

Heating Controller

Series B
RVL469

for use with a partner unit



- 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
- For exclusive use on the bus together with an RVL47... heating controller as a partner unit
- 1 programmed plant type: three-position control of the mixing valve in a heating zone
- Analog or digital setting of the heating curve, analog room temperature readjustment, operating line principle for all other parameters
- Operating voltage AC 230 V, CE conformity

Use





- Types of buildings:
 - Multi-family houses
 - Single-family houses
 - Smaller non-residential buildings
- Types of plants:
 - Combined plants consisting of several heating zones and heat generation
- Types of heating systems:
 - Radiator, convector, underfloor and ceiling heating systems, radiating panels

Functions

Heating zone control

Weather-dependent flow temperature control through control of the mixing valve in a heating zone in combined plants.

Operating modes

-  **Automatic mode**
Automatic changeover from normal to reduced temperature, and vice versa, according to the seven-day 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

When ordering, please give type reference **RVL469**. Partner unit, sensors, actuator and valve and, if required, room unit must be ordered as separate items.

Equipment combinations

Partner unit

Suitable partner units are:

- RVL470 (data sheet CE1N2522E)
- RVL471 (data sheet CE1N2524E)
- RVL472 (data sheet CE1N2526E)
- RVL47 (data sheet CE1N2523E)

Suitable sensors and room units

- Flow and return temperature: all sensors with LG-Ni 1000 Ω at 0 °C, for example:
 - Clamp-on temperature sensor QAD22
 - Immersion temperature sensors QAE22... 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

All electric and electrohydraulic actuators for three-position control made by Landis & Staefa can be used.

For the different types of actuators, refer to data sheets 4500...4599.

Communication

The controller is capable of communicating with:

- All units with LPB capability made by Landis & Staefa
- SYNERGYR OZW30 central unit (from software version 3.0)

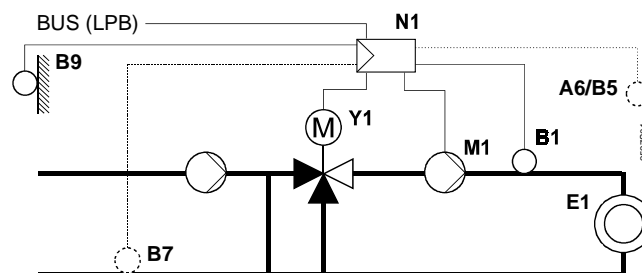
Technical design

Working principle

Connection to an RVL47... partner unit is mandatory. The partner unit is defined by assigning an address. Each partner unit can be operated with only one RVL469.

Plant type

The RVL469 has one plant type preprogrammed: room heating with mixing zone, three-position control acting on mixing valve.



A6	Room unit QAW50 or QAW70	E1	Load (space)
B1	Flow sensor	LPB	Data bus
B5	Room sensor	M1	Heating circuit pump
B7	Return sensor	N1	Controller RVL469
B9	Outside sensor	Y1	Mixing valve heating circuit

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 with the little bar on the front of the unit or on an operating line. The room temperature can be readjusted with the knob.

In addition, following can be entered by the enduser:

- Room temperature setpoints for normal heating, reduced heating and frost protection/holidays
- Seven-day switching program and a maximum of eight holiday periods per year
- Operating mode
- Time of day and date

Temperature acquisition

- Flow temperature: with one or two (averaging) sensors
- Outside temperature: with Ni or NTC sensor; the RVL469 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 two 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 setpoint for the non-occupancy time is reached (quick set-back, can be disabled). During heating up, the room temperature setpoint can be boosted (boost heating). It is possible to set maximum limits for the heating up time and for early shutdown.

Three-position control

Three-position control operates as weather-dependent or load-dependent flow temperature control. P-band and integral action time are adjustable. The flow temperature is controlled via the regulating unit (control or slipper valve).
Minimum and maximum limitation of the flow temperature as well as maximum limitation of the rate of setpoint rise are adjustable.

