

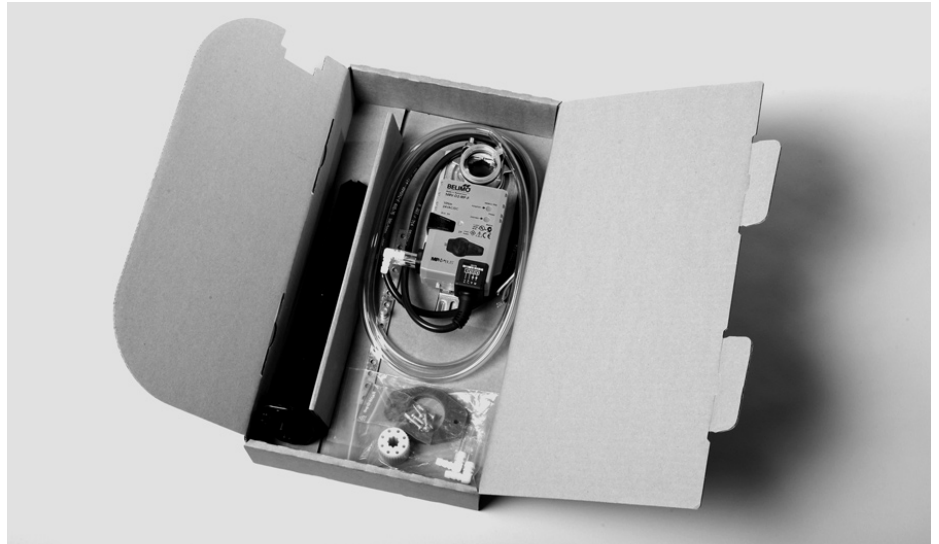
NMV-D3-RE2-SET

VAV-Compact Retrofit Set for utilisation of existing VAV devices made by various manufacturers.

- for various air velocities

Note

Suitable for round VAV boxes only.

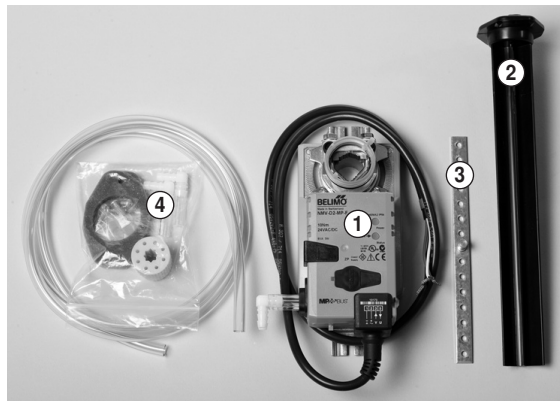


General Information

Application The VAV-Compact Retrofit Set was designed for the retooling of existing VAV-/CAV units. Thanks to the set solution, the replacement of VAV control devices from a wide variety of manufacturers, including pneumatic solutions, is exceptionally simple. The set contains all of the components required for the conversion.

The ZTH-GEN service tool is used for the adaptation of the VAV-Compact Retrofit to the existing VAV unit and the air velocity. The setting data required for this purpose are already stored in the VAV-Compact Retrofit in a table, the «TypeList». This simplifies the conversion sequence and reduces the amount of time required for its completion.

Package contents



- ① VAV controller NMV-D3-RE2
- ② Pick-up device ZPD-RE2
- ③ Anti-rotation stud
- ④ Form-fit insert 8 x 8 mm

Installation instructions

These installation instructions describe the application of the VAV-Compact Retrofit Set NMV-D3-RE2-SET. For a detailed description of the VAV controller, we draw your attention to the respective separate product documentation for VAV-Compact, ZTH-GEN and NMV-D3-MP; see www.belimo.eu.

Belimo Automation AG can at any time implement changes and improvements without prior notification. For the current edition of the operating instructions, see www.belimo.eu

Safety notes

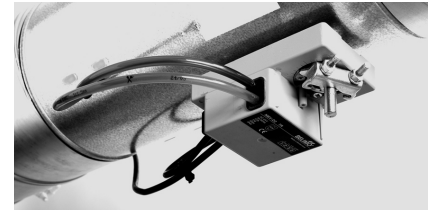


- The device must not be used outside the specified field of application, especially not in aircraft or in any other airborne means of transport.
- It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during installation.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cable must not be removed from the device.
- When calculating the required torque, the specifications supplied by the damper manufacturers (cross section, design, installation site), and the air flow conditions must be observed.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.

Dismantling the existing VAV controller

Electrical connection

1. In the control cabinet, undo supply / signal cable to the outgoing terminals
Caution: Observe and note connection sequence
2. Undo supply/signal cable to the VAV controller
Caution: Observe and note connection sequence



Mechanical components

1. Dismantling the existing pick-up device
2. Dismantling the controller
3. Dismantling the actuator

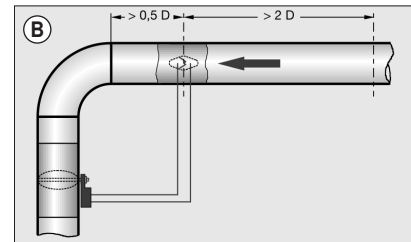
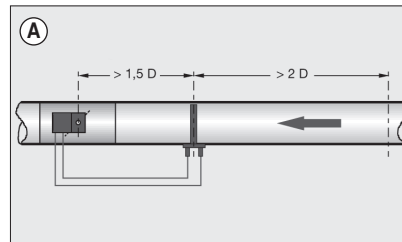


Installation of the new pick-up device

Measured value recording

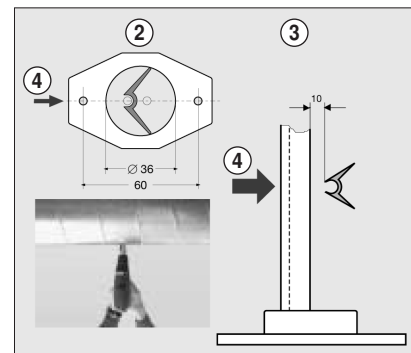
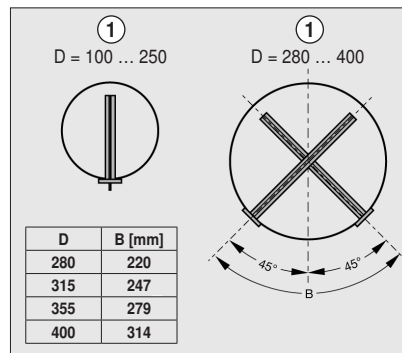
The installation position and the inflow of the pick-up device are of decisive importance for measuring accuracy. If the measurement recording is positioned in an area of turbulence or if no sufficiently wide-ranging flow takes place, then measurement inaccuracies could occur under certain circumstances.

Placement

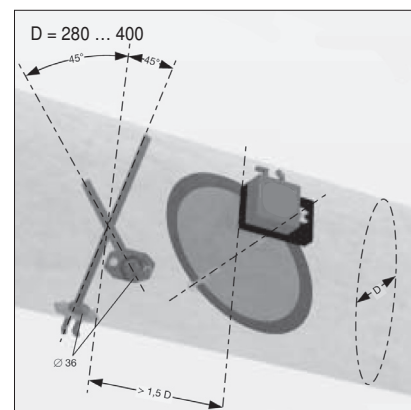
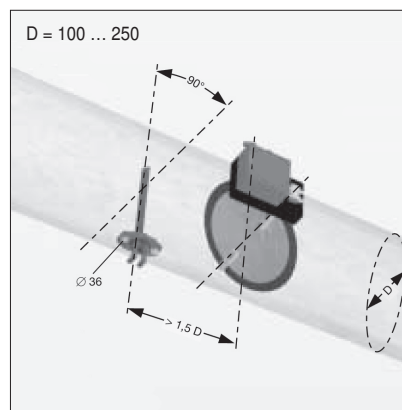


- Ⓐ Measurement site
- Ⓑ Maximum hose length 3 m per measurement line

Installation position



- ① Air duct
- ② Bore hole for pick-up device installation
- ③ Clearance between the pick-up devices
- ④ Air direction



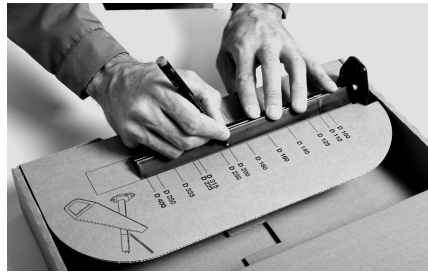
Note
Two pick-up devices are required for VAV boxes from 280 to 400 mm.
For this purpose use the ZPD-RE2-SET.

