

VAV control unit complete with damper blade and air velocity sensor for pressure-independent VAV applications in controlled apartment ventilations. For installation in round ducts.

- Control modulating, communicative (0/2...10 V)



Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...28.8 V / DC 19.2...28.8 V
	Power consumption in operation	1.5 W
	Power consumption in rest position	1 W
	Power consumption for wire sizing	2.5 VA
	Connection supply / control	Cable 1 m, 4x 0.34 mm ²
Data bus communication	Communicative control	MP-Bus
	Number of nodes	MP-Bus max. 8
Functional data	Torque motor	2 Nm
	Round duct diameter	DN 100
	Operating range Y	2...10 V
	Input impedance	100 kΩ
	Operating modes optional	modulating
	Position feedback U	2...10 V
	Position feedback U note	Max. 0.5 mA
	V'max adjustable	20...100% of V'nom
	V'mid adjustable	>V'min...<V'max
	V'min adjustable	0...100% of V'nom (<V'max)
	Manual override	with magnet
	Running time motor	70 s
	Sound power level, motor	35 dB(A)
	Position indication	Mechanical, pluggable (with integrated magnet for gear train disengagement)
	Airtightness	Class 3 (DIN EN 1751)
Static differential pressure	Max. 1000 Pa via the damper (4" w.g)	
Safety data	Flame class	Damper blade UL 94 HB Actuator UL 94 V-0
	Fire behaviour group	Damper blade RF3 (CH) Actuator RF2 (CH)
	Fire load	5.4 MJ
	Protection class IEC/EN	III, Safety Extra-Low Voltage (SELV)
	Degree of protection IEC/EN	IP00
	Degree of protection NEMA/UL	NEMA 1
	Enclosure	UL Enclosure Type 1

Technical data

Safety data	EMC	CE according to 2004/108/EU
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Type of action	Type 1
	Rated impulse voltage supply / control	0.8 kV
	Pollution degree	2
	Ambient humidity	Max. 95% RH, non-condensing
	Ambient temperature	0...50°C [32...122°F]
	Storage temperature	-40...80°C [-40...176°F]
	Servicing	maintenance-free
Weight	Weight	0.25 kg

Safety notes


- The device must not be used outside the specified field of application, especially not 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 device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- Cables must not be removed from the device.
- The device contains electrical and electronic components and must not be disposed of as household refuse. All locally valid regulations and requirements must be observed.

Product features

Operating mode	<p>Conventional operation:</p> <p>The actuator is connected with a standard control signal of 0...10 V and drives to the position defined by the control signal. The measuring voltage U serves for the electrical display of the actuator position 0.5...100% and as control signal for other actuators.</p> <p>Operation on Bus:</p> <p>The actuator receives its digital control signal from the higher level controller via the MP-Bus and drives to the position defined. Connection U serves as communication interface and does not supply an analogue measuring voltage.</p>
Converter for sensors	<p>Connection option for a sensor (active sensor or switching contact). The MP actuator serves as an analogue/digital converter for the transmission of the sensor signal via MP-Bus to the higher level system.</p>
Application	<p>The device is used for pressure-independent control of air volume flows in controlled apartment ventilations.</p>
Application Variable Air Volume (VAV)	<p>Variable air volume control in the V'min...V'max range, demand-dependent via a modulating reference variable (analogue or bus), e.g. room temperature or CO₂ controller for energy-saving air conditioning of individual rooms or zones.</p>
Application Constant Air Volume (CAV)	<p>Constant volumetric flow control. If required, via step switching (switching contacts) for constant volumetric flow applications.</p> <p>Steps: CLOSE / Min / Mid / Max / OPEN</p>
Parametrisable actuators	<p>The factory settings cover the most common applications. Single parameters can be modified with the Belimo service tools MFT-P or ZTH EU.</p>
Operating and service tools	<p>PC-Tool (PP or MP-Bus) or service tool ZTH EU (PP only) can be connected.</p>

