



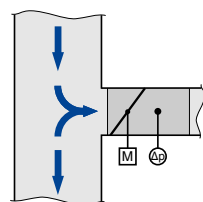
Easy controller, Compact controller



TROX UNIVERSAL controller,
TROX LABCONTROL controller



Rectangular connections on both ends



For all upstream conditions



Conforms to VDI 6022

VAV terminal units

TA-Silenzio



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

Rectangular air terminal units for extract air systems with variable volume flow in buildings requiring high acoustic comfort and low air velocities

- Highly effective integrated attenuator
- Optimised for air velocities of 137.8 – 1,377.95 fpm
- High control accuracy under all upstream conditions
- Compact construction with rectangular connections at both ends
- Electronic control components for different applications (Easy, Compact, Universal, and LABCONTROL)
- Leakage airflow at closed damper blade according to EN 1751, up to class 4
- Casing air leakage according to EN 1751, class C

Optional equipment and accessories

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

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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 with auxiliary power
- For variable or constant volume flow systems
- Shut-off via customer-provided forced override
- Can also be used for differential pressure control with suitable control components

Special characteristics

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

Nominal sizes

- 5, 6, 8, 10, 12

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 differential 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 regardless of upstream conditions

Attachments

- Easy controller: compact unit with potentiometers
- Compact controller: compact unit consisting of controller, differential pressure transducer and actuator
- Universal controller: controller, differential 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)

Material and surfaces

- Casing made of galvanised sheet steel
- Damper blade and differential 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

- According 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 3,937.01 fpm Inert to fungal and bacterial growth

Standards and guidelines

Fulfil 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

- Low-maintenance as construction and materials are not subject to wear

Disclosure of Chemicals

- RoHS EU Directive 2011/65/EU (RoHS)
 - This product or single variants comply with EU Directive 2011/65/EU (RoHS) on the restriction of the use of certain hazardous substances in electrical and electronic equipment. For more information, please refer to our Environmental Product Declarations.
- REACH 1907/2006 (EC Regulation REACH)
 - This product or single variants comply with the provisions of EC Regulation No. 1907/2006, also known as REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals). For more information, please refer to our Environmental Product Declarations.

Function

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

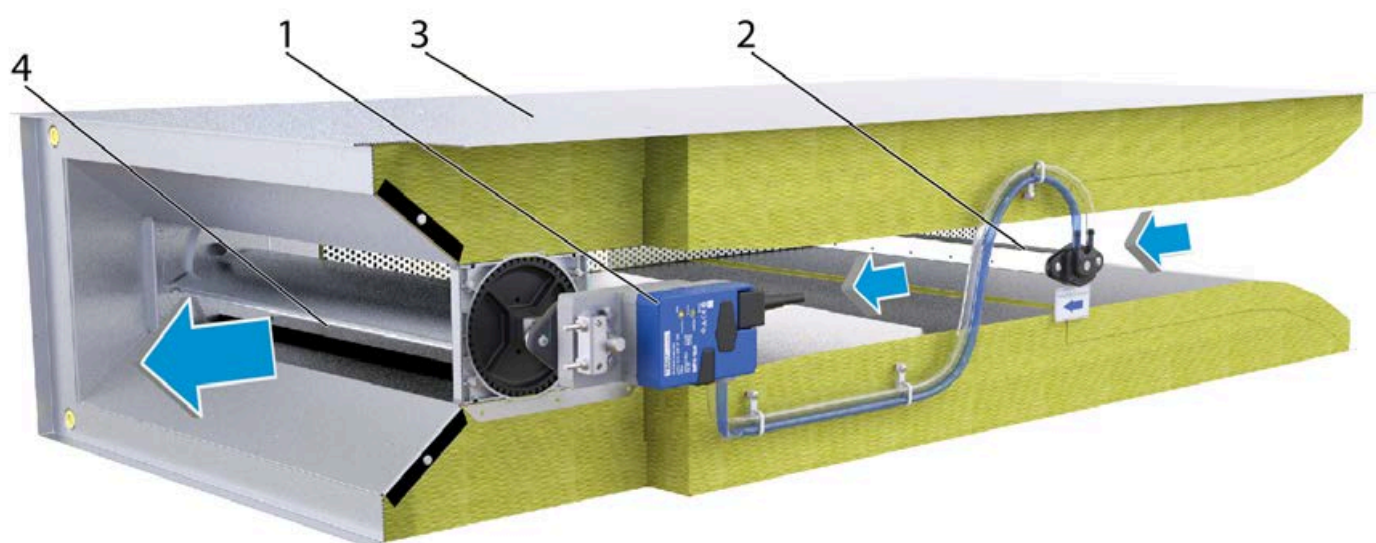
The control components (attachments) include a differential pressure transducer that transforms the differential pressure into an electric signal, a controller, and an actuator; the control functions can be achieved with an Easy controller, with a Compact controller, or with individual components (Universal).

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

The controller compares the actual value with the setpoint 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 TA-Silenzio



- 1 Integrated attenuator
- 2 Measuring probe
- 3 Control components, e.g. Easy controller
- 4 Damper blade with seal

Technical data

Nominal sizes	5 – 12
Volume flow rate range	57.2 - 2,315.62 cfm or 95 – 3937 m³/h
Volume flow rate control range (unit with dynamic differential pressure measurement)	Approx. 10 – 100 % of the nominal volume flow rate
Minimum differential pressure	Up to 0.44 in. w.g. (without secondary silencer)
Maximum differential pressure	4.01 in. w.g.
Operating temperature	50 to 122 °F

Quick sizing

Quick sizing tables provide a good overview of the minimum differential pressures, the volume flow 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 "General information and Nomenclature".

