

TYPE APPROVAL CERTIFICATE**This is to certify:****That the Gas Detector**

with type designation(s)

GIR-3000; GTD-2000Ex; GTD-2000Tx(O2); GTD-2000Tx(H2S)

Issued to

**GASTRON Co., Ltd.
Kyunggi-do, Korea**

is found to comply with

DNV GL rules for classification – Ships, offshore units, and high speed and light craft**Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.****Location classes:**

Temperature	D
Humidity	B
Vibration	A
EMC	A
Enclosure	B / IP66/67

Issued at **Høvik** on **2018-01-31**This Certificate is valid until **2022-12-31**.DNV GL local station: **Seoul**Approval Engineer: **Nils Jarem**for **DNV GL**

Digitally Signed By: Sneen, Ståle

Location: DNV GL Høvik, Norway

on behalf of

**Odd Magne Nesvåg
Head of Section**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.



Product description

The gas detectors consist of main housing for display and transmitter parts and sensor housing for detecting parts, it is structure of one piece type. The inner structure is composed of LCD panel part that shows measured values, and PCB having terminal parts for delivering measured value (DC 4-20mA), isolated RS-485 communication signal, and alarms signals to outside.

The GIR-3000 and GTD-2000Ex models are combustible gas detector for detection of flammable gases with measuring range 0-100%LEL.

The GTD-2000Tx(O2) oxygen gas detector is for detecting of leak of oxygen gas from industrial work places and manufacturing processes which generate or use oxygen gas. When installed in hazardous area, GTD-2000Tx(O2) oxygen gas detector will regularly and continuously detect the O2 gas leakage and display the data with integrated LCD and to supply 4-20mA standard output.

The GTD-2000Tx(H2S) hydrogen sulphide gas detector is for detecting of leak of H2S gas from industrial work places and manufacturing processes which generate or use hydrogen sulphide gas. When installed in hazardous area, GTD-2000Tx(H2S) gas detector will regularly and continuously detect the H2S gas leakage and display the data with integrated LCD and to supply 4-20mA standard output.

Software versions: GIR-3000: V1.31; GTD-2000Ex: V1.17; GTD-2000Tx(O2): V1.19;
 GTD-2000Tx(H2S): V1.19.



Approval conditions

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV GL, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case. Reference is made to DNV GL rules for classification of ships Pt.4 Ch.9 Control and monitoring systems.

Application/Limitation

Ex installations to be approved in each case according to the Rules and Ex-Certification/ Special Condition for Safe Use listed in valid Ex-certificate issued by a notified/recognized Certification Body.

Ex-certification is not covered by this certificate and the following paragraph, which is for information only, is based on information received from the manufacturer, but not verified by DNV GL.

Information on Ex-Certification received from manufacturer – not verified by DNV GL		
Type	Certified	Certificate No.
GTD-2000Ex	Ex d IIC Gb T5 (Ta -20°C to +60°C)	IECEX SIR 08.0003 Issue No.2 dated 2010-07-15
GTD-2000Ex	 II 2G Ex d IIC Gb T5 (Ta -20°C to +60°C)	SIRA 08ATEX1003 Issue 1
GTD-2000Tx GIR-3000	Ex d IIC Gb T6 (Ta -20°C to +60°C)	IECEX SIR 08.0003 Issue No.2 dated 2010-07-15
GTD-2000Tx GIR-3000	 II 2G Ex d IIC Gb T6 (Ta -20°C to +60°C)	SIRA 08ATEX1003 Issue 1

Type Approval documentation

Model	Name of document	Document number	Date	Rev.
GIR-3000	Drawing	G-10003	2012.08.02	0
	Instruction manual	GDM-004	2013.03.05	1
	Software module test specification	GIR3000_MTS_V1_0-080724	2013.03.08	1.00
	Product acceptance test specification	GIR3000_PATS_V1_03-080731	2013.03.08	1.02
	Software quality plan	GIR3000_SQP_C	2008.08.21	C
	Visual & Functional test report	G-1209-0002	2012.09.20	0
	Environmental test report	KOMERI-CTA-12T1270	2013.01.09	0

