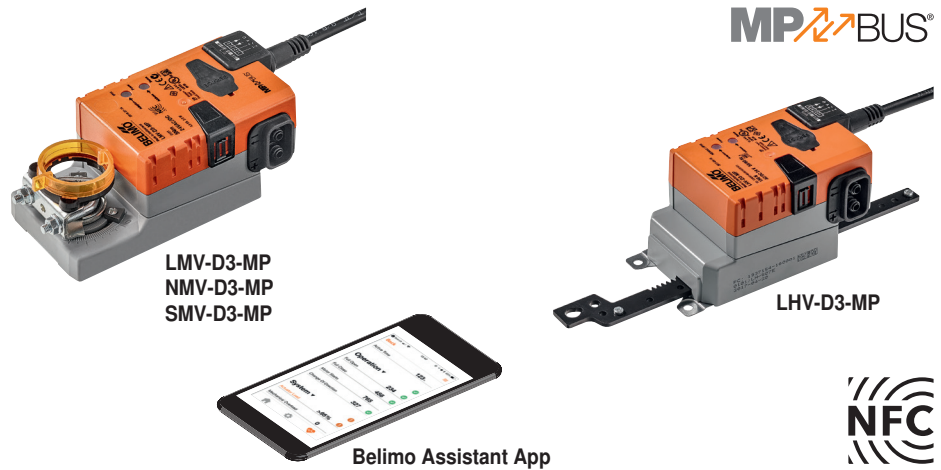


Pressure sensor, digital VAV controller and damper actuator as communicative compact solution for pressure-independent VAV and CAV systems in the comfort zone

- Control (0) 2...10 V or via MP-Bus
- MP-Bus: Control devices with MP interface,
Gateway: BACnet / Modbus
- DCV - Fan Optimiser function in DDC
- Conversion of sensor signals
- Service socket for operating devices
- NFC interface for Smartphone App


Brief description

Application	The VAV-Compact with its PI control characteristic is used for the pressure-independent control of VAV units in the comfort zone.
Volumetric flow measurement	The integrated D3 differential pressure sensor is also suitable for very small volumetric flows. The maintenance-free sensor technology enables a wide range of applications in the comfort zone: residential construction, office, hospital, hotel, cruise ship, etc.
Actuator	A variety of actuator versions (rotary or linear actuators) are available to the VAV unit manufacturer for the different VAV unit designs.
Control function	Volumetric flow (VAV/CAV) or position control (Open Loop for integration in external VAV control loop).
VAV (VVS) - Variable volumetric flow	Demand-dependent specification of the volumetric flow $V'_{min} \dots V'_{max}$ via modulating reference variable (0/2...10 V / MP-Bus), e.g. room temperature/CO ₂ controller, DDC or bus system, for energy-saving air conditioning of individual rooms or zones.
CAV (KVS) - Constant volumetric flow	Step mode (via switching contacts) for constant volume applications CLOSE / V'_{min} / V'_{mid} / V'_{max} / OPEN.
DCV - Demand Controlled Ventilation	Via Bus Client or MP-Partner solution with integrated Optimiser function.
Bus mode	Belimo MP devices (VAV / damper and valve actuators) can be connected via the MP-Bus to an MP client device: <ul style="list-style-type: none"> – MP Partner solution: DDC controller with integrated MP-Bus protocol – Gateway for integration in BACnet and Modbus applications In Bus mode, an additional sensor (0...10 V / passive), e.g. temperature, or a switch for the higher-level system can be overridden. See separate MP-Bus documentation at www.belimo.com .
Operating and service devices	Smartphone Belimo Assistant App: Contact-free operation via the integrated NFC interface. Service tool ZTH EU, PC-Tool service socket: Local plug-in or via MP-Bus.
Electrical connection	The connection is made using the integrated connecting cable.
Sales, assembly and setting	The VAV-Compact is mounted by the VAV unit manufacturer (OEM), and the application is adjusted and calibrated accordingly. The VAV-Compact is sold exclusively via the OEM channel for this reason.

Type overview MP versions	Type	Torque	Power consumption	For wire sizing	Weight
	LMV-D3-MP	5 Nm	2 W	3.5 VA (max. 8 A @ 5 ms)	Approx. 500 g
	NMV-D3-MP	10 Nm	3 W	5 VA (max. 8 A @ 5 ms)	Approx. 700 g
	SMV-D3-MP	20 Nm	3 W	5.5 VA (max. 8 A @ 5 ms)	Approx. 830 g
	LHV-D3-MP	150 N	2.5 W	4.5 VA (max. 8 A @ 5 ms)	Approx. 550 g

- OEM version** In addition to the Belimo standard version, there is also the VAV-Compact in OEM versions, i.e. variants produced for VAV unit manufacturers. These versions receive OEM-specific adjustment and labelling on the sensors, damper shafts and fastening systems used. See VAV units manufacturer documentation.
Designation, e.g. LMV-D3-MP ABC (ABC = customer designation)
- Other versions** The VAV-Compact is also available with built-in interface for direct integration in KNX, BACnet and Modbus.
For more information please visit your local website.

