

RABR-VAV

Fire damper and VAV unit in one



FIRE SAFETY



CE
EN
125

30/09/2024



Quick facts

- Fire resistance class E120
- Sizes up to 800 x 900 mm
- Prefitted 24 V safety actuator
- Duct mounted
- Factory-set max and min flows
- CE-marked building product in acc. with EN 15650:2010

CE-marked smoke damper and VAV unit in one

RABR-VAV is both a CE-marked E120 smoke damper and a variable/constant flow unit. This combination of two functions takes care of both fire shielding and VAV flow control in the same damper. This saves time, space and money for installations in premises such as hotels, office and shopping complexes, where both these functions are required. RABR-VAV consists of a damper section, measurement unit, regulator and safety actuator.

Using the smoke function

CE-marked smoke damper designed to prevent the spread of smoke at the ventilation duct's penetration of fire classified walls/joist systems or for placement after air handling units that serve more than one fire compartment.

Performance

EC and UKCA certificate in accordance with EN 15650:2010

402-CPR-SC0899-13
2822-UKCA-CPR-0132

Classification of fire resistance in accordance with EN 13501-3

E120 (ve ho i <-> o) S

For complete classification, see the Declaration of Performance.



VAV function

Demand-adjusted airflow minimises the energy consumption of fans, heating and cooling, as well as reducing filter costs. It also has an impact on duct dimensions, and in many cases the size of the entire ventilation system can be reduced. The dampers can be controlled with a 2–10 V/0–10 V signal from e.g. presence, temperature or carbon dioxide sensors. Max and min flows or a constant flow are always calibrated and verified at the factory before delivery. The regulator provides an actual value signal of 2–10 V/0–10 V depending on the flow. If the damper is to be controlled with 0–10 V, specify this in plain text when ordering. The standard factory setting is 2–10 V.

Size

Up to 800 mm x 900 mm.



Specifications

RABR-VAV is supplied complete with a factory mounted, maintenance-free, 24 V electric safety actuator with thermal sensor featuring built-in signal contacts to indicate the damper position.

RABR-VAV is supplied prepared for possible overinsulation of 50 mm. Control takes place from room regulators, air quality sensors, or other devices that give a 2–10 V/0–10 VDC output signal. In the event of a power failure, the damper closes with the actuator's spring.

Material and surface finish

The casing and components are supplied as standard in hot-dip galvanised steel plate in accordance with environmental class C3. For higher environmental classes, the casing and components can be supplied in stainless steel. The measurement tube is made of extruded aluminium.

Control and monitoring

When the damper is used to prevent the spread of fire and smoke, it must be closed via impulses from the smoke detector or thermal sensor. This must be fitted in the ventilation duct near the damper or in another suitable location. Smoke detectors are monitored by means of the Bevent Rasch MRB3 system or equivalent. The MRB3 monitoring system also performs automatic function tests on the damper every 48 hours and is designed so that faults are indicated immediately and the damper closes.

For further information, refer to the technical section on the website.

The following Bevent Rasch monitoring units can be used:

- MRB3 with RCTC/RCTU

OBS! The RCTU must be mounted on the damper at the factory before delivery!

Installation

Regulating smoke dampers may be mounted where ducts penetrate building parts in accordance with the associated installation instructions. If mounted as a final device, the damper must be fitted with steel meshing.

Actuator

RABR-VAV is always supplied with a factory-mounted, 24 V electric regulating safety actuator with spring return and energy-free closure in order for the approval to apply. The actuator has a microswitch for closed and open damper.

Miscellaneous

All data refers to dampers in normal design.

Specification

Example:

Fire damper **RABR-VAV - 600 - 400 - 1 - 1**

Size

Width x Height (W x H), mm

Connection

Slip joint = 1

Material

Galvanised sheet steel

= 1

Stainless AISI 316L – EN 1.4404

= 3

Note Factory-fitted actuator device is always included.