Product features

- Simple direct mounting** The actuator is mounted directly on the damper shaft (ø6...12.7 mm) with a universal shaft clamp and then secured with the anti-rotation clip, to prevent it from rotating.
The anti-rotation clip Z-ARCM is included in the scope of delivery.
- Manual override** Manual override with magnet possible (the gear train is disengaged as long as the magnet adheres to the magnet symbol). The magnet for gear train disengagement is integrated in the position indication.
- Adjustable angle of rotation** Adjustable angle of rotation with mechanical end stops.
- High functional reliability** The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

Accessories

Gateways	Description	Type
	Gateway MP to BACnet MS/TP	UK24BAC
	Gateway MP to Modbus RTU	UK24MOD
Electrical accessories	Description	Type
	MP-Bus power supply for MP actuators	ZN230-24MP
Mechanical accessories	Description	Type
	Gear train disengagement magnet, Multipack 20 pcs.	Z-MA
Tools	Description	Type
	Service tool, with ZIP-USB function, for parametrisable and communicative Belimo actuators, VAV controller and HVAC performance devices	ZTH EU
	Belimo PC-Tool, Software for adjustments and diagnostics	MFT-P
	Adapter for Service-Tool ZTH	MFT-C
	Connecting cable 5 m, A: RJ11 6/4 ZTH EU, B: free wire end for connection to MP/PP terminal	ZK2-GEN

Electrical installation


Supply from isolating transformer.
Parallel connection of other actuators possible. Observe the performance data.

Parameter and tool overview

Installation

Nominal dimension [mm]	Volumetric flow [l/s]	Volumetric flow [m³/h]	Air velocity [m/s]	ΔP _{tot} [Pa]	Static differential pressure Δp [Pa]																	
					50 Sound power L _w [dB/Oct] Octave-mid-frequency range f _m [Hz]								100 Sound power L _w [dB/Oct] Octave-mid-frequency range f _m [Hz]									
					63	125	250	500	1000	2000	4000	8000	L _{wa} [dB(A)]	63	125	250	500	1000	2000	4000	8000	L _{wa} [dB(A)]
100	7.9	28	1	< 5	53	41	39	37	33	24	< 20	< 20	< 38	56	43	42	42	40	33	24	< 20	44
	16	57	2	< 5	55	48	45	40	36	26	< 20	< 20	42	59	51	50	46	43	36	27	< 20	48
	24	85	3	5	58	52	49	44	38	29	< 20	< 20	46	62	56	53	50	44	38	29	20	51
	39	141	5	15	63	58	54	49	43	36	27	< 20	51	66	62	59	55	49	43	36	27	56
	55	198	7	29	66	61	55	51	46	40	32	25	53	68	66	61	56	51	46	39	33	58
125	12.3	44	1	< 5	51	39	36	32	29	23	< 20	< 20	35	53	42	40	39	38	33	25	< 20	42
	25	88	2	< 5	54	46	42	37	31	22	< 20	< 20	39	57	49	46	43	39	34	25	< 20	45
	37	133	3	< 5	59	50	46	41	35	28	< 20	< 20	43	62	54	51	47	41	35	27	< 20	48
	61	221	5	11	66	56	52	48	41	34	23	< 20	49	68	60	57	53	47	41	32	23	54
	86	309	7	21	71	59	55	51	45	38	31	24	53	73	63	60	56	50	44	38	31	58
150	17.7	64	1	< 5	52	40	40	34	29	< 20	< 20	35	56	44	44	40	37	32	22	< 20	42	
	35	127	2	< 5	57	47	44	38	31	23	< 20	< 20	40	60	51	50	45	40	34	25	< 20	47
	53	191	3	< 5	61	50	48	42	35	27	< 20	< 20	44	65	54	53	49	43	37	28	20	50
	88	318	5	9	66	55	53	49	42	34	25	< 20	50	70	59	58	54	48	42	34	23	55
	124	445	7	18	68	58	56	51	46	40	29	23	53	72	64	62	57	51	46	37	31	59
160	20	72	1	< 5	54	41	37	34	29	21	< 20	< 20	36	56	43	42	40	36	30	23	< 20	41
	40	145	2	< 5	58	47	44	39	33	25	< 20	< 20	41	60	51	50	47	42	36	27	< 20	48
	60	217	3	< 5	62	51	49	44	36	28	< 20	< 20	45	64	56	54	50	44	38	29	21	51
	101	362	5	8	70	57	53	48	43	37	25	< 20	51	71	61	58	54	48	44	34	25	56
	141	507	7	15	74	60	55	52	46	41	32	< 20	54	75	64	60	56	51	46	38	29	58