Safety notes

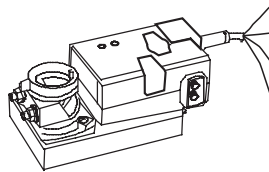


- The device is not allowed to be used outside the specified field of application, especially not in aircraft or in any other airborne means of transport.
- Outdoor applications: Only possible if no (sea) water, snow, ice, solar radiation or aggressive gases act directly on the actuator and it is guaranteed that the ambient conditions are always within the limit values according to the data sheet.
- Only authorised specialists may carry out installation. All applicable legal and government agency regulations must be complied with during use.
- The device may be opened only at the manufacturer's plant. It does not contain any parts that can be replaced or repaired by the user.
- Cables must not be removed from the device.
- When calculating the torque requirement, the specifications supplied by the damper manufacturers (cross-section, construction, installation situation), and the ventilation conditions must be observed.
- The device contains electrical and electronic components and is not permitted to be disposed of as household waste. Local and currently valid legislation must be observed.

Electrical installation

Notes

- Supply via safety isolating transformer!
- In conventionally controlled systems, is recommended to run connections 1 to 5 (PP/MP) on accessible terminals (e.g. floor distributors) in order to enable remote access for diagnostics and service tasks.



No.	Designation	Cable colour	Function
1	⊥-	black	} AC/DC 24 V supply
2	~ +	red	
3	◀ Y	White	Reference signal / Override / Sensor
5	▶ U	orange	- Actual value signal - MP-Bus connection

See separate documentation for description of function and application

Technical data		
Electrical data	Nominal voltage	AC/DC 24 V, 50/60 Hz
	Operating range	AC 19.2...28.8 V/DC 21.6...28.8 V
	Performance data	See type overview (page 1)
	Connection	Cable, 4 x 0.75 mm ² , pre-fabricated
Volumetric flow controller	Control function	VAV/CAV and position control (Open Loop)
	V'_{nom} ¹⁾	Nominal flow rate setting OEM-specific, matches the VAV unit
	$\Delta p @ V'_{nom}$ ¹⁾	38...450 Pa
	V'_{max}	20...100% of V'_{nom} , adjustable
	V'_{mid}	$>V'_{min} \dots <V'_{max}$, adjustable
	V'_{min}	0...100% of V'_{nom} , adjustable ($<V'_{max}$)
Analogue control - VAV	Mode (Y)	0...10 V / 2...10 V / (Y and U5 individually) adjustable, Input impedance 100 k Ω (0/4...20 mA with 500 Ω resistance)
	Actual value signal (U)	0...10 V/2...10 V, max. 0.5 mA Volumetric flow / Damper position / Δp , reversible
Step control - CAV	Operating modes	CLOSE / V'_{min} / V'_{mid} ^{*)} / V'_{max} / OPEN ^{*)} ^{*)} AC 24 V supply required
Bus mode	Communication	Belimo MP-Bus
	Addressing	MP1...8 (analogue control: PP)
	Bus Client	DDC with MP interface (see list Belimo-MP-Partner www.belimo.com)
	Control	Setpoint specification in % between the set V'_{min}/V'_{max} values
	Sensor integration	Passive sensor (Pt1000, Ni1000 ...) or active sensor (0...10 V) Switching contact (0/1) (switching capacity 16 mA @ 24 V)
Operation and service	Assistant App (Smartphone)	Contactless connection via integrated NFC interface
	Service Tool ZTH EU, PC-Tool	Local connector socket / Remote via PP/MP connection or MP client
	LED	Supply, status and communication display
	Push-button	Addressing, angle-of-rotation adaptation and test function
Actuator	Rotary / Linear version	Brushless, blockage-proof actuator with power-save mode
	Direction of rotation ¹⁾	Left/right or up/down, adjustable
	Angle of rotation	95° or 150 / 200 / 300 mm stroke, adjustable mechanical or electrical limitation
	Gear disengaged	Push button, self-resetting without functional limitation
	Position indication	Mechanical or for read-out (Tool, Bus Client)
	Shaft holder	Shaft clamp for round and square axes, form fit, OEM versions
Volumetric flow measurement	Differential pressure sensor	Belimo D3 sensor, dynamic measurement principle
	Measurement, nominal voltage range	-20...500 Pa, 0...500 Pa
	Overload capacity	± 3000 Pa
	Altitude compensation	Adaptation to system altitude (adjustment range 0...3000 meters above sea level)
	Installation position	Position-independent, no reset necessary
	Materials in contact with measuring materials	Glass, epoxy resin, PA, TPE
	Condition of measuring air	Comfort zone 0...50°C / 5...95% RH, non-condensing
Security	Protection class IEC/EN	III Protective extra low voltage (PELV)
	Degree of protection IEC/EN	IP54
	EMC	CE according to 2014/30/EU
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Rated impulse voltage	0.8 kV
	Supply / Control	
	Control pollution degree	3
	Ambient temperature	0...50°C
	Storage temperature	-40...80°C
	Ambient humidity	95% RH, non-condensing
	Maintenance	Maintenance-free. Depending on use, the differential pressure pickup device (measuring cross, disc, etc.) of the VAV unit must be checked now and then and cleaned as needed.

