UK Type Examination Certificate CML 22UKEX1523X Issue 2

United Kingdom Conformity Assessment

1 Product or Protective System Intended for use in Potentially Explosive Atmospheres UKSI 2016:1107 (as amended) – Schedule 3A, Part 1

2 Equipment **FTIR Spectrometer, Model IRmadillo**

3 Manufacturer **Keit Ltd**

4 Address **Unit 4 Zephyr Building,**
Eighth Street, Harwell Campus
Didcot, OX11 0RL
United Kingdom

5 The equipment is specified in the description of this certificate and the documents to which it refers.

6 Eurofins E&E CML Limited, Newport Business Park, New Port Road, Ellesmere Port, CH65 4LZ, United Kingdom, Approved Body Number 2503, in accordance with Regulation 42 of the Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016, UKSI 2016:1107 (as amended), certifies that this equipment 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 Schedule 1 of the Regulations.

The examination and test results are recorded in the confidential reports listed in Section 12.

7 If an 'X' suffix appears after the certificate number, it indicates that the equipment is subject to specific conditions of use (affecting correct installation or safe use). These are specified in Section 14.

8 This UK Type Examination certificate relates only to the design and construction of the specified equipment. Further requirements of the Regulations apply to the manufacturing process and supply of the product. These are not covered by this certificate.

9 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 IEC 60079-0:2018 EN 60079-1:2014 EN IEC 60079-26:2024

10 The equipment shall be marked with the following:

Ex II 1/2 G

Ex db IIB+H_2 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

11 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

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

Variation 1

This variation introduces the following change:

i. Update to standard from EN 60079-26:2015 to EN IEC 60079-26:2024.

12 Certificate history and evaluation reports

Issue	Date	Associated Report	Notes
0	09 Nov 2022	R15255A/00	Issue of Prime Certificate
1	11 Oct 2023	-	Correction of Certificate Template
2	15 May 2025	R18688A/00	The introduction of Variation 1

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

13 Conditions of Manufacture

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

i 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.

ii 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)

iii 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

14 Specific Conditions of Use

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

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.

Certificate Annex

Certificate Number	**CML 22UKEX1523X Issue 2**
Equipment	**FTIR Spectrometer, Model IRmadillo**
Manufacturer	**Keit Ltd**

The following documents describe the equipment defined in this certificate:

Issue 0

Drawing No	Sheets	Rev	Approved Date	Title
ASM0627-09 ATEX	1 to 4	02	09 Nov 2022	IRmadilloEx FTIR Spectrometer
PRT1260-02 ATEX	1 to 2	02	09 Nov 2022	EJB23 Enclosure Machined
ASM1556 ATEX	1 to 3	01	09 Nov 2022	Diamond V3 Probe
ASM1328-01 ATEX	1 to 4	01	09 Nov 2022	High temperature dia25 probe assembly
ASM1169-01 ATEX	1 to 4	01	09 Nov 2022	Diamond Ex probe
ASM1174-01 ATEX	1 of 1	01	09 Nov 2022	Diamond Bulb Assembly
ASM0572-06 ATEX	1 to 4	06	09 Nov 2022	DIP Probe Tube Assembly
ASM0329-08 ATEX	1 of 1	08	09 Nov 2022	Ex d Emitter Bulb Assembly
PRT1559 ATEX	1 of 1	01	09 Nov 2022	IRmadillo Product Label

Issue 1
None.

Issue 2
None.