Product information ZTH EU

Service tool for parameterisable and communicative actuators / VAV controllers and HVAC performance devices from Belimo.
- Connection via service socket on the device or MP/PP connection
- ZIP USB function

Technical data

<table>
<thead>
<tr>
<th>Electrical data</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage</td>
<td>AC 24 V, 50/60 Hz, DC 24 V (from actuator)</td>
<td></td>
</tr>
<tr>
<td>Operating range</td>
<td>AC 19.2…28.8 V / DC 21.6…28.8 V</td>
<td></td>
</tr>
<tr>
<td>Power consumption</td>
<td>1 W</td>
<td></td>
</tr>
<tr>
<td>Connection</td>
<td>Socket for connecting cable ZK1-GEN (3 m) supplied with connector</td>
<td></td>
</tr>
<tr>
<td>Interface USB 2.0</td>
<td>USB socket type B, connecting cable (1 m) with socket A to B supplied</td>
<td></td>
</tr>
<tr>
<td>Optional cables</td>
<td>ZK2-GEN, ZK6-GEN</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interface</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>Point to Point (PP), no bus mode possible (MP)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operating modes</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameterisation</td>
<td>Point to Point (PP)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Connection using service socket or connecting terminals on the actuator</td>
<td></td>
</tr>
<tr>
<td>MP level converter (ZIP function)</td>
<td>Connection in control cabinet or via service socket on actuator For MP monitor operation, connection on MP-Bus</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operation</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LCD display</td>
<td>2 x 16 characters, with background lighting</td>
<td></td>
</tr>
<tr>
<td>Keys</td>
<td>i / esc / ▲ / ▼ / OK</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Safety</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection class</td>
<td>III Safety extra-low voltage</td>
<td></td>
</tr>
<tr>
<td>EMC</td>
<td>CE according to 2014/30/EU</td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>0…50 °C, non-condensing</td>
<td></td>
</tr>
<tr>
<td>Non-operating temperature</td>
<td>−20…50 °C, non-condensing</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimensions / weight</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>L x W x D: 95 x 55 x 25 mm</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 135 g</td>
<td></td>
</tr>
</tbody>
</table>

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 connection to Belimo devices with 24 V safety extra-low voltage and PP/MP interface permitted.
- Changes to parameters etc. may only be performed following consultation with/specification from the OEM, device or mechanical/electrical contractor. Operating and adjustment regulations must be observed.

Definitions

ZTH EU
The ZTH EU is sold worldwide. Therefore the product name for the European region is defined as ZTH EU. In the product information, the term ZTH is used to represent the ZTH EU.

Actuators
For simplicity in the product information, the terms actuators, VAV controllers, fire damper actuators and HVAC performance devices are summarised using the term actuators.
## Supported devices

<table>
<thead>
<tr>
<th>Supported devices</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Damper product range</strong></td>
<td>..-MF / ..-MP / ..-MPL / ..-MFT(2) / ..-MOD / ..LON</td>
</tr>
<tr>
<td><strong>Valve product range</strong></td>
<td>..-MF / ..-MP / ..-MPL / ..-MFT(2) / ..-MOD / ..LON / ..LON / ..BAC</td>
</tr>
<tr>
<td><strong>Electronic pressure-independent characterised control valve EPIV</strong></td>
<td>P6..W..-MP / EP0..R+MP</td>
</tr>
<tr>
<td><strong>Fire damper actuator</strong></td>
<td>BF-TopLine with BKN230-24MP</td>
</tr>
<tr>
<td></td>
<td>VRD3</td>
</tr>
<tr>
<td></td>
<td>VRP-M (VAV and STP applications)</td>
</tr>
<tr>
<td></td>
<td>NMV-D2</td>
</tr>
<tr>
<td></td>
<td>LMV-D2M / NMV-D2M</td>
</tr>
<tr>
<td></td>
<td>LMV-D2-MP / NMV-D2-MP / SMV-D2-MP.., LHV-D2-MP..</td>
</tr>
<tr>
<td></td>
<td>LMV-D2LON / NMV-D2LON</td>
</tr>
<tr>
<td></td>
<td>LMV-D3-MP / NMV-D3-MP / SMV-D3-MP.., LHV-D3-MP..</td>
</tr>
<tr>
<td></td>
<td>LMV-D3LON / NMV-D3LON</td>
</tr>
<tr>
<td></td>
<td>LMV-D3-MOD / NMV-D3-MOD</td>
</tr>
<tr>
<td></td>
<td>LMV-D3-KNX / NMV-D3-KNX, LHV-D3-KNX..</td>
</tr>
<tr>
<td></td>
<td>CMV..-MP</td>
</tr>
</tbody>
</table>

