# ZCR-4001 WIRELESS RADIO DETECTOR SET

## Overview

The ZCR-4001 wireless radio detector set is designed for early detection of a fire in premises, where wiring connection of the detectors and the control panel is not possible. The above wireless set contains at least one universal wireless smoke detector - DUR-4047 and the ACR-4001 radio detector adapter, which can work with up to 16 wireless radio detectors.

## Wireless smoke detector - DUR-4047

## Overview

The DUR-4047 processor based wireless radio optical smoke detector is designed for detection of a visible smoke, concurrent with an early stage of an open fire ignition that is when material begins to smoulder, i.e. a long time before the appearance of an open flame and a rise in temperature.
The DUR-4047 is an analogue detector with automatic sensitivity self-compensation that maintains constant sensitivity during progressing dirt build-up in the measuring chamber and during changes of air pressure and vapour condensation.
The DUR-4047 wireless radio optical smoke detector can operate only in lines/loops of the addressable POLON 4000 system fire alarm panels via the detector's wireless ACR-4001 adapter. The detector is power supplied by two batteries.

## Principles of operation

The DUR-4047 is a Tyndall effect detector, which is based on the scattering of radiation on smoke particles. The main element of the detector is an optical module, consisting of an electroluminescence diode emitting infrared (IR) radiation and a photodiode acting as the receiver of the radiation. The optical module is protected by a labyrinth, damping both external light and direct light from the emitting diode. When smoke particles enter the optical module area, infrared radiation scatters on smoke particles. Part of this scattered radiation reaches the photodiode that generates an alarm signal. The DUR-4047 detector contains self-compensation circuits, which maintain constant sensitivity during progressive dirt accumulation inside the measuring chamber. After exceeding a pre-set level of dirt/ dust contamination, the detector emits a fault signal denoting the necessity for servicing and cleaning works. The detector has a replaceable optical chamber, which can be easily cleaned or replaced with a new one.

A failure to perform the servicing works before self-regulation is completely exhausted (e.g. for a few weeks) can cause triggering of false alarms at the control panel.
The applied built-in microprocessor device and the appropriate detector software guarantee that the entire fire-accompanying phenomenon near the detector will be analysed quickly and false alarms will be eliminated. After selecting a suitable alarm variant (from the control panel level), the detectors can operate in an interactive mode, one detector can communicate with the others in the same zone. They can also provide the current analogue value measurements of the fire factor.
The detectors, in addition to transmitting into the detection loop through the ACR-4001 adapter their own address, code type, alarm, and operation modes, they also send information about the servicing mode, a fault of internal devices, and activation of the short circuit isolator.
The alarm mode is indicated by a red flashing of a dual-colour LED diode. The fault status of the detector, service alarm, and operation of the short circuit isolator is indicated by the same (dual-colour) LED diode flashing a yellow light. The DUR-4047 detectors can be programmed to appropriate sensitivity in three modes: normal, increased, and decreased level. This makes it possible to adapt the detectors to specific conditions during operation in the protected area.
Coding of the detector address can be done automatically from the control panel level – the address code is saved in its non-volatile memory.
Communication between the POLON 4000 system control panel and the DUR-4047 smoke detectors is carried out through the detector's wireless ACR-4001 radio adapter.
The smoke detector communicates with the adapter using the radio protocol with confirmation and a possibility of changing the radio channel. During operation, radio interferences are minitored and in an event of an occurrence of an interference the radio channel is changed, which allows further, uninterrupted operation of the detector.

The detectors are installed in the non-addressable G-40 bases, which are deprived of cable connectors and are delivered together with the ordered detectors.

The DUR-4047 wireless radio smoke detectors meet the requirements of the PN-EN 54-7 European standard.

## Technical specifications

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| Battery supply | 2 lithium batteries CR123 |
| Supply voltage | 3 V |
| Max. quiescent current | < 80 µA |
| Max. current consumption during an alarm or fault | < 1 mA |
| Radio frequency operating range | 863-870 MHz |
| Distance from adapter – depending on muffling by the environment | up to 100 m |
| Type of radio communication | multi-channel with confirmation |
| Quiescent operating time | 3 years |
| The number of programmable sensitivity levels | 3 |
| Test fires | from TF1 to TF5 and TF8 |
| Address coding | programmed by the control panel |
| Operation temperature range | from -25 °C up to +55 °C |
| Dimensions (with base) | Ø 115 x 54 mm |
| Mass | 0.2 kg |

# Wireless detector adapter - ACR-4001

## Overview

The ACR-4001 adapter is an addressable device, enabling the connection of radio detectors (recognized by the control panel as a branch of the monitoring line) to an addressable loop of the POLON 4000 system fire alarm control panels. The control panel recognizes each radio detector with its own address, declared by the ACR-4001 adapter as a separate detector.
It is recommended to use the radio adapter and the detectors in an event when leading monitoring lines to the detector is not possible, e.g., in historical sites, churches etc.

## Principles of operation

The wireless radio detector's adapter ACR-4001 is a line device operating in an addressable loop, which monitors radio detectors. A fire alarm detected by the wireless detector is transmitted through the adapter to the control panel, and adapter's built-in LED diode signalizes the alarm by a flashing red light. Fault/damage of the radio detectors and a lost connection with them is also reported to the control panel. In that event, the LED diode flashes a yellow light. The fault/damage of one radio detector has no effect on the operation of other detectors interoperating with the adapter. The wireless radio detector adapter is equipped with an internal short circuit isolator, which cuts off short-circuited detector line and ensures that other devices function properly.
The isolation of a short circuit is signalled by a yellow flashing LED diode, and information about the occurrence is transmitted to the control panel.

## Design

The ACR-4001 adapter is located in a plastic white case containing a basket, a cover, and a screen. The adapter is installed in the G-40 base, to which detection wire lines are connected.

## Technical specifications

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|---|---|
| Power supply | 16.5 – 24 V |
| Max. quiescent current | ≤ 6 mA |
| Radio frequency operating range | 863-870 MHz |
| Type of radio communication | multichannel with confirmation |
| Distance from detector – depending on muffling by the environment | up to 100 m |
| Number of interoperating detectors | max 16 |
| Operation temperature range | from -25 °C up to +55 °C |
| Dimensions (with base) | Ø 106 x 52 mm |
| Mass | 0.13 kg |

## IMPORTANT

To determine the exact location of the detectors and the adapter in a secured facility, it is recommended to use a special TZCR-4001 tester.