



Installation manual

System controller

for modulating gas-absorption condensing heat pump +
renewable aerothermal energy K18



DISPOSAL

The appliance and all its accessories must be disposed of separately in accordance with the regulations in force.



Use of the WEEE symbol (Waste Electrical and Electronic Equipment) indicates that this product cannot be disposed of as household waste. Proper disposal of this product helps to prevent potential negative consequences for the environment and human health.

Revision: B

Code: D-LBR849

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I INTRODUCTION



Installation manual

This Installation manual contains all the information required for installing and configuring the System controller for all K18 Simplygas heat pump units (Gas Absorption Heat Pump) and K18 Hybrigas hybrid units (Gas Absorption Heat Pump and integrated auxiliary boiler module), according to one of the standard system configurations, also described in the document.



Referring to this manual requires familiarity with Robur products and is based on certain information included in the specific product manuals to

which this document refers.

I.1 RECIPIENTS

This Manual is intended for:

- ▶ Electrical installers for proper installation of the control equipment.
- ▶ Installers and authorised Robur Technical Assistance Centres (TAC) for configuration.

I.2 AVAILABLE LANGUAGES

For versions of this Installation manual in other languages, see Robur website.

II SYMBOLS AND DEFINITIONS

II.1 KEY TO SYMBOLS



DANGER



WARNING



NOTE



PROCEDURE



REFERENCE (to other document)

II.2 TERMS AND DEFINITIONS

Siemens RV521.826 = control unit (electronic board).

CSK18 = System controller for K18 installed in the provided enclosure.

Siemens QAA74.611 = advanced room unit.

Siemens QAA55.110 = base room unit.

Appliance / Unit K18 = equivalent terms, both used to refer to K18 Simplygas or K18 Hybrigas unit type.

Auxiliary boiler = equipment (e.g. boiler) for the production of heat for space heating and/or DHW, able to integrate or replace the heat pump of the K18 unit. It is always found in the K18 Hybrigas type of unit and consists of an integrated boiler module, whereas it is optional in K18 Simplygas units, not necessarily supplied by Robur, and connected to the plumbing system outside the unit.

TAC = Technical Assistance Centre authorised by Robur.

DHW = Domestic Hot Water.

III WARNINGS

III.1 GENERAL AND SAFETY WARNINGS



Installer's qualifications

Installation must exclusively be performed by a qualified firm and by skilled personnel, with specific knowledge of electrical systems, in compliance with the laws in force in the Country of installation.



Declaration of conformity

Upon completing installation, the installing firm shall issue to the owner/client the appliance's workmanlike conformity declaration, according to national/local regulations in force and the manufacturer's instructions/provisions.



Misuse

The appliance must only be used for the purposes for which it has been designed. Any other use is deemed hazardous. Incorrect use may affect operation, duration and safety of the appliance. Adhere to the manufacturer's instructions.



Electrocution hazard

- Disconnect the electrical power supply before any operation on appliance components.
- For electrical connections exclusively use compliant components and according to the specifications provided by the manufacturer.
- Ensure the appliance cannot be accidentally switched back on.

**Earthing**

Electrical safety depends on effective earthing system, correctly connected to the appliance and installed according to the regulations in force.

**In the event of failure**

Operations on internal components and repairs may exclusively be carried out by a TAC, using only original spare parts.

- In the event of fault of the appliance, do not attempt to repair and/or restore and immediately contact the TAC.

**Keep the Manual**

This Installation manual must always accompany the appliance and must be handed to the new owner or installer in the event of sale or removal.



The equipment must be installed indoors and out of the weather. For its positioning, refer to the protection rating given in Paragraph 2 p. 9.

III.2 COMPLIANCE

For the appliance's technical and conformity data, refer to Appendix A p. 43.

III.3 EQUIPMENT

The standard equipment for the System controller includes:

1. CSK18 electrical enclosure: contains the Siemens

RVS21.826 electronic board, the relays and electrical terminal blocks.

1. QAA74.611 advanced room unit.

1. Siemens QAC34 outdoor temperature probe.

Optional additional room units are available, of types QAA74.611 (optional code ODSP050) and QAA55.110 (optional code ODSP004).

III.4 EXCLUSIONS OF LIABILITY AND WARRANTY

Any contractual or extra-contractual liability of the manufacturer for any damage caused by incorrect installation and/or improper use and/or failure to comply with regulations and with the manufacturer's directions/instructions shall be disclaimed.



In particular, the warranty on the appliance may be rendered void by the following conditions:

- Incorrect installation/cabling.
- Misuse.
- Failure to comply with the manufacturer's indications on installation, use and maintenance.
- Alteration or modification of the product or any part thereof.
- Extreme operational conditions or however outside of the operational ranges set forth by the manufacturer.
- Abnormal actions transmitted to the appliance by the system or installation (mechanical stresses, pressure, vibrations, thermal expansion, electrical surges...).
- Accidental damages or due to force majeure.

1 GENERAL INFORMATION AND SYSTEM DIAGRAMS

The System controller for the models of the K18 family essentially ensures:

- Controls ambient comfort by controlling the heating circuits or zone valves.
- Manage the domestic hot water (DHW) production, by controlling the components dedicated to charge the DHW buffer tank.
- Manage the heat generation, by controlling a K18 Simplygas or a K18 Hybrigas unit.

All this is possible for certain types of system plumbing diagrams indicated in Figures 1.1 p. 6, 1.2 p. 7 and 1.3 p. 7 with regards to the K18 Simplygas unit and Figures 1.4 p. 8, 1.5 p. 8 and 1.6 p. 9 with regards to the K18 Hybrigas unit.



The System controller for K18 unit is supplied preconfigured to facilitate the installation and startup of the types of system illustrated in Figure 1.1 p. 6, 1.2 p. 7 and 1.3 p. 7, 1.4 p. 8, 1.5 p. 8 and 1.6 p. 9. However, it can also support other configurations. For applications other than those indicated in this manual, Robur provides custom consultancy service.

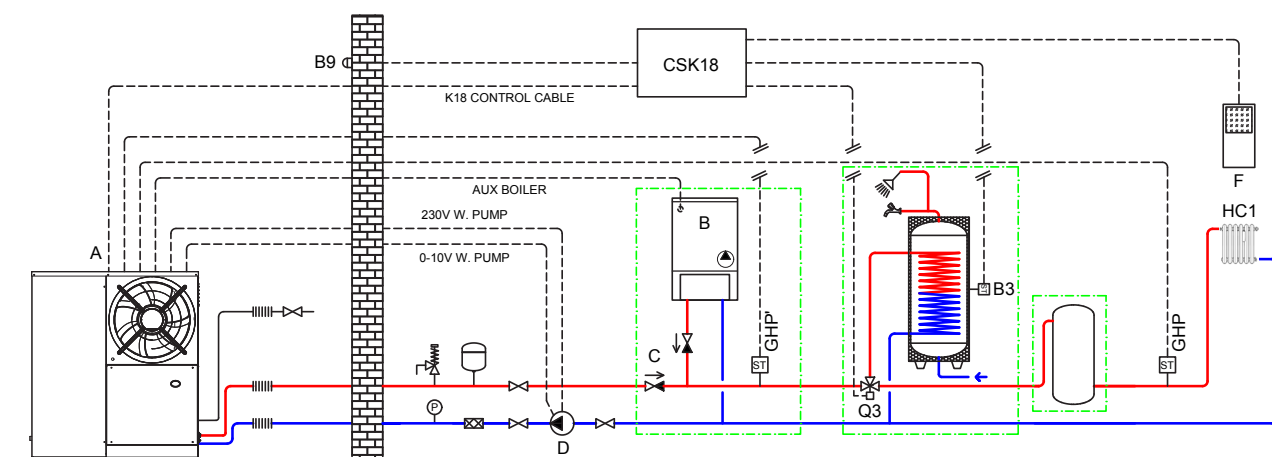


For water circuits with primary circuit only (Figure 1.1 p. 6, 1.2 p. 7, 1.4 p. 8 e 1.5 p. 8) water circulation must be guaranteed to handle the K18 unit's antifreeze cycle. In the diagrams given in Figure 1.2 p. 7 and 1.5 p. 8 this requires that a outlet/inlet bypass is installed, with overpressure valve set to open only when both zone valves are closed. For the diagrams given in Figure 1.1 p. 6 and 1.4 p. 8 it may be sufficient to ensure circulation in one branch of the distribution; for instance, by not installing the valve (thermostatic or manual) on one of the radiators.



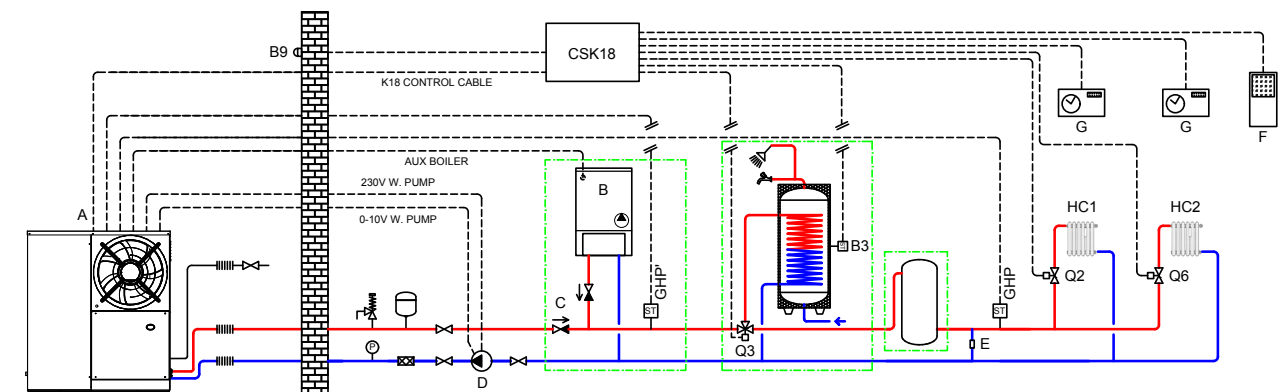
The following diagrams intend to show the hydraulic configurations supported by System controller, including the parts to be connected to it. Ancillary hydraulic components (expansion tanks, safety valves, etc.) are only shown as a guide; for the detailed plumbing layout, refer to the handbook of the K18 range and to the specific installation manual of the K18 unit used.

Figure 1.1 System with K18 Simplygas unit, primary water circuit only and one zone, auxiliary boiler and DHW production optional



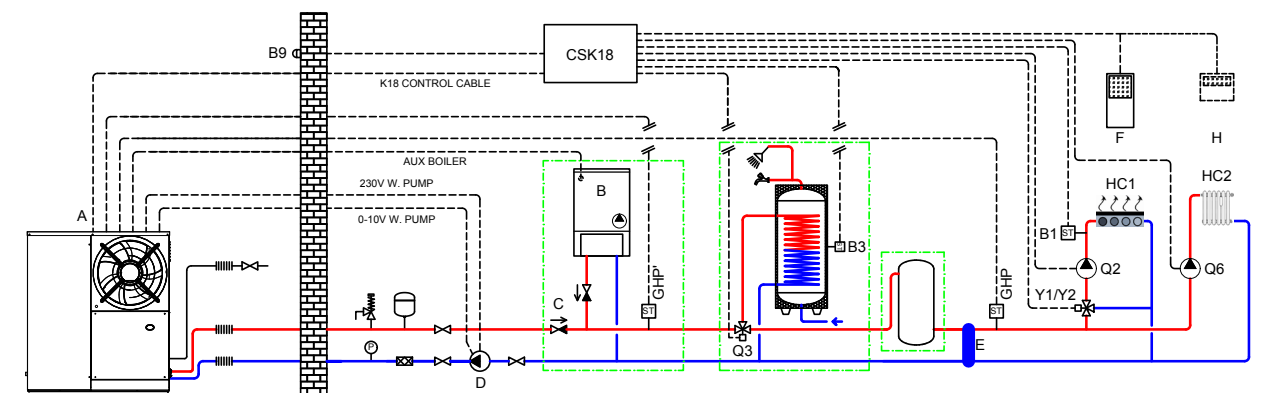
- | | | | |
|---|---|---------|--|
| A | Unit K18 Simplygas | boiler) | |
| B | Auxiliary boiler (optional) | D | External water pump (only for C0 versions) |
| C | check valve (to be installed only in the presence of an auxiliary | E | Room unit 1 (QAA74.611) |

Figure 1.2 System with K18 Simplygas unit, primary water circuit only and two zones, auxiliary boiler and DHW production optional



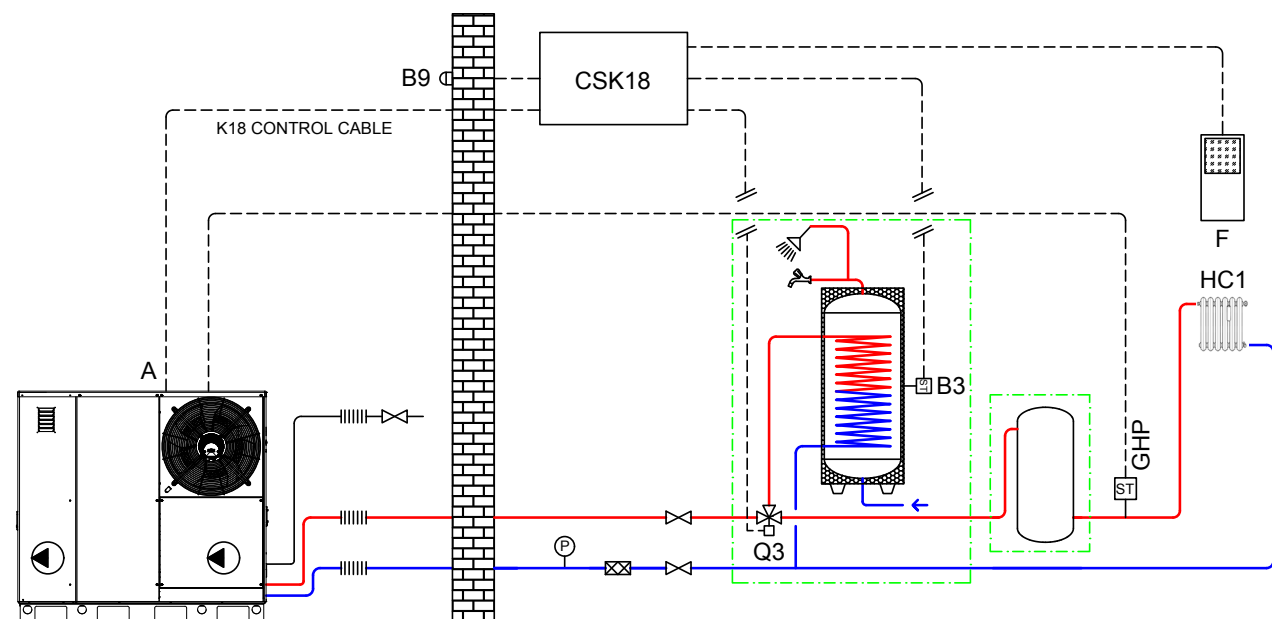
- | | |
|---|--|
| A Unit K18 Simplygas | D External water pump (only for C0 versions) |
| B Auxiliary boiler (optional) | E Bypass section with overpressure valve |
| C check valve (to be installed only in the presence of an auxiliary boiler) | F Room unit 1 (QAA74.611) |
| | G Thermostats (with timer) for zones |

Figure 1.3 System with K18 Simplygas unit, primary and secondary water circuits, up to two heating circuits, one of which is optionally mixed, auxiliary boiler and DHW production optional



- | | |
|---|--|
| A Unit K18 Simplygas | D External water pump (only for C0 versions) |
| B Auxiliary boiler (optional) | E Decoupling of primary/secondary circuits |
| C check valve (to be installed only in the presence of an auxiliary boiler) | F Room unit 1 (QAA74.611) |
| | H Room unit 2 for HC2 circuit (optional, QAA74.611 or QAA55.110) |

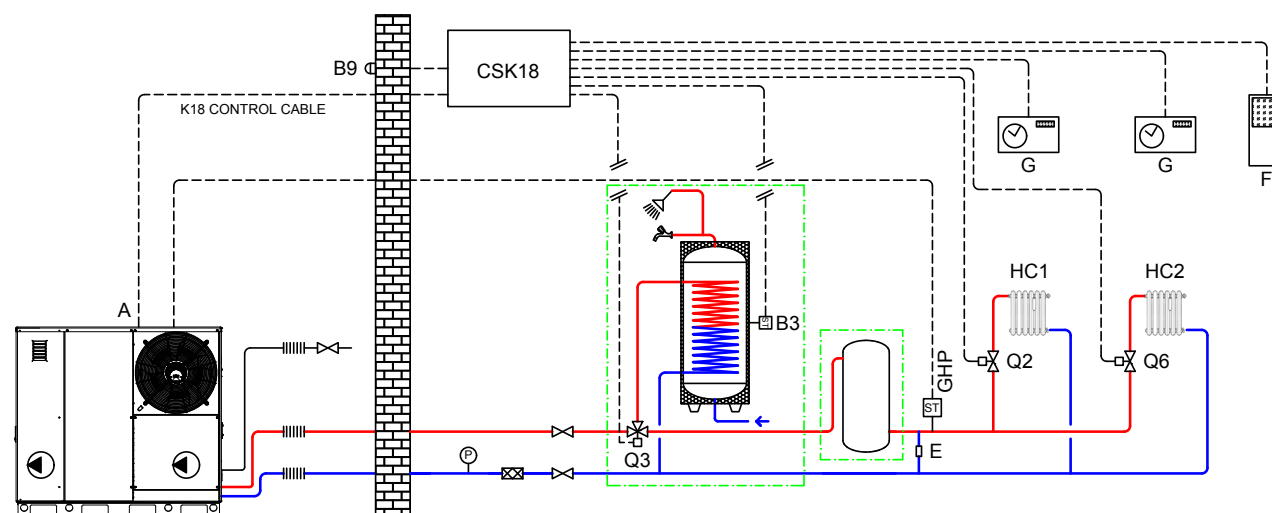
Figure 1.4 System with K18 Hybrigas unit, primary water circuit only and one zone, DHW production optional



A K18 Hybrigas unit

F Room unit 1 (QAA74.611)

Figure 1.5 System with K18 Hybrigas unit, primary water circuit only and two zones, DHW production optional



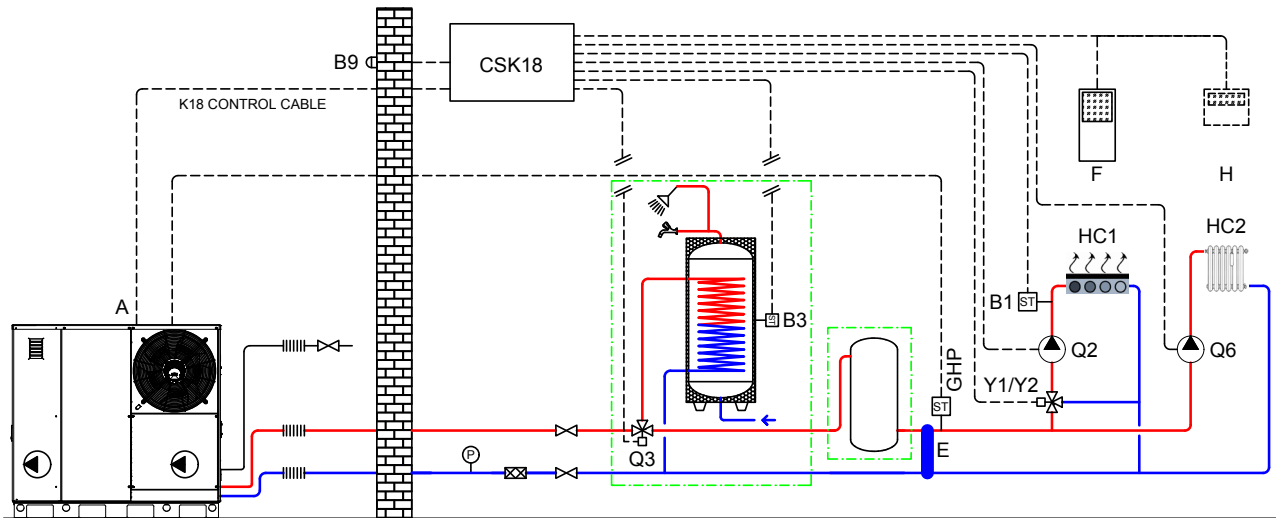
A K18 Hybrigas unit

F Room unit 1 (QAA74.611)

E Bypass section with overpressure valve

G Thermostats (with timer) for zones

Figure 1.6 System with K18 Hybrigas unit, primary and secondary water circuits, up to two heating circuits, one of which is optionally mixed, DHW production optional



A K18 Hybrigas unit

E Decoupling of primary/secondary circuits

F Room unit 1 (QAA74.611)

H Room unit 2 for HC2 circuit (*optional*, QAA74.611 or QAA55.110)

i All temperature probes (GHP, GHP', B1, B3) must be placed and fixed in dedicated thermowells, with a length suitable to result immersed in water flow or in water mass, using thermal paste to ensure a good heat transfer.

i In case one of the optional DHW preparation tanks

is used (code OSRB012 or OSRB004), it is recommended to use the thermowell just above mid height for the probe B3.