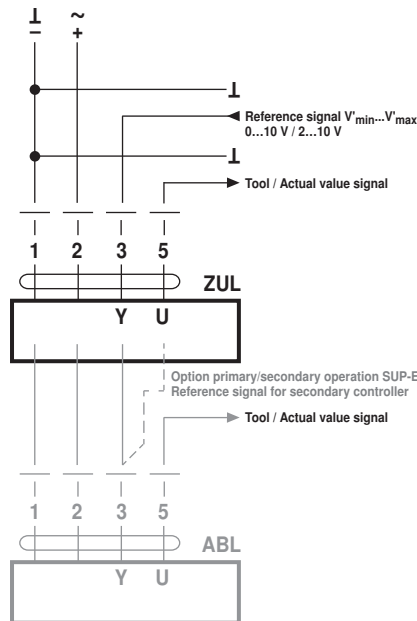
¹⁾ Setting by VAV manufacturer (OEM)

FCC: See US-relevant notes on page 12

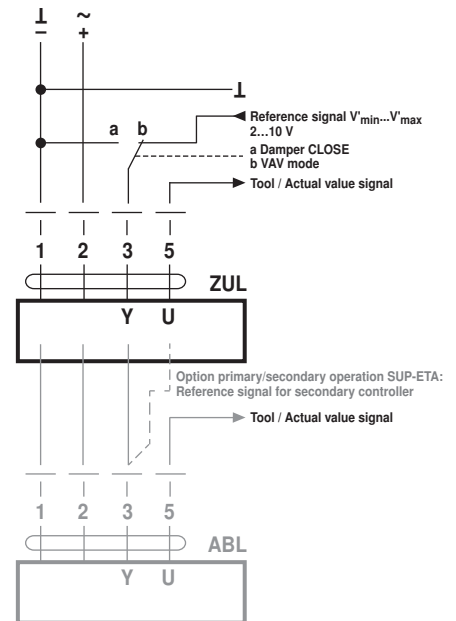
VAV - Variable operation $V'_{min} \dots V'_{max}$

Wiring diagrams

Example 1:
VAV, analogue reference signal



Example 2:
VAV with shut-off (CLOSE), 2...10 V mode



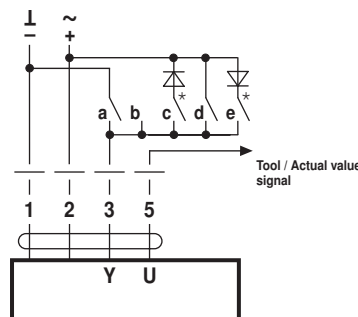
Description:
Damper CLOSE via 0...10 V reference signal (Mode 2...10 V)
Setting parameters:
Mode 2...10 V, Shut-off level 0.1 V or 0.5 V
If the necessary switching threshold of 0.1 V cannot be achieved, then the value can be changed to 0.5 V with the PC-Tool.
Function: Default 0.1 V: Shut-off level 0.5 V:
Damper CLOSE <0.1 V <0.5 V
 V'_{min} >0.1...2V >0.5...2V
 $V'_{min} \dots V'_{max}$ 2...10 V 2...10 V
For CAV applications, the shut-off level must not be set to 0.5 V, because otherwise the open connection 3 will be interpreted as damper CLOSE.

CAV – Step mode CLOSE / V'_{min} / V'_{mid} / V'_{max} / OPEN

CAV control

The VAV-Compact can be adapted for constant volumetric flow applications with the PC-Tool, "CAV function" option on the desired CAV function template:
– Damper CLOSE – V'_{min} – V'_{max} – Damper OPEN (default)
– Damper CLOSE – V'_{min} – V'_{mid} – V'_{max} – Damper OPEN (NMV-D2M-compatible)

Wiring diagram



Notes
• Note that the contacts are mutually interlocking.
• DC supply: * c and e are not available with DC 24 V.
• Setting parameters for CAV application:
Mode 2...10 V, shut-off level 0.1 V
The shut-off level cannot be set to 0.5 V with CAV applications, because otherwise the open connection 3 will be interpreted as damper CLOSE.

CAV function CLOSE – V'_{min} – V'_{max} – OPEN (Default)

	a	b	c	d	e
Signal	\perp –		\sim	\sim +	\sim
Protective circuit terminal 3	\perp 3	\perp 3	\perp 3	\perp 3	\perp 3
Mode 2...10 V	CLOSE	V'_{min}	CLOSE *	V'_{max}	OPEN *
Mode 0...10 V	V'_{min}	V'_{min}	CLOSE *	V'_{max}	OPEN *

