Installation manual

Expansion kit
for System controller for K18 absorption heat pump
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I Introduction</td>
<td>4</td>
</tr>
<tr>
<td>I.1 Recipients</td>
<td>4</td>
</tr>
<tr>
<td>I.2 Available languages</td>
<td>4</td>
</tr>
<tr>
<td>II Symbols and definitions</td>
<td>4</td>
</tr>
<tr>
<td>II.1 Key to symbols</td>
<td>4</td>
</tr>
<tr>
<td>II.2 Terms and definitions</td>
<td>4</td>
</tr>
<tr>
<td>III Warnings</td>
<td>4</td>
</tr>
<tr>
<td>III.1 General and safety warnings</td>
<td>4</td>
</tr>
<tr>
<td>III.2 Conformity</td>
<td>5</td>
</tr>
<tr>
<td>III.3 Equipment</td>
<td>5</td>
</tr>
<tr>
<td>III.4 Exclusions of liability and warranty</td>
<td>5</td>
</tr>
<tr>
<td>1 General information and system diagrams</td>
<td>6</td>
</tr>
<tr>
<td>2 Assembly and installation</td>
<td>10</td>
</tr>
<tr>
<td>2.1 Installing the expansion kit into the CSK18 enclosure</td>
<td>10</td>
</tr>
<tr>
<td>3 Electrical hookup</td>
<td>14</td>
</tr>
<tr>
<td>3.1 Hooking up the room unit</td>
<td>14</td>
</tr>
<tr>
<td>3.2 Temperature sensor connection</td>
<td>15</td>
</tr>
<tr>
<td>3.3 Water circulation pump connection</td>
<td>15</td>
</tr>
<tr>
<td>3.4 Mixer valve connection</td>
<td>16</td>
</tr>
<tr>
<td>3.5 External request signal connection to CSK18 enclosure</td>
<td>17</td>
</tr>
<tr>
<td>4 Commissioning</td>
<td>17</td>
</tr>
<tr>
<td>4.1 Using the QAA74.611 advanced room unit’s interface</td>
<td>17</td>
</tr>
<tr>
<td>4.2 Commissioning procedure</td>
<td>17</td>
</tr>
<tr>
<td>4.3 Functional tests</td>
<td>17</td>
</tr>
<tr>
<td>4.4 Standby</td>
<td>18</td>
</tr>
<tr>
<td>5 Settings</td>
<td>19</td>
</tr>
<tr>
<td>5.1 Optimising heating service</td>
<td>19</td>
</tr>
<tr>
<td>5.2 Optimising DHW service</td>
<td>21</td>
</tr>
<tr>
<td>5.3 Optimizing auxiliary boiler management</td>
<td>21</td>
</tr>
<tr>
<td>6 Errors</td>
<td>21</td>
</tr>
<tr>
<td>6.1 List of errors and troubleshooting instructions</td>
<td>21</td>
</tr>
<tr>
<td>6.2 Error log</td>
<td>22</td>
</tr>
<tr>
<td>7 Special operations and configurations</td>
<td>22</td>
</tr>
<tr>
<td>8 Appendix A: technical data</td>
<td>23</td>
</tr>
<tr>
<td>8.1 RVS21.826, QAA74.611, QAA55.110</td>
<td>23</td>
</tr>
<tr>
<td>8.2 AV55.196</td>
<td>23</td>
</tr>
</tbody>
</table>
I  INTRODUCTION

Installation manual

This Installation manual contains all the information required for installing and configuring the Expansion kit (KECSK18) for 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), 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.

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

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, use and maintenance manual in other languages, see Robur website.

II  SYMBOLS AND DEFINITIONS

II.1  KEY TO SYMBOLS

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 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.
III. **Earthing**

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

III. **In the event of failure**

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

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

III. **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 appliance must be installed indoors and out of the weather. For positioning, refer to the protection rating given in Paragraph 2 of the K18 System controller Installation manual.

III.2 **CONFORMITY**

For the appliance's technical and conformity data, refer to Section 8 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 optionals
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 optionals.
Figure 1.3 System with K18 Hybrigas unit, primary water circuit only and three zones, DHW production optional

A  K18 Hybrigas unit
B  Bypass section with overpressure valve
C  Room unit 1 (QAA74.611)
D  Thermostats (with timer) for zones
E  K18 CONTROL CABLE
F  HC1
G  Q6
H  Q2
I  HC2
J  Q20
K  HC3
L  Q3
M  ST
N  ST
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
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 System controller Installation manual 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

2.1.1 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.

