



DESIGO™ RXA

Non-communicating room controllers

RXA20.1
RXA21.1
RXA22.1

For fan-coil systems

The RXA20.1, RXA21.1 and RXA22.1 room controllers are used for temperature control in individual rooms.

- For 2-pipe or 4-pipe fan-coil systems, with or without changeover
- Control of AC 24 V PWM ¹⁾ thermic valve actuators, 3-position AC 24 V valve and damper actuators, or electric heating coils
- Volt-free relay contacts for fan control and electric heating coils
- PI control
- AC 230 V operating voltage

1) PWM = pulse-width modulated

Use

The RXA20.1, RXA21.1 and RXA22.1 room controllers are optimised for control of fan-coil systems in individual rooms.

They can be used for the following:

- RXA20.1: Single-speed automatic fan control, thermic valves
- RXA21.1: 3-speed automatic fan control, thermic or motorised valves
- RXA22.1: 3-speed automatic fan control, thermic valves with built-in relay for electric re-heating

Functions

The controller application and the configuration of connected field devices are defined manually with DIP switches and a potentiometer.

For a detailed description of functions, refer to the DESIGO RXA applications library, document CA2A3886.

Types

The RXA20.1, RXA21.1 and RXA22.1 room controllers differ only in the number of outputs available:

Type	AC 24 V triac outputs	Relay outputs
RXA20.1/FC-01	For two thermic valve actuators	For single-speed fan control
RXA21.1/FC-02	For two thermic valve actuators or two 3-position actuators	For 3-speed fan control
RXA22.1/FC-03	For two thermic valve actuators	For 3-speed fan control; built-in relay for electric heating coil

RXZ20.1	Accessories: terminal covers
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Ordering

When ordering, please specify the quantity, product name and type code. The RXZ20.1 terminal covers are supplied in packs of 10 pairs and must be ordered as a separate item (see also "Mounting").

Example:

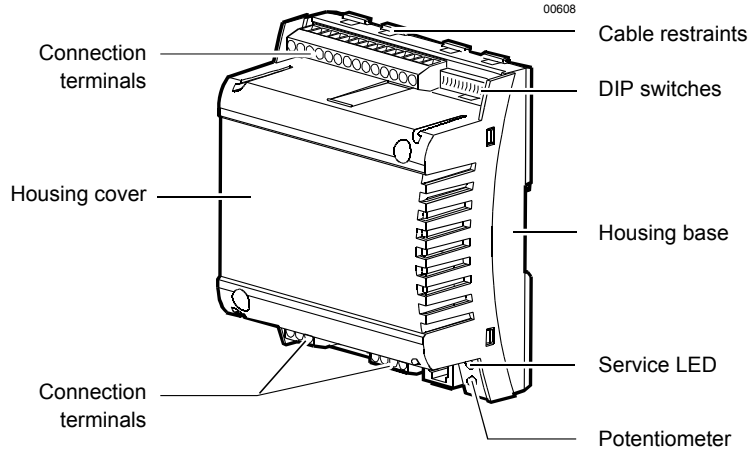
30	Room controllers, type RXA20.1	RXA20.1/FC-01
30	Pairs of terminal covers	RXZ20.1

Compatibility

The QAX... room units and the Siemens field devices are suitable for use with the RXA20.1, RXA21.1 and RXA22.1 room controllers.

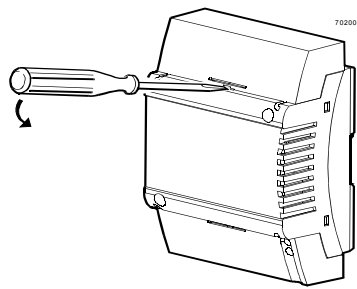
For details, refer to the Desigo Hardware overview, N3804.

The RXA20.1, RXA21.1 and RXA22.1 room controllers consist of a housing base, a housing cover and the printed circuit board. The printed circuit board incorporates the connection terminals and the DIP switches used for configuration. The controllers also have a potentiometer for setpoint adjustment and testing, and a Service LED with different flashing patterns to indicate operational status and test states.



