



Easy controller, Compact controller



TROX UNIVERSAL controller, TROX LABCONTROL controller

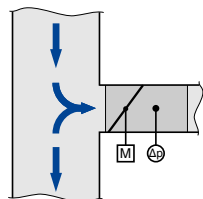
# Variable volume flow control VAV terminal units

## TA-Silenzio



Rectangular connections on both ends

### For extract air systems with demanding acoustic requirements and low airflow velocities



For all upstream conditions

Rectangular VAV terminal units for the extract air control in buildings with variable air volume systems, demanding acoustic requirements and low airflow velocities

- Highly effective integral attenuator
- Optimised for airflow velocities of 0.7 – 7 m/s
- High control accuracy, even in case of unfavourable upstream conditions
- Compact construction with rectangular connections on both ends
- Electronic control components for different applications (Easy, Compact, Universal, and LABCONTROL)
- Closed blade air leakage to EN 1751, up to class 4
- Casing leakage to EN 1751, class C



Tested to VDI 6022

Optional equipment and accessories

- Acoustic cladding for the reduction of case-radiated noise
- Secondary silencer Type TS for the reduction of air-regenerated noise

|                     |   |                       |    |
|---------------------|---|-----------------------|----|
| General information | 2 | Order code            | 11 |
| Function            | 3 | Variants              | 18 |
| Technical data      | 4 | Dimensions and weight | 21 |
| Quick sizing        | 4 | Product details       | 25 |
| Specification text  | 9 | Nomenclature          | 30 |

## General information

### Application

- Rectangular VAV terminal units for use in ventilation and air conditioning systems
- For controlling, restricting or shutting off airflows in extract air systems with low velocities and demanding acoustic requirements
- Integral attenuator
- Closed-loop volume flow control using an external power supply
- For variable or constant volume flow systems
- Shut-off by means of switching (by others)
- Can also be used for differential pressure control with suitable control components

### Special features

- Hygiene tested and certified
- Direct connection to ductwork
- Factory set-up or programming and aerodynamic function testing
- Parameters can also later be set on the control component; additional adjustment device may be necessary

### Nominal sizes

- 125, 160, 200, 250, 315

### Variants

- TA-Silenzio: Extract air unit
- TA-Silenzio-D: Extract air unit with acoustic cladding
- Units with acoustic cladding and/or secondary silencer Type TS for very demanding acoustic requirements
- Acoustic cladding cannot be retrofitted

### Parts and characteristics

- Ready-to-commission unit which consists of mechanical parts and control components
- Averaging effective pressure sensor for volume flow rate measurement
- Damper blade
- Integral attenuator
- Factory assembled control components complete with wiring and tubing
- Aerodynamic functional testing on a special test rig prior to shipping of each unit
- Set-up data is given on a label or volume flow rate scale affixed to the unit
- High control accuracy even in case of unfavourable upstream conditions

### Attachments

- Easy controller: compact unit with potentiometers
- Compact controller: compact unit consisting of controller with potentiometers, effective pressure transducer and actuator
- Universal controller: controller, effective pressure transducer and actuators for special applications
- LABCONTROL: Control components for air management systems

### Useful additions

- Secondary silencer Type TS

### Construction features

- Rectangular casing
- Replaceable seals
- Flanges on both ends for the connection to ductwork
- Position of the damper blade indicated externally at shaft extension
- Thermal and acoustic insulation (lining)

### Materials and surfaces

- Casing made of galvanised sheet steel
- Damper blade and effective pressure sensor made of aluminium
- Lining is mineral wool
- Plastic plain bearings

### Variant with acoustic cladding (-D)

- Acoustic cladding made of galvanised sheet steel
- Lining is mineral wool
- Rubber elements for the insulation of structure-borne noise

### Mineral wool

- To EN 13501, fire rating class A1, non-combustible
- RAL quality mark RAL-GZ 388
- Non-hazardous to health thanks to being highly biosoluble in accordance with the Ordinance on Hazardous Substances and Note Q of the European Directive (EC) No. 1272/2008
- Faced with glass fibre fabric as a protection against erosion from airflow velocities of up to 20 m/s
- Inert to fungal and bacterial growth

### Standards and guidelines

Fulfils the hygiene requirements of

- EN 16798, Part 3
- VDI 6022, Sheet 1
- DIN 1946, Part 4
- Other standards and guidelines in accordance with the hygiene certificate

### Casing leakage

- EN 1751, Class C

### Closed blade air leakage

- EN 1751, Class 4
- Meets the increased requirements of DIN 1946, Part 4, with regard to the acceptable closed blade air leakage

### Maintenance

- Maintenance-free as construction and materials are not subject to wear

## Function

The VAV terminal unit is fitted with an effective pressure sensor for measuring the volume flow rate.

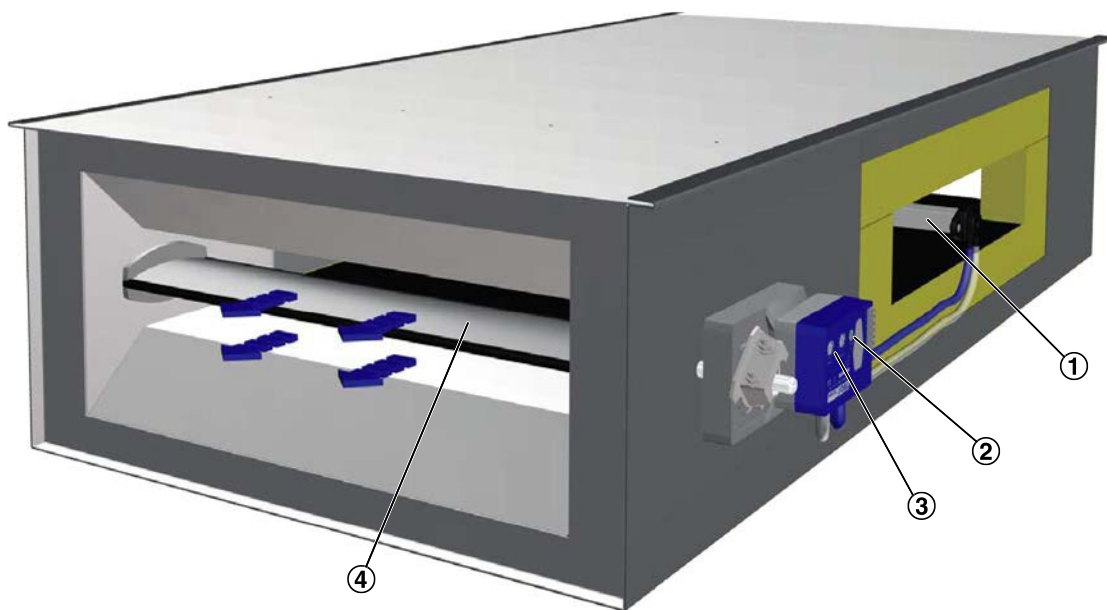
The control components (attachments) include an effective pressure transducer that transforms the effective pressure into an electric signal, a controller, and an actuator; the control functions can be achieved with an Easy controller, with a Compact controller, or with individual components (Universal).

For most applications, the setpoint value comes from a room temperature controller.

The controller compares the actual value with the setpoint value and alters the control signal of the actuator if there is a difference between the two values.

An integral attenuator reduces the noise that is created by the restriction of the airflow.

### Schematic illustration of the TA-Silenzio



- ① Effective pressure sensor
- ② Indicator light
- ③ Control components, e.g. an Easy controller
- ④ Damper blade with seal

### Technical data

|  |   |
|--|---|
| Nominal sizes  | 125 – 315   |
| Volume flow rate range   | 30 – 840 l/s or 108 – 3024 m <sup>3</sup> /h        |
| Volume flow rate control range (unit with dynamic differential pressure measurement) | Approx. 10 to 100 % of the nominal volume flow rate |
| Minimum differential pressure  | 5 – 65 Pa   |
| Maximum differential pressure  | 1000 Pa   |
| Operating temperature  | 10 – 50 °C  |

### Quick sizing

Quick sizing tables provide a good overview of the minimum differential pressures, the volume flow rate accuracy and the room sound pressure levels that can be expected. Intermediate values may be achieved by interpolation.

The sound power levels for calculating the sound pressure levels were measured in the TROX laboratory according to DIN EN ISO 5135 - see "Basic information and nomenclature".

Precise results and spectral data for all control components can be calculated with our Easy Product Finder design program. The first selection criteria for the nominal size are the actual volume flow rates  $q_{vmin}$  and  $q_{vmax}$ .

