



CERTIFICATION REPORT 21(C)0354

REPORT ON. Advent Hand Tachometer Type A2109
DATED 10 February 2022
REGISTRATION No. 4099
CUSTOMER Compact Instruments Limited
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M Powney
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Where values of uncertainty of measurement are given, these are expressed at the 95% confidence level unless otherwise stated.

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Baseefa tests

None

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

Those signing the front sheet of this report do so on behalf of SGS Baseefa Ltd.

<u>Annexed Documents</u>	<u>No. of Pages</u>
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Baseefa reports and Baseefa subcontractors reports with own cover

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Manufacturer supplied reports and information

None

Other reports and information

None

Responsibility for individual documents remains with the originator of the individual document.

1. INTRODUCTION

This report covers the assessment of a variation to the Advent Hand Tachometer Type A2109 against the relevant clauses of IEC 60079-0, IEC 60079-11 and IEC 60079-28. This equipment is currently afforded EU-Type Examination Certificate BAS01ATEX2301X.

This report covers the assessment of the Advent Hand Tachometer Type A2109 manufactured by Compact Instruments Limited, against the requirements of relevant standards in support of UKEX Type Examination certificates in accordance with the Equipment or Protective System Intended for use in Potentially Explosive Atmospheres UKSI 2016:1107 (as amended by UKSI 2019:696) – Schedule 3A, Part 1

This report also provides an assessment of the essential health and safety requirements of the Equipment or Protective System Intended for use in Potentially Explosive Atmospheres UKSI 2016:1107 (as amended by UKSI 2019:696) – Schedule 3A, Part 1 with respect to Group II Category 2 Equipment.

Finally, this report covers assessment of the Advent Hand Tachometer Type A2109 manufactured by Compact Instruments Limited against the current editions of the standards EN 60079-0, EN 60079-11 and EN 60079-28. Consequently, the equipment is re-assessed against the essential health and safety requirements of the equipment against the ATEX Directive 2014/34/EU to ensure continued compliance.

2. DESCRIPTION

The Advent Hand Tachometer Type A2109 is a hand held instrument designed to measure the speed of rotating shafts.

It produces either an optical beam using photo diodes or a laser beam using laser diodes. The reflection of the beam from a reflective surface on a rotating shaft is detected by a sensor in the Tachometer. The Tachometer may be used with a contact adapter fitted to the front which is held against a rotating shaft. The contact adapter has a permanent magnet that rotates to produce a rotating field which is sensed by the instrument.

The Tachometer contains electronic components and an LCD display mounted on a printed circuit board (PCB).

The instrument is internally powered using 4 x Duracell size AAA alkaline cells. The electrical components are enclosed in a chrome plated plastic housing with separate compartments for the PCB and the battery. The instrument has a transparent window for the display and the battery compartment is fitted with a cover which is secured using fixing. The Tachometer has an optional Rear Plug to which external diagnostic instruments may be connected.

The Type number may be suffixed with various characters to signify the following variants:

A2109/LSR/***/ Laser output

A2019/LED/***/ LED output

*** is replaced by 002 when Tachometer fitted with a 5-pin rear plug

*** is left blank when Tachometer not fitted with a rear plug

Input Parameters

At the Rear Plug: Pin 4 w.r.t. Pin 3:
 $U_i = 10.1V$

Output Parameters

At the Rear Plug: Pin 4 w.r.t. Pin 3:

$U_o = 6.6 V$
 $I_o = 0.3 mA$
 $P_o = 0.43 mW$
 $L_o = 700 mH$
 $C_o = 22 \mu F$
 $L_o/R_o = 68mH/\Omega$
 $L_i = 0$
 $C_i = 0$

At the Rear Plug: Pin 1 w.r.t. Pin 2:

$U_o = 6.6 V$
 $I_o = 463 mA$
 $P_o = 0.63 mW$
 $L_o = 0.17 mH$
 $C_o = 22 \mu F$
 $L_o/R_o = 49mH/\Omega$
 $L_i = 0$
 $C_i = 2.245\mu F$