Nominal dimension [mm]	Volumetric flow [l/s]	Volumetric flow [m³/h]	Air velocity [m/s]	ΔP _{tot} [Pa]	Static differential pressure Δp [Pa]																	
					200 Sound power L _w [dB/Oct] Octave-mid-frequency range f _m [Hz]								300 Sound power L _w [dB/Oct] Octave-mid-frequency range f _m [Hz]									
					63	125	250	500	1000	2000	4000	8000	L _{wa} [dB(A)]	63	125	250	500	1000	2000	4000	8000	L _{wa} [dB(A)]
100	7.9	28	1	< 5	59	45	46	47	47	43	36	30	51	61	46	48	50	51	49	43	38	55
	16	57	2	< 5	63	54	54	52	50	47	40	32	55	65	56	57	55	54	53	47	41	59
	24	85	3	5	66	59	58	55	51	47	40	34	57	68	61	61	59	55	52	47	41	61
	39	141	5	15	69	67	65	61	55	50	44	38	62	71	69	68	64	59	54	50	44	65
	55	198	7	29	71	71	67	62	57	52	47	42	64	72	73	70	65	61	56	51	46	67
125	12.3	44	1	< 5	56	44	44	46	46	43	36	< 27	50	57	46	46	50	52	49	43	34	55
	25	88	2	< 5	60	52	51	48	47	45	38	29	52	61	54	53	52	52	52	45	36	57
	37	133	3	< 5	65	57	55	52	48	43	38	30	54	66	59	57	55	51	47	45	38	57
	61	221	5	11	70	63	61	58	53	47	42	33	59	71	66	64	60	56	51	47	39	62
	86	309	7	21	74	67	65	61	56	50	45	38	63	75	70	68	64	59	54	49	42	66
150	17.7	64	1	< 5	59	47	49	47	45	43	37	29	50	61	50	51	51	49	50	46	37	55
	35	127	2	< 5	64	56	56	52	49	46	37	29	55	66	58	59	57	55	52	44	37	60
	53	191	3	< 5	68	58	58	55	51	46	39	32	57	70	61	61	59	55	52	45	39	61
	88	318	5	9	73	63	63	59	54	49	43	33	61	75	66	65	62	58	54	48	40	64
	124	445	7	18	75	69	68	62	57	52	45	38	64	77	72	71	65	60	55	50	43	67
160	20	72	1	< 5	57	46	47	47	43	39	32	26	48	58	48	50	51	46	44	37	32	52
	40	145	2	< 5	62	55	56	55	51	47	39	32	56	63	58	60	60	56	54	46	40	62
	60	217	3	< 5	67	60	60	57	53	48	40	33	58	68	62	63	60	58	53	46	40	62
	101	362	5	8	72	65	63	59	54	50	43	36	60	73	68	66	61	57	53	48	43	64
	141	507	7	15	75	68	65	60	56	52	45	39	63	75	70	68	63	58	55	49	45	65

