HEKATRON

Installation Instructions

Ventilation-Duct Smoke Switch System LRS 01 Basic

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Introduction

Figure 01

The **LRS 01** consists of a **ventilation duct socket LKS 02** and an **ORS 210 optical Smoke Switch with alarm latching**. It is used for monitoring smoke in ventilation ducts.

The LKS 02 provides a mounting for Smoke Switch ORS 210 and is fitted on the outside of a ventilation duct. The LRS 01 is intended for use inside buildings.

1. Project planning

The socket LKS 02 is designed for use on rectangular ventilation ducts with dimension “a” from 0.15 m to 1.0 m. It can also be used on circular ducts from 0.2 m to 1.0 m in diameter. The lateral reach of the inlet tube into a duct is ca. 500 mm. The ventilation duct socket must be placed so that reliable smoke detection can be assumed. Disruptive factors, which could affect reliable operation of the LRS 01 must be eliminated.

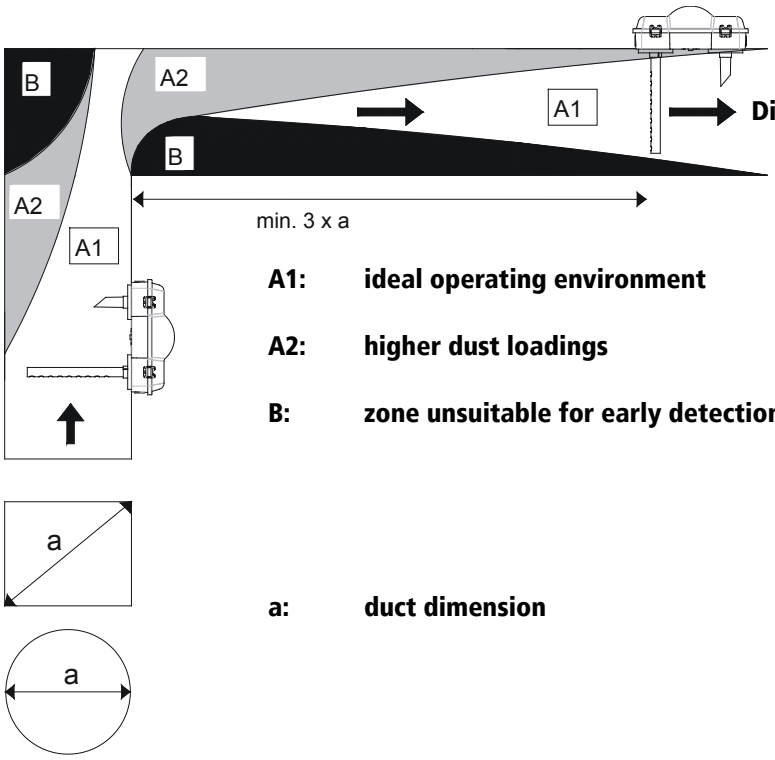


Figure 02

Figure 02 provides recommendations for project planning. To ensure reliable smoke detection, in large ducts several LRS 01 Smoke Switches should be installed. The airflow parameters must be taken into account when determining their positions.

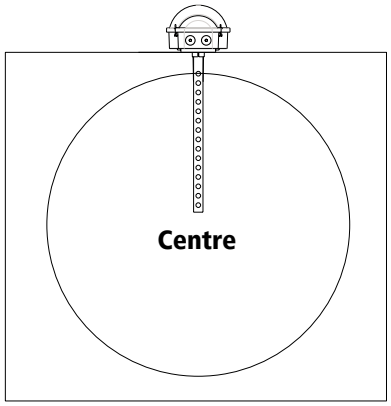


Figure 03

2 Technical data

Housing LKS 02

Field of application	ventilation ducts
Min. air speed	1 m/s
Max. air speed	20 m/s
Temperature range	see Smoke Switch ORS 210
Degree of protection	IP 54 (on duct surface)
Colour	blue / transparent
Material	PC / aluminium tube
Installation	on a ventilation duct
Openings	2 x Ø 28-30 mm at 150 mm pitch centres for mounting in housing 2 x max. 6 dia. at 206 mm pitch centres
Cable entries	4 x Ø6-10 mm
Dimensions without tube	L 25 cm x B 13.5 cm x H 10 cm
Weight without tube	ca. 350 g

The temperature range of the socket LKS 02 and Smoke Switch ORS 210 combination is determined by the technical data of the Smoke Switch.

