



# Explosion-proof fire damper

## Type FKRS-EU

according to Declaration of Performance  
DoP / FKRS-EU / DE / 004



EPS 21 ATEX 2 142 X



II 2G Ex h IIC T5/T6 Gb  
II 2D Ex h IIIC T95°C/T80°C Db  
II 3G Ex h IIC T5/T6 Gc  
II 3D Ex h IIIC T95°C/T80°C Dc

**TROX<sup>®</sup> TECHNIK**

The art of handling air

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## 1 General information

### About this supplementary operating manual

This supplementary operating manual describes the following explosion-proof variants of the fire damper:

- FKRS-EU with spring return actuator  
ExMax-15-BF-TR
- FKRS-EU with spring return actuator  
RedMax-15-BF-TR

To ensure correct functioning of the fire damper, it is essential to read the provided supplementary operating manual before starting any work, and to comply with it. This supplementary operating manual must be given to the system owner when handing over the system. The system owner must include the supplementary operating manual with the system documentation.

The manufacturer does not accept any liability for any malfunction or damage resulting from non-compliance with this supplementary operating manual or non-compliance with relevant statutory regulations.

This supplementary operating manual is intended for specialist consultants, developers, and owners of the ventilation systems in which the fire dampers are to be installed. This operating manual is also intended for people conducting the following work:

- Electrical connection
- Commissioning
- Functional test

### Other applicable documentation

In addition to this supplementary operating manual, the following documents apply:

- Operating and installation manual FKRS-EU
- ATEX declaration of conformity  
EPS 21 ATEX 2 142 X

### Symbols used in this manual

**DANGER!**

Imminently hazardous situation which, if not avoided, will result in death or serious injury.

**WARNING!**

Potentially hazardous situation which, if not avoided, may result in death or serious injury.

**CAUTION!**

Potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

**NOTICE!**

Potentially hazardous situation which, if not avoided, may result in property damage.

## 2 Safety and correct use

### General information regarding safety

Only specialist personnel are allowed to perform the described work on the fire damper. Only skilled qualified electricians are allowed to work on the electrical system.

The installation location must be easily accessible and have sufficient clearance for electrical connection and maintenance of the fire damper.

### Standards and guidelines

- Construction Products Regulation (EU) No. 305/2011
- EN 15650 – Ventilation for buildings – Fire dampers
- EN 13501-3 – Classification: Fire resistant ducts and fire dampers
- EN 1366-2 – Fire resistance tests for installations: Fire dampers
- EN 1751 Ventilation for buildings – Air terminal devices

The basic safety and health requirements stipulated in Directive 2014/34/EC are fulfilled through conformity with the following standards:

- EN 1127-1 – Explosive atmospheres – Explosion protection: Basic concepts and methodology
- DIN EN ISO 80079-36 – Explosive atmospheres: Non-electrical equipment for explosive atmospheres – Basic method and requirements
- DIN EN ISO 80079-37 – Explosive atmospheres: Non-electrical equipment for explosive atmospheres - Non-electrical type of protection constructional safety "c"

### Maintenance and replacement parts

The FKRS-EU fire damper is a safety related product that has been specially developed for fire protection. To maintain the function, use only original TROX replacement parts.

### Environmental protection

To protect the environment keep the following in mind:

- Dispose of packaging in an environmentally sound manner.
- Have used fire damper components or the used fire damper only disposed of by an authorised company.
- Dispose of electronic components according to the local electronic waste regulations.

### Correct use

The fire damper is used as a shut-off device to prevent fire and smoke from spreading through ducting in areas with potentially explosive atmospheres.

The fire damper may be used in supply air or extract air systems in areas with potentially explosive atmospheres.

For details on the operation of the fire dampers, refer to the operating and installation manual FKRS-EU and the technical data in this supplementary operating manual.

### Use in areas with potentially explosive atmospheres (ATEX)

In accordance with the certificate of conformity EPS 21 ATEX 2 142 X, the fire damper can be used in certain Ex zones. The ambient temperatures and types of release and actuation specified in the technical data are binding, .

### Incorrect use

The following applications are not allowed:

For use

- as a smoke control damper,
- as an air transfer damper,
- outdoors without sufficient protection against the effects of weather,
- in extract air systems in commercial kitchens,
- in ventilation systems in which high levels of dust and pollution, extreme humidity, or chemical contamination may impair the function of the unit and
- in installation situations that prevent an inspection of the internal components of the fire damper.

Modifying the fire damper or using replacement parts that have not been approved by TROX is not permitted.

### Residual risks

TROX fire dampers are subject to strict quality controls during manufacturing. In addition, a functional test is performed before shipping.

Damage can, however, occur during transport or installation and impair the function of the fire damper.

