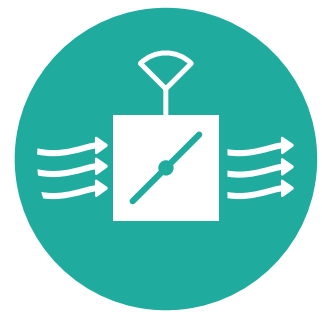


BVAV-1/BVAV-2

Circular variable/constant flow device



VAV, CAV & FLOW
MEASURING DAMPERS



BVAV-1 universal

BVAV-2 compact

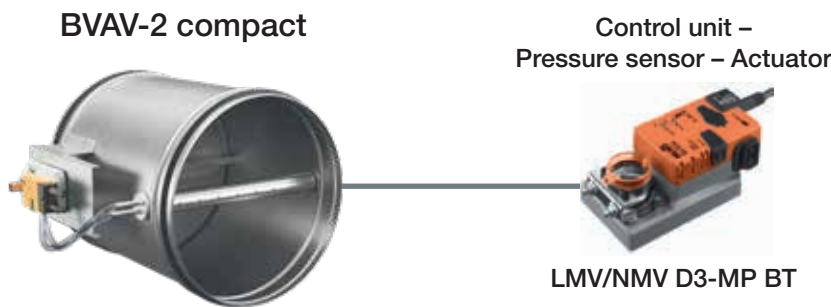
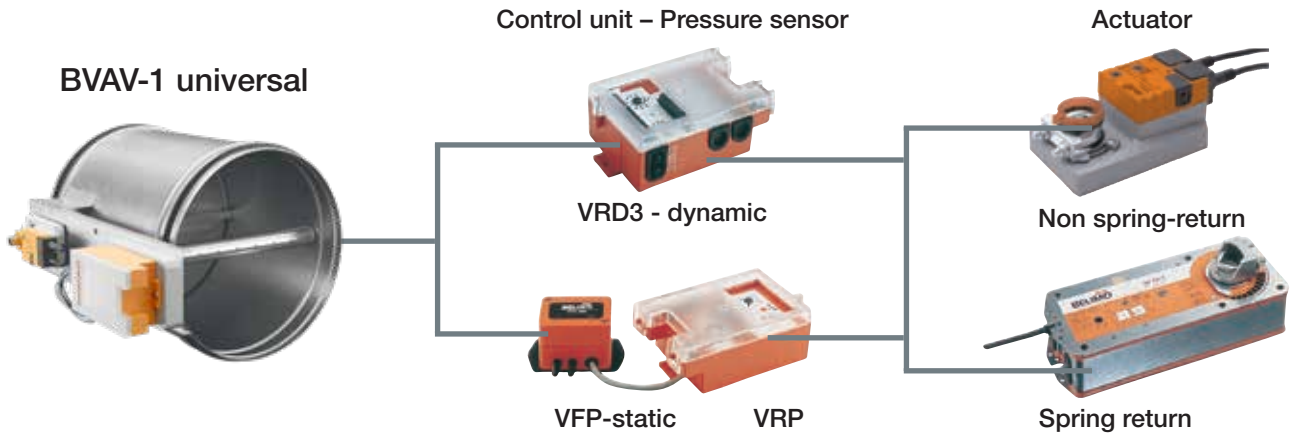
20/09/2016

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AIR SOLUTIONS – FOR A BETTER TOMORROW



Quick facts

- Sizes Ø100 mm to Ø630 mm
- Universal version. Air flows can be adjusted manually. Dynamic pressure sensor. Static pressure sensor as option.
- Compact version. Dynamic pressure sensor.
- Max and min. air flow calibrated before delivery

Use

BVAV is a variable/constant air flow device, complete with actuator, control unit and measuring device.

The actuator is separate in the universal version.

Minimum and maximum flows can be adjusted manually using two potentiometers on the regulator. Dynamic pressure sensor is standard.

The BVAV universal is also available with a static pressure sensor for dirtier environments.

In the compact version the pressure sensor, regulator and actuator are integrated into a single unit. Minimum and maximum flows can be adjusted using a manual setting tool.

Material, surface treatment

Casing and parts in hot galvanised sheet steel as per environmental class C3. The measuring tube is manufactured in extruded aluminium.

The device is delivered as standard in pressure class A and air tightness class 2. For higher pressure and environmental requirements it is possible to offer alternative materials for the casing and parts.

Specification

Example:

**Variable/constant air flow device
BVAV - 1 - 160 - 1 - 1 - 200/100**

Version:

Circular - universal = 1

Circular - compact = 2

Size, Ød mm as per size table

Actuator:

Non spring-return = 1

Spring-return = 3

Compact = 4

Control unit - Pressure sensor:

Dynamic = 1

Static (universal only) = 2

Set air flow, max/min air flow, l/s

NOTE! If the devices are to be used as master/slave this must be specified.

