



CAV controllers

EN-Ex

TROX GmbH

Heinrich-Trox-Platz

47504 Neukirchen-Vluyn

Germany

Phone: +49 (0) 2845 2020

Fax: +49 (0) 2845 202-265

E-mail: trox@trox.de<http://www.troxtechnik.com>

Product overview

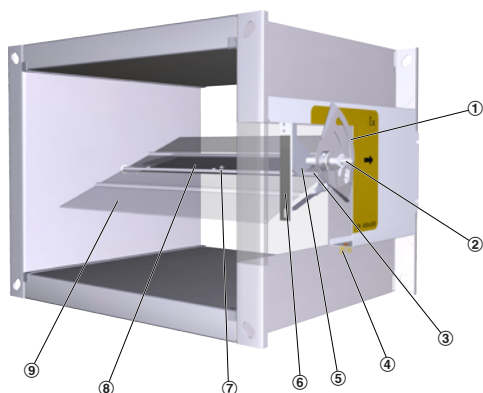


Fig. 1: EN-Ex

- ① Scale
- ② Volume flow rate scale lock
- ③ Crossbar
- ④ Blade connector for equipotential bonding
(2 ground straps and 2 blade connectors are part of the supply package)
- ⑤ Cam plate
- ⑥ Leaf spring
- ⑦ Bellows inlet
- ⑧ Bellows
- ⑨ Damper blade

Important notes

Information on the installation manual

This manual enables operating or service personnel to correctly install the product described below and to use it safely and efficiently.

It is essential that these individuals read and fully understand this manual before starting any work. The basic prerequisite for safe working is to comply with the safety notes and all instructions in this manual.


The local regulations for health and safety at work and general safety regulations also apply.

Correct use

CAV controllers of Type EN-Ex are used for constant volume flow control in ventilation and air conditioning systems. They can be used for supply air and extract air systems in the following areas with potentially explosive atmospheres:

⚠ II 2G Ex h IIC T6 Gb

⚠ II 2D Ex h IIC T80 °C Db

Test certificate  TÜV 05 ATEX 7159 X

Do not use the CAV controller with an electric actuator!

Do not use CAV controllers in extract air systems in commercial kitchens unless the extract air has been cleaned as much as possible with high-sufficiency aerosol separators; see VDI 2052.

The installation of air terminal devices in humid rooms, areas with potentially explosive atmospheres or rooms with dust-laden or aggressive air has to be assessed for each individual case.

TROX Technical Service

To ensure that your request is processed as quickly as possible, please keep the following information ready:

- Product name
- TROX order number
- Delivery date
- Brief description of the fault

Online	www.troxtechnik.com
Phone	+49 2845 202-400

Qualified staff

HVAC technician for Ex areas

HVAC technicians are individuals who have sufficient professional or technical training in the field they are working in to enable them to carry out their assigned duties at the level of responsibility allocated to them and in compliance with the relevant guidelines, safety regulations and instructions. HVAC technicians are individuals who have in-depth knowledge and skills related to HVAC systems; they are also responsible for the professional completion of the work under consideration.

HVAC technicians are individuals who have sufficient professional or technical training, knowledge and actual experience to enable them to work on HVAC systems, understand any potential hazards related to the work under consideration, and recognise and avoid any risks involved.

HVAC technicians for Ex areas have been specially trained for work in areas with potentially explosive atmospheres. They know the rules and regulations relevant to their work and to explosion protection. Evidence of the relevant experience and training claimed must be available.

Personal protective equipment

Personal protective equipment must be worn for any work in order to reduce health or safety hazards to the minimum.

The appropriate protective equipment for a job must be worn for as long as the job takes.

Industrial safety helmet



Industrial safety helmets protect the head from falling objects, suspended loads, and the effects of striking the head against stationary objects.

Protective gloves



Protective gloves protect hands from friction, abrasions, punctures, deep cuts, and direct contact with hot surfaces.

Safety shoes



Safety shoes protect the feet against crushing, falling parts, and slipping on slippery ground.

Limitation of liability

The information in this manual has been compiled with reference to the applicable standards and guidelines, the state of the art, and our expertise and experience of many years.