In any case, the proper function of the fire damper must be checked during commissioning, and ensured through regular maintenance while in use.

### 3 Technical data

#### 3.1 FKRS-EU with explosion-proof spring return actuator

##### Dimensions and weight

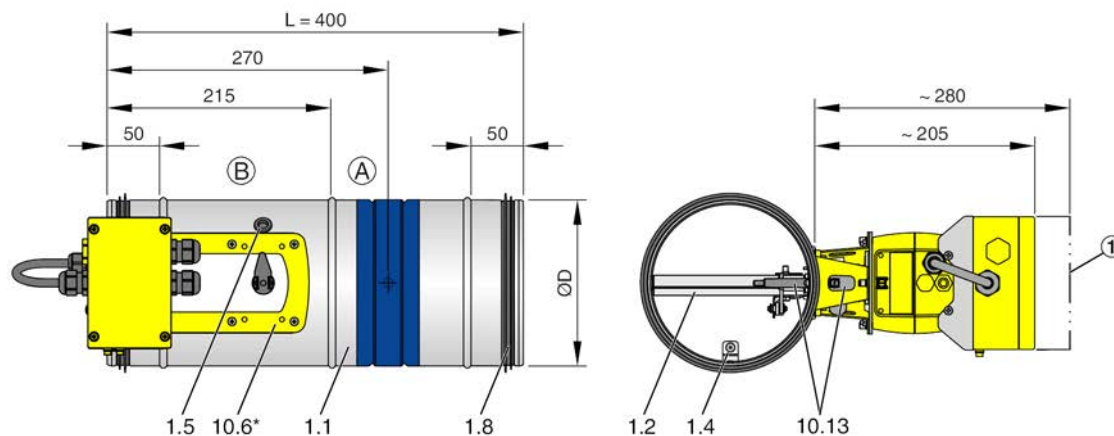


Fig. 1: FKRS-EU with explosion-proof spring return actuator





- |      |  |       |   |
|------|--|-------|---|
| 1.1  | Enclosure                                  | 10.7* | RedMax spring return actuator                                     |
| 1.2  | Damper blade with seal                     | 10.13 | Thermoelectric release mechanism ExPro-TT with temperature sensor |
| 1.4  | Travel stop for CLOSED position            | 1     | Keep clear to provide access for operation                        |
| 1.5  | Inspection access (12 mm)                  | A     | Installation side   |
| 1.8  | Lip seal                                   | B     | Operating side  |
| 10.6 | ExMax spring return actuator, alternative* |       |   |

Dimensions [mm] / Weight [kg]										
Nominal size DN	100	125	150	160	180	200	224	250	280	315
ØD	99	124	149	159	179	199	223	249	279	314
Weight with spring return actuator	4.8	5.1	5.3	5.5	5.8	6.0	6.2	6.8	7.3	7.9

Spring return actuator ExMax-15-BF TR/RedMax-15-BF-TR		
Supply voltage	24 – 240 V AC/DC, ± 10 %, self-adjusting 50 – 60 Hz ± 20 %	
Power rating	16 W / 15 VA	
Switch-on current (< 1 s)	2 A	
Run time	Actuator / spring return	30 s / 10 s
Limit switch	Type of contact	2 changeover contacts
	Switching voltage	230 V AC / 24 V DC
	Switching current	0.4 mA – 3 A
IEC protection class / IP protection	I (earthed) / IP66	
Storage temperature	-40 ... +55 °C	
Ambient humidity	≤ 90% rh, no condensation	

### 3.2 ATEX areas of application

ATEX areas of use, depending on the type of release mechanism, actuation, ambient temperature and air-flow velocity

Release mechanism	Type of actuation	Labelling	Ambient temperature	Maximum air velocity
ExPro-TT	ExMax-15-BF-TR	 II 2G Ex h IIC T6 Gb II 2D Ex h IIIC T80°C Db	-40 °C ≤ Ta ≤ +40 °C	10 m/s
ExPro-TT	ExMax-15-BF-TR	 II 2G Ex h IIC T5 Gb II 2D Ex h IIIC T95°C Db	-40 °C ≤ Ta ≤ +50 °C	10 m/s
ExPro-TT	RedMax-15-BF-TR	 II 3G Ex h IIC T6 Gc II 3D Ex h IIIC T80°C Dc	-40 °C ≤ Ta ≤ +40 °C	10 m/s
ExPro-TT	RedMax-15-BF-TR	 II 3G Ex h IIC T5 Gc II 3D Ex h IIIC T95°C Dc	-40 °C ≤ Ta ≤ +50 °C	10 m/s

## 4 Electrical connection

### General safety notes

#### DANGER!

Danger of electric shock! Do not touch any live components! Electrical equipment carries a dangerous electrical voltage.

