

Room sensor CO₂ / Humidity / Temperature

For measuring temperature, humidity and CO₂ in the room and for regulating the room temperature and/or ventilation. Thanks to MP-Bus communication and integrated analog outputs, the room operating units can be seamlessly connected to existing third-party controllers. Commissioning and configuration of the devices 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



Type Overview

Type	Communication	Output signal active CO ₂	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 mm ²
	Electrical connection note	Cable type USA and 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	Medium	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 CO ₂ TLF (traffic light function). The LED can be configured and deactivated via Belimo Assistant 2. (Type (P-)22RTM-..).

Technical data

Measuring Data	Measured values	CO ₂ relative humidity Dew point Temperature
Specification CO₂	Sensing element technology	Non-dispersive infrared (NDIR) 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 active	Measuring range	32...122°F [0...50°C] (default setting)
	Accuracy temperature	±0.3°C @ 25°C [±0.5°F @ 77°F]
	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	32...122°F [0...50°C]
	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.

Product Features

- CO₂ dual-duct technology** All CO₂ sensors are subject to drift, which is caused by the ageing process of the components and requires regular calibration and adjustment or replacement of the sensors. The dual-duct technology minimizes this drift by compensating for the majority of the ageing effects of the measuring duct through adjustment with a reference duct.
- This makes it possible to use dual-channel sensors in applications with 24/7 occupancy. Regular calibration with fresh outdoor air, as is the case with sensors with ABC logic, is not necessary with dual-duct sensors. Recalibration of the sensor is recommended after 5 years of operation.

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.

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.

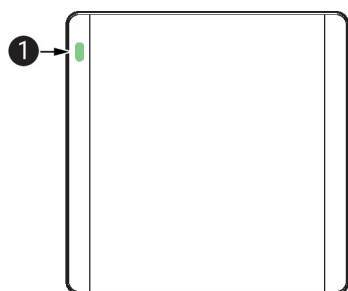
Belimo room sensors have adaptive temperature compensation for the entire supply voltage range. This ensures that the ambient temperature is detected with the highest accuracy at all times.

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.

Indicators and Operation


1 CO₂ TLF (traffic light function), available on the (P-)22RTM-.. sensor

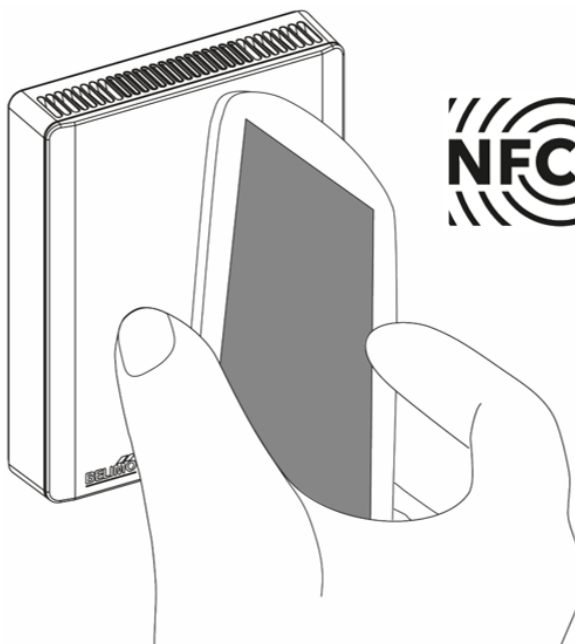
Colors: green, yellow and red. LED can be configured and deactivated via Belimo Assistant 2.

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

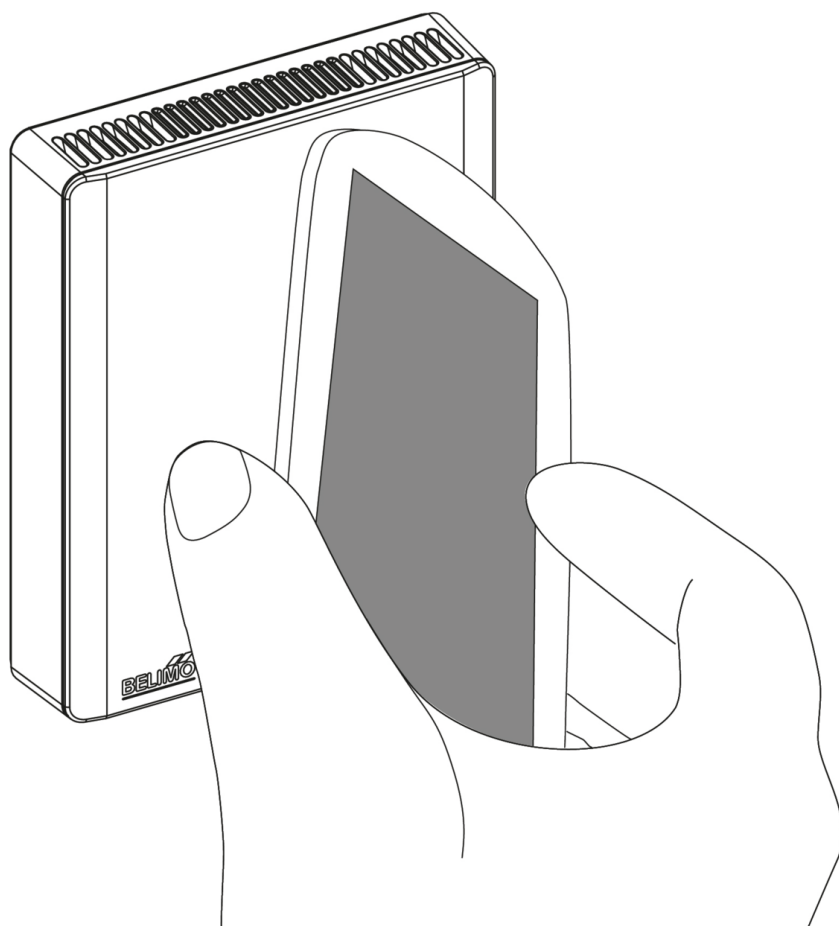
Screws

Accessories

Tools	Description	Type
	Belimo Display App	Belimo Display App
	Service tool for wired and wireless setup, on-site operation and troubleshooting.	Belimo Assistant 2
	Belimo Assistant Link Bluetooth and USB to NFC and MP-Bus converter for configurable and communicative devices	LINK.10