Accessories

Union piece

Air quality sensor aSENSE VAV

Timer TEL

Silencers

Summing unit eSUM



Size and weight

Size Ød	A	B	Weight *) kg
100	215	295	0,9
125	215	295	1
160	215	295	1,3
200	215	295	1,6
250	285	365	2,3
315	285	365	3
400	435	515	5,2
500	435	515	8,3
630	500	580	12,5

Weight control unit and actuator

BVAV-2

- Compact 0,7 kg

BVAV-1

Control unit:

- Dynamic 0,4 kg
- Static 0,7 kg

Actuator:

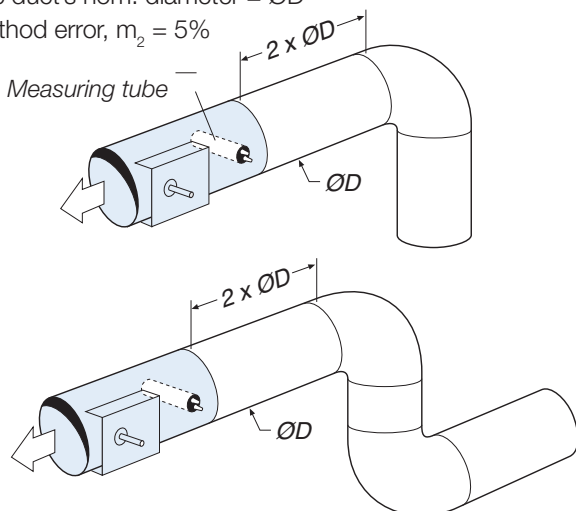
- Non spring-return 0,7 kg
- Spring-return 2,3 kg

*) Excl. control unit and actuator

Installation

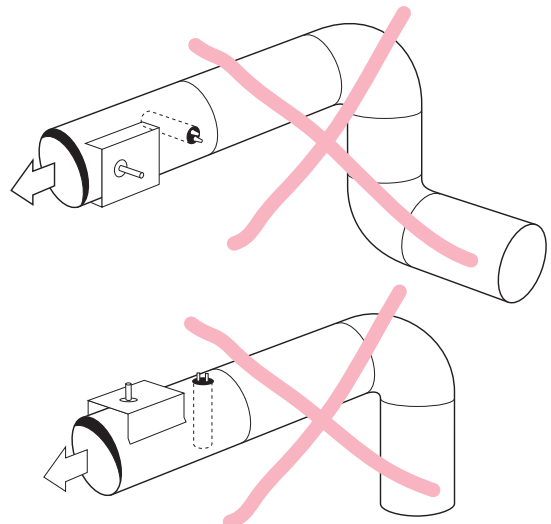
An adequately sized straight duct and correct installation are essential for low measuring uncertainty when measuring the flow in a duct. The required straight duct following a bend is shown in the figures below. For other sources of interference such as union pieces, a straight duct of at least 5 x ØD is necessary before the device.

The duct's nom. diameter = ØD
Method error, $m_2 = 5\%$



NOTE!

- The measuring tube shall be fitted at 90° to the plane of the bends.
- Measuring tubes shall not be placed after two 90° bends in perpendicular alignment.
- For cleanable versions the device is fitted with two union pieces.