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.

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

3. Push the connectors of the AVS82.496 ribbon cable included with the Expansion kit 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 used (code OSR8012 or OSR8004), 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.
cable already assembled to connector X100 of the AVS55.196 electronic board; in this case, insert the free connector into the RVS21.826 board.

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.

### 2.1.2 Electrical hookup

Figure 2.4 p. 13 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 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 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.

To identify the position of the connectors, refer to the wiring diagram given in fig. 2.4 p. 13.

#### Table 2.1 Line Voltage connections to Siemens RVSS5.196 board connectors

<table>
<thead>
<tr>
<th>Function (Siemens logo on water circuit diagrams and description)</th>
<th>Logo on connector Color</th>
<th>Connector code Siemens</th>
</tr>
</thead>
<tbody>
<tr>
<td>230 VAC phase input to RVSS5.196</td>
<td>Pre-wired</td>
<td>X10</td>
</tr>
<tr>
<td>Ground connection to RVSS5.196</td>
<td>Pre-wired</td>
<td>BPZ.3AGPSS.03A/109</td>
</tr>
<tr>
<td>Neutral input to RVSS5.196</td>
<td>Pre-wired</td>
<td>X110</td>
</tr>
<tr>
<td>BPZ:AGPSS.03A/109</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QX31 Y5 - Heating circuit 2 mixer valve open phase output</td>
<td>Pre-wired</td>
<td>X110</td>
</tr>
<tr>
<td>QX32 Y6 - Heating circuit 2 mixer valve close phase output</td>
<td>Pre-wired</td>
<td>BPZ.3AGPSS.10P/109</td>
</tr>
<tr>
<td>QX33 Q6 - Heating circuit 2 water pump phase output / Zone 2 valve (1)</td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td>QX34 Q6 - Heating circuit 2 water pump neutral output / Zone 2 valve (1)</td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td>ZX35 Q20 - Heating circuit 3 water pump phase output / Zone 3 valve</td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td>QX35 Q20 - Heating circuit 3 water pump neutral output / Zone 3 valve</td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td>N Q20 - Heating circuit 3 water pump neutral output / Zone 3 valve</td>
<td>Not used</td>
<td></td>
</tr>
</tbody>
</table>

(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. 12 lists the SELV supply and signals connections on the extractable connectors on the right edge of the Siemens RVSS5.196 expansion board.
Table 2.2 SELV signal connections to Siemens AVS55.196 board connectors

<table>
<thead>
<tr>
<th>Function (Siemens logo on water circuit diagrams and description)</th>
<th>Logo on connector Color</th>
<th>Connector code Siemens</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSB+ - QAA74/QAA55 optional Room Unit data bus connection (1)</td>
<td>X150 Red</td>
<td>BPZ:AGPSS.O7L/109</td>
</tr>
<tr>
<td>BSB- - QAA74/QAA55 optional Room Unit data bus ground (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G+ - QAA74 optional Room Unit backlighting power output (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H31 - Heating circuit 3 normally open request signal input (2)</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>H31 - Heating circuit 3 request signal input return</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H32 - Not used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gx1 - Not used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H33 - Not used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BX31 - Heating circuit 2 temperature sensor input (mixed only)</td>
<td>BX31 - Not used</td>
<td>BPZ:AGPSS.10R/109</td>
</tr>
<tr>
<td>M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BX32 - Not used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BX33 - Not used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BX34 - Not used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(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 in Paragraph 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.
Figure 2.4 Layout of components and wiring diagram of system controller for K18 with expansion kit installed
3 ELECTRICAL HOOKUP

3.1 HOOKING UP THE ROOM UNIT

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

A Grey connector X86 (bottom edge of RVS21.826 board)
B Room unit 1 (QAA74.611)
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 QAA74.611 and QAA55.110 (optional) room unit connection

<table>
<thead>
<tr>
<th>RVS21.826</th>
<th>QAA74.611</th>
<th>QAA55.110</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>M</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>G+</td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>
### 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**

- 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 2 pump connection diagram (if any)

**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. 11)
### 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 AVSSS.196

