



1. **TYPE EXAMINATION CERTIFICATE**

2. **Equipment or Protective System Intended for use in Potentially Explosive Atmospheres Directive 94/9/EC**

3. **Type Examination Certificate Number:** ITS15ATEX48263X

4. **Equipment or Protective System:** Titan NextGen DAQ

5. **Manufacturer:** Applied Automation and Controls Inc

6. **Address:** 10700 Corporate Drive, Suite 108, Stafford, TX, 77477 U.S.A.

7. This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8. Intertek Testing and Certification Limited certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive 94/9/EC of 23 March 1994

The examination and test results are recorded in confidential Intertek Report 102080041DAL-001, Dated 29 July 2015.

9. Compliance with the Essential Health and Safety Requirements has been assured by compliance with standards EN 60079-0:2012+A11:2013; EN 60079-15:2010 except in respect of those requirements referred to at item 16 of the Schedule.

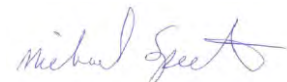
10. If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

11. This Type examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12. The marking of the equipment or protective system shall include the following:-

 II 3 G Ex nA IIC T5 Gc IP 54

$-20^{\circ}\text{C} \leq T_a \leq 60^{\circ}\text{C}$



Michael Spector
Certification Officer
7 Aug 2015

Intertek Testing & Certification Limited
Intertek House, Cleeve Road, Leatherhead, Surrey, KT22 7SB
Tel: +44 (0)1372 370900 Fax: +44 (0)1372 370977

www.intertek.com

Registered No 3272281 Registered Office: Academy Place, 1-9 Brook Street, Brentwood, Essex, CM14 5NQ.

This certificate may only be reproduced in its entirety and without any change, schedule included and is subject to Intertek Testing and Certification's Conditions for Granting Certification.

13. **Description of Equipment or Protective System**

The Titan NextGen DAQ is data acquisition and control system. The unit powers the sensors, displays their data, runs calculations, and records job information. In addition, the sensor data can be transmitted to a PC in real-time or after the completion of the job. Enclosure is provided with piezoelectric keypad with no electrical make or break connection. Titan NextGen DAQ contains terminal blocks fuse, connectors, Ethernet port for Ethernet cable, Mechanically secured Coin cell; non-arcing solid state relay in it. USB port inside is not for use in hazardous area. LCD used has no internal arcing or sparking parts.

The equipment is rated for 10-28VDC; 175mA.

14. **Report Number**

Intertek Report Ref: 102080041DAL-001, Dated 29 July 2015.

15. **Conditions of Certification**

(a). Special Conditions for safe use

1. The equipment enclosure provides IP54 protection for the electronics inside. Steps must be taken by the installer to control condensation and humidity inside the equipment to ensure that a Pollution Degree 2 environment as defined in EN 60664-1 is maintained inside the enclosure of the equipment.
2. For fixed installation only. WARNING – POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS
3. End user has responsibility to use ATEX certified cable glands providing minimum IP 54 protection

(b). Conditions of Manufacture

- A routine dielectric strength test shall be carried out. Test vtg: 500 Vrms (+5% tolerance) or 700VDC (140% of 500Vrms) for 60 or 65 seconds; alternatively 600Vrms for minimum of 100 ms.

Test points: Input connection to Grounding Terminal

16. **Essential Health and Safety Requirements (EHSR's)**

The relevant EHSR's have been identified and assessed in Intertek Report 102080041DAL-001, Dated 29 July 2015



Michael Spector
Certification Officer
7 Aug 2015

Intertek Testing & Certification Limited
Intertek House, Cleeve Road, Leatherhead, Surrey, KT22 7SB
Tel: +44 (0)1372 370900 Fax: +44 (0)1372 370977

www.intertek.com

Registered No 3272281 Registered Office: Academy Place, 1-9 Brook Street, Brentwood, Essex, CM14 5NQ.

This certificate may only be reproduced in its entirety and without any change, schedule included and is subject to Intertek Testing and Certification's Conditions for Granting Certification.



SCHEDULE

TYPE EXAMINATION CERTIFICATE NUMBER ITS15ATEX48263X

17. Drawings and Documents

Title:	Drawing No.:	Rev. Level:	Date:
NextGenDAQ, Titan Certification Drawing (Total Sheets=6)	00-92412	F	7/7/2015

Schedule drawing contains total 6 sheets that details enclosure general arrangement drawing; including ATEX label and warning copies.

This Certificate 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 Certificate. Only the Client is authorized to permit copying or distribution of this Certificate 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.

Intertek Testing & Certification Limited
Intertek House, Cleeve Road, Leatherhead, Surrey, KT22 7SB
Tel: + 44 (0)1372 370900 Fax: +44 (0)1372 370977

www.intertek.com

Registered No 3272281 Registered Office: Academy Place, 1-9 Brook Street, Brentwood, Essex, CM14 5NQ.

This Certificate is the property of Intertek Testing and Certification Ltd and is subject to Intertek Testing and Certification's Conditions for Granting Certification.



ASSESSMENT REPORT

Intertek Report Ref 102080041DAL-001

REPORT ON: **Titan NextGen DAQ**
DATED: **29 July 2015**
APPLICANT: **Applied Automation and Controls Inc**
ADDRESS: **10700 Corporate Drive, Suite 108, Stafford, TX, 77477
U.S.A.**

Prepared by:

Chaitanya Katekar

A handwritten signature in black ink, appearing to read "C. Katekar".

Sr. Compliance
Investigator

Reviewed by:

Ryan Parks, P.E.

A handwritten signature in black ink, appearing to read "Ryan Parks".

Engineering Manger

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.

This document may be reproduced only in its entirety and without change.

INDEX FOR CERTIFICATION REPORT 102080041DAL-001

Section	Description/Identification	Page No
A	Assessment Narrative and Conclusions	3
B	Compliance Checklists	11
B1	EN 60079-0:2012+A11:2013 Checklist	11
B2	EN 60079-15:2010 Checklist	25
B3	EC Directive 94/9/EC Assessment	39
C	Tests	44

The cover sheet and this index are paginated as part of this report.

The signatures, date and other information on the cover sheet apply to all the above sections.

Section	Description/Identification	No of Pages
D	Intertek Reports with own cover	None
D1	None	--
E	Manufacturer supplied reports and information	None
E1	None	--
F	Other reports and information	None
F1	None	--

The signatories of reports or the publishers of documents reproduced in Sections D, E and F are deemed to take responsibility for the technical content of each document. The signatories on the cover sheet of this report take responsibility for the way this information is used in support of certification.

Where reliance is placed on reference to authoritative documents from other certification bodies (for example Component Certificates), those bodies are deemed to take responsibility for the validity of those documents. The signatories on the cover sheet of this report take responsibility for the way those documents are used in support of certification.

SECTION A: Assessment Narrative and Conclusions

A1 INTRODUCTION

This report identifies the basis on which the Titan NextGen DAQ can be assessed in accordance with the requirements of the European Community Directive 94/9/EC Group II, Category 3G.

Conformity with the Essential Health and Safety Requirements (EHSRs) of the European Community Directive 94/9/EC is demonstrated by compliance with the following harmonised European Standards for Apparatus Group IIC with a Temperature Classification of T5 in an ambient temperature of -20°C to +60°C.

EN 60079-0:2012+A11:2013 Explosive gas atmospheres Part 0: Equipment- General requirements

EN 60079-15:2010 Explosive Atmospheres - Part 15: Equipment Protection By type of protection "n"

A2 DESCRIPTION OF APPARATUS

The Titan NextGen DAQ is data acquisition and control system. The unit powers the sensors, displays their data, runs calculations, and records job information. In addition, the sensor data can be transmitted to a PC in real-time or after the completion of the job. Enclosure is provided with piezoelectric keypad with no electrical make or break connection. Titan NextGen DAQ contains terminal blocks, fuse, connectors, Ethernet port for Ethernet cable, mechanically secured Coin cell, and non-arcing solid state relay in it. USB port inside is not for use in hazardous area. LCD used has no internal arcing or sparking parts

Ratings: 10-28VDC; 175mA

ATEX Code:  II 3 G Ex nA IIC T5 Gc (-20°C to +60°C)

Ingress Protection : IP 54

A3 ASSESSMENT OF APPARATUS

A3.1 Examination of Drawings

The drawings were examined and the details thereon found to be in accordance with the requirements of the standards listed in Section A1.

A3.2 Examination of Sample

Samples of equipment were provided for testing purposes. Testing was done at following Intertek Ex Test Lab:

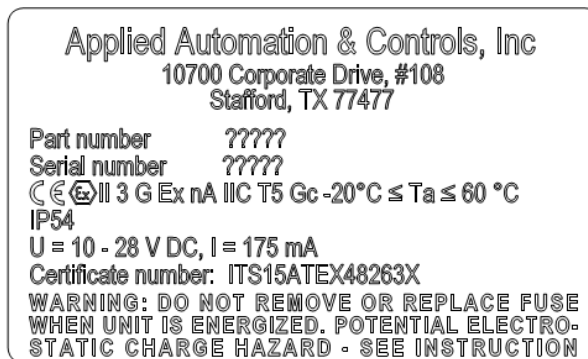
Ex Lab	Address
Intertek Testing Services NA, Inc.	1809 10 th St., Suite 400, Plano, TX 75074, USA

A3.3 Assessment of Apparatus

Detailed assessment of the apparatus is contained within this test reports against the standards mentioned in Section A1 of this report.

A3.4 Marking

Copy of marking plate:



Copy of Warning Labels:



A3.5 Information for use

The manufacturer's information for use and instructions were examined and found to comply with the requirements of the Directive 94/9/EC

Routine tests were specified for the units:

- A routine dielectric strength test shall be carried out as follows: 500 Vrms (+5% tolerance) or 700VDC (140% of 500Vrms) for 60 or 65 seconds; Alternatively 600Vrms for minimum of 100 ms.

Test points: Input connection to Frame

Special Conditions of Use were specified for the units:

1. The equipment enclosure provides IP54 protection for the electronics inside. Steps must be taken by the installer to control condensation and humidity inside the equipment to ensure that a Pollution Degree 2 environment as defined in EN 60664-1 is maintained inside the enclosure of the equipment.
2. For fixed installation only. WARNING – POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS
3. End user has responsibility to use ATEX certified cable glands providing minimum IP 54 protection

A4 ASSESSMENT FOR COMPLIANCE WITH EC DIRECTIVE 94/9/EC

The apparatus and associated technical dossier document were assessed for compliance with the Essential Health and Safety Requirements of EC Directive 94/9/EC under Intertek project reference G102080041. The results of this assessment are shown in Section B3.

This report forms part of the Technical Dossier.

A copy of the original Technical Dossier is held with file ref. G102080041.

A5. CONCLUSIONS

The Titan NextGen DAQ as described by the documents listed in Section A6 is considered to comply with the requirements of the European Community Directive 94/9/EC with respect to Group II, Category 3G apparatus together with the requirements for Apparatus Group IIC as specified per standards mentioned in Section A1. The Temperature Classification T5 is referred to an ambient temperature of -20°C to +60°C.

A6. DRAWINGS

Title:	Drawing No.:	Rev. Level:	Date:
NextGenDAQ, Titan Certification Drawing (Total Sheets=6)	00-92412	F	7/7/2015
Titan NextGen DAQ User manual	--	F	06/18/2015

NOTES: Above schedule drawing 00-92412 contains total 6 sheets that details enclosure general arrangement drawing; including all labels identified in section A3.4 of this report.

A7. LIST OF ATEX CERTIFIED COMPONENTS

Certificate number	Manufacturer	Component	Standards in Certificate or DoC	ATEX ratings
ETL10ATEX41132X Issue 1	Schlumberger	Enclosure	EN 60079-0:2009 EN 60079-15:2010 EN 60079-11:2012	II 3 G Ex ic nA IIB T5 Gc -20C to +60C, IP 54

NOTES:

- Keypad used on Titan NextGen DAQ is piezoelectric keypad (No electrical make/ break). "ic" protection is not relied upon.
- Product under ETL10ATEX41132X was limited to IIB gas groups because of "ic" protection type. Since "ic" is not relied upon for Titan NextGen DAQ, it meets all applicable test/ evaluation requirement for group IIC.

Special conditions of use on ETL10ATEX41132X:

a. Special Conditions for safe use

For fixed installation only. Not for portable applications.

Compliance to special conditions of use:
Titan NextGen DAQ is also for fixed installations only. See X condition on certificate

A7.1 GAP ANALYSIS FOR EN 60079-0:2009 TO EN 60079-0:2012+A11:2013

Enclosure is certified to EN 60079-0:2009. End product is certified to EN 60079-0:2012+A11:2013. Following gap analysis is done to verify enclosure meets EN 60079-0:2012+A11:2013 requirement

Gap Analysis from EN 60079-0:2009 to EN 60079-0:2012

EN 60079-0:2012 has following major changes compared to EN 60079-0:2009





Clarification of test to determine capacitance of accessible metal parts with reduction in acceptable capacitance	7.5 Table 9			C1
Addition of requirements for ventilating fans	17.1.5			C2
Addition of test requirements for arc-quenching test on plugs and sockets	20.2			C3
Additional information on cell voltages	23.3 Table 12			C4
Removal of "charging test" and addition of note providing guidance	Formerly 26.14			C5



Major changes do not apply to enclosure as



- C1. Capacitance test is not required, enclosure is only accessible metal part; properly grounded.
- C2. No fans
- C3. No plugs or sockets
- C4. Additional information/ no test requirement
- C5. Removal of test/ no additional test requirement.

Based on this analysis, the component is accepted for EN 60079-0:2012

Gap Analysis from EN 60079-0:2012 to EN 60079-0:2012+A11:2013

In EN 60079-0:2012+A11:2013; The CENELEC common modifications have been implemented at the appropriate places in the text. The start and finish of each common modification is indicated in the text by tags  . The common modifications introduced by CENELEC amendment A11 are indicated by  .

Clause	Modification indicated by   .	Comment	Verdict
2	Added EN 1710 and EN 14986 under normative references	Does not affect safety of product	N/A
17.1.5; 26.15; 30.4	For Group I equipment, the applicable requirements of EN 1710 shall be applied. For Group II and Group III equipment, all requirements except marking of EN 14986 shall be applied	Not a ventilating fan.	N/A
29.3	Additionally, the nameplate shall include the following fan details: za) rating information (casing pressure and temperature), where applicable; zb) where appropriate, maximum inlet temperature; zc) for variable speed fans, the speed range.	Not a fan	N/A

Clause	Modification indicated by   .	Comment	Verdict
Annex ZY; Table ZY.1	For Zones with EPL Ma and Mb, changed wording from “NA” to “Not applicable”	Not Ma or Mb/ Editorial modification	N/A
Annex ZY; Marking ZY.3	Allowance for combined marking for gas and dust environment	Only for gases	N/A
Annex ZZ; Coverage of Essential Requirements of EU Directives	Introduced word “partly” at following locations: - ER 1.0.1 (partly), ER 1.0.2 to ER 1.0.4, ER 1.0.5 (partly) and ER 1.0.6 (partly) - ER 1.1 - ER 1.2.1, ER 1.2.2, ER 1.2.4 to ER 1.2.6, ER 1.2.7 (partly) and ER 1.2.8 (partly) - ER 1.3.1 to ER 1.3.4 - ER 1.4.1 (partly) and ER 1.4.2 (partly) - ER 1.6.2 and ER 1.6.4 - ER 2.0 to ER 2.3	EHSR for end product is addressed in this test report	P
29.3 a)	Changed wording from “the name of the manufacturer or his registered trade mark” to “the name and address of the manufacturer”	Does not affect safety	N/A

Conclusion:

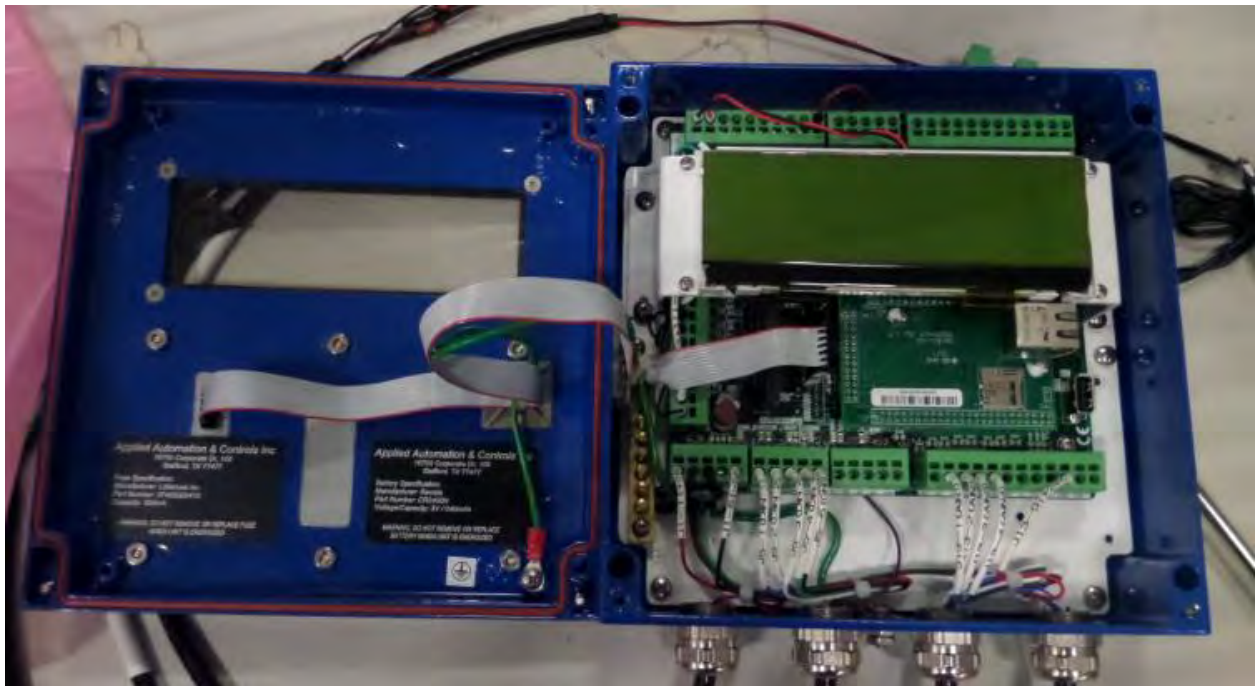
Enclosure complies with EN 60079-0:2012+A11:2013 requirements