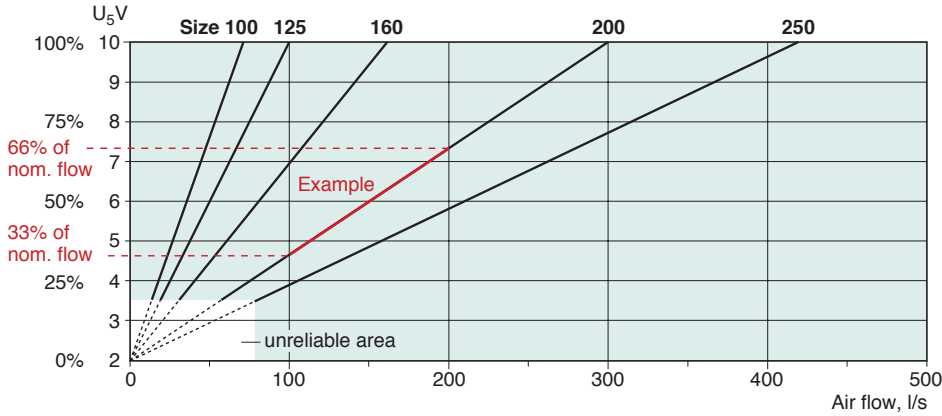




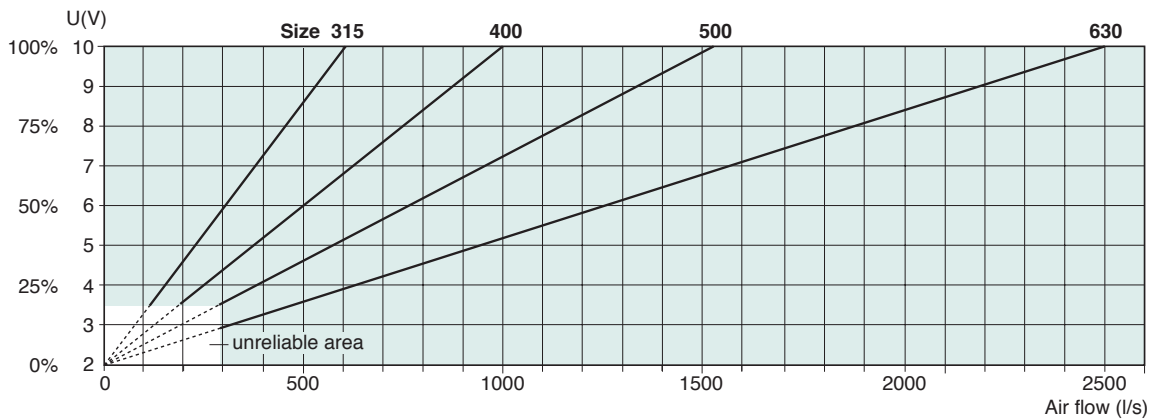
Air flow areas

The diagrams show the relationship between nominal flow and the output signal (U5) for each size.

BVAV-1 and -2, sizes 100-250



BVAV-1 and -2, sizes 315-630



Operation range

Size	Nom. air flow l/s	Max. air flow l/s	Min. air flow l/s
100	70	21-70	12-70
125	100	30-100	20-100
160	160	50-160	35-160
200	300	90-300	50-300
250	420	130-420	90-420
315	600	180-600	120-600
400	1000	300-1000	200-1000
500	1530	460-1530	300-1530
630	2500	750-2500	400-2500

Max. adjustable air flow is 30-100% of nom. air flow.
With min. air flow below the recommended min. air flow, the measuring uncertainty increases.

Example:

Prerequisites:

– Air flow, max. 200 l/s, min. 100 l/s

Select size 200.

Nom. air flow = 300 l/s

Max. air flow (66% av nom. air flow) = 200 l/s

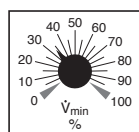
Min. air flow (33% av nom. air flow) = 100 l/s

(all the above air flows are set at the factory)

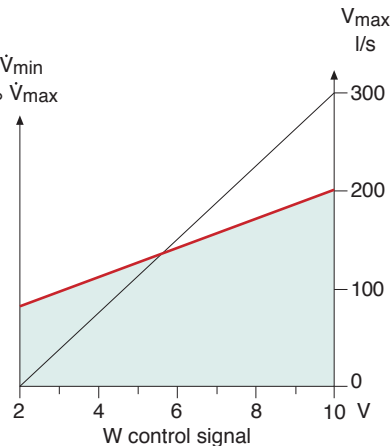
Min. and max. air flow is always set as a % of nom. air flow.

The output signal U_5 is not affected by the V_{max} and V_{min} settings.

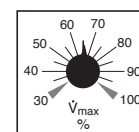
Set min. air flow
33% of nom. air flow
= 100 l/s



V_{min}
% V_{max}



Set max. air flow
66% of nom. air flow
= 200 l/s

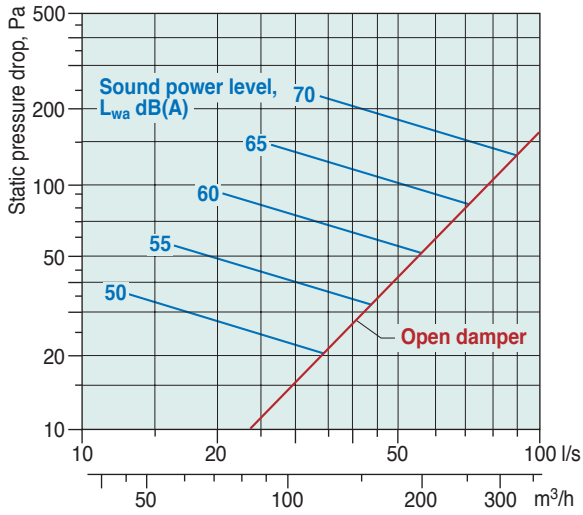


The max. air flow can be regulated between 100-30 % of nom. air flow.

