



All-in-one pressure sensor and controller

Control input DC 0...10 V

Communication capacity (PP)

Application

The VAV-Universal VRD2 is used in conjunction with a suitable ...24-V actuator for pressure independent air flow control of VAV boxes. Since it can be combined with many different types of actuators, the VRD2 can be used with different sizes of dampers.

Construction

The VAV-Universal VRD2 circuit contains a dynamic differential-pressure sensor and an electronic measuring and control unit incorporating a microprocessor.

Operation and adjustment

The parameters for $\dot{V}_{MIN}$ and $\dot{V}_{MAX}$ are set by means of the appropriate potentiometers.

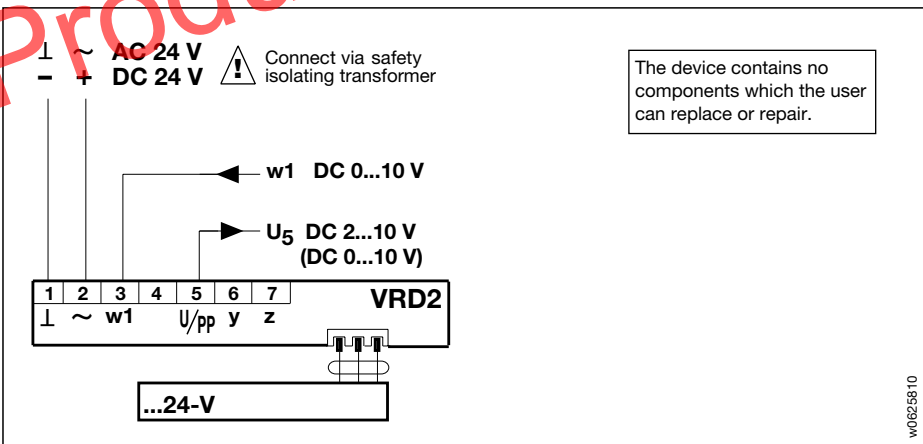
The VRD2 is controlled with a reference signal of DC 0...10 V (w1).

The operating range and the actual-value signal range of the VRD2 are set at DC 2...10 V by the manufacturer. These ranges can be changed to DC 0...10 V when necessary with the aid of the ZEV adjuster via the PP connector.

Damper actuators

NM24-V, SM24-V, AM24-V, GM24-V, LF24-V, AF24-V

Wiring diagram

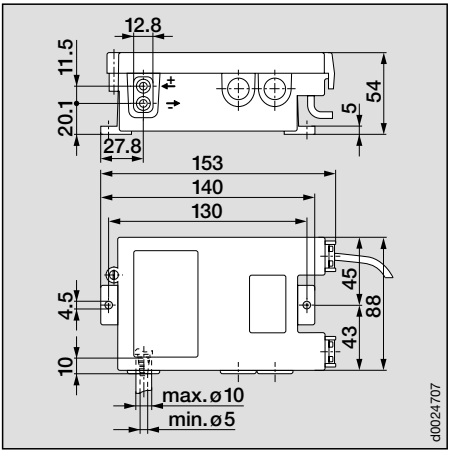


Technical data	VRD2
Nominal voltage	AC 24 V 50/60 Hz, DC 24 V
Nominal voltage range	AC 19.2...28.8 V, DC 21.6...26.4 V
Power consumption	1.3 W
For wire sizing	3 VA (without damper actuator)
Reference value w1	DC 0...10 V @ input resistance 100 kΩ (Reference in the range between $\dot{V}_{MIN}$ and $\dot{V}_{MAX}$)
Operating range	DC 2...10 V (DC 0...10 V changeover with ZEV)
Actual-value signal for volumetric flow U5	DC 2...10 V @ 0.6 mA (DC 0...10 V changeover with ZEV) Signal linear, corresponds to 0...100% $\dot{V}_{NOM}$
Adjusting ranges	
• $\dot{V}_{MAX}$ (max. volumetric flow)	30...100% of adjusted reference value ($\dot{V}_{NOM}$)
• $\dot{V}_{MIN}$ (min. volumetric flow)	0...80% of adjusted $\dot{V}_{MAX}$
Sensor range	2... ≈ 300 Pa (OEM-dependent)
Connection	Screw terminals for 2 × 1.5 mm ²
Protection class	III safety extra-low voltage
Degree of protection	IP40
Ambient temperature range	0... +50 °C
Storage temperature range	-20... +80 °C
Humidity test	to EN 60730-1
EMC	CE according to 89/336/EEC
Mode of operation	Type 1 (EN 60730-1)
Weight	400 g