A8. PRODUCT PHOTOS

Photo 1: External View



Photo 2: Internal View



SECTION B: Compliance Checklists**B1. EN 60079-0:2012+A11:2013 Checklist**

EN 60079-0:2012+A11:2013			
Clause	Requirement – Test	Result – Remark	Verdict
1	Scope		
2	Normative references		
3	Terms and definitions		
4	Equipment grouping		
4.1	Group I	Product covered under this report is Group II	N/A
4.2	Group II	The equipment is group IIC T5 apparatus. The equipment is protected by Ex nA and is marked T5	P
4.3	Group III	Not For Group III	N/A
4.4	Equipment for a particular explosive atmosphere	Not for a particular explosive atmosphere, For Group IIC.	N/A
5	Temperatures		
5.1	Environnemental influences		
5.1.1	Ambient temperature	The equipment is designed for use in the ambient temperature range of - 20°C to +60°C	P
5.1.2	External source of heating or cooling	No external sources of heating or cooling	N/A
5.2	Service temperature	See Test data	P
5.3	Maximum surface temperature		
5.3.1	Determination of maximum surface temperature	Maximum surface temperature determined according to 26.5.1 considering the maximum ambient temperature	P
5.3.2	Limitation of maximum surface temperature		
5.3.2.1	Group I electrical equipment	Not for Group I	N/A

EN 60079-0:2012+A11:2013			
Clause	Requirement – Test	Result – Remark	Verdict
5.3.2.2	Group II electrical equipment	No surface of any part of the apparatus, including the surface of internal parts to which the explosive atmosphere might have access attains a temperature exceeding T5 in a 60°C ambient	P
5.3.2.3	Group III electrical equipment		
5.3.2.3.1	Maximum surface temperature determined without a dust layer	Not for Group III	N/A
5.3.2.3.2	Maximum surface temperature with respect to dust layers	Not for Group III	N/A
5.3.3	Small component temperature for Group I or Group II electrical equipment	This relaxation is not utilised	N/A
6 Requirements for all electrical equipment			
6.1	General	Equipment complies with the applicable clauses of EN60079-0; EN60079-15; EN 60079-15 Checklist is included in test report	P
6.2	Mechanical strength of equipment	Enclosure is previously ATEX certified under ETL10ATEX41132X/1. Enclosure previously certified was conditioned based on Service temp < 70C. Titan NextGen DAQ also had service temp <70C. See Service Temp test data on Page 47 of this report. Ambient of Enclosure (-20C to +60C) previously ATEX certified under ETL10ATEX41132X/1 is same as Titan NextGen DAQ . No testing needed	N/A
6.3	Opening times	Excluded per EN 60079-15, Table 1	N/A
6.4	Circulating currents in enclosures (e.g. of large electrical machines)	Grounding terminal provided	P
6.5	Gasket retention	Part of approved enclosure	P
6.6	Electromagnetic and ultrasonic energy radiating equipment	Not an Electromagnetic and ultrasonic energy radiating equipment	N/A
6.6.1	Radio frequency sources	See 6.6	N/A
6.6.2	Lasers or other continuous wave sources	No Lasers or other continuous wave sources	N/A
6.6.3	Ultrasonic sources	See 6.6	N/A
7 Non-metallic enclosures and non-metallic parts of enclosures			

EN 60079-0:2012+A11:2013			
Clause	Requirement – Test	Result – Remark	Verdict
7.1	General		
7.1.1	Applicability	Enclosure is previously ATEX certified under ETL10ATEX41132X/1. No testing needed	P
7.1.2	Specification of materials		
7.1.2.1	General	See 7.1.1	P
7.1.2.2	Plastic materials	See 7.1.1	P
7.1.2.3	Elastomers	See 7.1.1	P
7.2	Thermal endurance		
7.2.1	Tests for thermal endurance	Enclosure is previously ATEX certified under ETL10ATEX41132X/1. No testing needed	N/A
7.2.2	Material selection	See 7.2.1	N/A
7.2.3	Alternative qualification of elastomeric sealing O-rings	Alternative qualification not used.	N/A
7.3	Resistance to light	Enclosure is previously ATEX certified under ETL10ATEX41132X/1. No testing needed	N/A
7.4	Electrostatic charges on external non-metallic materials		
7.4.1	Applicability	See below	P
7.4.2	Avoidance of a build-up of electrostatic charge on Group I or Group II electrical equipment	Fixed installation, "X" condition added to avoid risk of static electricity. Warning added- WARNING – POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS	P
7.4.3	Avoidance of a build-up of electrostatic charge on equipment for Group III	Not for Group III	N/A
7.5	Accessible metal parts	Enclosure is only accessible metal part, properly grounded	P
8	Metallic enclosures and metallic parts of enclosures		
8.1	Material composition	Enclosure is previously ATEX certified under ETL10ATEX41132X/1.	P
8.2	Group I	Not for Group I	N/A
8.3	Group II	EPL Gc, no requirement, no fan impellers, fan hoods and ventilating screens	N/A
8.4	Group III	Not for Group III	N/A

EN 60079-0:2012+A11:2013			
Clause	Requirement – Test	Result – Remark	Verdict
9	Fasteners		
9.1	General	Enclosure is previously ATEX certified under ETL10ATEX41132X/1.	P
9.2	Special fasteners	Excluded per EN 60079-15, Table 1	N/A
9.3	Holes for special fasteners		
9.3.1	Thread engagement	See 9.2	N/A
9.3.2	Tolerance and clearance	See 9.2	N/A
9.3.3	Hexagon socket set screws	See 9.2	N/A
10	Interlocking devices	Excluded per EN 60079-15, Table 1	N/A
11	Bushings	No bushings	N/A
12	Materials used for cementing	RTV/ Loctite 422 with COT of -20C to +80C used, documented in control drawing	P
13	Ex Components		
13.1	General	Not an Ex component	N/A
13.2	Mounting	See 13.1	N/A
13.3	Internal mounting	See 13.1	N/A
13.4	External mounting	See 13.1	N/A
13.5	Ex Component certificate	See 13.1	N/A
14	Connection facilities and terminal compartments		
14.1	General	Product intended for connection to external circuits; includes connection facilities	P
14.2	Termination compartment	Termination compartments and their access openings are dimensioned so that the conductors can be readily connected.	P
14.3	Type of protection	Type of protection-"nA", EN 60079-15 check list included	P

EN 60079-0:2012+A11:2013			
Clause	Requirement – Test	Result – Remark	Verdict
14.4	Creepage and clearance	Low power equipment; no clearance or creepage requirement; meets Clause 13 of EN 60079-15	N/A
15	Connection facilities for earthing or bonding conductors		
15.1	Equipment requiring earthing		
15.1.1	Internal	Grounding terminal provided with equipment	P
15.1.2	External	See 15.1.2	N/A
15.2	Equipment not requiring earthing	See 15.1.2	N/A
15.3	Size of conductor connection	No PE Conductor, The maximum size of wiring allowed by the terminal block datasheet is 12 AWG (3.31 mm ²)	N/A
15.4	Protection against corrosion	Adequate protection provided against corrosion, Connection facilities are inside IP 54 enclosure	P
15.5	Secureness of electrical connections	Connection facilities are designed so that the electrical conductors cannot be readily loosened or twisted	P
16	Entries into enclosures		
16.1	General	Entries through wall of enclosure	P
16.2	Identification of entries	Entries identified on schedule drawing 00-92412	P
16.3	Cable glands	None, See X Condition of use of cable glands	N/A
16.4	Blanking elements	None	N/A
16.5	Thread adapters	None	N/A
16.6	Temperature at branching point and entry point	Temperature under rated conditions is not higher than 70 °C	N/A

EN 60079-0:2012+A11:2013			
Clause	Requirement – Test	Result – Remark	Verdict
16.7	Electrostatic charges of cable sheaths	No cables	N/A
17	Supplementary requirements for rotating machines		
17.1	Ventilation		
17.1.1	Ventilation openings	Product is not rotating machines	N/A
17.1.2	Materials for external fans	See 17.1.1 of EN 60079-0	N/A
17.1.3	Cooling fans of rotating machines		
17.1.3.1	Fans and fan hoods	See 17.1.1 of EN 60079-0	N/A
17.1.3.2	Construction and mounting of the ventilating systems	See 17.1.1 of EN 60079-0	N/A
17.1.3.3	Clearances for the ventilating system	See 17.1.1 of EN 60079-0	N/A
17.1.4	Auxiliary motor cooling fans	See 17.1.1 of EN 60079-0	N/A
17.1.5	Ventilating fans		
17.1.5.1	Applicability	See 17.1.1 of EN 60079-0	N/A
17.1.5.2	General	See 17.1.1 of EN 60079-0	N/A
17.1.5.3	Fan and fan hoods	See 17.1.1 of EN 60079-0	N/A
17.1.5.4	Construction and mounting	See 17.1.1 of EN 60079-0	N/A
17.1.5.5	Clearances for rotating parts	See 17.1.1 of EN 60079-0	N/A
17.2	Bearings	See 17.1.1 of EN 60079-0	N/A
18	Supplementary requirements for switchgear		
18.1	Flammable dielectric	Product is not Switchgear	
18.2	Disconnectors	See 18.1	N/A
18.3	Group I – Provisions for locking	See 18.1	N/A
18.4	Doors and covers	See 18.1	N/A
19	Supplementary requirements for fuses	Replaceable fuse warning is provided WARNING: DO NOT REMOVE OR REPLACE FUSE WHEN UNIT IS ENERGIZED	P
20	Supplementary requirements for plugs, sockets outlets and connectors		

EN 60079-0:2012+A11:2013			
Clause	Requirement – Test	Result – Remark	Verdict
20.1	General	Modified per EN 60079-15, See checklist for EN 60079-15	P
20.2	Explosive gas atmospheres	EPL is not Gb	N/A
20.3	Explosive dust atmospheres	Not for Dust	N/A
20.4	Energized plugs	Plugs and components do not remain energized when not engaged with a socket outlet	P
21	Supplementary requirements for luminaires		
21.1	General	Not a luminaire	N/A
21.2	Covers for luminaires of EPL Mb, EPL Gb, or EPL Db	See 21.1	N/A
21.3	Covers for luminaires of EPL Gc or EPL Dc	See 21.1	N/A
21.4	Sodium lamps	See 21.1	N/A
22	Supplementary requirements for caplights and handlights		
22.1	Group I caplights	No caplight or handlight	N/A
22.2	Group II and Group III caplights and handlights	See 22.1	N/A
23	Equipment incorporating cells and batteries		
23.1	General	Coin cell Li/ MnO ₂ 3V	P
23.2	Batteries	Single Coin cell	
23.3	Cell types	IEC 60086-1 Type C	
23.4	Cells in a battery	Single cell	N/A
23.5	Ratings of batteries	Cell operated within manufacturer's ratings	P

EN 60079-0:2012+A11:2013			
Clause	Requirement – Test	Result – Remark	Verdict
23.6	Interchangeability	Replaceable Coin cell present. Enclosure Marked with cell Manufacturer; Part number, Voltage and Capacity	P
23.7	Charging of primary batteries	Not rechargeable	N/A
23.8	Leakage	Constructed and arranged so that no leakage can occur.	P
23.9	Connections	Per manufacturer's recommendations	P
23.10	Orientation	Orientation is per manufacture's instruction,	P
23.11	Replacement of cells or batteries	Replaceable Coin cell present. Enclosure Marked with cell Manufacturer; Part number, Voltage and Capacity	P
23.12	Replaceable battery pack	No battery pack	N/A
24	Documentation	Documentation provided by manufacturer give full and correct specification of the explosion safety aspects of the electrical equipment	P
25	Compliance of prototype or sample with documents	Samples subjected to Type Test comply with manufacturer's documents	P
26	Type tests		
26.1	General	Samples subjected to Type Test comply with requirements of this standard	P
26.2	Test configuration	Most unfavorable configuration tested (worst case tolerances for assessment).	P
26.3	Tests in explosive test mixtures	No tests required to be carried out in explosive test mixtures	N/A
26.4	Tests of enclosures		
26.4.1	Order of tests		
26.4.1.1	Metallic enclosures, metallic parts of enclosures and glass parts of enclosures	Enclosure is previously ATEX certified under ETL10ATEX41132X/1. No testing needed	N/A
26.4.1.2	Non-metallic enclosures or non-metallic parts of enclosures	Enclosure is previously ATEX certified under ETL10ATEX41132X/1. No testing needed	N/A

EN 60079-0:2012+A11:2013			
Clause	Requirement – Test	Result – Remark	Verdict
26.4.1.2.1	Group I electrical equipment	Not for Group I	N/A
26.4.1.2.2	Group II and Group III electrical equipment	See 26.4.1.1,	N/A
26.4.2	Resistance to impact	See 26.4.1.1	N/A
26.4.3	Drop test	See 26.4.1.1	N/A
26.4.4	Acceptance criteria	See 26.4.1.1	N/A
26.4.5	Degree of protection (IP) by enclosures		
26.4.5.1	Test procedure	Enclosure is previously ATEX certified under ETL10ATEX41132X/1. No testing needed	N/A
26.4.5.2	Acceptance criteria	Enclosure is previously ATEX certified under ETL10ATEX41132X/1. No testing needed	N/A
26.5	Thermal tests		
26.5.1	Temperature measurement		
26.5.1.1	General	The measuring devices (thermocouples, etc.) are selected and so arranged that they do not significantly affect the thermal behavior of the electrical equipment.	P
26.5.1.2	Service temperature	See Test data	P
26.5.1.3	Maximum surface temperature	The maximum external surface temperature meets limits for temperature class T5	P
26.5.2	Thermal shock test	No windows	N/A
26.5.3	Small component ignition test (Group I and Group II)		
26.5.3.1	General	No small components that exceeds permitted temperature classification	N/A
26.5.3.2	Procedure	Informative clause	N/A
26.5.3.3	Acceptance criteria	See 26.5.3.1	N/A
26.6	Torque test for bushings		
26.6.1	Test procedure	No bushings	N/A
26.6.2	Acceptance criteria	See 26.6.1	N/A
26.7	Non-metallic enclosures or non-metallic parts of enclosures		
26.7.1	General	Enclosure is previously ATEX certified under ETL10ATEX41132X/1. No testing needed	N/A
26.7.2	Test temperatures	Enclosure is previously ATEX certified under ETL10ATEX41132X/1. No testing needed	N/A
26.8	Thermal endurance to heat	See 26.7.1	N/A
26.9	Thermal endurance to cold	See 26.7.1	N/A
26.10	Resistance to light		
26.10.1	Test procedure		

EN 60079-0:2012+A11:2013			
Clause	Requirement – Test	Result – Remark	Verdict
26.10.2	Acceptance criteria	Enclosure is previously ATEX certified under ETL10ATEX41132X/1. No testing needed	N/A
26.11	Resistance to chemical agents for Group I electrical equipment	Excluded per EN 60079-15 per Table 1/ Not for Group I	N/A
26.12	Earth continuity	Earth continuity found satisfactory, Checked with DMM Cal id 996; Due on 11/29/2015	P
26.13	Surface resistance test of parts of parts of enclosures of non-metallic materials	For fixed installation only. See X Condition, Test not needed	N/A
26.14	Measurement of capacitance		
26.14.1	General	Enclosure is only accessible part, properly grounded. Test not needed	N/A
26.14.2	Test procedure	See 26.14.1	N/A
26.15	Verification of ratings of ventilating fans	No fans	N/A
26.16	Alternative qualification of elastomeric sealing O-rings	Alternate requirement noted	N/A
27	Routine tests	Dielectric test required.	P
28	Manufacturer's responsibility		
28.1	Conformity with the documentation	Compliant, all required documentation held in Project folder G102080041DAL	P
28.2	Certificate	A certificate confirming that the equipment is in conformity with the requirements of this standard along with its other applicable parts and additional standards is prepared	P
28.3	Responsibility for marking	Manufacturer attests to Responsibility for marking	P
29	Marking		
29.1	Applicability	Applicable marking for Type of protection "nA" EPL "Gc" used	P


EN 60079-0:2012+A11:2013			
Clause	Requirement – Test	Result – Remark	Verdict
29.2	Location	The electrical equipment is legibly marked, visible all the time.	P
29.3	General	The marking includes the following: a) the name of the manufacturer b) the manufacturer's type identification; c) Serial number d) the name or mark of the certificate issuer and the certificate reference per requirement of this standard e) the specific Ex marking	P
29.4	Ex marking for explosive gas atmospheres	The marking includes the following: a) the symbol Ex b) the symbol for each type (or level) of protection used- "nA", (for EPL Gc) c) the symbol of the group "IIC" d) T-code T5 e) EPL "Gc"	P
29.5	Ex marking for explosive dust atmospheres	Not for Group III	N/A
29.6	Combined types (or levels) of protection	Same level of protection (Gc)	N/A
29.7	Multiple types of protection	nA Only	N/A
29.8	Ga equipment using two independent Gb types (or levels) of protection	No Ga Equipment	N/A
29.9	Ex Components	Not an Ex component	N/A
29.10	Small equipment and small Ex Components	See 29.11	N/A
29.11	Extremely small equipment and extremely small Ex Components	Not an Extremely small equipment and extremely small Ex Components	N/A

EN 60079-0:2012+A11:2013			
Clause	Requirement – Test	Result – Remark	Verdict
29.12	Warning markings	<p>The following warnings are provided. See copy of label</p> <p>WARNING: POTENTIAL ELECTROSTATIC CHARGE HAZARD-SEE INSTRUCTION</p> <p>WARNING: DO NOT REMOVE OR REPLACE FUSE WHEN UNIT IS ENERGIZED</p> <p>WARNING: DO NOT REMOVE OR REPLACE BATTERY UNLESS AREA IS KNOWN TO BE NON HAZARDOUS</p>	P
29.13	Alternate marking of equipment protection levels (EPLs)	Alternate marking is Optional, not required	N/A
29.13.1	Alternate marking of type of protection for explosive gas atmospheres	See 29.13	N/A
29.13.2	Alternate marking of type of protection for explosive dust atmospheres	Not for Group III	N/A
29.14	Cells and batteries	Replaceable Coin cell present. Enclosure marked with cell Manufacturer, Part number, Voltage, and Capacity	P
29.15	Converter-fed electrical machines	Not a Converter-fed electrical machines	N/A
29.16	Examples of marking	Informative clause	N/A
30	Instructions		
30.1	General	<p>Instruction manual contains:</p> <ul style="list-style-type: none"> • Recapitulation of marking • Instructions for safety • Special instructions • Applicable warnings 	P
30.2	Cells and batteries	See 29.14	N/A
30.3	Electrical machines	Not a electrical machine	N/A
30.4	Ventilating fans	No Ventilating fans	N/A
Annex A (Normative)	Supplementary requirements for cable glands		N/A
A.1	General	No cable glands	N/A

