



Synco™ living

## Multi-controller

RRV934

- **RF-based multi-controller**
  - For precontrol of up to 2 room groups
  - For control of ventilation plant with up to 3 stages
- **RF communication based on KNX standard (868 MHz, bidirectional)**
- **Mains-powered AC 230 V**
- **3 universal relay outputs**
- **1 additional output**
  - for 3-position actuator, or
  - as a 4th universal relay output
- **4 universal inputs**
- **2 universal outputs DC 0...10 V**

### Use

- For integration into the Siemens Synco living system
- Designed for use in heating plants for precontrol of up to 2 room groups
  - 2 primary controllers each with 1 DC 0...10 V actuator
  - 1 primary controller with a DC 0...10 V actuator and 1 primary controller with a 3-position actuator
 With flow and return temperature limitation, optional control of room group pumps and DHW heating.
- Suited for control of 3-stage ventilation plant including HR bypass, with influence from humidity, indoor air quality or CO<sub>2</sub> level, fault supervision
- Forwarding of heat demand signal to primary energy plant

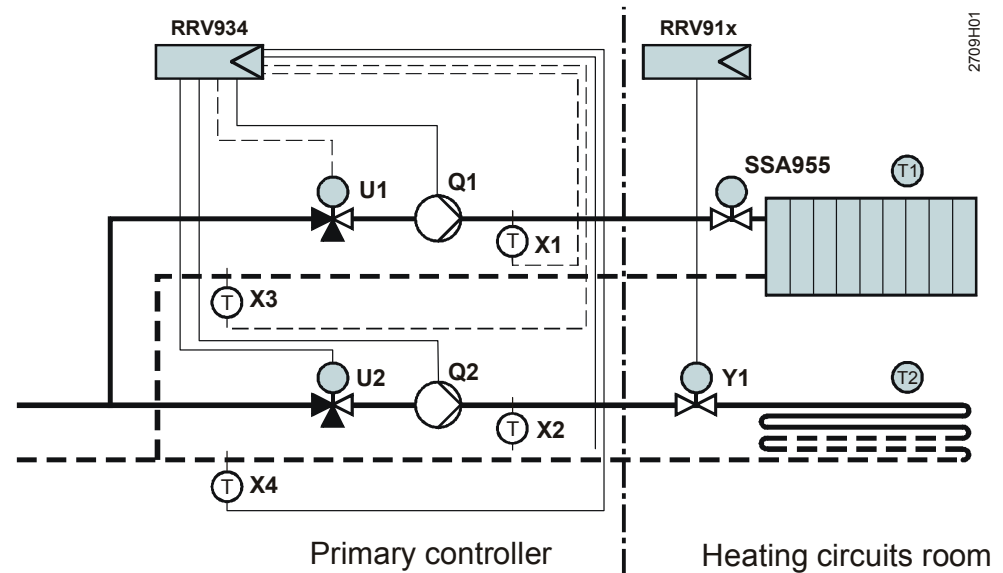
## Equipment combinations

The RRV934 multi-controller is designed for use with the Siemens Synco living system. For more detailed information about equipment combinations, refer to the Data Sheet covering the central apartment unit CE1N2707en.

## Application examples

### Precontrol of 2 independent room groups

Radiator heating and low-temperature floor heating with flow temperature control, maximum limitation and maintained return temperature



#### Precontrol:

X1 – X2 Flow temperature sensor  
X3 – X4 Return temperature sensor  
Q1 / Q2 Room group pump  
U1 / U2 Mixing valve (DC 0...10 V)

