

Control component XTS

Volume flow rate measurement – static transducer



Type VMRK with control component XTS



Type VME with control component XTS



Type VMR with control component XTS



Effective pressure transducer for contaminated air – for example, in extract air applications

Effective pressure transducers based on the static measurement principle for volume flow rate measuring unit types VME, VMR or VMRK

- Use in ventilation and air conditioning systems, with clean and contaminated air
- Analogue actual value signal for monitoring and evaluation by the central BMS
- Recording of measured values for the display of volume flow rates or for the control of slave controllers
- Suitable for constant and variable volume flow rates
- No commissioning using factory-set parameterisation
- Integral display for volume flow rate indication (l/s or m³/h)

General information	2	Variants	6
Function	3	Technical data	7
Specification text	4	Product details	9
Order code	5	Nomenclature	11

General information

Application

- Determination of volume flow rates for transmission and processing as an electrical signal for monitoring or tracking control
- Measurement of effective pressure and conversion of the volume flow rate actual value into an analogue voltage signal
- For use with clean air and, in particular, contaminated air
- Transducer factory-set to the unit-related constant (K value) of the measuring unit

Interface

- Analogue interface with adjustable signal voltage range

Signal voltage ranges

- 0 – 10 V DC
- 2 – 10 V DC

Parts and characteristics

- Effective pressure transducer with static measurement principle
- Connecting cable with 3 wires, approx. 0.9 m, halogen-free
- Integral display
- Any installation orientation

Construction

Type GT-VM-DS3 for volume flow rate measuring unit

- For VME, VMR, VMRK, all sizes

Commissioning

- Completely factory-set
- On-site adjusting is not required

Useful additions

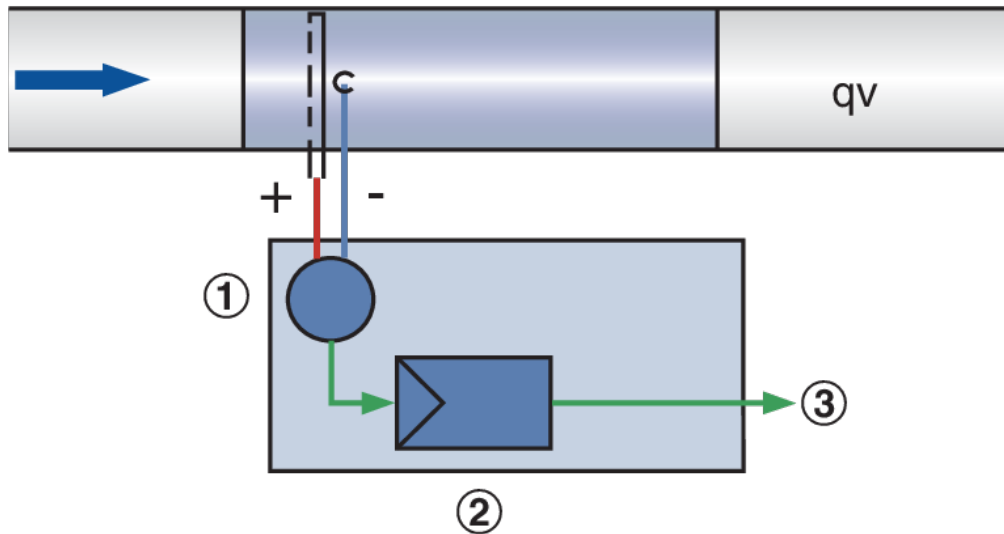
- Adjustment device GUIV-A
- PC software WIN-VAV

Function

The volume flow rate measurement is carried out by measuring the effective pressure. For this reason, the volume flow rate measuring unit is fitted with an effective pressure sensor. The effective pressure is converted into a voltage signal by an effective pressure transmitter with a static measurement

principle. The volume flow rate actual value is hence available as a voltage signal. Due to factory adjustment, 10 V DC always corresponds to the nominal flow rate ($q_{vnom.}$). Voltage ranges are stored in the transducer.

Principle of operation of volume flow rate measuring unit



- ① Effective pressure transducer (dynamic measurement principle)
- ② Transducer for converting the differential pressure signal into a volume flow rate signal
- ③ Analogue actual value signal

Specification text

This specification text describes the general properties of the product.

Category

- Measuring units for volume flow rate

Application

- Recording of a constant or variable volume flow rate actual value e.g. for connection to the central building management system for the purpose of monitoring or integration into a room balancing system.