EN 60079-0:2012+A11:2013			
Clause	Requirement – Test	Result – Remark	Verdict
A.2	Constructional requirements		
A.2.1	Cable sealing	See A.1	N/A
A.2.2	Filling compounds	See A.1	N/A
A.2.3	Clamping		
A.2.3.1	General	See A.1	N/A
A.2.3.2	Group II or III cable glands	See A.1	N/A
A.2.4	Lead-in of cable		
A.2.4.1	Sharp edges	See A.1	N/A
A.2.4.2	Point of entry	See A.1	N/A
A.2.5	Released by a tool	See A.1	N/A
A.2.6	Fixing	See A.1	N/A
A.2.7	Degree of protection	See A.1	N/A
A.3	Type tests		
A.3.1	Tests of clamping of non-armoured and braided cables		
A.3.1.1	Cable glands with clamping by the sealing ring	See A.1	N/A
A.3.1.2	Cable glands with clamping by filling compound	See A.1	N/A
A.3.1.3	Cable glands with clamping by means of a clamping device	See A.1	N/A
A.3.1.4	Tensile test	See A.1	N/A
A.3.1.5	Mechanical strength	See A.1	N/A
A.3.2	Tests of clamping of armoured cables		
A.3.2.1	Tests of clamping where the armourings are clamped by a device within the gland	See A.1	N/A
A.3.2.1.1	Tensile test	See A.1	N/A
A.3.2.1.2	Mechanical strength	See A.1	N/A
A.3.2.2	Tests of clamping where the armourings are not clamped by a device within the gland	See A.1	N/A
A.3.3	Type test for resistance to impact	See A.1	N/A
A.3.4	Test for degree of protection (IP) of cable glands	See A.1	N/A
A.4	Marking		
A.4.1	Marking of cable glands	See A.1	N/A
A.4.2	Marking of cable-sealing rings	See A.1	N/A
Annex B (Normative)	Requirements for Ex Components		N/A

EN 60079-0:2012+A11:2013			
Clause	Requirement – Test	Result – Remark	Verdict
Annex C (Informative)	Example of rig for resistance to impact test		
Annex D (Informative)	Motors supplied by converters		
Annex E (Informative)	Temperature rise testing of electric machines		
Annex F (Informative)	Guideline flowchart for tests of non-metallic enclosures or non-metallic parts of enclosures (26.4)		

EN Modifications to EN 60079-0:2012+A11:2013:

Annex ZA (Normative)	Normative references to international publications with their corresponding European publications		P
Annex ZY (Informative)	Additional Information relating to the European ATEX Directive 94/9/EC		
ZY.1	Equipment Groups	Noted, for Group II, Category 3G (Zone 2)	P
ZY.2	Instructions	Noted, The manufacturer or his authorized representative in the Community is to draw up the instructions for use in the required Community languages.	P
ZY.3	Marking	Noted,  II 3 G Ex nA IIC T5 Gc	P
ZY.4	Significant changes between this European Standard and EN 60079-0:2009	Noted, This product evaluation is for EN60079-0:2012+A11:2013	NA
Annex ZZ (Informative)	Coverage of Essential Requirements of EU Directives		P

SECTION B: Compliance Checklists

B2. EN 60079-15:2010 Checklist

EN 60079-15			
Clause	Requirement – Test	Result – Remark	Verdict
1	Scope	Scope noted, Product covered under this report is Group II electrical equipment with type of protection, “nA” intended for use in explosive gas atmospheres,	P
2	Normative references		
3	Terms and definitions		
4	General		
4.1	Equipment grouping and temperature classification	The equipment is group IIC T5 apparatus. The equipment is protected by Ex nA is marked T5 per EN60079-15	P
4.2	Potential ignition sources	Potential ignition sources are evaluated by nA type of protection. The equipment is protected by Ex nA is marked T5	P
5	Temperatures		
5.1	Maximum surface temperature	Maximum surface temperature determined according to 26.5.1 considering the maximum ambient temperature,	P
5.2	Small components	This relaxation is not utilized	P
6	Requirements for electrical equipment		
6.1	General	Equipment complies with the applicable clauses of EN60079-0; EN60079-15; EN 60079-0 Checklist is included in this ATEX test report	P
6.2	Opening times	Excluded per EN 60079-15, Table 1	N/A
6.3	Minimum degree of protection		
6.3.1	General	Enclosure is previously ATEX certified under ETL10ATEX41132X/1. No testing needed	N/A
6.3.2	Degree of protection provided by installation	Enclosure is previously ATEX certified under ETL10ATEX41132X/1. No testing needed	N/A

EN 60079-15			
Clause	Requirement – Test	Result – Remark	Verdict

6.4	Clearances, creepage distances and separations		
6.4.1	General	Complies with clause 13, low power equipment . no minimum creepage and clearance requirements. (Rated voltage of the equipment or the working voltage of any part of the equipment being considered does not exceed 85 V d.c.)	N/A
6.4.2	Determination of working voltage	See 6.4.1	N/A
6.4.3	Conformal coating	See 6.4.1	N/A
6.4.4	Comparative tracking index (CTI)	See 6.4.1	N/A
6.4.5	Measurement of creepage and clearance	See 6.4.1	N/A
6.4.6	Compound filled cable sealing boxes	See 6.4.1	N/A

6.5	Electric strength		
6.5.1	Insulation from earth or frame	Dielectric test done. See TDP	P
6.5.2	Insulation between conductive parts	See 6.5.1	N/A

7	Connection facilities and terminal compartments		
---	---	--	--

7.1	General	<p>Connection facilities is via Phoenix terminal blocs, meets following</p> <ul style="list-style-type: none"> a) constructed in such a way that the conductors cannot slip out from their intended location during tightening of a screw or after insertion b) Provide a means to avoid loosening of the connection in service c) Contact is made without damage d) Provides positive compression force e) Temperature changes do not affect contact made f) Provides contact pressure g) Designed for one conductor h) Not for stranded conductors i) No screw connections j) Terminals are provided with mechanism to open clamping mechanism 	P
-----	---------	--	---

7.2	Field wiring connections		
-----	--------------------------	--	--

EN 60079-15			
Clause	Requirement – Test	Result – Remark	Verdict
7.2.1	General	Terminals for field wiring are dimensioned to allow the effective connection of conductors of cross-section equal to at least that corresponding to the rated current of the electrical equipment.	P
7.2.2	Connections made using terminals complying with IEC 60947-7-1, IEC 60947-7-2, IEC 60999-1, or IEC 60999-2	Terminal blocks comply with IEC 60999-1	P
7.2.3	Field wiring connection facilities integral to "n" equipment or components	Meets 7.2.2	P
7.2.4	Connections designed to be used with cable lugs and similar devices	No cable lugs	N/A
7.2.5	Connections using permanent arrangements	No permanent arrangements	N/A

7.3	Factory connections		
7.3.1	General	Factory connections such as soldering of PCB components are fixed in specific position	P
7.3.2	Field wiring connection methods used for factory connections	Informative clause	N/A
7.3.3	Other factory connections	See 7.3.2	N/A
7.3.4	Permanent connections	None	N/A
7.3.5	Pluggable connections	See Test data. No connectors that remain energized when separated, warning not required	P
7.3.6	Terminal bridging connections	No Such connections	N/A

8	Supplementary requirements for non-sparking electrical rotating machines		
---	--	--	--

8.1	General	Not a rotating machine	N/A
-----	---------	------------------------	-----

8.2	Machine enclosure	See 8.1	N/A
-----	-------------------	---------	-----

8.3	Terminal boxes	See 8.1	N/A
-----	----------------	---------	-----

8.4	Conduit stopping boxes, cable sealing and dividing boxes	See 8.1	N/A
-----	--	---------	-----

8.5	Connection facilities for external conductors	See 8.1	N/A
-----	---	---------	-----

8.6	Neutral point connections	See 8.1	N/A
-----	---------------------------	---------	-----

EN 60079-15			
Clause	Requirement – Test	Result – Remark	Verdict
8.7	Radial air gap	See 8.1	N/A
8.8	Rotor cages		
8.8.1	Rotor cages built from bars connected to end rings	See 8.1	N/A
8.8.2	Cast rotor cages	See 8.1	N/A
8.8.3	Assessment for possible air gap sparking	See 8.1	N/A
8.9	Stator winding insulation system	See 8.1	N/A
8.10	Surface temperature limitation		
8.10.1	Prevention of thermal ignition	See 8.1	N/A
8.10.2	Operation with a frequency convertor or a non-sinusoidal supply		
8.10.2.1	Test methods	See 8.1	N/A
8.10.2.2	Type test for a specific converter	See 8.1	N/A
8.10.2.3	Alternative type test by calculation	See 8.1	N/A
9	Supplementary requirements for non-sparking fuses and fuse assemblies		
9.1	Fuses	The electronics are protected by a Littlefuse Inc P/N 34705000410	P
9.2	Temperature class of equipment	The equipment is group IIC T5 apparatus. The equipment is protected by Ex nA, marked T5	P
9.3	Fuse mounting	Fuse holder connection meet 7.3.5	P
9.4	Fuse enclosures	Fuses are in ATEX certified enclosure, marked with following WARNING: DO NOT REMOVE OR REPLACE FUSE WHEN UNIT IS ENERGIZED	P
9.5	Replacement fuse identification	Fuse identification marked on label	P
10	Supplementary requirements for non-sparking plugs and sockets		
10.1	Plugs and sockets for external connections	No plugs or sockets for external connection. Input connection is made using terminal block, housed in IP 54 ATEX certified enclosure	N/A

EN 60079-15			
Clause	Requirement – Test	Result – Remark	Verdict
10.2	Maintaining degree of protection (IP code)	See 10.1	N/A
10.3	Sockets that do not have plugs inserted in normal operation	No Sockets that do not have plugs inserted in normal operation	N/A
11	Supplementary requirements for non-sparking luminaires		
11.1	General	Not a luminaire	N/A
11.2	Construction		
11.2.1	General	See 11.1	N/A
11.2.2	Enclosure of lamp	See 11.1	N/A
11.2.3	Lampholders		
11.2.3.1	General	See 11.1	N/A
11.2.3.2	Bayonet non-sparking lampholders	See 11.1	N/A
11.2.3.3	Screw non-sparking "nA" lampholders	See 11.1	N/A
11.2.3.4	Bi-pin non-sparking lampholders	See 11.1	N/A
11.2.4	Auxiliaries		
11.2.4.1	General	See 11.1	N/A
11.2.4.2	Glow-type starters	See 11.1	N/A
11.2.4.3	Electronic starters and ignitors	See 11.1	N/A
11.2.4.4	Starter holders	See 11.1	N/A
11.2.4.5	Ballasts	See 11.1	N/A
11.2.5	Creepage distances and clearances	See 11.1	N/A
11.2.6	Terminals		
11.2.6.1	Looping connections	See 11.1	N/A
11.2.6.2	Screw type lampholder polarity	See 11.1	N/A
11.2.7	Internal wiring	See 11.1	N/A
11.3	Luminaires for tubular fluorescent bi-pin lamps		
11.3.1	General	See 11.1	N/A
11.3.2	Maximum ambient temperature	See 11.1	N/A
11.3.3	Temperature class	See 11.1	N/A
11.3.4	Endurance tests and thermal tests		
11.3.4.1	General	See 11.1	N/A

EN 60079-15			
Clause	Requirement – Test	Result – Remark	Verdict
11.3.4.2	Thermal test (normal operation)	See 11.1	N/A
11.3.4.3	Thermal test (abnormal conditions)		
11.3.4.3.1	Temperatures except for windings	See 11.1	N/A
11.3.4.3.2	Temperatures for windings	See 11.1	N/A
11.3.4.3.3	Tests for luminaires containing electronic ballasts	See 11.1	N/A
11.3.4.4	Surface temperatures		
11.3.4.4.1	Luminaires	See 11.1	N/A
11.3.4.4.2	Illuminated surfaces	See 11.1	N/A
11.3.5	Resistance to dust and moisture	See 11.1	N/A
11.3.6	Insulation resistance and electric strength	See 11.1	N/A
11.4	Other equipment containing light sources	See 11.1	N/A
12	Supplementary requirements for equipment incorporating non-sparking cells and batteries		
12.1	General	See 12.2 to 12.6 below	P
12.2	Categorization of cells and batteries		
12.2.1	General	540mAh; Type 1	P
12.2.2	Type 1 cells and batteries	Operating parameters are within the manufacturer's recommended limits	P
12.2.3	Type 2 cells and batteries	Type 1	N/A
12.2.4	Type 3 cells and batteries	Type 1	N/A
12.3	General requirements for cells and batteries of types 1 and 2		
12.3.1	General	See 12.3.2 to 12.3.15.	P
12.3.2	Maximum capacity	540mAh < 25Ah	P
12.3.3	Secondary cells	None	N/A
12.3.4	Cell connection	One cell	N/A
12.3.5	Discharge mode	Being discharged per manufacturer's instruction, see Note 25 on schedule drawing. <i>25 Sealed battery (BT1) with cell according to IEC 60086-1 Type B or C. The battery is installed and used as specified by the manufacturer with no possibility of voltage connection or charging current passing through the battery.</i>	P
12.3.6	Temperature	Not exceeded, see test data	P
12.3.7	Creepage and clearance	One cell	N/A

EN 60079-15			
Clause	Requirement – Test	Result – Remark	Verdict
12.3.8	Connections	One cell	N/A
12.3.9	Connecting cells in series	One cell	N/A
12.3.10	Deep discharge protection	No deep discharge protection	N/A
12.3.11	Temperature test conditions	See Test data	P
12.3.12	Battery packs	One cell	N/A
12.3.13	Battery pack connections	One cell	N/A
12.3.14	Cell electrolyte and gas release	No electrolyte leakage was observed during temperature testing of end product. No Cell electrolyte and gas release expected, cell used within manufactures ratings.	P
12.3.15	Excessive load draw	Used within manufacturer's recommendations; not for excessive load draw	N/A

12.4	Charging of type 1 and type 2 cells and batteries		
12.4.1	Temperature range	Not for charging	N/A
12.4.2	Charger specifications	See 12.4.1	N/A
12.4.3	Charging separated cells or batteries	See 12.1	N/A
12.4.4	Charger limitations	See 12.1	N/A
12.4.5	Charging outside the hazardous area	See 12.1	N/A
12.4.6	Gassing during charging of type 2 cells or batteries	See 12.1	N/A

12.5	Requirements for type 3 secondary batteries		
12.5.1	Types of permissible batteries	Not capable of venting electrolytic gas/ Not type 3	N/A
12.5.2	Battery containers		
12.5.2.1	Internal surfaces	See 12.5.1	N/A
12.5.2.2	Mechanical requirements	See 12.5.1	N/A
12.5.2.3	Creepage distances	See 12.5.1	N/A
12.5.2.4	Covers	See 12.5.1	N/A
12.5.2.5	Cell assembly	See 12.5.1	N/A
12.5.2.6	Liquid extraction	See 12.5.1	N/A
12.5.2.7	Ventilation	See 12.5.1	N/A
12.5.2.8	Plugs and sockets	See 12.5.1	N/A
12.5.2.9	Polarity marking	See 12.5.1	N/A
12.5.2.10	Other equipment	See 12.5.1	N/A
12.5.2.11	Insulation resistance	See 12.5.1	N/A
12.5.3	Cells		
12.5.3.1	Lids	See 12.5.1	N/A
12.5.3.2	Support	See 12.5.1	N/A

EN 60079-15			
Clause	Requirement – Test	Result – Remark	Verdict
12.5.3.3	Electrolyte maintenance	See 12.5.1	N/A
12.5.3.4	Expansion space	See 12.5.1	N/A
12.5.3.5	Filling and vent plugs	See 12.5.1	N/A
12.5.3.6	Electrolyte seals	See 12.5.1	N/A
12.5.4	Connections		
12.5.4.1	Intercell connections	See 12.5.1	N/A
12.5.4.2	Temperature assessment	See 12.5.1	N/A
12.5.4.3	Connector protection	See 12.5.1	N/A
12.6	Verification and tests		
12.6.1	Insulation resistance	See 12.5.1	N/A
12.6.2	Mechanical shock test	See 12.5.1	N/A
13	Supplementary requirements for non-sparking low power equipment		P
	a) Enclosure is IP 54, Previously ATEX certified b) Rated voltage is 10-28VDC c) Internal transient protection provided. See Note 28 on schedule drawing 28 TVS installed on power input set at a level not exceeding 140 % of the peak rated voltage values at the power supply terminals of the equipment such as but not limited to LITTLEFUSE 5KP26CA as per the manufacturer's data sheet and the component's specifications		
14	Supplementary requirements for non-sparking current transformers		N/A
15	Other non-sparking electrical equipment		N/A
16	General supplementary requirements for equipment producing arcs, sparks or hot surfaces		N/A
17	Supplementary requirements for enclosed-break devices and non-incendive components producing arcs, sparks or hot surfaces		
17.1	Type testing	No Enclosed-break devices and non-incendive components	N/A
17.2	Ratings		
17.2.1	Enclosed-break devices	See 17.1	N/A
17.2.2	Non-incendive components	See 17.1	N/A
17.3	Construction of enclosed-break devices		
17.3.1	Free internal volume	See 17.1	N/A

