

**Room sensor CO<sub>2</sub> / Humidity / Temperature**

For measuring temperature, humidity and CO<sub>2</sub> 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


**Type Overview**

Type	Communication	Output signal active CO <sub>2</sub>	Output signal active humidity	Output signal active temperature
22RTM-59L0A	MP-Bus	0...5 V, 0...10 V, 2...10 V	0...5 V, 0...10 V, 2...10 V	-
22RTH-59L0A	MP-Bus	-	0...5 V, 0...10 V, 2...10 V	-

**Technical data**

<b>Electrical Data</b>	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 <sup>2</sup>
	Electrical connection note	Cable type USA and Canada: CL2 or higher
	Cable entry	Back side Top side Bottom side
<b>Data bus communication</b>	Communication	MP-Bus
	Number of nodes	MP-Bus max. 8 (16)
<b>Functional Data</b>	Medium	Air
	Voltage output	2 x 0...5 V, 0...10 V, 2...10 V
	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 <sub>2</sub> TLF (traffic light function). The LED can be configured and deactivated via Belimo Assistant 2. (Type (P-)22RTM-...).

**Technical data**

<b>Measuring Data</b>	Measured values	CO <sub>2</sub> relative humidity Dew point Temperature
	<b>Specification CO<sub>2</sub></b>	Sensing element technology Measuring range Accuracy Long term stability
		Non-dispersive infrared (NDIR) dual channel default setting: 0...2000 ppm ±(50 ppm + 2% of measured value) ±20 ppm p.a.
<b>Specification temperature active</b>	Measuring range	32...122°F [0...50°C] (default setting)
	Measuring current	NTC10k2: <2 mA @ 77°F [25°C] NTC10k3: <2.7 mA @ 77°F [25°C]
	Accuracy temperature	±0.9°F @ 77°F [±0.5°C @ 25°C]
	Long-term stability	±0.05°F p.a. @ 77°F [±0.03°C p.a. @ 25°C]
<b>Specification temperature passive</b>	Accuracy temperature	±0.35°F @ 77°F [±0.2°C @ 25°C]
<b>Specification Humidity</b>	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
<b>Safety Data</b>	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]
<b>Materials</b>	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**

- CO<sub>2</sub> dual-duct technology** All CO<sub>2</sub> 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.

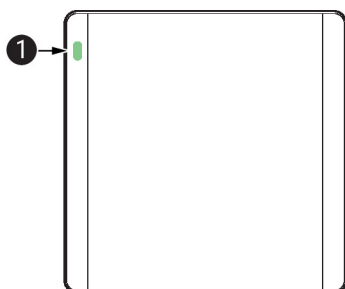
**Remarks**

- 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** CO<sub>2</sub> TLF (traffic light function), available on the (P-)22RTM... sensor

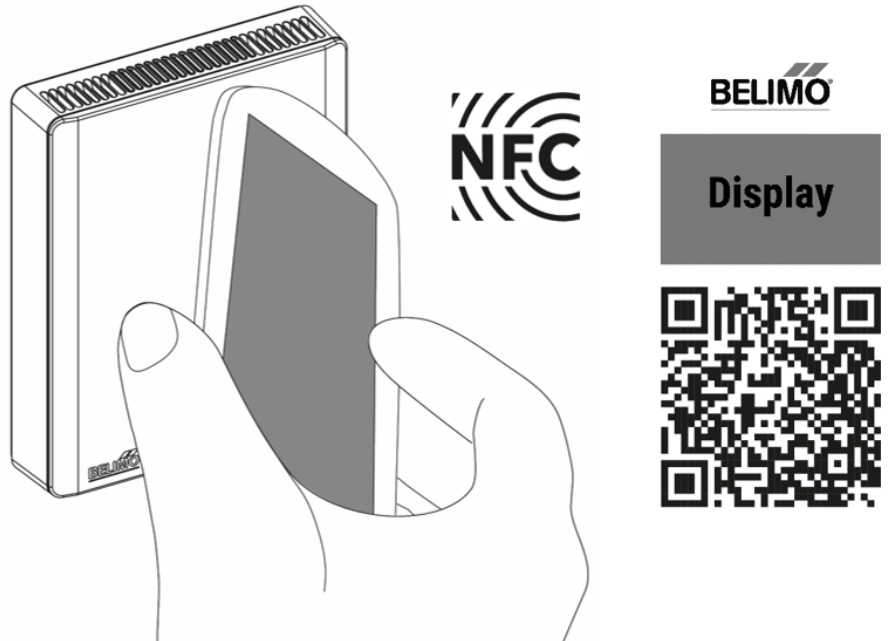
Colors: green, yellow and red. LED can be configured and deactivated via Belimo Assistant 2.