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 Certificate No: **TAA00001KW**

Model	Name of document	Document number	Date	Rev.	
	EMC test report	KOMERI-0311-12T1271	2013.01.07	0	
	IP test	KOMERI-0306-12T1567	2012.10.25	0	
	Performance test report	SIRA N 0569	2008.03.	0	
GTD-2000Ex	Drawing	G-10001	2012.08.02	0	
	Instruction manual	GDM-003	2013.03.05	1	
	Software module test specification	GTD2000_MTS_V1_1-080910	2008.09.11	1.01	
	Product acceptance test specification	GTD2000_PATS_V1_01-080910	2013.03.08	1.02	
	Software quality plan	GTD2000_SQP_A	2008.08.21	A	
	Visual & Functional test report	G-1209-0002	2012.09.20	0	
	Environmental test report	KOMERI-CTA-12T1266	2013.01.09	0	
	EMC test report	KOMERI-0311-12T1267	2013.01.07	0	
	IP test report	KOMERI-0306-12T1317	2012.10.25	0	
	Performance test report	SIRA N 0568	2008.03.	0	
	GTD-2000Tx(O2)	Drawing	G-10002	2012.08.02	0
		Instruction manual	GDM-002	2013.03.05	1
Software module test specification		GTD2000_MTS_V1_2-080918(2)	2008.09.18	1.02	
Product acceptance test specification		GTD2000_PATS_V1_0-080826	2008.09.11	1.01	
Software quality plan		GTD2000_SQP_A	2008.08.21	A	
Visual & Functional test report		G1209-0002	2012.09.20	0	
General requirements		G1209-0004	2012.09.20	0	
Environmental test report		KOMERI-CTA-12T1268	2013.01.09	0	
EMC test report		KOMERI-0311-12T1269	2013.01.07	0	
IP test		KOMERI-0306-12T1566	2012.10.25	0	
Performance test report		KOMERI-CTA-12T1280	2013.01.23	0	
Performance test report		KOMERI-CTA-12T1467	2013.01.28	0	
GTD-2000Tx(H2S)	Drawing	G-10004	2012.08.02	0	
	Instruction manual	GDM-001	2013.03.05	1	
	Software module test specification	GTD2000_MTS_V1_2-080918(2)	2008.09.18	1.02	
	Product acceptance test specification	GTD2000_PATS_V1_0-080826	2008.09.11	1.01	
	Software quality plan	GTD2000_SQP_A	2008.08.21	A	
	Visual & Functional test report	G-1209-0003	2012.09.20	0	
	Environmental test report	KOMERI-CTA-0314-12T1277	2012.11.30	0	
	Environmental test report	KOMERI-6062-12T1279-1	2012.11.29	0	
	Environmental test report	KOMERI-0306-12T1276	2012.10.23	0	
	EMC test report	KOMERI-0311-12T1278	2013.01.07	0	
	IP test report	KOMERI-0306-12T1566	2012.10.25	0	
	Performance test report 1	KOMERI-CTA-12T1388	2013.02.05	0	
Performance test report 2	KOMERI-CTA-12T1468	2013.01.30	0		
Type approval renewal assessment report for A-13398, DNV GL Seoul 2017-11-27					

Tests carried out

Applicable tests according to DNV Standard for Certification No. 2.4, April 2006.
 - EN 50271:2002; IEC 60092-504:2001; EN 50104:2010; IEC 60533:1999; EN 45544-1:2000;
 EN 45544-2:2000; IEC 60529:2001; EN 61779-1:2000; EN 61779-4:2000.

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Marking of product

The products to be marked with:

- manufacturer name
- model name
- serial number
- power supply ratings

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE