ERBESSDINSTRUMENTS

ERBESSD INSTRUMENTS TECHNOLOGIES INC. 19 EXCHANGE STREET GLENS FALLS, NY 12801 +1-877-223-4606

MANUFACTURER DECLARATION OF CONFORMITY

ERBESSD INSTRUMENTS TECHNOLOGIES INC.



Declare under our sole responsibility that the following product:

Product:	PHANTOM ATEX VIBRATION & TEMPERATURE SENSORS
Model:	EPH-V15 & EPH-V16
Serial Number:	XXXXXXXXXX+
Manufacturer:	DigitalVibrations, an ERBESSD INSTRUMENTS Company
Brand:	PHANTOM
Country:	USA



Is in conformity with the applicable requirements of the following directives and standards:

/	D.C. 2014/30/EU	ELECTROMAGNETIC COMPATABILITY (EMC)
3		RESTRICTION OF THE USE OF CERTAIN HAZARDOUS
		SUBSTANCES IN ELECTRONIC AND ELECTRICAL
2	D.C. 2011/65/EU	EQUIPMENT
	MILSTD-810G	2M DROP AND SHOCK TEST
	IP69	DUST PROOF & WATERPROOF
		RELATED TO EQUIPMENT AND PROTECTIVE
		SYSTEMS INTENDED FOR USE IN POTENTIALLY
Į.	ATEX DIRECTIVE 2014/34/EU	EXPLOSIVE ATMOSPHERES
		EQUIPMENT PROTECTIONS BY INTRINSIC SAFETY
	IEC 60079-11 - EXPLOSIVE ATMOSPHERES PART 11	ulu
ł	IEC 60079-0 EXPLOSIVE ATMOSPHERES PART 0	EQUIPMENT GENERAL REQUIREMENTS

Dr. M. David Howard Chief Executive Officer



®		
ExTR Reference Number		
ExTR Free Reference Number:		
Compiled by + signature (ExTL):	(Megh McCane-Howard)	marg
Reviewed by + signature (ExTL) :	(Dr. Michael David Howard)	
Date of issue:	1 March 2023	
Ex Testing Laboratory (ExTL):	Intertek Testing Service NA Inc	
Address:	3933 US Route 11, Cortland, N	Y 13045, USA
Applicant's name:	ERBESSD INSTRUMENTS TECHNOLOGIES INC.	
Address:	19 EXCHANGE STREET, GLENS	S FALLS NY 12801 USA
Standards	IEC 60079-0, Ed. 7 Explosive Atmospheres - Part 0: Equipment - General Requirements	IEC 60079-11 Ed. 6.0 "Explosive Atmospheres - Part 11: Equipment Protection By Intrinsic Safety "i"
Test Report Form Number:	ExTR Addendum_3 (released 2	018-02)
Related Amendments, Corrigenda or ISHs	IEC 60079-0, Ed. 7.0, 2017-2 +ISH1: 2019 +ISH2: 2019 +CORR1: 2020	IEC 60079-11, Ed 6.0, 2011-06 +CORR1: 2012 +ISH1: 2014 +ISH2: 2016 +ISH3: 2016 +ISH4: 2019 +ISH5: 2019 +ISH6: 2019

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Possible test case verdicts:

- test case does not apply to the test item......N / A

General remarks:

The test results presented in this ExTR Addendum relate only to the item or product tested, and are only valid when considered together with the related Ex Test Report that was previously issued, along with any previously issued ExTR Addendums for the same item or product.

Only clauses and manufacturer's documents impacted by this document are detailed.

- "(see Attachment #)" refers to additional information appended to this document.
- "(see appended table)" refers to a table appended to this document.
- Throughout this document, a point is used as the decimal separator.

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Clause	Requirement – Test	Result – Remark	Verdict

10.1	Spark ignition test - Capacitive	Spark ignition testing to move to Rev 3 of device with new capacitor and battery	Pass
10.1	Spark ignition test - Inductive	Spark ignition testing to move to Rev 3 of device with new capacitor and battery	Pass
10.1	Spark ignition test - Resistive	Spark ignition testing to move to Rev 3 of device with new capacitor and battery	Pass
	Gap analysis	To IEC 60079-0, Ed. 7.0, 2017-12	
6.5 (C1)	Added requirement that where an adhesive is used to secure a gasket, it shall be used within its COT and shall comply with the requirements for cements.	The product does not use adhesive to secure a gasket.	N/A
7.4.2.c) (C2)	Added reference to IEC 60243-1 and IEC 60243-2 for test method to require a 4 kV DC test	The product does not have external painted surfaces.	N/A
8.5 (C3)	Clarified Group I limits 8.2 X Clarified Group II, EPL Ga limits 8.3 X Added limitation for external surfaces of >65% copper	The equipment is not for Ga	N/A
20.1 (C4)	Added requirements for EPL Gc and Dc	The equipment is Gc	Pass
Table 14 (C5)	New cell types and data added based on latest available data	Cell was an existing cell type	N/A
Former 29.13 (C6)	The alternate marking of EPL has been deleted.	Alternate marking not used	N/A
30.3 (C7)	Additional instruction material for electric machines added	Not an electric machine	N/A
30.5 A.5 (C8)	Additional instruction material for cable glands added	No cable glands	N/A
	Gap analysis	To IEC 60079-0, Ed. 7.0, 2017-12 +ISH1:2019	