Service

- NFC connection** Belimo devices marked with the NFC logo can be operated with the Belimo Assistant 2.
- Requirement:
- NFC- or Bluetooth-capable smartphone
 - Belimo Assistant 2 (Google Play and Apple AppStore)
- Align NFC-capable smartphone on the device so that both NFC antennas are superposed.
- Connect Bluetooth-enabled smartphone via the Bluetooth-to-NFC converter ZIP-BT-NFC to the device. Technical data and operating instructions are shown in the ZIP-BT-NFC data sheet.


Wiring Diagram

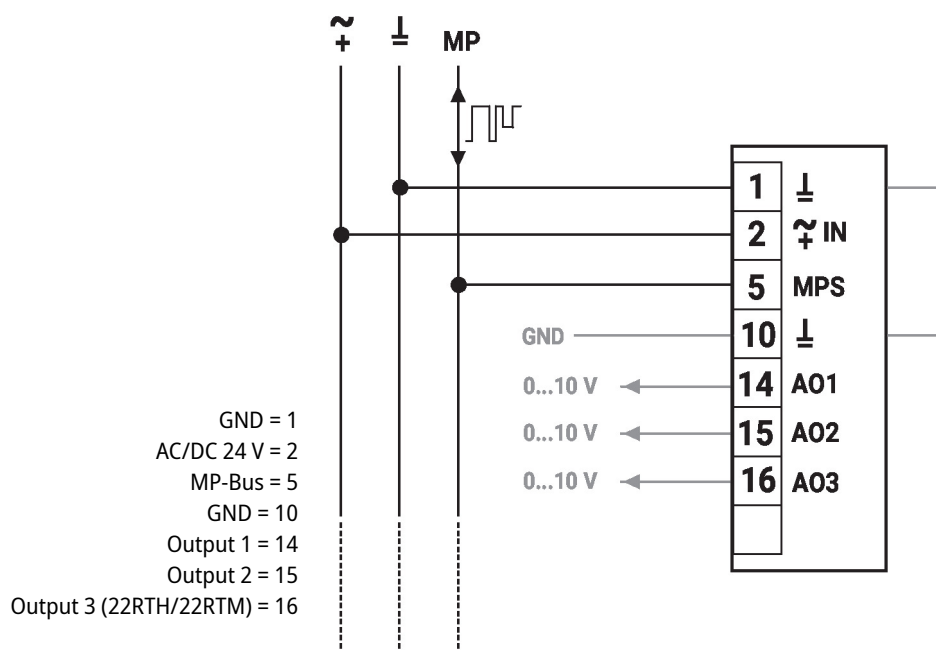
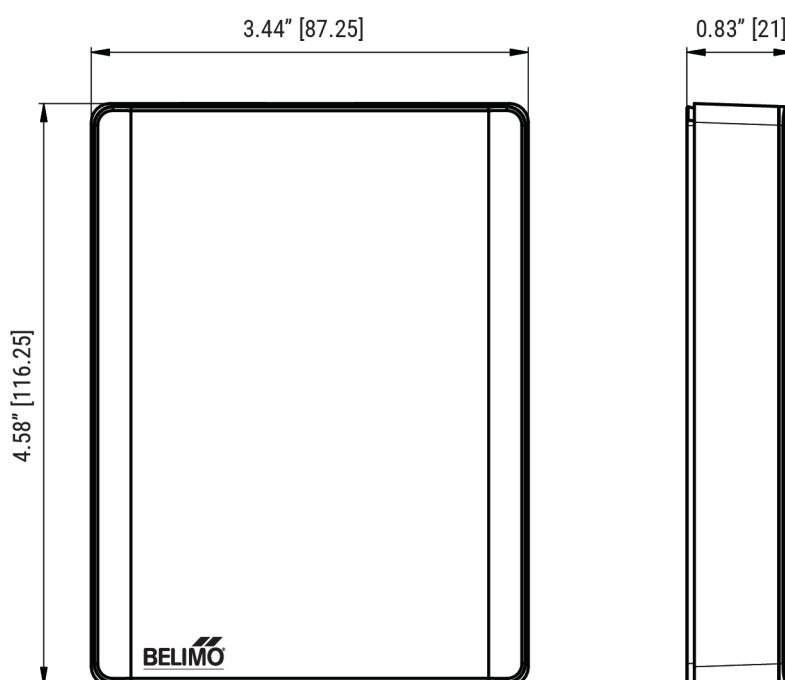

Analog outputs: The analog outputs AO1, AO2 and AO3 can be configured via NFC.

Factory settings:

AO1: Temperature

AO2: Setpoint Temperature

AO3: 22RTH: Humidity, 22RTM: CO₂"

Wiring Diagram

Dimensions

Type
Weight

22RTM-5900A	0.27 lb [0.124 kg]
22RTH-5900A	0.33 lb [0.150 kg]
22RT-5900A	0.33 lb [0.150 kg]

Further documentation

- Overview MP Cooperation Partners
- Description Data-Pool Values
- Installation instructions
- Quick Guide – Belimo Assistant 2