



RCC-C3DOCS

Pre-programmed room controller with built-in CO₂ sensor, display and communication

RCC-C3DOCS is a complete pre-programmed room controller from the Regio Midi series intended to control heating, cooling and CO₂ in a zone control system. It has a built-in CO₂-sensor, a display and communicates via Modbus, BACnet or EXOline for easy system integration.

- ✓ Communication via RS485 (Modbus, BACnet or EXOline)
- ✓ Quick and simple configuration via Regio tool®
- ✓ On/Off or 0...10 V control
- ✓ Built-in CO₂ sensor
- ✓ Input for motion detector, CO₂ sensor, window contact, condensation sensor, or change-over function
- ✓ Supply air temperature limitation

Function

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.

The controller is a PI controller with configurable P-band, I-time and setpoints for different operating modes.

The controller has a built-in sensors for room temperature and CO₂-levels. An external sensor (Pt1000) for room temperature, change-over or supply air temperature limitation can also be connected, as well as an external sensor for CO₂.

It can control 0...10 V DC valve actuators and dampers and/or 24 V AC thermal actuators or On/Off actuators with spring return.

The controller can be connected to a central SCADA system via EXOline, BACnet or Modbus and configured for a specific application using the free configuration software Regio tool®.

Installation

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 a wall or on a wall box.

Configuration

The controller is pre-programmed upon 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 its settings using a comprehensive user interface.

The program is available as a free download on Regin's website www.regincontrols.com.

The controller can be configured for different control modes/control sequences:

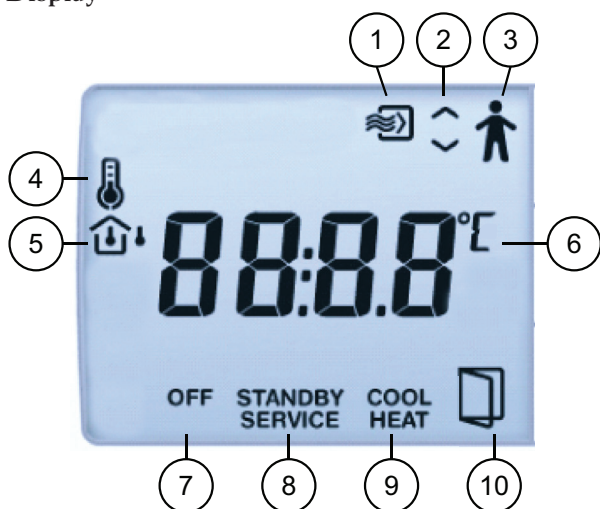
- Heating
- Heating/Heating
- Heating/Cooling via change-over
- Heating/Cooling
- Heating/Cooling with VAV-control and forced supply air function
- Heating/Cooling with VAV-control
- Cooling
- Cooling/Cooling
- Heating/Cooling/VAV
- Change-over with VAV function

Appearance

Buttons

The arrow buttons on the controller is used to change set points in the display, and to access and work with the parameter values. It is possible to block the button functionality to prevent unauthorised users making changes. The occupancy button (♂) is used to change operating mode and to confirm changes in the parameters.

Display



Number	Description
1	Forced ventilation
2	Changeable value
3	Occupancy detection
4	Temperature setpoint
5	Indoor/outdoor temp
6	Current room temperature / CO ₂ level
7	The controller is turned off
8	STANDBY: Standby indication SERVICE: Parameter list
9	Shows if the unit controls according to the cooling or heating setpoint
10	Open window indication

Features

Operating modes

There are five different operating modes: *Off*, *unoccupied*, *Stand-by*, *Occupied* and *Bypass*. They are used to configure the behavior of the controller.

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.

Bypass can also be activated if CO₂ levels are high.

Occupied: The room is in use and a comfort mode is activated. The temperature setpoints are close to keep a good climate in the room.

Stand-by: The room is in energy saving mode and 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. The dead band between the setpoints is extended to save energy.

Unoccupied: The room is not used for a extended time period. The dead band is extended even more to save energy.

Off: Heating and cooling are disconnected. Frost protection is still active.

CO₂ control

In control modes where VAV (Variable Air Volume) has been selected, the damper will be affected by the CO₂ levels. If the CO₂ concentration rises, the damper will open to increase air volume regardless of controller temperature requirements. If an external CO₂ detector is configured for AI2, this overrides the internal detector

Automatic calibration of built-in CO₂ detector

The sensor uses ABC-logic, a self-calibration technique which eliminates the need for recalibration. The sensor will typically reach its operational accuracy after 24 hours of operation. If immediate consistency is desired, the sensors may be single point calibrated using reference gas or ambient air measured by a reference sensor.

Occupancy control

If a connected motion detector indicates movement, the control mode (see above) will change in a pre-determined way, and the temperature is controlled from requirement, making it possible to save energy while maintaining the temperature at a comfortable level.

EC fan control

It is possible to select whether the fan should run in Heating, Cooling or both Heating and Cooling.

The fan has both a boost function and a kickstart function.