Installation of the new pick-up device (Continued)

- Preparations**
1. Shorten the pick-up device to the diameter of the VAV unit. The auxiliary template is located on the packaging of sets.

Note

The specified lengths must be maintained without fail in order to ensure that the desired measuring accuracy can be achieved.



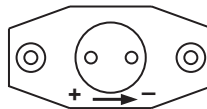
2. Mount pick-up device seal



3. Drill an opening in the duct; hole size: 36 mm Ø



- Installation**
1. Installation of the pick-up device in the duct
Caution: Observe direction of arrow and of air



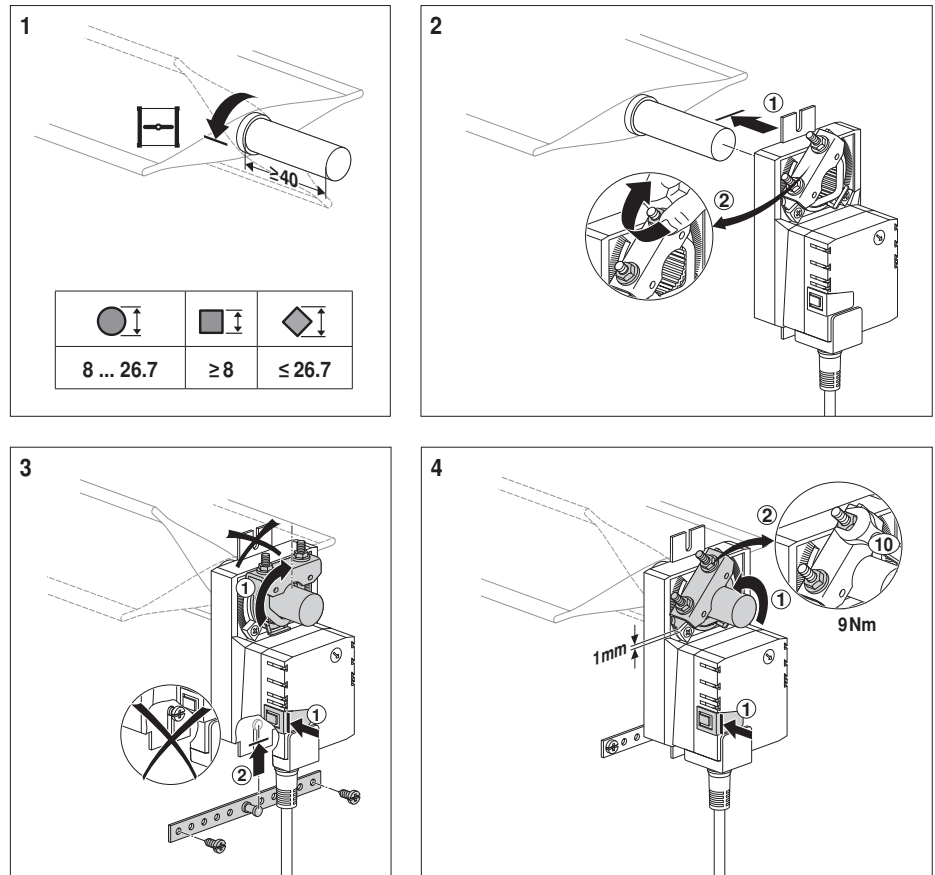
2. Mount pick-up device with accompanying screws