Clause	Requirement – Test	Result – Remark	Verdict
16.6 (ISH1)	Temperature at branching point and entry point:	No branching point	N/A
	<u>Gap analysis</u>	To IEC 60079-0, Ed. 7.0, 2017-12 +ISH1:2019 +ISH2:2019	
29 (ISH2)	Marking for equipment covered by both the electrical and non-electrical	All electric	N/A
	<u>Gap analysis</u>	To IEC 60079-0, Ed. 7.0, 2017-12 +ISH1:2019 +ISH2:2019 +CORR1:2020	
26.5.1.1 (CORR1)	Temperature tests	No change in temperature tests Gc battery powered	N/A
	<u>Gap analysis</u>	To IEC 60079-11, Ed. 6.0, 2011-06 +CORR1: 2012	
Table 1 (CORR1)	26.4.4 Applicability of Enclosure Sequence	No change from original	N/A
Table 3 (CORR1)	Temp class of PCB	Mass fault used	N/A
Figure 1 (CORR1)	Separations	Mass fault used	N/A
8.2.3 (CORR1)	Transformer constructtion	No transformer	N/A
12.1 (CORR1)	IP Markings	No IP marking required	N/A
Figure D.3a (CORR1)	Moudling/Encapsulation	No moulding or encapsulation	N/A
Figure G.1 (CORR1)	FISCO Drawing	Not FISCO	N/A
	<u>Gap analysis</u>	To IEC 60079-11, Ed. 6.0, 2011-06 +CORR1: 2012 +ISH1: 2014	
Table 1 (ISH1)	GAP analysis between IEC 60079-11:2006(ED5) and IEC 60079-11:2011 (ED6)	No change for this product	N/A

Clause	Requirement – Test	Result – Remark	Verdict
	<u>Gap analysis</u>	To IEC 60079-11, Ed. 6.0, 2011-06 +CORR1: 2012 +ISH1: 2014 +ISH2: 2016	
6.2.5 (ISH2)	Non-Haz-Loc Accessories	No accessories	N/A
	<u>Gap analysis</u>	To IEC 60079-11, Ed. 6.0, 2011-06 +CORR1: 2012 +ISH1: 2014 +ISH2: 2016 +ISH3: 2016	
Ex ic (ISH3)	Ex ic	The device meets all ic requirements by low energy mass fault testing and battery spark ignition testing	N/A
	<u>Gap analysis</u>	To IEC 60079-11, Ed. 6.0, 2011-06 +CORR1: 2012 +ISH1: 2014 +ISH2: 2016 +ISH3: 2016 +ISH4: 2019	
6.1.3 (ISH4)	Group III Enclosures	Not for Group III	N/A
6.1.2.4 (ISH4)	Annex F Enclosures	Annex F not used for spacings	N/A
	<u>Gap analysis</u>	To IEC 60079-11, Ed. 6.0, 2011-06 +CORR1: 2012 +ISH1: 2014 +ISH2: 2016 +ISH3: 2016 +ISH4: 2019 +ISH5: 2019	
Group III (ISH5)	Component relaxation per IEC 60079-11 superseding IEC 60079-0 for Group III	No relaxation used	N/A
	<u>Gap analysis</u>	To IEC 60079-11, Ed. 6.0, 2011-06 +CORR1: 2012 +ISH1: 2014 +ISH2: 2016 +ISH3: 2016 +ISH4: 2019 +ISH5: 2019 +ISH6: 2019	

Clause	Requirement – Test	Result – Remark	Verdict
10.5.3 b) (ISH6)	Battery Temp Test: Internal Limiters	No internal limiters single cell no limiters	N/A
	Last assessment done 2022 August 15		

Measurement Section, including Additional Narrative Remarks (as deemed applicable)

<u>*Narrative remarks:*</u> Changes to the circuit per Phantom ATEX Rev 003, including changing the battery to from Energizer Lithium CR2032 to battery Lithium CR2477, and including the addition of a 470 μ F capacitor across the battery. Capacitor does not influence spark gap analysis.

Files included in the changes:

Phantom ATEX Rev3.pdf (Drawing of changes)

CR2477N_v06-1943.pdf (new battery)

RENATA__MSDS_2018.pdf (MSDS for new battery)

1050976811CRT-001.pdf (Interek spark ignition testing report and gap report)

Measurements Section: Per Intertek testing from report 105976811CRTT011.pdf

Drawings provided: Phantom ATEX Class II Rev 002 date 27/10/2020, were used to determine the following testing, and complete details of testing included in Interek 1050976811CRT-001.pdf documentation.

- 1. A purely resistive circuit using the Renata CR2477 Lithium battery with no current limitation as the supply with a 1.5 safety factor on the gas concentration was used for spark ignition testing and no ignition occurred.
- 2. A capacitive circuit using the Renata CR2477 Lithium battery with no other protective circuit and 588 µF of capacitance was connected to the spark chamber using a 1.5 safety factor on the gas and no ignition occurred. The capacitance was determined by totaling all the capacitance identified in the above drawings, no voltage changes could be found in the schematics and no protective components.
- An inductive circuit was tested using the Renata CR2477 lithium battery with no protective devices and a safety factor of 1.5 through gas mixture, with the total inductance of 12.5 μH, based on worse case inductance of the circuit and no other inductance added in the remaining circuits, no ignition occurred.



