## Technical data sheet ZEV

### Technical data

#### Electrical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage</td>
<td>AC 24 V, 50/60 Hz, DC 24 V</td>
</tr>
<tr>
<td>Power supply range</td>
<td>AC 19.2 ... 28.8 V, DC 21.6 ... 26.4 V</td>
</tr>
<tr>
<td>Power consumption</td>
<td>1 W</td>
</tr>
<tr>
<td>PP communication</td>
<td>DC 1.0/12.5 V max. DC 15 V bidirectional 1200 baud</td>
</tr>
<tr>
<td>Connection</td>
<td>Screw terminals for 2 x 1.5 mm²</td>
</tr>
</tbody>
</table>

#### Safety

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection class</td>
<td>III Safety extra-low voltage</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP42</td>
</tr>
<tr>
<td>EMC</td>
<td>CE according to 89/336/EEC</td>
</tr>
<tr>
<td>Ambient temperature range</td>
<td>0 ... +50 °C</td>
</tr>
<tr>
<td>Non-operating temperature range</td>
<td>-20 ... +80 °C</td>
</tr>
<tr>
<td>Moisture test</td>
<td>According to EN 60730-1</td>
</tr>
</tbody>
</table>

#### Dimensions / weight

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>See «Dimensions» on page 3</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 500 g</td>
</tr>
</tbody>
</table>

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### Brief description

**Applications**

The ZEV adjustment tool enables the operating volumetric flow settings in VAV and CAV systems with conventional control to be adjusted on site. It is not suitable for systems with an MP bus connection.

**Can be used with**

- NMV-D2, VRD2, VRD2-L
- LMV-D2M, NMV-D2M
- LMV-D2-MP, NMV-D2-MP, SMV-D2-MP
- LHV-D2M

**Connection**

The ZEV is connected to the VAV-Compact using the PP (peer-to-peer) interface of the VAV controller.

As well as using the service socket on the VAV-Compact, it is also possible to connect the ZEV to easily accessible connection points such as the service plug on the CR24-B room temperature controller or on the terminals in the control cabinet. This means there is no need for direct access to the VAV controller.

**Supply**

The 24 V supply to the ZEV comes via the service socket of the VAV, CR24 controller or from a local 24 V supply, e.g. connection terminals of the VAV controller.

**VAV-Compact**

The VAV-Compact devices do not have any operating elements such as switches or setpoint potentiometers. If necessary, the operating parameters are set using the ZEV or another adjustment tool, e.g. the PC-Tool with additional functions such as trend, etc.

**VAV-Universal**

In the VRD2(-L), it is possible to set the mode appropriately for the selected 0...10 V or 2...10 V room temperature controller.

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1) Mode setting 0 ... 10 V / 2 ... 10 V
2) See mode setting
3) Devices manufactured before 8/2006 need a modified scale sticker

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Products no longer available
Safety notes

- The device is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Only for Belimo VAV devices with 24 V safety extra-low voltage.

Electrical installation

Wiring diagrams

The ZEV is connected to connections 1 and 5 of the corresponding controller. The ZEV supply (AC/DC 24 V) comes directly from connection 2.

When the system is being wired up, it is advantageous for the actual value signal U5 (terminal 5) of the VAV controller to be fed back to the room temperature controller or into the control cabinet. Communication is via a peer-to-peer connection (PP).

Connection options Connection via service socket (Cable see «Accessories» on page 4)

Note

Connection via safety transformer!

- When an operating device (e.g. ZEV) is connected via the U/-PP connection (terminal 5) of the VAV controller, the voltage signal of output U5 does not correspond to the current actual value signal.
- When using the service socket of an LMV-D2-MP, NMV-D2-MP or SMV-D2-MP, the U5 signal is not impaired.
- The maximum communication level is DC 15 V. To prevent damage to third-party equipment, it may have to be disconnected from terminal 5 under certain circumstances – for the duration of communication.

Connection via connection terminals

- Device terminals / connection socket
- Switch cabinet terminals

Note

- When an operating device (e.g. ZEV) is connected via the U/-PP connection (terminal 5) of the VAV controller, the voltage signal of output U5 does not correspond to the current actual value signal.
- When using the service socket of an LMV-D2-MP, NMV-D2-MP or SMV-D2-MP, the U5 signal is not impaired.
- The maximum communication level is DC 15 V. To prevent damage to third-party equipment, it may have to be disconnected from terminal 5 under certain circumstances – for the duration of communication.
**Operation**

**Structure**

A. Operating volumetric flow $V_{\text{min}}$
B. Operating volumetric flow $V_{\text{max}}$
C. Mode setting for reference and volumetric flow actual value signal
D. Functional check of control loop nominal/actual value comparison
E. Reset $V_{\text{min}}$, $V_{\text{max}}$ setting to original OEM values

**Query**

for VRD2(-L), NMV-D2, LMV-D2M, NMV-D2M

Turn the rotary button slowly until the check LED lights up.
- Flashing LED: Value in VAV controller is lower
- LED dark: Value in VAV controller is higher

Set the value at the corresponding rotary button:
Press and hold the «Set» button for 2 seconds. The write procedure is acknowledged by the LED lighting up (see application table on page 4).

for LMV-D2-MP, NMV-D2-MP, SMV-D2-MP

Turn the rotary button slowly until the check LED flashes.
- LED Vmin
- LED Vmax

The following flashing sequence indicates that the value in the VAV controller is greater.
- LED Vmin
- LED Vmax

- LED dark: Value in VAV controller is higher.

**Programming**

Set the value at the corresponding rotary button:
Press the «Set» button repeatedly until the following flashing sequence indicates that the value has been accepted.
- LED Vmin
- LED Vmax

Functional check VAV control loop

Green LED lights up $\rightarrow$ Actual value same as nominal value
Green LED flashes $\rightarrow$ Actual value not same as nominal value
- Dark $\rightarrow$ Volumetric flow not reached
- Bright $\rightarrow$ Volumetric flow too high

**Legend**

- Yellow LED lights up
- LED dark

Note
ZEV devices manufactured before 8/2006 need a modified scale sticker. Please contact your Belimo branch.
1) See product information for VAV-Compact and VAV-Universal
2) Lowest setting depends on the creep flow suppression. See VAV product information documents or refer to data from the VAV manufacturer.
3) ZEV devices (manufactured before 8/2006) need a modified scale sticker. Please contact your Belimo branch.
4) The "Constant" option is irrelevant for the current VRD2, LMV-D2-MP, and LN/SVM-D2-MP versions.
5) If the LED constantly displays low-power "dark" flashes (>3 min), this means the actuator is most probably at a limit position.

### Accessories

<table>
<thead>
<tr>
<th>Accessory</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable</td>
<td></td>
</tr>
<tr>
<td>ZKS-VAV</td>
<td>for LMV-D2M, NMV-D2M, CR24-A, CR24-B, etc.</td>
</tr>
<tr>
<td>ZKS-GEN</td>
<td>for new generation VAV-Compact, LMV-D2-MP, NMV-D2-MP, SMV-D2-MP, LHV-D2-MP</td>
</tr>
</tbody>
</table>

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