



## User manual

# LUMEX 1 IR DETECTOR



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## 1. INTRODUCTION - GENERAL

This documentation functions as a Customer Manual that concerns the LUMEX 1 IR (infrared optical) detector. It contains basic technical data, operation description for a customer, installation, maintenance and service instructions for the IR detector. It also contains prohibited functions and activities that may never be performed by operators. The documentation is handed over to a customer together with the IR detector, and serves as instruction documentation while the system is handed over to the customer.

The documentation can be given to the customer before the IR detector is supplied as well, the customer thus can become familiar with its function, method of installation, electric installation, etc. in advance.

The LUMEX 1 IR Detector is an electronic component supplied by the RSBP spol. s r.o. company (further only RSBP), and it is an integral part of a technological system, offered by this company that functions as a protection against explosion or fire (HRD systems, HRD barriers, etc.).

## 2. BASIC TECHNICAL DATA

### 2.1. GENERAL

This is a detector that works on the principle of measurement and evaluation of optical infrared radiation in the range of approx 950 nm. The analysis unit and the sensor head are installed in a metal case. The detector is connected by a multiple lead shielded cable (four or six lead) through a transition box to a control unit, or to other detectors on a detection line. Setting and parameterization of the detector is done through a communication converter using PC or notebook software. All settings, parameterization and service are done exclusively by RSBP or its authorized representative. Blow-off of the detector by pressure air with prescribed parameters (provided by a customer) that ensures cleanliness of the front glass is required.

### 2.2. TECHNICAL DATA TABLE

Source voltage	8 to 27VDC
Source current	less than 30mA
Reaction time	less than 3ms
Spectrum sensitivity	950nm
Protection	IP65
Detector case diameter	approx. 62mm
Length of the detector case	approx. 220mm
Detector weight	1560g
Case material	Stainless steel, dural
Setting of sensitivity	two IR sensors – each 0-99% (using SW)
Recording angle of the recording head	approx. 110°
Blow-off pressure air parameters – pressure	0.1 to 0.5 bar
Connection pressure air	push-in fitting for 8 mm tubing

Blow-off pressure air parameters – consumption	200l/min – dry
Anti-explosion design (dust)	II 1D/2D Ex t IIIB Da/Db T85°C IP65
Anti-explosion design (gas)	II 3G Ex ic IIB T4 Gc
Temperature resistance	-20 to 80°C

### 2.3. ELECTRICAL CONNECTIONS

The detector is connected to a control unit or to other detectors on a detection line by special cables. These cables can be harmfully affected by unwanted effects of electromagnetic noise (EMC). Therefore cables made by HELUKABEL, specifically the types PAAR-TRONIC-CY 2x2x0.75mm<sup>2</sup> for a detector that is connected as the last one on the detection line (or 3x2x0.75mm<sup>2</sup> for a detector that is not the last one on the detection line) for detection lines with the length of up to 150m (the detection line length is the distance between a control unit and the last detector on the detection line) are suggested. These are special cables highly resistant to negative effects of electromagnetic noise (EMC). The cables are shielded with paired twisted couples of leads.

The detectors are connected with four leads, two cable leads supply 24VDC voltage, two remaining cable leads carry the signal that is evaluated by a control unit (the change in electrical resistance).

### 3. INSTALLATION AND DISASSEMBLY

All installations (mechanical and electrical preparation, installation itself, parameterization and setting) related to these detectors are performed exclusively by RSBP or its authorized representative.

The detectors are placed in and attached to installation adapters that are installed to the appropriate technology (reservoirs, pipes, etc.). The attachment is done using a sleeve nut supplied with the detector. A pipe or a hose with pressure air supply needs to be brought to the end of the installation adapter.

The analyzing unit is electrically connected by the above mentioned special cables with a control unit or other detectors connected to a detection line using a connection cable and the transition box with a terminal strip.

The detector does not pollute environment during its proper function, and does not emit harmful substances or electromagnetic radiation higher than accepted limits. It is harmless from the ecological point of view.

Disassembly and liquidation of detectors is performed exclusively by RSBP or its authorized representative. The disassembly and liquidation is done according to the law about electric waste, and individual components are ecologically liquidated or recycled.

#### **4. MAINTENANCE**

The detector maintenance that is performed by a customer lies only in visual control for cleanliness, mechanical damage and integrity of the detector and cables, and in the check of pressure air supply used for blow-off. In case of any damage or breach of integrity of the detector and cables RSBP or its authorized representative must be contacted. Customer or other entities cannot perform any other detector maintenance than specified above. The blow-off pressure air supply is provided by a customer, and if there is any defect on this part, then the maintenance, repairs and service is also done by the customer.

Operators must be demonstrably instructed in the detector maintenance by RSBP or its authorized representative. Uninstructed personnel are expressly forbidden to perform any detector maintenance.

#### **5. SERVICE**

Complete detector service with the exception of pressure air supply service is performed by RSBP or its authorized representative in regular half-year intervals. Customers or other subjects cannot perform any manner of service, with the exception of pressure air supply service. The blow-off pressure air supply is provided by a customer, and if there is any defect on this part then the maintenance, repairs and service is also done by the customer.

#### **6. OPERATION**

The detector that is connected to a complete system for suppression or prevention of fire or explosion can work automatically and without human intervention. Operators cannot and are not authorized to change detector parameters set by RSBP or its authorized representative. A separate detector operation is not performed; a detector is included in a complete superior system.

Operators must be demonstrably instructed in the complete superior system operation by RSBP or its authorized representative. Uninstructed personnel are expressly forbidden to operate the complete superior control system.

#### **7. FORBIDDEN ACTIVITIES**

The detector can be maintained only by persons that were demonstrably instructed for these activities. The persons must be physically and psychically capable to perform these activities, and may not be under influence of alcohol or drugs.

Operators, other customer workers and other subjects may not perform the following forbidden activities with the detector:

- Mechanically damage the detector in any way
- Mechanically damage the electric cables coming out of the detector in any way
- Uninstall a detector from its installation adapter

The detector works on the continuous sensing and analyzing of optical spectrum level principle. It identifies sparks and flames that appear as infrared radiation. It is installed in dark areas (reservoirs, pipes, etc.), and cannot be exposed to any light (either natural or artificial). All these types of light can contain infrared components of the optical spectrum level, and can be analyzed by the detector as possible fire, which can cause the suppression or elimination system to react. This undesirable reaction can cause serious injuries with possible permanent results or death.

A customer must ensure that the detectors are not exposed to undesirable natural daylight or artificial light. This case can occur during cleaning, mechanical work or repairs (opening of protective covers). Also the detector may not be uninstalled from its installation adapter, and exposed to undesirable natural daylight or artificial light. Customer workers (and also other subjects) must be in this regard demonstrably instructed by the customer about the above mentioned safety principles, and they have to adhere to them.

If a customer wants to perform the above mentioned activities (cleaning, mechanical work, repairs, uninstallation of a detector from its installation adapter), it is necessary that he places a given technological section (zone) to the "service mode", which is done by operators through a control unit. This procedure is completely described in the Operation Manual for the CONEX control unit.

All above mentioned activities should be demonstrably recorded to the technological system Book of Operations, including dates, names, and operator signatures.