RC-DO

Room controllers with display and manual forced ventilation function

RC-DO is a room controller from the Regio Mini series intended to control heating and cooling in a single zone.

RC-DO is a room controller in the Regio series. The controller does not have a communication port.

Regio

Regio is an extensive range of controllers for control of heating and cooling.

The controllers are divided into three different series; Mini, Midi and Maxi. The Midi range consists of pre-programmed controllers with communication. Maxi consists of freely programmable controllers with communication. The Mini controller range, of which RC-DO is a part, consists of pre-programmed, stand-alone controllers.

Applications

The Regio controllers are suitable for use in buildings requiring optimum comfort and reduced energy consumption, such as offices, schools, shopping centres, airports, hotels and hospitals.

See application example on page 3.

Sensor

The controller has a built-in room temperature sensor. An external sensor for room temperature or change-over can also be connected (PT1000).

Actuators

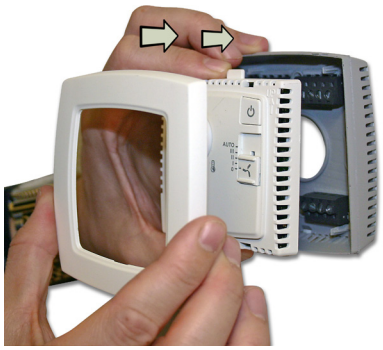
RC-DO can control 0...10 V DC valve actuators and/or 24 V AC thermal actuators.

Short facts about RC-DO

- Easy installation
- Built-in function for forced ventilation
- On/Off or 0...10 V control
- Input for occupancy detector, window contact, condensation detector and change-over function

Easy to install

The modular design, featuring a separate bottom plate for wiring, makes the entire Regio range of controllers easy to install and commission. The bottom plate can be put into place before the electronics are installed. Mounting takes place directly on the wall or on an electrical connection box.



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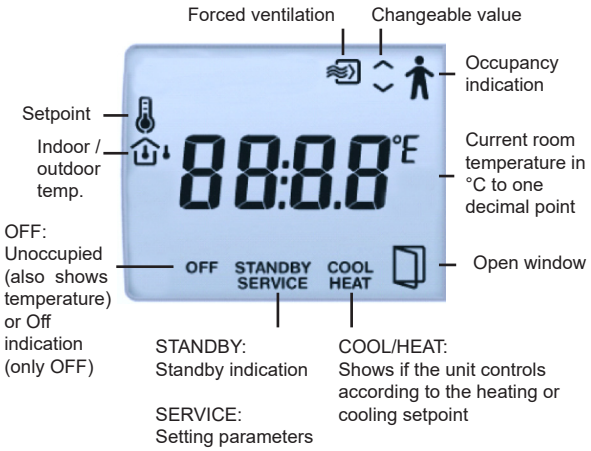
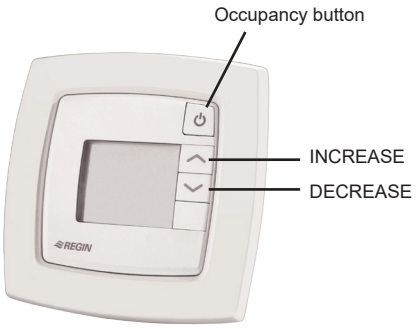
Display handling

The display has the following indications:



The buttons on the controller enables easy setting of parameter values using a parameter menu shown in the display. The parameter values are changed with the INCREASE and DECREASE buttons and changes confirmed with the occupancy button.



Control modes

RC-DO can be configured for different control modes/ control sequences:

- Heating
- Heating or Cooling via 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 set to Stand-by using the parameter menu in the display. The operating modes can be activated via an occupancy detector or the occupancy button.

Off: Heating and cooling are disconnected. However, frost protection is still active (factory setting (FS) = 8°C). This mode is activated if a window is opened.

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

Stand-by: The room is in an energy saving mode and is not used at the moment. This can, for instance, be during nights, weekends and evenings. The controller stands by to change operating mode to *Occupied* if presence is detected. Both heating and cooling are disconnected within a temperature interval surrounding the current setpoint (FS heating setpoint=-3°C, cooling setpoint=+3°C).

Occupied: The room is in use and a comfort mode is activated. The controller maintains 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 the *Occupied* operating mode. The output for forced ventilation is also active. This operating mode is useful for instance in conference rooms, where many people are present at the same time for a certain period of time.