The manufacturer does not accept any liability for damages resulting from:

- Non-compliance with this manual
- Incorrect use
- Operation or handling by untrained individuals
- Unauthorised modifications

The actual scope of delivery may differ from the information in this manual for special constructions, additional order options or as a result of recent technical changes.

Transport and storage

Delivery check

Upon delivery, carefully remove the packaging and check the unit for transport damage and completeness. In case of any damage or an incomplete shipment, contact the shipping company and your supplier immediately. Put the product back into its packaging after the delivery check to protect it from dust and contamination.



Fixing and installation material

Fixing and installation material is not part of the supply package (unless stated otherwise), but has to be provided by others; it has to be suitable for the installation situation.

Transport on site



CAUTION!

Danger of injury from sharp edges, sharp corners and thin sheet metal parts!

Sharp edges, sharp corners and thin sheet metal parts may cause cuts or grazes.

- Be careful when carrying out any work.
- Wear protective gloves, safety shoes and a hard hat.

Please note:

- Always secure the load against tipping and falling.
- Do not move bulky items just by yourself. Get help to prevent injuries and damage.

Storage

Please note:

- Store the product only in its original packaging
- Protect the product the effects of weather
- Protect the product from humidity, dust and contamination
- Storage temperature: -10 °C to 50 °C.
- Relative humidity: 95% max., no condensation

Packaging

Properly dispose of packaging material.

Technical data

Nominal sizes	200 × 100 to 600 × 600 m m
Volume flow rate range	40 – 3360 l/s or 144 – 12096 m³/h
Volume flow rate control range	Approx. 25 to 100% of the nominal volume flow rate
Scale accuracy	± 4%
Minimum differential pres- sure	50 Pa
Maximum differential pres- sure	1000 Pa
Operating temperature	10 – 50 °C

Dimensions and weight

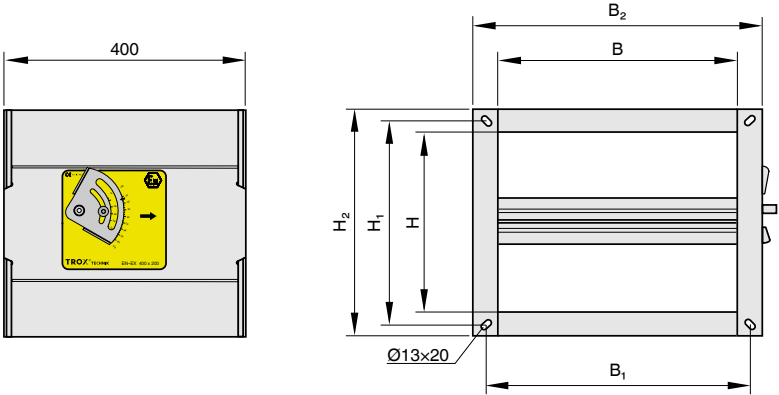


Fig. 2: EN-Ex

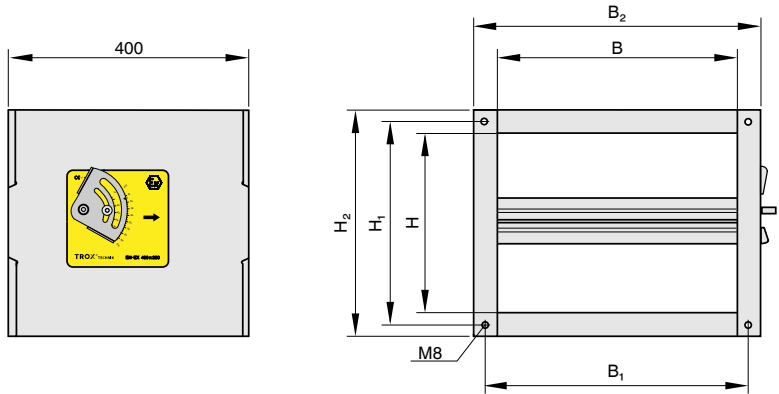


Fig. 3: EN-Ex-D (with acoustic cladding)

