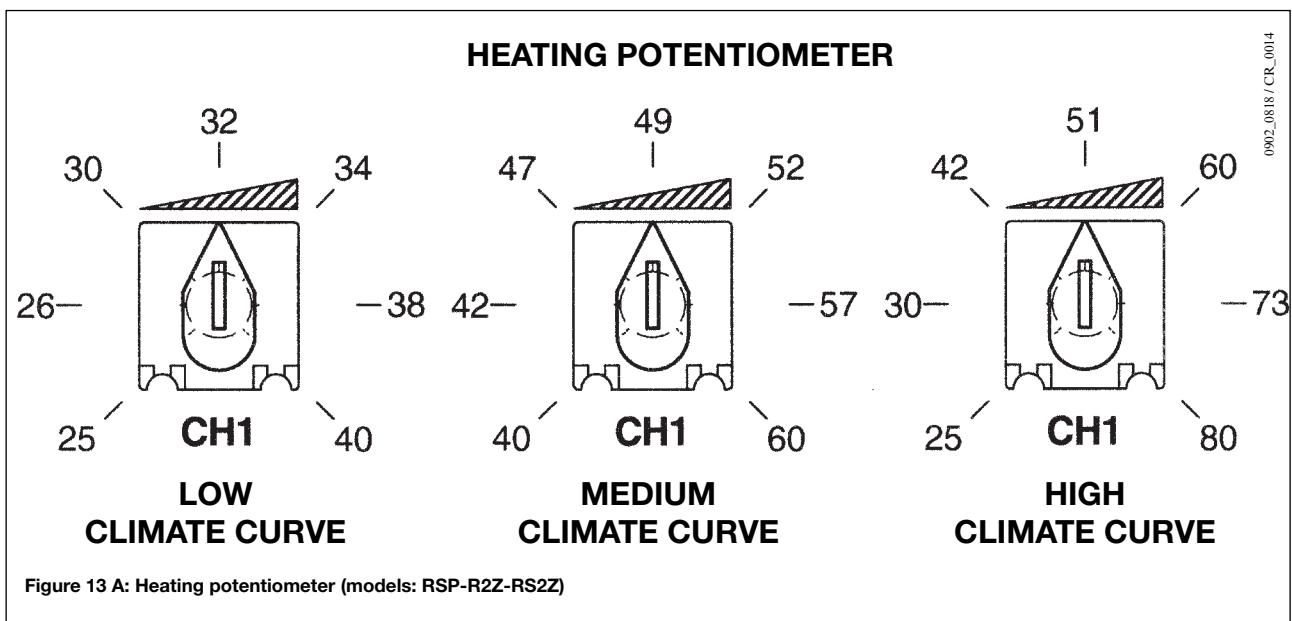
TR = Heating temperature adjustment potentiometer (CH1)

Adjusts the heating delivery temperature according to the set climate curve.

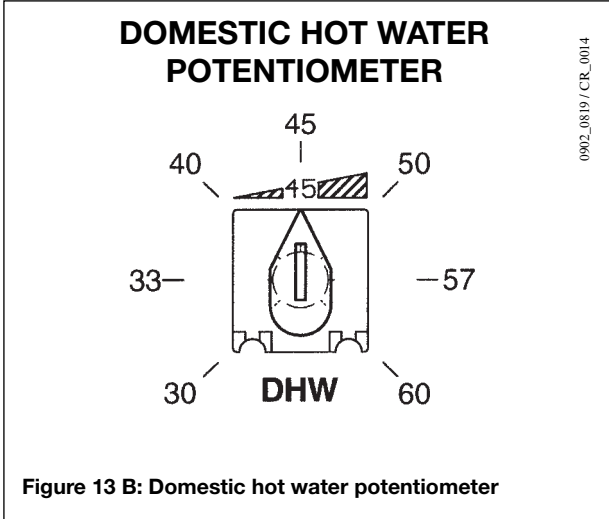
TR temperature range TR: 25 ÷ 80°C (see climate curve selection table)

With the external probe, this device acts as a maximum temperature limiting device

For dual-zone models (**R2Z – RS2Z**), heating temperature adjustment only applies to the mixed zone. The other zone works directly with the temperature of the inlet water from the centralised system.



TS = Domestic hot water (DHW) adjustment potentiometer
 Adjusts domestic hot water temperature.
TS temperature range: 30 ÷ 60°C
 Factory setting 45°C

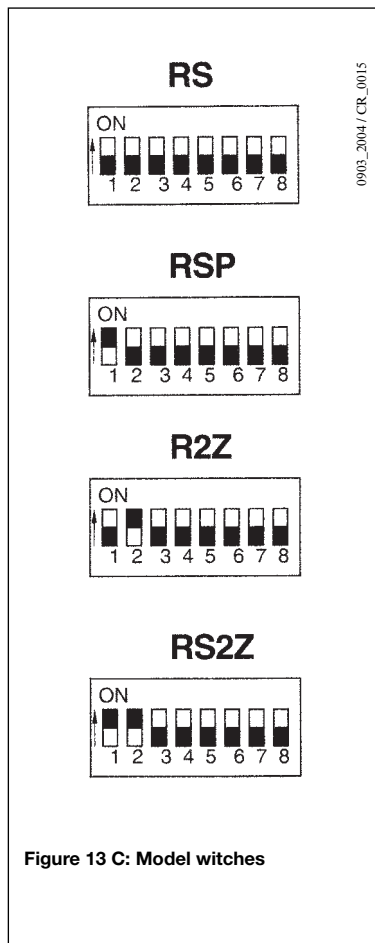


SELECTORS 1 – 2 – 3 : USER MODULE CONFIGURATIONS

Model selection table

MODEL	Switch 1	Switch 2	Switch 3
RS	OFF	OFF	OFF
RSP	ON	OFF	OFF
R2Z	OFF	ON	OFF
RS2Z	ON	ON	OFF

Make sure the switches are in the correct position for the model



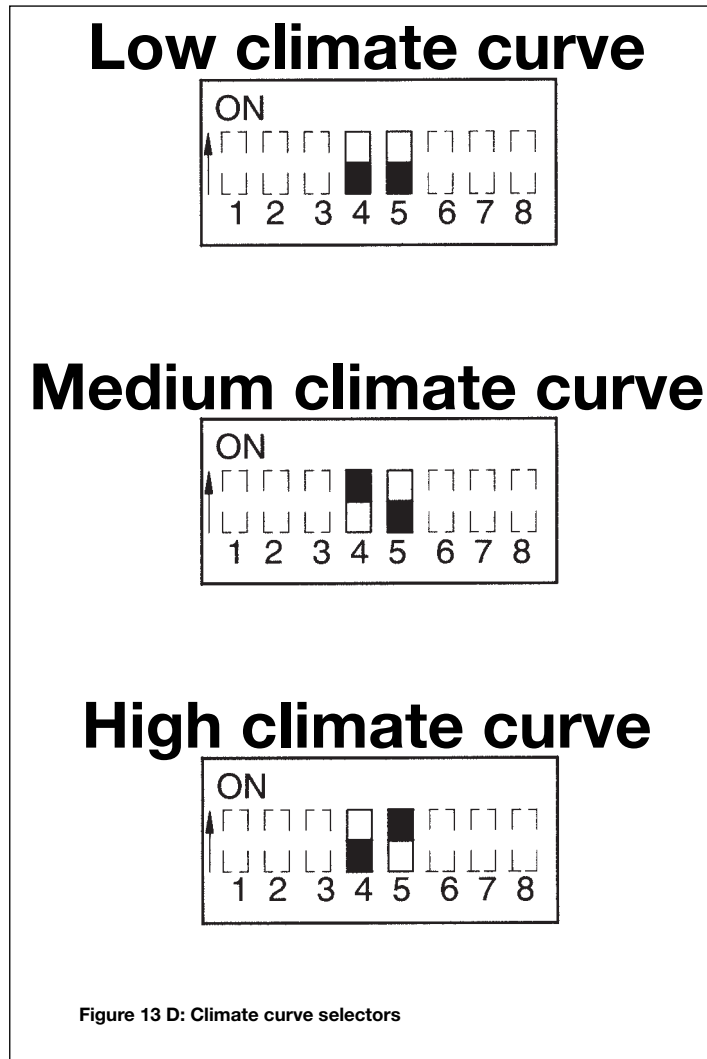
SWITCHES 4 – 5 : CLIMATE CURVE SELECTION (only for models RSP-R2Z-RS2Z))

Climate curve selection table

CLIMATE CURVE	Switch 4	Switch 5	Temperature range
LOW	OFF	OFF	25 ÷ 40 °C
MEDIUM	ON	OFF	50 ÷ 60 °C
HIGH (*)	OFF	ON	25 ÷ 80 °C

(*) factory setting

The high curve should be selected for heating elements at high temperatures: radiators
The medium curve should be selected for heating elements fitted with fans: fan coil units
The low curve should be selected for heating elements at low temperatures: underfloor or similar systems.



