

Heating controllers

for 1 heating circuit

RVP34..

Heating controllers

for 1 heating circuit and d.h.w.

RVP35..

Multifunctional heating controllers with LPB communication capability for residential and nonresidential buildings. RVP34.. are suited for the control of 1 heating circuit, RVP35.. for 1 heating circuit and d.h.w. heating. RVP34.. incorporate 2, RVP35.. 3 programmed plant types. Operating voltage AC 230 V.

Use

- Types of plants:
 - Heating zone
 - Heating zone with district heat connection
 - Heating zone and d.h.w. heating with own heat generation
 - Interconnected plants consisting of several heating zones each with 1 heating circuit and integrated d.h.w. heating
- Types of buildings:
 - Residential and nonresidential buildings
- Types of heating systems:
 - All types of standard heating systems, such as radiator, convector, floor and ceiling heating systems, radiant panels
- Types of d.h.w. heating systems:
 - With storage tank
 - With electric immersion heater and solar collector

Functions

Heating circuit control

- Weather-compensated flow temperature control
- Weather-compensated flow temperature control with room influence
- Weather-compensated flow temperature control, valve installed in the primary return of a district heat zone (only RVP34..)
- Demand-based control of the boiler temperature (only RVP35..)

D.h.w. control

- D.h.w. heating with coil type storage tanks and charging pump (only RVP35..)
- D.h.w. heating with electric immersion heater and solar collector (only RVP35..)

Other functions

- Optimized heating up and setback
- Automatic heating limit (automatic ECO function)
- Frost protection (building, plant, and d.h.w.)
- Year clock with automatic summer- / wintertime changeover
- Autonomous scheduler programs for space heating and d.h.w. (only RVP35..)
- Limitation of maximum rate of flow temperature increase
- Digital input for remote control of operating mode
- Communication via LPB (Local Process Bus, only RVP340 and RVP350)
- Pump kick
- Relay and sensor test
- Remote control via room unit

Type summary

<i>Description</i>	<i>Instructions in ...</i>	<i>Product no.</i>	<i>Stock no.</i>
Heating controller for 1 heating circuit, communicating	German, English, French, Italian, Dutch, Spanish, Greek, and Russian	RVP340	S55370-C136
Heating controller for 1 heating circuit and d.h.w., communicating	German, English, French, Italian, Dutch, Spanish, Greek, and Russian	RVP350	S55370-C137
Heating controller for 1 heating circuit and d.h.w., noncommunicating	German, English, French, Italian, Dutch, Spanish, Greek, and Russian	RVP351	S55370-C138

Ordering

When ordering, please give product no., e.g. **RVP340**.
The controllers are supplied complete with Operating and Installation Instructions.

Note

Sensors, room units, actuators and valves must be ordered separately.

Equipment combinations

Suitable sensors and room units

- Flow, return and d.h.w. temperature:
All types of sensors using a sensing element LG-Ni1000, for example:
 - Strapon sensor QAD22
 - Immersion sensors QAE212... and QAP21.3
 - Collector sensor (solar) QAP21.2
- Room temperature:
 - Room units (PPS) QAW50 and QAW70
 - Room sensor QAA24 (sensing element LG-Ni1000)
- Outside temperature:
 - Outside sensor QAC22 (sensing element LG-Ni1000)
 - Outside sensor QAC32 (sensing element NTC 575)

Note

The controllers identify automatically the type of sensor used.

Suitable actuators

The following types of actuators from Siemens can be used:

- 3-position actuators with a running time of 30...873 s
- 2-position actuators
- Operating voltage AC 24...230 V

For more detailed information about actuators and valves, refer to the respective Data Sheets.

