SIEMENS

# Cerberus® DO1131, DO1133
# Wide spectrum smoke detectors, AnalogPLUS

## Technical description

**Fire & Security Products**

Siemens Building Technologies Group

# 1 Application

Due to its balanced response sensitivity, the OptoRex **DO1131** can be used as an universal smoke detector. The DO1131 is fitted with a new, high performance opto-electronic sensor system that optimally detects light and dark smoke particles.

Thanks to its stability against environmental influences such as temperature, humidity, corrosion and electrical interference fields, the detector complies with the complex requirements for use in normal installations.

The **DO1133** is suitable for applications in air sampling smoke detection systems, which need increased sensitivity.

## 1.1 Compatibility

| | |
|---|---|
| **Fire detection system:** | S11 AlgoRex AnalogPLUS® |
| | CS1115 / CS1140 (E3M110/111) |
| **Base:** | DB1131A |

## 1.2 Application guidelines

*See application guidelines for AlgoRex® detectors, document e1225, manual DS11, section 10.*

## 1.3 Adjustment functions / sensitivity choice

On the detectors itself there are no mechanical and electrical adjustments.

- The control unit evaluates as a default the danger signal «standard sensitivity».
- Due to corresponding programming of the control unit the danger signal «increased sensitivity» can be evaluated.
- The self holding of the alarm signals is effected in the control unit until its resetting.

## 1.4 Installation

- The installation is usually executed with **twisted two-wire line** from base to base.
- Parallel leaded lines and screened cabling from prevailing installations are also allowed.
- Loop and stub lines are admissible.
- T-branches are only possible with the T-branch module DC1135.
- To a T-branch a maximum of 20 detectors can be connected.
- Maximum 128 smoke detectors OptoRex DO113x can be connected to a detection line.

*Further informations concerning installation of the bases, see mounting instructions x1243, manual DS11, section 9.*

# 2 Function / Design

## 2.1 OptoRex DO1131

The OptoRex DO1131 works on the principle of light scattering. The heart of the detector is a high-quality opto-electronic system enclosed in the measurement chamber that screens off extraneous light but optimally detects light and dark smoke particles.

The detector is installed in an impact-resistant plastic housing and is secured in the base with a vibration-proof bayonet fitting. The base does not contain any electronic components. A comprehensive range of base accessories is available for special applications such as installation in humid environments, protection against unauthorized removal, etc.

The detector is equipped with a response indicator (red LED) to indicate alarm. Each detector is equipped with a short-circuit proof output for connecting an external response indicator.

## 2.2 OptoRex DO1133

The OptoRex DO1133 has the same design and mode of operation as the DO1131. However, the DO1133 has considerably higher response sensitivity than the DO1131 and is therefore only suitable for installation in air sampling smoke detection systems. The DO1133 does not comply with EN.

## 2.3 Emergency operation

If the OptoRex DO1131 can no longer be periodically addressed, for example due to a µP failure in the control unit, nevertheless a danger signal is triggered by the evaluation electronics in the control unit interface.

## 2.4 Line disconnection function

If a short circuit occurs on the detector bus, total bus failure is prevented by disconnecting switches in each AnalogPLUS detector.

In a loop line installation the short-circuited section between two detectors will be isolated.

In the event of a short circuit the «electronic switches» (FET) open automatically and the short-circuited section between two detectors will be isolated. Because of this all detectors keep the full functioning

The FET’s reclose by acknowledging in the control unit when the short circuit is remedied.

# 3 Technical data

Normal ambient conditions, if nothing else is specified:
Temperature $T_a$ = 20°C (293K)
Air pressure p = 1'000hPa (1'000mbar)

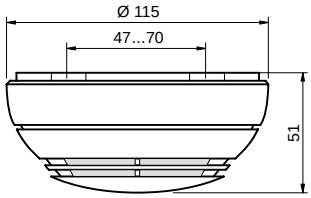
| Parameters | Symbol | Value | | | | Conditions |
|---|---|---|---|---|---|---|
| | | Unit | min. | typ. | max. | |
| Operating voltage | $U_b$ | V | 16.0 | | 28.0 | modulated |
| Operating current (quiescent condition) | $I_b$ | µA | | | 200 | FET's closed |
| Baud rate | | Bd | | 167 | | Duplex |
| Response sensitivity «standard sensitivity» DO1131<br>DO1133 | $D_1$<br>$D_1$ | %/m<br>%/m | | 3.0<br>1.1 | | smoke sensitivity with paraffin test aerosol (1m/s) |
| Response sensitivity «increased sensitivity» DO1131<br>DO1133 | $D_1$<br>$D_1$ | %/m<br>%/m | | 2.2<br>0.5 | | smoke sensitivity with paraffin test aerosol (1m/s) |
| Integration «standard/increased sensitivity» | | measurements | 3 | | | measuring interval 2.5s |
| Danger signal threshold, referring to «standard sensitivity» DO1131<br>DO1133 | $\Delta_{U3}$<br>$\Delta_{U3}$ | V<br>V | 1.4<br>0.8 | | 2.8<br>2.2 | measured with the detector test unit DZ1194 |
| Response indicator:<br>Flashing interval times: bright<br>dark<br>Response indicator current | | <br>ms<br>s<br>mA | | <br>32<br>1<br>15 | | |
| External response indicators | | pieces | | | 2 | |
| Elektromagnetic compatibility DO1131<br><br>DO1133 | | V/m<br>V/m<br>V/m<br>V/m | 50<br>30<br>30<br>30 | | | 1MHz ... 1GHz<br>1GHz ... 2GHz<br>1MHz ... 1GHz<br>1GHz ... 2GHz |
| Operating temperature DO1131<br>DO1133 | $T_a$<br>$T_a$ | °C<br>°C | –25<br>–10 | | +60<br>+60 | |
| Storage temperature | $T_l$ | °C | –30 | | +75 | |
| Humidity ≤34°C DO1131<br>>34°C DO1131<br>>34°C DO1133 | | | | | ≤95% rel.<br>≤35g/m$^3$<br>≤95% rel. | transient condensation allowed<br>no condensation |
| Connection factor | APMK | | | 1 | | |

