Room sensor CO₂ / Humidity / Temperature

For measuring temperature, humidity and CO_2 in the room and for regulating the room temperature and/or ventilation. Thanks to MP-Bus communication and integrated analogue outputs, the room operating units can be seamlessly connected to existing third-party controllers. Commissioning and parametrizing of the device are conveniently done with the Belimo Assistant App. The end user can access the device via the Belimo Display App to read room values and to adjust the temperature setpoint.

5-year warranty

MP BUS

NFC

Type Overview

Type	Communication	Output signal active CO₂	Output signal active humidity	Output signal active temperature
22RTM-5900A	MP-Bus	0...5 V, 0...10 V, 2...10 V	0...5 V, 0...10 V, 2...10 V	0...5 V, 0...10 V, 2...10 V
22RTH-5900A	MP-Bus	-	0...5 V, 0...10 V, 2...10 V	0...5 V, 0...10 V, 2...10 V
22RT-5900A	MP-Bus	-	-	0...5 V, 0...10 V, 2...10 V

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
	Electrical connection note	Cable Type USA & Canada: CL2 or higher
	Cable entry	Back side Top side Bottom side
Data bus communication	Communication	MP-Bus
	Number of nodes	MP-Bus max. 8 (16)
Functional Data	Application	air
	Voltage output	2 x 0...5 V, 0...10 V, 2...10 V (Type 22RT-5900A) 3 x 0...5 V, 0...10 V, 2...10 V (Type 22RTH-5900A, 22RTM-5900A)
	Output signal active note	Output 0...5 V, 0...10 V (factory setting), 2...10 V selectable via NFC min. resistance 5 kΩ
	Display	Belimo Display App and LED The LED is used for the CO₂ TLF (traffic light function). The LED can be parametrized and deactivated via Belimo Assistant App. (Type (P-)22RTM-..)

Technical data

Measuring Data	Measured values	CO_2 relative humidity Dew point Temperature
Specification CO₂	Sensing element technology	NDIR (non dispersive infrared) dual channel
	Measuring range	default setting: 0...2000 ppm
	Accuracy	±(50 ppm + 2% of measured value)
	Long term stability	±20 ppm p.a.
Specification Temperature	Measuring range	32...122°F [0...50°C] (default setting)
	Accuracy temperature active	±0.5°F @ 77°F [±0.3°C @ 25°C]
	Long term stability	±0.05°F p.a. @ 77°F [±0.03°C p.a. @ 25°C]
Specification Humidity	Measuring range	Default setting: 0...100% RH
	Measuring range dew point	Default setting: -58...122°F [-50...50°C]
	Accuracy	±2% between 0...90% RH @ 77°F [25°C]
	Long term stability	±0.25% RH p.a. @ 77°F [25°C]@ 50% RH
Safety Data	Protection class IEC/EN	III, Protective Extra-Low Voltage (PELV)
	Degree of protection IEC/EN	IP30
	Degree of protection NEMA/UL	NEMA 1
	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...160°F [-40...70°C]
Materials	Housing	PC, white, RAL 9003

Safety Notes

⚠️

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. Unauthorized 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 authorized specialists may carry out installation. All applicable legal or institutional installation regulations must be complied with 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.

Remark: Occurring draft leads to a better carrying-off of dissipative power at the sensor. Thus temporally limited fluctuations might occur upon temperature measurement.

Remarks

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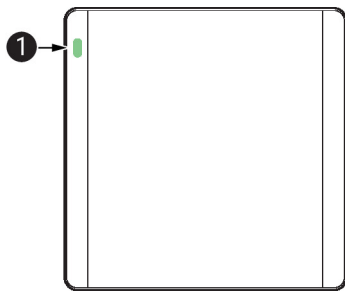
❶ **CO_2 TLF (traffic light function), available on the (P-)22RTM-.. sensor**

Colors: green, yellow and red. LED can be parametrized and deactivated via Belimo Assistant App.

Indicators and Operation

Operation   With the Belimo Display App, actual values of the room unit can be displayed and setpoints can be adjusted. This means that no display on the room unit is required. Thanks to communication via NFC (near field communication), third parties cannot access safety critical data.

