Report No. 277576

TECHNICAL REPORT

Product	Portable Gas Monitor	
Name and address of the applicant	RIKEN KEIKI Co., Ltd. 2-7-6, Azusawa, Itabashi-ku, Tokyo, 174-8744, Japan	
Rating and principal characteristics	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.	
Trade mark (If any)	RIKEN KEIKI	
Model/type	GX-6000	
DNV certificate no.	Presafe 15 ATEX 6171X	
Ex-code for component / electrical apparatus	Ⓔx II 1 G Ex ia IIB T4/T3 Ga -20°C ≤ Ta ≤ +50°C Ⓔx II 1 G Ex ia IIC T4/T3 Ga -20°C ≤ Ta ≤ +50°C	
Additional information	N/A	
Report issue No.	5	
Tested according to	EN IEC 60079-0:2018 (IEC 60079-0 ed. 7)	Explosive atmospheres, Part 0: Equipment – General requirements
	EN 60079-11:2012 (IEC 60079-11 ed. 6)	Electrical apparatus for potentially explosive atmospheres Equipment protection by intrinsic safety "i"
Name and address of the testing laboratory	DNV	**DNV Product Assurance AS** **Veritasveien 3** **1363 Høvik** **Norway** **Tel:** **+47 67 57 88 00** **e-mail:** **ex@dnv.com** **Web:** **www.dnv.com**
Tested by		2021-08-05
	signature	**Date**
	Ke Shen	
	Printed name	
Verified by		2021-08-05
	signature	**date**
	Gunnar Nielsen	
	Printed name	

General remarks:
The test results presented in this Technical Report relate only to the item or product tested.
The technical content of this report shall not be reproduced except in full without the written approval of the issuing Notified Body.

Appendix; Part 0 (IECEx TEST REPORT, IEC 60079-0)
Appendix; Part 1 (IECEx TEST REPORT, 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.

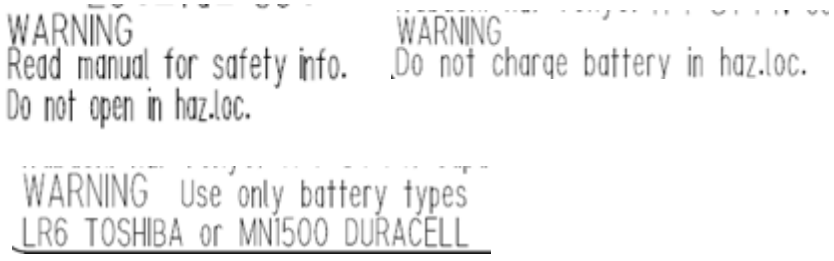
When the combustible gas sensor is used the gas group is limited to IIB.

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)