Temperature range:	- 20 °C to + 75 °C
Permissible rel. humidity:	up to 95 % RH (dewing and steam condensation can cause false alarms)

Smoke Switch ORS 210

Operating principle	light-scattering
Reaction thresholds	to construction and testing rules for smoke-triggered installations (12/76)
Operating voltage	18 to 28 V DC
Current draw at 28 V DC	
quiescent	22 mA
in alarm	11 mA
in fault	16 mA
Relay contacts with latching alarms	
switchable voltage, max.	30 V DC
switchable current, max.	1 A
switchable power, max.	30 W
Degree of protection	IP 40
Operating ambient temperature	-20°C to +75 °C
Weight	120 g

The ORS 210 has latching alarm functions. Following an alarm , the relay (contacts 4 and 5) remains open until the supply voltage is briefly interrupted.

3 General information

3.1 Operation of the LRS 01

When it is in operation, the Smoke Switch ORS 210 (in conjunction with socket LKS 02) is continuously exposed to the flow of air in the ventilation duct being monitored. When it detects smoke particles, an alarm is triggered and held. The safety equipment is activated. Resetting is carried out by briefly interrupting the power supply when the duct is free of smoke.

3.2 Transport, storage and unpacking

The LRS 01 is supplied in a suitable carton package. This package can be recycled.

Please note the properties of the package!

The carton in which the LRS 01 is packed complies with minimal package requirements, and can support up to 10-times its own weight when stacked. The package is only to a limited extent suitable for transport by post or rail. For transport in tropical zones, transport by sea etc., special packages are available. For further information, please contact the manufacturer.

Do not open the package until the Smoke Switch is to be installed. Keep the installation instructions for future reference.

3.3 Scope of supply

- Housing with transparent cover
- Inlet tube: 415 mm long - total length of standard version
  length in duct = 345 mm
- Flow adapter for ORS 210
- Plugs and gaskets
- Installation instructions
- Packaging and markings
- M 16 x 1.5 duct connection
- M 16 x 1.5 locknut
- Mounting screws
- Optical Smoke Switch ORS 210

4 Rules and regulations

The requirements of § 3 and § 17 of the MBO (Musterbauordnung = Specimen Construction Code) apply to fire protection in ventilation equipment. These paragraphs are incorporated into the local regulations issued by the States of the German Federal Republic. Rules and regulations of the country in which the equipment is installed must be observed.

Extract:
„Buildings and their equipment must be constructed so that measures are incorporated to prevent outbreaks of fire and restrict the spread of fire and smoke, and so that, in the event of a fire, the rescue of people and animals and effective fire-extinguishing operations are possible.“

As a matter of principle, if a product simultaneously falls within the scope of other directives, all directives will be applied in parallel so that the special requirements of all directives can be fulfilled.

5 Installation instructions

5.1 Mounting the LKS 02

If the inside diameter of the ventilation duct is less than 350 mm, the inlet tube must be shortened to suit. The inlet tube can be sawn off to the required length.

To ensure reliable smoke detection, at least five of the holes in the tube must be inside the ventilation duct (see Figure 04).