Precise results and spectral data for all control components can be obtained by using our Easy Product Finder design programme. The nominal size is initially selected according to the given 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. Sufficient static differential pressure ($\Delta p_{stat,min}$) must be ensured for all operating conditions and for all controllers. 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 [cfm]	qv [m³/h]	Δp_{stmin} [in. w.g.]		Δqv [±%]
			1	2	
5	57.21	95	0.01	0.01	8
5	167.38	283	0.05	0.09	6
5	277.55	472	0.14	0.25	5
5	387.71	660	0.27	0.49	4
6	89.00	150	0.01	0.01	8
6	262.76	447	0.04	0.08	6
6	438.64	745	0.12	0.23	5
6	612.40	1042	0.23	0.45	4
8	127.13	213	0.01	0.01	9
8	372.88	634	0.05	0.10	6
8	620.75	1056	0.13	0.29	5
8	868.62	1477	0.25	0.55	5
10	158.91	269	0.01	0.01	9
10	472.51	801	0.05	0.09	6
10	786.11	1334	0.14	0.25	5
10	1,097.59	1866	0.27	0.49	5
12	266.98	452	0.01	0.01	9
12	794.57	1349	0.05	0.08	6
12	1,322.15	2245	0.14	0.22	5
12	1,847.69	3142	0.28	0.43	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 [cfm]	q_v [m³/h]	Δp_{stmin} [in. w.g.]		Δq_v [±%]
			1	2	
5	57.2	95	0.01	0.01	8
5	199.16	339	0.07	0.13	5
5	343.25	584	0.21	0.39	5
5	487.34	828	0.43	0.78	4
6	88.99	150	0.01	0.01	8
6	315.7	535	0.06	0.12	5
6	542.39	920	0.18	0.35	5
6	767.05	1305	0.36	0.71	4
8	127.13	213	0.01	0.01	9
8	447.08	759	0.07	0.15	6
8	769.17	1305	0.20	0.43	5
8	1,089.07	1851	0.39	8.69	5
10	158.91	269	0.01	0.01	9
10	563.6	959	0.07	0.13	6
10	970.34	1649	0.21	0.38	5
10	1,375.08	2338	0.41	0.76	5
12	266.98	452	0.01	0.01	9
12	949.2	1614	0.08	0.12	6
12	1,633.56	2775	0.22	0.34	5
12	2,315.62	3937	0.44	0.68	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

NS	q_v [cfm]	q_v [m³/h]	Δp_{stmin} [in. w.g.]		Δq_v [±%]
			1	2	
5	57.20	95	0.01	0.01	8
5	171.61	292	0.06	0.10	6
5	288.18	488	0.15	0.27	5
5	402.60	684	0.29	0.53	4
6	88.99	150	0.01	0.01	8
6	271.20	460	0.05	0.09	6
6	453.41	770	0.13	0.25	5
6	635.62	1080	0.25	0.49	4
8	127.13	213	0.01	0.01	9
8	171.61	652	0.05	0.11	6
8	641.98	1092	0.14	0.31	5
8	900.48	1531	0.27	0.59	5
10	158.91	269	0.01	0.01	9
10	485.19	824	0.05	0.10	6
10	811.59	1379	0.14	0.27	5
10	1,137.99	1934	0.29	0.52	5
12	266.98	452	0.01	0.01	9
12	815.83	1387	0.06	0.09	6



NS	qv [cfm]	qv [m³/h]	Δpstmin [in. w.g.]		Δqv [±%]
			1	2	
12	1,366.53	2322	0.15	0.24	5
12	1,915.52	3257	0.3	0.47	5

① Basic unit

② Basic unit with secondary silencer TS

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

NS	qv [cfm]	qv [m³/h]	Δpstmin [in. w.g.]		Δqv [±%]
			1	2	
5	57.20	95	0.01	0.01	8
5	171.61	292	0.06	0.10	6
5	345.37	488	0.15	0.27	5
5	402.60	685	0.29	0.53	4
6	88.99	150	0.01	0.01	8
6	271.20	460	0.05	0.09	6
6	453.41	770	0.13	0.25	5
6	635.62	1080	0.25	0.49	4
8	127.13	213	0.01	0.01	9
8	383.51	652	0.05	0.11	6
8	641.98	1092	0.14	0.31	5
8	900.48	1531	0.27	0.59	5
10	158.91	269	0.01	0.01	9
10	485.19	824	0.05	0.10	6
10	811.59	1379	0.14	0.27	5
10	1,137.99	1934	0.29	0.52	5
12	266.98	452	0.01	0.01	9
12	815.83	1387	0.06	0.09	6
12	1,366.53	2322	0.15	0.24	5
12	1,915.52	3257	0.30	0.47	5

① Basic unit

② Basic unit with secondary silencer TS

Quick sizing table for sound pressure levels

The quick sizing tables are based on generally accepted attenuation 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 for this type)

NS	qv [cfm]	qv [m³/h]	0.6 in. w.g.		2.01 in. w.g.	
			①	②	①	②
5	57.20	95	< 0.06	< 0.06	0.08	< 0.06
5	199.16	339	0.11	0.07	0.14	0.09
5	343.25	584	0.13	0.10	0.16	0.12
5	487.34	828	0.14	n.V.	0.16	0.13
6	88.99	150	0.06	0.06	0.08	< 0.06
6	315.70	535	0.12	0.08	0.14	0.10
6	542.39	920	0.13	0.10	0.15	0.11
6	767.05	1305	0.14	n.V.	0.16	0.12

NS	qv [cfm]	qv [m³/h]	0.06 in. w.g.		2.01 in. w.g.	
			①	②	①	②
8	127.13	213	< 0.06	< 15	0.08	< 0.06
8	447.08	759	0.10	< 15	0.12	0.08
8	769.17	1305	0.12	20	0.14	0.10
8	1,089.07	1851	0.12	n.V.	0.15	0.11
10	158.91	269	<0.06	< 15	0.08	<0.06
10	563.60	959	0.10	< 15	0.12	0.08
10	970.34	1649	0.11	18	0.14	0.09
10	1,375.08	2338	0.12	n.V.	0.15	0.10
12	266.98	452	0.06	< 15	0.09	<0.06
12	949.20	1614	0.10	< 15	0.12	0.07
12	1,633.56	2775	0.11	19	0.14	0.09
12	2,315.62	3937	0.12	n.V.	0.14	0.10

Air-regenerated noise L_{PA} [dB(A)] with static differential pressure Δ_{pst} of 0.06 or 2.01 in. w.g.

