[1] # EU TYPE EXAMINATION CERTIFICATE

[2] Protective equipment and systems intended for use in potentially explosive atmospheres. Directive 2014/34/EU (Rozporządzenie Ministra Rozwoju z dnia 06.06.2016r. Dz.U. z dnia 09.06.2016r. Poz. 817)

[3] EU type examination certificate (module B):

KDB 20ATEX0003X **1st edition**

[4] Equipment:

GasEye Cross Duct Ex1, GasEye Cross Duct Ex1 IS, GasEye Cross Duct Ex1 ET, GasEye Cross Duct Ex1 ET IS. Versions: SG, MG

[5] Manufacturer:

Airoptic Sp. z o.o.

[6] Address:

ul. Rubież 46B, 61-612 Poznań, Poland

[7] The protective equipment or system and any acceptable variations thereto are specified in the schedule to this certificate.

[8] Główny Instytut Górnictwa, Notified Body no 1453 according to Directive 2014/34/EU of February 26, 2014, approves that the protective equipment or system specified in this certificate has been found to comply with the essential health and safety requirements for the design and construction of protective equipment and systems intended for use in potentially explosive atmosphere given in Annex II to Directive 2014/34 /EU (Załącznik nr 2 Rozporządzenia Ministra Rozwoju z dnia 06.06.2016r. Dz.U. z dnia 09.06.2016r. Poz. 817). The results of the assessment and examinations as well as the list of agreed documentation are recorded in the confidential Report **KDB No 20.003-1 [T-7616/1]**

[9] The essential health and safety requirements have been met by compliance with the requirements of the following standards:

EN IEC 60079-0:2018; EN 60079-2:2014; EN 60079-11:2012; EN 60079-26:2015; EN 60079-28:2015;

[10] If sign "X" is placed after the certificate number, this means the specific conditions of use set out in the schedule to this certificate.

[11] This EU type examination certificate relates only to the construction, assessment and testing of the specified product in accordance with Directive 2014/34 /EU (Rozporządzenie Ministra Rozwoju z dnia 06.06.2016r. Dz.U. z dnia 09.06.2016r. Poz. 817). The certificate shall not cover the remaining requirements of the Directive regarding the manufacturing process and placing the protective equipment or system on the market.

[12] The marking of the equipment see technical parameters [15]

Główny Instytut Górnictwa
Jednostka Oceny Zgodności
KIEROWNIK ZESPOŁU
ds. Bezpieczeństwa Przeciwwybuchowego
inż. Andrzej Trębaczewski
ATEX Certification Expert

Główny Instytut Górnictwa
KIEROWNIK
Jednostki Oceny Zgodności
dr inż. Dariusz Stefaniak

Date of issue: 16 August 2021

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Jednostka Oceny Zgodności, 43-190 Mikołów, ul. Podleska 72, www.gigcert.com
Certification Body accredited by PCA *[Polish Centre for Accreditation]*, **No AC038.**

[15] Description:

GasEye Cross Duct Ex1 spectrometer
Marking:

II 1/2G Ex pxb op is IIC T6 Ga/Gb
II 1/2D Ex pxb op is IIIC T85°C Da/Db

The laser based GasEye Cross Duct Ex1 spectrometer is a versatile gas analyzer tool for industrial process applications. It can be configured to operate in the near-infrared (NIR), mid-infrared (MIR) and infrared (IR) wavelength range thereby covering the majority of all gases of interest in the industrial process monitoring.

The GasEye Cross Duct Ex 1 gas analyzer consists of a pair of cross-duct sensors - a transmitter unit (TX) and a receiver unit (RX) mounted directly on the process flanges. The transmitter unit emits laser radiation directly through the process containing the constituents of interest. The receiver unit collects the radiation on the other side of the process duct. The concentration of the gas(es) is determined by the level of received optical power by the receiver unit (RX). The equipment, both the transmitter unit as of the receiver unit, are mounted to the installation through a flange, which can additionally act as a thermal insulator.

GasEye Cross Duct Ex 1 versions are described below:

GasEye Cross Duct SG version has one laser placed in transmitter unit. The system consists of receiver (RX) and transmitter (TX) enclosures, main system electronics is placed in transmitter (TX) enclosure.