#### Volume flow rate ranges and minimum differential pressure values

The minimum differential pressure of VAV terminal units is an important factor in designing the ductwork and in rating the fan including speed control. It must be ensured that for all operating conditions and for all terminal units a sufficient pressure differential is applied to each controller ( $\Delta p_{stat,min}$ ). The measurement points for fan speed control must be selected accordingly. The volume flow rates given for VAV terminal units depend on the nominal size and on the control component (attachment) that is installed.

#### Volume flow rate ranges and minimum differential pressure values

Control component of dynamic measurement principle – Easy (potentiometer)

Attachment: Easy

| NS  | qv [l/s] | qv [m <sup>3</sup> /h] | $\Delta p_{stmin}$ [Pa] |     | $\Delta qv$ [±%] |
|-----|----------|------------------------|-------------------------|-----|------------------|
|     |          |                        | ①                       | ②   |                  |
| 125 | 27       | 95                     | 2                       | 3   | 8                |
| 125 | 79       | 283                    | 13                      | 23  | 6                |
| 125 | 131      | 472                    | 35                      | 63  | 5                |
| 125 | 183      | 660                    | 68                      | 123 | 4                |
| 160 | 42       | 150                    | 2                       | 3   | 8                |
| 160 | 124      | 447                    | 11                      | 21  | 6                |
| 160 | 207      | 745                    | 30                      | 58  | 5                |
| 160 | 289      | 1042                   | 58                      | 113 | 4                |
| 200 | 60       | 213                    | 2                       | 3   | 9                |
| 200 | 176      | 634                    | 12                      | 26  | 6                |
| 200 | 293      | 1056                   | 32                      | 71  | 5                |
| 200 | 410      | 1477                   | 62                      | 138 | 5                |
| 250 | 75       | 269                    | 2                       | 3   | 9                |
| 250 | 223      | 801                    | 13                      | 23  | 6                |
| 250 | 371      | 1334                   | 34                      | 62  | 5                |
| 250 | 518      | 1866                   | 66                      | 121 | 5                |
| 315 | 126      | 452                    | 2                       | 3   | 9                |
| 315 | 375      | 1349                   | 13                      | 20  | 6                |
| 315 | 624      | 2245                   | 36                      | 56  | 5                |
| 315 | 872      | 3142                   | 70                      | 108 | 5                |

① Basic unit

② Basic unit with secondary silencer TS

## Volume flow rate ranges and minimum differential pressure values

Control component measurement principle –  $q_v$  Extended

Attachments: BC0, BL0, BM0, BM0-J6

| NS  | $q_v$ [l/s] | $q_v$ [m³/h] | $\Delta p_{stmin}$ [Pa] |     | $\Delta q_v$ [±%] |
|-----|-------------|--------------|-------------------------|-----|-------------------|
|     |             |              | ①                       | ②   |                   |
| 125 | 27          | 95           | 2                       | 3   | 8                 |
| 125 | 94          | 339          | 18                      | 33  | 5                 |
| 125 | 162         | 584          | 53                      | 97  | 5                 |
| 125 | 230         | 828          | 106                     | 194 | 4                 |
| 160 | 42          | 150          | 2                       | 3   | 8                 |
| 160 | 149         | 535          | 16                      | 30  | 5                 |
| 160 | 256         | 920          | 45                      | 88  | 5                 |
| 160 | 362         | 1305         | 90                      | 177 | 4                 |
| 200 | 60          | 213          | 2                       | 3   | 9                 |
| 200 | 211         | 759          | 17                      | 37  | 6                 |
| 200 | 363         | 1305         | 49                      | 108 | 5                 |
| 200 | 514         | 1851         | 98                      | 216 | 5                 |
| 250 | 75          | 269          | 2                       | 3   | 9                 |
| 250 | 266         | 959          | 18                      | 32  | 6                 |
| 250 | 458         | 1649         | 52                      | 95  | 5                 |
| 250 | 649         | 2338         | 103                     | 190 | 5                 |
| 315 | 126         | 452          | 2                       | 3   | 9                 |
| 315 | 448         | 1614         | 19                      | 29  | 6                 |
| 315 | 771         | 2775         | 55                      | 85  | 5                 |
| 315 | 1093        | 3937         | 109                     | 170 | 5                 |

① Basic unit

② Basic unit with secondary silencer TS

## Volume flow rate ranges and minimum differential pressure values

Control component dynamic measurement principle -  $q_v$  As standard

Attachments: BUDN, BUDNF, LN0, LK0, XB0, XB4, (B13 \*, B1B \*)

| NS  | $q_v$ [l/s] | $q_v$ [m³/h] | $\Delta p_{stmin}$ [Pa] |     | $\Delta q_v$ [±%] |
|-----|-------------|--------------|-------------------------|-----|-------------------|
|     |             |              | ①                       | ②   |                   |
| 125 | 27          | 95           | 2                       | 3   | 8                 |
| 125 | 81          | 292          | 14                      | 25  | 6                 |
| 125 | 136         | 488          | 37                      | 68  | 5                 |
| 125 | 190         | 684          | 73                      | 133 | 4                 |
| 160 | 42          | 150          | 2                       | 3   | 8                 |
| 160 | 128         | 460          | 12                      | 22  | 6                 |
| 160 | 214         | 770          | 32                      | 62  | 5                 |
| 160 | 300         | 1080         | 62                      | 121 | 4                 |
| 200 | 60          | 213          | 2                       | 3   | 9                 |
| 200 | 181         | 652          | 13                      | 27  | 6                 |
| 200 | 303         | 1092         | 34                      | 76  | 5                 |
| 200 | 425         | 1531         | 67                      | 148 | 5                 |
| 250 | 75          | 269          | 2                       | 3   | 9                 |
| 250 | 229         | 824          | 13                      | 24  | 6                 |
| 250 | 383         | 1379         | 36                      | 66  | 5                 |
| 250 | 537         | 1934         | 71                      | 130 | 5                 |
| 315 | 126         | 452          | 2                       | 3   | 9                 |

| NS  | qv [l/s] | qv [m³/h] | Δpstmin [Pa] |     | Δqv [±%] |
|-----|----------|-----------|--------------|-----|----------|
|     |          |           | ①            | ②   |          |
| 315 | 385      | 1387      | 14           | 22  | 6        |
| 315 | 645      | 2322      | 38           | 59  | 5        |
| 315 | 904      | 3257      | 75           | 116 | 5        |

① Basic unit

② Basic unit with secondary silencer TS

\* Discontinued control component

## Volume flow rate ranges and minimum differential pressure values

Control component of static measurement principle

**Attachments: BUSN, BUSNF, BUSS, XD0, XD4, TUN, TUNF, TUS, TUSD, ELAB (BP3 \*, BPG \*, BPB \*, BB3 \*, BBB \*)**

| NS  | qv [l/s] | qv [m³/h] | Δpstmin [Pa] |     | Δqv [±%] |
|-----|----------|-----------|--------------|-----|----------|
|     |          |           | ①            | ②   |          |
| 125 | 27       | 95        | 2            | 3   | 8        |
| 125 | 81       | 292       | 14           | 25  | 6        |
| 125 | 136      | 488       | 37           | 68  | 5        |
| 125 | 190      | 685       | 73           | 133 | 4        |
| 160 | 42       | 150       | 2            | 3   | 8        |
| 160 | 128      | 460       | 12           | 22  | 6        |
| 160 | 214      | 770       | 32           | 62  | 5        |
| 160 | 300      | 1080      | 62           | 121 | 4        |
| 200 | 60       | 213       | 2            | 3   | 9        |
| 200 | 181      | 652       | 13           | 27  | 6        |
| 200 | 303      | 1092      | 34           | 76  | 5        |
| 200 | 425      | 1531      | 67           | 148 | 5        |
| 250 | 75       | 269       | 2            | 3   | 9        |
| 250 | 229      | 824       | 13           | 24  | 6        |
| 250 | 383      | 1379      | 36           | 66  | 5        |
| 250 | 537      | 1934      | 71           | 130 | 5        |
| 315 | 126      | 452       | 2            | 3   | 9        |
| 315 | 385      | 1387      | 14           | 22  | 6        |
| 315 | 645      | 2322      | 38           | 59  | 5        |
| 315 | 904      | 3257      | 75           | 116 | 5        |

① Basic unit

② Basic unit with secondary silencer TS

\* Discontinued control component

## Quick sizing table for sound pressure level

The quick sizing tables are based on generally accepted attenuation and insulation levels. If the sound pressure level exceeds the required level, a larger air terminal unit and/or a silencer or acoustic cladding is required. For more information on the acoustic data, see basic information and nomenclature.