### HVAC performance devices

According to system description
- Energy valve, pressure-independent zone valve 6-way

**sharedlogic**

According to system description

## Connection

### Connection and supply

The ZTH EU is supplied via the actuator. The connection is set up
- either directly on the service socket of the actuator
- or via PP/MP connection (U5), e.g. connection socket, control cabinet and room controller CR24

### Type of connection and connection cable

<table>
<thead>
<tr>
<th>Suitable cable</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZK1-GEN</td>
<td></td>
</tr>
<tr>
<td>ZK2-GEN</td>
<td></td>
</tr>
<tr>
<td>ZK4-GEN</td>
<td></td>
</tr>
<tr>
<td>ZK6-GEN</td>
<td></td>
</tr>
</tbody>
</table>
Connection for ZTH adjustment and diagnostic device

Direct connection to the MP-Bus or MP master is not possible with the ZTH EU.

Right

Wrong

Solution: Use the service socket on the actuator or temporarily disconnect the MP connection of the MP device from the MP-Bus and connect the ZTH EU to the MP connection.

ZIP function connection

Note

The USB driver required will be automatically installed with PC-Tool version 3.9 or higher. For older versions of the PC-Tool, the driver can be downloaded from www.belimo.eu and installed separately.

Connection via service socket - local connection with ZK1-GEN cable

Connection via connecting cable - local connection with ZK2-GEN cable
ZIP function connection

PC-Tool as MP master
- Actuator parameterisation via MP-Bus
- Specification of setpoints for simulation of actuators via MP-Bus
- Reading in of sensors that are connected to the MP actuator
- Recording of graphic trends

Note
* Interrupt connection between ZTH EU and MP master before using the ZIP function.

PC-Tool connection with ZK6-GEN, ZK4-GEN on Belimo gateways
- For connection to UK24MOD and UK24BAC, use the ZK6-GEN cable.
- For connection to UK24EIB and UK24LON, use the ZK4-GEN cable.
ZIP function connection

PC-Tool as monitor
Check the MP communication with the MP monitor tool (module of PC-Tool V3.x).

PC-Tool with monitor function / connection: ZK2-GEN to MP master

PC-Tool with monitor function / connection: tool socket with ZK6-GEN, ZK4-GEN
MP tester connection

MP-Bus direct ZTH connection

ZTH connection to tool socket with ZK6-GEN, ZK4-GEN
**Operation**

When the ZTH EU is connected to the Belimo actuator, the operating device starts and data is read from the connected device. The available adjustment and operating options are displayed in accordance with the device type. The available setting parameters are listed in the product documentation for the actuators. See www.belimo.eu

### Operating elements

- **LCD display**
  - Background lighting
  - Display with 2 x 16 characters

### Key function

- ▼ and ▲: Forward/backward
  - Change value / status
- OK: Confirm entry,
  - go to submenu
- esc: Abort entry,
  - leave submenu,
  - discard change
- i: Shows additional information
  - (if available)

- RJ12 connection socket
- USB connection socket for communication with PC

### Language setting, unit depiction

Language and units can be set in the Configuration menu.

### Operation

Operating is context-related, i.e. the user sees only the options available for the connected device. The corresponding Configuration table is read from the actuator for this purpose. In addition to the parameter type, this table also contains the corresponding divisions, e.g.: minimum running time which can be set, type etc. Non-relevant options are not displayed.

### Menu structure, handling

The operating menu can be scrolled through from both sides using the ▼▲ keys.

