

Installation manual

Expansion kit

for System Controller for K18 absorption heat pump

Revision: A

Code: D-LBR809

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I INTRODUCTION



Installation manual

This Installation manual contains all the information required for installing and configuring the Expansion kit for all K18 Simply-gas heat pump units (Gas Absorption Heat Pump) and K18 Hybrigas hybrid units (Gas Absorption Heat Pump and integrated auxiliary boiler module), in line with one of the standard system configurations also described in the document. The manual is a supplement to the System Controller Installation Manual; as such, it must be used in combination with the latter.



Referring to this manual requires familiarity with Robur products and assumes that certain information included in the product manuals to which this document refers.

RECIPIENTS

This Manual is intended:

- for electrical installers for proper installation of the control equipment;
- for installers and authorised Technical Assistance Centres Robur (TAC) for configuration;

II SYMBOLS AND DEFINITIONS

II.1 KEY TO SYMBOLS



DANGER



WARNING



NOTE



PROCEDURE



REFERENCE (to other document)

II.2 TERMS AND DEFINITIONS

KECSK18 = expansion kit.

Siemens RVS21.826 = control unit (electronic board).

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

Siemens QAA75.611 = 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

This manual is an integral and essential part of the product and must be delivered to the user together with the appliance.

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 intervention/work 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, only using original 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, Use and Maintenance 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 positioning, refer to the protection rating given in par. 2 of the K18 system controller Installation manual.

III.2 CONFORMITY

For the appliance's technical and conformity data, refer to Appendix A p. 23 and Appendix A of the K18 system controller Installation manual.

III.3 EQUIPMENT

The Expansion kit KECSK18 (ODSP030) unit's equipment includes:

- n. 1 Siemens AVS55.196 expansion board
- n. 1 Siemens AVS92.280 mounting plate
- n. 1 Siemens AVS82.496 ribbon cable
- n. 1 10 pole connector (green) marked **X110**
- n. 1 7 pole connector (red) marked **X150**

- n. 1 10 pole connector (grey) marked **X152**

There may also be n. 1 3 pole connector (green) marked **X10**, which is not used.

The above parts may also be supplied assembled or partly assembled together.

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 by the plant or installation to the appliance (electric shock, overheating, power surges, etc.)
- Accidental damages or due to force majeure.

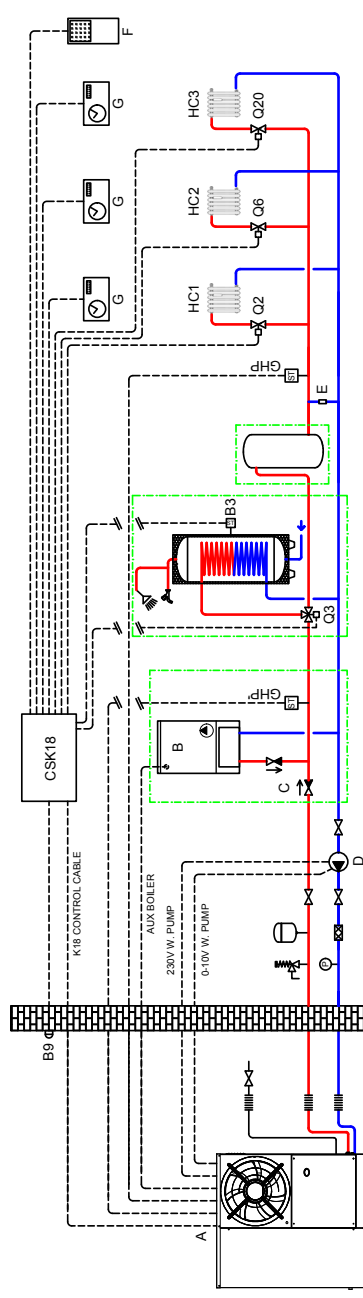
1 GENERAL INFORMATION AND SYSTEM DIAGRAMS

The Expansion kit (KECSK18) of the System Controller for the models of the K18 family allows the system configurations supported by it to be extended. In particular, the addition of the kit allows the types of plumbing diagrams indicated in Figures 1.1 p. 6 and 1.2 p. 7 to be set up with regards to the K18 Simplygas unit and those indicated in Figures 1.3 p. 8 and 1.4 p. 9 to be set up with regards to the K18 Hybrigas unit.



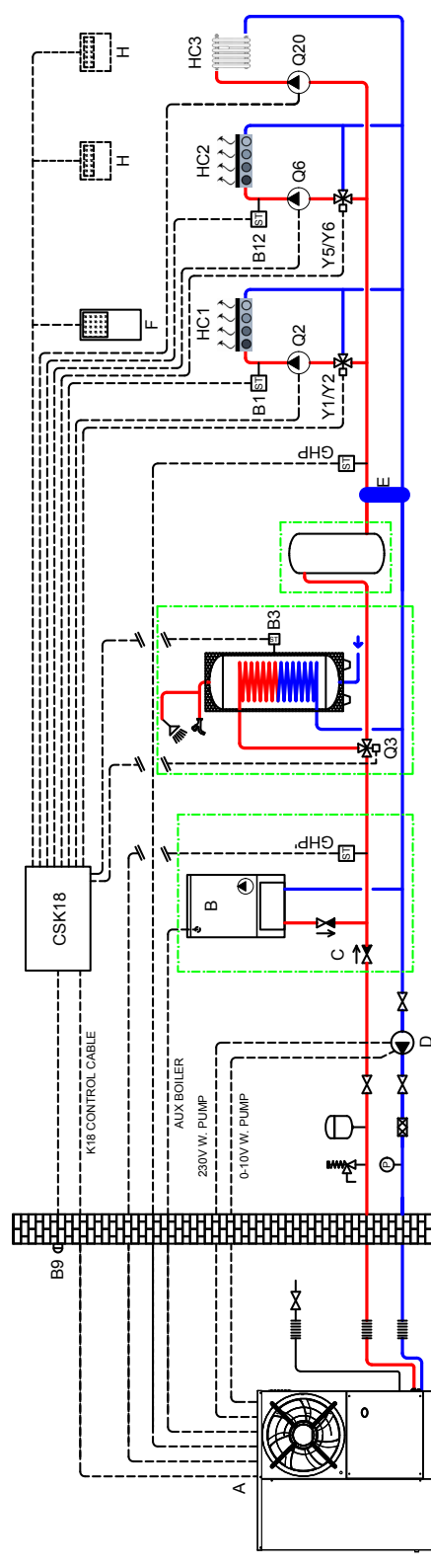
The following diagrams intend to show the hydraulic configurations supported by System controller, including the parts to be connected to it. Ancillary hydraulic components (expansion tanks, safety valves, etc.) are only shown as a guide; for the detailed plumbing layout, refer to the handbook of the 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 three zones, auxiliary boiler and DHW production optional