**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**

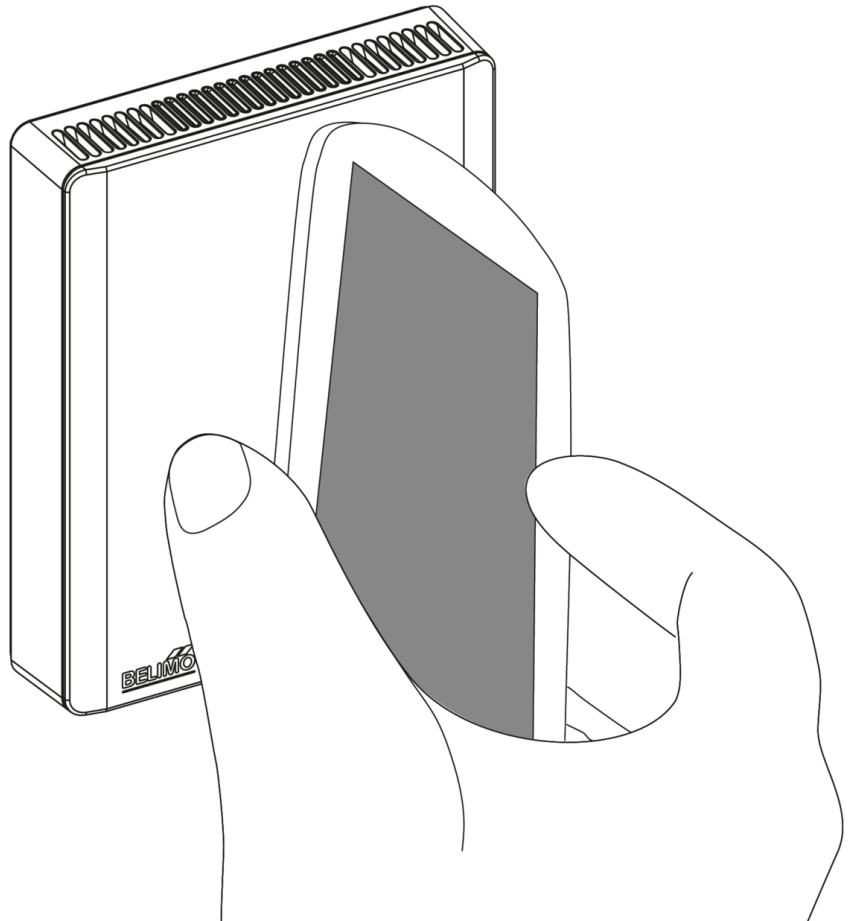
Screws

**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



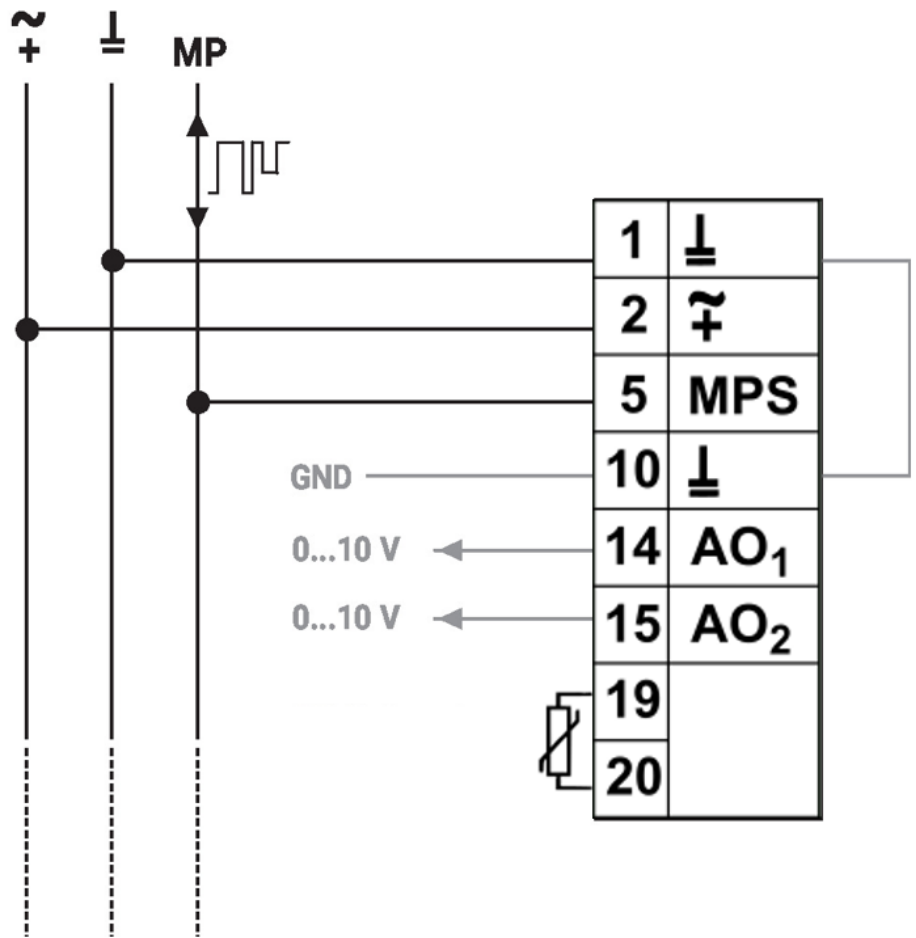
**Analog outputs:** Both options are configurable to your application via the Belimo Assistant APP. Using NFC

**Factory settings:**

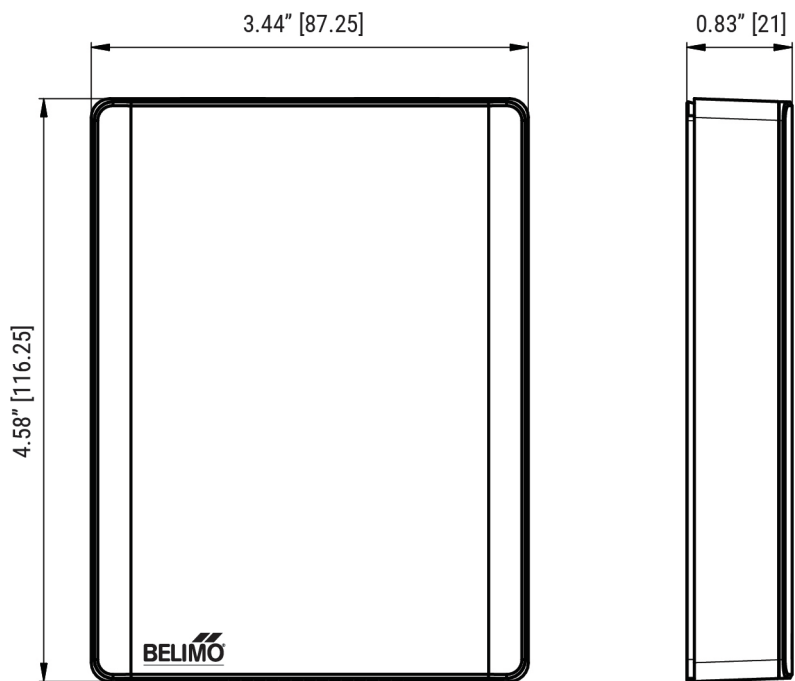
**AO1:** Humidity, Temperature Setpoint, CO2 (RTM)

**AO2:** Humidity, Temperature Setpoint, CO2 (RTM)

Wiring Diagram



Dimensions



**Dimensions**

Type	Weight
22RTM-59L0A	0.374 lb [0.170 kg]
22RTH-59L0A	0.462 lb [0.210 kg]

**Further documentation**

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