Even in case other water tanks are used, place probe B3 in an intermediate position, possibly just above mid height.

2 MOUNTING AND INSTALLATION

The System controller for the K18 is supplied preassembled and precabled in an IP55 rated enclosure. The protection rating is reduced if the included cable gland caps are used. Use suitable cable glands (not included) to maintain the indicated protection rating, if necessary.

! Before installing the unit, check that the equipment is not connected to its power supply.

The cabling must satisfy the requirements of safety class II, **i.e. the mains power cables and the SELV cables must be ducted separately.**

Also, keep a distance of at least 50 mm between the ducts that contain mains cables and those which contain safety extra low voltage cables and between the two categories of cables inside the enclosure; to achieve this, with reference to Figure 2.1 p. 10, use:

- **For the mains connections:** the hole on the lower left side of the enclosure and, if required, the two holes at the centre and at the top on its left side.
- **For the safety extra low voltage connections:** the two holes at the centre and on the lower right

side of the enclosure and, if required, the two holes at the centre and at the bottom on its right side.

Do NOT use the holes on the upper side of the enclosure, the hole at the top on its right side and the one on the bottom on the left side.

The CSK18 and any other equipment and accessories must be powered up only when the installation is complete. Failure to observe this instruction incurs a risk of electrocution and short-circuit.



The CSK18 must not be exposed to water.

The unit's ambient operating temperature range is 0 °C - 50 °C.

2.1 CSK18 SYSTEM CONTROLLER ENCLOSURE

2.1.1 Mounting and installation

Figure 2.1 External overall dimensions for CSK18 enclosure

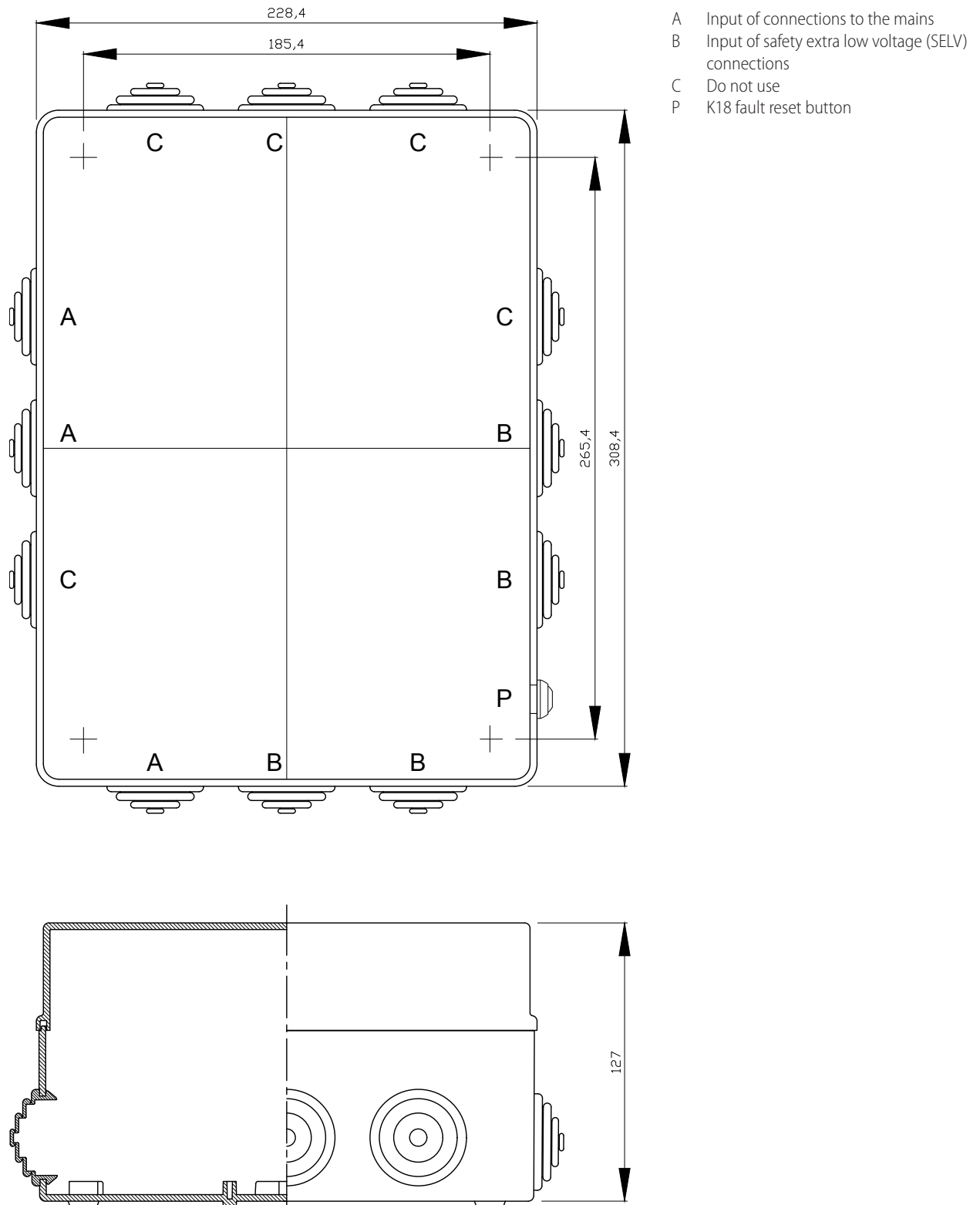
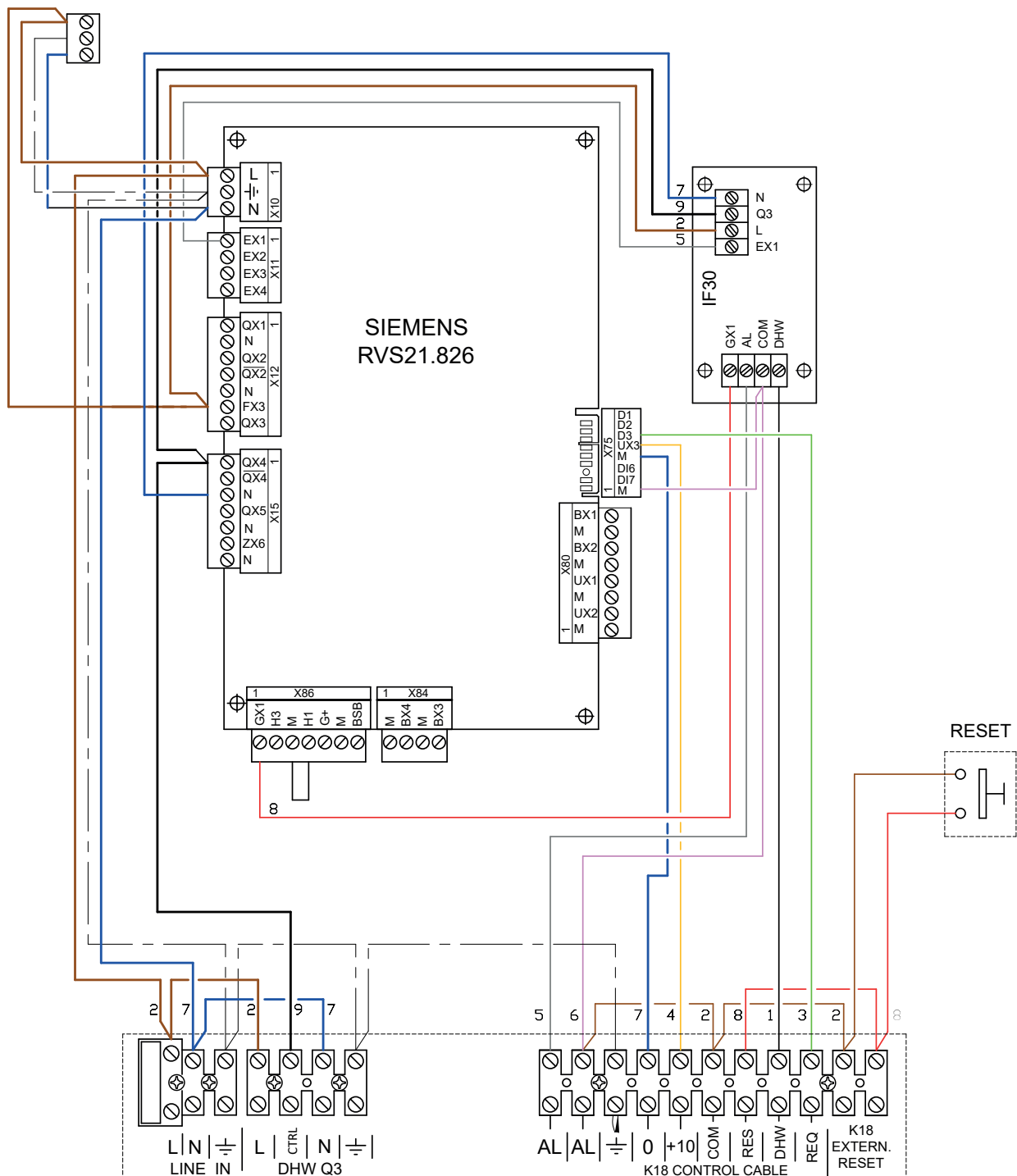


Figure 2.2 General layout of components and wiring diagram for K18 system controller




The electrical connections are partly done with the terminal blocks inside the bottom of the enclosure, and partly with the included extractable connectors which fit directly onto the board.

Table 2.1 p. 12 lists the Line Voltage supply and signal connections on the extractable connectors at the left edge of the Siemens RVS21.826 board (with reference to the electronic board orientation inside the enclosure, see Figure 2.1 p. 10), while Table 2.2 p. 12 lists the Line Voltage supply and signal connections on the terminal

block at the bottom left interior of the CSK18 enclosure. To identify the position of the connectors and terminal blocks, refer to the wiring diagram given in fig. 2.2 p. 11. To identify the plumbing parts and the sensors that correspond to the Siemens function codes (e.g. Q2, Y1, Y2) refer to the plumbing diagrams in Figures 1.1 p. 6, 1.2 p. 7 and 1.3 p. 7 with regards to applications with K18 Simplygas units and 1.4 p. 8, 1.5 p. 8, 1.6 p. 9 for applications with K18 Hybrigas units.

Table 2.1 Line Voltage connections to Siemens RVS21.826 board connectors

Function (Siemens logo on water circuit diagrams and description)			Logo on connector Color	Siemens connector code
L	230 VAC phase input to RVS21.826	Pre-wired	X10 Green	BPZ:AGP5S.03A/109
	Ground connection to RVS21.826	Pre-wired		
N	Neutral input to RVS21.826	Pre-wired		
EX1	K18 unit alarm signal input on RVS21.826	Pre-wired	X11 Green	BPZ:AGP5S.04D/109
EX2	Not used			
EX3	Not used			
EX4	Not used			
QX1	Y1 - heating circuit 1 mixer valve open phase output		X12 Green	BPZ:AGP5S.07H/109
N	Heating circuit 1 mixer valve neutral output			
QX2	Y2 - heating circuit 1 mixer valve close phase output			
QX2	Not used			
N	Q6 - Heating circuit 2 water pump neutral output / Zone 2 valve			
FX3	Phase input for output QX3	Pre-wired	X15 Orange	BPZ:AGP5S.07M/109
QX3	Q6 - Heating circuit 2 water pump phase output / Zone 2 valve			
QX4	DHW diverter valve control phase output (2)	Pre-wired		
QX4	Q3 - DHW diverter valve phase inverse output (1)			
N	Neutral output	Pre-wired		
QX5	Q2 - Heating circuit 1 water pump phase output / Zone 1 valve			
N	Q2 - Heating circuit 1 water pump neutral output / Zone 1 valve			
ZX6	Not used			
N	Not used			



(1) Not normally used. It may be used:

* In place of Q3 (see Table 2.2 p. 12) if the DHW diverter valve is set to DHW when the phase is NOT present at the output.

* In addition to Q3 if the valve has an actuator with two terminals which are excited alternately to set the valve to Heating or DHW circuit.

(2) Connect the valve to the CTRL output (Table 2.2 p. 12).

Table 2.2 Line Voltage connections to bottom LH terminal block in CSK18 enclosure

	Function (description)	Group of terminals
L	230 VAC phase power input	LINE IN
N	Neutral power input	
	Ground connection	
L	DHW diverter valve power fixed phase output	DHW Q3
CTRL	Q3 - DHW diverter valve power control phase output (1)	
N	DHW diverter valve power neutral output	
	DHW diverter valve power ground connection	

(1) Output Q3 is active (230 VAC phase present) during DHW service and inactive during space heating service. See note (1) to Table 2.1 p. 12.

Table 2.3 p. 13 lists the SELV supply and signals connections on the extractable connectors at the bottom and right edges of the Siemens RVS21.826 board (once more with reference to the specific position of the board inside the enclosure), while Table 2.4 p. 13 lists the SELV signals connections on the terminal block at the bottom right interior of the CSK18 enclosure.



The connections in Table 2.4 p. 13 include those which connect the System controller to the K18 unit.

Table 2.3 SELV signal connection to Siemens RVS21.826 board

Function (Siemens logo on water circuit diagrams and description)			Logo on connector Color	Siemens connector code
BX1	B9 - Outdoor temperature sensor input		X80 Grey	BPZ:AGP5S.08N/109
M	B9 - Outdoor temperature sensor input			
BX2	Not used (available for additional functions)			
M	Not used (BX2 return mass)			
UX1	Not used (available for additional functions)			
M	Not used (UX1 return mass)			
UX2	Not used (available for additional functions)			
M	Not used (UX2 return mass)		X84 Grey	BPZ:AGP5S.04E/109
BX3	B3 - DHW buffer tank temperature sensor input			
M	B3 - DHW buffer tank temperature sensor input			
BX4	B1 - Heating circuit 1 temperature sensor input (mixed only)			
M	B1 - Heating circuit 1 temperature sensor input (mixed only)		X86 Grey	BPZ:AGP5S.07K/109
BSB	BSB+ - QAA74/QAA55 Room Unit data bus connection			
M	BSB- - QAA74/QAA55 Room Unit data bus ground			
G+	G+ - QAA74 Room Unit backlighting power output			
H1	H1 - Heating circuit 1 normally open request signal input (1)			
M	H1/H3 - Heating circuit 1 and 2 request signal input return			
H3	H3 - Heating circuit 2 normally open request signal input (2)			
GX1	GX1- 12 VDC power output	Pre-wired		

- (1) Input **H1** is prewired active with a jumper to terminal **H1/H3**; to insert an external request signal (**voltage-free contact**), remove the jumper and cable it between terminals **H1** and **H1/H3**.
- (2) Input **H3** is open to keep heating circuit 2 inactive. If this heating circuit is present, fit a jumper between terminals **H3** and **H1/H3** or insert an external request signal between them (**voltage-free contact**).

Table 2.4 SELV signal connection to bottom RH terminal block in CSK18 enclosure

	Function (description)	Group of terminals
AL	K18 unit alarm signal input	GAHP K18 CONTROL CABLE
AL	K18 unit alarm signal input	
±	K18 unit cable shielding braid ground connection	
0	K18 unit 0 – 10V setpoint output ground	
+10	K18 unit 0 – 10V setpoint output	
COM	K18 unit digital output common ground	
RES	K18 unit alarm reset digital output	
DHW	Service type request digital output to K18 unit (heating/DHW)	
REQ	Service request (request) digital output to K18 unit	EXTERNAL RESET
GAHP K18 EXTERN RESET	K18 alarm reset external control input (NO voltage-free contact)	
GAHP K18 EXTERN RESET	K18 alarm reset external control input (NO voltage-free contact)	

2.2 SIEMENS QAC34 AMBIENT TEMPERATURE PROBE

The external sensor is essential to the operation of the CSK18 system. If this sensor is not connected to the Siemens RVS21.826 board, the system is not operational.

The sensor is used to acquire the external temperature and, in part, also the effects of the sunlight, the wind and the temperature of the wall to which it is mounted.

2.2.1 Technical specifications

Table 2.5 Characteristics of QAC34/101 external sensor

Model	Sensor type	Measurement range (°C)	Tolerance (K) (1)	Time constant (min)	Weight (g)	Wire cross section (mm²)	Max. length (m)
QAC34/101	NTC1000 Ω at 25 °C	-50...70	± 1	12	73	1,5	120

(1) QAC34/101 over range -10 - +20 °C

2.2.2 Mounting and installation

Figure 2.3 Description of installation procedure for QAC34 external sensor

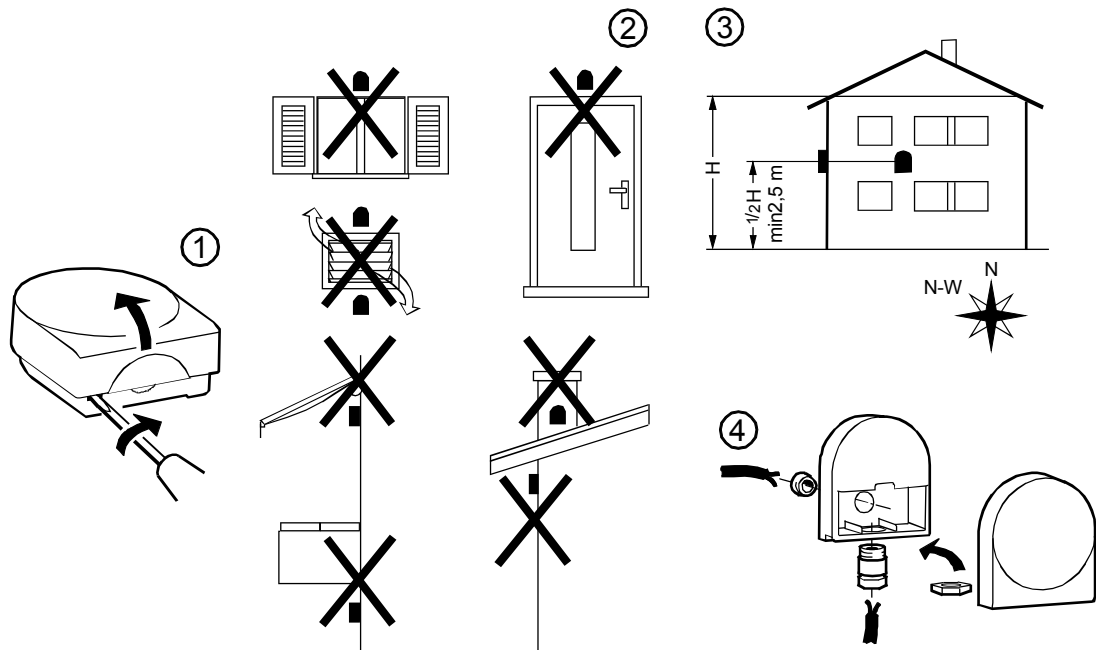
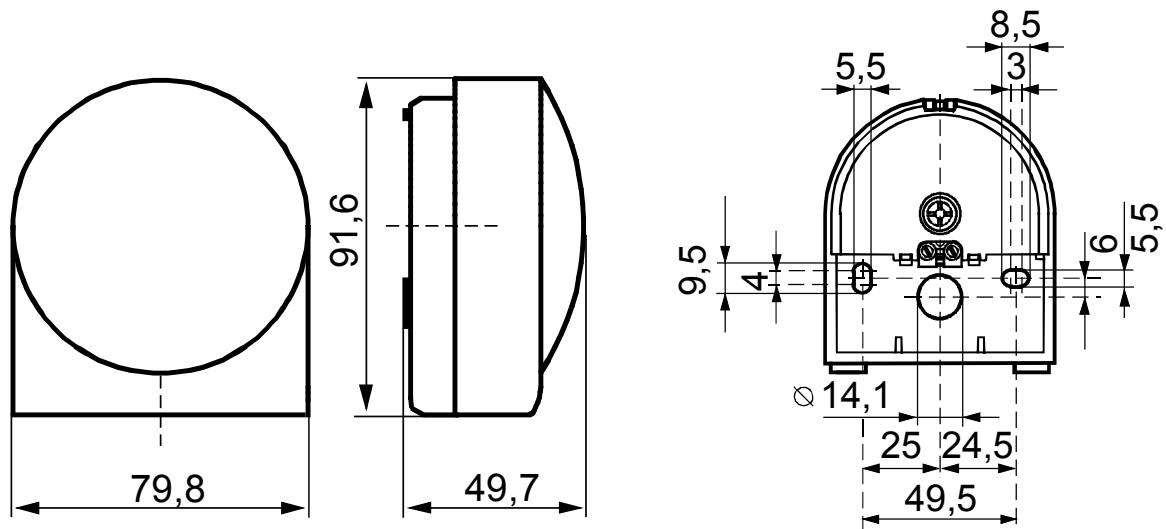


