



# IECEX Certificate of Conformity

## INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit [www.iecex.com](http://www.iecex.com)

Certificate No.: **IECEX CML 22.0082X** Page 1 of 3 [Certificate history:](#)  
Status: **Current** Issue No: 0  
Date of Issue: 2022-11-09  
Applicant: **Keit Limited**  
4 Zephyr Building  
Eighth Street  
Harwell Oxford  
Didcot  
OX11 0RL  
**United Kingdom**  
Equipment: **FTIR Spectrometer, Model IRmadillo**  
Optional accessory:  
Type of Protection: **Flameproof "db"**  
Marking: Ex db IIB+H<sub>2</sub> T4 Ga/Gb  
Ta = -20/-15 °C to +60.9 °C\*  
\*Dependent on model configuration  
Refer to Product Description for marked process temperature and pressure limits

Approved for issue on behalf of the IECEx  
Certification Body:

**R C Marshall**

Position:

**Operations Manager**

Signature:  
(for printed version)

Date:  
(for printed version)

2022-11-09

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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 [www.iecex.com](http://www.iecex.com) or use of this QR Code.



Certificate issued by:

**Eurofins E&E CML Limited**  
Unit 1, Newport Business Park  
New Port Road  
Ellesmere Port, CH65 4LZ  
**United Kingdom**





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Manufacturer: **Keit Limited**  
4 Zephyr Building  
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Harwell Oxford  
Didcot  
OX11 0RL  
**United Kingdom**

Manufacturing  
locations:

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 equipment 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 60079-0:2017](#) Explosive atmospheres - Part 0: Equipment - General requirements  
Edition:7.0

[IEC 60079-1:2014-06](#) Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"  
Edition:7.0

[IEC 60079-26:2021-02](#) Explosive atmospheres - Part 26: Equipment with Separation Elements or combined Levels of Protection  
Edition:4.0

This Certificate **does not** indicate compliance with 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/ExTR22.0203/00](#)

Quality Assessment Report:

[GB/BAS/QAR17.0007/05](#)



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**EQUIPMENT:**

Equipment and systems covered by this Certificate are as follows:

The IRmadillo is a Fourier Transform Infrared (FTIR) spectrometer for real-time chemical reaction monitoring of industrial processes at the point of production.

Refer to Annex for full description and conditions of manufacture.

**SPECIFIC CONDITIONS OF USE: YES as shown below:**

Refer to Annex for specific conditions of use.

**Annex:**

[IECEX CML 22.0082X Iss. 0 Certificate Annex\\_1.pdf](#)

**Annexe to:** IECEx CML 22.0082X Issue 0  
**Applicant:** Keit Ltd  
**Apparatus:** FTIR Spectrometer, Model IRmadillo



## Description

The IRmadillo is a Fourier Transform Infrared (FTIR) spectrometer for real-time chemical reaction monitoring of industrial processes at the point of production.

The rigidly attached probe of the equipment can be inserted into reaction vessels or pipelines which are zone 0 while the instrument is in zone 1. Optionally, a flange or lap joint flange is present around the probe tube. The flanges are for connection to suitable ANSI/ASME B16.5 or BS EN 1092-1 or ISO 7005-1 process connections.

The input to the equipment is single phase mains power (100-240V, 50/60Hz) and its output is a wired USB or fibre-optic signal. An optional dry air purge is provided for functional reasons.

The main flameproof enclosure houses the electronics and the emitter is either housed either within the same enclosure or a separate flameproof assembly depending on the model.

The equipment is outside the scope of IEC 60079-28 as the optical radiation does not enter areas where absorbers are expected and the optical connector (if present) meets the limits of IEC/EN 60825-1 class 1.

The following models are covered by this approval,  
**ASM0627-09-B-C-D-E-F-G-H**

Where,

B	Hazardous area certification: E = IECEx/ATEX/UKEx
C	Ambient temperature ranges (depends on configuration and fitted Ex d fixtures)
D	Data communication type
E	Connector type
F	Probe type: D = Diamond V1 probe K = 25H AMTIR probe D3 = Diamond V3 probe
G	Probe interface type
H	Probe material: [blank] = Hastelloy TI = Titanium IN = Inconel SS = Stainless Steel TA = Tantalum

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The process (analyte) temperature and pressure limits are as follows,

Probe Type	Type D	Type K	Type D3
Analyte temperature	-20°C to +80°C	-15°C to +220°C	-20°C to +220°C
Analyte pressure	0 to 20 barg	-0.7 to 41.37 barg	-0.999 to 41.37 barg

**Notes:**

- IECEx BAS 17.0030X Issue 5 is superseded by this certificate.
- Where IECEx BAS 17.0030X Issue 5 is specified in other product certification, or other technical specifications, this certificate reference for the product shall be used in its place; updating of the other product certificate or technical specification is not required.

### Conditions of manufacture

The following are conditions of manufacture:

- Where the product incorporates certified parts or safety critical components, the manufacturer shall ensure that any changes to those parts or components do not affect the compliance of the certified product that is the subject of this certificate.
- The sensing end of each sensor tube shall be subjected to a routine pressure test at the following minimum test pressures:

Probe Type	Test Pressure
D	22 barg
K	45.5 barg (660 psig)
D3	45.5 barg (660 psig)

- The fitted cable gland, breather, power connector and data connector shall be suitably approved as Ex d equipment. All Specific Conditions of Use for these parts shall be complied with and any conditions relevant to their use shall be communicated to the installer and end user. The following temperature rises above the marked IRmadillo ambient temperature range (specific to configuration of unit) shall be taken into account when selecting the approved Ex d parts,

Cable gland (probe tube): +32.6 K

Breather: +11 K

Power connector: +11 K

Data connector: +11 K



## Specific conditions of use

The following conditions relate to the safe installation and/or use of the product,

- i The media to be monitored shall be in an area where dust particles are excluded.
- ii The probe shall be mounted so it is protected from impact.
- iii Models with external parts manufactured from light metals (eg titanium) can be an ignition source due to impact or friction sparks. This shall be considered during installation, particularly in zone 0 locations.
- iv On equipment fitted with probe type 'K' (High Temperature dia25), the rate of change of temperature on the end of the probe shall be limited to 50 °C per minute maximum.
- v It is the responsibility of the manufacturer, installer and end user to ensure chemical compatibility between the process analyte and all wetted materials. Consult manufacturer before installation in a process.
- vi The main enclosure shall not be opened and the flamepaths shall not be repaired.