FROSTY'S ZAP LAB, LLC LETTER REPORT

SCOPE OF WORK Spark Testing and review of the Phantom ATEX Class II

REPORT NUMBER 1050976511CRT-001

ISSUE DATE 15 August 2022 [REVISED DATE] NA

PAGES 17

DOCUMENT CONTROL NUMBER GFT-OP-10a (21-June-2019) © 2019 INTERTEK





LETTER REPORT

3933 US route 11 Cortland, NY, 13045

Telephone: 607 758 6111 www.intertek.com

15 August 2022

Intertek Report No. 105097681CRT-001 Intertek Project No. G105097681

Ph: 518 -56 4640

Ms. Nancy Frost Frosty's Zap Lab 641 Grooms Road Suite 103 Clifton Park, NY 12065 USA **docfrosty42@gmail.com**

Subject: Spark Testing and review Changes to the Phantom ATEX Class II

This letter report represents the results of our evaluation and testing of the above referenced product to some sections in the following standard:

UL 913:2015Ed.8+R:16Oct2015 Intrinsically Safe Apparatus And Associated Apparatus For Use In Class 1, 2, 3, Division 1, Hazardous (Classified) Locations

IEC 60079-0 Ed. 7 Explosive Atmospheres - Part 0: Equipment - General Requirements

IEC 60079-11 Ed. 6.0 "Explosive Atmospheres - Part 11: Equipment Protection By Intrinsic Safety "i"

SECTION 1

SUMMARY

Intertek wish to inform you of the findings of our testing and circuit review.

This report completes the testing in the project.

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.



LETTER REPORT

SECTION 2

Circuits

Drawings provided: Phanton ATEX Class II Rev 002 date 27/10/2020, were used to determine the following testing

- 1. A purely resistive circuit using the Renata CR2477 Lithium battery with no current limitation as the supply with a 1.5 safety factor on the gas concentration was used for spark ignition testing and no ignition occurred
- 2. A capacitive circuit using the Renata CR2477 Lithium battery with no other protective circuit and 588µF of capacitance was connected to the spark chamber using a 1.5 safety factor on the gas and no ignition occurred. The capacitance was determined by totalling al the capacitance identified in the above drawings, no voltage changes could be found in the schematics and no protective components
- 3. An inductive circuit was tested using the Renata CR2477 lithium battery with no protective devices and a safety factor of 1.5 through gas mixture, with the total inductance of 12.5 μ H, based on worse case inductance of the circuit and no other inductance added in the remaining circuits, no ignition occurred

SECTION 3

PROJECT STATUS & ACTION

Issuance of this letter report completes the testing portion covered by Intertek Project No. G1043876 G105097681

MPORTANT – CLIENT DECISION:

If there are any questions regarding the results contained in this report, or any of the other services offered by Intertek, please do not hesitate to contact your dedicated Intertek Project Manager.

Completed by:	Kevin Wolf	Reviewed by:	Michal Spector
Title:	Engineer	Title:	Senior Staff Engineer
Signature:	Kein J. Walf	Signature	michael Spect
Date	18 August 2022	Date:	30 August 2022

Please note: this Letter Report does not represent authorization for the use of any Intertek certification marks.



LETTER REPORT

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Project #: G105097681	- 2		
Standard(s): IEC 60079-11: 2011, EN	60079-11: 2012, CSA C22.2 N	o. 60079-11: 2014, UL 60079-11	L – Edition 6
	General Ir	formation	
Customer:	Frostys Zap Lab		
Customer Address:	641 Grooms Road, Sui	te 103, Clifton Park, NY 12	065, USA
Report Number:	104506861CRT-001	revised	
Equipment Group:	ПС		
Protection Method(s):	inic		
Temperature Classification:	TBD		
Ambient Temperature Range:	-20 to 40C		
	Testing Approval and	Reviewer Acceptance	10 301 22
Role	Name	Signature	Dated
Engineer:	Kevin Wolf	Kune D. W. of	20-Jul-22 12-Aug-22
Reviewer	Michael Spector	miled Spect	12AUG2022
	Intertek's Client and is provid	ed pursuant to the agreement	between Intertek and its Client.

Table Of Contents				
Clause No.	Test Description	Required Test	Page	Test Verdict
10.1	Spark ignition test – Capacitive	YES	2	Pass
10.1	Spark ignition test – Inductive	YES	4	Pass
10.1	Spark ignition test – Resistive	YES	6	Pass

Test Locations			
Laboratory ID	Legal Entity	Location	
Cortland	Intertek Testing Service NA Inc	3933 US Route 11, Cortland, NY, 13045 United States of America +1 607 753 6711	_

Samples					
Model	Sample Number				
NA	CRT2207270927-001				
	Samples Model NA				

Note: Sample tested as supplied by customer.

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Project #	C105007691						
tandard(s)	IEC 60079-11: 2	011. EN 600	079-11: 2012. CS	SA C22.2 No. 60079-11:	2014. UL 60079	-11 - Edition 6	
		1 mar 1					
		-	Clause 10.1: 5	Spark Ignition Test	- Capacitive		
FERENCE	IECEY ENTAG D	ecision: D	\$2013/002 "	Spark ignition test"			
THER REF	FRENCE DOCUM	AFNTS: F	TR Fx PT Sc	heme – Recomme	dations for i	performing sp	ark ignition test w
ark test a	apparatus (STA)					seriering sp	and British rest in
FERENCE	WORK INSTRU	CTION:					
	Location	Work In	struction Nu	umber			
	Chester	WI-Haz	oc-CHE-019				
	Cortland	WI-Haz	loc-CRT-149				
	Edmonton	WI-Hazl	loc-EDM-109				
	India	None					
	Italy	None					
	Leatherhead	WI-Haz	oc-LHD-036				
	Plano	WI-Haz	loc-DAL-175				
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est Volt	age (VTEST)						Renata CR247
est Curr	ent (ITEST)	FERTAL					Renata CR247
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LETTER REPORT

