





## TECHNICAL REPORT

<b>Product</b>	Portable Gas Monitor		
<b>Name and address of the applicant</b>	RIKEN KEIKI Co., Ltd. 2-7-6, Azusawa, Itabashi-ku, Tokyo, 174-8744, Japan		
<b>Rating and principal characteristics</b>	Battery operated. BUL-6000 (rechargeable Li-ion battery unit) or BUD-6000 (Alkaline battery unit) For BUD-6000: use only Toshiba LR6 or Duracell MN1500 AA-batteries.		
<b>Trade mark (If any)</b>			
<b>Model/type</b>	GX-6000		
<b>DNV certificate no.</b>	Presafe 15 ATEX 6171X Issue 4		
<b>Ex-code for component / electrical apparatus</b>	 II 1 G Ex ia IIB T4/T3 Ga -20°C ≤ Ta ≤ +50°C  II 1 G Ex ia IIC T4/T3 Ga -20°C ≤ Ta ≤ +50°C See «Description of equipment under test» for details.		
<b>Additional information</b>	N / A		
<b>Report issue No.</b>	4		
<b>Tested according to</b>	EN IEC 60079-0:2018 (IEC 60079-0 ed. 7) EN 60079-11: 2012 (IEC 60079-11 ed. 6)	Explosive atmospheres, Part 0: Equipment – General requirements Electrical apparatus for potentially explosive atmospheres Equipment protection by intrinsic safety "i"	
<b>Name and address of the testing laboratory</b>		<b>DNV Product Assurance AS</b> Veritasveien 3 1363 Høvik Norway	<b>Tel:</b> +47 67 57 88 00 <b>e-mail:</b> <a href="mailto:ex@dnv.com">ex@dnv.com</a> <b>Web:</b> <a href="http://www.dnv.com">www.dnv.com</a>
<b>Tested by</b>	2021-04-28		
	<b>signature</b>	<b>Date</b>	
	Gunnar Nielsen		
	<b>Printed name</b>		
<b>Verified by</b>	2021-04-28		
	<b>signature</b>	<b>date</b>	
	Stig André Norheim		
	<b>Printed name</b>		

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**General remarks:**

The test results presented in this Technical Report relate only to the item or product tested.

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



**Appendix; Part 0** ([IECEX TEST REPORT, IEC 60079-0](#))

**Appendix; Part 1** ([IECEX TEST REPORT ADDENDUM, IEC 60079-11](#))

**Description of equipment under test:**

This certificate covers the portable gas monitor GX-6000 which is used for measuring flammable gas concentration in hazardous location. GX-6000 is an battery-operated handheld portable device and is built up by anti-electrostatic plastic enclosure with minor metal parts such as assembly screws. Two alternative battery units may be used, BUL-6000 (rechargeable Li-ion battery) and BUD-6000 (alkaline dry battery). Replacement or charging of battery unit can be performed by end-users and is only allowed in non-hazardous areas. Safety instructions and warnings must be followed. Following parts are also included in the investigation, charger module BC-6000 or SDM-6000, Combustible gas sensor NC-6264A, Toxic gas sensor and Oxygen sensor, Smart sensor type DES, ESS, PIS & OSS.

When the combustible gas sensor is used the gas group is limited to IIB.

Ex code	Ambient temperature	Combustible gas sensor	Battery
 II 1 G Ex ia IIB T4 Ga	-20°C to +50°C	Mounted	BUL-6000
 II 1 G Ex ia IIC T4 Ga	-20°C to +50°C	Not mounted	BUL-6000
 II 1 G Ex ia IIB T4 Ga	-20°C to +50°C	Mounted	BUD-6000 LR6 (Toshiba)
 II 1 G Ex ia IIC T4 Ga	-20°C to +50°C	Not mounted	BUD-6000 LR6 (Toshiba)
 II 1 G Ex ia IIB T3 Ga	-20°C to +50°C	Mounted	BUD-6000 MN1500 (Duracell)
 II 1 G Ex ia IIC T3 Ga	-20°C to +50°C	Not mounted	BUD-6000 MN1500 (Duracell)

**Electrical Data**

Battery operated. BUL-6000 (rechargeable Li-ion battery unit) or BUD-6000 (Alkaline battery unit)

For BUD-6000: use only Toshiba LR6 or Duracell MN1500 AA-batteries (different battery types shall not be mixed).

**Degrees of protection (IP Code)**

(Compliance with requirement of IP20 is checked)

**Warning markings;**

N / A

**Descriptive documents;**

Drawing No.	Name/Title	Rev.	Date	Page/s
E3-6991-5470-70-01K	INDEX GX-6000	6	2021.04.23	1

See complete list of descriptive documents at the end of the report.

**Copy of marking plate:**

MODEL GX-6000  
INST.No.  
RIKEN KEIKI Co., Ltd.  
2-7-6, Azusawa, Itabashi-ku, Tokyo, 174-8744, Japan

MODEL BUL-6000  
INST.No.  
RIKEN KEIKI Co., Ltd./2-7-6, Azusawa,  
Itabashi-ku, Tokyo, 174-8744, Japan  
WARNING  
Do not charge battery in haz.loc.

MODEL BUD-6000  
INST.No.  
RIKEN KEIKI Co., Ltd./2-7-6, Azusawa,  
Itabashi-ku, Tokyo, 174-8744, Japan  
WARNING  
Use only battery types: LR6 TOSHIBA

 2460   
II 1GEExia IIC/II BT4/T3Ga  
Presafe15ATEX6171X  
IECEX PRE 15.0011  
-20°C ≤ Ta ≤ +50°C  
WARNING  
Read manual for safety info.  
Do not open in haz.loc.

**Tested according to additional information:**

N / A

**National requirements:**


N / A

**Other requirements:**

N / A

**Additional information:**

N / A

<b>Calibration:</b>	All instruments used in the tests given in this test report are calibrated and traceable to national or international standards. Further information about traceability will be given on request.
<b>Measurement uncertainty:</b>	Measurement uncertainties are calculated for all instruments and instrument set-ups given in this report. Calculations are based on the principles given in the standard EA-4/02 (Oct 2013). Further information about measurement uncertainties will be given on request
<b>Laboratory accreditation</b>	 Testing laboratory satisfy requirements in NS-EN ISO/IEC 17025

**Possible test case verdicts:**

- test case does not apply to the test item.....: N / A
- test item does meet the requirement.....: Pass

Report History		
Issue No.	Date of revision	Description
0	2015-04-21	Original report
1	2015-06-16	- Changed layout of DES sensor PCB in order to change the optical path length. The infrared sensor is then able to measure additional gas type. - Minor changes of non-safety components on charger module SDM-6000.
2	2020-08-27	Update the notified body number
3	2020-11-02	Removed EN60079-26: 2007
4	2021-04-28	Updated to the latest edition of EN 60079-0, include an additional battery cell for use with BUD-6000 and update gas group to IIB when the combustible gas sensor (NC-6264A) is used.

**Equipment tested:**




DNV Sample ID.	Date received	Description (size, colour, material, prototype modification, version no. etc)	Serial no. (if any)
No new test samples needed for this update. The Duracell primary cell is tested by DEKRA, NL/DEK/ExTR13.0075/02.			

**Photos of equipment**

N / A – No changes from previous issues.

EN IEC 60079-0:2018			
Clause	Requirement - Test	Result - Remark	Verdict
<b>Endorsement notice:</b> The text of the International Standard IEC 60079-0:2017 was approved by CENELEC as a European Standard without any modifications Additional information relating to the European ATEX directive 2014/34/EU (informative):			
<b>Annex ZY.1</b>	<b>Equipment groups and categories</b>		
<b>Annex ZY.2</b>	<b>Instructions</b> In clause 30.1 under: "instructions for safety addressing the following areas – installation and erection;" "Information other than the general requirements given in IEC 60079-14" Is replaced by "Information other than the general requirements given in EN 60079-14 and EN 50628"		Pass
<b>Annex ZY.3</b>	<b>Marking</b>	Refer to checklist for MARKING: -ADDITIONAL REQUIREMENTS ACCORDING TO ATEX DIRECTIVE	Pass
<b>Annex ZY.4</b>	<b>Fans</b> Clause 17.2.5 "Room ventilating fans" is to be supplemented by the requirements given in EN 14986 "Design of fans working in potentially explosive atmospheres"	EUT is not a ventilating fan.	N / A

EN 60079-11:2012			
Clause	Requirement - Test	Result - Remark	
<b>Endorsement notice:</b> The text of the International Standard IEC 60079-11:2011 was approved by CENELEC as a European Standard without any modifications.			