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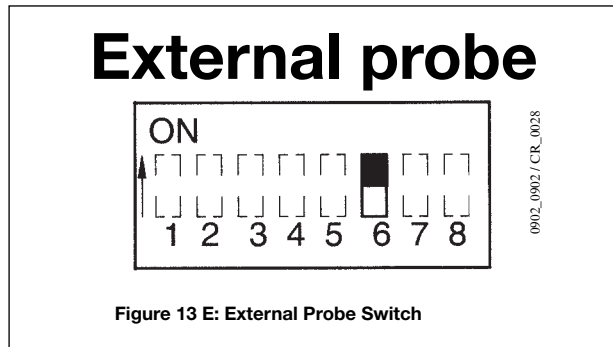
For dual-zone models (**R2Z – RS2Z**), the choice of the climate curve only applies to the mixed zone. The other zone works directly with the temperature of the inlet water from the centralised system.

SWITCH 6: EXTERNAL PROBE ENABLE (only for models RSP-R2Z-RS2Z)

External probe enable table

EXTERNAL PROBE	Switch 6
WITH PROBE	ON
WITHOUT PROBE (*)	OFF

(*) factory setting

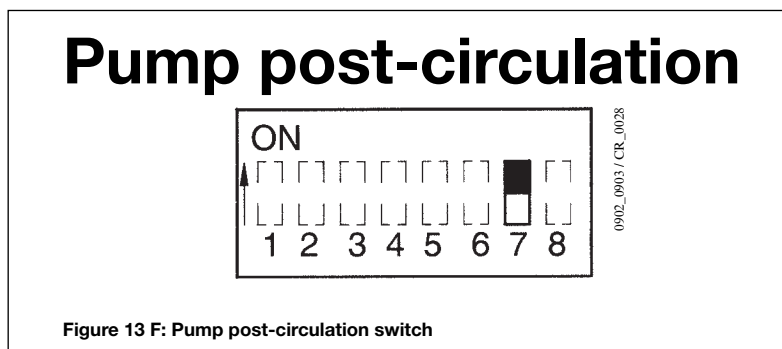


SELECTOR 7 : PUMP POST-CIRCULATION TIME

Pump post-circulation time selection table

EXTERNAL PROBE	Switch 7
WITH PROBE	ON
WITHOUT PROBE (*)	OFF

(*) factory setting



INSTALLATION INSTRUCTIONS: HEAT METERING

17. HEAT METERING

The modules are supplied standard with a SIEMENS MEGATRON electronic heat meter.

This device measures heat consumption in the zone controlled by the user module.

The electronic unit features an 8-digit LCD display. The 3 Vdc input voltage is provided by a lithium battery (lifetime 8 years). A button for querying the appliance is located on the front of the display.

The appliance can be turned by 360° and inclined by 90°.

The appliance display has two levels with which the following information can be shown:

- Total power consumed since the last reading date.
- Segment test
- Current consumption
- Current flow rate
- Current delivery temperature
- Current return temperature
- Current T Delta between the two temperatures
- Operating hours since initial start-up
- Last reading date
- Last year's power consumption.
- Check code
- Total power consumption since installation
- Fault signals (consult the following section)

The units of measurement are °C or K, kWh, m³/h, kW, and hours.

The display shows total heating consumption by default.

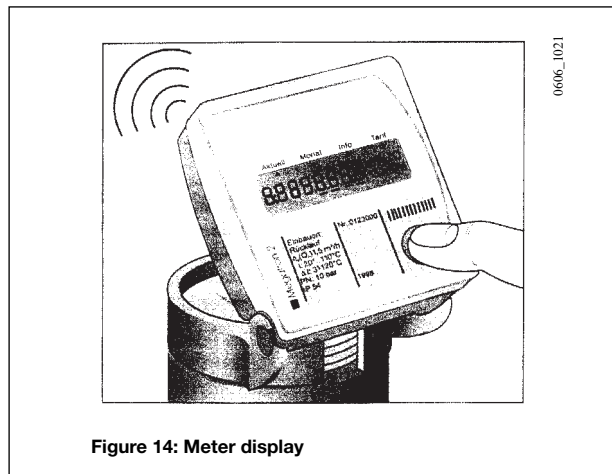
Fault signals

The appliance automatically carries out diagnostic controls and displays the faults it finds. It divides the faults into two categories.

Temporary faults that do not cause operating problems. In this case, the display flashes for 32 seconds and then resumes normal operation;

Major faults that stop the appliance. In this case, the display alternatively indicates the fault code and the date on which it appeared for the first time. The flows metered up until that moment, remain memorised.

For further information, see the supplied **SIEMENS** instructions supplied with the meter.



Metering data can also be transmitted via radio to a remote reception device (Radio system expansion).

18. AUTOMATIC MEASUREMENT SYSTEM VIA RADIO

This system allows all the consumption data of the building to be handled from a single station, thus reducing measurement times whilst protecting user privacy. Transmission frequency is the 868 MHz established by the national radio transmission plan (European standard). The duration and power of the radio signal are irrelevant and are in no way connected with problems of “electro smog”.

The heat meters of the various user modules transmit consumption via a radio signal and the relative floor aerials (WTT16) which receive and save the data. Consumption can be read by connecting a Personal computer to any of the floor aerials via radio or making a cable connection to an aerial with a serial output or using a remote modem (GSM).

- Local reading via cable from the WTT16.232 aerial with RS232 interface:
via PC (with ACS26 data reading software) connected with a serial cable (figure 15b case 1).
- Local reading via radio of the WTT16 floor aerials:
via PC (with ACS26 data reading software) connected to the WTZ.RM radio module (figure 15b case 2).
- Remote reading via GSM from the WTX16.GSM Gateway aerial:
Via PC (with ACS26 reading software and GSM modem + phone card) (figure 15b case 3).

In certain cases, the following accessory components must be used:

- **WTT16 FLOOR AERIAL**
- **WTT16.232 AERIAL WITH SERIAL OUTPUT (local reading via PC)**
- **WTX16.GSM GATEWAY AERIAL (telephone reading via PC)**
- **SIEMECA WTZ.RM RADIO MODULE FOR PC (radio reading via PC)**
- **ACS26 READING SOFTWARE (for PC)**

During installation, no special start-up procedures are required for radio transmissions as all the system components are automatically configured for signal transmissions. These characteristics guarantee rapid, problem-free start-up and simple system management.

Install the Radio system according to the following parameters:

- Average reception capacity of WTT16 aerials: radius of 25 metres on the floor where they are installed and 15 metres on the floors above and below (install one WTT16 aerial every two floors).
- System capacity: max. 12 WTT16 aerials (or 11 WTT16 aerials + 1 GATEWAY WTX16 aerial) with max. reception of 500 meters.
- Lifetime of battery-operated WTT16 aerial: at least 6 years plus 1 reserve year during which a “battery low” message is sent
- Lifetime of heat meter: 6 years plus 15 reserve months
- The WTX16.GSM Gateway aerial must be powered at mains voltage.

The floor aerials (WTT16) must be fixed to a wall of the stairwell, at a height that prevents tampering, using the supplied expansion grip. The Gateway aerial (WTX16.GSM) must be installed in the entrance area of the metered building (this component requires mains voltage input).