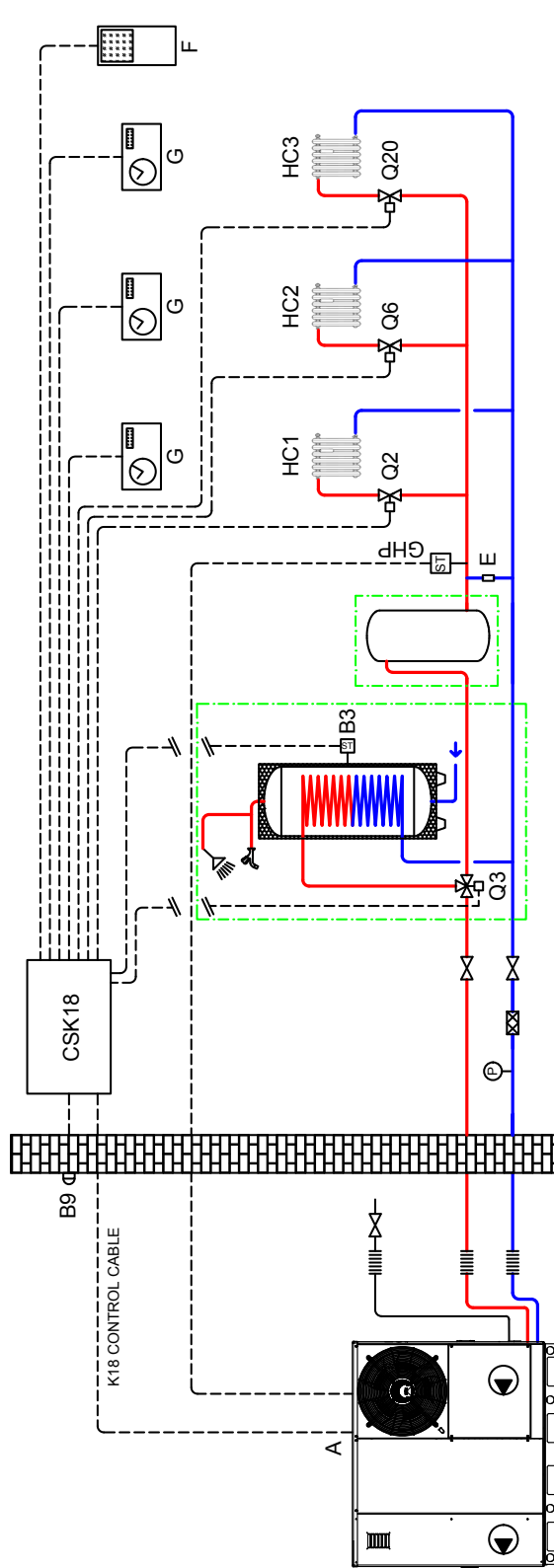
- | | | | |
|---|---|---|---|
| A | Unit K18 Simplygas | E | By-pass section with overpressure valve |
| B | Auxiliary boiler (optional) | F | Room unit 1 (QAA75.611) |
| C | check valve (to be installed only in the presence of an auxiliary boiler) | G | Thermostats (with timer) for zones |
| D | External water pump (only for C0 versions) | | |

Figure 1.2 System with K18 Simplygas unit, primary and secondary water circuits, up to three heating circuits, two of which are optionally mixed, auxiliary boiler and DHW production optional



- | | | | |
|---|---|---|---|
| A | Unit K18 Simplygas | E | Decoupling of primary/secondary circuits |
| B | Auxiliary boiler (optional) | F | Room unit 1 (QAA75.611) |
| C | check valve (to be installed only in the presence of an auxiliary boiler) | H | Room unit 2 and 3 for HC2 and HC3 circuits (<i>optionals</i> , QAA75.611 or QAA55.110) |
| D | External water pump (only for C0 versions) | | |

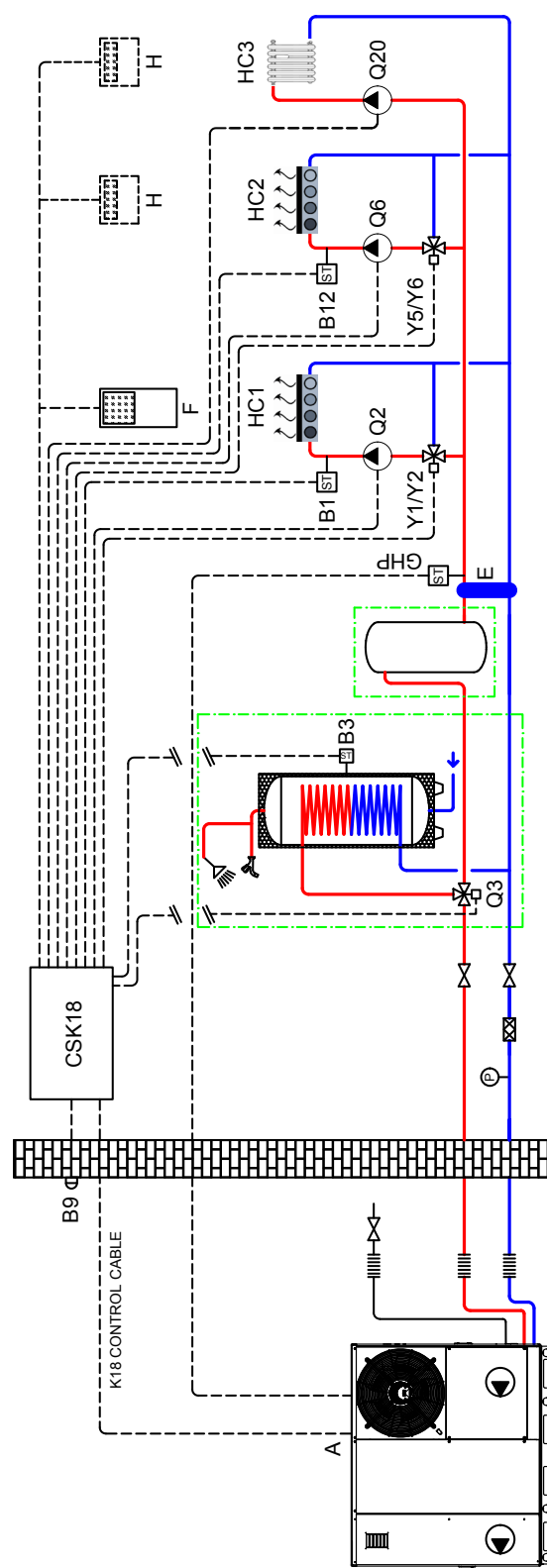
Figure 1.3 System with K18 Hybrigas unit, primary water circuit only and three zones, DHW production optional



A K18 Hybrigas unit
E By-pass section with overpressure valve

F Room unit 1 (QAA75.611)
G Thermostats (with timer) for zones

Figure 1.4 System with K18 Hybrigas unit, primary and secondary water circuits, up to three heating circuits, two of which are optionally mixed, DHW production optional



- A K18 Hybrigas unit
 E Decoupling of primary/secondary circuits
 F Room unit 1 (QAA75.611)

- H Room unit 2 and 3 for HC2 and HC3 circuits (*optionals*, QAA75.611 or QAA55.110)



For water circuits with a primary circuit only (fig.

1.1 p. 6 and 1.3 p. 8) water circulation **must** be

guaranteed to handle the K18 unit's anti-icing cycle. This requires that a outlet/inlet bypass be installed, with over-pressure valve set to open only when all zone valves are closed.

i All temperature probes (GHP, GHP', B1, B3, B12) 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.



Following installation of the KECSK18 expansion kit, the K18 system controller is automatically configured to facilitate the installation and commissioning of the types of circuit indicated in fig. 1.1 p. 6, 1.2 p. 7, 1.3 p. 8 and 1.4 p. 9. However, it can also support other configurations. For applications other than those indicated in this manual, Robur provides custom consultancy service.

2 ASSEMBLY AND INSTALLATION

The Expansion kit for the K18 system controller is supplied complete with everything required for quick installation inside the CSK18 enclosure.

! 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; achieve this by following the instructions provided in the Installation Manual of the System Controller with regards to the choice of the input holes in the enclosure to use for the mains connections and for the safety extra low voltage (SELV) ones.