Product documentation

<i>Type of document</i>	<i>Document no.</i>	<i>Stock no.</i>
Operating Instructions Language set: de, en, fr, it, nl, es, el, ru	B2545	74 319 0816 0
Installation Instructions Language set: de, en, fr, it, nl, es, el, ru	G2545	74 319 0815 0
Basic Documentation	P2545	STEP Web Client
CE Declaration of Conformity	T2545	STEP Web Client
Environmental Declaration	E2545	STEP Web Client

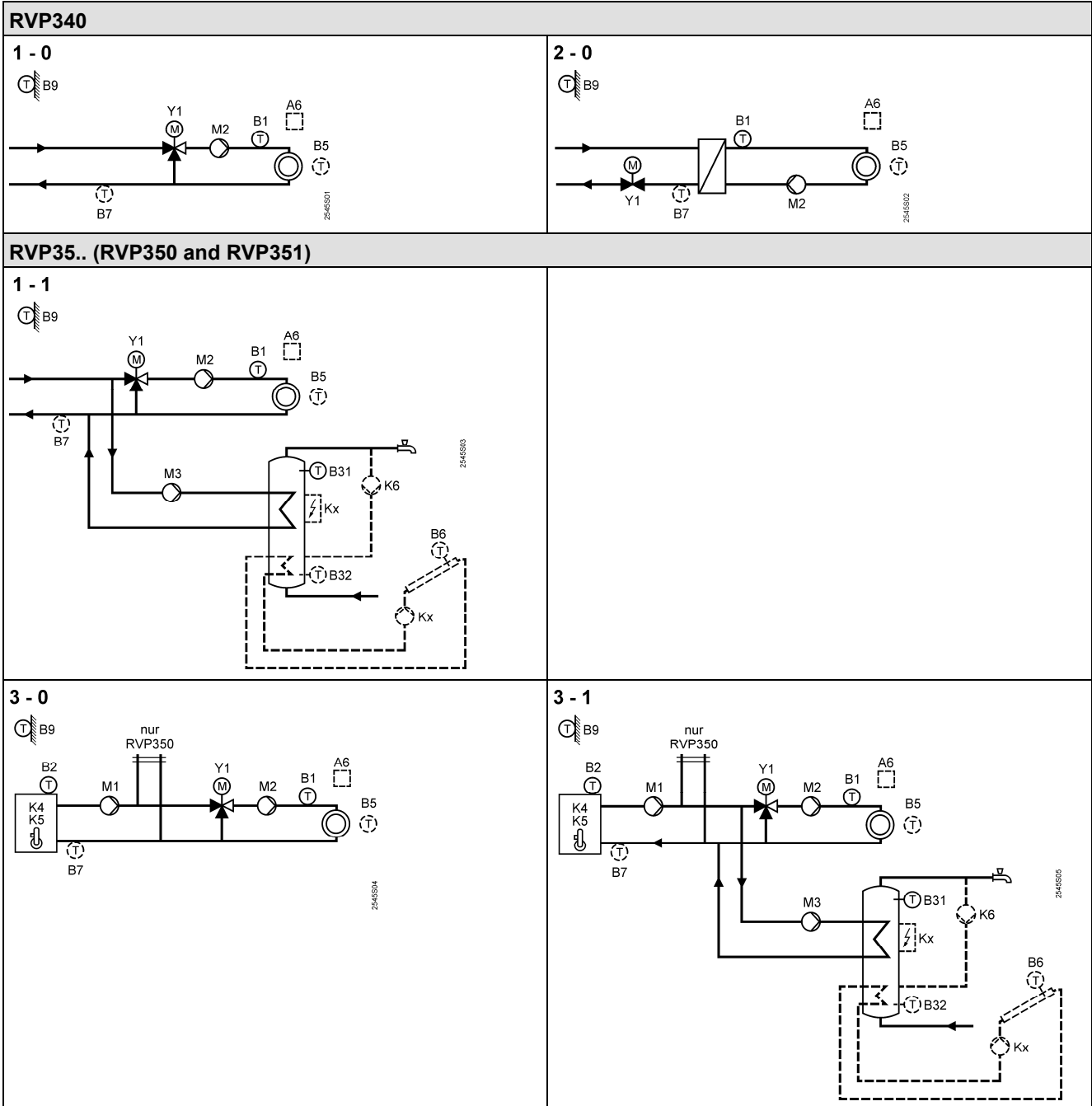
Technical design

Mode of operation







The RVP34.. makes possible the configuration of 2 plant types, the RVP35.. the configuration of 3 plant types as combinations of heat generation, heating circuit and d.h.w. When commissioning a plant, the respective plant type is to be entered. The required functions, settings and displays are then automatically assigned, and parameters that are not needed will be hidden.

Note

Optional functions necessitate extra configurations.



