# TYP EN-EX

## FOR THE PRECISE CONTROL OF NORMAL AND HIGH CONSTANT VOLUME FLOWS IN POTENTIALLY EXPLOSIVE ATMOSPHERES (ATEX)

Rectangular, mechanical self-powered volume flow controllers for the control of supply air or extract air in constant air volume systems, approved and certified for potentially explosive atmospheres (ATEX)

- ATEX-compliant construction
- Approved for gases, mists, vapours and dusts in zones 1, 2, 21 and 22
- Suitable for volume flow rates up to 12,096 m³/h or 3,360 l/s
- Volume flow rate can be set using an external scale, no tools required
- High control accuracy
- No on-site test measurements required for commissioning
- Suitable for airflow velocities up to 8 m/s
- Casing air leakage to EN 1751, class C

Optional equipment and accessories

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

## Application

Application

- Rectangular EXCONTROL CAV controllers of Type EN-Ex for the precise supply air or extract air flow control in constant air volume systems
- For use in potentially explosive atmospheres (ATEX)

- Mechanical self-powered volume flow control without external power supply
- Simplified project handling with orders based on nominal size

Special features

- ATEX mark and certification
- ATEX equipment group II, approved for zones 1, 2, 21 and 22
- Volume flow rate can be set using an external scale; no tools required
- High volume flow rate control accuracy
- Any installation orientation

## Description

Variants

- EN-Ex: Volume flow controller
- EN-Ex-D: Volume flow controller with acoustic cladding
- Units with acoustic cladding and/or secondary silencer Type TX for demanding acoustic requirements
- Acoustic cladding cannot be retrofitted

Construction

- Galvanised sheet steel
- P1: Powder-coated, silver grey (RAL 7001)

Parts and characteristics

- Ready-to-commission controller
- Damper blade with low-friction bearings
- Bellows that acts as an oscillation damper
- Cam plate with leaf spring
- Scale with pointer to set the volume flow rate setpoint
- Connection for equipotential bonding
- Aerodynamic function testing of each unit on a special test rig prior to shipping
- Correct operation even under unfavourable upstream or downstream conditions (1.5 B straight section required upstream and 0.5 B required downstream)

Useful additions

- Secondary silencer Type TX

Construction features

- Rectangular casing
- Construction and materials comply with the EU directive for use in potentially explosive atmospheres (ATEX)
- Flanges on both sides, suitable for duct connection

Materials and surfaces

- Casing and damper blade made of galvanised sheet steel
- Leaf spring made of stainless steel
- Polyurethane bellows
- Plain bearings with PTFE coating

EN-Ex-D

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

Mineral wool

- To EN 13501, fire rating class A2, non-combustible
- RAL quality mark RAL-GZ 388
- Biosoluble and hence hygienically safe according to the German TRGS 905 (Technical Rules for Hazardous Substances) and EU directive 97/69/EG

# INFORMACJE TECHNICZNE

Functional description

The volume flow controller is a mechanical self-powered unit and works without external power supply. A damper blade with low-friction bearings is adjusted by aerodynamic forces such that the set volume flow rate is maintained within the differential pressure range.

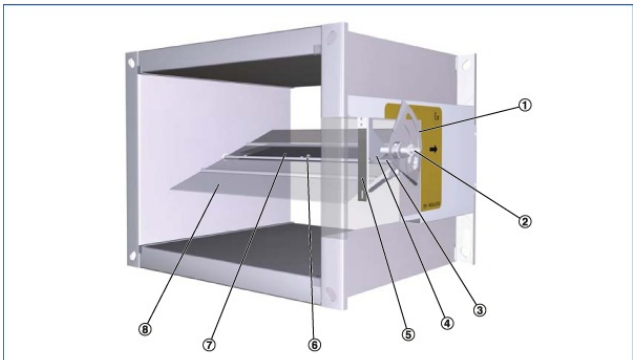
The aerodynamic forces of the airflow create a closing torque on the damper blade. The bellows extends and increases this force while at the same time acting as an oscillation damper. The closing force is countered by a leaf spring that unrolls over a cam plate. The shape of the cam plate is such that a change in the differential pressure leads to an adjustment of the damper blade in a way that the volume flow rate is maintained almost exactly.

