



The foundation  
of comfort.

**Belimo sensors.**

**BELIMO**<sup>®</sup>

# Sensors by Belimo. The perfect complement to actuators and valves.



Belimo, the global market leader in the development and production of actuators and control valves for heating, ventilation and air-conditioning (HVAC) systems, has now opened a new chapter in its company history by adding an innovative line of sensors to its product range.

The sensors from Belimo have been designed to ensure the highest quality and reliability, easy installation and seamless compatibility with all major building automation and control systems (BACS). As a complete field level device solution provider, we offer a range that includes sensors for measuring temperature, humidity, pressure, CO<sub>2</sub> and volatile organic compounds (VOCs) for outdoor, pipe and duct applications. Sensors from Belimo are backed with first-class service and support.



# Seamless integration, reliable and intuitive.

The new range of sensors is the result of Belimo's experience and knowledge in the HVAC industry and our continuous focus on providing added value to our customers. The innovative design offers easy installation and seamless integration to ensure optimal system performance.



## Seamless

Utilising innovative technology, the sensors are designed to work seamlessly with all major building automation and control systems ensuring optimised solutions in terms of performance and energy efficiency.



## Reliable

The well-known high quality guarantees reliable and accurate readings over the complete life cycle of the building. The highly resistant sensors also carry a 5-year warranty and conform to NEMA 4X/ IP65 requirements.



## Intuitive

Installation and commissioning are done in just a few simple steps thanks to the compact modular design featuring a screwless snap-on cover that can be opened and closed without tools and a detachable mounting plate which serves as drilling template.

“I have worked with Belimo for over 17 years. The company has always exceeded my expectations regarding quality, customer service and reliability. The new sensors which can be integrated via BACnet and Modbus are a very interesting addition to the product range from Belimo.

As proven by the innovative Energy Valve, these products provide a significant added value in building automation.”

**Andreas Wechner, Project Manager,  
Trane (Schweiz) GmbH**

# Innovation for your peace of mind.

## Snap-on cover

First sensor housing on the market offering screwless no-tool design and NEMA 4X / IP65 protection allowing quicker and more reliable installation.



## BACnet and Modbus communication protocols

Provide superior application data access and allow for easy commissioning and configuration.