Operating modes

-  **Automatic operation**
Automatic heating operation with changeover between normal and reduced operation according to scheduler program, automatic ECO function and room unit active
-  **Reduced operation**
Continuous heating to reduced room temperature, automatic ECO function active
-  **Normal operation**
Continuous heating to normal room temperature
-  **Protection mode**
Heating operation off, frost protection ensured
-  **Automatic d.h.w. heating**
-  **Manual control**
No automatic control, pumps in operation

Notes

- Frost protection is ensured in all operating modes
- The heating circuit's operating mode has no impact on d.h.w. heating

Heating circuit control

The RVP34.. provides control of a pump heating circuit via heat exchanger or control of a mixing heating circuit.
The RVP35.. provides control of a mixing heating circuit.

Compensating variables

With weather-compensated control, the composite outside temperature is used as the compensating variable. It is generated from the current and the attenuated outside temperature (calculated by the controller). The building time constant is adjustable.

Setpoints

Adjustable are the room temperature setpoints for NORMAL and REDUCED heating and for holiday plus protection mode. Using the setting knob on the controller front, the room temperature setpoint for NORMAL heating can be readjusted by ± 4.5 °C.

Generation of flow temperature setpoint

The assigned flow temperature setpoint is generated as follows:

- Weather-compensated control: The setpoint is continuously shifted by the outside temperature. The heating curve assigns the flow temperature to the current outside temperature
- Weather-compensated control with room influence: The setpoint is shifted by the outside temperature and the deviation of current room temperature and room temperature setpoint
- The maximum rate of flow temperature increase is adjustable

Controlled variable

The controlled variable is the flow temperature. In the case of district heating (only RVP34..), it is controlled via the 2-port valve installed in the primary return; with the other plant types, via the heating circuit's mixing valve.

Heating curve

With weather-compensated control, the heating curve assigns the flow temperature to the outside temperature. Its basic setting is made on 2 operating lines.

Optimization

The control is optimized; switching on, heating up and switching off are controlled in such a way that the required room temperature is always ensured during occupancy times.
At the end of occupancy, the heating (circulating pump) is switched off until the room temperature has dropped to the setpoint for non-occupancy (quick setback, can be deactivated).
Maximum limit values can be set for the heating up time and for early shutdown.
The optimization functions can be deactivated.

Automatic ECO function	The automatic ECO function controls the heating system depending on demand; it is deactivated when permitted by the progression of the outside temperature. The function gives consideration to the current, the attenuated and the composite outside temperature, plus 2 adjustable heating limits; 1 for normal heating and 1 for reduced heating. The automatic ECO function requires an outside sensor. It can be deactivated, if required.
Max. and min. limitation of flow temperature	For the flow temperature, maximum and minimum limitation and a maximum rate of setpoint increase (heating up brake) can be set. Active limitations are displayed.
Maximum limitation of primary return temperature	The RVP34.. can provide maximum limitation of the primary return temperature in district heating systems. For that, the start (point of inflection) and the slope of the limitation curve can be selected. The integral action time of the limiting function can be set.
Frost protection for the building	Frost protection for the building ensures an adjustable minimum room temperature. This function cannot be deactivated.
Frost protection for the plant	Frost protection for the plant activates the heating circuit pump to protect the heating plant against freeze-ups. Outside temperature and flow temperature setpoint for frost protection are adjustable. The function can be deactivated, if required.
Heat generation	With the RVP35.., boiler control operates as demand-based 2-position control. The boiler temperature is controlled by switching a 1- or 2-stage burner (direct burner control). 2-stage operation is enabled when the release integral is reached; it is disabled when the reset integral is reached. Both integrals are adjustable. When there is no demand for heat, the boiler is either shut down or controlled to the minimum limit value (selectable). Minimum and maximum limitation of the boiler temperature are adjustable.
Minimum limitation of return temperature	Minimum limitation protects the boiler against flue gas corrosion. Active limitations are displayed.
D.h.w. heating	The RVP35.. makes possible d.h.w. heating with a coil type storage tank, storage tank charging pump and 2 sensors.
Adjustments	Adjustable are the normal and the reduced temperature setpoint, boost, switching differential, overrun time of charging pump, and maximum time of d.h.w. charging.
Releases	Release of d.h.w. charging and of the circulating pump can be selected: <ul style="list-style-type: none"> • Always (24 hours a day) • According to the scheduler program of d.h.w. heating • According to the controller's heating circuit scheduler program (d.h.w. charging with forward shift of first daily release) • According to the heating circuit scheduler programs of the controllers on the data bus
Forced charging	D.h.w. charging takes place daily, always with the first release (or at midnight with the 24-hour program). It is also effected when the actual value lies within the switching differential.

