



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.: IECEx SIR 13.0107 issue No.:3

Status: **Current**

Date of Issue: **2017-03-08** Page 1 of 4

Certificate history:
Issue No. 3 (2017-3-8)
Issue No. 2 (2015-5-18)
Issue No. 1 (2014-3-26)
Issue No. 0 (2013-12-10)

Applicant: **SPM Instrument AB**
Finningevägen 71
SE-645 42 Strängnäs
Sweden

Equipment: **Leonova Diamond IS DIA500IS and Emerald IS EME600IS**
Optional accessory:

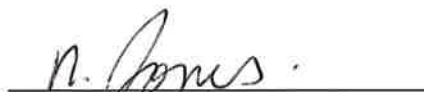
Type of Protection: **Intrinsically Safe**

Marking: Ex ia I Ma or Ex ia IIC T4 Ga
(-10 °C ≤ Ta ≤ +50 °C) (-20 °C ≤ Ta ≤ +50 °C)

Approved for issue on behalf of the IECEx Certification Body: N Jones

Position: Certification Manager

Signature:
(for printed version)


2017-03-08

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](http://www.iecex.com).

Certificate issued by:

SIRA Certification Service
CSA Group
Unit 6, Hawarden Industrial Park
Hawarden, Deeside, CH5 3US
United Kingdom

sira
CERTIFICATION





IECEX Certificate of Conformity

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Manufacturer: **SPM Instrument AB**
Finningevägen 71
SE-645 42 Strängnäs
Sweden

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 electrical 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 Edition: 6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-11 : 2011 Edition: 6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-26 : 2006 Edition: 2	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga

*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/SIR/ExTR13.0327/00
GB/SIR/ExTR17.0045/00

GB/SIR/ExTR14.0068/00

GB/SIR/ExTR15.0141/00

Quality Assessment Report:

NO/NEM/QAR09.0004/03



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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The Leonova Diamond IS DIA500IS and Emerald IS EME600IS are intrinsically safe (IS), multifunction, data collectors/signal analyzers for monitoring, recording and diagnosing a machine by means of various sensors, including for example types TTP10IS/TTP11IS. Both instruments are hand-held and are powered from an identical battery pack. The instruments consist of a plastic enclosure, each having a high resolution colour display and various push buttons with various connectors for the connection of the sensors. The equipment is powered via a re-chargeable battery pack that is inserted into the base of the instrument. The battery pack is to be removed only whilst in the safe area, so that it may be recharged separately from the instrument.

Refer to the annexe for additional information.

SPECIFIC CONDITIONS OF USE: NO



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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Refer to the Annexe

Annexe to: IECEx SIR 13.0107 Issue 3

Applicant: SPM Instrument AB

Apparatus: Leonova Diamond IS DIA500IS & Emerald IS EME600IS



The Leonova Diamond IS DIA500IS is the larger version with a larger display. It monitors:

- Three vibration sensors (VIB1, VIB2, VIB3).
- An RPM Revolution counter or temperature (for use with the TTP10IS and TTP11IS tachometer)
- An SPM transducer e.g. shock pulse
- An Aux sensor (e.g. NAMUR sensor)

The VIB vibration sensor inputs may be connected to a combination of 1, 2 or 3 sensors via one of the following cables:

Cable Type	Connected to channels
CAB97IS	CH1
CAB82IS	CH1
CAB83IS	CH1
CAB89IS	CH1, CH2
CAB88IS	CH1, CH2, CH3

The Leonova Emerald IS EME600IS is smaller and monitors:

- A single vibration sensor (VIB).
- An RPM Revolution counter or temperature (for use with the TTP10IS and TTP11IS tachometer)
- An SPM transducer e.g. shock pulse

The VIB vibration sensor inputs may be connected to a single sensor via one of the following cables:

Cable Type	Connected to channels
CAB97IS	CH1
CAB82IS	CH1
CAB83IS	CH1

Both models have an ear piece socket that is provided for connection of a suitably certified headset. A headset adaptor can be provided to allow the connection of headsets with different types of connector.

The equipment has the following safety description:

Leonova Diamond IS DIA500IS - VIB1 or VIB2 or VIB3
Leonova Emerald IS EME600IS - VIB

$U_o = 26\text{ V}$ $I_o = 93\text{ mA}$ $P_o = 560\text{ mW}$ $C_i = 0$ $L_i = 20\text{ }\mu\text{H}$

Leonova Diamond IS DIA500IS - RPM
Leonova Emerald IS EME600IS - RPM

$U_o = 9.6\text{ V}$ $I_o = 0.59\text{ A}$ $P_o = 0.8\text{ W}$ $C_i = 15\text{ nF}$ $L_i = 0$

Leonova Diamond IS DIA500IS - SPM
Leonova Emerald IS EME600IS - SPM

$U_o = 12\text{ V}$ $I_o = 33\text{ mA}$ $P_o = 49\text{ mW}$ $C_i = 1.7\text{ nF}$ $L_i = 13.2\text{ mH}$

Leonova Diamond IS DIA500IS - AUX/NAMUR

$U_o = 14\text{ V}$ $I_o = 15\text{ mA}$ $P_o = 49\text{ mW}$ $C_i = 0$ $L_i = 0$

