



1 **EC-TYPE EXAMINATION CERTIFICATE**

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

5 EC-Type Examination Certificate Number : **BAS01ATEX2301X**

6 Equipment or Protective System: **ADVENT HAND TACHOMETER TYPE A2109**

7 Manufacturer: **COMPACT INSTRUMENTS LTD**

8 Address: **Bolton, Lancashire, BL3 2AB**

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

10 The Electrical Equipment Certification Service, notified body number 600 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, 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.

The examination and test results are recorded in confidential Report N°

**99(C)0950 dated 3 September 2001**

11 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

**EN 50014: 1997 + Amds 1 & 2**

**EN 50020: 1994**

except in respect of those requirements listed at item 18 of the Schedule.

12 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.

13 This EC-TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified equipment or protective system. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment or protective system.

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

 **II 2 G** **EEx ia IIC T4**

This certificate may only be reproduced in its entirety and without any change, schedule included.

File No: EECS 4099/02/001

This certificate is granted subject to the general conditions of the Electrical Equipment Certification Service. It does not necessarily indicate that the apparatus may be used in particular industries or circumstances.



Electrical Equipment Certification Service  
Health and Safety Executive  
Harpur Hill, Buxton, Derbyshire, SK17 9JN, United Kingdom  
Tel: +44(0)1298 28000 Fax: +44(0)1298 28244  
internet: [www.baseefa.com](http://www.baseefa.com) e-mail: [baseefa.info.eecs@hsl.gov.uk](mailto:baseefa.info.eecs@hsl.gov.uk)



**I M CLEARE**  
**DIRECTOR**  
10 September 2001



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### Schedule

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### EC-TYPE EXAMINATION CERTIFICATE N° BAS01ATEX2301X

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#### Description of Equipment or Protective System

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. 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 magnetic 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 anti-tamper 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:

$$U_o = 6.6 V$$

$$I_o = 0.3 mA$$

$$P_o = 0.43 mW$$

$$L_o = 700 mH$$

$$C_o = 22 \mu F$$

$$L_o/R_o = 68 mH/\Omega$$

$$L_i = 0$$

$$C_i = 0$$



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

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

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**Report No.**

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**Special Conditions For Safe Use**

Tachometer fitted with a contact adapter presents a potential risk of frictional ignition and must not be used continuously for more than 10 seconds.

18.

**Essential Health and Safety Requirements**

ESSENTIAL HEALTH & SAFETY REQUIREMENTS not covered by standards listed in Section 9		
Clause	Subject	Compliance
1.1.3	Changes in characteristics of materials and combinations thereof	Report No 99(c)0950 Clause 5.1.1.3
1.2.2	Components for incorporation or replacement	Report No 99(c)0950 Clause 5.1.2.2
1.2.5	Additional means of protection	Report No 99(c)0950 Clause 5.1.2.5
1.2.7	Protection against other hazards	Report No 99(c)0950 Clause 5.1.2.7
1.4.2	Withstanding attack by aggressive substances	Report No 99(c)0950 Clause 5.1.4.2



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**Schedule**

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**EC-TYPE EXAMINATION CERTIFICATE N° BAS01ATEX2301X**19 **DRAWINGS**

<b>Number</b>	<b>Issue</b>	<b>Date</b>	<b>Description</b>
P0474	1.2	07.08.01	General assembly
P0477	1.2	07.08.01	Contact Adaptor
P0475	1.2	07.08.01	Chrome masking base details
P0476	1.2	07.08.01	Chrome masking top details
P0478	1.1	07.08.01	Labelling
001284	1.1	07.08.01	Label details
P0479	1.1	07.08.01	PCB Subassembly with LED
P0472	1.2	07.08.01	PCB Subassembly with LSR
P0473	1.2	07.08.01	PCB component layout
C001015	1.2	30.08.01	Circuit
001285	1.1	07.08.01	PCB track layout

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**BASEEFA List Keywords**  
2TACHOME