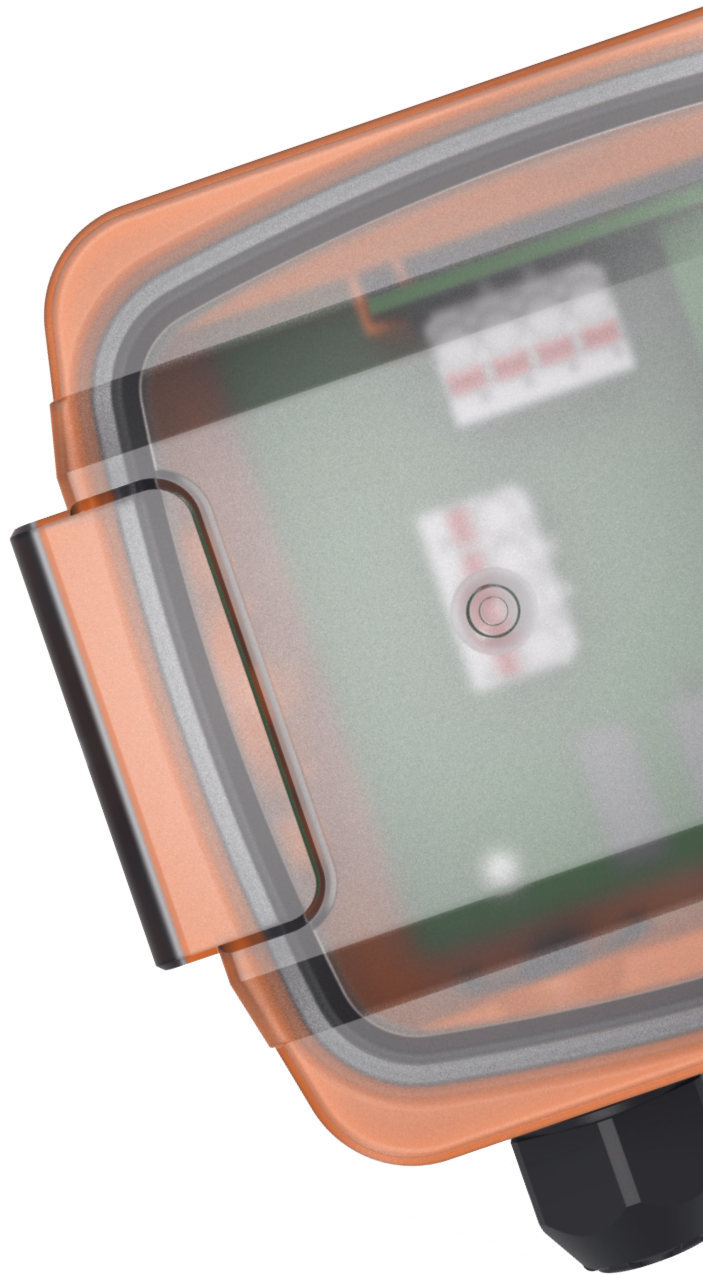
## Detachable mounting plate

Designed to be used as a drilling template for easy mounting and installation.



## NEMA 4X / IP65 compliance

All sensors from Belimo with snap-on cover housing fulfill these requirements. These sensors are suitable for demanding and outdoor applications including dirt, dust, humidity, condensation, rain and snow.

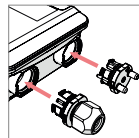






#### Universal design enclosure

Ensures a streamlined product range, which makes the product selection process and installation quick and easy.



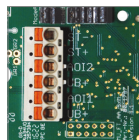
#### Modular conduit fitting

Suitable for additional wiring options and mounting configurations.



#### Plug-in terminals

Allow tool-less connection and maximum pull-out force, saving time during wiring and ensuring maximum contact reliability.



#### Output protection

Reverse-polarity protected to prevent damage caused by incorrect wiring.

Sensors from Belimo feature a unique uniform enclosure, which allows quick installation and makes them fully compatible with all major building automation and control systems. This design blends seamlessly into the product range from Belimo (actuators, valves and sensors). One single enclosure design meets NEMA 4X/IP65 requirements and streamlines the product range.

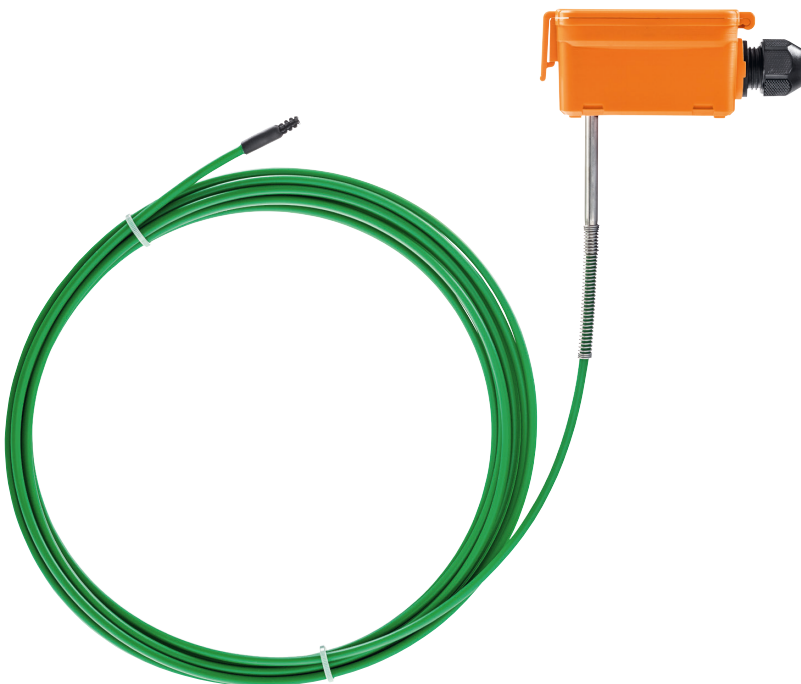
# A comprehensive range of HVAC sensors.

