4. LMV-D2M-1
Product Information (Overview)
Air Volume Control

Products no longer available
The product range for air volume control

<table>
<thead>
<tr>
<th>VAV-Compact</th>
<th>VAV-Universal</th>
</tr>
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<tbody>
<tr>
<td>Sensor</td>
<td>Sensor</td>
</tr>
<tr>
<td>5 NM</td>
<td>VFP-100</td>
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<tr>
<td>VAV controller</td>
<td>VFP-300</td>
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<tr>
<td>8 NM</td>
<td>VFP-600</td>
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<tr>
<td>Actuators</td>
<td>VRD2</td>
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<td>Actuators with safety function</td>
<td>VRP</td>
</tr>
<tr>
<td>NM24-V</td>
<td>VRP-STP</td>
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<tr>
<td>LF24-V</td>
<td>AF24-V</td>
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<tr>
<td>General accessories: Positioner</td>
<td>SGE24</td>
</tr>
<tr>
<td>SGF24</td>
<td>SGA24</td>
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<tr>
<td>Room temperature controller</td>
<td>CR24-B1</td>
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<tr>
<td>CR24-B2 / CR24-B2E</td>
<td>CR24-B3</td>
</tr>
<tr>
<td>Adjuster</td>
<td>ZEV</td>
</tr>
<tr>
<td>ZEV-Set</td>
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Accessories for the LMV-D2M / NMV-D2M:

- **UK24LON**: Interface for LonWorks® applications
- **MFT-H**: Parameterizing device
- **PC-Tool**: Parameterizing and service software
- **ZKS-VAV**: Cable set for the NMV-D2M

Products no longer available
LMV-D2M VAV-Compact Controller

Pressure sensor, digital controller and 5 Nm damper actuator all in one, providing a VAV-Compact solution with a communications capability

Variable/Constant volumetric flow for Master-Slave or Parallel applications

Classic control: DC 2...10 V / 0...10 V / adjustable voltage range

Bus control: For integrating into DDC control or LonWorks® systems - with additional connection facility for active sensors or switches

Diagnostic socket for operating devices

Application

The VAV-Compact LMV-D2M controller has PI control characteristics and is used for the pressure independent control of VAV air control units. Stepped-mode constant flow control e.g. switch or clock program. Variable flow with modulating reference variable based on, for example, temperature, occupancy, room thermostat, DDC or LonWorks® system, allowing demand-related, energy-saving ventilation of individual rooms or zones of air-conditioning systems. Maintenance-free sensor technology, thoroughly proven in a great variety of previous applications, means that the controllers can offer total reliability and dependability in various climate conditions.

Variable volumetric flow: VAV

For variable-flow applications the operating range \( V_{\text{MIN}}...V_{\text{MAX}} \) can be subdivided by selecting any of the following operating modes:

- DC 2...10 V / 0...10 V / Adjustable.

Constant volumetric flow: CAV

The following operating modes are available for constant-flow applications:

- CLOSE / \( V_{\text{MIN}} \)
- \( V_{\text{MID}} \)
- \( V_{\text{MAX}} \)
- OPEN

Bus function: MP-Bus

Up to 8 Belimo MFT2 devices (VAV units/damper actuators/valves) can be connected together over the MP-Bus and linked into the following systems:

- LonWorks® applications: All variables of Functional Profile 8110 are available in conjunction with the Belimo UK24LON interface.
- DDC controllers with integrated MP-Bus protocol.

Additionally, an active sensor (0...10 V), e.g. a temperature sensor or a switch, can be linked into a higher level DDC or LonWorks® system via the MP-Bus.

Operating and service tools

- PC-Tool, MFT-H, ZEV – plugs into the LMV-D2M controller or the control cabinet
- PC-Tool or MFT-H – plugs into the UK24LON / DDC controller.

OEM factory settings

The LMV-D2M controller is mounted on the air control unit by the maker of the unit who then adjusts and tests it according to the requirements of the particular application involved.

Installing and connecting up

Mounted on an air control unit by an OEM, the LMV-D2M controller is connected by means of a 1 m long cable.

Important note:

It is the manufacturer of the VAV unit (the OEM) who is responsible for the correct installation and adjustment of the LMV-D2M controller and the overall accuracy of the VAV unit. When replacement units are ordered they are parameterized by the OEM before they leave the factory according to the requirements of the system in which they are to be used. This means that LMV-D2M controllers can only be sold through OEM channels.

