

UK-TYPE EXAMINATION CERTIFICATE

Product or Protective Systems Intended for Use in Potentially Explosive Atmospheres

UKSI 2016:1107 (as amended) – Schedule 3A, Part 1

- UK-Type Examination Certificate Number:** ITS22UKEX0623X **Issue 00**
- Product:** ISE, FAW, FCR Liquid, Air and Gas Heaters
- Manufacturer:** EXHEAT Ltd.
- Address:** Threxton Road Industrial Estate, Watton, Norfolk, IP25 6NG, UK
- This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.
- Intertek Testing and Certification Limited, Approved Body number 0359, 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 product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Schedule 1 of the Regulations.

The examination and test results are recorded in the confidential report 103867040CHE-001 dated 15 August 2023.
- Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN IEC 60079-0:2018, EN 60079-1:2014 and EN IEC 60079-7:2015+A1:2018 except in respect of those requirements referred to within item 14 of the Schedule.
- If the sign “X” is placed after the certificate number, it indicates that the product is subject to the special conditions of use specified in the Schedule to this certificate.
- This UK-Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Regulations apply to the manufacturing process and supply of this product. These are not covered by this certificate.
- The marking of the product shall include the following:



II 2 G Ex eb IIC T1...T6 Gb
-60°C ≤ Ta ≤ +60°C

Or,

II 2 G Ex db eb IIC T1...T6 Gb
-60°C ≤ Ta ≤ +60°C

Certification Officer: _____

M Newman

Date: _____

18th August 2023

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11. Description of Product or Protective System

ISE

The main enclosure is made of stainless steel or coated mild steel, with gland plates of the same material. This enclosure comes in a range of size from 100mm x 100mm x 60mm up to 4000mm x 4000mm x 1000mm. A gasket is bonded using RTV silicon to the lid of the box and gland plates which are closed by M6x12 hexagonal head screw associated to M6 rivet bush. The temperature inside the box is limited to 80°C; enclosure may be fitted with a HEF anti-condensation heater (ITS19ATEX104973X / ITS22UKEX0286X) and gas detector (PTB 11 ATEX 1005X).

Supply cables enter the box via “Ex e” or “Ex d” certified glands fitted into the gland plates. Both of the internal and external earth studs are made from brass or stainless steel.

Tubular heating elements made of stainless steel, incoloy or titanium with an insulating bead made of steatite or high alumina ceramic have a minimum cold length of 20mm. The elements enter the base of the enclosure via heating element glands made of brass or stainless steel including nitrile or silicon rubber ‘o’ring. These elements may be paralleled together with small bus bars before being connected to the supply terminals.

An auxiliary terminal box may be fitted (IBEXU07ATEX1147U, IBEXU14ATEX1050, Sira08ATEX1056, PTB09ATEX1108, BASEEFA08ATEX0207U, CML15ATEX3078U, BASEEFA08ATEX0116U, BASEEFA08ATEX0271U, LCIE08ATEX6059X) to connect the temperature transmitters (DEKRA19ATEX0076X, BASEEFA03ATEX0030X, BAS00ATEX1033X, BASEEFA03ATEX0708X, KEMA07ATEX0130X, FM16ATEX0019X, BVS19ATEXE020X, BVS08ATEXE019X, PTB05ATEX2040X, PTB99ATEX1144X, PTB05ATEX2017X) and thermostats (EPS11ATEX1354, EPS11ATEX1338U). This junction box may be positioned on any side providing that it is not within the stand off area. This box is designed on the same principles than the main enclosure. The temperature sensors are connected via “Ex e” certified terminals (DEMKO14ATEX1338U, KEMA97ATEX1798U, KEMA04ATEX2048U). If an anti-condensation heater is mounted, any separate junction box must be mounted at least 50mm away from the anti-condensation heater.

ISE housing may also be populated with Breathers / Drains (CML19ATEX3347X) and Buttons and Switches (CML13ATEX3010U).

