Service-Tool for parameterisable and communicative Belimo actuators and VAV controllers. Connection via service socket on the device or MP/PP connection.

Information
Belimo Automation AG reserves the right to implement supplements, changes and improvements at any time, i.e. without prior notification.
See www.belimo.eu for current
- version overview,
- release information,
- most up-to-date operating instruction, etc.

Technical data

Electrical data	Power supply	AC 24V, 50/60 Hz, DC 24V (from actuator)
	Operating range	AC 19.2 ... 28.8V/DC 21.6 ... 28.8V
	Power consumption Operation	1 W
	Dimensioning	2 VA
	Connection	Socket for Belimo PP connection, RJ12
	Connecting cable	see «Connection»
Interface	Communication	Point to Point (PP), no bus mode (MP)
Supported devices	Belimo actuator/VAV controller	with PP/MP connection, see «Supported devices», Scope of function dependent on type of device
Operating	LCD display	2 x 16 characters, with background illumination
	Keys	▲ / ▼ / – / + / OK
	Quick start guide	enclosed stickers, de/en
Safety	Protection class	**III** Safety extra-low voltage
	Electromagnetic compatibility	CE in accordance with 2004/108/EC
	Operating temperature	0 ... 50 °C, non-condensing
	Non-operating temperature	–20 ... 50 °C, non-condensing
Dimensions / Weight	Dimensions	L x W x D: 85 x 65 x 23 mm
	Weight	Approx. 260 g

Supported devices

Damper product range	..-MF / ..-MP / ..-MPL / ..-MFT(2) /..-MOD / ..LON	
Valve product range	..-MF / ..-MP / ..-MPL / ..-MFT(2) /..-MOD / ..LON	
EPIV – pressure-independent characterised control valve	P6..W..-MP	available starting 2011
Fire damper actuator	BF-TopLine with BKN230-24MP	
VAV product range	VRD2 / VRD2-L	available 1992-2007
	VRD3	available starting 2008
	VRP-M (VAV and STP applications)	available starting 2005
	NMV-D2..	available 1992 to 2000
	LMV-D2M / NMV-D2M..	available 2000 to 2006
	LMV-D2-MP / NMV-D2-MP / SMV-D2-MP.., LHV-D2-MP..	available 2006 to 2011
	LMV-D2LON / NMV-D2LON	available 2006 to 2011
	LMV-D3-MP / NMV-D3-MP / SMV-D3-MP.., LHV-D3-MP..	available starting 2011
	LMV-D3LON / NMV-D3LON	available starting 2011
	LMV-D3-MOD / NMV-D3-MOD	available starting 2012

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.**
- **Connection permitted only to Belimo devices with 24V safety extra-low voltage and PP/MP interface.**

Safety notes

(Continued)

- **Changes of parameters, etc. may not be performed except after consultation/specification of the OEM, device or mechanical/electrical contractor. Operating and adjustment regulations must be observed.**

Versions, compatibilities

This document describes the function and handling of the new ZTH-GEN V4.5x.

Current information regarding
- Upgrade ZTH-VAV → ZTH-GEN
- Firmware upgrade to V4.xx
- Version overview, documentation

see www.belimo.eu

The ZTH-GEN V4.xx contains the functionality of all previous versions of ZTH-GEN and ZTH-VAV, in addition to those of the new VAV-Compact D3.

Previous ZTH versions can be upgraded to a ZTH-GEN V4.xx by means of a simple firmware download.
Contact your Belimo representative or consult www.belimo.eu for information.

ZEV The adjustment tool ZEV (1992 to 2007) is replaced by the ZTH-GEN V4.xx

ZTH-VAV Will be replaced by the new ZTH-GEN V4.xx

ZTH-GEN V2.xx / V3.xx Will be replaced by the new ZTH-GEN V4.xx

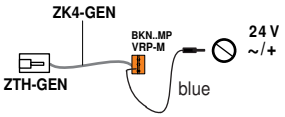
Connection

Connection and supply

The ZTH-GEN is supplied via the actuator/VAV controller. The connection is set up
- directly at the Service socket of the actuator/VAV controller or
- via the PP/MP connection (U5) e.g. connection socket, in the control cabinet, room controller CR24

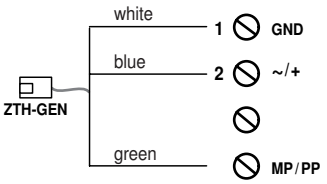
Local connection to service socket

Recommendation
Wire the PP connection (U5) to the floor distributor/control cabinet.
This means there is no need for direct access to the device.

