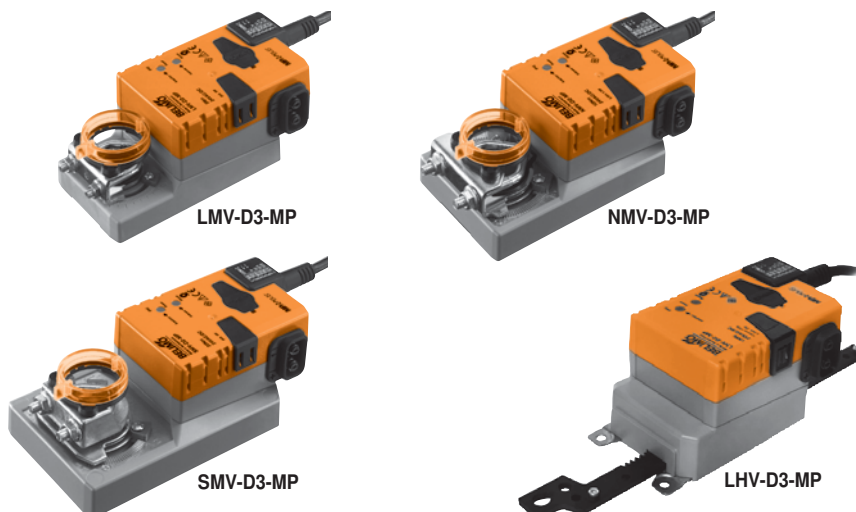


VAV-Compact controller with integrated pressure sensor, VAV controller and damper actuator for pressure-independent VAV and CAV applications in the comfort zone

- Control: DC 0/2 ... 10V / MP-Bus
- Integration in bus systems
  - DDC controller with MP interface
  - LONWORKS® systems
  - Fan optimiser systems
- With additional switch-on option for sensors and switches
- Diagnostic socket for Service and PC-Tool


**Brief description**

<b>Application</b>	The digital VAV-Compact has PI control characteristics and is used for pressure-independent control of VAV units in the comfort zone.
<b>Pressure measurement</b>	The integrated maintenance-free Belimo D3 differential pressure sensor is also suitable for very small volumetric flows. It is for this reason that it covers versatile applications in the comfort zone, e.g. in residential construction, offices, hospitals, hotels, cruise ships, etc.
<b>Actuator</b>	Three versions available, depending on the size of the VAV unit: 5 / 10 / 20 Nm. <ul style="list-style-type: none"> <li>– Rotary actuator, depending on the size</li> <li>– Linear actuator 150 N with 100, 200 or 300 mm linear movement</li> </ul>
<b>Control function</b>	VAV-CAV or Open-Loop operation for integration in an external VAV control loop.
<b>Feedback</b>	Damper position for fan optimiser systems, current volumetric flow or pressure value.
<b>VAV – variable volumetric flow</b>	For variable volumetric flow applications with a modulating reference variable, e.g. room temperature controller, direct digital control or bus system, it enables demand-related, energy-saving ventilation of individual rooms or zones. The operating range $\dot{V}_{min} \dots \dot{V}_{max}$ can be connected via selectable mode. The following are available: DC 2 ... 10V / 0 ... 10V / adjustable range / bus operation
<b>CAV – constant volumetric flow</b>	For constant volumetric flow applications, e.g. in step mode, controlled by means of a switch. The following operating modes can be selected from: CLOSED / $\dot{V}_{min}$ / ( $\dot{V}_{mid}$ ) / $\dot{V}_{max}$ / OPEN
<b>Bus function</b>	Up to eight Belimo MP devices (VAV / damper actuator / valve actuator) can be connected together over the MP-Bus and integrated into the following systems: <ul style="list-style-type: none"> <li>– LONWORKS® applications with Belimo UK24LON interface</li> <li>– EIB Konnex applications with Belimo UK24EIB interface</li> <li>– MODBUS RTU applications with Belimo UK24MOD interface</li> <li>– BACnet applications with Belimo UK24BAC interface</li> <li>– DDC controller with integrated MP-Bus protocol</li> <li>– Fan optimiser applications with optimiser COU24-A-MP</li> </ul> A sensor (0...10V or passive), e.g. a temperature sensor or a switch, can optionally be integrated into the higher-level DDC or bus system via the MP-Bus.
<b>Operating and service devices</b>	Belimo PC-Tool or service tool ZTH-GEN, can be plugged into the VAV-Compact (PP connection) or via MP-Bus.
<b>Assembly and connection</b>	The VAV-Compact, which is assembled on the unit by the OEM, is connected using the prefabricated connecting cable.
<b>Test function / test display</b>	The VAV-Compact features two LEDs with a functional readiness display for commissioning and functional checking. Extended information with ZTH-GEN.
<b>OEM factory settings</b>	The VAV-Compact is mounted on the VAV unit by the unit manufacturer, who adjusts and tests it according to the application. The VAV-Compact is sold exclusively via the OEM channel for this reason.