With a complete range of sensors, Belimo is now your single source for HVAC field devices. Actuators and valves are complemented by an extensive range of sensors for temperature, humidity, air quality and pressure.

Belimo provides standardisation, streamlined ordering, on-time delivery directly to the building project site, easy installation and various cable fittings along with quick setup, saving you time and money. The attractive uniform design makes the sensors easy to use and install and ensures high reliability. Furthermore, the characteristic orange housing allows the sensors to be immediately identified as products from Belimo. This is particularly useful in the commissioning phase.

## Temperature sensors

Temperature is one of the most important measurement values in building control. Accurate and reliable temperature readings are essential for optimal building comfort and energy efficiency. Outdoor air, duct and pipe-temperature sensors are designed for easy installation and are compatible with all major BACS.



## FEATURES

- Variety of output signals, passive NTC and RTD, 0...5/10 V, 4...20 mA ensure seamless connection to all major BACS on the market.
- Up to 8 field-selectable measurement ranges to simplify logistics and reduce stock storage, providing flexibility.
- Sintered moisture protection coating on all duct, immersion, and cable sensors protects against condensation and mechanical stress and vibrations.

## PRODUCT SERIES

Outdoor, Duct averaging, Duct / Immersion, Strap-on, Cable, Frost protection.

## Humidity sensors

Controlling humidity in buildings is critical to occupant comfort. It is also important to protecting building infrastructure, production processes, stored goods and museum artwork. The range of durable duct, outdoor air and condensation sensors is designed to provide energy-efficient monitoring and is compatible with all major BACS. High-quality sensors that perform reliably provide high 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.
- Multisensor with selectable output-measurement values: relative humidity, absolute humidity, enthalpy and dew point.
- Up to 4 field-selectable temperature measurement ranges provide flexibility during commissioning, simplify logistics and reduce stock storage.

## PRODUCT SERIES

Outdoor Air, Duct and Condensation.





## Air Quality sensors

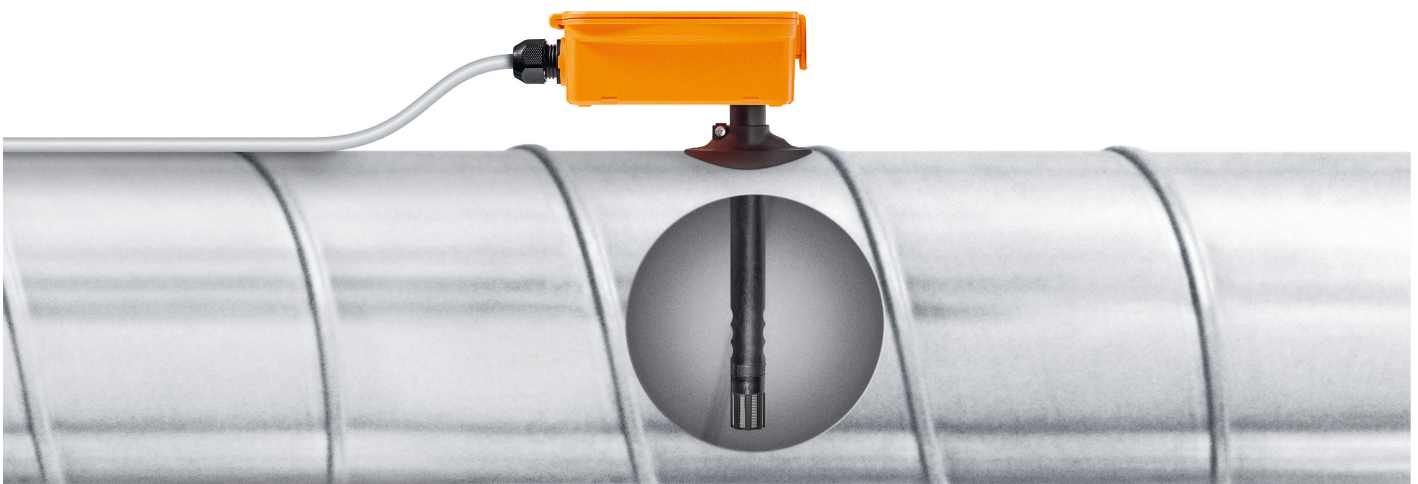
Air quality sensors from Belimo, such as CO<sub>2</sub> and VOC sensors, guarantee optimal indoor air quality with increased comfort levels and maximised energy savings in buildings. Integrated temperature and humidity sensors are available.

