RCP200 / RCP200T

Freely programmable controllers with communication

RCP200 and RCP200T are freely programmable controllers from the Regio Maxi series intended to control heating and cooling in a zone control system.

- **Communication via RS485 (Modbus or EXOline) alt. TCP/IP (RCP200T)**
- **Fast and safe configuration via Regio Tool©**
- **Simple installation**
- **On/Off, 0...10 V or three-point control**
- **Input for occupancy detector, window contact, condensation detector and change-over function**

RCP200 and RCP200T are controllers from the Regio series. They have communication via RS485 (Modbus or EXOline) alt. TCP/IP (RCP200T) for integration into systems.

The controllers can be configured via Regio Tool© and freely programmed via EXOdesigner.

The controllers are connected to different room units (RU-units) with built-in temperature sensor from the Regio series.

Regio

Regio is a wide series of controllers which handle heating and cooling.

The controllers are divided into three different series, Mini, Midi and Maxi. Mini are pre-programmed, stand-alone controllers. The Midi controllers are pre-programmed with communication. The Maxi group, to which RCP200 and RCP200T belong, consists of freely programmable controllers with communication.

Applications

The Regio controllers are suitable in buildings where you want optimal comfort and low energy consumption, for example offices, schools, shopping centres, airports, hotels and hospitals etc.

See application examples on page 4.

Design

The room units have a modern design. The design has been awarded the 2007 “iF product design award”.

product design award 2007

Actuators

RCP200 and RCP200T can control 0...10 V DC valve actuators, 24 V AC three-point actuators and/or 24 V AC thermal actuators.

Easy to install

The modular design with a separate bottom plate for wiring makes the whole Regio series easy to install and commission. The bottom plate can be put into place before the electronics are installed.

The controller is mounted in the ceiling void, on a junction box plate, or with Regin’s mounting kit ”RCP-DIN, RCP DIN RAIL mounting details” on a DIN-rail. The form factor of the casing is EURO norm, which makes it fit into a standard EURO norm cabinet.

Flexibility with communication

RCP200 and RCP200T can be connected to a central SCADA-system via RS485 (EXOline or Modbus) alternatively TCP/IP (only RCP200T) and configured for a particular application using the cost-free configuration tool Regio Tool©. Read more about Regio Tool© on page 3.

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Connection of RU-units

Different Regio room units (RU-units) with built-in temperature sensor are connected to the controller.

RCP200 and RCP200T can be combined with the following RU-units:

- RU
- RU-O
- RU-DO
- RU-DOS

The room unit is connected to the controller with an RJ12-cable, max length 30 m. Regin has two cables as accessories, RU-CBL3 (length 3 m) and RU-CBL10 (length 10 m).

For more information about the room units, see the product sheet for each respective RU-unit.

Control states

RCP200 and RCP200T can be configured for different control states/control sequences:

- Heating
- Heating or cooling via the change-over function
- Heating/Heating
- Heating/Cooling
- Heating/Cooling with VAV-control and forced supply air function
- Heating/Cooling with VAV-control
- Cooling
- Cooling/Cooling

Operating modes

There are five different operating modes: Off, Unoccupied, Stand-by, Occupied and Bypass. Occupied is the preset operating mode. It can be changed to Stand-by with a dipswitch on the connected room unit alt. in the parameter menu in the RU-unit's display.

The operating modes can be activated via local time control in RCP200/RCP200T, a central command, an occupancy detector, or via the Occupancy button on the room unit (if the room unit has an occupancy button).

Off: Heating and cooling are disconnected. However, the temperature must not drop below the set minimum temperature (Factory setting (FS)=8°C). Operating mode Off is activated on open window.

Unoccupied: The room where the controller is placed is not used for an extended period, for example during holidays or long weekends. Both heating and cooling are disconnected within a temperature interval with configurable min/max temperatures (FS min=15°C, max=30°C).