Dimensions

<table>
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<th>Width</th>
<th>Height</th>
<th>Depth</th>
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<tr>
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<td>66.8</td>
<td>35.4</td>
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<tr>
<td>26.5</td>
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<td>6.9</td>
</tr>
<tr>
<td>81</td>
<td>26.5</td>
<td>14</td>
</tr>
</tbody>
</table>

Wiring diagram

(Functional diagram refer to the NVM-D2M Product information)

Connect via safety isolating transformer
Technical data

Function | Data
--- | ---
**Power supply**
Nominal voltage | AC 24 V 50/60 Hz DC 24 V
Nominal voltage range | AC 19.2...28.8 V DC 21.6...28.8 V
For wire sizing | 5 VA (I<sub>max</sub>. 8.3 A @ 5 ms)
Power consumption | 3 W
**Differential-pressure sensor** | 2...~300 Pa (depends on OEM)
Operating pressure | max. 1000 Pa
Characterizing | linearized for specific differential-pressure air probe and OEMs
Mounting position | any, no zero setting needed
Operating medium (see «Materials») | SUPPLY/EXHAUST air for comfort applications and others with sensor-compatible media
Materials | PC+ABS to UL94-V0, stainless steel DIN 1.4301 X10CrNiS1810; PP Santoprene
Measuring air conditions | 0...+50°C / 5...95% rH, non-condensing

**Applications VAV and CAV**
- SUPPLY/EXHAUST air control units in stand-alone mode / master-slave / parallel connection for rooms with positive/negative or neutral air pressure
- Air mixing units

**Operating volumetric-flow**
\( V_{\text{NOM}} \) | depending on OEM and type of VAV unit
\( V_{\text{MAX}} \) | 30...100% of \( V_{\text{NOM}} \)
\( V_{\text{MIN}} \) | 0...100% of \( V_{\text{MAX}} \) (see NMV-D2M doc. p.8 «Creep flow suppression; Minimum setting limit»)
\( V_{\text{MID}} \) | 0...100% of (\( V_{\text{MIN}}...V_{\text{MAX}} \))

**Classic control**
Mode for reference value input \( w \) (Terminal 3)
- DC 2...10 V / (4...20 mA with ext. 500 \( \Omega \) resistor)
- DC 0...10 V / (0...20 mA with ext. 500 \( \Omega \) resistor)
- adjustable DC 0...30 V

Mode for actual volumetric flow \( U_5 \) (Terminal 5)
- DC 2...10 V
- DC 0...10 V
- adjustable DC 0...10 V

Operating modes for CAV
CLOSE/\( V_{\text{MIN}}/V_{\text{MAX}}/V_{\text{MID}} \) /OPEN* (*only with AC 24 V)

**Bus control – MP-Bus function**
Addressing in bus mode | MP1...8 (classic control: PP)
LONWORKS® with Belimo UK24LON Interface, 1...8 Belimo MFT2 devices (VAV / damper actuator / valve)
DDC controller | DDC controller with integrated MP interface
Your Belimo representative will be glad to inform you about DDC solutions with MP-Bus)
Sensor links | active sensor with DC 0...10 V signal, e.g. temperature, humidity
2-point signal (contact rating 16 mA @ 24 V), e.g. switches, occupancy detector

**Operation, Service**
pluggable, with ZEV / MFT-H / PC-Tool
Communications | PP/MP-Bus, max. DC 15 V, 1200 baud
Actuator | brushless, non-blocking actuator with current reduction
Torque | min. 5 Nm at nominal voltage
Direction of rotation | cw / ccw
Angle of rotation | 95°, with adjustable mechanical limiting
Adaption setting | acquisition of angle of rotation and adaption of control range
Manual disengagement
- multiple function
- push-button, auto-return without affecting functions
- manual control, start function test, trigger angle of rotation adaption
Position indication | mechanical with pointer
Spindle attachment
- spindle clamp, for round spindles 10...20 mm / square spindles 8...16 mm
- form-fit, wide range of versions, e.g. 8 x 8 mm

**Connecting cable**
1 m long, 4 x 0.75 mm²

**Ambient conditions**
0...+50°C, 5...95% rH, non-condensing
Non-operating temperature | -20...+80°C

**Protection class and tests**
Protection class / EMC | III (extra low voltage) / CE conforming to 89/336/EU
Sound power level | max. 35 dB (A)
Maintenance | maintenance-free
Weight | 900 g

Refer to the NMV-D2M Product-Information for selecting systems and descriptions of functions and applications
**VAV – Application example**

**Function**
Variable volumetric flow application with 2...10 V control, e.g. by Belimo room controller CR24-B1. The air flow rate is regulated variably – within the preset range of volumetric flow rates from V_MIN and V_MAX – to the reference value issued by the room controller, positioner, etc. The reference signal is normally based on room temperature. Occupancy, control energy hold on, etc can be incorporated into the reference value issued by the room controller, positioner, etc.

**Application**
A version of installation for economic operation with high comfort levels suitable for:
- conference rooms, offices
- presentation and counter rooms
- hotel rooms
- patient wards in hospitals.

**Control**
2...10 V control in a Master-Slave circuit.

**Diagram**
The diagram illustrates the control logic with a Master-Slave configuration. It shows the connection of a Master unit and several Slave units, each with an actual volumetric flow signal and a reference signal. The reference signal is modulating via the room temperature controller CR24-B1.

**Products no longer available**
Products no longer available as of 2005.
Products no longer available

Innovation, Quality and Consultancy: A partnership for motorizing HVAC actuators

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