ATEX CENTER

User manual

DETEX PRESSURE DETECTOR

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1. INTRODUCTION - GENERAL

This documentation functions as a Customer Manual that concerns the DETEX Pressure Detector. It contains basic technical data, operation description for a customer, installation, maintenance and service instructions for the pressure 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 pressure 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 pressure detector is supplied as well, the customer thus can become familiar with its function, method of installation, electric installation, etc.

The DETEX Pressure Detector is an electronic component supplied by the RSBP spol. s r.o. company (further only RSBP), and it is an integral part of technological systems, offered by this company that function as a protection against explosion (HRD systems, HRD barriers, etc.).

2. BASIC TECHNICAL DATA

2.1. GENERAL

This is a detector that works on the principle of measurement of static and dynamic pressure analysis. It contains its own logic that enables automatic corrections and verification of its own function states, in order to guarantee maximum accuracy, reliability, and especially safety. It consists of a sensor head for pressure sensing, analyzing unit, and a connection cable. The sensing head also contains a temperature sensor that allows exact recording of pressure and its correction within the whole range of operating temperatures. Setting (parameterization) of the detector is done through a communication interface using PC or notebook software; the detector has its own internal memory as well that enables to record events in dependence on real time, and possibly processing, archiving, etc. of this data. All settings and parameterization of this detector is done exclusively by the RSBP or its authorized representative employees.

The detectors are made in the version with one sensing head (the length of the cable between the sensing head and the analyzing unit is 2 meters) and in the version with two sensing heads (the lengths of the cables between the sensing heads and the analyzing unit is 4 meters for each sensing head). Then they are made in the “pass through” version and the “end” version. The “pass through” version allows its installation as a pass through element in a detection line (other detectors or components can be connected behind the detector). The “end” version allows its installation as the end element of a detection line only.

There are also specially made detector versions made for food and pharmaceutical industries, and the versions with a ceramic sensor in the sensing head that are suitable for applications with high degree of harmful abrasion.

All produced detector versions come from a common basis and differ in details only. All differences of individual versions are specified in this documentation with their appropriate explanations.

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2.2. THE SUMMARY OF PRODUCED VERSIONS

DetEx K12 – one-head end sensor (cable length 2m)
DetEx P12 – one-head pass-through sensor (cable length 2m)
DetEx K24 – two-head end sensor (cable lengths 4m – for each sensing head)
DetEx P24 – two-head pass-through sensor (cable lengths 4m – for each sensing head)
DetEx-F – for pharmaceutical and food industries (one-head)
DetEx-C – with a ceramic sensor in the sensing head (one-head)

All versions correspond to the marking specified in Type Testing Certificates.

2.3. TECHNICAL DATA TABLE

Source voltage	18 to 27VDC
Source current (version with one sensing head)	maximum 45mA
Source current (version with two sensing heads)	maximum 60mA
Protection (both sensing head and analyzing unit)	IP65
Material of the analysis unit box	Aluminum alloy
Sensing head material	stainless steel
Internal memory	16MB
Pressure measurement range (versions K12, P12, K24, P24)	-1 to 5 bar
Short-term overloadability (versions K12, P12, K24, P24)	10 bar
Pressure measurement range (version “C”)	0 to 1 bar
Short-term overloadability (version “C”)	3 bar
Pressure measurement range (version “F”)	0 to 5 bar
Short-term overloadability (version “F”)	10 bar
Certification (analysis units of all versions)	II (1)2D Ex tD T90°C IP65 II 3G Ex nA nR [ib] IIB T4
Certification (sensing head – version K12, P12, K24, P24)	II 1/2D Ex tD T152/127°C IP65 II 2G Ex ib IIB T3-T4
Certification (sensing head – version “C”)	II 1/2D Ex tD T135/125°C II 2G Ex ib IIB T4
Certification (sensing head – version “F”)	II 1D Ex ia IIIC T100°C II 2G Ex ib IIB T4

2.4. ELECTRICAL CONNECTIONS

A detector analyzing unit 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^2 for detection lines above 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.

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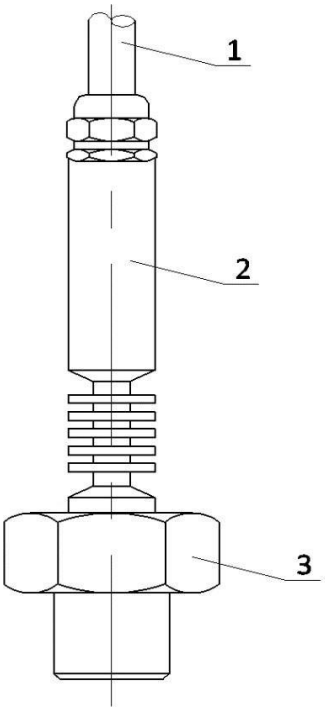
The detectors are connected with four leads, two cable leads supply 24VDC voltage, two remaining cable leads carry the signal that is evaluated by a control unit (the change in electrical resistance).

The detector analyzing unit box is also equipped by a ground terminal that needs to be connected to a grounding system of the protected device, object, construction, etc. by the CYA 4mm^2 lead or equivalent. Thus is the metal box electrically shielded from harmful effects of electromagnetic noise (EMC).