The receiver unit is connected to the transmitter unit by means of a hybrid loop cable (included). Single Gas system is used to analyze one or more gases which absorption line wavelengths lies in the spectrum range that can be covered by a single laser module.

GasEye Cross Duct MG version has two lasers placed in transmitter enclosure. The system consists of receiver, transmitter (with two lasers and no other electronics) and central unit enclosure which contains only main electronics and no lasers.

The receiver unit is connected to the central unit by means of a hybrid loop cable whereas the transmitter unit is connected to the central unit by means of two electrical cables (included). Multi Gas system is used to analyze two or more gases of interest in case their absorption line wavelenghts lies in the spectrum range exceeding the range of a single laser module.

Technical parameters:

Power input Un:	24VDC
Supply voltage range:	19 ÷ 30VDC
Power consumption:	< 15W (SG) < 25W (MG)
Degree of protection:	IP 66
Ambient temperature:	-30°C ÷ +70°C
Pre-purge time:	≥ 7 min.
Inlet pressure:	2 bar
Minimal pressure:	not less than 2.3 mbar during continuous system work after initial purging

GasEye Cross Duct Ex1 IS spectrometer
Marking:

II 1/2G Ex pxb ia op is IIC T6 Ga/Gb
II 1/2D Ex pxb ia op is IIIC T85°C Da/Db

GasEye Cross Duct Ex1 IS spectrometer extends the functionality of the systems GasEye Cross Duct Ex1 in both versions (SG and MG).

Introduced:

- four independent and galvanically isolated 4-20mA intrinsically safe passive analog outputs,
- two independent intrinsically safe active analog inputs 4-20mA,
- four independent and galvanically isolated intrinsically safe (relay) digital outputs.

Technical parameters:

Power input Un:	230VAC
Supply voltage range:	100 ÷ 240VAC
Power consumption:	< 40W
Degree of protection:	IP 66
Ambient temperature:	-30°C ÷ +70°C
Pre-purge time:	≥ 10 min.
Inlet pressure:	2 bar
Minimal pressure:	not less than 2.3 mbar during continuous system work after initial purging.

Parameters of GasEye Cross Duct Ex1 IS intrinsically safe circuits:

"COM" vs. "IN" terminals of circuits 4..20mA: AIN1, AIN2
Uo=27,3V
Io=74mA
Co, Lo pairs from the table below:

Group IIA:

Lo[mH]	41.000	20.000	10.000	5.000	2.000	1.000	0.500	0.200
Co[µH]	0.370	0.480	0.480	0.480	0.480	0.540	0.630	0.810
Lo[mH]	0.100	0.050	0.020	0.010	0.005	0.002	0.001	
Co[µH]	0.990	1.200	1.600	2.100	2.280	2.280	2.280	

Group IIB:

Lo[mH]	25.000	20.000	10.000	5.000	2.000	1.000	0.500	0.200
Co[µH]	0.290	0.290	0.290	0.290	0.320	0.380	0.460	0.600
Lo[mH]	0.100	0.050	0.020	0.010	0.005	0.002	0.001	
Co[µH]	0.683	0.683	0.683	0.683	0.683	0.683	0.683	

Group IIC:

Lo[mH]	3.600	2.000	1.000	0.500	0.200	0.100
Co[µH]	0.037	0.046	0.058	0.074	0.088	0.088
Lo[mH]	0.050	0.020	0.010	0.005	0.002	0.001
Co[µH]	0.088	0.088	0.088	0.088	0.088	0.088

Główny Instytut Górnictwa
Jednostka Oceny Zgodności

The circuits are not galvanically separated from each other
The circuits are galvanically separated from the remaining circuits of the equipment.

"COM" vs. "OUT" terminals of circuits AOUT1, AOUT2, AOUT3, AOUT4:
Ui=30V Ci=57nF
Ii=100mA Li= negligibly small
Pi=3W
The circuits are galvanically separated from each other and from the remaining circuits of the equipment.

Terminals of circuits DO1, DO2, DO3, DO4
Ui=30V Ci= negligibly small
Ii=2A Li= negligibly small
Pi=3W
The circuits are galvanically separated from each other and from the remaining circuits of the equipment.