Inter	tek	Т	est Data Package		Page 3 of 8
Project #:	G105097681		Contraction of the second	in the second second	
Standard(s):	IEC 60079-11: 201	1, EN 60079-11: 2012, CS	A C22.2 No. 60079-11: 2014	4, UL 60079-11 - Edition 6	
		Calibrate Before Test	Positive Polarity	Negative Polarity	After
Calibration	Voltage	24.01			24.01
Air Coil Ind	uctance	98.5			98.5
Calibration	Current	20.50			20.5
Revolution	s to ignition	13	201	201	89
Oxygen An	alyzer Reading	39.681	40.371		40.394
Gas Concer	tration	39.68%	40.371		40.394

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Project # Standard(s):	G105097681	011 EN 60079-	11: 2012 CS	A C22 2 No. 60079-11	2014 UI 60079-1	1 - Edition 6	
standard(s).		Cla	10 1. 2012, 00	Spark Ignition Tool	Inductive	Luttone	
		Cla	use 10.1. 3	spark ignition res	- maactive		
EFERENCE	IECEx ExTAG D	ecision: DS2	013/002 "S	park ignition test"			
THER REF	ERENCE DOCUM	MENTS: PTB	B Ex PT Sch	neme – Recomme	ndations for pe	erforming sp	ark ignition test wit
park test a	pparatus (STA)						
EFERENCE	WORK INSTRU	CTION:					
	Location	Work Insti	ruction Nu	mber			
	Chester	WI-Hazloc	-CHE-019				
	Cortland	WI-Hazloc	-CRT-153				
	Edmonton	WI-Hazloc	-EDM-109				
	India	None					
	Italy	None	1110.020				
	Diano	WI-Hazloc	DAL 175				
	Plano	WI-Haziou	-DAL-175				
escription							
Circuit Ide	entification						
Test Volte	age (VTEST)						Renata CR2477
Test Curr	ent (ITEST)	TECT					Battery
Carles To							12 50
Series Tes Test Indu est Values A est Circuit	st Resistance (R ctance (LTEST) S: Gas Group		Numbe NA	er Of Countable Fa	nults 1.5 t	Energy Fo	actor Applied
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Series Tes Test Indu est Values A rest Circuit est Circuit SesULTS: Analyzer Ci Date 08/11/20 Measured	alibration NA se	vites if	Numbe NA	er Of Countable Fa	Span Gas Used: 19.92% O2	Energy Fe prough gas co k guitien k guitien Span Gas Reading: 19.921	Span Gas Bottle Number: NEA000297745
Series Tes Test Indu est Values A est Circuit SesULTS: Nalyzer Ca Date 08/11/20 Measured Circuit Idu	alibration NA se Time 2 22 1330 Circuit paramete 24 1330 25 1330 26 21 2330 27 23 23 23 27 23 23 23 27 23 27 27 23 27 27 23 27 23 27 23 27 23 27 25 27 25 2	vites if	Numbe NA	er Of Countable Fa	Span Gas Used: 19.92% O2	Energy Fe prough gas co k guilien paratas Span Gas Reading: 19.921	Span Gas Bottle Number: NEA000297745
Series Tes Test Indu est Values A est Circuit est Circuit SesULTS: Nalyzer Ca Date 08/11/20 Measured Circuit Idu Test Volta Test Curr	alibration NA se Time 2 22 1330 Circuit paramete 22 1330 Circuit paramete 23 1330 Circuit parameter 24 1330 Circuit parameter 25 1 26 1 27 1 27 1 28 1 29 1 20	vites if	Numbe NA	er Of Countable Fa	Span Gas Used: 19.92% O2	Energy Fe prough gas co k galilien paratas Span Gas Reading: 19.921	Span Gas Bottle Number: NEA000297745
Series Tes Test Indu est Values A est Circuit est Circuit analyzer Ci Date 08/11/20 Measured Circuit Idu Test Volta Test Curri Series Tes	alibration NA se Time 2 22 1330 Circuit paramete antification Circuit paramete Circuit parameter Circuit pa	vites if	Numbe NA	er Of Countable Fa	Span Gas Used: 19.92% O2	Energy Fo prough gas co k galilion paratus Span Gas Reading: 19.921	Span Gas Bottle Number: NEA000297745 2.994 and 3.034 Renata CR2477

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Interior	cek	Test Data Package				
Project #:	G105097681	- Contraction of the				
Standard(s):	IEC 60079-11: 201	1, EN 60079-11: 2012, CS/	A C22.2 No. 60079-11: 2014	4, UL 60079-11 – Edition 6		
		Calibrate Before Test	Positive Polarity	Negative Polarity	After	
Calibration	Voltage	24.01			24.01	
Air Coil Indu	uctance	98.5			98.5	
Calibration	Current	20.05			20.05	
Revolutions	to ignition	7	201	202	9	
Oxygen Ana	alyzer Reading	40.424	40.225		40.371	
Gas Concen	tration	40.424	40.225		40.371	

