BELIMO

Room Operating Unit CO₂ / Humidity / Temperature

For measuring temperature, humidity and CO₂ in the room and for regulating the room temperature and/or ventilation. The high-contrast ePaper touch display ensures best readability and intuitive operation. Thanks to MP-Bus communication and integrated analogue outputs, the room operating units can be seamlessly connected to existing third-party controllers. Commissioning and parametrisation of the device is conveniently done with the Belimo Assistant App. The ePaper display can be optimised for a wide range of applications.

5 YEAR WARRANTY

MP↗BUS®

NFC

Type Overview

Type	Communication	Voltage output	Measured values	Setpoint	Display type
P-22RTM-1900D-1	MP-Bus	3 x 0...5 V, 0...10 V, 2...10 V	CO₂, Temperature, Relative humidity, Dew point	Volumetric flow, Temperature	ePaper touch display and LED
P-22RTH-1900D-1	MP-Bus	3 x 0...5 V, 0...10 V, 2...10 V	Temperature, Relative humidity, Dew point	Volumetric flow, Temperature	ePaper touch display
P-22RT-1900D-1	MP-Bus	2 x 0...5 V, 0...10 V, 2...10 V	Temperature	Volumetric flow, Temperature	ePaper touch display

Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage range	AC 19.2...28.8 V / DC 19.2...28.8 V
	Power consumption AC	1 VA
	Power consumption DC	0.5 W
	Electrical connection	Spring loaded terminal 0.25...1.5 mm²
	Cable entry	Back side Top side Bottom side
Data bus communication	Communication	MP-Bus
	Number of nodes	MP-Bus max. 8 (16)
Functional data	Sensor Technology	CO₂: NDIR (non dispersive infrared) dual channel
	Application	Air
	Voltage output	2 x 0...5 V, 0...10 V, 2...10 V (Type P-22RT-1900D-1) 3 x 0...5 V, 0...10 V, 2...10 V (Type P-22RTH-1900D-1, P-22RTM-1900D-1)
	Output signal active note	Output 0...5 V, 0...10 V (factory setting), 2...10 V selectable via NFC min. resistance 5 kΩ

Functional data	Display	ePaper touch display and LED, 69x62 mm
		The LED is used for the CO_2 TLF (traffic light function). The LED can be parametrised and deactivated via Belimo Assistant App. (Type (P-)22RTM-..)
Measuring data	Measured values	CO_2
		Relative humidity
		Dew point
		Temperature
	Measuring range CO_2	Default setting: 0...2000 ppm
	Measuring range humidity	Default setting: 0...100% RH
	Measuring range temperature	Default setting: 0...50°C [32...122°F]
	Measuring range dew point	Default setting: -50...50°C [-60...120°F]
	Accuracy CO_2	±(50 ppm + 2% of measured value)
	Accuracy humidity	±2% between 0...90% RH @ 25°C
	Accuracy temperature active	±0.5°C @ 25°C [±0.9°F @ 77°F]
	Long-term stability	±20 ppm p.a.
		±0.25% RH p.a. @ 25°C @ 50% RH
		±0.03°C p.a. @ 25°C [±0.05°F p.a. @ 77°F]
Materials	Housing	PC, white, RAL 9003
Safety data	Protection class IEC/EN	III, Protective Extra-Low Voltage (PELV)
	Degree of protection IEC/EN	IP30
	EU Conformity	CE Marking
	Quality Standard	ISO 9001
	Ambient humidity	Max. 95% RH, non-condensing
	Ambient temperature	0...50°C [32...122°F]
	Storage temperature	-40...70°C [-40...160°F]

Safety notes

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This device has been designed for use in stationary heating, ventilation and air-conditioning systems and must not be used outside the specified field of application. Unauthorised modifications are prohibited. The product must not be used in relation with any equipment that in case of a failure may threaten humans, animals or assets.

Ensure all power is disconnected before installing. Do not connect to live/operating equipment.

Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.

The device contains electrical and electronic components and must not be disposed of as household refuse. All locally valid regulations and requirements must be observed.

Remarks

General remarks concerning sensors

The measuring result is influenced by the thermal characteristics of the wall. A solid concrete wall responds to thermal fluctuations within a room more slowly than a light-weight structure wall. A room sensor always detects a mixture of air and wall temperature. This means that the radiant heat of the wall, which is important for comfort, is also included in the measurement result.

Build-up of self-heating by electrical dissipative power

Temperature sensors with electronic components always have a dissipative power which affects the temperature measurement of the ambient air. The dissipation in active temperature sensors shows a linear increase with rising operating voltage. The dissipative power should be taken into account when measuring temperature.