Belimo PC-Tool setting "CAV function":
2...10 V, Shut-off level 0.1 V

CAV function CLOSE – V'_{min} – V'_{mid} – V'_{max} – OPEN

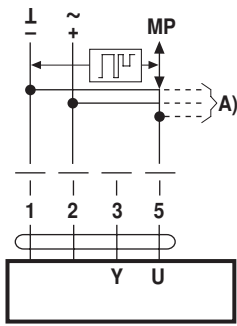
	a	b	c	d	e
Signal	\perp –		\sim	\sim +	\sim
Protective circuit terminal 3	\perp 3	\perp 3	\perp 3	\perp 3	\perp 3
Mode 2...10 V	CLOSE	V'_{min}	V'_{mid} *	V'_{max}	OPEN *
Mode 0...10 V	V'_{min}	V'_{min}	V'_{mid} *	V'_{max}	OPEN *

Belimo PC-Tool setting "CAV function":
CLOSE – V'_{min} – V'_{max} . Shut-off level CLOSE: 0.1 V

Belimo PC-Tool setting "CAV function":
CLOSE – V'_{min} – V'_{mid} – V'_{max} (NMV-D2M-compatible)

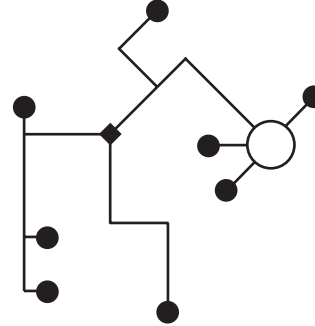
MP-Bus mode – VAV/CAV function

Connection on the MP bus



A) Additional actuators and sensors (max. 8)

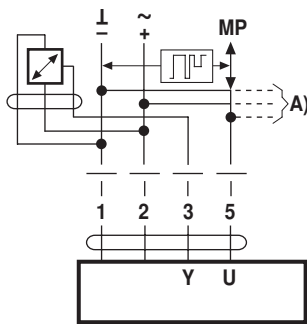
Line topology



There are no restrictions for the network topology (star, ring, tree or hybrid forms are permissible).
Supply and communication in one and the same 3-wire cable

- no shielding or twisting necessary
- No terminating resistors required

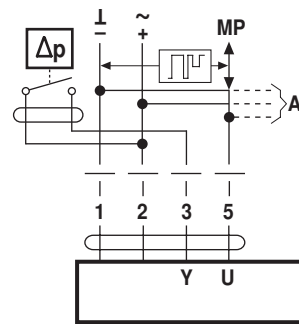
Connection of active sensors



A) Additional actuators and sensors (max. 8)

- Supply AC/DC 24V
- Output signal DC 0 ... 10 V (max. DC 0 ... 32 V)
- Resolution 30 mV

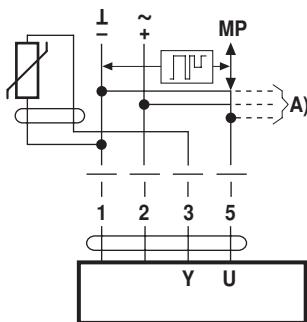
Connection of external switching contact



A) Additional actuators and sensors (max. 8)

- Switching current 16 mA @ 24 V
- Start point of the operating range must be parameterised on the MP actuator as ≥ 0.5 V

Connection of passive sensors



Ni1000	-28...+98 °C	850...1600 Ω^2
PT1000	-35...+155 °C	850...1600 Ω^2
NTC	-10...+160 °C ¹⁾	200 Ω ...60 k Ω^2

A) Additional actuators and sensors (max. 8)

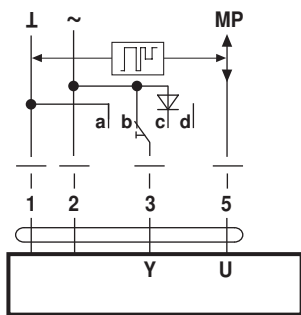
1) Depending on type
2) Resolution 1 Ohm

Local override control

If no sensor is integrated, then connection 3 (Y) is available as the protective circuit for a local override control.

Options: CLOSE – V_{max} – OPEN

Caution: Functions only with AC 24 V supply!



a Damper CLOSE
b V_{max}
c Damper OPEN
d Bus mode

See www.belimo.com / Bus and System Integration for more detailed information regarding MP-Bus and installation (max. signal cable lengths, etc.)