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Project #:	G105097681		Ter Street and			
tandard(s):	IEC 60079-11: 2	011, EN 60079-11: 2012	, CSA C22.2 No. 60079-11: 2	014, UL 60079-1	1 – Edition 6	
		Clause 10	1: Spark Ignition Test -	Resistive		
			"Construction toot"			
THER REFE	RENCE DOCUM	VENTS: PTB Fx PT	Scheme – Recommend	lations for ne	erforming sn	ark ignition test w
ark test ap	paratus (STA)			actions for p		and Burners cost in
FERENCE	WORK INSTRU	CTION:				
	Location	Work Instruction	Number			
	Chester	WI-Hazloc-CHE-01	9			
	Cortland	WI-Hazloc-CRT-14	9			
	Edmonton	WI-Hazloc-EDM-1	09			
	India	None				
	Italy	None	C			
	Diano	WI-Hazioc-LHD-U3				
	Plano	WI-HAZIOC-DAL-17	2			
scription:						
Circuit Ide	ntification		Rena	ta CR2477N b	pattery no cu	rrent limiting resist
Test Volta	ge (VTEST)			1.		Renata CR247
Series Test	Resistance (R	TEST				Renata CR247
et Values						
st Values:	Care Group	Alum	when Of Countrable Free	lte	En avera E	rates Applied
est Values:	Gas Group	Nur NA	nber Of Countable Fau	lts 1.5 t	Energy Fo	actor Applied
est Values: A	Gas Group	Nur NA	nber Of Countable Fau	<i>lts</i> 1.5 t	Energy Fo hrough gas c	oncentration
A A est Circuit:	Gas Group	Nur NA	nber Of Countable Fau	<i>lts</i> 1.5 t	Energy Fo hrough gas c	actor Applied oncentration
A A est Circuit:	Gas Group	Nur NA	nber Of Countable Fau	lts 1.5 t	Energy Fo hrough gas c	oncentration
A A A est Circuit:	Gas Group	Nur NA	nber Of Countable Fau	Its 1.5 t	Energy Fo hrough gas c	actor Applied oncentration
A A est Circuit:	Gas Group	Nur NA	nber Of Countable Fau	Its 1.5 t	Energy Fo hrough gas c	actor Applied oncentration
A A est Circuit:	Gas Group		nber Of Countable Fau	Its 1.5 t	Energy Fo	actor Applied oncentration
A A est Circuit:	Gas Group		nber Of Countable Fau	Its 1.5 t	Energy Fo	actor Applied oncentration
A A est Circuit:	Gas Group		nber Of Countable Fau	Its 1.5 t	Energy Fo	actor Applied oncentration
A A est Circuit:	Gas Group		nber Of Countable Fau	Its 1.5 t	Energy Fo	actor Applied oncentration
A	Gas Group		nber Of Countable Fau	Its 1.5 t	Energy Fo hrough gas c	actor Applied
est Values: A	Gas Group		nber Of Countable Fau	Its 1.5 t	Energy Fo hrough gas c	actor Applied
st Values: A st Circuit:	Gas Group		nber Of Countable Fau	Its 1.5 t	Energy Fo	actor Applied oncentration
st Values: A st Circuit:	Gas Group		nber Of Countable Fau	Its 1.5 t	Energy Fo hrough gas c	actor Applied oncentration
st Values: A st Circuit:	Gas Group		nber Of Countable Fau	Its 1.5 t	Energy For hrough gas c	actor Applied oncentration
st Values: A st Circuit: SULTS:	Gas Group		nber Of Countable Fau	Its 1.5 t	Energy For hrough gas c	actor Applied oncentration
st Values: A st Circuit: SULTS: nalvzer Cal	Gas Group		nber Of Countable Fau	Its 1.5 t	Energy For hrough gas c	actor Applied oncentration
st Values: A st Circuit: SULTS: nalyzer Cal	Gas Group	Nur NA	nber Of Countable Fau	Its 1.5 t	Energy Fo hrough gas c	oncentration
SULTS: Date	Gas Group	VIIIST VIIIST VIIIST Used: Zero Reading	The second secon	Its 1.5 t	Energy Fo hrough gas c	Span Gas Bottle Number:
SULTS: Date 8/12/202.	Gas Group	VIIST VIIST	The contable fau	Its 1.5 t	Energy Fo hrough gas c	Span Gas Bottle Number: NEA000297745
SULTS: Date 8/12/202. easured C	Gas Group	VIENT VIENT	Zero Gas Bottle Number: 000000BJX035	Its 1.5 t	Energy Fo hrough gas c	Span Gas Bottle NEA000297745
ESULTS: Date 8/12/202. easured C Circuit Ider	Gas Group	VIIN VIININ VIINI VIINI VIINI VIINI VIINI VIINI VIINI VIINI VIINI VIININ	Zero Gas Bottle Number: 000000BJX035	Its 1.5 t	Energy Fo hrough gas c	sctor Applied oncentration Span Gas Bottle Number: NEA000297745
SULTS: alyzer Cal Balyzer Cal Balyzer Cal Balyzer Cal Balyzer Cal Car Balyzer Cal Car Balyzer Cal Car Car Car Car Car Car Car Car	Gas Group	VIIIS I VIIIS I VIIISI I VIIIS	The contable fau	Its 1.5 t	Energy Fo hrough gas c	Span Gas Bottle Number: NEA000297745
SULTS: SULTS: Date 8/12/2022 easured C Circuit Iden Fest Voltage Fest Current	Gas Group	VITES T VITES	The contable fau	Its 1.5 t	Energy Fo hrough gas c	Span Gas Bottle Number: NEA000297745 3.214 and 3.200 Renata CR247
SULTS: ast Circuit: SULTS: alyzer Cal Date 8/12/202. easured C Circuit Iden Test Voltan Test Currer Series Test	Gas Group	VIIIST VIIIST VIIIST Used: litrogen -0.0008 ers	The contable fau	Its 1.5 t	Energy Fo hrough gas c	Span Gas Bottle Number: NEA000297745 3.214 and 3.200 Renata CR247
SULTS: alyzer Cal B/12/2022 easured C Circuit Iden Test Voltag Test Voltag Test Curren Series Test arget Gas	Gas Group	VIIISI VIIIISI VIIISI VIIISI VIIISI VIIISI VIIISI VIIISI VIIISI VIIISI VIIISI VIIISI VIIISI VIIISI VIIISI VIIISI VIIISI VIIISI VIII VIII VIII VIIISI VIII VIIII VIII VIII VIII VIIII VIII VIII VIII VIIIII VIIIII VIIIII VIIIII VIIIII VIIIII VIIIIII	The contrable for the formation of the f	Its 1.5 t	Energy Fo hrough gas c	Span Gas Bottle Number: NEA000297745 3.214 and 3.200 Renata CR247
A est Values: A est Circuit: est Circuit: alyzer Cal Date 8/12/202. easured C Circuit Ideu Fest Volta; Test Volta; Test Volta; Test Volta; Test Colres Series Test arget Gas Required C	Gas Group	VIIIST VIIIST VIIIST VIIIST VIIIST J VIIIST VIII VIII	Imber Of Countable Fau Imber Of Countable F	Its 1.5 t	Energy Fo hrough gas c	Span Gas Bottle Number: NEA000297745 3.214 and 3.200 Renata CR247