### FEATURES

- Dual-channel CO<sub>2</sub> sensor based on NDIR technology. The additional reference channel allows compensation of the long-term drift, providing precise accuracy and long-term stability.
- Wide range of combined multisensors for CO<sub>2</sub>, humidity, temperature and VOC offer reduced labour and material costs.
- Dual-channel self-calibration technology allows the CO<sub>2</sub> sensors from Belimo to be used for all types of buildings and applications where the ABC method (Automatic Background Calibration) can not be used.

### PRODUCT SERIES

- CO<sub>2</sub>
- CO<sub>2</sub> + Temperature
- CO<sub>2</sub> + Humidity + Temperature
- CO<sub>2</sub> + VOC
- CO<sub>2</sub> + VOC + Temperature
- CO<sub>2</sub> + VOC + Mix CO<sub>2</sub>/VOC + Temperature



## Pressure sensors

Accurate pressure measurement is important for optimal HVAC system performance. Pressure sensors from Belimo measure very low to high pressures in air, water and refrigerants. The sensors offer precise measurement of pressure, differential pressure and volumetric flow with high accuracy for reliable monitoring. Selectable measuring ranges are available for application flexibility.



### FEATURES DIFFERENTIAL PRESSURE SENSOR FOR AIR

- Eight field-selectable measurement ranges for differential pressure output.
- Direct volume-flow-output equations are preprogrammed for most major fan manufacturers.
- Excellent zero point stability and high accuracy.
- Auto-zero or manual-calibration option.
- LCD display optional.

### FEATURES DIFFERENTIAL PRESSURE SWITCH FOR AIR

- Field-adjustable switch point.
- Over  $10^6$  switching cycles.

### FEATURES DIFFERENTIAL PRESSURE SENSOR FOR WATER

- Highly stable resistive sensor element on ceramic substrate.
- Rugged stainless-steel housing.

### FEATURES PRESSURE SENSOR FOR WATER AND REFRIGERANTS

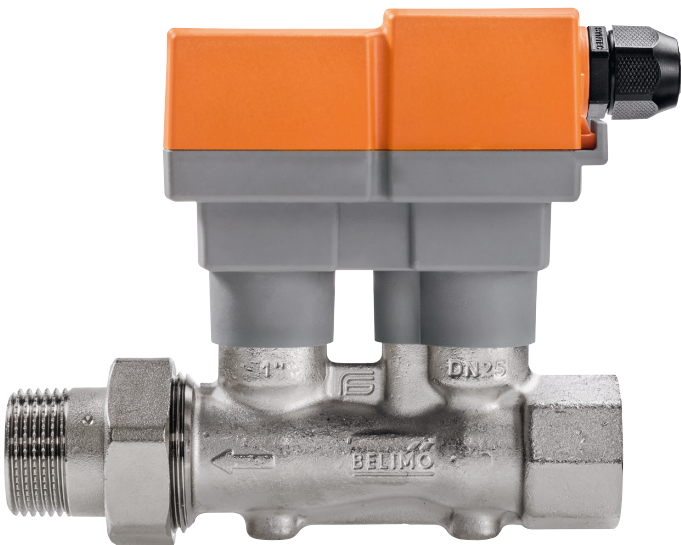
- Resistive sensor element on stainless-steel membrane.
- All wetted material stainless-steel.

