Characterised control valve (CCV) with sensor-operated flow control, 2-way, with internal thread

- **Nominal voltage AC/DC 24V**
- **Control modulating**
- **For modulating water-side control of air handling units and heating systems**
- **Communication via Belimo MP-Bus or conventional control**
- **Conversion of (active) sensor signals and switching contacts**

MP-BUS

Type overview

Model No.	Frequency [Hz]	V̇nom [l/s]	V̇nom [l/min]	kvs theor.* [m³/h]	DN [mm]	Rp [”]	PN [bar]	n(gl) [ ]
EP015R+MP	50/60	0.35	21	2.9	15	1/2	25	3.2
EP020R+MP	50/60	0.65	39	4.9	20	3/4	25	3.2
EP025R+MP	50/60	1.15	69	8.6	25	1	25	3.2
EP032R+MP	50/60	1.8	108	14.2	32	1 1/4	25	3.2
EP040R+MP	50/60	2.5	150	21.3	40	1 1/2	25	3.2
EP050R+MP	50/60	4.8	288	32.0	50	2	25	3.2
EP050R+MP-N	50/60	6.3	378	32.0	50	2	25	3.2

* : Theoretical kvs value for pressure drop calculation

Technical data

Electrical data	Nominal voltage	AC/DC 24V
	Nominal voltage frequency	50/60Hz
	Nominal voltage range	AC 19.2...28.8V / DC 21.6...28.8V
	Power consumption in operation	4.5W
	Power consumption in rest position	1.4W
	Power consumption for wire sizing	7VA
	Connection supply / control	Cable 1m, 4x 0.75mm²
	Parallel operation	Yes (note the performance data)
Flow measurement	Measuring principle	Ultrasonic volumetric flow measurement
	Measuring accuracy	±2% (of 25...100% V̇nom at 20°C, Glycol 0% vol.)
	Min. flow measurement	0.5% of V̇nom
Functional data	Torque motor	5Nm (DN 15...25) / 10 Nm (DN 32 + 40) / 20Nm (DN 50)
	Positioning signal Y	DC 0...10V
	Operating range Y	DC 2...10V
	Operating range Y variable	Start point DC 0.5...24V End point DC 8.5...32V
	Position feedback U	DC 2...10V
	Position feedback U variable	Start point DC 0.5...8V End point DC 2…10V
	Sound power level motor max.	45dB(A)
	Adjustable flow rate Vmax	30...100% of V̇nom
	Control accuracy	±5% (of 25...100% V̇nom at 20°C, Glycol 0% vol.)
	Media	Cold and hot water, water with glycol up to max. 60% vol.
	Media temperature	-10°C...120°C

UL marked actuators is optional, please contact your local Sales Representative for details.

Technical data

Functional data	Permissible Operating Δps	1600kPa
	Closing pressure Δps	1380kPa
	Differential pressure Δpmax	350kPa
	Flow characteristic	Equal percentage (VDI/VDE 2178), linear
	Leakage rate	Air bubble-tight (Leakage rate A, EN12266-1)
	Pipe connections	Internal thread (ISO 7-1/ EN10226-1)
	Installation position	Upright to horizontal (in relation to the stem)
	Maintenance	Maintenance-free
	Manual override	Gear disengagement with push-button, can be locked
	Running time	90s
Safety	Protection class IEC/EN	III Safety extra-low voltage
	Degree of protection IEC/EN	IP54
	EMC	CE according to 2004/108/EC
	Mode of operation	Type 1
	Rated impulse voltage supply / control	0.8kV
	Control pollution degree	3
	Ambient temperature	-30...50°C
	Non-operating temperature	-40...80°C
	Ambient humidity	95% r.h., non-condensing
Materials	Housing	Brass body, nickel-plated
	Measuring pipe	Brass body, nickel-plated
	Ball	Stainless steel AISI 316
	Stem	Stainless steel AISI 304
	Stem seal	O-ring EPDM

Safety notes

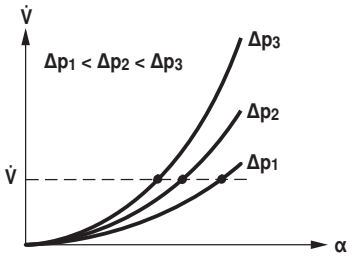
- The device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied with during installation.
- The connection between the control valve and the measuring tube should not be separated.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.

Product features

Mode of operation

The actuator is comprised of three components: characterised control valve (CCV), measuring pipe with volumetric flow sensor and the actuator itself. The adjusted maximum flow (V̇max) is assigned to the maximum positioning signal (typically 10V/100%).
The actuator control can be either communicative or analogue. The medium is detected by the sensor in the measuring pipe and is applied as the flow value. The measured value is balanced with the setpoint. The actuator corrects the deviation by changing the valve position. The angle of rotation α varies according to the differential pressure through the final controlling element (see volumetric flow curves).