FAW air warmer:

The FAW range is generically made from powder-coated mild steel mesh surround (specials may be stainless steel) up to 2.0mts long 180mm high and 280 wide with a blanking plate at one end and an Ex eb terminal box on the other. The elements as mentioned below are installed through element support brackets and secured to the terminal box via ferrules and locknuts/gaskets.

FAW-C “compact” air warmer: The FAW-C range is generically made from stainless steel mesh surround up to 0.6mts long, approx. 170mm high x 170mm wide with a blanking plate at one end and an Ex eb terminal box on the other. The elements as mentioned below are installed and the element support brackets are on the end plate and secured to the terminal box via ferrules and locknuts/gaskets.

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FAW-C-T "compact" air warmer complete with EXHEAT Ltd. Ex d HFT thermostat: The FAW-C-T range is as the FAW-C above, but with the addition of the HFT stainless steel thermostat which mounts on a bracket welded to the heater. The connections are made using barrier and non-barrier glands and 3 core cable. The glands may also be terminated through swivel and set 90° elbows.

FCR air warmer:

The FCR range is generically made from powder-coated sheet mild steel surround up to 2.0mts long, approx. 600 high and 200 deep with a blanking plate at one end and an Ex eb terminal box on the other. The elements as mentioned below are installed through element support brackets and secured to the terminal box via ferrules and locknuts/gaskets.

FCR-A air warmer complete with EXHEAT Ltd. Ex d HFT thermostat: The FCR-A range is as the FCR above, but with the addition of the HFT stainless steel thermostat which mounts on the terminal box lid to the heater. The connections are made using barrier and non-barrier glands and 3 core cable. The glands may also be terminated through swivel and set 90° elbows.

The heaters are in principle Ex eb protection concept, or Ex db eb when a Ex component thermostat is installed.

The elements within these heaters are sealed as per certificate numbers:

ATEX: ELT 21 ATEX 0025U

IECEX: IECEX ITS 21.0015U

UKEX: ITS 21 UKEX 0260U

All elements with the above heaters are designed as per the parameters below:

The FAW & FCR (FCR-A) are based on a maximum power density at the element sheath of $3.01\text{W}/\text{cm}^2$ at its rated supply voltage, this will give the heaters a temperature class of T3 in an ambient of up to $+40^\circ\text{C}$ and T2 in an ambient up to $+60^\circ\text{C}$.

The FAW & FCR (FCR-A) may also be based on a maximum power density at the element sheath of $1.35\text{W}/\text{cm}^2$ at its rated supply voltage, this will give the heaters a temperature class of T4 in an ambient of up to $+40^\circ\text{C}$.

The FAW-C (FAW-C-T) is based on a maximum power density at the element sheath of $1.1\text{W}/\text{cm}^2$ at its rated supply voltage, this will give the heaters a temperature class of T3 in an ambient of up to $+40^\circ\text{C}$ and T2 in an ambient up to $+60^\circ\text{C}$.

The HFT Thermostat used on the FAW-C-T and the FCR-A has the following certificates covering ATEX, IECEX & UKEX:

ATEX: SIRA 18 ATEX 1238X

IECEX: IECEX SIR 18.0053X

UKEX: ITS 22 UKEX 0280X

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For further details refer to the list of documents / Schedule Drawings on the current Technical File document.

12. Report Number

Intertek Report: 103867040CHE-001 dated 15 August 2023.

13. Special Conditions of Certification

(a). Special Conditions of Use

ISE

- For assembly 150mm minimum stand-off and non-stand-off version, the auxiliary terminal box shall not be mounted nearer than the minimum stand-off distance of 50mm from the main enclosure side/base where the optional anti-condensation heater is mounted.
- For assembly dummy flange version, additionally to the condition above, the installer and/or end user shall ensure that the dummy flange is fully seal welded to the lagging cover and that this cover prevents ingress of hazardous area.

The installer and/or end user shall ensure that the lagging is applied between the dummy flange process and the process flange.

