

# The Foundation of Comfort



## Belimo Sensors



Discover the advantages  
[www.belimo.com](http://www.belimo.com)

**BELIMO**<sup>®</sup>

# Seamless integration and intuitive design

Belimo sensors result from years of experience with HVAC and a continuous focus on providing added value to our customers. The innovative design offers easy installation and seamless integration to ensure optimal system performance.



## Seamless

Compatible with major building automation systems, making them suitable for use in any HVAC application.



## Reliable

Built from the highest quality materials, our sensors deliver accurate and dependable readings over the entire life cycle of the building. They are backed with a 5-year warranty and conform to UL and NEMA requirements.



## Intuitive

The compact modular design allows easy installation and commissioning in just a few simple steps to ensure optimal system performance.

“Our installers like the innovative design of Belimo’s sensor range and have told us that using them reduces their installation time compared to competitive products.”

**Brian Dutt, President  
Controls & Equipment, Moncton,  
New Brunswick, Canada**

# Innovation for peace of mind

The simple installation, combined with a slim, timeless design, provides the latest intelligence to manage modern workspaces and ensure occupant comfort.

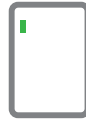
### ePaper Touch Display

Featuring high contrast and intuitive operation, our system illustrates current room values and allows for setpoint adjustments.



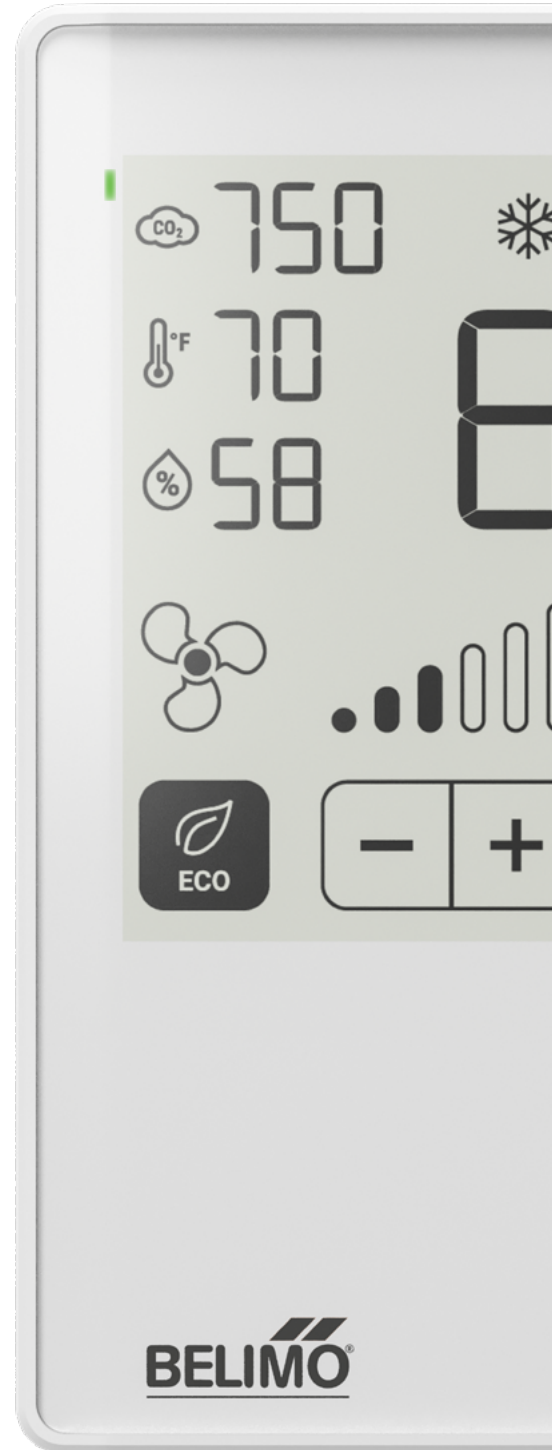
### CO<sub>2</sub> Traffic Light

The LED displays the CO<sub>2</sub> concentration, which is fully customizable through NFC.