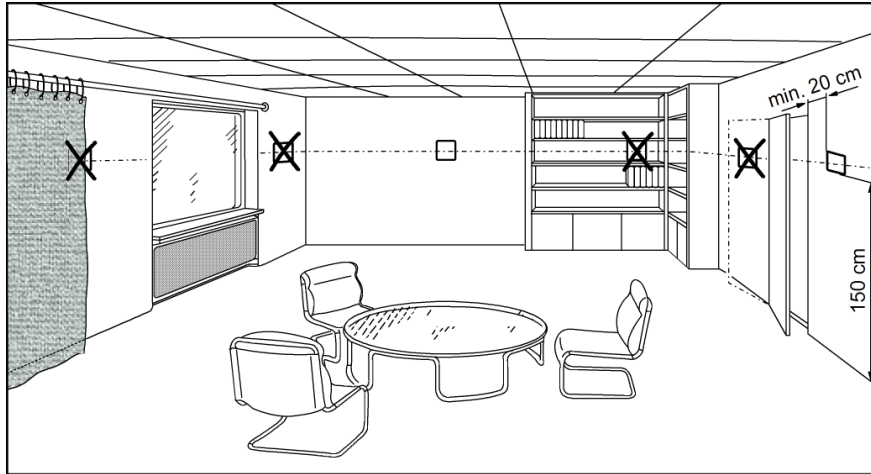
Figure 2.4 QAC34 external room sensor dimensions



2.3 QAA55.110 BASIC ROOM UNIT (OPTIONAL)

2.3.1 Location

Figure 2.5 Description of installation position of room unit



The room unit should be installed in a reference room, usually the living room, bearing the following in mind:

- The room unit must be installed about 1,5 m off the ground, in an area which allows the sensor to read the room temperature as accurately as possible, it should therefore be out of the way of draughts, sunlight and

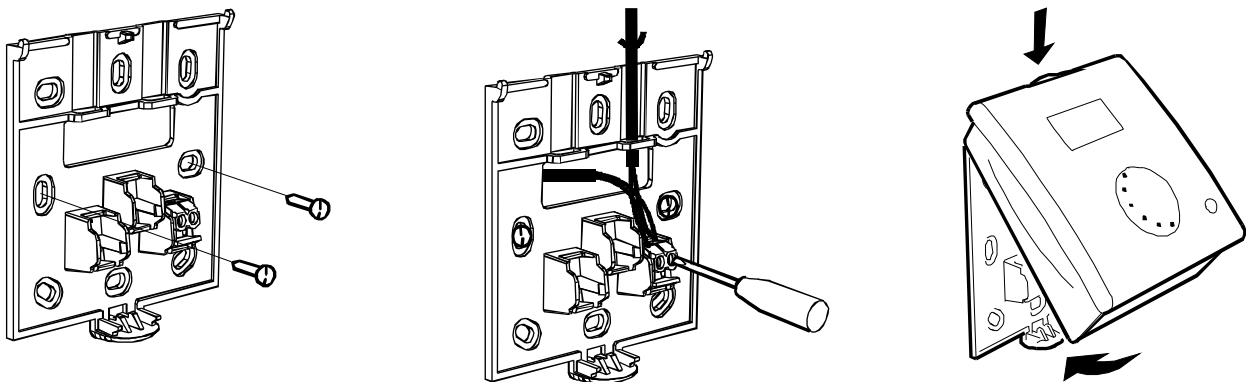
other sources of heat.

- If wall mounted, leave enough space above the unit for it to be installed and removed when necessary.

i Once removed from its base, the room unit is no longer powered and is thus inactive.

2.3.2 Installation

Figure 2.6 Description of installation procedure for room unit QAA55.110



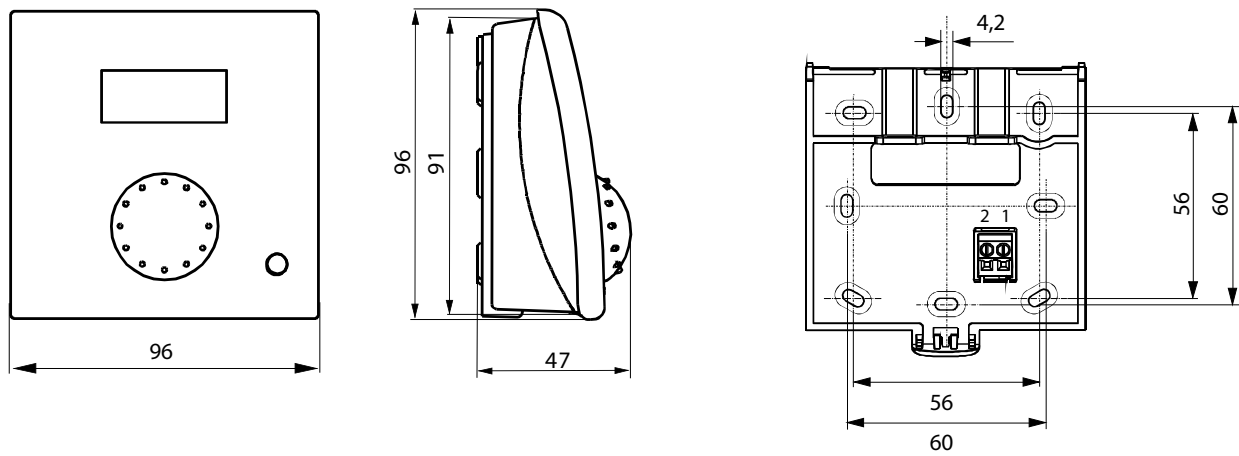
i Do not install the room unit in rooms exposed to water or damp.



For further details on the operation, installation and use of the room unit, refer to Section 5 p. 33, in particular to Paragraphs 5.1.5 p. 36 and 5.1.7 p. 37.

2.3.3 Dimensions and jig for installation holes

Figure 2.7 Description of mounting holes for room unit QAA55.110



2.3.4 Electrical hookup

Figure 2.8 Room unit QAA55.110 connections

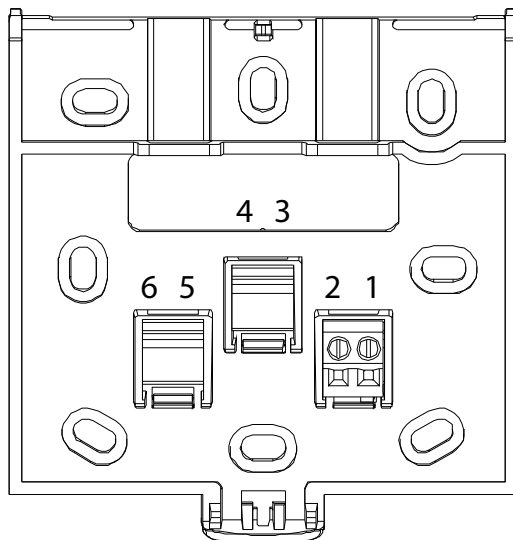


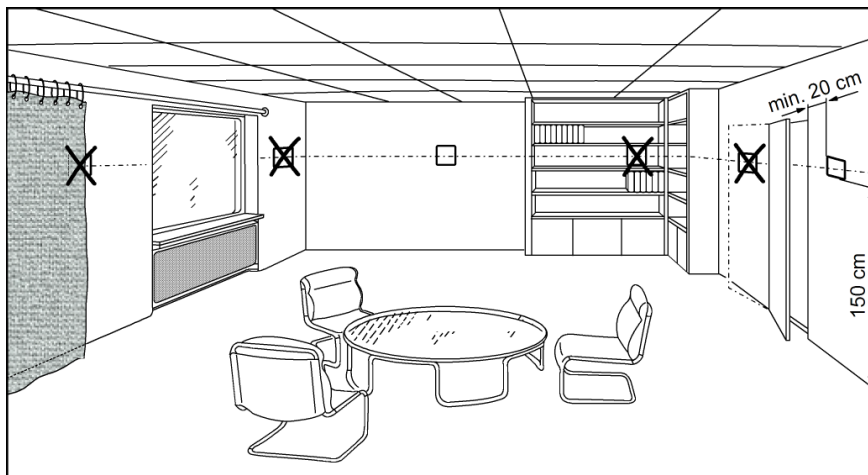
Table 2.6 Room unit QAA55.110 connections

Terminal	Name	Description
1	BSB	Data bus BSB +
2	M	Data bus BSB -

2.4 QAA74.611 ADVANCED ROOM UNIT

2.4.1 Location

Figure 2.9 Description of installation position of room unit



The room unit should be installed in a reference room, usually the living room, bearing the following in mind:

- The room unit must be installed about 1,5 m off the ground, in an area which allows the sensor to read the room temperature as accurately as possible, it should therefore be out of the way of draughts, sunlight and

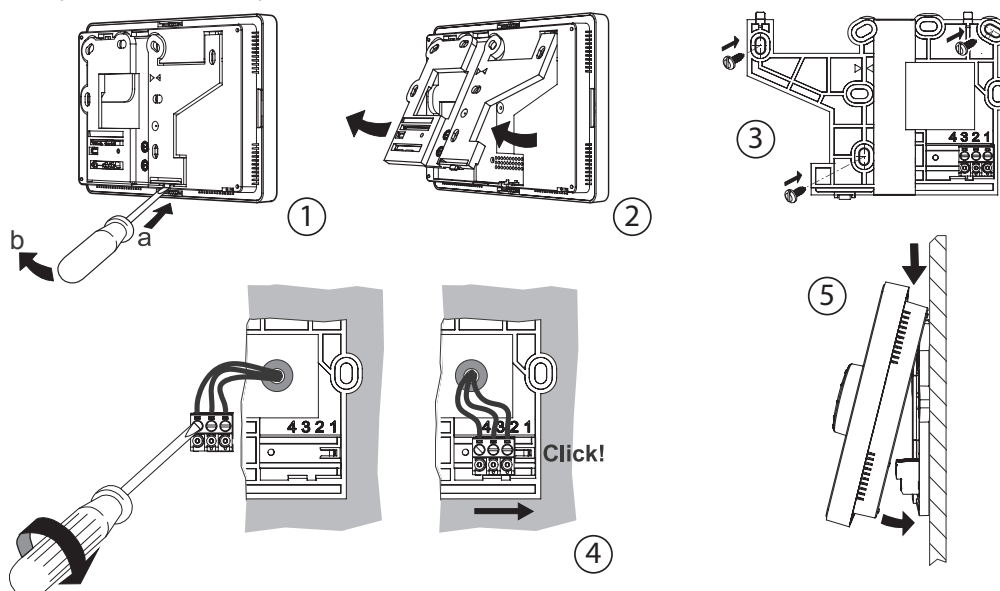
other sources of heat.

- If wall mounted, leave enough space above the unit for it to be installed and removed when necessary.

i Once removed from its base, the room unit is no longer powered and is thus inactive.

2.4.2 Installation

Figure 2.10 Description of installation procedure for room unit QAA74.611



i Do not install the room unit in rooms exposed to water or damp.

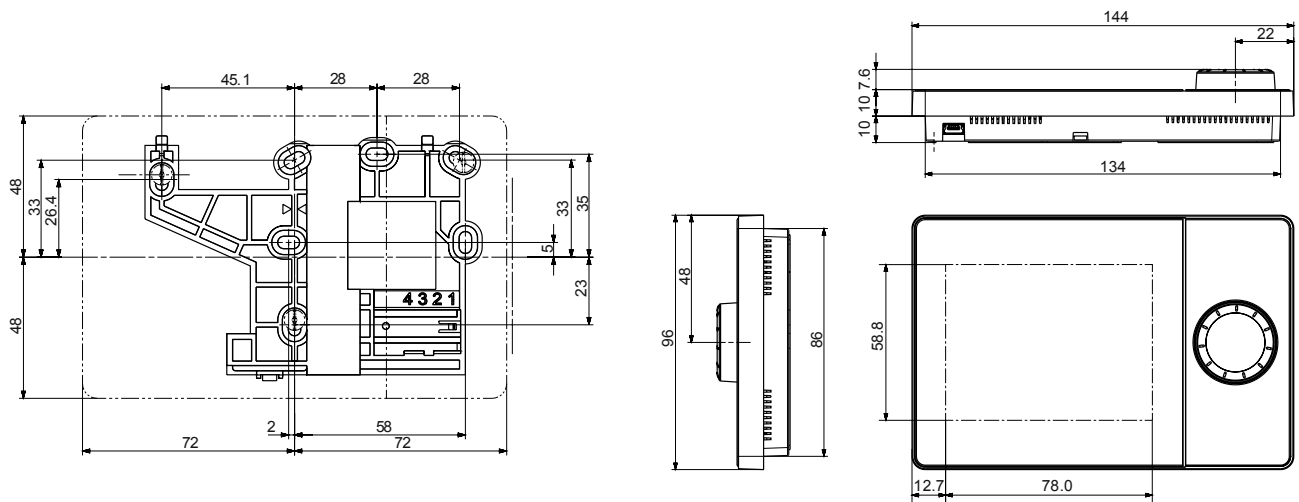
5 p. 33, in particular Paragraph 5.1.5 p. 36 and 5.1.7 p. 37.



For further details on the operation, installation and use of the room unit, refer to section

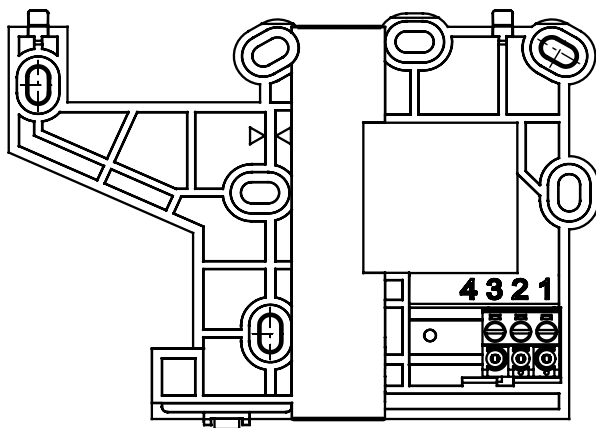
2.4.3 Dimensions and jig for installation holes

Figure 2.11 Description of mounting holes for room unit QAA74.611



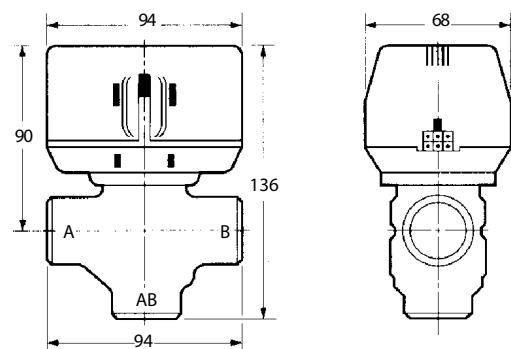
2.4.4 Electrical hookup

Figure 2.12 Room unit QAA74.611 connections



2.5 OVLV007 DIVERTER VALVE (OPTIONAL)

Figure 2.13 OVLV007 diverter valve dimensions



Consider the following for the hydraulic connection:

- ▶ AB = common
- ▶ A = DHW circuit
- ▶ B = space heating circuit

Table 2.7 Room unit QAA74.611 connections

Terminal	Name	Description
3	BSB	Data bus BSB +
2	M	Data bus BSB -
1	G+	Power 12V DC

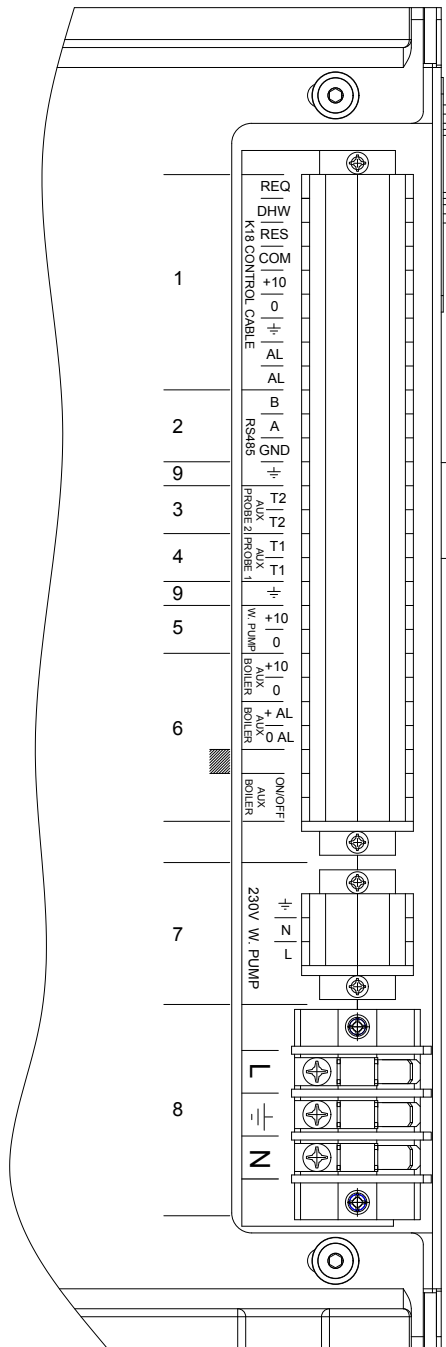
2.6 THE K18 UNIT

For installation considerations, refer to the *Installation, use and maintenance manual* of the specific mode of K18

unit.

For convenience we include the terminal block details for the electrical hookup here.

Figure 2.14 Terminal block for electrical connections of K18 unit

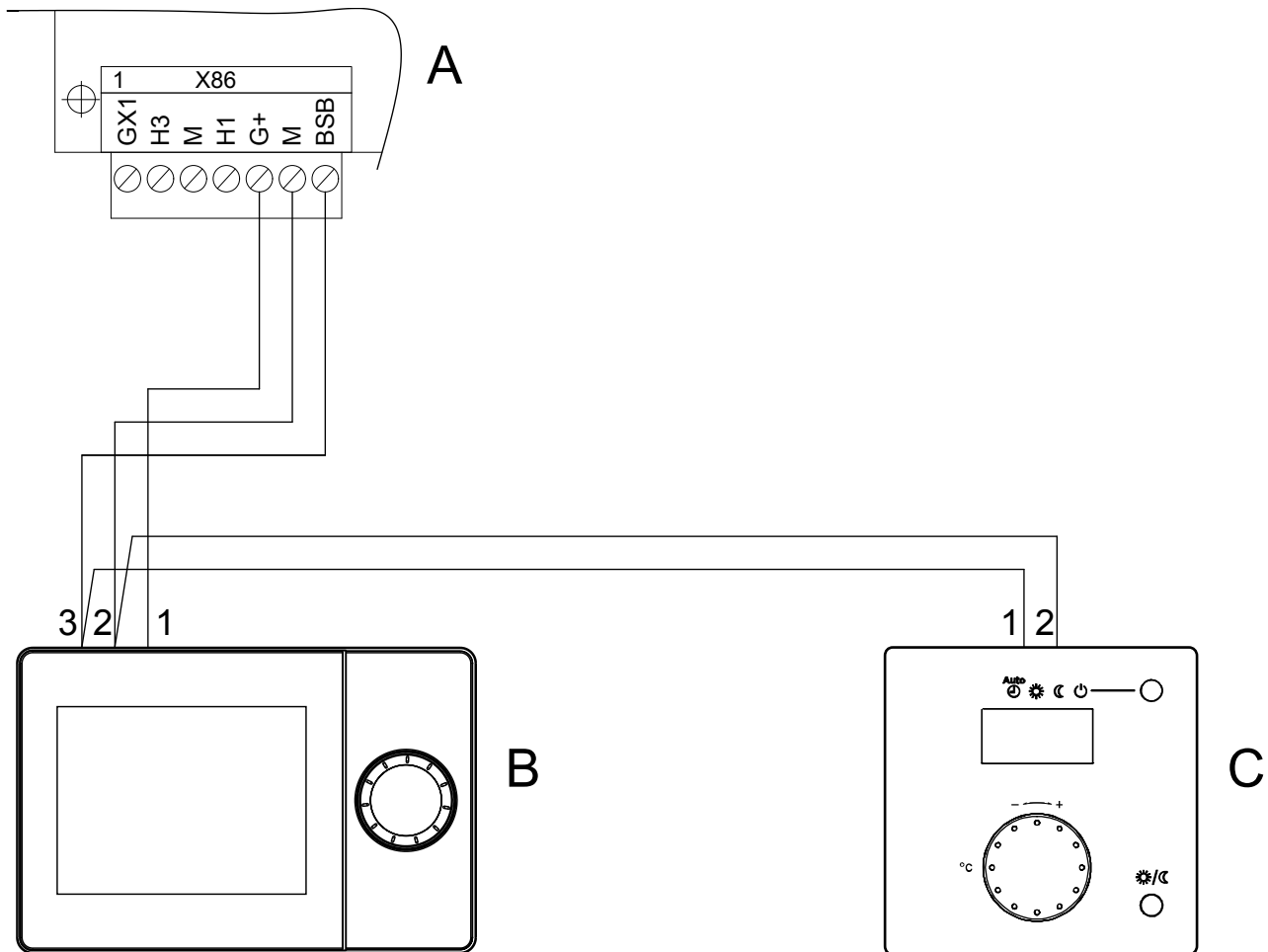


- 1 Connection to CSK18 enclosure (see Paragraph 3.6 p. 26)
- 2 Modbus connection to RS485 port for optional monitoring
- 3 GHP¹ temperature sensor connection (see Paragraph 3.7 p. 27)
- 4 GHP temperature sensor connection (see Paragraph 3.7 p. 27)
- 5 Connection of 0-10 V signal on the optional external water pump (only for K18 Simplygas C0 models; see manual of specific K18 unit used)
- 6 Optional auxiliary boiler connection (only for K18 Simplygas models; see Paragraph 3.8 p. 27)
- 7 Supply connection on the optional external water pump (only for K18 Simplygas C0 models; see manual of specific K18 unit used)
- 8 Power connection (see K18 unit manual)
- 9 Earth connections for signal cable shielding

3 ELECTRICAL HOOKUP

3.1 HOOKING UP THE ROOM UNIT

Figure 3.1 Example of connection of two room units, one type QAA74.611, the other (optional) type QAA55.110



- A Grey connector X86 (bottom edge of RVS21.826 board)
- B Room unit 1 (QAA74.611)
- C Ambient unit 2 (QAA55.110) (optional code ODSP004)

NOTE Use shielded signal cable 3x0.75 mm² (2x0.75 mm² for QAA55.110).
 Maximum total length 400 m.
 Maximum length between controller and room unit 200 m.

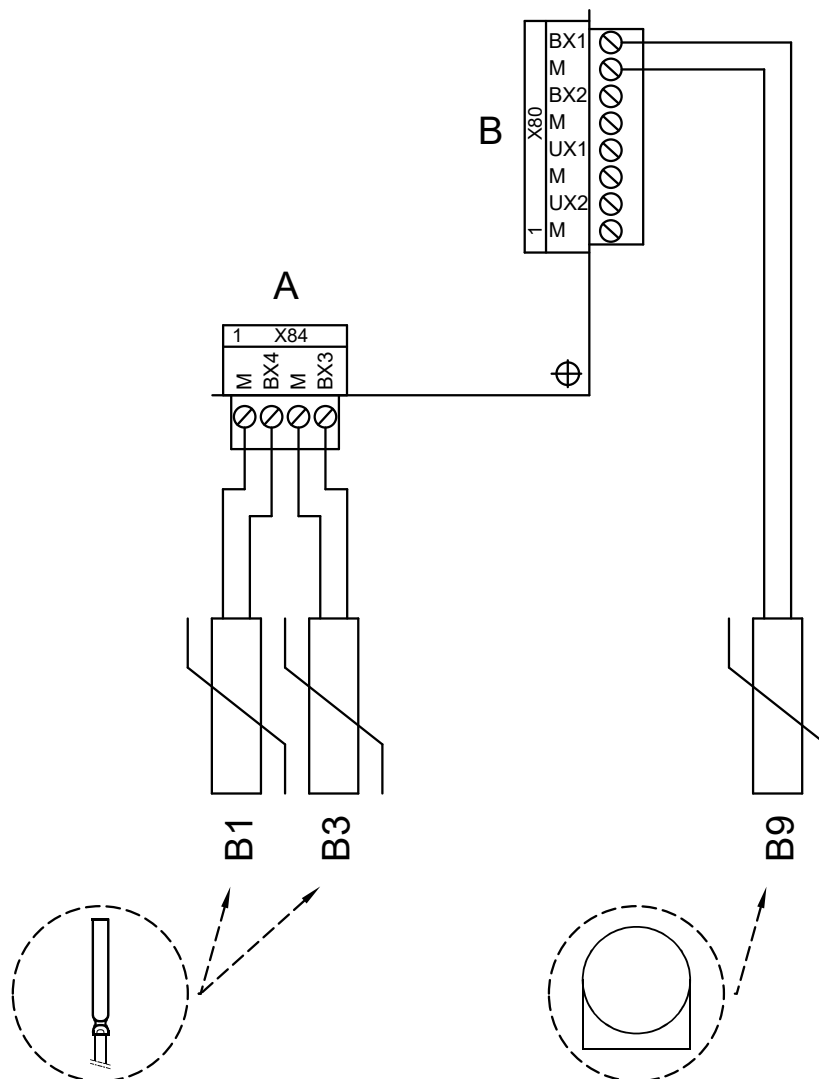
Both room units can also be connected to connector X86.

Table 3.1 QAA74.611 and QAA55.110 (optional) room unit connection

RVS21.826	QAA74.611	QAA55.110
BSB	3	1
M	2	2
G+	1	-

3.2 TEMPERATURE PROBES CONNECTION

Figure 3.2 Temperature sensor connection diagram (NTC 10k - Beta 3977) to RVS21.826



- A Grey connector X84 (bottom edge of RVS21.826 board)
- B Grey connector X80 (right edge of RVS21.826 board)
- B1 NTC 10k Beta 3977 temperature sensor
- B3 NTC 10k Beta 3977 temperature sensor
- B9 NTC 1k temperatrue sensor - included

Use of temperature sensors

- B9 always
- B1 only if heating circuit 1 is mixed
- B3 only if DHW service is provided with K18 (only EVO versions)

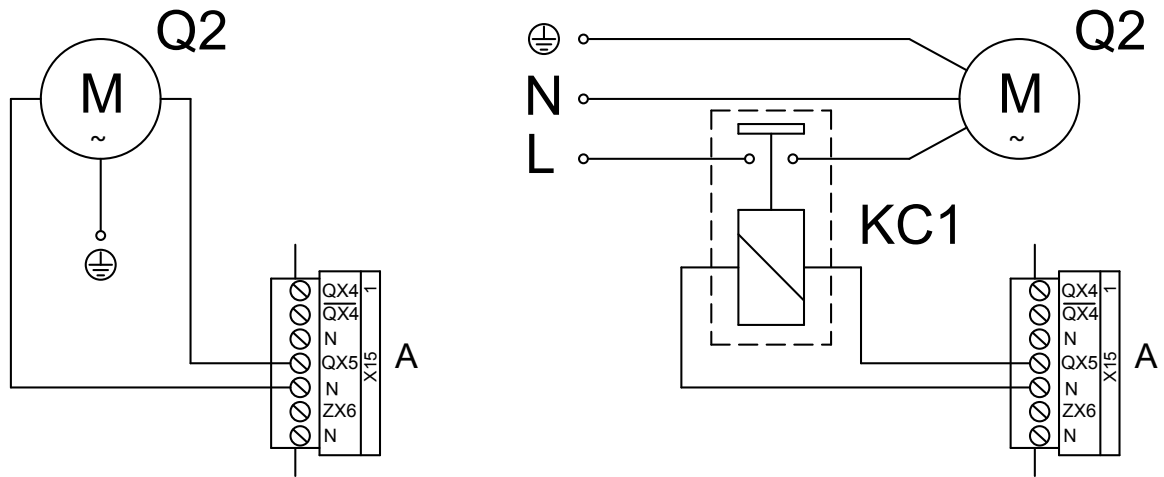
Use shielded cable

- 2x0,5 mm² up to 40 m
- 2x0,75 mm² up to 60 m
- 2x1,0 mm² up to 80 m
- 2x1,5 mm² up to 120 m

3.3 WATER CIRCULATION PUMP CONNECTION

3.3.1 Heating circuit 1 pump connection diagram

Figure 3.3 Direct or external relay connection of heating circuit 1 pump to RVS21.826



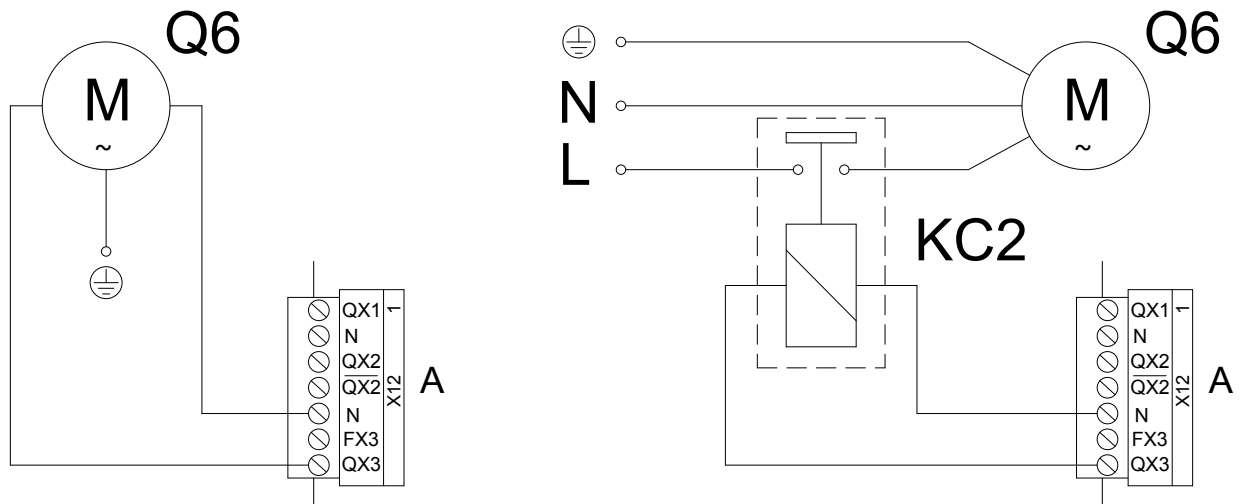
A Orange connector X15 (left edge of RVS21.826 board)

Q2 Heating circuit 1 pump

KC1 Relay (not supplied)

3.3.2 Heating circuit 2 pump connection diagram (if any)

Figure 3.4 Direct or external relay connection of heating circuit 2 pump to RVS21.826



A Green connector X12 (left edge of RVS21.826 board)

Q6 Heating circuit 2 pump

KC2 Relay (not supplied)

3.4 MIXER/DIVERTER VALVE CONNECTION

3.4.1 Q3 diverter valve connection diagrams for DHW service (if present)

Figure 3.5 Q3 diverter valve connection to CSK18 enclosure terminal block – Case 1 (use of optional code OVLV007 valve)

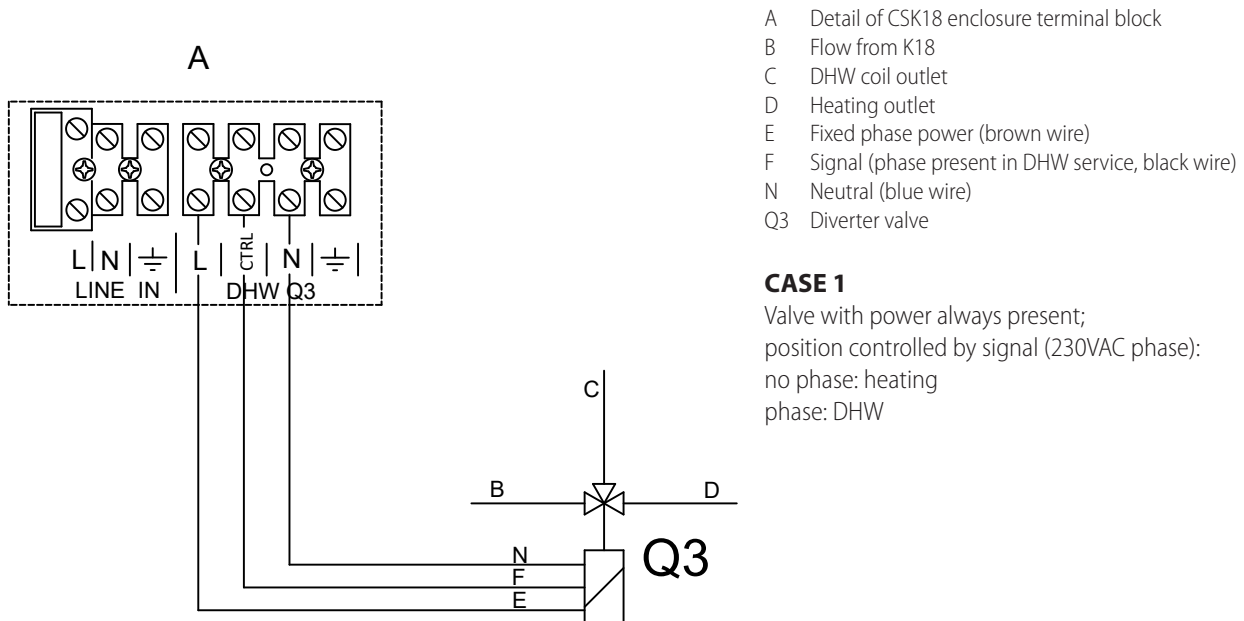


Figure 3.6 Q3 diverter valve connection to CSK18 enclosure terminal block and RVS21.826 – Case 2

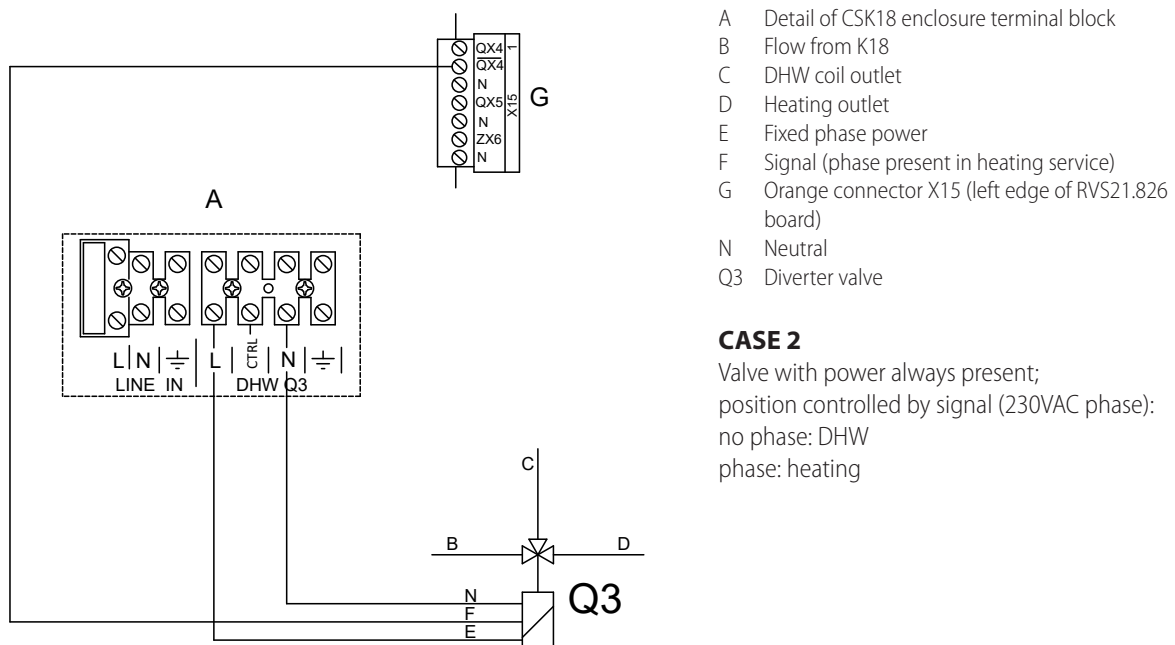
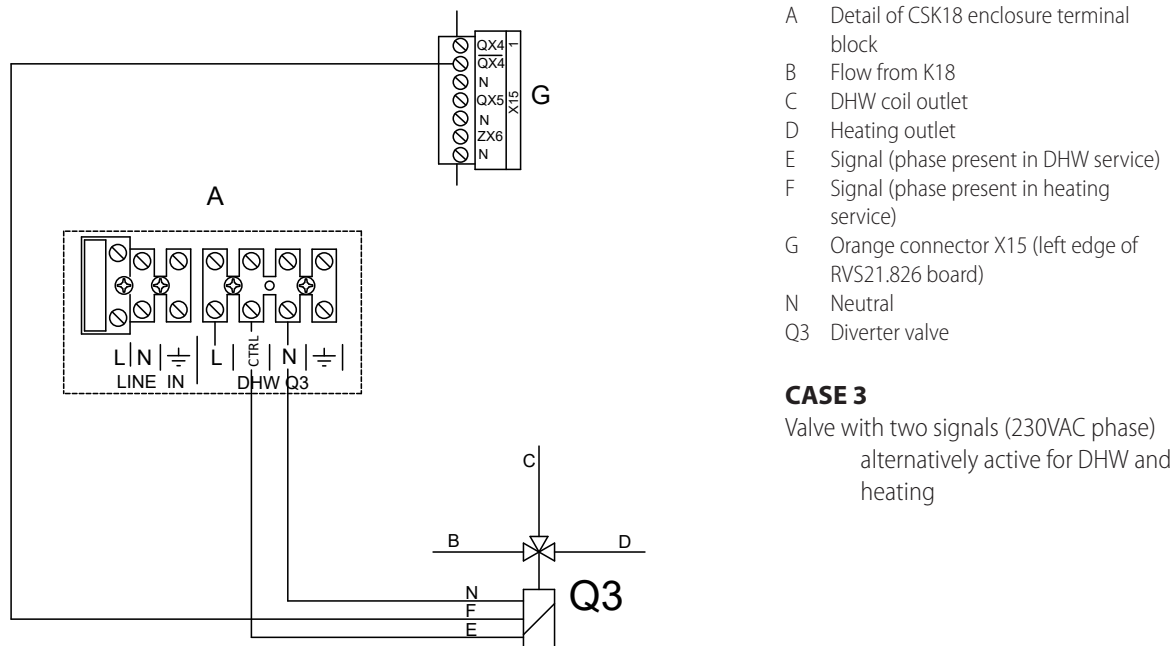


Figure 3.7 Q3 diverter valve connection to CSK18 enclosure terminal block and RVS21.826 – Case 3

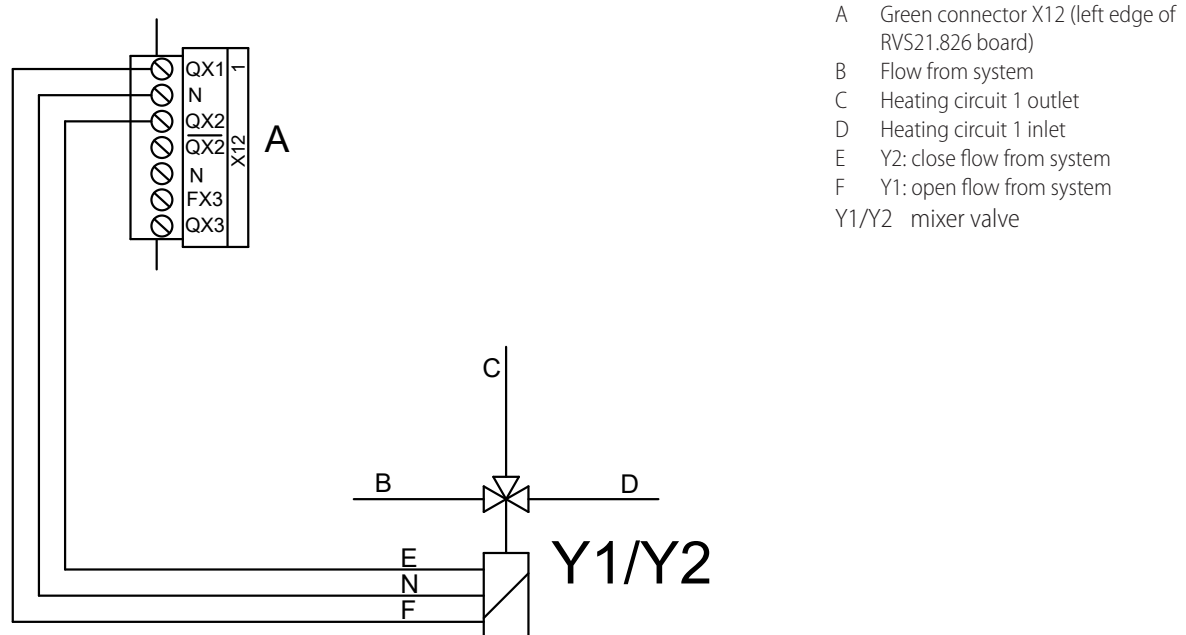


CASE 3

Valve with two signals (230VAC phase) alternatively active for DHW and heating

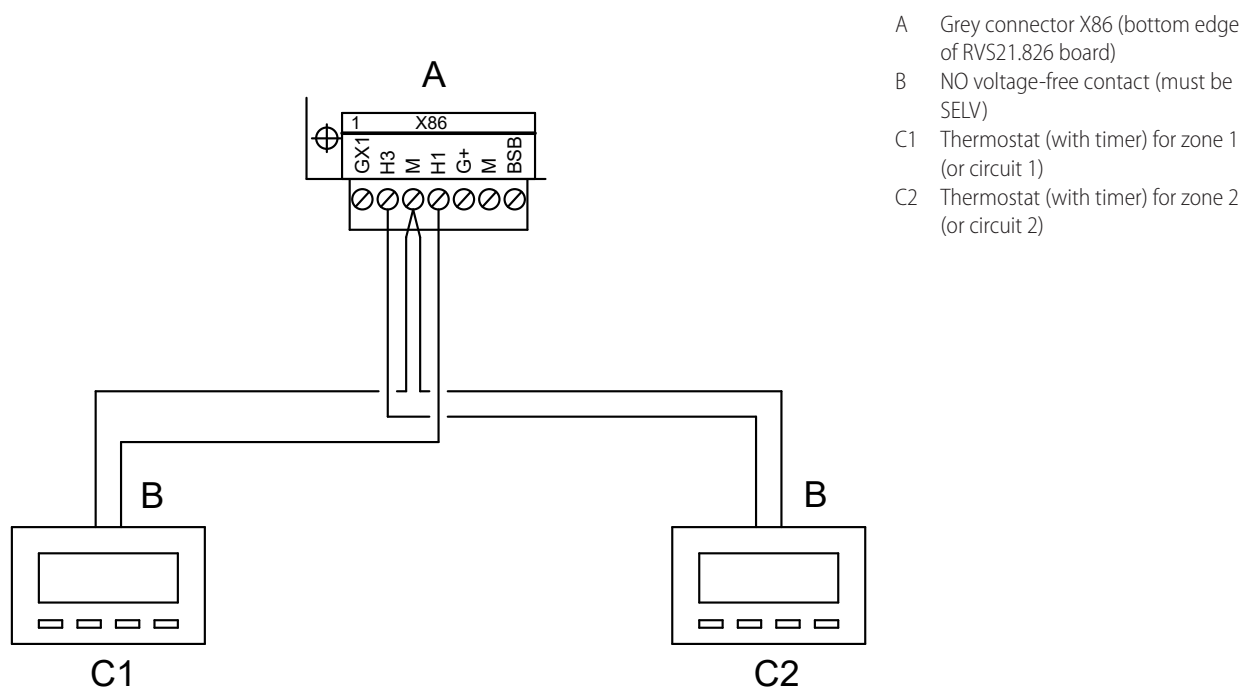
3.4.2 Y1/Y2 mixer valve connection (if present)

Figure 3.8 Y1/Y2 mixing valve connection (for mixed heating circuit 1) to RVS21.826



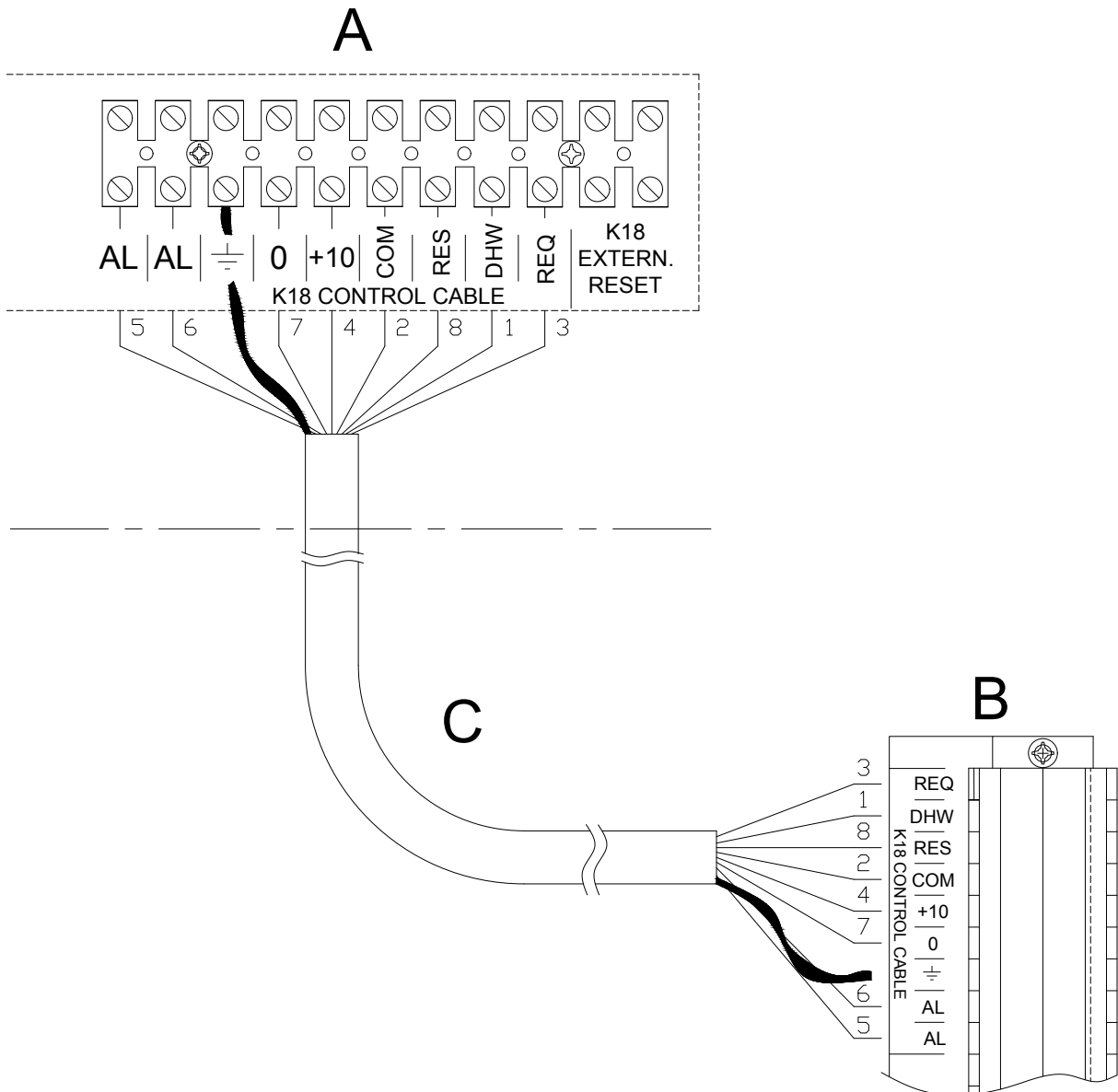
3.5 EXTERNAL REQUESTS CONNECTION

Figure 3.9 Connection of optional external request signals (thermostats, thermostat timers, timers) to RVS21.826



3.6 K18 UNIT CONNECTION TO CSK18 ENCLOSURE

Figure 3.10 K18 unit connection to CSK18 enclosure terminal block



- A Detail of CSK18 enclosure terminal block
- B K18 unit terminal block detail
- C Shielded multi-wire cable, type Li - YcY 8x0,75 mm² (available as OCVO009 optional)
Maximum length 50 m.

NOTE

Connect the shield to the ground terminals at both ends.
Using DIN 47100 conforming cable (colour coded) simplifies the hookup (see Table 3.2 p. 26).

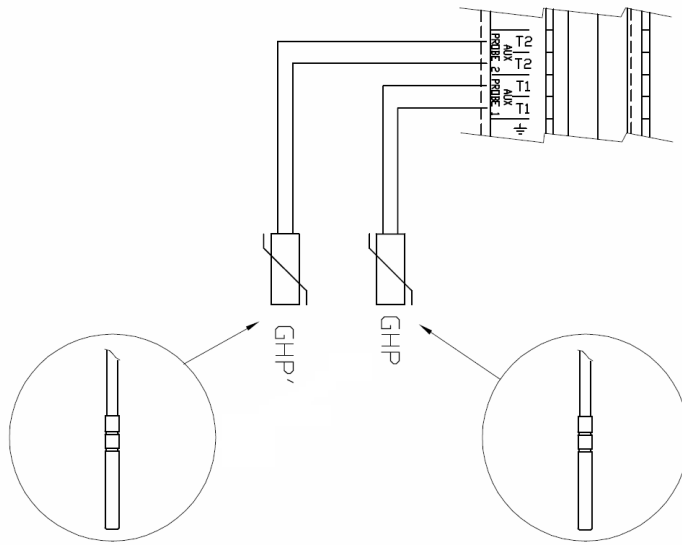
Table 3.2 Wire colours per DIN47100

Wire n.	Wire colour
1	White
2	Brown
3	Green
4	Yellow
5	Grey
6	Pink
7	Blue

Wire n.	Wire colour
8	Red
9	Black
10	Purple

3.7 TEMPERATURE PROBES CONNECTION TO K18 UNIT

Figure 3.11 Collector temperature probes connection to K18 unit



- A Detail of K18 unit terminal block
 GHP NTC 10k Beta 3977 probe (included with K18 unit)
 GHP' NTC 10k Beta 3977 probe (available as OSND004 optional)

Use of temperature sensors

GHP always

GHP' **K18 Simplygas** models: only if an auxiliary boiler is present and DHW service is made by K18 models **K18 Hybrigas**: pre-installed in the machine; connect as shown in the figure if the DHW service managed by the K18 unit is present

Use shielded cable

2x0,5 mm² up to 40 m

2x0,75 mm² up to 60 m

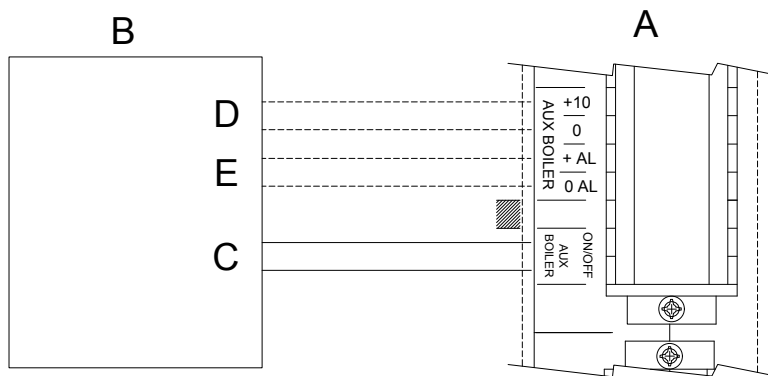
2x1,0 mm² up to 80 m

2x1,5 mm² up to 120 m

Connect the shield to a ground terminal on the K18 unit's terminal block.

3.8 AUXILIARY BOILER CONNECTION (IF PRESENT) TO THE K18 UNIT (ONLY FOR K18 SIMPLYGAS MODELS)

Figure 3.12 ON/OFF request connection, optional 0-10 V output (temperature setpoint) and optional alarm signal for the auxiliary boiler on the unit terminal block



- A K18 unit terminal block detail
 B Auxiliary boiler
 C ON/OFF contact request (2x0.75 mm² cable)
 D 0-10V input for setpoint acquisition (*)
 E Alarm signalling output (mandatory SELV voltage-free contact) (*)

(*) (optional); shielded cable 2x0.75 mm²

4 COMMISSIONING

Before commissioning the system, check that the plumbing system and electrical installations are complete in relation to the information contained in sections 1 p. 6, 2 p. 9 and 3 p. 20 of this manual.



The K18 and auxiliary boiler (if present) may start during and at the end of commissioning. **Make sure that the plumbing system is complete and filled with water.**



Commissioning must be done by a TAC.

4.1 USING THE QAA74.611 ADVANCED ROOM UNIT'S INTERFACE

The QAA74.611 room unit is also used for configuring and adjusting the System controller for the K18.

This paragraph explains how to operate on the user interface of the device at the Engineer user level; this will allow you to perform all checking and parameters change operations required for the commissioning and optimisation of the system, briefly described in the following part of this Installation manual.

The System controller User manual contains a more structured description of the room unit and of the operations available to the end user; for the technical staff, involved in the installation or in technical support of the product, the information contained in the User manual is useful and complementary to those contained in this document. The user interface of the room unit consists of a backlit monochrome display and a knob that can be turned and pressed.

4.1.1 Access to complete parameter list at Engineer user level

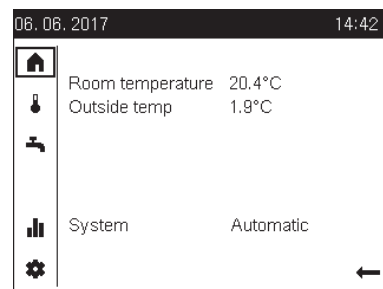
Proceed as follows:

1. When the device is turned on, check that the display appearance looks like Figure 4.1 p. 28, which is an example of the start page.
If the display looks different, simply press and hold the knob for a few seconds: the device will automatically move to the start page.
Sometimes also, i.e. immediately after powering up the system, the display may show the message **Operator unit being refreshed** together with a progress indication of the operation. In this case, wait a few minutes for the operation to complete, then proceed as above to the start page.



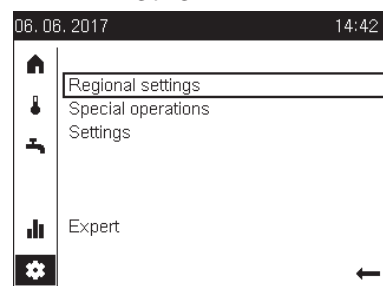
The start page may show some different information from the example in Figure 4.1 p. 28, depending on your system configuration. That is quite normal. The important thing is that the display shows the symbol (start page identifier) framed, i.e. . The frame around the symbol indicates that the symbol is preselected: the start page is shown on the display but not accessed.

Figure 4.1 Start page example, for a device configured as room unit



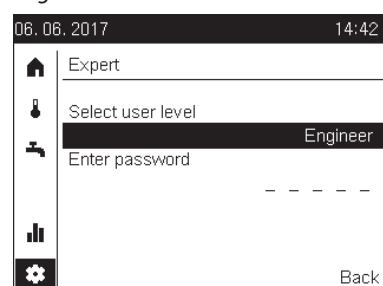
2. Turn the knob clockwise: the frame will move in sequence to enclose the symbols placed vertically below that of the start page and, at the same time, the page showed will change. Turn to enclose the symbol, which identifies the device settings page. This symbol will then be shown as .
3. Press the knob: the symbol is then selected and shown in negative . The configuration settings page, which already appeared by following step 2 above, is accessed and looks like Figure 4.2 p. 28, with the frame enclosing the first editable field (**Regional settings**) inside the page.

Figure 4.2 Device setting page



4. Turn the knob clockwise until the **Expert** field is framed, then press the knob to access the user level selection page. The value of the field indicating the current user level is framed (preselected).
5. Press again the knob to select the field, then turn it to change its value to **Engineer**; at the end of this step, the display looks like Figure 4.3 p. 28.

Figure 4.3 User level selection page with user level set to Engineer



6. Press the knob to confirm the setting, then turn the

knob to preselect the password input field and press the knob again. The first digit on the left is selected and becomes **0**.


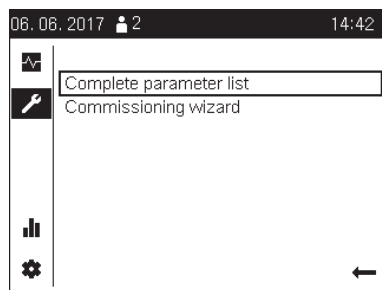
7. Turn the knob to set the first digit of the password, then press it to confirm. The selection moves to the second digit. Repeat this step four more times to set the next four digits of the password (12354).
8. If the password is incorrect, the display shows **Login failed**. Press the knob to return back to the user level selection page and insert the password again. Once the correct password is provided, **Login successful** and **Accessible for engineer** are shown. Press the knob to access the **Engineer** user level pages.
9. Turn the knob to preselect the  symbol, then press the knob to select it. This causes the access to the page shown in Figure 4.4 p. 29.

Figure 4.4 Complete parameter list access page

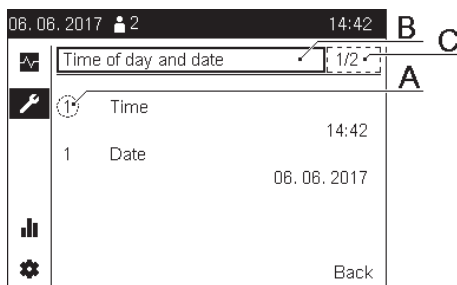


10. Press the knob to select the **Complete parameter list** field. This causes the access to the first parameter page, shown in Figure 4.5 p. 29.



Sometimes, by following this step, the display may show the message **Operator unit being re-freshed** together with a progress indication of the operation. In this case, wait a few minutes for the operation to complete, at the end of which the page in Figure 4.5 p. 29 will be shown.