Manual charging	<ul style="list-style-type: none"> • Independent of scheduler program and temperature conditions • During protection mode for the heating circuit
Priority	<p>The heating circuit's behavior during d.h.w. charging is selectable:</p> <ul style="list-style-type: none"> • Absolute: Heating circuit pump OFF or heating circuit mixing valve CLOSED and pump ON • Shifting: Heating circuit pump remains ON as long as heating energy is available. Control to the d.h.w. setpoint or the maximum setpoint • Parallel: No priority; heating circuit remains ON. Control to the d.h.w. setpoint or the maximum setpoint
Frost protection for d.h.w.	A minimum d.h.w. temperature of 5 °C is always maintained.
Legionella function	Periodic heating up of d.h.w. ensures protection against legionella viruses.
Circulating pump, electric immersion heater and solar collector	For the plant types with d.h.w. storage tank (only RVP35..), 2 multifunctional relays for the circulating pump and d.h.w. heating with electric immersion heater and solar collector can be parameterized.
Other functions	
Scheduler programs	<p>For automatic heating operation, the RVP34.. and RVP35.. controllers feature a 7-day program with 3 adjustable heating phases per day. Another 7-day program is available for the release of d.h.w.charging (only RVP35..).</p> <p>Using the year clock with automatic summer- / wintertime changeover, a holiday period can be programmed. During the holiday period, heating circuit control operates in protection mode.</p>
Remote control via room unit	<ul style="list-style-type: none"> • Room unit QAW50: Changeover of operating mode, readjustment of room temperature setpoint • Room unit QAW70: Overriding setpoints, the heating and the holiday program
Pulse lock with actuators	To protect the relay contacts, the total duration of the OPEN / CLOSE pulses delivered to an actuator is limited to 5 times the actuator running time.
Multifunctional relays	<p>The RVP34.. has 1 multifunctional relay, the RVP35.. has 2, offering the following choices:</p> <ul style="list-style-type: none"> • Alarm contact for error messages • ON / OFF according to heat demand • Control of circulating pump (only RVP35..) • Control of electric immersion heater (only RVP35..) • Control of collector pump (only RVP35..)
Pump kick	To prevent pump seizing, a kick can be set for all pumps. The pump kick is made once a week and lasts 30 seconds.
Pump overrun	To prevent accumulation of heat, a pump overrun time can be set .
Relay and sensor test	<p>To facilitate commissioning and fault tracing, the controller offers the following choices:</p> <ul style="list-style-type: none"> • Relay test: The relays can be manually energized • Sensor test: The current sensor values can be queried • Display of setpoints: The current setpoints can be displayed

Communication
(only RVP340, RVP350)

Via LPB, for example, locking and forced signals, assignment of d.h.w., master-slave assignments for the time switch, outside temperature signal, heat demand to heat generation, error messages.

Manual control

The heating system can be controlled manually while d.h.w. heating remains activated. The relays are energized as follows:

- Burner ON (only RVP35..)
- Actuator dead, but can be manually controlled via the controller
- Heating circuit pump activated
- Collector pump activated and electric immersion heater released (only RVP35..)

Signal input

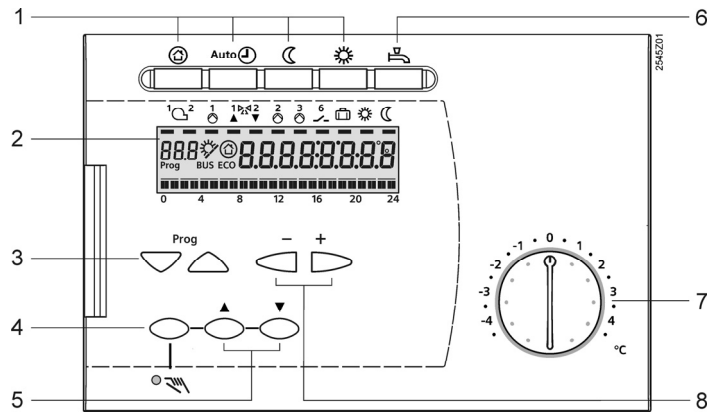
Digital input for remote control of heating circuit and d.h.w. operating mode.