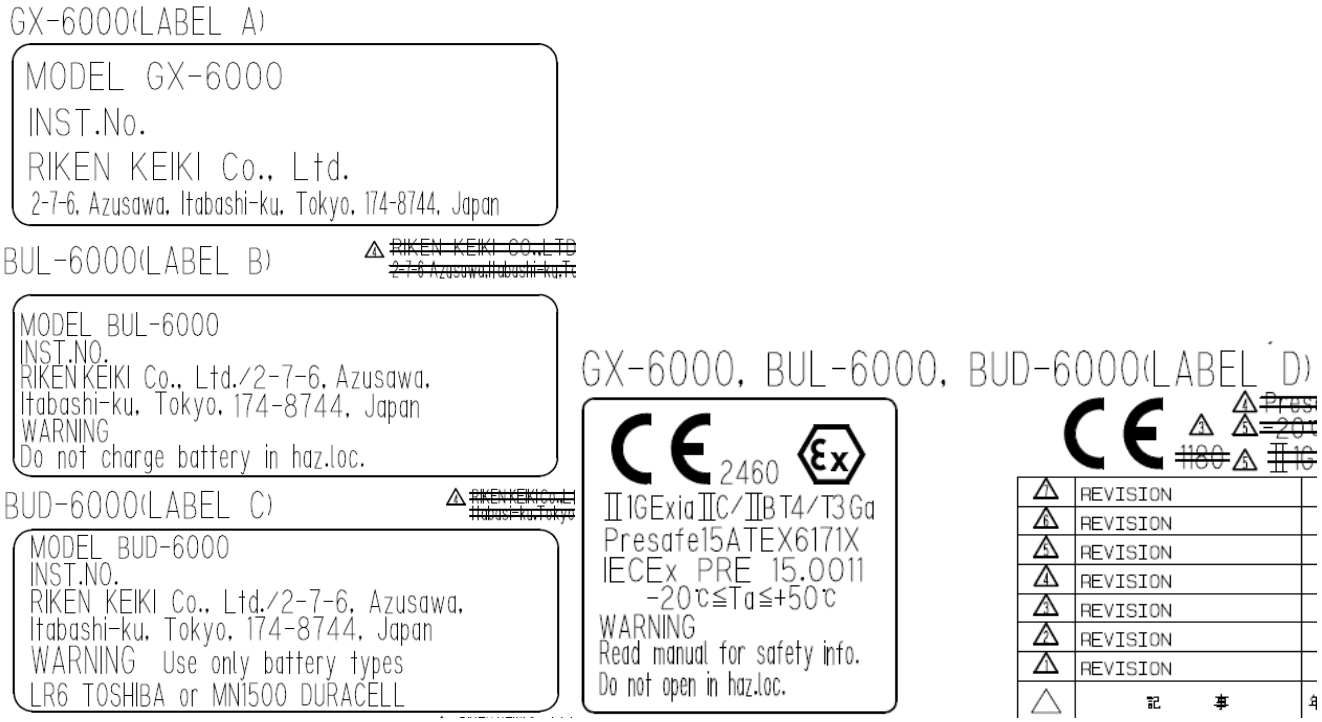
Warning markings;



Descriptive documents;

Drawing No.	Name/Title	Rev.	Date	Page/-s
E3-6991-5470-70-01K	INDEX GX-6000	7	2021-07-26	

Copy of marking plate:



Tested according to additional information:

N/A

National requirements:

N/A

Other requirements:

N/A

Additional information:

N/A

Calibration:	**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.**
Measurement uncertainty:	**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**
Laboratory accreditation	NORWEGIAN ACCREDITATION TEST 274 **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

Report History		
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 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.
5	2021-08-05	Correct the marking label with new battery cell type.

EN IEC 60079-0:2018			
Clause	Requirement - Test	Result - Remark	Verdict
Endorsement notice: 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):			
Annex ZY.1	**Equipment groups and categories**		
Annex ZY.2	**Instructions** 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
Annex ZY.3	**Marking**	Refer to checklist for MARKING: -ADDITIONAL REQUIREMENTS ACCORDING TO ATEX DIRECTIVE	Pass
Annex ZY.4	**Fans** 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	
Endorsement notice: 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
	• **name, registered trade name or registered trade mark, and address of the manufacturer,**	RIKEN KEIKI Co., Ltd. 2-7-6, Azusawa, Itabashi-ku, Tokyo, 174-8744, Japan	Pass
	• **the year in which the equipment was constructed**	Small equipment – limited space.	N / A
	• **the specific marking of explosion protection** Ex **followed by the symbol of the equipment-group and the category**	Ex II 1G	Pass
	• **CE marking with identification number to the notified body involved in the production control phase**	CE 2460	Pass
	• **If ATEX component, no CE mark, only NB number**	EUT is not an Ex component.	N / A
	for equipment Group II:		Pass
	• **the letter 'G' where explosive atmospheres caused by gases, vapours or mists are concerned and/or**	G	Pass
	• **the letter 'D' where explosive atmospheres caused by dusts are concerned**		N / A