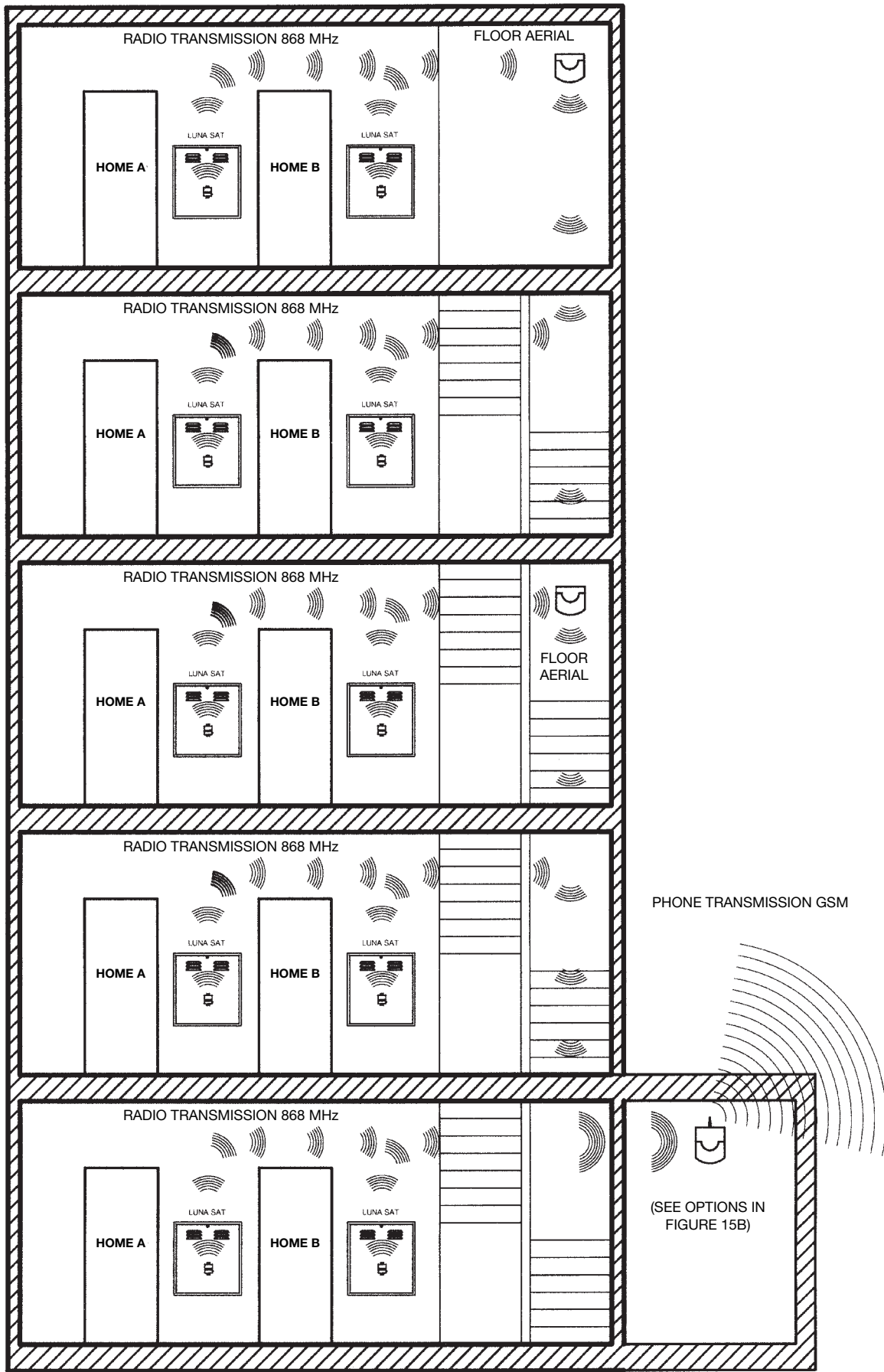
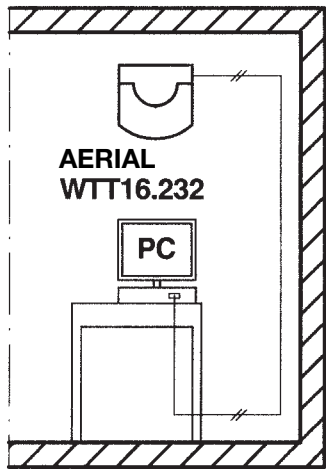
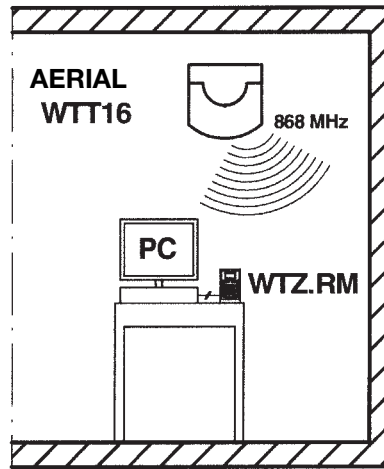


Figure 15 A: Automatic measurement system via radio

1) LOCAL TRANSMISSION VIA "SERIAL"



2) LOCAL TRANSMISSION VIA "RADIO"



3) TRANSMISSION VIA "GSM"

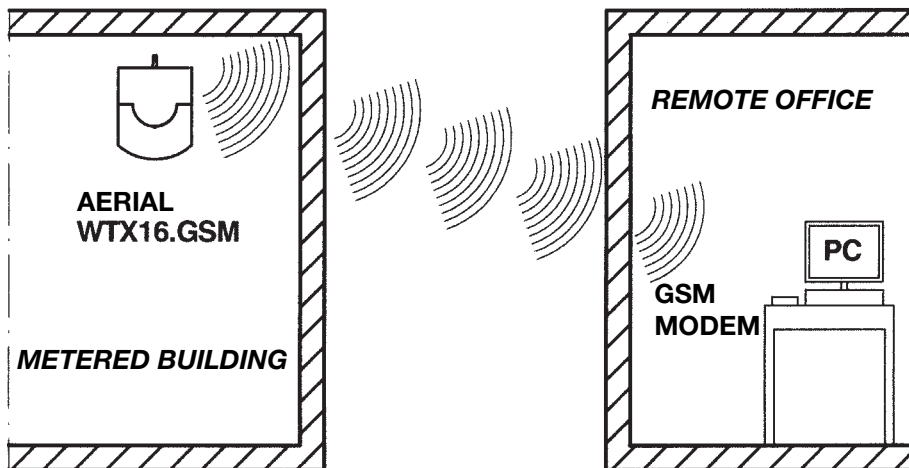


Figure 15 B: Reading options

18.1 START-UP

Start-up of the radio system comprises several steps:

- Set the WTT16 aerials to the start-up mode (press the red MODE button on each WTT16 aerial).
- At this point, the WTT16 aerials configure themselves and automatically create a virtual communication network.
- Set the heat meter to the start-up mode by pressing the button on the front. After setting the mode, all the meters send a start-up signal to the WTT16 aerials.
- After receiving all the meters in the field, to complete system start-up, set the aerials to the standard mode (press the blue button on each WTT16 aerial).

18.2 OPERATING PROCEDURE

During automatic system operation, the WTT16 aerials and the GATEWAY WTX16.GSM aerial exchange the consumption data of the meters on a daily basis in order to allow each single aerial to store the data of the entire building. The data of the entire building can be manually updated without having to wait for the daily exchange routine.

18.3 DATA FORMAT

Consumption data is coded in XML format or in ASCII code to that it can be processed by any editor (Notepad, Excel, etc.).

For further information, read the manuals of the individual components.

START-UP AND OPERATING INSTRUCTIONS

19. FILLING THE SYSTEM

Before starting the user module, open the on/off valves on the hydraulic connectors and check the system filling pressure in the boiler room and distribution columns (< 3 bar).

The centralised plant must have an automatic filling device.

20. AIR VENT AND PUMP RESET

20.1 AIR VENT

In the first plant filling operation, vent any air in the system, including the user module. The appliance is fitted with an automatic air vent valve.

20.2 PUMP RESET (MODELS: RP/1 – RSP - R2Z – RS2Z)

The user module is fitted with a pump reset device (not present in model **RP/1**) which, if no heat demand (heating and/or domestic water) is received for 24 consecutive hours, automatically runs the pump for one minute. This function is operative if the system is powered.

If, however, the pump/s need/s to be reset after a period of inactivity or during initial starting, simply remove the cap screwed onto the shaft, insert a screwdriver and turn the rotor a few times in order to reset it and allow it to start. Collect the water flowing from the pump shaft.

21. OPERATING PROCEDURE

21.1 STARTING

To start the appliance correctly, proceed as follows:

- Power the module.
- Check that the system is full and at the right pressure (see § 19) and temperature ($65 \div 75^{\circ}\text{C}$).
- For models with electronic board, check that the electronic board switches are in the correct position (see § 16).
- Press the luminous switch on the cover of the electrical box.
- Adjust the ambient thermostat (or the climate adjustor) to the required temperature.

Following a heat demand from the ambient thermostat, the water from the centralised system begins to circulate in the heating elements of the zone controlled by the user module.

For dual-zone models (**R2Z – RS2Z**) the heating bands of two zones can be managed separately by the relative ambient thermostats (or with the **ECO CRONO** climate adjustor).

For models **RS – RSP – RS2Z** (with plate exchanger), when a domestic hot water tap is opened, the user module heats the water at the temperature set by the relative **DHW potentiometer. TS temperature range: $30 \div 60^{\circ}\text{C}$** (see § 16).

Different adjustments of domestic hot water temperature can be made directly using the **ECO CRONO** climate adjuster.

21.2 PARTIAL SHUT-DOWN

Adjust the ambient thermostat / heating programmer / ECO CRONO climate adjuster to disable the heating function (lower the set ambient temperature or disable heating). The domestic hot water function (models **RS – RSP – RS2Z**) and the frost protection device (only for **RS – RSP – RS2Z**) remain active).

21.2 TOTAL SHUT-DOWN

Disconnect the appliance from the power supply by turning the luminous switch and the two-pole switch.

22. ELECTRONIC BOARD SIGNALS (MODELS RS – RSP – R2Z – RS2Z)

The models with electronic board display the operating status and any system blocks via the board LED's.

Key to LED's:

LED	COLOUR	LED STATUS	OPERATING STATUS
DL1	RED	OFF	NO ALARMS
DL1	RED	1 FLASH EVERY 3 SECONDS	EXTERNAL PROBE FAULTY
DL1	RED	2 FLASHES EVERY 1 SECOND	DOMESTIC HOT WATER PROBE FAULTY
DL1	RED	3 FLASHES EVERY 1 SECOND	HEATING PROBE FAULTY
DL1	RED	ON	ON/OFF VALVE CLOSED
DL2	GREEN	OFF	NO POWER
DL2	GREEN	ON	ZONE I HEAT DEMAND (MIXED)
DL2	GREEN	1 FLASH EVERY 0.5 SECONDS	POWER ON (NON-OPENTHERM AMBIENT THERMOSTAT)
DL2	GREEN	1 FLASH EVERY 0.5 SECONDS	POWER ON (OPENTHERM: QAA73 AMBIENT THERMOSTAT)
DL3	GREEN	ON	ZONE II PUMP FEED (HIGH TEMPERATURE)
DL4	GREEN	ON	ZONE 1 PUMP FEED (MIXED)
DL5	GREEN	ON	ON/OFF VALVE SERVOMOTOR POWER INPUT
DL6	GREEN	ON	DOMESTIC HOT WATER CIRCULATION PUMP (NON-OPERATIVE)
DL7	GREEN	ON	ZONE II VALVE OPEN
DL8	GREEN	ON	DOMESTIC HOT WATER THREE-WAY VALVE
DL9	GREEN	ON	HEATING THREE-WAY VALVE
DL10	GREEN	ON	DOMESTIC HOT WATER DEMAND
DL11	GREEN	ON	ON/OFF VALVE OPEN (AT TRAVEL STOP)
DL12	RED	ON	SAFETY THERMOSTAT TRIPPED (*)
DL12	RED	FLASHING	AFTER SAFETY THERMOSTAT RESET (*)
DL13	GREEN	ON	ZONE II HEAT DEMAND

(*) Safety thermostat tripping

If the safety thermostat trips due to a fault in the adjustment system, the user module stops for safety reasons and the red **LED DL12** shines on the electronic board.