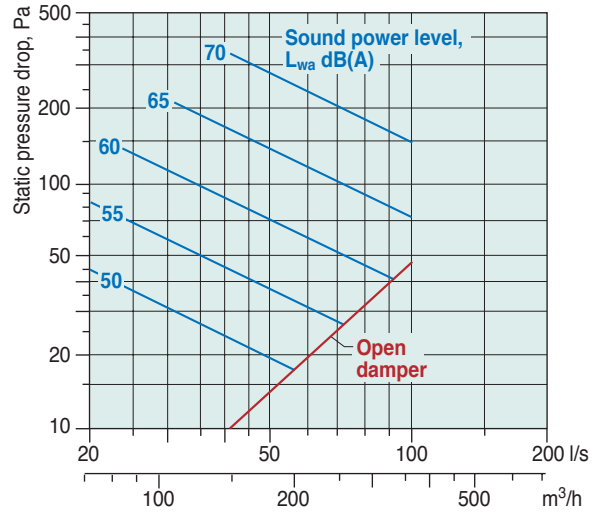


Size chart

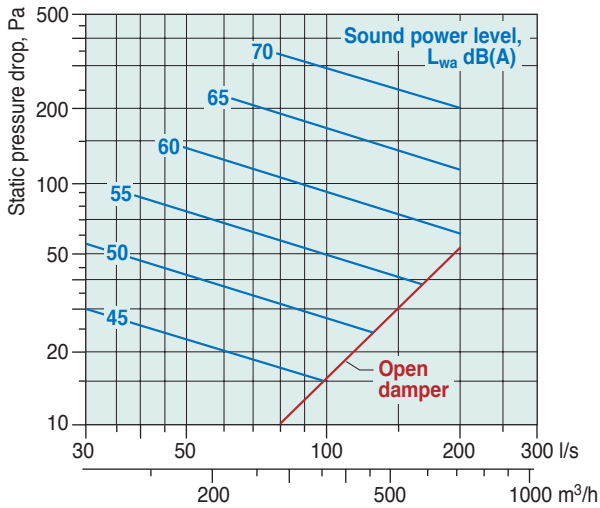
Size 100



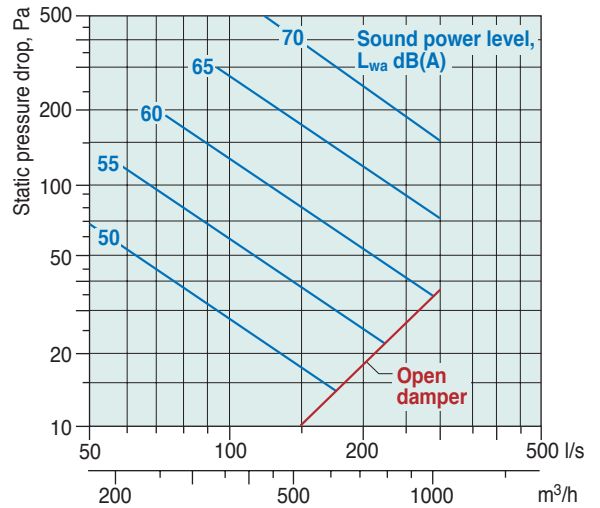
Size 125



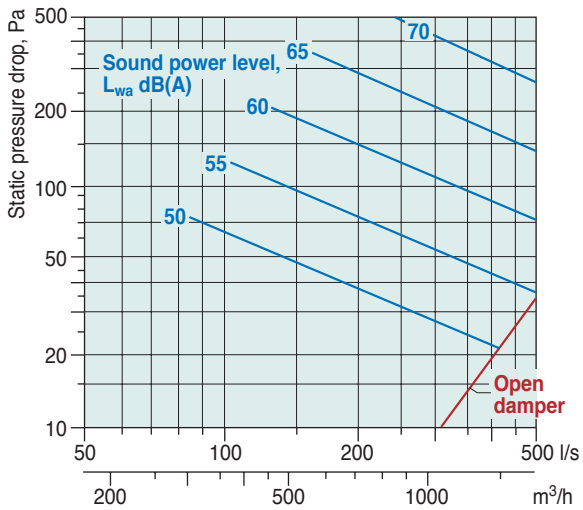
Size 160



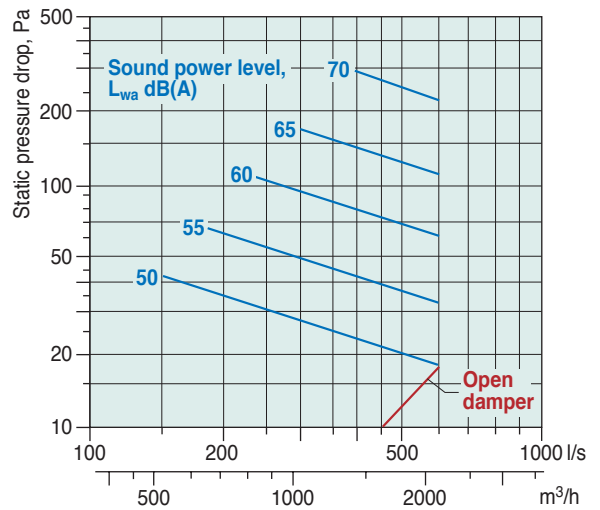
Size 200



Size 250

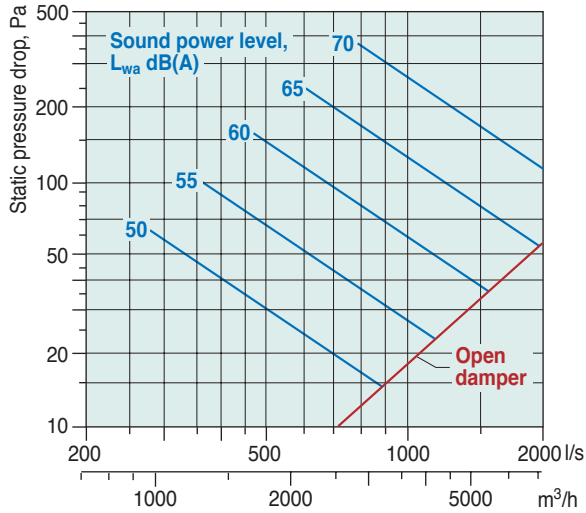


Size 315

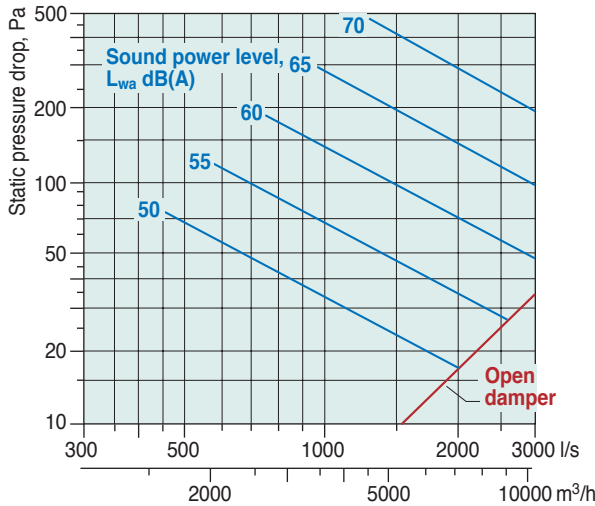




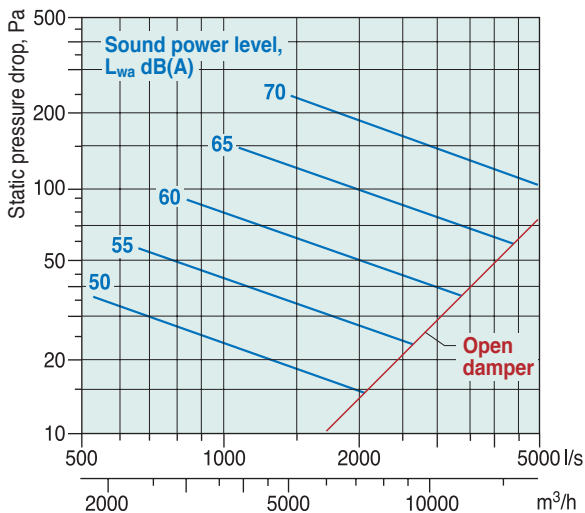
Size 400



Size 500



Size 630



Sound data

Correction of sound power level, $L_{w_{ok}}$, in octave band

$$L_{w_{ok}} = L_w + K_{ok}$$

Correction, K_{ok}

Size	Centre frequency Hz						
	125	250	500	1000	2000	4000	8000
100	11	-1	-4	-12	-13	-22	-29
125	10	-3	-5	-11	-14	-20	-29
160	9	1	-2	-10	-13	-18	-28
200	8	0	-2	-10	-13	-17	-28
250	6	0	-2	-6	-11	-13	-27
315	5	0	-3	-7	-10	-12	-24
400	4	1	-4	-8	-10	-12	-22
500	4	2	-5	-9	-11	-12	-21
630	3	3	-6	-10	-11	-12	-20