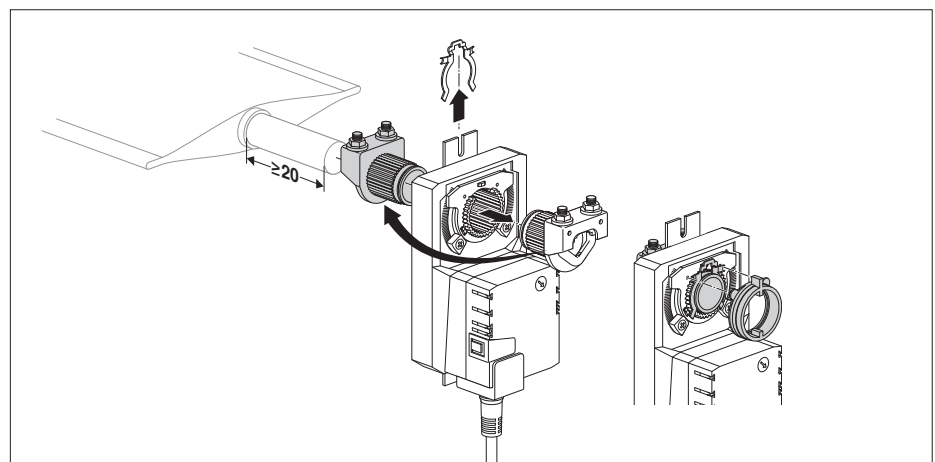
Installation of the new VAV controller

Spindle clamp installation

The VAV controller NMV-D3-RE2 is equipped with the base plate for form-fit mounting. The **front mounting clip may not be used under any circumstances** when the controller is used with **clamp connection** (Illustration 3). Damage to the VAV unit and/or the VAV controller would be the result.

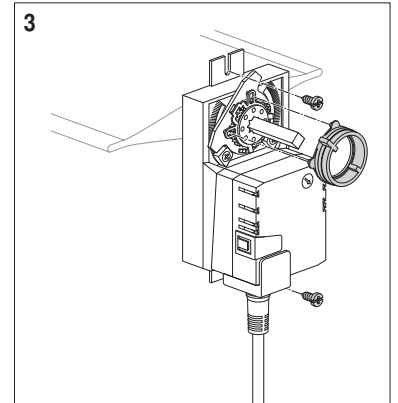
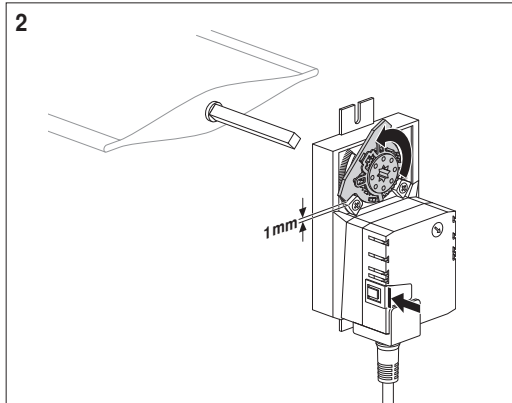
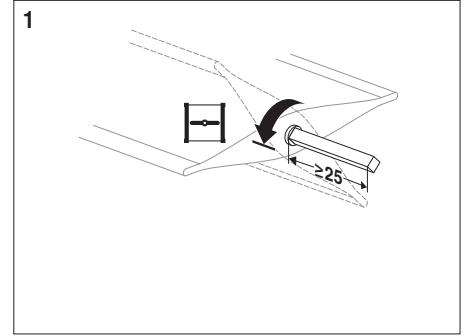
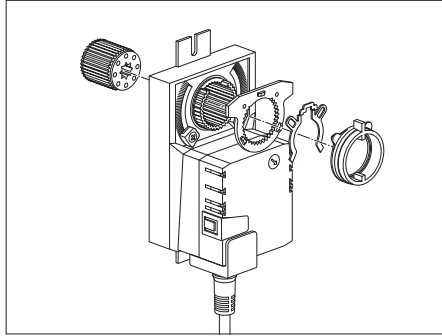


Spindle clamp installation with short axes



Installation of the new VAV controllers (Continued)

Installation with form-fit 8 x 8 mm

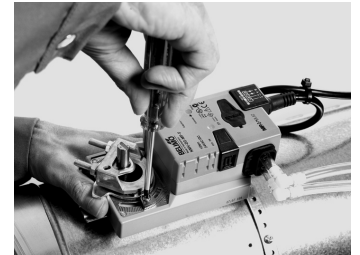


Adjusting angle of rotation limiter

Note

Incorrect settings can lead to damage to the damper blade and to a diminishment of the quality of the control.

The two mechanical end stops for angle of rotation limiting must be tailored to the conditions of the VAV unit and are therefore to be adjusted very carefully. The dismantled actuator is used as an orientation aid for placing the end stops.