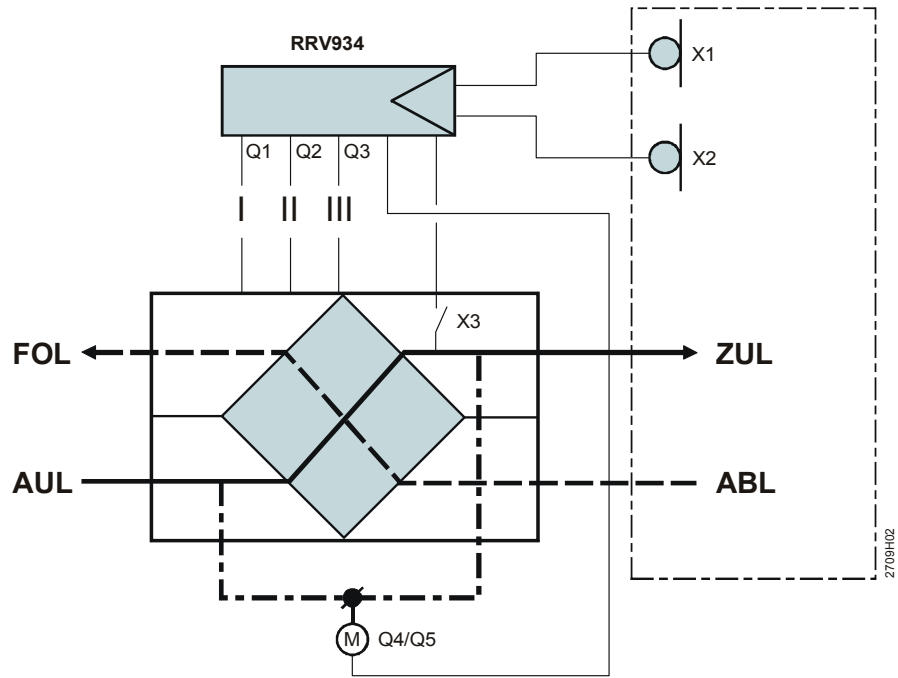
#### Heating circuits room:

Y1 Heating circuit valve (2- or 3-position)  
T1 / T2 Room unit and / or room temperature sensor (QAW910 and / or QAA910)

Suited for use with the system are all electromotoric and electrohydraulic actuators featuring 3-position or DC 0...10 V control supplied by SBT HVAC Products. For detailed information, refer to product range overview of Acvatix valves and actuators C00020403en.

Also refer to the Data Sheet covering the heating circuit controllers RRV912 CE1N2705en and RRV918 CE1N2706en.

## Integration of ventilation plant



|              |   |
|--------------|---|
| Q1 / Q2 / Q3 | 3-stage step selector of ventilation plant                          |
| Q4 / Q5      | HR bypass, 3-position actuator                                      |
| X1 / X2      | Humidity, indoor air quality or CO <sub>2</sub> sensor, DC 0...10 V |
| X3           | Fault / maintenance contact (e.g. for monitoring a filter)          |
| FOL          | Exhaust air   |
| AUL          | Outside air   |
| ZUL          | Supply air  |
| ABL          | Extract air   |

## Ordering

When ordering, please give quantity, product name and type reference.

## Scope of delivery

The RRV934 is supplied complete with Mounting Instructions.

## Product documentation

The Operating and Commissioning Instructions for the RRV934 are contained in the product documentation supplied with the central apartment unit.

## Functions

### Main function

The RRV934 multi-controller is used for connection and control of ventilation plant and / or for control of hydraulic room groups. All inputs and outputs are suited for universal use.

The central apartment unit delivers the relevant data via RF.

|                                |   |
|--------------------------------|---|
| <b>Universal relay outputs</b> | The universal relay outputs are capable of controlling different pieces of equipment, such as 3-stage ventilation units. Release is controlled via the central apartment unit and ensured via RF. <sup>1</sup>                              |
| <b>Universal inputs</b>        | The universal inputs accept the signals from different sensors used for room group precontrol or for control of ventilation plant. <sup>1</sup>   |
| <b>Universal outputs</b>       | The RRV934 converts percentage-scaled signals from the central apartment unit (e.g. heat demand) to analog DC 0...10 V signals. The outputs can also be used for control of the room group valves, for instance (DC 0...10 V). <sup>1</sup> |