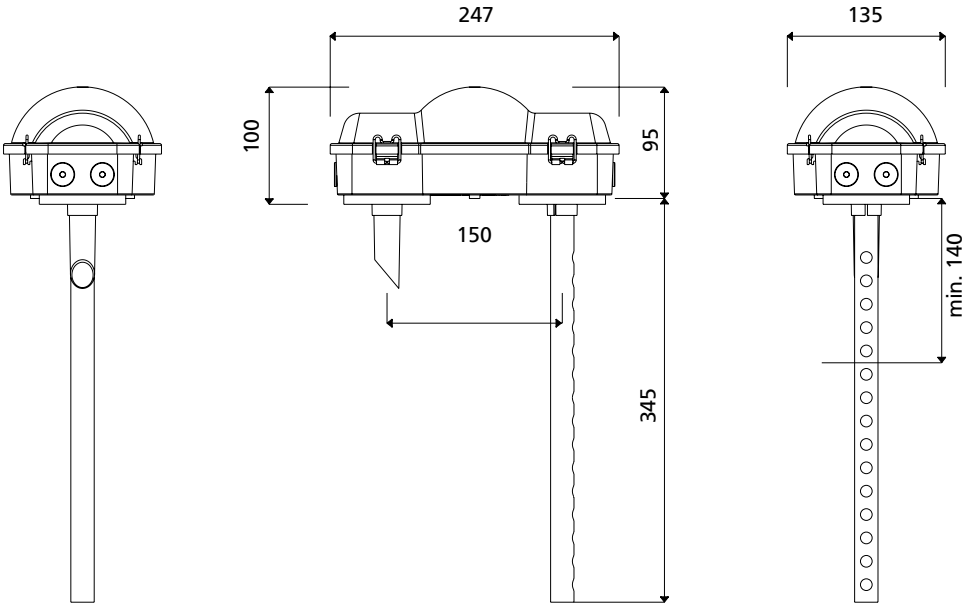


Figure 04

The tube must not be bent and it must be cut cleanly at right-angles.

When choosing a place to mount the LKS 02, take care that there is enough space to change the inlet tube. If the inlet tube has not been shortened, a space of at least 470 mm is required outside the duct.

The LKS 02 must be mounted on the duct using suitable fasteners, aligned with the direction of flow, and sealed with rubber gaskets.

Ensure that the place where the socket LKS 02 is installed is, as far as possible, free of vibration.

Make sure that the direction in which the socket LKS 02 is installed corresponds to the direction of airflow in the duct. To help with this, the LKS 02 has arrows on its base showing the direction of flow (see Figure 05).

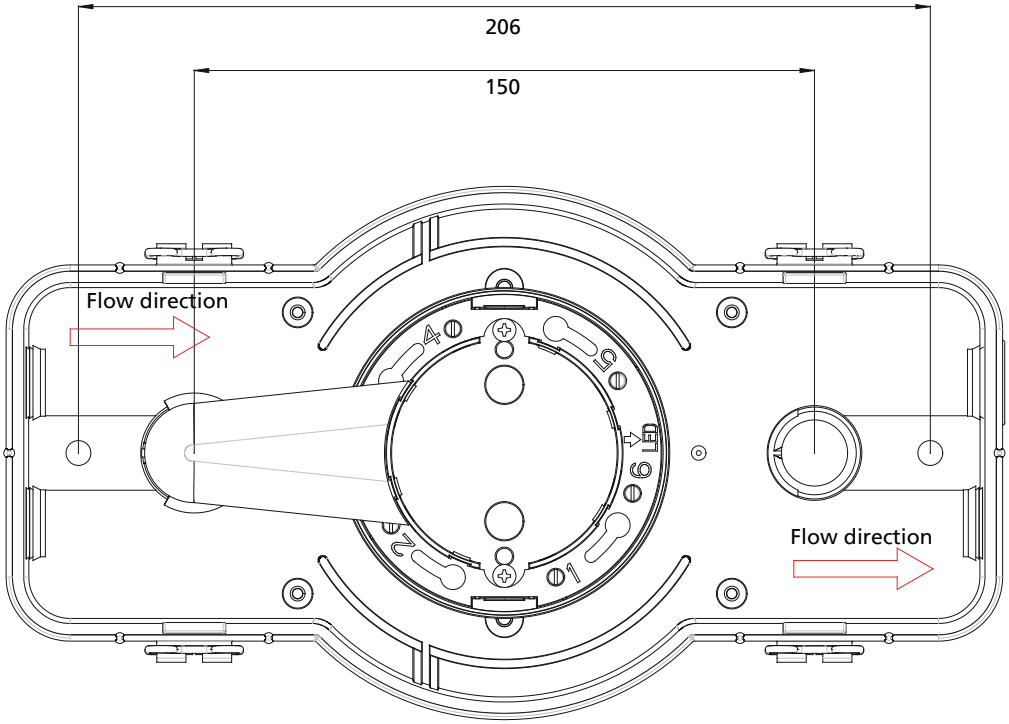


Figure 05

Warning!

When mounting the LKS 02 socket, it is important to ensure that the airflow direction is correct, and that the socket is properly sealed.

If the self-drilling screws (4.8 x 22) supplied are not suitable for fastening the socket to the ventilation duct, use other more suitable fasteners. There are two holes 6 mm diameter spaced at 206 mm in the base of the LKS 02 for mounting it.
Two larger holes for the inlet and outlet tubes must also be drilled in the ventilation duct (see Figure 06).