- Only skilled qualified electricians are allowed to work on the electrical system.
- Switch off the power supply before working on any electrical equipment.

For any wiring work, follow the national and local regulations and guidelines for electrical installation.

### Equipotential bonding

To prevent ignition sources due to static charges, the fire damper must be integrated into the equipotential bonding of the ventilation system.

Construction of equipotential bonding (by others):

- Single-wire CU-line 4 mm<sup>2</sup> with ring cable lug.

Connection options of equipotential bonding:

- Fire damper with ExMax/RedMax spring return actuator
  - Terminal box at PA terminal

### FKRS-EU with ExMax or RedMax spring return actuator

The ExMax or RedMax spring return actuator has automatic voltage detection 24 V – 240 V AC/DC. The actuator detects the voltage automatically and does not have to be adjusted.

Connect the spring return actuator according to the wiring example.

Several actuators can be connected in parallel as long as the performance specifications are taken into consideration.

Functional testing requires a switch that interrupts the voltage supply (by others).

The electrical connection is made in the terminal box. The factory installed wiring must not be changed.

#### Attention!

If the voltage has been interrupted with either the switch (1) or the optional release mechanism (2), the heating (6) is not active.

### Wiring example for ExMax or RedMax spring return actuator

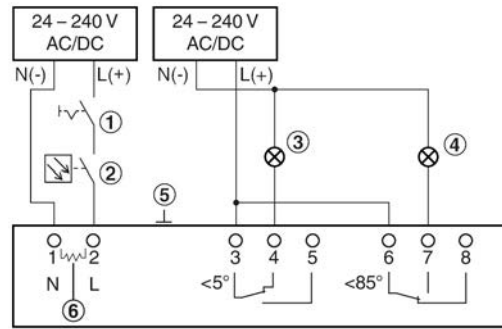


Fig. 2: Actuator connection, example

- 1 Switch for opening and closing, to be provided by others
- 2 Optional release mechanism, e.g. TROX duct smoke detector type RM-O-3-D or RM-O-VS-D (outside the Ex zone)
- 3 Indicator light for CLOSED position, to be provided by others
- 4 Indicator light for OPEN position, to be provided by others
- 5 Terminal for equipotential bonding 4 mm<sup>2</sup>
- 6 Heating

### TROXNETCOM AS-i

The fire dampers with spring return actuator and module AS-EM/C (accessory) form a functional unit ready for automatic operation.

The module is to be installed and wired outside of the potentially explosive atmosphere by others

- The module transmits the control signals between the spring return actuator and the controller and power unit. This allows for controlling the actuator and monitoring the actuator run time during functional testing.
- The 24 V DC supply voltage for the module and the actuator is transmitted using the AS-i flat cable.
- Status display:
  - Operation
  - 4 inputs
  - 2 outputs



## Wiring example for TROXNETCOM

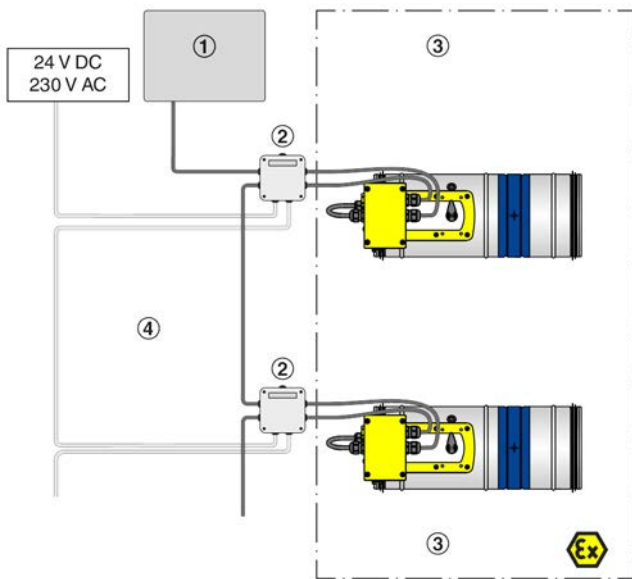


Fig. 3: Wiring example for TROXNETCOM

- 1 Controller
- 2 AS-EM/C module
- 3 FKRS-EU
- 4 Safe area

## 5 Functional test

### General

During operation at normal temperatures, the damper blade is open. A functional test involves closing the damper blade and opening it again. The exact procedure depends on the type of release mechanism.

#### **WARNING!**

Risk of injury from the release mechanism or from a moving damper blade. Do not touch the release mechanism or reach into the fire damper while actuating the release mechanism.