- For assembly Heat shield version, additional to the first condition, the installer and/or end user shall ensure that the heat shields are always left unobstructed.
- For assembly type submersible heater, additional to the first condition, the installer and/or end user shall ensure that the heater is de-energized if the liquid level does not completely cover the heating elements.
- Leads connected to the terminals shall be insulated for the appropriate voltage and this insulation shall extend to within 1 mm of the metal of the terminal throat.
- All the terminal screws, used and unused, shall be tightened down.
- Supply terminal lugs shall be insulated for the appropriate voltage and this insulation shall be set to maintain a minimum clearance of 15mm.
- A suitable temperature controller shall be fitted with a manually re-settable temperature trip (access to which is only possible by use of a tool) set to a maximum of:

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Temperature Class with 150mm Stand-Off		
Temperature Class	Maximum Flange RTD or TC Sensor Setpoint	Maximum Over temperature thermostat Sensor Setpoint
T6	Up To 80°C	Up To 75°C
T5	Up To 95°C	Up To 90°C
T4	Up To 130°C	Up To 125°C
T3	Up To 195°C	Up To 190°C
T2*	Up To 290°C	Up To 285°C
T1*	Up To 440°C	Up To 435°C
Temperature Class with Zero Stand-Off		
T6	Up To 80°C	Up to 75°C
The above table assumes unit vertical (terminal box at top) with maximum number of elements in a 40°C, 50°C or 60°C ambient.		
*T1 & T2 require heat shields and terminal box standoff		

And a trip response to allow the temperature class to be met or the elements shall be suitably down rated to allow an uncontrolled temperature maximum of 80°C (T6), 90°C (T5), 130°C (T4), 195°C (T3) when equated to an ambient of 40°C, 50°C or 60°C as appropriate.

- The safety trip shall be set using the manufacturers setting up procedure number WI/09/131, prior to use, failure to adhere to this mandatory requirement nullified all certification.
- Faulty/replacement safety trip controllers shall be set up as condition above, prior to use, failure to adhere to this mandatory requirement nullified all certification.
- When installing supply cables due note should be taken that the anti-condensation heater without a guard may reach high temperature and the cables shall be routed a minimum of 50 mm away this heat source.
- Conditions of certification concerning the components already certified depend on the relevant certificates.
- When materials in standoff (e.g. heating elements) are Titanium, the heater must be installed in an area of low mechanical (impact) risk
- If painted, electrostatic charging hazard - clean only with a damp cloth.

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FAW/FCR

- FAW & FCR (power density at element surface of 3.01 W/cm²):
 - -60°C to +40°C for T3
 - -60°C to +60°C for T2
 - FAW & FCR (power density at element surface of 1.35W/cm²):
 - -60°C to +40°C for T4
 - FAW-C (power density at element surface of 1.1 W/cm²):
 - -60°C to +40°C for T3
 - -60°C to +60°C for T2
- (b). Conditions of Manufacture
- Each heating element is to be subjected to a routine di-electric strength test in accordance with Clause 6.1 of EN IEC 60079-7:2015+A1:2018.
- For resistance heating devices and resistance heating units to which additional requirements of 5.8 apply: (1000+2Un) V r.m.s., where Un is the rated voltage.
- Each RTD and thermocouple circuit not terminated in a Ex d enclosure or as simple apparatus in an I.S. circuit is to be subjected to a routine dielectric strength test in accordance with Clause 6.1 of EN IEC 60079-7:2015+A1:2018.
- For electrical equipment and Ex Components with rated voltages not exceeding 90 V peak or in which working voltages not exceeding 90 V peak are present: 500 V r.m.s.

14. Essential Health and Safety Requirements (EHSRs)

The relevant Essential Health and Safety Requirements (EHSRs) have been identified and assessed in Intertek Report: 103867040CHE-001 dated 15 August 2023.

15. Drawings and Documents

Title:	Drawing No.:	Rev. Level:	Date:
Ex eb Element Gland ATEX & IECEx & UKEX Approved	2000-12-81	6	16.03.23
Alternative Ex eb Element Gland ATEX & IECEx & UKEX Approved	2003-03-23	6	16.03.23
Ex eb ISEH Type Air/Gas Heater General Arrangement IECEx & UKEX Approved	2003-12-01	9	16.03.23
Ex eb Terminal Box Construction Drawing IECEx & UKEX Approved	2003.12.12	7	17.03.23
Ex eb ISES Type ATEX & IECEx & UKEX Approved Submersible Liquid Tank Heater General Arrangement	2003-12-71	8	17.03.23

This Certificate is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Certificate. Only the Client is authorized to permit copying or distribution of this Certificate and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. This Certificate is accredited under UKAS schedule 0010

Intertek Testing & Certification Limited, Cleeve Road, Leatherhead, Surrey, KT22 7SA
Registered No 3272281 Registered Office: Academy Place, 1-9 Brook Street, Brentwood, Essex, CM14 5NQ.

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Ex eb ISES Type Air/Gas Heater Zero Stand-Off ATEX & IECEx & UKEX Approved General Arrangement	2003-12-80	7	17.03.23
Alternative Element & Flange Temperature Sensor Fitting Detail Drawing Ex eb ISE Type ATEX & IECEx & UKEX Approved Liquid or Air/Gas Heater (2 Sheets)	2003.12.89	5	02.09.22
Ex eb ISEH Type Air/Gas Heater Zero Stand-Off ATEX & IECEx & UKEX Approved General Arrangement	2003-12-90	7	17.03.23
ISE Series Ex eb ATEX & IECEx & UKEX Approved Heater Detail Drawing	2003.12.91	6	17.03.23
Ex eb ISES Type Liquid or Air/Gas Heater ATEX & IECEx & UKEX Approved General Arrangement Drawing	2003.12.92	8	17.03.23
Current Carrying Capacities – ISE Series Heaters (ATEX / IECEx / UKEX Approved)	2003.12.93	05	15.09.22
Schedule of Terminal and Insulators – ISE Series Heaters (ATEX / IECEx / UKEX Approved) (2 Sheets)	2003.12.94	6	23.02.23
Schedule of Thermocouple / RTD / Transmitter Series Heaters (2 Sheets)	2003-12-95	6	17.03.23
Copper Element Link Ex eb ISE Type ATEX & IECEx & UKEX Approved Liquid or Air Gas Heater	2003-12-96	4	05.09.22
Heating Element Terminal Pin Current Carrying Capacities (ATEX / IECEx / UKEX Approved)	2003.12.98	05	15.09.22
Anti-Condensation Heater Mounting Detail ATEX & IECEx & UKEX Approved	2003-12-99	6	17.03.23
Schedule of Temperature Transmitters, Breathers / Drains, Buttons & Switches – ISE Series Heaters (ATEX, IECEx & UKEX Approved)	2003.13.01	1	23.02.2023
Ex eb ISE Type Liquid or Air/Gas Heater Complete with Heat Shields ATEX & IECEx & UKEX Approved General Arrangement	2003-14-92	7	17.03.23

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Ex eb ISES Type Liquid or Air/Gas Heater Complete with Dummy Flange ATEX & IECEX & UKEX Approved General Arrangement	2003-18-01	7	17.03.23
ATEX & IECEX & UKEX Type Solid Hater (Cast In Elements Variant) General Arrangement	2003-21-01	4	17/03/23
Ex eb ISES Type Air/Gas heater 150mm Stand-Off General Arrangement ATEX & IECEX & UKEX Approved	2003-50-91	4	17.03.23
Alternative 12.5mm Element Ex eb Box Fitting Details ATEX & IECEX & UKEX Approved	2004-03-24	6	17.03.23
Ex eb ISES/H Type Heater Element Manufacturing Parameter ATEX & IECEX & UKEX Approved	2004.15.04	5	17.03.23
Ex eb Cartridge Heating Element Manufacturing Parameters ATEX & IECEX & UKEX Approved	2004-16-04	3	05.09.22
Nameplate for ISE Type ATEX / IECEX / UKEX Approved Heaters (2 Sheets)	2004.50.41	8	17.03.23
Gas Detector / ATEX & IECEX & UKEX Approved Terminal Box Assembly Drawing	2004-50-42	3	17.03.23
General Arrangement Ex db eb ISE Type ATEX & IECEX & UKEX Approved Liquid or Air/Gas Heater with Thermostatic Control	2004-50-90	7	17.03.23
Nameplate For ISE Type ATEX / IECEX / UKEX Approved Enclosures	2004-50-91	1	20.03.23
Installation, Operation & Maintenance Instructions Manual Appendix X IOM Ex Heater Annex	Cert 005	0	04th October 2022
FAW Range (standard) General Arrangement Drawing Industrial Product ATEX, IECEX & UKEX	2004-17-01	04	30.09.22
FAW, FAW-C, FAW-C-T & FCR, FCR-A Range Terminal Box General Arrangement Drawings Industrial Product ATEX, IECEX & UKEX (2 Sheets)	2004-17-12	06	20.06.23
FAW-C & FAW-C-T Air Heating Element 8.5mm, ATEX, IECEX & UKEX Industrial Product 8.5mm up to 12mm	2004-17-14	04	20.06.23
FAW, FCR & FCR-A Air Heating Element 12.5mm, ATEX, IECEX & UKEX Industrial Product	2004-17-15	03	30.09.22
FAW-C-T Type Range Nameplate General Arrangement Drawing Industrial Product ATEX, IECEX & UKEX	2004-17-40	03	30.09.22
FAW-C Type Range Nameplate General Arrangement Drawing Industrial Product ATEX, IECEX & UKEX	2004-17-41	05	30.09.22

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FAW Type Range Nameplate General Arrangement Drawing Industrial Product ATEX, IECEX & UKEX	2004-17-42	03	30.09.22
Supplementary Data Sheet: ATEX & UKEX Page 1 of 2	2004-17-90	04	30.09.22
Supplementary Data Sheet: IECEX Page 2 of 2	2004-17-90	04	30.09.22
FAW-C Range General Arrangement Drawing Industrial Product ATEX, IECEX & UKEX	2004-17-91	04	30.09.22
FAW-C-T (Thermostat Option) General Arrangement Drawing Industrial Product ATEX, IECEX & UKEX	2004-17-92	03	30.09.22
FAW Type General Wiring Details General Arrangement Drawing ATEX, IECEX & UKEX Industrial Product	2004.17.94	03	30.09.22
FAW-C & FAW-C-T Range Hazardous Area Air Warmer Wiring ATEX, IECEX * UKEX Single Phase 4 Elements in Parallel 110/240V (Sheet 1 of 3)	2004.17.95	03	30.09.22
FAW-C- & FAW-C-T Range Hazardous Area Air Warmer Wiring ATEX, IECEX & UKEX 3PH 3 Element & 1PH 3 Element in Parallel 110/240/415V (Sheet 2 of 3)	2004.17.95	03	30.09.22
FAW-C & FAW-C-T Range Hazardous Area Air Warmer Wiring ATEX, IECEX & UKEX Single Phase 2 Elements in Parallel 110/240V (Sheet 3 of 3)	2004.17.95	03	30.09.22
FCR Type Convector Heater General Arrangement Drawing Industrial Product ATEX, IECEX & UKEX	2004-27-01	04	30.09.22
FCR-A (Thermostat Option) General Arrangement Drawing Industrial Product ATEX, IECEX & UKEX	2004-27-02	03	30.09.22
FCR Type Range Nameplate General Arrangement Drawing Industrial Product ATEX, IECEX & UKEX	2004-27-40	03	30.09.22
FCR-A Type Range Nameplate General Arrangement Drawing Industrial Product ATEX, IECEX & UKEX	2004-27-41	03	30.09.22
FCR & FCR-A Type General Wiring Details General Arrangement Drawing ATEX, IECEX & UKEX Industrial Product	2004.27.94	03	30.09.22
Installation Operation and Maintenance Instructions FAW, FAW-C & FAW-C-T Type Air Warmers FCR & FCR-A Type Convectors	-	First Edition	OCT 2022

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