### Special functions for use with the room group primary controller

|   |  |
|---|--|
| <b>Outside temperature-compensated minimum flow temperature</b> | The minimum flow temperature setpoint is raised depending on the composite outside temperature, thus ensuring a minimum flow temperature (e.g. in connection with uncontrolled rooms).   |
| <b>Flow temperature control / limitation</b>                    | The flow temperature can be controlled via the RRV934. It is regulated with the help of the heat demand signal. Minimum or maximum limitation of the flow temperature setpoint can be provided, based on an adjustable value. If the temperature request is invalid, flow temperature regulation becomes inactive and the controlling elements are closed (no output of heat). |
| <b>Limitation of the return temperature</b>                     | The return temperature can be maintained at a high or low level, based on an adjustable value. Extremely hot water returning to the heat source can thus be prevented, for instance. Return temperature limitation is given priority over flow temperature limitation.   |
| <b>Cooling mode</b>   | The primary controller's valve is fully opened and the room group pump activated. It runs continuously during the period of time cooling mode is active and is not influenced by locking signals. The room valves (RRV91x and SSA955) ensure the hydraulic distribution of chilled water in accordance with the room's configuration.  |

### Specific ventilation functions

|                            |  |
|----------------------------|--|
| <b>Stage selection</b>     | On the central apartment unit, a ventilation stage can be defined for each operating mode. If there is no humidity or CO <sub>2</sub> / VOC control, the operating modes can be run according to a time program.   |
| <b>Humidity sensor</b>     | The humidity sensor monitors the acquired relative humidity and ensures the adjusted limit value is not exceeded. If the relative humidity exceeds the limit value, the ventilation system is switched to a selectable ventilation stage. With each central apartment unit, a maximum of 1 humidity sensor can be used.          |
| <b>Ventilation contact</b> | Using the ventilation input contact, ventilation plant can be set to a selectable ventilation stage. The "wave AP 260" door / window contact, a universal input of an RRV91x heating circuit controller, a universal input of an RRV934 multi-controller, or an S-Mode object can act on the ventilation contact (OR operation). |

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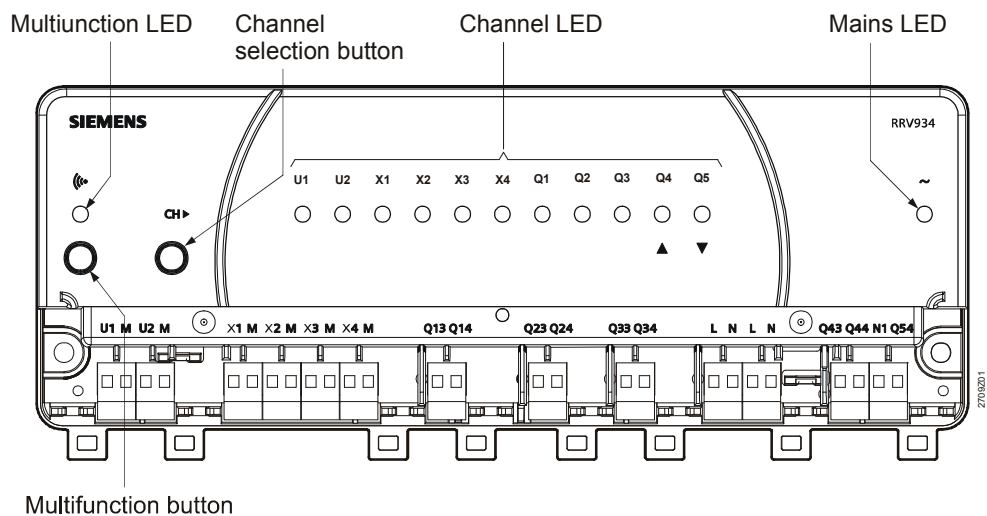
<sup>1</sup> For detailed information on assignment options for the inputs and outputs, refer to the Synco living Mounting and Commissioning Instructions (CE1C2707en).