After checking the reason for the overheating, restart the system by pressing the safety thermostat reset device and momentarily disconnecting the power supply from the module (this operation is required in order to cancel the block from the board memory: the red **LED DL12** flashes). In case this device trips repeatedly, contact the technical assistance service.

Safety thermostat tripping

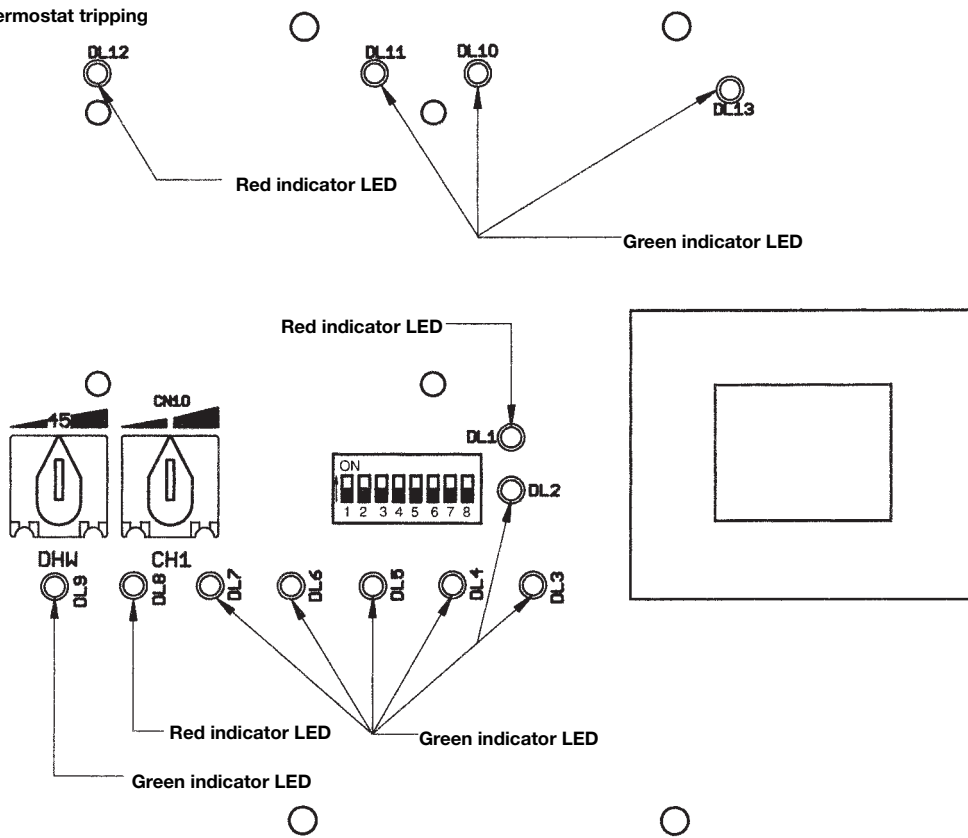


Figure 16: Electronic board signals

MAINTENANCE INSTRUCTIONS

For regular and cost-effective operation of the user modules, they must be periodically checked and overhauled approximately once every two years.

23. DISMOUNTING/ CLEANING THE DOMESTIC HOT WATER EXCHANGER

(only for models RS – RSP – RS2Z)

The stainless steel domestic hot water plate-type heat exchanger can be easily disassembled with a screwdriver as described below:

- Close all the on/off taps on the hydraulic connectors of the module;
- Empty the heating circuit with the relative drain tap;
- Empty the water in the domestic hot water circuit by opening a hot water tap;
- Remove the by-pass pipe by releasing the fixing springs;
- Remove the two front screws securing the water-water heat exchanger and pull it out.

To clean the exchanger and/or DHW circuit, use Cillit FFW-AL or Benckiser HF-AL. Remove the scale from the seat and relative NTC sensor fitted on the DHW circuit.

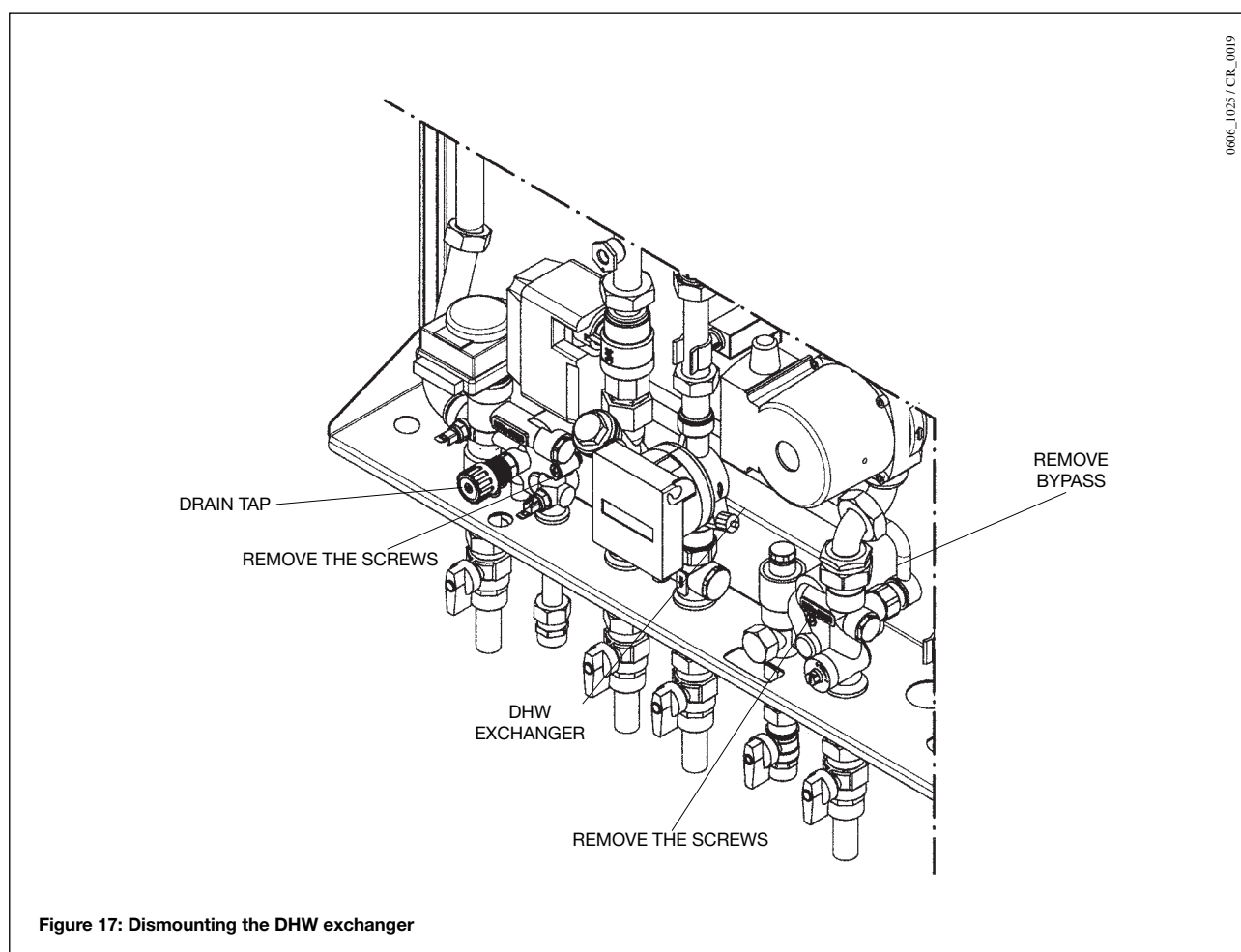
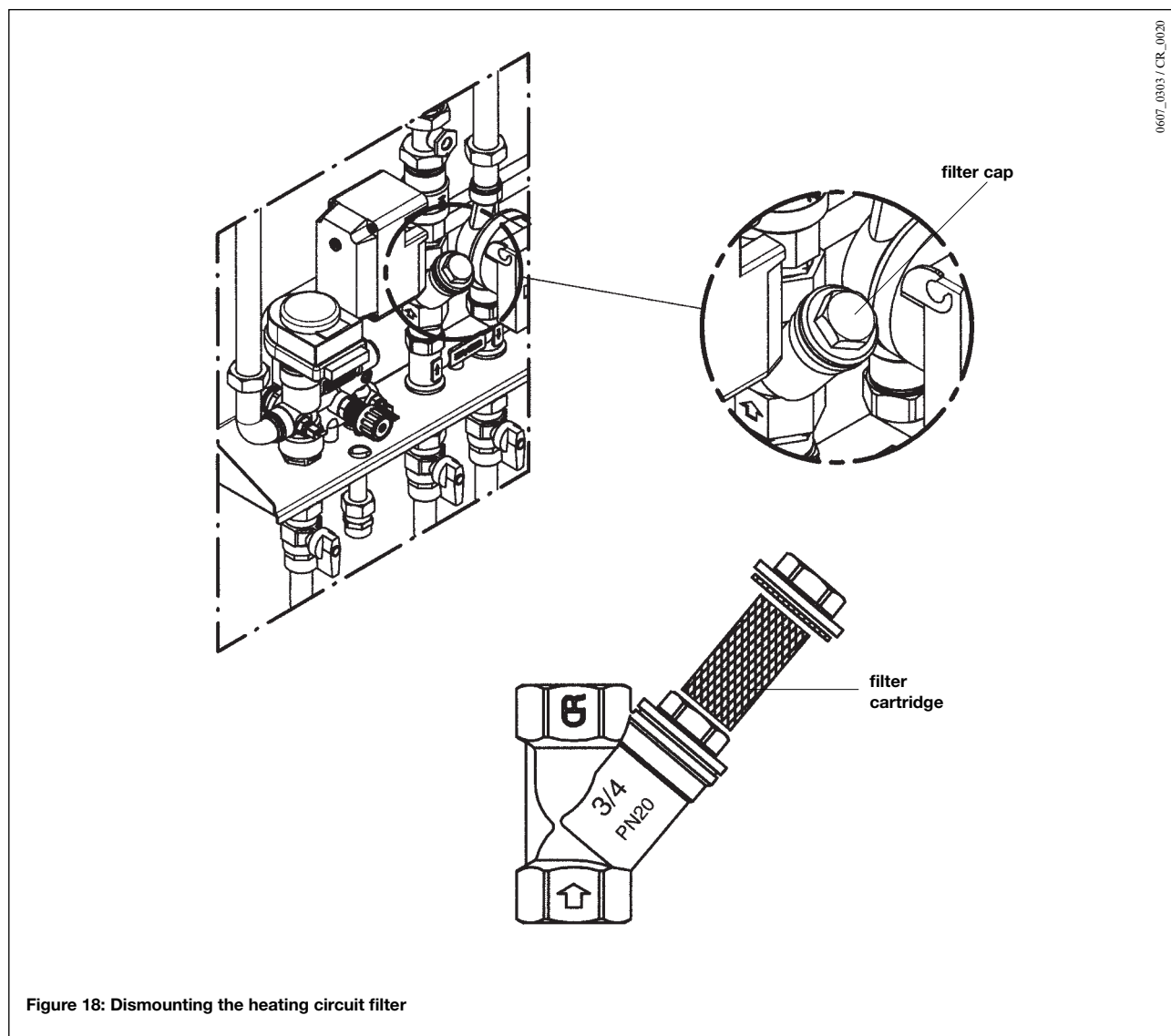