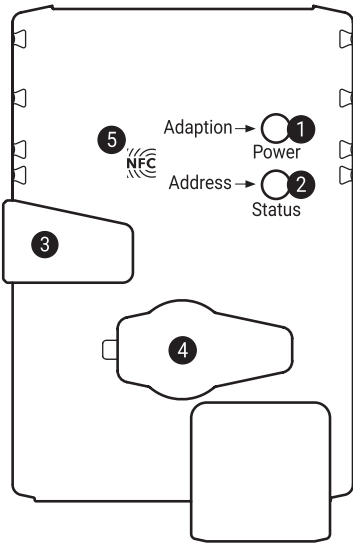
Settings and tool functions

Designation	Setting values, limits, explanations	Units	Tools ⁷⁾			Remarks
			Assistant app	ZTH EU	PC-Tool	
System-specific data						
Position	16 characters, e.g. Office 4 6th OG ZL	Text	r/w	r	r/w	
Designation	16 characters: Unit designation, etc.	Text	r	r	r/w	
Address	PP / MP1...8		r/w ³⁾	r/w	r/w	PP: 0...10 / 2...10 V MP1...8: MP mode
V' _{max}	20...100% [V' _{nom}]	m ³ /h / l/s / cfm	r/w	r/w	r/w	>= V' _{min}
V' _{mid}	V' _{min} ...V' _{max}	m ³ /h / l/s / cfm	r/w	r/w	r/w	
V' _{min}	0...100% [V' _{nom}]	m ³ /h / l/s / cfm	r/w	r/w	r/w	<= V' _{max}
Altitude of installation	0...3000	Meter	r/w	r/w	r/w	Adaptation of Δp sensor to altitude (meters above sea level)
Controller Settings						
Control function	Volumetric flow / Position control (Open Loop)		r/w ³⁾		r/w	
Mode	0...10 / 2...10	Volt	r/w ³⁾	r/w ³⁾	r/w	
CAV function	CLOSE/V' _{min} /V' _{max} ; Shut-off level CLOSE 0.1 V CLOSE/V' _{min} /V' _{max} ; Shut-off level CLOSE 0.5 V V' _{min} /V' _{mid} /V' _{max} ; (NMV-D2M-comp.)				r/w	For explanation, see ⁴⁾
Positioning signal Y	Start value: 0...30; Stop value: 2...32	Volt	r	r	r/w	
Feedback U	Volume / Damper position / Δp				r/w	Definition of feedback signal
Feedback U	Start value: 0.0...8.0; Stop value: 2.0...10	Volt			r/w	
Behaviour when switched on (Power-on) ⁶⁾	No action / Adaptation / Synchronisation				r/w	
Synchronisation behaviour	Y=0% Y=100%			-	r/w	Synchronisation at damper position 0 or 100%
Bus fail position	Last setpoint / Damper CLOSE V' _{min} / V' _{max} / Damper OPEN				r/w	
Unit-specific settings						
V' _{nom}	0...60000 m ³ /h	m ³ /h / l/s / cfm	r	r	r/(w) ¹⁾	Unit-specific setting value
Δp@V' _{nom}	38...450 Pa	Pa	r	r	r/(w) ¹⁾	Unit-specific setting value
NFC interface	Read / Read and write		r		r/(w) ¹⁾	
Print function label					w	Incl. customer logo
Other settings						
Direction of rotation (for Y=100%)	cw/ccw or ▲/▼		r/w ³⁾	r/w ³⁾	r/w	
Range of rotation	Adapted ⁵⁾ / programmed 30...95	°			r/w	
Torque	100 / 75 / 50 / 25	%			r/w	% of nominal torque
Renovation of old systems (Retrofit of old VAV units with leaking damper)						
Suppress damper leakage	Yes/No				r/(w) ²⁾	Suppresses volume display with damper closed
Operating data						
Actual value / Setpoint Damper position		m ³ /h / l/s / cfm Pa / %	r Trend	r	r Trend	Trend display
Simulation	Damper OPEN/CLOSE V' _{min} / V' _{mid} / V' _{max} / Motor Stop			w	w	
Running times	Operating time, Running time Ratio (relation)	h %	r		r	
Alarm messages	Setting range enlarged, Mech. overload, Stop&Go ratio too high				r/w	
Serial number	Device ID		r	r	r	Incl. production date
Type	Type designation		r	r	r	
Version display	Firmware, Config. table ID			r	r	
Configuration data						
Print, send			yes		yes	
Backup in file			yes		yes	
Log data / Logbook	Activities log				yes	Incl. complete setting data

Explanations

- 1) Write function accessible only for VAV manufacturers
- 2) Parameters accessible only for VAV manufacturers and Retrofit partners
- 3) Access only via servicing level 2
- 4) Shut-off level 0.1/0.5 V – Application: VAV mode, in the mode 2...10 V, "Damper CLOSE" via 0...10 V control signal. If the necessary switching threshold of 0.1 V cannot be achieved, then the threshold can be changed to 0.5 V. Note on CAV application: The shut-off level must not be set to 0.5 V. When line 3 (Y) is open, "Damper CLOSE" is activated instead of "V'_{min}".
- 5) Within the mechanical limitation.
- 6) The first time the supply voltage is switched on, i.e. at the time of initial commissioning, the actuator carries out an adaption, which is when the operating range and position feedback adjust themselves to the mechanical setting range. The actuator then moves into the required position in order to ensure the volumetric flow defined by the control signal.
- 7) For function and version overview, see www.belimo.com.

