



Installation and operating manual

Duct smoke detector RM-O-3-D

to provide the control input signal for fire dampers and smoke protection dampers

General building inspectorate licence

Z-78.6-125



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The art of handling air

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1 General information

This operating manual describes the following variants of the duct smoke detector:

- RM-O-3-D for 24 V DC supply
- RM-O-3-D for 230 V AC supply

To ensure correct functioning of the RM-O-3-D duct smoke detector it is essential to read the provided operating manual before starting any work, and to comply with it. This manual must be given to the system owner when handing over the system. The system owner must include the manual with the system documentation.

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

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

- Transport and storage
- Installation
- Electrical connection
- Commissioning
- Maintenance
- Cleaning

Other applicable documentation

The general building inspectorate licence no. Z-78.6-125 also applies. Download: www.troxtechnik.com

Symbols used in this manual



Danger!

Designates danger to life and limb due to electrical voltage.



Note

Designates important notes or information.

Symbols used on the RM-O-3-D duct smoke detector



Danger!

Danger of electric shock from live components when you open the casing!

- Only skilled qualified electricians should open the casing.
- Switch off the power supply before working on any electrical equipment.

2 Safety and correct use

General information regarding safety

Only specialist personnel are allowed to perform the described work on the duct smoke detector. 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 duct smoke detector

Standards and guidelines

Compliance with the following regulations and guidelines is required for any job performed on the duct smoke detector:

- Equipment and Product Safety Laws
- Industrial Health and Safety Regulation
- Building regulations
- Accident Prevention Regulations (BGV A1, BGV A3)
- Maintenance standards DIN 31051 and EN 13306
- DIN 14675
- Any additional related fire protection standards and regulations

Repair and replacement parts

The RM-O-3-D duct smoke detector is a safety related product that has been especially developed for the fire protection in ventilation systems. 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.
- After final decommissioning, have the duct smoke detector disposed of by an authorised company.
- Dispose of electronic components according to the local electronic waste regulations.

Correct use

The RM-O-3-D duct smoke detector is used to signal to and release fire dampers and smoke protection dampers to prevent fire and smoke from spreading through ducting.

The duct smoke detector can also be used to switch off fans in a ventilation system.

Fire dampers or smoke protection dampers must be fitted with an electric spring return actuator, an electromagnet or a solenoid valve.

The duct smoke detector must only be used in compliance with general building inspectorate licence Z-78.6-125. The installation details and the technical data in this manual also apply.

Incorrect use

The following applications are not allowed:

- Use in extract air systems in commercial kitchens (kitchen extract air in general)
- Use in potentially explosive atmospheres
- Use outdoors without sufficient protection against the effects of weather
- Use in ventilation systems in which high levels of dust and pollution, extreme humidity, or chemical contamination impair the function of the product.
- Installation in a way that prevents inspection, cleaning or testing.

Modifying the duct smoke detector or using replacement parts that have not been approved by TROX is not permitted.

Residual risks

TROX products 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 a product.

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

3 Product description

Functional description

To prevent smoke from spreading in buildings, it is extremely important that it is detected at an early stage.

The RM-O-3-D duct smoke detector is used to signal to and release fire dampers and smoke protection dampers. The duct smoke detector operates on the principle of light scattering and detects the smoke regardless of its temperature so that fire dampers can be closed before the release temperature is reached.

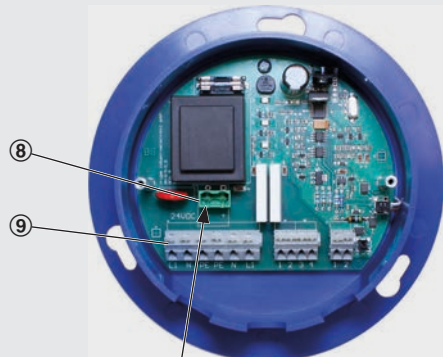
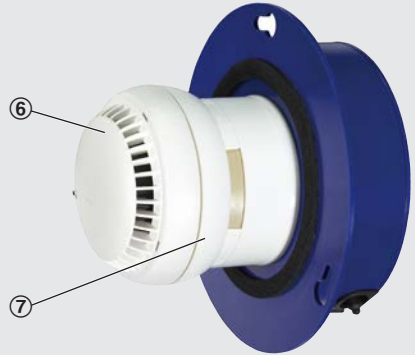
The duct smoke detector can also be used to switch off fans in a ventilation system.

