The Foundation of Comfort

Belimo Sensors

BELIMO®

Providing the reliability you know and expect

Sensors from Belimo offer superior reliability, easy installation, and seamless integration with major Building Automation Systems (BAS). The innovative sensor housing design offers IP65/NEMA 4X protection, enabling quick mounting and easy commissioning. Belimo offers a complete range of sensors for measuring temperature, humidity, pressure, CO_2, volatile organic compounds (VOCs), and flow in pipe, duct, and outdoor applications. A world-class service and support team back every product.

Seamless integration and intuitive design

Belimo sensors result from years 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.
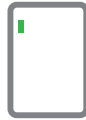
ePaper Touch Display
Featuring high contrast and intuitive operation, our system illustrates current room values and allows for setpoint adjustments.

CO₂ Traffic Light
The LED displays the CO₂ concentration, which is fully customizable through NFC.
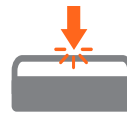
Configurable
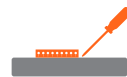Temperature setpoints or fan stage can be displayed or used solely as a sensor.

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.

Quick Response Time
The sophisticated technology allows the sensor to react very quickly to changes in temperature.

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 App and a smartphone, NFC allows quick data access, field adjustments, commissioning, and troubleshooting.
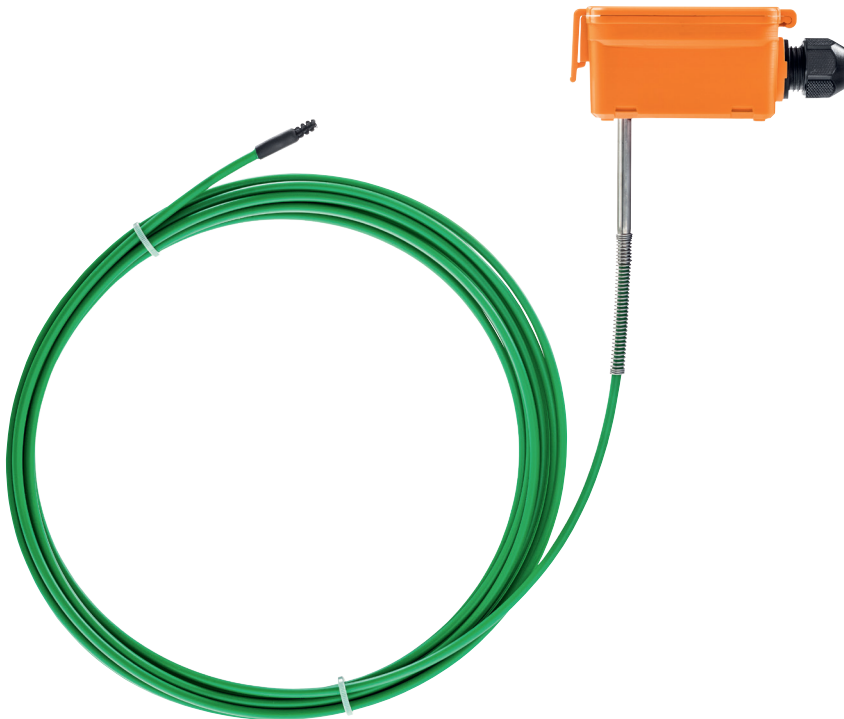
A comprehensive range of HVAC sensors

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.

– 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 ±2% relative humidity as standard and long-term drift <±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

Air Quality Sensors

Air quality sensors provide occupant comfort and energy efficiency. We offer a wide range of combined multi-sensors for CO_2, humidity, temperature, and VOCs designed to ensure air quality and maximize energy savings over the life cycle of the building.

FEATURES

– Dual channel CO_2 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_2 and VOCs sensors are available for building applications that require sensors with multi-functional capabilities.

– Dual channel self-calibration technology allows the Belimo CO_2 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_2
CO_2 + Temperature
CO_2 + Humidity + Temperature
CO_2 + VOCs
CO_2 + VOCs + Temperature
CO_2 + VOCs + CO_2/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.