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 INSTALLING THE EXPANSION KIT INTO THE CSK18 ENCLOSURE

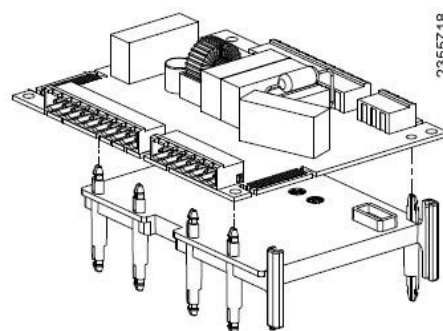
Assembly and installation

1. As shown in fig. 2.1 p. 10, assemble the AVS55.196 electronic board with the plastic mounting plate; push the six short retainers fully into the holes in the board until the pawls click.



The Expansion kit may also be supplied with the electronic board and mounting plate assembled together; in this case, go directly to the next step.

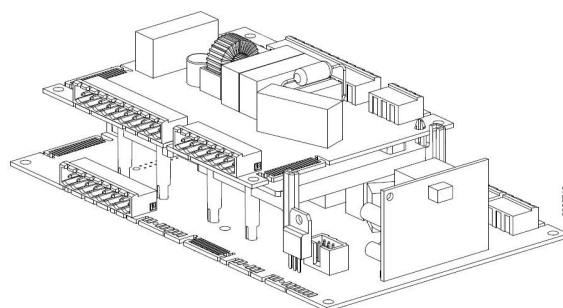
Figure 2.1 Assembling the AVS55.196 electronic board with the mounting plate



i DO NOT remove the RVS21.826 board from the CSK18 enclosure.

2. Align the six long retainers on the bottom side of the mounting plate with the holes in the RVS 21.826 electronic board already present in the CSK18 enclosure, then push them in until they snap into place.

Figure 2.2 Detail of the two boards assembled together



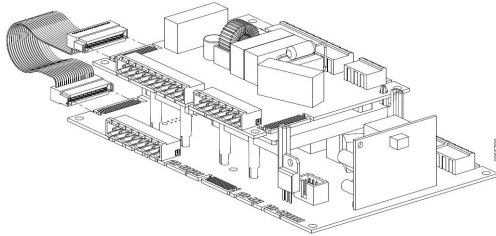
3. Push the connectors of the included AVS82.496 ribbon cable fully in the comb connectors marked **X100**, on the edge of the two electronic boards.



The Expansion kit may also be supplied with the ribbon cable already assembled to connector **X100** of the

AVS55.196 electronic board; in this case, insert the free connector into the RVS21.826 board.

Figure 2.3 Detail of ribbon cable connection between the two boards



4. If the expansion kit is supplied with the connectors not yet installed, fit the following into the corresponding sockets after having identified them:
 - ▶ 10 pole connector, green, **X110**
 - ▶ 7 pole connector, red, **X150**
 - ▶ 10 pole connector, grey, **X152**
 - ▶ even if it is included in the kit, DO NOT install the 3 pole green connector **X10**



If the expansion kit is supplied with the connectors already installed, pull out the 3 pole green connector X10.

5. Identify the 3 pole green connector **X10** left free inside the CSK18 enclosure and fit it into the corresponding socket on the AVS55.196 board of the Expansion kit.

Electrical hookup

Figure 2.4 Layout of components and wiring diagram of system controller for K18 with expansion kit installed

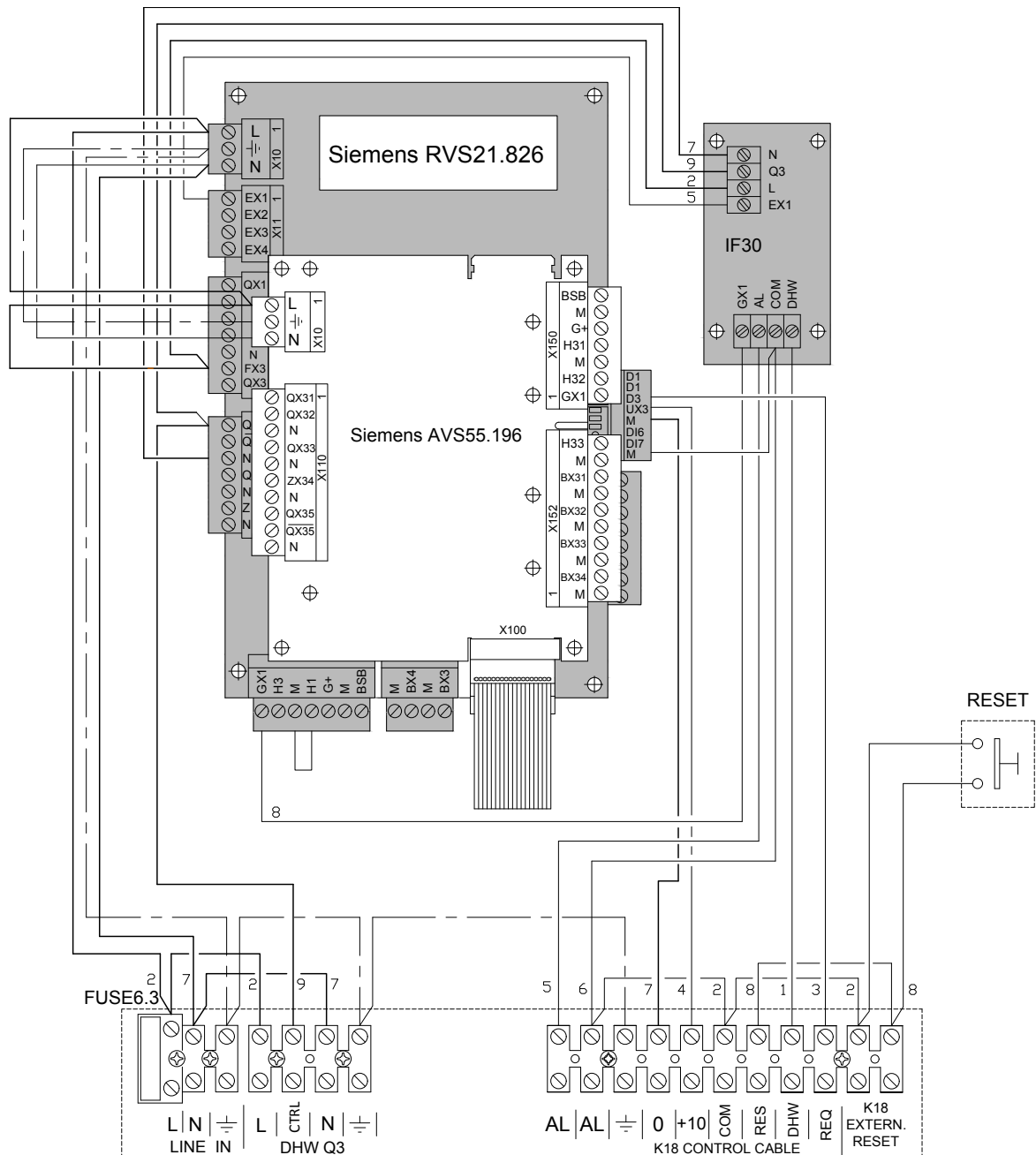


Figure 2.4 p. 12 gives a schematic illustration (not to scale) of the layout of components inside the CSK18 enclosure with the Expansion kit installed.



The additional electrical connections, regarding the functions handled by the Expansion kit, are made on the included extractable connectors which fit directly into the kit's AVS55.196 electronic board, as described in this manual.

On the other hand, unless otherwise expressly specified, for the functions available without the Expansion kit, refer to the system controller Installation manual.


Table 2.1 p. 13 lists the Line Voltage supply and signal connections on the extractable connectors on the left edge of the

Siemens AVS55.196 expansion board.

