Manuals+ — User Manuals Simplified.

WILDEBOER OR4 basic Smoke Release Device User Manual

Contents

WILDEBOER OR4 basic Smoke Release Device

Product range:
Areas of application for smoke detectors

|	Smoke detector As per DIN EN 54-27 with VdS approval		Smoke detectors As per DIN EN 54-27 with VdS and DIBt (German Institute for Construction Engineering) approval		
	RL4 basic	RL4 pro	OR4 basic	OR4 pro	OR32
Area of application					

• For detection of smoke in ventilation ducts • For activation of fans	X	X	X	X	X
For activation and release of fire dampers and smoke protection dampers for ventilation ducts			X	X	X
For activation and release of fire dampers and smoke protection dampers for air transfer applications					X
For use in particularly cramped installation scenarios					X
You will find further information on out product website. Use the QR code to open the link.					

Application

OR4 smoke detector
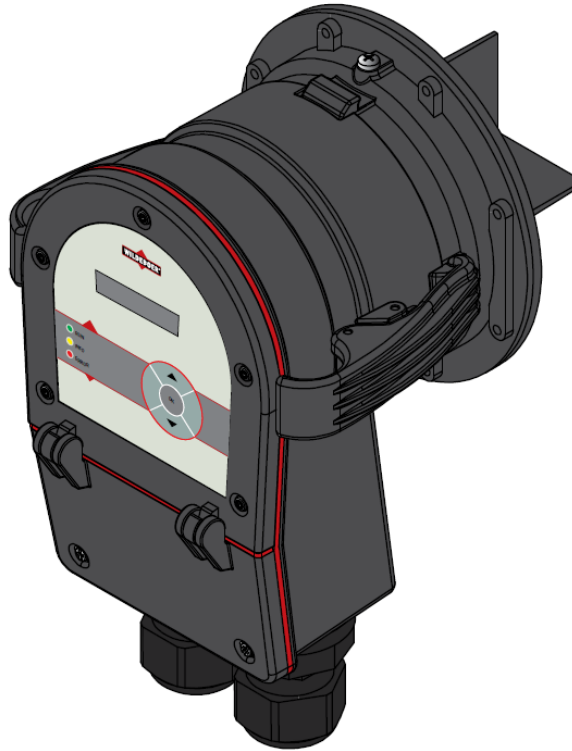
- For detection of smoke in round and rectangular ventilation ducts
- For activation and tripping of fire dampers and smoke protection dampers
- For activation of fans
- For transmission of signals to fire detection systems or the building management system
- VdS approval (G221008)
- DIBt approval (Z-78.6-205)

Installation option
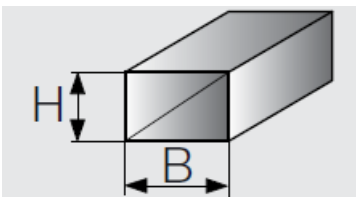
- Ventilation ducts, rectangular (B x H): ≥ 100 x 100 mm

  Distance from disruption points:

  1.5 x hydraulic Ø, upstream and downstream

- Ventilation ducts, circular (Ø): ≥ DN100

  Distance from disruption points:

  1.5 x hydraulic Ø, upstream and downstream

- Installation not dependent on position or direction of air flow

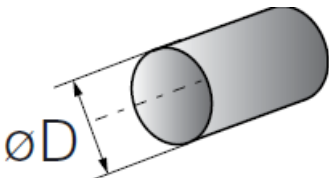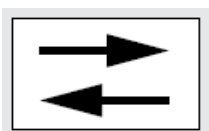| Area of application	
Voltage supply	230 V AC or 24 V AC/DC*
Min./max. flow velocity	1 … 20 m/s
Min./max. temperature for operation, transportation, storage, environment	-20 … +60 °C
Max. relative humidity	95 %, non-condensing

* Any CE certified power supply unit (SELV) can be used for the 24 V AC/DC voltage supply.

Product features

- Quick release fastener for quick accessibility and functional test without use of tools
- Integrated flow monitoring
- Enclosed casing for electronics
- Replaceable protective screen for protection from soiling
- RM4 smoke switch with automatic tracking of the response threshold for longer service life
- LEDs + LCD display screen for visualisation of operating statuses, soiling and setting operating parameters.
- TEST locally or using the GLT interface
- Cable glands with strain relief for up to 7 connection lines
- Spring terminals for maintenance-free connection of all lines
- Galvanically isolated inputs and outputs
- Galvanically isolated RS485 interface with BACnet MS/TP and Modbus RTU
- Alarms and faults saved in case of power failure

| Interfaces/protocols	
Alarm relay	2 x changeover contact
Inputs	2 x galvanically isolated - Test/reset - Activate flow sensor
Outputs	6 x galvanically isolated - Warning - Alarm/fault - Flow present - Ready for operation - 70 … 99 % level of soiling - 100 % level of soiling
RS485	Galvanically isolated with BACnet MS/TP and Modbus RTU

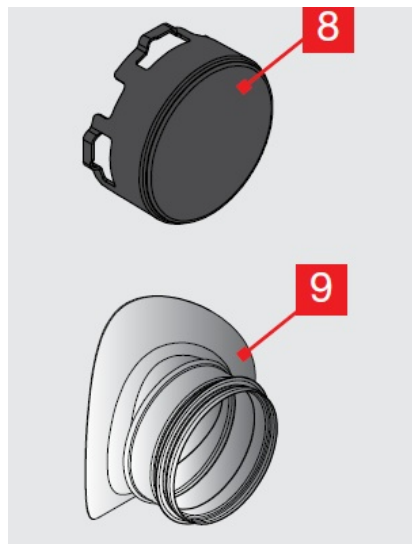## Approvals/certificates

VdS approval (G221008)

- An overview of equipment variants OR4 basic and OR4 pro can be found on Page 5.
- Refer to the installation and operating instructions for detailed information on mechanical and electrical installation.