Electrical data

BVAV-1, non spring-return

AC 24V, 50/60Hz, DC 24V

AC 19,2...28,8V, DC 21,6...28,8V

Effect: 2 W (3,5 VA)

+ Actuator BVAV-1-xxx-1-x 2-3,5 W (3,5-5,5 VA)

Sound level: 35 dB(A)

Pressure range 2-300 Pa

Ambient temperature: 0°C - 50°C

BVAV-1, spring-return

AC 24V, 50/60Hz, DC 24V

AC 19,2...28,8V, DC 21,6...28,8V

Effect: 2 W (3,5 VA)

+ Actuator BVAV-1-xxx-3-x 7,5 W (10 VA)

Sound level: 40 dB(A) (spring 62 dB(A))

Pressure range 2-300 Pa

Ambient temperature: 0°C - 50°C

BVAV-2

AC 24V, 50/60Hz, DC 24V

AC 19,2...28,8V, DC 21,6...28,8V

Effect: 3-3,5 W (5-5,5 VA)

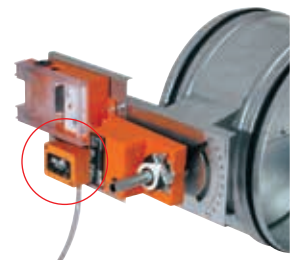
Sound level: 35 dB(A)

Pressure range 2-300 Pa

Ambient temperature: 0°C - 50°C

Installation

The static pressure sensor VFP must be fitted in horizontal position because it is set horizontally at the factory. However, on site readjustment is possible.



