

Thermal energy  
management and  
billing made  
easier than ever.

## Belimo Energy Valve™ and Thermal Energy Meter

# Bringing together what belongs together.



The unity of the certified Belimo Thermal Energy Meter™ and the enhanced Belimo Energy Valve™ allows for transparent thermal energy management. The two worlds of “energy control” and “certified energy measurement and billing” are now being united. Accurately measure and monitor thermal flows and energy consumption in heating and cooling systems with direct IoT-based cost accounting using a single device. The new MID-approved Thermal Energy Meters assure high accuracy and reliability, allowing for easy and efficient billing. But measuring reliably is only the beginning. The Belimo Energy Valve™ instantly controls the thermal flow and optimises the energy supply to the user. With this important combination Belimo is stepping into a new era of integrated thermal energy management and is bringing together what belongs together.

# Integrated thermal energy management and billing.

The new range of Belimo Energy Valve™ and Thermal Energy Meters integrates energy metering, energy control, and IoT-enabled billing in one device. It offers seamless and direct integration to the BMS or to IoT-based monitoring platforms, with IoT-based monitoring, performance improvement tools, and billing data. Bringing together performance features to save you time and money.

## → Measure and Control

The Belimo Energy Valve™ offers certified energy metering (MID) and pressure-independent flow, energy efficiency, power control, and delta T management in one device. Monitor and instantly optimise energy consumption for optimal system performance.

## → Certified Metering

The Belimo Thermal Energy Meters™ are certified according to EN 1434/MID and are equipped for remote, IoT-based billing. Belimo's patented automatic glycol monitoring and compensation ensure that your measurement remains accurate, even if the glycol concentrations change.

## → Digital Workflow

Apps and web tools support the design process and offer fast and simple commissioning at your fingertips. A truly digital approach and full transparency on the end users's energy data makes your life easier.

## → Seamless Integration

Seamless and direct integration to the BMS and equipped for IoT-based energy monitoring and billing. Integration of energy-data has never been easier. One device provides all the information you need to improve the energy performance of your system.

“The cloud connection gives us transparency about the energy flows and the certainty that we are doing everything right. We can now individually bill the heating costs via cloud in accordance with the European Measuring Instruments Directive (MID).”

**Samuel Lorez, Head of Technology,  
Lenzerheide Bergbahnen AG**

“Commissioning, integration and activation of the Energy Valve with the integrated Thermal Energy Meter was very easy with the new app via NFC.”

**Martin Eckhoff, AZ systems AG**

# Key features at a glance.

## Belimo Thermal Energy Meter™

### Certified metering, MID approval

The Thermal Energy Meter meets the requirements of EN 1434 and has type approval according to the European Measuring Instruments Directive 2014/32/EU (MI-004).



### Digitally supported workflows

The Belimo Assistant guides you through the setup process.



### IoT-based billing

When connected to the Belimo Cloud, owner-authorized third parties are able to securely access consumption data and provide billing services.



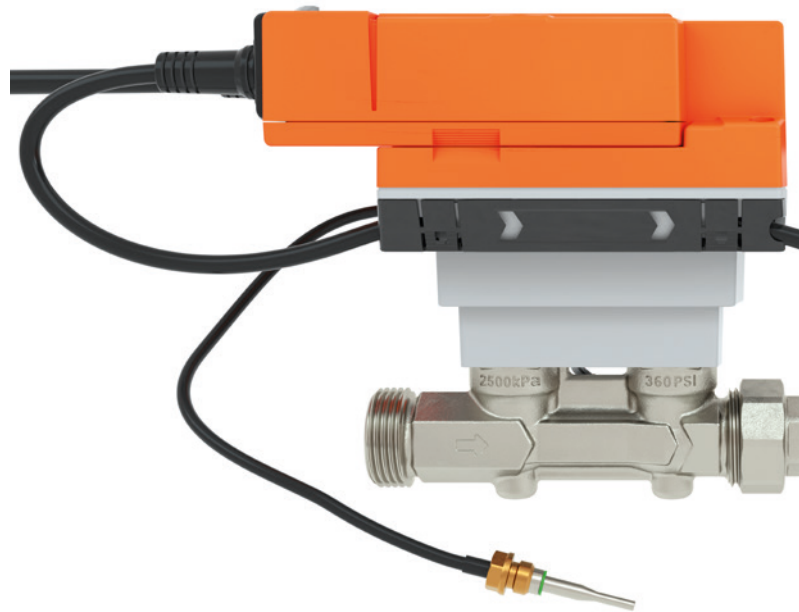
### Easy integration

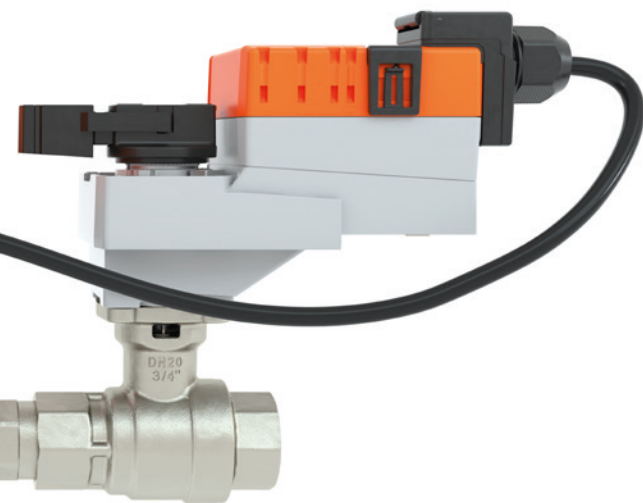
Using BACnet/IP & MSTP and Modbus TCP & RTU (always on board), the Thermal Energy Meter can be integrated directly into the building management system.



### Power over Ethernet (PoE)

The devices can be connected with one standard Ethernet cable providing power and data transmission.





## Belimo Energy Valve™



### Energy monitoring

The thermal energy supplied to the coil is accurately measured and logged. The data helps to identify potential areas for optimisation.



### Glycol measurement and compensation

Glycol measurement and compensation guarantee precise energy metering at all times. With MID versions, a glycol alarm is triggered.



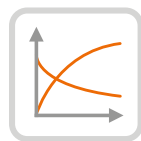
### Power control

Power control allows you to set your power output to a specific value in a linear response. Coil and valve characteristics become irrelevant. Coil control is now both pressure and temperature-independent.



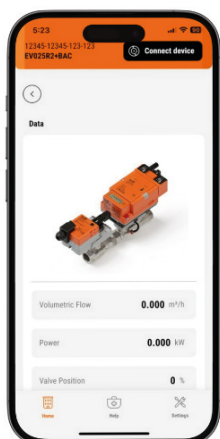
### Automatic balancing

The volumetric flow through the valve is permanently measured and pressure fluctuations in the hydronic system are instantly compensated. This makes hydronic balancing unnecessary.



### Delta T management

The integrated logic prevents the occurrence of low delta T and ensures maximum comfort with the lowest possible energy consumption.



### Simple parameterisation, setup and monitoring

Quick data access, field adjustable, commissioning and troubleshooting with the Belimo Assistant and a smartphone/tablet or PC/laptop (Windows).

# The added value for you as a Belimo customer.

For the first time in history, thermal energy management and billing are combined in one device. This makes the lives of our customers easier than ever.