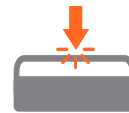


### Configurable

Temperature setpoints or fan stage can be displayed or used solely as a sensor.

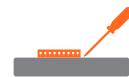


5-year warranty



#### Snap Cover

Allows for quick installation and easy commissioning.



#### Removable Terminal

Spring-loaded terminal block saves wiring time and ensures reliable contact.



#### High Accuracy

The low wall coupling factor provides accurate measurement unaffected by the wall temperature.



#### Seamless Integration



With BACnet, Modbus, and MP-Bus the sensor can communicate directly with the BMS.



#### Near Field Communication

With the Belimo Assistant 2 App and a smartphone, NFC allows quick data access, field adjustments, commissioning, and troubleshooting.

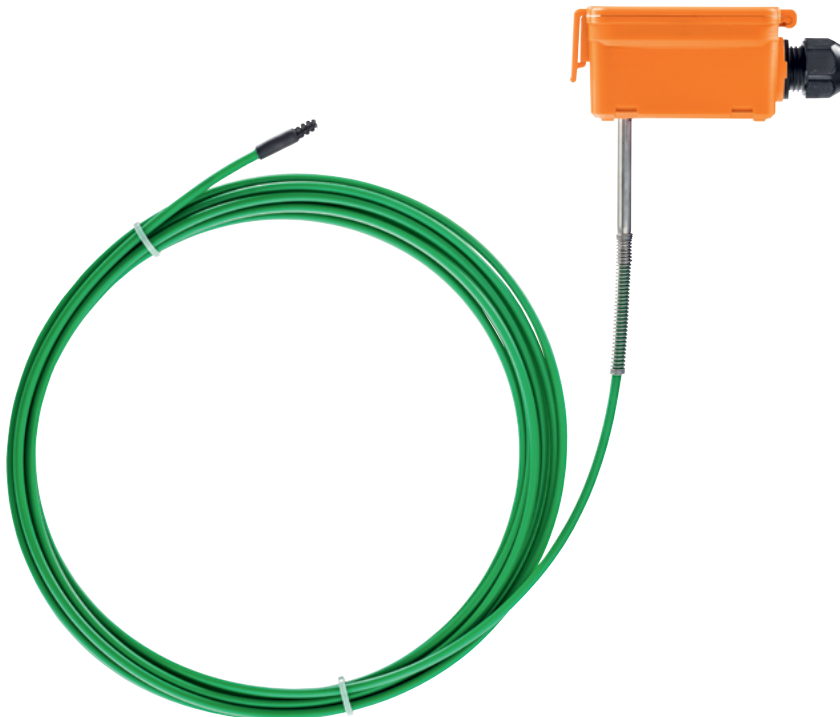


# A comprehensive range of HVAC sensors

Our complete range of sensors offer superior reliability and seamlessly integrate with major Building Automation Systems. Their unique, uniform design simplifies installation and maintenance. All mounting accessories are included as standard which expedites setup, while saving time, money, and labor.

## Temperature Sensors

Accurate and reliable temperature readings are essential for optimal building comfort and energy efficiency. Duct, pipe, and outdoor air temperature sensors are designed for easy installation and are compatible with all major Building Automation Systems.



### FEATURES

- Up to eight active measurement ranges simplify field selection and reduce stock storage for maximum flexibility.
- One unit for both Pipe and Duct with optional thermowell.
- Variety of output signals:  
passive: Ni1000, Pt100, Pt1000, NTC10k2, NTC10k3, NTC20k  
active: 0...5/0...10 V and 4...20 mA
- Sintered moisture protection coating on all duct, immersion, and cable sensors protects against condensation, mechanical stress, and vibrations.

### PRODUCT SERIES

#### Duct

Single Point  
Averaging  
Cable  
Low Limit Detection

#### Pipe

Single Point  
Cable  
Strap-on  
Condensation

#### Outdoor

Single Point

#### Room

Wall-mounted zone measurement

## Humidity Sensors

Controlling humidity in buildings is critical to occupant comfort and key to protecting building infrastructure, production processes, stored goods, and museum artwork. Belimo's range of durable duct, outdoor air, and condensation sensors are manufactured using the highest quality materials to ensure superior reliability, accuracy, and repeatability. Combined temperature and humidity sensors provide a flexible and cost-effective solution.