Fire dampers and smoke protection dampers close because the power supply is cut off when smoke is detected.

The duct smoke detector is suitable for fire dampers and smoke protection dampers that are fitted with one of the following:

- Electric spring return actuator (power off to close)
- Pneumatic actuator (pressure off to close)
- Electromagnet





























Parts of RM-O-3-D



- ① Casing
- ② LED red Alarm
- ③ LED yellow Indicates contamination
- ④ LED green System monitoring
- ⑤ Push button Test/Reset
- ⑥ Sensor head (order no. M536HC7)
- ⑦ Base
- ⑧ Slot for the 24 V DC PCB
- ⑨ Terminals 230 V AC
- ⑩ 24 V DC PCB type VWM (order no. M516EJ4)

3 Produktbeschreibung

Operating status LEDs

LED			Operating status	Damper blade position
Red	Yellow	Green		
Alarm relay	Signal relay			
 3 — 4	 1 — 2		Ready Supply voltage OK	
 3 — 4	 1 — 2		No voltage	
 3 — 4	 1 — 2		Supply voltage OK Electrical error No duct smoke detector - Alarm - immediate release -	
 3 — 4	 1 — 2		Contamination ¹⁾ 70% 90%	
 3 — 4	 1 — 2		Contamination ¹⁾ > 90% - Alarm - immediate release -	
 3 — 4	 1 — 2		Test/Reset - Inspection -	
 3 — 4	 1 — 2		Smoke detected ²⁾ - Alarm - immediate release -	



LED on



LED off



LED blinking

1) Contamination
up to 70% – Acceptable > 70% ... 90% – Warning
> 90% – Alarm

2) If there is an alarm because smoke has been detected (smoke incident or maintenance), you can only reset the duct smoke detector with the reset button after the duct smoke detector is free from smoke again.

4 Technical data

RM-O-3-D	
EMC immunity to	EN 61000-6-1 EN 61000-6-2 EN 61000-6-3 EN 61000-6-4
Supply voltage	230 V AC + 10 / - 15% 50/60 Hz or 24 V DC ± 6%
Power rating	3 VA
Micro fuse	T 100 L 250 V
Protection level	IP 42
Ambient temperature	0 °C ... + 60 °C
Airflow velocity:	1 m/s ... 20 m/s
Acceptable humidity	≤ 95% rh, no condensation
Alarm threshold for increased contamination	> 70%
System monitoring	<ul style="list-style-type: none">• > 90% contaminated• No duct smoke detector• Data transmission to duct smoke detector has failed
Alarm relay contact (release, contamination)	250 V 2 A 24 V DC 100 W
Weight	0.7 g

5 Transport, storage and packaging

Delivery check

Check delivered items immediately after arrival for transport damage and completeness. In case of any damage or an incomplete shipment, contact the shipping company and your supplier immediately.

A complete shipment includes:

- Duct smoke detector RM-O-3-D
- Operating and installation manual

Transport on site

If possible, take the product in its transport packaging up to the installation location.

Storage

For temporary storage please note:

- Remove the plastic wrapping
- Protect the product from dust and contamination.
- Store the product in a dry place and away from direct sunlight.
- Do not expose the product (not even with its packaging) to the effects of weather.
- Do not store the product below -40 °C or above 50 °C.

Packaging

Properly dispose of packaging material.

6 Installation

Installation in fire damper FK-EU

The RM-O-3-D duct smoke detector can be installed into the inspection access of FK-EU fire dampers. For the exact position see the illustration on the right.