① Basic unit

② Basic unit with secondary silencer TS

n.V./abbreviation: Specified static differential pressure Δ_{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 for this type)

NS	qv [l/s]	qv [m³/h]	0.06 in. w.g.		2.01 in. w.g.	
			①	②	①	②
5	57.20	95	< 0.06	< 0.06	0.06	< 0.06
5	199.16	339	0.09	0.09	0.12	0.11
5	343.25	584	0.12	0.12	0.15	0.14
5	487.34	828	0.13	0.14	0.16	0.16
6	88.99	150	<0.06	<0.06	0.08	0.06
6	315.70	535	0.11	0.10	0.14	0.13
6	542.39	920	0.13	0.13	0.16	0.16
6	767.05	1305	0.15	0.15	0.18	0.18
8	127.13	213	<0.06	<0.06	0.08	<0.06
8	447.08	759	0.11	0.10	0.14	0.12
8	769.17	1305	0.13	0.13	0.16	0.15
8	1,089.07	1851	0.15	0.15	0.18	0.17
10	158.91	269	<0.06	<0.06	0.08	<0.06
10	563.60	959	0.11	0.10	0.14	0.12
10	970.34	1649	0.14	0.13	0.16	0.16
10	1,375.08	2338	0.15	0.15	0.18	0.17
12	266.98	452	0.07	<0.06	0.10	0.07
12	949.20	1614	0.13	0.12	0.16	0.14
12	1,633.56	2775	0.15	0.15	0.18	0.17
12	2,315.62	3937	0.17	0.17	0.20	0.19

Case-radiated noise L_{PA} [dB(A)] with static differential pressure Δ_{pst} of 0.06 or 2.01 in. w.g.

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 programme.

Specification text

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

Specification text

Rectangular VAV terminal units for variable and constant air volume systems with high acoustic requirements, for extract air, available in 5 nominal sizes. High control accuracy of the set volume flows under any upstream conditions. Ready-to-commission control unit, consisting of mechanical parts and electronic control components. Each unit contains an averaging differential pressure sensor for volume flow measurement, a damper blade, and an integrated sound attenuator. Control components are factory-mounted, piped and wired. Differential pressure sensor with 0.12 in. measuring holes, making it resistant to contamination. Fan side and room side both suitable for the connection of air duct profiles. Casing with acoustic and thermal insulation. Position of the damper blade visible from the outside due to the shape of the shaft. The damper blade is factory-set to open position, which allows airflow even without control function; except for variants with defined NC safety position. 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 setting 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 differential pressure sensor made from aluminium profiles
- Lining made of mineral wool
- Plastic plain bearings

Mineral wool:

- RAL quality mark RAL-GZ 388
- According to EN 13501, fire rating class A1, non-flammable
- RAL quality mark RAL-GZ 388
- Non-hazardous to health due to high bio-solubility, in accordance with the German Hazardous Substance Ordinance and Note Q of European Regulation (EC) No. 1272/2008
- Protected against erosion from airflow velocities up to 20 m/s by glass-fibre fabric facing
- Inert to fungal and bacterial growth

Connection type

- With flanges on both ends
- Suitable on both fan and room sides for mounting air duct profiles

Technical data

- Nominal sizes: 5 – 12

- Volume flow range: 57.2 - 1,752.17 cfm
- Minimum differential pressure: up to 0.44 in. w.g. (without secondary silencer)
- Maximum differential pressure: 4.01 in. w.g.
- Leakage airflow with damper blade closed according to EN 1751, class 4. Casing air leakage according to EN 1751, class C

Equivalence criteria

- Declaration of hygiene conformity in accordance with VDI 6022, Part 1 (01/2018), ÖNORM H 6020 (02/2007) and ÖNORM H 6021 (09/2003)
- Meets the hygiene requirements according to EN 16798 Part 3, VDI 6022 Sheet 1, DIN 1946 Part 4
- Acoustic data determined to ÖNORM EN ISO 5135:1999
- No upstream sections required
- Maximum control deviation of 5 % at $q_{v,max}$, without upstream section
- Setting the volume flow rates without adjustment device via $q_{v,min}$ - and $q_{v,max}$ potentiometer
- Electrical connections with screw terminals, no additional terminal boxes required
- The test report of the factory parameterisation, functional test and adjustment under airflow using reference measurement on a regularly validated test rig in accordance with DIN EN ISO 9001 is made available

Specification text attachment

Variable volume flow control with an electronic Easy controller, featuring setpoint input and actual value output for integration into the MCE.

- Supply voltage 24 V AC/DC
- Signal voltages 0 – 10 V DC
- Possible override control with external switches using potential-free contacts: CLOSE, OPEN, $q_{v,min}$ and $q_{v,max}$
- Potentiometers with percentage scales to set the volume flow $q_{v,min}$ and $q_{v,max}$
- Actual value signal relates to the nominal volume flow, therefore simplifying commissioning and subsequent adjustment
- Volume flow control range: approx. 10 – 100 % of the nominal volume flow
- Externally clearly visible control indicator for signalling the functions: controlled, not controlled, and power failure
- Electrical connections with screw terminals
- Double terminals for connecting the supply voltage, for easy transmission of the voltage to the subsequent controller

Sizing data

- q_v [cfm]
- $\Delta_{p,st}$ [cfm]



Air-regenerated noise

- L_{PA} [dB(A)]

Case-radiated noise

- L_{PA} [dB(A)]

Order code

Order code for volume flow control (with Easy controller)

TA-Silenzio – D / 8 / Easy

1 2 3 4

1 Type

TA-Silenzio VAV terminal unit, extract air

2 Acoustic cladding

No entry: none

D with acoustic cladding

3 Nominal size [in.]

5, 6, 8, 10, 12

Order example: TA-Silenzio/5/Easy

Acoustic cladding

Nominal size

none

5

Attachments (control component)

Easy volume flow controller, dynamic, setting q_{vmin} and q_{vmax} with potentiometers (provided by the customer)

Order code for volume flow control (with VARYCONTROL attachment)