Attaching hoses to the controller and pick-up device

1. Mount the two accompanying angle pieces to the connection nipples of the pick-up device.

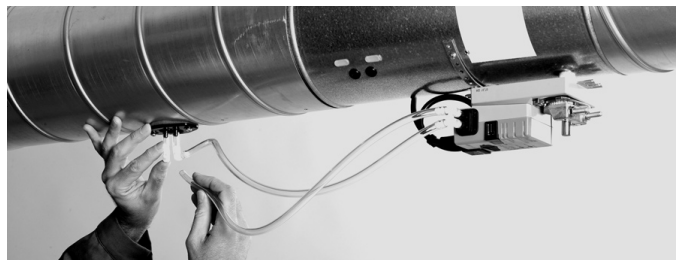


2. Attach hoses to VAV controller with pick-up device

Caution: Observe connection (\pm)

Note

Depending on the type of installation of the VAV controller, individual parts such as screws, form-fit insert or universal mounting brackets are not required and remain left over after completion of the installation.



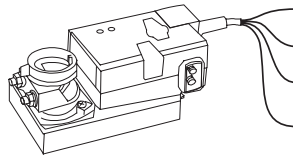
Electrical connection of the new VAV controller

The VAV controller NMV-D3-RE2 is equipped with a 4-wire connecting cable. An electrical connection socket should be used for ensuring a permanent connection with the existing installation.

Cable connection

The connection is made using the connecting cable mounted to the VAV-Compact device.

Note
 – Supply via safety isolation transformer!
 – Connections 1, 2 (AC/DC 24 V) and 5 (MP signal) must be routed to accessible terminals (room temperature controller, floor distributor, control cabinet, etc.), in order to simplify access with the ZTH-VAV or with the PC-Tool for diagnostic and service work.



No.	Designation	Wire colour	Function
1	— — ⊥	black	} Supply AC/DC 24 V
2	— — + ~	red	
3	← — Y	white	Reference signal VAV/CAV
5	→ — U	orange	– Actual value signal – MP-Bus connection

Settings and commissioning

The adaptation of the VAV-Compact Retrofit Set to the nominal width of the VAV/CAV unit is accomplished by shortening the differential pressure sensor in accordance with the auxiliary template (see page 3).

**Settings with ZTH-GEN
TypeList function**

The TypeList stored in the NMV-D3-RE2 contains the parameter sets for the following unit diameters.

TypeList

For air velocities up to 12 m/s				For air velocities up to 6 m/s			
TypeList designation	VAV unit Ø [mm]	\dot{V}_{nom} [l/s]	\dot{V}_{nom} [m³/h]	TypeList designation	VAV unit Ø [mm]	\dot{V}_{nom} [l/s]	\dot{V}_{nom} [m³/h]
ZPD-12 m/s 100	100	97	349	ZPD-6 m/s 100	100	48	175
ZPD-12 m/s 125	125	153	551	ZPD-6 m/s 125	125	77	276
ZPD-12 m/s 160	160	250	900	ZPD-6 m/s 160	160	125	450
ZPD-12 m/s 200	200	403	1451	ZPD-6 m/s 200	200	202	726
ZPD-12 m/s 224	224	525	1890	ZPD-6 m/s 224	224	263	945
ZPD-12 m/s 250	250	617	2221	ZPD-6 m/s 250	250	309	1111
ZPD-12 m/s 280	280	795	2862	ZPD-6 m/s 280	280	398	1431
ZPD-12 m/s 315	315	1028	3701	ZPD-6 m/s 315	315	514	1851
ZPD-12 m/s 355	355	1275	4590	ZPD-6 m/s 355	355	638	2295
ZPD-12 m/s 400	400	1676	6034	ZPD-6 m/s 400	400	838	3017

The desired data record can be selected with the TypeList function of the ZTH-GEN or of the PC-Tool.

