SIEMENS

3878

RXL

Room controller RXL24.1

Communicating controller for chilled ceiling and radiator applications CC-02

The RXL24.1 room controller is used for temperature control in individual rooms.

- **For chilled ceiling and radiator systems**
- **PI control**
- **Proprietary bus communication**
- **Integration into the DESIGO building automation and control system via PX KNX**
- **Integration into Synco**
- **Control of AC 24 V PDM [1] thermic valve actuators or 3-position AC 24 V motorized valve actuators**
- **Commissioning with Synco ACS or "HandyTool"**
- **AC 24 V operating voltage**
- **Screw terminals**

1) PDM = Pulse Duration Modulation

Application

The RXL24.1 room controller is optimized for control of chilled ceiling and radiator systems in individual rooms.

The application of each controller is determined by the application software.

The controllers are delivered with a fixed set of applications, each of which contains various individual applications. The relevant application is selected and activated during commissioning using one of the following tools:

- Synco ACS
- "HandyTool" (the QAX34.3 room unit includes a tool function allowing you to parameterize the connected RXL controller).

No use of spare inputs/outputs

Unlike the RXB controllers, the RXL controllers do NOT support the use of spare inputs and outputs by the building automation and control system.

Functions

The room controller functions are determined by the selected application and its parameters, and by the input/output configuration.

For details, refer to the CLC and RAD description of functions, document CA110784.

When DESIGO RXL controllers are integrated into a building automation and control system, or into a Synco system, additional functions become available such as time scheduling, central control of setpoints, etc.

Applications

The following applications are available for the RXL24.1 room controllers:

Application group (type)	Applications	
CC-02 (with RXL24.1)	CLC01	Chilled ceiling with dew point monitoring
	CLC02	Chilled ceiling with dew point monitoring, radiator with downdraft compensation
	RAD01	Radiator with downdraft compensation

Note

Only one application at a time can be activated with the tool (Synco ACS or "HandyTool").

Types

The RXL24.1 room controller has the following outputs:

Type	AC 24 V triac outputs
RXL24.1	For 2 thermic valve actuators or two 3-position actuators
RXZ20.1	Accessories: Terminal covers

Ordering

When ordering please specify the quantity, product name, type code and application group.

Example: **30 Room controllers, type RXL24.1/CC-02**

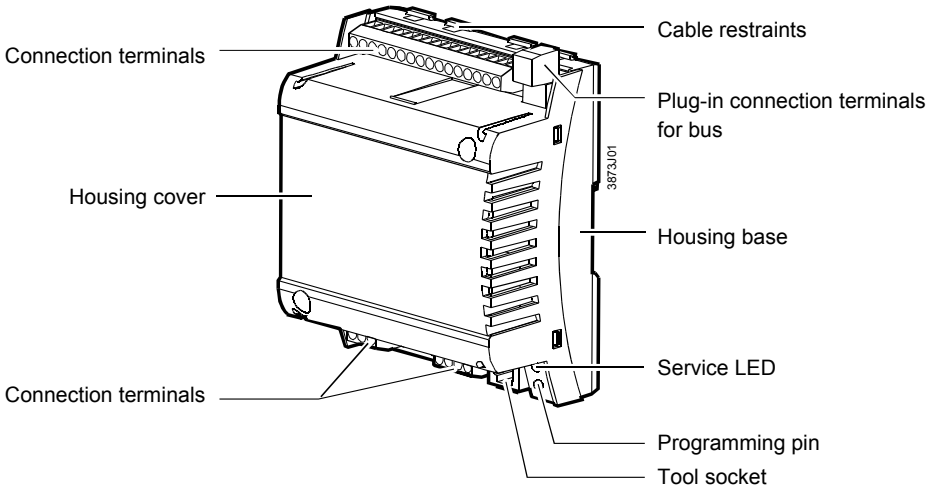
Compatibility

The RXL24.1 room controller is compatible with field devices from Siemens Building Technologies.

For details, refer to the DESIGO RX hardware overview, CA2N3804.

