



## Heating Controller

## RVP310

- Multifunctional heating controller for use in residential and non-residential buildings; suitable for weather-dependent flow temperature control of heating zones with or without room temperature compensation
- Control of d.h.w. heating
- With communication capability
- 1 preprogrammed plant type with fixed assignment of the functions required
- Digital setting of the heating curve, analog room temperature readjustment, operating line principle for all other parameters
- Multifunctional relay
- Operating voltage AC 230 V, CE conformance

### Use

- Types of buildings:
  - Multi-family houses
  - Single-family houses
  - Smaller non-residential buildings
- Types of plants:
  - Heating zones and d.h.w. heating plants that have their own heat generating equipment
  - Interconnected plants consisting of heat generating equipment, several heating zones and central or decentral d.h.w. heating plant
- Types of heating systems:
  - Radiator, convector, underfloor and ceiling heating systems, radiating panels

## Functions

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**Heating zone control**

- Weather-dependent flow temperature control through control of the seat or slipper valve in a heating zone

**D.h.w. control**

- D.h.w. heating through control of the charging pump
- Control of a circulating pump and of an electric immersion heater

### Operating modes



#### **Automatic mode**

Automatic changeover from normal to reduced temperature, and vice versa, according to the weekly program, automatic changeover to holiday mode, demand-dependent control of heating system (ECO function)



#### **Setback mode**

Continuous heating to the reduced temperature, with ECO function



#### **Comfort mode**

Continuous heating to the normal temperature, no ECO function



#### **Standby**

Frost protection is ensured in all operating modes.

The controller can be switched to manual operation.

### Other functions

- Optimization functions
- Protective functions
- Remote control
- Commissioning aids
- Communication functions

## Ordering

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When ordering, please give type reference **RVP310** and the language code letter (-A, -B or -C) for the Operating Instructions and the Installation Instructions in the requested language:

**-A** for English, French, Italian, German (e.g. RVP310-A for English)

**-B** for French, Dutch, Spanish (e.g. RVP310-B for French)

**-C** for Danish, Finnish, Swedish, Greek (e.g. RVP310-C for Danish)

Sensors, room unit, actuators and valves must be ordered as separate items.

## Equipment combinations

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### Suitable sensors and room units

- Flow, return and d.h.w. temperature: all sensors with LG-Ni 1000  $\Omega$  at 0 °C, for example:
  - Strap-on temperature sensor QAD22
  - Immersion temperature sensors QAE212... and QAP21.3
- Room temperature:
  - Room unit QAW50
  - Room unit QAW70
  - Room temperature sensor QAA24
- Outside temperature:
  - Outside sensor QAC22 (Ni sensing element)
  - Outside sensor QAC32 (NTC sensing element)

### Suitable actuators

The following actuators made by SBT HVAC Products can be used:

- for 3-position control, running time 0.5...14.5 minutes
- for 2-position control
- operating voltage AC 24 V...AC 230 V

## Communication

The controller is capable of communicating with:

- All units with LPB capability made by SBT HVAC Products
- SYNERGYR OZW30 central unit (from software version 3.0)

## Technical design

### Plant types

Description plant type	Picture
<b>1-1</b> Space heating with mixing zone, 3-position control or 2-position control, acting on seat or slipper valve. D.h.w. heating through control of the charging pump	

A6 Room unit QAW50 or QAW70

B1 Flow sensor

B31 D.h.w. storage tank sensor / control thermostat

B5 Room sensor

B7 Return sensor

B9 Outside sensor

E2 Load (room)

K6 Electric immersion heater / circulating pump

LPB Data bus

M2 Circulating pump

M3 Charging pump

N1 Controller RVP310

Y1 Seat or slipper valve

### Working principle

The RVP310 offers 1 plant type that is ready programmed in the controller. The standard settings are practice-oriented.

### Enduser settings

With weather-dependent control, the flow temperature is controlled in function of the prevailing outside temperature via the heating curve. Its basic setting is made on 2 operating lines. The room temperature can be readjusted with the knob.

