



# 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 ITS 23.0018X**

Page 1 of 3

[Certificate history](#):

Status: **Current**

Issue No: 0

Date of Issue: 2023-09-07

Applicant: **Alleima India Private Limited (Formerly Sandvik Materials Technology India Private Limited)**  
Plot No. 49 and 49B, SIPCOT Industrial Complex Hosur - 635126,  
Tamil Nadu  
India

Equipment: **Increased Safety Electrical Heater - Terminal Enclosure**

Optional accessory:

Type of Protection: **Increased Safety and Dust Ignition Protection by Enclosure**

Marking: Ex eb IIC T6..T1 Gb

Ex tb IIIC T75°C.. T430°C Db IP66

-40°C / -20°C ≤ Ta ≤ +45°C / +60°C

IECEx ITS 23.0018X

Approved for issue on behalf of the IECEx  
Certification Body:

**Mark Newman**

Position:

**Certificate Officer**

Signature:  
(for printed version)

Date:  
(for printed version)

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**Intertek Testing & Certification Limited**  
ITS House, Cleeve Road  
Leatherhead  
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United Kingdom

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Page 2 of 3

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Manufacturing locations: **Alleima India Private Limited  
(Formerly Sandvik Materials  
Technology India Private Limited)**  
Plot No. 49 and 49B, SIPCOT  
Industrial Complex Hosur - 635126,  
Tamil Nadu  
India

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 60079-31:2022** Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure "t"  
Edition:3.0

**IEC 60079-7:2017** Explosive atmospheres - Part 7: Equipment protection by increased safety "e"  
Edition:5.1

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/ITS/ExTR23.0015/00](#)

Quality Assessment Report:

[GB/ITS/QAR12.0006/05](#)



# IECEx Certificate of Conformity

Certificate No.: **IECEx ITS 23.0018X**

Page 3 of 3

Date of issue: 2023-09-07

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## EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

The 1 Ø, 3 Ø - 3/4 Wire 50/60Hz Electrical Heater- Terminal Enclosure having operating voltage upto 690V, upto 5378kW with max. current of upto 4500A, is designed to be used in hazardous areas.

See Annex for full details.

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

1. All unused threaded entries require suitably certified blanking device to be fitted in order to maintain the integrity of the Increased Safety Heater enclosure.
2. The heating elements are to be connected with high temperature cables suitable for min. 125°C.
3. All the temperature probes are to be suitably mechanically protected and terminated in a suitable terminal facility. The temperature sensors might be influenced by the temperature of the process medium. It shall be verified that the nipple for the process where connected to the enclosure, shall not exceed 80°C.
4. As indicated in the Installation, Operation & Maintenance instructions, the factory settings of the Thermocouple/RTD temperature controller are not to be changed. Controls are set according to T class or temperature rating as detailed in the Installation, Operation & Maintenance instructions. The Increased Safety Terminal Enclosure T class / temperature is selected and marked on the label, the control device set to the respective value. Change in set points will void the certification requirements.
5. For assembly 100 mm minimum stand-off and non-stand-off versions, the auxiliary terminal box shall not be mounted nearer than the minimum stand-off distance of 50mm from the main enclosure side/base when the optional anti-condensation heater is mounted.
6. For assembly dummy flange version, additionally to the condition as detailed 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.
7. For assembly Heat shield version, the installer and/or end user shall ensure that the heat shields are left unobstructed at all times.
8. For assembly type submersible heater, 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.
9. 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.
10. All the terminal screws, bolts used and unused shall be tightened with the rated torques.
11. Supply terminal lugs shall be insulated for the appropriate voltage and this insulation shall be set to maintain a minimum clearance of 12mm for 690V/10mm for 480V/8mm for 415V.
12. A suitable temperature controller shall be fitted with a manually re-settable temperature trip (access to which is only possible by use of a key or tool) set to a maximum of:
  - a. T6 - 75°C
  - b. T5 - 90°C
  - c. T4 - 120°C
  - d. T3 - 180°C
  - e. T2 - 280°C (Heat shield and dummy flange versions only)
  - f. T1 - 430°C (Heat shield and dummy flange versions only)
13. 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), 120°C (T4), 180°C (T3), 280°C (T2) and 430°C (T1) when equated to an ambient of 60°C as appropriate.
14. The anti-condensation heater supply shall be interlocked to prevent energize whilst the main power is present.
15. Use suitable cables rated for a temperature of at least 90°C (for ambient temperature ≤45°C) and 105°C (for 45°C to 60°C) for mains connections.
16. The clearance hole for plain entries having diameter not more than 0.7mm greater than the nominal diameter of the thread entry.