Design

The RXL24.1 controller consists of a housing base, a housing cover and the printed circuit board with connection terminals. The controller also has a tool socket, a service LED and a programming pin.



Service LED

The programming LED shows the operational status of the room controller as follows:

Green flashing	OK, device is in operation
Red ON	• Addressing mode (ACS / ETS) • Fault
Orange / green flashing	Parameter download
OFF	• No supply voltage • Fault • Service LED disabled by software
Other patterns	• Start-up (approx. 5.sec) • Fault

Programming pin

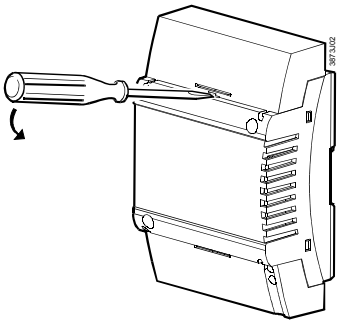
The programming pin is used to identify the controller in the commissioning phase.

Pressing this pin causes the red programming LED to light up and remain on until identification of the controller is complete.

Once the programming pin has been pressed, the tool overwrites the hardware address in the room controller.

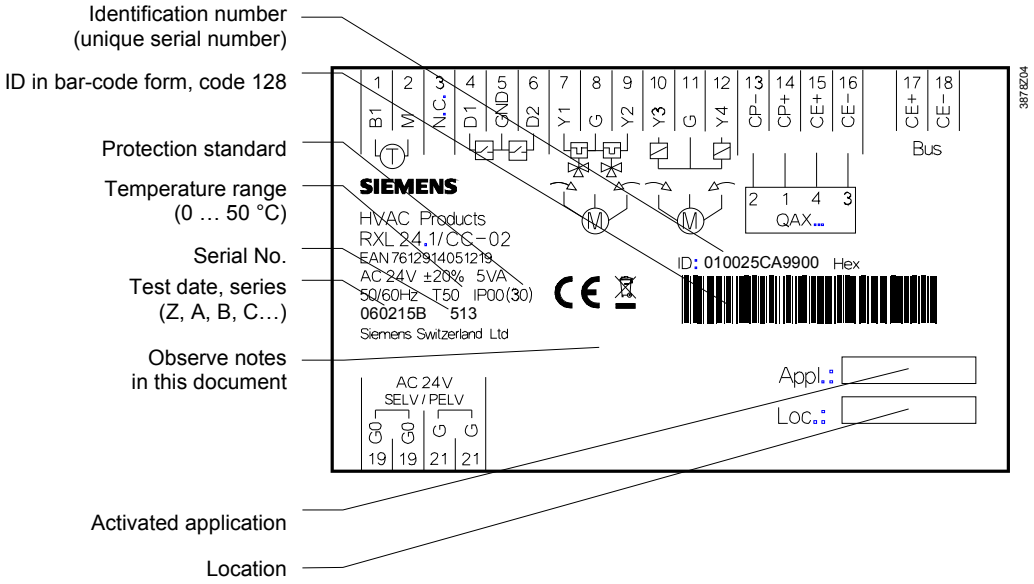
Terminal cover

Terminal covers (RXZ20.1) are available as an option, to protect the connection terminals from physical contact and dirt. The service LED remains visible when the terminal covers are in place, and the programming pin can be operated with a pointed implement. The cable is connected to the room controller by breaking out the perforated cable entry guide.



Removing the terminal cover

Label



Note

Options for use of the labeling fields “Appl.” and “Loc.”:
Handwritten identification of the location and the activated application group.

Connection terminals

The connection terminals for the bus are detachable plug-in screw-terminals. All other terminals are fixed..