Figure 17: Dismounting the DHW exchanger

24. CLEANING THE HEATING INLET FILTER

These appliances are fitted with a heating water filter on the water inlet line coming from the centralised plant. To clean, proceed as follows:

- Close all the on/off taps on the hydraulic connectors of the module;
- Empty the heating circuit (**using the relative drain tap for models RS – RSP – R2Z – RS2Z**);
- Unscrew the cap at the top of the filter, remove the internal cylinder cartridge and eliminate any impurities.

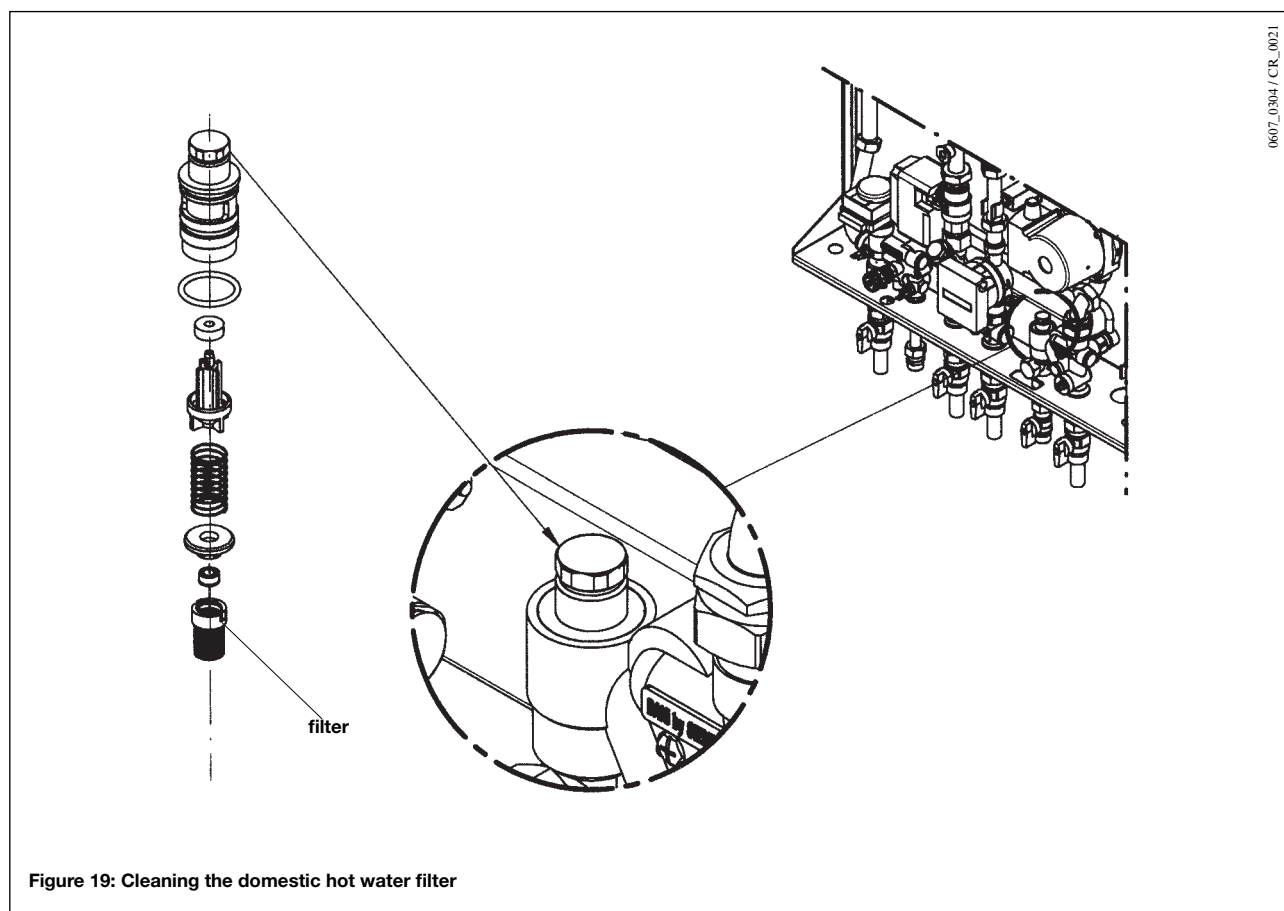


25. CLEANING THE COLD WATER FILTER (only for models RS – RSP – RS2Z)

The module is fitted with a cold water filter on the hydraulic assembly.
To clean, proceed as follows:

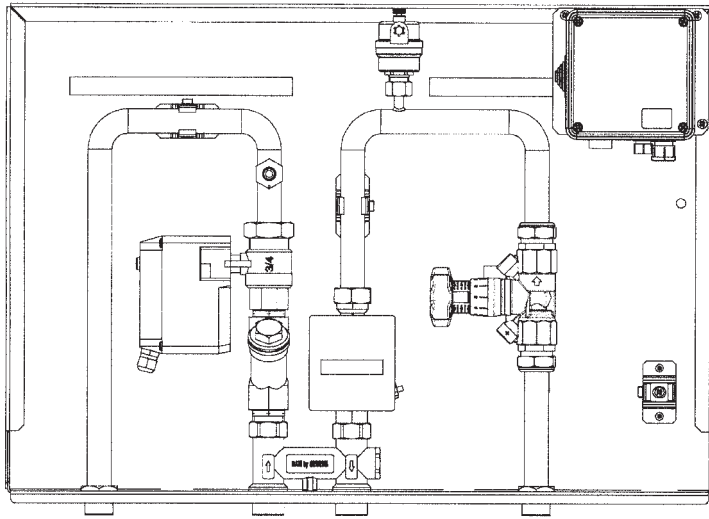
- Drain the domestic hot water system.
- Unscrew the nut on the flow sensor assembly (figure 19).
- Pull out the flow sensor and its filter.
- Remove any impurities.

IMPORTANT: when replacing and/or cleaning the O-rings on the hydraulic assembly, only use Molykote 111 as a lubricant, not oil or grease.