|                                   |   |
|-----------------------------------|---|
| <b>Indoor air quality control</b> | <p>The CO<sub>2</sub> or VOC sensor monitors the indoor air quality. The indoor air quality controller calculates a positioning signal, based on the current setpoint (in accordance with the ventilation level) and the current indoor air quality. From this, the linear step selector determines the ventilation stage currently required. A total of 2 setpoints can be defined (setpoint 1: Protection / Economy; setpoint 2: Precomfort / Comfort).</p> <p>Indoor air quality must be acquired in the room itself and not in the air duct, since air does not circulate around a duct sensor when the ventilation system is shut down so that adequate control could not be ensured. With each central apartment unit, a maximum of 1 CO<sub>2</sub> or VOC sensor can be used.</p> |
| <b>Night cooling</b>              | <p>If, in summer operation, the room temperature rises above the outside temperature and night cooling is active, the ventilation plant is operated at a selectable ventilation stage during night hours also. In that case, the HR bypass is released also.</p>  |
| <b>Smoke alarm</b>                | <p>If the smoke detector triggers an alarm, the central apartment unit can be set to a selectable ventilation stage (or OFF) via the central apartment unit.</p>  |
| <b>Holiday function</b>           | <p>To prevent stale room air during holiday periods, the ventilation plant can be switched on at selectable intervals. The ventilation stage can be selected also. During holiday periods, no consideration is given in terms of control to the levels of humidity, indoor air quality and CO<sub>2</sub>. Priority is given to smoke alarms however.</p>   |
| <b>Apartment timer</b>            | <p>The apartment timer also acts on the ventilation plant.</p>  |
| <b>Forced ventilation</b>         | <p>The ventilation plant can be manually operated at the highest stage for a predefined period of time.</p>   |
| <b>Open fireplace function</b>    | <p>If the ventilation plant uses an open fireplace function so that the plant is externally overridden, the contact can be connected via a universal input. In that case, a special symbol indicating open fireplace mode appears on the display of the central apartment unit.</p>   |
| <b>Exhaust hood</b>               | <p>To prevent excessive underpressure when operating the exhaust hood, the hood can be released via a universal output. Release is effected as soon as the supply of sufficient air is ensured via a window.</p>  |
| <b>Service message</b>            | <p>A service message "Service ventilation" can be delivered based on the number of operating hours of the ventilation unit (total of all 3 ventilation stages). For that, a service interval can be parameterized on the central apartment unit.</p>  |
| <b>Window airing</b>              | <p>The window airing function is triggered by the central apartment unit. When a selected window contact responds, the ventilation plant switches to a selectable ventilation stage. When the window is closed again, the ventilation plant resumes normal operation.</p>   |
| <b>Absence</b>                    | <p>A ventilation stage can be defined for the absence function. During holiday periods, no consideration is given in terms of control to the levels of humidity, indoor air quality and CO<sub>2</sub>. Priority is given to smoke alarms however.</p>  |

## Device and system functions

|  |   |
|--|---|
| <b>Binding</b>                               | The binding of the first selected channel or channel group is used by the RRV934 to sign on at the central apartment unit, thus ensuring integration into the RF system. Then, the other channels or channel groups can be assigned to other functions. The binding process is triggered via the multifunction button and indicated by the multifunction LED. |
| <b>State query</b>                           | The multifunction button can be used to query the state of the configured control channels. The state is indicated by the multifunction LED.  |
| <b>RF binding test</b>                       | The multifunction button can be used to trigger a binding test per channel. The test is made to check the radio link to the central apartment unit. The RF binding test is indicated by the multifunction LED.  |
| <b>Disconnecting channel from the system</b> | Using the multifunction button, a channel that has already been connected, or a channel group, can be disconnected from the system. In that case, the respective channel or channel group is reset to the supply state. Then, the channel or channel group can again be reconnected to the system. The state is indicated by the multifunction LED.           |
| <b>Supply state</b>                          | Using the multifunction button, the RRV934 can be reset to the supply state. Then, the RRV934 can be reconnected to the system.   |
| <b>RF failure</b>                            | If the RF link between RRV934 and central apartment unit breaks down, control of the room groups and the ventilation plant is no longer ensured. When radio transmission is reestablished, the RRV934 returns to control mode.  |
| <b>Mains failure</b>                         | If power supply to the RRV934 is cut, control of the heating groups and ventilation plant is no longer ensured. The positions of the individual actuators can only be changed manually on the actuators themselves. When power supply is restored, the RRV934 returns to control mode.  |

## Operating and indicating elements



### Function of operating elements

| Operating elements       | Function   |
|--------------------------|--|
| Multifunction button     | State query of channel configuration<br>RF binding test<br>Binding<br>Disconnection of channel and channel groups from the system<br>Restoration of supply state |
| Channel selection button | Channel and channel group selection  |