### FEATURES

- Complementary Metal Oxide Semiconductor (CMOS) based polymer-capacitance sensor with an accuracy of  $\pm 2\%$  relative humidity as standard and long-term drift  $< \pm 0.25\%$  not affected by high humidity and contaminants.
- Multi-sensor with selectable output measurement values: relative humidity, absolute humidity, enthalpy, and dew point.
- Up to four active temperature measurement ranges simplify field selection and reduce stock storage, providing flexibility for change requests during commissioning.
- BACnet and Modbus communication protocols provide superior application data access and enable easy commissioning and configuration.

### PRODUCT SERIES

Duct  
Outdoor Air

#### Leak

Single point free standing

## Air Quality Sensors

Air quality sensors provide occupant comfort and energy efficiency. We offer a wide range of combined multi-sensors for CO<sub>2</sub>, humidity, temperature, and VOCs designed to ensure air quality and maximize energy savings over the life cycle of the building.



### FEATURES

- Dual channel CO<sub>2</sub> sensor based on NDIR technology. The additional reference channel allows effective compensation of long term drift, thus providing precise accuracy and long-term stability.
- Sensors are completely maintenance free.
- Integrated temperature, humidity, CO<sub>2</sub> and VOCs sensors are available for building applications that require sensors with multi-functional capabilities.
- Dual channel self-calibration technology allows the Belimo CO<sub>2</sub> sensors to be used for all types of buildings and applications where ABC logic cannot be used.
- BACnet communication protocol provides superior application data access and enables easy commissioning and configuration.

### PRODUCT SERIES

- CO<sub>2</sub>
- CO<sub>2</sub> + Temperature
- CO<sub>2</sub> + Humidity + Temperature
- CO<sub>2</sub> + VOCs
- CO<sub>2</sub> + VOCs + Temperature
- CO<sub>2</sub> + VOCs + CO<sub>2</sub>/VOCs + Temperature

## Pressure Sensors

Accurate pressure measurement is important for optimal HVAC system performance. Pressure sensors from Belimo are capable of measuring extremely high and low pressures in air and water applications. The sensors offer precise measurement of pressure, differential pressure, and velocity for reliable monitoring. Selectable measuring ranges are available for application flexibility.



### 22PDP-5XX LIQUID DIFFERENTIAL PRESSURE SENSORS

- Offset sensors for easy mounting.
- Manual and remote zero-point adjustment.
- PVC or armored cable options.
- Measuring values and settings displayed on LCD.
- Optional 3-valve manifold, armored cables and extensions.

## FEATURES

### DIFFERENTIAL AIR PRESSURE SENSOR

- Eight field selectable pressure ranges in one unit.
- Excellent zero-point stability and high accuracy.
- Auto-zero or manual calibration option.
- LCD display optional.
- BACnet or Modbus communication protocol provides superior application data access and enables easy commissioning and configuration.

### DIFFERENTIAL AIR PRESSURE SWITCH

- Field-adjustable switch point.
- Working life of over one million switch operations.

### DIFFERENTIAL WATER PRESSURE SENSOR

- Highly stable resistive sensor element on ceramic substrate.
- Rugged stainless steel housing.
- All wetted material is made from stainless steel.

### WATER PRESSURE SENSOR

- Resistive sensor element on stainless steel membrane.
- All wetted material is made from stainless steel.

## PRODUCT SERIES

Air Differential Pressure/Static Pressure Sensor  
 Air Differential Pressure/Static Pressure Switch  
 Water Differential Pressure Sensor  
 Water Static Pressure Sensor

## Room Sensors

Belimo room sensors accurately measure temperature, humidity, dew point, and CO<sub>2</sub> in a surface-mounted streamlined design with or without an ePaper touch display. The sensors are maintenance-free and provide long-term reliability for a comfortable room environment. Integrated with Near Field Communication (NFC) and the Belimo Assistant 2 App, room sensors can be set up quickly and easily. The touch display can be displayed or hidden via the App. Easy data access, field adjustable commissioning and troubleshooting are allowed through the touch display or the App even without power. For devices without an integral ePaper display, setpoints can be programmed using the new Belimo Room Display App, which turns your smartphone into a remote display. The NFC apps associated with Belimo's room sensors can be password protected for an added layer of security.