## Quick sizing table for air-regenerated noise $L_{PA}$

Controller, including sound attenuator variants  
(total flow rate range of type)

| NS  | qv [l/s] | qv [m³/h] | 150 Pa |      | 500 Pa |      |
|-----|----------|-----------|--------|------|--------|------|
|     |          |           | ①      | ②    | ①      | ②    |
| 125 | 27       | 95        | < 15   | < 15 | 20     | < 15 |
| 125 | 94       | 339       | 27     | 17   | 34     | 23   |
| 125 | 162      | 584       | 33     | 24   | 39     | 29   |
| 125 | 230      | 828       | 35     | n.V. | 41     | 33   |

| NS  | qv [l/s] | qv [m³/h] | 150 Pa |      | 500 Pa |      |
|-----|----------|-----------|--------|------|--------|------|
|     |          |           | ①      | ②    | ①      | ②    |
| 160 | 42       | 150       | 15     | < 15 | 21     | < 15 |
| 160 | 149      | 535       | 29     | 19   | 35     | 24   |
| 160 | 256      | 920       | 32     | 24   | 38     | 28   |
| 160 | 362      | 1305      | 34     | n.V. | 41     | 30   |
| 200 | 60       | 213       | < 15   | < 15 | 20     | < 15 |
| 200 | 211      | 759       | 25     | < 15 | 31     | 19   |
| 200 | 363      | 1305      | 29     | 20   | 35     | 24   |
| 200 | 514      | 1851      | 31     | n.V. | 37     | 28   |
| 250 | 75       | 269       | < 15   | < 15 | 20     | < 15 |
| 250 | 266      | 959       | 25     | < 15 | 31     | 19   |
| 250 | 458      | 1649      | 28     | 18   | 34     | 23   |
| 250 | 649      | 2338      | 31     | n.V. | 37     | 26   |
| 315 | 126      | 452       | 16     | < 15 | 22     | < 15 |
| 315 | 448      | 1614      | 24     | < 15 | 30     | 18   |
| 315 | 771      | 2775      | 28     | 19   | 34     | 22   |
| 315 | 1093     | 3937      | 30     | n.V. | 36     | 26   |

Air-regenerated noise  $L_{PA}$  [dB(A)] with static differential pressure  $\Delta_{pst}$  of 150 or 500 Pa

① Basic unit

② Basic unit with secondary silencer TS

n.V./abbreviation: Specified static differential pressure  $\Delta_{pst}$  is less than the minimum differential pressure  $\Delta_{pst.min}$

### Quick sizing table case-radiated noise $L_{PA}$

Controller including acoustic cladding variants

(total flow rate range of type)

| NS  | qv [l/s] | qv [m³/h] | 150 Pa |      | 500 Pa |      |
|-----|----------|-----------|--------|------|--------|------|
|     |          |           | ①      | ②    | ①      | ②    |
| 125 | 27       | 95        | < 15   | < 15 | 16     | < 15 |
| 125 | 94       | 339       | 23     | 22   | 31     | 28   |
| 125 | 162      | 584       | 29     | 30   | 37     | 36   |
| 125 | 230      | 828       | 33     | 34   | 41     | 40   |
| 160 | 42       | 150       | < 15   | < 15 | 20     | 15   |
| 160 | 149      | 535       | 27     | 26   | 34     | 32   |
| 160 | 256      | 920       | 33     | 33   | 40     | 39   |
| 160 | 362      | 1305      | 37     | 38   | 44     | 44   |
| 200 | 60       | 213       | < 15   | < 15 | 20     | < 15 |
| 200 | 211      | 759       | 27     | 25   | 34     | 31   |
| 200 | 363      | 1305      | 33     | 32   | 40     | 38   |
| 200 | 514      | 1851      | 37     | 37   | 44     | 43   |
| 250 | 75       | 269       | < 15   | < 15 | 21     | < 15 |
| 250 | 266      | 959       | 28     | 25   | 35     | 31   |
| 250 | 458      | 1649      | 34     | 33   | 41     | 39   |
| 250 | 649      | 2338      | 38     | 37   | 45     | 43   |
| 315 | 126      | 452       | 17     | < 15 | 25     | 18   |
| 315 | 448      | 1614      | 32     | 30   | 39     | 35   |
| 315 | 771      | 2775      | 38     | 37   | 45     | 43   |
| 315 | 1093     | 3937      | 42     | 42   | 49     | 47   |

Case-radiated noise  $L_{PA}$  [dB(A)] with static differential pressure  $\Delta_{pst}$  of 150 or 500 Pa

① Basic unit

② Basic unit with acoustic cladding



Note:  
Information on case-radiated noise for combinations of basic unit and optional acoustic cladding and secondary silencer can be found in the Easy Product Finder design program.



## Specification text

This specification text describes the general properties of the product. Texts for variants can be generated with our Easy Product Finder design program.

### Specification text

Rectangular VAV terminal units for variable and constant air volume systems, for demanding acoustic requirements, suitable for extract air, available in 5 nominal sizes. High control accuracy even in case of unfavourable upstream conditions. Ready-to-commission unit which consists of the mechanical parts and the electronic control components. Each unit contains an averaging effective pressure sensor for volume flow rate measurement, a damper blade, and an integral sound attenuator. Factory-assembled control components complete with wiring and tubing. Effective pressure sensor with 3 mm measuring holes, hence resistant to contamination. Both ends suitable for the connection of ducts. Casing with acoustic and thermal insulation. Position of the damper blade indicated externally at shaft extension. The damper blade is factory set to open position, which allows a ventilation airflow even without control; this does not apply to variants with defined safe position NC (normally closed). Meets the hygiene requirements of VDI 6022, DIN 1946, Part 4, as well as EN 13779 and VDI 3803.

### Special features

- Hygiene tested and certified
- Direct connection to ductwork
- Factory set-up or programming and aerodynamic function testing
- Parameters can also later be set on the control component; additional adjustment device may be necessary

### Materials and surfaces

- Casing made of galvanised sheet steel
- Damper blade and effective pressure sensor made of aluminium
- Lining is mineral wool
- Plastic plain bearings

### Mineral wool:

- RAL quality mark RAL-GZ 388
- To EN 13501, fire rating class A1, non-combustible
- RAL quality mark RAL-GZ 388
- Non-hazardous to health thanks to being highly biosoluble in accordance with the Ordinance on Hazardous Substances and Note Q of the European Directive (EC) No. 1272/2008
- Faced with glass fibre fabric as protection against erosion from airflow velocities of up to 20 m/s
- Inert to fungal and bacterial growth

### Connection

- With flanges on both ends
- Both ends suitable for the connection of ducts.

### Technical data

- Nominal sizes: 125 – 315
- Volume flow rate range: 27 – 872 l/s or 95 – 3142 m<sup>3</sup>/h
- Minimum differential pressure: up to 109 Pa (without secondary silencer)
- Maximum differential pressure: 1000 Pa
- Closed blade air leakage to EN 1751, class 4. Casing air leakage to EN 1751, class C.

### Equivalence criteria

- Declaration of hygiene conformity in accordance with VDI 6022, Sheet 1 (01/2018), ÖNORM H 6020 (02/2007) and ÖNORM H 6021 (09/2003)
- Setting the volume flow rates without adjustment device via  $q_{vmin}$  and  $q_{vmax}$  potentiometer
- Electrical connections with screw terminals, no additional terminal boxes required
- Aerodynamic functional testing of each volume flow controller on test rigs at the factory, before a label is affixed to the controller
- No inflow lengths required
- Acoustic data measured to ÖNORM EN ISO 5135:1999
- Maximum system deviation 5 % at  $q_{vmax}$ , without inflow length

### Specification text for attachment

Variable volume flow control with electronic Easy controller for applying a reference value and capturing an actual value to be integrated with the central BMS.