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Broinst # C105087691			
Project #: G105097681	11 EN 60079-11: 2012 CSA C22 2 No	60079-11: 2014 UI 60079-11 - Edi	tion 6
liberties Malteres	11, EN 00075-11. 2012, CSA C22.2 NO.	00075-11. 2014, 02 00075-11 - 20	24.01
alibration Voltage	24.01		24.01
libration Current	20.5		98.5
evolutions to ignition	37 201	200	149
xygen Analyzer Reading	40.402 40.338	-40.355	40.376
s Concentration	40.402 40.338	-40.355	40.376
TURDUCT			
TVERDICT	· · · · · · · · · · · · ·		
The product comp	les with all applicable requirem	ents of this test.	
The product does	not comply with the requiremen	ts of this test.	
X The test was perfo	rmed for information purposes	only.	
est Date: 12 August 2	2022 Tested By: Michael V	Villiams Signature:	Michael R. Williams
ocation: Cortland	and the second		
nvironmental Condition	s During Testing:		
nvironmental Condition emperature: 22.0°C	s During Testing: Humidity: 42%F	RH Pressure	982mb
nvironmental Condition emperature: 22.0°C	s During Testing: Humidity: 42%f 270927-001	RH Pressure	982mb
emperature: 22.0°C	s During Testing: Humidity: 42%f 270927-001	RH Pressure	982mb
nvironmental Condition emperature: 22.0°C ample ID: CRT22077 est Equipment escription	5 During Testing: Humidity: 42%F 270927-001 Equipment Tracking Number	RH Pressure	982mb
invironmental Condition iemperature: 22.0°C iample ID: CRT22077 iest Equipment Description Hydrogen	A During Testing: Humidity: 42%F 170927-001 Humidity: 42%F 170927-001 Humidity: 42%F Humidity: 4	RH Pressure Range Used NA	22 982mb Calibration Due
invironmental Condition iemperature: 22.0°C iample ID: CRT22072 iest Equipment Description Hydrogen Oxygen	A During Testing: Humidity: 42%F 270927-001 Equipment Tracking Number D00001656409 N108102	RH Pressure	222 982mb Calibration Due NA NA
nvironmental Condition emperature: 22.0°C ample ID: CRT22072 est Equipment escription Hydrogen Oxygen Nitrogen	Souring Testing: 42%F Humidity: 42%F 270927-001 42%F Equipment Tracking Number 000001656409 N108102 000000BJX035	RH Pressure Range Used NA NA NA	222 982mb Calibration Due NA NA NA
nvironmental Condition emperature: 22.0°C ample ID: CRT22072 est Equipment Hydrogen Oxygen Nitrogen Span Gas	Buring Testing: 42% Humidity: 42% 10027-001 42% Equipment Tracking Number 1000001656409 D000001656409 N108102 000000BJX035 NEA000297745	RH Pressure Range Used NA NA NA NA NA	22222222222222222222222222222222222222
invironmental Condition imperature: 22.0°C imple ID: CRT22072 Cest Equipment Hydrogen Oxygen Nitrogen Span Gas Dxygen Analyzer	Buring Testing: 42% Humidity: 42% 270927-001 42% Equipment Tracking Number 000001656409 D000001656409 N108102 0000000BJX035 0000000BJX035 NEA000297745 0193	RH Pressure Range Used NA NA NA NA NA NA	222 982mb Calibration Due NA NA NA NA Cal before use
invironmental Condition iemperature: 22.0°C ample ID: CRT22072 est Equipment Description Hydrogen Oxygen Nitrogen Span Gas Xxygen Analyzer imer	Equipment Tracking Number D000001656409 N108102 000000BJX035 NEA000297745 0193 Q107	RH Pressure Range Used NA NA NA NA NA NA NA	22222222222222222222222222222222222222
nvironmental Condition emperature: 22.0°C ample ID: CRT22077 est Equipment escription Hydrogen Oxygen Nitrogen Span Gas xygen Analyzer imer ev Counter	Equipment Tracking Number D000001656409 N108102 000000BJX035 NEA000297745 0193 Q107 Q108	Range Used NA NA NA NA NA NA NA NA NA	2 982mb Calibration Due NA NA NA Cal before use 12/06/2022 12/06/2022
invironmental Condition emperature: 22.0°C ample ID: CRT22077 est Equipment description Hydrogen Oxygen Nitrogen Span Gas bxygen Analyzer imer ev Counter park Test Apparatus	Equipment Tracking Number D000001656409 N108102 000000BJX035 NEA000297745 0193 Q107 Q108 \$104Z	RH Pressure Range Used NA NA NA NA NA NA NA NA NA	22222222222222222222222222222222222222
invironmental Condition imperature: 22.0°C imple ID: CRT22077 iest Equipment Description Hydrogen Oxygen Nitrogen Span Gas Dxygen Analyzer imer imer iev Counter ipark Test Apparatus invironmental Monitor	Buring Testing: 42% f Humidity: 42% f 270927-001 42% f Equipment Tracking Number 000001656409 N108102 000000BJX035 NEA000297745 0193 Q107 Q108 S104Z 0800	RH Pressure Range Used NA NA NA NA NA NA NA NA NA NA All	2 982mb Calibration Due NA NA NA Cal before use 12/06/2022 12/06/2022 8/11/2023 11/11/2023
invironmental Condition imperature: 22.0°C imple ID: CRT22077 iest Equipment Description Hydrogen Oxygen Nitrogen Span Gas Dxygen Analyzer imer Rev Counter Spark Test Apparatus invironmental Monitor	Souring Testing: 42% Humidity: 42% 270927-001 42% Equipment Tracking Number 00001656409 N108102 000000BJX035 NEA000297745 0193 Q107 Q108 S104Z 0800 S105 \$105	RH Pressure Range Used NA NA NA NA NA NA NA NA NA NA NA NA NA	2 982mb Calibration Due NA NA NA Cal before use 12/06/2022 12/06/2022 8/11/2023 11/11/2022 10/18/2022
invironmental Condition emperature: 22.0°C iample ID: CRT22072 Test Equipment Description Hydrogen Oxygen Nitrogen Span Gas Dxygen Analyzer Timer Rev Counter Spark Test Apparatus Invironmental Monitor I5mH Coil Aultimeter	Souring Testing: 42%6 Humidity: 42%6 270927-001 42%6 Equipment Tracking Number 000001656409 D00001656409 1008102 0000000BJX035 0000000BJX035 NEA000297745 0193 0193 0107 0107 0108 \$104Z 0800 \$105 M229	RH Pressure Range Used NA NA NA NA NA NA NA NA NA NA Dc Volts and milliamps	22222222222222222222222222222222222222
invironmental Condition imperature: 22.0°C imple ID: CRT22072 is Equipment Description Hydrogen Oxygen Nitrogen Span Gas Dxygen Analyzer imer Rev Counter Spark Test Apparatus Environmental Monitor D5mH Coil Multimeter	s During Testing: Humidity: 42%f 270927-001 Equipment Tracking Number D00001656409 N108102 0000000BJX035 NEA000297745 0193 Q107 Q108 \$104Z 0800 \$104Z 0800 \$105 M229 P1208	RH Pressure Range Used NA NA NA NA NA NA NA NA NA NA Dc Volts and milliamps Hydrogen	2: 982mb Calibration Due NA NA NA Cal before use 12/06/2022 12/06/2022 8/11/2023 11/11/2022 10/18/2022 01/08/2023 05/11/2023