![Menu structure diagram](image)

### Changing values

- Change value (with ▼▲ keys)
  - Press OK to enter the edit mode (> appears)

- Take over new value (with OK key)
  - Press OK to accept the new value and switch to the main menu

- Discard changes (with esc key)
  - Press ESC to cancel the new value and switch back to the main menu

### Starting / ending

The connection to the actuator is started by plugging in the RJ plug and terminated by unplugging it.

### Device specifications/Technical data

For a more detailed description, including setting parameters, please refer to the respective separate product information. See www.belimo.eu | Documentation.
Configuration

Starting configuration
1. Press the key (OK) while simultaneously plugging in the connecting cable.
2. Configuration menu display appears.

Configuration menu

<table>
<thead>
<tr>
<th>Option / Display</th>
<th>Setting</th>
<th>Product range</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empty cache</td>
<td>Yes / No</td>
<td>Empty cache</td>
<td>Function to delete data profiles of HVAC performance devices from the local cache</td>
</tr>
<tr>
<td>Backlight</td>
<td>After 0..255 sec off / always active</td>
<td>Backlight</td>
<td>Setting for duration of backlight in seconds</td>
</tr>
<tr>
<td>Show favourites</td>
<td>Disabled / after 1...65535 s</td>
<td>Show favourites</td>
<td>Alternating display of the first 3 values after the set time</td>
</tr>
<tr>
<td>OEM number</td>
<td>0...65535 VAV</td>
<td>OEM number</td>
<td>VAV</td>
</tr>
<tr>
<td>Advanced Mode 1)</td>
<td>Yes / No</td>
<td>Advanced Mode</td>
<td>VAV</td>
</tr>
<tr>
<td></td>
<td>Fire protection</td>
<td>Fire protection Modbus</td>
<td>Enabled settings:</td>
</tr>
<tr>
<td></td>
<td>Modbus</td>
<td></td>
<td>– VAV: direction of rotation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>– VAV: set Vmin / Vmax to original values</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(call up OEM setting)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>– CMV: Correction factor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>– BF-Top: adaption</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>– Modbus: basic address</td>
</tr>
<tr>
<td>Expert Mode 1)</td>
<td>Yes / No</td>
<td>Expert Mode</td>
<td>VAV</td>
</tr>
<tr>
<td></td>
<td>Valves</td>
<td>Expert Mode</td>
<td>Enabled settings:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>– VAV: switching mode</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>– VAV: Vmid parameter</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>– VAV: altitude compensation</td>
</tr>
<tr>
<td>PICCV function</td>
<td>Yes / No</td>
<td>PICCV function</td>
<td>Valves Belimo US:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Enable PICCV Wizard function</td>
</tr>
<tr>
<td>Start RT-Monitor</td>
<td>RTMonitor active</td>
<td>Start RT-Monitor</td>
<td>Realtime monitor function</td>
</tr>
<tr>
<td>Start MP tester</td>
<td>MP-Bus level / Frame counter</td>
<td>Start MP tester</td>
<td>MP tester function</td>
</tr>
<tr>
<td>Power supply measurement</td>
<td>Value V (AC) VHW (%)</td>
<td>Power supply measurement</td>
<td>Enabled settings:</td>
</tr>
<tr>
<td>Pressure unit</td>
<td>Pa / in WC</td>
<td>Pressure unit</td>
<td>– VAV: direction of rotation</td>
</tr>
<tr>
<td>Flow unit (water)</td>
<td>m³/h / l/min / gpm / l/s</td>
<td>Flow unit (water)</td>
<td>– VAV: set Vmin / Vmax to original values</td>
</tr>
<tr>
<td>Flow unit (air)</td>
<td>m³/h / l/s / cfm</td>
<td>Flow unit (air)</td>
<td>(call up OEM setting)</td>
</tr>
<tr>
<td>Exit configuration</td>
<td>ESC</td>
<td>Exit configuration</td>
<td>ESC</td>
</tr>
</tbody>
</table>

1) Only activate this option as needed and with the respective know-how. Adjustment of the respective parameters requires special expertise.

Basic functions

Device identification
The following menu tree shows the basic functions which are identical for all devices.
Basic functions

**MP address**

With MP-capable actuators, the MP address (PP, MP1-MP8) can be set.