Connection to	Cable type	Connection
VAV: ..-D2-MP / LON	ZK1-GEN (enclosed)	Direction connection to Service socket - plug in the plug - set up contact with clockwise rotation
VAV: ..-D3-MP / -MOD / LON		
..-MF / -MP / -MOD / LON		
EPIV: P6..W..-MP		
VAV: VRP-M [1]	ZK4-GEN (Accessories)	
F/S: BKN230-24MP (BF-Top)		
VAV: VRD3	ZK6-GEN (Accessories)	
VAV: ..MV-D2M [1]	ZK1-VAV (Accessories)	
VAV via CR24-..		

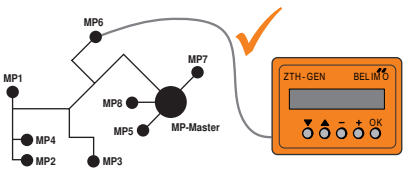
[1] ZTH-GEN connection in MP bus system: The MP connection should be separated from the MP bus while the ZTH-GEN is operating.

Direction connection to terminals

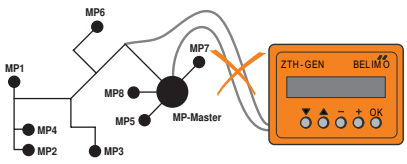
Connection to	Cable type	Connection
VAV: ..-D2-MP / LON	ZK2-GEN (Accessories)	
VAV: ..-D3-MP / -MOD / LON		
VAV: ..MV-D2M		
VAV via CR24-..		
..-MF / -MP / -MPL / -MOD / LON		
EPIV: P6..W..-MP		
VAV: VRP-M		
VAV: VRD3		
F/S: BKN230-24MP (BF-Top)		

Connection in the MP bus system

Correct



Wrong



Direct connection to the MP bus or MP master is not possible with the ZTH-GEN.

Solution: Use the service socket on the actuator/VAV controller or temporarily disconnect the MP connection of the MP device from the MP bus and connect the ZTH-GEN to the MP connection.

Operating

The operating device is started and the data of the connected device is read out when the ZTH-GEN is connected to the Belimo actuator/VAV controller.
The available adjustment and operating options are displayed in accordance with the device type. The available setting parameters are listed in the respective product documentation for the actuators/VAV controller. See www.belimo.eu

Operating elements

LCD display

- Background illumination
- Display 2 x 16 characters

Key function

▼ and ▲ Forward/backward, abort entry
– and **+** Change value/status
OK Confirm entry

RJ12 tool socket

Supply 24V / PP communication

Operating instruction

A quick start guide and a sticker with the basic functions for the the rear of the unit are enclosed with the ZTH-GEN.

Language setting, unit depiction

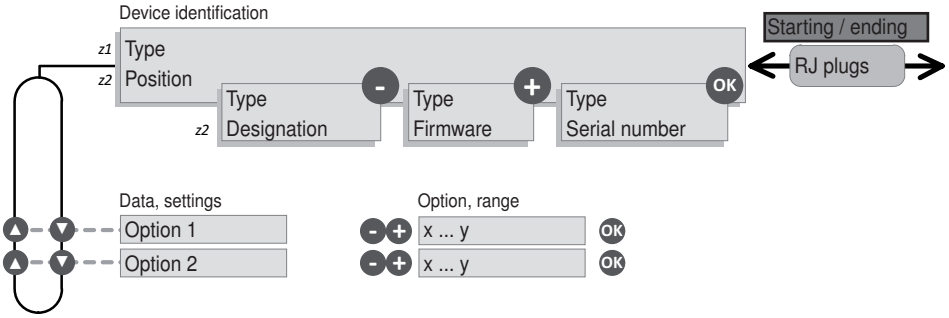
Language and units can be set in the Configuration menu.