TA-Silenzio – D / 8 / XD4 / V 0 / 235.43 – 706.29 [cfm] / NO

1 2 3 4 6 7 8 9

1 Type

TA-Silenzio VAV terminal unit, extract air

2 Acoustic cladding

No entry: none

D with acoustic cladding

3 Nominal size [in.]

5, 6, 8, 10, 12

4 Attachments (control component)

For example

BC0 Compact controller

XD4 Universal controller (VARYCONTROL)

6 Operating mode

F Constant value mode, one setpoint value (no external switch contact)

Order example: TA-Silenzio/10/BC0/V0/294.29–882.86 cfm

Acoustic cladding

Nominal size

Attachments (control component)

Operating mode

Signal voltage range

Operating values

V Variable operation (adjustable 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 rate [cfm]

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 (Normally Open)

NC power off to close (Normally Closed)

None

10

Compact controller

Variable

0 – 10 V DC

$q_{vmin} = 294.29$ cfm

$q_{vmax} = 882.86$ cfm

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

TA-Silenzio – D / 8 / 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

R with EM-IP (including real time clock, RTC) for BACnet IP, Modbus IP and web server

2 Acoustic cladding

No entry: none

D with acoustic cladding

Option 3: Automatic zero point correction

No entry: none

Z with EM-AUTOZERO, solenoid valve for automatic zero point correction

3 Nominal size [in.]

5, 6, 8, 10, 12

4 Attachments (control component)

TROX UNIVERSAL controller with

TUN Actuator (150 s)

TUNF Spring return actuator (150 s)

TUS Fast-acting actuator (3 s)

TUSD Fast-acting actuator (3 s) with digital communication interface (TROX HPD)

9 Operating values for factory setting

Volume flow rate [cfm]

For operating mode F

q_{Vconst} : constant volume flow rate¹

For operating mode M

q_{Vmin} : minimum volume flow rate^{1,2}

q_{Vmax} : maximum volume flow rate^{1,2}

Other parameters are only relevant for the room master as part of a room solution³; for single controllers enter 0

q_{Vconst_Supply} : constant supply air (room value)

$q_{Vconst_Extract}$: constant extract air (room value)

q_{VDiff} : supply air/extract air difference (room value)

5 Equipment function

Room control

RE Extract air controller (Room Extract)

6 Operating mode

F Single controller, fixed setpoint

M Single controller or room master, variable setpoint value

S Slave controller (only with room solutions)

For operating mode S

No parameters are required for the slave controller; all entries have to be made on the room master

7 Signal voltage range

0 0 – 10 V DC

2 2 – 10 V DC

For volume flow rate operating values please note:

¹ Single controller: q_{Vmin} , q_{Vmax} or q_{Vconst} apply to the controller

² Room solutions: q_{Vmin} , q_{Vmax} , $q_{Vconst_Supply/Extract}$ apply to the room

³ For more information on room solutions with several directly connected TROX UNIVERSAL controllers (Plug&Play) and for order examples, please refer to the product data sheet

8 Expansion modules

Option 1: Power supply

No entry: 24 V AC/DC supply

T with EM-TRF for 230 V AC mains supply

U with EM-TRF-USV (including battery pack) for uninterruptible 230 V AC power supply (UPS)

Option 2: Digital communication interface

No entry: none

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

M with EM-BAC-MOD for Modbus RTU

I with EM-IP for BACnet IP, Modbus IP and web server

10 Damper blade position

Only with spring return actuators

NO de-energised OPEN (Normally Open)

NC de-energised CLOSED (Normally Closed)

Useful additions

Optional room control panel

CP-TOUCH with Touch display

Order example: TA-Silenzio-D/12/TUN/RE/S/0/Z

Acoustic cladding

Nominal size

Attachments (control component)

Equipment function

Volume flow rate setting

Signal voltage range

Expansion of attachments

Operating values

With

12

Controller TROX UNIVERSAL, static transducer, slow-acting actuator
Extract air control

Slave

0 – 10 V DC

With expansion module EM-AUTOZERO,
Solenoid valve for automatic zero point correction of
measurement point
None (slave)

Order code for differential pressure control (with VARYCONTROL attachment)

TA-Silenzio – D / 8 / XF4 / PRE / V 0 / 0.12 – 0.24 [in.w.g.] / NO

1 2 3 4 5 6 7 8 9

1 Type

TA-Silenzio VAV terminal unit, extract air

2 Acoustic cladding

No entry: none

D with acoustic cladding

3 Nominal size [in.]

5, 6, 8, 10, 12

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 controller – extract air (Pressure Duct Extract)

PRE Room pressure controller – extract air (Pressure Room Extract)

6 Operating mode

Order example: TA-Silenzio/10/PDE/XF4/F2/2.01 in. w.g./NO

Acoustic cladding

Nominal size

Attachments (control component)

Equipment function

Operating mode

Signal voltage range

Operating value

Damper blade position

F Constant value mode, one setpoint value (no external switch contact)

V Variable operation (adjustable 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

Differential pressure [in. w.g.]

For duct pressure control, enter the differential pressure [in. w.g.] as an absolute value

Δp_{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 de-energised OPEN (Normally Open)

NC de-energised CLOSED (Normally Closed)

None

10

VARYCONTROL Universal controller duct pressure, interface analogue with safety position and display

Duct pressure control, extract air

Fixed setpoint

2 – 10 V

$\Delta p_{\text{const}} = 2.01$ in. w.g.

de-energised OPEN (NO)

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

TA-Silenzio – D / 8 / 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

2 Acoustic cladding

No entry: none

D with acoustic cladding

3 Nominal size [in.]

5, 6, 8, 10, 12

4 Attachments (control component)

TROX UNIVERSAL controller with

TUN Actuator (150 s)

TUNF Spring return actuator (150 s)

TUS Fast-acting actuator (3 s)

TUSD Fast-acting actuator (3 s) with digital communication interface (TROX HPD)

5 Equipment function

Pressure control

PDE Duct pressure controller – extract air (Pressure Duct Extract)

PRE Room pressure controller – extract air (Pressure Room Extract)

6 Operating mode

MFP Single controller or room master, constant pressure setpoint

MVP Single controller or room master, variable pressure setpoint with room solutions only:

SFP Slave, constant pressure setpoint

SVP Slave, variable pressure setpoint

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 with EM-TRF for 230 V AC mains supply

U with EM-TRF-USV (including battery pack) for uninterruptible 230 V AC power supply (UPS)

Option 2: Digital communication interface

No entry: none

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

M with EM-BAC-MOD for Modbus RTU

I with EM-IP for BACnet IP, Modbus IP and web server

R with EM-IP (including real time clock, RTC) for BACnet IP, Modbus IP and web server

Option 3: Volume flow rate measurement

No entry: none

V with EM-V for volume flow rate measurement at the differential pressure controller

Option 4: Automatic zero point correction

No entry: none

Z with EM-AUTOZERO solenoid valve for automatic zero point correction (only in combination with EM-V)

9 Operating values for factory setting

Volume flow rate [cfm], pressure [in. w.g.]