Terminal cover

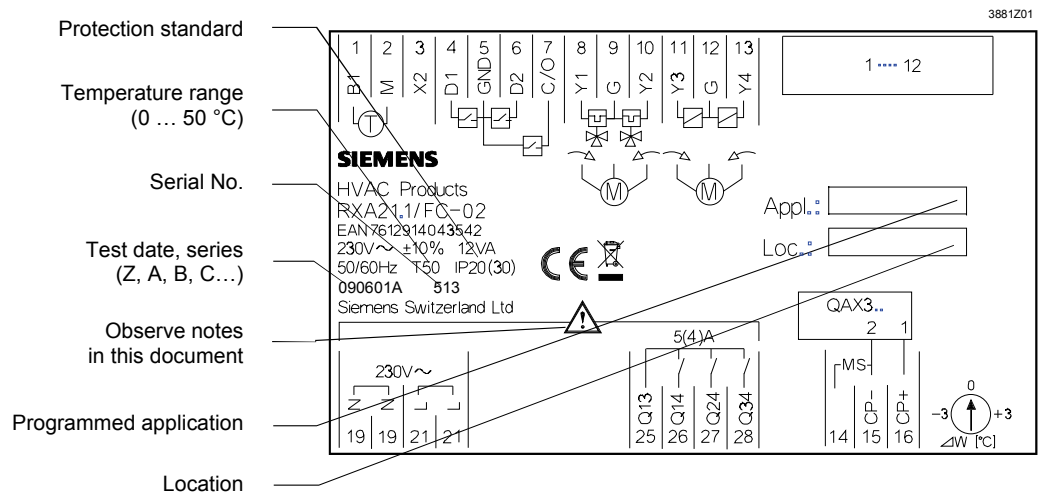
Terminal covers (RXZ20.1) are available as an option, to protect the connection terminals from physical contact and dirt. The Service LED and the potentiometer remain visible even with the terminal covers fitted. The potentiometer can be operated with a screwdriver. The cable is connected to the room controller by breaking out the perforated cable entry guide.



Removing the terminal cover

Label

(example for RXA21.1)



Note

Options for use of the labeling fields “Appl.” and “Loc.”:

- Handwritten entry of location and the final application, or
- Printed adhesive label

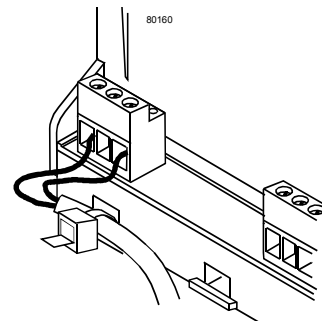
Connection terminals

To avoid incorrect wiring, terminals which can be connected to AC 230 V (supply and relay outputs) are physically separate from the other terminals.



Caution

The cable restraints on the housing base *must* be used for the connections to terminals 19 ... 28 (AC 230 V). The conductors must be secured with cable ties (see diagram).



Disposal



The device is classified as waste electronic equipment in terms of the European Directive 2002/96/EC (WEEE) and should not be disposed of as unsorted municipal waste. The relevant national legal rules are to be adhered to.

Regarding disposal, use the systems setup for collecting electronic waste. Observe all local and applicable laws.

Engineering

For information on selecting and sizing the cables for the power supply and for the field devices, refer to the installation guide, document CA2Z3884. The room controllers have an AC 230 V mains supply voltage. The controlled devices (valves and damper actuators) are supplied directly from the room controller. This means that a separate AC 24 V supply is not necessary for the RXA20.1, RXA21.1 and RXA22.1 controllers and the associated field devices.

Master/slave

- Where several room controllers are operating in the same space, they must be synchronized via the master/slave interface
- Up to 3 slaves may be used (operating in parallel)
- The outputs of the master controller are mapped in the slaves. Note that room units connected to a slave controller cannot be operated
- The polarity of the M/S wires has to be respected!
- The master/slave interface is compatible with the PRFA and PRFB controllers in the PRONTO range

AC 230 V supply cables

Sizing and fuse protection of the supply cables depends on the total load and on local regulations. The cables must be secured with cable restraints.

AC 230 V volt-free relay outputs

The volt-free relay outputs allow switching of loads up to AC 250 V, 5 A (4 A). The heating coil relay in the RXA22.1 switches resistive loads up to 1.8 kW. The cable dimensions depend on the connected load and the local installation regulations. The circuits must be externally fused (max. 10 A) as there are no internal fuses. The cables must be secured with cable restraints.



Caution

The fans must not be connected in parallel.

AC 24 V triac outputs

The **simultaneous** load on outputs Y1 ... Y4 must not exceed 9.5 VA.

