



RCP100F / RCP100FT / RCP100FL

Freely programmable controllers with fan control and communication

RCP100F, RCP100FT and RCP100FL are freely programmable controllers from the Regio Maxi series intended to control heating and cooling in a zone control system.

The RCP100F... controllers are part of the Regio Maxi series. Since they have communication, they can be integrated into larger or centralized SCADA systems, e.g. EXOscada, if required. As opposed to RCP100... they have three digital outputs for control of a three-speed fan (fan-coil).

The controllers can be configured via the free software Regio tool® and freely programmed via EXOdesigner. They can be connected to Regio room units (RU-units) containing a built-in temperature sensor.

Applications

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

See application examples on page 4.

Easy to install



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

The controller is mounted above a false

ceiling, on a junction box plate, or on a DIN-rail. The form factor of the casing is EURO norm, which makes it fit into a standard EURO norm cabinet.

Quick facts about RCP100F..

- Communication via RS485 (Modbus or EXOline), TCP/IP (RCP100FT) or LonWorks (RCP100FL)
- Fast configuration via Regio tool®
- Simple installation
- On/Off or three-point control
- Input for occupancy detector, window contact, condensation detector and change-over function

Actuators

RCP100F, RCP100FT and RCP100FL can control 0...10 V DC valve actuators, 24 V AC three-point actuators and/or 24 V AC thermal actuators.

Flexibility with communication

All Regio Maxi controllers can be configured for a particular application using the cost-free configuration tool Regio tool®. They can also be integrated into a central SCADA-system via RS485 (EXOline or Modbus) using EXOdesigner. Read more on page 3.



Control modes

RCP 100F, RCP100FT and RCP100FL can be configured for different control modes, depending on requirements:

- 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
- Heating/Cooling/VAV
- Heating/Heating or Cooling via change-over

Special functions

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.

Change-over function

RCP100F, RCP100FT and RCP100FL 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.

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.

Fan control

RCP100F, RCP100FT and RCP100FL have three digital outputs for fan control. The controllers have the following positions:

| | |
|------|--|
| Auto | Automatic control of the fan speed to maintain desired room temperature. |
| 0 | Fan off. |
| I | Manual position with low speed. |
| II | Manual position with medium speed. |
| III | Manual position with high speed. |

The different positions are selected via the room unit's fan switch, fan button or Select button.

In operating modes Off and Unoccupied, the fan is stopped, regardless of the position of the fan switch or the setting in the display.

Electrical heater

This function is intended to work as a Heating/Cooling controller, with the added ability for heat support from an electric heater. This function requires a fan and is therefore only available on the RCP100Fx and RCP200xx models.

Forced ventilation

It is possible to configure a digital output for forced damper control for increasing the airflow to a room for all controllers in the Regio series.

CO₂ control

CO₂ concentration can be used in different control modes in order to increase the quantity of air, regardless of controller temperature requirements. For example, the operating mode can be set to change or the VAV damper open when CO₂ levels exceed a set value.

Built-in safety functions

To prevent condensation damages, you can connect a condensation detector to RCP100F, RCP100FT and RCP100FL. 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.

Setpoint

In Occupied mode, the controller operates from a heating or a cooling setpoint that can be changed centrally or locally via the room unit's DIP-switches or display.

Operation

Operating modes

There are five different operating modes: Off, Unoccupied, Stand-by, Occupied and Bypass.

Off: The controller is turned off. Only frost protection is active.

Unoccupied: The room where the controller is placed is not used for an extended period. Both heating and cooling control with two predefined setpoints (one for heating, the other for cooling).

Stand-by: The room is in an energy save mode and is not used at the moment. The controller is prepared to change operating mode to Occupied if someone enters the room. Both heating and cooling control with a large deadband.

Occupied: The room is in use and is therefore in a comfort mode. The controller controls the temperature around a setpoint.

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.

Occupancy detector

By connecting an occupancy detector, RCP100F, RCP100FT and RCP100FL can switch between Bypass or Occupied and the preset operating mode. The temperature is then controlled according to requirement, which saves energy and keeps the temperature at a comfortable level.

Room units

Connection of RU-units

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



RCPI00F, RCPI00FT and RCPI00FL can be combined with the following RU-units:

- RU-F
- RU-FO
- RU-DFO
- RU-DOS

The room unit is connected to the controller with a cable with an RJ12-connector (see page 8). 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.

Changing operating mode via the Occupancy button

If the controller is connected to a room unit with an occupancy button, you can change between Bypass and the preset operating mode.



Special functions with RU-DOS



RU-DOS is a flexible room unit with special functions. When RCPI00F, RCPI00FT and RCPI00FL are used together with RU-DOS, they can control lighting and blinds.

It is also possible to measure the current percentage of CO₂

and 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.