Can be supplied with a static pressure sensor; state in plain text when ordering.



Electrical data	RABR-VAV	VRD3
Dimensioning, max	10 VA - BF24-V	3,5 VA
Runtime;		
- motor opening	120-300 s	
- spring return, max.	ca 20 s	
Protection class	IP 54	
Supply voltage	24V~ ±20%, 6V ±1V (från VRD3), 50/60 Hz	
- Control signal Y		DC 2-10 V DC 0-10 V (option)
- Measuring signal U		DC 2-10 V DC 0-10 V (option) 0-100% U nom.
Ambient temperature		0° till +50°C
End position contacts:		
- load ≤ 300 mW	min 1 mA/5V=, max 100 mA/250V~	
Following exceeding the above values, the following applies:		
- load > 300 mW	min 100 mA, max 3 A/250~	
Noise level when in operation..approx 45 dB(A)		
- with spring	ca 62 dB(A)	

Installation

If the damper is fitted with the VFP static pressure sensor, this must be mounted in a vertical position as it is factory-installed in the vertical position. However, on-site adjustment is possible.

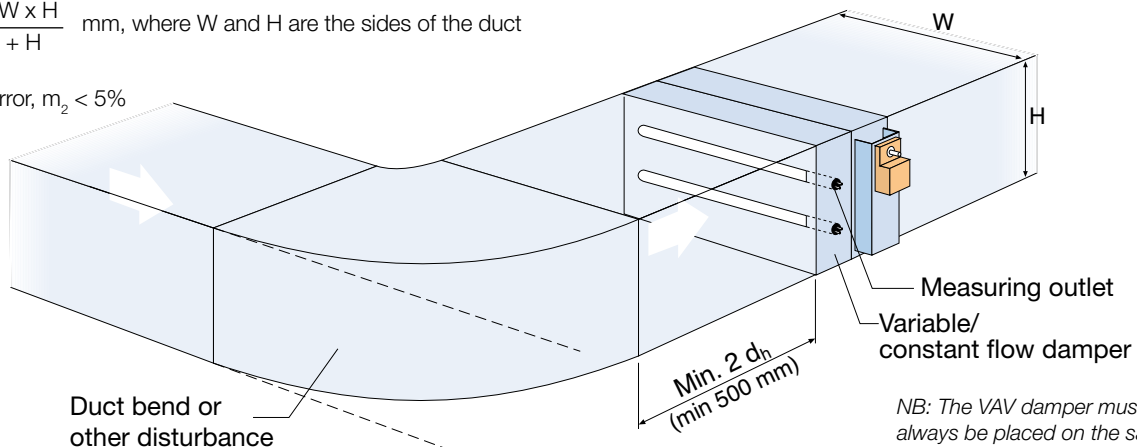


Installation

The VAV damper must be mounted with a distance of at least 2 hydraulic diameters (d_h), although not less than 500 mm after a disturbance source, see the figure below. For other disturbance sources, e.g. a T-piece, at least $5 \times d_h$ is recommended.

$$d_h = \frac{2 \times W \times H}{W + H} \text{ mm, where W and H are the sides of the duct}$$

Method error, $m_2 < 5\%$



NOTE! At width greater than 1000 mm, use of guide vanes are recommended.

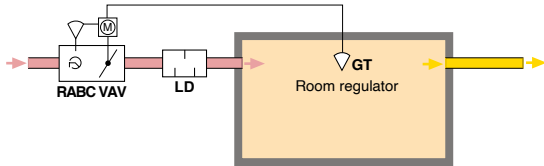
NB: The VAV damper must always be placed on the same level as the duct bend or branch and with the measuring outlet facing outward.