EN 60079-15			
Clause	Requirement – Test	Result – Remark	Verdict
17.3.2	Continuous operating temperature (COT) requirements	See 17.1	N/A
17.3.3	Seal protection	See 17.1	N/A
18	Supplementary requirements for hermetically sealed devices producing arcs, sparks or hot surfaces		N/A
19	Supplementary requirements for sealed devices producing arcs, sparks or hot surfaces		N/A
19.1	Non-metallic materials	No Sealed Devices	N/A
19.2	Opening	See 19.1	N/A
19.3	Internal spaces	See 19.1	N/A
19.4	Handling	See 19.1	N/A
19.5	Gasket and seals	See 19.1	N/A
19.6	Type tests	See 19.1	N/A
20	Supplementary requirements for restricted-breathing enclosures protecting equipment producing arcs, sparks or hot surfaces		
20.1	General	Not a restricted breathing enclosure	N/A
20.2	Constructional requirements		
20.2.1	Type of equipment		
20.2.1.1	Equipment containing normally sparking devices	See 20.1	N/A
20.2.1.2	Equipment not containing normally sparking devices	See 20.1	N/A
20.2.2	Cable glands and conduit entries		
20.2.2.1	Cable glands	See 20.1	N/A
20.2.2.2	Conduit entries	See 20.1	N/A
20.2.3	Operating rods, spindles and shafts	See 20.1	N/A
20.2.4	Windows		
20.2.4.1	Cemented windows	See 20.1	N/A
20.2.4.2	Gasketed windows	See 20.1	N/A
20.2.5	Gasket and seal requirements	See 20.1	N/A
20.2.6	Non-resilient seals	See 20.1	N/A
20.2.7	Test port		
20.2.7.1	General	See 20.1	N/A
20.2.7.2	Test port exemptions		
20.2.7.2.1	Luminaires	See 20.1	N/A

EN 60079-15			
Clause	Requirement – Test	Result – Remark	Verdict
20.2.7.2.2	Other restricted breathing equipment	See 20.1	N/A
20.2.7.2.3	Gasket and sealing replacement	See 20.1	N/A
20.2.7.2.4	Testing procedure	See 20.1	N/A
20.2.8	Internal fans	See 20.1	N/A
20.2.9	Routine test exemptions	See 20.1	N/A
20.3	Temperature limitation		
20.3.1	General	See 20.1	N/A
20.3.2	Temperature calculation	See 20.1	N/A
20.4	Additional requirements for restricted breathing luminaires		
20.4.1	Mounting arrangement	See 20.1	N/A
20.4.2	Reflectors	See 20.1	N/A
20.4.3	Surface temperatures of restricted breathing luminaires	See 20.1	N/A
21	General information on verification and tests		P
22	Type tests		
22.1	Representative samples	Representative samples tested for applicable tests	P
22.2	Test configuration	Most unfavorable configuration tested	P
22.3	Tests for enclosures on which the type of protection depends		
22.3.1	Thermal endurance tests		
22.3.1.1	Thermal endurance to heat	Enclosure is previously ATEX certified under ETL10ATEX41132X/1. No testing needed	N/A
22.3.1.2	Drop test for hand-held equipment	Not a hand-held equipment	N/A
22.4	Tests for enclosed break devices and non incensive components		
22.4.1	Preparation of enclosed-break device samples	Not an enclosed break device or non incensive component	N/A
22.4.2	Preparation of non-incensive component samples	See 22.4.1	N/A
22.4.3	Test conditions for enclosed-break devices and non-incensive components		
22.4.3.1	General	See 22.4.1	N/A
22.4.3.2	Enclosed-break devices	See 22.4.1	N/A

EN 60079-15			
Clause	Requirement – Test	Result – Remark	Verdict
22.4.3.3	Non-incendive components	See 22.4.1	N/A

22.5	Tests for sealed devices		
22.5.1	Conditioning	No Sealed Device	N/A
22.5.2	Voltage test	See 22.5.1	N/A
22.5.3	Tests on devices with free space		
22.5.3.1	Equipment for leakage test on sealed devices	See 22.5	N/A
22.5.3.2	Leakage test on sealed devices	See 22.5	N/A
22.5.3.3	Dielectric withstand test	See 22.5	N/A
22.5.4	Test for sealed devices for luminaires	Not a luminaire	N/A

22.6	Type test requirements for restricted-breathing enclosures		
22.6.1	General	Not a restricted-breathing enclosures	N/A
22.6.2	Test procedures		
22.6.2.1	Equipment where the nominal volume of the enclosure will be unchanged due to pressure		N/A
22.6.2.2	Equipment with test port		
22.6.2.2.1	Type test only without additional routine test	See 22.6.1	N/A
22.6.2.2.2	Type test with additional routine test	See 22.6.1	N/A
22.6.2.3	Type test for equipment without test port	See 22.6.1	N/A
22.6.3	Alternative type test for equipment where the nominal volume of the enclosure changes due to pressure	See 22.6.1	N/A

22.7	Test for screw lampholders	Not a screw lamp holder	N/A
------	----------------------------	-------------------------	-----

22.8	Test for starter holders for luminaires	Not a luminaire	N/A
------	---	-----------------	-----

22.9	Tests for electronic starters for tubular fluorescent lamps and for ignitors for high pressure sodium or metal halide lamps		
22.9.1	General	Not a lamp	N/A
22.9.2	Moisture resistance, insulation and electric strength test	See 22.9.1	N/A
22.9.3	Cut-out device test	See 22.9.1	N/A
22.9.4	Life test (failed lamp)		
22.9.4.1	Ignitor thermal endurance test	See 22.9.1	N/A

EN 60079-15			
Clause	Requirement – Test	Result – Remark	Verdict
22.9.4.2	Evaluation criteria	See 22.9.1	N/A
22.10	Test for wiring of luminaires subject to high-voltage impulses from ignitors	See 22.8	N/A
22.11	Mechanical shock test for batteries		
22.11.1	General	Batteries not subjected to mechanical shock in normal service	N/A
22.11.2	Test procedure	See 22.11.1	N/A
22.11.3	Evaluation criteria	See 22.11.1	N/A
22.12	Insulation resistance test for batteries		
22.12.1	Test conditions	See 22.11.1	N/A
22.12.2	Evaluation criteria	See 22.11.1	N/A
22.13	Additional ignition tests for large or high-voltage machines		
22.13.1	Test for cage rotor construction		
22.13.1.1	General	Not a high voltage machine	N/A
22.13.1.2	Rotor cage ageing process	See 22.13.1.1	N/A
22.13.1.3	Ignition test	See 22.13.1.1	N/A
22.13.2	Test for stator winding insulation system incendivity		
22.13.2.1	General	See 22.13.1.1	N/A
22.13.2.2	Test conditions	See 22.13.1.1	N/A
22.13.2.3	Steady state ignition test	See 22.13.1.1	N/A
23	Routine verifications and tests		
23.1	General	Manufacturer agrees to run Dielectric Test	P
23.2	Specific routine tests		
23.2.1	Electric strength test	See 23.1	P
23.2.2	Alternate dielectric strength test	Alternate dielectric strength test option provided as part of routine test	P
23.2.3	Routine test requirements for restricted-breathing enclosures		
23.2.3.1	General	Not a restricted breathing enclosure	N/A
23.2.3.2	Test procedure		
23.2.3.2.1	Equipment where the nominal volume of the enclosure will be unchanged due to pressure		
23.2.3.2.1.1	Equipment with test port	See 23.2.3.2.1.1	N/A
23.2.3.2.1.2	Equipment without test port	See 23.2.3.2.1.1	N/A

EN 60079-15			
Clause	Requirement – Test	Result – Remark	Verdict
23.2.3.2.2	Equipment where the nominal volume of the enclosure changes due to pressure	See 23.2.3.2.1.1	N/A
23.2.4	Routine tests for electronic starters and ignitors	See 23.2.3.2.1.1	N/A

24	Marking		
----	---------	--	--

24.1	General	Marking includes required elements of EN 60079-0 and EN 60079-15	P
------	---------	--	---

24.2	Additional marking for batteries	Coin cell present, Marked with cell Manufacturer; Part number, Voltage and Capacity	P
------	----------------------------------	---	---

24.3	Examples of marking	Noted	N/A
24.3.1	Warning markings	The following warnings are provided. See copy of label: WARNING: POTENTIAL ELECTROSTATIC CHARGE HAZARD-SEE INSTRUCTION WARNING: DO NOT REMOVE OR REPLACE FUSE WHEN UNIT IS ENERGIZED WARNING: DO NOT REMOVE OR REPLACE BATTERY UNLESS AREA IS KNOWN TO BE NON HAZARDOUS	P

25	Documentation		P
----	---------------	--	---

26	Instructions		P
----	--------------	--	---

Annex A (Informative)	Application, installation, and testing considerations for Ex "nA" asynchronous machines		
-----------------------	---	--	--

EN Modifications to EN 60079-15:2010

Annex ZA (Normative)	Normative references to international publications with their corresponding European publications		P
----------------------	---	--	---

Annex ZZ (Informative)	Significant changes between this European Standard and EN 60079-0:2015		N/A
------------------------	--	--	-----

NOTE: Annex ZZ does not apply. This evaluation is done to EN 60079-15:2010

Annex ZY (Informative)	Additional Information relating to the European ATEX Directive 94/9/EC	P
---------------------------	--	---

SECTION B: Compliance Checklists**B3 CHECKLIST FOR ESSENTIAL HEALTH AND SAFETY REQUIREMENTS (EHSRS) CONCERNING EQUIPMENT AND PROTECTION SYSTEMS INTENDED FOR USE IN POTENTIALLY EXPLOSIVE ATMOSPHERES DIRECTIVE 94/9/EC**

NOTE: 1 – EN 60079-0 2 – EN 60079-15

RELEVANT CLAUSE FROM ANNEX II OF THE ATEX DIRECTIVE	Result / Remark	P / Fail / N/A
1 ESSENTIAL HEALTH AND SAFETY REQUIREMENTS		
1.0 General remarks		
1.0.1 Principles of integrated explosion safety a. formation of explosive atmospheres by equipment and protective systems b. prevention of ignition by electrical and non-electrical sources of ignition c. limitation of explosion, flames and explosion pressures	1, 2	P
1.0.2 Analysis of possible operating faults	2	P
1.0.3 Special checking and maintenance conditions	The instruction manual provides all the required information.	P
1.0.4 Surrounding area conditions	1, 2	P
1.0.5 Marking	1, 2	P
1.0.6 Instructions	The instruction manual provides all the required information.	P
1.1 Selection of materials		
1.1.1 Materials used in the construction of equipment	1, 2	P
1.1.2 Reaction between the materials of construction and the constituents of a potentially explosive atmosphere	1, 2	P
1.1.3 Material characteristics, corrosion and wear resistance, electrical conductivity, impact strength, ageing resistance and effects of temperature	Manufacturer's documentation gives details	P
1.2 Design and construction		
1.2.1 Design and construction for foreseeable lifetime	The state of the art as specified in 1, 2, satisfies this requirement	P
1.2.2 Components to be incorporated and replacements	Manufacturer's documentation gives details	P
1.2.3 Enclosed structures and prevention of leaks	To be installed inside an enclosure	N/A
1.2.4 Dust deposits	No dust deposits	N/A

1.2.5 Additional means of protection	Transient protection and Ingress protection required. To be provided by end user	P
1.2.6 Safe opening	Not for opening in hazardous area	N/A
1.2.7 Protection against other hazards a. physical injury b. surface temperatures c. non-electrical dangers d. overload conditions	1, 2	P
1.2.8 Overloading of equipment (Avoidance by design)	No overload protection	N/A
1.2.9 Flameproof enclosure systems	Not applicable	N/A
1.3 Potential ignition sources		
1.3.1 Hazards arising from different ignition sources	1, 2	P
1.3.2 Hazards arising from static electricity	1, 2	P
1.3.3 Hazards arising from stray electric and leakage currents	Not an electric machine or equipment	N/A
1.3.4 Hazards arising from overheating	No overheating by Friction	N/A
1.3.5 Hazards arising from pressure compensation operations	No hazard from pressure compensation operations.	N/A
1.4 Hazards arising from external effects		
1.4.1 Design and construction for changing environmental conditions	1, 2	P
1.4.2 External mechanical and thermal stresses, aggressive substances	Manufacturer's documentation gives detail	P
1.5 Requirements in respect of safety-related devices		
1.5.1 Failure of safety devices	No safety devices	N/A
1.5.2 Security of failed safety devices	See 1.5.1 for details	N/A
1.5.3 Emergency stop controls	See 1.5.1 for details	N/A
1.5.4 Control and display units (ergonomic principles)	See 1.5.1 for details	N/A
1.5.5 Requirements for devices that rely on a measuring function for explosion protection	See 1.5.1 for details	N/A
1.5.6 Measuring accuracy and serviceability	See 1.5.1 for details	N/A
1.5.7 Alarm threshold safety factors for devices with a measuring function	See 1.5.1 for details	N/A
1.5.8 Risks arising from software	See 1.5.1 for details	N/A
1.6 Integration of safety requirements relating to the system		
1.6.1 Manual override	No manual override	N/A

1.6.2 Emergency shutdown	No emergency shutdown devices.	N/A
1.6.3 Hazards arising from power failure	No equipment influenced by potential power failure	N/A
1.6.4 Hazards arising from connections	Not a system	N/A
1.6.5 Placing of warning devices as parts of equipment	No warning devices used.	N/A
2 Requirements applicable to equipment in category M of equipment-group I		
2.0.1 Requirements applicable to equipment in category M1 or equipment group 1	Not for category M	N/A
2.0.1.1 Design and construction to prevent sources of ignition from becoming active a. primary and secondary means of protection OR b. protection in the event of two faults occurring	See 2.0.1 for details	N/A
2.0.1.2 Construction to prevent the ingress of dust	See 2.0.1 for details	N/A
2.0.1.3 Surface temperature (dust in air)	See 2.0.1 for details	N/A
2.0.1.4 Opening of equipment in safe areas or warnings of dangers by the use of labels	See 2.0.1 for details	N/A
2.0.2 Requirements applicable to equipment in category M2 of equipment group 1	See 2.0.1 for details	N/A
2.0.2.1 Design and construction to prevent sources of ignition from becoming active in normal operation	See 2.0.1 for details	N/A
2.0.2.2 Opening of equipment in safe areas, interlocking systems or warning of dangers by the use of labels	See 2.0.1 for details	N/A
2.0.2.3 Hazards arising from dust (2.0.1.3 applies)	See 2.0.1 for details	N/A
2.1 Requirements applicable to equipment in category 1 of equipment- group II		
2.1.1 Explosive atmospheres caused by gases, vapours or hazes	Not for category 1	N/A
2.1.1.1 Design and construction to prevent sources of ignition from becoming active in rare incidents a. primary and secondary means of protection OR b. protection in the event of two faults occurring	See 2.1.1	N/A
2.1.1.2 Surface Temperature (gas in air)	See 2.1.1	N/A
2.1.1.3 Equipment parts that might be sources of ignition	See 2.1.1	N/A
2.1.2 Explosive atmospheres caused by air/dust mixtures	See 2.1.1.	N/A
2.1.2.1 Dust and construction to prevent sources of ignition from becoming active in rare incidents a. primary and secondary means of protection OR b. protection in the event of two faults occurring	See 2.1.1	N/A
2.1.2.2 Controlled entry of dust into equipment	See 2.1.1	N/A
2.1.2.3 Surface temperatures (dust and air)	See 2.1.1	N/A

2.1.2.4 Safe opening of equipment parts (see 2.1.1.3)	See 2.1.1	N/A
2.2 Requirements for category 2 of equipment-group II		
2.2.1 Explosive atmospheres caused by gases, vapours or mist	Not for Category 2	N/A
2.2.1.1 Design and construction to prevent sources of ignition from becoming active when frequent disturbances or faults are occurring	See 2.2.1	N/A
2.2.1.2 Surface temperatures (abnormal conditions)	See 2.2.1	N/A
2.2.1.3 Opening of equipment in safe areas, interlocking systems or warning of dangers by the use of labels	See 2.2.1	N/A
2.2.2 Explosive atmospheres caused by air/dust mixtures	See 2.2.1	N/A
2.2.2.1 Design and construction to prevent sources of ignition from becoming active when frequent disturbances or faults are occurring	See 2.2.1	N/A
2.2.2.2 Surface temperatures (see 2.1.2.3)	See 2.2.1	N/A
2.2.2.3 Protection against dust (see 2.2.1.3)	See 2.2.1	N/A
2.2.2.4 Opening of equipment (see 2.2.1.3)	See 2.2.1	N/A
2.3 Requirements applicable to equipment in category 3 of equipment-group II		
2.3.1 Explosive atmospheres caused by gases, vapours or mist	1, 2	P
2.3.1.1 Designed and constructed to prevent foreseeable ignition sources in normal operation	1, 2	P
2.3.1.2 Surface temperatures	1, 2	P
2.3.2 Explosive atmospheres caused by air/dust mixtures	Not for dust	N/A
2.3.2.1 Designed and constructed to prevent foreseeable ignition sources in normal operation	1, 2	P
2.3.2.2 Surface temperatures (see 2.1.2.3)	1, 2	P
2.3.2.3 Dust accumulations inside equipment	1, 2	P
3 SUPPLEMENTARY REQUIREMENTS IN RESPECT OF PROTECTIVE SYSTEMS		
3.0 General requirements		
3.0.1 Dimensioning to reduce the effects of an explosion	No protective systems.	N/A
3.0.2 Positioning by design to prevent dangerous chain reactions	See 3.0.1	N/A
3.0.3 Power failure	See 3.0.1	N/A
3.0.4 Failure due to outside interference	See 3.0.1	N/A
3.1 Planning and design		
3.1.1 Characteristics of material	Requirements covered by manufacturer	N/A
3.1.2 Protective systems designed to contain explosions and withstand shock waves	See 3.1.1	N/A
3.1.3 Accessories	See 3.1.1	N/A


3.1.4 Reactions caused by pressure in peripheral equipment	See 3.1.1	N/A
3.1.5 Pressure-relief systems	See 3.1.1	N/A
3.1.6 Explosion suppression systems	See 3.1.1	N/A
3.1.7 Explosion decoupling systems	See 3.1.1	N/A
3.1.8 Protective systems integrated into a circuit to enable a safe shutdown	See 3.1.1	N/A

SECTION C: Tests

Test Overview

EN 60079-0 – TESTS PERFORMED					
Required Tests*		Clause #	Test Description	Comments	Pass (P) or Fail (F)
YES	NO				
<input checked="" type="checkbox"/>	<input type="checkbox"/>	26.5.1.3	Maximum surface temperature	None	P
<input checked="" type="checkbox"/>	<input type="checkbox"/>	5.2	Service temperature	None	P

EN 60079-15 – TESTS PERFORMED					
Required Tests*		Clause #	Test Description	Comments	Pass (P) or Fail (F)
YES	NO				
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.3.5 (a)	Pull Test	None	P
<input checked="" type="checkbox"/>	<input type="checkbox"/>	6.5.1	Dielectric Test	None	P

TEST SAMPLE DESCRIPTION			
Sample #	Control Number	Manufacturer	Model #
1	DAL150511131 4-001	Applied Automation and Controls Inc	Titan NextGen DAQ
Type of item tested			Titan NextGen DAQ
Environmental rating			-20°C to +60°C  II 3 G Ex nA IIC T5 Gc (ATEX Group II; Zone 2 Certification for Category 3)
Equipment mobility			Unit will be in a Fixed position while in use
Operating conditions			10-28VDC; 175mA
Notes			Enclosure is previously ATEX certified under ETL10ATEX41132X/1.