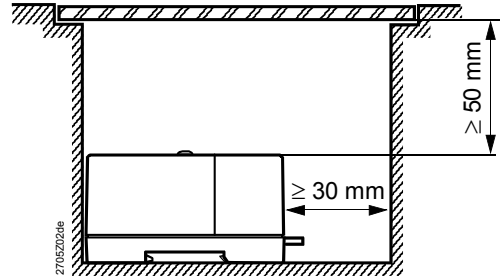
### Function of indicating elements

| Indicating element  | Function  |
|---|---|
| Multifunction LED   | Indication of channel and channel group configuration<br>RF binding test<br>Binding process<br>Disconnection of channel and channel groups from the system                              |
| Channel LEDs:<br>U1 ... U2<br>X1 ... X4<br>Q1 ... Q3<br>Q4 / Q5 | Indication of channel configuration / status indication:<br>Universal output<br>Universal input<br>Universal relay output<br>Universal relay output (Q4) or 3-position output (Q4 / Q5) |
| Mains LED   | Power supply  |

For more detailed information about the functions and operation of the RRV934, refer to the product documentation covering the central apartment unit.

### Mounting location

- Due to its compact design, the RRV934 can be fitted directly in the electrical distribution panel\*, heat distribution panel\*, on the ceiling in the cellar, or in the cable riser
- The permissible environmental conditions must be observed
- The RRV934 must not be exposed to dripping water
- For notes relating to engineering and mounting RF devices of the Siemens Synco living system, refer to Data Sheet CE1N2708en
- When mounting the RRV934, ensure that there is sufficient space by the connection terminals to introduce the cable ( $\geq 30$  mm)
- At the top of the unit, a minimum clearance of 50 mm must be observed to ensure that the operating elements can be accessed and that the terminal cover can be easily opened



\* Plastic covers are used in place of metal covers to support radio communication

### Mounting

The RRV934 is designed for:

- Mounting on top hat rails conforming to EN 60715-TH35-7,5
- Fitting with the help of 2 fixing screws

### Note

Prior to applying power, connect all inputs and outputs.

### Commissioning

Prior to commissioning, check to ensure that the RRV934 is correctly mounted, that all wiring is correctly made, and that power is switched on.

### Maintenance

The RRV934 is maintenance-free.

### Disposal



In terms of disposal regulations, the RRV934 is 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 regulations must be observed and the unit must be disposed of through the appropriate channels. Local and currently valid legislation must be observed.

### Warranty



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Application-related technical data are only warranted in connection with the Siemens Synco living system. For equipment combinations, refer to the Data Sheet covering the central apartment unit CE1N2707en.

**When using the RRV934 together with third-party devices, correct functioning must be ensured by the user. In that case, Siemens will assume no responsibility for service or warranty.**