Area of application

- Effective pressure transducer with static measurement principle for contaminated air in ventilation and air conditioning systems

Installation orientation

- Either direction

Connection

- Connecting cable with 3 wires, halogen-free

Supply voltage

- 24 V AC/DC

Interface

- Analogue signal 0 – 10 V or 2 – 10 V DC

Interface information

- Volume flow rate actual value

Special functions

- Display for showing the volume flow rate actual value (m³/h or l/s) and adjustment of the signal characteristic and the volume flow rate unit

Parameter setting

- Parameters specific to measuring unit are factory-set
- Signal characteristic is factory-set
- Subsequent adjustment on the device itself or using optional tools: Adjustment device, PC software (wired in each case)

Factory condition

- Electronic transducer factory-mounted on the measuring unit
- Factory-set parameterisation and testing of air distribution technology; certified with sticker

Order code

VME – P1 / 600 × 400 / XTS / 0
| | | | |
1 3 5 7 9

1 Type

VME Volume flow rate measuring unit

3 Material

No entry required: Galvanised sheet steel (standard construction)

P1 Powder-coated RAL 7001, silver grey

5 Nominal size [mm]

B × H

Order example: VME-P1/400x300/XTS/0**Materials**

With powder coating

Nominal size

400 × 300 mm

Attachment

Effective pressure transducer with static measurement principle and display

Signal voltage range

0 – 10 V DC, corresponds to 0 – q_{vnom}

7 Attachments (control components)

XTS Effective pressure transducer with static measurement principle and display

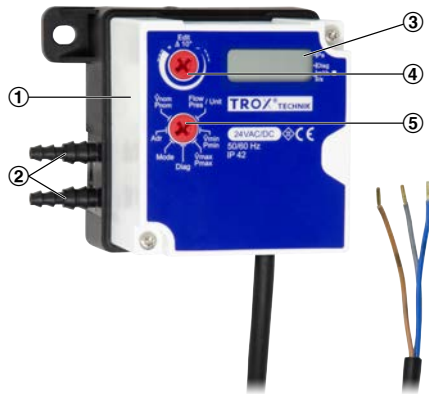
9 Signal voltage range

0 0 – 10 V DC

2 2 – 10 V DC

Variants

Effective pressure transducer GT-VM-DS3



- ① Effective pressure transducer
- ② Connection for effective pressure
- ③ Display
- ④ Potentiometer
- ⑤ Selection of setting menu

Effective pressure transducer GT-VM-DS3



- ① Rating plate
- ② Connecting cable

Technical data

Effective transducer for volume flow rate measuring units

Type	Part number	Volume flow rate measuring unit
GT-VM-DS3	A00000047145	VME, VMR, VMRK

Effective pressure transducer GT-VM-DS3



Effective pressure transducer GT-VM-DS3

Measurement principle/installation orientation	Effective pressure transducer with static measurement principle, independent of position
Supply voltage	24 V AC \pm 20%, 50/60 Hz
Power consumption (when running/when idle)	0.5 W
Power rating	1.5 VA
Actual value signal output	0 – 10 V DC or 2 – 10 V DC; 0.5 mA max.
IEC protection class	0 – 10 V DC, Ra > 100 k Ω or 2 – 10 V DC, Ra > 50 k Ω
Protection level	IP 54
EMC	EMC to 2014/30/EU
Weight	0.15 kg

XTS, display



Note: Function selection with XTS limited

Range of display functions

Display functions

- Volume flow rate actual value (unit optionally m³/h, l/s)
- Display via 3-character display with position valuation labelling (upstroke symbolises thousands of digits)

Setting options

- Unit of the volume flow rate display m³/h or l/s
- Signal voltage range 0 – 10 V or 2 – 10 V DC

Product details

Analogue interface 0 – 10 V or 2 – 10 V DC

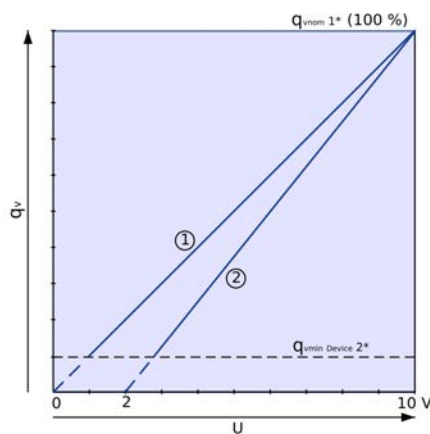
The analogue interface can be set for signal voltage range 0 – 10 V DC or 2 – 10 V DC. The assignment of the volume flow rate actual value for voltage signals is shown in the characteristic curves.