**Type overview**

Type	Torque	Power consumption	Dimensioning	Weight
LMV-D3-MP	5 Nm	2 W	4 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



Technical data	
<b>Supply</b>	
Nominal voltage	AC 24V, 50/60 Hz DC 24 V
Operating range	AC 19.2 ... 28.8V DC 21.6 ... 28.8V
<b>Differential pressure sensor</b>	
Type, principle of operation	Belimo D3 sensor, dynamic response
Operating range	0 ... 600 Pa
Overload capability	±3000 Pa
Installation position	Any, no reset necessary
Materials in contact with medium	Glass, epoxy resin, PA, TPE
<b>Control function</b>	– VAV-CAV – Open-loop operation
<b>Adjustment values</b>	
$\dot{V}_{nom}$	OEM-specific nominal volumetric flow setting, suitable for the VAV unit
$\Delta p @ \dot{V}_{nom}$	50 ... 450 Pa
$\dot{V}_{max}$	20 ... 100% of $\dot{V}_{nom}$
$\dot{V}_{min}$	0 ... 100% of $\dot{V}_{nom}$
$\dot{V}_{mid}$	50% of $\dot{V}_{min}$ to $\dot{V}_{max}$
<b>Classic control</b>	
VAV mode for reference value input Y (Connection 3)	– DC 2 ... 10V / (4 ... 20 mA with 500 Ω resistance) – DC 0 ... 10V / (0 ... 20 mA with 500 Ω resistance) – Adjustable DC 0 ... 10V
Mode for actual value signal U <sub>5</sub> (Connection 5)	– DC 2 ... 10V – DC 0 ... 10V – adjustable: volumetric flow, damper position or differential pressure
	} Input impedance min. 100 kOhm } max. 0.5 mA
CAV operating modes (constant volumetric flow)	CLOSED / $\dot{V}_{min}$ / ( $\dot{V}_{mid}$ *) / $\dot{V}_{max}$ / OPEN * (* only with AC 24V supply)
<b>MP-Bus function</b>	
Address in bus operation	MP1 ... 8 (classic operation: PP)
LONWORKS® / EIB-Konnex / MODBUS RTU / BACnet	with BELIMO Interface UK24LON / UK24EIB / UK24MOD / UK24BAC 1 ... 8 BELIMO MP devices (VAV / damper actuator / valve)
DDC controller	DDC controllers/programmable controller with an integrated MP interface from various manufacturers
Fan optimiser (fan control)	with BELIMO Fan Optimiser COU24-A-MP
Sensor integration	Passive (Pt1000, Ni1000, etc.) and active sensors (0...10V), e.g. temperature, humidity 2-point signal (switching capacity 16 mA @ 24V), e.g. switches, occupancy switches
<b>Operating and service</b>	
Communication	Pluggable / PC-Tool (V3.6 or higher) / service tool ZTH-GEN PP/MP-Bus, max. DC 15V, 1200 baud
Push-button	Adaption / addressing
LED display	– 24V supply – Status / bus function
<b>Actuator</b>	
Direction of rotation	Brushless, non-blocking actuator with power-save mode left / right or ↑ / ↓
Adaption	Capture of setting range and resolution to control range
Gear disengagement	Push-button self-resetting without functional impairment
Sound power level	max. 35 dB (A), SMV-D3-MP max. 45 dB (A)
<b>Actuator - rotating</b>	
Angle of rotation	95° ↯, adjustable mechanical or electronic limiting
Position indication	Mechanical with pointer
Spindle holder	– Spindle clamp, spindle round 10 ... 20 mm / spindle square 8 ... 16 mm – Form fit in various versions, e.g. 8 x 8 mm
<b>Actuator – linear</b>	
Stroke	100, 200 or 300 mm, adjustable mechanical or electronic limiting
Connection	Cable, 4 x 0.75 mm <sup>2</sup>
<b>Safety</b>	
Protection class	III Safety extra-low voltage
Degree of protection	IP54
Electromagnetic compatibility	CE according to 89/336/EEC