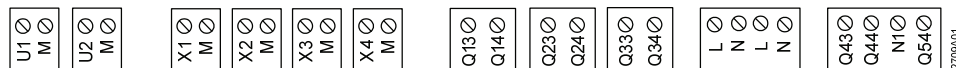
## Technical data

|  |   |   |
|--|---|---|
| Power supply   | Operating voltage   | AC 230 V ( $\pm$ 10%)   |
|  | Frequency   | 50 Hz   |
|  | Power consumption (excluding extern. loads)   | max. 7 VA   |
|  | Fusing of supply line   | 10 A  |
| RF   | Frequency   | 868 MHz (bidirectional)   |
|  | Range   | Typically 30 m inside buildings   |
|  | Protocol  | KNX RF-compatible  |
| Universal input  | Type  | LG-Ni1000 resistor, on / off, DC 0...10 V   |
|  | Quantity  | 4   |
|  | Measuring range   | 0...120 °C  |
| Permissible cable length to sensor or external contact | Copper cable 0.6 mm dia.  | max. 20 m   |
|  | Copper cable 1 mm <sup>2</sup>  | max. 80 m   |
|  | Copper cable 1.5 mm <sup>2</sup>  | max. 120 m  |
| Universal relay output                                 | Type  | NO contact<br>AC 24...230 V, AC 0.02...2 (2) A  |
|  | Quantity  | 5   |
| Universal output                                       | Type  | DC 0...10 V, max. DC 1 mA   |
|  | Quantity  | 2   |
| Electrical connections                                 | Screw terminals for   | max. 2.5 mm <sup>2</sup>  |
| Type of controller                                     | Primary controller  | PI  |
| Standards  |  conformity to   |   |
|  | EMC directive   | 2004/108/EC   |
|  | - Immunity, Emissions   | - EN 60730-1, EN 60730-2-9  |
|  | Low-voltage directive   | 2006/95/EC  |
|  | - Electrical safety   | - EN 60730-1, EN 60730-2-9  |
|  | RTTE Radio & Telecom. Equipment   | 1999/5/EC   |
| - Radio communication                                  | - EN 300220-2, EN 301489-1<br>- EN 301489-3   |   |
| Protection   | Safety class  | II to EN 60730  |
|  | Housing   | IP30 to EN 60529  |
|  | Degree of pollution   | 2 to EN 60730   |
| Environmental compatibility                            | Environmental Declaration CM1E2709en  | ISO 14001 (environment)   |
|  | contains data on environmental-compatible product design and assessment (RoHS compliance, compositions, packaging, environmental benefits and disposal) | ISO 9001 (quality)<br>SN 36350 (environment-compatible products)<br>RL 2002/95/EG (RoHS)              |
|  |   |   |
|  |   |   |
| Dimensions   |   | refer to "Dimensions"   |
| Weight   | Unit complete with accessories  | 0.602 kg  |
| Housing material                                       |   | Plastics PC+ABS   |
| Housing colors   | Upper / lower housing section   | RAL 7035 light-gray<br>RAL 5014 dove-blue   |
|  |   |   |

Environmental 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                  | 5...95% r.h.<br>(noncondensing)                             | <95% r.h.    | 5...95% r.h. |
| Mechanical conditions     | Class 3M2   | Class 2M2    | Class 1M2    |
| Elevation above sea level | min. 700 hPa, corresponding to max. 3.000 m above sea level |              |              |

## Connection terminals



### Protective extra-low voltage

|         |  |
|---------|--|
| U1, U2  | Universal output DC 0...10 V                                 |
| M       | Ground for universal output                                  |
| X1...X4 | Universal input (digital input, sensor input or DC 0...10 V) |
| M       | Ground for universal input                                   |

### Mains voltage or protective extra-low voltage

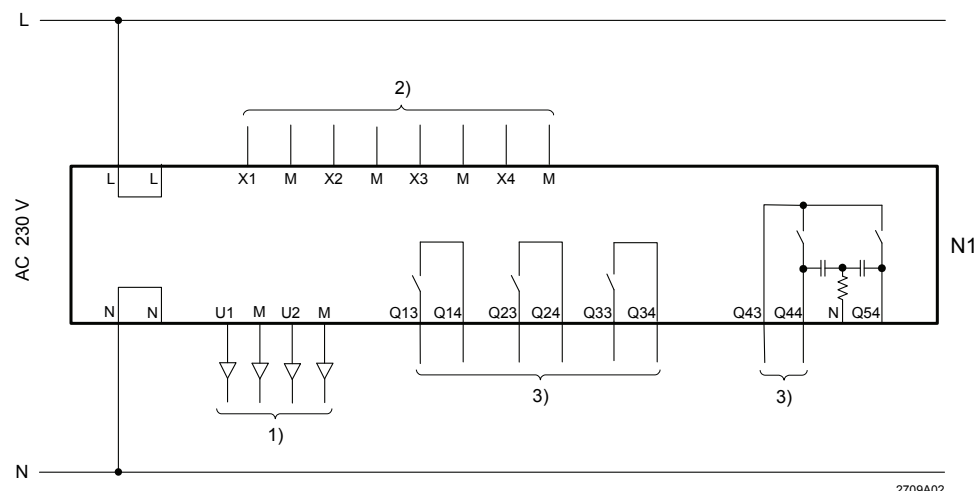
|          |  |
|----------|--|
| Q13, Q14 | Potential-free universal relay output (NO) for AC 24...230 V (relay 1)                                     |
| Q23, Q24 | Potential-free universal relay output (NO) for AC 24...230 V (relay 2)                                     |
| Q33, Q34 | Potential-free universal relay output (NO) for AC 24...230 V (relay 3)                                     |
| Q43, Q44 | Potential-free universal relay output (NO) for AC 24...230 V (relay 4), or if used as a 3-position output: |
| Q43      | Input for Q44 and Q54  |
| Q44      | Actuator / valve open for AC 24...230 V  |
| Q54      | Actuator / valve closed for AC 24...230 V  |
| N1       | Connection of neutral conductor (AC 24...230 V) for internal mixing valve interference suppression         |