If FK-EU is used as an air transfer damper according to general building inspectorate licence Z-6.50-2031:

Install the RM-O-3-D duct smoke detector in the upper inspection access of the fire damper.

Proceed as follows:

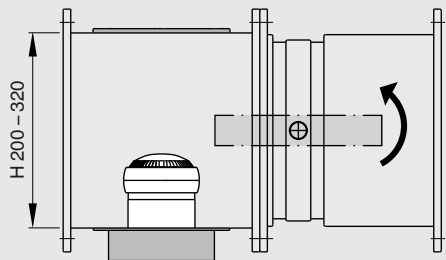
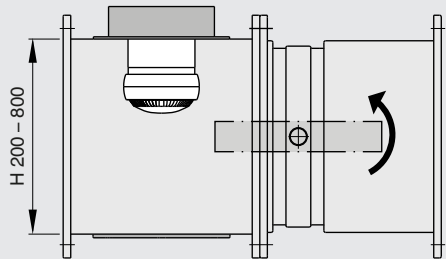
1. Place the adapter ③ on the inspection access panel ② and screw-fix it with self-tapping screws ④ to the casing (the inspection access panel is used for centering).
2. Remove the inspection access panel by turning and lifting it.
3. Insert RM-O-3-D ① into the inspection access opening and fix it with knurled nuts ⑤ to the adapter.
4. Connect the fire damper electrically to the duct smoke detector, siehe „Elektrische Installation“ auf Seite 10.

Note:

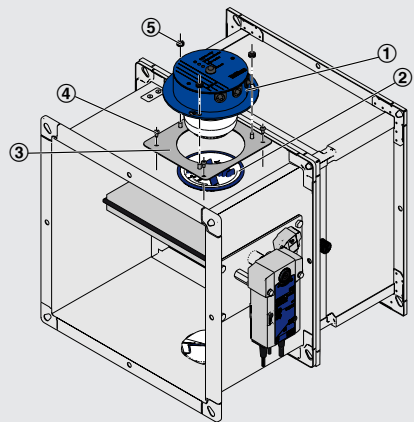
Older FK-K90 and FK-EU fire dampers may have an inspection access panel made of metal.

In this case you can remove the inspection access panel and install the duct smoke detector with washers and wing nuts in the fire damper (no adapter required).

Installation location based on height H



Installation in FK-EU



- ① RM-O-3-D duct smoke detector
- ② Inspection access panel (plastic) of the fire damper
- ③ Adapter RM-O-3-D, order no.
Galvanised: A00000043410
Stainless steel: A00000043411
- ④ Self-tapping screws (4 screws)
- ⑤ Knurled nuts (3 nuts)

6 Einbau

Installation into a duct or an extension piece

Proceed as follows to install the RM-O-3-D duct smoke detector:



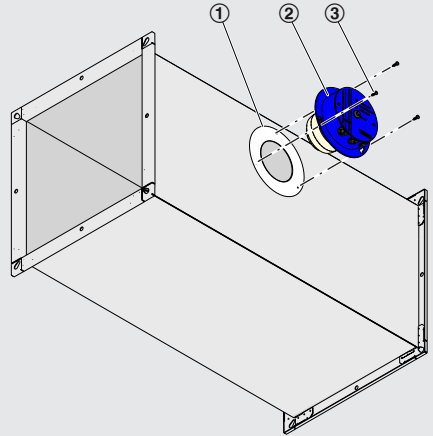
Note

The sensor head has to be permanently in the airflow as otherwise its function will be impaired. Consequently:

- 1.5 x H minimum distance between duct smoke detector and any bend, control unit or other obstacle.
- Place the duct smoke detector in the upper third of the duct (not near a corner).