## Consulting engineer:

- Reduced effort and time savings thanks to the all-in-one solution
- Reduced planning effort through simple valve selection
- Traceable verification and logging (commissioning report)
- Automatic hydronic balancing at every load condition
- Easy adaptations to power changes possible



## Building owner:

- Certified and traceable measurement and logging of energy data, ready for tenant billing
- Open data access provides flexibility in the choice of the energy service provider (e.g. for billing)
- Low commissioning and operating costs, which translate to optimum investment protection
- Future-proof and transparent thanks to direct internet connection



## Operator, facility manager:

- Maximum comfort with minimum operating costs throughout the entire life cycle
- Pressure-independent control eliminates need of regular hydronic re-balancing
- Integrated glycol measurement and compensation, or in the case of MID devices an alarm, guarantee system safety and ensure accurate measuring values
- Traceable verification and logging of billing-relevant data
- High transparency and efficiency thanks to energy and system monitoring with the Belimo Cloud
- Equipment subject to calibration is easy to replace





### Installer:

- Cost reduction and time savings with an all-in-one solution
- No complicated hydronic balancing necessary
- Easy logging of the approved energy meter during commissioning with the Belimo Assistant
- Automatic creation of a metering commissioning report, available online
- Additional commissioning benefits can be found below



### System integrator:

- Billing and control in a single device
- Simple, time-saving commissioning and configuration
- Free choice of control signal (BACnet, Modbus, MP-Bus, M-Bus or analogue signal)
- Energy optimisation through data transparency
- Simplified installation through PoE (Power over Ethernet), as no local power supply is required
- Additional commissioning benefits can be found below



### Measurement service provider:

- App-guided commissioning, automatically creating a formal commissioning report
- The measured data from the MID-certified energy meter can be used directly for tenant billing
- Easy connection to other cloud interfaces
- Easy data logging and processing
- Seamless integration into open metering or billing platforms
- Additional commissioning benefits can be found below



### Commissioning:

- The European requirements of the EN 1434 standard and the MID directive are met
- Integrated web server for direct data access and setting options
- A single smartphone app for everything: commissioning, configuration, diagnosis and monitoring
- Intuitive start-up assistant for commissioning and logging the Thermal Energy Meter

# Measure and control instantly with the Belimo Energy Valve™.

## Certified energy metering

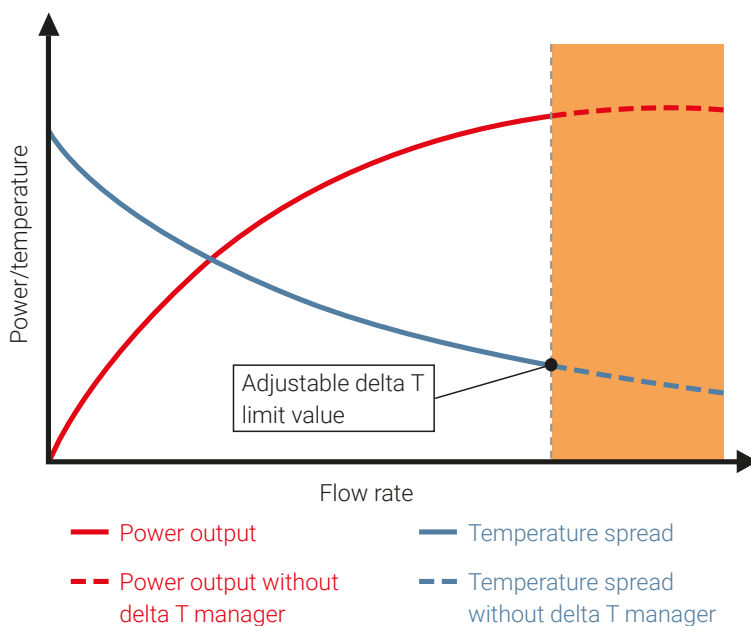
The Belimo Energy Valve™ provides pressure independent flow control and a transparent permanent monitoring of heating and cooling equipment. By measuring, calculating, and visualising important system data such as flow rates, supply and return temperature and current power supplied to the unit and carrying out optimisations based on this data, energy-efficient system operation can be maintained for the entire service life of the product.

## Power control

The all-in-one features of the Belimo Energy Valve™ provide power control for pressure and temperature-independent operation.