TEST EQUIPMENT AND CALIBRATION LIST:

FOR TEMPERATURE TESTING:

Number:	Description:	Intertek Tracking Number:	Calibration Due:
1	Data Logger	1306	07/09/2015
2	Power Supply	1336	02/20/2016
3	DMM	996	11/29/2015
4	Multiplexer	1212	08/15/2015
5	Ambient Meter	3012	05/04/2016

FOR PULL TESTING AND DIELECTRIC TESTING:

Number:	Description:	ITS' Tracking Number:	Calibration Due:
1	Ambient Meter	3012	05/04/2016
2	Pull Tester	912	09/05/2015
3	Hipot Tester	865	07/30/2015

COMMENTS / INSTRUCTIONS: NONE

Standard	Clause #	Test Date	Sample ID	Verdict (Pass/ Fail)
EN 60079-0:2012+A11:2013	5.2	22 May 2015	DAL1505111314-001	Pass
	26.5.1			

Test Description for Service Temperature Test:

Product is rated for 10-28VDC; 175mA.

With loading information provided by client, temperature test is run at 10VDC and at 28VDC. Loading instructions are detailed below. LEDs were used as resistive loads. Temperatures of hot spots are determined via Thermal imagers. Temperature is recorded at room ambient; in degree Celsius (°C) and linearly corrected to max ambient of +60C. For temperature testing purposes, unit was installed vertically.

Loading Instruction from Client:

Load Description:						
<i>Terminal</i>	<i>Pin</i>	<i>Description</i>	<i>Voltage</i>	<i>External Resistor</i>	<i>Current</i>	<i>Power</i>
<i>ID</i>	<i>#</i>		<i>V</i>	<i>Ohms</i>	<i>mA</i>	<i>W</i>
J1	1	24VDC In	24			
	5	24VDC GND	0			
J5	1	Digital Input 1	24	10000	2.4	0.06
	2	Digital Input 2	24	10000	2.4	0.06
	3	Digital Input 3	24	10000	2.4	0.06
	4	Digital Input 4	24	10000	2.4	0.06
J13	1	Analog Input 1	24	1200	20	0.48
	2	Analog Input 2	24	1200	20	0.48
	3	Analog Input 3	24	1200	20	0.48
	4	Analog Input 4	24	1200	20	0.48
J4	1	4-20mA Output	24	1200	20	0.48
J2	1	Digital Output 1	24	10000	2.4	0.06
	2	Digital Output 2	24	10000	2.4	0.06
	3	Digital Output 3	24	10000	2.4	0.06
	4	Digital Output 4	24	10000	2.4	0.06
Total Auxiliary Load			24 V		0.119 Amps	2.86Watts

Equipment Ratings:

LOADING CONDITION	VOLTAGE	CURRENT	POWER	FREQUENCY
Fully Loaded per instructions provided by client	10VDC	0.29A	2.9W	N/A
Fully Loaded per instructions provided by client	28VDC	0.20A	5.6W	N/A

RESULTS FOR SERVICE TEMPERATURE TEST AT 28 VDC

MEASURED LOCATION	Temp in °C at 3:20PM	Temp in °C at 3:35PM	Temp in °C at 3:50PM	MAXIMUM TEMPERATURE (ADJUSTED FOR 60°C AMBIENT)
Ambient (External)	25.1	25.1	25.1	60
Ambient (Internal)	30.0	30.0	30.1	65
Gasket	25.3	25.4	25.5	60.4
Enclosure	25.5	25.5	25.5	60.4

RESULTS FOR SERVICE TEMPERATURE TEST AT 10 VDC

MEASURED LOCATION	Temp in °C at 3:55PM	Temp in °C at 4:10PM	Temp in °C at 4:25PM	MAXIMUM TEMPERATURE (ADJUSTED FOR 60°C AMBIENT)
Ambient (External)	25.2	25.0	25.0	60
Ambient (Internal)	30.0	29.4	29.0	64.8
Gasket	25.5	25.3	25.3	60.3
Enclosure	25.5	25.5	25.5	60.4

Conclusion: Service Temperature test recorded service temperature of enclosure and parts of enclosure such as Gasket below 70C. Internal ambient was recorded to be 65C and 64.8C at 28VDC and 10VDC respectively. Enclosure previously certified was conditioned based on Service temp < 70C. It's not required to re-condition the enclosure for Thermal endurance to heat/cold. Impact and IP testing is not required to repeat.

TESTED BY:	Chaitanya Katekar	Test Date	22 May 2015
Ambient Conditions	25.0°C, 47.86% RH, 1001.3 hPa		

Standard	Clause #	Test Date	Sample ID	Verdict (Pass/ Fail)
EN 60079-0:2012+A11:2013	5.3	22 May 2015	DAL1505111314-001	Pass
	26.5.1			

Test Description for Surface Temperature Test:

Product is rated for 10-28VDC; 175mA. With loading information provided by client, electrical measurements are recorded at 90/100% rating as follows

Equipment power consumption at 90/100% rating:

LOADING CONDITION	VOLTAGE	MEASURED CURRENT	MEASURED POWER	FREQUENCY
Fully Loaded per instructions provided by client	90% (9VDC)	0.31A	2.79W	N/A
Fully Loaded per instructions provided by client	110% (11VDC)	0.29A	3.19W	N/A
Fully Loaded per instructions provided by client	90%(25.2VDC)	0.20A	5.04W	N/A
Fully Loaded per instructions provided by client	110%(30.8VDC)	0.20A	6.16W	N/A

Based on the conditions measured and observed above, the equipment was operated under the following conditions: (Worst Power Configuration)

LOADING CONDITION	VOLTAGE	CURRENT	POWER	FREQUENCY
Fully Loaded per instructions provided by client	110%(30.8VDC)	0.20A	6.16W	N/A

Temperature is recorded at room ambient; in degree Celsius (°C) and linearly corrected to max ambient of +60C. For temperature testing purposes, unit was installed vertically

RESULTS FOR SURFACE TEMPERATURE TEST:

MEASURED LOCATION	Temp in °C at 2:04PM	Temp in °C at 2:20PM	Temp in °C at 2:35PM	MAXIMUM TEMPERATURE (ADJUSTED FOR 60°C AMBIENT)	MAXIMUM ALLOWED TEMPERATURE ² (T ₅)
Ambient (External)	21.3	21.7	21.9	60°C	NA
Ambient (Internal)	29.1	29.4	29.7	67.8°C	100°C
Outside of enclosure	24.2	24.5	24.0	62.8°C	100°C
Gasket	24.7	24.7	25.0	63.1°C	100°C
LCD Display Screen	26.9	27.2	27.2	65.3°C	100°C
Fuse	28.5	29.2	29.2	67.3°C	100°C
Coin cell	30.0	30.3	30.6	68.7°C	100°C
Cable/wire entry on input terminal block	27.5	27.8	27.1	66.1°C	100°C
CPU (Top Side)	42.4	42.7	43.1	81.2°C	100°C
CPU (Bottom Side)	36.7	36.9	36.9	75°C	100°C

For Group II apparatus subjected to type testing for maximum surface temperature, the marked temperature or temperature class, less 5°K for temperature classes T6, T5, T4 and T3 (or marked temperatures ≤ 200 °C), and less 10°K for temperature classes T2 and T1 (or marked temperatures >200 °C).

Conclusion: Based on Highest recorded temperature of 81.2C at ambient of 60C, T-code **T5 (100C)** is awarded

TESTED BY:	Chaitanya Katekar	Test Date	22 May 2015
Ambient Conditions	25.0°C, 47.86% RH, 1001.3 hPa		

Standard	Clause #	Test Date	Verdict (Pass/ Fail)
EN 60079-15:2010	7.3.5 5.3	22 May 2015	P

Test Description for Pull Test for Pluggable connections:

Pluggable connections are designed to be readily connected or disconnected during assembly, maintenance, or repair.

NOTE Typical examples are plug-in components, and card edge connectors.

Pluggable connections shall provide one of the following:

a) each connection or group of connections shall be secured with a mechanical retaining device which may or may not be an integral part of the connector, but which, excluding internal friction, provides a force resisting separation of at least 15 N;

NOTE Where a group of individual connections is mechanically linked, special consideration should be given to the security of the connection.

b) for a lightweight connecting component relying on friction to remain in place and not attached in any way outside of the connection points, the separating force in Newtons shall be greater than 100 times the mass of the component (in kg) and a mechanical retaining device is not required. The force shall be applied gradually near the center of the component;

If the factory connection may remain energized when separated, it shall be marked in accordance with item b) of Table 14. For small items, adjacent marking can be provided.

Test Data:

Connector Under Test	Applied Force (N)	Pass/Fail
Ribbon Cable connector for Piezoelectric keypad. (Tested at both ends)	>15N	P
Ethernet cable connector	>15 N	P
All Terminal Blocks	>15 N	P
Ribbon Cable to LCD connection	>15 N	P

NOTE:

Other end of LCD cable connection is secured with RTV on PCB.

No Lightweight components

Environmental Conditions during Testing:

TESTED BY:	Chaitanya Katekar	Test Date	22 May 2015
Ambient Conditions	25.0°C, 47.86% RH, 1001.3 hPa	PASS/FAIL	Pass

Dielectric Test: (EN 60079-15:2010; Clause 6.5.1)

Method:

AC test voltage of 500 Vrms was used.

Test points: Input connections tied together to Ground terminal

Test duration: 60 seconds.

Result: No breakdown of insulation, Test passed.

TESTED BY:	Chaitanya Katekar	Test Date	22 May 2015
Ambient Conditions	25.0°C, 47.86% RH, 1001.3 hPa	PASS/FAIL	Pass

SECTION D: Intertek Reports with own cover

Total pages =None.

SECTION E: Manufacturer supplied reports and information

None.

Rev 006



1813 Rotary Drive
Humble, Texas 77338
Tel: 281 548 3424
Fax: 281 548 3624
sales@abtech-inc.com
www.abtech-inc.com

EU DECLARATION OF CONFORMITY

European ATEX Directive 2014/34/EU

To whom it may concern:

We declare on our sole responsibility that the products listed below conform to the relevant provisions of ATEX Directive 2014/34/EU of 20th April 2016.

This declaration accepts that the declarations from the manufacturers of components used, including but not limited to terminals, cable glands, blanking plugs, thread adaptors, and breather drains are valid.

Date:	<u>6/25/2019</u>
Product Part Number:	<u>SX1.200C</u>
Protection Type & Level:	<u>II 2 GD Ex e IIC Gb</u>
Certification:	<u>Increased Safety</u>
EC Type Examination Certificate:	<u>CML15ATEX3078U, IECExCML15.0039U</u>
Abtech SO Reference:	<u>53957</u>
Item Number:	<u>1a</u>
Start Serial Number:	<u>1092982</u>
End Serial Number:	<u>1092985</u>
Notified Body:	<u>Certification Management Ltd</u>
Notified Body #:	<u>2503</u>

Conformity has been demonstrated with reference to the following documentation:

EC Type Examination Certificates listed above;
Quality Assurance Notification ITS17ATEXQ1873
Quality Assessment Report; US ETL QAR17.0003 00
Compliance with the following standards;

IEC 60079-0:2011, Ed 6.0	IEC 60079-7:	2006-07, Ed 4
EN 60079-0:2012:A11:2013	EN 60079-7:	2007

Signed for and on behalf of A.B. Controls & Technology, Humble, TX

Dated: 06/25/2019

Philip Fearnough
Production Manager



IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	Annexes ↓ IECEx CML 15,0039U	Issue No.:	0	Certificate history:
Status:	Current			Issue No. 2 (2017-6-23) Issue No. 1 (2017-3-21) Issue No. 0 (2015-7-27)
Date of Issue:	2015-07-27	Page 1 of 3		
Applicant:	Abtech Limited 199/201, Newhall Road, Lower Don Valley, Sheffield, S9 2QJ United Kingdom			
Equipment:	SX Range of Empty Enclosures			
Optional accessory:				
Type of Protection:	Increased safety, Intrinsically safe and Dust			
Marking:	Ex e IIC Gb or Ex Ia IIC Ga or Ex Ib IIC Gb or Ex tc III C Da or Ex tb III C Gb			
Approved for issue on behalf of the IECEx Certification Body:	M D Shearman FinstMC			
Position:	Managing Director			
Signature: (for printed version)	_____			
Date:	_____			

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

Certification Management Limited
Unit 1, Newport Business Park
New Port Road
Ellesmere Port
CH65 4LZ
United Kingdom





IECEx Certificate of Conformity

Certificate No.: IECEx CML 15.0039U

Date of Issue: 2015-07-27

Issue No.: 0

Page 2 of 3

Manufacturer: **Abtech Limited**
199/201, Newhall Road,
Lower Don Valley,
Sheffield,
S9 2QJ
United Kingdom

Additional Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:

The apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011 Explosive atmospheres - Part 0: General requirements
Edition: 6.0
IEC 60079-31 : 2013 Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "T"
Edition: 2
IEC 60079-7 : 2006-07 Explosive atmospheres - Part 7: Equipment protection by increased safety "e"
Edition: 4

This Certificate does not indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

GB/CML/ExTR15.0053/00

Quality Assessment Report:

GB/SIR/QAR06.0046/08



IECEx Certificate of Conformity

Certificate No.: IECEx CML 15.0039U

Date of Issue: 2015-07-27

Issue No.: 0

Page 3 of 3

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows

The SX Range of Empty Enclosures are manufactured from steel, stainless steel or brass, other alloys of steel or other alloys of copper.

See Annex for full description and Conditions of Manufacture and Certification

SPECIFIC CONDITIONS OF USE: NO



EU Type Examination Certificate CML 15ATEX3078U Issue 1

- 1 Equipment intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU
- 2 Component **SX Range of Empty Enclosures**
- 3 Manufacturer **Abtech Limited**
- 4 Address 199 Newhall Road,
Lower Don Valley,
Sheffield, S9 2QJ,
UK
- 5 The component is specified in the description of this certificate and the documents to which it refers.
- 6 Certification Management Limited, Unit 1 Newport Business Park, New Port Road, Ellesmere Port CH65 4LZ, UK, Notified Body Number 2503, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this component has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.
- 7 The examination and test results are recorded in the confidential reports listed in Section 12.
- 8 The 'U' suffix after the certificate number indicates that the component is subject to conditions of safe use (affecting correct installation or safe use). These are specified in Section 14.
- 9 This EU Type Examination certificate relates only to the design and construction of the specified component. Further requirements of Directive 2014/34/EU Article 13 apply to the manufacture of the equipment or component and are separately certified.
- 10 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the confidential report, has been demonstrated through compliance with the following documents:

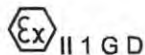
EN 60079-0:2012:A11:2013

EN 60079-11:2012

EN 60079-31:2014

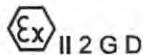
EN 60079-7:2007

- 10 The equipment shall be marked with the following:



II 1 G D

Ex ia IIC Ga
Ex ta IIIC Da



II 2 G D

Ex e IIC Gb
Ex ib IIC Gb
Ex tb IIIC Gb



CML 15ATEX3078U
Issue 1

11 Description

The SX Range of Empty Enclosures are manufactured from steel, stainless steel or brass, other alloys of steel or other alloys of copper, and are manufactured in the following standard sizes:

SX Ref.	Group and Category	Length (mm)	Width (mm)	Depth (mm)	
				Min.	Max.
SX0	II 2 G D	229	152	140	2000
SX0.5	II 2 G D	274	184	140	2000
SX1	II 2 G D	324	234	140	2000
SX1.5	II 2 G D	306	306	140	2000
SX2	II 2 G D	324	372	140	2000
SX3	II 2 G D	448	372	140	2000
SX4	II 2 G D	510	372	140	2000
SX5	II 2 G D	510	510	140	2000
SX6	II 2 G D	780	510	140	2000
SX7	II 2 G D	950	650	140	2000
SX8	II 2 G D	1250	800	140	2000
SX225	II 2 G D	2000	2000	140	2000
SX45	II 2 G D	114	114	51 (Nominal)	
SX64	II 2 G D	152	102	63 (Nominal)	
SX66	II 2 G D	152	152	102 (Nominal)	

Enclosures may also be manufactured to sizes not specified in the above table. This assumes that any given dimension is not larger than the respective dimension of the largest enclosure or smaller than the respective dimension of the smallest enclosure.

The lid may be hinged and gland plates may be provided on the base, top, sides or back of the enclosure. Cable entries may be provided either through the gland plates or in the enclosure walls. Additionally, threaded bosses may be provided, welded, brazed or soldered into position.

An external and optional internal earth stud is provided on all enclosures (Min. size M6) and gaskets are manufactured from a closed cell silicone rubber strip or solid silicone rubber.

Optionally, the enclosures may be provided with a glass window.

Variation 1

This variation introduces the following modifications:

- i. The introduction of an alternative flange gasket and lid sealing arrangement option.
- ii. To allow units with shared gland plate options to be bolted together.
- iii. The introduction of a hank bushing fixing arrangement option for the gland plates.
- iv. The update of the certificate reference to Directive 2014/34/EU.



CML 15ATEX3078U
Issue 1

12 Certificate history and evaluation reports

Issue	Date	Associated report	Notes
0	27/07/2015	R406A/00	Issue of prime certificate
1	20/03/2017	R1759A/00	Introduction of variation 1

Note: Drawings that describe the equipment or component are listed in the Annex.

13 Conditions of manufacture

The following conditions are required of the manufacturing process for compliance with the certification.