3. DRAWINGS

<u>Number</u>	<u>Sheet</u>	<u>Issue</u>	<u>Date</u>	<u>Description</u>
01284	1 of 1	1.5	28-09-21	*A2109 Label Details
P0478	1 of 1	1.5	28-09-21	*A2109 Case Label Details
P0477	1 of 1	1.3	24.11.09	Contact Adapter
P0475	1 of 1	1.3	08.03.10	Chrome masking base details
P0476	1 of 1	1.3	08.03.10	Chrome masking top details
P0479	1 of 1	1.2	24.11.09	PCB Sub assembly with LED
P0472	1 of 1	1.3	24.11.09	PCB Sub assembly with LSR
P0473	1 of 1	1.2	07.08.01	PCB Component layout
001285	1 of 1	1.2	02.07.13	A2109/LSR PCB Artwork
P0474	1 of 1	1.4	12.02.14	A2109 Advent Assembly
C001015	1 of 1	1.3	8-Jul-2013	A2109 I.S. Tachometer Circuit

Note 1: An * is included before the title of documents that are new or revised.

Note 2: The certification drawings are compiled here for ease of reference. The drawings are common to BAS01ATEX2301X and are held with ATEX certificate BAS01ATEX2301X.

4 TESTS AND ASSESSMENTS

4.1 COMPLIANCE TO THE REQUIREMENTS OF EN IEC 60079-0: 2018

The Advent Hand Tachometer Type A2109 was reviewed against the requirements of EN IEC 60079-0:2018 in respect of the differences from EN 60079-0: 2012.

None of the changes listed in Table ZY.2 of EN IEC 60079-0:2018 – Significant changes with respect to EN 60079-0:2012 apply to this equipment. No further consideration required.

The following sub-section(s) deal with specific considerations introduced by the standards update that require additional detail relating to the certification.

4.1.2 Copper Content of Exposed Metal Parts

The main enclosure is a plastic enclosure with an optional chrome plating option provided.

Chrome plating is known to contain no copper and therefore the prevention of acetylides forming is achieved by limitation of the Copper content to less than 65 %.

Should the coating fail and the plastic enclosure be exposed, acetylides cannot form as the plastic will contain less than 65 % Copper and therefore the enclosure prevents the formation of acetylides by limitation of copper.

Consequently, adequate precautions have been taken to prevent the formation of acetylides.

The equipment is therefore considered compliant against the requirements of EN IEC 60079-0: 2018.

4.2 COMPLIANCE TO THE REQUIREMENTS OF EN 60079-28: 2015

The Advent Hand Tachometer Type A2109 was reviewed against the requirements of EN 60079-28: 2015 in respect of the differences from EN 60079-28: 2007.

None of the changes listed in the Foreword of EN 60079-28:2015 between IEC 60079-28, Edition 2.0 (2015), and IEC 60079-28, Edition 1.0 (2006), apply to this equipment. No further consideration required.

The equipment is therefore considered compliant against the requirements of EN 60079-28: 2015.

4.3 UKEX CERTIFICATION

The Advent Hand Tachometer Type A2109 manufactured by Compact Instruments Limited was considered compliant with the requirements of the relevant clauses of EN IEC 60079-0: 2018, IEC 60079-11: 2012 and EN 60079-28. The equipment, referenced above, is afforded EU-Type Examination Certificate BAS01ATEX2301X.

The assessment conducted previously is documented in the ATEX test reports 99(C)0950, 12(C)0995 and 15(C)0406 issued by SGS Baseefa Limited, Rockhead Business Park, Staden Lane, Buxton, Derbyshire, SK17 9RZ, United Kingdom and held with project files 99/0950, 12/0995 and 15/0406 respectively. Minor changes to the certificate are documented under project file 10/0188 issued by SGS Baseefa Limited and does not have a standalone test report.

Compliance to the requirements of EN IEC 60079-0: 2018, EN 60079-11: 2012 and EN 60079-28: 2015 was determined by the issuance of this ATEX test report (21(C)0354) which must also be considered in conjunction with the previous assessment reports listed.

The Advent Hand Tachometer Type A2109 manufactured by Advent Hand Tachometer Type A2109 were assessed against standards as listed in the UK Designated Standards List (currently aligned with the ATEX Official Journal).

This report considered the equipment against the current editions of the standards. These standards are EN IEC 60079-0: 2018, EN 60079-11: 2012 and EN 60079-28: 2015. These standards are current and harmonised and no further assessment is required for these standards.

The Specific Conditions of Use are listed on the UKEX certificate and are in line with those listed on the relevant ATEX certificate.

Annex A provides evidence of compliance to the applicable national deviations and considerations related to the format and information related to the UKEX mark.