Operating

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.: minimally adjustable running time/type. Non-relevant options are not displayed.

Menu structure, handling

The operating menu can be run through from both sides ▼▲.



Starting / ending

The connection to the actuator/VAV controller 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, we draw your attention to the respective separate product information. See www.belimo.eu ¦ Documentation

Configuration

Start Configuration

1. Press the key (OK) while simultaneously plugging in the connecting cable

2. Configuration menu display appears

Configuration Menu

Option / Display	**Setting**	**Product range**	**Explanation**
HW Version Vx.x FW Version Vx.x			Display of the current hardware and firmware version of the ZTH-GEN
Text	German / **English**	-	
VAV unit	**m³/h** / l/s / cfm	VAV	
EPIV unit	m³/h / **l/min** / gpm	Valves	
Supply. … AC … V VHW: … %			Display of the current AC 24V supply voltage, with direct connection to terminals (ZK2-GEN)
Start MP tester	OK	-	MP bus diagnostics tool for system integrators. The MP tester is not part of this documentation.
PICCV function	**0** / 1	Valves	Belimo US Enable PICCV Wizard function
Expert Mode [1)]	**0** / 1	VAV Valves	Enable settings: – VAV: Switching mode – VAV: V̇mid parameter – VAV: Altitude compensation – Valves: Y characteristic curve
Advanced Mode [2)]	**0** / 1	VAV Fire protection	Enable settings: – VAV: Direction of rotation – VAV: set V̇min / V̇max to original values (call up OEM setting) – BF-Top: Adaption – Modbus: Base-Address
Exit Configuration	OK		

Activate options [1)] and [2)] only as needed and with the respective know-how; the adjustment of the respective parameters requires special expertise.

Basic functions

Device-specific identification

Key	**Display examples** (Read only)	**Explanation**
	LMV-D3-MP Office 2.12 Supply air	Type designation of the actuator/VAV controller Position (16 characters) optional
–	LMV-D3-MP DN160 / xxx	Type designation of the actuator/VAV controller Designation (16 characters) optional
+	LMV-D3-MP FW: Vxx.xx.00	Type designation of the actuator/VAV controller Firmware version of the actuator/VAV controller
OK	Address: xx 0073040033146142	MP address MP1 … 8 / PP (PP: no bus operation) Serial number of the actuator/VAV controller

Position and Designation (16 characters) optional.
These display options can be described with the PC-Tool if required.

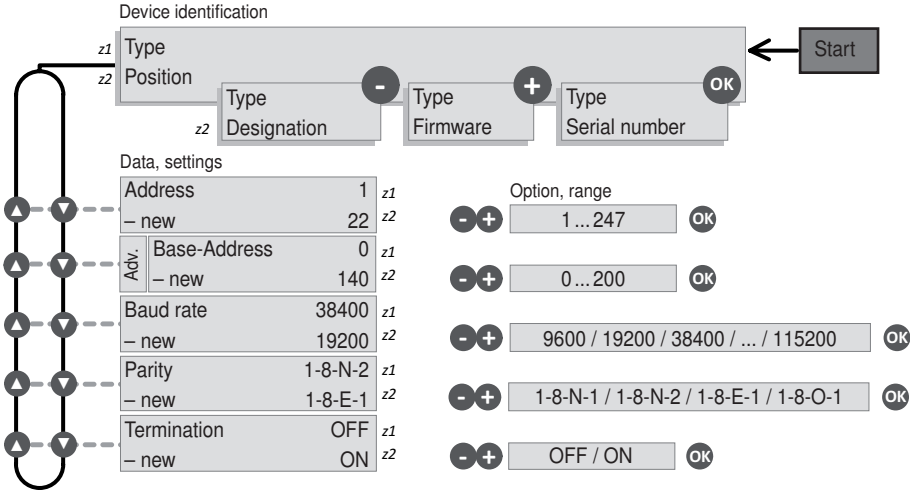
Set the MP bus address

Key	**Display examples** (Read/write)	**Explanation**
▲	MP address: PP -new: MP1	Active setting (PP: no bus operation) Set the desired address MP1…8 (OK)

