



EN

**"MINPROEKT" EAD****CERTIFICATE**

- [1] **Module B-EU-TYPE-EXAMINATION CERTIFICATE**
(Translation)
- [2] Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres – Directive 2014/34/EU (ATEX)
- [3] **Module B EC-type-examination Certificate Number: №: MP 18 ATEX 0178 X**
- [4] **Product (Equipment or protective system): „Gas detector GS-x.x.x.x”**
- [5] Applicant: "Invest Electronics OOD"
- [6] Address: 145 "Brezovski shoese" str., Plovdiv, Bulgaria
- [5] Manufacturer: "Invest Electronics OOD"
- [6] Address: 145 "Brezovski shoese" str., Plovdiv, Bulgaria
- [7] This product (equipment or protective system) and any acceptable variation thereto are specified in details in the schedule to this certificate as well as the documents therein referred to.
- [8] Minproekt EAD, notified body No.1877 in accordance with Article 17 of the Council Directive 2014/34/EU (ATEX) of 26th February 2014, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment or protective system, intended for use in potentially explosive atmospheres, specified in Annex II of the Directive. The examination and test results are recorded in:

Confidential Test report № No. 06/11.04.2016

- [9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with: 60079-0:2012; EN 60079-11:2012; EN 60079-1:2014; EN 60079-7:2015; EN 60079-18:2015.
- [10] If the sign "X" is placed after the certificate number, it indicates that this equipment or protective system is subject to special conditions for safe use, specified in the schedule to this certificate.
- [11] This EU-type-examination Certificate on Module B relates only to the design and the construction of this specified equipment or protective system in accordance with Directive 2014/34/EU.
This certificate does not cover the requirements of the Directive on the forthcoming procedures relating to the production process and the delivery of the product.
- [12] The marking of the equipment or protective system shall include the following:

With external barrier for input and output circuitsModel GS-x.BC.D.0/GS-x.BO.D.0Model GS-x.BC.V.0/GS-x.BO.V.0II 1G Ex d i_a m_a IIC T4 GaII 1G Ex i_a m_a IIC T4 GaII 1D Ex t_a i_a m_a IIC T135°C IP65 DaII 1D Ex t_a i_a m_a IIC T135°C IP65 Da**Without external barrier for input and output circuits**Model GS-x.BC.D/GS-x.BO.DModel GS-x.BC.V/GS-x.BO.VII 2G Ex d [i_b] m_a e IIC T4 GbII 2G Ex m_a [i_b] e IIC T4 GbII 2D Ex t_b [i_b] m_a IIC T135°C IP65 DbII 2D Ex t_b [i_b] m_a IIC T135°C IP65 Db**-40°C ≤ T_a ≤ +60°C**

This certificate does not authorize the manufacturer or his authorized representative to affix the CE mark followed by the identification number of the Notified Body as well as the marketing and/or use. This Certificate appears as a continuation of the Certificate MP 16 ATEX 0178 X. This Certificate is valid until 01.08.2023, if there is no change of the conditions under which it has been issued.

Sofia, 01.08.2018

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[13] Schedule

[14] Certificate on "Module B: EU-type-examination" №: MP 18 ATEX 0178 X (Translation)

[15] Characteristics of the type, subject to the examination

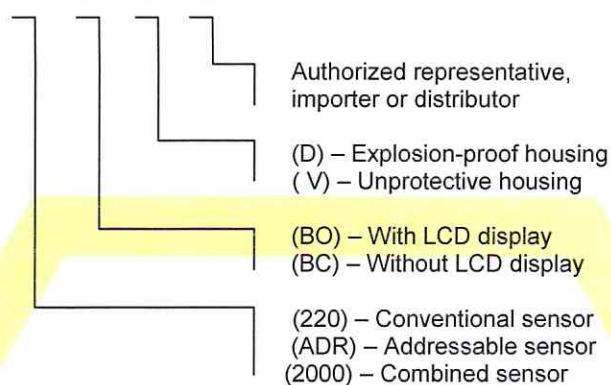
1. Technical description

"Gas detector GS-x.x.x.x" is available in two versions: aluminum housing with an inspection window and aluminum housing without an inspection window. In versions of Category I the gas detector is fitted with a zener barrier "Ga-x.x" for input and output circuits.

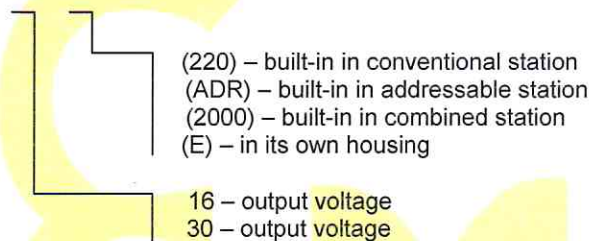
2. Technical data of the product.

2.1. Type designation:

Gas detector GS - x x x x



Zener barrier GA - x x



2.2. Gas detector technical characteristics:

- ambient temperature: - 40°C to + 60°C;
- maximum supply voltage: $U_{max} = 35VDC$;
- maximum voltage of the relay contacts: $U_{max} = 250V$;

Gas detector: GS-x.BC.D.0, GS-x.BO.D.0, GS-x.BC.V.0, GS-x.BO.V.0

2.1.1 Input DC / DC converter Z-0. The module has a type of protection "m_a", achieved through encapsulation.

Its output circuits are intrinsically safe with a level of protection I_a, achieved through built-in zener barriers.