Display and operation



- 1 Push-button and LED display green**
Off: No power supply or fault
On: Operation
Press button: Switches on angle-of-rotation adaptation
- 2 Push-button and LED display yellow**
Off: Normal operation
Flickering: MP communication active
On: Adaptation or synchronising process active
Flashing: Addressing request sent to MP client
Press button: Confirmation of addressing
- 3 Gear disengagement button**
Press button: Gear disengaged, motor stops, manual override possible
Release button: Gear engaged, synchronisation starts, followed by standard mode
- 4 Service plug** For connecting the parametrisation and service tools
- 5 NFC Logo** Can be operated with Belimo Assistant App

MP-Bus mode: Incorrect wiring display

- 1** Off and **2** On AC supply: Connections 1 (⬇) and 2 (⋈) switched
 - 1** Off and **2** Off DC supply: Connections 1 (-) and 2 (+) switched
- The test is run once after the 24 V supply is switched on.
For this check, the MP client must be connected with the VAV-Compact.

NFC, Smartphone – Belimo Assistant App

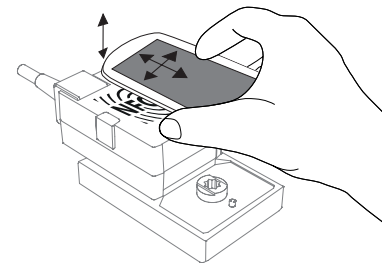


Equipment marked with the NFC logo can be operated contact-free via the NFC interface with the Belimo Assistant App (..MV-D3-MP starting with year of manufacture 2015).

Prerequisites:

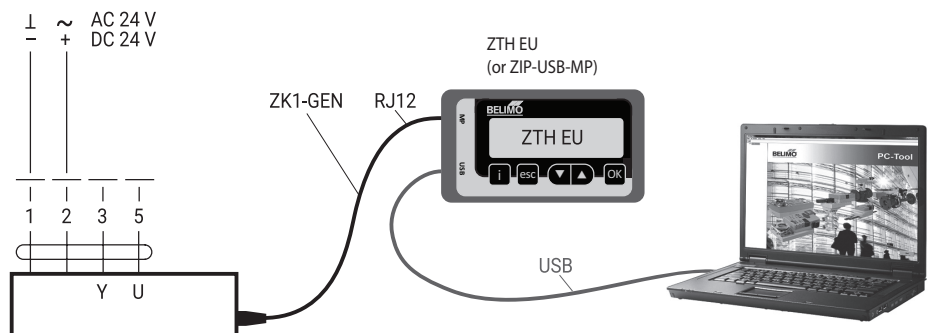
- Android or iOS Smartphone
- ZIP-BT-NFC for Bluetooth connection for Smartphone without NFC (iOS Android)
- Belimo Assistant App (Google Play / App Store)

The optimum reception range is within the antenna range indicated by arrows.
Align Smartphone or ZIP-BT-NFC on the VAV-Compact in such a way that the two NFC antennas are on top of one another.



ZTH EU / PC-Tool - Local service connection

Setting and diagnostics of the VAV-Compact can be carried out quickly and easily with the Belimo PC-Tool or the ZTH EU service tool. When the PC-Tool is used, the ZTH EU acts as the interface converter.

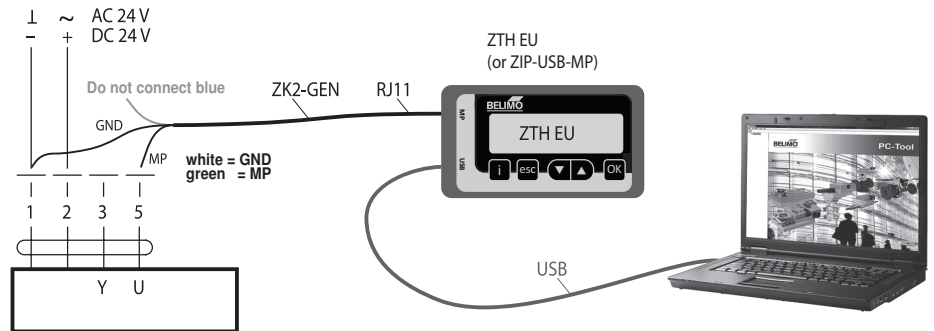


Download Belimo PC-Tool (MFT-P) from www.belimo.com

Display and operation

ZTH EU / PC-Tool - Remote connection

The VAV-Compacts can communicate with the service tools via the MP connection (wire 5). The connection can be made during operation at the connector socket, at the tool connector socket of the CR24 room controller or at the switchbox terminals. In MP-Bus mode, the Tool is connected at the MP client. The ZTH EU is used as interface converter with the PC-Tool is used.