Parameter and tool overview

Settings and tool functions

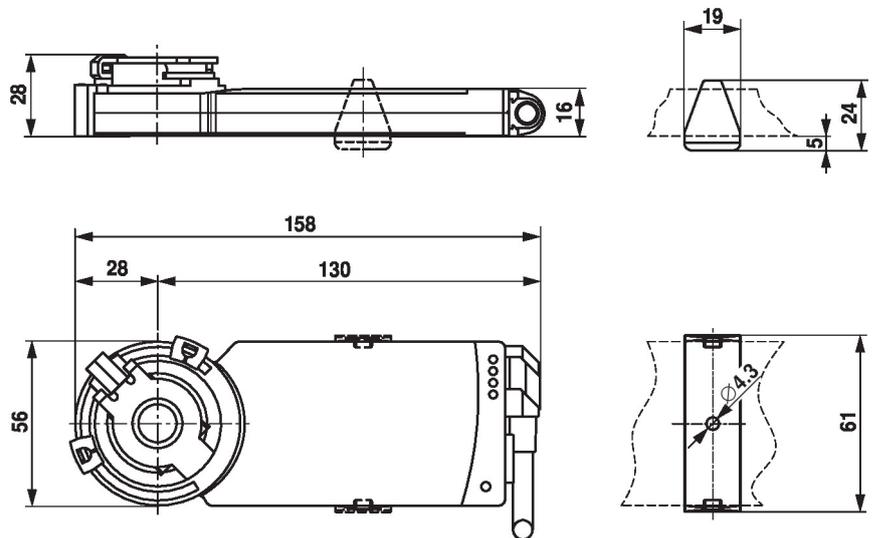
Designation	Setting values, limits, explanations	Units	Tool		Remarks
			ZTH EU	PC-Tool from V3.9	
System-specific data					
Position	16 characters, e.g. office 4 6th floor SUP	String	r	r/w	Display in operating and bus devices
Designation	16 characters: unit designation etc.	String	r	r/w	Display in operating and bus devices
Address (MP)	MP1...MP8 (16)		r/w	r/w	MP-Bus address
V'_{max}	20...100% [V'_{nom}]	m ³ /h / l/s / cfm	r/w	r/w	$>/= V'_{min}$
V'_{mid}	$V'_{min}...V'_{max}$	m ³ /h / l/s / cfm	r/w	r/w	
V'_{min}	0...100% [V'_{nom}]	m ³ /h / l/s / cfm	r/w	r/w	$</= V'_{max}$
Altitude of installation ¹⁾	0...3000	m	r/w	r/w	Adaptation of Δp sensor to altitude (meters above sea level)
Controller settings					
Mode	0...10 / 2...10	V	r/w	r/w	
Feedback U5 – function	Volumetric flow / damper position		–	r/w	
Override control	AUTO / OPEN / CLOSE / V'_{min} / V'_{mid} / V'_{max} / STOP		r/w	r/w	
Site adjustment factor	0.7...1.3		r/w	r/w	
Bus fail position	Last setpoint OPEN / CLOSE / V'_{min} / V'_{max}		–	r/w	MP-Bus function: Behaviour with bus master failure
Unit-specific settings					
V'_{nom}	Unit-specific value	m ³ /h / l/s / cfm	r	r	Related to nominal air velocity
Nominal air velocity	3 / 5 / 7	m/s	–	r/w	Value is permanently set by the OEM
Display					
Air temperature in round duct	Temperature currently measured in the round duct	°	r	r	
Air velocity	Air velocity currently measured in the round duct	m/s	r	r	
Control loop display	Volume / setpoint / damper position		r	r	
Type	Type designation		r	r	
Version overview	Firmware		r	r	
Serial number	nnnn-nnnn-nnn-nnn		r	r	
Operating data	Operating time / runing time / ratio		–	r	

¹⁾ The air density has an influence on the measurement system of the CMV-..-MP. This is strongly affected by the elevation above sea level of the current mounting position. An additional parameter is available for increasing the measuring accuracy of the CMV-..-MP with which the elevation of the system can be entered.

Service

Tool connection The actuator can be parametrised by ZTH EU via terminal connection.
For extended parametrisation the PC tool can be connected.

Dimensions



Further documentation

- Tool connections