To identify the position of the connectors, refer to the wiring diagram given in fig. 2.4 p. 12.

To identify the plumbing system components and sensors corresponding to the Siemens function codes (e.g. Q6, Y5, Y6) refer to the plumbing system diagrams in fig. 1.1 p. 6, 1.2 p. 7, 1.3 p. 8 and 1.4 p. 9.

Table 2.1 Line Voltage connections to Siemens RVS55.196 board connectors

Function (Siemens logo on water circuit diagrams and description)			Logo on connector Color	Connector code Siemens
L	230 VAC phase input to RVS55.196	Pre-wired	X10 Green	BPZ:AGP55.03A/109
	Ground connection to RVS55.196	Pre-wired		
N	Neutral input to RVS55.196	Pre-wired		
QX31	Y5 - heating circuit 2 mixer valve open phase output		X110 Green	BPZ:AGP55.10P/109
QX32	Y6 - heating circuit 2 mixer valve close phase output			
N	Heating circuit 2 mixer valve neutral output			
QX33	Q6 - Heating circuit 2 water pump phase output / Zone 2 valve (1)			
N	Q6 - Heating circuit 2 water pump neutral output / Zone 2 valve (1)			
ZX34	Not used			
N	Not used			
QX35	Q20 - Heating circuit 3 water pump phase output / Zone 3 valve			
QX35	Not used			
N	Q20 - Heating circuit 3 water pump neutral output / Zone 3 valve			

(1) Note that this function is also available when the expansion kit is not used. In this case, as indicated in the system controller Installation Manual, pump **Q6** is hooked up to terminals **QX3** and **N** on connector **X12** of the RVS21.826 electronic board.

If using the expansion kit, on the other hand, follow the diagrams and instructions given in this manual.

Table 2.2 p. 13 lists the SELV supply and signals connections RVS55.196 expansion board. on the extractable connectors on the right edge of the Siemens

Table 2.2 SELV signal connections to Siemens AVS55.196 board connectors

Function (Siemens logo on water circuit diagrams and description)			Logo on connector Color	Connector code Siemens
BSB	BSB+ - QAA75/QAA55 Room Unit data bus connection (1)		X150 Red	BPZ:AGP55.07L/109
M	BSB- - QAA75/QAA55 optional Room Unit data bus ground (1)			
G+	G+ - QAA75 optional Room Unit backlighting power output (1)			
H31	H31 - Heating circuit 3 normally open request signal input (2)			
M	H31 - Heating circuit 3 request signal input return			
H32	Not used		X152 Grey	BPZ:AGP55.10R/109
GX1	Not used			
H33	Not used			
M	Not used			
BX31	B12 - Heating circuit 2 temperature sensor input (mixed only)			
M	B12 - Heating circuit 2 temperature sensor input (mixed only)			
BX32	Not used			
M	Not used			
BX33	Not used			
M	Not used			
BX34	Not used			
M	Not used			

(1) These terminals need not be used to connect additional room units. They can also be connected directly in parallel to the terminals of connector X86 of the RVS21.826 controller, or connected in cascade, as indicated in the system controller Installation manual and par. 3.1 p. 14 of this manual.

(2) Input **H31** is open to keep heating circuit 3 inactive. If this heating circuit is present, fit a jumper between terminals **H31** or insert an external request signal between them (**voltage free contact**).

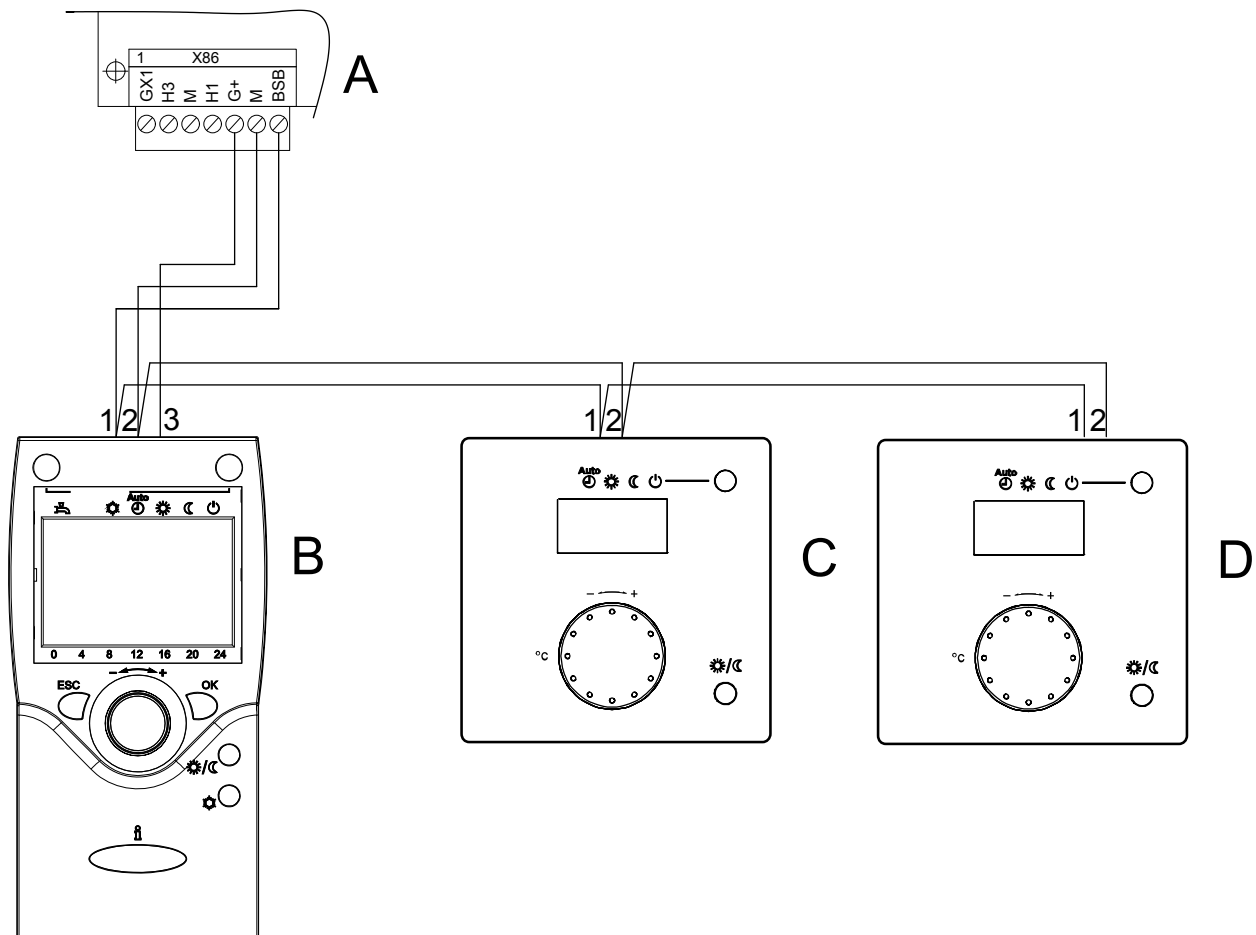


The temperature sensors connected to the Siemens AVS55.196 expansion board are of the **NTC 10k (Beta 3977)** type.

3 ELECTRICAL HOOKUP

3.1 HOOKING UP THE ROOM UNIT

Figure 3.1 Example of connection of three room units, one type QAA75.611, the others (optional) type QAA55.110



- A Grey connector X86 (bottom edge of RVS21.826 board)
B Room unit 1 (QAA75.611)
C - D Ambient units 2 and 3 (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.

