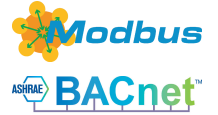


To measure the room's temperature, humidity, and CO₂ and adjust temperature and ventilation setpoints. The high-contrast ePaper touch display ensures the best readability and intuitive operation. The room operating units can be seamlessly connected to existing third-party controllers thanks to MP-Bus, Modbus RTU, and BACnet MS/TP communication. Commissioning and parametrization of the device are conveniently done with the Belimo Assistant App.



5-year warranty


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	
	Cable entry	Back side Top side Bottom side	
	Data bus communication	Communication	Modbus RTU BACnet MS/TP
Functional Data			
	Sensor Technology	CO ₂ : NDIR (non dispersive infrared) dual channel	
	Application	air	
	Display	ePaper touch display, 69x62 mm	
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: 32...122°F [0...50°C]	
	Measuring range dew point	Default setting: -58...122°F [-50...50°C]	
	Accuracy CO ₂	±(50 ppm + 2% of measured value)	
	Accuracy humidity	±2% between 0...90% RH @ 77°F [25°C]	
	Accuracy temperature active	±0.9°F @ 77°F [±0.5°C @ 25°C]	
	Long-term stability	±20 ppm p.a. ±0.25% RH p.a. @ 77°F [25°C]@ 50% RH	
	Time constant τ (63%) in the room	Typical 960 s	
	Wall Coupling Factor	52 %	
	Materials	Housing	PC, white, RAL 9003
		Safety Data	Protection class IEC/EN
Degree of protection IEC/EN	IP30		

Safety Data

EU Conformity	CE Marking
Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-9
Quality Standard	ISO 9001
Ambient humidity	Max. 95% RH, non-condensing
Ambient temperature	0...50°C [32...122°F]

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 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

Refrain from touching the sensitive humidity sensor element. Touching the sensitive surface will void warranty.

When exposed to harsh environmental conditions such as high ambient temperature and/or high levels of humidity, or presence of aggressive gases (i.e. chlorine, ozone, ammonia), the sensor element may be affected and readings may be outside the specified accuracy. Replacement of deteriorated humidity sensors due to harsh environmental conditions is not covered by the general warranty.

The sensor shows best performance when operated within recommended normal temperature range of 5...60°C and humidity range of 20...80% RH. Long-term exposure to conditions outside normal range, especially at high humidity, may temporarily offset the humidity signal (e.g. +3% RH after 60h kept at >80% RH). After returning into the normal temperature and humidity range, the sensor will slowly come back to calibration state by itself.

Information self-calibration feature CO₂

All CO₂ 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 hospitals or other commercial applications. Manual calibration is not required.

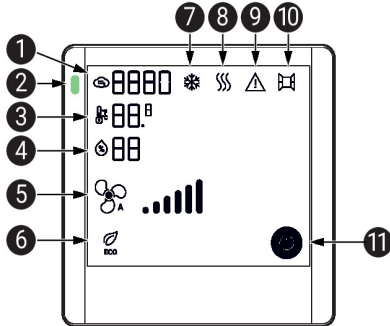
Digital input

Auxiliary Digital Input can be used with third-party sensors and switches (window alarm, occupancy detector, etc.). The input values are monitored and transmitted only through the MP-Bus communication protocol.

Indicators and Operation

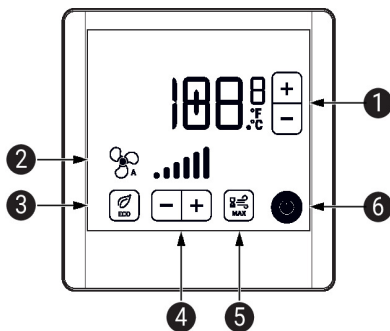
Indicators The operating display is an ePaper display that reflects light like normal paper. It is therefore a non-illuminated display with an integrated touch control panel.

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.



- ❶ **Current CO₂ concentration: 0...2000 ppm**
- ❷ **CO₂ 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.
- ❸ **Current temperature: 0...50°C or -32...122°F**
- ❹ **Current relative humidity: 0...99%**
- ❺ **Fan speed display: 6 levels**
- ❻ **Eco mode: Symbol is displayed if this mode is activated**
- ❼ **Cooling mode: Information provided by controller via bus**
- ❽ **Heating mode: Information provided by controller via bus**
- ❾ **Warning / Error**
Symbol is displayed if an internal error occurred or if warning is transmitted by the controller via the connected bus (external error).
- ❿ **External input, information provided by controller via bus**
- ⓫ **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.



