

**ANALOG ADDRESSABLE COMBINED GAS
AND RATE-OF-RISE AND FIXED TEMPERATURE DETECTOR
S2000-IPG**



ICO 9001

INSTRUCTION MANUAL

1 TECHNICAL DATA

1.1 General

S2000-IPG Analog Addressable Combined Gas and Rate-of-Rise and Fixed Temperature Detector (hereinafter referred to as the detector) is designed to detect fires accompanied by appearance of carbon monoxide and by generating heat in enclosed premises. The gas detection part of the detector is sensitive to the chemical composition of air and issues a Fire Alarm when the change has exceeded a threshold level. The rate-of-rise and fixed temperature part of the detector met the requirements of Class A1R issues a Fire Alarm if the temperature is rising slowly up to threshold value or if the rate of rising of the temperature in the premises has exceeded a relevant level. The detector provides generating the following messages: Norm, Fire Alarm, Fire Prealarm, Trouble. The detector operates within the two-wire multiplex addressable polling loop of a polling loop controller such as S2000-KDL or S2000-KDL-2I (hereinafter referred to as PLC) in an Orion system. Each functional part of the detector is to be assigned to its own address in the polling loop of a PLC. Upon the request of the PLC the detector returns the value of the current CO concentration (ppm) or the surrounding air temperature.

The detector supports DPLS_v2.xx Multiplex Addressable Polling Loop Protocol providing monitoring PL voltage at the point where the detector is connected. Electromagnetic compatibility of the detector meets the requirements of Russian Standard ГOCT P 53325-2012 for the third severity level. The firmware version of the S2000-IPG is 1.01. The detector can be tested by means of a laser-based tester (for example, manufactured by System Sensor). The detector is intended for round-the-clock operation. The content of precious materials: no need to account for the storage, disposal and recycling (see Clause 1.2 of Russian Standard ГOCT 2.608-78).

1.2 Specifications

- | | |
|--|---------------------|
| 1) CO Sensitivity, ppm | - 20 to 80 |
| 2) Alarm Temperature, °C | - +54 |
| 3) Power Voltage, V | - 8 ... 11 |
| 4) Consumed Current, mA | - 0.6 |
| 5) Operation Temperature, °C | - minus 30 to +55 |
| 6) Pre-operation Time, s | - 60 max |
| 7) Relative Humidity, % | - Up to 93 at +40°C |
| 8) Ingress Protection Rating | - IP41 |
| 9) Weight, kg | - 0.2 max |
| 10) Transportation and Storage Temperature, °C | - minus 50 to +55 |
| 11) Average Lifetime, years | - 10 |
| 12) Overall Dimensions, mm: | |
| - Diameter, max | - 100 |
| - Height, max | - 47 |

1.3 Standard Delivery

- | | |
|----------------------------------|------------|
| <i>Single-piece delivery:</i> | |
| - S2000-IPG Detector | - 1 pc.; |
| - Instruction Manual | - 1 pc.; |
| - Protective Cover | - 1 pc.; |
| - Address Label | - 1 pc.; |
| - Individual Packing | - 1 pc.; |
| - MK-2 Mounting Kit (if ordered) | - 1 pc. |
| <i>Group delivery:</i> | |
| - S2000-IPG Detector | - 10 pcs.; |
| - Instruction Manual | - 1 pc.; |
| - Protective Cover | - 10 pcs.; |
| - Address Label | - 10 pcs.; |
| - Group Packing | - 1 pc.; |
| - MK-2 Mounting Kit (if ordered) | - 10 pcs. |

1.4 Operating Principles

The sensitive element of the gas part of the detector is an electrochemical gas sensor the current drawn through which varies (as a result of a chemical reaction with accumulation of potential on the measuring electrode) depending on concentration of the gas in the environment. The detector's microcontroller recognizes the state of the electrometric amplifier output and provides generating a relevant message to the PLC.

For the thermal part of the detector, the sensitive element is a thermistor which resistance varies when the ambient temperature varies. The detector provides generating a relevant message for the PLC on temperature's exceeding a threshold value and depending on the rate of its rising in accordance with Russian Standard ГOCT P 53325-2012.

The Norm condition of the detector is indicated by LED's pulsing once per approximately four seconds. The Fire Alarm state is indicated by double flashing of the LED once per four seconds. The detector monitors its operability and provides generating a Trouble message when its performance is impaired. The Trouble state is indicated by LED's pulsing twice per second.

2 OPERATION DIRECTIVES

2.1 Connection Diagram

Figure 1 shows a standard schematic for connecting the detectors to the polling loop of a PLC (maximum 63 detectors per a single loop). The Input Type parameters should be programmed in accordance with Table 1. For Input Types 9 and 19 user-defined configurable thresholds for sending fire alarms and fire pre-alarms can be defined in the PLC configuration. The heat fire detector can also be used with the Input Type 10, "Heat Thermostatic". The Input Types and configuring them are described in manuals for PLC, S2000M, and Orion Pro Workstation.

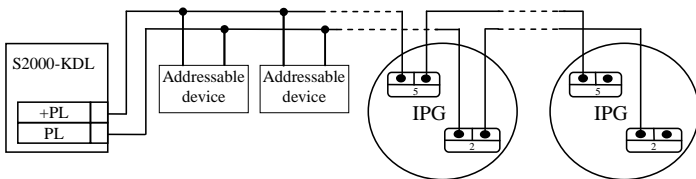


Figure 1. Connection Diagram

Table 1. Types of Inputs

Part	Fixed Thresholds	Variable Thresholds
Gas	-	Type 19
Heat	Type 3	Type 9

2.2 Mounting

The detectors should be located in accordance with the requirements of Russian CII 5.13130.2009 rules and regulations.