Product overview

Illustration
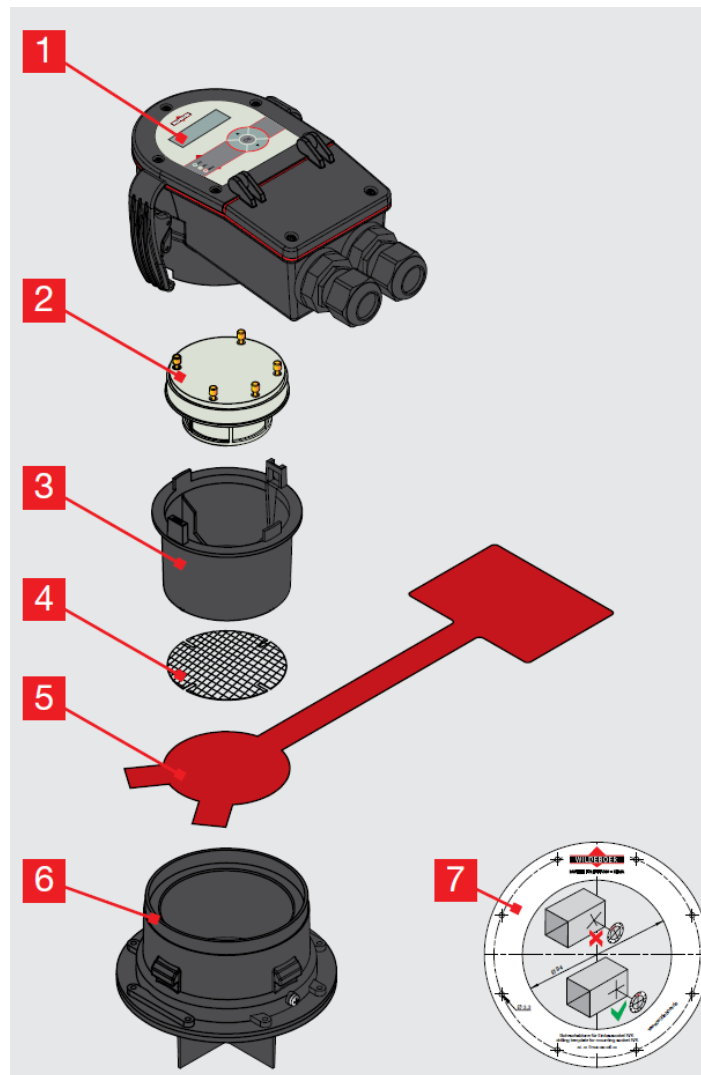
Optional:

No.: Description

1. Casing with analysis and control electronics

  - OR4 basic:

    LEDs for visualisation of operating statuses and soiling as a percentage.

    TEST/RESET button

    Galvanically isolated outputs
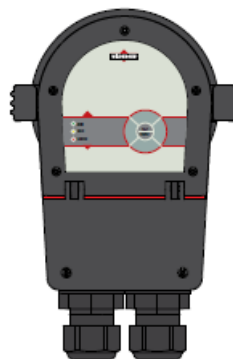
  - OR4 pro:

    LEDs + LCD display screen for visualisation of operating statuses, soiling as a percentage, and setting operating parameters.

    3 buttons for operation on the device

    Galvanically isolated inputs and outputs and RS485 interface

2. RM4 smoke switch

    For detection of smoke in ventilation ducts with automatic alarm threshold tracking for extended service life.

3. Flow insert
    - OR4 basic:

      For optimum flow-through of the smoke switch.
    - OR4 pro:

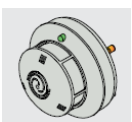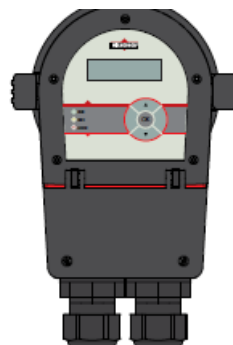   For optimum flow-through of the smoke switch with integrated flow sensor.
4. Protective screen

   For protection of the smoke switch from coarse soiling.
5. Protective film

   For protection of the smoke switch and the protective screen from soiling during the construction stage.

6. R/K installation socket

   For more straightforward installation of the smoke detection and tripping device in circular and rectangular ventilation ducts. A saddle pipe [9] is required for installation in circular ventilation ducts.
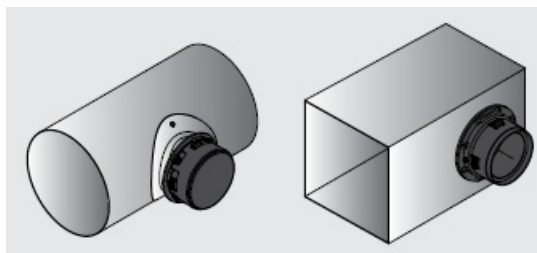
7. Drilling template

   For marking the required sections and drilled holes on required ventilation ducts.
8. Optional: Sealing cover for installation socket For sealing the installation socket when the smoke detector has not yet been installed during the construction stage.
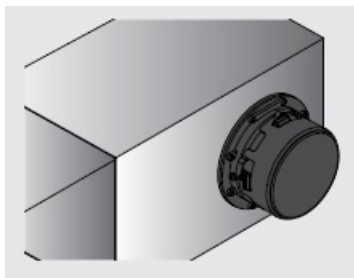
9. Optional: Saddle pipe

   For installation of the smoke detector in circular ventilation ducts.
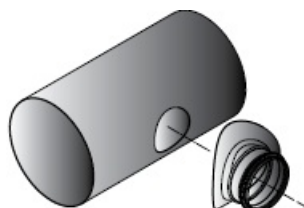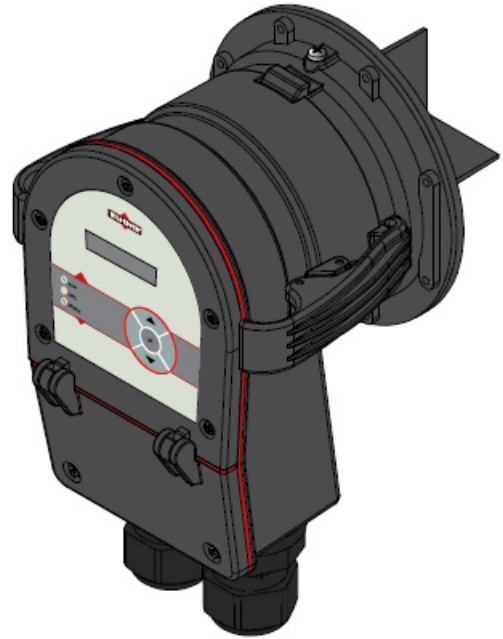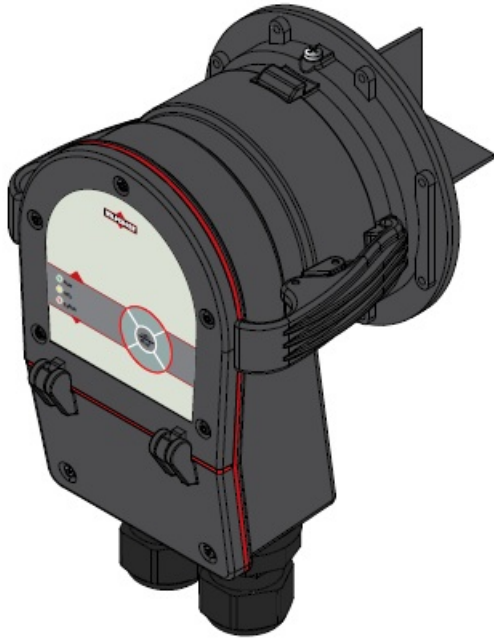
OR4 basic/OR4 pro

General information	OR4 basic	OR4 pro
Display screen	–	LCD display screen, 2 lines, backlit
Operation	1 x Reset/Test button	3 buttons for operation on the device
Flow monitoring	–	Yes
Signalling	Optical	Optical and acoustic
GLT interface RS485	OR4 basic	OR4 pro
Communication interface	–	RS485
Communication protocol	–	BACnet MS/TP, Modbus RTU
Galvanically isolated	–	Yes
GLT interface inputs	OR4 basic	OR4 pro

|		
Quantity	1 x semiconductor input for external normally open contact for Reset/Test	2 x semiconductor input for external normally open contact • for Reset/Test • for flow sensor On/Off
Specification	24 V DC (SELV), 11 mA	EN 61131-2, type 1
Signal voltage 0	–	0 … 5 V DC (SELV)
Signal voltage 1	–	15 … 30 V DC (SELV)
Galvanically isolated	–	Yes (potential group)
GLT interface outputs	OR4 basic	OR4 pro
Quantity	1 x changeover contact (relay) Soiling display at ≥ 70 %	6 x semiconductor outputs • Warning • Alarm/fault • Flow present • Ready for operation • Soiling 70 – 99 % • Soiling 100 %
Specification	–	EN 61131-2
Nominal load	–	24 V DC (SELV), max. 600 mA per output
Contact load	30 V AC/DC (SELV), 2 A	–
Galvanically isolated	Yes	Yes (potential group)
Alarm interface	OR4 basic	OR4 pro
Quantity	2 x changeover contact (relay)	

Contact load	24 V AC/DC (SELV), 250 V AC, min. 11 mA, max. 8 A
Max. bounce time, closing/ opening	4 ms / 10 ms

For further technical data.

Function
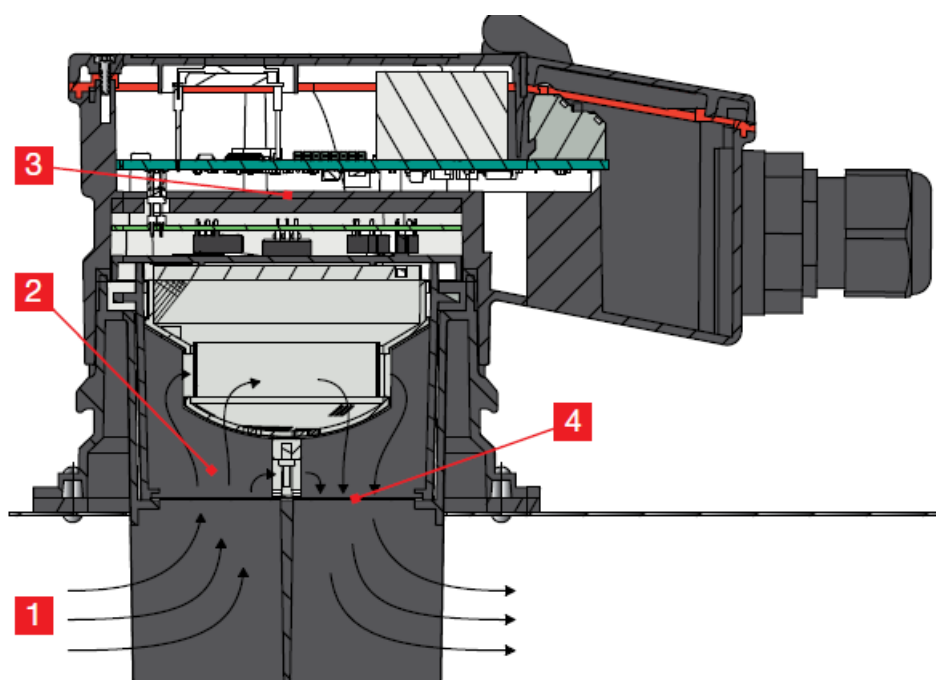
Part of the air which flows in the ventilation duct [1] is diverted into the flow chamber [2]. The separation plane [3] and the protective screen [4] protect the electronics from soiling in the process. The electronics monitor the air flow for soiling and particles. Messages can be transmitted to a fire detection system or the building management system so that, in case of smoke detection, the necessary control scenarios can be triggered in good time in order to prevent smoke from transferring to other fire compartments.
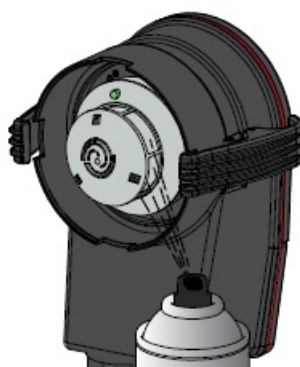
The analysis and control unit can be removed and sprayed with a test aerosol for a functional test.
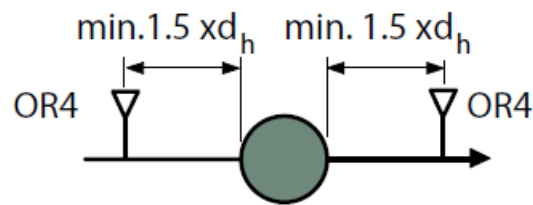
Installation

Installation details

The OR4 can be installed with any alignment in ventilation ducts regardless of the direction of air flow

(horizontally, vertically or at an angle). The continual through-flow and thus effective smoke detection must be guaranteed in the process. The corner area on rectangular ventilation ducts must not be used for installation.
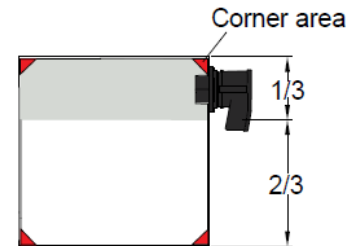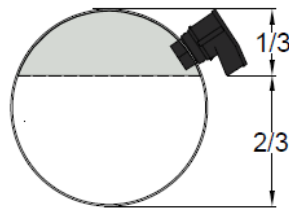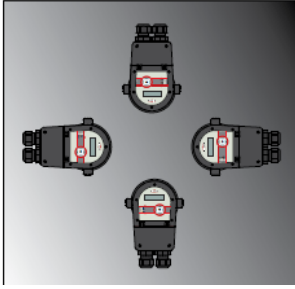
In small and medium-sized duct cross sections, installation at the top, side or bottom is possible. In large, horizontal cross sections, installation in the upper third of the ventilation duct is recommendable in the interest of early smoke detection. Installation must be performed at a sufficient distance from connection points, such as plug connections or flanges.

The gap upstream and downstream of disruption points (of all kinds) must be at least 1.5 x d h (hydraulic diameter).

Disruption point
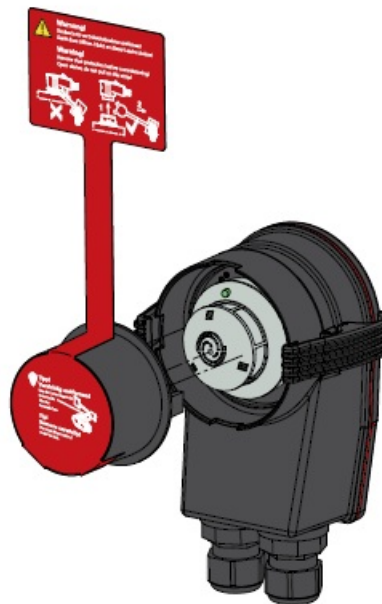
A protective film is fitted in the factory in order to protect the smoke switch and the protective screen from soiling during the construction stage. It must be removed before commissioning.

Installation in circular ventilation ducts

Installation in circular ventilation ducts is shown with the optional saddle pipe.