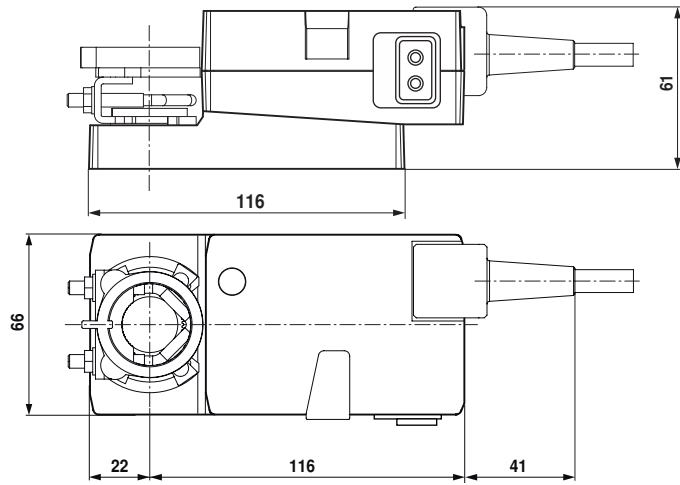


Accessories

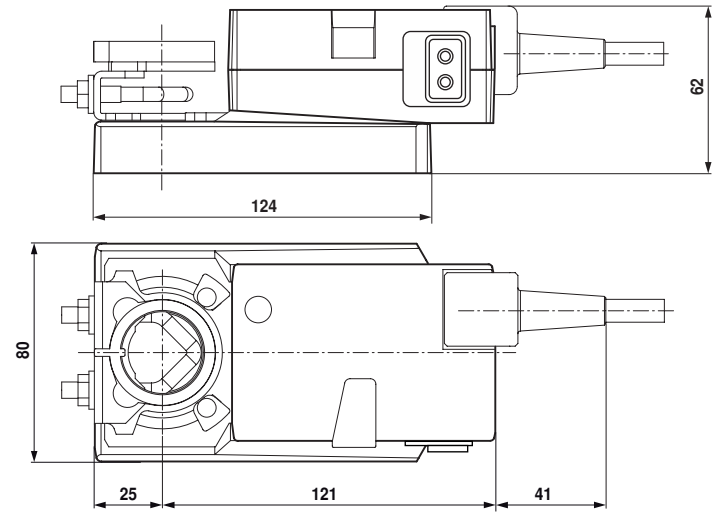
Room controller (2...10 V control)	Description	Type
	Room temperature controller, AO: VAV; DI: Standby/EHO/C-O	CR24-B1
	Room temperature controller, AO: VAV/HZ 3-point; DI: Standby/EHO/Ventilation	CR24-B2
	Room temperature controller, AO: VAV/HZ EI-LE; DI: Standby/EHO/Boost	CR24-B2E
	Room temperature controller, AO: VAV/HZ 3-point; H/K 0...10 V; DI: Standby/EHO/C-O/Boost	CR24-B3
	Apartment ventilation controller, AO: 2 x VAV/HZ valve; DI: EHO/override Kitchen+Bath	CRA24-B3
	Step control, 3-step (Min/COMF/Max)	CRA24-B1P
	Positioner, 0...100%	CRP24-B1
Gateways	Description	Type
	Gateway MP to BACnet MS/TP, AC/DC 24 V	UK24BAC
	Gateway MP to Modbus RTU, AC/DC 24 V	UK24MOD
VAV-Compact / VAV-Universal	Description	Type
	VAV-Compact: Version with integrated BACnet, Modbus and KNX interface	
	VAV-Universal: VAV / pressure controller incl. Δp sensors, actuators (fail-safe, fast running actuator, etc.)	
	For more information please visit your local website.	
Electrical accessories	Description	Type
	Connection cable 5 m, to ZTH EU / ZIP-USB-MP (RJ12) with service plug	ZK1-GEN
	Connection cable 5 m, to ZTH EU / ZIP-USB-MP (RJ11) with free wire ends	ZK2-GEN
Service tools	Description	Type
	Service tool, with ZIP-USB function, for parametrisable and communicative actuators, VAV controllers and HVAC performance devices from Belimo	ZTH EU
	Belimo PC-Tool, software for adjustments and diagnostics, Belimo Assistant App, for Android or iOS Smartphone, free download at Google Play/App Store	MFT-P
	Bluetooth / NFC converter	ZIP-BT-NFC
	Adapter for ZTH service tool EU	MFT-C

Dimensions [mm]