Communication

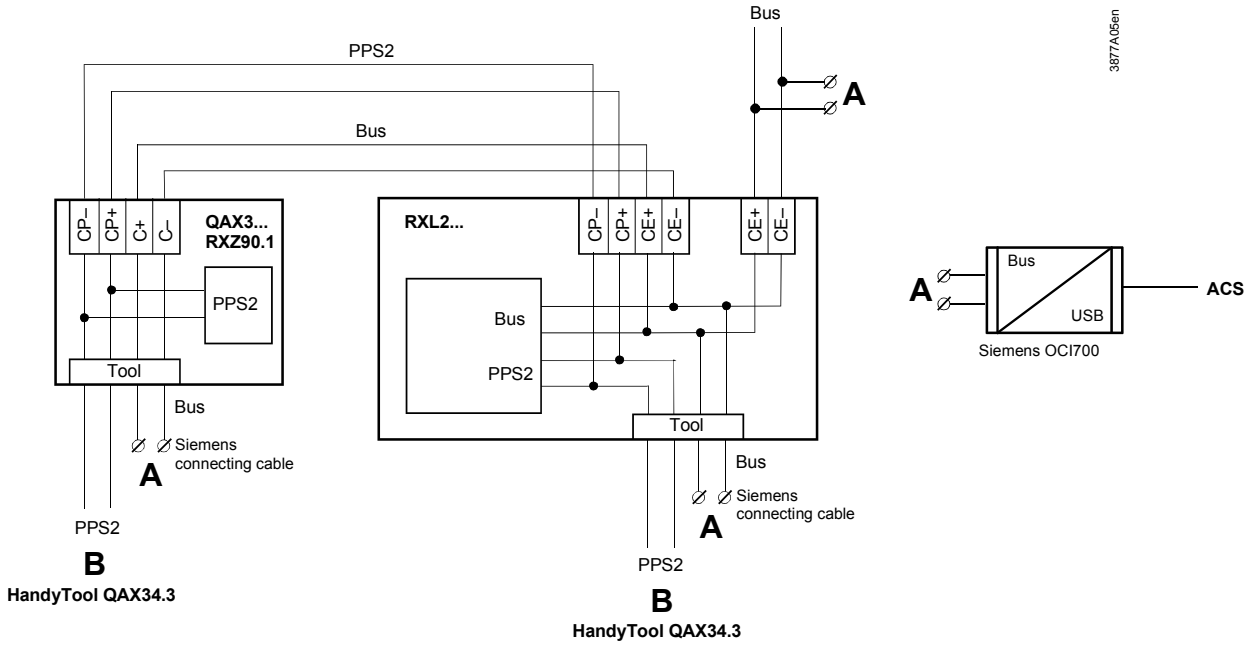
The RXL24.1 controller communicates with other devices via the following interfaces:

- PPS2 interface (proprietary) for the exchange of data with the room units
- Bus (terminals CE+ and CE-) for communication with:
  - PX/KNX interface (to DESIGO INSIGHT)
  - Interface OCI700 (to Synco)
  - Other DESIGO RXL controllers

Connecting the tool

To facilitate commissioning, the Synco ACS tool can be connected at three different points (marked (**A**) in the diagram) in the plant:

- to the bus cable at any point
- to the RXL2… controller (RJ45 tool socket)
- to the room unit (RJ45 tool socket)



Notes

- The tool socket is a proprietary socket.
  A Siemens connecting cable must be used (e.g. PXA-C1).
  When connected to Ethernet, the device on the other end may be damaged!

Caution!

- The ACS tool, even if connected to a tool socket, requires an interface (OCI700).
- The "HandyTool" is connected to the tool socket of the room controller or to the tool socket of the room unit (QAX3…, RXZ90.1) (**B**).
- If you use OCI700 as an interface, it is connected to the service plug of the controller or of the room unit.
  As long as the OCI700 is connected to the service plug, it must be supplied by the computer via the USB interface. Otherwise the LCD display of the room unit will turn dark and the controller will switch to addressing mode.

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 notes

Bus

Topology	Line or star NO closed loops
Cable length	Max. 1000 m
Cable length	E.g. YCYM 2 x 2 x 0.8 mm
Number of RXL Controllers per Network	Max. 45
Bus supply	Up to 45 RXL-controllers: 5WG1 125-1AB12
Bus terminator	Not required

AC 24 V supply cables

The RXL2… room controllers operate with a supply voltage of AC 24 V.
The controlled devices (damper actuators) receive their power directly from the room controller. This means that a separate AC 24 V supply is not necessary for the field devices.