- Supply voltage 24 V AC/DC
- Signal voltages 0 – 10 V DC
- Possible override controls with external switches using volt-free contacts: CLOSE, OPEN,  $q_{vmin}$  and  $q_{vmax}$
- Potentiometers with percentage scales to set the volume flow rates  $q_{vmin}$  and  $q_{vmax}$
- The actual value signal relates to the nominal volume flow rate such that commissioning and subsequent adjustment are simplified
- Volume flow rate control range: approx. 10 – 100 % of the nominal volume flow rate
- Clearly visible external indicator light for signalling the functions: Set, not set, and power failure
- Electrical connections with screw terminals
- Double terminals for looping the supply voltage, i.e. for the simple connection of voltage transmission to the next controller

### Sizing data

- $q_v$  \_\_\_\_\_ [m<sup>3</sup>/h]
- $\Delta_{pst}$  \_\_\_\_\_ [Pa]



Air-regenerated noise

▪  $L_{PA}$  \_\_\_\_\_ [dB(A)]

Case-radiated noise

▪  $L_{PA}$  \_\_\_\_\_ [dB(A)]

## Order code

Order code for volume flow control (with Easy attachment)

TA-Silenzio – D / 200 / Easy  
 |        |        |        |  
 1        2        3        4

**1 Type**

TA-Silenzio VAV terminal unit, extract air

**2 Acoustic cladding**

No entry required: None  
 D With acoustic cladding

**3 Nominal size [mm]**

125, 160, 200, 250, 315

**4 Attachments (control component)**

Easy Volume flow controller, dynamic, interface analogue, setting  $q_{vmin}$  and  $q_{vmax}$  with potentiometers

**Order example: TA-Silenzio/125/Easy**

|                                 |   |
|---------------------------------|---|
| Acoustic cladding               | None  |
| Nominal size                    | 125   |
| Attachments (control component) | Easy volume flow controller, dynamic, setting $q_{vmin}$ and $q_{vmax}$ with potentiometers |

Order code for volume flow control (with VARYCONTROL attachment)

TA-Silenzio – D / 200 / XD4 / V 0 / 400 – 1200 [m³/h] / NO  
 |        |        |        |        |        |        |        |  
 1        2        3        4        6 7        8        9

**1 Type**

TA-Silenzio VAV terminal unit, extract air

**2 Acoustic cladding**

No entry required: None  
 D With acoustic cladding

**3 Nominal size [mm]**

125, 160, 200, 250, 315

**4 Attachments (control component)**

For example  
 BC0 Compact controller  
 XD4 Universal controller (VARYCONTROL)

**6 Operating mode**

F Constant value (one setpoint value)

V Variable (setpoint value range)

**7 Signal voltage range**

For the actual and setpoint value signals  
 0 0 – 10 V DC  
 2 2 – 10 V DC

**8 Operating values for factory setting**

Volume flow rates [m³/h or l/s]  
 $q_{vconst.}$  (with operating mode F)  
 $q_{vmin} - q_{vmax}$  (with operating mode V)

**9 Damper blade position**

Only with spring return actuators  
 NO Power off to OPEN  
 NC Power off to CLOSE

**Order example: TA-Silenzio/250/BC0/V0/500–1500 m³/h**

|                                 |   |
|---------------------------------|---|
| Acoustic cladding               | None  |
| Nominal size                    | 250   |
| Attachments (control component) | Compact controller  |
| Operating mode                  | Variable  |
| Signal voltage range            | 0 – 10 V DC   |
| Operating values                | $q_{vmin} = 500 \text{ m}^3/\text{h}$<br>$q_{vmax} = 1500 \text{ m}^3/\text{h}$ |

Order code for volume flow control (with TROX UNIVERSAL attachment)

TA-Silenzio – D / 200 / TUNF / RE / M / 0 / UMZ / ... / NC  
 |        |        |        |        |        |        |        |        |  
 1        2        3        4        5        6        7        8        9        10

**1 Type**

TA-Silenzio VAV terminal unit, extract air

**2 Acoustic cladding**

No entry: None  
 D With acoustic cladding

**3 Nominal size [mm]**  
 125, 160, 200, 250, 315

**4 Attachments (control component)**

TROX UNIVERSAL controller with  
 TUN Actuator (150 s)  
 TUNF Spring return actuator (150 s)  
 TUS Fast-running actuator (3 s)  
 TUSD Fast-running actuator (3 s) with digital communication interface (TROX HPD)

**5 Equipment function**

Room control  
 RE Extract air control (Room Exhaust)

**6 Volume flow rate setting**

M Master (RMF)  
 S Slave  
 F Constant flow rate controller

**7 Signal voltage range**

0 0 – 10 V DC  
 2 2 – 10 V DC

**8 Expansion modules**

Option 1: Power supply  
 No entry: 24 V AC/DC  
 T EM-TRF for 230 V AC  
 U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)

**Order example: TA-Silenzio-D/315/TUN/RE/S/0/Z**

|                                 |  |
|---------------------------------|--|
| Acoustic cladding               | With   |
| Nominal size                    | 315  |
| Attachments (control component) | Controller TROX UNIVERSAL, static transducer, slow-running actuator  |
| Equipment function              | Extract air control  |
| Volume flow rate setting        | Slave  |
| Signal voltage range            | 0 – 10 V DC  |
| Expansion of attachments        | With expansion module EM-AUTOZERO, Solenoid valve for automatic zero point correction of measurement point |
| Operating values                | None (slave)   |

Option 2: Digital communication interface  
 No entry: None  
 B EM-BAC-MOD-01 for BACnet MS/TP  
 M EM-BAC-MOD-01 for Modbus RTU  
 I EM-IP: EM-IP for BACnet/IP, Modbus/IP and web server  
 R EM-IP with real time clock

Option 3: Automatic zero point correction  
 No entry: None  
 Z EM-AUTOZERO with solenoid valve

**9 Operating values for factory setting**

Volume flow rates [m³/h or l/s], pressure [Pa]  
 Master (RMF):  
 $q_{vmin}$ : Minimum volume flow rate (room value)  
 $q_{vmax}$ : Maximum volume flow rate (room value)  
 $q_{vconst\_sup}$ : Constant supply air (room value)  
 $q_{vconst\_ext}$ : Constant extract air (room value)  
 $q_{vDiff}$ : Supply air/extract air difference (room value)

Constant value  
 $q_{vconst}$ : Constant volume flow rate

Slave  
 No entry required

**10 Damper blade position**

Only spring return actuators  
 NO Power off to OPEN  
 NC Power off to CLOSE

**Useful additions**

Room control panel  
 BE-LCD 40-character display

Order code for differential pressure control (with VARYCONTROL attachment)

TA-Silenzio – D / 200 / XF4 / PRE / V 0 / 30 – 60 [Pa] / NO  
 |            |            |            |            |            |            |            |            |  
 1            2            3            4            5            6 7            8            9

## 1 Type

TA-Silenzio VAV terminal unit, extract air

## 2 Acoustic cladding

No entry required: None  
 D With acoustic cladding

## 3 Nominal size [mm]

125, 160, 200, 250, 315

## 4 Attachments (control component)

For example  
 XF0 Compact controller for duct pressure  
 XF4 Universal controller for duct pressure (VARYCONTROL)

## 5 Equipment function/Installation location

PDE Duct pressure control, extract air  
 PRE Room pressure control extract air

## 6 Operating mode

F Constant value (one setpoint value)  
 V Variable setpoint value range

## 7 Signal voltage range

For the actual and setpoint value signals  
 0 0 – 10 V DC  
 2 2 – 10 V DC

## 8 Operating values for factory setting

With duct pressure control, the differential pressure [Pa] is always an absolute value

$\Delta p_{\text{const}}$  (with operating mode F)

$\Delta p_{\text{min}} - \Delta p_{\text{max}}$  (with operating mode V)

## 9 Damper blade position

Only with spring return actuators  
 NO Power off to OPEN  
 NC Power off to CLOSE

Order example: TA-Silenzio/250/PDE/XF4/F2/500 Pa/NO

|                                 |   |
|---------------------------------|---|
| Acoustic cladding               | None  |
| Nominal size                    | 250   |
| Attachments (control component) | VARYCONTROL Universal controller duct pressure, interface analogue with safe position and display |
| Equipment function              | Duct pressure control, extract air  |
| Operating mode                  | Constant value  |
| Signal voltage range            | 2 – 10 V  |
| Operating value                 | $\Delta p_{\text{const}} = 500 \text{ Pa}$  |
| Damper blade position           | Power off to OPEN (NO)  |

Order code for differential pressure control (with TROX UNIVERSAL attachment)

TA-Silenzio – D / 200 / TUNF / PRE / MFP / 0 / UMZ / ... / NC  
 |            |            |            |            |            |            |            |            |  
 1            2            3            4            5            6            7            8            9            10

## 1 Type

TA-Silenzio VAV terminal unit, extract air

I EM-IP for BACnet/IP, Modbus/IP and web server  
R EM-IP with real time clock

## 2 Acoustic cladding

No entry: None  
D With acoustic cladding

Option 3: Volume flow rate measurement  
No entry: None  
V EM-V Volume flow rate measurement for differential pressure control

## 3 Nominal size [mm]

125, 160, 200, 250, 315

Option 4: Automatic zero point correction  
No entry: None  
Z EM-AUTOZERO solenoid valve (only with V)

## 4 Attachments (control component)

TROX UNIVERSAL controller with  
TUN Actuator (150 s)  
TUNF Spring return actuator (150 s)  
TUS Fast-running actuator (3 s)  
TUSD Fast-running actuator (3 s) with digital communication interface (TROX HPD)

## 9 Operating values for factory setting

Volume flow rate [m<sup>3</sup>/h or l/s], pressure [Pa]

## 5 Equipment function

Differential pressure control  
PRE Room pressure control, extract air  
PDE Duct pressure control, extract air