- 13.1 The manufacturer shall take all reasonable steps to ensure the items used in the construction of the enclosure are used within the minimum and maximum service temperatures stated in the 'schedule of limitations/conditions of safe use'. When supplied, the manufacturer shall the installer/user with a copy of the certificate(s) associated with any blanking plugs, adapters, reducers or breather drains.
- 13.2 If the enclosures are supplied with blanking plugs, reducers, adapters or breather drains, then the manufacturer shall ensure that:
- The fitted items do not affect the installation of the enclosure, e.g. any conditions of safe use that would alter the allowable specification of the enclosure, such as reduced levels of mechanical protection.
 - The fitted items do not adversely affect the minimum IP rating of the enclosure.
 - That when fitted, the enclosure marking reflects the "worst case" item fitted.
- 13.3 When trunking is fitted, it may be sited as required, provided the minimum creepage and clearance distances are met.
- 13.4 When the optional earth bar is provided, it shall allow for a conductor size that is in accordance with EN 60079-0, clause 15.3.
- 13.5 The earth bar connection washers, screws and nuts, shall not be constructed of light metals.
- 13.6 When the earth connection to the earth bar is secured via thread sealant alone, it shall be ensured that the sealant used has a suitable operating temperature range to account for the lowest ambient range and the T-class to be applied.

Certificate Annex



Certificate Number CML 15ATEX3078U
Equipment SX Range of Empty Enclosures
Manufacturer Abtech Ltd

The following documents describe the equipment or component defined in this certificate:

Issue 0

Drawing No	Sheets	Rev	Approved date	Title
ATB28780	1 of 1	A	27/07/2015	SX Manufacturing Specification
ATB28781	1 of 1	A	27/07/2015	SX Range of Enclosures
ATB28782	1 of 1	A	27/07/2015	SX Range Large Window
ATB29300	1 of 1	A	27/07/2015	External ATEX Label SX Range
ATB29307	1 of 1	A	27/07/2015	External IECEx Label SX Range

Issue 1

Drawing No	Sheets	Rev	Approved date	Title
ATB28781	1 of 1	B	20/03/2017	SX Range of Enclosures



CML 15ATEX3078U
Issue 1

14 Special Conditions for Safe Use (Conditions of Certification)

The following conditions relate to safe installation and/or use of the equipment.

- 14.1 The following parts used in the construction have the maximum service temperature ranges listed below and shall not be exceeded:

Item	Service Temperature Range	
	Minimum	Maximum
Closed cell silicone strip gasket	-60°C	180°C
Solid silicone rubber gasket	-60°C	180°C
Glass window	-60°C	180°C
Blanking plugs, reducers, adapters and breather drains	Refer to individual certificate(s)	Refer to individual certificate(s)

INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS FOR ABTECH 'S' RANGE ENCLOSURES CML15ATEX3078U and IECEx CML 15.0039U



Marking

The marking shown is for a component certified enclosure. The user must submit the completed unit for type examination if it is to be used in a hazardous area.

The ambient temperature range for which this product is suitable extends from -60°C to +175°C.

The marking:

Ex e IIC Gb Ex tb IIIC Db may be replaced by

Ex ib IIC Gb Ex tb IIIC Db or

Ex ia IIC Ga Ex ta IIIC Da.

For Ex ia the ATEX marking "II 1 G D" will apply

Enclosures marked Ex ia or Ex ib may only be used for terminating intrinsically safe circuits.

Installation

- 1) Using the mounting dimensions data provided, either in the product catalogue data sheets or on the drawings supplied (as part of the project documentation) mark out the positions for the mounting holes on the surface where installation is required.
- 2) Drill the mounting holes for either M8 or M9 fixing studs (for size S64 upwards) or for M6 fixing studs for size S45.
- 3) Insert the top two studs leaving 8 to 10mm protruding. Lift the enclosure into position using such assistance as may be necessary to avoid injury and hang the top fixing brackets of the box onto the studs. Ensuring that the box is secure, insert and tighten the bottom two studs. Now complete tightening the top two studs.
- 4) Install and secure the cable glands in accordance with the manufacturers instructions.
- 5) Where slotted trunking has been supplied (solid trunking is not permitted) ensure that it is suitable for the proposed T classification of the final certified product. Where the T6 is the proposed rating and no windows are fitted any polymeric or metallic slotted trunking may be used. For other T classifications and where a window is fitted metallic slotted trunking must be used. Trunking may be mounted in any orientation in the box, vertically, horizontally or diagonally.
- 6) Secure the lid by closing the lid and tightening the lid fixing screws and ensure that all gland plate securing screws are tightened.
- 7) For additional security a padlock may be fitted to all box sizes larger than and including size S0.

Earthing/Grounding

All S range enclosures are provided with an internal and external earthing/grounding facility. This must be connected to the appropriate earth bonding circuit before electrical power is connected to the contents of the enclosure.

An earth connection between the lid and the box is provided. Care must be taken to ensure this is not damaged during installation or maintenance.

Operation

1. The lid must be secured using all the lid screws provided in order to maintain the IP rating.
2. No attempt must be made to remove the enclosure lid whilst electrical power is connected to the contents of the enclosure.
3. The earthing/grounding facility must be connected to the earth bonding circuit at all times when electrical power is connected to the enclosure.

Maintenance

Routine maintenance is likely to be a requirement of local Health and Safety legislation. The laws of the applicable country must be considered and maintenance checks carried out accordingly.

Additional checks that are advisable to ensure the efficiency of ABTECH 'S' range enclosures are:-

Activity	Frequency
1 Check that the lid seal is not damaged and is in place	Each time the enclosure is opened
2 Check that all lid fixing screws are in place and secured	Each time the enclosure is opened
3 Check that all gland plate fixing screws are in place and secured	Each time the enclosure is opened
4 Check that the lid earth strap is not frayed or damaged and is secure at both ends	Each time the enclosure is opened
5 Check lid earth strap continuity (hot work permit may be required)	Every 3 years
6 Check that the mounting bolts are tight and free of corrosion	Annually
7 Check the security of all cable glands	Annually
8 Check the enclosure for damage	Annually

Chemical attack

The ABTECH S range enclosures are available in mild steel or 316 stainless steel. The following additional material are also used:-

Silicone rubber,
Brass.

If the enclosure is of mild steel it may be zinc plated prior to painting. The standard paint finish is epoxy polyester grey hammer.

Stainless steel enclosures are not painted except to customer specifications.

Consideration should be given to the environment in which these enclosures are to be used to determine the suitability of these materials to withstand any corrosive agents that may be present.

Static hazard

S range enclosures do not present a hazard from static electricity.

CERTIFICATE OF COMPLIANCE

Certificate Number 20120926-E325802
Report Reference E325802-20081115
Issue Date 2012-SEPTEMBER-26


Issued to: A B CONTROLS & TECHNOLOGY LTD
SAUNDERSON ST
LOWER DON VALLEY
SHEFFIELD
S9 2UA UNITED KINGDOM

This is to certify that representative samples of CABINETS AND CUTOUT BOXES
Type 1, 4 and 4X; steel box, Type SX may be followed by 0 through 8.

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 50, the Standard for Enclosures for Electrical Equipment
Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Listing Mark for the US and Canada should be considered as being covered by UL's Listing and Follow-Up Service meeting the appropriate requirements for US and Canada.

The UL Listing Mark for the US and Canada generally includes: the UL in a circle symbol with "C" and "US" identifiers:  the word "LISTED"; a control number (may be alphanumeric) assigned by UL; and the product category name (product identifier) as indicated in the appropriate UL Directory.

Look for the UL Listing Mark on the product.

William R. Carney

William R. Carney, Director, North American Certification Programs
UL LLC

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact a local UL Customer Service Representative at www.ul.com/contactus



Model 511

HAMMER UNION PRESSURE TRANSMITTER



Viatran 511 Hammer Union Pressure Transmitter for measuring pump discharge pressure for drilling, fracturing, acidizing, cementing and nitrogen injection.

- Patented[†] Design to withstand extreme vibration and abusive impact
- Impervious to Fluid Ingress with patented angled connector base, drain holes, and sealing method
- Easy Access Connector Housing - 77% greater area
- Expanded compensated temperature range
- Improved sealing method for connector pins
- External adjust, identification and peak pressure capture
- RoHS compliant



PERFORMANCE

Full Scale Pressure Ranges.....	0-5K, 0-6K, 0-10K, 0-15K, 0-20K PSIS (0-350, 410, 700, 1000, 1400 Bar)
Combined Accuracy (BFSL) (Non-Linearity, Hysteresis & Repeatability).....	$\leq \pm 0.25\%$ FSO
Full Scale Output (FSO).....	16.00 mA $\pm 1\%$ FSO @70°F
Zero Balance.....	4 mA $\pm 1\%$ FSO @70°F
Compensated Temperature Range.....	+40°F to 140°F (4°C to 60°C)
Operating Temperature Range.....	-40°F to 185°F (-40°C to 85°C)
Storage Temperature Range.....	-67°F to 302°F (-55°C to 150°C)
Long Term Stability (%FSO).....	$\leq \pm 0.25\%$ FSO per 6 months
Thermal Effect on Zero.....	$\leq \pm 1\%$ FSO per 100°F Typical
Thermal Effect on Span.....	$\leq \pm 1\%$ FSO per 100°F Typical

ELECTRICAL

Output Signal.....	4-20 mA @70°F
Supply Voltage.....	9-28 Vdc
Power Supply Regulation.....	$\leq \pm 0.01\%$ FSO per volt
Load Impedance.....	900 ohms @ 28 VDC decreasing linearity to 0 ohms @ 9 VDC
Circuit Protection.....	Reverse polarity protected
RFI/EMI.....	$< 1\%$ FSO output change with 3V Rms from 150 kHz to 80 MHz (80% AM modulated at 1 kHz) applied to power supply and signal lines [IEC 61000-4-6 radio frequency common mode immunity], 1% output change when exposed to a radiated electromagnetic field of 10 V/m from 80 MHz to 1 GHz AM modulated at 1 kHz and 3 V/m 1.4 GHz to 2.7 GHz. [IEC 61000-4-3 Radiated electromagnetic field immunity]



* Pending

Viatran

199 Fire Tower Drive
Tonawanda, New York 14150 USA

Hotline: 1-800-688-0030
Phone: 1-716-629-3800
Fax: 1-716-693-9162

Email: solutions@viatran.com
Web: www.viatran.com



Model 511

HAMMER UNION PRESSURE TRANSMITTER

Voltage Spike Protection	Withstand 1000 volt spike per EN 61000-4-5
Insulation Resistance.....	<5 nS
Response Time.....	<1 millisecond to reach 90% of FSO
Range Calibration Signal.....	100% FSO \pm 10% by exciting pins E&F
Calibration Power Supply Voltage.....	8.5-28 VDC
Calibration Signal Accuracy.....	Readings on calibration certificate are within \pm 0.2% FSO of actual Cal signal output
Bridge Resistance.....	10K ohms, nominal
Standard Electrical Connection.....	Mates with 6 pin, Hermetic, Box Mount, Shell Size 10, MIL-C-26482 bendix type connector

MECHANICAL

Standard Pressure Port.....	Male hammer union 2 inch #1502
Pressure Cavity Volume	Standard: 0.45 cubic inches Option "TP": 0.22 cubic inches
Zero Effect from Installation	< \pm 0.3% FSO w/200 ft-lbs torque on union #1502
Shock Sensitivity	1000 g, 0.5 ms half sine wave pulse shall not cause change in calibration
Proof Pressure	1.67X range or 22,500 PSI max
Burst Pressure	3 times full scale pressure range, limited by union #1502: 22.5K PSI

MATERIALS OF CONSTRUCTION

Wetted Materials	NACE compliant Inconel 718 wetted material as standard (MR0175/ISO 15156-3:2009(E))
Enclosure Material.....	304 Stainless Steel
Identification	Laser marked on body of unit
Enclosure Rating	IP68*, NEMA 6P*
Weight.....	5.6 lbs. nominal

OPTIONS

DC	Compensated temperature -40°F to 140°F
DG	Improved temperature compensation
DH	Special Range
DN	Improved accuracy
EA.....	Special Calibration Run
EH.....	Compensated temperature range 40°F to 180°F
LW.....	Narrow adapter for banding
NA.....	Carrying handle attached
NH	Customer specific identification
NP.....	Protective ring cage
NQ.....	Protective criss-cross cage
QJ.....	17-4 PH wetted material, heat treated per NACE MR0175-2000
Z().....	Special connectors

APPROVALS

NX	Canada Intrinsic Safety Label
TJ.....	Canada Non-Incendive Label
NK	Europe Intrinsic Safety Label
TK.....	Europe Non-Incendive
KH	IECEX International Intrinsic Safety Label
TW*.....	GOST-R
TF.....	US Intrinsic Safety Label
NZ	US Non-Incendive
TG	US & Canada Intrinsic Safety Labels

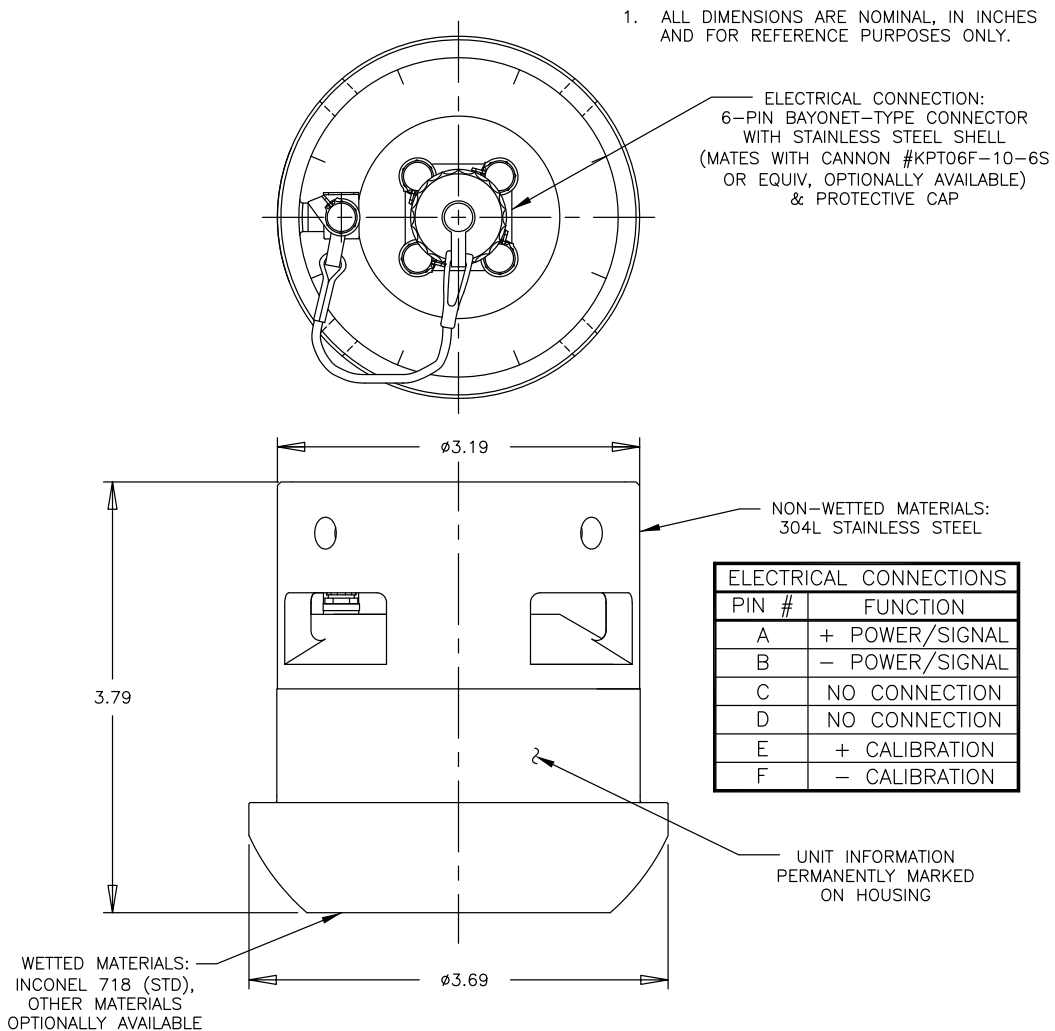
* Pending

PAGE 2

Model 511 HAMMER UNION PRESSURE TRANSMITTER

CERTIFICATIONS (CONSULT FACTORY FOR AVAILABLE OPTIONS)

- USA Intrinsic Safety: Class I, Division 1, Groups A-D, Zone 0, AEx ia IIC, T4: Ta -40° to 85°C, T5: -40° to 40°C, NEMA Type 6P, IP68
 Non-Incendive: Class I, Division 2, Groups A-D, Class 1 Zone 2, AEx nA IIC, T4 -40° to 85°C, T5: -40° to 40°C, NEMA Type 6P, IP68
- CANADA Intrinsic Safety: Class I, Division 1, Groups A-D, Class 1 Zone 0 Ex ia IIC, T4: -40° to 85°C, T5: -40° to 40°C, NEMA Type 6P, IP68
 Non-Incendive: Class I, Division 2, Groups A-D, Class 1 Zone 2, Ex nA Group IIC, T4: -40° to 85°C, T5: -40° to 40°C, NEMA Type 6P, IP68
- IECEX Intrinsic Safety: II 1G, Ex ia IIC, T4 Ga, Ta: -40° to 85°C, T5: -40° to 40°C, IP68
 Non-Sparking: I1 3 G, Ex nA IIC T4 Gc, Ta -40° to 85°C T5: -40° to 40°C, IP68
- EUROPE Intrinsic Safety: II 1G Ex ia IIC, T4 Ga, Ta -40° to 85°C T5: -40° to 40°C, IP68
- EMC Directive 2004/108/EC EN 61326-1:2006



Information is accurate to the best of Viatran's knowledge. We reserve the right to change specifications at any time. Please contact Viatran for specific order inquiries.