When Bypass has been activated by pressing the occupancy button, the controller will automatically return to its preset operating mode (*Occupied* or *Stand-by*) after a configurable time has elapsed (FS=2 hours). If an occupancy detector is used, the controller will automatically return to its preset operating mode if no occupancy is detected for 10 minutes.

Occupancy detector

By connecting an occupancy detector, RC-DO can switch between the *Bypass* operating mode and its preset operating mode (*Occupied* or *Stand-by*). This way, the temperature is controlled from requirement, making it possible to save energy while maintaining the temperature at a comfortable level.

The occupancy button

Pressing the occupancy button for less than 5 seconds when the controller is in its preset operating mode will cause it to change to operating mode *Bypass*. A short press of the button when the controller is in *Bypass* mode will cause it to revert to the preset operating mode.

If the occupancy button is pressed for more than 5 seconds will change the controller's operating mode to *"Shutdown"* (*Off/Unoccupied*) regardless of its current operating mode. The display enables selecting which operating mode, Off or Unoccupied, should be activated on "Shutdown" (FS=Unoccupied). A short press when in *Shutdown* mode will return the controller to *Bypass*.

Forced ventilation

Regio has a built-in function for forced ventilation. A closing of the digital occupancy detector input will set the controller to *Bypass* mode and activate the output for forced ventilation (DO1). This can for instance be used to open a damper. This function is terminated when the settable forcing interval (10 min.) has run out. The function can also be activated at the press of a button.

Change-over function

RC-DO has an input for change-over that automatically resets output UO1 to operate with heating or cooling function. A PT1000 type sensor can be connected and mounted so that it monitors the supply temperature of the heating coil.

The output function is set to Heating when the fluid temperature exceeds 22°C and to Cooling when the temperature falls below 18°C.

Alternatively, a potential-free contact can be used. When the contact is open, the controller will operate using the heating function, and when closed using 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 adjustment

When in mode Occupied, the controller operates using a heating setpoint (FS = 22°C) or a cooling setpoint (FS = 24°C) that can be changed locally using the INCREASE and DECREASE buttons.

Pressing INCREASE will increase the current setpoint by 0.5°C per press until the maximum offset (FS = +3°C) has been reached. Pressing DECREASE will decrease the current setpoint by 0.5°C per press until the maximum offset (FS = -3°C) has been reached.

Switching between heating and cooling setpoints takes place automatically in the controller depending on heating or cooling requirements.

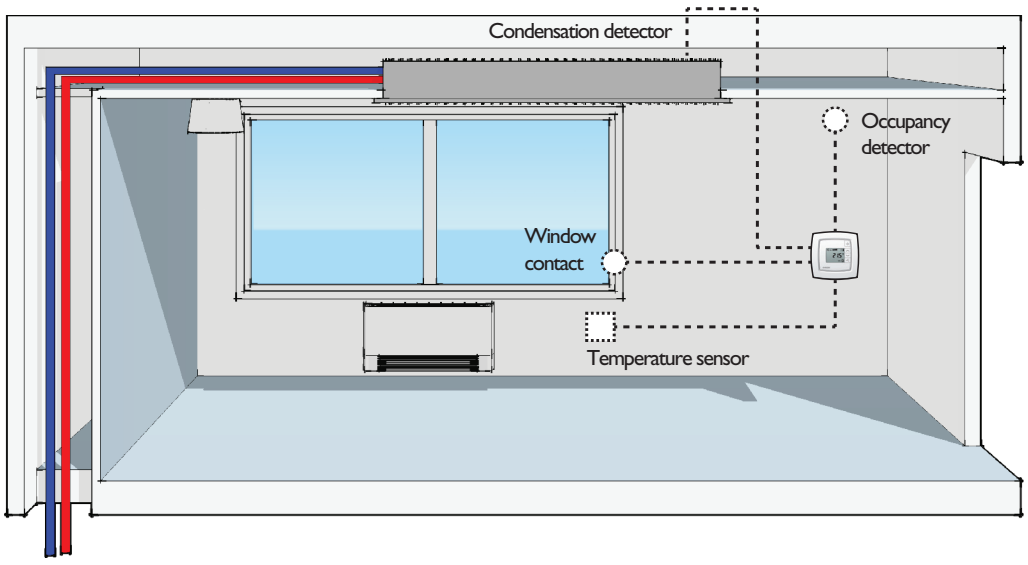
Built-in safety functions

RC-DO has an input for a condensation detector to detect moisture accumulation. If detected, the cooling circuit will be stopped. The controller also has frost protection. This prevents frost damages by ensuring that the room temperature does not drop below 8°C when the controller is in mode *Off*.