### 5.1 FKRS-EU with ExMax or RedMax spring return actuator

#### damper blade position indicator

The position of the damper blade is indicated by the pointer on the actuator.

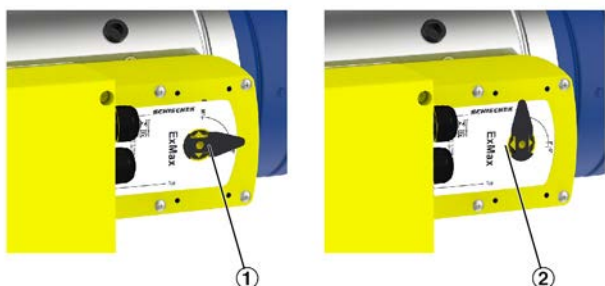


Fig. 4: damper blade position indicator

- 1 Damper blade is closed
- 2 Damper blade is open

#### Closing/opening the fire damper with spring return actuator



Fig. 5: Thermoelectric release mechanism ExPro-TT

- 1 Push button for functional test

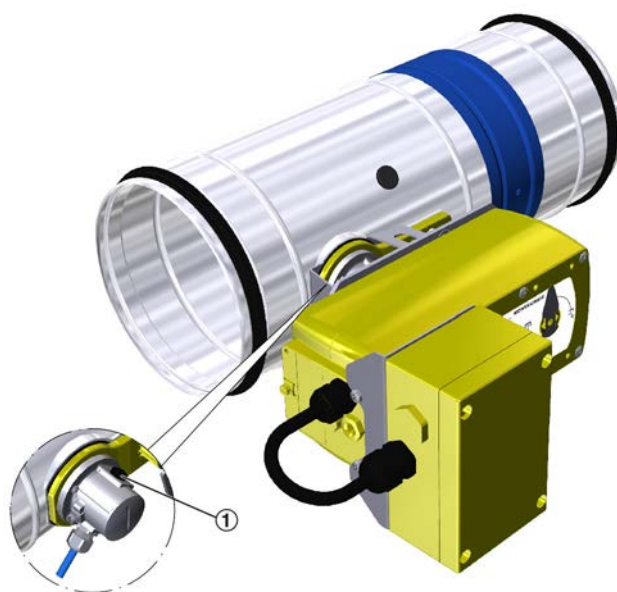


Fig. 6: Functional test (FKRS-EU with ExMax actuator shown in OPEN position)

#### **CAUTION!**

Danger of injury when reaching into the fire damper while the damper blade is moving. Do not reach into the fire damper while actuating the release mechanism.

#### Requirement

- Power is being supplied
1. ▶ Push the push button (1) and keep it pushed.
    - ⇒ This interrupts the power supply, and the damper blade closes.
  2. ▶ Check if the damper blade is CLOSED, check run time.
  3. ▶ Release the push button (1).
    - ⇒ Power is supplied again, and the damper blade opens.
  4. ▶ Check if the damper blade is OPEN, check run time.

### Opening/closing the fire damper using the crank handle

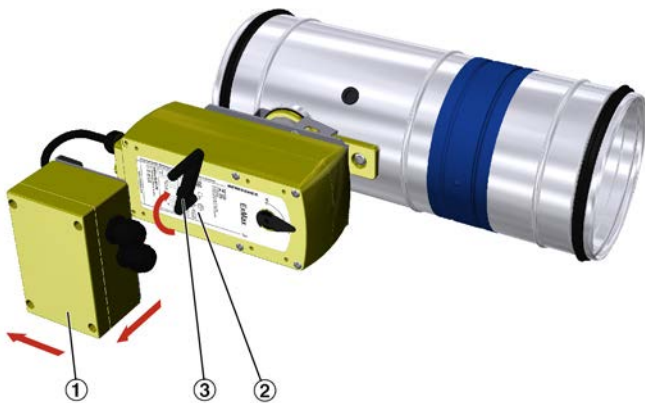


Fig. 7: Functional test (without power supply)

#### **⚠ DANGER!**

Danger due to malfunction of the fire damper.

If the damper blade has been opened by means of the crank handle (without power supply), it will no longer be triggered by a temperature increase, i.e. in the event of a fire. In other words, the damper blade will not close.

To re-establish its function, connect the power supply.

#### **Requirement**

- The damper blade is CLOSED
- 1. ▶ Remove the terminal box (1).
- 2. ▶ Insert the crank handle (2) into the opening for the spring-winding mechanism (The crank handle is clip-fixed to the connecting cable.)
- 3. ▶ Turn the crank handle (2) in the direction of the arrow (3) to the travel stop.
- 4. ▶ Remove the crank handle (2).  
⇒ The damper blade (1.2) will then CLOSE.
- 5. ▶ Mount the terminal box (1).