- ❶ **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
- ❷ **Fan speed display: 6 levels**
- ❸ **Eco mode: Symbol is displayed if this mode is activated**
- ❹ **Fan speed setpoint: Set the desired fan level**
- ❺ **Max mode: Symbol is displayed if this mode is activated**
- ❻ **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 Converter Bluetooth / NFC	Belimo Assistant App ZIP-BT-NFC

Service

NFC connection Belimo equipment marked with the NFC logo can be operated and configured using the Belimo Assistant App.

Requirements:

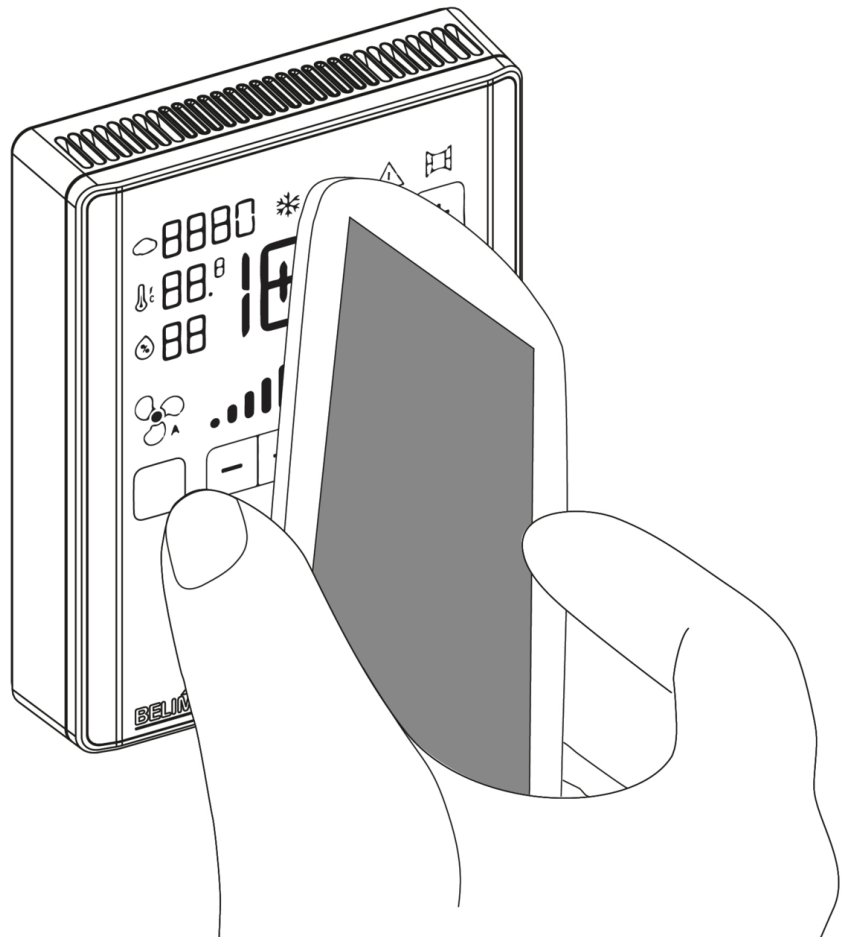
- Smartphone with NFC or Bluetooth
- Belimo Assistant App (Available on Google Play & Apple AppStore)

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.