MARKING: -ADDITIONAL REQUIREMENTS ACCORDING TO ATEX DIRECTIVE			
Clause	Requirement - Test	Result - Remark	Verdict
	Where reference is made to Directive 2014/34/EU, the marking shall also include (Annex II, 1.0.5)		Pass
	<ul style="list-style-type: none"> <li>name, registered trade name or registered trade mark, and address of the manufacturer,</li> </ul>	RIKEN KEIKI Co., Ltd. 2-7-6, Azusawa, Itabashi-ku, Tokyo, 174-8744, Japan	Pass
	<ul style="list-style-type: none"> <li>the year in which the equipment was constructed</li> </ul>	Small equipment – limited space.	N / A
	<ul style="list-style-type: none"> <li>the specific marking of explosion protection  followed by the symbol of the equipment-group and the category</li> </ul>	 II 1 G	Pass
	<ul style="list-style-type: none"> <li>CE marking with identification number to the notified body involved in the production control phase</li> </ul>	 2460	Pass
	<ul style="list-style-type: none"> <li>If ATEX component, no CE mark, only NB number</li> </ul>	EUT is not an Ex component.	N / A
	for equipment Group II:		Pass
	<ul style="list-style-type: none"> <li>the letter 'G' where explosive atmospheres caused by gases, vapours or mists are concerned and/or</li> </ul>	G	Pass
	<ul style="list-style-type: none"> <li>the letter 'D' where explosive atmospheres caused by dusts are concerned</li> </ul>		N / A