## FEATURES

- Near Field Communication (NFC) allows fast programming, commissioning, and troubleshooting.
- The Belimo Display App can be used to create a remote display with setpoint functionality.
- LED light indicates CO<sub>2</sub> concentrations in rooms for ventilation or air purification.
- Through the Belimo Assistant 2 App, the sensors can maintain a record of the highest CO<sub>2</sub> concentration in the past 30 days.
- Snap cover and spring-loaded terminal block allow for quick installation and easy commissioning.
- In the Belimo Assistant 2 App, troubleshoot a faulty connection, a short circuit, or an output configuration discrepancy with the wiring debugging feature.
- PC-board cover plate provides additional protection from mechanical damage, dust, and vibration.
- Flexible and user defined analog outputs (0.5...10, 0...10 or 2...10VDC 4...20mA) selectable via the Belimo Assistant 2 App.
- BACnet, Modbus, or MP-Bus integration offers enhanced communication on select models saving on installation, cables, and terminal connections.

## PRODUCT SERIES

- Temperature
- Temperature with Setpoint
- Temperature + Relative Humidity
- Temperature + Relative Humidity + CO<sub>2</sub>

# Convenience

## Simplifying installation and ensuring optimal performance

A variety of Apps are offered by Belimo, from the RetroFIT+ App, which provides quick, efficient replacement solutions, to Apps that facilitate programming, commissioning, and troubleshooting products with NFC.

### Duct Sensor Assistant App

The App provides the ability to view basic sensor information, parameterize the output signals and measurement ranges, and change the LCD text alignment, brightness, color, and measuring units for sensors. It allows you to modify the sensor's address, view the BUS settings, schedule future servicing dates, and view past dates. Saving the configuration to the App and uploading it to other sensors saves time and money. The App is available in six languages.

### Belimo Room Display App

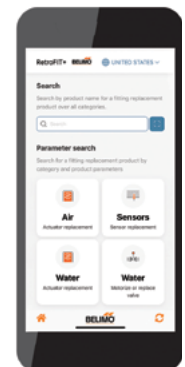
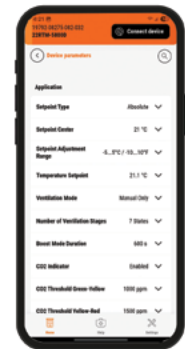
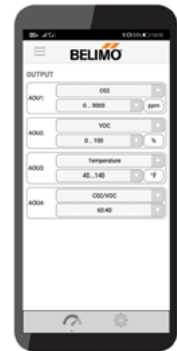
This App is the most innovative way to access Belimo room sensors. The intuitive App displays current room values and allows users to modify the setpoints. Access protection prevents input by unauthorized personnel. The App communicates with the room unit via NFC. Adaptation of the temperature setpoint even without a display is available.

### Belimo Assistant 2 App

Access real-time data, diagnostics, and configuration parameters for NFC-enabled Belimo sensors with the Belimo Assistant 2 App—no external power needed. Gain full system transparency with instant insights into sensor performance, status, and settings, ensuring precise control and streamlined troubleshooting.







### Belimo RetroFIT+ App

The Belimo RetroFIT+ App is designed to help you seamlessly find the perfect replacement for your old or damaged actuator or sensor. Whether you're looking for air applications or water solutions, modernizing or replacing your installation, our app will quickly guide you to the ideal actuator or sensor that caters to your needs while providing top-quality and high performance.