**Technical data**
*(continued)*
**Safety**

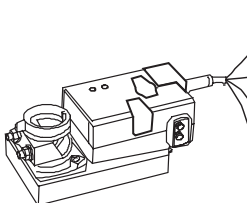
Principle of operation	Type 1 (in acc. with EN 60730-1)
Rated current voltage	0.5 kV (in accordance with EN 60730-1)
Control pollution degree	2 (in accordance with EN 60730-1)
Ambient temperature	0 ... +50°C
Non-operating temperature	-20 ... +80°C
Ambient humidity	5 ... 95% r.h., non-condensing (in accordance with EN 60730-1)
Maintenance	Maintenance-free

**Connection**
**Cable connection**

The connection is made using the connecting cable mounted to the VAV-Compact device.

**Information**

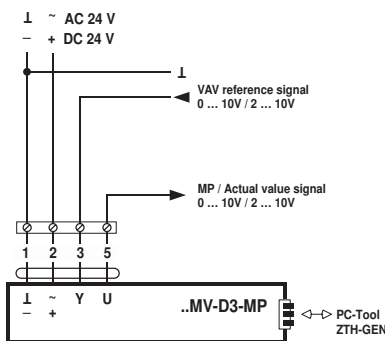
- Supply via safety isolating transformer!
- Connections 1 and 2 (AC/DC 24V) and 5 (MP signal) must be routed to accessible terminals (room temperature controller, floor distributor, control cabinet, etc.) in order to enable access with the tool for diagnostic and service work.



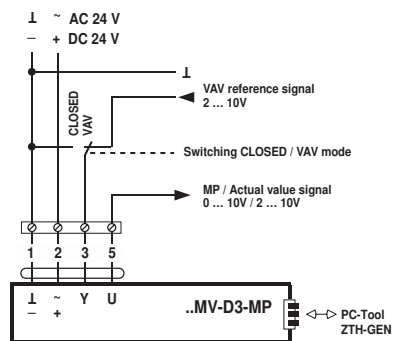
No.	Designation	Wire colour	Function
1	– ⊥	black	⊥ –
2	+ ~	red	~ +
3	← Y	white	Reference signal VAV/CAV
5	→ U	orange	– Actual value signal – MP-Bus connection

**VAV – variable operation  $\dot{V}_{min} \dots \dot{V}_{max}$** 
**Wiring diagrams**
**Example 1:**

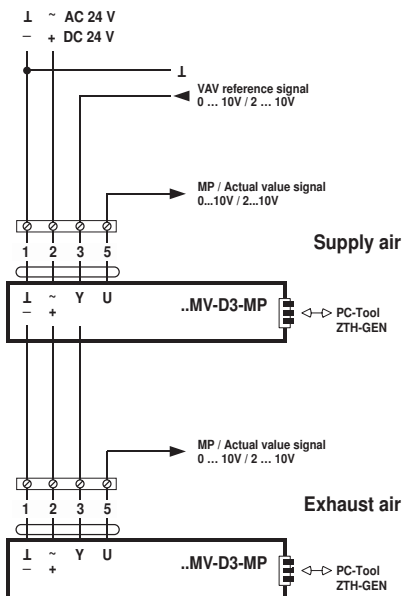
VAV with analogue reference signal


**Example 2:**

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


**Example 3:**

VAV with analogue reference signal supply/exhaust air in parallel operation


**Example 4:**

VAV with analogue reference signal, in Master/Slave operation