There are two options for mounting the detectors (see Figure 2). To attach the detector to solid surface (Variant A) the detector base plate provided is used. Suspended Ceiling Mounting Kit MK-2 (Variant B) provides installing the detector into a suspended ceiling.

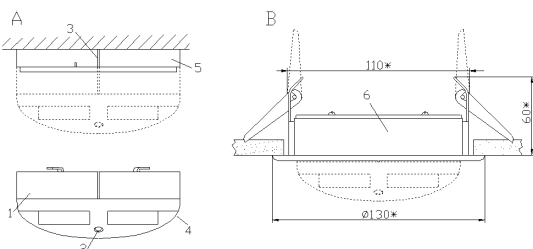


Figure 2.

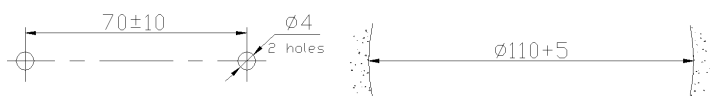


Figure 3.

- 1 – Detector;
- 2 – Light Guide;
- 3 – Alignment Guide;
- 4 – The Mark and the Bar, **OPEN HERE** ;
- 5 – Base Plate;
- 6 – Suspended Ceiling Mounting Kit MK-2.

Figure 3 shows the drilling pattern to install the detector for Variant A as well as the diameter of a hole in a suspended ceiling for Variants B.

ATTENTION

To install the detector on the base plate, align the guide on the detector with the short guide of the base plate. Then turn the detector clockwise until the detector guide is aligned with guide 3 as shown in Figure 2 (A).

2.3 Programming the Detector Address

The detector provides storing its address within the polling loop for communicating with the PLC in the non-volatile memory. The factory address for the gas part of the detector is 126 while the factory address for the thermal part of the detector is 127.

There are two ways to give an address to an S2000-IPG, the first way is to set a required address and the second way is to change the known address value to the required value. Each of these commands can be sent from a network controller or by means of the UProg configuration tool.

When the command for setting a given address is used (for example, in case when the same address is incorrectly assigned to two different devices into the polling loop), together with sending the command within 5 minutes press on the detector's LED or light it with the beam of a laser test tool. The network controller shall show a message about disconnecting the device with an old address and connecting the device with the newly programmed address. In the case when two devices had the same address no message about disconnecting the device with the old address is indicated.

If the current address of the detector is known and should be changed for another address, send the change address command from the network controller with the old address and the new address as the parameters. The network controller shall indicate a message about disconnecting the device with the old address and connecting the device with the new address.

Then write the programmed address on the address label provided and stick this label to the detector base.

2.4 Testing

2.4.1 Before testing notify the proper authorities that the detector is undergoing maintenance and will be temporarily out of service. Disconnect all outputs of control devices and executive modules that can run an automated fire-fighting system.

2.4.2 Power on the S2000M panel or Orion Pro Workstation and the PLC and observe steady lighting of the detector's LED. As soon as communication between the detector and the polling loop controller has been established the detector's LED starts pulsing once per 4 s indicating the Norm condition.

2.4.3 Observing safety regulations spray a small amount of test gas from the aerosol can into the detector. The S2000M panel or Orion Pro Workstation shall display a Fire Alarm for the relevant address. The detector's LED shall flash doubly with intervals 0.5 s in pairs once per four seconds.

2.4.4 To test the thermal part of the detector, blow it with hot air (for example, from a hairdryer). A Fire Alarm message shall be issued with the relevant address.

2.4.5 The detector can also be tested by pressing on its LED and keeping it pressed for at least 2 s or by lighting it with the laser beam of a laser test tool. This will cause the LED to show solid light: if an S2000-KDL of version 1.40 or higher is in use then the network controller (S2000M or Orion Pro Workstation) shall indicate Alarm Test or Fire Alarm depending on the test mode. To get more information about light indication of the detector when an S2000-KDL of version 1.30 and higher is in use and about testing please refer to user's manuals for the S2000-KDL, S2000M and Orion Pro software.

2.4.6 When the light emitter is released or the laser test tool is disposed ensure the network controller indicates the Norm condition of the detector. If the S2000M panel or Orion Pro software has displayed no messages mentioned above for the address of the detector or the detector's LED performs in a different way, then the detector is unhealthy and must be replaced.

2.4.7 After testing, restore all binds between system executive outputs and automated fire-fighting system and notify the proper authorities that the system is back in operation.

2.5 Maintenance

2.5.1 Inspect operation of the detector as discussed in Section 2.4 annually.

2.5.2 Inspect operation of the detector when it sends trouble messages.

WARNING

- 1) To avoid contamination of the detector please do not remove the protective cover until the surrounding area is cleaned from dirt and dust.
- 2) Do not attempt to remove the detector PCB. Disassembling the detector automatically cancels the warranty.
- 3) The detector is not designed to be installed within areas where air velocity exceeds 15 m/s.

3 CERTIFICATES

3.1 S2000-IPG Analog Addressable Combined Gas and Rate-of-Rise and Fixed Temperature Detector is approved by Conformity Certificate № C-RU.4C13.B.00542.

3.2 Production of S2000-IPG detectors is certified according to OCT ISO 9001-2011 by Conformity Certificate No.POCC RU.HK32.K00153.

4 PRODUCT ACCEPTANCE CERTIFICATE

The S2000-IPG analog addressable combined gas and rate-of-rise and fixed temperature detector (the serial number can be seen on the detector enclosure) is qualified as proper for operation and packaged by CJSC NVP "Bolid".

Accepted and packaged by

Quality Department

Full Name

Date, Month, Year