Efficient commissioning

The volume flow rate setpoint value can be set quickly and easily using the pointer on the external scale; no measurements are required.

The advantage over flow adjustment dampers is that there is no need for repeat measurements or adjustments by an air conditioning engineer. Should the system pressure change, e.g. by opening or closing of duct sections, the flow rates in the entire system will also change if flow adjustment dampers are used; however, this is not the case with mechanical self-powered volume flow controllers. A mechanical self-powered controller reacts immediately and adjusts the damper blade such that the set constant volume flow rate is maintained.

**Schematic illustration of the EN-Ex**




| | |
|---|---|
| ① Volume flow rate scale | ⑤ Leaf spring |
| ② Volume flow rate scale lock | ⑥ Bellows inlet |
| ③ Crossbar | ⑦ Bellows |
| ④ Cam plate | ⑧ Damper blade |

| | |
|---|---|
| **Nominal sizes** | 200 × 100 to 600 × 600 mm |
| **Volume flow rate range** | 40 – 3360 l/s |
| **Volume flow rate range** | 144 – 12096 $m^3/h$ |
| **Volume flow rate setting range** | approx. 25 – 100 % of the nominal volume flow rate |
| **Scale accuracy** | ± 4 % |
| **Differential pressure** | 50 – 1000 Pa |
| **Operating temperature** | 10 – 50 °C |

## Quick sizing: Sound pressure level at differential pressure 150 Pa

| Nominal size | $\dot{V}$ | | Air-regenerated noise | | Case-radiated noise | |
|---|---|---|---|---|---|---|
| | | | ① | ② | ① | ③ |
| | | | $L_{PA}$ | $L_{PA1}$ | $L_{PA2}$ | $L_{PA3}$ |
| | l/s | m³/h | dB(A) | | | |
| 200 × 100 | 40 | 144 | 35 | 19 | 21 | <15 |
| | 80 | 288 | 41 | 28 | 28 | 21 |
| | 120 | 432 | 44 | 34 | 33 | 26 |
| | 160 | 576 | 46 | 38 | 35 | 30 |
| 300 × 100 | 65 | 234 | 38 | 22 | 24 | 16 |
| | 130 | 468 | 44 | 30 | 32 | 24 |
| | 195 | 702 | 45 | 35 | 36 | 29 |
| | 260 | 936 | 47 | 38 | 39 | 32 |
| 300 × 150 | 105 | 378 | 41 | 24 | 28 | 19 |
| | 210 | 756 | 44 | 31 | 34 | 26 |
| | 315 | 1134 | 46 | 35 | 39 | 32 |
| | 420 | 1512 | 47 | 38 | 41 | 35 |
| 300 × 200 | 130 | 468 | 45 | 24 | 31 | 21 |
| | 260 | 936 | 46 | 29 | 35 | 26 |
| | 390 | 1404 | 46 | 33 | 38 | 29 |
| | 520 | 1872 | 47 | 35 | 40 | 32 |
| 400 × 200 | 210 | 756 | 42 | 23 | 30 | 20 |
| | 420 | 1512 | 43 | 27 | 35 | 26 |
| | 630 | 2268 | 44 | 31 | 38 | 30 |
| | 840 | 3024 | 44 | 33 | 40 | 33 |
| 500 × 200 | 230 | 828 | 40 | 21 | 28 | 18 |
| | 460 | 1656 | 40 | 26 | 33 | 24 |
| | 690 | 2484 | 41 | 29 | 36 | 28 |
| | 920 | 3312 | 42 | 31 | 38 | 31 |
| 600 × 200 | 255 | 918 | 38 | 20 | 27 | 17 |
| | 510 | 1836 | 39 | 24 | 31 | 23 |
| | 765 | 2754 | 39 | 28 | 35 | 27 |
| | 1020 | 3672 | 40 | 31 | 37 | 31 |
| 400 × 250 | 220 | 792 | 44 | 23 | 32 | 22 |
| | 440 | 1584 | 45 | 28 | 37 | 27 |
| | 660 | 2376 | 45 | 31 | 39 | 30 |
| | 880 | 3168 | 45 | 34 | 41 | 33 |
| 500 × 250 | 300 | 1080 | 41 | 21 | 31 | 21 |
| | 600 | 2160 | 42 | 26 | 36 | 27 |
| | 900 | 3240 | 43 | 30 | 39 | 30 |
| | 1200 | 4320 | 43 | 33 | 41 | 33 |
| 600 × 250 | 320 | 1152 | 40 | 20 | 30 | 20 |
| | 640 | 2304 | 40 | 25 | 34 | 25 |
| | 960 | 3456 | 41 | 28 | 37 | 29 |
| | 1280 | 4608 | 42 | 31 | 39 | 32 |
| 400 × 300 | 315 | 1134 | 45 | 25 | 53 | 25 |
| | 630 | 2268 | 46 | 29 | 40 | 30 |
| | 945 | 3402 | 47 | 34 | 43 | 34 |
| | 1260 | 4536 | 47 | 36 | 45 | 36 |
| 500 × 300 | 375 | 1350 | 43 | 22 | 34 | 23 |
| | 750 | 2700 | 44 | 28 | 38 | 29 |
| | 1125 | 4050 | 44 | 31 | 41 | 32 |
| | 1500 | 5400 | 45 | 33 | 43 | 35 |