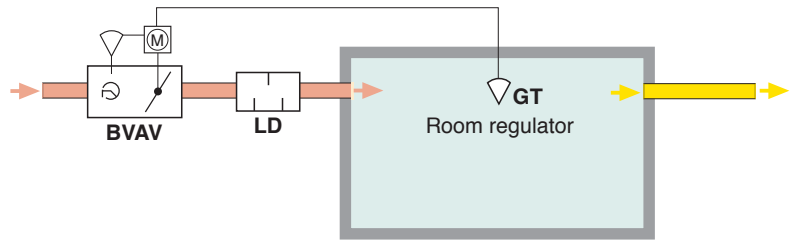


Installation examples

Alt. 1. Installation of separate VAV devices

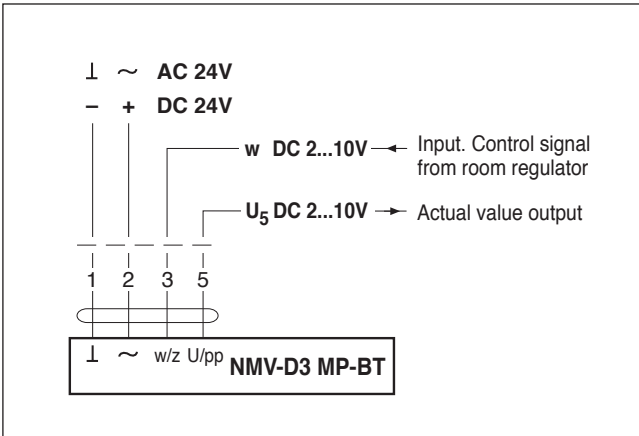
The control signal from the room regulator or DUC, controls the VAV-device.

The actual value signal can be forwarded for external monitoring of the actual flow.

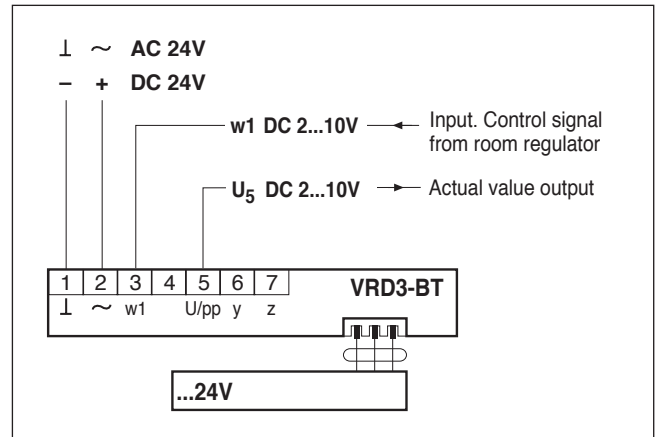


Wiring diagrams

BVAV-Compact, NMV-D3 MP-BT



BVAV-Universal, VRD3-BT

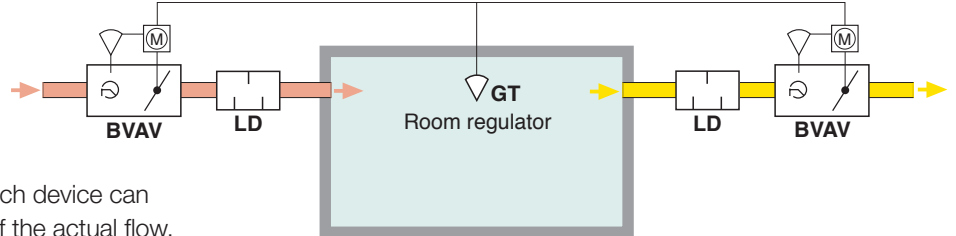


CAUTION! When connecting several VAV devices to the same transformer, it is important that all system phases are connected to (⊥) and all system neutrals are connected to (⊃).

Alt. 2. Supply and exhaust air are controlled in parallel

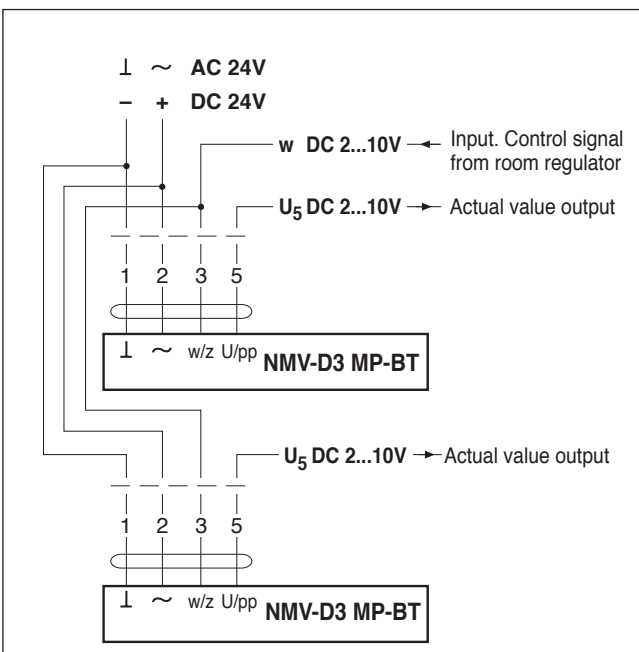
The control signal from the room regulator or DUC, controls the supply air and exhaust air devices in parallel.