## Delta T management

The delta T manager integrated in the Belimo Energy Valve™ continuously measures the temperature spread and compares it with the limit value set for the specific system. If the temperature falls below the limit value, the Belimo Energy Valve™ automatically adjusts the flow rate so that only the amount of water actually required to achieve the desired power is used. In this way, the integrated logic prevents the occurrence of low delta T and ensures maximum comfort with the lowest possible energy consumption.



### LOW DELTA T:

If a heating or cooling heat exchanger is experiencing overflow, this does not equate to a higher heating or cooling output. It rather leads to a lower temperature spread between the supply and return flow as the water has insufficient time to give up its energy, which provides no real power gains. This results in the so-called low delta T. This affects the efficiency of the overall system and leads to additional energy demand at the pumps and plant. True delta T correction can only be accomplished at the consumer, a function that is automatically performed by the Belimo Energy Valve™ if activated. This offers efficient operation of the system, throughout its now extended life cycle.

# Reliable certified metering enabling IoT-based billing.

## High-quality measurement

Belimo Thermal Energy Meters™ use ultrasonic transit time technology, and as a result are dirt-resistant, wear-free, and measure precisely. This is achieved thanks to a fast-measuring cycle. The multipoint wet calibration of each individual meter in production ensures high accuracy over the entire flow measurement range.

## Multi-application device

Belimo Thermal Energy Meters™ are designed to be multi-application devices, i.e. they can be used as heat meters, cold meters, or combined heat/cold meters. They can also be installed either in the return flow or in the supply flow of the system. The application and installation position are provided to the valve during setup using a smartphone and the Belimo Assistant or using a laptop and the built in web-server.

## Certified energy metering

Belimo's certified Thermal Energy Meters meet the requirements of EN 1434 and have type approval in accordance with the European Measuring Instruments Directive 2014/32/EU (MID). The certified devices bear the accompanying MID conformity marking. They provide validated data for invoicing purposes, which can be used for direct tenant billing. The Thermal Energy Meters are approved according to MID for heat metering in pure water systems. Permanent glycol monitoring means that an alarm can be triggered if glycol is present in the water.

## Even higher accuracy using automatic glycol compensation

Our Thermal Energy Meters are also available as variant without MID/EN 1434 approval. They can reliably measure energy, even when there is glycol in the water. They automatically and continuously measure the glycol content in the fluid, compensate for it and, in doing so, ensure reliable ultrasonic volumetric flow measurement. This results in precise determination of the thermal energy.



Multipoint wet calibration

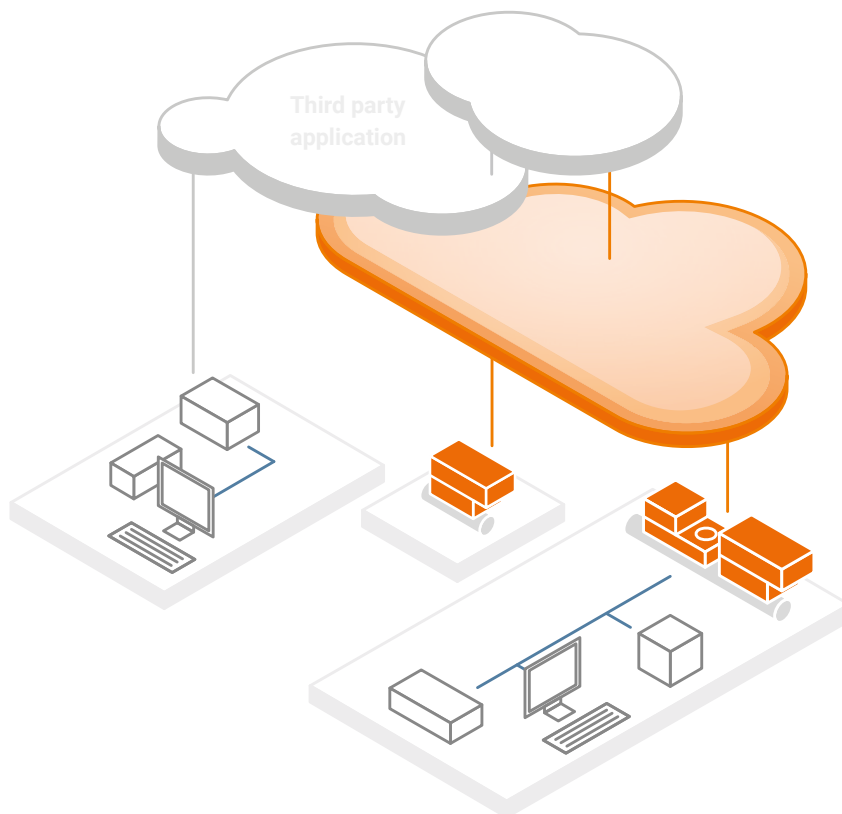


MID conformity marking

# IoT-based billing.

## Simplified energy billing

The Belimo Energy Valve™ and Thermal Energy Meters are ready for remote, IoT-based billing. Authorised users can access the data via a cloud interface. This means it can be easily integrated with other platforms and, in turn, gives you maximum flexibility when choosing your service provider. Thanks to the high data quality, the data can also be used for various other applications.



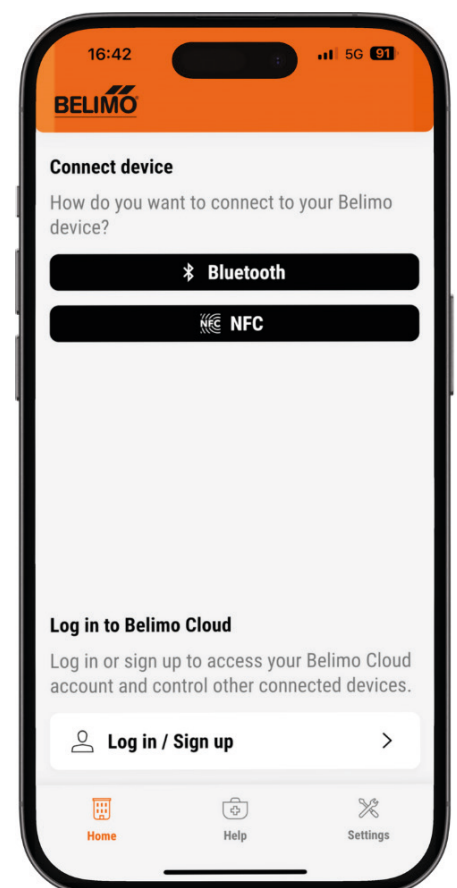
# Digitally supported project design and commissioning.

## Simple parameterisation, setup and monitoring

The Belimo Energy Valve™ and Thermal Energy Meter with NFC interface (Near Field Communication) enable easy configuration and maintenance directly from a smartphone/tablet or PC/laptop (Windows). With the Belimo Assistant, the devices can be configured intuitively and commissioning values can be logged. Key performance indicators, which make it easy to determine the "health status" of the device, ensure reliable operation. Numerous diagnostic parameters show how the device interacts with the system during operation. If servicing is required, it is possible to draw up a failure analysis quickly.

## Multifunctional devices with connection to the cloud

Connection to the Belimo cloud offers not just an extension of the guarantee by two years to seven years, but a whole host of benefits. By maintaining a digital twin of the Energy Valve in the cloud, authorised users are free to interact with the data directly or device owners can authorise a third party to provide billing or even analytical services. The possibilities are endless and continue to grow daily.



# Seamless integration of metering data – with an open approach.

## The future of HVAC systems is connected

Connectivity has always been an important feature of our products. The Belimo Energy Valve™ and the Thermal Energy Meter have on board all common building automation communication protocols (BACnet IP and MS/TP, Modbus TCP and RTU, and Belimo MP-Bus) and also support M-Bus via a converter. Bus communication can also be used for monitoring and overriding when controlling the Belimo Energy Valve™ using an analogue control signal.