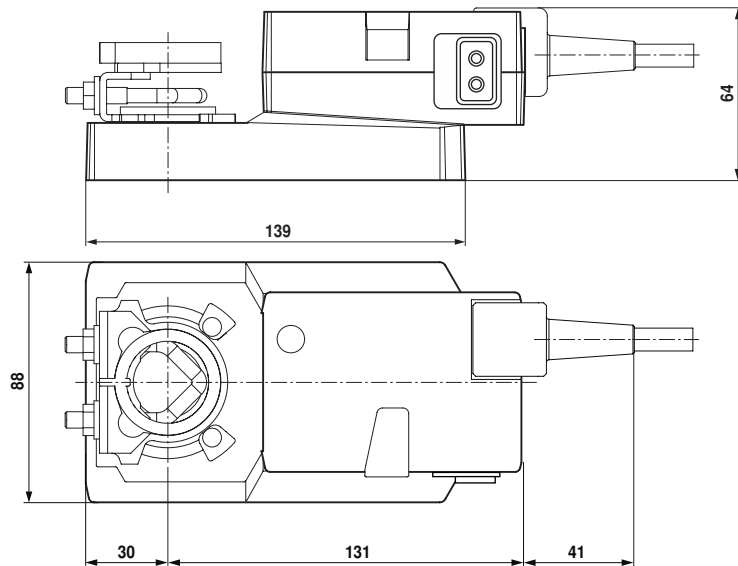
Dimensional drawings LMV-D3-MP



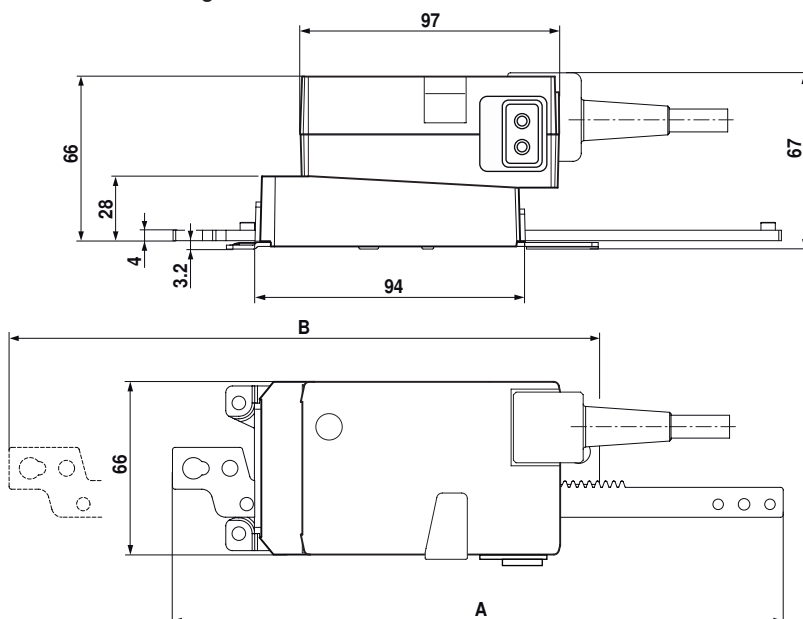
Dimensional drawings NMV-D3-MP



Dimensional drawings SMV-D3-MP



Dimensional drawings LHV-D3-MP



Type	Max. stroke	A	B
LHV-D3-MP100	100	233.5	264.2
LHV-D3-MP200	200	333.5	364.2
LHV-D3-MP300	300	433.5	464.2

FCC notes (relevant only for US market)

This device complies with part 15 of the FCC:

Operation is subject to the following two conditions:

1. This device may not cause harmful interference
2. This device must accept any interference received, including interference that may cause undesired operation.

The following statement applies to the products covered in this manual, unless otherwise specified herein. The statement for other products will appear in the accompanying documentation.

NOTE:




This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio / T.V. technician for help.

Further documentations

- Brochure – Belimo volumetric flow and pressure control
- Technical data sheet – VAV-Compact-MP
- Brochure - Overview Bus solutions from Belimo
- Tool connections

	-MF	-MP	-KNX	-MOD
				
Field of application: Supply air/Extract air in the comfort zone and in sensor-compatible media	X	X	X	X
AC/DC 24 V supply	X	X	X	X
Δp Sensor installed, dynamic D3, measuring range:	-20...500 Pa	-20...500 Pa	-20...500 Pa	-20...500 Pa
Actuator variants:				
– Rotary actuator	5 / 10 Nm	5 / 10 / 20 Nm	5 / 10 / 20* Nm	5 / 10 / 20* Nm
– Linear actuator	–	150 / 200 / 300 mm	150* / 200* / 300* mm	150* / 200* / 300* mm
VAV-Function Close, $V'_{min} \dots V'_{max}$	X	X	X	X
CAV steps $V'_{min} / V'_{mid} / V'_{max} / \text{Close}$	X	X	–	–
Position Control (Open Loop / External V control)	X	X	X	X
DCV (Optimiser function)	–	DDC MP Partner	Yes, programmable	Yes, programmable
Analogue control	0/2...10 V	0/2...10 V	–	0/2...10 V
Bus actuation	–	X	X	X
Bus specification	–	Belimo MP-Bus	KNX S-Mode	Modbus RTU/ BACnet MS/TP/ RS485
Direct integration DDC MP-Partner	–	X	–	–
Integration via Gateway	–		–	–
– BACnet		X		
– KNX		X		
– Modbus RTU		X		
Number of bus subscribers	–	8 per string	64 per line segment	32 per string
Sensor integration	–			
– Passive (resistance)		X	–	–
– Active (0...10 V)		X	X	X
– Switching contact		X	X	X
Optional control function	–	–	–	–
Local override	–	CLOSE / V'_{max} / OPEN	CLOSE / V'_{max} / OPEN	CLOSE / V'_{max} / OPEN
Aids	–	MP-Bus tester MP monitor	ETS Product database	–
Integration tool	PC-Tool	PC-Tool	ETS	...
TypeList function (Retrofit, OEM)	–	X	(–)	(–)
Tool connection (U – PP/MP)	PP	PP/MP	PP	PP
Service socket ZTH EU/PC-Tool	X	X	X	X
NFC interface	–	X	–	–
Assistant app	–	X	–	–
Service tool ZTH EU	X	X	X	X
PC-Tool	X	X	X	X
– Parameters				
– Save data				
– Trend, Logbook				
– Label print				

* on request