For operating mode MFP and SFP

Δp_{const} : constant differential pressure

For operating mode MVP and SVP

Δp_{min} : minimum differential pressure

Δp_{max} : maximum differential pressure

Other parameters for operating modes MFP and MVP

Only relevant for the room master as part of a room solution¹; for single controller enter 0

q_{vmin} : minimum volume flow rate (room value)

q_{vmax} : maximum volume flow rate (room value)

q_{vconst_Supply} : constant supply air (room value)

$q_{vconst_Extract}$: constant extract air (room value)

q_{vDiff} : supply air/extract air difference (room value)

Please note

¹ For more information on room solutions with several directly connected TROX UNIVERSAL controllers (Plug&Play) and for order examples, please refer to the product data sheet

10 Damper blade position

Only with spring return actuators

NO de-energised OPEN (Normally Open)

NC de-energised CLOSED (Normally Closed)

Useful additions

Differential pressure transducers required for room or duct pressure control have to be ordered separately or provided by others, e.g.

PT-699 Differential pressure transducer for room pressure control

PT-699-DUCT Differential pressure transducers for duct pressure control, including duct pressure measurement kit

Optional room control panel

CP-TOUCH with Touch display

Order example: TA-Silenzio-D/12/TUS/PRE/MVP/2/V/0.04 in. w.g./0.12 in. w.g./441.43 cfm/1,471.43 cfm/0/0/58.86 cfm

Acoustic cladding

With



Nominal size	12
Attachments (control component)	Controller TROX UNIVERSAL, static transducer, fast-acting 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: $\Delta p_{\min}$ - $\Delta p_{\max}$: 0.04 - 0.12 in. w.g.
	Volume flow rate range $q_{v\min}$ - $q_{v\max}$: 441.43 - 1,471.43 cfm (room values)
	Constant supply/extract air q_{vconst_CLOSED} , q_{vconst_Ex} : 0 cfm (room values)
	Supply air/extract air difference: q_{vDiff} : 58.86 cfm (room value)

Order code for room control (with EASYLAB attachment)

TA-Silenzio – D / 8 / ELAB / S / RE / UMZ / LAB / ...

1	2	3	4	5	6	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 [in.]

5, 6, 8, 10, 12

4 Attachments (control component)

ELAB EASYLAB controller TCU3

5 Actuators

S Fast-acting actuator (3 s)

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

6 Equipment function

Room control

RE Extract air controller (Room Extract)

PC Room pressure controller (Pressure Control)

8 Expansion modules

Option 1: Power supply

No entry: 24 V AC/DC supply

T with EM-TRF for 230 V AC mains supply

U with EM-TRF-USV (including battery pack) for uninterruptible 230 V AC power supply (UPS)

Option 2: digital communication interface

No entry: none

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

M with EM-BAC-MOD for Modbus RTU

I with EM-IP for BACnet IP, Modbus IP and web server

R with EM-IP (including real time clock, RTC) for BACnet IP, Modbus IP and web server

Option 3: Automatic zero-point adjustment

No entry: none

Order example: TA-Silenzio/6/ELAB/SD/RE/IZ/LAB Acoustic cladding

Nominal size

Attachments (control component)

Actuator

Equipment function

Expansion of attachments

Additional function

Operating values

Z with EM-AUTOZERO, solenoid valve for automatic zero point correction

9 Additional functions

Without room management function

LAB extract air led system (Laboratory)

CLR supply air led system (Clean Room)

Room management function is active

LAB-RMF extract air led system (Laboratory) - with room management function (RMF)

CLR-RMF supply air led system (Clean Room) with room management function (RMF)

10 Operating values for factory setting

Volume flow rate [cfm], pressure [in. w.g.]

Only required when room management function is active; total room extract air/supply air

q_{v1} : standard mode

q_{v2} : reduced operation

q_{v3} : increased operation

q_{v4} : constant supply air

q_{v5} : constant extract air

q_{v6} : Supply air/extract air difference

Δp_{set} : setpoint pressure (only with differential pressure control)

Useful additions

Room control panel (only for units with RMF)

CP-TOUCH-4.3 Touch control panel with 4.3"

Differential pressure transducers required for room pressure control have to be ordered separately or provided by the client, e.g.

PT-699 Measuring range ± 0.2 in. w.g. or ± 0.4 in. w.g.

PT-GB604 Measuring range ± 0.4 in. w.g.

Order code for single operation (with EASYLAB attachment)

TA-Silenzio – D / 8 / 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 [in.]