Change-over function

The controller has an input for change-over that automatically changes the control mode based on the temperature difference between the room temperature and the water temperature in the pipes.

Optionally, 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.

Forced ventilation

Regio has a built-in function for forced ventilation. If activated the air flow into the room will increase. It can be activated via presence detection, the buttons on the controller or via communication.

Setpoint adjustment

The user can change the setpoint by pressing the arrow buttons on the controller.

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

Lighting control

The controller can be set to control lighting. When occupancy is detected, lighting is activated, remaining switched on for as long as someone is in the room.

Supply air temperature limitation

The controller can be used with a supply air temperature limitation sensor. A room controller will then work together with a supply air temperature controller using cascade control, resulting in a calculated supply air temperature maintaining the room temperature setpoint.

Built-in safety functions

The controller has an input for a condensation sensor 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.

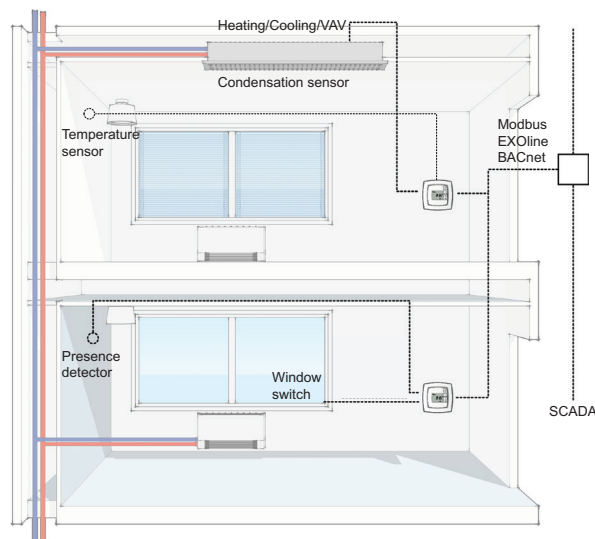
Actuator exercise

The controller has a function for actuator exercise. The exercise takes place at intervals, settable in hours.

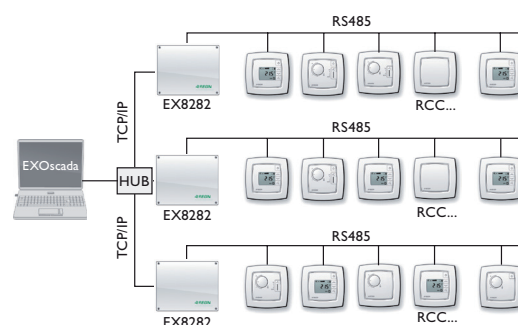
Application examples

The controller can be used in for example hotels, office buildings, residential buildings and shopping centers. It can be connect to BMS via Modbus, BACnet or EXOline. The controller is mainly suitable for VAV systems even if an EC-fan can be controlled as well.

Room installation example:



Network setup example:



Technical data

Supply voltage	18...30 V AC, 50 / 60 Hz
Internal power consumption	2.5 VA
Ambient temperature	0...50°C
Storage temperature	-20...+70°C
Ambient humidity	Max 90 % RH
Protection class	IP20
Communication	RS485 (EXoline or Modbus with automatic detection/change-over, or BACnet)
Modbus	8 bits, 1 or 2 stop bits. Odd, even (FS) or no parity
BACnet	MS/TP
Communication speed	9600, 19200, 38400 bps (EXoline, Modbus and BACnet) or 76800 bps (BACnet only)
Display	Backlit LCD
Weight	110g

Technical data, built-in temperature sensor

Temperature sensor	NTC type
Temperature range	0...50°C
Accuracy	±0.5°C at 15...30°C

Technical data, built-in CO₂ sensor

Temperature dependance	5 ppm per °C or 0.5 % of the reading per °C (whichever is greater)
Long term stability	< 2 % of FS over life of a sensor (15 years typical)
Response time	< 3 min. for 90 % step change typical
Warm-up time	< 2 min. (operational), 10 min. (maximum accuracy)
Measuring principle	NDIR (Non-Dispersive Infrared Technology)
Measuring range CO ₂	0...5000 ppm
Accuracy	400...5000 ppm ±25 ppm ± 3 % of the reading
Signal update	Every 5 seconds

Material

Material, housing	Polycarbonate, PC
Colour	White RAL9003

* Regio is available in other colours on inquiry. Please contact Regin for more information.