## Annex:

[SFT IECEx OP 19f Annex for IECEx CoC\\_1.pdf](#)

<b>Certificate No:</b>	IECEx ITS 23.0018X	<b>Issue No. 0</b>
<b>Annex No. 1</b>		

<b>Technical Documents</b>			
<b>Title:</b>	<b>Drawing No.:</b>	<b>Rev. Level:</b>	<b>Date:</b>
General Spec. for Electrical Heater (ATEX Ex e / IECEx e Enclosure) Sheet 1 of 6	PHS-IECEXE-001	0	20.07.2023
G A Drawing for Electrical Heater (ATEX Ex e / IECEx e Enclosure) Sheet 2 of 6	PHS-IECEXE-001	0	20.07.2023
G A Drawing for Electrical Heater (ATEX Ex e / IECEx e Enclosure) Sheet 3 of 6	PHS-IECEXE-001	0	20.07.2023
Terminal Box Drg. for Electrical Heater (ATEX Ex e / IECEx e Enclosure) Sheet 4 of 6	PHS-IECEXE-001	0	20.07.2023
Circuit Drawing for Electrical Heater (ATEX Ex e / IECEx e Enclosure) Sheet 5 of 6	PHS-IECEXE-001	0	20.07.2023
Marking Plate Detail for Electrical Heater (ATEX Ex e / IECEx e Enclosure) Sheet 6 of 6	PHS-IECEXE-001	0	20.07.2023
Installation, Operation & Maintenance Manual (20 Sheets)	AIPL/IECEXE/PHS	00	20.07.2023

<b>Description of Equipment</b>	
The 1 Ø, 3 Ø - 3/4 Wire 50/60Hz Electrical Heater- Terminal Enclosure having operating voltage upto 690V, upto 5378kW with max. current of upto 4500A, is designed to be used in hazardous areas. The Electrical Heater comprises an Increased Safety Terminal Enclosure body and cover made of stainless steel with alternative material SS304, SS321, SS316, SS316L with or without painting, with/without gland plates of the same material. This Increased Safety Terminal Enclosure comes in a wide range of size from 200mm x 150mm x 150mm up to 1500mm x 1500mm x 500mm. The Self-adhesive Silicone gasket is bonded to the lid of the box and gland plates which are closed by M6 or M8 hexagonal head screw with associated to rivet bushes. The terminal box cover is retained by Cam Lock or Key Locks and back cover with Cam Lock or Key Locks or bolts which also provide compression of Silicone gasket installed in between the enclosure and cover. The Main supply cables enter the Increased Safety Terminal Enclosure via "Ex eb" certified cable glands fitted into the gland plates.	
The Electrical Heaters are made of Alloy800, Alloy825, Alloy840, Alloy625, Alloy600, Hastalloy 276, Duplex, Super-duplex, SS310, SS321, SS316, SS316L, SS304. The Electrical Heating System consists of U/multiple U/Straight shaped sheathed heating elements either strength welded, thread fitted, silver brazed, onto the process side mounting tube sheet or welded, thread fitted, silver brazed, silicon grommet, onto a standoff connection fitted to the base of the terminal enclosure. These elements may be paralleled / series together with small connection strips / cable loops before being connected to the Main bus bar / connectors for the connections of the supply terminals. The heating elements are connected in 1 phase or 3 phase Delta / Star mode.	
The Terminal box enclosure is also provided with thermocouple / RTD for sensing the temperature inside the heater box assembly (optional if operating temperature is less than T class). The temperature sensor provided inside the terminal enclosure is to protect the components and wiring inside the terminal enclosure in line with their maximum temperature limit. The maximum temperature inside terminal enclosure should be less than 90°C/75°C and the temperature sensor inside the terminal enclosure should trip if the temperature exceeds beyond 90°C for T Class T1 to T5 & 75°C for T Class T6 requirements. Terminal enclosure assembly is also provided with the optional Anti-Condensation Heaters (ACH) which will operate only in the absence of the main power to heaters, to avoid the condensation inside the heater terminal enclosure. The Silicone gasket maintains the ingress protection rating of the enclosure. The terminal enclosures are provided with internal and external earthing	

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<b>Certificate No:</b>	IECEx ITS 23.0018X	<b>Issue No. 0</b>
<b>Annex No. 1</b>		