This device has no circuit breakers for supply lines to external consumers (field power supply)!

Line insulation must always be sufficient for the available rated voltage.

Caution ⚠

When forwarding supply voltage (**for 24 V low voltage as well**) to external consumers, the wiring cross sections must at any rate be adapted to the preswitched overcurrent protection device. Please comply under all circumstances with local regulations.

AC 24 V triac outputs

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

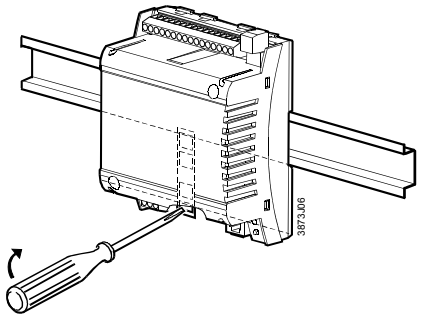
Example:

Y1 (heating)	2 thermic valve actuators, type STP72E	5 W
Y2 (cooling)	2 thermic valve actuators, type STP72E	5 W

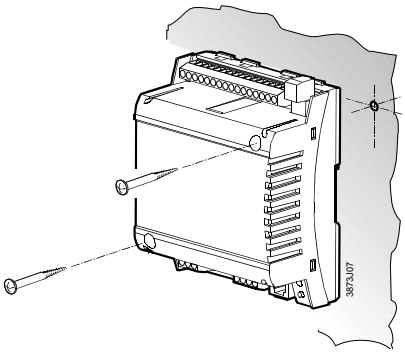
The maximum load is 9.5 VA for the heating sequence and 9.5 VA for the cooling sequence.
This is acceptable because the two sequences never operate at the same time.

Mounting instructions

The room controllers can be mounted in any orientation, and fixed as follows:



Rail mounting
The housing base is designed for snap-mounting on DIN rails, type EN50022-35 x 7.5 (can be released with a screwdriver).



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 mm

Note!

Tightening torque for fixing screws max. 1.5 Nm

When mounting note the following:

- The controller should not be freely accessible after mounting. It must be mounted in a cabinet or behind a cover that can only be opened / removed with a key or a tool.
- 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 RXL24.1 room controller is commissioned with one of the following tools:

- Synco ACS via the OCI700 interface
- "HandyTool" via PPS2.

Labeling

The definitive application and the controller's location are handwritten in the labeling fields "Appl." and "Loc" in the commissioning stage.

Function test

A special test mode (HandyTool) is available for operation of the outputs and interrogation of the inputs.

