TROX® TECHNIK
The art of handling air

XB0 for TVE

XB0 for TVR, TVJ, TVT, TZ-Silenzio, TA-Silenzio, TVZ, TVA, TVM

XB0

CONTROL COMPONENTS FOR VAV TERMINAL UNIT WITH DYNAMIC TRANSDUCER

Compact device for use with VAV terminal units

- Controller, dynamic differential pressure transducer and actuator in one casing
- Use in ventilation and air conditioning systems, only with clean air
- Suitable for constant and variable volume flow rates
- Activation of override controls via external switch contacts
- Volume flow rates q_{vmin} and q_{vmax} are set in the factory and saved in the controller
- Change of operating parameters using adjustment devices
- Service access for manual adjustment devices and PC configuration software
- Simple terminal connection without the use of additional junction boxes (for types TVE and TVE-Q)

General information

Application

- All-in-one control devices for VAV terminal units
- Dynamic effective pressure transducer, electronic controller and actuator are fitted together in one casing
- Dynamic differential pressure transducer for clean air in ventilation and air-conditioning systems
- Various control options based on setpoint value default setting
- Volume flow rate control is based on setpoint values received from room temperature controller, central BMS, air quality controller or other devices as an analogue signal.
- Override controls for activating qvmin, qvmax, shut-off or OPEN position can be set with a switch or relay
- The actual volume flow rate value is available as a linear voltage signal

If air is contaminated with dust, lint, sticky, moist or slightlyaggressive particles:

- Use Compact controller XS0 or XD0 with static effective pressure transducer instead of the Compact controller XB0 described here
- XS0 (for TVE and TVE-Q series)
- XD0 (for TVR, TVJ, TVT, TZ-Silenzio, TA-Silenzio, TVZ, TVA, TVRK)

Control strategy

- The volume flow controller works dependently of the duct pressure
- Differential pressure fluctuations do not result in permanent volume flow rate changes
- To prevent the control from becoming unstable, a dead band is allowed within which the damper blade does not move
- Flow rate range in the controller set in the factory
  - q_{vmin}: Minimum volume flow rate
  - q_{vmax}: Maximum volume flow rate
- Operating parameters are specified via the order code and set in the factory

Operating modes

- Variable or constant value

Variable operation (V)

- Setpoint value default setting via analogue interface
- Signal voltage range corresponds to q_{vmin} to q_{vmax}

Constant value mode (F)

- A setpoint signal is not required, setpoint value corresponds to q_{vmin}

Interface

Analogue interface with adjustable signal voltage range

- Analogue signal for volume flow rate setpoint value
- Analogue signal for volume flow rate actual value (factory setting), alternatively: analogue signal for damper blade position (adjustment by others required)

Signal voltage ranges

- 0 – 10 V DC
- 2 – 10 V DC

Parts and characteristics

- Transducer based on dynamic measuring principle. It can only be used with clean air, as a partial volume flow is passed through the transducer
- Actuators with overload protection
- Release button to allow for manual operation (only 227V-024-10-DD3)
- Connecting cable with 4 wires, approx. 0.9 m, halogen-free (only 227V-024-10-DD3)
- Terminals with cover (only TR0V-024T-05I-DD15)
- Service interface

Construction

- Type 227V-024-10-DD3 for TVR
- Type 227V-024-10-DD3 for TVJ
- Type 227V-024-10-DD3 for TVT up to 1000x300 or 800x400
- Type 227V-024-10-DD3 for TZ-Silenzio, TA-Silenzio
- Type 227V-024-10-DD3 for TVZ, TVA
- Type 227V-024-10-DD3 for TVM
- Type TR0V-024T-05I-DD15 for TVE

Commissioning

- Due to the volume flow rates set at the factory, always ensure that the terminal units are only installed at the specified locations
- After successful installation and wiring, the controller is ready for use
- Operating parameters can be adjusted by the customer (via the adjustment device)

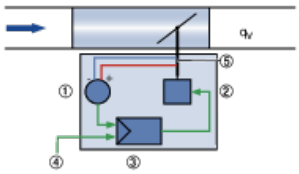
Useful additions

- Adjustment device GUIV-A (order code AT-VAV-G) for 227V-024-10-DD3
- Adjustment device GUIV3-M (order code AT-VAV-G3) for TR0V-024T-05I-DD15