Stand-by: The room is in an energy save mode and is not used at the moment. This can for example be during nights, weekends, evenings etc. The controller is prepared to change operating mode to Occupied if someone enters the room. Both heating and cooling are disconnected within a temperature interval around the applicable setpoint (FS heating setpoint value=-3°C, cooling setpoint=+3°C).

Occupied: The room is in use and is therefore in a comfort mode. The controller regulates the temperature around a heating setpoint (FS=22°C) and a cooling setpoint (FS=24°C).

Bypass: The temperature in the room is controlled in the same way as in operating mode Occupied. The output for forced ventilation is also active. Bypass is useful for example in conference rooms, where many people are present at the same time for a certain period of time.

When Bypass has been activated by a press on the Occupancy button, the controller will automatically return to the preset operating mode (Occupied or Stand-by) after a configurable time (FS=2 hours). If an occupancy detector is used, the controller will automatically return to the preset operating mode after 10 minutes absence.

Occupancy detector

By connecting an occupancy detector, RCP200 and RCP200T can switch between Bypass and the preset operating mode (Occupied or Stand-by). The temperature is then controlled according to requirement, which saves energy and keeps the temperature at a comfortable level.

Changing operating mode via the Occupancy button

If the controller is connected to a room unit with an occupancy button, you can change the operating mode via the Occupancy button.

If you press the Occupancy button for less than 5 seconds when the controller is in the preset operating mode, the controller changes to operating mode Bypass. If you press the button for less than 5 seconds when the controller is in Bypass, it changes operating mode to the preset operating mode.

When the Occupancy button is held depressed for more than 5 seconds, the controller changes operating mode to "Shutdown" (Off/Unoccupied), regardless of the current operating mode. Via Regio Tool© or the room unit's display (if the room unit has a display), you can configure which operating mode, Off or Unoccupied, should be activated on "Shutdown" (FS=Unoccupied). If you press the Occupancy button for less than 5 seconds in Shutdown, the controller returns to Bypass.

Forced ventilation via the Occupancy button

Regio has a built-in function for forced ventilation. A short press on the room unit's Occupancy button activates the output that has been configured for forced ventilation, for example for a damper.

Actuator exercise

All actuators are exercised. An opening signal is sent to the actuator for as long time as the run time has been configured. Then a closing signal is sent for as long time and the exercise is finished.

You can configure if the actuators should be exercised, which day you want the exercise to take place, or if it should take place every day. You can also configure at what time during the day the exercise should occur (FS=Every day at 3 pm).

Change-over

RCP200 and RCP200T have an input for change-over that automatically resets the configured heating output to operate with heating or cooling function. The input can be connected to sensors of type PT1000 and have the sensor mounted so that it senses the temperature on the supply pipe to the coil.

When the temperature exceeds 22°C, the output function is set to heating and when the temperature drops below 18°C, the output is set to cooling.

As an alternative, a potential-free contact can be used. When the contact is open the controller works with the heating function and when it is closed, with the cooling function.

To ensure satisfactory functioning using sensor, the system must have continuous primary circuit circulation. When the change-over function is not used, the input must be left disconnected.

Setpoint

In Occupied mode, the controller operates from a heating setpoint (FS=22°C) or a cooling setpoint (FS=24°C) that can be changed centrally or locally via the room unit's dipswitches or display.

The setpoint can be adjusted up and down (FS=+/-3°C) with the knob on the front of the room unit or using the INCREASE and DECREASE buttons.

Switching between heating and cooling setpoints is done automatically in the controller depending on the heating and cooling requirement.

Indications

Adjacent to terminals 40-43 and 80, there are a number of LED:s which indicate status.

Designation	Colour	Description
P/B (Power supply/Battery)	Green/ Red	Power supply on/ Battery error
Lan/Serv	Green/ Yellow	For TCP/IP status indication
Rx	Green	Port 1, Receiving
Tx	Green	Port 1, Transmitting
RURX	Green	Port RU, Receiving

The controller's indications

Built-in safety functions

To prevent condensation damages, you can connect a condensation detector to RCP200 and RCP200T. The controller also has frost protection. It prevents frost damages by ensuring that the room temperature does not drop below 8°C when the controller is in Off-mode.