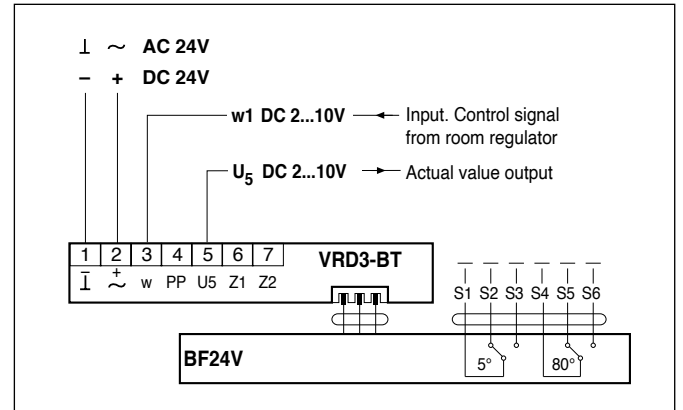
Installation examples

Option 1. Connection of single VAV units

A control signal from e.g. the room regulator or DUC controls the VAV unit. The actual value signal can be forwarded for external monitoring of the current flow.

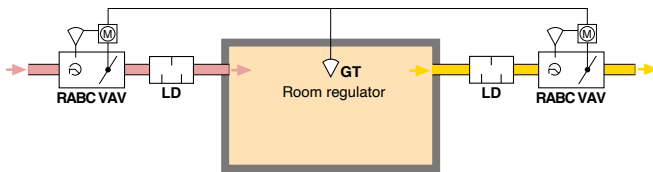


Wiring diagram

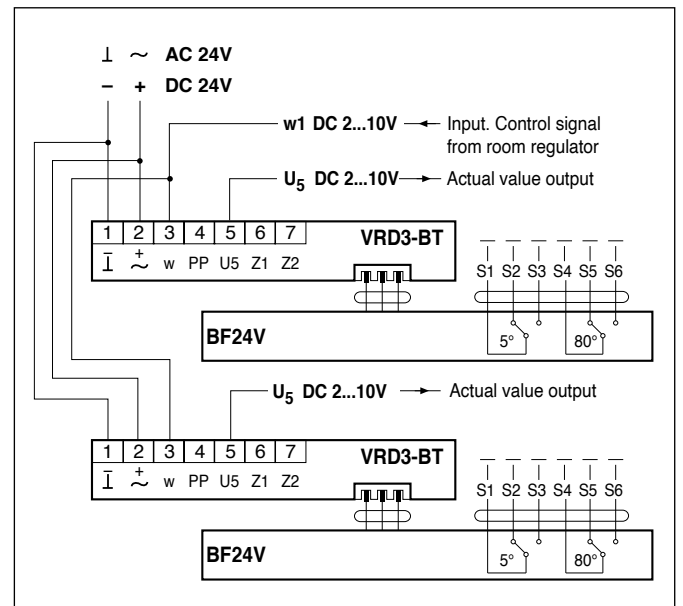


Option 2. Supply and exhaust air are controlled in parallel

A control signal from e.g. the room regulator or DUC controls the supply and exhaust air terminal devices in parallel. The flows of both devices are individually set. The actual value signal from each device can be forwarded for external monitoring of the current flow.



Wiring diagram

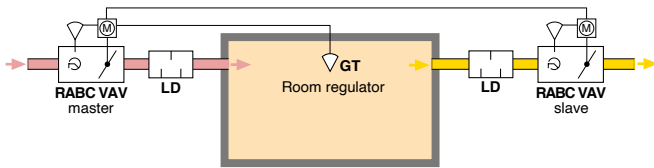


OBS!
 When connecting several VAV units to the same transformer, it is important that all system phases are connected to (↔) and all system zeros are connected to (⊥).
 In case of alarm and function test, the 24 V supply circuit should be broken!