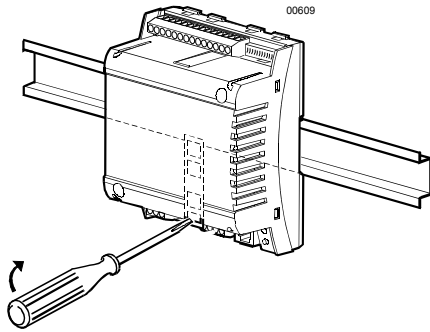
Example:

Y1 (heating)	2 thermic valve actuators, type STP72E	6 W
Y2 (cooling)	2 thermic valve actuators, type STP72E	6 W
Y3, Y4 (outside air)	Damper actuator	3.5 VA

The maximum load is 9.5 VA for the heating sequence and 9.5 VA for the cooling sequence. This is acceptable because the two sequences never operate at the same time.

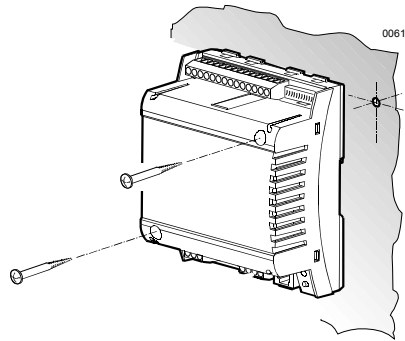
Mounting instructions

The room controllers can be mounted in any orientation using the following fixing options:



Rail mounting

The housing base is designed for snap-mounting on DIN rails, type EN50022-35x7.5 (can be released with a screw-driver)



Surface mounting

There are two drill holes for screw-mounting (see "Dimensions" for drilling template). The housing base is fitted with raised supports. Screws: Max. diameter 3.5 mm, min. length 38 m



Note!

Tightening torque for fixing screws max. 1.5 Nm

When mounting note the following:

- The controller should not be freely accessible after mounting
- Ensure adequate air circulation to dissipate heat generated during operation.
- Easy access is required for service personnel
- Local installation regulations must be observed.

Mounting instructions and a drilling template are printed on the controller packaging.

Commissioning

The controller application and the configuration of the connected field devices are defined manually with DIP switches and the potentiometer. The Service LED provides information on power up and operational status.

There is no special test for checking that the connected field devices match the DIP switch settings. Depending on the application, if the controller has insufficient information it switches to "Idle" mode (all outputs at zero) and the LED remains on continuously.

For details refer to the applications library CA2A3886.






Caution

In the event of a long-term short circuit or overload, the thermal fuse in the transformer may trip. The controller must then be replaced.

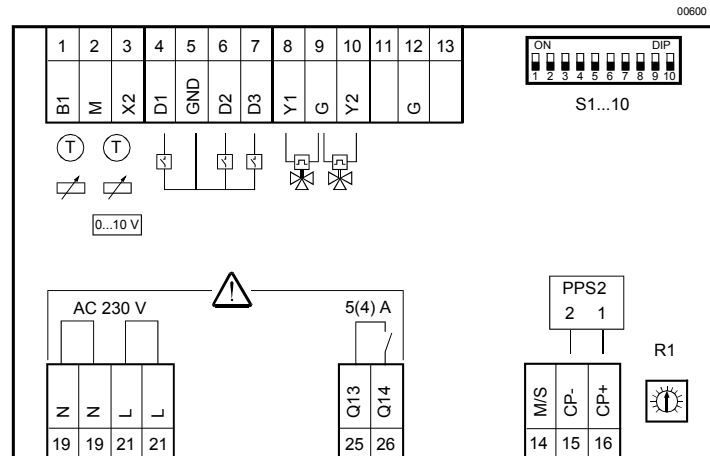
There is no protection against accidental connection with 230 V on the AC 24 V side.