① EN
② EN with secondary silencer TX
③ EN-D

Rectangular volume flow controllers for constant air volume systems in potentially explosive atmospheres, mechanical self-powered, without external power supply, suitable for supply or extract air, available in 19 nominal sizes.

Ready-to-commission unit consists of the casing containing a damper blade with low-friction bearings, bellows, external cam plate with leaf spring, and parts for equipotential bonding and for protection in potentially explosive atmospheres.

Volume flow controllers are factory set to a reference volume flow rate (customers can set the required volume flow rate on site).

Both ends suitable for the connection of air duct profiles.

Casing air leakage to EN 1751, class C (B + H ≤400, class B)

Special features

- ATEX mark and certification
- ATEX equipment group II, approved for zones 1, 2, 21 and 22
- Volume flow rate can be set using an external scale; no tools required
- High volume flow rate control accuracy
- Any installation orientation

Materials and surfaces

- Casing and damper blade made of galvanised sheet steel
- Leaf spring made of stainless steel
- Polyurethane bellows
- Plain bearings with PTFE coating

EN-Ex-D

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

Mineral wool

- To EN 13501, fire rating class A2, non-combustible
- RAL quality mark RAL-GZ 388
- Biosoluble and hence hygienically safe according to the German TRGS 905 (Technical Rules for Hazardous Substances) and EU directive 97/69/EG

Construction

- Galvanised sheet steel
- P1: Powder-coated, silver grey (RAL 7001)

Technical data

- Nominal sizes: 200 × 100 to 600 × 600
- Volume flow rate range: 40 to 3360 l/s or 144 to 12096 $m^3/h$
- Volume flow rate control range: approx. 25 – 100 % of the nominal volume flow rate
- Differential pressure: 50 – 1000 Pa

TROX TECHNIK
The art of handling air

## EN-Ex

**EN – Ex – D – P1 / 400×200**
1 2 3 4

**1 Type**
**EN-Ex** Volume flow controller for potentially explosive atmospheres

**2 Acoustic cladding**
No entry: none
**D** With acoustic cladding

**3 Material**
No entry: galvanised sheet steel
**P1** Powder-coated, silver grey (RAL 7001)

**4 Nominal size [mm]**
B × H