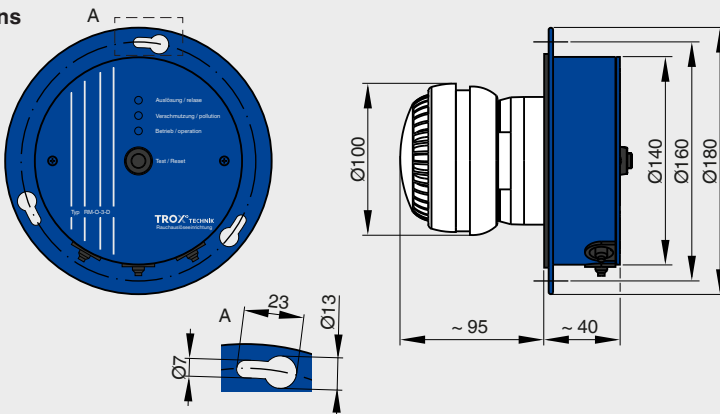
1. Decide upon an installation location and affix the sticker ①.
2. Create an opening for the sensor head of the duct smoke detector.
3. Drill holes for the self-tapping screws.
4. Insert RM-O-3-D ② into the opening and fix it with 3 self-tapping screws ③.
5. Connect the fire damper electrically to the duct smoke detector, siehe „Elektrische Installation“ auf Seite 10.

Duct installation



- ① Sticker
- ② RM-O-3-D duct smoke detector
- ③ Self-tapping screws (3 screws), by others

Dimensions



7 Electrical installation



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.

Be sure to comply with the guidelines of your national association for electrical and electronic technology as well as with the regulations of the local power utility for any wiring job.

Be sure to comply with any applicable national or local regulations, in particular the guideline regarding fire protection requirements on ventilation systems.

Supply voltage 230 V AC

Terminal strip L1, terminal L1 / N / PE

Make the connection according to the wiring example (see figure).

Wire clamping bracket by others.

Supply voltage 24 V DC

Terminal strip L4, terminal + / -

Make the connection according to the wiring example on Seite 11.

Connection of a 24 V DC voltage source requires the optional type VWM PCB (order no. M516EJ4) as only that PCB will release a damper if there are unusual voltage fluctuations. Wire clamping bracket by others.

Connecting a fire damper or smoke protection damper

Terminal strip L2, terminal 3 / 4

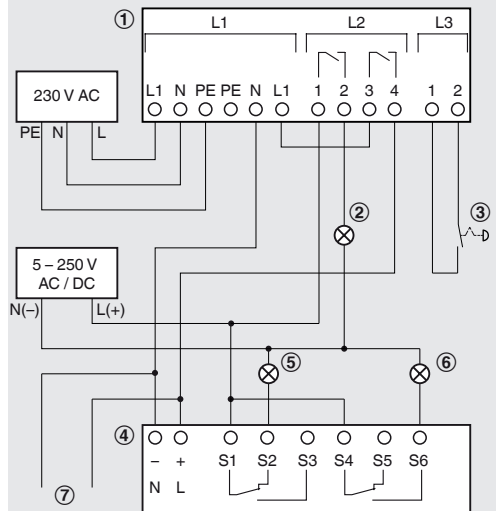
You can connect several fire dampers or smoke protection dampers in parallel as long as the acceptable switch rating (see Seite 7) is not exceeded.

Connecting a fan

Terminal strip L2, terminal 3 / 4

You can also have the duct smoke detector switch of the fan as long as the acceptable switch rating (see Seite 7) is not exceeded. Higher switch ratings require auxiliary relays.