## Power over Ethernet

The Belimo Energy Valve™ and the Thermal Energy Meters can be integrated using PoE. This allows the device to be powered and the data to be transmitted simultaneously via an Ethernet cable. This simplifies installation, avoids wiring errors and eliminates the need for a local power supply.



## Direct integration into IoT platforms

Belimo's IoT-ready products allow field devices to be connected directly to modern building IoT platforms. Now you can benefit from the possibilities of a networked digital ecosystem.

- Take full control of your data.
- Implement effective optimisation and energy-saving strategies in buildings.
- Reduce your maintenance costs.
- Easy, open data access and integration provides you with flexibility when choosing your service provider.
- Secure, transparent, and reliable provision of data over the entire life cycle.
- Integration into the platforms of billing service either over the cloud via an API or using M-Bus with a converter.



# The multifunctional all-in-one solution.

The Belimo Energy Valve™, which consists of a 2-way or 3-way characterised control valve, a volumetric flow meter, two temperature sensors, an actuator, and integrated logic, combines several functions in one single, easy-to-install unit. With this new generation, direct IoT-based tenant billing is now also possible with just a single device. This reduces investment costs compared to a conventional solution.

- Measuring: Integrated sensors for measuring temperature spread, flow (including compensation of glycol content) and therefore power.
- Control: Control of valve position, flow or power for perfectly controlling the heat exchanger.
- Balancing: The Belimo Energy Valve™ always ensures the correct amount of water is used – even in the event of differential pressure changes and in partial load operation.
- Isolating: The energy supply to a zone can be completely shut off. No leakage thanks to the air-bubble tight characterised control valve.
- Energy monitoring: Optimisation potential can be identified by recording all system data.
- Billing: Ready for IoT-based tenant billing.

## Modular design for a fast meter exchange

The Thermal Energy Meter consists of a sensor module (lower part) with connected temperature sensors, which houses the calculator unit and measuring system, and the logic module (upper part), which connects the Thermal Energy Meter to the power supply and provides the bus and NFC communication interface.

The sensor module is available as a spare part and, in certain countries, must be periodically replaced according to national regulations. To do this, the logic module can be separated (leaving all cables connected) and the lower sensor module can be easily exchanged. After that the logic module is clipped back on again. There is no need to re-connect cables or re-integrate the meter into the system. A very significant time-saving!

### Shopping list

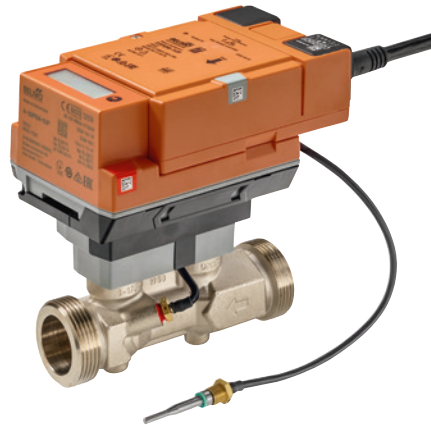
- 1 Belimo Energy Valve MID ✓
- ~~1 Control valve~~
- ~~1 Balancing valve~~
- ~~1 Meter with MID approval~~
- ~~1 Separate power supply~~
- ~~1 Complex calculation~~
- ~~30 min of hydronic balancing~~
- ~~45 min for assembly work~~
- ~~Expenses for cloud connection~~



# Thermal Energy Meter range.

Depending on the desired application, Thermal Energy Meters that meet the requirements of EN 1434 and have type approval according to the European Measuring Instruments Directive 2014/32/EU (MID) or devices with automatic glycol compensation are available. If the application requires a calibrated heat measurement, which can be used to settle the costs directly, the MID-approved Thermal Energy Meters are used.