5, 6, 8, 10, 12

4 Attachments (control component)

ELAB EASYLAB controller TCU3

5 Actuators

S Fast-acting actuator (3 s)

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

6 Equipment function

Single operation

EC Single controller – extract air (Extract Controller)

7 External volume flow rate setting

E0 Variable, signal voltage range 0 – 10 V DC

E2 Variable, signal voltage range 2 – 10 V DC

2P 2 switching steps (for one switch contact, by others)

3P 3 switching steps (for two switch contacts, by others)

F Constant value mode, one setpoint value (no external switch contact)

8 Expansion modules

Option 1: Power supply

No entry: 24 V AC/DC

T with EM-TRF for 230 V AC mains supply

U with EM-TRF-USV (including battery pack) for uninterruptible 230 V AC power supply (UPS)

Option 2: digital communication interface

No entry: none

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

M with EM-BAC-MOD for Modbus RTU

I with EM-IP for BACnet IP, Modbus IP and web server

R with EM-IP (including real time clock, RTC) for BACnet IP, Modbus IP and web server

Option 3: Automatic zero point correction

No entry: none

Z with EM-AUTOZERO solenoid valve for automatic zero point correction

10 Operating values for factory setting

Volume flow rate [m³/h or cfm]

Depends on external volume flow rate setting

E0: $q_{vmin} - q_{vmax}$

E2: $q_{vmin} - q_{vmax}$

2P: q_{v1}/q_{v2}

3P: $q_{v1}/q_{v2}/q_{v3}$

F: q_{v1}

Order example: TA-Silenzio/8/ELAB/S/EC/E0/176.57-588.58

Acoustic cladding

Nominal size

Attachments (control component)

Actuator

Equipment function

External volume flow setpoint

Operating values

none

8

EASYLAB controller TCU3

fast-acting actuator (3 s)

Single controller (extract air)

Variable, signal voltage range 0–10 V DC

$q_{vmin} = 176.57 \text{ cfm}$

$q_{vmax} = 588.58 \text{ cfm}$

Variants

VAV terminal unit TA-Silenzio



- VAV terminal unit for variable extract air volume flow control

VAV terminal unit, variant TA-Silenzio-D



- 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
- Ideally, the ducts on the room side should also be insulated (by others)
- Acoustic cladding cannot be retrofitted

Material

Standard construction

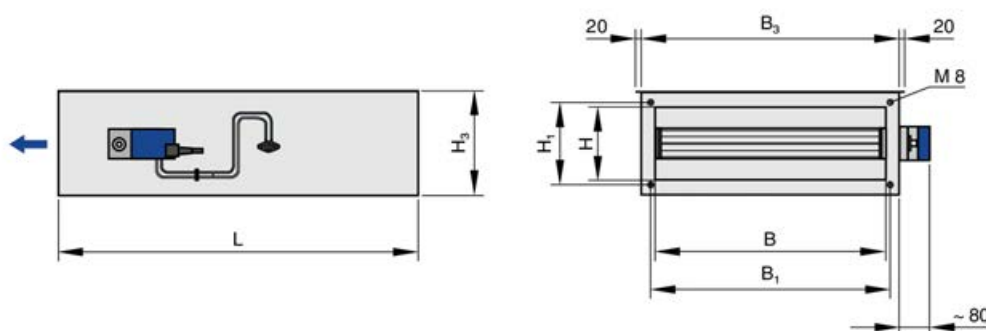
–	Casing	Galvanised sheet steel
–	Differential pressure sensor	Aluminium
–	Damper blade	Aluminium
–	Damper blade seal	Polyethylene, PE
–	Shaft and linkage	Galvanised steel
–	Plain bearings	Plastic
–	Gears	Plastic, ABS

With acoustic cladding (optional)

D	Acoustic cladding casing	Galvanised sheet steel
D	Insulation of structure-borne noise	Polyethylene, PE
D	Lining	Mineral wool 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.

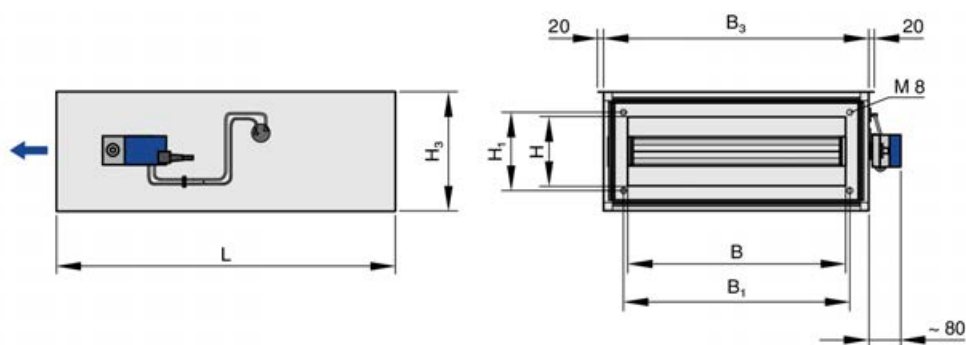
The length of the installed unit is approx. 0.94 in. less. See details for air duct profile.

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 ₁	B ₃	H ₁	H ₃	lbs
5	7.80	5.98	40.75	9.13	11.81	7.32	9.29	37.48
6	12.13	5.98	40.75	13.46	16.14	7.32	9.29	46.3
8	18.03	8.27	49.21	19.37	22.05	9.61	11.06	70.55
10	23.54	7.91	49.21	24.88	27.56	9.25	12.24	90.39
12	31.42	9.92	49.21	32.76	35.43	11.26	14.21	119.05

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



Notes:

Total length L is the total casing length.

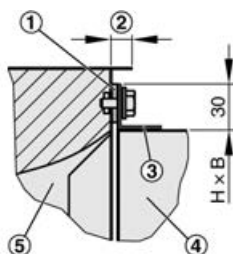
The length of the installed unit is approx. 0.94 in. less. See details for air duct profile.

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 ₁	B ₃	H ₁	H ₃	lbs
5	7.80	5.98	40.75	9.13	14.96	7.32	12.44	70.55
6	12.13	5.98	40.75	13.46	19.29	7.32	12.44	83.78
8	18.03	8.27	49.21	19.37	25.20	9.61	14.21	141.10
10	23.54	7.91	49.21	24.88	30.71	9.25	15.39	158.73
12	31.42	9.92	49.21	32.76	38.58	11.26	17.36	200.62

Details air duct profile

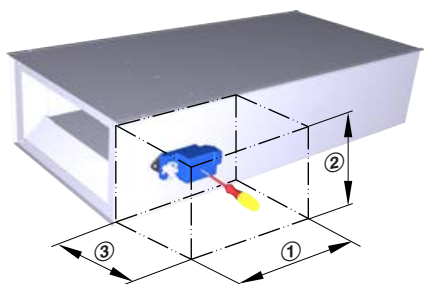


- 1 Compressible seal, to be provided by others
- 2 Connection profile recessed by approx. 0.47 in. on both sides
- 3 Air duct profile
- 4 Duct
- 5 VAV terminal unit