- **LM24A-MP**
  - * changes according to the type
  - PP, MP1...MP8 (on MF types only PP)

Functions for -MOD Actuators (Modbus/ BACnet /MP-Bus)

**Bus Protocol**

Specific communication settings of actuators with integrated BACnet MS/TP, Modbus RTU and MP-Bus interface (...-MOD).

The specific communication protocols are displayed by selecting the corresponding bus protocol.

**Note:**
After changing communication settings (baudrate, address, parity etc.) wait at least 5 seconds before selecting the next menu. This also applies when writing the setting before unplugging the ZTH EU or interrupting the power supply.

**BACnet Settings**

The following menu tree shows the adjustment/display options for the BACnet communications settings.

**Note:**
After changing communication settings (baudrate, address, parity etc.) wait at least 5 seconds before selecting the next menu. This also applies when writing the setting before unplugging the ZTH EU or interrupting the power supply.
Functions for -MOD Actuators (Modbus/ BACnet / MP-Bus)

Modbus Settings
The following menu tree shows the adjustment/display options for the Modbus communications settings.

- **Bus Protocol**: Modbus
- **Data, Settings**
  - **Address**: 1
  - **Basis Address**: 0
  - **Baudrate**: 19200
  - **Parity**: 1-8-N-1
  - **Termination**: off / on

Possible settings with ✅ in editing mode:
- Address: 1...247
- Basis Address: 0...200*
- Baudrate: 9600 / 19200 / 38400 / 76800 / 115200
- Parity: 1-8-N-2 / 1-8-N-1 / 1-8-E-1 / 1-8-0-1
- Termination: off / on

*) The setting of the base address is also taken into account for the BACnet MS / TP address.

MP-Bus Settings
The following menu tree shows the adjustment/display options for the MP-Bus communications settings.

- **Bus Protocol**: MP-Bus
- **Data, Settings**
  - **MP Address**: 1
  - **Possible settings with ✅ in editing mode:**
    - MP Address: PP, MP1...MP8

Setpoint source (hybrid mode)
The setpoint source setting allows to select the operating mode for controlling the devices.

- **Setpoint Source**: Bus
- **Possible settings with ✅ in editing mode:**
  - Bus / Analogue

Selection Bus: The control takes place exclusively via selected bus protocol (Modbus or BACnet)

Selection Analog: The control takes place via analogue 0...10V signal. Reading out and monitoring of the device is still possible via the selected bus protocol (Modbus or BACnet).
Functions for damper / rotary valve product range

Menu tree

The ZTH EU recognises the device family of the connected device automatically. The menu and the options available are shown related to the connected device.

Adjustment/display options

LM24A-MP*

* changes according to the type

Data, settings

Min

0%

Mid

50%

Max

90%

Running time

30 s

Mode

2 - 10 V

Act. value: 0% Auto -> OK

PF-Time

10 s

MP Address

PP

Possible settings with ▼ ▲ in editing mode:

Min always = 0%

Min...Max

Min...100%

depending on type

0.5 - 10 V / 2 - 10 V

Range 0...100% (OPEN / CLOSE / STOP / Y-wire override)

0...10 s (only at SuperCap actuators)

PP, MP1...MP8
(on MF types only PP)

Functions for globe valve product range

Menu tree

The ZTH EU recognises the device family of the connected device automatically. The menu and the options available are shown related to the connected device.

Adjustment/display options

NVK24A-MP-TPC *

* changes according to the type

Data, settings

Min

0%

Mid

50%

Max

100%

Running time

30 s

Mode

2 - 10 V

Act. value: 0% auto

PF-Time

2 s

MP Address

MP1

Possible settings with ▼ ▲ in editing mode:

Min always = 0%

Min...Max

Min...100%

depending on type

0.5 - 10 V / 2 - 10 V / 0.5 - 10 V inv / 2 ... 10 V inv

0...10 s (only at SuperCap actuators)