Figure 4.5 First page of complete parameter list: first page of Time of day and date group



- A Parameter code
B Parameter menu selection field
C Menu page selection field

4.1.2 Parameters check and change

Figure 4.5 p. 29 also highlights three important elements, that are present on all pages of the complete

parameter list:

- The parameter code (A) is a code uniquely associated with each parameter. It is always shown in the Installation manual, together with the textual description of the parameter to be checked or changed, in order to facilitate the search. This is not an editable field.
- The parameter menu selection field (B) allows access to various sets of pages, each of which contains the parameters of a specific menu (**Time of day and date**, **Operator unit**, **Configuration**, etc.). In the following part of the Installation manual, when you are asked to check or change the value of a specific parameter, the menu to which it belongs will always be specified. To access the page containing the parameter, you must first select this field and set it to the specified menu name; to do so, starting from the situation in Figure 4.5 p. 29:
 1. If needed, turn the knob to preselect the field (B).
 2. Press the knob to select it.
 3. Turn the knob to set the required menu name.
 4. Press the knob to confirm.
- The menu page selection field (C) allows to scroll, and to access if needed, the pages of the previously chosen menu. To do so:
 1. If needed, turn the knob to preselect the field (C).
 2. Press the knob to select it.
 3. Turn the knob to scroll through the pages, until the page containing the parameter whose value you want to check or change is displayed: each turn of the knob, the header of the page selection field changes (**1/n**, **2/n**, ..., **n/n**, where **n** is the total number of pages belonging to the menu), and the parameter page corresponding to the new header is shown. In each menu pages, the parameters are arranged by increasing code; this makes it easier to search for the page containing a specific parameter, especially in menus that have many pages.



In the specific case in which a menu contains only one page, this field is not editable, and therefore not selectable, and always has **1/1** header.

If you need to change one or more of the parameters on the displayed page:

4. Press the knob to access the page.
5. Turn the knob to preselect the parameter of interest on the page.
6. Press the knob to select the parameter.
7. Turn the knob to set the value.
8. Press the knob to confirm.
9. If needed, repeat steps 5-8 to change other parameters on the page.
10. If you need to view and/or change parameters on other menu pages, simply repeat steps 1, 2 and 3 until you see the menu page that contains them, then repeat steps 4-9.





On the other hand, if you do not need to make any changes, after viewing the parameters of interest by scrolling through the various pages of the menu (step

3), press the knob once to access any page of the menu. In this case, access to a page is only needed to exit the menu, as described below.

After displaying and/or changing all the parameters of interest in the menu, turn the knob to preselect the **Back** field and press the knob. This will return you back to the complete parameter list access page, shown in Figure 4.4 p. 29.

4.1.3 Exit from Engineer user level

Once the commissioning and optimisation operations described in the following part of the Installation manual have been completed, you must return back to the user level **Enduser**. Proceed as follows:

1. Press the knob for a few seconds to exit the complete parameter list access page. The  preselected symbol is shown, i.e. .
2. Turn the knob to preselect  symbol, then press the knob to select it (.
3. On the page that appears, turn the knob to preselect the **Enduser** field and press it. The system returns to show the start page, like Figure 4.1 p. 28.

4.2 COMMISSIONING PROCEDURE

1. Remove the cover of the System controller CSK18 enclosure and the external housing panel of the K18 located under its fan.
2. Power up the System controller CSK18 enclosure, the K18 unit and, if present, the auxiliary boiler (K18 Simplygas models).
3. Check that all components are actually powered on:
 - System controller: the display of the QAA74.611 room unit is on and the green led in the top right corner of the RVS21.826 board is on (steady or flashing).
 - K18 unit: the control electronic user interface display on the right side of the unit is on.
 - Auxiliary boiler: refer to the manufacturer's manual.



When the System controller for K18 is powered on, the display of the QAA74.611 room unit will indicate that the system is updating, and will display progress indication of the operation, which may take **several minutes** to complete. When the update completes, the unit will display the start page, as shown in Figure 4.1 p. 28.

4. On the **K18 unit's** user interface, proceed as follows, with reference to its *Installation, user and maintenance manual*:
 - Access menu **4**, with the password **1111**.
 - Select parameter **47** and set it to **2**.
 - Select parameter **210** and set it to **1**.
 - If the DHW production managed by the K18 unit is present (models K18 Simplygas EVO and K18 Hybrigas EVO) and, in the case of the K18 Simplygas model, there is also the auxiliary boiler, select parameter **209** and set it to **1**.

5. Only if the unit is a K18 Simplygas model and the auxiliary boiler is present must its control interface be configured. While still using the user interface **of the K18 unit** (Menu **4**), and while also referring to the relevant *Installation, use and maintenance manual*, operate as follows:
 - Select parameter **49** and set it to **1** (interfacing with the auxiliary boiler via the 0-10 V signal) or **2** (interfacing with the auxiliary boiler via ON/OFF signal).
 - If the interface is with the 0-10 V signal configure parameters **52**, **53** and **54** by following the instructions provided in the installation manual of the K18 unit.
 - If the alarm signal of the auxiliary boiler has been connected (only mandatory **SELV** voltage-free contact, i.e. safety extra low voltage) to the specific input of the K18 unit, select parameter **55** and set it to **1** (alarm contact closed in the presence of an alarm) or **2** (alarm contact open in the presence of an alarm).

6. Access to complete parameter list by operating on the QAA74.611 room unit **of the System controller**, as described in Paragraph 4.1.1 p. 28.
7. If needed, change the System controller language by accessing the **Operator unit** menu and setting parameter **20 (Language)**, as described in Paragraph 4.1.2 p. 29.
8. Access the **Time of day and date** menu and set parameters **1 (Time)** and **1 (Date)**.
9. Access **Configuration** menu, select parameter **6200 (Save sensors)** and set it to **Yes**.



The value of parameter **6200** which displays at the end of the configuration procedure will still be **no**; this is normal (this setting executes an action, i.e. memorization of the actually installed sensors).



The green led on the RVS21.826 board should now be steady on.

10. Access **Diagnostics consumers** menu, select parameter **8703 (Outside temp attenuated)**, preselect **Reset** field and confirm.



The display shows the **Reset** value even before the setting, because it is the only value that can be set. However, the setting **must** be performed to take effect.

11. Return back to the **Enduser** user level, as described in Paragraph 4.1.3 p. 30. This step is not necessary if you intend to proceed immediately with the functional checks described in the next paragraph.

This completes commissioning; you can now run the functional tests to check that the installation and startup were successful.

4.3 FUNCTIONAL TESTS

These tests are not strictly necessary, however they allow

you to quickly identify most problems with the electrical hookup and system anomalies; we **strongly** recommend running them.

4.3.1 Testing the inputs and outputs

1. If needed, access again to the complete parameter list, proceeding as described in Paragraph 4.1.1 p. 28.
2. Access the **Input/output test** menu and select parameter **7700 (Relay test)**.
3. Set it to **QX5 relay output** (QX5 relay output, function Q2 -> heating circuit 1 pump) and check that the heating circuit 1 pump runs (or the zone 1 valve opens).
4. If heating circuit 1 is mixed type:
 - Set the parameter to **QX1 relay output** (QX1 relay output, function Y1 -> open mixing valve on system outlet line) and check that the mixing valve responds as desired.
 - Set the parameter to **Relay output QX2** (QX2 relay output, function Y2 -> open mixing valve on heating circuit 1 inlet line) and check that the mixing valve responds as desired.
5. If heating circuit 2 (or zone 2) is present:
 - Set the parameter to **QX3 relay output** (QX3 relay output, function Q6 -> heating circuit 2 pump) and check that the heating circuit 2 pump runs (or the zone 2 valve opens).
6. If the DHW function managed by the K18 unit is present (EVO models):
 - Set the parameter to **QX4 relay output** (QX4 relay output, function Q3 -> set DHW diverter valve to DHW service) and check that the diverter valve responds as desired.
7. Set parameter to **No test**.
8. Display the page containing parameter **7804 (Sensor temp BX1)** and check its value (BX1 probe, function B9 -> Outdoor temperature).
9. If the DHW function managed by the K18 unit is present (EVO models):
 - Display the page containing parameter **7806 (Sensor temp BX3)** and check its value (BX3 probe, function B3 -> DHW buffer tank temperature).
10. If heating circuit 1 is mixed type:
 - Display the page containing parameter **7807 (Sensor temp BX4)** and check its value (sensor BX4, function B1 -> Heating circuit 1 outlet temperature).



To facilitate checking the connection of each temperature probe to its input, you can take them out of their mounts one at a time and heat them up slightly; observe the variation of the readings on the display to check that they are hooked up to the right inputs. Make sure you have restored each sensor to its own mounting afterwards.

11. If an external request has been installed for heating circuit 1 (or zone 1), e.g. a thermostat or a chronothermostat:
 - Display the page containing parameter **7844 (Input signal H1)** and, by activating the external

request, check the correct switching between the **Open** state to **Closed** state and vice versa.

NOTE: If no external request is present, this test must indicate **Closed** state, due to the jumper **installed at the factory**.

12. If heating circuit 2 (or zone 2) is present, and an external request has been installed:
 - Display the page containing parameter **7858 (Input signal H3)** and, by activating the external request, check the correct switching between the **Open** state to **Closed** state and vice versa.
 - NOTE:** If no external request is present, this test must indicate **Closed** state, due to the jumper **added during installation**.
13. Display and access the page containing parameter **7700 (Relay test)**, select it and set it to **Everything off**.
14. Display and access the page containing parameter **7724 (Output test UX3)**, select it and set it to **50%**.
15. Access the terminal block of the K18 unit (refer to Figure 3.10 p. 26):
 - Check that the **DC** voltage between the **COM** and **DHW** terminals is around **17 V**.
 - Check that **DC** voltage between the **0** and **+10** terminals of the **K18 CONTROL CABLE** terminals group is **5 V**.
 - Check that the **DC** voltage between the **COM** and **RES** terminals is around **8,5 V**.
16. Display and access the page containing parameter **7700 (Relay test)**, select it and set it to **Relay output QX4**.
17. Install a temporary jumper between the **EXTERN RESET** terminals on the CSK18 enclosure terminal block.
18. Access the terminal block of the K18 unit (refer to Figure 3.10 p. 26):
 - Check the voltage between the **COM** and **DHW** terminals again: it should now be around **0 V**.
 - Check the voltage between the **COM** and **RES** terminals again: it should now be around **0 V**.
19. Set parameter **7700 (Relay test)** to **No test**.
20. Display and access the page containing parameter **7724 (Output test UX3)**, select it and set it to **--%** (test disabled).
21. Select **Back** field to return back to the page shown in Figure 4.4 p. 29.
22. Remove the temporary jumper between the **EXTERN RESET** terminals on the CSK18 enclosure terminal block.

4.3.2 Checking the start and stop commands on the heat pump

The System controller for K18 is shipped preconfigured with heating circuit 1 and DHW production (if present) already activated.

The K18 unit may therefore start up from the first time the system is powered on and start and stop during the tests described in Paragraph 4.3.1 p. 31.

1. On the **K18 unit's** user interface, proceed as follows, with reference to its *Installation, user and maintenance manual*:

- Access Menu **4**, with the password **1111**.
 - Select parameter **49**, **take note of the set value** and then set it to **0** (excluded optional auxiliary boiler for **K18 Simplygas** models and integrated boiler module for **K18 Hybrigas** models).
2. If needed, access again to the complete parameter list on the QAA74.611 room unit, proceeding as described in Paragraph 4.1.1 p. 28.
 3. Access **Service/special operation** menu.
 4. Display and access the page containing parameter **7223 (Disable heat pump)**, select it and set it to **Active**.
 5. Display and access the page containing parameter **7212 (Outp selection HP multistage)**, select it and set it to **Compressor 1**.
 6. Display and access the page containing parameter **7202 (Commissioning heat pump)**, select it and set it to **Heating mode**.



When this operation is performed, the heat pump of the K18 unit turns on **after about 3 minutes**; complete the next steps 7-9 **within a few minutes after start-up**.

7. Access the K18 unit's terminal block and check that the **DC** voltage between the **COM** and **REQ** terminals is around **0 V**.
8. Also on the K18 unit terminal block, check the **DC** voltage between the **0** and **+10** terminals of the **K18 CONTROL CABLE** terminal block, located directly under the **COM** terminal; it must be around **10.0 V**.
9. Set parameter **7202 (Heat pump commissioning)** to **Off**.



This cancels the service request to the K18 unit. Some of its components may continue to run for a few minutes, as it runs its shutdown cycle. The following steps can be run without waiting for the unit to shut down completely.

10. Access the K18 unit's terminal block and check that the **DC** voltage between the **COM** and **REQ** terminals is around **15 V**.
11. Also on the K18 unit terminal block, check the **DC** voltage between the **0** and **+10** terminals of the **K18 CONTROL CABLE** terminal block, located directly under the **COM** terminal; it must be around **0 V**.
12. Display and access the page containing parameter **7223 (Disable heat pump)**, select it and set it to **Inactive**.
13. If required, (always for **K18 Hybrigas** models, only in the presence of the auxiliary boiler for **K18 Simplygas** models), access Menu **4** of the user interface of the **K18 unit**, select parameter **49** and reset it to the correct value, which was noted in step **1** of the procedure.

4.3.3 Checking the start and stop commands on the auxiliary boiler (if present)

This Paragraph applies to all units type **K18 Hybrigas**, as well as to those type **K18 Simplygas** if an auxiliary boiler is present.

1. On the **K18 unit's** user interface, proceed as follows, with reference to its *Installation, user and maintenance manual*:

- Access Menu **4**, with the password **1111**.
- Select parameter **50**, **take note of the set value** and then set it to **3**.
- Select parameter **217**, **take note of the set value** and then set it to **10.0**.
- Select parameter **218**, **take note of the set value** and then set it to **10.0**.

2. If needed, access again to the complete parameter list on the QAA74.611 room unit, proceeding as described in Paragraph 4.1.1 p. 28.
3. Access **Service/special operation** menu.
4. Display and access the page containing parameter **7223 (Disable heat pump)**, select it and set it to **Active**.
5. Display and access the page containing parameter **7212 (Outp selection HP multistage)**, select it and set it to **Compressor 1**.
6. Display and access the page containing parameter **7202 (Commissioning heat pump)**, select it and set it to **Heating mode**.



When this operation is performed, the integrated boiler module of the K18 Hybrigas unit (or the auxiliary boiler of the K18 Simplygas unit) is started up; complete the next steps 7-10 **within a few minutes**.



If the boiler does not start, verify that it is actually enabled to operate by actuating the relevant control panel: with regards to the K18 Hybrigas unit, consult its *Installation, use and maintenance manual* and in the case of the K18 Simplygas unit, the manual provided by the manufacturer of the auxiliary boiler.

7. Only for K18 Simplygas units:
 - Access the connection terminal block of the auxiliary boiler, identify the terminals of the ON/OFF request and verify the actual activation of the request from the K18 unit: closed contact, no voltage between the terminals.
8. Only in the case of the K18 Simplygas unit and interface to the auxiliary boiler with the 0-10 V signal:
 - Access the connection terminal block of the auxiliary boiler, identify the terminals of the 0-10 V signal and verify the value of the **DC** voltage; it must correspond to that required by the boiler to obtain a setpoint of 80.0 °C, according to the settings of parameters **52** and **53** described in Paragraph 4.2 p. 30.
9. Only for the K18 Simplygas unit and alarm signal of the auxiliary boiler connected to the specific input of the K18 unit:
 - Generate an alarm of the auxiliary boiler (e.g. by provoking a flame lock-out) and verify that the display of the K18 unit shows the **E495** error.
10. Set parameter **7202 (Heat pump commissioning)** to

Off.



When this operation is performed, the service request to the K18 unit is cancelled and the auxiliary boiler is switched off.

11. Only for K18 Simplygas units:

- Access the connection terminal block of the auxiliary boiler, identify the terminals of the ON/OFF request and verify that the request from the K18 unit is deactivated: open contact, and therefore, DC or AC voltage between the terminals with value depending on the model of the boiler.

12. Only in the case of the K18 Simplygas unit and interface to the auxiliary boiler with the 0-10 V signal:

- Access the connection terminal block of the auxiliary boiler, identify the terminals of the 0-10 V signal and verify the value of the DC voltage that must be approximately 0 V.

13. Only for the K18 Simplygas unit and alarm signal of the auxiliary boiler connected to the specific input of the K18 unit:

- Follow the instructions in the manual of the auxiliary boiler to restore its alarms and verify that the **E495** error no longer appears on the display of the K18 unit.

14. Display and access the page containing parameter **7223 (Disable heat pump)**, select it and set it to

Inactive.

15. Access Menu **4** of the user interface of the **K18 unit** and reset parameters **50, 217** and **218**, setting them to the values noted in step **1** of the procedure.

4.4 STANDBY

Once all checks have been completed, if you do not wish to operate the system but simply ensure antifreeze protection, proceed as follows:

- If needed, access again to the complete parameter list on the QAA74.611 room unit, proceeding as described in Paragraph 4.1.1 p. 28.
 - Access **Heating circuit 1** menu, select parameter **700 (Operating mode)** and set it to **Protection**.
 - If a second heating circuit is present, access next the **Heating circuit 2** menu, select parameter **1000 (Operating mode)** and set it to **Protection**.
 - If DHW service is present, access next the **Domestic hot water** menu, select parameter **1600 (Operating mode)** and set it to **Off**.
 - Follow the instructions provided in Paragraph 4.1.3 p. 30 to return to the **Enduser** user level.
 - Leave the system powered on and the gas line open.
- If you do not wish to ensure antifreeze protection:
- Run steps 1-5 above.
 - Make sure the K18 unit shuts down completely; if the unit is running, wait (about 10 minutes) for it to stop.
 - Leave the system powered off and the gas line closed.

5 SETTINGS

The System controller for K18 is supplied preconfigured with "average" settings, which enable **basic** heating and DHW service (if any) automatically after commissioning. However, for best results, it is often necessary to adjust certain parameters to suit the characteristics of the building and the circuits, as well as the client's specific requirements.

This section contains instructions for satisfactory regulation.

Paragraph 5.1.7 p. 37 also gives information about

the options regarding the installation and use of the QAA74.611 and QAA55.110 room units.



For further details, the full manual for the Siemens RVS21.826 controller may be obtained. However, due to the large number of possible controller adjustments, we do not recommend making settings other than those indicated in this document. For special requirements, please contact the Robur technical support centre.

5.1 OPTIMISING HEATING SERVICE

5.1.1 Heating circuit 1 (or zone 1)

This circuit (or zone) is preconfigured active with the main settings given in Table 5.1 p. 33.

Table 5.1 Heating circuit 1 (or zone 1) preconfiguration

	Preconfiguration	Dependency on parameter
Operating mode	Automatic (Comfort 6 – 22 Monday – Sunday)	700
Comfort setpoint	21 °C	710
Reduced setpoint	18 °C	712
Protection setpoint	7 °C	714
Heating curve slope	0.76 (water setpoint around 40 °C with external temperature -10 °C)	720
Summer/winter heating limit	18 °C	730
Flow temp setpoint min	8 °C	740

	Preconfiguration	Dependency on parameter
Flow temp setpoint max	40 °C	741
Room influence	20%	750
Room temperature limitation	2.5 °C	760

To change the settings of Table 5.1 p. 33, follow the instructions provided in Paragraph 4.1.1 p. 28 to access the complete parameter list, then access **Heating circuit 1** menu; then scroll through the pages to view the parameters shown in Table 5.1 p. 33 and eventually access the pages to be able to select and edit the parameters of interest.



For information about the choice of operating mode, on room setpoint setting and time programming, refer to Paragraph 5.1.3 p. 34. For information on the heating curve slope settings and the min/max water temperature setpoint, see Paragraph 5.1.4 p. 35. For information on the room influence and room temperature limitation settings, see Paragraph 5.1.5 p. 36.

5.1.2 Heating circuit 2 (or zone 2) (if any)

This circuit (or zone) is preconfigured to be inactive; if present, it must be activated by adding a jumper or external request signal (e.g. zone thermostat or thermostat

timer), as described in figure 3.9 p. 25.

Once activated, the preconfigured settings are those given in Table 5.2 p. 34.

Table 5.2 Heating circuit 2 (or zone 2) preconfiguration (if any)

	Preconfiguration	Dependency on parameter
Operating mode	Automatic (Comfort 6 – 22 Monday – Sunday)	1000
Comfort setpoint	21 °C	1010
Reduced setpoint	18 °C	1012
Protection setpoint	7 °C	1014
Heating curve slope	0.76 (water setpoint around 40 °C with external temperature -10 °C)	1020
Summer/winter heating limit	18 °C	1030
Flow temp setpoint min	8 °C	1040
Flow temp setpoint max	40 °C	1041
Room influence	20%	1050
Room temperature limitation	2.5 °C	1060

To change the settings of Table 5.2 p. 34, follow if needed the instructions provided in Paragraph 4.1.1 p. 28 to access the complete parameter list, then access **Heating circuit 2** menu; then scroll through the pages to view the parameters shown in Table 5.2 p. 34 and eventually access the pages to be able to select and edit the parameters of interest.



