



## SIL DECLARATION OF CONFORMITY

**Manufacturer:** ABB Automation Products GmbH  
**Address:** Borsigstraße 2 – D-63755 Alzenau  
**Product name:** Temperature Sensor SensyTemp TSS... , TSH... , TSC...  
 Temperature Sensor SensyTemp MI. , BA. , BE. , UT. , MA. , AN. , SF. , ST. ,  
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### FIT Failure rates acc. Functional safety according to IEC 61508

We as the manufacturer declare that the a.m. products are suitable for the use in a safety related application up to SIL 2 single configuration and SIL 3 dual configuration according to IEC 61508 Edition2000, provided that the attached safety instructions are observed. The assessment of the safety critical and dangerous random errors results, in case of an annual function test, in the following parameters:

#### Sensor Option:

Temperature Sensor	Fehler	low stress close coupled	high stress close coupled	low stress extension wire	high stress extension wire
Thermocouple	Open circuit Short circuit Drift	95 FIT 4 FIT 1 FIT	1900 FIT 80 FIT 20 FIT	900 FIT 50 FIT 50 FIT	18000 FIT 1000 FIT 1000 FIT
4-wire RTD	Open circuit Short circuit Drift	41,5 FIT 2,5 FIT 6 FIT	830 FIT 50 FIT 120 FIT	410 FIT 20 FIT 70 FIT	8200 FIT 400 FIT 1400 FIT
2/3-wire RTD	Open circuit Short circuit Drift	37,92 FIT 1,44 FIT 8,64 FIT	758,4 FIT 28,8 FIT 172,8 FIT	370,5 FIT 9,5 FIT 95 FIT	7410 FIT 190 FIT 1900 FIT

\*) Remark 1 FIT =  $1 \cdot 10^{-9}$ , Failure rates acc. FMEDA Report Exida ABB 06/05-29 R029 V2, Nov. 2009

15.07.2010

Date

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## Function test

Perform quick tests of thermocouples and resistance thermometers as well as the associated measuring circuits in the uninstalled state.

Instruments required:

- Millivolt meter
- Resistance meter or resistance bridge
- Isolation meter with 60 ... 100 V voltage (all measurements at room temperature)

The following tests can be performed:

- Check opening and isolation at room temperature

A thermocouple is regarded as functioning correctly when  $R < 20 \Omega$  (wire  $> 0.5 \text{ mm } \varnothing$ ).

The value depends on the wire cross section and the length.  
 $R_{isol} = 110 \text{ M}\Omega$  (with isolated thermocouple).

A resistance thermometer is regarded as functioning correctly when  $R \gg 110 \Omega$  (for Pt100),  $R_{isol} > 100 \text{ M}\Omega$ .

- The heating of the thermocouples or resistance thermometers to approx.  $200 \text{ }^\circ\text{C}$  to  $400 \text{ }^\circ\text{C}$  (without temperature controls) allows for further conclusions to be drawn about interruptions, reversed polarity (with thermocouples), too little isolation resistance, etc.

The accuracy of temperature sensors according to the ISO 9000 requirements can only be checked by comparison with a reference element. In most cases, the deinstallation and test in a test oven are necessary.