PP, MP1...MP8
(on MF types only PP)
**Functions for butterfly valve actuators**

**Menu tree**

The following menu tree shows the adjustment/display options of an PRKCA-BAC-S2-T.

```
PRKCA-BAC-S2-T
-►
Max
100%
Running time
35 s
Mode
2 - 10 V
Act. value: 0%
Auto -> OK
Power off Pos.
100%
PF-Time
10 s
```

Possible settings with ▼ ▲ in editing mode:

- **Max**: 33...100%
- **Running time**: 30...120 s
- **Mode**: 0.5 - 10 V / 2 - 10 V / 0.5 - 10 V Y inv / 2 ... 10 V Y inv
- **Act. value**: 0%
- **Power off Pos.**: 0...100%
- **PF-Time**: 0...10 s

**Functions for rotary actuators with high torque**

**Menu tree**

The ZTH EU recognises the device family of the connected device automatically. The menu and the options available are shown related to the connected device.

The following menu tree shows the adjustment/display options of an PKCA-BAC-S2-T.

```
PKCA-BAC-S2-T
-►
Min
0 %
Mid
50 %
Max
100%
Running time
35 s
Mode
2 - 10 V
Act. value: 0%
Auto -> OK
Power off Pos.
100%
PF-Zeit
10 s
```

Possible settings with ▼ ▲ in editing mode:

- **Min**: 0...max - 33 %
- **Mid**: Min...Max %
- **Max**: Min + 33 %...100 %
- **Running time**: 30...120 s
- **Mode**: 2 - 10 V / 0.5 - 10 V
- **Act. value**: 0%
- **Power off Pos.**: 0...100%
- **PF-Zeit**: 0...10 s

Range 0...100% (OPEN / CLOSE / STOP)
The following menu tree shows the adjustment/display options of an EP015R+KMP:

- **Data, settings**
  - **Vol 0.100 l/s**
  - **SP 0.200 l/s**
  - **Vol 0.100 l/s**
  - **Position 65%**
  - **Vol 0.100 l/s**
  - **Step Auto**

- **Sensor Status**
  - **ok**

- **Mode**
  - **2 - 10 V**

- **Vmax**
  - **331 l/s**

- **PF-Time**
  - **2 s**

- **MP Address**
  - **PP**

Possible settings with in editing mode:

- **Setpoint 0.000 l/s...Vmax**
- **Auto / OPEN / CLOSE / Vmax / Stop**
- **ok, ok airbubbles, not ok**
- **2 - 10 V / 0.5 - 10 V / 0.5 - 10 V Y inv / 2 - 10 V Y inv**
- **0...Vnom**
- **0...10 s (only at SuperCap actuators)**
- **PP, MP1...MP8** (on MF-types only PP)

* ok: Flow sensor is working properly
  - ok airbubbles: Flow sensor is working properly, airbubbles in the system
  - not ok: Sensor error
Functions for VAV product range

Menu tree

The following menu tree corresponds to the new VAV-Compact D3 generation: L/N/SMV-D3-MP, LHV-D3-MP, L/NMV-D3LON, L/NMV-D3-MOD, LHV-D3-MOD, L/NMV-D3-KNX, LHV-D3-KNX.

1) For Modbus settings, see previous description of „Basic functions for Modbus actuators“
2) With defined Vnom the volume is displayed in m³/h. With non-defined Vnom the volume is displayed in %.

Adjustment/display options

LMV-D3-MP.

Note: VAV-Universal actuators
The V-actuators L/N/SM24A-V, L/NMQ24A-SRV-ST, which fit the VAV universal controllers VR.., have a tool connection but are nevertheless not tool-capable.