Slave SVP  
 $\Delta p_{\min}$ : Minimum differential pressure  
 $\Delta p_{\max}$ : Maximum differential pressure

## 6 Differential pressure setting

MFP Master, constant pressure control  
MVP Master, variable pressure control  
SFP Slave, constant pressure control  
SVP Slave, variable pressure control

SFP  
 $\Delta p_{\text{const}}$ : Constant differential pressure

## 7 Signal voltage range

0 0 – 10 V DC  
2 2 – 10 V DC

Master MFP and MVP – same as slave, but additionally:

$q_{v\min}$ : Minimum volume flow rate (room value)  
 $q_{v\max}$ : Maximum volume flow rate (room value)  
 $q_{v\text{const\_sup}}$ : Constant supply air (room value)  
 $q_{v\text{const\_ext}}$ : Constant extract air (room value)  
 $q_{v\text{diff}}$ : Supply air/extract air difference (room value)

## 8 Expansion modules

Option 1: Power supply  
No entry: 24 V AC/DC  
T EM-TRF for 230 V AC  
U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)

## 10 Damper blade position

Only spring return actuators  
NO Power off to OPEN  
NC Power off to CLOSE

Option 2: Digital communication interface

No entry: None  
B EM-BAC-MOD-01 for BACnet MS/TP  
M EM-BAC-MOD-01 for Modbus RTU

## Useful additions

Room control panel  
BE-LCD 40-character display

Order differential pressure transducer for room or duct pressure control separately e.g.

PT-699 For room pressure control  
PT-699-DUCT For duct pressure control, including tube and pressure tap

Order example: TA-Silenzio-D/315/TUS/PRE/MVP/2/V/10 Pa/30 Pa/750 m<sup>3</sup>/h/2500 m<sup>3</sup>/h/0/0/100 m<sup>3</sup>/h

|                                 |   |
|---------------------------------|---|
| Acoustic cladding               | With  |
| Nominal size                    | 315   |
| Attachments (control component) | Controller TROX UNIVERSAL, static transducer, fast-running actuator                           |
| Equipment function              | Room pressure control extract air   |
| Differential pressure setting   | Master, variable pressure control   |
| Signal voltage range            | 2 – 10 V DC   |
| Expansion of attachments        | Volume flow rate measurement  |
| Operating values                | Pressure range: $\Delta p_{\min}$ - $\Delta p_{\max}$ : 10 – 30 Pa                            |
|                                 | Volume flow rate range $q_{v\min}$ - $q_{v\max}$ : 750 – 2500 m <sup>3</sup> /h (room values) |



Constant supply/extract air  $q_{vconst\_CLOSED}, q_{vconst\_Ex}: 0 \text{ m}^3/\text{h}$  (room values)  
Supply air/extract air difference:  $q_{vDiff}: 100 \text{ m}^3/\text{h}$  (room value)

Order code for room control (with EASYLAB attachment)

TA-Silenzio – D / 200 / ELAB / S / RE / UMZ / LAB / ...  
                   |          |          |          |          |          |          |          |          |  
                   1          2          3          4          5          6          8          9          10

**1 Type**

TA-Silenzio VAV terminal unit, extract air

R EM-IP with real time clock

**2 Acoustic cladding**

No entry: None

D With acoustic cladding

Option 3: Automatic zero point correction

No entry: None

Z EM-AUTOZERO Solenoid valve for automatic zero point correction

**3 Nominal size [mm]**

- 125
- 160
- 200
- 250
- 315

**9 Additional functions**

Without room management function

LAB Extract air led system (laboratories)

CLR Supply air led system (clean rooms)

**4 Attachments (control component)**

ELAB EASYLAB controller TCU3

With room management function

LAB-RMF Extract air led system

CLR-RMF Supply air led system

**5 Actuators**

S Fast-running actuator (3 s)

SD Fast-running actuator (3 s), with digital communication interface (TROX HPD)

**10 Operating values for factory setting**

(only required when room management function is active)

Volume flow rate [m³/h] or [l/s]

**6 Equipment function**

Room control

RE Extract air control (Room Exhaust)

PC Differential pressure control (Pressure Control)

Total extract air/supply air of room:

q<sub>v1</sub>: Standard mode

q<sub>v2</sub>: Reduced operation

q<sub>v3</sub>: Increased operation

q<sub>v4</sub>: Constant supply air

q<sub>v5</sub>: Constant extract air

q<sub>v6</sub>: Supply air/extract air difference

Δp<sub>set</sub>: Setpoint pressure (only with differential pressure control)

**8 Expansion modules**

Option 1: Power supply

No entry: 24 V AC/DC

T EM-TRF for 230 V AC

U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)

**Useful additions**

Room control panel (only for units with RMF)

BE-LCD 40-character display

Option 2: Digital communication interface

No entry: None

B EM-BAC-MOD-01 for BACnet MS/TP

M EM-BAC-MOD-01 for Modbus RTU

I EM-IP: EM-IP for BACnet/IP, Modbus/IP and web server

The differential pressure transducer required for room pressure control (equipment function) has to be ordered separately, e.g.

PT-699 Measuring range ±50 Pa or ±100 Pa

PT-GB604 Measuring range ±100 Pa

**Order example: TA-Silenzio/160/ELAB/SD/RE/IZ/LAB**

|                                 |   |
|---------------------------------|---|
| Acoustic cladding               | None  |
| Nominal size                    | 160   |
| Attachments (control component) | EASYLAB controller TCU3   |
| Actuator                        | Fast-running actuator (3 s), with digital communication interface (TROX HPD)  |
| Equipment function              | Extract air control   |
| Expansion of attachments        | With expansion module Type EM-IP<br>BACnet/Modbus-IP interface, web server<br>with expansion module EM-AUTOZERO,<br>Solenoid valve for automatic zero point correction of measurement point |
| Additional function             | Extract air led system for laboratories<br>Room management function has been deactivated  |
| Operating values                | Not required  |



Order code for single operation (with EASYLAB attachment)

TA-Silenzio – D / 200 / ELAB / S / EC – E0 / UMZ / ...  
 |            |    |    |    |    |    |    |    |  
 1            2    3    4    5    6    7    8    10

### 1 Type

TA-Silenzio VAV terminal unit, extract air

### 2 Acoustic cladding

No entry: None  
 D With acoustic cladding

### 3 Nominal size [mm]

125  
 160  
 200  
 250  
 315

### 4 Attachments (control component)

ELAB EASYLAB controller TCU3

### 5 Actuators

S Fast-running actuator (3 s)  
 SD Fast-running actuator (3 s), with digital communication interface (TROX HPD)

### 6 Equipment function

Single operation  
 EC Extract air controller

### 7 External volume flow rate setting

E0 Voltage signal 0 – 10 V DC  
 E2 Voltage signal 2 – 10 V DC  
 2P Switch contacts (provided by others) for 2 switching steps

### Order example: TA-Silenzio/200/ELAB/S/EC/E0/300-1000

|                                   |   |
|-----------------------------------|---|
| Acoustic cladding                 | None  |
| Nominal size                      | 200   |
| Attachments (control component)   | EASYLAB controller TCU3   |
| Actuator                          | Fast-running actuator (3 s)   |
| Equipment function                | Extract air controller  |
| External volume flow rate setting | Voltage signal 0 – 10 V DC  |
| Operating values                  | $q_{vmin} = 300 \text{ m}^3/\text{h}$<br>$q_{vmax} = 1000 \text{ m}^3/\text{h}$ |

3P Switch contacts (provided by others) for 3 switching steps  
 F Volume flow rate constant value, without signalling

### 8 Expansion modules

Option 1: Power supply  
 No entry: 24 V AC/DC  
 T EM-TRF for 230 V AC  
 U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)

### Option 2: Digital communication interface

No entry: None  
 B EM-BAC-MOD-01 for BACnet MS/TP  
 M EM-BAC-MOD-01 for Modbus RTU  
 I EM-IP: EM-IP for BACnet/IP, Modbus/IP and web server  
 R EM-IP with real time clock

### Option 3: Automatic zero point correction

No entry: None  
 Z EM-AUTOZERO Solenoid valve for automatic zero point correction

### 10 Operating values for factory setting

Volume flow rate [ $\text{m}^3/\text{h}$ ] or [ $\text{l}/\text{s}$ ]  
 Depending on external volume flow rate setting  
 E0, E2:  $q_{vmin}/q_{vmax}$   
 2P:  $q_{v1}/q_{v2}$   
 3P:  $q_{v1}/q_{v2}/q_{v3}$   
 F:  $q_{v1}$