- The signal voltage range is pre-set in the factory according to the order code entries
- Signal voltage range adjustable by others on the unit using a potentiometer and integral display or with service tools

Actual value as feedback for monitoring or tracking control

- On the terminal U, the actual volume flow rate measured by the controller can be tapped as a voltage signal
- The selected signal voltage range 0 – 10 V DC or 2 – 10 V DC is shown in the volume flow rate range 0 – q_{vnom} .

Characteristic of the actual value signal



① Signal voltage range 0 – 10 V

② Signal voltage range 2 – 10 V

1* = q_{vnom} , nominal volume flow rate

2* = $q_{vmin\ unit}$ Minimum controllable volume flow rate

Calculation of volume flow rate actual value at 0 – 10 V

$$q_{vact} = \frac{U}{10\ V} \times q_{vnom}$$

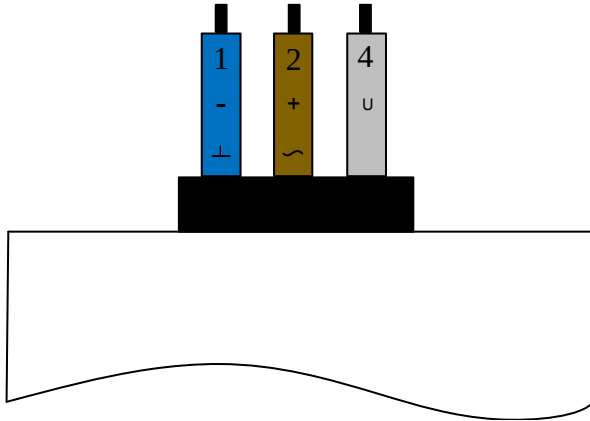
Calculation of volume flow rate actual value at 2 – 10 V

$$q_{vact} = \frac{U - 2}{10\ V - 2\ V} \times q_{vnom}$$

Commissioning

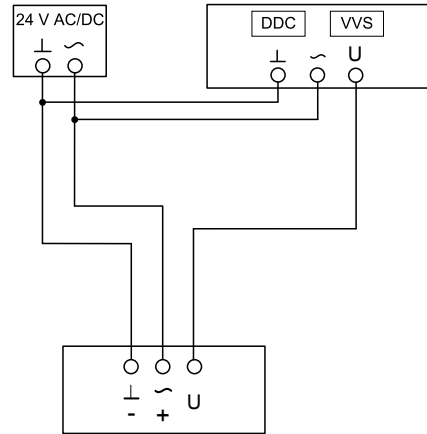
- On-site adjusting is not required
- After successful installation and wiring, the transducer is ready for use
- Observe the volume flow rate ranges of the measuring unit; in particular, the rate may not fall below the minimum volume flow rate.

View of connecting cable



- 1: BU, ⊥, -: Ground, neutral
- 2: BN, ~, +: Supply voltage 24 V
- 4: GY, U: Actual value signal or service tool connection

Connection



- 1: BU, ⊥, -: Ground, neutral
- 2: BN, ~, +: Supply voltage 24 V
- 4: GY, U: Actual value signal or service tool connection

DDC = Monitoring, processing actual value signal

Nomenclature

q_{vnom} [m³/h]; [l/s]

Nominal flow rate (100 %): The value depends on product type, nominal size and effective pressure transducer (attachment). Values are published on the internet and in technical leaflets and stored in the Easy Product Finder design program. Reference value for calculating percentages (e.g. q_{vmax}). Upper limit of the setting range and maximum volume flow rate setpoint value for the VAV terminal unit.

q_v [m³/h]; [l/s]

Volume flow rate

Δ_{pw}

Quantity measured with the sensor (in this case the differential pressure). Basis for the calculation of the actual volume flow rate or for the conversion into an electrical signal (linear to the volume flow rate) by an effective pressure transducer.

Volume flow rate measuring unit

Consists of a basic unit and an optional effective pressure transducer.

Basic unit

Unit for recording volume flow rates without an attached measuring transducer. The main components include the casing with sensor(s) to measure the effective pressure and the connection points for effective pressure tubes. In contrast to a volume flow controller, there is no damper blade. Distinguishing features of the basic unit: unit shape (geometry), materials and types of connection. The basic unit can either be prepared for manual measurement with a mobile differential pressure measuring unit or be fitted with an electric attachment for converting the effective pressure into an electrical (effective pressure transducer).

Effective pressure transducer

Electronic device mounted on the basic unit for measuring volume flow rates. The electronic device essentially consists of an effective pressure transducer. Important distinguishing features: Transducer for dynamic pressure measurements that is suitable for clean air or transducer for static pressure measurements that is suitable for contaminated air and interface(s) (analogue interface and digital bus interface).