The air flow for the devices can be set individually. The output signals from each device can be forwarded for external monitoring of the actual flow.

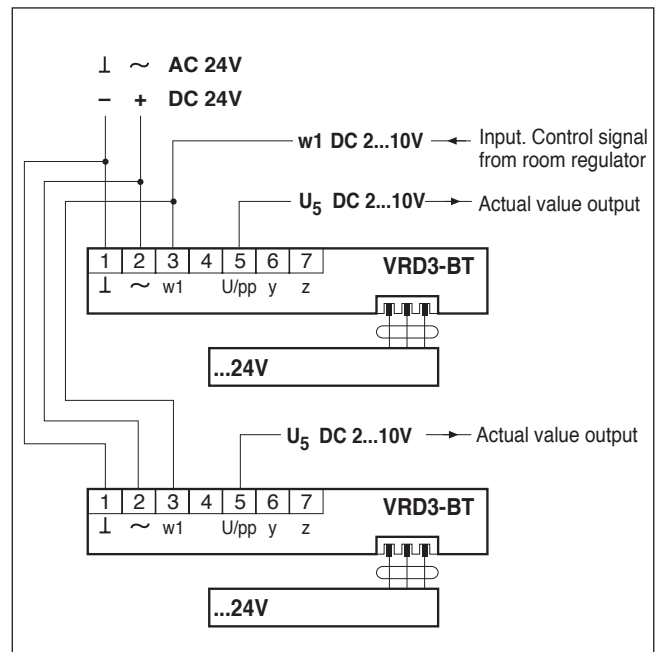


Wiring diagrams

BVAV-Compact, NMV-D3 MP-BT



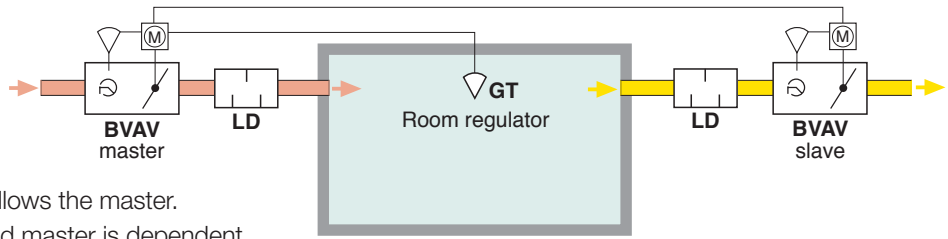
BVAV-Universal, VRD3-BT





Alt. 3. The exhaust air is slave controlled by the supply air

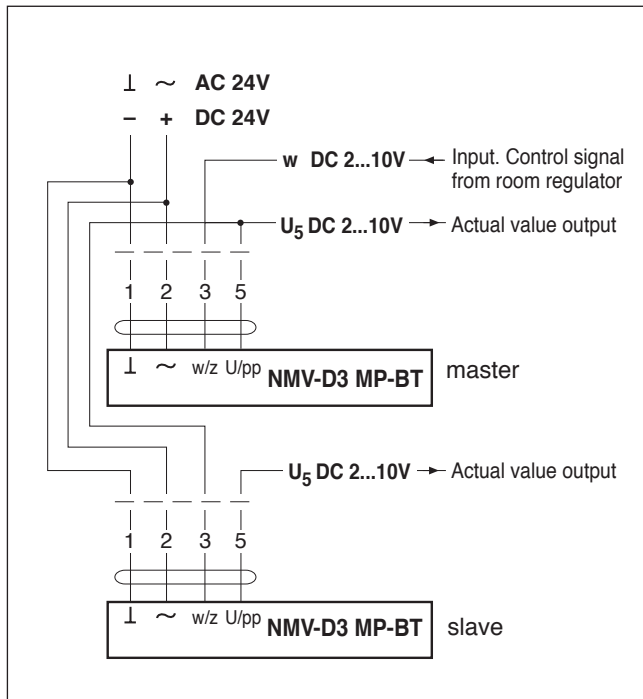
The control signal from the room regulator or DUC, controls the supply air device (BVAV master). The exhaust air device (BVAV slave) is controlled by the supply air device's control signal (U5 output). The slave follows the master. The flow relationship between slave and master is dependent on the set maximum flow of the slave (normally 100%). The output signal from each device can be forwarded for external monitoring of the actual flow.