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



Product examples



Schematic illustration of required installation space

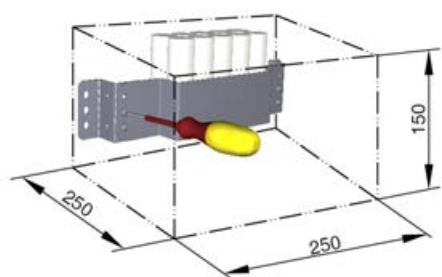
BC0, XB4, BUDNF, TUN

Space required

Attachment	1	2	3
Easy controller			

Attachment	1	2	3
Easy	700	300	300
Compact controller			
BC0, 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	700	300	300
TROX UNIVERSAL			
TUN, TUNF, TUS, TUSD	700	350	400
EASYLAB			
ELAB	700	350	400

Accessibility to the backup battery pack



Schematic illustration of required installation space

Note: Additional space for fixing and accessing the backup battery pack (optional accessory for TROX UNIVERSAL or LABCONTROL EASYLAB control component).

Product example



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

Product details

Installation and commissioning

- Any installation orientation (except units with static differential pressure transducer)
- Drilled holes in the housing flange 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

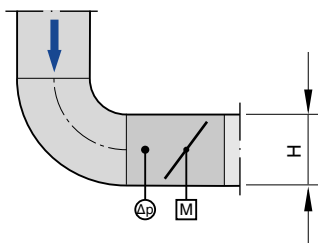
The volume flow accuracy Δ_{qv} applies to all upstream conditions.

Note on supply via an open air duct (extract air mode)

Air entering at the open end of a duct causes strong turbulence and also affects the accuracy of the air volume flow. In this case, an upstream section or a flow straightener is required.

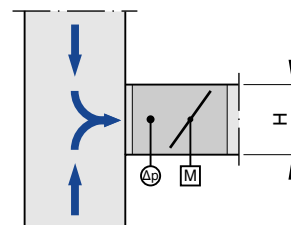
For further information on this specific installation situation, see the installation and operating manual.

Illustration example vertical



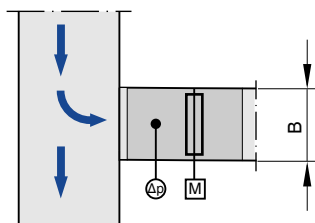
A bend – without a straight duct section upstream of the VAV terminal unit – has only a negligible effect on the volume flow rate accuracy q_v .

Convergence of 2 airflows, vertical



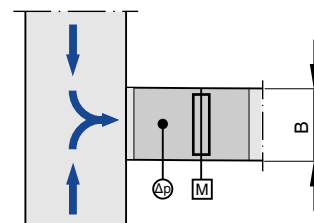
The stated volume flow rate accuracy Δ_{qv} will be achieved, even when the VAV terminal unit is installed at a junction and at the point of convergence of two airflows.

Illustration example horizontal



The stated volume flow rate accuracy Δ_{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 Δ_{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	Differential pressure transducer	Actuator	Manufacturer
Easy controller, dynamic					
Easy	q_v	0 – 10 V	integrated	slow-acting integrated	(1)
Compact controller, dynamic					
BC0	q_v	0 – 10 V or 2 – 10 V or MP-bus interface	integrated	slow-acting integrated	2
BM0	q_v	Modbus RTU/BACnet MS/TP	integrated	slow-acting integrated	2
BM0-J6	q_v	Modbus RTU/BACnet MS/TP with RJ12 socket (for X-AIRCONTROL)	integrated	slow-acting integrated	2
LN0	q_v	0 – 10 V or 2 – 10 V	integrated	slow-acting integrated	⑤
LK0	q_v	KNX interface	integrated	slow-acting integrated	⑤
XB0	q_v	0 – 10 V or 2 – 10 V	integrated	slow-acting integrated	(1)
Compact controller, static					
SB0N	q_v , Δp	0 – 10 V or 2 – 10 V or BACnet MS/TP or Sauter SLC	integral, 1.2 in. w.g.	slow-acting, integrated	④
SB0S	q_v , Δp	0 – 10 V or 2 – 10 V or BACnet MS/TP or Sauter SLC	integral, 1.2 in. w.g.	fast-acting, integrated	④
XD0	q_v	0 – 10 V or 2 – 10 V	integrated	slow-acting integrated	3
XF0	Δp	0 – 10 V or 2 – 10 V	integral, control range adjustable 0.1 – 2.2 in.w.g.	slow-acting integrated	3
Universal controller, dynamic					
BUDN	q_v	0 - 10 V or 2 - 10 V or MP-Bus or Modbus RTU or BACnet MS/TP	integrated	slow-acting separate	2
BUDNF	q_v	0 - 10 V or 2 - 10 V or MP-Bus or Modbus RTU or BACnet MS/TP	integrated	Spring return actuator separate	2
XB4	q_v	0 – 10 V or 2 – 10 V	integrated	Spring return actuator separate	3
VARYCONTROL Universal controller, static					
BUSN	q_v	0 - 10 V or 2 - 10 V or MP-Bus or Modbus RTU or BACnet MS/TP	integrated	slow-acting separate	2
BUSNF	q_v	0 - 10 V or 2 - 10 V or MP-Bus or Modbus RTU or BACnet MS/TP	integrated	Spring return actuator separate	2
BUSS	q_v	0 - 10 V or 2 - 10 V or MP-Bus or Modbus RTU or BACnet MS/TP	integrated	fast-acting separate	2