For information about the choice of operating mode, on room setpoint setting and time programming, refer to Paragraph 5.1.3 p. 34. For information on the heating curve slope settings and the min/max water temperature setpoint, see Paragraph 5.1.4 p. 35. For information on the room influence and room temperature limitation settings, see Paragraph 5.1.5 p. 36.

setpoint set to **Comfort**.



This setting forces the heating service to run even when the system is in summer mode.

- **Reduced:** the circuit (or zone) works with the room setpoint set to **Reduced**.
- **Protection:** the circuit (or zone) works with the room setpoint set to **Protection** (antifreeze).

To set the operating mode and the room setpoint of heating circuit 1, proceed as described in Paragraph 5.1.1 p. 33 to edit parameters **700 (Operating mode)**, **710 (Comfort setpoint)**, **712 (Reduced setpoint)** and **714 (Protection setpoint)**; for heating circuit 2, proceed as described in Paragraph 5.1.2 p. 34 to edit parameters **1000 (Operating mode)**, **1010 (Comfort setpoint)**, **1012 (Reduced setpoint)** and **1014 (Protection setpoint)**.



The operating mode and the comfort setpoint can easily be modified at a later time by the end user. See the User manual for further details.

5.1.3 Operating mode selection, room setpoint and time program setting

The operating mode can be set separately for the heating circuits/zones as described in the two previous paragraphs. The following settings are available:

- **Automatic:** the circuit (or zone) works with the **Comfort** or **Reduced** room setpoint, depending on the time programming.
- **Comfort:** the circuit (or zone) works with the room

If you select **Automatic** operating mode, the preconfigured time programming provides a daily time slot at **Comfort** setpoint from **6:00** to **22:00**. Proceed as follows to change this setting.

For heating circuit 1

1. If needed, follow instructions in Paragraph 4.1.1 p. 28 to access the complete parameter list, then access **Time prog heating/cooling 1** menu.
2. Select the **Set time program** field, then follow the instructions provided in the System controller User manual to proceed with programming.

For heating circuit 2

1. Proceed the same way, but using the **Time program heating/cooling 2** menu.

5.1.4 Setting the heating curve slope and min/max outlet water setpoint

To set the heating curve slope for a heating circuit, refer to Figure 5.1 p. 36 and select the curve that passes through the circuit's design point (water outlet setpoint required at the minimum outdoor design temperature, with reference to the room temperature setpoint **20 °C**). For example, if the minimum outdoor design temperature is **- 5 °C** and the circuit requires a water outlet temperature in these conditions of **55 °C** to maintain a **20 °C** room temperature, set the slope to **1.5**.

To avoid reaching too high temperatures in unexpectedly harsh climate conditions, we recommend setting the **Flow temp setpoint max** parameter to a suitable value. As a first general criterion, set this parameter to a value that ensures the system and building will not be damaged.



Special care must be taken in the case of floor heating systems. It is best to ask the system installer and the flooring vendor for advice, especially for parquet floors. Moreover, for floor heating systems it is recommended that the heating be supplied by

a mixed heating circuit.

Furthermore, except for cases in which the system will be operated exclusively with the auxiliary boiler at high thermal loads (i.e. the system is intended to run at a higher water temperature setpoint than the operating limit of the K18 heat pump), we recommend setting this parameter to no more than **65 °C**.

To optimise the heating service with certain room heat exchangers (for example, ducted hot air or fan coil heating) it is often also worth setting the value of the **Flow temp setpoint min** parameter to ensure sufficient heat exchange in all room conditions.



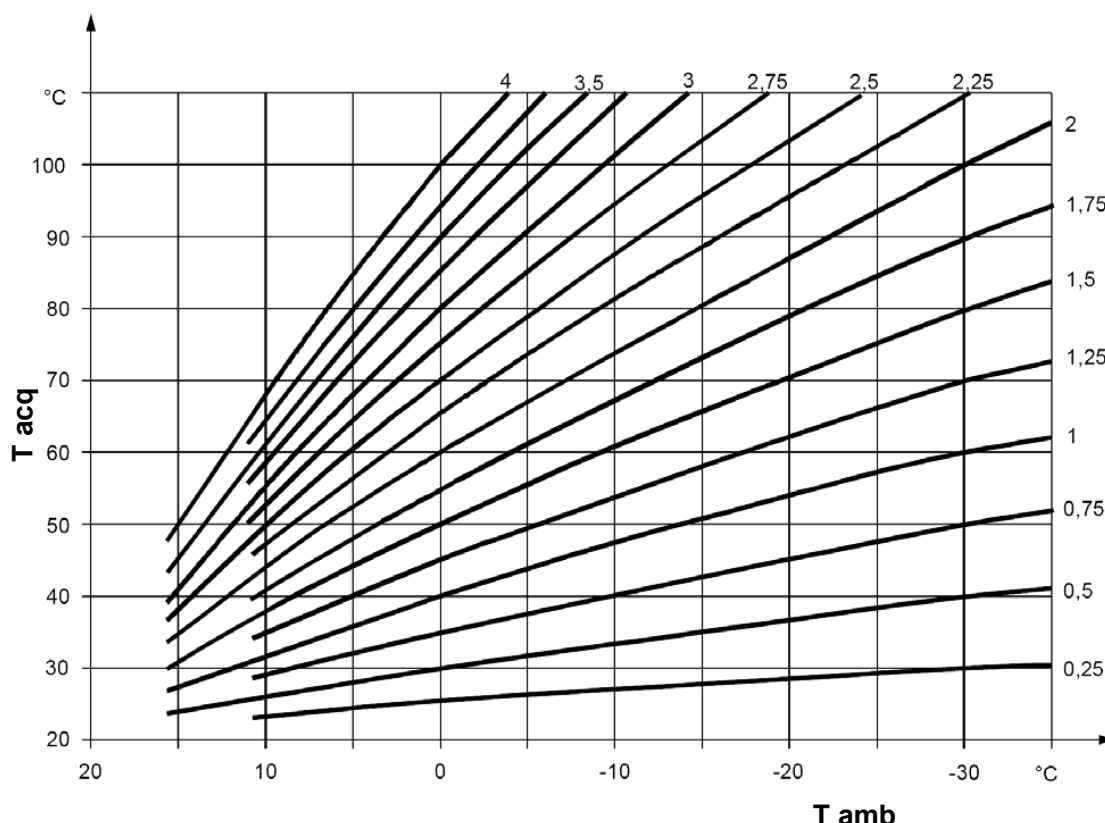
Since the efficiency of the K18 heat pump (GUE, Gas Utilization Efficiency) is greater the lower the water temperature, it is good to set these parameters to the lowest value compatible with the needs of distribution. This enables you to get the most out of heating curve operating mode, and boosts efficiency.

To set the heating curve slope and the flow temp setpoint min and max of heating circuit 1, proceed as described in Paragraph 5.1.1 p. 33 to edit parameters **720 (Heating curve slope)**, **740 (Flow temp setpoint min)** and **741 (Flow temp setpoint max)**; for heating circuit 2, proceed as described in Paragraph 5.1.2 p. 34 to edit parameters **1020 (Heating curve slope)**, **1040 (Flow temp setpoint min)** and **1041 (Flow temp setpoint max)**.



Be careful not to change the factory setting (**Unused**) of parameters **742** and **1042 (Flow temp setpoint room stat)**.

Figure 5.1 Heating curve graph - Each curve plots the outlet temperature against the outdoor temperature, when the room setpoint temperature is 20 °C



T_{acq} water temperature

T_{amb} external ambient temperature

5.1.5 Setting the Room influence and Room temperature limitation parameters

When a room unit is installed in a heated room (reference room), it acquires the local temperature and interacts with the control system. In particular, it may:

1. Modify the outlet water setpoint relative to the heating curve setpoint. If the reference room temperature stays below the requested value for too long or reaches it too slowly, the water setpoint is gradually increased. In the opposite case, the water setpoint is gradually decreased. This compensates for errors in selecting the heating curve or due to particular conditions (variations in the internal thermal load, strong winds, etc.). This compensating action can be made more or less effective, to the point of completely substituting the heating curve system, or it can be disabled. Heating circuit 1 and, if present, heating circuit 2, are preconfigured to use this function in relation to the included room unit 1 temperature reading, with a mild compensating action (**20%**), which is suited to many installations. To modify the degree of influence, or disable the function:
 - for heating circuit 1, proceed as described in Paragraph 5.1.1 p. 33 to edit parameter **750 (Room influence)**; for heating circuit 2, proceed as described in Paragraph 5.1.2 p. 34 to edit parameter **1050 (Room influence)**. Set the influence

level as %, or set --% to disable the function.



Setting a value of **100 %** disables the heating curve. It is best not to use this setting, or even very high influence percentages. For most applications, do not exceed a setting of **30 %**.

2. Interrupt the heating service request when the reference room temperature exceeds the setpoint by a configurable amount. This action is similar to that of a normal room thermostat or chronothermostat. Heating circuit 1 and, if present, circuit 2 as well, are preconfigured to use this function in relation to the temperature read by room unit 1 (included), with a value of **2.5 K** (the service request is interrupted when room unit 1 reads a temperature **2.5** degrees higher than the setpoint). To change this setting or disable the function:

- for heating circuit 1, proceed as described in Paragraph 5.1.1 p. 33 to edit parameter **760 (Room temp limitation)**; for heating circuit 2, proceed as described in Paragraph 5.1.2 p. 34 to edit parameter **1060 (Room temp limitation)**. Set the desired value, or set --°C to disable the function.

5.1.6 Setting the building time constant

Climate regulation does not directly use the outdoor

temperature acquired by the sensor, but a value which has passed an inertial filter. This accounts for the thermal inertia of the building, thus damping the variation of the outlet setpoint in relation to changes in the outdoor temperature.

The filter is preconfigured to a value of **10** hours, which is suitable for a vast range of buildings with moderate thermal inertia.

To modify this setting, proceed as follows:

1. If needed, follow instructions in Paragraph 4.1.1 p. 28 to access the complete parameter list, then access **Configuration** menu.
2. Display and access the page containing parameter **6110 (Time constant building)**, select it and set it to desired value:
 - **0 h** Filter disabled (not recommended)
 - **< 10 h** Building with low thermal inertia
 - **10-20 h** Building with average thermal inertia
 - **> 20 h** Building with high thermal inertia

5.1.7 Choice of installation and use of room units

The system is supplied with a QAA74.611 room unit. The room unit is preconfigured as **Room unit 1** to acquire the room temperature in a reference heated room served by heating circuit 1, and to influence the regulation of this circuit accordingly and, if present, **also that of heating circuit 2** (as described in Paragraph 5.1.5 p. 36). This setting is suited to the following type of installation:

Case 1

- The included room unit is actually installed in a reference heated room.
- Heating circuit 2 is not present or, if so, no dedicated room unit will be installed.
- If both heating circuits are present: the reference room, served by heating circuit 1, is at least partly also representative of the rooms served by circuit 2.



You can adjust the parameters described in Paragraph 5.1.5 p. 36, differentiating the settings for the two circuits, to the point even of disabling one or both of the room unit influence functions for heating circuit 2, which does not directly serve the reference room.

If, on the other hand, the situation is as follows:

Case 2

- The included room unit is not installed in a reference heated room, for example, it is in the machine room.
- In this case, you must configure the room unit so as not to provide the room temperature value to the system. Proceed as follows:

1. If needed, follow instructions in Paragraph 4.1.1 p. 28 to access the complete parameter list, then access **Operator unit** menu.
2. Display and access the page containing parameter **40 (Used as)**, select it and set it to **Operator unit 1**.
3. Access **Configuration** menu.
4. Display and access the page containing parameter

6200 (Save sensors), select it and set it to **Yes**.



The value of parameter **6200** which displays at the end of the configuration procedure will still be **no**; this is normal (this setting executes an action, i.e. memorization of the actually installed sensors).

Finally, in the following situation:

Case 3

- Both heating circuits are present.
- A second room unit dedicated to heating circuit 2 is present.

In this case, you must configure the first room unit, installed in a reference room served by circuit 1, so that it is dedicated to that circuit. Proceed as follows, **working on the first room unit**:

1. If needed, follow instructions in Paragraph 4.1.1 p. 28 to access the complete parameter list, then access **Operator unit** menu.
2. Display and access the page containing parameter **40 (Used as)**, select it and set it to **Room unit 1**.
3. Display and access the page containing parameter **47 (Room values device 1)**, select it and set it to **For zone 1 only**.
4. Display and access the page containing parameter **48 (Warmer/cooler device 1)**, select it and set it to **For zone 1 only**.

You must now configure the second room unit, installed in a reference room served by heating circuit 2. Proceed as follows, depending on the type of room unit:


Second room unit type QAA74.611

Proceed as follows, **working on the second room unit**:

- If needed, follow instructions in Paragraph 4.1.1 p. 28 to access the complete parameter list, then access **Operator unit** menu.
- Display and access the page containing parameter **40 (Used as)**, select it and set it to **Room unit 2**.

Second room unit type QAA55.110

Proceed as follows, **working on the second room unit**:

- Press the occupancy button  for at least 3 seconds, until the display reads ru = 1, ru = 2 or ru = 3.
- Turn the knob to set the parameter to ru = 2.
- Wait for the text ru = 2 to clear from the display.

Now, **on the first room unit**, proceed as follows:

5. If needed, follow instructions in Paragraph 4.1.1 p. 28 to access the complete parameter list, then access **Configuration** menu.
6. Display and access the page containing parameter **6200 (Save sensors)**, select it and set it to **Yes**.



The value of parameter **6200** which displays at the end of the configuration procedure will still be **no**; this is normal (this setting executes an action, i.e. memorization of the actually installed sensors).

5.2 OPTIMISING DHW PRODUCTION

5.2.1 Main preconfigured settings

DHW service managed by K18 unit (if present, K18

Simplygas EVO and K18 Hybrigas EVO models) is pre-configured active with the main settings given in Table 5.3 p. 38.

Table 5.3 DHW service preconfiguration (if present)

	Preconfiguration	Dependency on parameter
Operating mode	On	1600
Nominal setpoint	55 °C	1610
Reduced setpoint	45 °C	1612
Request	24h/day	1620
Charging priority	absolute	1630
Legionella function	off	1640
Legionella function week day	Thursday	1642
Legionella function time	02:00	1644
Legionella function setpoint	60 °C	1645
Legionella function duration	45 min	1646

To change these settings, follow the instructions provided in Paragraph 4.1.1 p. 28 to access the complete parameter list, then access **Domestic hot water** menu; then scroll through the pages to view the parameters shown in Table 5.3 p. 38 and eventually access the pages to be able to select and edit the parameters of interest.



For information about the choice of operating mode, the setpoint setting and time programming, refer to Paragraph 5.2.2 p. 38. For information about the legionella function, refer to Paragraph 5.2.3 p. 38.

5.2.2 Operating mode selection, DHW setpoint and time program setting

The operating mode for DHW production can be set to the following values:

- **Off:** DHW service is inactive.
- **On:** DHW production with the K18 unit and (if present) the auxiliary boiler is active with the nominal or reduced setpoint, depending on the value of the parameter **Release** and its time programming, if any.
- **Eco:** DHW production with the K18 unit and (if present) the auxiliary boiler is always active with the reduced setpoint.

The **Release** parameter is preconfigured to handle DHW production 24 hours a day at nominal level. If you wish to reduce the setpoint for certain times of the day (e.g. at night) and/or days of the week, the parameter can be set to the following values:

- **24h/day:** production at the nominal setpoint 24 hours a day, 7 days a week.
- **All time programs HC/CC:** production at the nominal setpoint at all times in which at least one of the time programs **of the heating circuits** is set to the comfort room setpoint; production at the reduced setpoint otherwise.



The system switches from reduced to nominal setpoint one hour ahead of switching from reduced to comfort room setpoint in the heating circuits time

programs.

- **Time program 4/DHW:** production at nominal or reduced setpoint depending on time program 4 (specific for DHW). This provides an additional time program for DHW which is independent of the heating circuit time programs.

To set the operating mode, the DHW setpoint and the parameter **Release**, proceed as described in Paragraph 5.2.1 p. 38 to edit parameters **1600 (Operating mode)**, **1610 (Nominal setpoint)**, **1612 (Reduced setpoint)** and **1620 (Release)**.



The operating mode and the nominal setpoint can easily be modified at a later time by the end user. See the User manual for further details.

If parameter **Release** is set to **Time program 4/DHW**, the preconfigured time programming provides for a first daily time slot at **nominal** from **00:00** to **05:00** and a second from **17:00** to **21:00**. To change this setting:

1. If needed, follow instructions in Paragraph 4.1.1 p. 28 to access the complete parameter list, then access **Time program 4/DHW** menu.
2. Select the **Set time program** field, then follow the instructions provided in the System controller User manual to proceed with programming.

5.2.3 Setting the legionella function

To activate the legionella function, use the **Legionella function** parameter, which takes the following values:

- **Off:** Legionella function inactive
- **Periodically:** The function is performed every **n** days, with **n** editable by a specific parameter; **not recommended**.
- **Fixed weekday:** The function is performed once a week on the day specified by the appropriate parameter.



The legionella function is preconfigured as **inactive**.

i If the legionella function is activated, it is pre-configured to run **Thursday** nights from **02:00** with a DHW setpoint of **60 °C**, which must be maintained for **45** minutes. This can be changed with the parameters listed in Paragraph 5.2.1 p. 38.

i **Before modifying the default settings, get in contact with Robur technical support centre.**

To activate legionella function and, if needed, change its default settings, proceed as described in Paragraph 5.2.1 p. 38 to edit parameters **1640 (Legionella function)**, **1642 (Legionella function weekday)**, **1644 (Legionella function time)**, **1645 (Legionella function setpoint)** and **1646 (Legionella function duration)**.

i Do not set a too high DHW setpoint for the legionella function. If there is no auxiliary boiler, in particular, do not exceed **62-63 °C**.

i If the legionella function is activated, it is important that the relevant settings allow it to execute

completely. If the system determines that it has not completed (e.g., the setpoint was not reached), it will restart it repeatedly. In wintertime, this can impact the system's heating service.

i For this reason, if the function is activated, make sure to run a test cycle to check that the system can complete the function as programmed.

5.3 OPTIMIZING AUXILIARY BOILER MANAGEMENT

A basic configuration is implemented during the commissioning operations (see Paragraph 4.2 p. 30, if necessary) of the parameters of the K18 unit, related to the management of the integrated boiler module (models K18 Hybrigas) or the optional auxiliary boiler (models K18 Simplygas). However, you can change various aspects of the control method of the integrated boiler module or the auxiliary boiler by setting other parameters of the K18 unit.

For further details and instructions refer to the *Installation, use and maintenance manual* of the K18 unit.

6 ERRORS

6.1 LIST OF ERRORS AND TROUBLESHOOTING INSTRUCTIONS


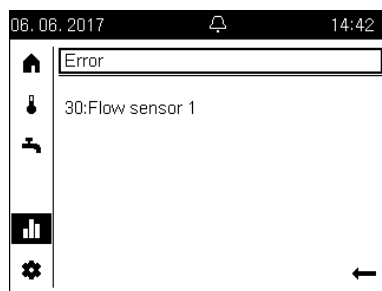
Table 6.1 p. 39 lists the error codes, their descriptions and priorities, which may be generated by the System controller for K18, when configured to support the circuits envisaged in this manual. The last column of the table lists measures for resolving the problem. Errors are shown on the QAA74.611 room unit's display with the  symbol, which is shown in the status bar. In this case, following the instructions in Paragraph 2.13 of the User manual, it is possible to access the error information page, that displays the code and description of the highest priority error. An example of such a page is shown in Figure 6.1 p. 39. No other errors will be displayed until this error is resolved.

Figure 6.1 Error information page



selectable field at the bottom left, turn the knob to pre-select it, then press the knob to select it and perform the reset attempt; if successful, the page will be automatically closed. However, the cause of the error must be identified and solved to prevent it from reoccurring.