Leonova Diamond IS DIA500IS - Headphone
Leonova Emerald IS EME600IS - Headphone

$U_o = 5\text{ V}$ $I_o = 330\text{ mA}$ $P_o = 0.4\text{ W}$ $L_o/R_o = 90.6\text{ }\mu\text{H}/\Omega$ $C_i = 0$ $L_i = 0$

Date: 08 March 2017

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Form 9530 Issue 1

Sira Certification Service

Unit 6 Hawarden Industrial Park,
Hawarden, CH5 3US, United Kingdom

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Annexe to: IECEx SIR 13.0107 Issue 3

Applicant: SPM Instrument AB

Apparatus: Leonova Diamond IS DIA500IS & Emerald IS EME600IS



Environment			Maximum CO, external to CONNECTION				
Zone	EPL	Group	SPM	RPM	VIB Ch. 1, 2 or 3	AUX	HEADSET
0, 1	Ga, Gb	IIC	1.41 uF	3.6 uF	107 nF	730 nF	100 uF
0, 1	Ga, Gb	IIB	9.0 uF	26 uF	820 nF	4 600 nF	1 000 uF
0, 1	Ga, Gb	IIA	36.0 uF	210 uF	2 900 nF	17 000 nF	1 000 uF
0, 1	Ma Mb	I	38.0 uF	500 uF	4 800 nF	21 500 nF	1 000 uF
2	Gc	IIC	8.4 uF	28 uF	390 nF	4 000 nF	1 000 uF
2	Gc	IIB	100 uF	650 uF	2 290 nF	30 000 nF	1 000 uF
2	Gc	IIA	1 000 uF	1 000 uF	9 300 nF	330 uF	1 000 uF

Environment			Maximum LO, external to CONNECTION					Lo / Ro
Zone	EPL	Group	SPM	RPM	VIB Ch. 1, 2 or 3	AUX	HEADSET	
0, 1	Ga, Gb	IIC	19.4 mH	90 uH	4.09 mH	158 mH	320 uH	90.6 uH/Ω
0, 1	Ga, Gb	IIB	117 mH	360 uH	16.4 mH	632 mH	1 280 uH	362 uH/Ω
0, 1	Ga, Gb	IIA	247 mH	720 uH	32.8 mH	1 264 mH	2 560 uH	724 uH/Ω
0, 1	Ma Mb	I	415 mH	1 500 uH	53.9 mH	2 074 mH	4 600 uH	1 188 uH/Ω
2	Gc	IIC	60.2 mH	200 uH	9.22 mH	355 mH	320 uH	203 uH/Ω
2	Gc	IIB	280 mH	800 uH	36.9 mH	1 422 mH	950 uH	815 uH/Ω
2	Gc	IIA	574 mH	1 600 uH	73.9 mH	2 844 mH	2 530 uH	1 630 uH/Ω

Data from both items of equipment may be downloaded to a computer via a USB Isolator Type 16999, where $U_m = 6.5 V$.

Issue 1 - The product was modified as follows:

i. Analog Board Drg 16676019

- Current in Sector +5V_A_DCDC is limited by resistors R66, R70, R80 & R81. These resistors have been changed to 20Ω 1% (were 30Ω 1%). In this Sector capacitor C46 has been changed to 22μF 10% (was 4.7μF 10%).
- Current in Sector -5V_A_DCDC is limited by resistors R91, R94, R95 & R97. These resistors have been changed to 39Ω 1% (were 30Ω 1%). In this Sector inductor L3 has been changed to 10μH 20% (was 4.7μH 30%).
- In Sector +V_B_DCDC capacitor C127 has been changed to 22μF 10% (was 4.7μF 10%).
- Sector VREF has been deleted. Resistors R244, R251, R254, R262, R350, R376, R388 & R77 have been removed which isolated Sector VREF. This has been merged with the existing Sector ADC123.
- In Sector ±5V resistor R132 replaced by two resistors (R132-1 & 132-2 connected in parallel, each 110Ω 1% 0.66W). The resistor assembly is covered under encapsulation.
- In Sector 8V2 resistors R459, R462, & R463 have been changed to 18K (were 9.1K)

ii. Digital Board

- **Drg 16754027:** In Sector 3V3 the voltage surveillance circuitry has been changed. Resistor R90 100K is added to pin 8 of IC11; capacitor C42 10nF is added in parallel to R111; resistor R112 3.32MΩ now connects directly to VBAT. These changes are in non-safety critical part of the circuit.
- Modification to PCB layout to reflect the above circuit changes
- Crystal OSC2 & OSC3 changed to a different type number.
- Minor correction to parts list Drg 16788004.
- Resistor R83 changed to 392Ω (was 100Ω)

iii. Other Minor Changes

- The TTP10-IS Board, Display Board and General Assembly have gone through minor changes reflecting current production.

Issue 2 - The product was modified as follows:

- To allow changes to the masking of the LCD unit before encapsulating the display module.
- The component list drawing of all PCBs was modified to remove the manufacturing details that do not have any impact intrinsic safety of the equipment.

Date: 08 March 2017

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Annexe to: IECEx SIR 13.0107 Issue 3
Applicant: SPM Instrument AB
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Issue 3 - The product was modified as follows:

- i. To permit a change to the material of the serial number label mounted in the inside battery chamber.

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Form 9530 Issue 1

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