Basic functions for Modbus actuators

Menu tree

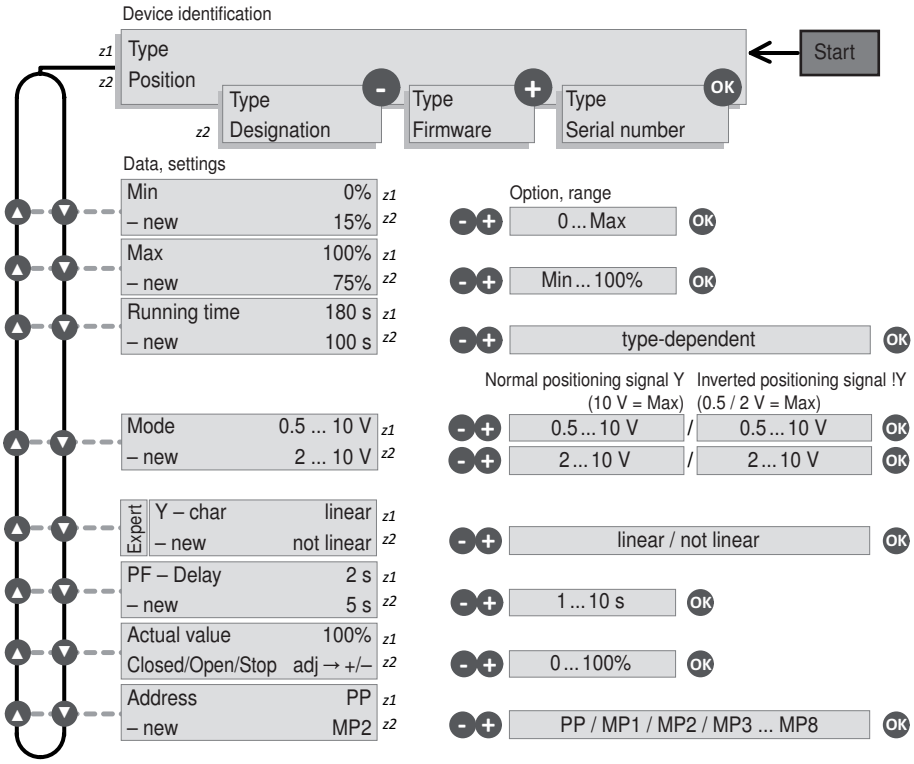
The following menu tree shows the adjustment possibilities of an actuator with integrated Modbus interface (..-MOD).



Functions for damper product range/valve product range

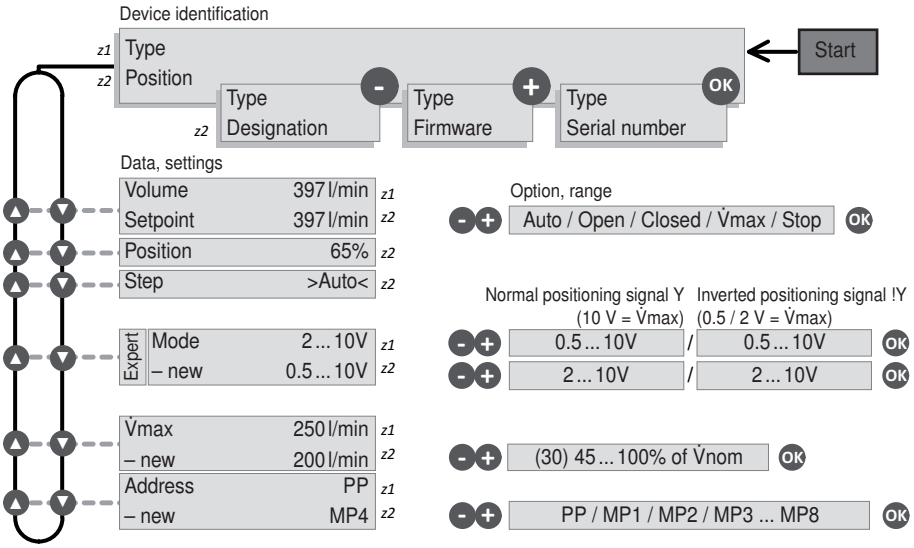
The ZTH-GEN recognizes the device generation, i.e. the menu and the setting options are displayed accordingly to the connected device.