Belimo room sensors have adaptive temperature compensation for the entire supply voltage range. This ensures that the ambient temperature is detected with the highest accuracy at all times.

|	
Application notice for humidity sensors	The humidity sensor is extremely sensitive. Touching the sensor element or exposing it to aggressive substances like chlorine, ozone, ammonia, hydrogen peroxide or ethanol (i.e. as a cleaning agent) may affect the measurement accuracy.
	Long term operation outside the recommended conditions (5...50°C and 20...80% RH) can result in a temporary offset. After returning into the recommended range, this effect disappears.
Information self-calibration feature CO_2	All CO_2 sensors are subject to drift caused by the aging process of the components, resulting in regular re-calibration or replacement of units. However, the dual channel technology integrates automatic self-calibration technology vs. common used ABC-Logic sensors. Dual channel self-calibration technology is ideally suited for applications operating 24/7 hours such as those in hosiptals or other commerical applications. Manual calibration is not required.

Indicators and Operation

Indicators The operating display is an ePaper display that reflects light like normal paper. It is therefore a non-illuminated display with an integrated touch control panel.

The representation on the display can be designed freely, depending on the requirements. Function blocks can be switched on or off by using the Belimo Assistant App. By default, all actual values and temperature setpoint adjustments are visible on the display.
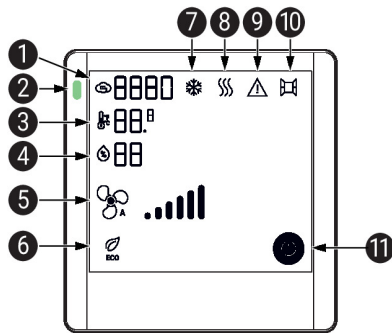
1 Current CO_2 concentration: 0...2000 ppm

2 CO_2 TLF (traffic light function), available on the (P-)22RTM-.. sensor

Colours: green, yellow and red. LED can be parametrised and deactivated via Belimo Assistant App.

3 Current temperature: 0...50°C or -32...122°F

4 Current relative humidity: 0...99%

5 Fan speed display: 6 levels

6 Eco mode: Symbol is displayed if this mode is activated

7 Cooling mode: Information provided by controller via bus

8 Heating mode: Information provided by controller via bus

9 Warning / Error

Symbol is displayed if an internal error occurred or if warning is transmitted by the controller via the connected bus (external error).
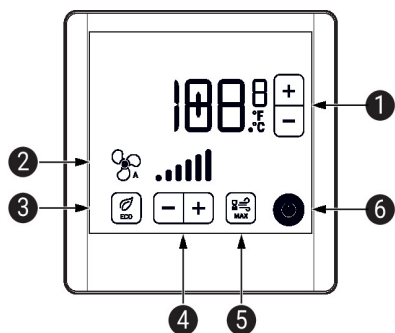
10 External input, information provided by controller via bus

11 HVAC system status

Symbol is displayed if the HVAC system is either completely off or in building protection mode. If this symbol is activated, the rest of the display is blank.

Operation The operating elements on the ePaper display are touch fields that can be operated with the finger. The touch fields are only active if the corresponding element is also displayed.

① Temperature setpoint: Set the desired temperature

Absolute setpoint:	10...40.0°C or 50...104.0°F
Relative setpoint:	-5...5°C / °F

Adjustable and restrictable via Belimo Assistant App

② Fan speed display: 6 levels

③ Eco mode: Symbol is displayed if this mode is activated

④ Fan speed setpoint: Set the desired fan level

⑤ Max mode: Symbol is displayed if this mode is activated

⑥ HVAC system status

Symbol can be displayed if the HVAC system is either completely off or in building protection mode. If this symbol is activated, the rest of the display is blank.

Parts included

Screws

Accessories

| Tools	Description	Type
	Belimo Assistant App, Smartphone app for easy commissioning, parametrising and maintenance	Belimo Assistant App
	Converter Bluetooth / NFC	ZIP-BT-NFC

Service

NFC connection

Belimo equipment marked with the NFC logo can be operated and parameterized with the Belimo Assistant App.

Requirement:

- NFC- or Bluetooth-capable smartphone

- Belimo Assistant App (Google Play & Apple AppStore)

Align NFC-capable smartphone on the sensor so that both NFC antennas are superposed.