In addition, the following can be entered by the enduser:

- Room temperature set values for normal heating, reduced heating and frost protection/holidays
- D.h.w. temperature setpoint
- 2 weekly switching programs and one holiday period per year
- Operating mode
- Time of day and date

### Temperature acquisition

- Outside temperature: with Ni or NTC sensor; the RVP310 identifies the type of sensor used. With interlinked controllers, it is also possible to define the source of the outside temperature
- Room temperature: with a room temperature sensor or a room unit or both (averaging)

### Space heating

- The room temperature is included in the control. It can be acquired with a sensor or simulated by a room model with an adjustable building time constant. When using a sensor, the effect on the control can be adjusted.  
It is also possible to limit the maximum room temperature.
- The heating is switched on and off depending on demand (ECO function). It is switched off when the amount of heat stored by the building mass is sufficient to maintain the required room temperature. In that case, the controller takes into account the development of the room temperature and the building's heat storage capacity. It is possible to set 2 heating limits, one for normal heating and one for reduced heating.
- The control is optimized. Switching on, heating up and shutting down are controlled such that, during occupancy times, the required room temperature is always maintained.  
At the end of each occupancy period, the heating will be shut down (circulating pump) until the room temperature set value for the non-occupancy time is reached

(quick setback, can be disabled). During heating up, the room temperature set value can be boosted (boost heating). It is possible to set maximum limits for the heating up time and for early shutdown.

<b>Heating zone control</b>	<p>The heating zone control operates as weather-dependent flow temperature control with 3-position or 2-position control. The flow temperature is controlled via the regulating unit (seat or slipper valve).</p> <p>Minimum and maximum limitation of the flow temperature as well as maximum limitation of the rate of set value rise are adjust.</p>
<b>Minimum limitation of return temperature</b>	<p>Minimum limitation of the return temperature helps prevent flue gas condensation.</p>
<b>Locking functions</b>	<p>On the software side, all settings can be locked to prevent unauthorized readjustments.</p>
<b>Time switch</b>	<ul style="list-style-type: none"><li>• The RVP310 has 2 independent weekly time switches whose assignment can be selected. Each weekly time switch affords 3 daily on periods, which may differ from one weekday to the other.</li><li>• For entering a holiday period, the RVP310 is equipped with a yearly time switch featuring automatic summer- / wintertime changeover.</li></ul>
<b>D.h.w. heating</b>	<p>D.h.w. heating is controlled independent of the heating circuit. It can be enabled:</p> <ul style="list-style-type: none"><li>• According to its own weekly program</li><li>• According to the switching program of the heating circuit control (one hour before space heating starts)</li><li>• According to the switching programs of the zone controllers on the data bus</li><li>• Permanently (24 hours a day)</li></ul> <p>D.h.w. heating features a legionella function which can be deactivated. Legionella protection is provided once a week.</p> <p>The d.h.w. temperature is acquired with a sensor or a thermostat.</p> <p>D.h.w. control also includes the control of a circulating pump and of an electric immersion heater (control via the multifunctional relay).</p> <p>The d.h.w. storage tank can be forcedly charged once a day.</p>
<b>Remote control</b>	<ul style="list-style-type: none"><li>• Changeover of operating mode with the QAW50 room unit</li><li>• Overriding the major controller functions with the QAW70 room unit</li><li>• Selection of another (programmable) operating mode with an external switch (H1)</li></ul>
<b>Communication</b>	<p>Communication with other devices is effected via the data bus and allows:</p> <ul style="list-style-type: none"><li>• Signaling of heat demand to the heat generator</li><li>• Exchange of locking and enforced signals</li><li>• Exchange of measured values such as outside temperature and return temperature as well as clock signals</li><li>• Communication with other devices</li><li>• Reception of heat demand from the SYNERGYR OZW30 central unit (from software version 3.0)</li><li>• Exchange of error messages</li></ul>
<b>Error messages</b>	<ul style="list-style-type: none"><li>• Error message in the event of sensor faults</li><li>• Error message in the event of data bus or room unit faults</li></ul>
<b>Other functions</b>	<ul style="list-style-type: none"><li>• Multifunctional relay. Choice of functions:<ul style="list-style-type: none"><li>– Alarm contact in the event of error messages</li><li>– On / off according to heat demand</li><li>– Control of the d.h.w. circulating pump</li><li>– Control of the electric immersion heater</li></ul></li><li>• Display of parameters, actual values, operational statuses and error messages</li></ul>

- Simulation of outside temperature
- Relay test; all relays can be controlled manually
- Sensor test; all measured values of the sensors can be displayed
- Outside temperature-dependent frost protection for the plant; a minimum flow temperature is maintained, its set value and the response threshold can be adjusted
- Pump overrun time to prevent buildup of heat
- Periodic pump run (pump kick) to prevent seizing of the pump in the summer
- Controller hours run meter

For more detailed information on technical features, functions and communication with LPB, please refer to the following pieces of documentation:

- Basic Documentation RVP3...: P2474
- Data sheet "Basic System Data LPB": N2030
- Data sheet "LPB": N2032

## Mechanical design

The RVP310 is comprised of controller insert, which accommodates the electronics, the power section, the output relays and – on the front – all operating elements, and the base, which carries the connection terminals. The operating elements are located behind a cover.

The operating instructions can be inserted in the cover.