- **M**
- **N**
- **L**
- **Q20** Heating circuit 3 pump
- **KC2** Relay

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

### 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 AVSSS.196

- **A** Green connector X110 (left edge of AVSSS.196 board)
- **B** Flow from system
- **C** Heating circuit 2 outlet
- **D** Heating circuit 2 inlet
- **E** Y6: close flow from system
- **F** Y5: open flow from system
- **N** Neutral
- **Y5/Y6** Mixer valve
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

- **A** Red connector X150 (right edge of AVS55.196 board)
- **B** NO voltage free contact
- **C3** Thermostat (with timer) for zone 3 (or circuit 3)

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 of 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 QAA74.611 ADVANCED ROOM UNIT’S INTERFACE**

Refer to Paragraph 4.1 of the System controller Installation manual.

**4.2 COMMISSIONING PROCEDURE**

Proceed as indicated in 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**

1. If needed, access again to the complete parameter list, proceeding as described in Paragraph 4.1.1 of the System controller Installation manual.

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 **Relay output QX2** (QX2 relay output on AVS55.196 board, 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 Relay output 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).

6. If heating circuit 2 is present and of the mixed type:
   - Set the parameter to Relay output 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 **Relay output QX32** (QX32 relay output on AVS55.196 board, function Y4 -> open mixing valve on heating circuit 2 inlet line) and check that the mixing valve responds as desired.

   - Set the parameter to Relay output 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.
output on AV55.196 board, function Y6 -> open mixer valve on heating circuit 2 inlet (and check that the mixer valve responds as desired.

7. If heating circuit 3 (or zone 3) is present:
   - Set the parameter to Relay output QX35 (QX35 relay output on AV55.196 board, function Q20 -> heating circuit 3 pump) and check that the pump of heating circuit 3 runs (or the zone 3 valve opens).

8. 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.

9. Set parameter to No test.

10. Display the page containing parameter 7804 (Sensor temp BX1) and check its value (BX1 probe, function B9 -> Outdoor temperature).

11. 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).

12. 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).

13. If heating circuit 2 is present and of the mixed type:
   - Display the page containing 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 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.

14. 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 signal is present, this test must indicate Closed, due to the jumper installed at the factory.

15. 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 signal is present, this test must indicate Closed, due to the jumper added during installation.

16. If heating circuit 3 (or zone 3) is present, and an external request has been installed:
   - Display the page containing parameter 7989 (Input signal H31) 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 signal is present, this test must indicate Closed, due to the jumper added during installation.

17. Display and access the page containing parameter 7700 (Relay test), select it and set it to Everything off.

18. Display and access the page containing parameter 7724 (Output test UX3), select it and set it to 50%.

19. 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 System controller Installation manual):
   - 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.

20. Display and access the page containing parameter 7700 (Relay test), select it and set it to Relay output QX4.

21. Install a temporary jumper between the EXTERN RESET terminals on the CSK18 enclosure terminal block.

22. 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 System controller Installation manual):
   - 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.

23. Set parameter 7700 (Relay test) to No test.

24. Display and access the page containing parameter 7724 (Output test UX3), select it and set it to –% (test disabled).

25. Select Back field to return back to the page shown in Figure 4.4 of the System controller Installation manual.

26. 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 Paragraph 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 Paragraph 4.3.3 of the System controller Installation manual.

4.4 STANDBY

Refer to Paragraph 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 controller Installation manual – Expansion kit.

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

<table>
<thead>
<tr>
<th>Preconfiguration</th>
<th>Dependency on parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating mode</td>
<td>Automatic</td>
</tr>
<tr>
<td></td>
<td>(Comfort 6 – 22 Monday – Sunday)</td>
</tr>
<tr>
<td>Comfort setpoint</td>
<td>21 °C</td>
</tr>
<tr>
<td>Reduced setpoint</td>
<td>18 °C</td>
</tr>
<tr>
<td>Protection setpoint</td>
<td>7 °C</td>
</tr>
<tr>
<td>Heating curve slope</td>
<td>1.26</td>
</tr>
<tr>
<td>Summer/winter heating limit</td>
<td>18 °C</td>
</tr>
<tr>
<td>Flow temp setpoint min</td>
<td>8 °C</td>
</tr>
<tr>
<td>Flow temp setpoint max</td>
<td>65 °C</td>
</tr>
<tr>
<td>Room influence</td>
<td>20%</td>
</tr>
<tr>
<td>Room temperature limitation</td>
<td>2.5 °C</td>
</tr>
<tr>
<td>Flow temp setpoint max</td>
<td>65 °C</td>
</tr>
<tr>
<td>Room influence</td>
<td>20%</td>
</tr>
<tr>
<td>Room temperature limitation</td>
<td>2.5 °C</td>
</tr>
</tbody>
</table>