Minimum limitation of return temperature

Minimum limitation of the return temperature acts with both three-position control and load-dependent control of the boiler temperature and helps prevent flue gas condensation.

Locking functions

On the software side, all settings can be locked to prevent unauthorized readjustments.

Time switch

- The RVL469 has one seven-day time switch for entering the daily occupancy times. Each day can accommodate three occupancy times, whereby each weekday may have different occupancy times
- For entering a maximum of eight holiday periods, the RVL469 is equipped with a yearly time switch featuring automatic summer- / wintertime changeover

Remote control

- Changeover of operating mode with the QAW50 room unit
- Overriding the major controller functions with the QAW70 room unit
- Selection of another (programmable) operating mode with an external contact
- Preselection of a fixed flow temperature setpoint with an external contact. Type of setpoint (fixed or minimum) and flow temperature can be selected

Communication To provide this function, connection of the RVL469 to its partner unit via the data bus is mandatory. Each RVL469 requires one partner unit. Communication with other units also takes place via the data bus and facilitates:

- Signalling of heat demand to the heat source
- Exchange of locking and enforced signals
- Exchange of measured values such as outside temperature, return temperature, flow temperature and of clock signals
- Communication with other devices
- Reception of heat demand signals from the SYNERGYR OZW30 central unit (from software version 3.0)
- Exchange of error messages

Fault messages and flow temperature alarm

- Fault message in the event of sensor faults
- Fault message in the event of data bus faults
- Flow temperature alarm; adjustable is a period of time during which the flow temperature may stay outside the set limits; a fault message is given when the time has elapsed

Other functions

- Display of parameters, actual values, operational statuses and fault messages
- Simulation of outside temperature
- Relay test; all relays can be controlled manually
- Sensor test; all measured values of the sensors can be displayed
- Testing the contacts connected to terminals H1–M and H2–M
- Outside temperature-dependent frost protection for the plant; a minimum flow temperature is maintained, its setpoint 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 about technical features, functions and communication with LPB, please refer to the following pieces of documentation:

- Basic Info RVL470: CE1P2522E
- Data sheet “Basic System Data LPB“: CE1N2030E
- Data sheet “LPB“: CE1N2032E

Mechanical design The RVL469 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 lockable transparent cover.

The operating instructions can be inserted in the transparent cover.

The controller insert is secured to the base with two screws, one of which can be sealed. The cover can also be sealed.

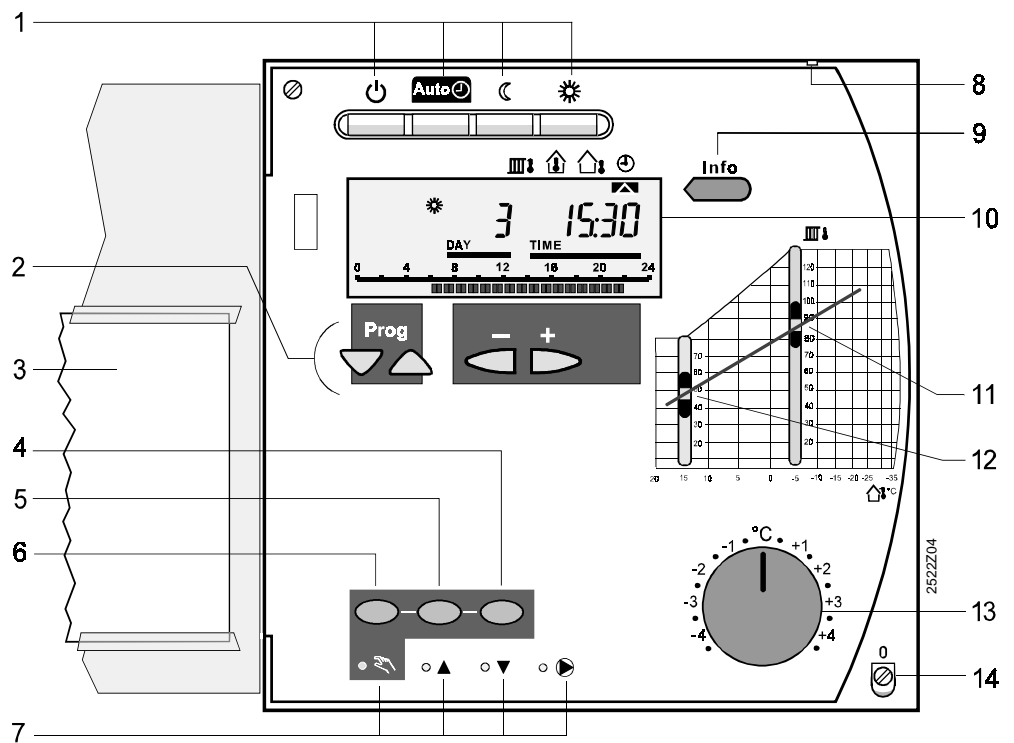
The RVL469 can be fitted in three different ways:

- 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
- Info button
- Direct adjustment of the heating curve with the little bar on the front of the unit (only if analog setting is selected)
- Knob for manual readjustment of the room temperature
- Three 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.



- 1 Operating mode buttons (selected button is lit)
- 2 Buttons for operating the display
Prog = selection of operating line
- + = readjustment of displayed value
- 3 Operating instructions
- 4 Button for «Close valve» in manual operation
- 5 Button for «Open valve» in manual operation
- 6 Button for manual operation
- 7 LEDs for:
 - Manual operation
 - Valve opens
 - Valve closes
 - Pump runs
- 8 Sealing facility in the cover
- 9 Info button for display of actual values
- 10 Display (LCD)
- 11 Setting slider for flow temperature setpoint at an outside temperature of $-5\text{ }^{\circ}\text{C}$
- 12 Setting slider for flow temperature setpoint at an outside temperature of $15\text{ }^{\circ}\text{C}$
- 13 Knob for room temperature readjustments
- 14 Fixing screw with sealing facility

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, etc.

Commissioning

The data bus address must be entered.

The partner unit must be available on the data bus.

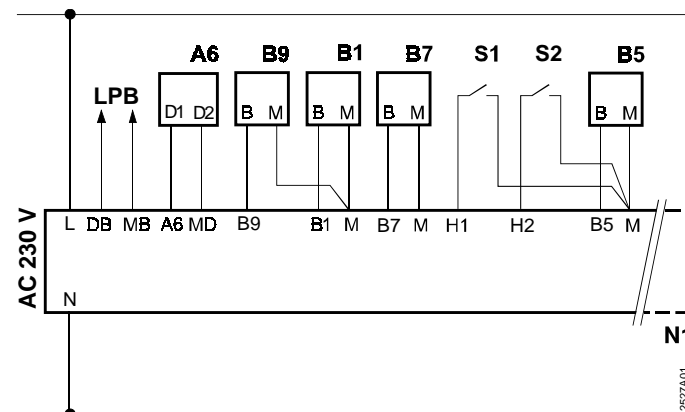
Each controller is supplied complete with installation and commissioning instructions.

