



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

Certificate No.: **IECEX SIR 18.0027U** Page 1 of 3 [Certificate history:](#)

Status: **Current** Issue No: 0

Date of Issue: 2019-11-28

Applicant: **MINCO PRODUCTS INC.**
7300 Commerce Lane NE
Minneapolis, MN 55432
United States of America

Equipment: **Type B216681 a b c d e f Temperature Sensors**

Optional accessory:

Type of Protection: **Intrinsically Safe and Increased Safety**

Marking: Ex ia IIC Ga
Ex eb IIC Gb
Ex ic IIC Gc
Ex ec IIC Gc
Refer to Product Description, service temperature and maximum surface temperature table

Approved for issue on behalf of the IECEx
Certification Body:

Neil Jones

Position:

Certification Manager

Signature:
(for printed version)

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 www.iecex.com or use of this QR Code.



Certificate issued by:

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





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Manufacturer: **MINCO PRODUCTS INC.**
7300 Commerce Lane NE
Minneapolis, MN 55432
United States of America

Additional
manufacturing
locations: **MINCO SAS**
Zone Industrielle
09310 Aston
France

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 60079-11:2011 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:6.0

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/SIR/ExTR19.0307/00](#)

Quality Assessment Reports:

[FR/LCIE/QAR12.0001/09](#)

[NL/DEK/QAR12.0028/06](#)



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EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

The B216681 model series Miniature Temperature Sensor are evaluated as components for use in particular installations. The B216681 is comprised of either thermocouple (E, J, K or T) or RTD (Resistance Temperature Detectors) type sensors, and are available in single or dual element configurations with a variety of case designs. Various springs and rings are available to fit flanged case sensors (Minco case type B). Case tip Babbitt layer available on Minco case styles A and B.

The B216681 is provided with flying leads from 18 AWG (0.823 mm²) to 30 AWG (0.05 mm²) in various lengths, depending upon the configuration, within a braided stainless steel jacket. The sensing element is enclosed by a metallic case, which is filled with a non-metallic cement / solid insulation. Optional accessories (i.e. case-tip Babbitt layers, springs and retaining rings and feedthrough) are not considered to contribute to the protection concept.

The operating ambient temperature range is -60°C to +200°C (apart from RTDs with an elastomer-filled cable, which is limited to +125°C).

Refer to the Annexe fo additional information

Refer to the Annexe

Annex:

[IECEx SIR 18.0027U Issue 0 Annexe.pdf](#)

Annexe to: IECEx SIR 18.0027U Issue 0

Applicant: Minco Products Incorporated

Apparatus: Type B216681 a b c d e f Temperature Sensors,



Resistance temperature detector (RTD) sensors are designed to be installed in or beneath the Babbitt layer of bearing shoes. They monitor metal temperature to give early warning of oil film breakdown before catastrophic failure can occur. RTDs have metal cases and insulated leads to withstand rough handling and harsh environments.

Ambient Temperature (Connecting Parts):

$$-60^{\circ}\text{C} \leq T_{\text{amb}} \leq +125^{\circ}\text{C}$$

Process Temperature (Sensor Location):

Thermocouple

$$-60^{\circ}\text{C} \leq T_{\text{amb}} \leq +200^{\circ}\text{C}$$

Resistive

$$-60^{\circ}\text{C} \leq T_{\text{amb}} \leq +200^{\circ}\text{C}$$

Resistive Limitation with feedthrough

$$-60^{\circ}\text{C} \leq T_{\text{amb}} \leq +85^{\circ}\text{C} \text{ (Available to } +135^{\circ}\text{C} \text{ on special order)}$$

RTD leadwire limitations:

Temperature range reducing to 180°C (356°F) for Polyimide insulated Leadwires.

Temperature range reducing to 180°C (356°F) for FEP Jackets on cables.

Temperature range reducing to 125°C (257°F) for Elastomer filled cables.

Thermocouple Leadwire limitations:

Temperature range reducing to 180°C (356°F) for Polyimide insulated Leadwires.

Temperature range reducing to 180°C (356°F) for FEP Jackets on cables.

Temperature range reducing to 125°C (257°F) for Elastomer filled cables.

Lead Wire Covering temperature limitations:

Designation	Description	Rating	Maximum Surface Temp assigned
T	PTFE insulated leads only	260°C	200°C
S	Stainless Steel Braid over PTFE Insulated Leads	260°C	200°C
F	FEP over TFE Insulated leads	200°C	135°C
R	FEP over stainless steel braid	200°C	135°C
E	FEP over stainless steel braid with Elastomer Fill	125°C	85°C
K	Polymide insulated leads only	200°C	135°C
KS	Stainless steel braid over polyimide insulated leads	200°C	135°C
P	PFA Teflon insulated leads Thermocouple Only	260°C	200°C
PS	Stainless Steel Braid over PFA Teflon insulated leads Thermocouple Only	260°C	200°C

For Ex ia protection:

Entity parameters:

$$U_i = 30 \text{ V}$$

$$I_i = 46 \text{ mA}$$

$$P_i = 0.4 \text{ W}$$

$$\text{Cable: } C_i = 0.28 \text{ nF/m}$$

$$L_i = 0.0013 \text{ mH/m}$$

$$R_i = 0.16 \text{ } \Omega/\text{m}$$

Date: 28 November 2019

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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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Web: www.csagroupuk.org

Annexe to: IECEx SIR 18.0027U Issue 0

Applicant: Minco Products Incorporated

Apparatus: Type B216681 a b c d e f Temperature Sensors,



For increased Safety, Ex eb / ec protection:

$U_i = 30 \text{ V}$

$I_i = 46 \text{ mA}$

$P_i = 0.4 \text{ W}$

Schedule of Limitations

- i. For EPL Gb and Gc, this device must be installed in an appropriately certified (e.g. Ex p, Ex d, Ex eb/ec, Ex nA or equivalent protection concept) enclosure, which provides a minimum ingress protection of at least IP54 and meets the enclosure requirements of IEC/EN 60079-0 and IEC/EN 60079-7.

Temperature

The hazardous locations maximum surface temperature assigned is contingent upon the rated ambient and process temperatures, as well as the power dissipated in the sensing element, as follows.

Model (RTD) S___ power dissipation	Maximum surface temperature assigned				
	85°C	100°C	135°C	200 °C	350 °C
	Maximum ambient / process temperature				
0.1 W	+70°C	+85°C	+120°C	+185°C	+200°C
0.2 W	+65°C	+80°C	+115°C	+180°C	+200°C
0.4 W	+50°C	+65°C	+100°C	+165°C	+200°C

Model TC___ power dissipation	Maximum surface temperature assigned				
	85°C	100°C	135°C	200 °C	350 °C
	Maximum ambient / process temperature				
0.1 W	+70°C	+85°C	+120°C	+185°C	+200°C

Conditions of Manufacture

- i. In accordance with IEC 60079-11:2011 clause 10.3, each manufactured sample of the equipment shall be subjected to an electric strength test using a test voltage of 500 Vac applied between the leads and enclosure. There shall be no evidence of flashover or breakdown and the maximum current flowing shall not exceed 5 mA.