To change the settings of Table 5.1 p. 19 follow if needed the instructions provided in Paragraph 4.1.1 of the System controller installation manual to access the complete parameter list, then access Heating circuit 3 menu; then scroll through the pages to view the parameters shown in Table 5.1 p. 19 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. 19. For more information on the heating curve slope settings and the min/max water temperature setpoint, see Paragraph 5.1.4 p. 19. For information on the room influence and room temperature limitation settings, see Paragraph 5.1.5 p. 19.

5.1.3 Operating mode selection, room setpoint and time program setting

Refer to Paragraph 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.

To set the operating mode and the room setpoint of heating circuit proceed as described in Paragraph 5.1.2 p. 19 to edit parameters 1300 (Operating mode, 1310 (Comfort setpoint), 1312 (Reduced setpoint) and 1314 (Protection setpoint).

The operating mode and the comfort setpoint can easily be modified at a later time by the end user, if he so wishes. See the System controller User manual for further details.

For the time programming of heating circuit 3 (obligatory if the circuit is running in Automatic mode):

1. If needed, follow instructions in Paragraph 4.1.1 of the System controller Installation manual to access the complete parameter list, then access Time prog heating/cooling menu.

2. Select the Set time program field, then follow the instructions provided in the System controller User manual to proceed with programming.

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

Refer to Paragraph 5.1.4 of the System controller Installation manual for the description of these functions and their programming for heating circuits 1 and 2.

To set the heating curve slope and the flow temp setpoint min and max of heating circuit 3, proceed as described in Paragraph 5.1.2 p. 19 to edit parameters 1320 (Heating curve slope), 1340 (Flow temp setpoint min) and 1341 (Flow temp setpoint max).

Be careful not to change the factory setting (Unused) of parameter 1342 (Flow temp setpoint room stat).

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.

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 change the influence level of the room unit or to disable the function, proceed as described in Paragraph 5.1.2 p. 19 to edit parameter 1350 (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%.

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, proceed as described in Paragraph 5.1.2 p. 19 to edit parameter 1360 (Room temp limitation).

▶ Set the desired value, or set -- °C to disable the function.

5.1.6 Setting the building time constant
Refer to Paragraph 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 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 the circuit accordingly and, if present, also that of heating circuits 2 and 3 (as described in Paragraph 5.1.5 p. 19 of this manual and of 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 Paragraph 5.1.5 of the System controller Installation manual and Paragraph 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, 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 of the System controller Installation manual 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. 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
▶ 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.
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 of the System controller Installation manual 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 of the System controller Installation manual 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.
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 QAA74.611
Proceed as follows, working on the third room unit:
▶ If needed, follow instructions in Paragraph 4.1.1 of the System controller Installation manual 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 3.

Third room unit type QAA55.110
Proceed as follows, working on the third 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 = 3.
▶ Wait for the text ru = 3 to clear from the display.
Now, on the first room unit, proceed as follows:
5. If needed, follow instructions in Paragraph 4.1.1 of the System controller Installation manual 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 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 List of K18 System controller with Expansion kit installed errors