Special functions with RU-DOS

RU-DOS is a flexible room unit with special functions.

When RCP200 and RCP200T are used together with RU-DOS, they can control lighting and blinds.

It is also possible to connect a CO_2-transmitter to the controller to measure the current percentage of CO_2 in the room, and a humidity sensor to measure the current relative humidity (% RH) in the room.

You can also connect an outdoor temperature sensor if you wish to measure the current outdoor temperature.

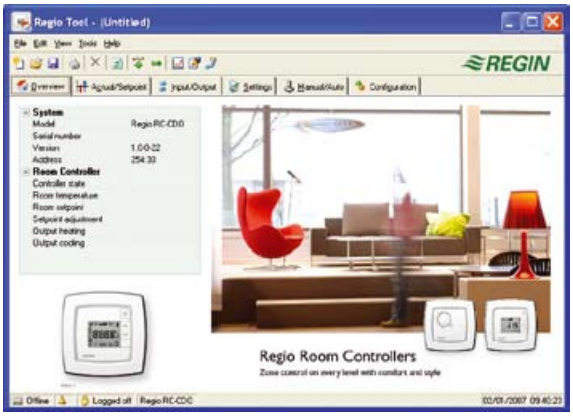
Read more in the product sheet for RU-DOS.

Configuration and supervision with Regio Tool©

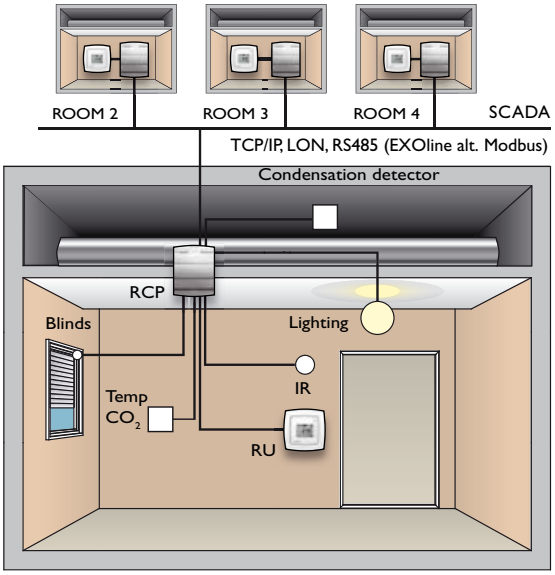
The controller is pre-programmed on delivery, but can be configured using Regio Tool©.

Regio Tool© is a PC-based program that makes it possible to configure and supervise an installation, and change settings, via a clear and easy user interface.

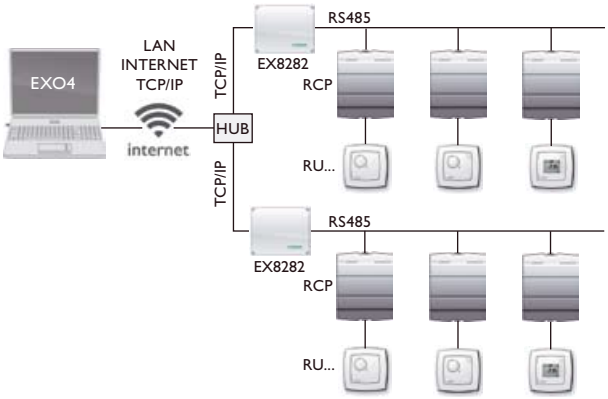
The program can be downloaded free of charge from Regin's homepage www.regin.se.