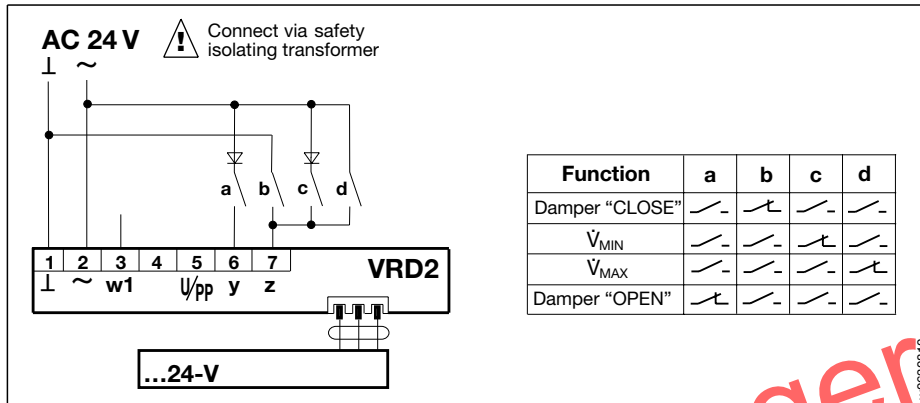
Important

The manufacturer of the VAV boxes (i. e. the OEM) is responsible for the proper assembly and correct adjustment of the VRD2 and the total accuracy of the VAV boxes.

Dimensions



Override control (central or local)



Control

In order for a ventilation and air-conditioning system to be operated economically, it is important to be able to select the operating modes " $\dot{V}_{MIN}$ ", " $\dot{V}_{MAX}$ ", "OPEN" or "CLOSE".

In the case of the VRD2, these functions can be accessed very easily as shown in the diagrams on the left.

The override control input z or input y overrides the signals from the reference input w1 and 4.

Override control commands can also act on several controllers simultaneously.

"CLOSE" damper: For saving energy in unoccupied zones by closing the supply- and exhaust-air dampers.

"OPEN" damper: For smoke extraction or safety purposes. Note: Air volume control is inoperative in this case.

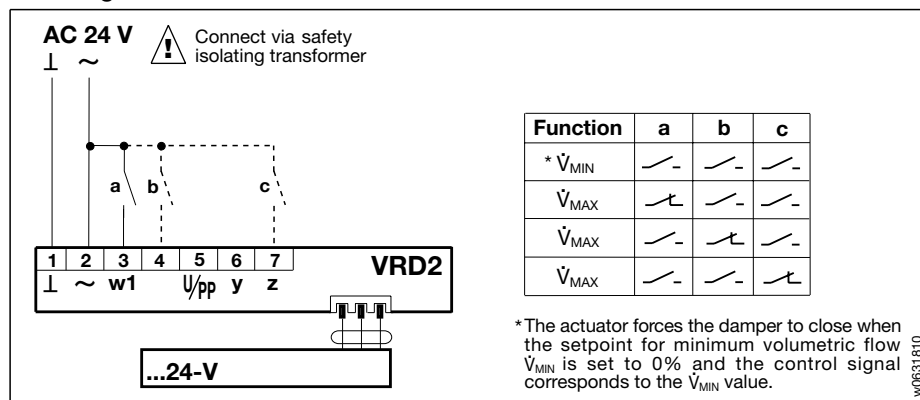
$\dot{V}_{MIN}$ – minimum volumetric flow

When individual zones are unoccupied, they can be switched to the standby mode so that there is minimum air flow through them and the consumption of energy is substantially reduced.

$\dot{V}_{MAX}$ – maximum volumetric flow

Maximum air flow can be directed to one or more rooms for short periods in order to provide extra ventilation, night cooling or fast morning warm-up.

Two-stage air volume control



Two-stage air volume control

If no reference signal w1 is being fed to the VRD2 controller, it will automatically maintain the constant value of volumetric flow that has been set with the $\dot{V}_{MIN}$ potentiometer.

If an AC 24 V signal is fed to the terminal 3 (w1), 4 or to the terminal 7, the VRD2 will maintain the constant value of volumetric flow that has been set with the $\dot{V}_{MAX}$ potentiometer.

This means that "dual volume control" is possible by means of a switch or contacts in the connecting circuit.