Flow rate curves



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V3.3 07.2016•Subject to modification

Characterised control valve (CCV) with sensor-operated flow control, 2-way, with flange PN16

- **Nominal voltage AC/DC 24V**
- **Control modulating**
- **For modulating water-side control of air handling unit and heating systems**
- **Communication via Belimo MP-Bus or conventional control**
- **Conversion of (active) sensor signals and switching contacts**

MP-BUS

Type overview

Model No.	Frequency [Hz]	V̇nom [l/s]	V̇nom [l/min]	kvs theor.* [m³/h]	DN [mm]	Rp [”]	PN [bar]	n(gl) [ ]
P6065W800E-MP	50	8	480	45	65	2 1/2	16	3.2
P6080W1100E-MP	50	11	660	65	80	3	16	3.2
P6100W2000E-MP	50	20	1200	115	100	4	16	3.2
P6125W3100E-MP	50	31	1860	175	125	5	16	3.2
P6150W4500E-MP	50	45	2700	270	150	6	16	3.2
P6065W806E-MP	60	8	480	45	65	2 1/2	16	3.2
P6080W1106E-MP	60	11	660	65	80	3	16	3.2
P6100W2006E-MP	60	20	1200	115	100	4	16	3.2
P6125W3106E-MP	60	31	1860	175	125	5	16	3.2
P6150W4506E-MP	60	45	2700	270	150	6	16	3.2

* : Theoretical kvs value for pressure drop calculation

Technical data

Electrical data	Nominal voltage	AC/DC 24V
	Nominal voltage frequency	50/60Hz (upon request)
	Nominal voltage range	AC 19.2...28.8V / DC 21.6...28.8V
	Power consumption in operation	9.5W
	Power consumption in rest position	6.5W
	Power consumption for wire sizing	13VA
	Connection supply / control	Cable 1m, 4 x 0.75 mm²
	Parallel operation	Yes (note the performance data)
Flow measurement	Measuring principle	Magnetic inductive volumetric flow measurement
	Measuring accuracy	±2% (of 25...100% V̇nom at 20°C, Glycol 0% vol.)
	Min. flow measurement	1.25% of V̇nom
Functional data	Torque motor	20Nm (DN 65...80) / 40Nm (DN 100...150)
	Positioning signal Y	DC 0...10V
	Operating range Y	DC 2...10V
	Operating range Y variable	Start point DC 0.5...24V End point DC 8.5...32V
	Position feedback U	DC 2...10V
	Position feedback U variable	Start point DC 0.5...8V End point DC 2…10V
	Sound power level motor max.	45dB(A)
	Adjustable flow rate max	30...100% of V̇nom
	Control accuracy	±5% (of 25...100% V̇nom at 20°C, Glycol 0% vol.)
	Media	Cold and hot water, water with glycol up to max. 60% vol.
	Media temperature	-10°C...120°C
	Permissible Operating Δps	1600kPa
	Closing pressure Δps	690kPa
	Differential pressure Δpmax	340kPa
	Flow characteristic	Equal percentage (VDI/VDE 2178), linear
	Leakage rate	Air bubble-tight (Leakage rate A, EN12266-1)
	Pipe connections	Flange (ISO 7005-2 / EN 1092-1)

UL marked actuators is optional, please contact your local Sales Representative for details.

Technical data

Functional data	Installation position	Upright to horizontal (in relation to the stem)
	Maintenance	Maintenance-free
	Manual override	Gear disengagement with push-button, can be locked
	Running time	90s
Safety	Protection class IEC/EN	III Safety extra-low voltage
	Degree of protection IEC/EN	IP54
	EMC	CE according to 2004/108/EC
	Mode of operation	Type 1
	Rated impulse voltage supply / control	0.8kV
	Control pollution degree	3
	Ambient temperature	-10...50°C
	Non-operating temperature	-20...80°C
	Ambient humidity	95% r.h., non-condensing
Materials	Housing	EN-JL1040 (GG25 with protective paint)
	Measuring pipe	EN-GJS-500-7U (GGG50 with protective paint)
	Ball	Stainless steel AISI 316
	Stem	Stainless steel AISI 304
	Stem seal	EPDM Perox

Safety notes

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- The connection between the control valve and the measuring tube should not be separated.
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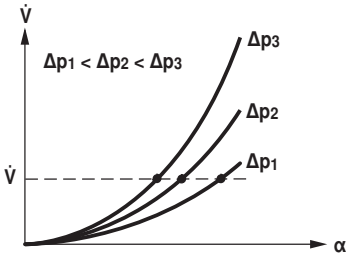
Product features

Mode of operation

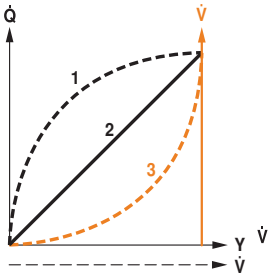
The actuator is comprised of three components: characterised control valve (CCV), measuring pipe with volumetric flow sensor and the actuator itself. The adjusted maximum flow ($\dot{V}max$) is assigned to the maximum positioning signal (typically 10V).
The actuator control can be either communicative or analogue. The medium is detected by the sensor in the measuring pipe and is applied as the flow value. The measured value is balanced with the setpoint. The actuator corrects the deviation by changing the valve position. The angle of rotation α varies according to the differential pressure through the final controlling element (see volumetric flow curves).

Flow rate curves



Flow characteristic of the characterised control valve

Heat exchanger transfer response
Depending on the construction, temperature spread, medium and hydraulic circuit, the power Q is not proportional to the volumetric flow of the water $\dot{V}$ (curve 1). With the classical type of temperature control, an attempt is made to maintain the control signal Y proportional to the power Q (Curve 2) and is achieved by means of an equal-percentage valve characteristic curve (Curve 3).



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