Technical data

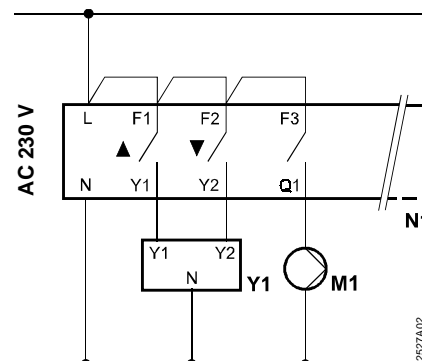
CE —conformity to	
EMC directive	89/336/EWG
Immunity	EN 50082-2
Emissions	EN 50081-1
Low voltage directive	73/23/EWG
Safety	EN 60730-1
Rated operating voltage	AC 230 V
Frequency	50 Hz
Power consumption	8 VA
Degree of protection (cover closed)	IP42 EN 60529
Safety class	II EN 60730
Output relays	
Rated 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, $\cos \varphi > 0.6$
Rated current of ignition transformer	max. 1 A during max. 30 s
Switch-on current of ignition transformer	max. 10 A during max. 10 ms
Perm. ambient temperature	
Transport and storage	-25...+65 °C
Operation	0...50 °C
Perm. cable lengths to the sensors and external contacts	
Copper cable 0.6 mm dia.	20 m
Copper cable 1.0 mm ²	80 m
Copper cable 1.5 mm ²	120 m
Perm. cable lengths to the room unit	
Copper cable 0.25 mm ²	25 m
Copper cable from 0.5 mm ²	50 m
Bus loading characteristic E (LPB)	6
Backup of time switch	12 h min.
Weight (net)	1.1 kg

Connection diagrams

Basic connections on the low voltage side



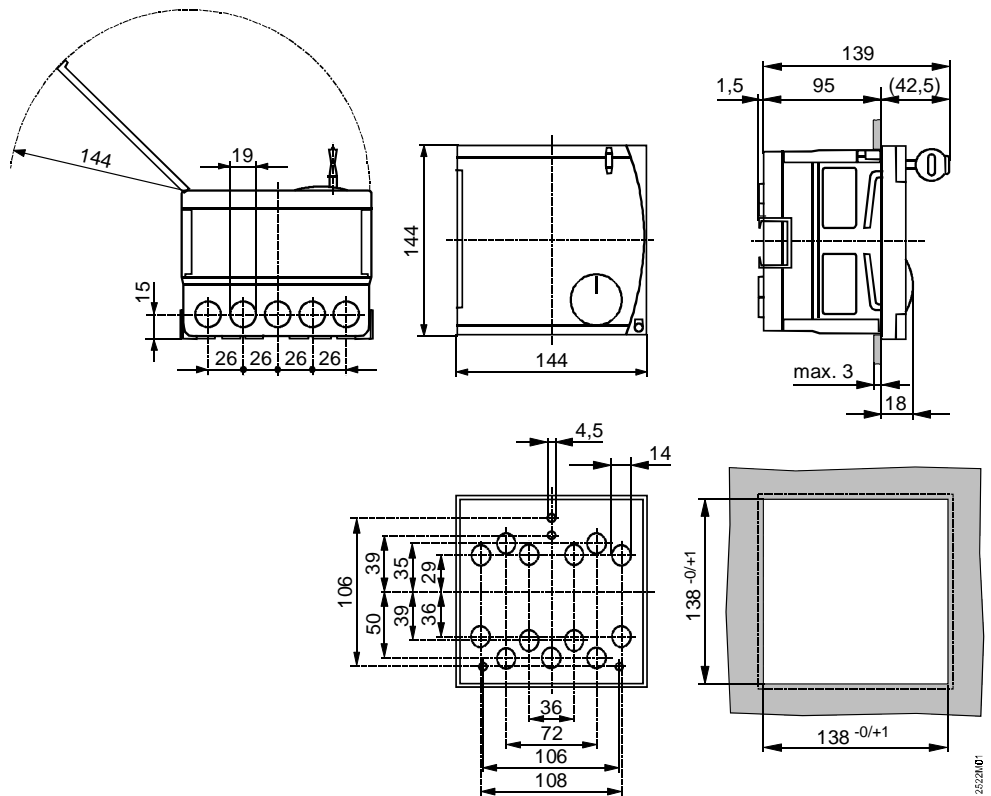
Basic connections on the mains voltage side



A6 Room unit QAW50 or QAW70
 B1 Flow sensor
 B5 Room sensor
 B7 Return sensor
 B9 Outside sensor
 LPB Data bus

M1 Heating circuit pump
 N1 Controller RVL469
 S1 Remote control operating mode
 S2 Remote control flow temperature setpoint
 Y1 Actuator heating circuit

Dimensions



Dimensions in mm

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