<b>Description of Equipment</b>						
facilities.						
Each heater bundles are provided with Thermocouples / RTDs / Temperature sensors for sensing heating element sheath skin temperature. The measured temperature signals are transmitted to auxiliary terminal enclosure which may be positioned on any side providing that it is not within the stand-off area. This auxiliary terminal enclosures are designed on the same principles of the main enclosure. The temperature sensors are connected via "Ex eb" certified terminals. Temperature sensors duly certified are terminated inside the instrument enclosure separately and are inserted into vessel side in the process and also attached to the heater elements sheath at anticipated highest sheath temperature. Atleast One no temperature sensor mounted on the sheath and atleast one no temperature sensor mounted inside the terminal enclosure to sense the respective temperatures. One no. thermocouple / RTD / Temperature Sensor provided on the heater flange (tube sheet) surface temperature (not required if the fluid operating temperature is below T-class setting) and the setting is done at max. as per T class temperature (@) to cut OFF the heater power, in case temperature rises above the set value.						
The Thermocouple / RTD / Temperature Sensor, terminations of which are housed in Ex d or Ex e certified enclosures and are touching the tubesheet / heater flange for temperature class protection. Duplex Thermocouples / RTDs / Temperature Sensors are mounted on tubesheet (heater flange) for sensing heating element sheath skin temperature at the highest anticipated sheath skin temperature location. The terminal enclosure is also provided with a thermocouple/RTD/temperature sensor for sensing the temperature inside, If the temperature of either of the temperature sensing devices rises above the set point, then heater control panel will cut off the power supply to heater.						
The output from temperature transmitter or thermocouples or RTD are connected to the Controller situated in Safe Zone. The controller is suitable to attain the predefined temperature class of T1, T2, T3, T4, T5 & T6 (Controller set at 430°C for T1, 280°C for T2, 180°C for T3, 120° for T4, 90°C for T5, 75°C for T6).						
<b>Model No.</b>	<b>Enclosure Dimensions (mm)</b>			<b>Max. kW Rating at 690 V (V x I x v3) / 1000</b>	<b>Max. kW. Rating at 415 V</b>	<b>Max. Line Current Rating (Amps.)</b>
	<b>Length</b>	<b>Width</b>	<b>Depth</b>			
KIEX-15015050	1500	1500	500	5378	3235	4500
KIEX-15012050	1500	1200	500	4302	2588	3600
KIEX-12015050	1200	1500	500	4302	2588	3600
KIEX-15012040	1500	1200	400	3466	2085	2900
KIEX-12015040	1200	1500	400	3466	2085	2900
KIEX-1209050	1200	900	500	2749	1653	2300
KIEX-9012050	900	1200	500	2749	1653	2300
KIEX-1209040	1200	900	400	2211	1330	1850
KIEX-9012040	900	1200	400	2211	1330	1850
KIEX-1008050	1000	800	500	2032	1222	1700
KIEX-8010050	800	1000	500	2032	1222	1700
KIEX-1008040	1000	800	400	1613	970	1350
KIEX-8010040	800	1000	400	1613	970	1350
KIEX-907040	900	700	400	1434	863	1200
KIEX-709040	700	900	400	1434	863	1200
KIEX-806040	800	600	400	1195	719	1000
KIEX-608040	600	800	400	1195	719	1000

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## Annex to IECEx Certificate of Conformity

<b>Certificate No:</b>	IECEx ITS 23.0018X	<b>Issue No. 0</b>
<b>Annex No. 1</b>		

Description of Equipment						
KIEX-705035	700	500	350	777	467	650
KIEX-507035	500	700	350	777	467	650
KIEX-604030	600	400	300	538	323	450
KIEX-406030	400	600	300	538	323	450
KIEX-503030	500	300	300	362	218	303
KIEX-305030	300	500	300	362	218	303
KIEX-383821	380	380	210	331	199	277
KIEX-403020	400	300	200	239	144	200
KIEX-302015	300	200	150	120	72	100
KIEX-201515	200	150	150	60	36	50

The temperature class (gas) or the maximum surface temperature (dust) is determined according to the maximum flange temperature and marked on the label.

Temp. Classification "**" T1...T6	Heater Flange Sensor Cut OFF Set Point " # " T430°C...T75°C	Orientation Horizontal / Vertical (H/V)	Min. Air Gap Between Flange and Terminal Box	Min. No. of Heat Shield Baffles	Flange Sensor Set Point Max. (@)	Heater Terminal Box Thermocouple/RTD Cut OFF Set Point
T1 (450°C)	T430°C	H/V	150 mm	2 3	430°C	90°C
T2 (300°C)	T280°C	H/V	150 mm	2 3	280°C	90°C
T3 (200°C)	T180°C	H/V	150mm	-	180°C	90°C
T4 (135°C)	T120°C	H/V	100mm	-	120°C	90°C
T5 (100°C)	T90°C	H/V	100mm	-	90°C	90°C
T6 (85°C)	T75°C	H/V	100mm	-	75°C	75°C
T Class with Zero stand off						
T5 (100°C)	T90°C	H/V	-	-	Upto 90°C	90°C
T6 (85°C)	T75°C	H/V	-	-	Upto 75°C	75°C

Interlocking of power supply to the heater (in case of heating element skin over temperature & heater flange over temperature) is achieved by wiring the relay contacts of temperature controllers in series with the coil of main contactor of power controller.