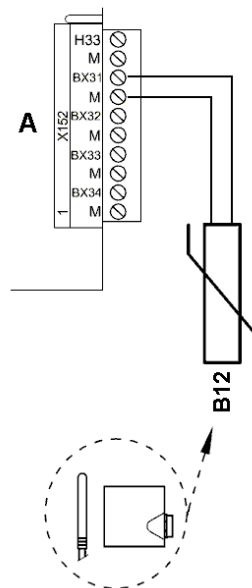
Both room units can also be connected to connector X86.

Table 3.1 QAA75.611 and QAA55.110 (optional) room unit connection

RVS21.826	QAA75.611	QAA55.110
BSB	1	1
M	2	2
G+	3	-

3.2 TEMPERATURE SENSOR CONNECTION

Figure 3.2 Temperature sensor connection diagram (NTC 10k - Beta 3977) to AVS55.196



A Grey connector X152 (right edge of AVS55.196 board)

B12 NTC 10k Beta 3977 temperature sensor

Use of temperature sensors

B12 Only if heating circuit 2 is mixed

Use shielded cable

2 x 0.5 mm² up to 40 m

2 x 0.75 mm² up to 60 m

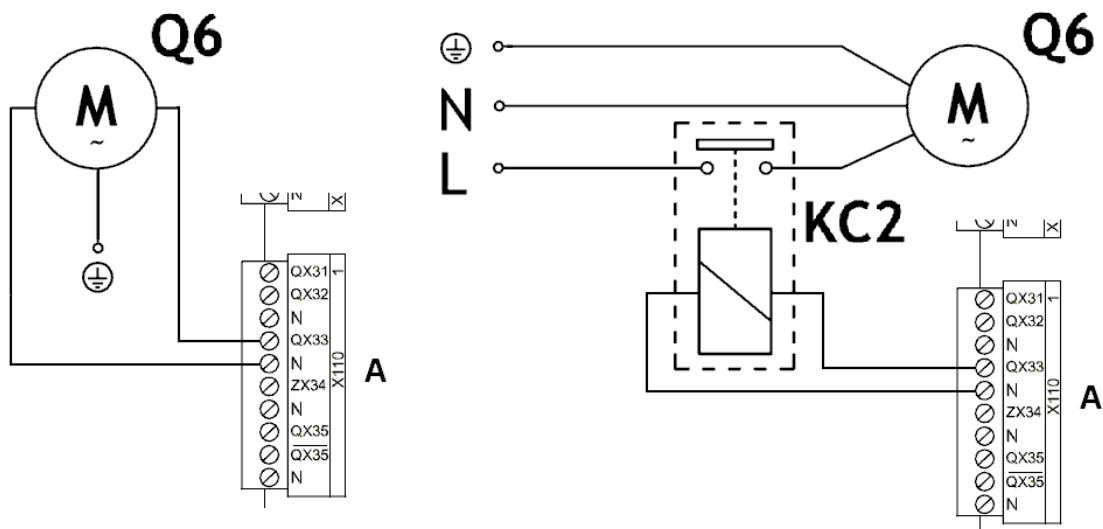
2 x 1.0 mm² up to 80 m

2 x 1.5 mm² up to 120 m

3.3 WATER CIRCULATION PUMP CONNECTION

3.3.1 Heating circuit 2 pump connection diagram (if present)

Figure 3.3 Direct or external relay connection of heating circuit 2 pump to AVS55.196



A Green connector X110 (left edge of AVS55.196 board)

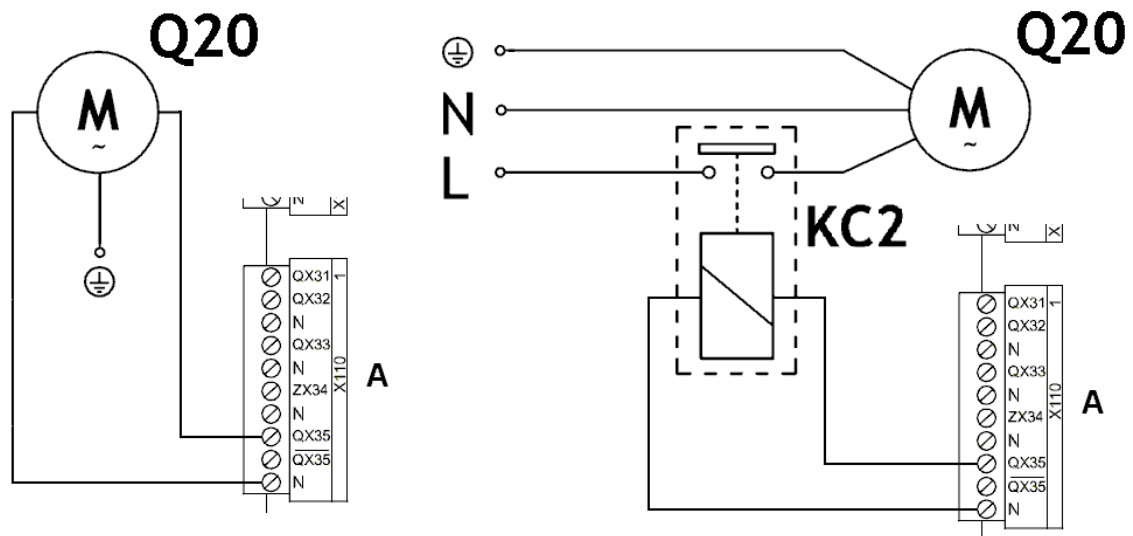
Q6 Heating circuit 2 pump

KC2 Relay

NOTE With the expansion kit installed, always use this diagram (see NOTE (1) to Table 2.1 p. 13)

3.3.2 Heating circuit 3 pump connection diagram (if present)

Figure 3.4 Direct or external relay connection of heating circuit 3 pump to AVS55.196

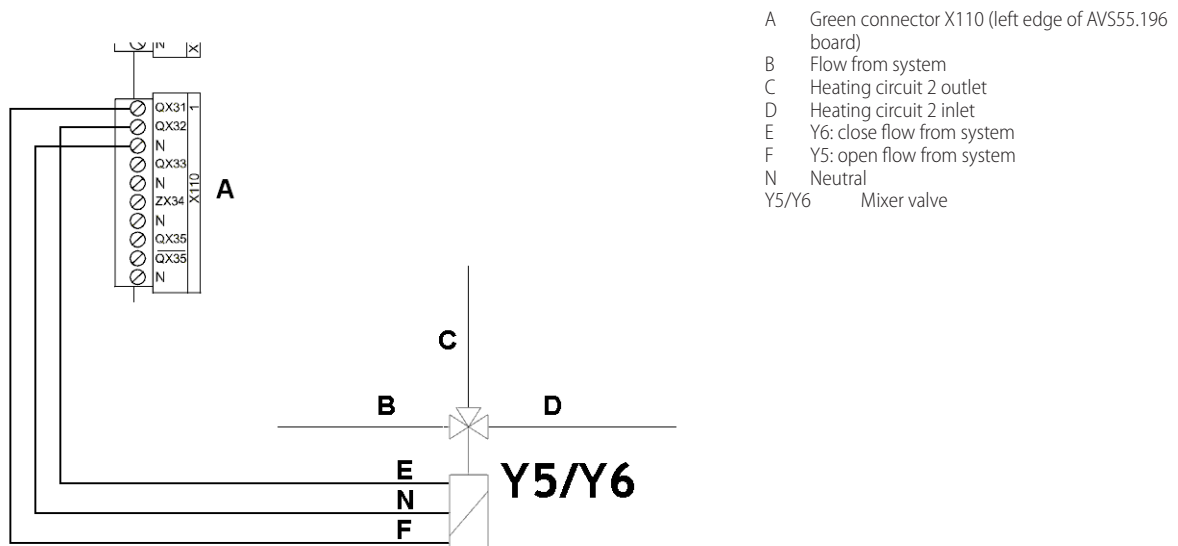


A Green connector X110 (left edge of AVS55.196 board)
 Q20 Heating circuit 3 pump
 KC2 Relay