Attachment	Controlled variable	Interface	Differential pressure transducer	Actuator	Manufacturer
BUPN	Δp	0 - 10 V or 2 - 10 V or MP-Bus or Modbus RTU or BACnet MS/TP	integrated Control range adjustable 1 – 1.8 in. w.g.	slow-acting separate	2
BUPNF	Δp	0 - 10 V or 2 - 10 V or MP-Bus or Modbus RTU or BACnet MS/TP	integrated Control range adjustable 0.1 – 1.8 in. w.g.	Spring return actuator separate	2
BURN	Δp	0 - 10 V or 2 - 10 V or MP-Bus or Modbus RTU or BACnet MS/TP	integrated Control range adjustable – 0.2- -0.04 in. w.g. or 0.2 – 0.04 in. w.g.	slow-acting separate	2
BURNF	Δp	0 - 10 V or 2 - 10 V or MP-Bus or Modbus RTU or BACnet MS/TP	integrated Control range adjustable – 0.2 - -0.04 in. w.g. or 0.2 – 0.04 in. w.g.	Spring return actuator separate	2
XD4	q_v	0 – 10 V or 2 – 10 V	integrated	Spring return actuator separate	3
XF4	Δp	0 – 10 V or 2 – 10 V	integral, control range adjustable 0.1 – 2.2 in. w.g.	Spring return actuator separate	3

 q_v Volume flow rate

 Δp Differential pressure

① TROX, ② TROX/Belimo, ③ TROX/Gruner, ④ Sauter, ⑤ Siemens

TROX UNIVERSAL control components

Attachment	Controlled variable	Interface	Differential pressure transducer	Actuator	Manufacturer
TROX UNIVERSAL controller – static					
TUN	$q_v, \Delta p$	TROX Plug&Play communication system and 0 – 10 V or 2 – 10 V or with optional accessories: Modbus, BACnet, web server	q_v = integrated,, Δp = separated	slow-acting separate	①
TUNF	$q_v, \Delta p$	TROX Plug&Play communication system and 0 – 10 V or 2 – 10 V or with optional accessories: Modbus, BACnet, web server	q_v = integrated, Δp = separated	Spring return actuator separate	①
TUS	$q_v, \Delta p$	TROX Plug&Play communication system and 0 – 10 V or 2 – 10 V or with optional accessories: Modbus, BACnet, web server	q_v = integrated, Δp = separated	fast-acting separate	①
TUSD	$q_v, \Delta p$	TROX Plug&Play communication system and 0 – 10 V or 2 – 10 V or with optional accessories:	q_v = integrated, Δp = separated	fast-acting with digital communication interface (TROX HPD), separate	①

Attachment	Controlled variable	Interface	Differential pressure transducer	Actuator	Manufacturer
		Modbus, BACnet, web server			

q_v Volume flow rate

Δp Differential pressure

① TROX

LABCONTROL EASYLAB control components

Attachment	Controlled variable	Interface	Differential pressure transducer	Actuator	Manufacturer
EASYLAB Regler – statisch					
ELAB	$q_v, \Delta p$ *	TROX plug and play communication system and 0 – 10 V or 2 – 10 V or with optional accessories: Modbus, BACnet, web server	q_v = integrated, Δp = separated	fast-acting, separate or fast-acting with digital communication interface (TROX HPD), separate	①

q_v Volume flow

Δp Differential pressure

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]; [in]

Duct width

B₁ [mm]; [in]

Screw hole pitch of air duct profile (horizontal)

B₂ [mm]; [in]

Overall dimension of air duct profile (width)

H [mm]; [in]

Duct height

H₁ [mm]; [in]

Screw hole pitch of air duct profile (vertical)

H₂ [mm]; [in]

Overall dimension of air duct profile (height)

Dimensions of circular units

ØD [mm]; [in]

Basic units made of sheet steel: Outer diameter of the spigot;
basic units made of plastic: Inside diameter of the spigot

ØD₁ [mm]; [in]

Pitch circle diameter of flanges

ØD₂ [mm]; [in]

Outer diameter of flanges

L [mm]; [in]

Length of unit including connecting spigot

L₁ [mm]; [in]

Length of casing or acoustic cladding

n []

Number of flange screw holes

T [mm]; [in]

Flange thickness

General information

m [kg]; [lb]

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 CAV terminal unit, system attenuation taken into account

L_{PA1} [dB(A)]

A-weighted sound pressure level of air-regenerated noise of the CAV 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 CAV terminal unit, system attenuation taken into account

L_{PA3} [dB(A)]

A-weighted sound pressure level of case-regenerated noise of the CAV 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 µPa.

q_{vNom} [m³/h]; [cfm]

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 defined in the Easy Product Finder design programme. 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} [m³/h]; [cfm]

Technical minimum volume flow: The value depends on product type, nominal size and control component (attachment). Values are defined in the Easy Product Finder design programme. 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} [m³/h]; [cfm]

Adjustable by others at upper limit of the operating range for the VAV terminal unit: q_{vmax} can be set to less than or equal to q_{vnom} on the terminal unit. In case of analogue control of volume flow controllers (typically used), the maximum value of the setpoint signal (10 V) is assigned to the set maximum value (q_{vmax}) (see characteristics).

q_{vmin} [m³/h]; [cfm]

Adjustable by others at lower limit of the operating range for the VAV terminal unit: q_{vmin} should be set to less than or equal to q_{vmax}. 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 control of volume flow controllers (typically used), the minimum value of the setpoint signal (0 or 2 V) is assigned to the set minimum value (q_{vmin}) (see characteristics).

q_v [m³/h]; [cfm]

Volume flow rate

Δ_{qv} [%]

Volume flow rate accuracy in relation to the setpoint (tolerance)

Δp_{st} [Pa]; [in. w.g.]

Static differential pressure

Δp_{stmin} [Pa]; [in. w.g.]

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 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 [mm]; [in]

All lengths are given in inches [in] unless stated otherwise.

Basic unit

Unit for controlling volume flow rates without an attached control component. The main components include the casing with sensor(s) to measure the differential 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 connection variants, acoustic characteristics (e.g. optional acoustic cladding or integrated silencers), range of volume flow.

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 essentially consists of a controller with differential pressure transmitter (integrated or external) and an integrated actuator (Easy and Compact controller).

Important distinguishing features:

- Transmitter: dynamic transmitter for clean air or static transmitter for contaminated air
- Actuator: Standard actuator, slow-acting
- Interface technology: analogue interface or digital bus interface for connecting and recording signals and data

Volume flow controller

Consists of a basic unit with an attached control component.