Additional equipment of GasEye Cross Duct Ex1 and GasEye Cross Duct Ex1 IS spectrometer:

1.Purging system controller

Producer: Pepperl+fuchs

Model: 6500-01-EXT1-PNO-LNO

Number of ATEX certificate: UL/DEMKO 16ATEX1640X

Marking:

II 2G Ex eb q ib [ib pxb] IIC T4 Gb
II 2D Ex tb ib [ib pxb] IIIC T135°C Db
II 2G Ex eb q ib [ib pyb] IIC T4 Gb
II 2D Ex tb ib [ib pyb] IIIC T135°C Db (Ta: -20°C÷+70°C)

2.Purging system vent

Producer: Pepperl+fuchs

Model: EPV-6500-07

Number of ATEX certificate: DEMKO 15ATEX1622X

Marking:

II 2G Ex ib [pxb] IIC T4 Gb
II 2D Ex ib [pxb] IIIC T135°C Db
II 2G Ex ib [pyb] IIC T4 Gb
II 2D Ex ib [pyb] IIIC T135°C Db (Ta: -20°C÷+70°C)

3.Solenoid operator

Producer: Nass magnet

Type: 1259 30 / 5146

Number of ATEX certificate: PTB 02ATEX2154

Marking:

II 2G Ex ia IIC T6 Gb
or
II 2G Ex ia IIB T6 Gb (Ta: -40°C÷+50°C)

or

II 2G Ex ia IIC T4 Gb
or
II 2G Ex ia IIB T4 Gb (Ta: -40°C÷+85°C)

or

Producer: Nass magnet

Type: 1262 50 / W5146

Number of ATEX certificate: PTB 09ATEX2001

Marking:

II 2G Ex ia IIC/IIB T6 Ga
II 2D Ex t IIIC T80°C Db (Ta: -40°C÷+50°C)

or

II 2G Ex ia IIC/IIB T6 Ga
II 2D Ex t IIIC T130°C Db (Ta: -40°C÷+85°C)

GasEye Cross Duct Ex1 ET and GasEye Cross Duct Ex1 ET IS
Marking:

II 1/2G Ex db eb h ia ib op is pxb q IIC T4 Ga/Gb
II 1/2D Ex h ia ib op is pxb q tb IIIC T135°C Da/Db

GasEye Cross Duct Ex1 ET and ET IS are versatile tools for analyzing gases in industrial processes, using GasEye Cross Duct Ex1 or GasEye Cross Duct Ex1 IS analyzers with additional accessories. All additional equipment was installed in an additional enclosure made of stainless steel. The enclosure is equipped with a convection heater controlled by a thermostat. The thermostat keeps the temperature inside the enclosure above 15°C.

The following explosion-proof equipment was used in **GasEye Cross Duct Ex1 ET** and **GasEye Cross Duct Ex1 ET IS** equipment:

No.	Device / Component	Type	Marking	Certificate
1.	GasEye Cross Duct	Ex1	II 1/2G Ex pxb op is IIC T6 Ga/Gb II 1/2D Ex pxb op is IIIC T85°C Da/Db	KDB 20ATEX0003X
		Ex1 IS	II 1/2G Ex pxb ia op is IIC T6 Ga/Gb II 1/2D Ex pxb ia op is IIIC T85°C Da/Db	
2.	Metal housing	RSA-ATEX-OH-116-042	II 2G Ex eb IIC Gb II 2D Ex tb IIIC Db	OBAC 15ATEX0203U
3.	Purging controller	6500-01-EXT1-PNO-LNO	II 2G Ex eb q ib [ib pxb] IIC T4 Gb II 2D Ex tb ib [ib pxb] IIIC T135°C Db II 2G Ex eb q ib [ib pyb] IIC T4 Gb II 2D Ex tb ib [ib pyb] IIIC T135°C Db	UL/DEMKO 16ATEX1640X
4.	Purging system vent	EPV-6500-07	II 2G Ex ib [pxb] IIC T4 Gb II 2D Ex ib [pxb] IIIC T135°C Db II 2G Ex ib [pyb] IIC T4 Gb II 2D Ex ib [pyb] IIIC T135°C Db	DEMKO 15ATEX1622X
5.	Solenoid operator	1259 30 / 5146	II 2G Ex ia IIC T6/T4 Gb II 2G Ex ia IIB T6/T4 Gb	PTB 02ATEX2154
		1262 50 / W5146	II 2G Ex ia IIC/IIB T6/T4 Ga II 2D Ex t IIIC T80°C/130°C Db	PTB 09ATEX2001
6.	Junction box	GR.TJE.13.13.09.B-S0004	II 2G Ex eb IIC T6 Gb II 2D Ex tb IIIC T80°C Db II 2G Ex eb IIC T5 Gb II 2D Ex tb IIIC T95°C Db	CML 17ATEX3255X
7.	Convection type heater 100W	CREx020 02052.0-10	II 2G Ex db IIC T5 Gb II 2D Ex tb IIIC T100°C Db	EPS 16ATEX1109X
8.	Manometer	232.30.063 + option ATEX	II 2G Ex h IIC T6...T1 Gb II 2D Ex h IIIC T85°C...T450°C Db	-
9.	Thermostat	REx 011	II 2G Ex db IIC T6 Gb II 2D Ex tb IIIC T85°C Db	EPS 16ATEX1118X
10.	Cable glands	EX1126.20.140 - M20 EX1126.17.100 - M16	II 2G Ex e IIC II 2D Ex tD IIIC A21 IP68	PTB 10ATEX1034X
		EX1100.12.065 - M12	II 2G Ex eb IIC Gb II 1D Ex tb IIIC Db	SEV 15ATEX0152X