Connect Bluetooth-enabled smartphone via the Bluetooth-to-NFC Converter ZIP-BT-NFC to the sensor. Technical data and operation instructions are shown in the ZIP-BT-NFC data sheet.
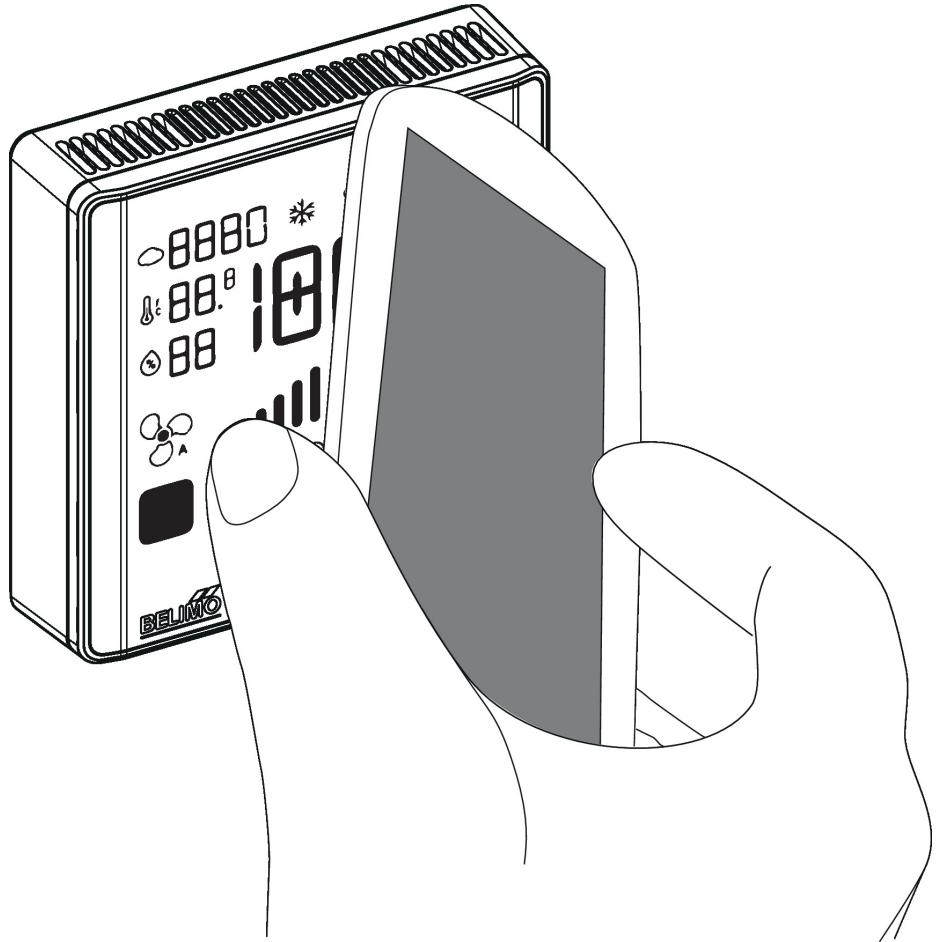
Wiring diagram