230 V AC supply voltage



Connecting a contamination indicator

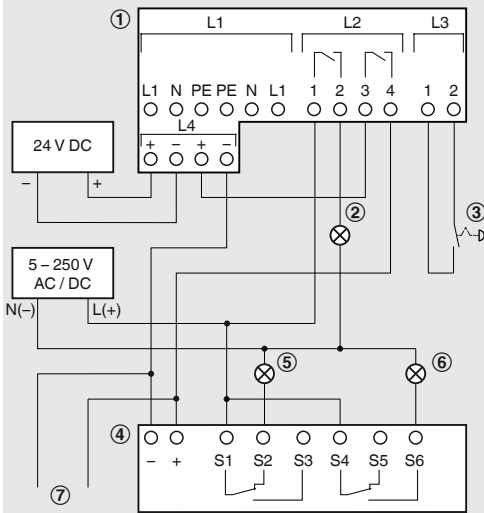
Terminal strip L2, terminals 1 – 2

It is possible to connect relays or indicator lights and to signal to the fire alarm system as long as the acceptable switch rating (see Seite 7) is not exceeded.

Connecting an external reset push button

Terminal strip L3, terminals 1 and 2

24 V DC supply voltage



- ① RM-O-3-D duct smoke detector
- ② External contamination indicator (by others)
- ③ External test/reset push button
- ④ Fire damper/smoke protection damper release mechanism
- ⑤ Indication of CLOSED damper blade
- ⑥ Indication of OPEN damper blade
- ⑦ Additional release mechanism or fan

A functional test should be carried out before commissioning, then every 12 months and after any modification, e.g. repair.

Without smoke

Press the test/reset push button on the duct smoke detector or in the engineering room (option).

The voltage supply to the smoke detector which is attached to the fire damper or smoke protection damper is interrupted, and the damper closes as a consequence.

Once the push button has been released, the damper OPENS, either by means of a spring return actuator or a pneumatic actuator.



Note

Fire dampers whose release mechanism includes electromagnets can be opened manually.

With smoke

Spray test gas into the duct through the opening right next to the duct smoke detector

If the threshold value is exceeded, the voltage supply to the duct smoke detector which is attached to the fire damper or smoke protection damper is interrupted, and the damper closes as a consequence.

To reopen the damper after the sensor head has become free of smoke, press the test/reset push button on the duct smoke detector.

Once the push button has been released, the damper OPENS, either by means of a spring return actuator or a pneumatic actuator.



Note

Fire dampers whose release mechanism includes electromagnets can be opened manually.

All operating, warning and alarm functions are described on page 4.



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.

Regular care and maintenance ensure operational readiness, functional reliability and long service life of the duct smoke detector.

Maintenance must comply with EN 13306 and DIN 31051.

The system owner is responsible for maintenance. The system owner is responsible for creating a maintenance plan, for defining the maintenance goals, and for the functional reliability of the equipment.

Maintenance

The sensor head has to be replaced after 8 years max. (→ DIN 14675).

All the other parts of the RM-O-3-D duct smoke detector are not subject to wear and hence maintenance-free.

Inspection

Duct smoke detectors must be inspected before commissioning and after any modification.

After that, the functional reliability of the duct smoke detector has to be examined with a test gas or smoke at least every 12 months. Local requirements and building regulations must be complied with.

The test of every duct smoke detector must be documented and evaluated. If the requirements are not fully met, suitable remedial action must be taken.

Repair

For safety reasons, repair work must only be carried out by expert qualified personnel or the manufacturer. Only original replacement parts are to be used. A functional test is required after any repair, see "Functional test/commissioning" on page 11.



Danger!

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

- Do not open the casing for cleaning.
- Do not use any liquids near the duct smoke detector.

If the contamination is > 70% (yellow LED is illuminated) the duct smoke detector should be cleaned.

- Clean it with compressed air that is free from oil or water. Should this not suffice, the sensor head has to be replaced (order no. M536HC7).
- Remove contamination from the mesh filter on the air inlets.

Removing the sensor head

- Remove the duct smoke detector ① from the duct.
- Turn the sensor head ② anti-clockwise until it is released.
- Remove the sensor head from the base ③.

Fitting the sensor head

- Place the sensor head ② on the base ③.
- Turn the sensor head on the base to engage it with the base.
- Turn the sensor head clockwise until it clicks into place (you should hear this).



Note

A functional test is required when the sensor head has been replaced.