Deviations

VRD2 (1992-2007)  Display showing actual value/setpoint in [% Vnom], Vmin in [% Vmax], Vmax in [% Vnom]  Read only  PP
VRD3 (as of 2008)  Display showing actual value/setpoint in [% Vnom], Vmin in [% Vnom], Vmax in [% Vnom]  HW potentiometer setting Tool  → Read/write, otherwise  → Read only  PP
VRP-M VAV  Up to V2.16  Vmin in [% Vmax], Vmax in [% Vnom]  PP / MP1...8
As of V3.0  Vmin in [% Vnom], Vmax in [% Vnom]  PP / MP1...8
NMV-D2 (1992 – 2000)  Display showing actual value/setpoint in [% Vnom], Vmin in [% Vmax], Vmax in [% Vnom]  PP
NMV-D2M (2000 – 2006)  Display showing actual value/setpoint in [% Vnom], Vmin in [% Vnom], Vmax in [% Vnom]  PP
Altitude compensation  This function requires VAV-Compact D3 with firmware V2.06 (03/2013) or higher

Note: Volume 125 m³/h
Setpoint 124 m³/h
ΔP : 164 Pa
Position 65%

Possible settings with ☐ ☐ in editing mode:

2 - 10 V / 0 - 10 V (only with MF/MP types)
ccw / cw
No / Yes
Vmin...Vmax
Vmin...Vnom, minimum 20% of Vnom
0...Vmax
Vmin...Vmax
Vmin...Vnom, minimum 20% of Vnom
0...3000 m

PP, MP1...MP8
(on MF types only PP)
**Functions for CMV actuators**

**Menu tree**

The following menu tree corresponds to that of the CMV-..-MP VAV control system.

**Adjustment/display options**

CMV-125-MP

- Volume 125 m³/h
- Setpoint 124 m³/h
- Position 65%
- Step Auto

- Air speed 0.0 m/s
- Duct temperature 24.5 °C

- Mode 2 - 10 V
- Vmin 0 m³/h
- Vmid 110 m³/h
- Vmax 200 m³/h

- Vnom 1200 m³/h
- Site adj.factor 1.000
- ALT.installation 500 m

- MP Address MP5

**Data, settings**

Possible settings with ▼ ▲ in editing mode:

- Volume 125 m³/h
- Setpoint 124 m³/h
- Position 65%
- Step Auto
- Air speed 0.0 m/s
- Duct temperature 24.5 °C

- Mode 2 - 10 V
- Vmin 0 m³/h
- Vmid 110 m³/h
- Vmax 200 m³/h

- Vnom 1200 m³/h
- Site adj.factor 1.000
- ALT.installation 500 m

- MP Address MP5

**Functions for MPL actuators**

**Menu tree**

The following menu tree corresponds to that of the MPL actuator.

**Adjustment/display options**

MPL actuator

- Act. Value: 0%
- Auto -> OK

- MP Address MP5

**Data, settings**

Possible settings with ▼ ▲ in editing mode:

- Act. Value: 0%
- Auto -> OK
- Stop ▼ / ▲

- MP Address MP5

**Possible settings with ▼ ▲ in editing mode:**

- Range 0...100%
- (OPEN / CLOSE / STOP)

- Auto / OPEN / CLOSE / Vmin / Vmid / Vmax / Stop

- 2 - 10 V / 0 - 10 V

- 0...100% of Vnom

- Vmin...Vmax

- 20...100% of Vnom

- 0.700...1.300

- 0...3000 m
Functions for BF-TopLine fire damper actuators

Menu tree

Adjustment/display options
BF-TopLine actuator.

Possible settings with in editing mode:

- Range A 95°
- Act. value: 20%
- Setpoint CLOSE
- MP Address MP4

Functions for room sensors MS24A-R0x-MPX

Menu tree

Adjustment/display options
Room sensor MS24A-R08-MPX
(T, rH, CO2, VOC).

Possible settings with in editing mode:

- Temperature 24.90 °C
- Temperature 76.78 °F
- Rel. Humidity 0.00%
- CO2 629 ppm
- VOC 45.0
- Analog Input 0.000 V
- Digital Input open
- Error State 0
- MP Address MP5

Possible settings with in editing mode:

- Measurement 0.00...50.00 °C
- Measurement 32.00...122.00 °F
- Measurement 10.00...90.00%
- Measurement 0...2000 ppm
- Measurement 0...2000 (pseudo ppm)
- Measurement 0.000...10.000 V
- open / closed
- 1,2,4,8 see Data pool value
- PP, MP1...MP8 (16)
ZTH EU

Service tool for parameterisable and communicative actuators
VAV controllers and HVAC performance devices from Belimo

ZIP functions

Note
If the ZTH EU is connected to the PC, the display flashes a few times until the driver is installed on the PC.