		DRAWING NAME	DRAWING No.	REV	DATE
	01	BLOCK DIAGRAM FOR MODEL GX-6000	E3-6991-5393-30-01K	0	2014.7.28
	02	DIAGRAM FOR I.S. KEEP FOR MODEL GX-6000	E3-6991-5361-10-01K	2	2014.12.16
	03	OUTER STRUCTURE GX-6000	M3-4777-01-01K	0	2014.7.18
	04	MAIN UNIT GX-6000	M2-4777-01-01K	1	2014.9.30
	05	SCHEMATIC MAIN PCB FOR MODEL GX-6000	E3-6991-5372-80-01K	0	2014.7.14
	06	SCHEMATIC MAIN PCB FOR MODEL GX-6000	E3-6991-5372-80-02K	0	2014.7.14
	07	SCHEMATIC MAIN PCB FOR MODEL GX-6000	E3-6991-5372-80-03K	0	2014.7.14
	08	SCHEMATIC MAIN PCB FOR MODEL GX-6000	E3-6991-5372-80-04K	0	2014.7.14
	09	SCHEMATIC MAIN PCB FOR MODEL GX-6000	E3-6991-5372-80-05K	0	2014.7.14
	10	PARTS LIST OF MAIN PCB	PLT-6991-5372-80 (1/4)	0	2014.7.14
	11	PARTS LIST OF MAIN PCB	PLT-6991-5372-80 (2/4)	3	2014.12.16
	12	PARTS LIST OF MAIN PCB	PLT-6991-5372-80 (3/4)	1	2014.11.5
	13	PARTS LIST OF MAIN PCB	PLT-6991-5372-80 (4/4)	0	2014.7.14
	14	MAIN PCB FOR MODEL GX-6000	E3-6991-5372-80-01A	0	2014.7.14
	15	MAIN PCB FOR MODEL GX-6000	E3-6991-5372-80-02A	0	2014.7.14
	16	SCHEMATIC SENSOR PCB FOR MODEL GX-6000	E3-6991-5373-50-01K	1	2014.11.5
	17	PARTS LIST OF SENSOR PCB	PLT-6991-5373-50 (1/1)	2	2014.12.16
	18	SENSOR PCB FOR MODEL GX-6000	E4-6991-5373-50-01A	1	2014.11.5
	19	SENSOR to MAIN WIRE FOR MODEL GX-6000	E4-6991-5382-70-01K	0	2014.7.14
	20	PUMP RP-12	M4-4181-61-01K	3	2013.1.29
	21	Buzzer BZ-9K	E4-6991-5008-70-01K	0	2011.2.28
	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

		DRAWING NAME	DRAWING No.	REV	DATE
	31	T- 3/4 BPA LAMP OL-8270BPA	E4-6991-5129-60-01K	0	2012.2.24
	32	SMART SENSOR Type-PIS	M4-4830-01-01K	1	2015.3.25
	33	PIS SENSOR PCB	E4-6991-5387-30-01K	2	2015.3.25
	34	PIS DIGITAL PCB	E3-6991-5388-10-01K	1	2015.3.25
	35	BUL-6000	M3-4777-03-01K	0	2014.7.28
	36	BUL PCB	E3-6991-5389-80-01K	1	2014.9.5
	37	BUD-6000	M3-4777-04-01K	1	2015.3.6
	38	BUD PCB	E4-6991-5390-50-01K	1	2014.9.5
	39	DIAGRAM FOR I.S. KEEP FOR MODEL BC-6000 / SDM-6000	E4-6991-5395-80-01K	1	2014.9.5
*	40	LABEL	M4-4777-01-01K	7	2021.7.26
	41	LABEL BC-6000 / SDM-6000	M4-4777-01-02K	0	2014.7.28
	42	SCHEMATIC CHARGER PCB FOR MODEL BC-6000	E3-6991-5255-80-01K	0	2014.12.16
	43	CHARGER PCB FOR MODEL BC-6000	E3-6991-5255-80-01A	0	2014.12.16
	44	SCHEMATIC CHARGER PCB FOR MODEL SDM-6000	E3-6991-5445-60-01K	1	2015.3.5
	45	CHARGER PCB FOR MODEL SDM-6000	E3-6991-5445-60-01A	2	2015.6.12
	46	SMART SENSOR Type-OSS	M4-4080-01-01K	0	2015.2.24
	47	OSS SENSOR PCB	E4-6991-5457-00-01K	0	2015.2.24
	48	OSS DIGITAL PCB	E3-6991-5458-70-01K	0	2015.2.24
	49	OXYGEN SENSOR	M4-4080-01-02K	0	2015.2.24
	50	BC-6000	M3-4777-02-01K	1	2015.3.23
	51	SDM-6000	M3-4395-23-01K	1	2015.3.23

注 記 NOTES		改版担当者 REV. BY	改版日 REVISED	名 称 NAME
No.40				INDEX
改版回数 REV. 7	総頁数 PAGES 1	小野圭	2021.7.26	GX-6000
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	E3−6991−5470−70−01K

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