Inputs

Input type	Sensor	Measuring range	Contact	Suitable Regin product
External room sensor	Pt1000	0...50°C	-	TG-R5/PT1000, TG-UH/PT1000 and TG-A1/PT1000
Supply air temperature limitation sensor	Pt1000	0...50°C	-	TG-R5/PT1000, TG-UH/PT1000 and TG-A1/PT1000
Change-over, temperature	Pt1000	0...100°C	-	TG-A1/PT1000
Change-over, digital	-	-	Closing potential-free contact	-
Occupancy detector	-	-	Closing potential-free contact	IR24-P
Condensation sensor	-	-	-	KG-A/1
Window contact	-	-	Potential-free contact	-
CO ₂	CO ₂	0...2000 ppm	-	CTRT2A, CTRT2A-D

Outputs

U01, U02	
Valve actuator	0...10 V, max. 5 mA
Thermal actuator	24 V AC, max. 2.0 A (PWM)
On/Off actuator	24 V AC, max. 2.0 A
Output	Heating, cooling, VAV
U03	
Forced ventilation	24 V AC, max. 2.0 A, or 0...10 V, max. 5 mA
Output	Forced ventilation, alt. EC fan or damper following Heating/Cooling in sequence alt. lighting control (on/off)
Exercise	Factory setting: 23 hours interval
Terminal blocks	Lift type for max. cable cross section 2.1 mm ²

Setpoint settings via Regio tool or in Display

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

CE

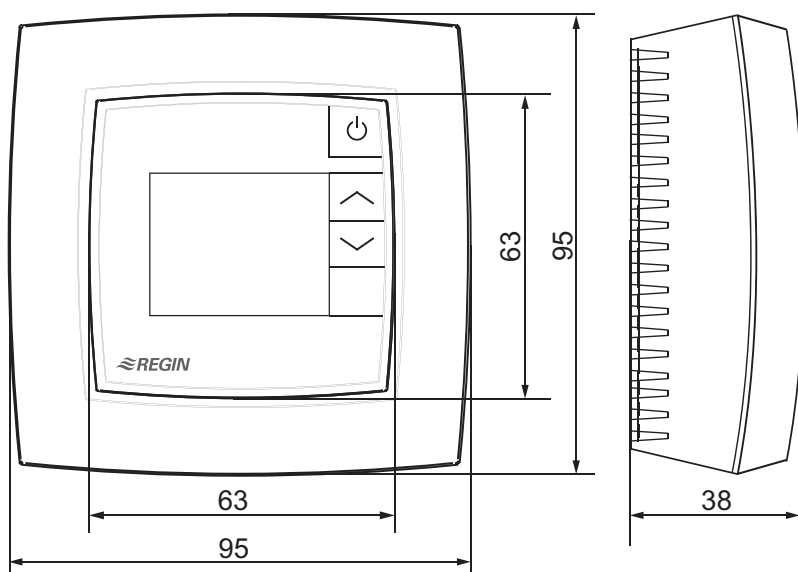
EMC emissions & immunity standards: This product conforms to the requirements of the EMC Directive 2014/30/EU through product standards EN 61000-6-1 and EN 61000-6-3.

RoHS: This product conforms to the Directive 2011/65/EU of the European Parliament and of the Council through standard EN 50581:2012.

Accessories

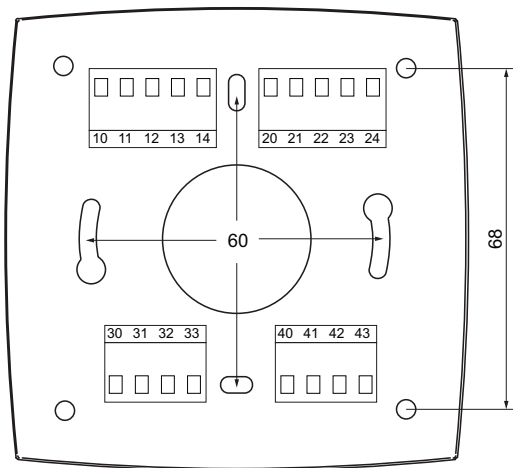
Article	Description
Regio tool	Software tool for Regio. Available as a free download on www.regincontrols.com
KG-A/1	Condensation detector, 1 m cable length
IR24-P	Motion detector
TG-R5/PT1000	Room temperature sensor
TG-UH/PT1000	Outdoor temperature sensor
TG-A1/PT1000	Clamp-on temperature sensor
RC-TEST	Service adapter for Rego Midi
RC-CONN:10	Connection plates, package of 10

Dimensions



Measurements in mm

Dimensions, bottom plate



Measurements in mm

Product documentation

Document	Description
RCC-C3DOCS instruction	Instruction for installation of RCC-C3DOCS
Regio Midi manual	Manual for the controllers from the Regio Midi series
Regio tool product sheet	Information about Regio tool
Regio tool manual	Information on how to connect and work with Regio tool together with Regio controllers
Product sheet TG-R5/Pt1000, TG/UH/Pt1000	Information about suitable sensors for RCC-C3DOCS
Product sheet IR24-P	Information on suitable occupancy detector for RCC-C3DOCS
Instruction IR24-P	Instruction for installation of IR24-P
Product sheet KG-A/1	Information about suitable condensation sensors for RCC-C3DOCS
Product sheet CTRT2A(-D)	Information about suitable CO ₂ and temperature transmitters
Instruction CTRT2A(-D)	Instruction for installation of CO ₂ and temperature transmitter

The documentation can be downloaded from www.regincontrols.com

The information in this document is subject to change without prior notification