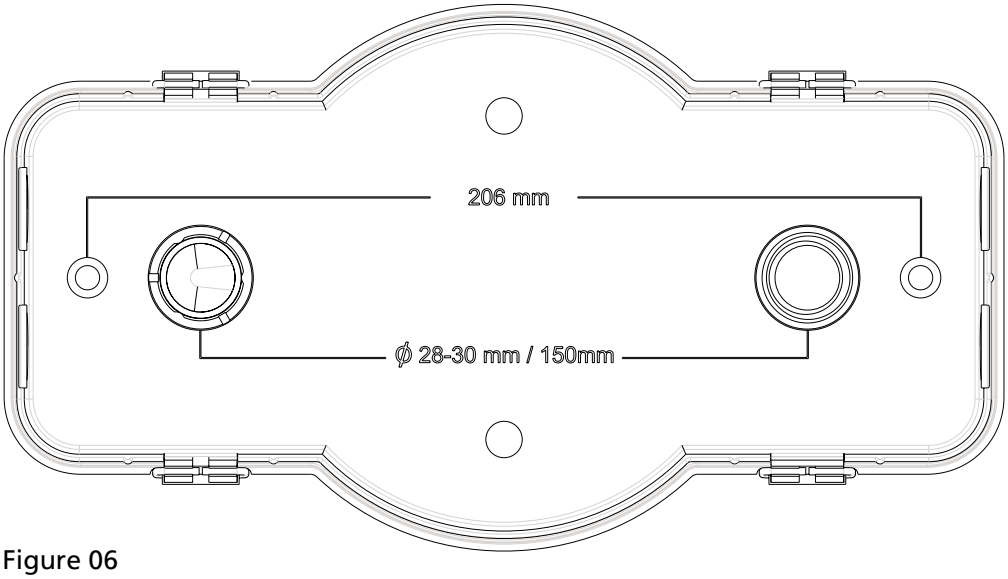


Figure 06

Opening the LKS 02 cover

For servicing, the LKS 02 has quick-action clips. By pressing gently on the housing cover, it is easier to open or close the clips. If the LKS 02 socket is mounted inverted, take care, when opening the transparent cover, that parts do not fall on the floor (cover, suction tube etc.).

Handling

The connection lead for the Smoke Switch ORS 210 must be passed through the plug supplied into the housing and connected.
The Smoke Switch ORS 210 is screwed into the socket LKS 02.
Then the inlet tube with flow adapter is fitted.
After a positive functional check with test gas, the cover of the LKS 02 can be fitted by pressing gently on it and closing the clips.

Display of Smoke Switch ORS 210

The display of Smoke Switch ORS 210 is visible through the transparent cover of the LKS 02 housing.

Application limits

This Smoke Switch should not be used where quantities of dust, smoke, moisture or steam are to be expected from plant operations. Make sure that the Smoke Switch will not be subject to dew formation. TheLRS 01 must not be used out of doors. These instructions must be taken into account when planning the installation.

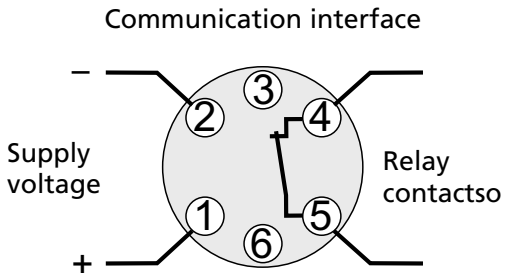
5.2 Electrical connection of the ORS 210

At the cable gland and fastening, there must be no leakage to the ventilation duct. When connecting or changing the socket, ensure that it is correctly orientated to the direction of flow. In the LKS 02, the LED of the ORS 210 and the arrow in the socket point towards the outlet tube. The LRS 01 can only operate correctly when the cover is properly closed.

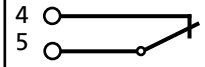
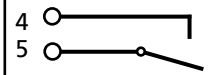
For cable entry, 4 x M16 plugs are fitted. When properly used, they comply with the requirements of IP 54 within their 6 – 10 mm sealing range.
The sealing plugs can be replaced/supplemented by 16 x 1.5 cable glands with M16 x 1.5 locknuts.

Terminal assignment in socket of LKS 02

Terminal 1	24 V DC
Terminal 2	0 V DC
Terminal 3	Option (communication/RS BUS)
Terminal 4 and 5	Potential-free NC
Terminal 6	free



Operating positions of relay contacts

	Operating status - slight contamination
	- heavy contamination - no power - fault - alarm

Electrical installation

The electrical installation must comply with VDE regulations.

Safety instruction
Electrical connection is only to be carried out by a qualified electrician or by a person suitably instructed in electrotechnical matters.

Mains connection

The power supply must be switched off before carrying out any work on the mains unit!

The power supplies recommended for the Smoke Switch are NG 519 and NAG 03.
The installation can be operated by hand using the manual triggering unit DKT 02. At the same time, there is a permanent display of the operating status of the installation.

Replacement/fault correction

Before fitting the Smoke Switch, before replacing a warning device, and before trying to correct a fault (broken wire and/or short circuit), the mains power supply must be switched off.

Cable installation

For low voltages, all normal, commercially-available telecommunications cable, with or without screening, can be used. The conductor cross-sections must be chosen to suit the current required by connected equipment and the installed lengths:

Conductor diameter:	min. 0.6 mm to max. 1.4 mm
Cable diameter:	max. 9 mm
Recommended cable type:	IY(ST)Y 4 x 2 x 0.6 mm

Only conductors with the same diameter may be connected at a terminal.
Cables must be installed so that they have adequate strain relief.

Contact loading

The electrical limits for loads on the relay contacts (30 V DC/1 A) must not be exceeded - not even for short periods. Appropriate measures must be adopted to protect the contacts.

Warning!

Safety-relevant switching-off and control of the installation must be carried out using the relay contacts of Smoke Switch ORS 210. Status information, transmitted via the communication interface (terminal 3), is purely for ease of operation and information

6 Commissioning

Before commissioning the Smoke Switch in a ventilation system, the air ducts and the LKS 02 must be cleaned carefully. Only then should the Smoke Switch be removed from its packing and fitted to the LKS 02 socket.

6.1 Functional testing

Testing must comprise at least the following points:

The interaction of all items of equipment and their technical condition must be checked. A check must be carried out to ensure that the detection parameter (smoke) to which the optical Smoke Switch should react, can reach it. For functional testing of the Smoke Switch ORS 210, test aerosol 918/5 must be used. Test aerosol 918/5 is free of halogenated hydrocarbons (CFCs etc.). If a Smoke Switch does not react when so tested, then it must be replaced. The inlet tube must be free of any obstructions.

Warning!

The warnings and safety instructions on the aerosol can must be observed without fail.

These tests and maintenance must only be carried out by a specialist or a person trained to do so. The tests and their results are to be recorded in a logbook.

6.2 Display of operating status of the ORS 210

Signal, frequency	Colour of LED	Meaning
———	green	Operating status
⊓⊓⊓	green/yellow	Slight contamination
⊓⊓⊓⊓	green/yellow	Heavy contamination
———	yellow	Fault
———	red	Alarm
	„Off“	No power

7 Maintenance instructions

Hekatron Smoke Switches are to be maintained in accordance with VDE 0833 Part 1 taking into account special ambient operating conditions. We recommend that Smoke Switches are serviced in our works when they have been in operation for 8 years. Under special ambient operating conditions (e.g. excessive exposure, external influences, contamination etc.), servicing in our works may be needed after a shorter period

By observing basic maintenance measures according to DIN 31051 in conjunction with DIN EN 13306, the LRS 01 system should be kept permanently ready for operation; it should be serviced annually as specified by the manufacturer.

Test aerosol 918/5 from HEKATRON is to be used for functional testing of Smoke Switch ORS 210.

The interaction of all items of equipment and their technical condition must be checked.

The inlet tube must be inspected visually at regular intervals. Any deposits found must be removed. For visual inspection, the inlet tube must be removed from the LKS 02 socket. After visual inspection and cleaning, the inlet tube must be correctly replaced.

The Smoke Switch must not be opened!

8 Ordering data

Description	Order No.
LRS 01	5000605
Replacement Smoke Switch ORS 210	5000614.0201
Cable gland, M16 x 1.5	3610370
Locknut M16 x 1.5	3610371
Replacement socket 143 A	5000350
Mains unit NG 519	5400080
Mains unit NAG 03	5400081
Signal, display and operating unit SAB 04	4400043
NG 519 with SAB 04	5400083
NAG 03 with SAB 04	5400084
Push-button DKT 02, grey	6200118
Push-button DKT 02, yellow	6200107
Test aerosol 918/5	6900331

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