## Variants

### VAV terminal unit TA-Silenzio



- VAV terminal unit for variable extract air volume flow control
- 

### VAV terminal unit, variant TA-Silenzio



- VAV terminal unit with acoustic cladding for the control of variable extract air volume flows
  - For rooms where the case-radiated noise of the unit is not sufficiently reduced by a false ceiling
  - The ducts for the room under consideration must have adequate acoustic insulation (to be provided by others) on the fan end
  - Acoustic cladding cannot be retrofitted
- 

## Material

Standard construction



| Order code detail | Part                      | Material               |
|-------------------|---------------------------|------------------------|
| -                 | Casing                    | Galvanised sheet steel |
|                   | Effective pressure sensor | Aluminium              |
|                   | Damper blade              | Polyethylene, PE       |
|                   | Damper blade seal         | Galvanised steel       |
|                   | Shaft and linkage         | Plastic                |
|                   | Plain bearings            | Plastic, ABS           |
|                   | Gears                     | Plastic, ABS           |

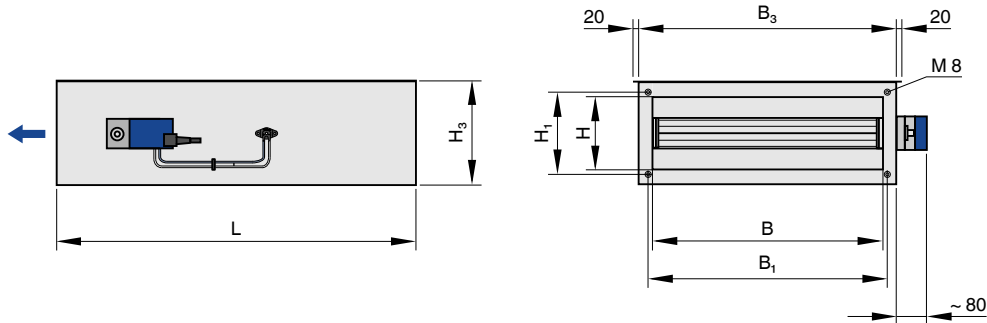


With acoustic cladding (optional)

| Order code detail | Part                                | Material  |
|-------------------|-------------------------------------|---|
| D                 | Acoustic cladding casing            | Galvanised sheet steel  |
|                   | Insulation of structure-borne noise | Polyethylene, PE  |
|                   | Lining                              | Mineral wool according to EN 13501, fire rating Class A1, non-combustible |

### Dimensions and weight

#### VAV terminal unit without acoustic cladding (TA-Silenzio)



Notes:

Total length L is the total casing length.

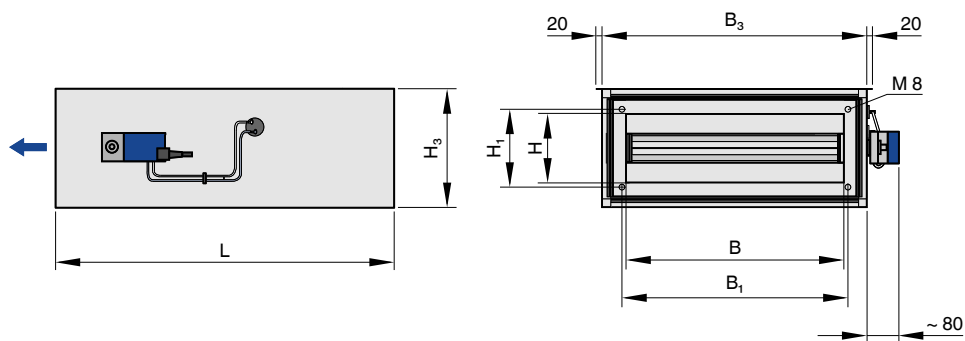
The length of the installed unit is approx. 24 mm less. See flange detail.

The illustration shows control component type Easy, Compact. For individual dimensions see section 'Space required for commissioning and maintenance'.

#### Dimensions/Weight for TA-Silenzio

| NS  | B   | H   | L    | B <sub>1</sub> | B <sub>3</sub> | H <sub>1</sub> | H <sub>3</sub> | kg |
|-----|-----|-----|------|----------------|----------------|----------------|----------------|----|
| 125 | 198 | 152 | 1035 | 232            | 300            | 186            | 236            | 17 |
| 160 | 308 | 152 | 1035 | 342            | 410            | 186            | 236            | 21 |
| 200 | 458 | 210 | 1250 | 492            | 560            | 244            | 281            | 32 |
| 250 | 598 | 201 | 1250 | 632            | 700            | 235            | 311            | 41 |
| 315 | 798 | 252 | 1250 | 832            | 900            | 286            | 361            | 54 |

#### VAV terminal unit with acoustic cladding (TA-Silenzio-D)



Notes:

Total length L is the total casing length.

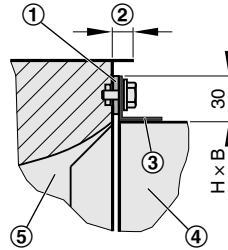
The length of the installed unit is approx. 24 mm less. See flange detail.

The illustration shows control component type Easy, Compact. For individual dimensions see section 'Space required for commissioning and maintenance'.

Dimensions/Weight for TA-Silenzio-D

| NG  | B   | H   | L    | B <sub>1</sub> | B <sub>3</sub> | H <sub>1</sub> | H <sub>3</sub> | kg |
|-----|-----|-----|------|----------------|----------------|----------------|----------------|----|
| 125 | 198 | 152 | 1035 | 232            | 380            | 186            | 316            | 32 |
| 160 | 308 | 152 | 1035 | 342            | 490            | 186            | 316            | 38 |
| 200 | 458 | 210 | 1250 | 492            | 640            | 244            | 361            | 64 |
| 250 | 598 | 201 | 1250 | 632            | 780            | 235            | 391            | 72 |
| 315 | 798 | 252 | 1250 | 832            | 980            | 286            | 441            | 91 |

Detail of flange

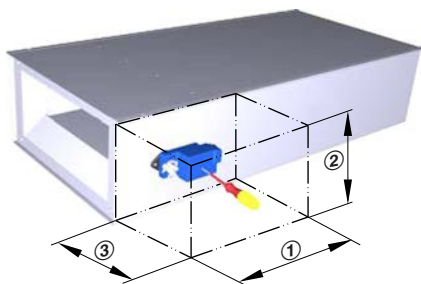


- 1 Compressible seal, to be provided by others
- 2 Flange indented approx. 12 mm on both sides
- 3 Flange
- 4 Duct
- 5 VAV terminal unit

Space required for commissioning and maintenance

Sufficient space must be kept clear near any attachments to allow for commissioning and maintenance. It may be necessary to provide sufficiently sized inspection access openings.

Access to attachments



Schematic illustration of required installation space

Product examples



BC0, XB4, BUDNF, TUN

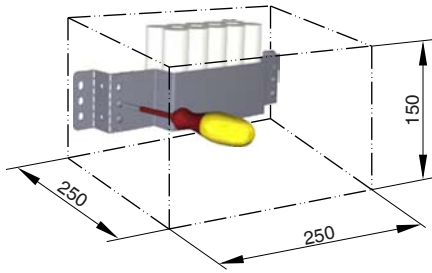


## Space required

| Attachment   | ①   | ②   | ③   |
|--|-----|-----|-----|
| Easy controller  |     |     |     |
| Easy   | 700 | 300 | 300 |
| Compact controller   |     |     |     |
| BC0, BL0, BM0, BM0-J6, LN0, LK0, XB0, XD0, XF0   | 700 | 300 | 300 |
| Universal controller   |     |     |     |
| BUDN, BUDNF, BUSN, BUSNF, BUSS, BUPN, BUPFN, BURN, BURNF, XB4, XD4, XF4, (B13 *, B1B *, BP3 *, BPB *, BPG *, BB3 *, BBB *, BR3 *, BRB *, BRG *, BS3 *, BSB *, BSG *, BG3, BGB, BH3 *, BHB *) | 700 | 300 | 300 |
| TROX UNIVERSAL   |     |     |     |
| TUN, TUNF, TUS, TUSD   | 700 | 350 | 400 |
| EASYLAB  |     |     |     |
| ELAB   | 700 | 350 | 400 |

\* Discontinued control component

## Accessibility to the battery pack



## Schematic illustration of required installation space

Note: Separate installation space for fixing and accessing the battery pack (optional accessories for TROX UNIVERSAL or LABCONTROL EASYLAB control components).