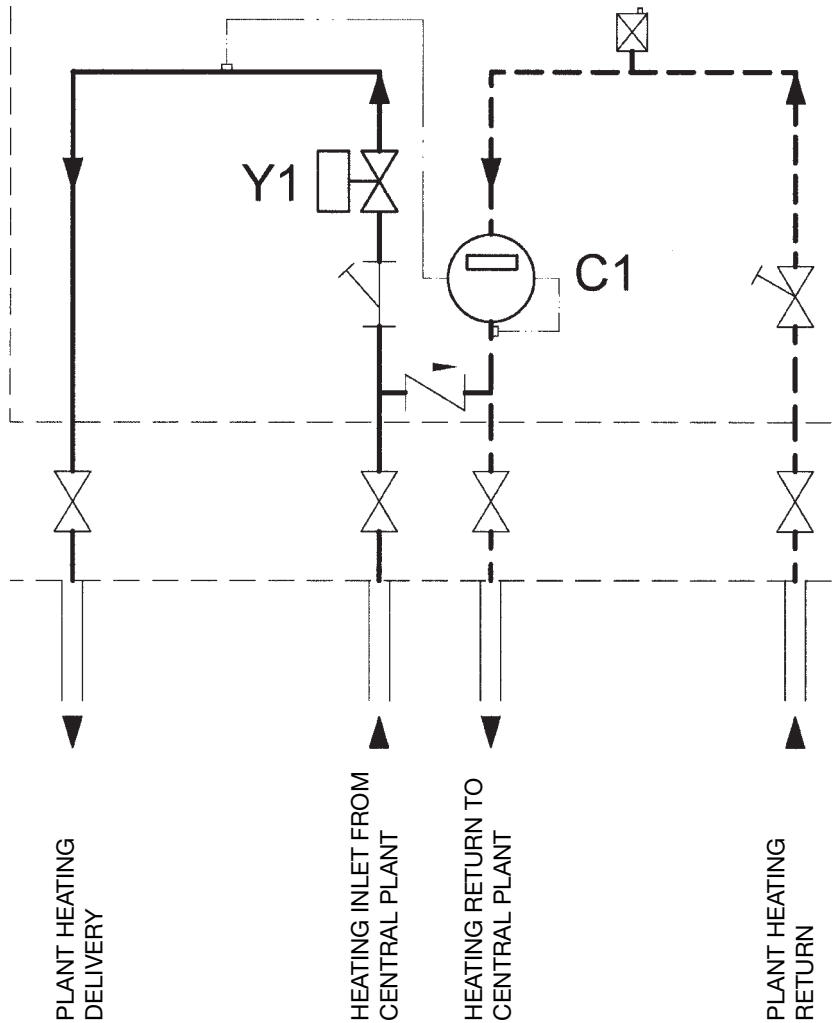
26. FUNCTIONAL CIRCUIT DIAGRAM

26.1 MODEL R/1



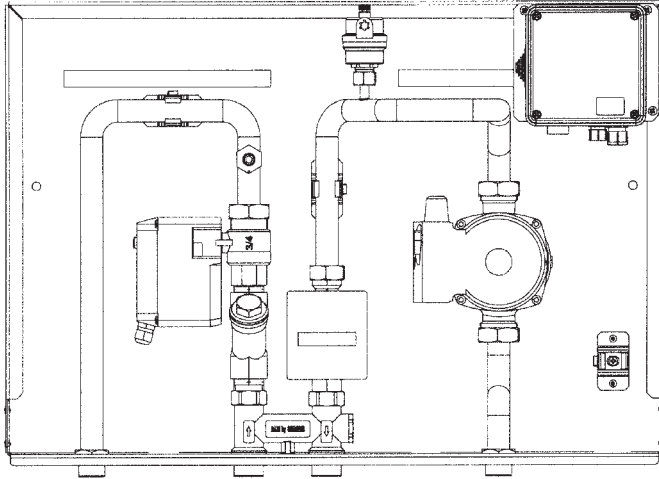
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LUNA SAT R/1