Menu tree The following menu tree shows the adjustment/display possibilities of an NVK24A-MP.



Functions for EPIV - pressure-independent characterised control valve

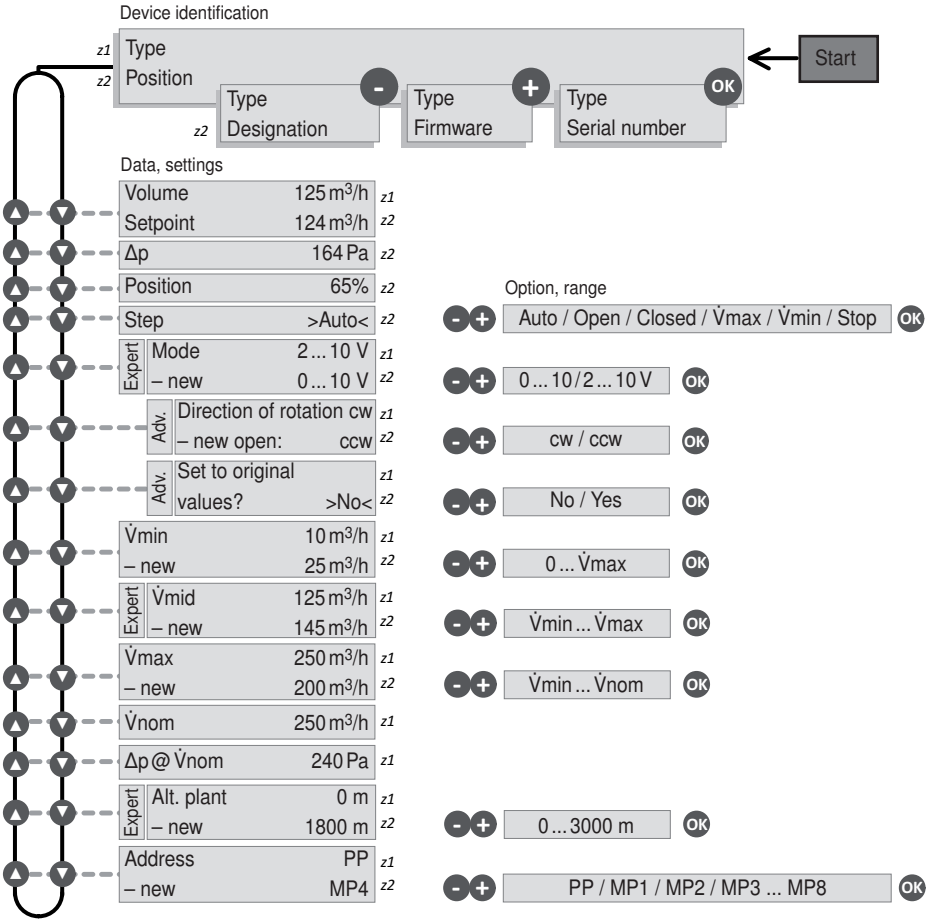
Menu tree The following menu tree shows the adjustment/display possibilities of an EPIV.