### Mains voltage

|   |   |
|---|---|
| N | Operating voltage, neutral conductor AC 230 V |
| L | Operating voltage, live conductor AC 230 V    |

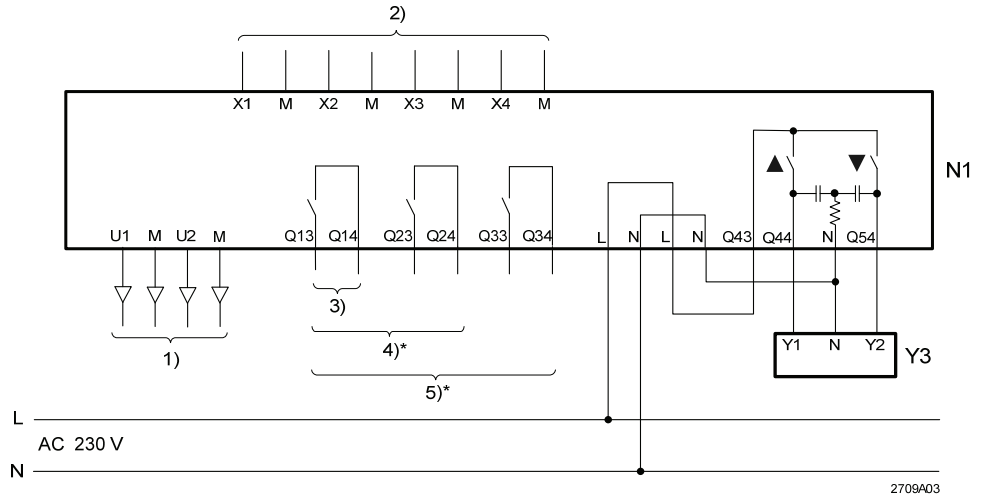
## Connection diagram

Example:  
Universal inputs and outputs



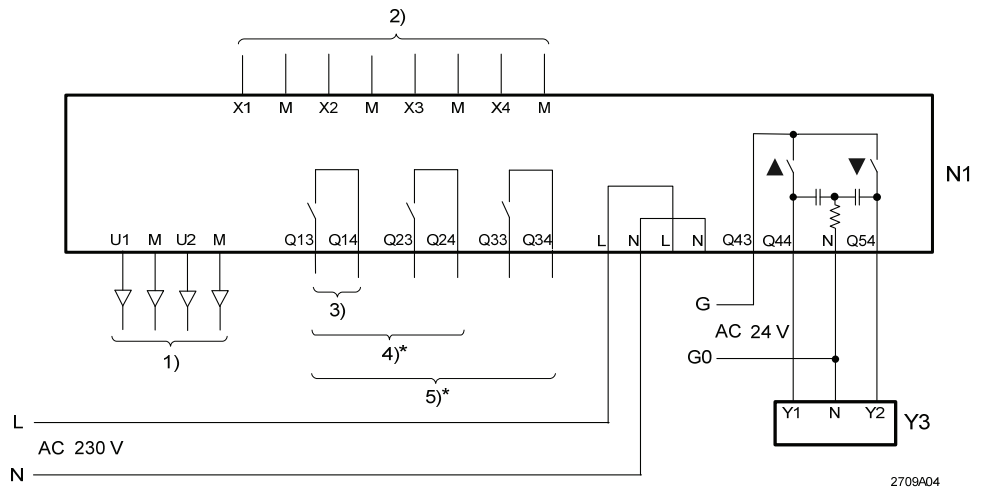
- N1 Multi-controller RRV934
- 1) Universal output DC 0...10 V
  - 2) Universal input, can be used for temperature measurement / digital input / DC 0...10 V
  - 3) Universal potential-free relay output, can be used for mains or low-voltage

Example: Controlled ventilation of apartment:  
Step selector,  
HR bypass AC 230 V