### PRODUCT SERIES

Differential pressure air, Differential pressure switch air, Differential pressure water, Pressure water and refrigerants.

## Flow sensors

Reliable measurement of flow plays an important role in maximising HVAC system efficiency and conserving energy. Inline flow sensors from Belimo utilise ultrasonic transit-time technology to provide accurate and repeatable water-flow measurement. Their compact size and insensitivity to dirt make them ideal for use with HVAC chilled water, hot water and water / glycol solutions at temperatures ranging from  $-20$  to  $120$  °C. The sensors are fabricated from corrosion-resistant materials, ensuring reliable operation and extended product life.



## FEATURES

- Multipoint wet calibrated to ensure accuracy and repeatability.
- Patented temperature and glycol compensation logic assures accuracy over the whole temperature and glycol concentration range.
- $\pm 2\%$  accuracy of reading and  $\pm 0.5\%$  repeatability ensure accurate and precise flow measurement.
- Ultra compact size: with a short inlet length of  $5 \times \text{DN}$  and no output-length requirements, the ultrasonic flow sensor from Belimo can be installed even where space restrictions are very tight.
- Low power consumption of  $0.5 \text{ W}$  saves energy and transformer capacity.

## PRODUCT SERIES

Ultrasonic flow (volumetric flow)

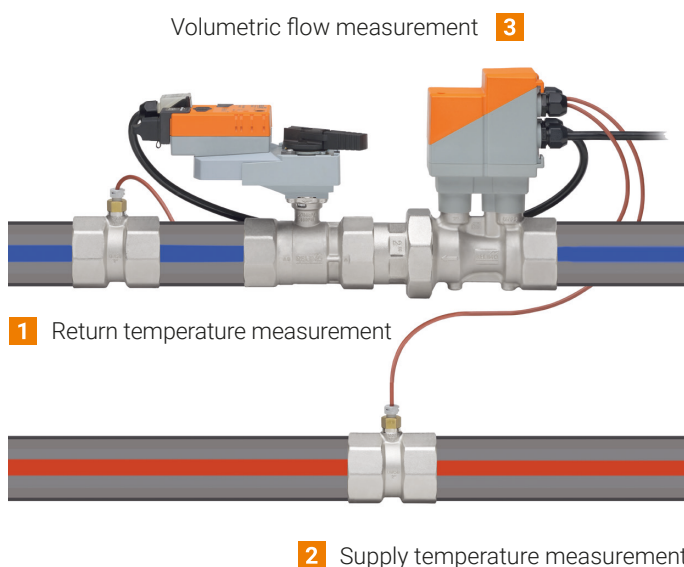


# A seamless approach.

For over 40 years, Belimo has been continuously developing and expanding its range of new products and technologies to improve efficiency in buildings. The new range of sensors stems from the release of the Belimo Energy Valve™, an innovative solution integrating sensors.

The Belimo Energy Valve™ is a pressure independent valve that measures and manages coil energy by using an embedded ultrasonic flow sensor, along with supply and return water-temperature sensors. The Belimo Energy Valve™ also has the patented Power Control and the built-in Belimo Delta-T manager logics, which monitors coil performance and optimises the available energy of the coil by maintaining a minimum differential temperature.

Since its introduction, the Belimo Energy Valve™ has won many major HVAC industry awards worldwide.



## SelectPro

SelectPro is a quick and simple tool for accurately sizing and selecting valves and actuators. Now also including sensors, it allows the selection of all field devices with one single tool.