The controller insert is secured to the base with 2 screws.

The RVP310 can be fitted in 3 different ways:

- Wall mounting (on a wall, in the control panel, etc.)
- Rail mounting (on a standard DIN mounting rail)
- Flush panel mounting (control panel door, etc.)

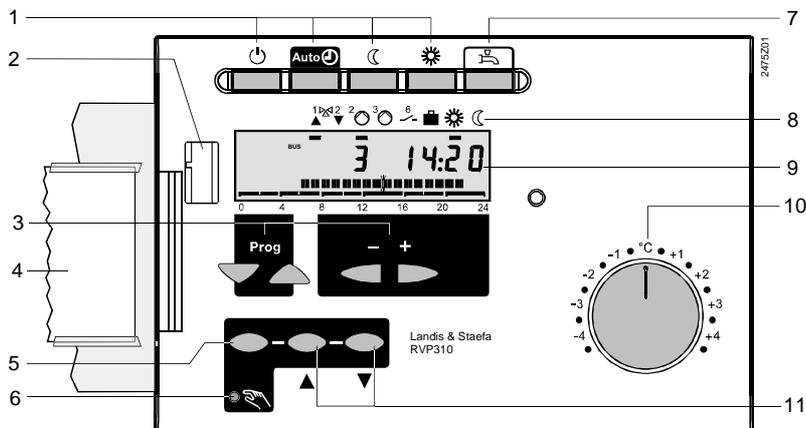
## Analog operating elements

- Buttons for selecting the required operating mode
- Button for d.h.w. heating on / off
- Knob for manual readjustment of the room temperature
- 3 buttons for manual operation and manual positioning commands

## Digital operating elements

The entry or readjustment of all setting parameters, activation of optional functions and reading of actual values and statuses is made according to the operating line principle. An operating line with an associated number is assigned to each parameter, each actual value and each function that can be selected.

One pair of buttons is used to select an operating line and one pair to readjust the display.



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|--|---|
| <ol style="list-style-type: none"> <li>1 Operating mode buttons (selected button is lit)</li> <li>2 Service plug</li> <li>3 Buttons for operating the display:<br/>Prog = selection of operating line<br/>- + = readjustment of displayed value</li> <li>4 Operating instructions</li> </ol> | <ol style="list-style-type: none"> <li>5 Button for manual operation</li> <li>6 LED for manual operation</li> <li>7 Button for d.h.w. heating on / off</li> <li>8 State display (outputs, temperature levels, holiday)</li> <li>9 Display (LCD)</li> <li>10 Knob for room temperature readjustments</li> <li>11 Buttons for "Open valve / Close valve" in manual operation</li> </ol> |
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## Notes

- Engineering**
- The wires of the measuring circuits carry extra low voltage, those to the actuator and the pump carry AC 24...230 V.
  - The local electrical regulations must be complied with.
  - Sensor cables should not be run parallel to mains carrying cables for loads such as actuator, pump, burner, etc.

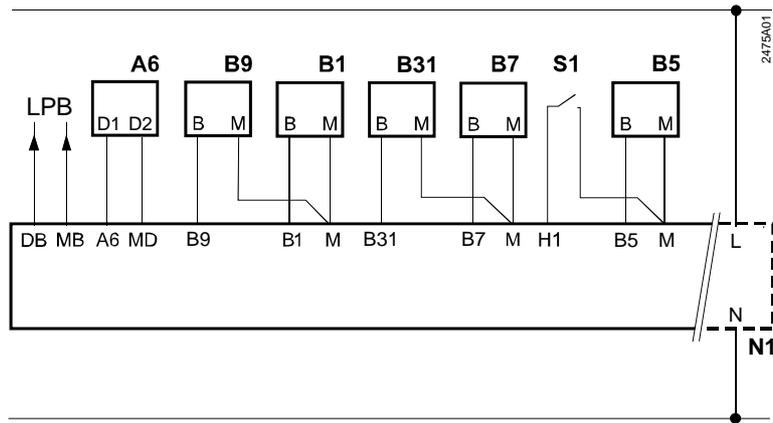
**Commissioning** Each controller is supplied complete with installation and commissioning instructions.