# Belimo sensors at a glance


## Temperature

Application	Type code	Output signal			Measurement range Factory settings	Probe length	Application/comment
		Passive	Active	Switch			
 Outdoor air	01UT	■			-30...+122°F [-35...+50°C]		<ul style="list-style-type: none"> <li>– Outdoor temperature</li> <li>– Wall temperature with NEMA 4X / IP65 protection</li> </ul>
	22UT		■		-30...+130°F [-50...+50°C]	8	
 Duct / Pipe immersion	01DT	■			Sensor dependent	2" [50 mm], 4" [100 mm], 6" [150 mm], 8" [200 mm], 12" [300 mm], 18" [450 mm]	<ul style="list-style-type: none"> <li>– Duct temperature</li> <li>– Immersion sensor and thermowell pockets in brass or stainless steel</li> </ul>
	22DT		■		0...150°F [0...160°C]	8	
 Duct averaging	01MT	■			Sensor dependent	10 ft [3 m], 20 ft [6 m], 50 ft [15 m]	Duct averaging temperature sensor for air-handling units or larger ducts with air stratification
	22MT		■		40...90°F [-20...+80°C]	8	
 Strap-on	01ST	■			-30...+212°F [-35...+100°C]		Pipe strap-on temperature sensors for heating systems, 01ST without housing and 01HT, 22HT with housing
	01HT	■			-30...+194°F [-35...+90°C]		
	22HT		■		40...240°F [0...100°C]	8	
 Cable	01CT	■			-30...+212°F [-35...+100°C]	2" [50 mm]	Cable temperature sensor passive (without housing) and active (with housing)
	22CT		■		0...150°F [0...160°C]*	8	
 Low temperature detection	01DTS			■	14...54°F [-10...+12°C]	10 ft [3 m], 20 ft [6 m]	Low temperature detection for frost protection in air-handling units available with automatic or manual reset





## Humidity / Leak

Application	Type code	Output signal				Measured values	Measurement range			Application/comment
		Active	Modbus RTU	BACnet MS/TP	Switch		Humidity	Temperature (factory settings)	Multirange (selectable)	
 Outdoor	22UTH	■	■	■		Humidity, Temperature, Enthalpy, Dew Point, Absolute Humidity	0...100% rH non-condensing	0...200°F [-20...+80°C]	4	<ul style="list-style-type: none"> <li>– Outdoor humidity temperature sensor</li> <li>– Wall humidity temperature sensor with NEMA 4X / IP65 protection</li> <li>– Weather/rain shield included</li> </ul>
 Duct	22DTH	■	■	■		Humidity, Temperature, Enthalpy, Dew Point, Absolute Humidity	0...100% rH non-condensing	0...200°F [-20...+80°C]	4	Duct humidity temperature sensor
 Condensation	22HH				■	Condensation				Condensation sensor Optional: external sensor
 Leak	22HL				■	Conductivity				Leak detection Relay switch 1x SPDT or 2x SPDT

## Air Quality

Application	Type code	Output signal			Measured values	Measurement range			Options	Application/ comment
		Active	Modbus RTU	BACnet MS/TP		CO <sub>2</sub>	Temperature	Humidity		
 Duct	22DC	■			CO <sub>2</sub>	0...2000 ppm				Duct CO <sub>2</sub>
	22DTC	■			CO <sub>2</sub> , Temperature	0...5000 ppm	32...122°F [0...50°C]			Duct CO <sub>2</sub> , Temp
	22DTM	■	■	■	CO <sub>2</sub> , Temperature, Humidity	0...2000 ppm	32...122°F [0...50°C]	0...100% Non condensing	■	Duct CO <sub>2</sub> , rH, Temp
	22DCV	■			CO <sub>2</sub> , VOCs	0...2000 ppm				Duct CO <sub>2</sub> , VOCs
	22DCM	■			CO <sub>2</sub> , Temperature, VOCs	0...2000 ppm	32...122°F [0...50°C]			Duct CO <sub>2</sub> , VOCs, Temp
	22DCK	■			CO <sub>2</sub> , Temperature, VOCs, CO <sub>2</sub> /VOCs mix	0...2000 ppm	32...122°F [0...50°C]			Duct CO <sub>2</sub> , VOCs, CO <sub>2</sub> /VOCs, Temp