## Product example



## TZ-Silenzio/.../TUN/.../U with attachment



## Product details

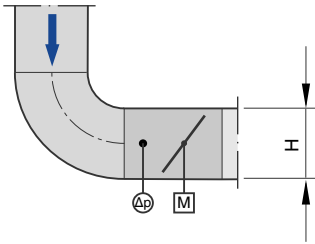
### Installation and commissioning

- Any installation orientation (except units with static effective pressure transducer)
- Return edges of the casing with drilled holes suitable for M10 threaded rods
- TA-Silenzio-D: For constructions with acoustic cladding, ducts on the room end should have cladding up to the acoustic cladding of the controller

### Upstream conditions

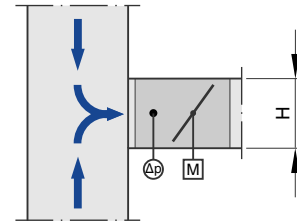
The volume flow rate accuracy  $\Delta_{qv}$  applies to all upstream conditions.

### Illustration example vertical



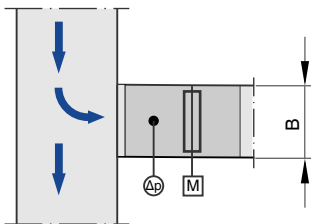
A bend – without a straight duct section upstream of the VAV terminal unit – has only a negligible effect on the volume flow rate accuracy  $\Delta_{qv}$ .

### Convergence of 2 airflows, vertical



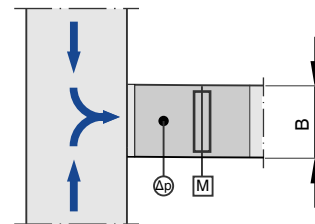
The stated volume flow rate accuracy  $\Delta_{qv}$  will be achieved, even when the VAV terminal unit is installed at a junction and at the point of convergence of two airflows.

### Illustration example horizontal



The stated volume flow rate accuracy  $\Delta_{qv}$  will be achieved even when the VAV terminal unit is installed (vertically or horizontally) in a branch just off the main duct.

### Convergence of 2 airflows, horizontal



The stated volume flow rate accuracy  $\Delta_{qv}$  will be achieved, even when the VAV terminal unit is installed at a junction and at the point of convergence of two airflows.

**VARYCONTROL control components**

| Attachment                           | Controlled variable | Interface  | Effective pressure transducer                  | Actuator                           | Manufacturer |
|--------------------------------------|---------------------|--|--|------------------------------------|--------------|
| <b>Easy controller, dynamic</b>      |                     |  |  |                                    |              |
| Easy                                 | qv                  | 0 – 10 V   | integral                                       | slow-running<br>integral           | ①            |
| <b>Compact controller, dynamic</b>   |                     |  |  |                                    |              |
| BC0                                  | -                   | 0 – 10 V or 2 – 10 V or MP bus interface                       | integral                                       | slow-running<br>integral           | ②            |
| BL0 **                               | qv                  | LonWorks FTT 10 interface                                      | integral                                       | slow-running<br>integral           | ②            |
| BM0                                  | qv                  | Modbus RTU/BACnet MS/TP  | integral                                       | slow-running<br>integral           | ②            |
| BM0-J6                               | qv                  | Modbus RTU/BACnet MS/TP with RJ12 socket (for X-AIRCONTROL)    | integral                                       | slow-running<br>integral           | ②            |
| LN0                                  | qv                  | 0 – 10 V or 2 – 10 V   | integral                                       | slow-running<br>integral           | ⑤            |
| LK0                                  | qv                  | KNX interface  | integral                                       | slow-running<br>integral           | ⑤            |
| XB0                                  | qv                  | 0 – 10 V or 2 – 10 V   | integral                                       | slow-running<br>integral           | ③            |
| <b>Compact controller, static</b>    |                     |  |  |                                    |              |
| XD0                                  | qv                  | 0 – 10 V or 2 – 10 V   | integral                                       | slow-running<br>integral           | ③            |
| XF0                                  | $\Delta p$          | 0 – 10 V or 2 – 10 V   | integral, control range adjustable 25 - 550 Pa | slow-running<br>integral           | ③            |
| <b>Universal controller, dynamic</b> |                     |  |  |                                    |              |
| B13 *                                | qv                  | 0 – 10 V or 2 – 10 V   | integral                                       | slow-running<br>separate           | ②            |
| B1B *                                | qv                  | 0 – 10 V or 2 – 10 V   | integral                                       | spring return actuator<br>separate | ②            |
| BUDN                                 | qv                  | 0 - 10 V or 2 - 10 V or MP bus or Modbus RTU or BACnet MS/TPTP | integral                                       | slow-running<br>separate           | ②            |
| BUDNF                                | qv                  | 0 - 10 V or 2 - 10 V or MP bus or Modbus RTU or BACnet MS/TPTP | integral                                       | spring return actuator<br>separate | ②            |
| XB4                                  | qv                  | 0 – 10 V or 2 – 10 V   | integral                                       | spring return actuator<br>separate | ③            |
| <b>Universal controller, static</b>  |                     |  |  |                                    |              |
| BP3 *                                | qv                  | 0 – 10 V or 2 – 10 V or MP bus interface                       | individual component                           | slow-running<br>separate           | ②            |



| Attachment | Controlled variable | Interface  | Effective pressure transducer                    | Actuator                           | Manufacturer |
|------------|---------------------|--|--|------------------------------------|--------------|
| BPB *      | qv                  | 0 – 10 V or 2 – 10 V or MP bus interface                       | individual component                             | spring return actuator<br>separate | ②            |
| BPG *      | qv                  | 0 – 10 V or 2 – 10 V or MP bus interface                       | individual component                             | fast-running<br>separate           | ②            |
| BB3 *      | qv                  | 2 – 10 V   | individual component                             | slow-running<br>separate           | ②            |
| BBB *      | qv                  | 2 – 10 V   | individual component                             | spring return actuator<br>separate | ②            |
| BR3 *      | $\Delta p$          | 0 – 10 V or 2 – 10 V or MP bus interface                       | individual component<br>100 Pa                   | slow-running<br>separate           | ②            |
| BRB *      | $\Delta p$          | 0 – 10 V or 2 – 10 V or MP bus interface                       | individual component<br>100 Pa                   | spring return actuator<br>separate | ②            |
| BRG *      | $\Delta p$          | 0 – 10 V or 2 – 10 V or MP bus interface                       | individual component<br>100 Pa                   | fast-running<br>separate           | ②            |
| BS3 *      | $\Delta p$          | 0 – 10 V or 2 – 10 V or MP bus interface                       | individual component<br>600 Pa                   | slow-running<br>separate           | ②            |
| BSB *      | $\Delta p$          | 0 – 10 V or 2 – 10 V or MP bus interface                       | individual component<br>600 Pa                   | spring return actuator<br>separate | ②            |
| BSG *      | $\Delta p$          | 0 – 10 V or 2 – 10 V or MP bus interface                       | individual component<br>600 Pa                   | fast-running<br>separate           | ②            |
| BG3 *      | $\Delta p$          | 2 – 10 V   | individual component<br>100 Pa                   | slow-running<br>separate           | ②            |
| BGB *      | $\Delta p$          | 2 – 10 V   | individual component<br>100 Pa                   | spring return actuator<br>separate | ②            |
| BH3 *      | $\Delta p$          | 2 – 10 V   | individual component<br>600 Pa                   | slow-running<br>separate           | ②            |
| BHB *      | $\Delta p$          | 2 – 10 V   | individual component<br>600 Pa                   | spring return actuator<br>separate | ②            |
| BUSN       | qv                  | 0 - 10 V or 2 - 10 V or MP bus or Modbus RTU or BACnet MS/TPTP | integral   | slow-running<br>separate           | ②            |
| BUSNF      | qv                  | 0 - 10 V or 2 - 10 V or MP bus or Modbus RTU or BACnet MS/TPTP | integral   | spring return actuator<br>separate | ②            |
| BUSS       | qv                  | 0 - 10 V or 2 - 10 V or MP bus or Modbus RTU or BACnet MS/TPTP | integral   | fast-running<br>separate           | ②            |
| BUPN       | $\Delta p$          | 0 - 10 V or 2 - 10 V or MP bus or Modbus RTU or BACnet MS/TPTP | integral<br>Control range adjustable 25 – 450 Pa | slow-running<br>separate           | ②            |
| BUPNF      | $\Delta p$          | 0 - 10 V or 2 - 10 V or MP bus or Modbus RTU or BACnet MS/TPTP | integral   | spring return actuator<br>separate | ②            |

| Attachment | Controlled variable | Interface  | Effective pressure transducer                                       | Actuator                           | Manufacturer |
|------------|---------------------|--|---|------------------------------------|--------------|
|            |                     |  | Control range adjustable 25 – 450 Pa                                |                                    |              |
| BURN       | $\Delta p$          | 0 - 10 V or 2 - 10 V or MP bus or Modbus RTU or BACnet MS/TPTP | integral<br>Control range adjustable -50 ... -10 Pa or 10 ... 50 Pa | slow-running<br>separate           | ②            |
| BURNF      | $\Delta p$          | 0 - 10 V or 2 - 10 V or MP bus or Modbus RTU or BACnet MS/TPTP | integral<br>Control range adjustable -50 ... -10 Pa or 10 ... 50 Pa | spring return actuator<br>separate | ②            |
| XD4        | qv                  | 0 – 10 V or 2 – 10 V   | integral  | spring return actuator<br>separate | ③            |
| XF4        | $\Delta p$          | 0 – 10 V or 2 – 10 V   | integral, control range adjustable 25 - 550 Pa                      | spring return actuator<br>separate | ③            |