2.5. THE DETECTOR DIAGRAM



1 - Connection cable
2 - Detector body
3 - Sleeve nut

Fig. 1

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 sensing heads are placed into installation adapters that are installed to the appropriate technology (reservoirs, tanks, etc.). They are attached by a nut supplied with the detector with the versions P12, K12, P24, K24, and the ceramic version “C”, or by attachment and sealing elements of the TRI- CLAMP system for the version “F”.

The analyzing units are attached by a pair of bolts or screws to the installation adapter that is installed to the appropriate technology in the appropriate distance from the sensing head or heads (according to the length of the connection cable between the sensing head and the analyzing unit).

The analyzing unit is electrically connected by the above mentioned special cables with a control unit or other detectors connected to a detection line. The cables need to be sealed by grommets for explosion environment that are supplied with the pressure detector. The ground terminal of theanalyzing unit is connected to the grounding system of the protected device, object, construction, etc.

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. They proceed according to the law about electric waste, and individual components are ecologically liquidated or recycled.

3.1. THE INSTALLATION OF THE DETECTOR INSTALLATION ADAPTER BODY

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A hole with 54mm diameter is drilled into the technology in the application location. The installation adapter body is applied to:

a) a vertical wall under the angle of 30-45° according to Figure 2a)
b) a horizontal wall perpendicularly according to Figure 2b)

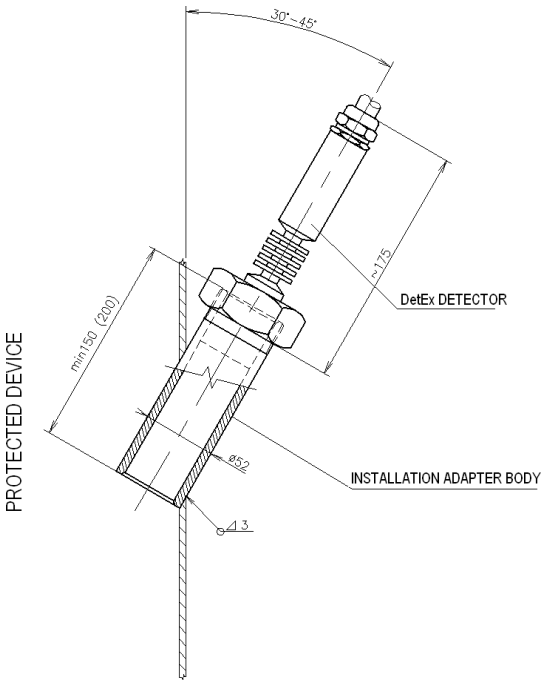

Fig. 2a)

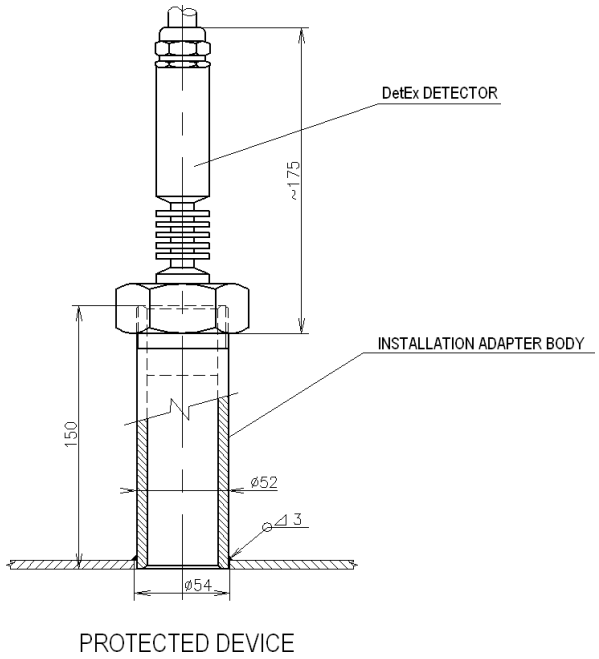

Fig. 2b)

The installation adapter body is welded along its whole circumference to the protected device by square tee weld size 3 according to the CSN EN ISO 4063 standard.

Remark: The square tee weld need to be welded with interruptions, so the installation adapter body does not get deformed. However the circumference weld needs to be continuous and pressure resistant.

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

5. SERVICE

Complete detector service is performed by RSBP or its authorized representative in regular half-year intervals. Customers or any other entities cannot perform any detector service.

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. Detector operation is not performed separately; the 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 forbiddenactivities with the detector:

- Remove or damage detector seals
- Unscrew the detector analyzing unit lid
- Mechanically damage the detector in any way
- Mechanically damage the electric cables coming out of the detector in any way
- Uninstall detector sensing heads from installation adapters

The pressure detector works on the principle of continuous sensing and analyzing of static and dynamic pressures recorded by a highly sensitive membrane in the sensing head. Any undesirable vibrations and mechanical shocks can be evaluated by the detector as possible explosions and the suppression or prevention system can react. This undesirable reaction can cause serious injuries with possible permanent results or death.

A customer must make sure that pressure detectors are not exposed to continuous undesirable vibrations or mechanical shocks that can originate for example during cleaning (hammering during removal of vaulted stuck-together material can be especially harmful), mechanical work or repairs (drilling, cutting, bolting can be especially harmful). 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, and repairs), 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.