In this configuration, the ZTH EU works as a level converter between the USB port of a PC and the Belimo MP device. The correct driver will be automatically installed on the PC when the ZTH EU is plugged in. As soon as the USB interface is connected, the ZTH EU switches to ZIP mode.

ZIP disabled

ZIP Master

Connection as MP master (e.g. PC-Tool).
If there is bus communication, this is indicated by Tx and Rx flashing.

ZIP Monitor

Connection for monitor function with PC-Tool.
If there is bus communication, this is indicated by Rx flashing.

Diagnose function power supply

Checking the power supply
The ZTH EU allows the "AC 24 V" power supply (III safety extra-low voltage) of the Belimo devices to be checked. Voltages >30V are not permitted!
Application: e.g. commissioning, troubleshooting in the event of a malfunction.

Measuring process
Equipment: ZTH EU, ZK2-GEN
Connect in the following order:
– Connect free wires of the ZK2-GEN to AC 24 V
• White to GND (connection 1 MP node)
• Blue to ~ (connection 2 MP node)
• Turquoise do not connect

Start:
Press the ZTH EU key (OK) while at the same time connecting the RJ12 plug
Select "AC measurement" function with arrow key (▼)

End:
Disconnect RJ12 plug or end "Configuration" function (ESC)

Display
Supply okay
AC 25V, VHW: 85%

Quality: Supply OK: VHW >80% and AC supply in the range 19.2 ... 28.8 V
Supply low: VHW <80% and AC feed <19.2 or >28.8 V
AC value: measured AC voltage (accuracy ±1.0 V provided that VHW >95%)

Explanation of VHW
The VHW unit describes the relationship between the positive and negative half-wave. The deviation between the positive and negative half-wave value must not be too great. The following formula applies: positive HW / negative HW x 100 should be >80%:

Possible problems
The following factors influence the half-wave load:
• Transformer dimensions too small
• Maximum signal cable length between transformer and MP node exceeded
**MP tester diagnostics function**

**MP tester**  
With the MP tester function, the ZTH EU offers the possibility of

- Determining the MP-Bus level on the MP master as well as on the MP slave nodes
- Checking the MP-Bus communication based on the counting of telegrams

**Selection**  
The MP tester function can be selected in the Configuration menu of the ZTH EU.
**MP tester / MP-Bus level diagnostics function**

**MP-Bus levels**

The MP signal levels from the MP master and the MP slave nodes are measured against GND and compared with the limit values of the protocol specification. The following values are checked:

- Signal level HIGH (identical with command and answer telegram)
- Signal level LOW with command telegram from the master
- Signal level LOW with answer telegram of the slaves (MP1 … MP16, PP)

The signal levels can be measured at any given place. It is recommended to carry out measurements at a variety of positions (e.g. control cabinet and bus end).

**Menu tree MP-Bus levels**

The following menu tree shows the display possibilities of the various MP levels:

![Menu tree](image)

**Interpretation of the measurements**

![Graph](image)  

<table>
<thead>
<tr>
<th>MP-Bus levels</th>
<th>OK:</th>
<th>not OK:</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP-Bus level</td>
<td>Signal level &gt;11 V</td>
<td>Signal level &lt;11 V</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MP master levels</th>
<th>OK:</th>
<th>not OK:</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP master levels</td>
<td>Signal level &lt;2.5 V</td>
<td>Signal level &gt;2.5 V</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MP slave levels</th>
<th>OK:</th>
<th>not OK:</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP slave levels</td>
<td>Signal level &lt;4.5 V</td>
<td>Signal level &gt;4.5 V</td>
</tr>
<tr>
<td>---V</td>
<td>No MP slave nodes detected and/or connected</td>
<td></td>
</tr>
</tbody>
</table>

**Possible causes**

- Incorrect cable dimension
- Signal cable lengths too long
- Node does not reply (---V)
MP tester / Frame counter diagnostics function

Frame counter
The number of telegrams and also the correctness of telegrams (checksum) are checked. The number of telegrams per node varies and is largely dependent on the function profile of the node. VAV controllers, for example, provide a larger range of information than damper/valve actuators do, which is why usually more communication is carried out with this type of node.