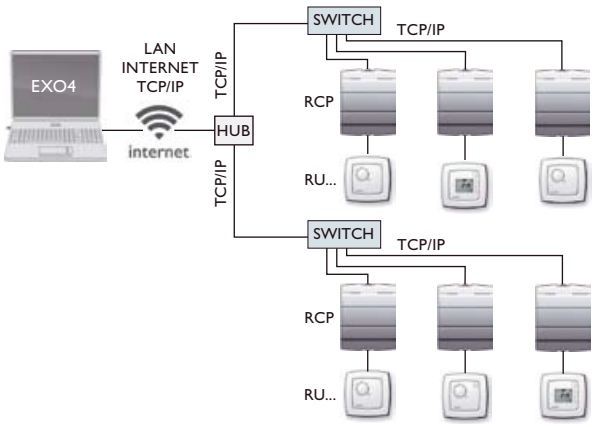


Application examples



ROOM 1





Technical data

Supply voltage	230 V AC +/- 10%, 50...60 Hz
Power consumption, internal electronics	2 VA
Ambient temperature	0...50°C
Storage temperature	-20...+70°C
Ambient humidity	Max 95% RH
Protection class	IP20
Material casing	Polycarbonate, PC
Weight	780 g
Fuse	Internal, automatic
Built-in transformer, max capacity	30 VA
Max power consumption for fuse	30 VA
Casing	EURO-norm
Mounting	In the ceiling void
alternative	In a cabinet front with separate mounting kit
alternative	On TS35 DIN-rail with separate mounting kit
Operating system	EXOreal
Real-time clock (RTC)	No
Battery backup	
Type	Lithium, CR2032
Battery backup of RAM	at least 5 years
Battery monitoring of RAM	Yes
Colour	Silver
CE	This product conforms with the requirements of European EMC standards CENELEC EN 61000-6-1 and EN 61000-6-3, and the requirements of European LVD standard IEC 60 730-1. It carries the CE mark.

Communication port, Port 1

Type	RS485 (EXOline or Modbus) with automatic detection/change-over
Modbus	8 bits, 1 or 2 stop bits. Odd, even (FS) or no parity.
Communication speed Modbus	300, 600, 1200, 2400, 4800, 9600 or 19200 bps
Communication speed EXOline	9600 bps
Galvanic isolation from the rest of the electronics, common mode voltage	Max 150 V
Data for RCP200T	
Connection	10Base-T/100Base-TX auto-negotiation (RJ45)
Cable length	Max 100 m (min Cat 5)
Protocol	EXOline-TCP
Port 1 available on -TCP/IP-models	No

Analogue inputs, AI

Temperature (PT1000)	-50 +/- 150°C
accuracy (excluding sensor)	+/- 0.4°C
Voltage	0...10 V
input resistance	10 MOhm
accuracy (% of full scale)	+/- 0.15%

Analogue outputs, AO

Output level	0...10 V DC
Max load	5 mA, short circuit proof

Digital inputs, DI

Type	24 V DC, floating contact, powered from 24 V DC output, pin 80 and 83
Logic 0	0...5 V DC
input current at 0 V	0 mA
input resistance	8 kOhm
Logic 1	12...24 V DC
input current 24 V DC	3 mA

Condensation input, CI

Type	Regin's condensation detector, KG-A

Contin. Technical data

24 V DC-output, +C

Output level on +C	24 V DC +/- 2 V
Max total load	0.1 A, short circuit proof

GDO, 24 V AC-output for power supply of actuators etc.

Output level on GDO	24...30 V AC depending on load
Max total load on terminals 20 and 23 (connected internally)	12 VA

Digital outputs, DO4-5 (MosFet)

Type	24 V AC
Max continuous load is limited by available power on GDO	See GDO for available power for all DO:s
Max transient load for each DO	4.0 A, 50 ms

Actuator exercise	Configurable, FS = Every day at 3 pm
Terminal blocks	So-called lift type for cable cross-section 2.1 mm^2

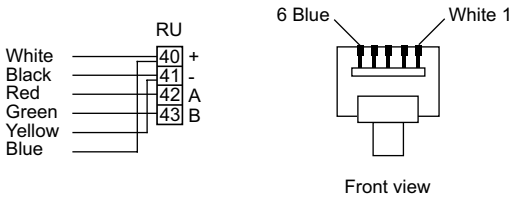
Wiring

The table shows the factory setting for the inputs and outputs on RCP200 and RCP200T.
For complete wiring table and connection diagram, see the manual for Regio Maxi.