Technical data

Power supply	Operating voltage	AC 230 V ± 10 %	
	Rated voltage	AC 230 V	
	Frequency	50/60 Hz	
Power consumption with output field devices connected		Max. 12 VA	
Internal fuse		Thermal, non-resetting	
Operating data Inputs	Control algorithm	PI	
	Signal inputs D1 ... D3 (for volt-free contacts)		
	Quantity	3	
	Contact voltage	DC 16 V	
	Contact current	DC 8 mA	
	Contact transfer resistance	Max. 100 Ω	
	Contact insulation resistance	Min. 50 kΩ	
	Not suitable for pulse control		
	Measured value inputs B1 and X2		
	Type of signal is programmable (DIP switch)	LG-Ni 1000 temperature sensor, setpoint adjuster or 0 ... 10 V signal	
	Temperature sensor	LG-Ni 1000	
	Measuring range	0 ... 50 °C	
	Sensor current	2.3 mA	
	Resolution	0.2 K	
	Measuring error at 25 °C sensor temp. (without cable)	Max. 0.2 K	
Setpoint adjuster	BSG21.5		
Reset range	+/- 3K		
Setpoint reset signal 0 ... 10 V for summer/winter compensation <i>(No longer available!)</i>	RKN-S See data sheet CA2N3389		
Outputs	AC24 V triac outputs , Y1 ... Y4		
	Quantity	2 (RXA20.1, RXA22.1) 4 (RXA21.1)	
	Output voltage (SELV, not earthed)	AC 24 V ON/OFF, PWM or 3-position (depending on application)	
	Output current	Max. 0.5 A	
	Total nominal load	Max. 9.5 VA	
	(at both outputs simultaneously)	(e.g. 2 thermic valves, type STE72 per heating and cooling sequence + 1 damper actuator 3.5 VA)	

	Relay outputs Q14, Q24, Q34	
	External fuse	Max. 10 A
	Quantity	1 (RXA20.1) 3 (RXA21.1, RXA22.1)
	Relay type	Monostable
	Contact rating with AC voltage	
	Switching voltage	Max. AC 250 V, min. AC 19 V
	Nominal current, resistive/inductive	Max. AC 5 A/4 A (cos φ = 0.6)
	Making current 200 ms half-time	Max. 20 A
	Switching current at AC 19 V	Min. AC 10 mA
	Contact rating with DC voltage	
	Switching voltage	Max. DC 250 V, min. DC 5 V
	Switching current at DC 5 V	Min. DC 100 mA
	Switching capacity	Max. 20 W
	Inductive load L/R	Max. 7 ms
	Q44	
	External fuse (essential)	Max. 10 A
	Relay type	Monostable
	Max. admissible load (resistive only)	Max. 1.8 kW
Interfaces	Interface to room units	Interface type PPS2
	Master/slave interface	Proprietary
	Max. number of slaves	3
Cable connections	Connection terminals for signals and power supply (screw terminals)	Stranded or solid conductors, 0.25 ... 2.5 mm ² or (solid conductors only) 2 x 1.5 mm ²
Single cable lengths	Signal inputs D1... D3	Max. 100 m with diameters ≥ 0.6 mm
	Measured value inputs B1 and X2	Max. 100m where A ≥ 1.5 mm ²
	AC24 V triac outputs , Y1 ... Y4	Max. 100m where A ≥ 1.5 mm ²
	Relay outputs Q14, Q24, Q34, Q44	Depends on load and local regulations
	Interface to room units (PPS2)	Max. 115 m where A = 0.75 mm ²
	Interface to slaves	Max. 50 m where A = 0.75 mm ²
	Cable type	2-core, twisted pair, unscreened
Housing protection standard	Protection standard to EN 60529	IP30 with terminal cover fitted and wall mounted without DIN rail IP20 for all other mounting arrangements
Protection class	Suitable for use in systems with protection class I or II	
Ambient conditions	Operation	Transport
	Class	3K5 to IEC 60721-3-3
	Temperature	0 ... 50 °C
	Humidity	< 85 % rh
Standards and directives	Product safety	
	Automatic electronic controls for household and similar use	EN 60730-1
	Electromagnetic compatibility	
	Immunity (industrial & domestic)	EN 60730-1
	Emissions (domestic)	EN 60730-1
	 CE compliance	
	Meets requirements of EMC Directive	2004/108/EC
	Low Voltage Directive	2006/95/EC
	 C-Tick conformity (EMC)	AS/NZS 61000-6-3
	 RoHS Reduktion gefährlicher Substanzen	2002/95/EG
Dimensions	See dimension diagrams	
Weight	Excluding packaging	0.59 kg

RXA20.1



Measured value inputs

- | | | |
|----|---|---|
| B1 | 1 | Measured value input for LG-Ni 1000 sensor or setpoint adjuster |
| M | 2 | Measured value input ground |
| X2 | 3 | Configurable input for LG-Ni 1000 sensor, setpoint adjuster or 0...10 V signals |