Nominal size	Nom- inal width B [mm]	Nom- inal height H [mm]	B1 [mm]	H1 [mm]	EN-Ex			EN-Ex-D		
					B2 [mm]	H2 [mm]	m [kg]	B2 [mm]	H2 [mm]	m [kg]
200 × 100	200	100	234	134	276	176	5	280	180	8
300 × 100	300	100	334	134	376	176	6	380	180	10
300 × 150	300	150	334	184	376	226	7	380	230	11
300 × 200	300	200	334	234	376	276	7	380	280	12

Nominal size	Nom- inal width B [mm]	Nom- inal height H [mm]	B1 [mm]	H1 [mm]	EN-Ex			EN-Ex-D		
					B2 [mm]	H2 [mm]	m [kg]	B2 [mm]	H2 [mm]	m [kg]
400 × 200	400	200	434	234	476	276	9	480	280	15
400 × 250	400	250	434	284	476	326	10	480	330	17
400 × 300	400	300	434	334	476	376	12	480	380	18
400 × 400	400	400	434	434	476	476	18	480	480	26
500 × 200	500	200	534	234	576	276	11	580	280	17
500 × 250	500	250	534	284	576	326	12	580	330	18
500 × 300	500	300	534	334	576	376	13	580	380	19
500 × 400	500	400	534	434	576	476	18	580	480	26
500 × 500	500	500	534	534	576	576	19	580	580	28
600 × 200	600	200	634	234	676	276	13	680	280	20
600 × 250	600	250	634	284	676	326	14	680	330	22
600 × 300	600	300	634	334	676	376	15	680	380	22
600 × 400	600	400	634	434	676	476	18	680	480	26
600 × 500	600	500	634	534	676	576	19	680	580	29
600 × 600	600	600	634	634	676	676	20	680	680	30

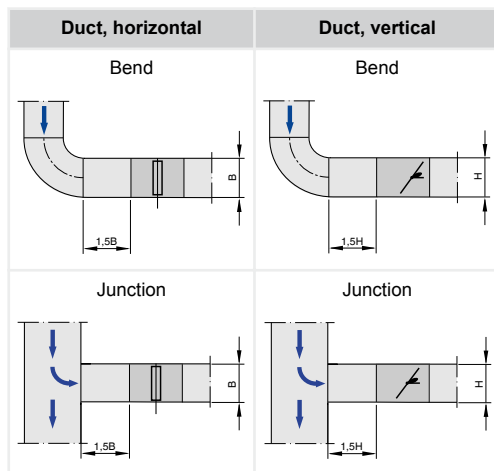
Installation

Installation orientation

Any installation orientation. Airflow direction is critical.

Upstream conditions

The volume flow rate accuracy of CAV controllers applies to a straight upstream section of the duct. Bends, junctions or a narrowing or widening of the duct cause turbulence that may affect measurement. Duct connections, e.g. branches off the main duct, must comply with EN 1505. Some installation situations require straight duct sections upstream.



Free air intake only with a straight duct section of 1B upstream.

Installing the CAV controller

Personnel:

- HVAC technician for Ex areas

Protective equipment:

- Industrial safety helmet
- Protective gloves
- Safety shoes



WARNING!

Risk of explosion from the commissioning of damaged products

Commissioning damaged products in areas with potentially explosive atmospheres may lead to an explosion. This can cause serious or even fatal injuries as well as considerable damage to property.

Before you install the controller, check it for damage that could impair the movement of the damper blade; if the controller has been damaged, replace it.

Before you install the product, take suitable precautions to protect air distribution components from contamination during installation (VDI 6022). If this is not possible, at least cover the product or take other precautions to protect it from contamination. In this case you have to ensure that the product cannot be started. Ensure that all components are clean before you install them. If necessary, clean them thoroughly. If you have to interrupt the installation procedure, protect all openings from the ingress of dust or moisture.

**WARNING!****Risk of explosion!**

Ignition sources, such as sparks, open flames or hot surfaces, can lead to explosions in an area with potentially explosive atmospheres.

- Get written permission before you start working in an area with potentially explosive atmospheres.
- Do not carry out any work in a potentially explosive atmosphere.
To remove any potentially explosive atmosphere, purge the system with fresh air before you work on it.
- Use only tools that have been approved for use in areas with potentially explosive atmospheres.

Failure to comply with these safety notes may lead to an explosion.