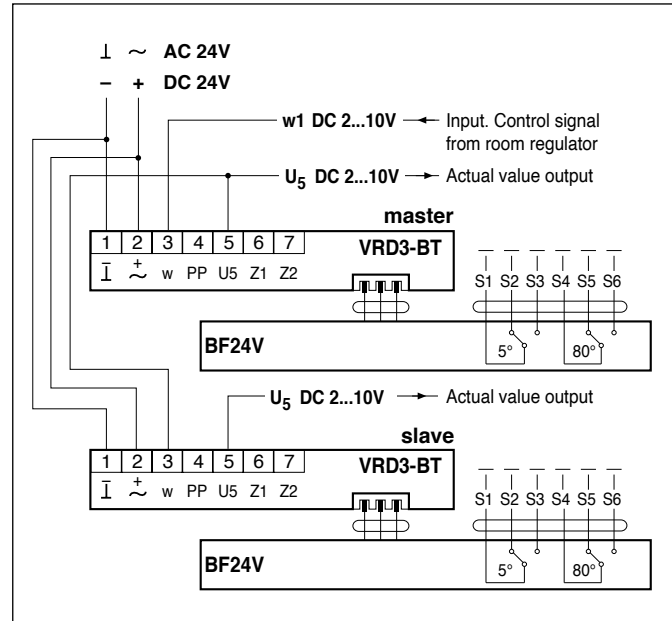
Option 3. Supply air slave controls exhaust air

A control signal from e.g. the room regulator or DUC controls the master unit (RABC-VAV master). The slave unit (RABC-VAV slave) is controlled by the master unit's actual value signal (U_5 signal). The slave unit thus follows the master unit. The flow ratio between slave and master units depends on the set max flow of the slave unit (normally 100%). The actual value signal from each device can be forwarded for external monitoring of the current flow. If this connection option is used, the master and the slave damper need to be the same size.



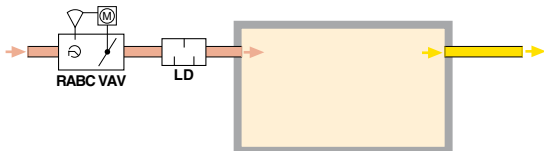
This installation option must be known before delivery of the VAT units.

Wiring diagram

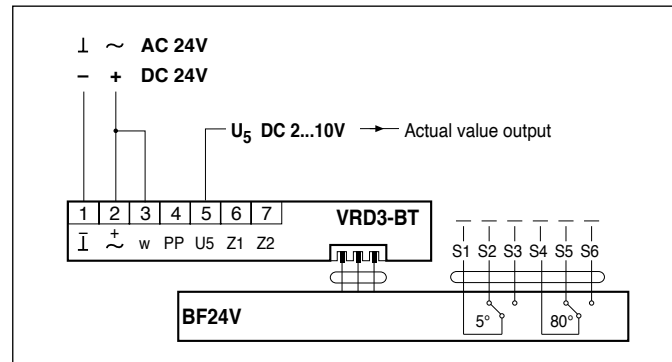


Option 4. Constant flow

RABC-VAV maintains a constant flow preset at the factory. The unit is therefore not normally controlled by an external control signal. The actual value signal can be forwarded for external monitoring of the current flow. RABC-VAV can be force-controlled to different operational requirements.



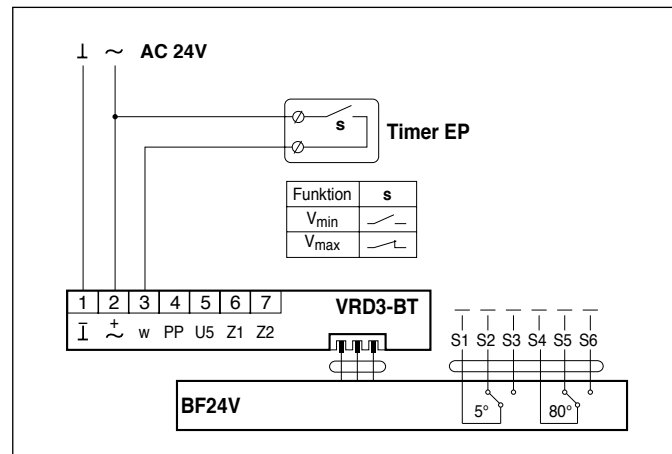
Wiring diagram



Constant supply airflow, basic or force flow

A timer or presence sensor controls the supply air terminal device (RABC-VAV) to force the supply air to the constant set maximum flow when the room is used. When the room is not in use, RABC-VAV works with the basic flow.