TECHNICAL INFORMATION

A closed control circuit for regulation of the volume flow rate, i.e. measuring - comparing - adjusting, is characteristic of air terminal units. The volume flow rate is measured via the differential pressure (effective pressure). This is done via a differential pressure sensor. An integrated differential pressure transducer converts the effective pressure into a voltage signal. The volume flow rate actual value is available as a voltage signal. The factory setting is such that 10 V DC always corresponds to the nominal volume flow rate (q_{vNom}).
The volume flow rate setpoint value is specified by a higher-level controller (e.g. room temperature controller, air quality controller, central BMS). Variable volume flow control results in a value between qv_{min} and qv_{max}. It is possible to override the room temperature control, e.g. by a complete shut-off of the duct.
The controller compares the volume flow rate setpoint value to the actual value and controls the integral actuator according to the system deviation.

Principle of operation – TR0V-024T-05I-DD15 (type TVE)



① Effective pressure transducer

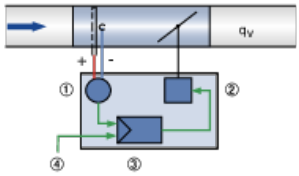
② Actuator

③ Volume flow controller

④ Setpoint value via analogue signal

⑤ Shaft with effective pressure channel

Principle of operation – LVC, TVR, TZ-Silenzio, TA-Silenzio, TVZ, TVA, TVJ, TVT



① Effective pressure transducer

② Actuator

③ Volume flow controller

④ Setpoint value signal

Category

- Compact controller for volume flow rate
- Control of a constant or variable volume flow rate setpoint
- Electronic controller for connecting a reference value and tapping an actual value
- The actual value relates to the nominal volume flow rate such that commissioning and subsequent adjustment are simplified
- Stand-alone operation or integration in central building management system

Application

- Dynamic transducer for clean air in ventilation and air conditioning systems

Supply voltage

- 24 V AC/DC

Actuator

- Integrated; slow running (run time <150 s for 90°)

Installation orientation

- Either direction

Interface/signalling

- Analogue signals (0 – 10 V or 2 – 10 V DC)

Connection

- Terminals with rubber cap cover, no additional terminal box required (control components for TVE)
- Connecting cable with 4 wires (control components for other types)

Interface information

Analogue:

- Volume flow rate setpoint and actual volume flow rate value
- Factory-set actual value: volume flow rate
- Actual value can be changed to damper position on site

Special functions

- Activation q_{vmin}, q_{vmax}, closed, open by external switch contacts

Parameter setting

- Specific parameters for VAV terminal unit are factory-set
- Operating values: qvmin, qvmax and interface type are factory-set
- Subsequent adjustment by means of optional tools: Adjustment tool, PC software (each wired)

Factory condition

- Electronic controller factory mounted on control unit
- Factory parameter settings
- Functional test under air; certified with sticker

TVE	–	D	/	200	/	D2	/	XB0	/	V	/	0	/	qvmin	–	qvmax	m³/h
1		2		5		6		7		8		9			10		11

1 Type
TVE VAV terminal unit

2 Acoustic cladding
No entry: none
D With acoustic cladding

3 Material
Galvanised sheet steel (standard construction)
P1 Powder-coated RAL 7001, silver grey
A2 Stainless steel construction

5 Nominal size [mm]
100, 125 , 160, 200, 250, 315, 400

6 Accessories
No entry: none
D2 Double lip seal both ends
G2 Matching flanges for both ends

7 Attachments (control components)
XB0 Compact controller with dynamic transducer

8 Operating mode
FL Constant value (one setpoint value)
V Variable (setpoint value range)

9 Signal voltage range
0 0 – 10 V DC
2 2 – 10 V DC

10 Operating values for factory setting
Volume flow rates in m³/h or l/s
q_{vconst} (only with operating mode F)
q_{vmin} (only with operating mode V)
q_{vmax} (only with operating mode V)

11 Volume flow rate unit
m³/h
l/s