The following menu tree shows the display possibilities of the frame counter function:

If it is determined that telegrams are being erroneously transmitted, then this will be indicated visually with a "!" as a mark of mistrust. Erroneous telegrams are not counted as answers.

The number of erroneous telegrams of both the MP master and the MP slaves can be displayed using the "i" Information button.

Function
The registered erroneous telegrams are identified separately for the nodes (MP1...MP16, PP and MA). The absolute number of errors must always be judged in relation to the total number of telegrams or the number of telegrams per node, respectively. Erroneous telegrams are ignored by the nodes (master/slaves) and the MP commands from the master are repeated if necessary, which is why low error rates (<5%) require no further clarification. It is only with high error rates or identified communications difficulties that a detail analysis should be carried out with the MP monitor.

Possible causes
- A high error rate could indicate insufficient signal levels (see "MP-Bus level" function).
- The MP command set used is not compatible with the node.
- An actuator expected by the MP master is not connected or not addressed.

If no answer is received from an MP slave node
- ...then no MP slave node is connected to the listed address
- ...or the MP slave node cannot be reached at the listed address

MP-Bus total failure
In the event of a total MP-Bus failure, no activity can be detected with the MP-Bus tester. Neither queries from the master nor answers from the slaves will be registered.

The following points are to be checked in the event of a total failure of MP-Bus communications:
- Disconnect MP master from the bus and secure the master activity separately with the MP-Bus tester
- The wiring at all nodes is to be checked:
  - Connection wire 1 (┴ / –) is wired correctly to the bus
  - Connection wires 1 (┴ / –) and 2 (~ / +) have not been interchanged
Firmware upgrade

The ZTH EU can be updated to the latest firmware version using the ZTH EU updater. The required software and the instructions for the upgrade can be downloaded from the download area of the Belimo website www.belimo.eu.

Compatibilities

Function and handling

The ZTH EU includes the complete functionality of all previous versions of the ZTH-GEN and ZTH-VAV.

Note
Latest information about firmware upgrades, version overviews, documentation:
See www.belimo.eu

The hardware of the ZTH EU is not however compatible with the hardware of the ZTH-GEN. The updates for the ZTH-GEN cannot be loaded to the ZTH EU.

In addition, the new ZTH EU supports the ZIP USB function. This can be used for the ZTH EU updates and also as a level converter USB/MP with the PC-Tool.

ZEV
The ZEV adjustment tool (1992 to 2007) is replaced by the ZTH EU.

ZTH-VAV
Is replaced by the ZTH EU.

ZTH-GEN V2.xx / V3.xx / V4.xx
Is replaced by the ZTH EU.

Version overview

V 2.09
• Supplement: BACnet Settings for -MOD actuators
• Supplement: Setpoint source function for -MOD actuators
• New devices: Support for PM../PK.. actuators
• Error correction: Detection of PM.. actuators
• Error correction Behaviour of Vmin and Vmax when connecting NMV-D2

V 2.08
• New devices: Support for PRKC.. actuators
• Error correction: Display for PR.. actuators
• Supplement: Control Mode Function for PR.. actuators

V 2.06
• Supplement: VAV: Function "Vmin / Vmax Set to original values" also in Expert Mode available
• Supplement: "Power Off Position" for PR.. actuators with SuperCap
• New devices: Support for EP..R6+BAC actuators
• New devices: Support for PR.. actuators

V 2.05
• Display of small flows optimised (EPIV)
• Supplement: Unit l/s for valve actuators
• New function: MP Tester with MP level measurement and frame counter
• Error correction: Failure of LCD display with low ambient temperature
• Error correction: Override is not set with BF-Top actuator
Version overview

V 2.03  •  Device identification for VRD2 / NMV-D2 corrected
V 2.02  •  New menu "Sensor monitoring of air bubbles" for the EPIV
      •  Error correction: impairment of the sensor measurement at Y3
      •  Error correction: impairment of the analogue setpoint at Y3
V 2.01  •  Release of the ZTH and ZIP function