Technical data

⚠ Power supply	Operating voltage	SELV / PELV AC 24 V ± 20 %
	Rated voltage	AC 24 V
	Frequency	50/60 Hz
	Power consumption with connected field devices	Max. 15 VA
	Internal fuse	None
Caution ⚠	Supply cable protection (external fuse)	Transformer with secondary limitation of max. 10 A or External secondary power fuse with max. T 10 A non-renewable fuse or max. C 13 A circuit breaker is required in all cases
Operating data	Control algorithm	PI
Inputs		
Signal inputs D1, D2	Quantity	2
(for volt-free contacts)	Contact voltage	DC 16 V
	Contact current	DC 5 mA
	Contact transfer resistance	Max. 100 Ω
	Contact insulation resistance	Min. 50 kΩ
	Switch time:	min. 20ms “ON”, min. 20ms “OFF”
Measured value input B1	Compatible temperature sensors	LG-Ni 1000
	Quantity	1
	measuring range	0 ... 50 °C
	Sensor current	0.5 mA
	Resolution	0.1 K
	Measuring error at 25 °C sensor temp. (without cable)	max. 0.5 K
Outputs		
AC24 V triac outputs , Y1 … Y4	Quantity	4
	Output voltage (equal to supply voltage)	AC 24 V ON/OFF, PWM or 3-position
	Permissible load current	Max. 0.5 A
	Power limitation	No internal limitations
	Total nominal load	Max. 9.5 VA (e.g. 2 thermic valve actuators
	(at both outputs simultaneously)	STA72E per heating and cooling sequence
Ports/interfaces		
Interface to room unit	Number of room units connectable	1
	Interface type for room unit	PPS2
	for ACS	Bus
	PPS2 baud rate	4.8 kbit/s
	Baud rate on bus	9.6 kbit/s
Bus	Interface type	Electrically isolated
	Bus current	5 mA
	Baud rate	9.6 kbit/s
	Bus topology	Refer to "engineering", page 6
Cable connections	Connection terminals for signals and power supply	Solid or stranded conductors 0.25 … 2.5 mm^2 or 2 x 1.5 mm^2
	Bus connection terminals	Solid or stranded conductors 2 x max.1.0 mm^2
	(plug-in screw terminals)	e.g. YCYM 2x2x0.8
	Single cable lengths	For field devices, see also the RXB & RXL installation guide, CM110381
	Signal inputs D1, D2	Max. 100 m with diameters ≥ 0.6 mm
	Measured value input B1	Max. 100 m
	AC24 V triac outputs , Y1 … Y4	Max. 100m where A ≥ 1.5 mm^2
	Interface to room unit	Max. 115 m where A= 0.75 mm^2 (including connecting cable for tool)
	Cable type	4-core, twisted pair, unscreened
	Bus	Max. 500 m, see "engineering", page 6
	Tool connecting cable	Max. 3 m

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	Normal operation	Class 3K5 to IEC 60721-3-3
	Temperature	0 ... 50 °C
	Humidity	< 85 % rh
	Transport	Class 2K3 to IEC 60721-3-2
	Temperature	– 25 ... 65 °C
	Humidity	< 95 % 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
	Home and Building Electronic Systems (HBES)	EN 50090-2-2
	Electronic individual zone control equipment	EN 15500
	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

eu.bac

Meets the requirements for eu.bac certification

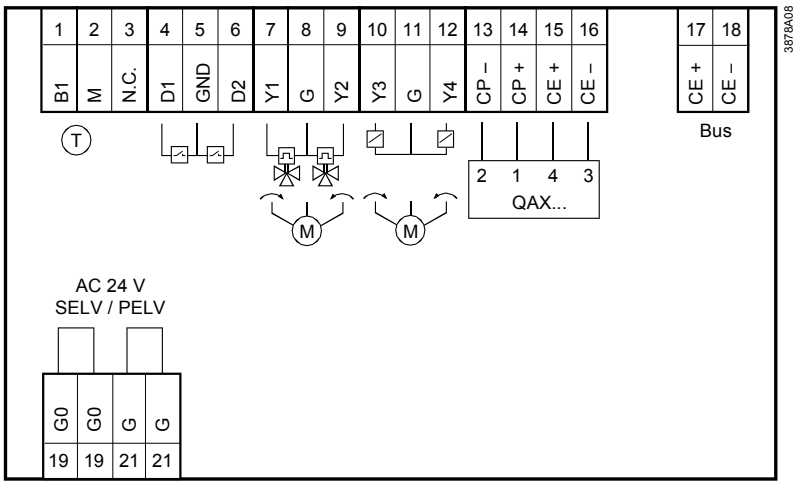
See product list at: http://www.eubaccert.org/ licences-by-criteria.asp

Type	License	Application	Control accuracy [K]
RXL24.1/CC02	20862	Heating Systems (Radiator)	0.4
		Chilled Ceiling Systems	0.3

RoHS	Reduction of hazardous substances	2002/95/EC

Dimensions	See dimension diagrams	
Weight	excluding packaging	0.250 kg
	including packaging	0.380 kg