Functions for VAV product range

Menu tree

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



Deviations

VRD2 (1992-2007)	Display actual value/setpoint in [% V̇nom], V̇min in [% V̇max], V̇max in [% V̇nom]	Read only	PP
VRD3 (starting 2008)	Display actual value/setpoint in [% V̇nom], V̇min in [% V̇nom], V̇max in [% V̇nom]	HW potentiometer setting «Tool» → Read/write, otherwise → Read only	PP
VRP-M VAV **VRP-M VAV / STP**	up to V2.16 V̇min in [% V̇max], V̇max in [% V̇nom] starting with V3.0 V̇min in [% V̇nom], V̇max in [% V̇nom]		PP / MP1…8
NMV-D2 (1992 – 2000) **NMV-D2M** (2000 – 2006)	Display actual value/setpoint in [% V̇nom], V̇min in [% V̇max], V̇max in [% V̇nom]		PP PP / MP1…8
Altitude compensation	This function requires VAV-Compact D3 with firmware V2.06 (03/2013) or higher and ZTH-GEN with firmware V4.50 or higher		

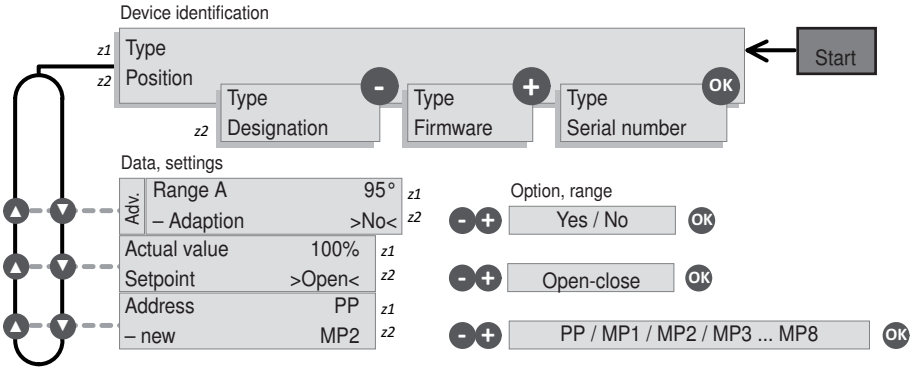
Information: VAV-Universal actuators

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!

Functions for BF-TopLine fire protection actuators

Menu tree

The following menu tree shows the adjustment/display possibilities of a BF-TopLine.



Checking the power supply

Checking the power supply

The ZTH-GEN offers the possibility of checking the AC 24V power supply (III safety extra-low voltage) of the Belimo devices. Voltages >30V are not permitted!
Application e.g. Commissioning, troubleshooting in the event of a malfunction.

Measurement procedure

Equipment: ZTH-GEN, ZK2-GEN
Connection: – connect free wires of the ZK2-GEN to AC 24V.
- white on GND (connection 1 actuator/VAV controller)
- blue on ~ (connection 2 actuator/VAV controller)
- third wire (turquoise) do not connect

– Do not connect RJ11 plug to ZTH-GEN yet!
Start: – Press the ZTH-GEN key (OK) while at the same time connecting the RJ12 plug
– Select Supply function with arrow key (▼)
End: Disconnect ZTH-GEN RJ12 plug or end Configuration function (OK)

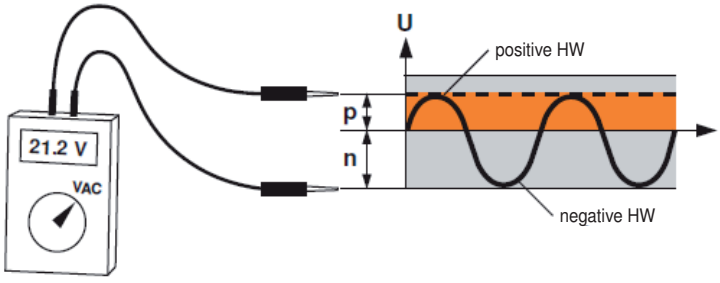
Display

Display

Supply		okay
AC 24V	VHW:	88%

Quality: okay: AC supply in the division 19.2 ... 28.8V
AC value: measured AC voltage (accuracy ±1.0V insofar as VHW >95%)
VHW: Relationship of positive to negative half-wave
The deviation of the positive half-wave value to the value of the negative half-wave may not be too large. As a rule: positive HW / negative HW x 100 should be >80%.

Explanation VHW



Possible problems

The following items influence the half-wave load:
- Transformer too small in its dimensions
- long signal cable length from transformer to VAV controller