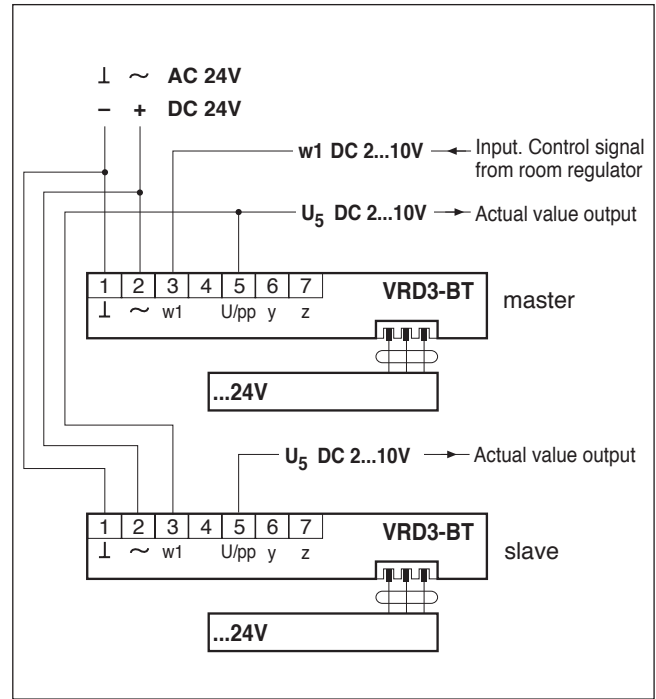
This setting option must be made known before delivery of the VAV devices.

Wiring diagrams

BVAV-Compact, NMV-D3 MP-BT



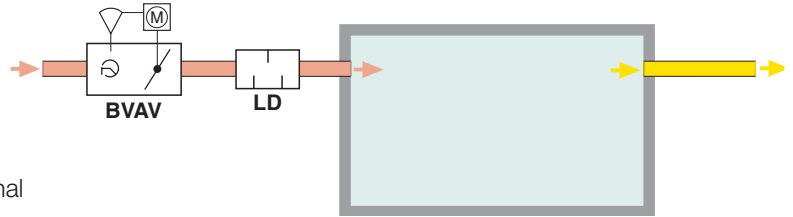
BVAV-Universal, VRD3-BT





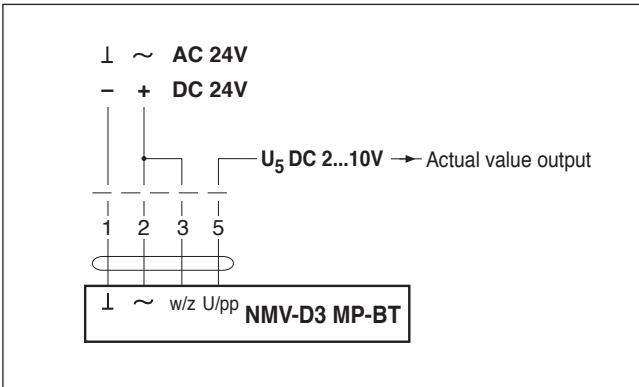
Alt. 4. Constant supply air flow

The VAV device maintains a constant flow that is preset at the factory, which is why the device is not normally controlled by any external control signal. The output signal can be forwarded for external monitoring of the actual flow. The VAV device can be mechanically operated for a range of operational alternatives

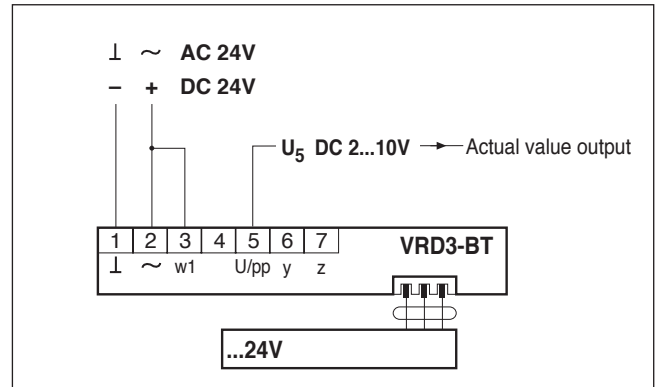


Wiring diagram

BVAV-Compact, NMV-D3 MP-BT



BVAV-Universal, VRD3-BT



Control functions for BVAV-Compact

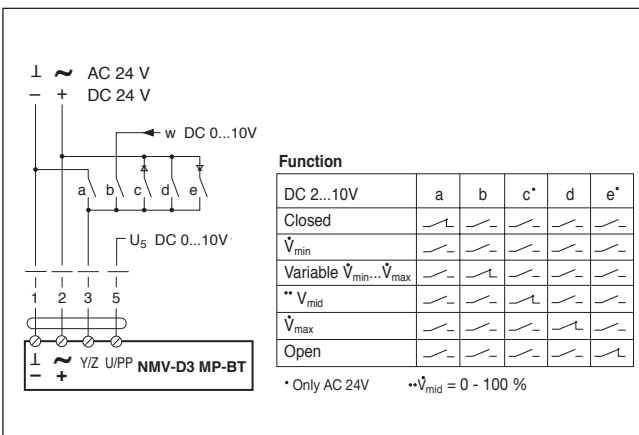
By using contact functions the supply air device (BVAV-Compact) can be controlled to closed, min. flow, variable flow, intermediate position, and max. flow and fully open.

Constant supply air flow, basic or forced flow

A timer or monitor controls the supply air device (BVAV) to force the supply air to a constant set max. flow when the room is used. When the room is not in use the BVAV device works with the basic flow.

Wiring diagram

BVAV-compact, NMV-D3 MP-BT



Wiring diagram

BVAV-universal, VRD3-BT