Table 6.1 List of system controller errors for K18

Code	Description	Priority	Action
10	Outside sensor B9	6	A
30	Flow sensor 1 ⁽¹⁾	6	A
50	DHW sensor 1 ⁽²⁾	6	A
60	Room sensor 1 ⁽³⁾	6	B
65	Room sensor 2 ⁽⁴⁾	6	B
83	BSB, short-circuit ⁽⁵⁾	8	C
84	BSB, address collision	3	D
103	Communication failure	3	C
127	Legionella temp	6	E
324	BX same sensors	3	F
330	BX1 no function	3	G
331	BX2 no function	3	G
332	BX3 no function	3	G
333	BX4 no function	3	G
173	Active alarm 3 contact	6	H

(1) Probe B1 (heating circuit 1 outlet sensor)

(2) Probe B3 (DHW production tank probe)

(3) Room unit 1

(4) Room unit 2

(5) Shown in this form in the error log (see Paragraph 6.2 p. 42). The information page displays the text "**No connection**" without error code

6.1.1 Troubleshooting measures

A Codes 10, 30, 50

1. Memorize the sensors:

Errors are usually reset automatically when the problem in question is resolved; only if the error information page, accessed as described above, contains the **Reset**

- Access the complete parameter list, proceeding as described in Paragraph 4.1.1 p. 28, then access the **Configuration** menu; display and access the page containing parameter **6200 (Save sensors)**, select it and set it to **Yes**.



The value of parameter **6200** which displays at the end of the configuration procedure will still be **no**; this is normal (this setting executes an action, i.e. memorization of the actually installed sensors).

- Wait for a minute.
2. If step 1 does not resolve the problem:
 - Check the connection of the sensor in question, fix it and save the sensors again as indicated in step 1.
 3. If step 2 does not resolve the problem:
 - Disconnect the sensor from the RVS21.826 controller and measure the resistance between the cable's two wires. If the measurement indicates a short or open circuit, identify and resolve the problem, which may be due to the sensor itself or its wiring. Once the problem has been resolved, reconnect the sensor and memorize it again as indicated in step 1.
 4. If step 3 does not resolve the problem:
 - If needed, access again the complete parameter list, proceeding as described in Paragraph 4.1.1 p. 28, then access the **Configuration** menu; display the page containing the parameter:
 - Error code 10: **5930 (Sensor input BX1)**; check that it is set to **Outside sensor B9**; if not, access the page, select the parameter and set it to this value.
 - Error code 30: **5933 (Sensor input BX4)**; check that it is set to the value **Used by parameter 6014**; if not, display and access the page containing parameter **6014 (Function mixing group 1)**, select it and set it to **Heating circuit 1**. **WARNING:** This sensor is used only if heating circuit 1 is mixed, otherwise no sensor should be connected to input **BX4**. If a sensor is connected to this input by mistake, remove it, then run save sensors again as indicated in step 1.
 - Error code 50: **5932 (Sensor input BX3)**; check that it is set to **DHW sensor B3**; if not, access the page, select the parameter and set it to this value. **WARNING:** This sensor is used only if DHW production is managed by the K18 unit, otherwise no sensor should be connected to input **BX3**. If a sensor is connected to this input by mistake, remove it, then run save sensors again as indicated in step 1.
 - Run sensor memorization again as indicated in step 1.
 5. If step 4 does not resolve the problem:
 - Power cycle the System controller; if the problem persists, contact the Robur technical support centre.

B Codes 60, 65

1. Memorize the sensors:

- Access the complete parameter list, proceeding as described in Paragraph 4.1.1 p. 28, then access the **Configuration** menu; display and access the page containing parameter **6200 (Save sensors)**, select it and set it to **Yes**.



The value of parameter **6200** which displays at the end of the configuration procedure will still be **no**; this is normal (this setting executes an action, i.e. memorization of the actually installed sensors).

- Wait for a minute.
2. If step 1 does not resolve the problem:
 - Check the communications between the controller and the room unit/s and their configuration (see Paragraph 5.1.7 p. 37). Resolve the problem, then run sensor memorization again as indicated in step 1.
 3. If step 2 does not resolve the problem:
 - Power cycle the System controller; if the problem persists, contact the Robur technical support centre.

C Codes 83, 103

1. Check the cables connecting the room unit/s to the RVS21.826 controller:
 - No short circuits between the wires.
 - No broken wires.
 - Correct wire polarity on controller and room unit(s).
 - Stable, secure connection of all cables to all controller and room unit terminal blocks.
 Correct any problems.
2. If step 1 does not resolve the problem:
 - Power cycle the System controller; if the problem persists, contact the Robur technical support centre.

D Code 84

This problem occurs when two room units are connected and they are both configured as the same type of device (e.g., both as room unit 1).

1. Resolve the problem as indicated in Paragraph 5.1.7 p. 37, **Case 3**, to configure the two room units correctly.
2. If step 1 does not resolve the problem:
 - Power cycle the System controller; if the problem persists, contact the Robur technical support centre.

E Code 127

This problem is caused by fault to achieve and maintain the legionella function setpoint while the function is executing.

1. Check sensor B3:
 - Check the position and thermal contact of probe **B3** in its mounting on the DHW tank. Correct the problem.
2. If step 1 does not resolve the problem:
 - Check the setpoint setting (parameter **1645**, see also Paragraph 5.2.1 p. 38 and 5.2.3 p. 38) and set a lower value if necessary, especially if no auxiliary boiler is present.

3. If step 2 does not resolve the problem, check the following system characteristics:
 - Water outlet during DHW charging.
 - Proper sizing of the coil exchanger in the DHW tank (exchange surface area).
4. If step 3 does not resolve the problem, contact the Robur technical support centre.

F Code 324

This error is generated if two or more **BX** temperature sensors have been configured to a single function.

1. Check the configuration:
 - Access the complete parameter list, proceeding as described in Paragraph 4.1.1 p. 28, then access the **Configuration** menu; display the pages containing the parameters:
 - **6014 (Function mixing group 1)**; access the page, select the parameter and set it to **Multifunctional**.
 - **5930 (Sensor input BX1)**; check that it is set to **Outside sensor B9**; if not, access the page, select the parameter and set it to this value.
 - **5931 (Sensor input BX2)**; check that it is set to **None**; if not, access the page, select the parameter and set it to this value.
 - **5932 (Sensor input BX3)**; check that it is set to **DHW sensor B3**; if not, access the page, select the parameter and set it to this value.
 - **5933 (Sensor input BX4)**; access the page, select the parameter and set it to **None**.
 - **6014 (Function mixing group 1)**; access the page, select the parameter and set it to **Heating circuit 1**.
 - Save sensors: display and access the page containing parameter **6200 (Save sensors)**, select it and set it to **Yes**.



The value of parameter **6200** which displays at the end of the configuration procedure will still be **no**; this is normal (this setting executes an action, i.e. memorization of the actually installed sensors).

- Wait for a minute.
2. If step 1 does not resolve the problem:
 - Power cycle the System controller; if the problem persists, contact the Robur technical support centre.

G Codes 330, 331, 332, 333

This problem is due to the physical presence of a sensor connected to one of inputs **BX1, BX2, BX3, BX4**, to which no function is assigned.

1. Check the configuration:
 - Access the complete parameter list, proceeding as described in Paragraph 4.1.1 p. 28, then access the **Configuration** menu. Display the page containing the parameter:
 - Error code 330: **5930 (Sensor input BX1)**; check that it is set to **Outside sensor B9**; if not, access the page, select the parameter and set it to this value.

- Error code 331: **5931 (Sensor input BX2)**; remove the optional sensor connected to input **BX2** (not used in the standard configurations).
- Error code 332: **5932 (Sensor input BX3)**; check that it is set to **DHW sensor B3**; if not, access the page, select the parameter and set it to this value.
- Error code 333: **5933 (Sensor input BX4)**; check that it is set to the value **Used by parameter 6014**; if not, display and access the page containing parameter **6014 (Function mixing group 1)**, select it and set it to **Heating circuit 1**.
- Save sensors: display and access the page containing parameter **6200 (Save sensors)**, select it and set it to **Yes**.



The value of parameter **6200** which displays at the end of the configuration procedure will still be **no**; this is normal (this setting executes an action, i.e. memorization of the actually installed sensors).

- Wait for a minute.
2. If step 1 does not resolve the problem:
 - Power cycle the System controller; if the problem persists, contact the Robur technical support centre.

H Code 173

This error is generated when the K18 unit activates its alarm output. This is therefore a signal of an error of the K18 unit and not of the System controller.



In the case of K18 Hybrigas unit, or K18 Simplygas unit and in the presence of the auxiliary boiler and connection of its alarm signal to the specific input of the K18 unit, the error can also be generated by the auxiliary boiler.

1. You can read the error code (or codes) of the heat pump of the K18 unit by viewing its display through the transparent window on the right side of the casing. The **E495** error code indicates the presence of an alarm of the integrated boiler module of the K18 Hybrigas unit or the optional auxiliary boiler connected to the K18 Simplygas unit.



If there are multiple errors, the K18's display will cycle through their codes. For further details and an explanation of the meanings of the error codes, refer to the K18 unit's *Installation, use and maintenance manual*.

2. The error conditions of the heat pump of the K18 unit can be reset by pressing the button on the lower side of the CSK18 enclosure (detail P Figure 2.1 p. 10), or that on the unit under the transparent window on the right side of the casing.

If error **E495** is active:

3. For the **K18 Hybrigas** unit: you can read the error code of the integrated boiler module by viewing its display through the transparent window on the left side of the casing.

Reset the error condition by pressing the button near this window for 1-2 seconds.



Do not press the button for longer as this activates test functions intended for the TAC.



For additional information and an explanation of the meanings of the error codes, refer to the *Installation, use and maintenance manual* of the K18 unit.

4. For **K18 Simplygas** unit: refer to the manual of the manufacturer of the auxiliary boiler for the interpretation of any error code displayed on its control panel and for the reset instructions.
5. If steps **2** and/or **3-4** do not resolve the problem, or if

it reoccurs after a while, contact the Robur TAC for the K18 unit.

6.2 ERROR LOG

The controller keeps the 10 most recent errors in memory; new errors overwrite the oldest ones as they occur. To access the log:

- Access the complete parameter list, proceeding as described in Paragraph 4.1.1 p. 28, then access the **Fault** menu; display the pages containing parameters **6800 (History 1)**, **6802 (History 2)**, ..., **6818 (History 10)**.



The data are kept in chronological order, from the most recent to the oldest (**History 1** contains the most recent error, **History 10** the oldest).

7 SPECIAL OPERATIONS AND CONFIGURATIONS

7.1 RESTORING FACTORY SETTINGS

If you wish to restore the controller's factory setting, proceed as follows:

1. Access the complete parameter list, proceeding as described in Paragraph 4.1.1 p. 28, then access the **Configuration** menu; display and access the page containing parameter **6205 (Reset to default parameters)**, select it and set it to **Yes**.



The value of parameter **6205** which displays at the end of the configuration procedure will still be **no**; this is normal (this setting executes an action, i.e. restore of the default parameters).



The factory settings can only be restored if any previous settings have not already been saved, using parameter **6204 (Save parameters)**. If so, using parameter **6205** will simply recall the previously saved settings.




Since saving a configuration overwrites the factory defaults, we recommend **not doing so**; this means you can always recall the factory settings if you think your custom configurations are mistaken.

Alternatively, you can save the controller's final configuration, **but only after being absolutely sure that the system is working as desired**.

7.2 LOCKING QAA55.110 ROOM UNIT CONTROLS

It is possible to disable the settings modification, usually made by the user using the keys on the QAA55.110 type room unit. Proceed as follows:

- **On the room unit you wish to lock**, hold down the

occupancy key  for at least 3 seconds, until the display reads ru...

- Press the occupancy key again, the display will read P2.
 - Turn the knob to set P2 = 1.
 - Wait for the display to inlet to its normal screen.
- To unlock the commands, set P2 = 0 in the same way.



These commands are detailed in the User manual of the System controller for K18.

APPENDIX A: TECHNICAL DATA

Table RVS21.826 technical data

Power supply	Supply voltage	AC 230 V (+10%/-15%)				
	Frequency	50 / 60 Hz				
	Consumption	max 9,5 VA				
	Power supply protection	Thermal-magnetic circuit breaker: max. 13 A (EN60898-1) or fuse: max. 10 AT				
Cabling	230 VAC supply and outputs; bars or braided cables (with/without terminals)	1 cable: 0,5 - 2,5 mm ² 2 cables: 0,5 - 1,5 mm ²				
Function	Software class	A				
	Operation per EN 60730	1.B (automatic operation)				
Inputs	230 VAC inputs EX1...EX4 • Functional range • Low state voltage • High state voltage • Internal resistance	max 230 Vac 0 - 253 VAC < 170 VAC 190 VAC > 100 kΩ				
	Digital inputs H1, H3 • Open contact voltage • Closed contact current	Safety Extra Low Voltage (SELV) for voltage-free contacts DC 12 V DC 3 mA				
	Analogue inputs H1, H3 • Functional range • Internal resistance	Safety Extra Low Voltage (SELV) DC 0 - 10 V > 100 kΩ				
	Pulse count inputs H1, H3 • Open contact voltage • Closed contact current • Pulse duration	Safety Extra Low Voltage (SELV) for voltage-free contacts DC 12V DC 3 mA min. 20 ms				
	Frequency measurement inputs H1, H3 • Functional range • Low state voltage • High state voltage • Internal resistance • Frequency	Safety Extra Low Voltage (SELV) DC 0 - 12 V < 1,7 V 2,7...12 V > 100 kΩ max. 500 Hz				
	Digital inputs DI6, DI7 (on connector X75) • Open contact voltage • Closed contact current	Safety Extra Low Voltage (SELV) for voltage-free contacts DC 12 V DC 3 mA				
	Sensor inputs BX1 - BX4	NTC 1k (QAC34, external sensor), NTC 10k (QAZ36, QAD36), Pt1000 (optional for solar collector and exhaust gas sensor) 5053...9671 Ω (room setpoint modification function)				
	Sensor cables (copper) • Cross section • Max. length	- 0,25 20	0,5 40	0,75 60	1,0 80	1,5 (mm ²) 120 (m)

Outputs	Relay outputs QX1...QX5 • Current range • Switching ON current • Total current • Voltage range	- AC 0,02...2 (2) A max. 15 A for ≤1 s max AC 10 A (total, all 230 VAC outputs) AC 24 - 230 V (for voltage-free contact outputs)
	Triac output ZX6 • Current range • Switching ON current • Total current	- AC 0,02 - 2 (2) A (On/Off operation); AC 0,02 - 1,2 (1,2) A (speed control) max. 4 A for ≤1 s max AC 10 A (total, all 230 VAC outputs)
	Analogue outputs UX1, UX2, UX3 (UX3 on connector X75) • Output voltage • Current • Ripple • Zero level accuracy • Error over rest of range	Safety Extra Low Voltage (SELV) outputs with short-circuit protection U _{out} = 0...10,0 V max ±2 mA RMS; ±2,7 mA peak ≤ 50 mV _{pp} < ± 80 mV ≤ 130 mV
	Outputs PWM UX1, UX2, UX3 (UX3 on connector X75) • Output voltage • Current • Frequency	Safety Extra Low Voltage (SELV) outputs with short-circuit protection High level 10 VDC, low 0 VDC U _x = min. 6 V @ 5 mA 3 kHz
	Digital outputs D1, D2, D3 (on connector X75) • Output voltage • Current	Internal pull-up High level 12 VDC, low 0 VDC max. 2,5 mA
	Power G+ • Output voltage • Current	Safety Extra Low Voltage (SELV), outputs with short-circuit protection 11,3...13,2 V max. 88 mA
	Power GX1 (configurable) • Output voltage 5 V • Output voltage 12 V • Current	Safety Extra Low Voltage (SELV), outputs with short-circuit protection 4,75...5,25 V 11,3...13,2 V max. 20 mA
Interfaces	BSB • Base unit/peripheral cable length • Total cable length • Cross section	Two-wire connection (not invertible) max. 200 m max. 400 m (max. cable capacity: 60 nF) min. 0,5 mm ²
	LPB (optional with LPB OCI345.06/101 adapter connected to X70) Cable length: • with power from controllers on bus (per controller) • with central power on bus • Bus load number	copper cable 1,5 mm ² two-wire connection (not invertible) - max. 250 m max. 460 m E = 3
	Modbus (optional with OCI350.01 Modbus adapter on X60)	for details, see the OCI350.01 Modbus adapter technical data
Protection rating and safety class	Enclosure protection rating per EN60529	IP 00 (without enclosure)
	Safety class per EN60730	safety class II for LV parts, if correctly installed
Standards, safety, EMC, etc.	Degree of contamination per EN60730	degree of contamination normal
	CE conformity (EU)	CE1T2355xx04
Climatic conditions	Storage, per EN60721-3-1	class 1K3, -20 - 65 °C
	Transport, per EN60721-3-2	class 2K3, -25 - 70 °C
	Operation, per EN60721-3-3	class 3K5, -20 - 50 °C (non condensing)
Weight	Packaging excluded	193 g

Table QAA55.110 technical data

Power supply	Bus powered	BSB
Room temperature measurement	Measurement range	0 - 50 °C
	Per EN12098:	-
	• Range 15 - 25 °C • Range 0 - 15 °C or 25 - 50 °C • Resolution	tolerance 0,8 K tolerance 1,0 K 1/10 K
Interfaces	BSB	Two-wire connection (not invertible)
	• Base unit/peripheral cable length	max. 200 m
	• Cross section	min. 0,5 mm ²
Protection rating and safety class	Enclosure protection rating per EN60529	IP20
	Safety class per EN60730	safety class II for LV parts, if correctly installed
	Degree of contamination per EN60730	degree of contamination normal
Standards, safety, EMC, etc.	CE conformity (EU)	-
	• EM directive	2004/108/EC
	• Immunity	EN61000-6-2
Climatic conditions	• Emissions	EN61000-6-3
	• Low voltage	2006/95/EC
	• Electrical safety	EN 60730-1, EN50090-2-2
Weight	Storage, per EN60721-3-1	class 1K3, -20 - 65°C
	Transport, per EN60721-3-2	class 2K3, -25 - 70°C
	Operation, per EN60721-3-3	class 3K5, -20 - 50°C (non condensing)
Weight	Packaging excluded	115 g

Table QAA74.611 technical data

Power supply	Bus powered	BSB
Cabling	Power supply and bus	solid wire or stranded wire (twisted or ferrule)
		0,25...1,5 mm ²
Room temperature measurement	Measurement range	0 - 50 °C
	Per EN12098:	tolerance 0,5 K
	• Range 15 - 25 °C • Range 0 - 15 °C or 25 - 50 °C • Resolution	tolerance 0,8 K 1/10 K
Interfaces	BSB	Two-wire connection (not invertible)
	Base unit/peripheral cable length	max. 200 m
	Cross section	min. 0,5 mm ²
	USB	Mini-B
Protection rating and safety class	Enclosure protection rating per EN60529	IP40 (installed)
	Safety class per EN60730	safety class III, for proper installation
	Degree of contamination per EN60730	2
Standards, safety, EMC, etc.	CE conformity (EU)	T7471x5
	Electromagnetic compatibility (application range)	for residential, commercial and industrial environments
Climatic conditions	Storage, per EN60721-3-1	class 1K3, -20 - 65°C
	Transport, per EN60721-3-2	class 2K3, -25 - 70°C
	Operation, per EN60721-3-3	class 3K5, 0...50 °C (non-condensing)
Mechanical conditions	Storage, per EN60721-3-1	class 1M2
	Transport, per EN60721-3-2	class 2M2
	Operation, per EN60721-3-3	class 3M2
Product environmental declaration		CE1E2348
Color	Housing parts	RAL 9003
Dimensions	Width	144 mm
	Height	96 mm
	Depth	20 mm (27,6 mm with control knob)
Weight	Packaging excluded	228 g

Robur mission

Robur is dedicated to dynamic progression
in research, development and promotion
of safe, environmentally-friendly, energy-efficiency products,
through the commitment and caring
of its employees and partners.



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