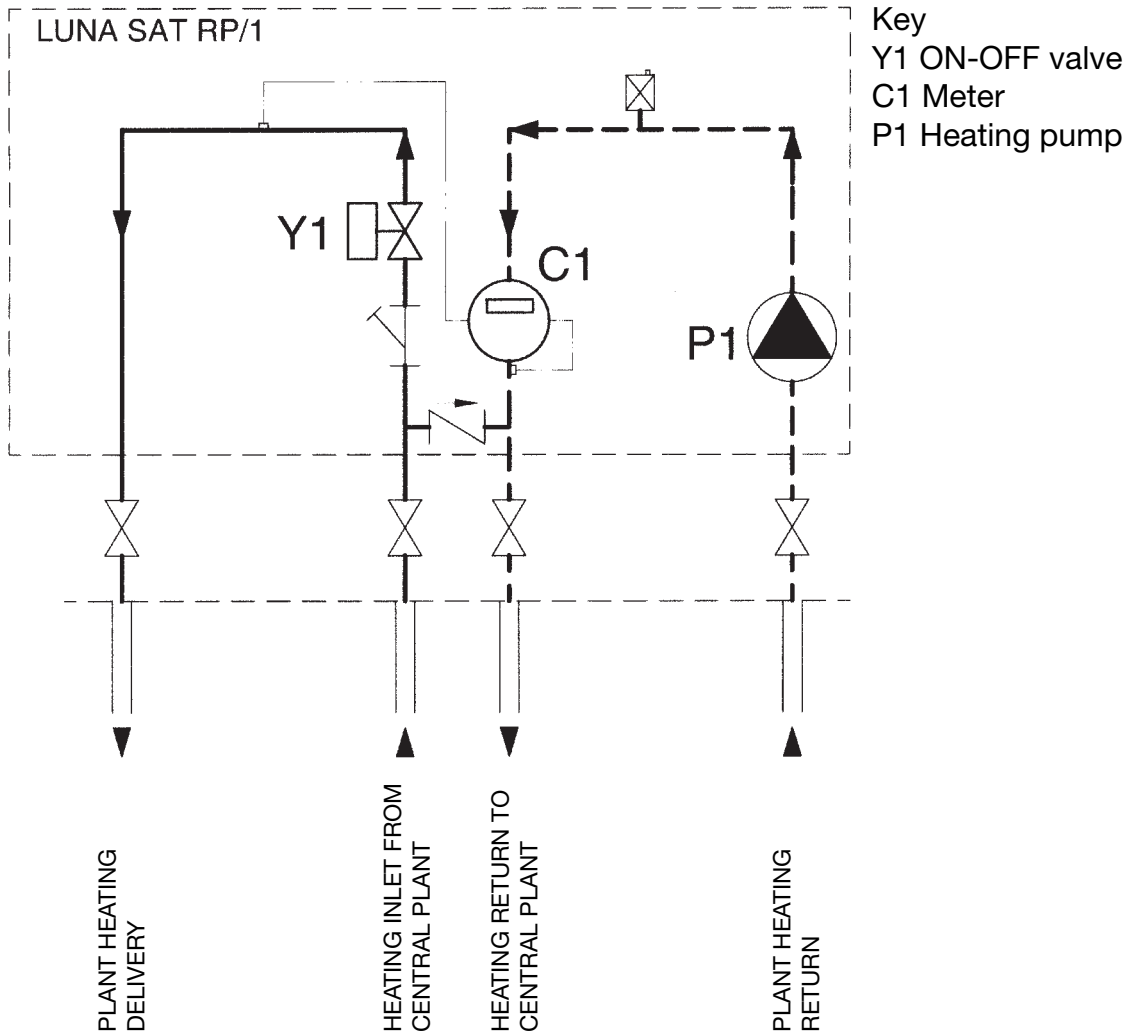


Key
Y1 ON-OFF valve
C1 Meter

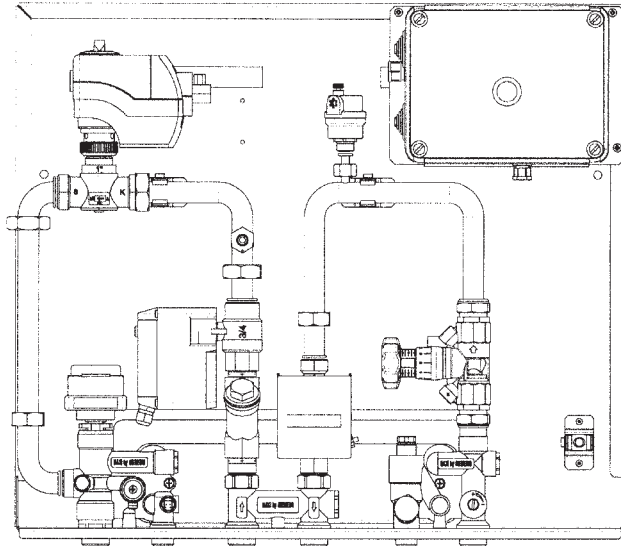
26.2 MODEL RP/1



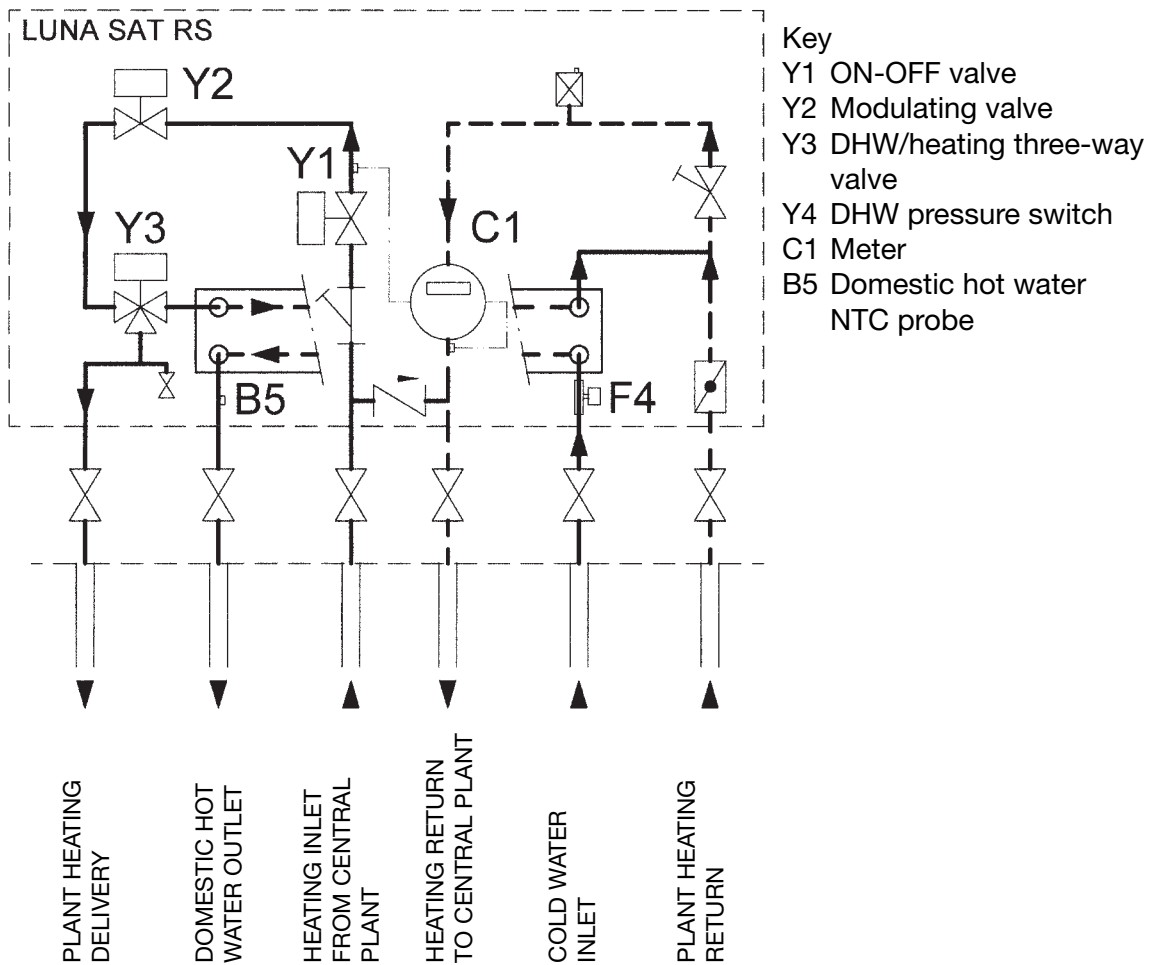
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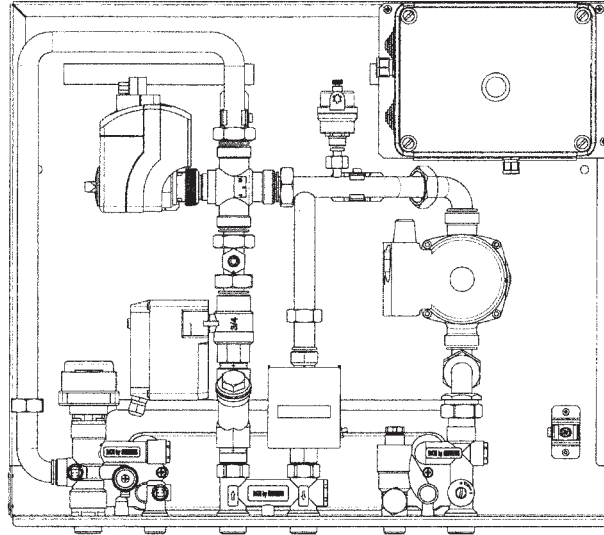
26.3 MODEL RS



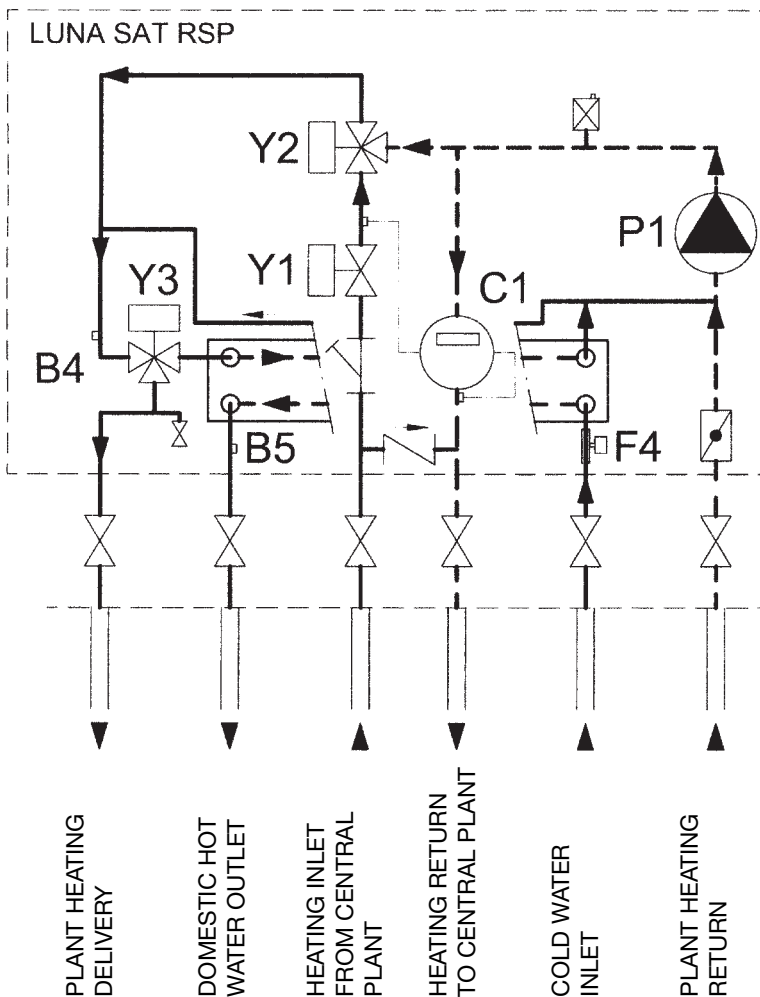
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26.4 MODEL RSP