- output voltage: $U_0 = 12,7V$;
- output current: $I_0 = 1,4A$;
- output power: $P_0 = 4,4W$;
- maximum external capacity: $C_0 = 1100nF$;
- maximum external inductance: $L_0 = 10\mu H$;

Sofia, 2018-08-01

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Schedule

Certificate on "Module B: EU-type-examination" №: MP 18 ATEX 0178 X (Translation)

[15] Characteristics of the type, subject to the examination**2. Technical data of the product.**

2.2.1 Module with intrinsically safety (main board). The power is supplied from input DC/DC converter Z-0.

- maximum input voltage: $U_i = 12,7V$;
- maximum output current: $I_i = 1,4A$;
- power: $P_i = 4,4W$;
- maximum internal capacity: $C_i = 1100nF$;
- maximum internal inductance: $L_i = 0$;

Gas detector: GS-x.BC.D, GS-x.BO.D, GS-x.BC.V, GS-x.BO.V2.2.2 Input DC/DC converter Z-1. The module has a type of protection "m_a", achieved through encapsulation.Its output circuits are intrinsically safe with a level of protection I_b, achieved through built-in zener barriers.

- output voltage: $U_o = 12,7V$;
- output current: $I_o = 1,4A$;
- output power: $P_o = 4,4W$;
- maximum external capacity: $C_o = 1100nF$;
- maximum external inductance: $L_o = 10\mu H$;

Module with intrinsically safety (main board). The power is supplied from input DC/DC converter Z-1.

- maximum input voltage: $U_i = 12,7V$;
- maximum output current: $I_i = 1,4A$;
- power: $P_i = 4,4W$;
- maximum internal capacity: $C_i = 1100nF$;
- maximum internal inductance: $L_i = 0$;

2.2.3 Relay outputs. The module has a type of protection "m_a", achieved through encapsulation.2.2.4 WiFi module. The module has a type of protection "m_a", achieved through encapsulation.2.2.5 Board LCD display. The module has a type of protection "m_a", achieved through encapsulation.

2.2.6 Sensor element. The module has a type of protection "d".

2.2.7 External zener barrier GA-x.16.

- output voltage: $U_o = 17,1V$;
- output current: $I_o = 400mA$;
- output power: $P_o = 700mW$;
- maximum external capacity: $C_o = 367nF$;
- maximum external inductance: $L_o = 130\mu H$;

2.2.8. External zener barrier GA-x.30.

- output voltage: $U_o = 32,0V$;
- output current: $I_o = 86mA$;
- output power: $P_o = 700mW$;
- maximum external capacity: $C_o = 56nF$;
- maximum external inductance: $L_o = 100\mu H$;

3. Application field

"Gas detector GS-x.x.x.x" is designed for measuring, signaling and monitoring of explosive and toxic gases.

Sofia, 2018-08-01

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[15] Characteristics of the type, subject to the examination

4. Marking

- a trademark of the manufacturer;
- a conditional sign of the device;
- a sign of the notified body;
- marking for explosion protection;
- serial number;
- year of manufacture.

[16] Test report № 06/11.04.2016

[17] Special requirements for safety use

"Gas detector GS-x.x.x.x" is designed for working temperature range $-40^{\circ}\text{C} \leq T_a \leq +60^{\circ}\text{C}$, different from the standard.

[18] Essential requirements

18.1. The product is allowed for use in hazardous areas according to the manufacturer's instructions and Directive 2014/34/EC (ATEX).

18.2. Other essential safety requirements are covered by the standards pointed in [9].

[19] List of the technical record parts

19.1. Technical passport

19.2. Constructional documentation (electrical diagrams) containing the following electrical diagrams:

- Gas detector GS-x.BC.x
- Gas detector GS-x.BO.x
- WiFi module
- Relay outputs
- Zener barriers, relay outputs
- DC/DC converters, version Z-0, zener barriers, input terminal
- DC/DC converters, version Z-1, zener barriers, input terminal
- Zener barriers, WiFi module
- Board LCD display
- Zener barriers LCD display
- Zener barrier GA-x.x
- Sensor boards

19.3. Constructional documentation (mechanical drawings) containing the following drawings:

- Gas detector box GS-x.BO.x
- Gas detector box GS-x.BC.x
- Sensor housing (D)
- Sensor housing (V)
- Encapsulation of boards „DC/DC converters "and" zener barriers, input terminals "
- Printed Boards

19.4. List of harmonized standards used

19.5. Presented certificates: PTB 06 ATEX 1061 U (for used terminals); IMQ 13 ATEX 010 X and IBExU 08 ATEX 1063 X for cable entries.

19.6. Additional information presented: Technical data for epoxy resin SEPOX 213;

Technical data for polyurethane encapsulating material used for the inspection window.

19.7. Updated technical passport and list of harmonized standards used.

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