Signal inputs

- | | | |
|-----|---|--------------------------------|
| D1 | 4 | Signal input (window or clock) |
| GND | 5 | Signal ground |
| D2 | 6 | Signal input (occupancy) |
| D3 | 7 | Changeover input |

Triac outputs

- | | | |
|----|----|---------------------------------|
| Y1 | 8 | AC 24 V, 0.5 A switching output |
| G | 9 | AC 24 V actuator supply |
| Y2 | 10 | AC 24 V, 0.5 A switching output |

Device bus

- | | | |
|-----|----|-------------------------|
| M/S | 14 | Master/slave connection |
| CP- | 15 | Ground for PPS2 and M/S |
| CP+ | 16 | PPS2 (room unit) |

Power supply

- | | | |
|---|----|-----------------------------------|
| N | 19 | Neutral conductor |
| L | 21 | Phase conductor AC 230 V +/- 10 % |

Relay outputs

- | | | |
|-----|----|--|
| Q13 | 25 | Lead wire for Q14 |
| Q14 | 26 | Normally-open contact max. AC 250 V, 5 (4) A |

Operator controls

- | | |
|---------|---|
| S1...10 | DIP switch for configuring the room controller. |
| R1 | Potentiometer for setpoint reset and test purposes. |



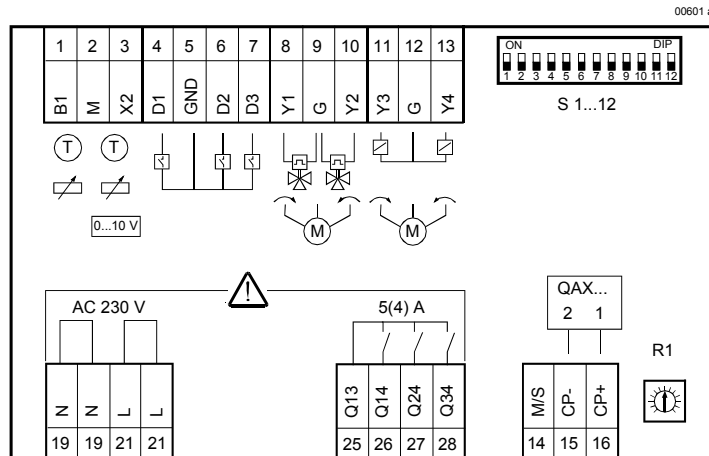
Caution

Observe the technical data for the relay output: max. AC 250 V, 5 (4) A

Important

Local installation regulations must be observed.

RXA21.1



Measured value inputs

- B1 1 Measured value input for LG-Ni 1000v sensor or setpoint adjuster
- M 2 Measured value input ground
- X2 3 Configurable input for LG-Ni 1000 sensor, setpoint adjuster or 0...10 V signals

Signal inputs

- D1 4 Signal input (window or clock)
- GND 5 Signal ground
- D2 6 Signal input (occupancy)
- D3 7 Changeover input

Triac outputs

- Y1 8 AC 24 V, 0.5 A switching output
- G 9 AC 24 V actuator supply
- Y2 10 AC 24 V, 0.5 A switching output
- Y3 11 AC 24 V, 0.5 A switching output
- G 12 AC 24 V actuator supply
- Y4 13 AC 24 V, 0.5 A switching output

Device bus

- M/S 14 Master/slave connection
- CP- 15 Ground for PPS2 and M/S
- CP+ 16 PPS2 (room unit)

Power supply

- N 19 Neutral conductor
- L 21 Phase conductor AC 230 V +/- 10 %

Relay outputs

- Q13 25 Shared contact for Q14, Q24 and Q34
- Q14 26 Normally-open contact, max. AC 250 V, 5 (4) A (Stage 1)
- Q24 27 Normally-open contact, max. AC 250 V, 5 (4) A (Stage 2)
- Q34 28 Normally-open contact, max. AC 250 V, 5 (4) A (Stage 3)

Operator controls

- S1...12 12 DIP switch for configuring the room controller.
- R1 Potentiometer for setpoint reset and test purposes.



Caution

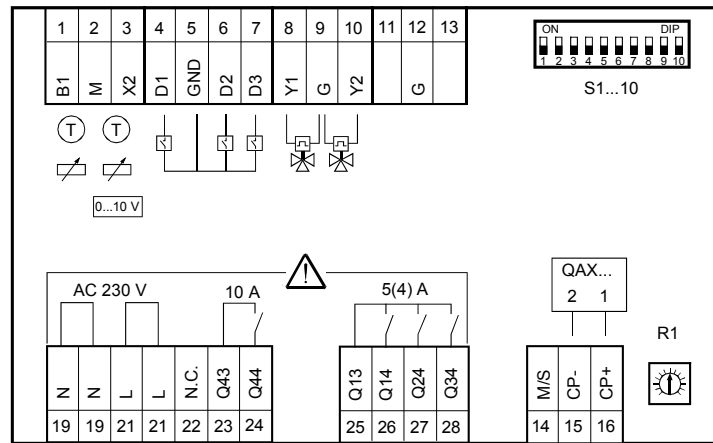
Observe the technical data for the relay outputs: max. AC 250 V, 5 (4) A

Important

Local installation regulations must be observed.

RXA22.1

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Measured value inputs

- B1 1 Measured value input for LG-Ni 1000 sensor or setpoint adjuster
- M 2 Measured value input ground
- X2 3 Configurable input for LG-Ni 1000 sensor, setpoint adjuster or 0...10 V signals

Signal inputs

- D1 4 Signal input (window or clock)
- GND 5 Signal ground
- D2 6 Signal input (occupancy)
- D3 7 Changeover input

Triac outputs

- Y1 8 AC 24 V, 0.5 A switching output
- G 9 AC 24 V actuator supply
- Y2 10 AC 24 V, 0.5 A switching output

Device bus

- M/S 14 Master/slave connection
- CP- 15 Ground for PPS2 and M/S
- CP+ 16 PPS2 (room unit)

Power supply

- N 19 Neutral conductor
- L 21 Phase conductor AC 230 V +/- 10 %

Relay outputs

- Q13 25 Shared contact for Q14, Q24 and Q34
- Q14 26 Normally-open contact, max. AC 250 V, 5 (4) A (Stage 1)
- Q24 27 Normally-open contact, max. AC 250 V, 5 (4) A (Stage 2)
- Q34 28 Normally-open contact, max. AC 250 V, 5 (4) A (Stage 3)
- N.C. 22 Not connected
- Q43 23 Lead wire for Q44
- Q44 21 N/O contact AC max. 250 V, 10 A...(electric heating coil)

Operator controls

- S1...10 DIP switch for configuring the room controller.
- R1 Potentiometer for setpoint reset and test purposes.



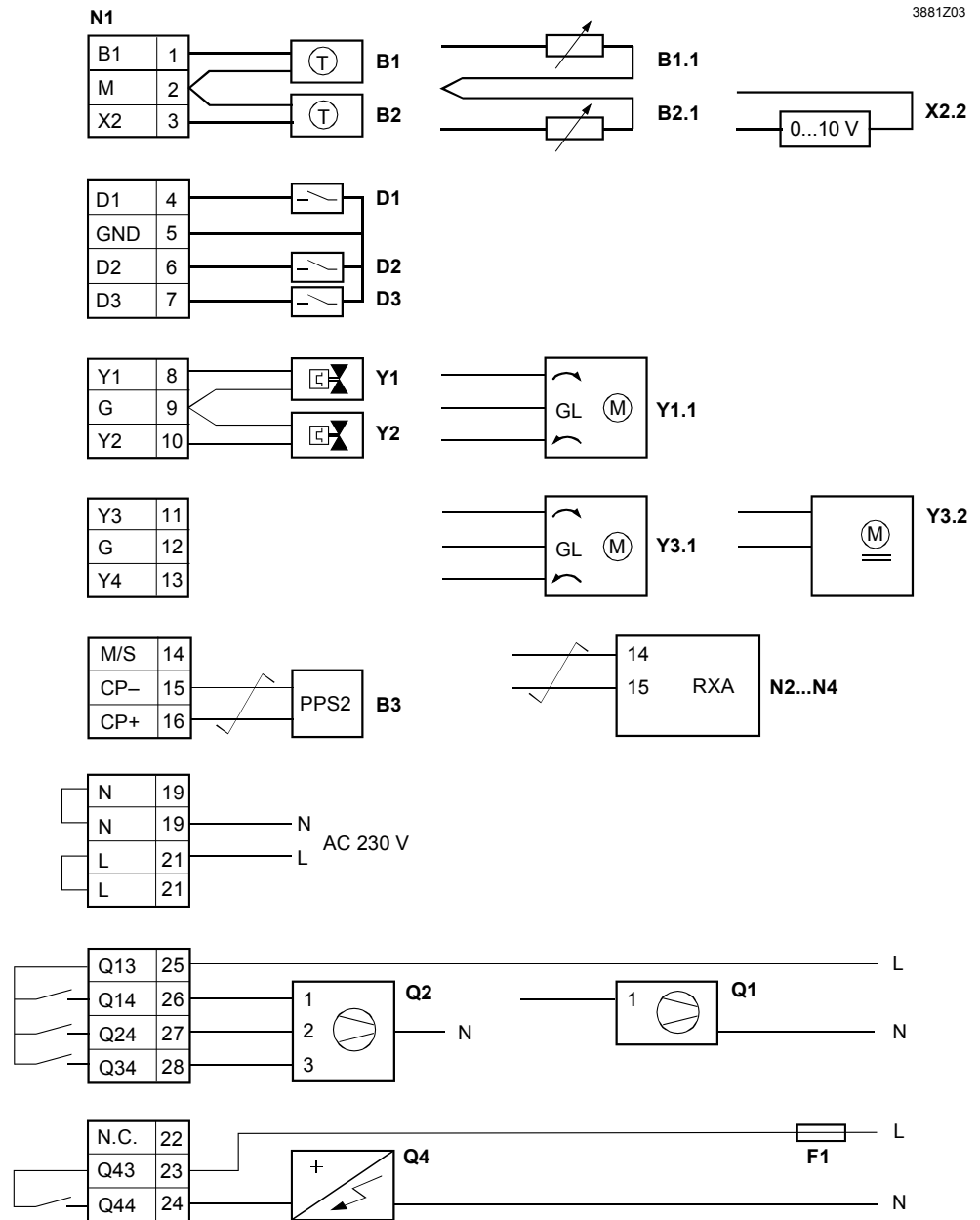
Caution

- **Observe the technical data for the relay outputs: max. AC 250 V, 5 (4) A or 10 A**
- **Local installation regulations must be observed.**

Connection diagrams

Connecting the field devices, room units and supply voltage

3881Z03



N1	RXA20.1, RXA21.1, RXA22.1
N2...N4	Max. 3 slave controllers
B1, B2	LG-Ni 1000 temperature sensor
B1.1, B2.1	Setpoint adjuster
X2.2	0...10 V signal (summer/winter compensation)
B3	QAX... room unit
D1, D2	Volt-free contacts (window contact, occupancy sensor, central time switch etc.)
D3	Changeover signal
Y1, Y2	AC 24 V thermic valve actuators
Y1.1, Y3.1	Valve actuator, AC 24 V, 3-position (RXA21.1 only)
Y3.2	Damper actuator with spring return
Q1	Single-speed fan
Q2	3-speed fan
Q4	Electric heating coil
F1	External fuse

 Twisted pair



Caution

- Fans connected to relay outputs Q14 ... Q34 must not be operated in parallel. For parallel operation use cut-off relays or slave controllers.
- At Q4 (max. resistive load 1.8 kW), use additional external fuses of max. 10 A to protect the pcb tracks.

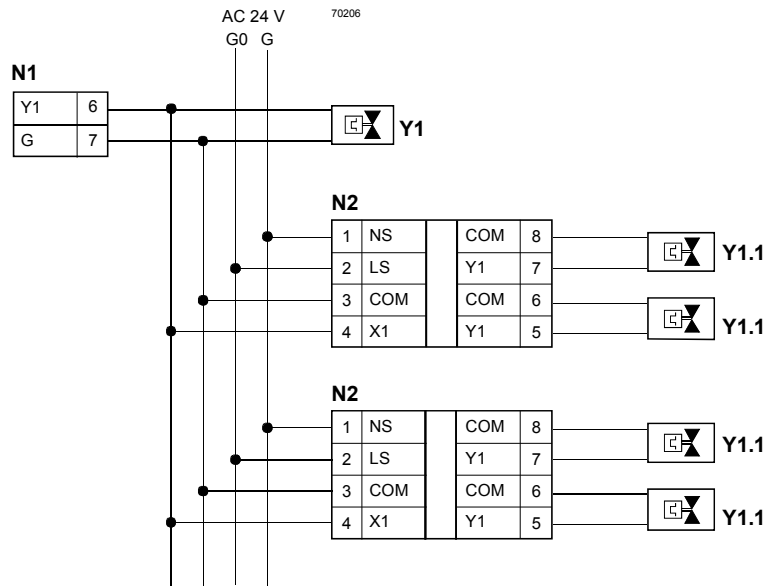
Note

For information on the compatibility of the various field devices with the RXA20.1, RXA21.1 and RXA22.1 room controllers, refer to the relevant application description.

Connecting a power amplifier

Parallel connection of a number of thermic valve actuators to output Y1 using the UA1T power amplifier.

The same principle applies to outputs Y2 ... Y4. Note that the simultaneous load on outputs Y1 ... Y4 must not exceed 9.5 VA (power consumption at input X1 of the UA1T: 0.5 VA)



- N1 RXA20.1, RXA21.1, RXA22.1
- N2 UA1T (see data sheet CA2N3591)
- Y1 AC 24 V thermic valve actuator
- Y1.1 AC 24 V thermic valve actuator (max. 2 STP72E actuators per Y1 output on the UA1T)

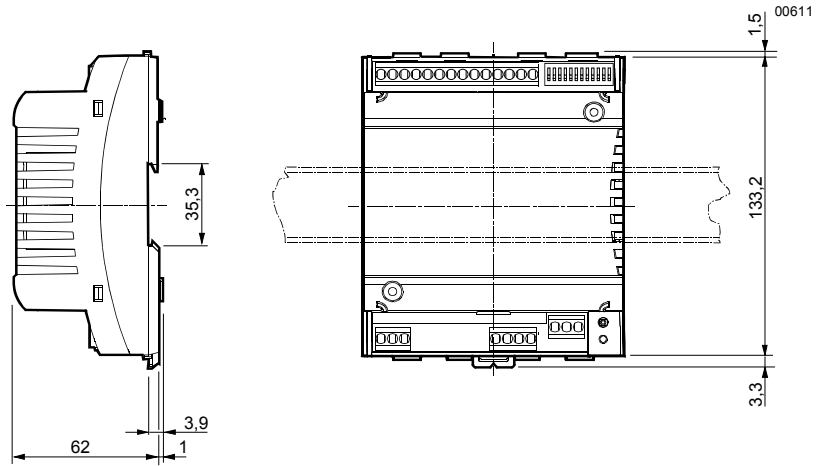
Notes

- The UA1T requires an AC 24 V supply voltage
- The UA1T is *not* suitable for the connection of 3-position actuators.

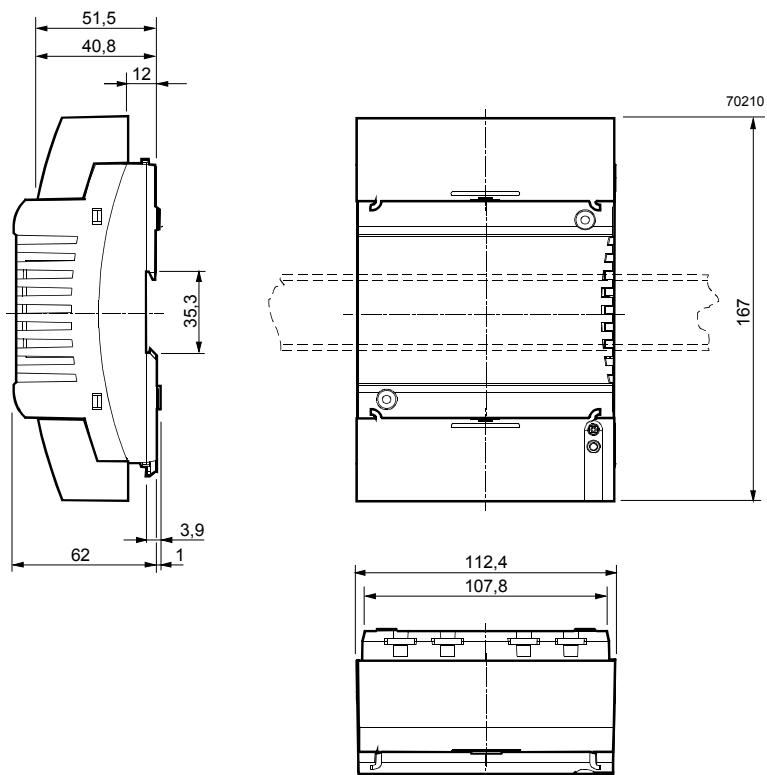
Dimensions

Without terminal covers

Dimensions in mm



With terminal covers



Drilling diagram