Thermal Energy Meters are available without approval, for applications or regions that do not require it. This model should also be selected if you require automatic compensation for glycol such as sub-zero applications.



## FEATURES

- Accurate measurement based on ultrasonic transit time technology
- Ready for IoT-based billing
- Simple setup and configuration with the Belimo Assistant
- Analogue/digital signal conversion of passive and active sensors or switches
- Analogue output (DC 0...10 V) is available and can output the flow rate or temperature of the fluid
- Seamless integration in the building management system via bus communication
- Device can be powered and data can be transferred directly via an Ethernet cable (PoE)

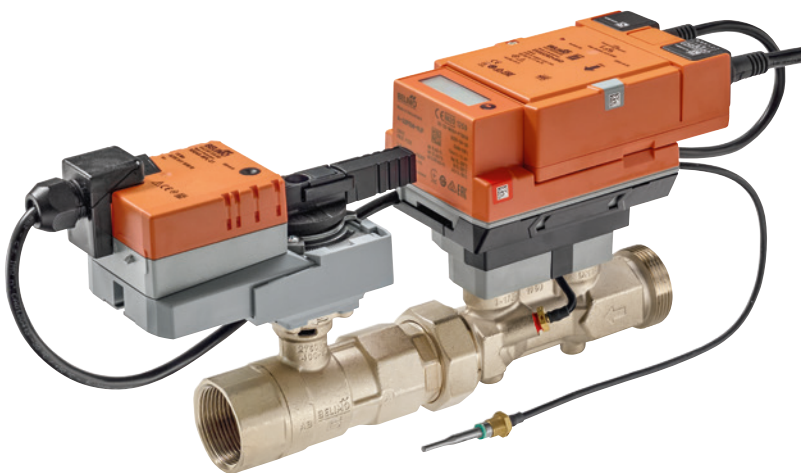
Version	Type code	Autom. glycol compensation	Glycol alarm	Approved according to EN 1434 MID	Display	Nominal diameter DN	Nominal flow [m <sup>3</sup> /h]
MID-approved	22PEM		■	■	■	15...50	1.5...15
Standard	22PE	■					

# Belimo Energy Valve™ range.

The Belimo Energy Valve™ provides pressure-independent flow and power control and transparent monitoring of heating or cooling systems, ensuring that they are not operated with a temperature spread that is too low (low delta T syndrome). By measuring, calculating, and visualising important system data and the performance reports provided by Belimo, energy-efficient system operation is guaranteed over the entire service life. The Belimo Energy Valve™ can be connected to the Belimo Cloud, providing easy access to data and reports anytime, anywhere. Depending on the desired application, the requirements according to EN 1434 are met with a type approval according to the European Measuring Instruments Directive 2014/32/EU (MID) or devices with automatic glycol compensation are available, all of which enable accurate billing.

## FEATURES

- Integrated sensors for measuring the temperature spread, the flow and thereby the power
- Control of the valve position, flow, or power for optimal operation of the heat exchanger
- Always the correct amount of water, even with differential pressure changes and during partial load operation
- Uses Belimo CCV 0% leakage technology
- Ready for IoT-based billing
- Simplified setup and configuration with the Belimo Assistant
- Seamless integration in the building management system via bus communication
- Device can be powered and data can be transferred directly via an Ethernet cable (PoE)



Version	Type code	Autom. glycol compensation	Glycol alarm	Approved according to EN 1434 MID	Display	Nominal diameter DN	Adjustable flow V' max [l/min]
2-way	EV..R2+BAC	■				15...50	6.3...250
	EV..R2+KBAC	■					
	EV..R2+MID		■	■	■		
3-way	EV..R3+BAC	■					

# All inclusive.

Belimo is the global market leader in the development, production, and sales of field devices for the energy-efficient control of heating, ventilation and air-conditioning systems. The focus of our core business is on damper actuators, control valves, sensors and meters.

Always focusing on customer 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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**BELIMO**<sup>®</sup>