## Pressure

Application	Type code	Output signal				Measured values	Media	Measurement range (22ADP factory default settings shown)		Options		Application/ comment
		Active	Modbus RTU	BACnet MS/TP	Switch			Pressure	Multirange (selectable)	Auto-zero	Display	
 Duct	22ADP	■	■	■	Differential Pressure	Air	0...1"wc [250 Pa] 0...10"wc [2500 Pa] 0...28"wc [7000 Pa]	8	■	■	Differential air pressure sensor	
 Switch	01APS				Differential Pressure	Air	0.08...1.20"wc [20...300 Pa] 0.20...2.00"wc [50...500 Pa] 0.80...4.00"wc [200...1000 Pa] 2.00...10.00"wc [500...2500 Pa]				Duct differential air pressure switch	
 Pipe	22PDP	■			Differential Pressure	Water	0...10 psid 0...20 psid 0...25 psid 0...50 psid 0...100 psid 0...125 psid 0...250 psid		■	■	Wet -to-wet differential pressure measurement utilizing remote sensors Optional armored cables	
 Pipe	22WP	■			Pressure	Air, Water, Steam	0...15 psi 0...50 psi 0...100 psi 0...200 psi 0...580 psi				Pipe water and pressure sensor	
	22WDP	■			Differential Pressure	Air, Water	0...15 psi 0...50 psi 0...100 psi				Pipe water differential pressure sensor	

### All sensors feature:

**Active:** 0...5/10 V, 4...20 mA

**Passive:** PT100, PT1000, Ni1000, 10K2, 10K3, NTC20K

**Supply voltage:** DC 15...24 V, AC 24 V


**UL:** cULus listing (except 22WP/WDP)

**Protection:** NEMA 4X / IP65 (except for 01DTS, 01APS, 22WP, 22WDP; 01APS is ETL listed)

\* For active temperature sensors with several measurement ranges, the default range is noted. For additional and allowable operating temperature ranges refer to the data sheet.

For pressure sensors with several measurement ranges, the maximum range is noted. Refer to the data sheet for additional ranges.

## Room

Application	Type code	Output signal				Measured values	Measurement range			Communication				
		Active	Passive	NTC10k2	NTC10k3		Temperature	Humidity	CO <sub>2</sub>	ePaper Display	Display App (remote)	BACnet MS/TP	Modbus	MP-Bus
	22RT-5900A*	■				Temperature	32...122°F [0...50°C]				■			■
	22RTH-58L0A*	■	■	■		Temperature, Relative Humidity, Dew Point		0...100%			■			■
	22RTH-5800A*	■				Temperature, Relative Humidity, Dew Point		0...100%			■			■
	22RTM-58L0A*	■	■	■		Temperature, Relative Humidity, CO <sub>2</sub>		0...100%	0...2000 ppm		■			■
	22RTH-58M0A*	■	■		■	Temperature, Relative Humidity, Dew Point		0...100%			■			■
	22RTM-58M0A*	■	■		■	Temperature, Relative Humidity, CO <sub>2</sub>		0...100%	0...2000 ppm		■			■
	22RTM-5800A*	■				Temperature, Relative Humidity, CO <sub>2</sub>		0...100%	0...2000 ppm		■			■
	22RT-5900D	■				Temperature					■			■
	22RTH-5800D	■				Temperature, Relative Humidity, Dew Point		0...100%			■			■
	22RTM-5800D	■				Temperature, Relative Humidity, CO <sub>2</sub>		0...100%	0...2000 ppm		■			■
	22RTH-5U00A*	■				Temperature, Relative Humidity, Dew Point		0...100%			■	■	■	■
	22RTM-5U00A*	■				Temperature, Relative Humidity, CO <sub>2</sub>		0...100%	0...2000 ppm		■	■	■	■
	22RTH-5U00D	■				Temperature, Relative Humidity, Dew Point		0...100%			■	■	■	■
	22RTM-5U00D	■				Temperature, Relative Humidity, CO <sub>2</sub>		0...100%	0...2000 ppm		■	■	■	■

\* Remote setpoint capability with Belimo Room Display App.