 Flow Controller, Alicat
 P1209
 Oxygen
 05/11/2023

 Note: Measurement uncertainty for results is addressed as necessary by the local site procedures in accordance with GMS-QC-12.
 Note: Necessary by the local site procedures in accordance with GMS-QC-12.

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Inter Total Quality. Assu	tek	Test Data Package	Page 8 of 8
Project #:	G105097681		
Chandend/als	IEC 60070 11. 2011 EN 60	11. 2012 CEA C22 2 No. 60020 11. 2014 UN 60020 11	Edition C

Standard(s): IEC 60079-11: 2011, EN 60079-11: 2012, CSA C22.2 No. 60079-11: 2014, UL 60079-11 – Edition 6

Revision History:

Document History						
Revision	Data	Changer	Name & Title			
No.	Date	Changes	Author	Approving Official		
14	June 12, 2020	Initial Release – Replaces TDS- G-Global-Test-3703	÷	WVH		
-						
		1				
	-			-		

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		GAP ANALYSIS	
From: IEC To:	60079-0:2011, Edition:6.0		
	IEC 60079-0, Edition 7.0, 2017-7	12	
Clause	Requirement – Test	Result – Remark	Verdict
6.5 (C1)	Added requirement that where an adhesive is used to secure a gasket, it shall be used within its COT and shall comply with the requirements for cements.	The product does not use adhesive to secure a gasket.	N / A
7.4.2.c) (C2)	Added reference to IEC 60243-1 and IEC 60243-2 for test method to require a 4 kV DC test	The product does not have external painted surfaces.	N / A
8.5 (C3)	Clarified Group I limits 8.2 X Clarified Group II, EPL Ga limits 8.3 X Added limitation for external surfaces of >65% copper	The equipment is not for Ga	N/A
20.1 (C4)	Added requirements for EPL Gc and Dc	The equipment is Gc	Pass
Table 14 (C5)	New cell types and data added based on latest available data	Cell was an existing cell type	NA
former 29.13 (C6)	The alternate marking of EPL has been deleted.	Alternate marking not used	NA
30.3 (C7)	Additional instruction material for electric machines added	Not an electric machine	NA
30.5 A.5 (C8)	Additional instruction material for cable glands added	No cable glands	NA



		GAP ANALYSIS	
From:			
IEC	60079-0, Edition 7.0, 2017-12		
To:			
IEC	60079-0, Edition 7.0, 2017-12		
	+ISH1:2019		
Clause	Requirement – Test	Result – Remark	Verdict