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		HSK-M-Ex-d 1.622.2000.50 - M20 1.622.1600.50 - M16	Ex II 2G Ex db IIC Gb Ex II 1D Ex ta IIIC Da	KEMA 99ATEX6968X
11.	Breath drain	DP-E-3-0-04-s2	Ex II 2G Ex e IIC Gb Ex II 2D Ex tb IIIC Db	ITS 16ATEX101338 X
		BDRVX-1MBNS.K01	Ex II 2G Ex eb IIC Gb Ex II 2D Ex tb IIIC Db	IMQ 13ATEX030X

Technical parameters:

Power input Un:	24VDC and 230VAC 230VAC **(Model: ET IS)**
Supply voltage range:	19 ÷ 30VDC and 100 ÷ 240VAC 100 ÷ 240VAC **(Model: ET IS)**
Power consumption:	<40W and <100W <140W **(Model: ET IS)**
Degree of protection:	IP 66
Ambient temperature:	-30°C ÷ +70°C
Pre-purge time:	≥ 7 min. ≥ 10 min. **(Model: ET IS)**
Inlet pressure:	2 bar
Minimal pressure:	not less than 2.3 mbar during continuous system work after initial purging.

Parameters of GasEye Cross Duct Ex1 ET IS intrinsically safe circuits:

"COM" vs. "IN" terminals of circuits 4..20mA: AIN1, AIN2
Uo=27,3V
Io=74mA

Co, Lo pairs from the table below:

Group IIA:

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Group IIB:

Lo[mH]	25.000	20.000	10.000	5.000	2.000	1.000	0.500	0.200
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Pi=3W
The circuits are galvanically separated from each other and from the remaining circuits of the equipment.

[16] Test Report:

"ATEX assessment report" KDB No 20.003-1

[17] Special conditions of use:

- External parts made of plastic should be cleaned with a damp cloth, with the addition of antistatic fluids.
- Enclosure should be installed in a way that prevents electrostatic charging, in accordance with the instructions.
- Maximum inlet pressure to the containment system should not exceed 2.5 bar.
- If the temperature of the connecting element exceeds 70°C, use thermally insulating elements in accordance with the instructions.
- The equipment GasEye Cross Duct Ex1 ET and GasEye Cross Duct Ex1 ET IS must be protected from direct sunlight

[18] Essential health and safety requirements:

Met by fulfilling the requirements of the following standards:

EN IEC 60079-0:2018	(PN-EN IEC 60079-0:2018-09);
EN 60079-2:2014	(PN-EN 60079-2:2015-02);
EN 60079-11:2012	(PN-EN 60079-11:2012);
EN 60079-26:2015	(PN-EN 60079-26:2015-04);
EN 60079-28:2015	(PN-EN 60079-28:2015-12);

Document history:

- EU type examination certificate KDB 20ATEX0003X, 0 edition of 09.01.2020, initial certification
- EU type examination certificate KDB 20ATEX0003X, 1 edition of 16.08.2021, replaces EU type examination certificate KDB 20ATEX0003X, 0 edition of 09.01.2020.
  The parameters of the equipment have changed. New versions of the execution were introduced.

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