- Create the installation opening for the installation socket (Ø 94 … 98 mm).
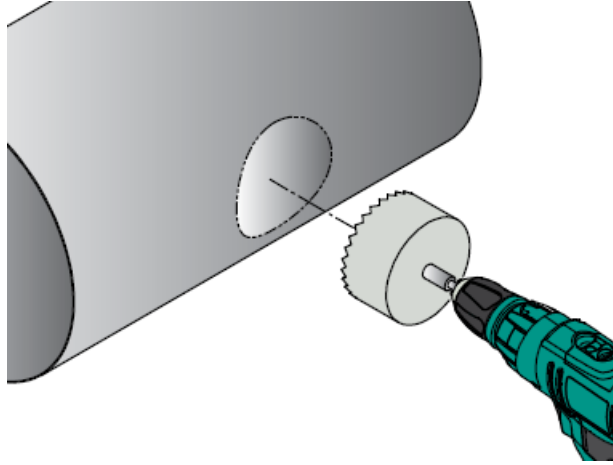
- Connect the connection socket to the saddle pipe, aligning the installation socket to the direction of the air in the process.
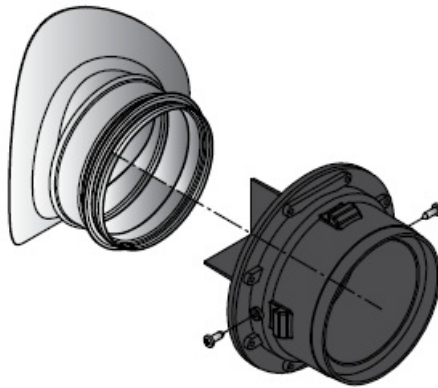
- Prick the saddle pipe slightly with the retaining screw, and pre-drill it without the installation socket (Ø 3 mm). Then, fit the installation socket again and secure it with screws.
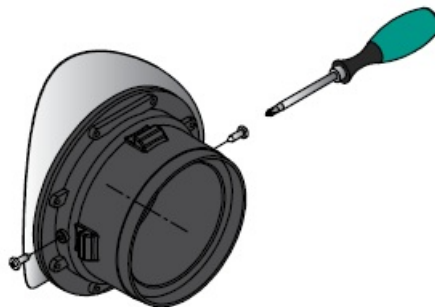
- Apply sealant (provided by the user) to the saddle socket so that it is airtight.
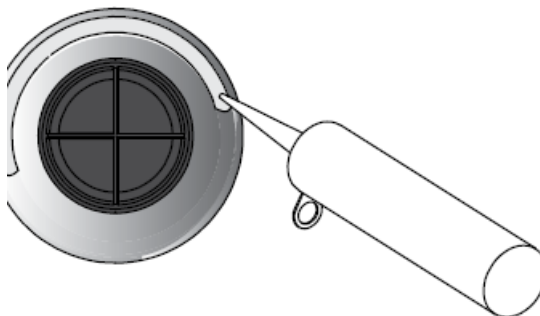
- Insert the saddle pipe into the installation opening with the installation socket.
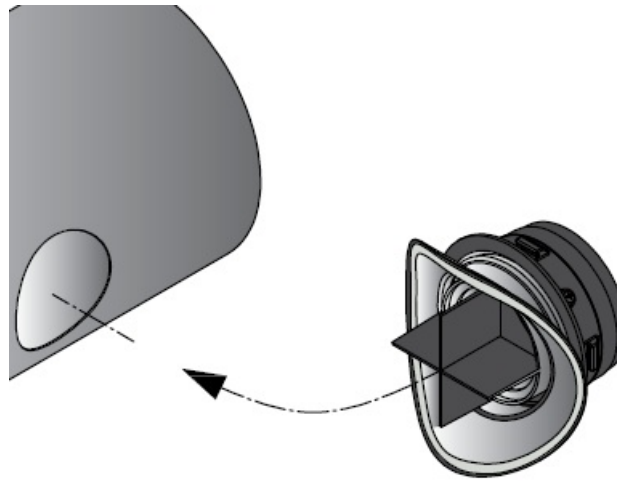
- Drill (Ø 3.3 mm) and rivet the fastening holes for the saddle socket.
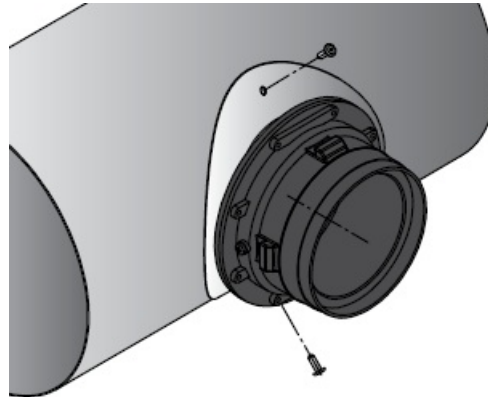
- Fasten the casing to the installation socket with the analysis and control unit.
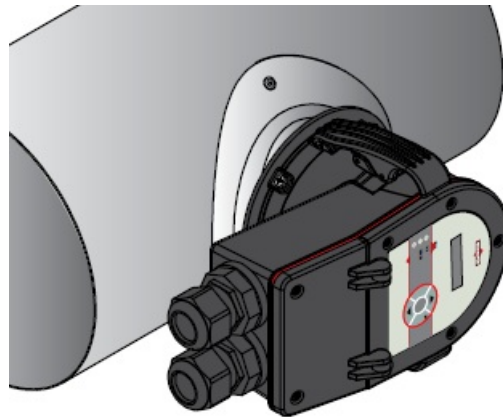
- Optional:

  A sealing cover can be used to seal the installation socket when the smoke detector has not yet been installed during the construction stage.
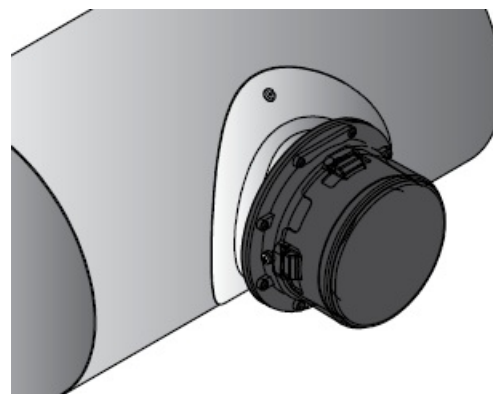
Installation in rectangular ventilation ducts

- Measure the centre point of the installation opening and stick on the drilling template.
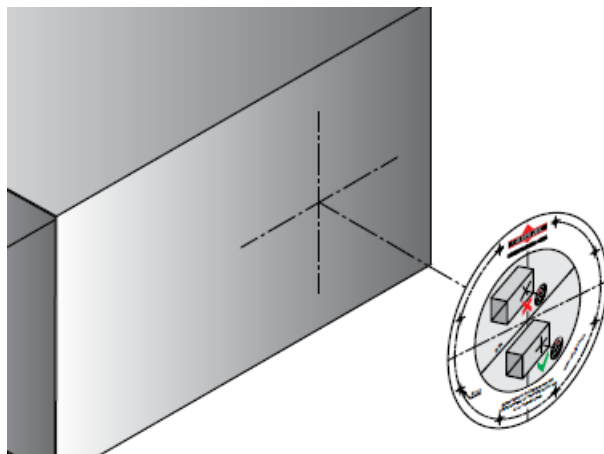
- Drill the fastening holes for installation of the installation socket (3.3 mm).
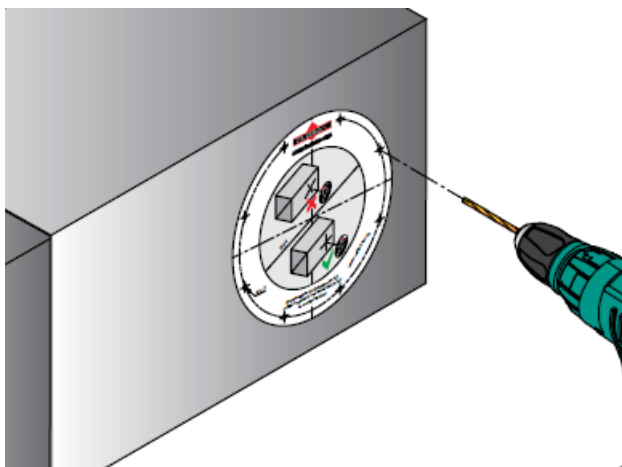
- Create the installation opening for the installation socket (Ø 94 … 98 mm).
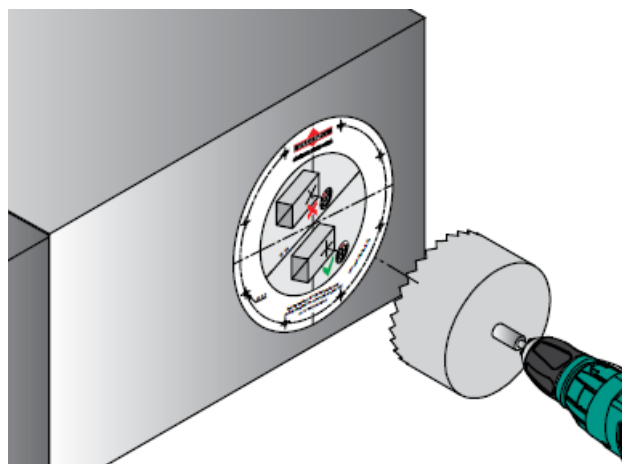
- Insert the installation socket into the installation opening and fasten it with pop rivets. In the process, align the installation socket to the direction of air.
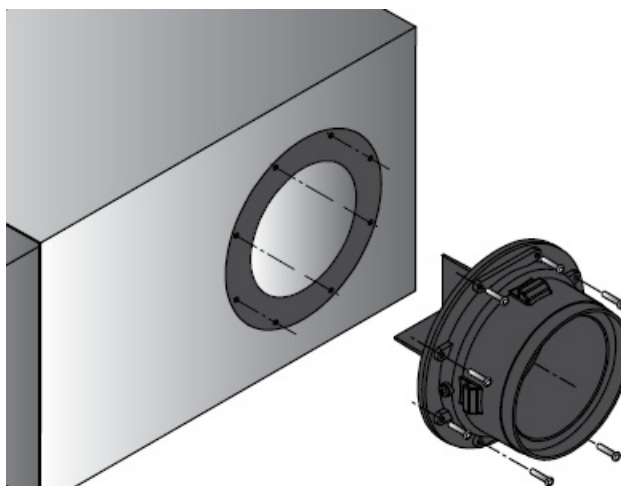
- Fasten the casing to the installation socket with the analysis and control unit.
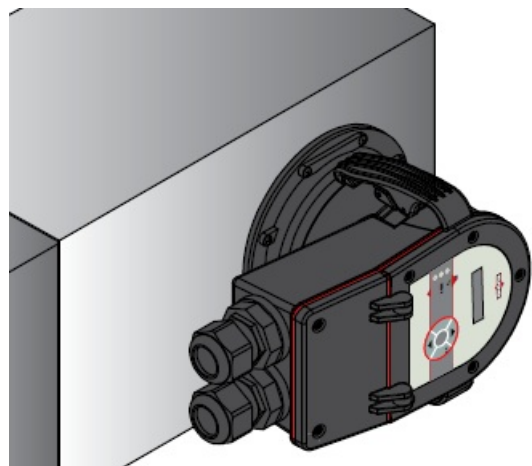
- Optional:

  A sealing cover can be used to seal the installation socket when the smoke detector has not yet been installed during the construction stage.
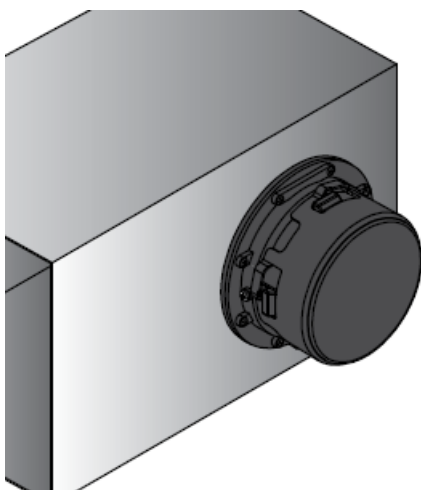
Dimensions
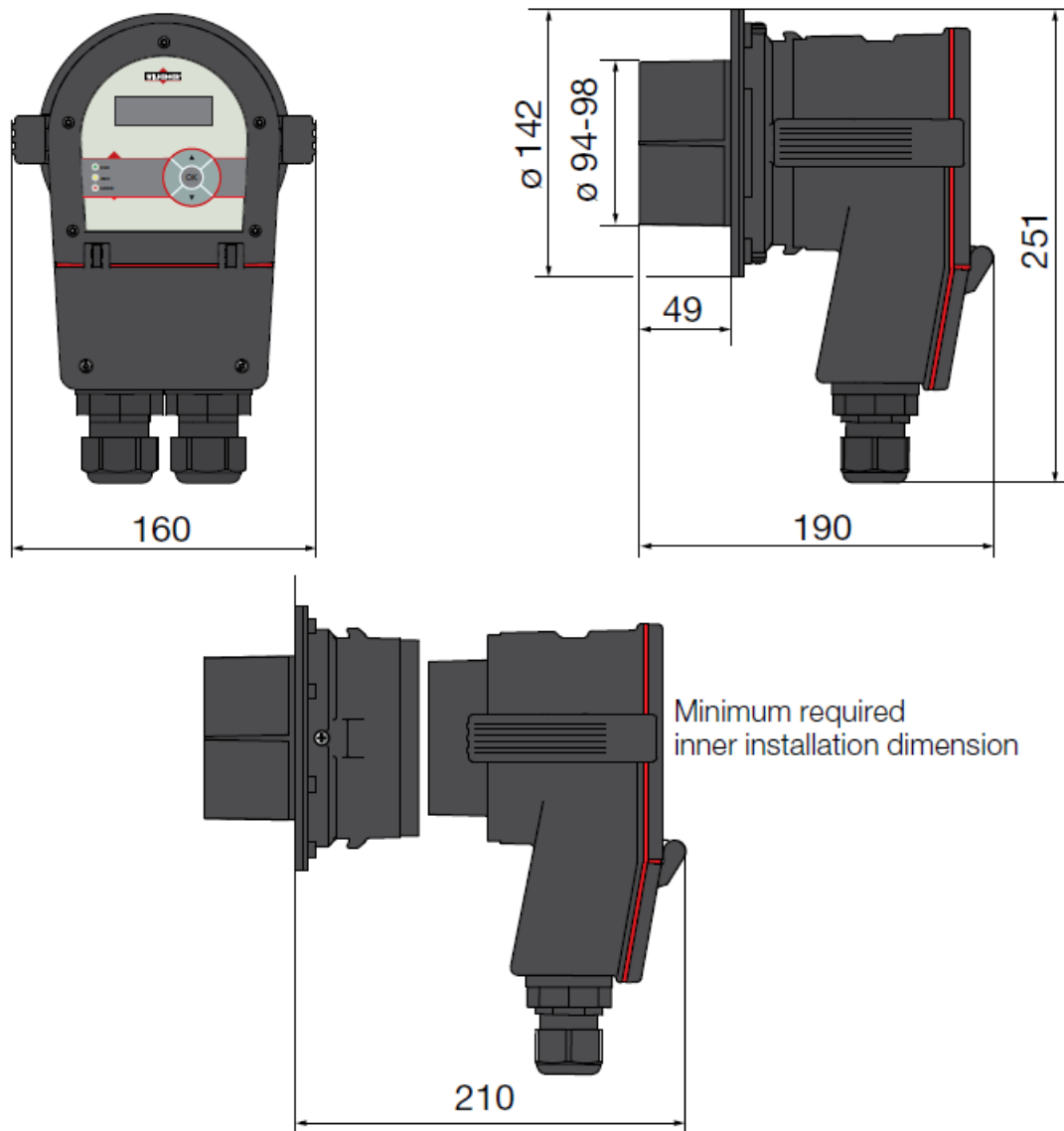
Order data
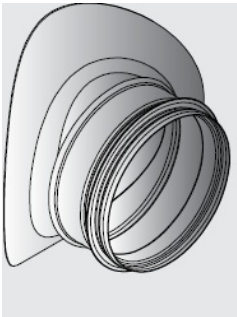
- For activation of fire dampers and smoke protection dampers for ventilation ducts
- For monitoring ventilation duct in conjunction with a fire detection system or the building management system
- For activation of fans
- Alarms and faults saved in case of power failure
- DIBt approval Z-78.6-250
- VdS approval G 221008

Equipment variant

- Optional:
    - basic OR4 basic variant
    - pro OR4 pro variant

Options

Illustration	Description	Nominal diam- eter	Order data
		DN 100	ORSTU10
		DN 125	ORSTU12
		DN 140	ORSTU14
		DN 150	ORSTU15
		DN 160	ORSTU16
		DN 180	ORSTU18
		DN 200	ORSTU20
		DN 224	ORSTU22
		DN 250	ORSTU25
	Pack: Saddle pipe	DN 280	ORSTU28
		DN 315	ORSTU31
		DN 355	ORSTU35
		DN 400	ORSTU40

		DN 450	ORSTU45
		DN 500	ORSTU50
		DN 560	ORSTU56
		DN 630	ORSTU63
		DN 710	ORSTU71
		DN 800	ORSTU80
	4 x sealing cover for installation socket	–	ZUB 0475

Spare parts

Illustration	Description	Order data
	1 x RM4 smoke switch	ZUB 0471
	20 x protective screen	ZUB 0470
	2 x R/K installation socket	ZUB 0472
	1 x flow insert with flow sensor (OR4 pro)	ZUB 0474
	1 x flow insert without flow sensor (OR4 basic)	ZUB 0473

Specification text

OR4 basic
Smoke detector with general type approval for activation and tripping of fire dampers and smoke protection dampers. Smoke detector for detection of smoke in ventilation ducts, for activation of fans and for transmitting signals to fire alarm systems or the building management system. Casing with flow insert and protective screen. Smoke switch and analysis electronics with floating relay outputs. Additional input without galvanic isolation. Smoke switch with automatic tracking of the response threshold in order to achieve a long service life. Removable without using tools for straightforward inspection and cleaning. Button for function test and for resetting after smoke detection. LEDs for visualisation of operating statuses and the soiling of the smoke switch as a percentage in multiple stages. Alarms and faults saved in case of power failure.
Suitable for installation at a short distance from disruption points (1.5 x hydraulic diameter). Installation not dependent on position or direction of air flow in rectangular ventilation ducts with an edge length of 100 mm or more and in ventilation pipes with a diameter of 100 mm or more.
….. pcs.

- Supply voltage: 230 V AC / 24 V AC/DC
- Manufacturer: WILDEBOER
- Type/series: OR4 basic
- VdS approval: G221008

OR4 pro
Smoke detector with general type approval for activation and tripping of fire dampers and smoke protection dampers. Smoke detector for detection of smoke in ventilation ducts, for activation of fans and for transmitting signals to fire alarm systems or the building management system. Casing with flow insert, protective screen and integrated flow sensor for flow monitoring. Smoke switch and analysis electronics with galvanically isolated and floating inputs and outputs. Smoke switch with automatic tracking of the response threshold in order to achieve a long service life. Removable without using tools for straightforward inspection and cleaning. Button for function test and for resetting after smoke detection. LEDs for visualisation of operating statuses and the soiling of the smoke switch as a percentage in multiple stages. LCD display screen for diagnostics, display and setting of all operating parameters. With galvanically isolated RS485 interface (protocols: BACnet, Modbus) for connection to GLT.
Suitable for installation at a short distance from disruption points (1.5 x hydraulic diameter). Installation not dependent on position or direction of air flow in rectangular ventilation ducts with an edge length of 100 mm or more and in ventilation pipes with a diameter of 100 mm or more.
….. pcs.