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Priority</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Outside sensor B9</td>
<td>6</td>
<td>A</td>
</tr>
<tr>
<td>30</td>
<td>Flow sensor 1 (1)</td>
<td>6</td>
<td>A</td>
</tr>
<tr>
<td>32</td>
<td>Flow sensor 2 (6)</td>
<td>6</td>
<td>A</td>
</tr>
<tr>
<td>50</td>
<td>OHW sensor 1 (2)</td>
<td>6</td>
<td>A</td>
</tr>
<tr>
<td>60</td>
<td>Room sensor 1 (3)</td>
<td>6</td>
<td>B</td>
</tr>
<tr>
<td>65</td>
<td>Room sensor 2 (4)</td>
<td>6</td>
<td>B</td>
</tr>
<tr>
<td>68</td>
<td>Room sensor 3 (7)</td>
<td>6</td>
<td>B</td>
</tr>
<tr>
<td>83</td>
<td>BSB, short-circuit (5)</td>
<td>8</td>
<td>C</td>
</tr>
<tr>
<td>84</td>
<td>BSB, address collision</td>
<td>3</td>
<td>D</td>
</tr>
<tr>
<td>103</td>
<td>Communication failure</td>
<td>3</td>
<td>C</td>
</tr>
<tr>
<td>127</td>
<td>Legionella temp</td>
<td>6</td>
<td>E</td>
</tr>
<tr>
<td>324</td>
<td>BX same sensors</td>
<td>3</td>
<td>F</td>
</tr>
<tr>
<td>330</td>
<td>BX1 no function</td>
<td>3</td>
<td>G</td>
</tr>
<tr>
<td>331</td>
<td>BX2 no function</td>
<td>3</td>
<td>G</td>
</tr>
<tr>
<td>332</td>
<td>BX3 no function</td>
<td>3</td>
<td>G</td>
</tr>
<tr>
<td>333</td>
<td>BX4 no function</td>
<td>3</td>
<td>G</td>
</tr>
<tr>
<td>441</td>
<td>BX1 no function</td>
<td>3</td>
<td>G</td>
</tr>
<tr>
<td>442</td>
<td>BX2 no function</td>
<td>3</td>
<td>G</td>
</tr>
<tr>
<td>443</td>
<td>BX3 no function</td>
<td>3</td>
<td>G</td>
</tr>
<tr>
<td>444</td>
<td>BX4 no function</td>
<td>3</td>
<td>G</td>
</tr>
<tr>
<td>173</td>
<td>Active alarm 3 contact</td>
<td>6</td>
<td>H</td>
</tr>
</tbody>
</table>

(1) Probe B1
(2) Probe B3
(3) Room unit 1
(4) Room unit 2
(5) Shows in this form in the error log (see Paragraph 6.2 p 22). The information page displays the text "No connection" without error code.
(6) Probe B1/2
(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 complete parameter list, proceeding as described in Paragraph 4.1.1 of the System controller Installation manual, then access the Configuration menu; display and access the page containing parameter 6391 (Sensor input BX31); check that it is set to the value Used by parameter 6455; if not, display and access the page containing parameter 6455 (Function mixing group 3) and set it to Heating circuit 2.
   - Run sensor memorization again as indicated in step 1.

B: Codes 60, 65, 68
1. Memorize the sensors:
   - Access the complete parameter list, proceeding as described in Paragraph 4.1.1 of the System controller Installation manual, then access the Configuration menu; display and access the page containing parameter 6200 (Save sensors), select it and set it to Yes.

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 memorisation again as described 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.

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).

1. Memorize the sensors:
   - Access the complete parameter list, proceeding as described in Paragraph 4.1.1 of the System controller Installation manual, then access the Configuration menu; display and access the page containing parameter 6200 (Save sensors), select it and set it to Yes.
   - Wait for a minute.

2. If step 1 does not resolve the problem:
   - Check the communication between the controller and the room unit/s and their configuration (see Paragraph 5.1.7 p 20). 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
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 Paragraph 5.1.7, p. 20, Case 3, to configure the 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
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 complete parameter list, proceeding as described in Paragraph 4.1.1 of the System controller Installation manual, 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.
     - 6455 (Function mixing group 3); access the page, select the parameter and set it to Multifunctional.
     - 6391 (Sensor input BX31); check that it is set to None; if not, access the page, select the parameter and set it to this value.
     - 6392 (Sensor input BX32); check that it is set to None; if not, access the page, select the parameter and set it to this value.
     - 6393 (Sensor input BX33); check that it is set to None; if not, access the page, select the parameter and set it to this value.
     - 6394 (Sensor input BX34); check that it is set to None; if not, access the page, select the parameter and set it to this value.
     - 6455 (Function mixing group 3); access the page, select the parameter and set it to Heating circuit 2.
   - 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).

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, 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 complete parameter list, proceeding as described in Paragraph 4.1.1 of the System controller Installation manual, then access the Configuration menu; display and access the page containing parameter 6391 (Sensor input BX31); check that it is set to the value Used by parameter 6455; if not, display and access the page containing 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).
   - 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).