– Measuring values and settings displayed on LCD.

– Optional 3-valve manifold accessory.

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_2 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 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.

– A smartphone app can be used to create a remote display with setpoint functionality.

– LED light indicates CO_2 concentrations in rooms for ventilation or air purification.

– Snap cover and spring-loaded terminal block allow for quick installation and easy commissioning.

– PC-board cover plate provides additional protection from mechanical damage, dust, and vibration.

– 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_2

Flow Sensors

Reliable, accurate flow measurement is essential for maximizing HVAC system efficiency and conserving energy. Belimo's inline flow sensors utilize ultrasonic transit-time technology to provide accurate and repeatable flow measurements in any application. The compact size and robust design make them suitable for chilled water, hot water, and water/glycol solutions at temperatures ranging from -4...+250°F [-20...+120°C]. The sensors are fabricated from corrosion resistant materials, ensuring reliable operation and extended product life.

FEATURES

– Multi-point wet calibrated to ensure accuracy and repeatability.

– A patented glycol algorithm provides the percentage of system glycol and dynamically compensates if concentration changes ensuring precise flow.

– Reliable ultrasonic flow measurement with total volume accumulation.

– Flexible and user defined analog outputs (0.5...10, 0...10 or 2...10 VDC) for flow and temperature; selectable via the Belimo Assistant App.

– An additional active sensor or switch can be connected, expanding application possibilities.

– ±2% flow measurement ensures accurate and precise flow measurement.

– Ultra-compact size with a short inlet length of 5 x nominal pipe diameter and no output-length requirements allow installation in tight spaces.

– An integrated temperature sensor allows accurate measurement of fluid temperature.

– All devices can be easily integrated into the BMS and support BACnet or Modbus communication.

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

PRODUCT SERIES

Ultrasonic Flow (Volumetric Flow)

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.
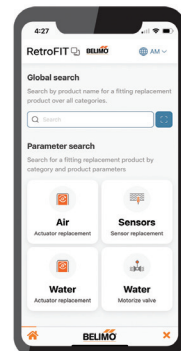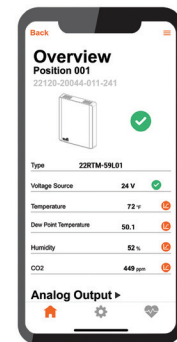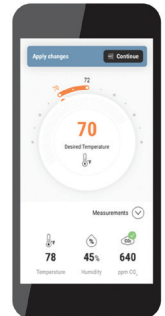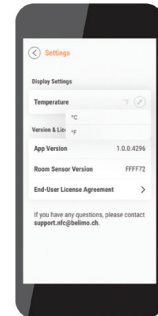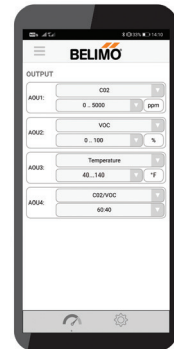
Belimo Room Display App

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 App

This App provides on-site operation of devices with built-in NFC interface and complete transparency at all times regarding your Belimo HVAC actuator solution and the process of your system. With the Belimo Assistant App, your smartphone or tablet provides on-site wireless operation for VAV, sensors, damper, and valve actuators.

Belimo RetroFIT App

With the Belimo RetroFIT App, you can specifically replace your obsolete or defective sensors and actuators from various suppliers with devices from Belimo. With the Belimo Duct Sensor Assistant App via the Belimo Duct Sensor Assistant App it is possible to extend the range of use and adapt the configuration individually to application requirements.