\* Control component being phased out

\*\* Control component to be discontinued - do not include in new projects

qv Volume flow rate

$\Delta p$  Differential pressure

① TROX, ② TROX/Belimo, ③ TROX/Gruner, ⑤ Siemens

### TROX UNIVERSAL control components

| Attachment                   | Controlled variable | Interface   | Effective pressure transducer          | Actuator   | Manufacturer |
|------------------------------|---------------------|---|--|--|--------------|
| Universal controller, static |                     |   |  |  |              |
| TUN                          | qv, $\Delta p$      | TROX Plug&Play communication system and 0 - 10 V or 2 - 10 V or with optional accessories: LonWorks, Modbus, BACnet, web server | qv = integral<br>$\Delta p$ = separate | slow-running<br>separate   | ①            |
| TUNF                         | qv, $\Delta p$      | TROX Plug&Play communication system and 0 - 10 V or 2 - 10 V or with optional accessories: LonWorks, Modbus, BACnet, web server | qv = integral<br>$\Delta p$ = separate | spring return actuator<br>separate                                     | ①            |
| TUS                          | qv, $\Delta p$      | TROX Plug&Play communication system and 0 - 10 V or 2 - 10 V or with optional accessories: LonWorks, Modbus, BACnet, web server | qv = integral<br>$\Delta p$ = separate | fast-running<br>separate   | ①            |
| TUSD                         | qv, $\Delta p$      | TROX Plug&Play communication system and 0 - 10 V or 2 - 10 V or with optional accessories: LonWorks, Modbus, BACnet, Webserver  | qv = integral<br>$\Delta p$ = separate | fast-running with digital communication interface (TROX HPD), separate | ①            |

qv, Volume flow rate

$\Delta p$ , Differential pressure

① TROX

### LABCONTROL EASYLAB control components

| Attachment | Controlled variable | Interface   | Effective pressure transducer              | Actuator   | Manufacturer |
|------------|---------------------|---|--|--|--------------|
| EASYLAB    |                     |   |  |  |              |
| ELAB       | qv, $\Delta p$ *    | TROX plug and play communication system and 0 - 10 V or 2 - 10 V or with optional accessories: Modbus, BACnet, web server | qv = integral<br><br>$\Delta p$ = separate | fast-running, separate<br><br>or<br><br>fast-running with digital communication interface (TROX HPD), separate | ③            |

① TROX

\* Controlled variable depending on the VAV terminal unit type

- TVR, TVRK: Fume cupboard, room supply air, room extract air, room pressure, single controller
- TVLK: Fume cupboard, single controller
- TVJ, TVT: Room supply air, room extract air, room pressure, single controller
- TVZ, TZ-Silenzio: Room supply air, room pressure, single controller
- TVA, TA-Silenzio: Room extract air, room pressure, single controller

## Nomenclature

### Dimensions of rectangular units

$B$  [mm]  
Duct width

$B_1$  [mm]  
Screw hole pitch of flange (horizontal)

$B_2$  [mm]  
Overall dimension of flange (width)

$H$  [mm]  
Duct height

$H_1$  [mm]  
Screw hole pitch of flange (vertical)

$H_2$  [mm]  
Overall dimension of flange (height)

### Dimensions of circular units

$\varnothing D$  [mm]  
Basic units made of sheet steel: Outer diameter of the spigot;  
basic units made of plastic: Inside diameter of the spigot

$\varnothing D_1$  [mm]  
Pitch circle diameter of flanges

$\varnothing D_2$  [mm]  
Outer diameter of flanges

$L$  [mm]  
Length of unit including connecting spigot

$L_1$  [mm]  
Length of casing or acoustic cladding

$n$  [ ]  
Number of flange screw holes

$T$  [mm]  
Flange thickness

### General information

$m$  [kg]  
Unit weight including the minimum required attachments (control component)

$NS$  [mm]  
Nominal size

$f_m$  [Hz]  
Octave band centre frequency

$L_{PA}$  [dB(A)]  
A-weighted sound pressure level of air-regenerated noise of the VAV terminal unit, system attenuation taken into account

$L_{PA1}$  [dB(A)]

A-weighted sound pressure level of air-regenerated noise of the VAV terminal unit with secondary silencer, system attenuation taken into account

$L_{PA2}$  [dB(A)]  
A-weighted sound pressure level of case-regenerated noise of the VAV terminal unit, system attenuation taken into account

$L_{PA3}$  [dB(A)]  
A-weighted sound pressure level of case-regenerated noise of the VAV terminal unit with acoustic cladding, system attenuation taken into account

Note on acoustic data: All sound pressure levels are based on a reference value of 20  $\mu$ Pa.

$q_{vNom}$  [ $m^3/h$ ]; [l/s]  
Nominal flow rate (100 %): The value depends on product type, nominal size and control component (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.

$q_{vmin Unit}$  [ $m^3/h$ ]; [l/s]  
Technically possible minimum volume flow rate: The value depends on product type, nominal size and control component (attachment). Values are stored in the Easy Product Finder design program. Lower limit of the setting range and minimum volume flow rate setpoint value for the VAV terminal unit. Setpoint values below  $q_{vmin unit}$  (if  $q_{vmin}$  equals zero) may result in unstable control or shut-off.

$q_{vmax}$  [ $m^3/h$ ]; [l/s]  
Upper limit of the operating range for the VAV terminal unit that can be set by customers:  $q_{vmax}$  can be set to less than or equal to  $q_{vNom}$ . In case of analogue signalling to volume flow controllers (which are typically used), the set maximum value ( $q_{vmax}$ ) is allocated to the maximum setpoint signal (10 V) (see characteristic).

$q_{vmin}$  [ $m^3/h$ ]; [l/s]  
Lower limit of the operating range for the VAV terminal unit that can be set by customers:  $q_{vmin}$  should be set to less than or equal to  $q_{vmax}$ . Do not set  $q_{vmin}$  to less than  $q_{vmin unit}$  as the control may become unstable or the damper blade may close.  $q_{vmin}$  may equal zero. In case of analogue signalling to volume flow controllers (which are typically used), the set minimum value ( $q_{vmin}$ ) is allocated to the minimum setpoint signal (0 or 2 V) (see characteristic).

$q_v$  [ $m^3/h$ ]; [l/s]  
Volume flow rate

$\Delta_{qv}$  [%]  
Volume flow rate accuracy in relation to the setpoint (tolerance)

**$\Delta_{pst}$  [Pa]**

Static differential pressure

 **$\Delta_{pst\ min}$  [Pa]**

Static minimum differential pressure: The static minimum differential pressure is equal to the pressure loss of the VAV terminal unit when the damper blade is open, caused by flow resistance (damper blade). If the differential pressure on the VAV terminal unit is too low, the setpoint volume flow rate may not be achieved, not even when the damper blade is open. Important factor in designing the ductwork and in rating the fan including speed control. Sufficient static differential pressure must be ensured for all operating conditions and for all controllers, and the measurement point or points for speed control must have been selected accordingly to achieve this.

**Lengths**

All lengths are given in millimetres [mm] unless stated otherwise.

**Basic unit**

Unit for controlling a volume flow without an attached control component. The main components include the casing with sensor(s) to measure the effective pressure and the damper

blade to restrict the volume flow. The basic unit is also referred to as a VAV terminal unit. Important distinguishing features: Geometry or unit shape, material and types of connection, acoustic characteristics (e.g. acoustic cladding or integral sound attenuator), volume flow rate range.

**Control component**

Electronic unit(s) mounted on the basic unit to control the volume flow rate or the duct pressure or the room pressure by adjusting the damper blade position. The electronic unit consists basically of a controller with effective pressure transducer (integral or external) and an integral actuator (Easy and Compact controllers) or external actuator (Universal or LABCONTROL controllers). Important distinguishing features: Transducer: dynamic transducer for clean air or static transducer for contaminated air. Actuator: slow-running actuator as standard, spring return actuator for safe position, or fast-running actuator. Interface: analogue interface or digital bus interface for the capturing of signals and data.

**VAV terminal unit**

Consists of a basic unit with an attached control component.