16.6	Temperature at branching	No branching point	NA
(ISH1)	point and entry point:		

		GAP ANALYSIS	
From:			
II	EC 60079-0, Edition 7.0, 2017-12		
	+ ISH1:2019		
To:			
II	EC 60079-0, Edition 7.0, 2017-12		
	+ ISH1:2019		
	+ ISH2:2019		
Clause	Requirement – Test	Result – Remark	Verdict

29	marking for equipment	All electric	NA
(ISH2)	covered by both the electrical and non-electrical		

		GAP ANALYSIS	
From:			
IEC	60079-0:2017, 7th Edition		
	+ISH1:2019		
	+ ISH2:2019		
To:			
IEC	60079-0:2017, 7th Edition		
	+ISH1:2019		
	+ ISH2:2019		
	+ CORR1:2020.		
Clause	Requirement – Test	Result – Remark	Verdict

26.5.1.1	temperature tests	No change in temperature tests Gc battery	NA
(CORR1)		powered	



Verdict

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GAP ANALYSIS

Result – Remark

From:

Clause		Requirement – Test
		+ CORR1: 2012
10.	IEC 60079-11, Edition 6.0, 2011-06	
To	IEC 6	60079-11, Edition 6.0, 2011-06

Table 1 (CORR1)	26.4.4 Applicability of Enclosure Sequence	No change from original	NA
Table 3 (CORR1)	Temp Class of PCB	Mass fault used	NA
Figure 1 (CORR1)	Separations	Mass fault used	NA
8.2.3 (CORR1)	Transformer construction	No transformer	NA
12.1 (CORR1)	IP Markings	No IP marking required	NA
Figure D.3a (CORR1)	Moulding / Encapsulation	No moulding or encapsulation	NA
Figure G.1 (CORR1)	FISCO Drawing	Not FISCO	NA

			GAP ANALYSIS	
From:				
	IEC 6	60079-11, Edition 6.0, 2011-06		
		+ CORR1: 2012		
To:				
	IEC 6	60079-11, Edition 6.0, 2011-06		
		+ CORR1: 2012		
		+ ISH1:2014		
Clause	•	Requirement – Test	Result – Remark	Verdict

Table 1	GAP Analysis Between IEC	No change for this product	NA
(ISH1)	60079-11:2006 (ED5) and IEC		
(-)	60079-11:2011 (ED6)		



		GAP ANALYSIS	
From:			
	IEC 60079-11, Edition 6.0, 2011-06		
	+ CORR1: 2012		
	+ ISH1:2014		
To:			
	IEC 60079-11, Edition 6.0, 2011-06		
	+ CORR1: 2012		
	+ ISH1:2014		
	+ ISH2:2016		
Clause	Requirement – Test	Result – Remark	Verdict

6.2.5	Non-Haz-Loc Accessories	No accessories	NA
(ISH2)			

		GAP ANALYSIS	
From:			
	IEC 60079-11, Edition 6.0, 2011-06		
	+ CORR1: 2012		
	+ ISH1:2014		
	+ ISH2:2016		
To:			
	IEC 60079-11, Edition 6.0, 2011-06		
	+ CORR1: 2012		
	+ ISH1:2014		
	+ ISH2:2016		
	+ ISH3:2016		
Clause	Requirement – Test	Result – Remark	Verdict
Ex ic (ISH3)	Ex ic	The device meets all ic requirements by low energy mass fault testing and battery spark ignition testing	NA



		GAP ANALYSIS	
From:			
IEC	60079-11, Edition 6.0, 2011-06		
	+ CORR1: 2012		
	+ ISH1:2014		
	+ ISH2:2016		
	+ ISH3:2016		
To:			
IEC	60079-11, Edition 6.0, 2011-06		
	+ CORR1: 2012		
	+ ISH1:2014		
	+ ISH2:2016		
	+ ISH3:2016		
	+ ISH4:2019		
Clause	Requirement – Test	Result – Remark	Verdict

6.1.3 (ISH4)	Group III Enclosures	Not for Group III	NA
6.1.2.3 (ISH4)	Annex F Enclosures	Annex F not used fr spacings	NA

		GAP ANALYSIS	
From:			
	IEC 60079-11, Edition 6.0, 2011-06		
	+ CORR1: 2012		
	+ ISH1:2014		
	+ ISH2:2016		
	+ ISH3:2016		
	+ ISH4:2019		
To:			
	IEC 60079-11, Edition 6.0, 2011-06		
	+ CORR1: 2012		
	+ ISH1:2014		
	+ ISH2:2016		
	+ ISH3:2016		
	+ ISH4:2019		
	+ ISH5:2019		
Clause	e Requirement – Test	Result – Remark	Verdict

Group III	Component Relaxation per	No relaxation used	NA
(ISH5)	IEC 60079-11 superseding IEC 60079-0 for Group III		



		GAP ANALYSIS	
From:			
	IEC 60079-11, Edition 6.0, 2011-06		
	+ CORR1: 2012		
	+ ISH1:2014		
	+ ISH2:2016		
	+ ISH3:2016		
	+ ISH4:2019		
	+ ISH5:2019		
To:			
	IEC 60079-11, Edition 6.0, 2011-06		
	+ CORR1: 2012		
	+ ISH1:2014		
	+ ISH2:2016		
	+ ISH3:2016		
	+ ISH4:2019		
	+ ISH5:2019		
	+ ISH6:2019		
Clause	e Requirement – Test	Result – Remark	Verdict

10.5.3 b) (ISH6)	Battery Temp Test; Internal Limiters	No internal limiters single cell no limiters	NA
(.0.10)			