Notes

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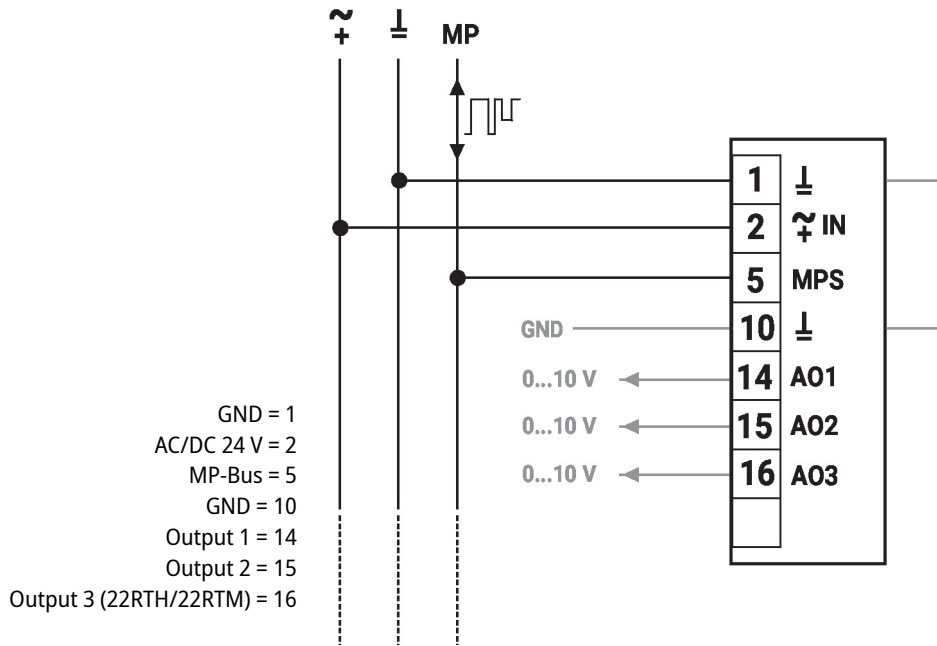Analogue outputs: The analogue outputs AO1, AO2 and AO3 can be parametrised via NFC.
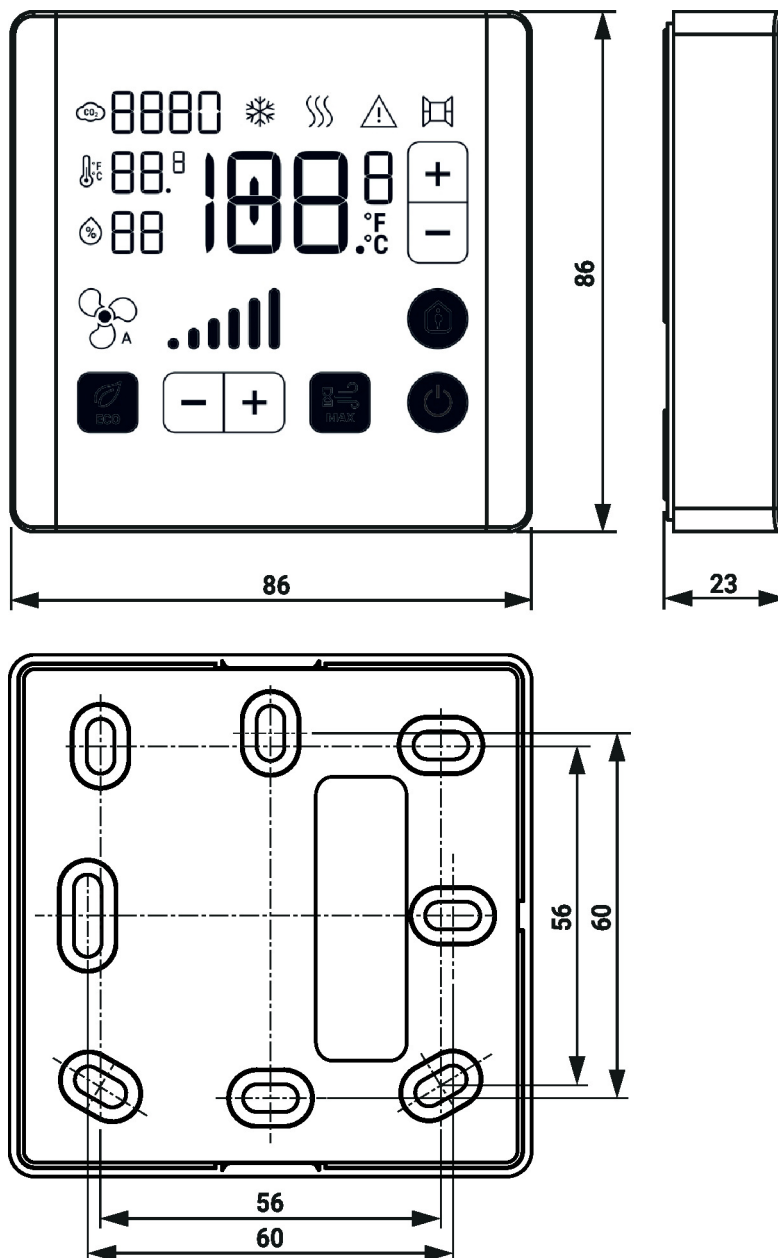
Factory settings:

AO1: Temperature

AO2: Setpoint Temperature

AO3: 22RTH: Humidity, 22RTM: CO_2

~ ⊥ MP
+

1 ⊥
2 ∼ IN
   +
5 MPS
10 ⊥
14 AO1
15 AO2
16 AO3

GND
0...10 V
0...10 V
0...10 V

GND = 1
AC/DC 24 V = 2
MP-Bus = 5
GND = 10
Output 1 = 14
Output 2 = 15
Output 3 (22RTH/22RTM) = 16

Dimensions

Type	Weight
P-22RTM-1900D-1	0.150 kg
P-22RTH-1900D-1	0.150 kg
P-22RT-1900D-1	0.150 kg

Further documentation

• Overview MP Cooperation Partners
• Description Data-Pool Values
• Installation instructions