For installation please note:

- Fix the product only to load-bearing structural elements.
- Load suspension systems only with the weight of the product. Adjacent components and connecting ducts must be supported separately.
- Use only approved and adequately sized fixing material (fixing material is not included in the supply package).
- The product must remain accessible for maintenance even after installation.
- **Important:** If there is a risk that the controller could be subject to mechanical impact during operation, protect it accordingly; protection has to be provided by others.

Be careful to not damage the controller accidentally:

- Handle the unit with care.
- Lift the unit only by lifting the entire casing.

- Do not lift the unit or device by holding the damper blade only.

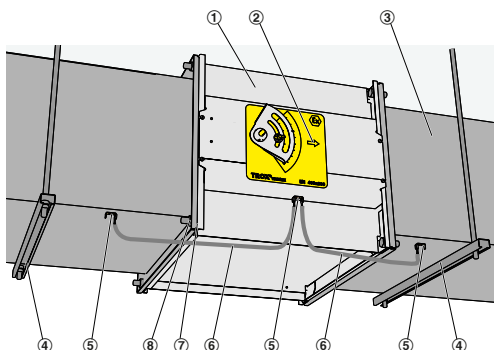


Fig. 4: Installation example

1. ▶ Pre-assemble suspensions (Fig. 4/4) at the installation location, at a distance of approx. L+100 mm.
2. ▶ Assemble the ducts (Fig. 4/3) and lead them up to the installation location of the controller.
3. ▶ Fix the controller (Fig. 4/1) including seals (Fig. 4/7) to the duct (note the airflow direction marked by the arrow (Fig. 4/2).
4. ▶ Fix the ducts and the controller to the suspension system.
5. ▶ Make the equipotential bonding (Fig. 4/6) using ground strap and blade connector (Fig. 4/5).

**WARNING!****Risk of explosion!**

To prevent electrostatic ignition hazards, make an electrical connection by connecting the controller with the ground straps and blade connectors (part of the supply package) on both sides to the ducting.

It is also possible to connect the controller directly to the terminal point for equipotential bonding of the building. This requires a cable (by others).

In any case, the ductwork has to be connected to the terminal point for equipotential bonding of the building.

Initial commissioning

**WARNING!****Risk of explosion from the commissioning of damaged products**

Commissioning damaged products in areas with potentially explosive atmospheres may lead to an explosion. This can cause serious or even fatal injuries as well as considerable damage to property.

Before you commission the controller, check it for damage that could impair the movement of the damper blade; if the controller has been damaged, replace it.

Before you start commissioning:

- Ensure that the device or unit has been correctly fixed and connected to the ducting.
- Ensure equipotential bonding of the device or unit.
- Ensure that the devices or units as well as the ventilation system are clean and that there are no residual matter and foreign objects.
- **Important:** If there is a risk that the controller could be subject to mechanical impact during operation, protect it accordingly; protection has to be provided by others.

For commissioning see also VDI 6022, part 1 – 'Hygiene requirements for ventilation and air-conditioning systems and units'.

**WARNING!****Risk of explosion!**

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- Do not carry out any work in a potentially explosive atmosphere.
To remove any potentially explosive atmosphere, purge the system with fresh air before you work on it.
- Use only tools that have been approved for use in areas with potentially explosive atmospheres.

Failure to comply with these safety notes may lead to an explosion.

Sufficient duct pressure must be ensured for all operating conditions and for all control units. The measurement points for fan speed control must be selected accordingly.

Setting the volume flow rate

- Loosen the wing screw (Fig. 1/2) and set the volume flow rate on the scale (Fig. 1/1).

Lock the scale in the required position with the wing screw (Fig. 1/2).

No further measurement or adjustment is necessary.

Volume flow rate setting ranges

Nominal size	\dot{V} [l/s]		\dot{V} (m³/h)	
	min	max	min	max
200 × 100	40	160	144	576
300 × 100	65	260	234	936
300 × 150	105	420	378	1512
300 × 200	130	520	468	1872
400 × 200	210	840	756	3024
500 × 200	230	920	828	3312

Nominal size	\dot{V} [l/s]		\dot{V} (m³/h)	
	min	max	min	max
600 × 200	255	1020	918	3672
400 × 250	220	880	792	3168
500 × 250	300	1200	1080	4320
600 × 250	320	1280	1152	4608
400 × 300	315	1260	1134	4536
500 × 300	375	1500	1350	5400
600 × 300	420	1680	1512	6048
400 × 400	420	1680	1512	6048
500 × 400	460	1840	1656	6624
600 × 400	510	2040	1836	7344
500 × 500	600	2400	2160	8640
600 × 500	640	2560	2304	9216
600 × 600	840	3360	3024	12096

Maintenance and cleaning



WARNING!