- Supply voltage: 230 V AC / 24 V AC/DC
- Manufacturer: WILDEBOER
- Type/series: OR4 pro
- VdS approval: G221008

Annex

Connection overview

Terminal diagram	No.	Connection description		
	1	Mains connection		
		Connection	Signal	
			OR4 basic	OR4 pro
		1, 3	L / +	
		2, 4	N / GND	
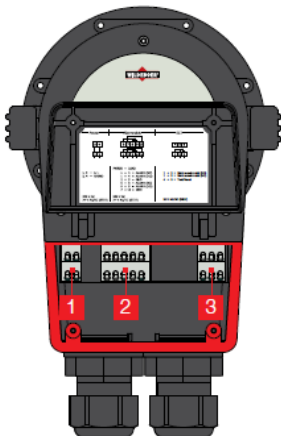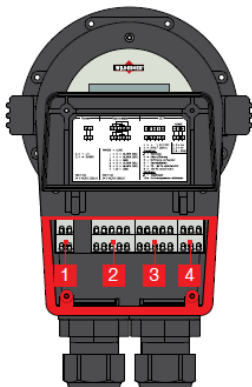
		Alarm interface		
2	Connection	Signal		
		OR4 basic		OR4 pro
	1, 6	L / +		
	2, 7	N / GND		
	3, 8	ALARM NO		
	4, 9	ALARM NC		
	5, 10	N / GND		

GLT interface

OR4 basic

OR4 pro

3

Connection	Signal	
	OR4 basic	OR4 pro
1	+	+
2	RM4 ≥ 70 % soiled NO	GND
3	RM4 < 70 % soiled NC	Warning
4	RESET < 3 sec. TEST ≥ 3 sec.	Alarm/fault
5		Flow present
6	–	Ready for operation
7	–	RM4: 70 … 99 % soiled
8	–	RM4: 100 % soiled
9		RESET < 3 sec. TEST ≥ 3 sec.
10	–	Activate flow sensor (ventilation system in operation)

GLT interface (RS485)

4	Connection	Signal	
		OR4 basic	OR4 pro
	1, 4	–	A+
	2, 5	–	B-
	3, 6	–	Shield

Technical data

Casing	
Dimensions (L x B x H)	Approx. 251 x 160 x 190 mm
Weight	Approx. 975 g
Material	ABS plastic
Connection cover tightening torque	0.3 Nm
Cable gland tightening torque	10 Nm
Retaining screws tightening torque, R/K on flanged collar	0.5 Nm

Ambient conditions	Operation/transportation/stor- age	in the air duct
Temperature	-20 … +60 °C	-20 … +60 °C
Relative humidity	95 %, non-condensing	≤ +34 °C 95 % > +34 °C max. 35 g/m³
Permissible flow range	–	1 … 20 m/s

Safety	
Protection class	Class II
Protection rating	IP 54

Mains connection		OR4 basic	OR4 pro
Voltage supply		24 V AC/DC ± 10 % / 230 V AC/DC ± 15 %	
Nominal flow	24 V AC/DC	135 mA / 100 mA	210 mA / 155 mA
	230 V AC	30 mA	40 mA
Power consumption	24 V AC/DC	P = 2.5 W / 2.4 W, S = 3.2 VA / 2.4 VA	P = 4.0 W / 3.7 W, S = 5.1 VA / 3.7 VA
	230 V AC	P = 3 W, S = 7.0 VA	P = 4.2 W, S = 8.9 VA

Alarm interface 3	OR4 basic	OR4 pro
Quantity	2 x changeover contact (relay)	
Contact load	24 V AC/DC (SELV), 250 V AC, min. 11 mA, max. 8 A	
Max. bounce time, closing/opening	4 ms / 10 ms	

GLT interface – inputs	OR4 basic	OR4 pro
Quantity	1 x input for external normally open contact	2 x semiconductor input
Specification	Semiconductor, 24 V DC (SELV), 11 mA	EN61131-2, type 1
Galvanic isolation	–	Potential group, isolated from the analysis electronics
Signal voltage 0	–	0 … 5 V DC (SELV)
Signal voltage 1	–	15 … 30 V DC (SELV)

GLT interface – outputs	OR4 basic	OR4 pro
Quantity	1 x changeover contact (relay)	6 x semiconductor outputs
Specification	–	EN61131-2
Galvanic isolation	Yes	Potential group, isolated from the analysis electronics
Nominal load	–	24 V DC (SELV), max. 600 mA per output
Contact load	30 V AC/DC (SELV), 2A	–

Certification	CE marking
DIN EN 54-27:2015-05	Directive 2014/30/EU (EMC Directive)
VdS 2344:2014-07	Directive 2014/35/EU (Voltage Limits Directive)
Principles of design and testing 1967-12 par. 4.5.1, 4.5.2	Directive 2014/65/EU (RoHs 2)

Spring terminals 1	
Permitted conductor cross section	0.5… 1.5 mm² (single-wire and extra-fine wired conductors without wire end ferrule) 0.5… 1.0 mm² (extra-fine wired conductors with wire end ferrule)
Stripping length	9 … 10 mm
Wire end ferrules (WEF) 2	Not required
Slotted screwdriver	2.5 mm blade width
Current rating	10 A per contact

1. With lever activation for connection of extrafine wired conductors and disconnection of conductors.

2. Flexible conductors can be used with wire end ferrules (WEF) as per DIN 46228 part 1 or part 4.

3. Take into account derating. See installation and operating instructions.

The technical data applies at input voltage nominal values and +24 °C ambient temperature.

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E-mail: **info@leipzig.wildeboer.de**
Internet: **www.wildeboer.de**

Documents / Resources

WILDEBOER OR4 basic Smoke Release Device [pdf] User Manual
OR4 basic Smoke Release Device, OR4 basic, Smoke Release Device, Release Device

References

- OER **Startseite - OER Einrichtung nach Maß**
- **Wildeboer Bauteile GmbH**