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

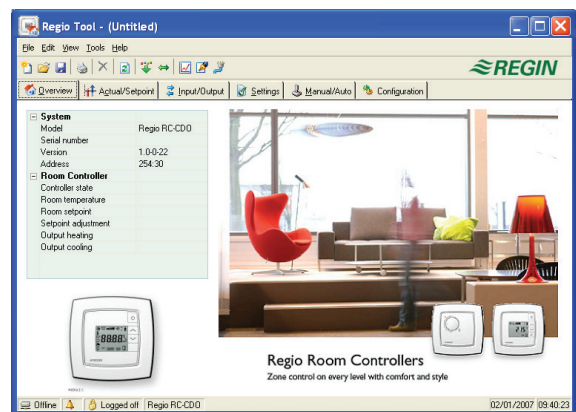
Configuration and supervision

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.regincontrols.com.



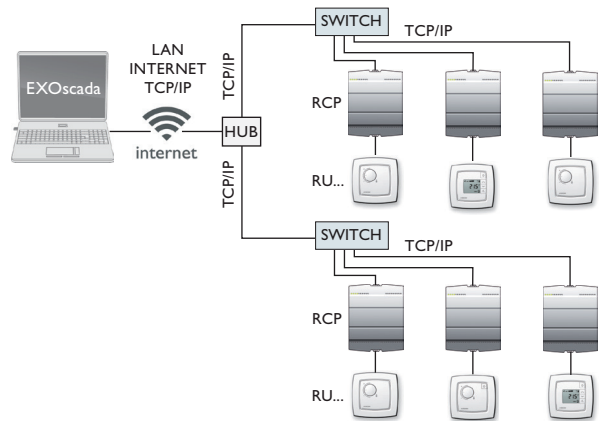
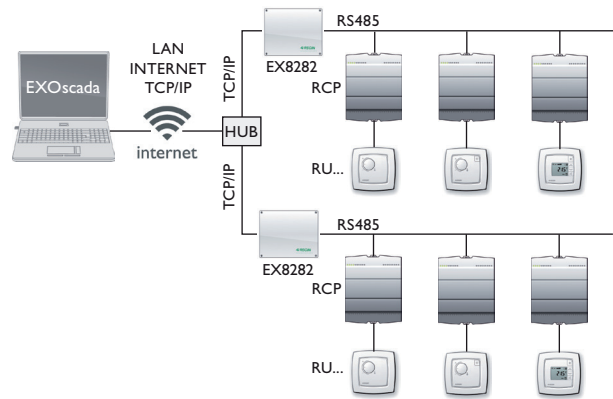
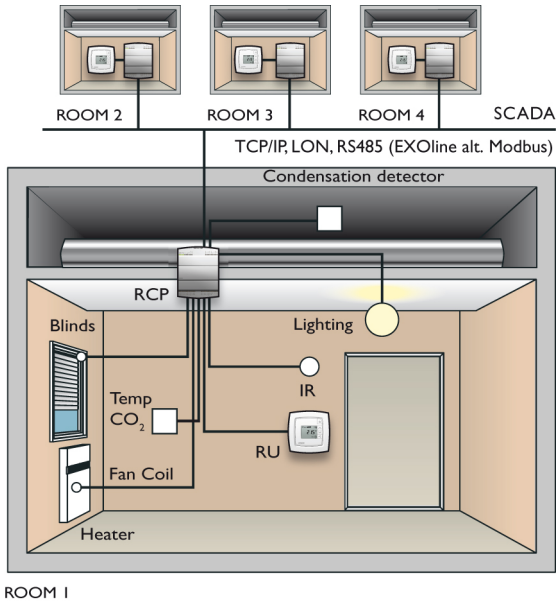
EXOdesigner and EXOscada

EXOdesigner needs to be used when configuring the Regio Maxi as a part of a larger system with a central SCADA, e.g. EXOscada.

Model with LON communication (RCPI00FL)

The LON model uses LonWorks, adjusted according to the LonMark guidelines. See the LonWorks network variable list in the Regio Maxi manual.

Application examples



Technical data

| | |
|---|---|
| Supply voltage | 230 V AC \pm 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 a TS35 DIN-rail |
| 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 |



LVD, Low Voltage Directive: This product conforms to the requirements of European LVD standard EN 60 730-1.

EMC emission and immunity standard: This product conforms with the requirements of European EMC standards EN 61000-6-1 and EN 61000-6-3 and carries the CE mark.

RoHS: This product conforms to the Directive 2011/65/EU of the European Parliament and of the Council.