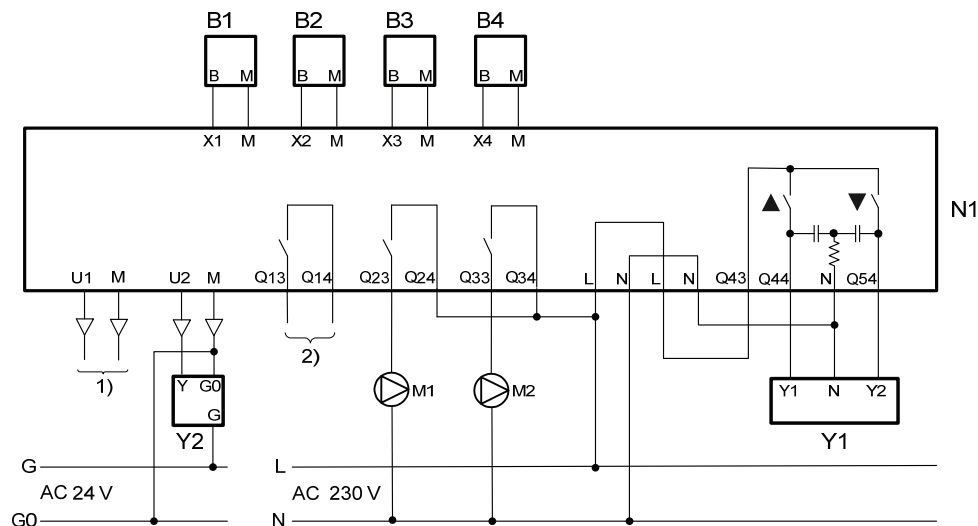
- N1 Multi-controller RRV934
- Y3 Actuator HR bypass, 3-position AC 230 V
- 1) Universal output DC 0...10 V
- 2) Universal input, can be used for temperature measurement / digital input / DC 0...10 V
- 3) Relay 1 (Q1) of 1-stage step selector
- 4) Relay 1 (Q1) and relay 2 (Q2) of 2- or 3-stage step selector
- 5) Relay 1 (Q1), relay 2 (Q2) and relay 3 (Q3) of 3-stage step selector
- \* The behavior of relays 1...3 with each stage can be selected on the central apartment unit

Example of controlled apartment ventilation:  
Step selector,  
HR bypass, AC 24 V



- N1 Multi-controller RRV934
- Y3 Actuator HR bypass, 3-position, AC 24 V
- 1) Universal output DC 0...10 V
- 2) Universal input, can be used for temperature measurement / digital input / DC 0...10 V
- 3) Relay 1 (Q1) of 1-stage step selector
- 4) Relay 1 (Q1) and relay 2 (Q2) of 2- or 3-stage step selector
- 5) Relay 1 (Q1), Relay 2 (Q2) and relay 3 (Q3) of 3-stage step selector
- \* The behavior of relays 1...3 with each stage can be selected on the central apartment unit

Example of precontrol:  
 Primary controller  
 1 with actuator, 3-position,  
 AC 230 V, primary  
 controller 2 with actuator,  
 DC 0...10 V



- N1 Multi controller RRV934  
 B1 Flow temperature sensor for primary controller 1 (LG-Ni1000)  
 B2 Return temperature sensor for primary controller 1 (LG-Ni1000)  
 B3 Flow temperature sensor for primary controller 2 (LG-Ni1000)  
 B4 Return temperature sensor for primary controller 2 (LG-Ni1000)  
 M1 Room group pump 1 for primary controller 1  
 M2 Room group pump 2 for primary controller 2  
 Y1 Valve actuator primary controller 1, 3-position, AC 230 V  
 Y2 Valve actuator primary controller 2, DC 0...10 V  
 1) Universal output DC 0...10 V  
 2) Universal potential-free relay output, can be used for mains or low-voltage

The function of the various inputs and outputs is defined only when connecting the individual channels to the central apartment unit. This means that the room group pumps can be connected to any of the relay outputs Q1...Q3. The temperature sensors too can be connected to any of the inputs X1...X4. In place of the 3-position valve actuator for primary controller 1, it would also be possible to connect a DC 0...10 V valve actuator to output U1.

## Dimensions

Dimensions in mm