SelectPro can be downloaded from:  
[www.belimo.eu/selectpro](http://www.belimo.eu/selectpro)

## Retrofit App






The Belimo Retrofit App is a mobile tool that can be used to quickly and easily find replacement solutions for valves, actuators and sensors. It is available for free download via Google play and App Store.



# Sensors from Belimo at a glance.




The following tables provide an overview of Belimo's wide range of sensors for each application and their technical specifications.

## Temperature


Application	Type code	Output signal			Measurement range <sup>1</sup> Factory settings		Probe length [mm]	Application / comment
		Passive	Active	Switch		Multirange (selectable)		
 Outdoor	01UT	■			-35...+50 °C	-	-	<ul style="list-style-type: none"> <li>- Outdoor temperature sensor</li> <li>- Room temperature sensor with NEMA 4X / IP65 protection</li> </ul>
	22UT		■		-50...+50 °C	8	-	
 Duct/ Immersion	01DT	■			Sensor dependent	-	50, 100, 150, 200, 300, 450	<ul style="list-style-type: none"> <li>- Duct temperature sensor</li> <li>- Immersion sensor, compression fitting or a thermowell required</li> </ul>
	22DT		■		0...+160 °C	8	50, 100, 150, 200, 300, 450	
 Duct averaging	22MT		■		-20...+80 °C	8	6000	Duct averaging temperature sensor for air-handling units or larger ducts with stratification
 Strap-on	01ST	■			-35...+100 °C	-	-	Strap-on temperature sensors for heating systems and solar collectors, passive (ST, without housing) and passive or active (HT, with housing)
	01HT	■			-35...+90 °C	-	-	
	22HT		■		0...+100 °C	8	-	
 Cable	01CT	■			-35...+100 °C	-	2000	Cable temperature sensor passive (without housing) and active (with housing)
	22CT		■		0...+160 °C	8	2000	
 Frost protection	01DTS			■	-10...+12 °C	-	3000, 6000	Frost protection thermostats for protection of heat exchangers and registers in air-handling units with automatic or manual reset

1) For active sensors with multiple field-selectable temperature measurement ranges the factory setting is noted. For the other ranges as well as the allowed ambient and media temperature ranges please see data sheet.

## Humidity





Application	Type code	Measured values						Output signal				Measurement range			Application / comment
		Humidity	Temperature	Enthalpy	Dew point	Abs. humidity	Condensation	Active	Modbus RTU	BACnet MS/TP	Switch	Humidity	Temperature Factory settings	Multirange (selectable)	
 Outdoor	22UTH	■	■	■	■	■		■	■	■		0...100% rH	-20...+80 °C	4	<ul style="list-style-type: none"> <li>– Outdoor sensor humidity / temperature</li> <li>– Room sensor humidity / temperature with NEMA 4X / IP65 protection</li> <li>– Option: weather protection</li> </ul>
 Duct	22DTH	■	■	■	■	■		■	■	■		0...100% rH	-20...+80 °C	4	Duct sensor humidity / temperature
 Condensation	22HH						■				■	–	–	–	Condensation sensor Option: external sensor

## Air Quality

Application	Type code	Measured values					Output signal			Measurement range			Application / comment
		CO <sub>2</sub>	Temperature	Humidity	VOC	Mix CO <sub>2</sub> /VOC	Active	Modbus RTU	BACnet MS/TP	CO <sub>2</sub>	Temperature	Humidity	
 Duct	22DC	■					■			0...2000 ppm	–	–	Duct sensor CO <sub>2</sub>
	22DTC	■	■				■			0...2000 ppm	–	–	Duct sensor CO <sub>2</sub> , T
	22DTM	■	■	■				■	■	0...2000 ppm	0...+50 °C	0...100% rH	Duct sensor CO <sub>2</sub> , H, T
	22DCV	■			■		■			0...2000 ppm	–	–	Duct sensor CO <sub>2</sub> , VOC, CO <sub>2</sub> /VOC, T
	22DCM	■	■		■		■			0...2000 ppm	0...+50 °C	–	Duct sensor CO <sub>2</sub> , VOC, T
	22DCK	■	■		■	■	■			0...2000 ppm	0...+50 °C	–	Duct sensor CO <sub>2</sub> , VOC, CO <sub>2</sub> /VOC, T