4.4 DOCUMENTATION

The manufacturer has provided revised copies of the drawings containing the amended marking plates. The affected drawings are identified in section 3 of this report. The revised marking plate provided on the drawing includes the appropriate marking and certificate number (BAS21UKEX0532X) assigned to the product for UKEX certification.

Annex A provides additional details regarding the specific UKEX marking requirements and how the product meets these marking. Refer to Annex A for additional information.

The marking included in the referenced drawing was determined to comply with the required marking conditions for the equipment for UKEX certification and the existing marking remains unaffected.





The general assembly drawing and marking drawings have also been amended to remove the brass options from the construction and to clarify the main enclosure material.

5 CONCLUSIONS

The variations to the certificates referenced above are considered to comply with the relevant requirements of the standards listed.

Additionally, the Advent Hand Tachometer Type A2109 manufactured by Compact Instruments Limited are deemed to meet the requirements of the standards listed previously and the Equipment or Protective System Intended for use in Potentially Explosive Atmospheres UKSI 2016:1107 (as amended by UKSI 2019:696) – Schedule 3A, Part 1.

The equipment certification has been extended to include the UKEX certificate number BAS21UKEX0532X.

	IECEX TEST REPORT of NATIONAL DIFFERENCES	
ExTR Reference Number	Not allocated	
ExTR Free Reference Number . :	Project No. 21/0354	
Compiled by + signature (ExTL)	A M Thomas	
..... :	Certification Engineer	
Reviewed by + signature (ExTL)	M Powney	
..... :	Certification Manager	
Date of issue	10 February 2022	
Ex Testing Laboratory (ExTL) . :	SGS Baseefa Limited	
Address	Rockhead Business Park, Staden Lane, Buxton, Derbyshire, SK17 9RZ, UK	
Applicant's name	Compact Instruments Limited	
Address	61-65 Lever Street, Bolton, Lancashire, BL3 2AB, United Kingdom	
Country/Region	European Economic Area (including EU and EFTA) for CE Marking and United Kingdom for UKCA Marking	
Standards	ATEX Directive 2014/34/EU and UK Statutory Instrument UKSI 2016:1107 (as amended)	
Test Report Form Number..... :	ExTR National Differences_3 (released 2018-02)	
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<p>Possible test case verdicts:</p> <p>- test case does not apply to the test item :N/A</p> <p>- test item does meet the requirement..... :Pass</p>
<p>General remarks:</p> <p>The test results presented in this ExTR of National Differences relate only to the item or product tested. Only clauses and manufacturer's documents impacted by this document are detailed.</p> <ul style="list-style-type: none"> ▪ "(see Attachment #)" refers to additional information appended to this document. ▪ "(see appended table)" refers to a table appended to this document. ▪ Throughout this document, a point is used as the decimal separator. <p>The technical content of this ExTR of National Differences shall not be reproduced except in full without the written approval of the Issuing ExCB and ExTL.</p>

In almost all cases, the technical requirements in the IEC/ISO standard and in the equivalent EN standard used to confirm presumption of conformity with the European Union Directive ATEX 2014/34/EU, and to confirm presumption of conformity with the UK Statutory Instrument UKSI 2016:1107 (as amended), are identical. The purpose of this report is to confirm such identity for the standards applied to the equipment and to record any differences and if they have been complied with. In some circumstances, the IEC/ISO standard may be applied directly.

IEC/ISO Standard	EN Standard, or IEC/ISO standard applied directly	Identical, or clause with difference	Applicable to this equipment ?
IEC 60079-0, Edition 7	EN IEC 60079-0: 2018	Annex ZY	Yes
IEC 60079-11, Edition 6	EN 60079-11: 2012	Annex ZY	Yes
IEC 60079-28, Edition 2	EN 60079-28: 2015	Identical	Yes

Clause	Requirement – Test	Result – Remark	Verdict
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EN IEC 60079-0:2018 (BS EN IEC 60079-0:2018)			
ZY.1	Groups and Categories	Correctly designated	Pass
ZY.2	Instructions	<p>Verification of instructions to be presented in community languages cannot be verified other than by manufacturer’s declaration. The manufacturer has provided a declaration that instructions will be available in community languages as appropriate.</p> <p>The inclusion of EN 50628 is not required for the equipment. The equipment is not intended for use in Mining atmospheres.</p>	Pass