Mechanical design

Controller

The controller consists of insert and base. The controller insert contains the electronics, the power section and 4 to 9 relays. The front of the controller carries the operating elements and the backlit LCD. 2 screws are used to secure the controller insert to the base. The base accommodates the connection terminals. The Operating Instructions supplied with the controller can be inserted at the rear of the cover.

Display and operating elements



- 1 Buttons for selecting the operating mode
- 2 Display (LCD, RVP35..-specific)
- 3 Buttons for selecting the operating lines
- 4 Button for manual control ON / OFF
- 5 Buttons for valve OPEN / CLOSE when manual control ON
- 6 Button for d.h.w. heating ON / OFF (only RVP35..)
- 7 Setting knob for readjusting the room temperature
- 8 Buttons for adjusting the values

Operation

- Operating elements:
 - Knob for readjusting the room temperature
 - Button for the respective operating mode
 - Buttons for manual control and manual positioning commands
 - Button for d.h.w. heating (only RVP35..)
- The setting and changing of all other parameters, the activation of functions and the reading of actual values and operating states are based on the operating line principle. An operating line with its number is assigned to each parameter, each actual value and each function. The operating lines are selected with buttons 3, and the values are changed with buttons 8.

Notes

Engineering

Electrical installation

- The cables of the measuring circuits carry extra low-voltage
- The cables to the actuator, burner and pumps carry AC 24...230 V
- Local electrical safety regulations must be complied with
- Sensor wires should not be run parallel to mains carrying cables powering actuators, pumps, burner, etc.

Radiator valves

In the case of control systems using room units or room sensors, the reference room must not be equipped with thermostatic radiator valves; manual valves must be locked in their fully open position.

Lightning protection

- If bus cables are laid outside buildings, the controls are exposed to transients resulting from lightning strokes and must be appropriately protected
- Every bus cable and the devices to be protected demand matching protective equipment
- The protection function is ensured only if the installation is made correctly.
- For notes on installation in compliance with EMC requirements, refer to Data Sheet N2034

Installation

Mounting choices

- Wall mounting (on a wall, in the control panel, etc.)
- Mounting on a top hat rail
- Flush mounting (cutout in control panel door, etc.)

Mounting locations

Suitable mounting locations are control panels, control desks, compact stations or the heating room. Not permitted are damp or wet spaces.

Connections

All connection terminals for protective extra low-voltage (sensors and room units) are located on the upper terminal block, those for mains voltage (actuator, burner, and pumps) on the lower terminal block.

Commissioning

- The plant type must be selected
- The settings can be locked on the software side
- The controllers are supplied complete with Installation and Commissioning Instructions

Disposal



In terms of disposal, the controllers are classified as electronic scrap conforming to the European Directive 2002/96/EG (WEEE) and must not be disposed of as domestic waste. The relevant national legal regulations must be complied with and the controllers must be disposed of via the appropriate channels. Local and currently valid legislation must be observed.

Warranty

If using the RVP34.. or RVP35.. controllers in connection with third-party devices, the correct functioning must be ensured by the user. In that case, Siemens will assume no responsibility for service and warranty.