## Pressure

Application	Type code	Measured values			Output signal			Media			Measurement range <sup>1</sup>		Options		Application / comment
		Differential pressure	Relative pressure	Flow <sup>2</sup> (Volumetric flow)	Active	Modbus RTU	MP-Bus	Switch	Air	Water	Refrigerants	Pressure	Multirange (selectable)	Auto-zero	
 Duct	22ADP	■	■	■	■			■			250 Pa, 2500 Pa, 7000 Pa	■	■	■	Differential pressure sensor air
 Duct	MS	■					■	■			- 20...600 Pa				VAV (Variable Air Volume) systems
 Duct	01APS	■						■	■		20...300 Pa, 50...500 Pa, 200...1000 Pa, 500...2500 Pa				Duct differential pressure switch air
 Pipe	22WP		■		■			■	■	■	4, 6, 10, 16 bar				Pipe pressure sensor water and refrigerants
	22WDP	■			■					■	1, 2.5, 4, 6 bar				Pipe differential pressure sensor water

1) For pressure sensors with multiple measurement ranges, the maximum range is noted. For the other ranges please see data sheet.

2) For sensors with Modbus RTU only.

## Flow

Application	Type code	DN [mm]	FS [l/s] FS: Full Scale (maximum measurable flow)	$\Delta p$ [kPa] $\Delta p$ : pressure drop at FS	Output signal  Active	Media  Water Water/glycol mix (<60%)	Application / comment	
	Pipe	FM015R-SZ	15	0.42	13	0...10 V	<ul style="list-style-type: none"> <li>■ Water</li> <li>■ Water/glycol mix (&lt;60%)</li> </ul>	Flow measurement with glycol compensation
		FM020R-SZ	20	0.78	13			
		FM025R-SZ	25	1.38	9			
		FM032R-SZ	32	2.16	7			
		FM040R-SZ	40	3.00	7			
		FM050R-SZ	50	5.76	16			
	Pipe	FM065F-SZ	65	9.60	12	0...10 V	<ul style="list-style-type: none"> <li>■ Water</li> <li>■ Water/glycol mix (&lt;60%)</li> </ul>	Flow measurement with glycol compensation
		FM080F-SZ	80	13.60	13			
		FM0100F-SZ	100	24.00	12			
		FM0125F-SZ	125	37.50	13			
		FM0150F-SZ	150	54.00	15			

### All sensors from Belimo feature:

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

**Passive:** PT100, PT 1000, Ni 1000, NiTK5000, Ni 891, NTC10K, NTC10K Precon, NTC20K

**Communication:** Modbus RTU, BACnet MS/TP

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

**Protection:** NEMA 4X/IP65 (except for 01APS und FM: IP54, MS: IP40)

# All inclusive.

Belimo as a global market leader develops innovative solutions for the controlling of heating, ventilation and air-conditioning systems. Actuators, valves and sensors represent our core business.

Always focusing on customer added value, we deliver more than only products. We offer you the complete product range for the regulation and control of HVAC systems from a single source. At the same time, we rely on tested Swiss quality with a five-year warranty. Our worldwide representatives in over 80 countries guarantee short delivery times and comprehensive support through the entire product life. Belimo does indeed include everything.

The "small" Belimo devices have a big impact on comfort, energy efficiency, safety, installation and maintenance. In short: Small devices, big impact.



5-year warranty



On site around the globe



Complete product range



Tested quality



Short delivery times



Comprehensive support



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