Belimo sensors at a glance

Temperature

Application		Type code	Output signal			Measurement range Factory settings	Multirange (selectable)	Probe length	Application/comment
			Passive	Active	Switch				
	Outdoor air	01UT	■			-30…+122°F [-35…+50°C]			– Outdoor temperature – Wall temperature with NEMA 4X / IP65 protection
		22UT		■		-30…+130°F [-50…+50°C]	8		
	Duct immersion	01DT	■			Sensor dependent		2" [50 mm], 4" [100 mm], 6" [150 mm], 8" [200 mm], 12" [300 mm], 18" [450 mm]	– Duct temperature – Immersion sensor and thermowell pockets in brass or stainless steel
		22DT		■		0…150°F [0…160°C]	8	2" [50 mm], 4" [100 mm], 6" [150 mm], 8" [200 mm], 12" [300 mm], 18" [450 mm]	
	Duct averaging	01MT	■			Sensor dependent		10 ft [3 m], 20 ft [6 m]	Duct averaging temperature sensor for air-handling units or larger ducts with air stratification
		22MT		■		40…90°F [-20…+80°C]	8	10 ft [3 m], 20 ft [6 m]	
	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	2" [50 mm]	
	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

Please note: For temperature and humidity sensors, the °F and °C are not direct conversions.
°F is the standard range for the United States, and °C is the standard range for Canada and Latin America.

Humidity

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	– Outdoor humidity temperature sensor – Wall humidity temperature sensor with NEMA 4X / IP65 protection – Weather/rain shield included
	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

Air Quality

Application		Type code	Output signal			Measured values	Measurement range			Options	Application/comment
			Active	Modbus RTU	BACnet MS/TP		CO_2	Temperature	Humidity	Display	
	Duct	22DC	■			CO_2	0...2000 ppm				Duct CO_2
		22DTC	■			CO_2, Temperature	0...5000 ppm	32...122°F [0...50°C]			Duct CO_2, Temp
		22DTM	■	■	■	CO_2, Temperature, Humidity	0...2000 ppm	32...122°F [0...50°C]	0...100% Non condensing	■	Duct CO_2, rH, Temp
		22DCV	■			CO_2, VOCs	0...2000 ppm				Duct CO_2, VOCs
		22DCM	■			CO_2, Temperature, VOCs	0...2000 ppm	32...122°F [0...50°C]			Duct CO_2, VOCs, Temp
		22DCK	■			CO_2, Temperature, VOCs, CO_2/VOCs mix	0...2000 ppm	32...122°F [0...50°C]			Duct CO_2, VOCs, CO_2/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
	Pipe	22WP	■				Pressure	Air, Water	0…15 psi 0…50 psi 0…100 psi 0…200 psi 0…580 psi				Pipe water and pressure sensor
		22WDP	■				Differential Pressure	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
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			ePaper Display	Communication			
		Active	Passive	NTC10k2	NTC10k3		Temperature	Humidity	CO_2		Display App (remote)	BACnet MS/TP	Modbus	MP–Bus
Room	22RT-5900A*	■				Temperature	32...122°F [0...50°C]				■			■
	22RTH-59L0A*	■	■	■		Temperature, Relative Humidity, Dew Point		0...100%			■			■
	22RTH-5900A*	■				Temperature, Relative Humidity, Dew Point		0...100%			■			■
	22RTM-59L0A*	■	■	■		Temperature, Relative Humidity, CO_2		0...100%	0...2000 ppm		■			■
	22RTH-59M0A*	■	■		■	Temperature, Relative Humidity, Dew Point		0...100%			■			■
	22RTM-59M0A*	■	■		■	Temperature, Relative Humidity, CO_2		0...100%	0...2000 ppm		■			■
	22RTM-5900A*	■				Temperature, Relative Humidity, CO_2		0...100%	0...2000 ppm		■			■
	22RT-5900D	■				Temperature				■				■
	22RTH-5900D	■				Temperature, Relative Humidity, Dew Point		0...100%		■				■
	22RTM-5900D	■				Temperature, Relative Humidity, CO_2		0...100%	0...2000 ppm	■				■
	22RTH-5U00A*	■				Temperature, Relative Humidity, Dew Point		0...100%			■	■	■	■
	22RTM-5U00A*	■				Temperature, Relative Humidity, CO_2		0...100%	0...2000 ppm		■	■	■	■
	22RTH-5U00D	■				Temperature, Relative Humidity, Dew Point		0...100%		■		■	■	■
	22RTM-5U00D	■				Temperature, Relative Humidity, CO_2		0...100%	0...2000 ppm	■		■	■	■

* Remote setpoint capability with Belimo Room Display App.