3.4 MIXER VALVE CONNECTION

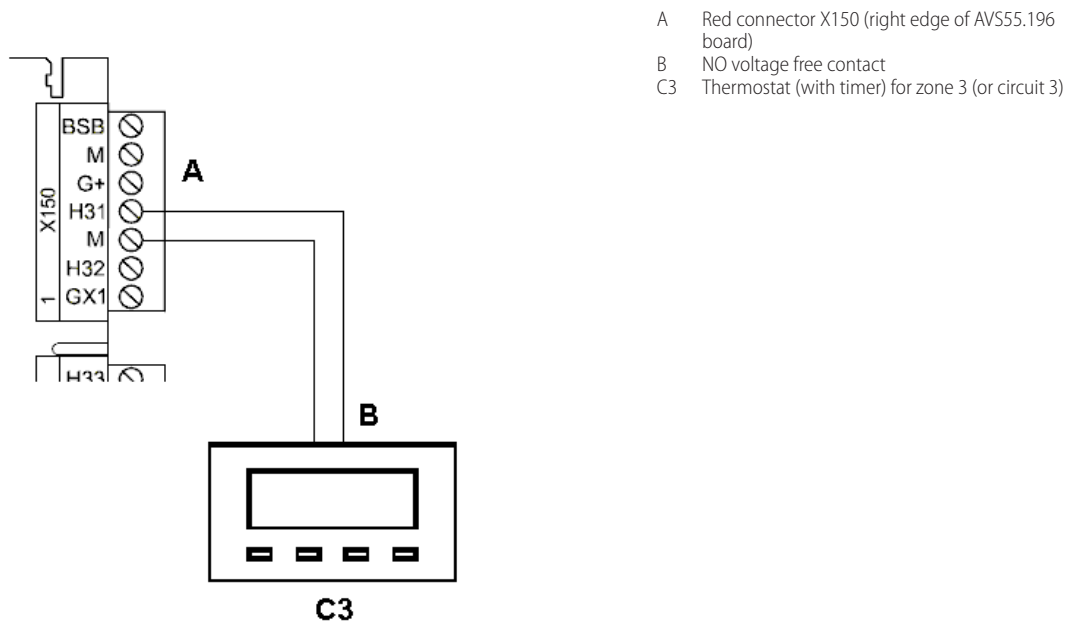
3.4.1 Y5/Y6 mixer valve connection diagram (if present)

Figure 3.5 Y5/Y6 mixer valve connection (for mixed heating circuit 2) to AVS55.196



3.5 EXTERNAL REQUEST SIGNAL CONNECTION TO CSK18 ENCLOSURE

Figure 3.6 Connection of optional external request signals (thermostats, thermostat timers, timers) to AVS55.196



4 COMMISSIONING

This section gives supplementary information regarding system commissioning, which are required when using the Expansion kit. As previously, this section must be consulted in combination with the matching section of the system controller Installation manual.

It is assumed that the plumbing system and electrical installations have been completed and checked in compliance with sections 1 p. 6, 2 p. 10 and 3 p. 14 of this manual and the matching sections of the system controller Installation 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 QAA75.611 ADVANCED ROOM UNIT'S INTERFACE

See the Paragraph 4.1 of the system controller Installation manual.

4.2 COMMISSIONING PROCEDURE

Proceed as indicated in to Paragraph 4.2 of the system controller Installation manual; when the system is powered up, also check that the green led on the AVS55.196 expansion board lights up; if the led does not light up, check that you have connected the 3 pole connector, green, **X10** to the socket on the expansion board and that the ribbon cable has been inserted into the comb connectors marked **X100** on the RVS21.826 and AVS55.196 boards.

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

- Access the Commissioning menu level, select the **Input/output test** menu and select parameter **7700 (Relay test)**.
- Set it to **QX5** (QX5 relay output, function Q2 -> Heating circuit 1 pump) and check that the heating circuit 1 pump runs (or the zone 1 valve opens).
- If heating circuit 1 is of the mixed type:
 - Set the parameter to **QX1** (QX1 relay output, function Y1 -> open mixer valve on system outlet line) and check that the mixer valve responds as desired.
 - Set the parameter to **QX2** (QX2 relay output, function Y2 -> open mixer valve on heating circuit 1 inlet line) and check that the mixer valve responds as desired.
- If heating circuit 2 (or zone 2) is present:
 - Set the parameter to **QX33** (QX33 relay output on AVS55.196 board, function Q6 -> heating circuit 2 pump) and check that the pump of heating circuit 2 runs (or the zone 2 valve opens).
- If heating circuit 2 is present and of the mixed type:
 - Set the parameter to **QX31** (QX31 relay output on AVS55.196 board, function Y5 -> open mixer valve on system outlet line) and check that the mixer valve responds as desired.
 - Set the parameter to **QX32** (QX32 relay output on AVS55.196 board, function Y6 -> open mixer valve on heating circuit 2 inlet) and check that the mixer valve responds as desired.
- If heating circuit 3 (or zone 3) is present:
 - Set the parameter to **QX35** (QX35 relay output on

AVS55.196 board, function Q20 -> heating circuit 3 pump) and check that the pump of heating circuit 3 runs (or the zone 3 valve opens).

7. If the Domestic Hot Water function managed by the K18 unit is present (EVO models):
 - Set the parameter to **QX4** (QX4 relay output, function Q3 -> set DHW diverter valve to DHW service) and check that the diverter valve responds as desired.
8. Now select parameter **7700** again and set it to **No test**.
9. Select parameter **7804 (Sensor temp BX1)** and check its value (sensor BX1, function B9 -> external temperature).
10. If the Domestic Hot Water function managed by the K18 unit is present (EVO models):
 - Select parameter **7806 (Sensor temp BX3)** and check its value (sensor BX3, function B3 -> DHW tank temperature).
11. If heating circuit 1 is of the mixed type:
 - Select parameter **7807 (Sensor temp BX4)** and check its value (sensor BX4, function B1 -> Heating circuit 1 outlet temperature).
12. If heating circuit 2 is present and of the mixed type:
 - Select parameter **7973 (Sensor temp BX31)** and check its value (sensor BX31, function B12 -> Heating circuit 2 outlet temperature).



To facilitate checking the connection of each temperature sensor 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!