Clause	Requirement – Test	Result – Remark	Verdict
ZY.3.1	ATEX/UKEX Coding	<p>The manufacturer provided an example of the applied marking in drawings 01284 and P0478. The drawing identifies that the equipment is marked:</p> <p>⊕ II 2 G Ex ia op is IIC T4 Gb</p> <p>The marking reflects the correct equipment grouping for the standard and the directive. The applied marking also complies with the guidance provided with the examples of marking given.</p>	Pass
ZY.3.2	Extended requirement for manufacturer's name and address	Correctly present in both certificate and product marking.	Pass
ZY.4	Extended requirements for fans	Not applicable; the equipment is not a fan nor does it incorporate any fans as part of its construction.	N/A
EN 60079-11: 2012 (BS EN 60079-11: 2012)			
ZY	ATEX/UKEX Coding	<p>The manufacturer provided an example of the applied marking in drawings 01284 and P0478. The drawing identifies that the equipment is marked:</p> <p>⊕ II 2 G Ex ia op is IIC T4 Gb</p> <p>The marking reflects the correct equipment grouping for the standard and the directive. The applied marking also complies with the guidance provided with the examples of marking given.</p>	Pass

ATEX EHSR Clause:	UKEX EHSR (Sched. 1) Clause:	ATEX and UKEX Essential Health and Safety requirements not fully covered by standards	Result – Remark	Verdict
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1.0.1 indent 1	2 (2)(a)	Prevent formation of Explosive Atmospheres	Not applicable to equipment other than where specifically mentioned, e.g. batteries (and then covered by the standards)	N/A
1.0.1 indent 3	2 (2) (c)	Mitigate an explosion	Applies only to Protective Systems	N/A
1.0.5 indent 2	5 (1) (b)	Application of CE/UKCA Marking	<p>The marking plate is described in drawings 01284 and P0478.</p> <p>The manufacturer provided the artwork of the applied marking in drawings 01284 and P0478. The drawing identifies that the equipment is CE marked as follows:</p> <p>CE 0598</p> <p>The CE marking includes the notified body number (0598) marked beneath the CE mark.</p> <p>The drawing also identifies that the equipment is UKCA marked as follows:</p> <p>UK CA 1180</p> <p>The CE marking includes the notified body number (1180) marked beneath the UKCA mark.</p>	Pass
1.0.6 a) first level indent 3	6 (1) (c)	Mark danger areas in front of pressure relief devices	Applies only to Protective Systems	N/A
1.0.6 c)	6 (3)	Literature must not contradict the instructions	Cannot be covered by certification – manufacturers’ sole responsibility	N/A

ATEX EHSR Clause:	UKEX EHSR (Sched. 1) Clause:	ATEX and UKEX Essential Health and Safety requirements not fully covered by standards	Result – Remark	Verdict
1.2.3	9	Enclosed structures to prevent leaks	Not applicable to electrical equipment generally	N/A
1.2.7	13	LVD type requirements	Standards require manufacturer's declaration, supplied.	Pass
1.2.8	14	Overloading of equipment (protection relays, etc.)	Covered by installation rules and manufacturer's instructions	Pass
1.3.5	20	Hazards from Pressure Compensation	Not applicable to electrical equipment generally	N/A
1.4.1	21 (1)	External effects	The Purchaser should make the manufacturer aware of such issues. Covered in Instructions	Pass
1.4.2	21 (2)	Aggressive substances, etc.	The Purchaser should make the manufacturer aware of such issues. Covered in Instructions	Pass
1.5	22 - 25	Safety related devices	Not directly applicable to equipment in the scope of IEC 60079-0	N/A
1.6.1	26 (1)	Manual Override to ensure safety of systems	Not directly applicable to equipment in the scope of IEC 60079-0	N/A
1.6.3	27	Hazards from Power Failure	Not directly applicable to equipment in the scope of IEC 60079-0	N/A
1.6.5	29	Placing of Warning Devices	Not directly applicable to equipment in the scope of IEC 60079-0	N/A
3	38 - 43	Protective Systems	Not directly applicable to equipment in the scope of IEC 60079-0	N/A

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

All Essential Health and Safety Requirements (EHSRs) of Directive 2014/34/EU and of the UK Statutory Instrument UKSI 2016:1107 (as amended) are addressed by the standards referenced above, by manufacturer's declaration (where permitted) or by installation instructions.