## Technical data

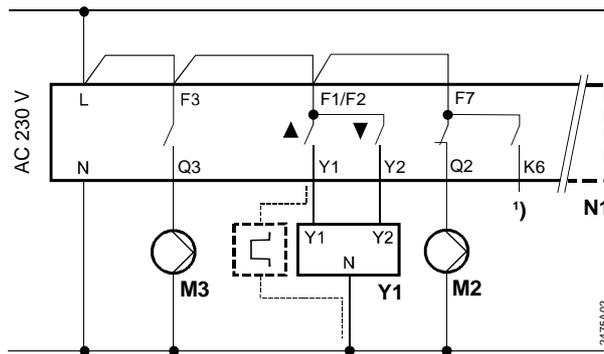
General data	Rated operating voltage	AC 230 V +10/-15 %
	Frequency	50 Hz
	Power consumption	8 VA
	Perm. ambient temperature	
	Transport and storage	-25...+65 °C
	Operation	0...50 °C
	Bus loading characteristic E (LPB)	7
	Backup of time switch	12 h min.
	Weight (net)	0,81 kg
Standards	Product safety	
	Automatic electrical controls for household and similar use	EN 60730-1
	Particular requirements for temperature sensing controls	EN 60730-2-9
	Degree of protection	IP40 to EN 60529
	Safety class (if correctly installed)	II to EN 60730
	CE conformance to	
	EMC directive	89/336/EWG
	Low voltage directive	73/23/EWG
	EMC directive	
	Electromagnetic immunity	EN 50082-2
Electromagnetic emissions	EN 50081-1	
Output relays	Rated voltage	AC 230 V
	Rated current	2 (2) A
	Contact current at AC 24...90 V	0,1...2 A, $\cos \varphi > 0,6$
	Contact current at AC 90...250 V	0,02...2 A, $\cos \varphi > 0,6$
	Max. switch-on current (fuse)	10 A max.
Perm. cable lengths	to the sensors and external contacts	
	Copper cable 0.6 mm dia.	20 m
	Copper cable 1,0 mm <sup>2</sup>	80 m
	Copper cable 1,5 mm <sup>2</sup>	120 m
	to the room unit	
	Copper cable 0,25 mm <sup>2</sup>	25 m
Copper cable from 0,5 mm <sup>2</sup>	50 m	

## Connection diagrams

### Low voltage side

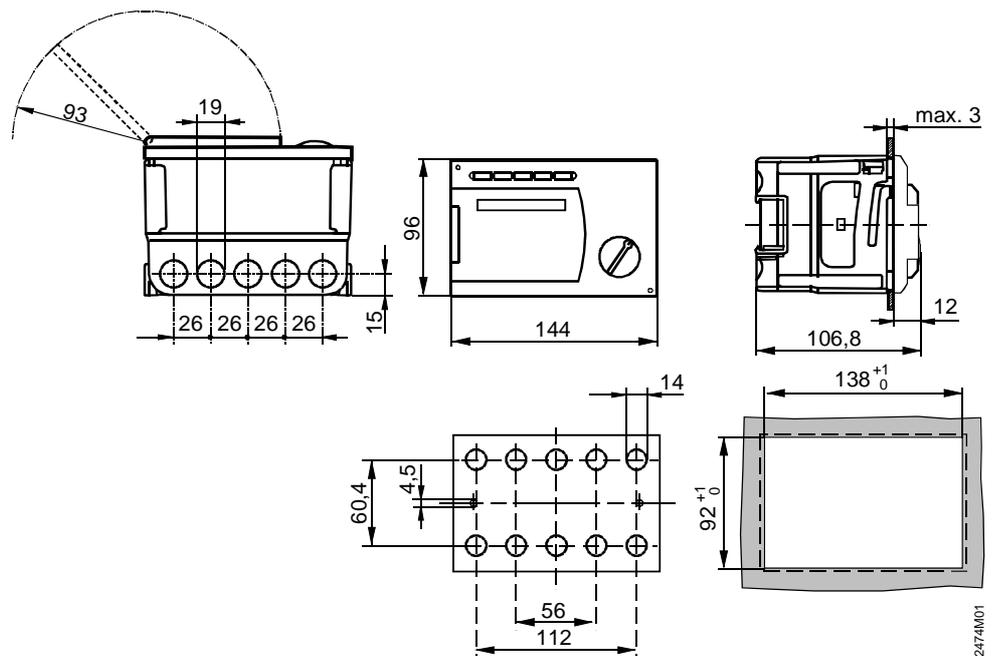


### Mains voltage side



- |     |   |    |                               |
|-----|---|----|-------------------------------|
| A6  | Room unit (QAW50 or QAW70)                      | M2 | Heating circuit pump          |
| B1  | Flow sensor                                     | M3 | Charging pump                 |
| B31 | D.h.w. storage tank sensor / control thermostat | N1 | Controller RVP310             |
| B5  | Room sensor                                     | S1 | Remote control operating mode |
| B7  | Return sensor                                   | Y1 | Actuator of heating circuit   |
| B9  | Outside sensor                                  | Y2 | Actuator of heating circuit   |
| LPB | Data bus  | Y) | Multifunctional output        |

## Dimensions



Dimensions in mm