Technical data

Power supply	Operating voltage	AC 230 V (+10 / -15%)
	Rated voltage	AC 230 V
	Frequency	50 Hz
	Power consumption (excl. external loads)	RVP34...: max. 6 VA RVP35...: max. 7 VA
	Fuse protection for supply line	Fuse slow: max. 10 A Automatic cutout LS: max. 13 A Response characteristic of LS: B, C, D, as per EN 60898

Inputs

Sensor inputs (B...)	Sensing elements	Refer to "Equipment combinations".
Digital input (H1)	Voltage when contact is open	DC 12 V
	Current when contact is closed	DC 3 mA
	Contact resistance	$R \leq 80 \Omega$

Outputs

Relay outputs	Voltage	AC 24...230 V
	Current RVP34.. Y1, Y2, Q2, K6	AC 0.02...2(2) A
	Current RVP35.. K4, K5	AC 0.02...2(2) A
	Q1, Q3, Y1, Y2, Q2 K6, K7	AC 0.02...1(1) A
	Rated current ignition transformer	Max. 1 A, max. 30 s
Starting current ignition transformer	Max. 10 A, max. 10 ms	



Interfaces

LPB	Connection	2-wire (not interchangeable)
	Bus loading number E	RVP340: 6 RVP350: 7
PPS	Connection (room unit or sensor)	2-wire (interchangeable)

Permissible cable lengths	For all sensors	
	Copper cable 0.6 mm dia.	20 m
	Copper cable 1.0 mm ²	80 m
	Copper cable 1.5 mm ²	120 m
	For room units (PPS)	
	Copper cable 0.25 mm ²	25 m
Copper cable from 0.5 mm ²	50 m	

Electrical connections	Screw terminals	For cross-sectional areas up to 2.5 mm ²
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Backup	Time switch	12 hours
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Standards and directives	 Conformity to	
	EMC directive	2004/108/EG
	immunity and emissions	EN 60730-1 (suited for use in residential and industrial environments)
	Low-voltage directive	2006/95/EG
	Electrical safety	EN 60730-1 / EN 60730-2-9
 C-tick conformity	AS/NZS 61000-6-3	

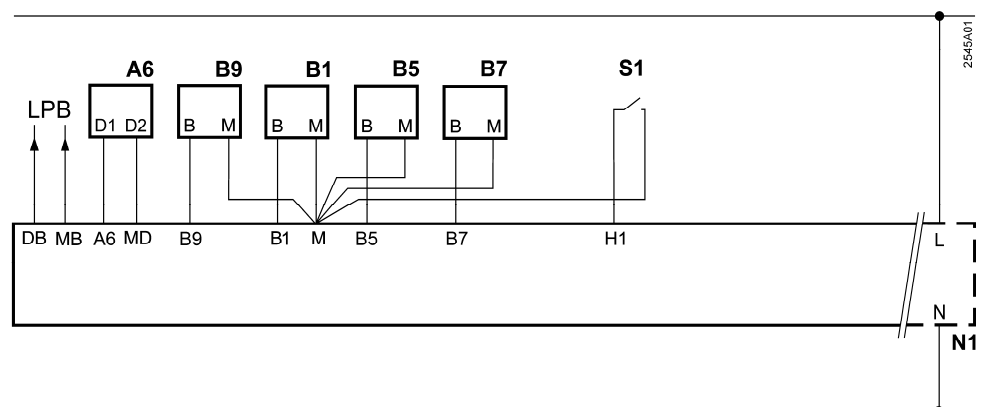
Classifications as per EN 60730	Software class Mode of operation	A 1B (automatic)
Protective data	Safety class Degree of protection of housing Degree of pollution	II as per EN 60730 (if correctly installed) IP40 as per EN 60529 (if correctly installed) 2 as per EN 60730
Environmental compatibility	The Environmental Declaration contains data on environmental-compatible product design and assessment (RoHS compliance, compositions, packaging, environmental benefits and disposal)	ISO 14001 (environment) ISO 9001 (quality) SN 36350 (environment-compatible products) RL 2002/95/EG (RoHS)
Dimensions	Refer to "Dimensions"	
Weight	Controller (net)	RVP34...: 0.75 kg RVP35...: 0.65 kg
Housing colors	Housing Base	Light-grey RAL 7035 Pigeon-blue RAL 5014

Permissible ambient conditions	Operation	Transport	Storage
	EN 60721-3-3	EN 60721-3-2	EN 60721-3-1
Climatic conditions	Class 3K5	Class 2K3	Class 1K3
Temperature	0...50 °C	-25...70 °C	-20...65 °C
Humidity	<95% r.h. (noncondensing)	<95% r.h.	<95% r.h. (noncondensing)
Mechanical conditions	Class 3M2	Class 2M2	Class 1M2
Altitude of operation	Max. 3000 m above sea level		