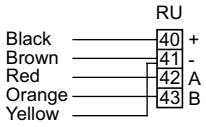
Terminal	Designation	Operation	
1	L	Line	230 V AC-connection
3	N	Neutral	
4		EMI ground, yellow-green conductor	
5		EMI ground	
10-13		No function	
20	GDO	24 V AC out common for DO, max total load 12 VA	
21	DO4	24 V AC-output for forced ventilation	
22	DO5	Output for 24 V AC. Not configured for use.	
23	GDO	24 V AC out common for DO, max total load 12 VA	
24-27		No function	
30	G0	0 V AC. Normally used as reference ground for valve actuators and external equipment.	
31	AGnd	Analogue ground	
32	AI1	Not configured for use	
33	AI2	For switching between heating and cooling on a two-pipe system (Change-over)	
40	B		EXOline-connection
41	A		
42	N	The 0 V reference. This should be connected to the screen of the communication cable, which in turn should be grounded at one point only.	
43	E		
47	Net+	Not used	Future function
48	Net-	Not used	
49	EGnd	Not used	
50	Gnd		
51	CI	Input for Regin's condensation detector, KG-A	
60	TCP/IP		TCP/IP-connection
70	RU	Room unit (see wiring on the next page)	
80	+C	24 V DC out common for DI1 and DI2	
81	DI1	Input for occupancy detector, potential-free, NO	
82	DI2	Input for window contact, potential-free, NO	
83	+C	24 V DC out common for DI3	
84	DI3	Not configured for use	
90	AGnd	Analogue ground	
91	AO1	Output for 0...10 V valve actuator. Heating.	
92	AO2	Output for 0...10 V valve actuator. Cooling.	

Wiring for RU-… (terminal 70)

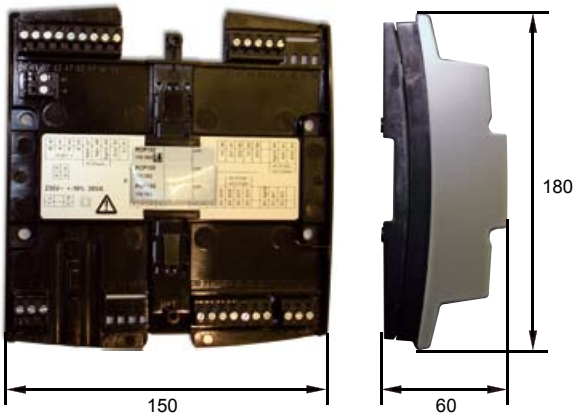
RU-connection with modular cable with RJ12 fast connector (own production). The maximum cable length is 30 m.



RU-connection with Regin's cables RU-CBL3 (3 m) or RU-CBL10 (10 m) with RJ12 fast connector.



Dimensions



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Product documentation

Document	Type
Regio Maxi Manual	Manual for the controllers from the Regio Maxi series
Installation instruction RCP200/RCP200T	Installation instruction for RCP200/RCP200T
Product sheet TG-R5/PT... Product sheet TG-UH/PT... Product sheet TG-A1/PT...	Information about room sensors, outdoor sensors and strap-on sensors suitable for RCP200/RCP200T
Product sheet and instruction IR24-P	Information about occupancy detector suitable for RCP200/RCP200T
Product sheet and instruction CO2RT	Information about CO_2-transmitter suitable for RCP200/RCP200T
Product sheet and instruction HRT	Information about humidity sensor suitable for RCP200/RCP200T
Product sheets and installation instructions RU, RU-O, RU-DO and RU-DOS	Information about RU-units that can be used with RCP200/RCP200T
Product sheet KG-A	Information about condensation detector for the Regio controllers

All product documentation is available on www.regin.se.

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