13. If an external request signal is connected for heating circuit 1 (or zone 1), for example, with a thermostat or thermostat timer:
 - Select parameter **7844 (Input signal H1)** and actuate the external signal's contact to check that it switches as expected from open (indicated by - - -) to closed (indicated by **o o o**) and back.
 - NOTE:** If no external request signal is present, this test must indicate closed (**o o o**), due to the jumper **installed at the factory**.
14. If heating circuit 2 (or zone 2) is present, and an external request is hooked up:
 - Select parameter **7858 (Input signal H3)** and actuate the external signal's contact to check that it switches as expected from open (indicated by - - -) to closed (indicated by **o o o**) and back.
 - NOTE:** If no external request signal is present, this test must indicate closed (**o o o**), due to the jumper **added during installation**.
15. If heating circuit 3 (or zone 3) is present, and an external request is hooked up:
 - Select parameter **7989 (Input signal H31)** and actuate the external signal's contact to check that it switches as expected from open (indicated by - - -) to closed (indicated by **o o o**) and back.
 - NOTE:** If no external request signal is present, this test must indicate closed (**o o o**), due to the jumper **added during installation**.
16. Now select parameter **7700 (Relay test)** and set it to **Everything off**.
17. Select parameter **7724 (Output test UX3)** and set it to **50%**
18. Access the terminal block of the K18 unit (refer to the "K18 unit connection to the CSK18 enclosure terminal block" Figure in Section 3 of the *Installation manual of the System*

Controller):

- 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**.
19. Select parameter **7700** and set it to **QX4**.
 20. Install a temporary jumper between the **EXTERN RESET** terminals on the CSK18 enclosure terminal block.
 21. Access the terminal block of the K18 unit (refer to the "K18 unit connection to the CSK18 enclosure terminal block" Figure in Section 3 of the *Installation manual of the System Controller*):
 - 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**.
 22. Set parameter **7700** to **No test**.
 23. Select parameter **7724 (Output test UX3)** and set it to - - - (test deactivated).
 24. Press **ESC** twice to inlet to the start screen.
 25. 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

Refer to par. 4.3.2 of the system controller Installation manual.

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

Refer to par. 4.3.2 of the system controller Installation manual.

4.4 SETTING THE SYSTEM TO STAND-BY

Refer to par. 4.4 of the system controller Installation manual.

5 SETTINGS

This section gives supplementary information regarding the optimisation of the system settings, which are required when using the Expansion kit. As previously, this section must be consulted in combination with the matching section of the system controller Installation manual.

5.1 OPTIMISING HEATING SERVICE

5.1.1 Heating circuits (or zones) 1 and 2

Refer to Paragraphs 5.1.1 and 5.1.2 respectively of the System

Table 5.1 Heating circuit 3 (or zone 3) preconfiguration (if present)

	Preconfiguration	Dependency on parameter
Operating mode	Automatic (Comfort 6 – 22 Monday – Sunday)	1300
Comfort setpoint	21 °C	1310
Reduced setpoint	18 °C	1312
Protection setpoint	7 °C	1314
Heating curve slope	1.26 (water setpoint around 56 °C with external temperature -10 °C)	1320
Summer/winter heating limit	18 °C	1330
Flow temp setpoint min	8 °C	1340
Flow temp setpoint max	65 °C	1341
Room influence	20%	1350
Room temperature limitation	2.5 °C	1360

To change the settings of Table 5.1 p. 19, access the *Engineer* menu level, and then the **Heating circuit 3** menu; then select the parameters indicated in Table 5.1 p. 19 and modify them as desired.



For information about the choice of operating mode and time programming, refer to par. 5.1.3 p. 19. For information on the heating curve settings and the min/max water temperature setpoint, see par. 5.1.4 p. 19. For information on the room influence and room temperature limitation settings, see par. 5.1.5 p. 19.

5.1.3 Selecting the operating mode and time programming

Refer to par. 5.1.3 of the system controller Installation manual for the description of the operating modes and for the time programming of heating circuits 1 and 2.

For the time programming of **heating circuit 3** (obligatory if the circuit is running in **Automatic** mode), proceed as indicated for heating circuit 1 in the above mentioned paragraph of the system controller Installation manual, but using the **Time prog heating/cooling 3** menu; in this case, use parameters **540 (Preselection)**, **541 - 546 (period settings)** and **555 (Copy)**.

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

Refer to Paragraph 5.1.4 of the system controller Installation manual.

5.1.5 Setting the Room influence and Room temperature limitation parameters

Refer to Paragraph 5.1.5 of the system controller Installation manual for a general description of the Room influence and Room temperature limitation functions, as well as for the settings relating to heating circuits 1 and 2.

Controller Installation manual.

5.1.2 Heating circuit 3 (or zone 3) (if present)

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 3.6 p. 17.

Once activated, the preconfigured settings are those given in Table 5.1 p. 19.

Room influence function for heating circuit 3 (if present)

Heating circuit 3, if present, is 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 entirely:

- Select parameter **1350** as described in par. 5.1.2 p. 19 of this manual, and set the influence percentage (%), or --- to disable the function entirely.



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 %**.

Room temperature limitation function for heating circuit 3 (if present)

Heating circuit 3 is 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:

- Select parameter **1360** as described in par. 5.1.2 p. 19 of this manual, and set the desired value, or --- to disable the function entirely.

5.1.6 Setting the building time constant

Refer to par. 5.1.6 of the System Controller Installation manual.

5.1.7 Choice of installation and use of room units

The system is supplied with a QAA75.611 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 heating circuit 1 accordingly and, if present, also that of heating circuits 2 and 3 (as described in par. 5.1.5 of this manual and the System Controller Installation

manual).

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 circuits 2 and 3 are not present, or additional room units dedicated to them are not to be installed.
- if at least one of heating circuits 2 and 3 is present: the reference room, served by heating circuit 1, is at least partly representative also for the rooms served by the other heating circuit/s.



You can adjust the parameters described in par. 5.1.5 of the System Controller Installation manual and par. 5.1.5 p. 19 of this manual to differentiate the settings for the various circuits, to the point even of disabling one or both of the room unit influence functions for heating circuits 2 and 3, which do 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, one must configure the room unit so as not to provide the room temperature signal to the system. Proceed as follows:

1. Access the *Engineer* menu level, then the **Operator section** menu.
2. Select parameter **40 (Used as)** and set it to **Operator unit 1**.
3. Still from the *Engineer* menu level, access the **Configuration** menu.
4. Select parameter **6200 (Save sensors)**, set it to **yes** and confirm.



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

- one or both of heating circuits 2 and 3 are present
 - additional room units have been installed, each dedicated to one of heating circuits 2 and 3,
- you must configure the first served by heating circuit 2 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. Access the *Engineer* menu level, then the **Operator section** menu.
2. Select parameter **40 (Used as)** and set it to **Room unit 1**.
3. Select parameter **47 (Room temperature device 1)** and set

it to **Heating circuit 1 only**.

4. Select parameter **48 (Occupancy button device 1)** and set it to **Heating circuit 1 only**.

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


Second room unit type QAA75.611

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

1. Access the *Engineer* menu level, then the **Operator section** menu.
2. Select parameter **40 (Used as)** and set it to **Room unit 2**.

Second room unit type QAA55.110

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

1. Press the occupancy button  for at least 3 seconds, until the display reads ru = 1, ru = 2, or ru = 3.
 2. Turn the knob to set the parameter to ru = 2.
 3. Wait for the text ru = 2 to clear from the display.
- If heating circuit 3 is present, you must now configure the third room unit, installed in a reference room served by such circuit. Proceed as follows, depending on the type of room unit:


Third room unit type QAA75.611

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

1. Access the *Engineer* menu level, then the **Operator section** menu.
2. Select parameter **40 (Used as)** and set it to **Room unit 3**.

Third room unit type QAA55.110

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

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

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

- Access the *Engineer* menu level, then the **Configuration** menu.
- Select parameter **6200 (Save sensors)**, set it to **yes** and confirm.



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 SERVICE

Refer to Paragraph 5.2 of the System Controller Installation manual.

5.3 OPTIMIZING AUXILIARY BOILER MANAGEMENT

Refer to Paragraph 5.3 of the System Controller Installation manual.

6 ERRORS

6.1 LIST OF ERRORS AND TROUBLESHOOTING INSTRUCTIONS

For a general description, refer to Paragraph 6.1 of the System Controller Installation manual.