Risk of explosion!

Ignition sources, such as sparks, open flames or hot surfaces, can lead to explosions in an area with potentially explosive atmospheres.

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- Do not carry out any work in a potentially explosive atmosphere.
To remove any potentially explosive atmosphere, purge the system with fresh air before you work on it.
- Use only tools that have been approved for use in areas with potentially explosive atmospheres.

Failure to comply with these safety notes may lead to an explosion.

Maintenance

It is the system owner's duty to set up a maintenance schedule, taking the actual operating conditions (contamination, operating time etc.) of the ventilation system into consideration.

Important: Do not lubricate the bearings of the damper blade.

Maintenance jobs to be carried out regularly:

- Visually check the controller for contamination, damage and corrosion. Remove contamination; if the controller has been damaged, or if there is any corrosion, replace the controller.
- Check the fixing of the controller and of the connected ductwork.
- Check the equipotential bonding.

Replacement parts

Incorrect replacement parts



WARNING!

Risk of injury from the use of incorrect replacement parts!

Incorrect or faulty replacement parts pose a risk to health and safety, and their use can cause malfunction, damage to property and total failure of equipment.

- Use only original replacement parts from TROX.

Cleaning

Please note:

- The cleaning intervals given in the VDI 6022 standard apply.
- Clean surfaces with a damp cloth.
- Use only common household cleaners, do not use any aggressive cleaning agents.
- Do not use cleaning agents that contain chlorine.

Declaration of conformity



EG Konformitätserklärung

EC Declaration of conformity
Déclaration de conformité

TROX GmbH

Heinrich-Trox-Platz
D-47504 Neukirchen-Vluyn

Hiermit erklären wir dass die Maschine/Baugruppe

We hereby declare that the machine / module
que le module / la machine

Volumenstromregler Serie RN-Ex; EN-Ex

CAV controller type RN-Ex; EN-Ex
Régulateur de débit série RN-Ex; EN-Ex

Folgenden Richtlinien entspricht:

Complies with the following directives
Est conforme aux directives suivantes

- Richtlinie 2014/34/EU Anhang III
Directive 2014/34/EU annex III
Directive 2014/34/EU appendice III



Angewandte harmonisierte Normen:

Applied harmonized standards
Normes harmonisées appliquées

- EN 60079-0:2012+A11:2013, Explosionsgefährdete Bereiche – Teil 0; Betriebsmittel - Allgemeine Anforderungen
IEC 60079-0:2011, modified + Cor.:2012 + Cor.:2013; German version EN 60079-0:2012 + A11:2013
Explosive atmospheres - Part 0: Equipment - General requirements
EN 60079-0:2013, version allemande: EN 60079-0:2012 + A11:2013,
Atmosphères explosives - matériel - Exigences générales
- EN ISO 80079-36:2016, Explosionsfähige Atmosphären - Teil 36: Nicht elektrische Geräte für den Einsatz in explosionsfähigen Atmosphären – Grundlagen und Anforderungen
ISO 80079-36:2016, Non-electrical equipment for explosive atmospheres - Part 36: Basic method and requirements; German version EN ISO 80079-36:2016
EN ISO 80079-36:2016, Atmosphères explosives - Partie 36: appareils non électriques destinés à être utilisés en atmosphères explosives - Méthodologie et exigences

Baumusterprüfbescheinigung TÜV 05 ATEX 7159 X

EC type-examination certificate TÜV 05 ATEX 7159 X
Attestation de conformité TÜV 05 ATEX 7159 X

Kennzeichnung:

Marking:

Identification:



II 2G Ex h IIC T6 Gb



II 2D Ex h IIC T80°C Db

Neukirchen-Vluyn, 30.06.2017

Jan Heymann

CE-Beauftragter,
Authorised Representative, CE-marked products