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 RCP100FT | |
| 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 |
| LonWorks (RCP100FL) | FT3150, gives a second communication port |

Analogue inputs, AI

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

*Contin. Technical data***Condensation input, CI**

Type Regin's condensation detector, KG-A/1

24 V DC-output, +C

Output level on +C 24 V DC \pm 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 the load
 Max total load on terminals 20,
 23 and 26 (connected internally) 12 VA

Digital outputs, DO4-8 (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

Digital outputs, DO1-3 (Relay)

Type Closing, NO
 Max switching voltage 250 V AC
 Min switching voltage 12 V AC
 Max continuous current DO1-3 4 A resistive load
 Max continuous current Common,
 terminal 13 8 A resistive load
 Max inrush current 20 A
 Min switching current 10 mA
 AC-connection
 Max switching power, resistive load 1000 VA
 Insulation, coil-contact 4000 VRMS

Actuator exercise

Configurable, FS = Every day at 3 pm

Terminal blocks

Lift type for cable cross-section 2.1 mm²

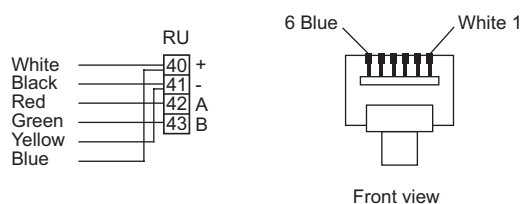
Wiring

The table shows the factory setting for the inputs and outputs on RCP100F, RCP100FT and RCP100FL. For complete wiring table and connection diagram, see the manual for Regio Maxi.

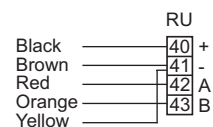
| Terminal | Designation | Operation | |
|----------|-------------|---|--------------------------------|
| 1 | L | Line | 230 V AC-connection |
| 3 | N | Neutral | |
| 4 | | EMI ground, yellow-green conductor | |
| 5 | | EMI ground | |
| 10 | DO1 | Output for fan control, speed I, 230 V AC | |
| 11 | DO2 | Output for fan control, speed II, 230 V AC | |
| 12 | DO3 | Output for fan control, speed III, 230 V AC | |
| 13 | COM | Connection of L (Line) | Common pole for DO1-3 |
| 20 | GDO | 24 V AC out common for DO4-DO5, 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 (configurable). | |
| 23 | GDO | 24 V AC out common for DO6-7, max total load 12 VA | |
| 24 | DO6 | Output for 24 V AC thermal actuator. Heating. | |
| 25 | DO7 | Output for 24 V AC thermal actuator. Cooling. | |
| 26 | GDO | 24 V AC out for DO8, max total load 12 VA | |
| 27 | DO8 | Output for 24 V AC. Not configured for use. | |
| 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+ | | LON-connection (only RCP100FL) |
| 48 | Net- | | |
| 49 | EGnd | | |
| 50 | Gnd | | |
| 51 | CI | Input for Regin's condensation detector, KG-A/1 | |
| 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 | |
| 90-92 | | No function | |

Wiring for RU-... (terminal 70)

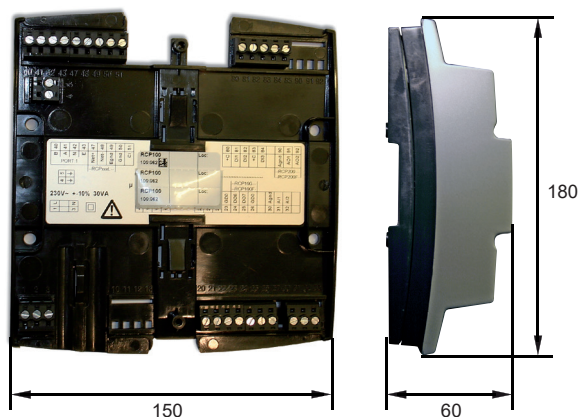
RU-connection with modular cable with RJ12 fast connector (own production). The maximum cable length is 30 m.



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



Dimensions



mm

Product documentation

| Document | Type |
|---|---|
| Regio Maxi Manual | Manual for the controllers from the Regio Maxi series |
| Installation instruction RCP100F/RCP100FT/RCP100FL | Installation instruction for RCP100F/RCP100FT/RCP100FL |
| Product sheet TG-R5/PT... | Information about room sensors, outdoor sensors and strap-on sensors suitable for RCP100F/RCP100FT/RCP100FL |
| Product sheet TG-UH/PT... | |
| Product sheet TG-A1/PT... | |
| Product sheet and instruction IR24-P | Information about occupancy detector suitable for RCP100F/RCP100FT/RCP100FL |
| Product sheet and instruction CO2RT | Information about CO ₂ -transmitter suitable for RCP100F/RCP100FT/RCP100FL |
| Product sheet and instruction HTWT | Information about humidity sensor suitable for RCP100F/RCP100FT/RCP100FL |
| Product sheets and installation instructions RU-F, RU-FO, RU-DFO and RU-DOS | Information about RU-units that can be used with RCP100F/RCP100FT/RCP100FL |
| Product sheet KG-A/1 | Information about condensation detector for the Regio controllers |

All product documentation is available at www.regincontrols.com.

Head Office Sweden
 Phone: +46 31 720 02 00
 Web: www.regincontrols.com
 Mail: info@regin.se

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