

VAV adjustment and diagnostic tool for use only with  
NMV-D3-MP.MHS or LMV-D3-MP.MHS compact volume controllers

The MHS version of the ZTH-EU has additional functions which allow full on-site calibration and setting of the V-Nominal airflow. These additional functions only work with the MHS range of volume controllers.

The ZTH-EU.MHS comes complete with a connection lead that allows quick connection to either the NMV-D3-MP.MHS or the LMV-D3-MP.MHS compact volume controllers.

The power for the tool is provided through its connection to the compact volume controller, it is therefore necessary to have the 24V supply available at the controller before commissioning / testing is commenced.

On initial power up the ZTH-EU will show "BELIMO ZTH-EU" and the software type installed. The ZTH-EU will then go to a "Startup" screen and try to establish communications with the actuator.



## Explanation of user buttons



Scroll up / down between screens & change values



Enter new value & confirm change



Go back



Information (where available)

Once powered up the ZTH-EU adjustment tool will display the model of volume controller you are currently connected to, for example:-

NMV-D3-MP MHS →

## Basic setting functions explained

Use the arrow buttons to scroll through the various screens  
Each screen displays the information as follows:

V<sub>max</sub>  
200 l/s

Line 1 is the function description  
Line 2 is the value that the unit is currently set to

**To change the value in line 2 you must first press the button.**  
The display will change to include an arrow before the value:

V<sub>max</sub>  
>200 l/s

Use the buttons to change to the current value to your required setting.

Once set press to confirm. The arrow will disappear and the new value will be displayed.

Note:- Press to exit the programming mode.




## Overview of the setting screens

You should set each function on the ZTH-EU.MHS in the order shown below for ease of use

Start with this screen

NMV-D3-MP MHS

Use the  button, scroll up once each time to the following screens:

### 1: Setting the communication channel:

For basic use ignore this screen and move to next screen.

MP Address:  
PP

### 2: Altitude pressure compensation height:

If the project is located in a high altitude area then you can enter the height of the installation for pressure correction. For basic use in the UK ignore this screen and move to next screen.

ALT.installation  
0 m

### 3: Setting the calibration value

The calibration pressure is normally provided by the VAV box manufacturer and is calculated from the V-Nominal volume (100% flow) and flow grid factor.

Example: A 160mm VAV unit with a V-Nom of 250l/s and a flow-grid factor of 21.4.

The formula for the calibration pressure is volume (250l/s) divided by factor (21.4) squared = 136pa.

**Note:- Without the flow grid factor you will not be able to calculate the calibration pressure. If you are unsure of this value it is suggested that you start with 150Pa (default set).**


ALT.insta 0m  
△p@Vnom 150Pa

### 4: Setting the nominal value (V-nom):

The nominal value is the maximum volume that the VAV box can achieve at (100%) in l/s, **it is not the V-Max design volume.**

When the tool is connected to a new volume controller for the first time there is no calibration data installed and the nominal figure is displayed as 100%, as below:

V<sup>nom</sup>  
100%

To enter the nominal value in l/s, press 

Example: A 160mm VAV unit V-Nom would normally be set at 250l/s, a 200mm VAV unit would be 445l/s. The exact V-Nominal setting can be found in the VAV box manufactures technical information.

V<sup>nom</sup>  
250 l/s



#### **4: Setting the V-max value:**

The V-max screen is where you set the maximum design volume that you want the controller to operate to.

```
Vmax
200 l/s
```

#### **5: Setting the V-mid value:**

The V-mid screen is only set when a constant volume is required.

The V-mid position allows a third constant volume to be set (V-max, V-mid & V-min).

In variable volume applications this setting automatically adjusts and no user input is required.

```
Vmid
100 l/s
```

#### **6: Setting the V-min value:**

The V-min screen is used to set the minimum design volume that you want the controller to operate to.

```
Vmin
0 l/s
```

#### **7: Re-setting the original values :**

This screen allows you to re-set the controller to the original programmed values. Only use this function if you want to wipe any new information you have entered, otherwise continue scrolling up to the next screen.

```
Set to original
Values? No
```

#### **8: Setting the direction of rotation to open:**

On this screen you can change the direction that the unit **opens**.

You can choose either ccw – counter clockwise, or cw – clockwise

```
Rotation direct.
ccw
```

#### **9: Setting the voltage input / output mode:**

This is where you set the control input voltage range that you require.

You can choose between 0-10V and 2-10V depending on the control system installed.

```
Mode
0 - 10V
```

### **Overview of the operation screens**

Once you have set all the operating values you can continue scrolling up to view the operation screens. These screens allow you to check that the VAV unit is working correctly.

#### **10: Test (step) screen**

This set of functions allows you to fully test the VAV unit and volume controller with a variety of overrides.

```
Volume      100 l/s
Step  Auto
```

The default is "Auto" to enable the override selection you must first press 

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# ZTH-EU.MHS

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```
Volume 100 l/s
Step >Auto
```

The override functions available are:-

<b>AUTO</b>	Unit responds to automatic control input signal on wire 3 of the LM/NMV-D3-MP.
<b>OPEN</b>	Actuator overridden fully open (not in control).
<b>CLOSE</b>	Actuator overridden fully closed (not in control).
<b>V'min</b>	Volume overridden to internal V-Min set on LM/NMV-D3-MP.
<b>V'mid</b>	Volume overridden to internal V-Mid set on LM/NMV-D3-MP.
<b>V'max</b>	Volume overridden to internal V-Max set on LM/NMV-D3-MP.
<b>STOP</b>	Actuator stops in last position and does not respond to volume changes.

The volume figure at the top of the screen indicates the "actual volume" the controller is currently reading, you can observe this volume and ensure the override selected is operating correctly.

**You should always ensure that you exit the ZTH-EU in the AUTO setting when testing is finished.**

### 11: Position indicator:

This screen shows the "actual volume" and damper blade rotation (in %) necessary to achieve the displayed volume.

**Note:- If this screen is indicating low volume with the damper 100% open, this could be due to low static pressure available at the VAV unit.**

```
Volume 100 l/s
Position 80%
```

### 12: Flow grid sensor pressure:

This screen shows the differential pressure generated by the flow grid at the displayed volume.

With the flow grid factors you can check that the displayed pressure is correct for the displayed volume.

```
Volume 100 l/s
Δp: 30Pa
```

### 13: Set-point screen:

This screen is very useful as it shows you the "actual volume" the volume controller is achieving on the top line and the required volume set-point on the line below. In the AUTO position this required set-point is based on the 0..10 / 2..10V control system input signal and the NMV-D3-MP internal V-max/V-min volume settings.

This screen allows you to check if the VAV unit is achieving the correct air flow and monitor exactly what the BMS / control system demand is at any time.

If any of the other ZTH-EU overrides are used (OPEN, CLOSE V-max etc.) the override values will be displayed on the set-point line.

```
Volume 100 l/s
Setpoint 150 l/s
```

**The ZTH-EU.MHS has all the normal functions available when used with Belimo standard range of communication actuators. For full technical details of the functionality available please visit Belimo's web site:- [www.belimo.co.uk](http://www.belimo.co.uk)**