



# 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)

### Ex COMPONENT CERTIFICATE

Certificate No.: **IECEX DEK 15.0018U** Page 1 of 4 [Certificate history:](#)  
[Issue 0 \(2017-06-12\)](#)

Status: **Current** Issue No: 1

Date of Issue: 2019-11-02

Applicant: **Minco Products Inc.**  
7300 Commerce Lane NE  
Minneapolis, MN 55432  
**United States of America**

Ex Component: Resistance Temperature Detector for Stator Windings, Type B217137

*This component is NOT intended to be used alone and requires additional consideration when incorporated into other equipment or systems for use in explosive atmospheres (refer to IEC 60079-0).*

Type of Protection: **Ex e, Ex ia**

Marking: Ex e IIC Gb  
Ex ia IIC Ga

Approved for issue on behalf of the IECEX  
Certification Body:

**T. Pijpker**

Position:

**Certification Manager**

Signature:  
(for printed version)

Date:

2019-11-02

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



Certificate issued by:

**DEKRA Certification B.V.**  
Meander 1051  
6825 MJ Arnhem  
Netherlands





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Manufacturer: **Minco Products Inc.**  
7300 Commerce Lane NE  
Minneapolis, MN 55432  
**United States of America**

Additional  
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 60079-0:2011** Explosive atmospheres - Part 0: General requirements  
Edition:6.0

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

**IEC 60079-7:2006-07** Explosive atmospheres - Part 7: Equipment protection by increased safety "e"  
Edition:4

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 Reports:

[NL/DEK/ExTR15.0015/00](#)

[NL/DEK/ExTR15.0015/01](#)

Quality Assessment Report:

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



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**Ex Component(s) covered by this certificate is describe below:**

Resistance Temperature Detectors for Stator Windings, Type B217137 is intended to be built into the stator slots of rotating electrical machines. Versions for 2-, 3- or 4-wire measurement circuits and single or dual elements are available. The RTD is capable to be applied as a component in an entire safety chain up to SIL 3.

For details about electrical data and thermal data see Annex 1 to this certificate.

**SCHEDULE OF LIMITATIONS:**

N/A



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**DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)**

The RTD is capable to be applied as a component in an entire safety chain up to SIL 3.

**Annex:**

[382035400-Annex1\\_1.pdf](#)

**Annex 1 to ExTR NL/DEK/ExTR15.0015/01**  
**Annex 1 to Certificate of Conformity IECEx DEK15.0018U, issue 1**  
**Annex 1 to EU-Type Examination Certificate DEKRA 15ATEX0027 U, issue 1**

**Electrical data**

In type of protection increased safety Ex e IIC:  
 Measuring current: max. 10 mA  
 Power: max. 1.5 W  
 Operating voltage: max. 20 V  
 Note) Point, “.” is used as decimal separator.

In type of protection intrinsic safety Ex ia IIC, with following maximum values:  
 U<sub>i</sub> = 20 V; P<sub>i</sub> = 170 mW; C<sub>i</sub> = 84 pF; L<sub>i</sub> = 4 µH (including cable with a length of 3 m).

**Thermal data**

Operating temperature range -50 °C to +180 °C.

When used in type of protection intrinsic safety Ex ia IIC, the relation between maximum ambient temperature T<sub>Amax</sub> and the maximum input power P<sub>i</sub> is shown in the following table.

P <sub>i</sub>	T <sub>Amax</sub> for Temperature class T6	T <sub>Amax</sub> for Temperature class T5	T <sub>Amax</sub> for Temperature class T4	T <sub>Amax</sub> for Temperature class T3
10 mW	78 °C	93 °C	128 °C	180 °C
50 mW	70 °C	85 °C	120 °C	180 °C
100 mW	60 °C	75 °C	110 °C	175 °C
170 mW	45 °C	60 °C	95 °C	160 °C

**Functional Safety**

As a safety device in accordance with EN 50495, the RTD is used as a component of a full system, and the safety parameters are calculated for the RTD only. The entire safety chain (the complete security device with RTD included) must fulfill the requirements of the safety function, according to table 1 of EN 50495:

For use in category 2 (zone 1 with Ex eb) a SIL=2 with a HFT=0 (single RTD) is required.

For use in category 1 (zone 0 with Ex ia) a SIL=2 with a HFT=1 (dual RTD or two RTDs in same motor phase) is required.

The following table indicates results for a maintenance interval of 20 years:

Parameter	Single Sensor RTD with detection of open and short circuit	Two Single Sensor RTDs installed in same motor phase with detection of open and short circuit	Dual Sensor RTD with detection of open, short circuit, and drift
HFT	0	1	1
SFF	83%	83%	90%
PFD <sub>avg</sub>	7.18 x 10 <sup>-3</sup>	7.18 x 10 <sup>-3</sup>	9.45 x 10 <sup>-4</sup>
PFH [1/h]	82 x 10 <sup>-9</sup>	82 x 10 <sup>-9</sup>	11 x 10 <sup>-9</sup>
SIL	2	2	3

Ordinary industrial RTDs typically drift less than 0.1 °C/year. This drift may be positive or negative, but worse case would be a drift of ±2.0 °C based on 0.1 °C\*20 year life used in MTBF.