## Annex to IECEx Certificate of Conformity

<b>Certificate No:</b>	IECEx ITS 23.0018X	<b>Issue No. 0</b>
<b>Annex No. 1</b>		

Description of Equipment			
Ex Auxiliary equipments used for the assembly of the Increased Safety Electrical Heater - Terminal Enclosure:			
<b>Ex auxiliary equipment</b>	<b>Manufacturer</b>	<b>IECEx Certificate No.</b>	<b>Ex Marking</b>
Temperature Transmitter	Honeywell, Inc.	IECEx SIR 14.0020X Issue 6	Ex db IIC T6...T5 Gb Ex tb IIIC T95°C Db Ta: -50°C to + 65°C for Ex db T6 Ta: -50°C to + 85°C for Ex db T5 Ta: -50°C to + 85°C for Ex tb
	Rosemount Incorporated	IECEx BAS 07.0002X Issue 4	Ex ia IIC T6 Ga (-60°C ≤ Ta ≤ +50°C) Ex ia IIC T5 Ga (-60°C ≤ Ta ≤ +75°C)
	Yokogawa	IECEx KEM 07.0044X Issue 11	Ex db IIC T6 / T5 Gb Ex tb IIIC T70°C / T90°C Db
Thermocouple/RTD For Terminal Box/Flange/Skin Temperature	Pyro Electric Instruments Goa Pvt Limited	IECEx BAS 17.0037X Issue 0	Ex db eb IIC T6...T1 Gb (Tamb = -20°C ≤ Ta ≤ +60°C)
	Yamari	IECEx TUR 15.0013X Issue 3	Ex db eb IIC T6...T1 Gb Ex tb III C T110°C Db
	WIKA Alexander Wiegand SE & Co. KG	IECEx BVS 11.0042X Issue 5	Ex db IIC <sup>2,3</sup> Gb Ex tb IIIC <sup>2,3</sup> Db -40°C ... 85 °C Ex db IIC <sup>2,3</sup> T6 Gb Ex tb IIIC Db -40°C ... 80°C <sup>2</sup> The temperature class depends on the ambient temperature. <sup>3</sup> The maximum surface temperature at the tip of the probe or thermowell = Process temperature + self-heating. Information are given in the manual.
Terminal Block For Instrument Junction Box	Weidmuller Interface GmbH & Co. KG	IECEx ULD 14.0005U Issue 7	Ex eb IIC Gb -60°C to +110°C
	Phoenix Contact GmbH & Co. KG	IECEx KEM 06.0029U Issue 7	Ex eb IIC Gb -60°C to +110°C
Instrument Junction Box (Optional)	Hoffman Enclosures Inc.	IECEx SIR 09.0099U Issue 9	Ex eb IIC Gb Ex tb III C Db -55°C to + 180°C
	Pepperl +Fuchs SE	IECEx CML 16.0007x Issue 3	Ex ia IIC T* Ga Ex eb IIC T* Gb Ex tb III C T***°C Db -40°C to + 120°C
	Rose Systemtechnik GmbH	IECEx PTB 07.0060X Issue 6	Ex db eb ia [ia Ga] mb [op is] op pr IIC T6... T4 Gb Ex tb IIIC T85°C... T135°C Db

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## Annex to IECEx Certificate of Conformity

<b>Certificate No:</b>	IECEx ITS 23.0018X	<b>Issue No. 0</b>
<b>Annex No. 1</b>		

Description of Equipment			
	Rittal Private Limited	IECEx ITS 23.0007U Issue 1	Ex eb IIC Gb Ex tb IIIC Db Tamb -50°C to +180°C

Required Manufacturer Routine Testing		
Test	Title/Description of Test	Standard and Clause
1	<p>A routine Dielectric Strength test to be carried out on each Terminal enclosure:</p> <ul style="list-style-type: none"> <li>• either as given in a relevant industrial standard for the individual items of electrical equipment <b>or</b></li> <li>• 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.</li> <li>• where working voltages in excess of 90 V peak are present: <math>(1000 + 2Un)</math> V r.m.s. or 1500 V r.m.s. whichever is greater, where <math>U</math> is the working voltage, at the appropriate voltage to each part for a period of at least 60 seconds and test results must be recorded.</li> </ul>	IEC 60079-7:2017 Clause 7.1