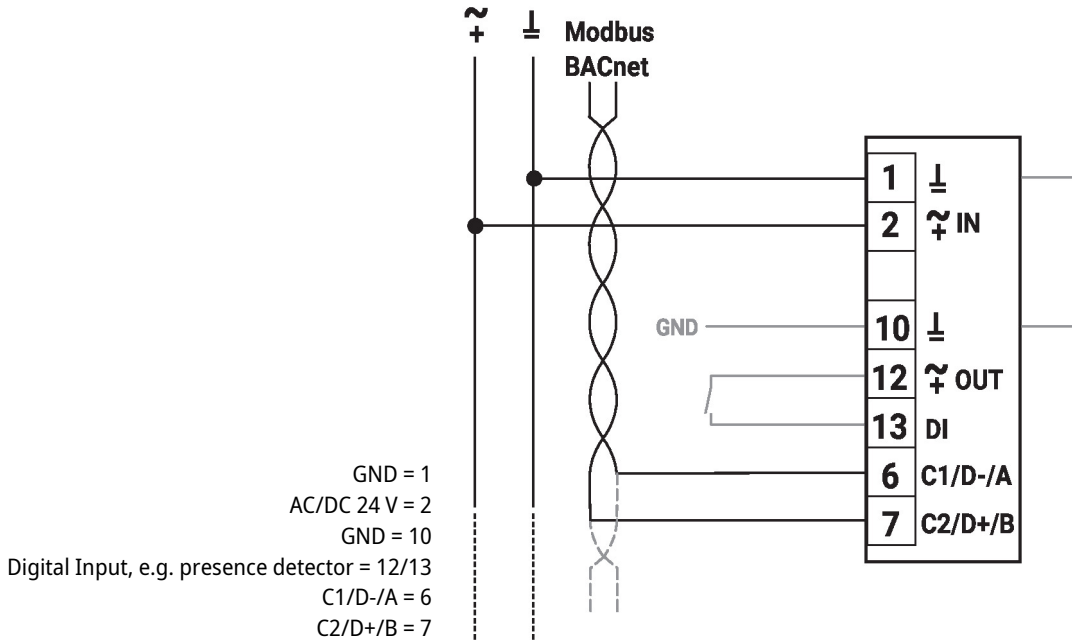
Wiring Diagram

Notes Supply from isolating transformer.



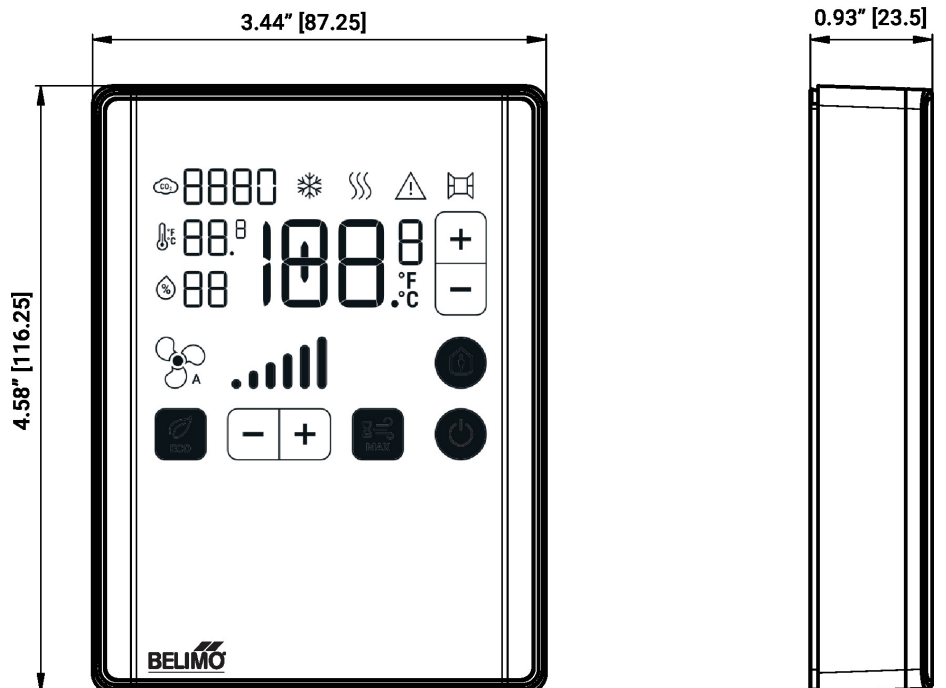
The wiring of the line for BACnet MS/TP / Modbus RTU is to be carried out in accordance with applicable RS485 regulations.

Modbus / BACnet: Supply and communication are not galvanically isolated. Connect earth signal of the devices with one another.



Detailed documentation The separate document Sensor Modbus-Register informs about Modbus register, addressing, parity and bus termination (DIP1: address, DIP2: baud rate, parity, bus termination)
 The separate document, BACnet PICS, informs about the PICS, MAC addressing and bus termination (DIP1 & DIP2).

Dimensions



Further documentation

- BACnet Interface description
- Modbus Interface description
- Installation instructions