1	2	3	4	5	6	7	8	9	10	11	12	13	14
		DRAWING NAME		DRAWING No.	REV	DATE			DRAWING NAME		DRAWING No.	REV	DATE
01		BLOCK DIAGRAM FOR MODEL GX-6000		E3-6991-5393-30-01K	0	2014.7.28		31	T- 3/4 BPA LAMP OL-82708PA		E4-6991-5129-60-01K	0	2012.2.24
02		DIAGRAM FOR I.S. KEEP FOR MODEL GX-6000		E3-6991-5361-10-01K	2	2014.12.16		32	SMART SENSOR Type-PIS		M4-4830-01-01K	1	2015.3.25
03		OUTER STRUCTURE GX-6000		M3-4777-01-01K	0	2014.7.18		33	PIS SENSOR PCB		E4-6991-5387-30-01K	2	2015.3.25
04		MAIN UNIT GX-6000		M2-4777-01-01K	1	2014.9.30		34	PIS DIGITAL PCB		E3-6991-5388-10-01K	1	2015.3.25
05		SCHEMATIC MAIN PCB FOR MODEL GX-6000		E3-6991-5372-80-01K	0	2014.7.14		35	BUL-6000		M3-4777-03-01K	0	2014.7.28
06		SCHEMATIC MAIN PCB FOR MODEL GX-6000		E3-6991-5372-80-02K	0	2014.7.14		36	BUL PCB		E3-6991-5389-80-01K	1	2014.9.5
07		SCHEMATIC MAIN PCB FOR MODEL GX-6000		E3-6991-5372-80-03K	0	2014.7.14		37	BUD-6000		M3-4777-04-01K	1	2015.3.6
08		SCHEMATIC MAIN PCB FOR MODEL GX-6000		E3-6991-5372-80-04K	0	2014.7.14		38	BUD PCB		E4-6991-5390-50-01K	1	2014.9.5
09		SCHEMATIC MAIN PCB FOR MODEL GX-6000		E3-6991-5372-80-05K	0	2014.7.14		39	DIAGRAM FOR I.S. KEEP FOR MODEL BC-6000 / SDM-6000		E4-6991-5395-80-01K	1	2014.9.5
10		PARTS LIST OF MAIN PCB		PLT-6991-5372-80 (1/4)	0	2014.7.14		* 40	LABEL		M4-4777-01-01K	6	2021.4.23
11		PARTS LIST OF MAIN PCB		PLT-6991-5372-80 (2/4)	3	2014.12.16		41	LABEL BC-6000 / SDM-6000		M4-4777-01-02K	0	2014.7.28
12		PARTS LIST OF MAIN PCB		PLT-6991-5372-80 (3/4)	1	2014.11.5		42	SCHEMATIC CHARGER PCB FOR MODEL BC-6000		E3-6991-5255-80-01K	0	2014.12.16
13		PARTS LIST OF MAIN PCB		PLT-6991-5372-80 (4/4)	0	2014.7.14		43	CHARGER PCB FOR MODEL BC-6000		E3-6991-5255-80-01A	0	2014.12.16
14		MAIN PCB FOR MODEL GX-6000		E3-6991-5372-80-01A	0	2014.7.14		44	SCHEMATIC CHARGER PCB FOR MODEL SDM-6000		E3-6991-5445-60-01K	1	2015.3.5
15		MAIN PCB FOR MODEL GX-6000		E3-6991-5372-80-02A	0	2014.7.14		45	CHARGER PCB FOR MODEL SDM-6000		E3-6991-5445-60-01A	2	2015.6.12
16		SCHEMATIC SENSOR PCB FOR MODEL GX-6000		E3-6991-5373-50-01K	1	2014.11.5		46	SMART SENSOR Type-OSS		M4-4080-01-01K	0	2015.2.24
17		PARTS LIST OF SENSOR PCB		PLT-6991-5373-50 (1/1)	2	2014.12.16		47	OSS SENSOR PCB		E4-6991-5457-00-01K	0	2015.2.24
18		SENSOR PCB FOR MODEL GX-6000		E4-6991-5373-50-01A	1	2014.11.5		48	OSS DIGITAL PCB		E3-6991-5458-70-01K	0	2015.2.24
19		SENSOR to MAIN WIRE FOR MODEL GX-6000		E4-6991-5382-70-01K	0	2014.7.14		49	OXYGEN SENSOR		M4-4080-01-02K	0	2015.2.24
20		PUMP RP-12		M4-4181-61-01K	3	2013.1.29		50	BC-6000		M3-4777-02-01K	1	2015.3.23
21		Buzzer BZ-9K		E4-6991-5008-70-01K	0	2011.2.28		51	SDM-6000		M3-4395-23-01K	1	2015.3.23
22		COMBUSTIBLE GAS SENSOR NC SENSOR		M3-4462-64-05K	3	2012.4.17							
23		TOXIC GAS SENSOR		M4-4084-92-03K	0	2014.7.30							
24		OXYGEN SENSOR		M4-4080-82-07K	0	2014.7.30							
25		SMART SENSOR Type-ESS		M4-4486-01-01K	0	2014.7.30							
26		TOXIC GAS SENSOR		M4-4084-30-08K	0	2014.7.30							
27		ESS SENSOR PCB		E3-6991-5384-10-01K	0	2014.7.14							
28		SMART SENSOR Type-DES		M4-4630-20-01K	0	2014.7.24							
29		DES SENSOR PCB		E3-6991-5385-90-01K	1	2015.5.25							
30		DES DIGITAL PCB		E3-6991-5386-60-01K	1	2015.2.24							

注 記 NOTES	No.40	改訂担当者 REV BY	改訂日 REVISED	名称 NAME
改訂回数 REV.	6 回頁数 PAGES	1 小野圭	2021.4.23	INDEX
承認 APPROVED	検討 CHECKED	製図 DRAWN	作成日 DATE	図番 DWG. NO.
石橋勝	北村正英	小野圭	2015.3.6	E 3 - 6 9 9 1 - 5 4 7 0 - 7 0 - 0 1 K
RIKEN KEIKI 理研計器株式会社 機密情報 / CONFIDENTIAL				