Wiring diagram





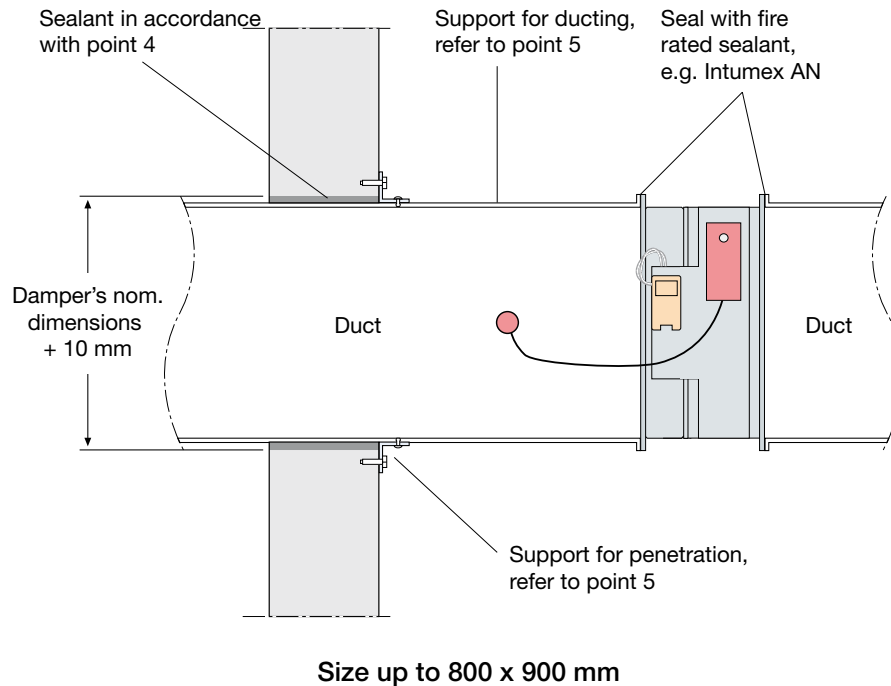
Installation instructions for RABR-VAV in insulated duct

Mounting in insulated horizontal duct.

Damper's fire resistance class: E60 (ve i <-> o) S, E120 (ve i <-> o) S.

EU certificate 0402-CPR-SC0899-13

UKCA certificate 2822-UKCA-CPR-0132



1. Mount the damper in the duct with connection for slip joint or flange. Seal the connection with fire sealant.
 2. Mount the thermal sensor with the sensor body in the airflow without obstructing the movement of the damper blades.
 3. The duct system is fitted in accordance with current requirements. Ensure that connecting ducts do not affect dampers under fire loading.
 4. Duct penetration through a building part is sealed using an approved method, e.g. caulking 40 kg/m³ and fire sealant.
 5. The duct is supported at the penetration in accordance with recommended methods in "Praktiska lösningar Brandskydd, Ventilation [Practical Solutions for Fire Protection, Ventilation]. The ducting may also be supported as necessary.
 6. Insulate the duct in accordance with an approved method and using the supplier's instructions.
- When mounting within the limitations of the fire compartment, the duct is insulated in accordance with an approved method to prevent thermal damage to the building (ducting system).
- The shortest distance between dampers must be 200 mm.
 - The shortest distance to wall/joist must be 75 mm.
 - The damper shaft must be mounted horizontally.
 - Ensure that the duct's diagonal dimensions are identical.