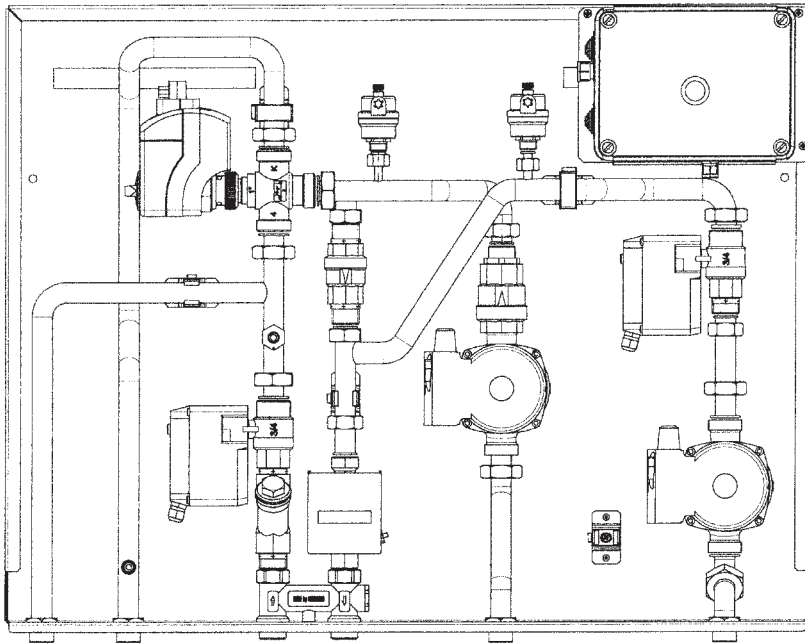


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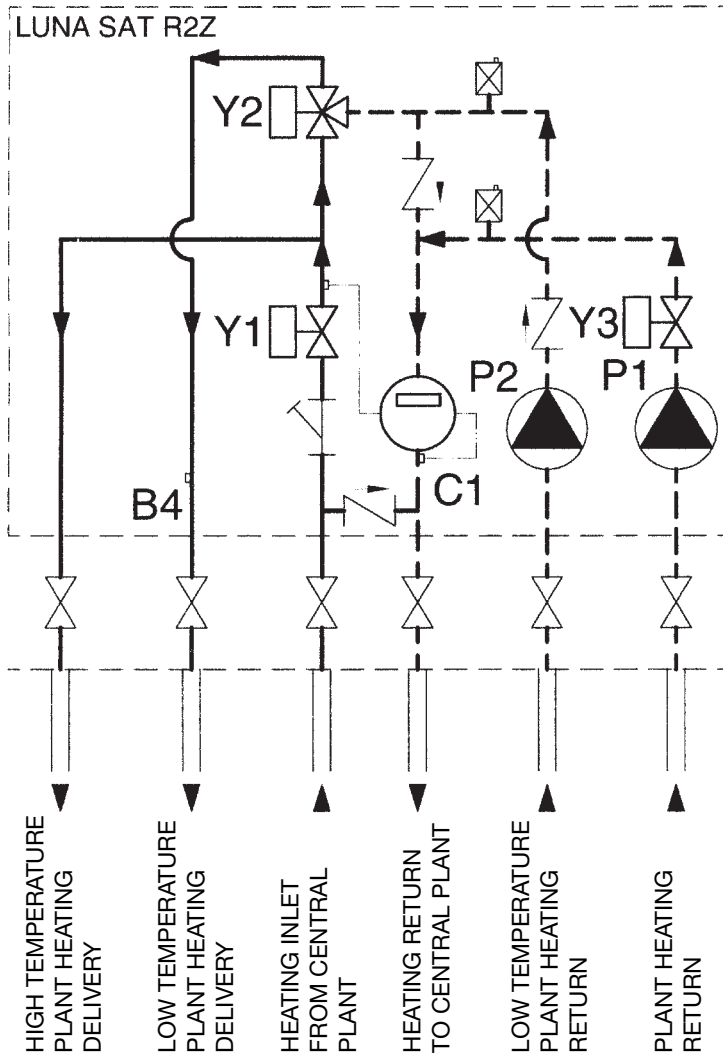


- Key
- Y1 ON-OFF valve
 - Y2 Mixing valve
 - Y3 DHW/heating three-way valve
 - P1 Heating-DHW pump
 - C1 Meter
 - B4 Heating NTC sensor
 - B5 Domestic hot water NTC probe
 - F4 DHW pressure switch

26.5 MODEL R2Z

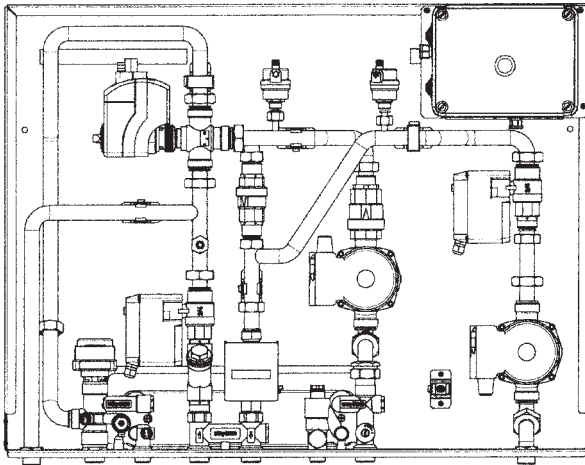


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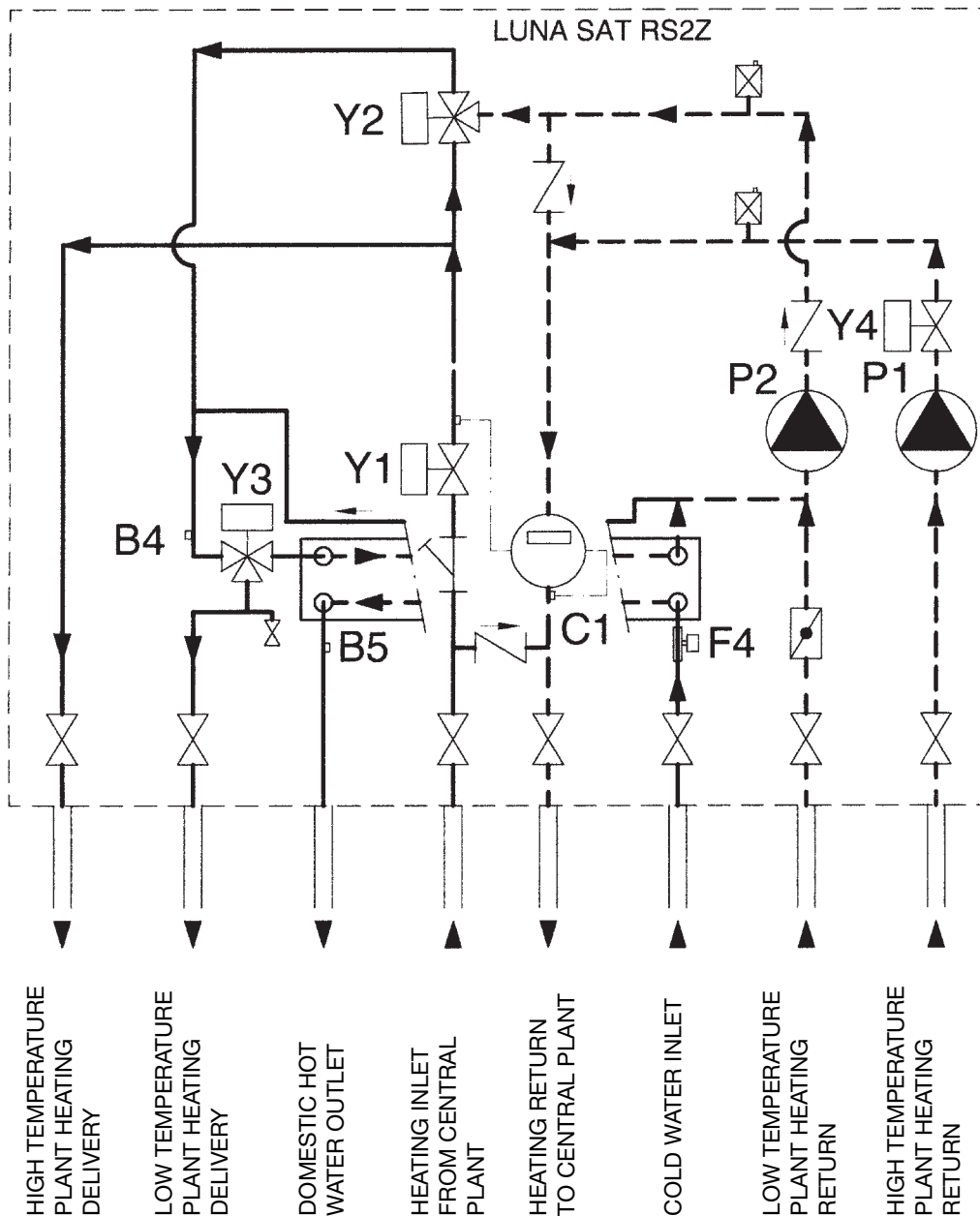
- Key**
- Y1 ON-OFF valve Y2 Mixing valve l.v. Y3 ON-OFF valve
 - B4 Heating NTC sensor
 - C1 Meter
 - P1 High temp. circuit pump
 - P2 Low temp. circuit pump

26.6 MODEL RS2Z



- Key**
- Y1 ON-OFF valve
 - Y2 Mixing valve
 - Y3 DHW/heating three-way valve
 - Y4 ON-OFF valve
 - P1 High temperature heating pump
 - P2 Low temperature heating - DHW pump
 - C1 Meter
 - B4 Heating NTC sensor
 - B5 Domestic hot water NTC probe
 - F4 DHW pressure switch

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27. DISPOSAL

This product has been built with materials that do not pollute the environment. At the end of its lifetime, do not treat it as domestic waste but take it to the nearest appliance recycling plant.

Disposal must be performed according to current environmental waste disposal laws.

28. TECHNICAL DATA

SIRIUS SAT user modules		R/1	RP/1	RS	RSP	R2Z	RS2Z
Production of domestic hot water		-	-	●	●	-	●
Models with pump		-	●	-	●	●	●
Dual-zone models		-	-	-	-	●	●
Heating water temperature adjustment with climate curve high	°C	-	-	25÷80	25÷80	25÷80	25÷80
Adjustment of domestic hot water temperature	°C	-	-	30÷60	30÷60	-	30÷60
Production of domestic hot water with $\Delta T = 35^{\circ}\text{C}$ and Inlet water temperature 75°C	l/min	-	-	14,3	14,3	-	14,3
Maximum pressure in heating circuit	bar	4	4	4	4	4	4
Maximum pressure in domestic hot water circuit	bar	-	-	8	8	-	8
Minimum dynamic pressure in domestic hot water circuit	bar	-	-	0,2	0,2	-	0,2
Water content	l	1,5	2	2	2,5	3,5	4
Input voltage	V	230	230	230	230	230	230
Input frequency	Hz	50	50	50	50	50	50
Rated electrical input	W	15	110	15	110	210	210
Width of casing	mm	600	600	600	600	800	800
Height of casing	mm	650	650	650	650	750	750
Depth of casing	mm	150	150	150	150	150	150
Net weight	kg	11	13	16	18	22	25

PART OF BDR THERMEA



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