ZTH-GEN service tool

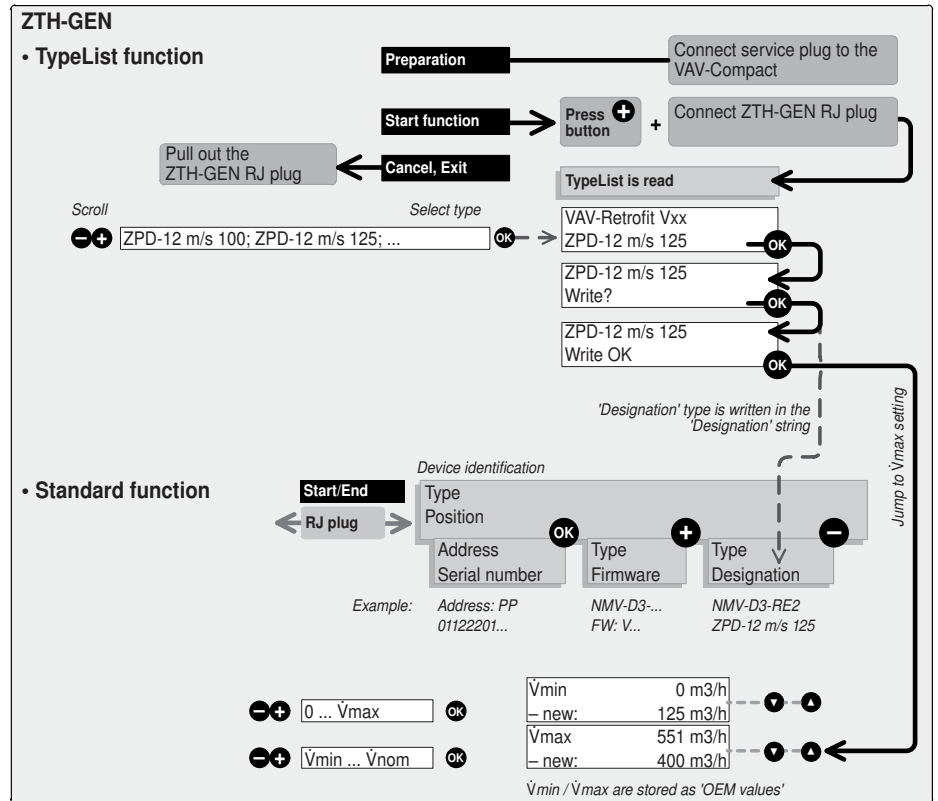


Note
 For the functions and applications of the ZTH-GEN, see separate service tool documentation. Available at www.belimo.eu or from your local Belimo representative.

Settings and commissioning (continued)

- ZTH-GEN preparation**
- Expert and Advanced option enabled (Configuration menu)
 - Enter OEM number
- A password (OEM number) is required for access to the TypeList function of the VAV-Compact Retrofit. Please contact your local Belimo representative.

Applying the TypeList sequence



- Setting parameters** The following parameters are to be adjusted in relation to the VAV unit or to the room, respectively:
- \dot{V}_{min} Minimum volumetric flow
 - \dot{V}_{max} Maximum volumetric flow
 - **Mode** Control signal Y (0 ... 10 V / 2 ... 10 V)
 - **Direction of rotation** Opening damper cw (clockwise) or ccw (counterclockwise)

- \dot{V}_{nom} / Δp @ \dot{V}_{nom} – Manual setting
- For ZTH-GEN preparation, see above.
- Δp @ \dot{V}_{nom} (pick-up device ZPD, page 6)
- Air velocity up to 6 m/s: 38 Pa
 - Air velocity up to 12 m/s: 150 Pa
- \dot{V}_{nom} in accordance with pick-up device ZPD, page 6
- \dot{V}_{min} see above
- ...

- Adapting the actuator (angle of rotation)** An adaption is made to adapt the actuator to match the available damper angle of rotation, e.g. 60°. This procedure should be carried out at the time of commissioning after each adjustment to the angle of rotation limitation.
- Switch on the 24 V supply
 - Press the 'Adaption' push-button.
- The actuator now moves to the CLOSE – OPEN – setpoint position.

Functional check

After the adjustment has been completed, it is recommended that a functional check be carried out on the VAV/CAV unit. The VAV controller is set to the desired operating mode with the ZTH-GEN and a setpoint/actual value comparison is made.

ZTH-GEN Stage selection

Volume	400 m ³ /h
Stage	> \dot{V}_{max} <

Available stages CLOSED / \dot{V}_{min} / \dot{V}_{max} / Motor stop / OPEN

Possible sources of errors

If the setpoint is not achieved, then this could be for several reasons:

- No volumetric flow or negative Δp value, respectively:
 - Pressure hoses incorrectly connected
 - Direction of rotation set incorrectly
 - Fire damper closed
- Actual volumetric flow is too low:
 - Supply pressure too low (supply pressure control, FU setting, air performance too low)
 - Damper spindle is mounted with an offset (damper cannot be opened all the way)

Extended energy-savings measure

Single room control Fan Optimiser System

Extended energy savings measures and comfort enhancements can be achieved through the utilisation of the BELIMO single room controller CR24.. and through the integration of the VAV system in a Fan Optimiser System

You will find more detailed information on these components and systems at the BELIMO web site www.belimo.eu or consult your local BELIMO representative.