Actuator exercise

All actuators are exercised, regardless of type or model. The controller performs this exercise at an interval of 23 hours. An opening signal is sent to the actuator for as long time as its configured run time. A closing signal is then sent for an equal amount of time, after which the exercise is completed.

Application example



Technical data

Supply voltage	18...30 V AC, 50...60 Hz
Power consumption	2.5 VA
Ambient temperature	0...50°C
Storage temperature	-20...+70°C
Ambient humidity	Max 90% RH
Protection class	IP20
Display	Backlit LCD
Built-in temperature sensor	NTC type, range 0...50°C, accuracy ±0.5°C at 15...30°C
Material, casing	Polycarbonate, PC
Weight	110 g
Colour	Cover: Polar white RAL9010 Bottom plate: Light gray
CE	**EMC emissions & immunity standards:** This product conforms to the requirements of the EMC Directive 2014/30/EU through product standards EN 61000-6-1 and EN 61000-6-3. **RoHS:** This product conforms to the Directive 2011/65/EU of the European Parliament and of the Council through EN 50581:2012.

Inputs

External room sensor	PT1000 sensor, 0…50°C. Suitable sensors are Regin's TG-R5/PT1000, TG-R5/PT1000,TG-UH/PT1000 and TG-A1/PT1000.
Change-over alt. potential free contact	PT1000 sensor, 0…100°C. Suitable sensor is Regin's TG-A1/PT1000.
Presence detector	Closing, potential-free contact. Suitable occupancy detector is Regin's IR24-P.
Condensation detector alt. window contact	Regin's condensation detector KG-A/1 resp. potential-free contact

Outputs

Forced ventilation	24 V AC actuator, max 0.5 A
Valve actuators alt. thermal actuators	2 outputs
Valve actuators	0…10 V DC, max. 5 mA
Termal actuator	24 V AC, max. 2.0 A
Output	Heating or cooling
Actuator exercise	FS = 23 hours interval
Terminal blocks	Lift type for max cable cross-section 2.1 mm^2

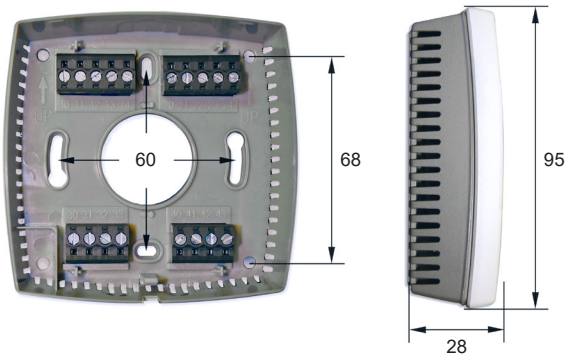
Setpoint settings via display

Basic heating setpoint	5...40°C
Basic cooling setpoint	5...50°C
Setpoint displacement	±0...10°C (FS = ±3°C)

Wiring

Terminal	Designation	Function
10	G	Supply voltage 24 V AC
11	G0	Supply voltage 0 V
12	DO1	Output for forced ventilation
13-14		No function
20	GDO	24 V AC out common for DO
21	G0	0 V common for UO (when using 0...10 V actuators)
22		No function
23	UO1	Output for 0...10 V valve actuator alt. thermal actuator. Heating or cooling
24	UO2	Output for 0...10 V valve actuator alt. thermal actuator. Heating or cooling.
30	AI1	Input for an external sensor
31	UI1	Input for change-over sensor, alt. potential-free contact
32	DI1	Input for occupancy detector
33	DI2/CI	Input for Regin's condensation detector KG-A/1 alt. window contact
40	+C	24 V DC out common for UI and DI
41	AGnd	Analogue ground
42-43		No function

Dimensions



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Product documentation

Document	Type
Instruction Regio RC-DO	Instruction for RC-DO
Product sheet TG-R4/PT1000, 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 RC-DO
Product sheet IR24-P	Information about occupancy detectors suitable for RC-DO
Instruction IR24-P	Instruction for IR24-P
Product sheet KG-A/1	Information about condensation sensors for the Regio controllers

The product documentation is available for download from Regin's website, www.regincontrols.com.

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