Model 511

HAMMER UNION PRESSURE TRANSMITTER

EXTERNAL CALIBRATION

- Trim zero and full scale with pressure source using DevCom 2000-LT desktop software
- Record 4 pressure spikes up to 140% of rated pressure and cumulative time on
- Digital output resolution +/- 0.06%
- Factory reset option
- Non interactive zero and span adjustment

EXTERNAL CALIBRATION ACCESSORIES:

DevCom 2000-LT Desktop software

System Requirements (minimum)

Operating System Windows NT, 2000, XP, Vista (32/64), 7 (32/64), 8 (32/64)

Processor Speed Pentium, 600 Mhz

Memory 256 MB

Hard Disk Space 500 MB

Monitor 256-color VGA

Communication Port USB, RS232, or Bluetooth

HART[®] Modem (Various PC connections and cable lengths/connections available)

24VDC power source

Power Xpress kit

250 ohm resistor

†US Patent D 711266
‡EU Patent No. 002334250-001
†CN Patent ZL 201330527540.1
† Patents Pending

*HART[®] is a registered trademark of the HART[®] Communications Foundation

PAGE 4

Viatran

199 Fire Tower Drive
Tonawanda, New York 14150 USA

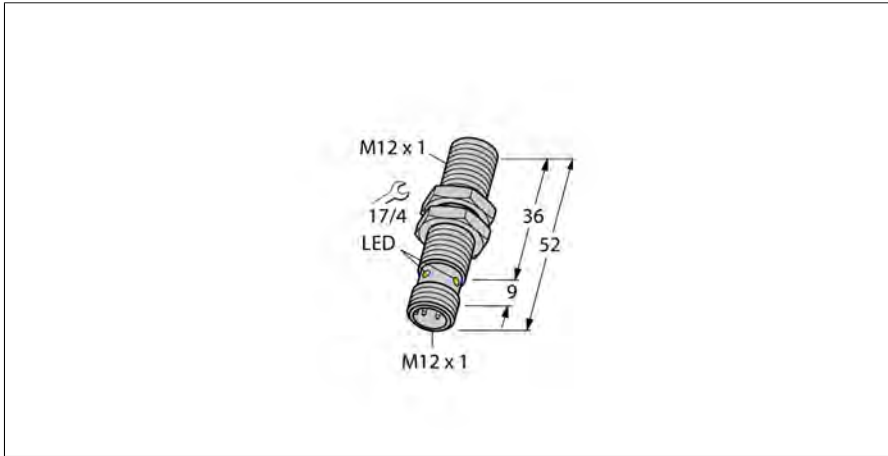
Hotline: 1-800-688-0030
Phone: 1-716-629-3800
Fax: 1-716-693-9162

Email: solutions@viatran.com
Web: www.viatran.com



98DS511 REV. H

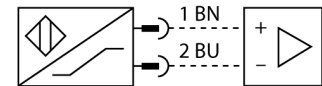
Inductive sensor BI2-EM12-Y1X-H1141



- ATEX category II 1 G, Ex zone 0
- ATEX category II 1 D, Ex zone 20
- SIL2 (Low Demand Mode) acc. to IEC 61508, PL c acc. to ISO 13849-1 at HFT0
- SIL3 (All Demand Mode) acc. to IEC 61508, PL e acc. to ISO 13849-1 with redundant configuration HFT1
- Threaded barrel, M12 x 1
- Stainless steel, 1.4301
- DC 2-wire, nom. 8.2 VDC
- Output acc. to DIN EN 60947-5-6 (NAMUR)
- M12 x 1 male connector

Type designation	BI2-EM12-Y1X-H1141
Ident-No.	4010201
Rated switching distance S_n	2 mm
Mounting conditions	Flush
Secured operating distance	$\leq (0,81 \times S_n)$ mm
Correction factors	St37 = 1; Al = 0.3; stainless steel = 0.7; Ms = 0.4
Repeat accuracy	$\leq 2\%$ of full scale
Temperature drift	$\leq \pm 10\%$
Hysteresis	1...10 %
Ambient temperature	-25...+70 °C
Output function	2-wire, NAMUR
Switching frequency	5 kHz
Voltage	Nom. 8.2 VDC
Non-actuated current consumption	≥ 2.1 mA
Actuated current consumption	≤ 1.2 mA
Approval acc. to	KEMA 02 ATEX 1090X
Design	Threaded barrel, M12 x 1
Dimensions	52 mm
Housing material	Stainless steel, V2A (1.4301)
Active area material	Plastic, PA12-GF30
Max. tightening torque housing nut	10 Nm
Electrical connection	Connector, M12 x 1
Vibration resistance	55 Hz (1 mm)
Shock resistance	30 g (11 ms)
Protection class	IP67
MTTF	6198 years acc. to SN 29500 (Ed. 99) 40 °C
Packaging unit	1
Switching state	LED, Yellow

Wiring Diagram

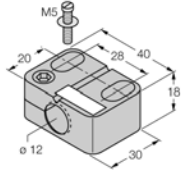
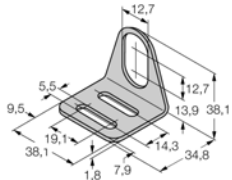
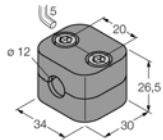
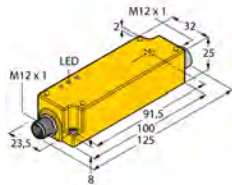
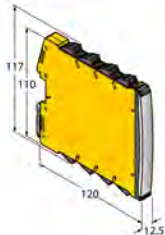


Functional principle

Inductive sensors detect metal objects contactless and wear-free. For this, they use a high-frequency electromagnetic AC field that interacts with the target. Inductive sensors generate this field via an RLC circuit with a ferrite coil.

Inductive sensor
BI2-EM12-Y1X-H1141

Accessories

Type code	Ident-No.	Description	
BST-12B	6947212	Fixing clamp for threaded barrel devices, with dead-stop; material: PA6	
MW-12	6945003	Mounting bracket for threaded barrel devices; material: Stainless steel A2 1.4301 (AISI 304)	
BSS-12	6901321	Mounting bracket for smooth and threaded barrel devices; material: Polypropylene	
IMC-DI-22EX-PNO/24VDC	7560003	2-channel isolating switching amplifier with M12x1 males, for peripheral use, IP67, zones 2/22, input circuits II(1) Ex ia, PNP transistor output NO	
IMX12-DI01-2S-2T-0/24VDC	7580020	Isolating switching amplifier, 2-channel; SIL2 acc. to IEC 61508; Ex-proof version; 2 transistor outputs; input Namur signal; ON/OFF switchable monitoring of wire-break and short-circuit; toggle between NO/NC mode; signal doubling; removable screw terminals; 12.5 mm wide; 24 VDC power supply	

Inductive sensor

BI2-EM12-Y1X-H1141

Operating manual

Intended use

This device fulfills the directive 2014/34/EC and is suited for use in explosion hazardous areas according to EN 60079-0:2012 + A11 and EN 60079-11:2012.

Further it is suited for use in safety-related systems, including SIL2 as per IEC 61508.

In order to ensure correct operation to the intended purpose it is required to observe the national regulations and directives.

For use in explosion hazardous areas conform to classification

II 1 G and II 1 D (Group II, Category 1 G, electrical equipment for gaseous atmospheres and category 1 D, electrical equipment for dust atmospheres).

Marking (see device or technical data sheet)

Ⓔ II 1 G and Ex ia IIC T6 Ga acc. to EN60079-0 and -26 and Ⓔ II 1 D Ex ia IIIC T115°C Da acc. to EN60079-0

Local admissible ambient temperature

-25...+70 °C

Installation/Commissioning

These devices may only be installed, connected and operated by trained and qualified staff. Qualified staff must have knowledge of protection classes, directives and regulations concerning electrical equipment designed for use in explosion hazardous areas.

Please verify that the classification and the marking on the device comply with the actual application conditions.

This device is only suited for connection to approved Exi circuits according to EN 60079-0 and EN 60079-11. Please observe the maximum admissible electrical values.

After connection to other circuits the sensor may no longer be used in Exi installations. When interconnected to (associated) electrical equipment, it is required to perform the "Proof of intrinsic safety" (EN60079-14).

Attention! When used in safety systems, all content of the security manual must be observed.

Installation and mounting instructions

Avoid static charging of cables and plastic devices. Please only clean the device with a damp cloth. Do not install the device in a dust flow and avoid build-up of dust deposits on the device.

If the devices and the cable could be subject to mechanical damage, they must be protected accordingly. They must also be shielded against strong electro-magnetic fields.

The pin configuration and the electrical specifications can be taken from the device marking or the technical data sheet.

In order to avoid contamination of the device, please remove possible blanking plugs of the cable glands or connectors only shortly before inserting the cable or opening the cable socket.

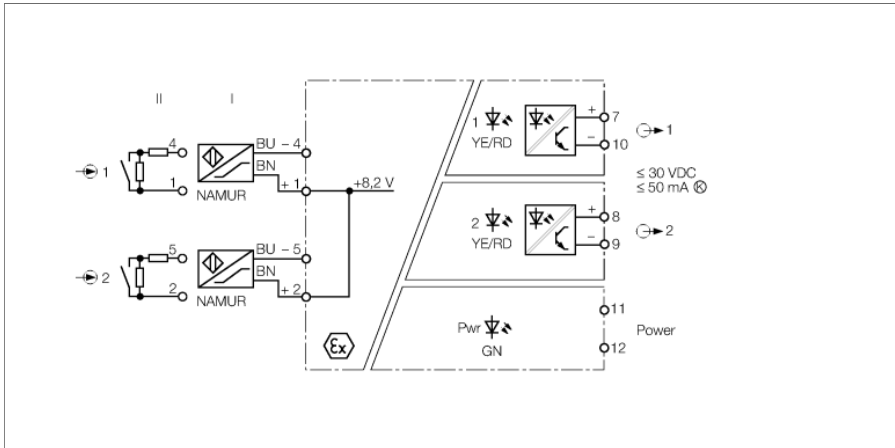
Special conditions for safe operation

Due to normative regulations, the ATEX approval is only valid for application under atmospheric conditions between 0.8 and 1.1 bar. Underwater application, with higher pressure conditions, is therefore not covered by the approval. Above the water level Ex protection is applied to wiring of intrinsically safe circuits.

Service/Maintenance

Repairs are not possible. The approval expires if the device is repaired or modified by a person other than the manufacturer. The most important data from the approval are listed.

**Isolating switching amplifier
2-channel
IM1-22EX-T**



The dual-channel isolating switching amplifier IM1-22EX-T is equipped with an intrinsically safe input circuit.

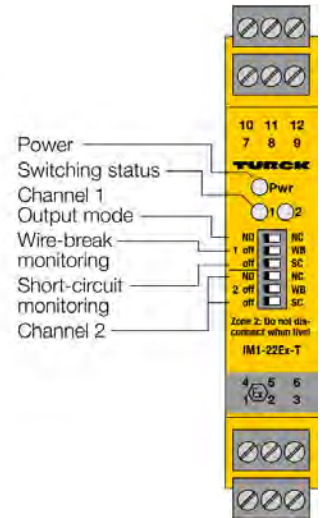
Sensors according to EN 60947-5-6 (NAMUR) can be connected to the device or potential-free contactors.

The output circuits feature two potential-free and short-circuit protected transistors.

Six front panel switches are available to set the output mode separately for each channel (NO/NC mode), as well as to enable/disable wire-break (WB) and short-circuit (SC) monitoring separately.

When using mechanical contacts, wire-break and short-circuit monitoring must be switched off or the contact must be wired with resistors (II) (see circuit diagram).

The green LED indicates operational readiness. The switching status of the corresponding output is indicated yellow by the two color LED. In the event of input circuit errors the dual color LED changes to red, provided the input circuit monitoring function is activated. Thereupon the related output transistor is de-energized.

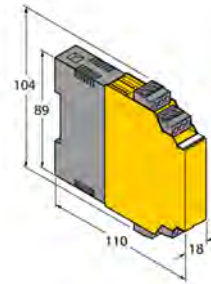


- Intrinsically safe input circuits Ex ia
- Installation in zone 2
- FM, NEPSI
- SIL2
- Application area acc. to ATEX: II (1) G, II (1) D; II G 3
- 2 transistor outputs
- Adjustable signal flow direction (NO/NC)
- Input circuit monitoring of wire-break/short-circuit (ON/OFF switchable)
- Removable terminal blocks
- Galvanic separation of input circuits, output circuits and power supply

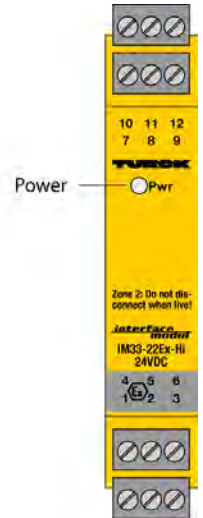
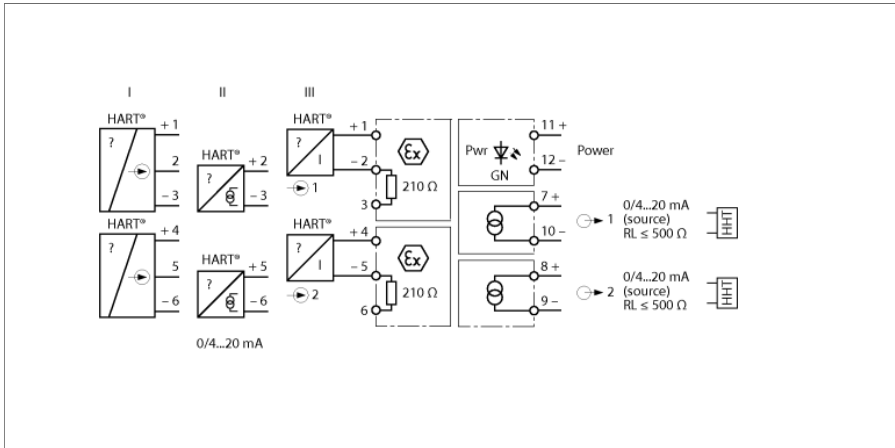
Isolating switching amplifier
2-channel
IM1-22EX-T

Type	IM1-22EX-T																					
Ident-No.	7541232																					
Ident-No (TUSA)	M7541232																					
Nominal voltage	Universal voltage supply unit																					
Operating voltage	20...250 VAC																					
Frequency	40...70 Hz																					
Operating voltage range	20...125 VDC																					
Power consumption	≤ 3 W																					
NAMUR	EN 60947-5-6																					
No-load voltage	8.2 VDC																					
Short-circuit current	8.2 mA																					
Input resistance	1 kΩ																					
Cable resistance	≤ 50 Ω																					
Switch-on threshold:	1.55 mA																					
Switch-off threshold:	1.75 mA																					
Wire breakage threshold	≤ 0.1 mA																					
Short-circuit threshold	≥ 6 mA																					
Voltage drop	≤ 2.5 V																					
Semiconductor output circuit(s)																						
Output circuits (digital)	2 x transistor (potential-free, short-circuit protected)																					
Switching voltage	≤ 30 VDC																					
Switching current per output	≤ 50 mA																					
Switching frequency	≤ 3000 Hz																					
Galvanic separation																						
Test voltage	2.5 kV																					
Ex approval acc. to conformity certificate	TÜV 04 ATEX 2553																					
Application area	II (1) G, II (1) D																					
Protection type	[Ex ia Ga] IIC; [Ex ia Da] IIIC																					
Max. output voltage U_o	≤ 9.6 V																					
Max. output current I_o	≤ 11 mA																					
Max. output power P_o	≤ 26 mW																					
Rated voltage	250 V																					
Characteristic	linear																					
Internal inductance/capacitance L/C,	Ci vernachlässigbar klein, Li= 65μH																					
External inductance/capacitance L _e /C _e ,																						
	<table border="1"> <thead> <tr> <th>Ex ia</th> <th colspan="3">IIC</th> <th colspan="3">IIB</th> </tr> </thead> <tbody> <tr> <td>Lo [mH]</td> <td>1</td> <td>5</td> <td>10</td> <td>2</td> <td>10</td> <td>20</td> </tr> <tr> <td>Co [μF]</td> <td>1,1</td> <td>0,83</td> <td>0,74</td> <td>5,2</td> <td>3,8</td> <td>3,4</td> </tr> </tbody> </table>	Ex ia	IIC			IIB			Lo [mH]	1	5	10	2	10	20	Co [μF]	1,1	0,83	0,74	5,2	3,8	3,4
Ex ia	IIC			IIB																		
Lo [mH]	1	5	10	2	10	20																
Co [μF]	1,1	0,83	0,74	5,2	3,8	3,4																
Ex approval acc. to conformity certificate	TÜV 06 ATEX 552968 X																					
Application area	II 3 G																					
Protection class for belonging equipment	Ex nA [ic Gc] IIC/IIB T4																					
Max. output voltage U_o	≤ 9.6 V																					
Max. output current I_o	≤ 11 mA																					
Max. output power P_o	≤ 26 mW																					
Characteristic	linear																					
External inductance/capacitance L/C,	Ci vernachlässigbar klein, Li= 65 μH																					
External inductance/capacitance L _e /C _e ,																						
	<table border="1"> <thead> <tr> <th>Ex ia</th> <th colspan="3">IIC</th> <th colspan="3">IIB</th> </tr> </thead> <tbody> <tr> <td>Lo [mH]</td> <td>1</td> <td>5</td> <td>10</td> <td>2</td> <td>10</td> <td>20</td> </tr> <tr> <td>Co [μF]</td> <td>1,1</td> <td>0,83</td> <td>0,74</td> <td>5,2</td> <td>3,8</td> <td>3,4</td> </tr> </tbody> </table>	Ex ia	IIC			IIB			Lo [mH]	1	5	10	2	10	20	Co [μF]	1,1	0,83	0,74	5,2	3,8	3,4
Ex ia	IIC			IIB																		
Lo [mH]	1	5	10	2	10	20																
Co [μF]	1,1	0,83	0,74	5,2	3,8	3,4																
Approval	SIL 2																					
Approval																						
Indication																						
Operational readiness	green																					
Switching state	yellow																					
Error indication	red																					

Dimensions



Isolating transducer
2-channel
IM33-22EX-HI/24VDC



The 2-channel HART[®] isolating transducer IM33-22EX-HI/24VDC is designed to operate intrinsically safe HART[®] 2-wire transducers (III) in the Ex area and to transmit the measured signals to the non-Ex area. In addition to the analog signals, also the digital HART[®] communication signals can be transmitted bidirectionally.

Alternatively, active 2-wire HART[®] transmitters (II) and passive 3-wire HART[®] transmitters (I) can be operated.

The device features 0/4...20 mA input and output circuits. A green LED indicates operational readiness.

The input signals are transmitted 1:1 without interference and made available at the outputs in the non-Ex area.

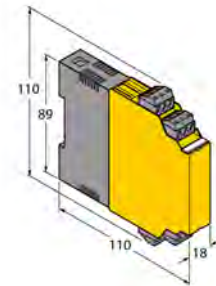
The removable terminal blocks feature test sockets (Ø 2 mm) for connection of a HART[®] handheld.