Table 6.1 p. 27 lists the error codes, with descriptions and priorities, which can be generated by the K18 system controller,

with Expansion kit installed, when it is configured to support the circuits indicated in this manual; The last column of the table lists measures for resolving the problem.

Table 6.1 List of K18 system controller error with expansion kit installed

Code	Description	Priority	Action
10	Outside sensor B9	6	A
30	Flow sensor 1 (1)	6	A
32	Flow sensor 2 (6)	6	A
50	DHW sensor 1 (2)	6	A
60	Room sensor 1 (3)	6	B
65	Room sensor 2 (4)	6	B
68	Room sensor 3 (7)	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
441	BX31 no function	3	G
442	BX32 no function	3	G
443	BX33 no function	3	G
444	BX34 no function	3	G
173	Active alarm 3 contact	6	H

- (1) Probe B1
 (2) Probe B3
 (3) Room unit 1
 (4) Room unit 2
 (5) Shown in this form in the error log (see par. 6.2 p. 22). The information screen displays the text "No connection" without error code.
 (6) Probe B12
 (7) Room unit 3

6.1.1 Troubleshooting measures

A: Codes 10, 30, 32, 50

For codes 10, 30, 50 refer to Paragraph 6.1 of the System Controller Installation manual. For code 32, proceed as follows:

1. Memorize the sensors:

- Access the *Engineer* menu level, then the **Configuration** menu; select parameter **6200 (Save sensors)**, set it to **yes** and confirm.



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, correct it and memorize the sensor 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:

- Access the *Engineer* menu level, then the **Configuration** menu; select parameter **6391 (Sensor input BX31)**; check that it is set to the value **used by parameter 6455**; if not, remaining in the *Engineer* menu level, **Configuration** menu, select parameter **6455 (Function mixing group 3)** and set it to **Heating circuit 2**.

- Run sensor memorization again as indicated in step 1.

ATTENTION: This sensor is used only in the presence of the mixed heating circuit 2, otherwise no sensor must be connected to input **BX31**. If a sensor is connected to this input by mistake, remove it, then run sensor memorization again as described in step 1.

5. If step 4 does not resolve the problem:

- Power the system controller off and on again; if the problem persists, contact the Robur Technical Support Centre.

B: Codes 60, 65, 68

1. Memorize the sensors:

- Access the *Engineer* menu level, then the **Configuration** menu; select parameter **6200 (Save sensors)**, set it to **yes** and confirm.



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 par. 5.1.7 p. 19). Resolve the problem, then run sensor memorization again as indicated in step 1.

3. If step 2 does not resolve the problem:

- Power the system controller off and on again; if the problem persists, contact the Robur Technical Support Centre.

C: Codes 83, 103

Refer to Paragraph 6.1 of the System Controller Installation manual.

D: Code 84

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

1. Resolve the problem as indicated in par. 5.1.7 p. 19, Case 3, to configure the room units correctly.

2. If step 1 does not resolve the problem:

- Power the system controller off and on again; if the problem persists, contact the Robur Technical Support Centre.

E: Code 127

Refer to Paragraph 6.1 of the System Controller Installation manual.

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 *Engineer* menu level, then the **Configuration** menu, and select parameters:
 - **6014 (Function mixing group 1)**; set it to **Multifunctional**.
 - **5930 (Sensor input BX1)**; check that it is set to **Outside sensor B9**; if not, set it to that value.
 - **5931 (Sensor input BX2)**; check that it is set to **none**; if not, set it to this value.
 - **5932 (Sensor input BX3)**; check that it is set to **DHW sensor B3**; if not, set it to this value.
 - **5933 (Sensor input BX4)**; set it to **none**.

- **6014 (Function mixing group 1)**; set it to **Heating circuit 1**.
- **6455 (Function mixing group 3)**; set it to **Multifunctional**.
- **6391 (Sensor input BX31)**; check that it is set to **none**; if not, set it to this value.
- **6392 (Sensor input BX32)**; check that it is set to **none**; if not, set it to this value.
- **6393 (Sensor input BX33)**; check that it is set to **none**; if not, set it to this value.
- **6394 (Sensor input BX34)**; check that it is set to **none**; if not, set it to this value.
- **6455 (Function mixing group 3)**; set it to **Heating circuit 2**.

- Run sensor memorization: access the *Engineer* menu level, then the **Configuration** menu; select parameter **6200 (Save sensors)**, set it to **yes** and confirm.



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 the system controller off and on again; if the problem persists, contact the Robur Technical Support Centre.

G: Codes 330, 331, 332, 333, 441, 442, 443, 444

This problem is due to the physical presence of a sensor connected to one of inputs **BX1, BX2, BX3, BX4, BX31, BX32, BX33, BX34**, to which no function is assigned.

For codes 330, 331, 332, 333 refer to Paragraph 6.1 of the System Controller Installation manual. For codes 441, 442, 443, 444 proceed as follows:

1. Check the configuration:

a. for code 441:

- Access the *Engineer* menu level, then the **Configuration** menu; select parameter **6391 (Sensor input BX31)**; check that it is set to the value **used by parameter 6455**; if not, remaining in the *Engineer* menu level, **Configuration** menu, select parameter **6455 (Function mixing group 3)** and set it to **Heating circuit 2**.

b. for codes 442, 443, 444:

- remove the sensor connected respectively to input **BX32, BX33, BX34** (unassigned inputs).

- Run sensor memorization: access the *Engineer* menu level, then the **Configuration** menu; select parameter **6200 (Save sensors)**, set it to **yes** and confirm.



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 the system controller off and on again; if the problem persists, contact the Robur Technical Support Centre.

H: Code 173

Refer to Paragraph 6.1 of the System Controller Installation manual.

6.2 ERROR LOG

Refer to Paragraph 6.2 of the System Controller Installation manual.

7 SPECIAL OPERATIONS AND CONFIGURATIONS

Refer to section 7 of the system controller Installation manual.

APPENDIX A: TECHNICAL DATA

RVS21.826, QAA75.611, QAA55.110

Refer to Appendix A of the system controller Installation manual.

AVS55.196

Table AVS55.196 technical data

Power supply	Supply voltage	AC 230 V (+10%/-15%)				
	Frequency	50 / 60 Hz				
	Consumption	max. 2.5 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				
Inputs	Digital inputs H31, H32, H33 Open contact voltage Closed contact current	Safety Extra Low Voltage (SELV) for voltage free contacts DC 12 V DC 3 mA				
	Analogue inputs H31, H32, H33 • Functional range • Internal resistance	Safety Extra Low Voltage (SELV) DC 0 - 10 V > 100 kΩ				
	Pulse count inputs H31, H32, H33 • Open contact voltage • Closed contact current • Pulse duration	Safety Extra Low Voltage (SELV) for voltage free contacts DC 12 V DC 3 mA min. 20 ms				
	Frequency measurement inputs H31, H32, H33 • 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				
	Sensor inputs BX31 - BX34	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 QX31... QX33, QX35 • Current range • Switching ON current • Total current	- AC 0.02 - 2 (2) A max. 15 A for ≤1 s max. AC 10 A (total, all 230 VAC outputs)				
	Triac output ZX34 • 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)				
	Power G+ • Output voltage • Current	Safety Extra Low Voltage (SELV), outputs with short-circuit protection 11.3 - 13.2 V max. 88 mA (including RVS21 and AVS55)				
	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 (including RVS21 and AVS55)				
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				
	Connection cable X100 to expansion module AVS55.19x • Cable length	- ribbon cable (18 pole) max. 1000 mm				
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				
	Degree of contamination per EN60730	degree of contamination normal				
Standards, safety, EMC, etc.	CE conformity (EU)	CE1T2355xx06				
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	112 g				

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