Connection diagrams

Low-voltage side

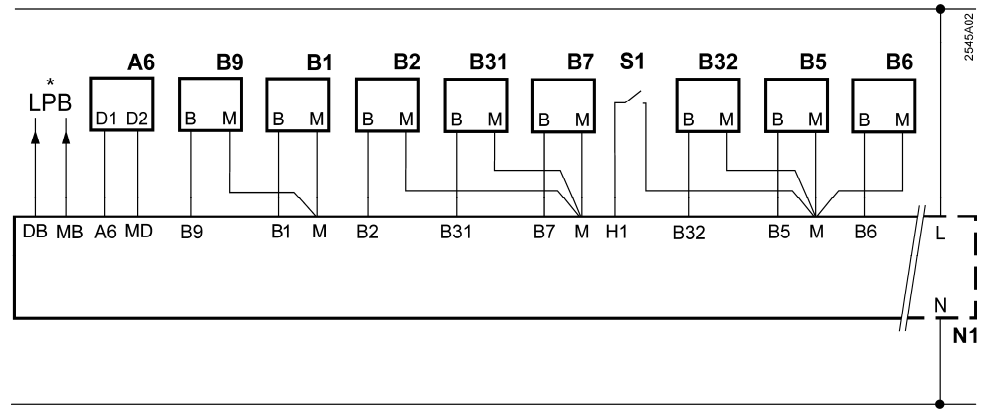
RVP340



Low-voltage side

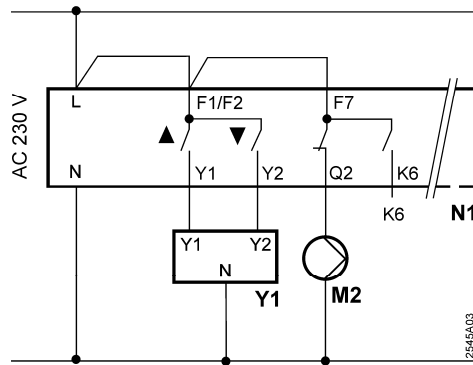
RVP350 and RVP351

* LPB only RVP350



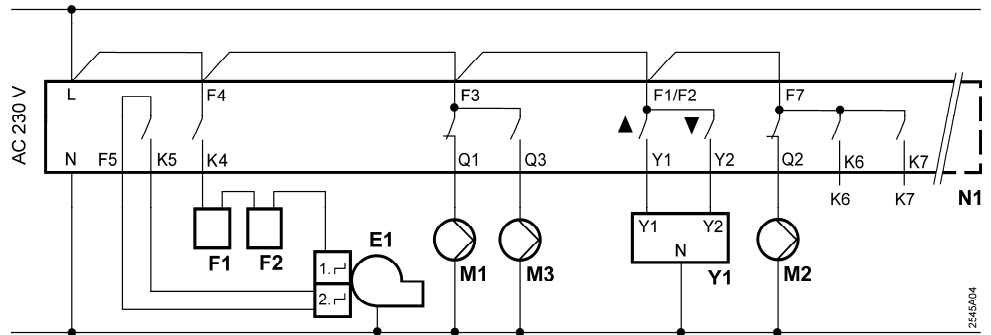
Mains voltage side

RVP340



Mains voltage side

RVP350 and RVP351



- A6 Room unit
- B1 Flow sensor
- B2 Boiler sensor (only RVP35..)
- B31 D.h.w. storage tank sensor / thermostat (only RVP35..)
- B32 D.h.w. storage tank sensor / thermostat (only RVP35..)
- B5 Room sensor
- B6 Collector sensor (only RVP35..)
- B7 Return sensor
- B9 Outside sensor
- E1 2-stage burner (only RVP35..)
- F1 Thermal reset limit thermostat (only RVP35..)
- F2 Safety limit thermostat (only RVP35..)
- Kx K6, K7 = multifunctional outputs
- LPB Data bus (only RVP340 and RVP350)
- M1 Circulating pump (only RVP35..)
- M2 Heating circuit pump
- M3 Storage tank charging pump (only RVP35..)
- N1 Controller RVP3...
- S1 Remote control of operating mode
- Y1 Actuator heating circuit

Dimensions

2545M01