- ATEX, IECEx, UL, cFM_{us}, TR CU, TIIS, CCOE, Kosha
- Installation in zone 2
- Supply of 2-wire measuring transducers with HART[®] communication as well as connection to active 2-wire and passive 3-wire transmitters
- Input circuits: 0/4...20 mA
- Output circuits: 0/4...20 mA
- SIL2
- Removable terminal blocks, screwable, with 2 mm test socket
- Complete galvanic isolation
- Input reverse-polarity protected

Isolating transducer
2-channel
IM33-22EX-HI/24VDC

Type designation	IM33-22EX-HI/24VDC
Ident-No.	7506441
Nominal voltage	24 VDC
Operating voltage range	19...29 VDC
Power consumption	≤ 3.2 W
Transmitter connection	
Supply voltage	≥ 17 V / 20 mA
Input current	0/4...20 mA
Input resistance (current)	≤ 250 Ω
Output circuits	
Output current	0/4...20 mA
Load resistance, current output	≤ 0.5 kΩ
Rise time (10...90 %)	≤ 50 ms
Fall time (90...10 %)	≤ 50 ms
Measuring accuracy (including linearity, hysteresis and repeatability)	≤ 0.1 % of full scale
Reference temperature	23 °C
Temperature drift	≤ 0.005 % of full scale/K
Galvanic isolation	
Test voltage	2.5 kV
Important note	For Ex-applications the values specified in the corresponding Ex certificates (ATEX, IECEx, UL, etc.) apply.
Ex approval acc. to conformity certificate	TÜV 00 ATEX 1595
Application area	II (1) G, II (1) D
Ignition protection category	[Ex ia Ga] IIC; [Ex ia Da] IIIC
Ex approval acc. to conformity certificate	TÜV 06 ATEX 552977 X
Application area	II 3 G
Ignition protection type	Ex nA [jc Gc] IIC T4 Gc
Characteristic	trapezoidal
Important note	If the device is used in applications to achieve functional safety according to IEC 61508, the safety manual must be used. Information in the data sheet are not valid for functional safety.
Approval	SIL 2 acc. to EXIDA FMEDA
Use in SIL safety circuits	SIL 2 acc. to IEC 61508
Indication	
Operational readiness	green
Protection class	IP20
Flammability class acc. to UL 94	V-0
Ambient temperature	-25...+70 °C
Storage temperature	-25 ... +60 °C für UL, FM, TIIS
Relative humidity	-40...+80 °C
Dimensions	≤ 95 %
Weight	110 x 18 x 110 mm
Mounting instructions	185 g
Housing material	DIN rail (NS35) or panel
Electrical connection	Polycarbonate/ABS
Terminal cross-section	4 × 3-pin removable terminal blocks with test socket, reverse polarity protected, screw terminal
Tightening torque	1 x 2.5 mm ² / 2 x 1.5 mm ²
	0.5 Nm

Dimensions





DC/DC CONVERTER

- 12V DC-Input
- Isolated 24Vdc Output
- Efficiency up to 87.7%
- Width only 32mm
- 20% Output Power Reserves
- Full Power Between -25°C and +60°C
- Soft-start Function Included
- Minimal Inrush Current Surge
- Reverse Input Polarity Protection
- 3 Year Warranty

GENERAL DESCRIPTION

The Dimension CD-Series offer DIN-rail DC/DC converters in the 92-120W output power range in a very compact housing. These DC/DC converters are allowed to run with a battery or similar sources.

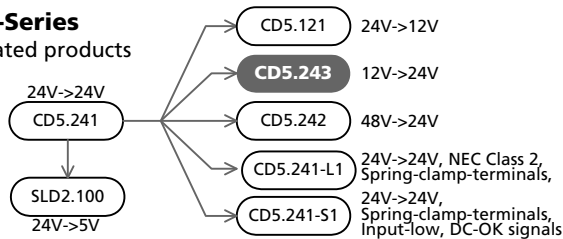
The CD5.243 converts a 12V voltage to a 24V voltage.

The CD5.243 includes all the essential basic functions and has a power reserve of 20% included. This extra power can be used continuously up to +45°C.

The output is electrically isolated from the input in a safe way. The input is protected against reversed voltages and contains a soft start function.

CD-Series

Related products



SHORT-FORM DATA

Output voltage	DC 24V	
Adjustment range	24 - 28V	*)
Output current	4.0 – 3.4A	ambient <60°C
	4.8 – 4.1A	ambient <45°C
Output power	96W	ambient <60°C
	116W	ambient <45°C
Output ripple	< 50mVpp	20Hz to 20MHz
Input voltage	DC 12V	
Input voltage range	10.8 to 16.2Vdc	full specified
	8.4 to 10.8Vdc	with derating
Input current	typ. 9.2A	at 12Vdc input
Input inrush current	typ. 1.0A peak	
Efficiency	87.7%	at 12Vdc input
Losses	13.5W	at 12Vdc input
Temperature range	-25°C to +70°C	operational
Derating	2.5W/°C	+60 to +70°C
Hold-up time	typ. 3ms	at 12Vdc input
Dimensions	32x124x102mm	WxHxD
Weight	435g / 0.96lb	

*) extended guaranteed adjustment range down to 23V.

ORDER NUMBERS

DC/DC Converter	CD5.243	Standard unit
Accessory	ZM1.WALL	Wall mount bracket
	ZM11.SIDE	Side mount bracket
	YRM2.DIODE	Redundancy module

MARKINGS





POWER SUPPLY

- AC 100-240V Wide-range Input
- Width only 40mm
- Efficiency up to 92.7%
- 150% (180W) Peak Load Capability
- Easy Fuse Tripping due to High Overload Current
- Active Power Factor Correction (PFC)
- DC Input from 88 to 360Vdc
- Negligible low Inrush Current Surge
- Short-term Operation down to 60Vac and up to 300Vac
- Full Power Between -25°C and +60°C
- DC-OK Relay Contact
- Quick-connect Spring-clamp Terminals
- 3 Year Warranty

GENERAL DESCRIPTION

The most outstanding features of this Dimension Q-Series DIN-rail power supply are the high efficiency and the small size, which are achieved by a synchronous rectification and further novel design details. The Q-Series is part of the Dimension family, existing alongside the lower featured C-Series.

With short-term peak power capability of 150% and built-in large sized output capacitors, these features help start motors, charge capacitors and absorb reverse energy and often allow a unit of a lower wattage class to be used.

High immunity to transients and power surges as well as low electromagnetic emission makes usage in nearly every environment possible.

The integrated output power manager, a wide range input voltage design and virtually no input inrush current make installation and usage simple. Diagnostics are easy due to the dry DC-ok contact, a green DC-ok LED and red overload LED.

Unique quick-connect spring-clamp terminals allow a safe and fast installation and a large international approval package for a variety of applications makes this unit suitable for nearly every situation.

SHORT-FORM DATA

Output voltage	DC 24V	
Adjustment range	24 - 28V	
Output current	5 - 4.5A	continuous
	7.5 - 6.7A	for typ. 4s
Output power	120W	continuous
	180W	for typ. 4s
Output ripple	< 50mVpp	20Hz to 20MHz
Input voltage	AC 100-240V	+10/-15%
Mains frequency	50-60Hz	±6%
AC Input current	1.10 / 0.62A	at 120 / 230Vac
Power factor	0.99 / 0.91	at 120 / 230Vac
AC Inrush current	typ. 9 / 11A peak	at 120 / 230Vac
Efficiency	91.6 / 92.7%	at 120 / 230Vac
Losses	11.0 / 9.4W	at 120 / 230Vac
Temperature range	-25°C to +70°C	operational
Derating	3W/°C	+60 to +70°C
Hold-up time	typ. 34 / 65ms	at 120 / 230Vac
Dimensions	40x124x117mm	WxHxD

ORDER NUMBERS

Power Supply	QS5.241	24-28V Standard unit
	QS5.241-A1	ATEX approved unit
Accessory	ZM1.WALL	Wall mount bracket
	ZM12.SIDE	Side mount bracket
	YR2.DIODE	Redundancy module
	UF20.241	Buffer unit

MARKINGS



Encoder Technology's HD2.5 Heavy Duty Industrial Encoder has been designed to withstand even the most severe conditions of today's harsh industrial environments. Utilizing new manufacturing technology that requires no electronic bias adjustments or mechanical alignments, the HD2.5 is tougher and more reliable than conventionally manufactured encoders. Its size and mounting options are configured to industry standards, making it interchangeable with other units currently in use. Monolithic opto components have reduced manufacturing costs while increasing MTBF, allowing substantial savings to be passed along to the OEM as well as the end user. The HD2.5 provides quality, reliability and value available only through Encoder Technology's proprietary design and manufacturing capabilities.

HD2.5 Heavy Duty Optical Encoder

for Harsh Industrial Environments



Technical Specifications

Mechanical

Shaft diameter	As specified
Flat on shaft	0.70 long x 0.018 deep
Shaft loading	Up to 100 lbs axial and radial
Shaft runout	0.0005 TIR at midpoint
Shaft	303 stainless steel (passivated)
Starting torque at 25°C	<i>Without shaft seal:</i> 1.0 in-oz. maximum <i>With optional shaft seal:</i> 2.5 in-oz. maximum
Bearings	5200ZZ double row
Bearing life	5 x 10 ⁸ revs at rated shaft loading, 5 x 10 ¹¹ revs at 10% of rated shaft loading. (manufacturers' specs)
Housing and cover	Die Cast Aluminum
Disc material	Metal or mylar
Moment of inertia	2.0 x 10 ⁻⁴ oz-in-sec ²
Weight	14 ounces, typical

Electrical

Code	Incremental
Cycles per Revolution	See "Current Resolutions" list
Supply voltage	See ordering information
Current requirements	50 mA (no load condition)
Output format	Channels A and B In quadrature ± 15° electrical
Output format options	Index, complementary outputs, and commutation signals
Output IC's	2N2222, 4469, ET7272, ET7273
Illumination	LED
Frequency response	125 kHz (data and index)
Output termination	See Table 1
Circuit Protection	Reverse over voltage and output short circuit

Environmental

Operating temp	-40 to 100°C
Operating temp ATEX	-40 to 80°C
Storage temperature	-40 to 100°C
Shock	50G's for 11msec duration
Vibration	5 to 2000Hz @ 20 G's
Humidity	98%RH without condensation
NEMA 4 and 13	When ordered with shaft seal

The above specifications are subject to change without notice. Dimensions shown in inches.

Ordering Information – This model series is available in an intrinsically safe version Certified to ATEX EEx ia IIB T4

Example part number:

HD2.5 D O - SS - 37F - 512 - AB C - 72 - S 16 - 28

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11.

1. Housing Configuration

Square flange (standard).....	D
Servo Mount (ø2.50).....	E
Servo Mount (ø2.62).....	G

2. Face Mount

Not required.....	0
Or specify.....	F1, F2, F3 or F4

3. Shaft Seal/Sealed Bearing

If not required (shielded).....	(blank)
Sealed bearing.....	SB
Shaft seal (not available with "G" housing).....	SS

4. Shaft Diameter

0.2497/0.2495.....	25
0.3747/0.3745 (standard).....	37F
0.3935/0.3942 (10mm).....	39
"F" = flat on shaft.....	i.e. 37F

5. Standard Resolutions

Many resolutions from 1 to 32,768. See "Current Resolutions" list. Others by special order. Consult the factory.

6. Output Channels

Single.....	A
Dual quadrature.....	AB
Dual with index (standard).....	ABZ
Commutation signals available. Contact the factory.	

7. Complements

With Complements.....	C
(available with differential line drivers only)	
Without complements.....	(blank)

8. Output ICs

2N2222 open collector (5 to 28V).....	220C
2N2222 with pull-ups (5 to 28V).....	221K or 222K
Differential line drivers	
4469 (5 to 15V).....	69
ET7272 (5 to 28V).....	72
ET7273 open collector (5 to 28V).....	73

9. Output Location

End.....	E
Side (standard).....	S

10. Output Termination

MS3102R14S-6P (6 pin).....	14
MS3102R16S-1P (7 pin).....	16
MS3102E18-1P (10 pin).....	18
Side Cable with seal (18" std).....	SCS18
End Cable with seal (18" std).....	ECS18

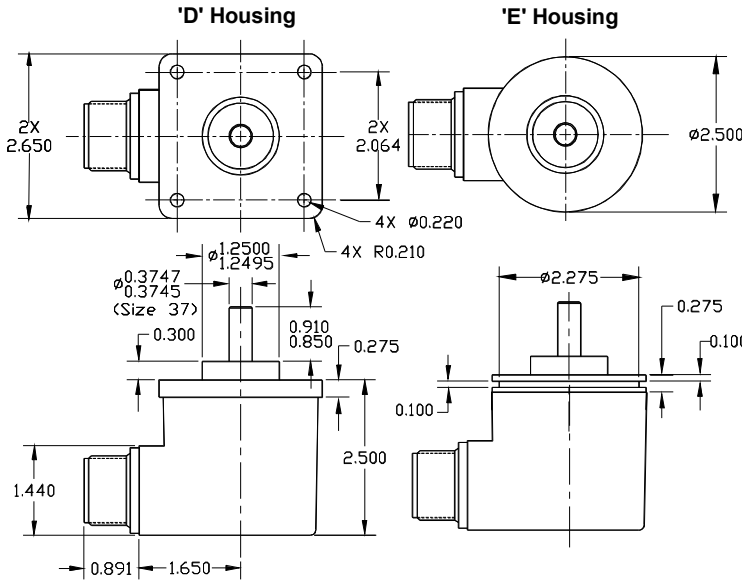
11. Voltage - Standard

5 to 15Vdc (4469).....	15
5 to 28Vdc.....	28
5 to 28Vdc in, 5vdc out (ET7272 only).....	28/5

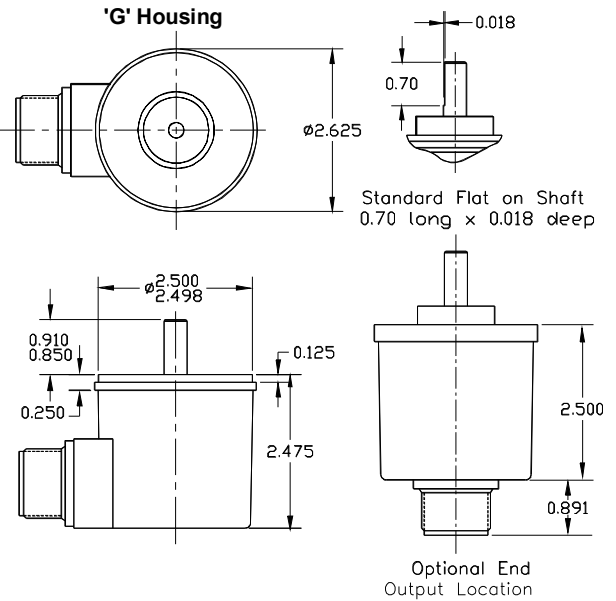
Voltage - ATEX

5 Vdc.....	5A
7 to 28Vdc.....	28A
7 to 28Vdc in, 5vdc out (ET7272 only).....	28/5A

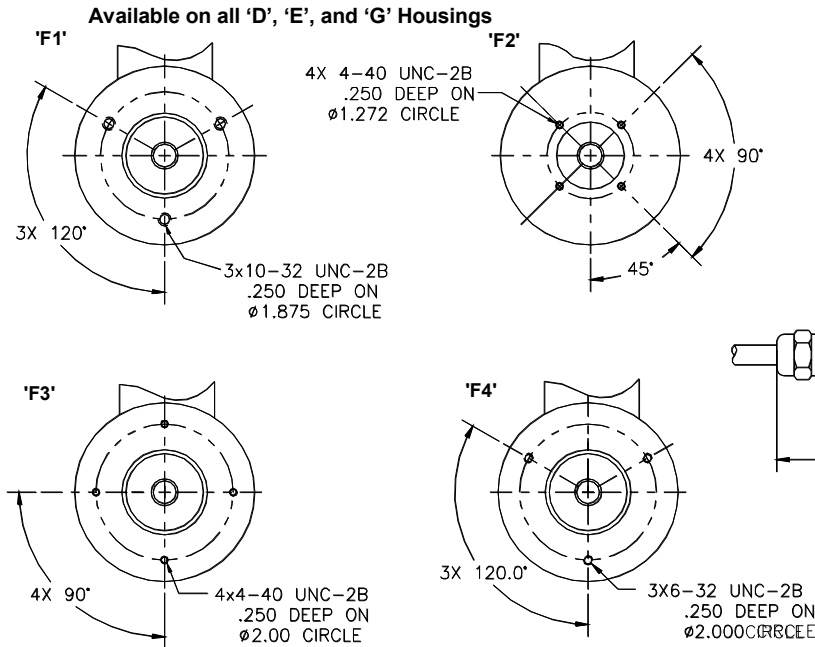
Outline Dimensions Standard 'D' and 'E' Housing



Optional 'G' Housing, Shaft and Output Location Options



Optional Face Mounts



Optional Output Termination Cable with Seal

See Shaft Diameter Options

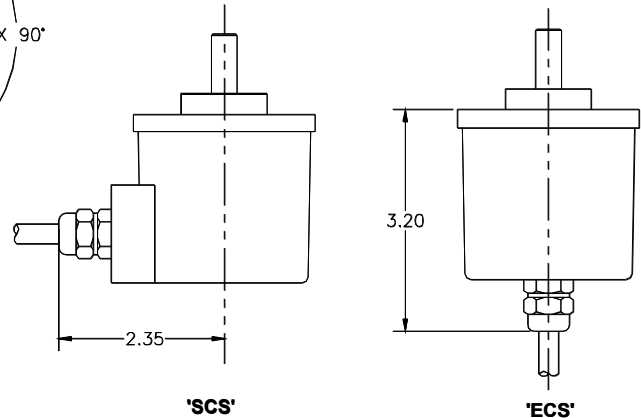


Table 1: Output Terminations (Pinout)

Connector Pins			Output Channels			Cable Termination	
M14	M16	M18	ABZ	ABC	ABZC	Wire Color	Function
E	A	A	A	A	A	Green	A
D	B	B	B	B	B	Blue	B
C	C	C	Z	A ^{Bar}	Z	Orange	Z
B	D	D	+V	+V	+V	Red	+Vdc
F	E	E	N/C	B ^{Bar}	N/C	Black	Ground
A	F	F	Circuit	Ground		Violet	A ^{Bar}
	G	G	Case Ground			Brown	B ^{Bar}
	H	H	N/C	N/C	A ^{Bar}	Yellow	Z ^{Bar}
	I	I	N/C	N/C	B ^{Bar}	White	Case Gnd
	J	J	N/C	N/C	Z ^{Bar}		

Case Ground not available on ATEX Certified Units

Output Format