RXL24.1



Measured value input

B1	1	Measured value input for LG-Ni 1000 sensors
M	2	Measured value input ground

Signal inputs

D1	4	Signal input
GND	5	Signal ground
D2	6	Signal input

Triac outputs

Y1	7	AC 24 V, 0.5 A switching output
G	8	AC 24 V actuator supply
Y2	9	AC 24 V, 0.5 A switching output
Y3	10	AC 24 V, 0.5 A switching output
G	11	AC 24 V actuator supply
Y4	12	AC 24 V, 0.5 A switching output

Room unit

CP–	13	PPS2 ground
CP+	14	PPS2 data
CE+	15	Bus
CE–	16	Bus

Bus **(plug-in connection)**

CE+	17	Bus
CE–	18	Bus

Power supply

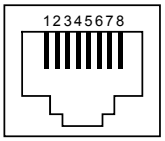
G0	19	Controller ground
G	21	AC 24 V +/- 20 %

⚠ Caution

- **Local installation regulations must be observed.**

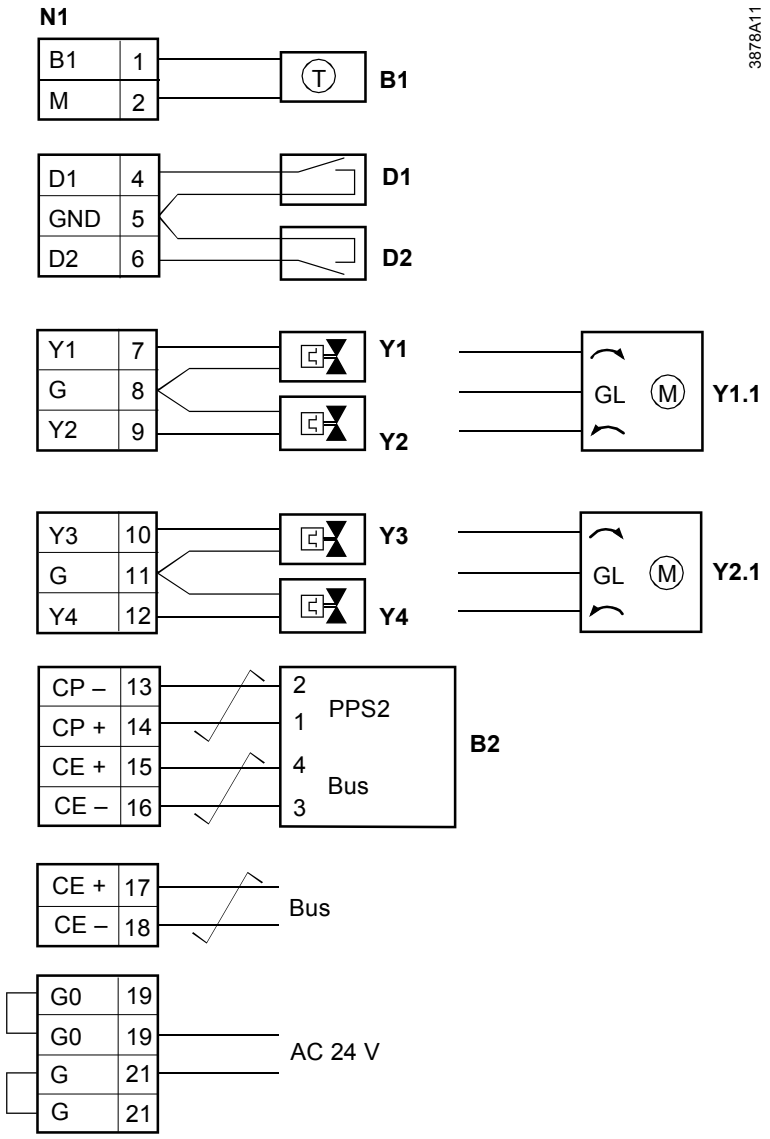
Tool socket

Proprietary RJ45-type tool socket



1	Bus (CE+)	5	+12VDC
2	Bus (CE–)	6	RxD
3	Not used	7	PPS2 (CP+) / TxD
4	Not used	8	PPS2 (CP–)

Connection of field devices, room unit, bus and power supply



N1	RXL24.1
B1	LG-Ni 1000 temperature sensor
D1, D2	Volt-free contacts (window contact, occupancy sensor, etc.)
Y1...Y4	AC 24 V thermic valve actuators
Y1.1	Motorized AC 24 V, 3-position valve actuator
Y2.1	Motorized AC 24 V, 3-position valve actuator
B2	QAX… room unit

