

SIEMENS



**Cerberus® DOT1131
Multisensor smoke detector,
AnalogPLUS**

Technical description

Fire & Security Products

Siemens Building Technologies Group

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1 Application

Due to its balanced response sensitivity, the PolyRex DOT1131 can be used as an universal smoke detector. The DOT1131 is fitted with a new, high performance opto-electronic sensor system that optimally detects light and dark smoke particles. In addition, the ambient temperature is continuously measured. Signals generated by temperature and smoke are combined and evaluated together.

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.

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

The detector requires neither mechanical nor 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 of the detector Bus 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 PolyRex DOT1131 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

The PolyRex DOT1131 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. Parallel to this, the heat sensor takes over the function of temperature monitoring. The signals of the increase in temperature and optical smoke measurement are added together which leads to optimum response and guarantees increased detection and fault reliability.

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.

2.1 Emergency operation

If the PolyRex DOT1131 can no longer be periodically addressed, for example due to a μ P failure in the control unit, nevertheless a danger signal is triggered by the evaluation electronics in the control unit interface.

2.2 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)

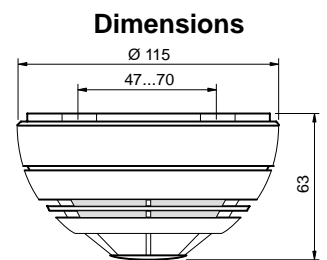
Air pressure p = 1'000hPa (1'000mbar)

Parameters	Symbol	Value				Conditions
		Unit	min.	typ.	max.	
Operating voltage	U_b	V	16.0		28.0	modulated
Operating current (quiescent condition)	I_b	μ A			200	FET's closed
Baud rate		Bd		167		Duplex
Response sensitivity «standard sensitivity»	D_1	%/m		4.3		smoke sensitivity with paraffin test aerosol
Response sensitivity «increased sensitivity»	D_1	%/m		3.0		smoke sensitivity with paraffin test aerosol
Integration «standard/increased sensitivity»		measurements	3			measuring interval 2.5s
Danger signal threshold, referring to «standard sensitivity»	ΔU_3	V	1.4		2.8	measured with the detector test unit DZ1194
Response indicator: Flashing interval times: bright dark		ms s		32 1		
Response indicator current		mA		15		
External response indicators		pieces			2	
Elektromagnetic compatibility		V/m V/m	50 30			1MHz ... 1GHz 1GHz ... 2GHz
Operating temperature	T_a	°C	-25		+60	
Humidity $\leq 34^\circ\text{C}$ $> 34^\circ\text{C}$					$\leq 95\%$ rel. $\leq 35\text{g/m}^3$	Transient condensation allowed
Storage temperature	T_l	°C	-30		+75	
Connection factor	APMK			1		

Colour: white ~RAL9010

Classification

Standards	EN 54-7	
Application category	IEC 60721-3:	3K6
Test category	IEC 60068-1:	25/060/42
Protection category	IEC 60529:	IP44



incl. base DB1131A

4 Environmental influences

4.1 Influence of the ambient temperature

The PolyRex DOT1131 is insensitive to normal temperature fluctuation within the entire operating temperature range. Large and rapid changes in temperature influence the response sensitivity of the detector, i.e. the sensitivity to smoke may be increased.

4.2 Other influencing variables

Ambient light, air drafts and fluctuations within the specified operating voltage range have no influence on the PolyRex DOT1131.

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 PolyRex DOT1131 is connected in parallel to the two-wire detector Bus. The address of the individual detectors is determined by the order in which the detectors are inserted or are checked with the detector tester.

6 Maintenance

6.1 Diagnostic possibilities

A detector DOT1131 can transmit 5 events to the control unit:

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

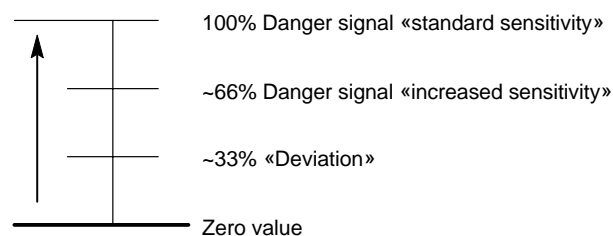


Fig. 1 Relationship between «deviation», «increased sensitivity» and «standard sensitivity»

Deviation: (A «deviation» only concerns the optical signal)

- 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 DOT1131 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 are strongly soiled 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.

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