How it works:

1. Download the Belimo Display App

2. Hold the smartphone to the room unit

3. View/adjust actual values or setpoints

4. To activate the setpoints, hold the smartphone to the room unit again
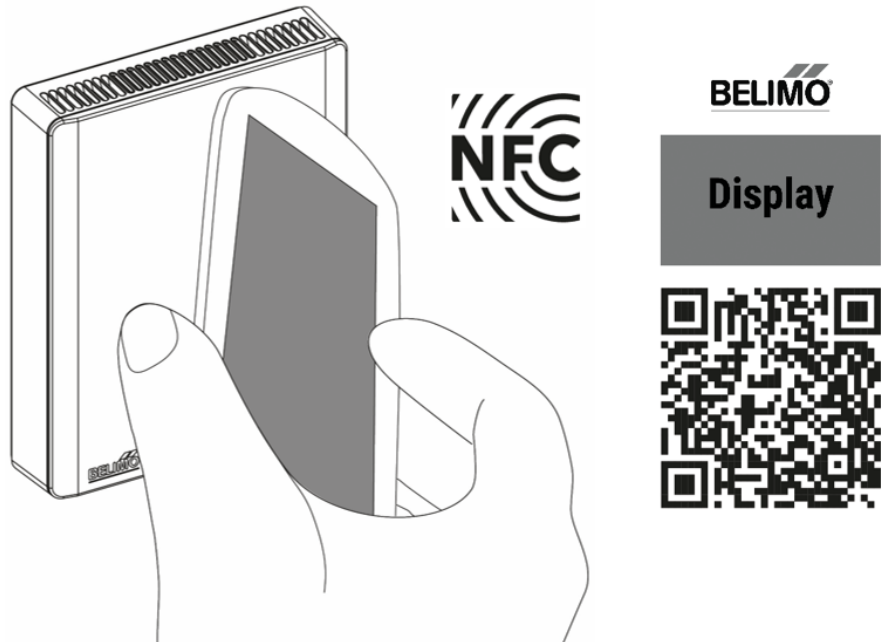
Parts included

Screws

Accessories

Tools	Description	Type
	Belimo Display App	Belimo Display App
	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 configured using the Belimo Assistant App.

Requirements:

- Smartphone with NFC or Bluetooth

- Belimo Assistant App (Available on Google Play & Apple AppStore)

Smartphone with NFC:

Place NFC-capable smartphone flat on the room sensor so that both NFC antennas are superposed.

Smartphone with Bluetooth without NFC:

Connect Bluetooth enabled smartphone via ZIP-BT-NFC (Bluetooth to NFC Converter) to the sensor. Technical data and operation instructions are shown on the ZIP-BT-NFC technical data sheet.
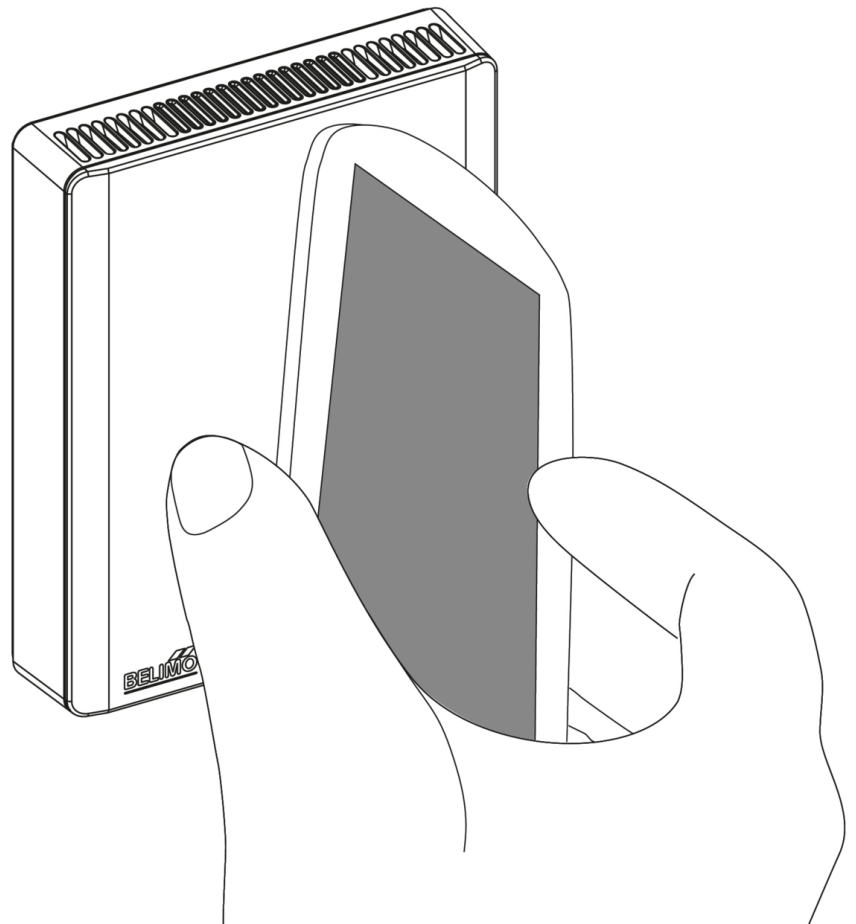
Wiring Diagram