Twisted pair

Note For information on the compatibility of field devices with the RXL24.1 room controller, refer to the various application descriptions (see the CLC and RAD description of functions, document CA110784)

Parallel connection of several thermic valve actuators

Up to two thermic actuators per sequence may be connected directly to the room controller. With more than two thermic actuators, a UA1T power amplifier is required.

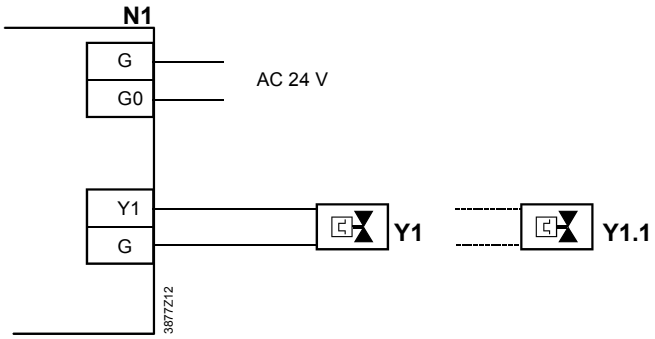
The principle is the same for output Y2. Do not exceed the maximum simultaneous load on outputs Y1 and Y2 (max. 9.5 VA).

Power consumption at input X1 of the UA1T: 0.5 VA.

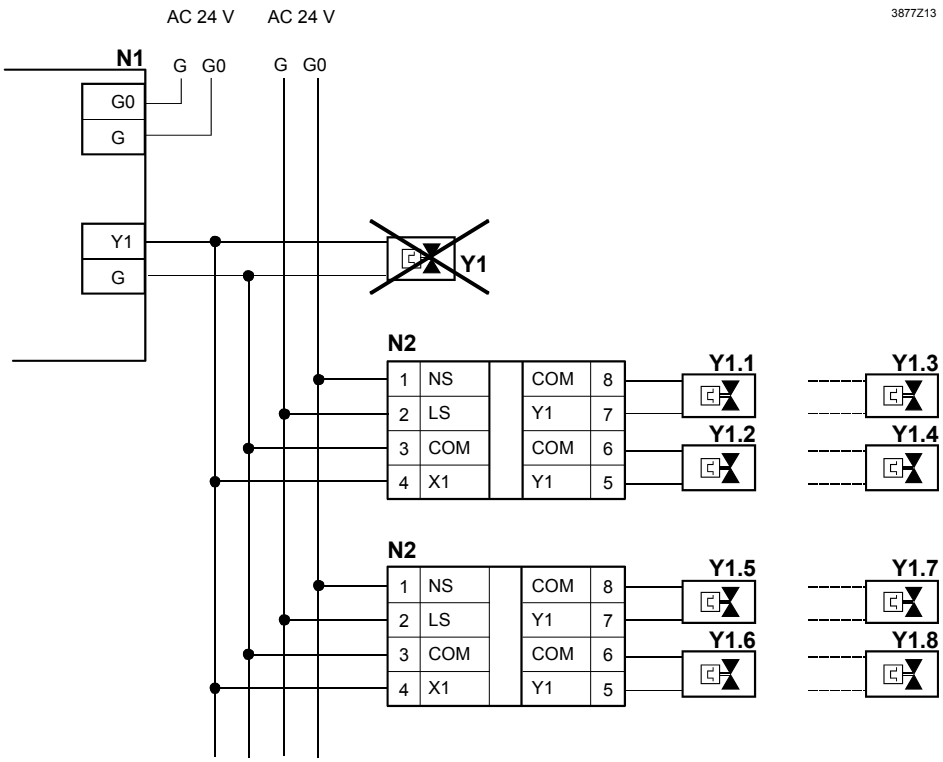
Note!