Colour: white ~RAL9010

## Classification

| | DO1131 | DO1133 |
|---|---|---|
| **Standards** | EN 54-7 | — |
| **Application category IEC 60721-3** | 3K6 | — |
| **Test category IEC 60068-1** | 25/060/42 | — |
| **Protection category IEC 60529** | IP44 | IP44 |

## Dimensions




incl. base DB1131A

# 4 Environmental influences

## 4.1 Influence of the ambient temperature

The OptoRex DO1131/DO1133 is insensitive against temperature fluctuations within the entire operating temperature range.

## 4.2 Other influencing variables

Ambient light, air drafts and fluctuations within the specified operating voltage range have no influence on the OptoRex DO1131/DO1133.

# 5 Commissioning

To prevent unnecessary soiling during the construction phase, the detectors should be inserted into the bases just before the system is put into service.

Each detector OptoRex DO1131/DO1133 is connected in parallel to the two-wire detector bus. The address of the individual detectors is determined by the installation order, the order in which the detectors are inserted or are checked with the detector tester.

# 6 Maintenance

## 6.1 Diagnostic possibilities

A detector **DO1131** can transmit 5 events to the control unit:

– Normal condition (quiescent value)
– Function state «impairment»
– «Deviation» (slightly increased signal)
– Danger signal «increased sensitivity»
– Danger signal «standard sensitivity»

A detector **DO1133** can transmit 4 events to the control unit:

– Normal condition (quiescent value)
– Function state «impairment»
– Danger signal «increased sensitivity»
– Danger signal «standard sensitivity»

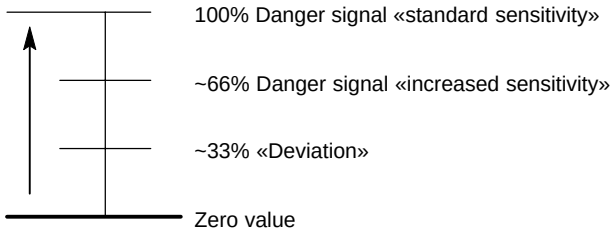



Fig. 1 Relationship between «deviation», «increased sensitivity» and «standard sensitivity»

**Deviation (DO1131 only):**

- If a detector repeatedly emits the «Deviation»-signal, this points to an environment which may not be suitable for this type of detector.
- Such applications must be evaluated more in details regarding choice of detector and the corrective steps which result from such evaluation must be taken.
- If a detector emits a constant «Deviation»-signal, this hints at soiled detector optic.
- The degree of soiling can be checked with the detector testing device DZ1194.

**Function state «impairment»:**

- If a detector responds with «impairment», the correct detector function is no longer ensured.
- Among the reasons are:
  - Line voltage at the detector location too low
  - Component failure in the detector etc.
- Such impairments must be remedied forthwith!

## 6.2 Functional check / overhaul

Through the detector self-test the DO1131/DO1133 are subjected automatically to an extensive electrical function check. However, it is still necessary to conduct a physical function test on site in regular intervals.

**Recommendation:** A visual check of the detectors must be performed periodically (usually **once per year**). Detectors that do not respond or which are mechanically damaged must be replaced.

All detectors should be jointly replaced and factory overhauled in intervals of **2 to 8 years**, depending on the environmental conditions and the severity of contamination.

A physical functional check of the detectors can be performed by means of a suitable testing device (e.g. DZ1193 or RE6).

An electrical functional check of the detectors can be performed by means of the suitable detector testing device DZ1194.

If mechanically damaged detectors must be scrapped, the plastic materials can be sorted out based on the embossed code.

Siemens Building Technologies AG
Alte Landstrasse 411
CH-8708 Männedorf
Tel. +41 1 – 922 61 11
Fax +41 1 – 922 64 50
www.cerberus.ch