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
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

8.1  RVS21.826, QAA74.611, QAA55.110
Refer to Appendix A of the System controller installation manual.

8.2  AVS55.196

Table 8.1  AVS55.196 technical data

<table>
<thead>
<tr>
<th>Power supply</th>
<th>Supply voltage</th>
<th>AC 230 V (+10%/-15%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>50 / 60 Hz</td>
</tr>
<tr>
<td></td>
<td>Consumption</td>
<td>max. 2.5 VA</td>
</tr>
<tr>
<td></td>
<td>Power supply protection</td>
<td>Thermal-magnetic circuit breaker: max. 13 A (EN60898-1) or fuse: max. 10 AT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cabling</th>
<th>230 VAC supply and outputs; bars or braided cables (with/without terminals)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 cable: 0.5 - 2.5 mm²</td>
</tr>
<tr>
<td></td>
<td>2 cables: 0.5 - 1.5 mm²</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Digital inputs H31, H32, H33</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Open contact voltage</td>
</tr>
<tr>
<td></td>
<td>Closed contact current</td>
</tr>
<tr>
<td>Analogue inputs H31, H32, H33</td>
<td>Safety Extra Low Voltage (SELV) for voltage free contacts</td>
</tr>
<tr>
<td>• Functional range</td>
<td>DC 12 V</td>
</tr>
<tr>
<td>• Internal resistance</td>
<td>DC 3 mA</td>
</tr>
</tbody>
</table>

| Pulse count inputs H31, H32, H33 | Safety Extra Low Voltage (SELV) for voltage free contacts |
| • Open contact voltage | DC 12 V |
| • Closed contact current | DC 3 mA |
| • Pulse duration | min. 20 ms |

| Frequency measurement inputs H31, H32, H33 | Safety Extra Low Voltage (SELV) |
| • Functional range | DC 0 - 12 V |
| • Low state voltage | < 1.7 V |
| • High state voltage | 2.7 - 12 V |
| • Internal resistance | > 100 kΩ |
| • Frequency | 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 | 0.25 0.5 0.75 1.0 1.5 (mm²) |
|                        | • Max. length   | 20 40 60 80 120 (m) |

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Relay outputs QX31…QX33, QX35</th>
<th>AC 0.02 - 2 (2) A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Current range</td>
<td>max. 15 A for ≤1 s</td>
</tr>
<tr>
<td></td>
<td>• Switching ON current</td>
<td>max. AC 10 A (total, all 230 VAC outputs)</td>
</tr>
</tbody>
</table>

| Triac output ZX34 | 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) |

<table>
<thead>
<tr>
<th>Power G+</th>
<th>Output voltage S V</th>
<th>11.3 - 13.2 V</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Output voltage 12 V</td>
<td>max. 88 mA (including RVS21 and AVS55)</td>
</tr>
</tbody>
</table>

| Power GX1 (configurable) | Output voltage 5 V | 4.75 - 5.25 V |
|                          | Output voltage 12 V | 11.3 - 13.2 V |
|                          | Current | max. 20 A (including RVS21 and AVS55) |

<table>
<thead>
<tr>
<th>Interfaces</th>
<th>BSB</th>
<th>Base unit/peripheral cable length</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total cable length</td>
<td>Two-wire connection (not invertible)</td>
</tr>
<tr>
<td></td>
<td>Cross section</td>
<td>max. 200 m</td>
</tr>
<tr>
<td></td>
<td>Connection cable X100 to expansion module AVS55.19x</td>
<td>max. 400 m (max. cable capacity: 60 nF)</td>
</tr>
<tr>
<td></td>
<td>• Cable length</td>
<td>min. 0.5 mm²</td>
</tr>
<tr>
<td></td>
<td>ribbon cable (18 pole)</td>
<td>max. 1000 mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Protection rating and safety class</th>
<th>Enclosure protection rating per EN60529</th>
<th>IP 00 (without enclosure)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety class per EN60730</td>
<td>Safety class II for LV parts, if correctly installed</td>
<td></td>
</tr>
<tr>
<td>Degree of contamination per EN60730</td>
<td>degree of contamination normal</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standards, safety, EMC, etc.</th>
<th>CE conformity (EU)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CE1T23S5xx06</td>
</tr>
</tbody>
</table>

| 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) |
### Appendix A: technical data

<table>
<thead>
<tr>
<th>Weight</th>
<th>Packaging excluded</th>
<th>112 g</th>
</tr>
</thead>
</table>
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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