Mixed operation: **It is not permissible to connect thermic actuators both to the controller and to the power amplifier.**
Owing to the difference in voltage between the controller's internal transformer and the power supply of the UA1T, this could cause the valve positions to deviate substantially.

Connection to the controller



Connection to the power amplifier



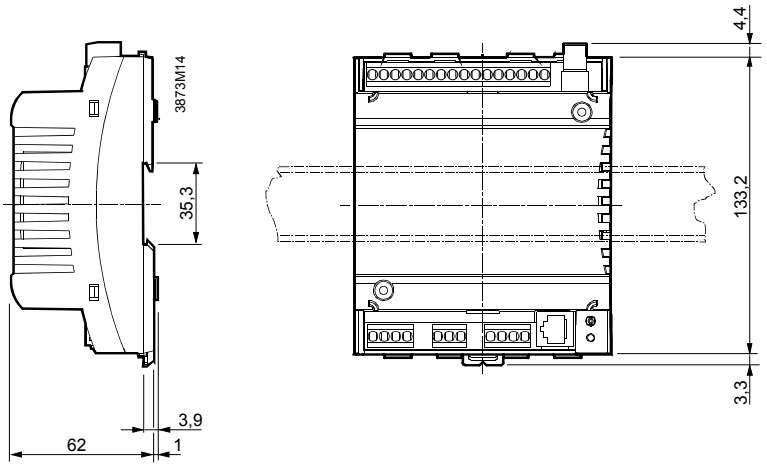
N1 Room controller RXL24.1
N2 UA1T power amplifier (see data sheet CA2N3591)
Y1 AC 24 V thermic valve actuators connected to the controller
Y1.x AC 24 V thermic valve actuators
(max. 2 STA72E/STP72E actuators per Y1 output on the UA1T)

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

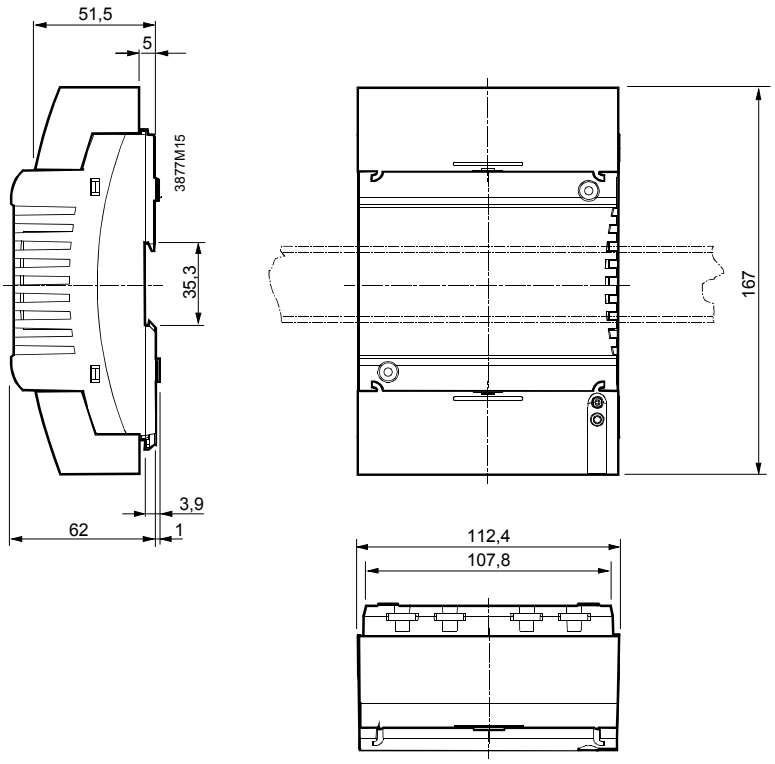
Dimensions

Dimensions in mm

Without terminal cover



With terminal covers



Drilling diagram (1:1)