Room (Continued)

Application	Type code	Output signal						Manual override	Measured values	Measurement range (Temperature)	No Belimo Logo	Additional information
		Active	Passive	NTC10k2	NTC10k3	NTC20k	PT1000					
Room	01RT-5B-0		■				■	■	Temperature	32...122°F [0...50°C]		
	01RT-5B00L-0		■				■	■			■	
	01RT-5L-0		■	■				■				
	01RT-5L00L-0		■	■				■			■	
	01RT-5M-0		■		■			■				
	01RT-5M00L-0		■		■			■			■	
	01RT-5Q-0		■			■		■				
	01RT-5Q00L-0		■			■		■			■	
	P-01RT-5B-0		■					■	Temperature with Setpoint			
	P-01RT-5B00L-0		■					■			■	
	P-01RT-5L-0		■	■				■				
	P-01RT-5L00L-0		■	■				■			■	
	P-01RT-5M-0		■		■			■				
	P-01RT-5M00L-0		■		■			■			■	
	P-01RT-5Q-0		■			■		■				
	P-01RT-5Q00L-0		■			■		■			■	
	EXT-RT-SS1000		■				■	■	Temperature			
	EXT-RT-SS10K3		■		■							
	EXT-RT-SS20K		■			■						
	EXT-TN-1066869	■							Light			Light Harvesting and Occupancy Detection 0...10 V
	EXT-TN-1071511	■										

Flow Sensors

Application	Type code	Output signal	Measured values	Media	Pipe size	Body pressure rating			Measurement range
		Analog (0 to 10 VDC)	Flow	Water/glycol (<60%)	Inches [mm]	360 psi	ANSI 125	ANSI 250	Max. GPM
Pipe	22PF-5UC	■	■	■	½" [15]	■			7.9
	22PF-5UD	■	■	■	¾" [20]	■			13
	22PF-5UE	■	■	■	1" [25]	■			18.5
	22PF-5UF	■	■	■	1¼" [32]	■			31.7
	22PF-5UG	■	■	■	1½" [40]	■			52.7
	22PF-5UH	■	■	■	2" [50]	■			79.2
	22PF-5UHH	■	■	■	2" [50]	■			100
	FM250	■	■	■	2½" [65]		■		152
	FM250-250	■	■	■	2½" [65]			■	152
	FM300	■	■	■	3" [80]		■		215
	FM300-250	■	■	■	3" [80]			■	215
	FM400	■	■	■	4" [100]		■		380
	FM400-250	■	■	■	4" [100]			■	380
	FM500	■	■	■	5" [125]		■		594
	FM500-250	■	■	■	5" [125]			■	594
	FM600	■	■	■	6" [150]		■		855
	FM600-250	■	■	■	6" [150]			■	855

NOTE: Vnom accounts for 20% overflow (120% flow is the max output reading at 10 V).

Exceptional service

At Belimo, we continually invest in new technologies that increase customer value by improving occupant comfort, energy efficiency, simplified installation, and maintenance-free operation. Our sales team is available to consult and provide insight and advice on how to achieve the best solution to help increase your system performance. Belimo will continue to focus on providing you with exceptional product availability, fast delivery times, and world-class customer service and technical support. We remain dedicated to continuously improve our standards and are committed to providing you with the highest value possible.

Whatever your HVAC application, our global network of support experts are on hand and ready to assist.

Global support

Tested quality

On-time delivery

Extensive service

Complete product range

Belimo Americas
USA, Latin America, and the Caribbean: www.belimo.us
Canada: www.belimo.ca, Brazil: www.belimo.com.br

BELIMO®