Notes

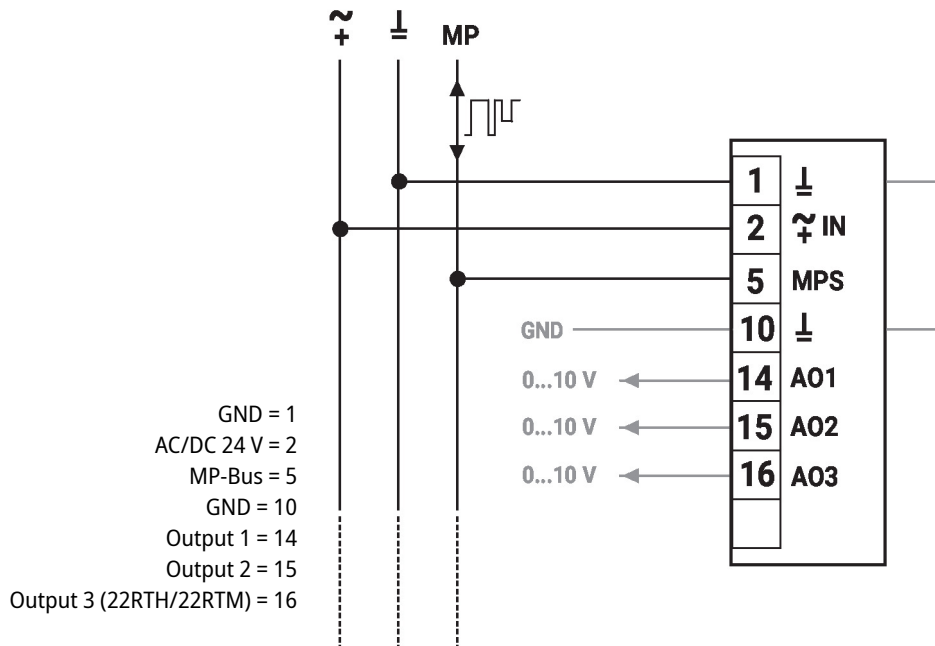Analogue outputs: The analogue outputs AO1, AO2 and AO3 can be parametrised via NFC.

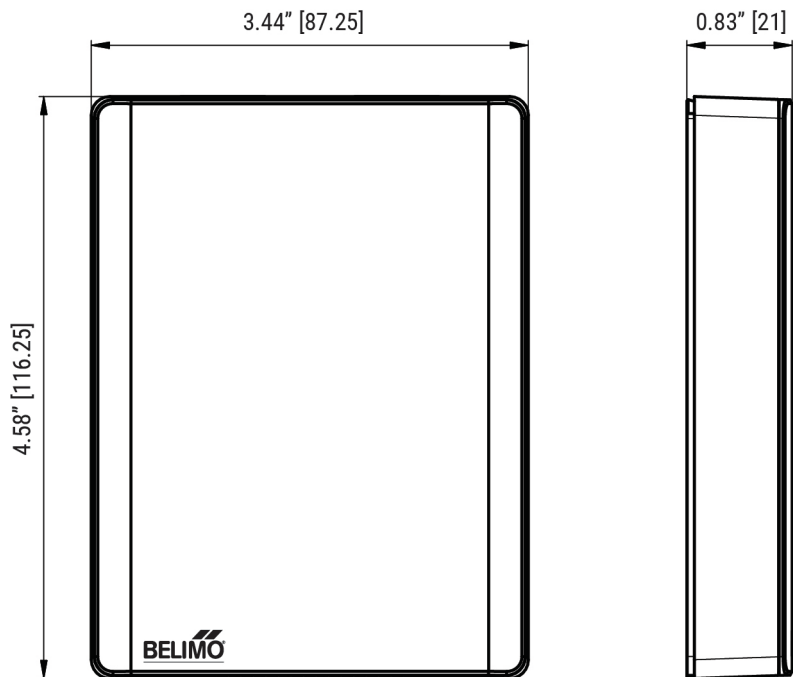Factory settings:

AO1: Temperature

AO2: Setpoint Temperature

AO3: 22RTH: Humidity, 22RTM: CO_2

Wiring Diagram

~ +
⊥
MP

1	⊥
2	~ IN
5	MPS
10	⊥ GND
14	AO1 0...10 V
15	AO2 0...10 V
16	AO3 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

3.44" [87.25]   0.83" [21]

4.58" [116.25]

Type	Weight
22RTM-5900A	0.124 kg
22RTH-5900A	0.150 kg
22RT-5900A	0.150 kg

Further documentation

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