TROX® TECHNIK
The art of handling air

MP-BUS MARKETING HIGHLIGHTS IMAGE

BACNET MARKETING HIGHLIGHTS IMAGE

MODBUS MARKETING HIGHLIGHTS IMAGE

X-AIRCONTROL zone module MP bus

BUDN

CONTROL COMPONENT WITH DYNAMIC TRANSDUCER AND SEPARATE ACTUATOR FOR VAV TERMINAL UNITS

Universal device for use with VAV terminal units

- Controller and dynamic differential pressure transducer in one casing
- Separate actuator with simple plug connection
- 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 wiring
- Volume flow rates qvmin and qvmax are set in the factory and saved in the controller
- Modification of operating parameters by PC software as well as smartphone and tablet app (TROX FlowCheck app)
- Service access for PC configuration software
- Smartphone access via NFC interface and Bluetooth
- Setpoint value settings, override controls and parameter adjustment via analogue interface or bus communication
- High data transparency through standardised bus communication MP-Bus, Modbus RTU or BACnet MS/TP

General information

Application

- All-in-one control device for VAV terminal units

- Dynamic differential pressure transducer and control electronics in one casing
- Separate actuator with prefabricated connection plug
- For use only with clean air
- Standard filtration in comfort air conditioning systems allows for use of the controller in the supply air without additional dust protection.
- Suitable for different control tasks depending on the specification of the setpoint value
- The room temperature controller, central BMS, air quality controller or similar units control the variable volume flow control by specifying the setpoint values via a communication interface or analogue signal
- Override controls for activating qvmin, qvmax, shut-off, OPEN position via MP-Bus data points or Modbus/BACnet register or switch/relay possible
- Volume flow rate actual value is available as a network data point or linear voltage signal
- Damper blade position is available as a network data point
- Use TROX FlowCheck app and PC tool to configure the controller and the communication parameters

With heavy dust levels in the room

- Install appropriate exhaust air filters upstream, as a partial volume flow is routed through the transducer for volume flow rate measurement.

If the air is additionally contaminated, e.g. with fluff or stickycomponents

- Use of the BUSN attachment group instead of the BUDN universal controller described here

Control concept
- The volume flow controller works independent 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.
- Volume flow rate range in the controller set in the factory
- qvmin: minimum volume flow rate
- qvmax: maximum volume flow rate
- Operating parameters are specified via the order code and set in the factory

Interface
Analogue interface

- Analogue interface with adjustable signal voltage range
- Analogue signal for volume flow rate setpoint
- Analogue signal for actual volume flow rate

Digital communication interface (Bus)

- MP bus
- Modbus RTU, RS485
- BACnet MS/TP, RS485
- Data points, see bus lists

Hybrid mode

- Mixed mode of analogue and digital interface

Factory setting

- Setpoint value setting via analogue interface
- Actual value output via analogue interface and Modbus communication interface

Operating modes
Variable operation (V)

- Setpoint value setting via analogue signal, Modbus, BACnet or MP-Bus Work area corresponds to qvmin – qvmax

Constant value mode (F)

- A setpoint signal is not required, setpoint value corresponds to qvmin

Operating parameters
- Volume flow rate range in the controller set in the factory
- qvmin: minimum volume flow rate
- qvmax: maximum volume flow rate
- qvmin = 0 – 100 % of the nominal volume flow rate qvnom adjustable
- qvmax= 20 – 100 % of the nominal volume flow rate qvenn adjustable

Signal voltage ranges
- 0 – 10 V DC
- 2 – 10 V DC

Parts and characteristics

- Transducer for dynamic measurement principle
- Separate overload protection
- Plug-in terminal for supply line and controls including cover
- Socket for the actuator
- NFC and service interface
- Release button to allow for manual operation
- Indicator lights for displaying the operating mode
- Addressing key for setting user addresses in bus mode
- Controller casing prepared with 4 openings for threaded connections, 2 cable glands M16x1.5 for connecting cable in the supply package

Construction
BUDN with actuator LM24A-VST for:

- TVR, TZ-Silenzio, TA-Silenzio, TVZ, TVA,

BUDN with actuator NM24A-VST for:

- TVJ
- TVT up to dimensions of 1000 × 300 or 800 × 400

BUDN with actuator SM24A-VST for:

- TVT from dimensions of 800 × 500 to 1000 × 600

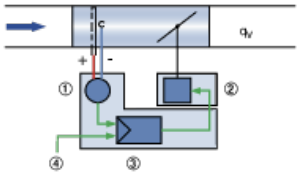
Commissioning
- Due to the volume flow rates set in the factory, always ensure that the control units are only installed in the specified locations
- Modbus/BACnet/MP bus interface: additional commissioning steps required
- Operating parameters can be adjusted using the TROX FlowCheck app

Useful additions
- TROX FlowCheck app for Android and iOS
- Adjustment device type ZTH-EU (order code AT-VAV-B)
- Belimo PC-Tool
- NFC Bluetooth converter ZIP-BT-NF
- X-AIRCONTROL zone modules for room control

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 by measuring a differential
pressure (effective pressure). This is done via a differential
pressure sensor. An integrated differential pressure transducerconverts the effective pressure into a voltage signal. The volume flow rate actual value is available as a voltage signal. The factorysetting is such that an actual output signal of 10 V DC always corresponds to the nominal volume flow rate (qvnom).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 qvmin and qvmax. It is possible to override the roomtemperature control by override controls, e.g. by a complete shutoff of the duct. The controller compares the volume flow rate setpoint value to the actual value and controls the external actuator accordingly tothe system deviation.

Principle of operation Universal controller: TVR, TVJ, TVT, TZ-/TA-Silenzio, TVZ, TVA, TVRK



① Differential pressure transducer

② Actuator

③ Volume flow controller

④ Setpoint value signal

This specification text describes the general properties of the

product.

Category

- Universal controller for volume flow rate

Application

- Control of a constant or variable volume flow rate setpoint
- Electronic controller for connecting a controlled variable and tapping an actual value signal
- The actual value signal 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

Area of application

- Differential pressure transducer with dynamic measuring principle for clean air in ventilation and air conditioning systems

Actuator

- Actuator slow-running; Running time 120s for 90°

Installation orientation

- Either direction

Connection

- Pluggable connection terminals; no additional terminal box required

Supply voltage

- 24 V AC/DC

Interface/Control

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

Bus interface
- MP bus
- Modbus RTU
- BACnet MS/TP

Interface information

Analogue
- Volume flow rate setpoint and actual value

Bus interface
- Volume flow rate setpoint and actual value
- Damper blade position
- Fault status

System connections
- MP-Bus for optional extensions
- Suitable for TROX X-AIRCONTROL zone module X-AIRZMO-MP
- Gateways for LonWorks, Modbus, BACnet, KNX e.g. Belimo UK24EIB
- Fan optimiser, e.g. Belimo COU24-A-MP

Modbus RTU for optional extensions
- Suitable for TROX X-AIRCONTROL zone module X-AIRZMO-MOD, e.g. in conjunction with X-SENS-SPLITTER

Special functions
- Activation qvmin, qvmax, Closed, Open, Control Stop by means of external switching contacts/wiring or bus communication

Parameter settings

Parameters specific to VAV terminal unit set at the factory
- Operating values qvmin, qvmax factory set
- Signal characteristic factory set

Subsequent adjustment
- Via TROX FlowCheck app (NFC or Bluetooth with optional adapter)
- Via PC software

Factory settings
- Electronic controller factory-mounted on the terminal unit
- Factory parameter settings
- Functional test under air; certified with sticker
- Controller in OPEN position

1 Type
TVR 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

4 Duct connection

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

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

7 Attachments (control component)
BUDN Universal controller with dynamic transducer

8 Operating mode
F Constant value (a 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
qvconst (only with operating mode F)
qvmin (only with operating mode V)
qvmax (only with operating mode V)

11 Volume flow unit
m³/h
l/s

Order example: TVR/100/D2/BUDN/V0/50-354 m³/h

TVR – D / 200 / D2 / BURN / PRS / V 0 / Pmin – Pmax Pa
1 2 5 6 7 8 9 10 11