



# Certificate / Certificat Zertifikat / 合格証

UEC 1602130 C002

*exida* hereby confirms that the:

## 120 Series

### Pressure and Temperature Switches

**United Electric Controls  
Watertown, MA - USA**

Has been assessed per the relevant requirements of:

**IEC 61508 : 2010 Parts 1-7**

and meets requirements providing a level of integrity to:

**Systematic Capability: SC 3 (SIL 3 Capable)**

**Random Capability: Type A Element**

**SIL 1 @ HFT=0; SIL 2 @ HFT = 1; Route 1<sub>H</sub>**

**SIL 2 @ HFT=0; SIL 3 @ HFT = 1; Route 2<sub>H</sub>**

**PFD<sub>AVG</sub> and Architecture Constraints  
must be verified for each application**

#### Safety Function:

The 120 Series switch contacts will change state when the setpoint Pressure / Temperature is reached within the stated safety accuracy.

#### Application Restrictions:

The unit must be properly designed into a Safety Instrumented Function per the Safety Manual requirements.



  
Evaluating Assessor

  
Certifying Assessor

The manufacturer  
may use the mark:



Revision 1.1 February 17, 2017  
Surveillance Audit Due  
February 1, 2020



ANSI Accredited Program  
PRODUCT CERTIFICATION  
#1004

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**Systematic Capability: SC 3 (SIL 3 Capable)**

**Random Capability: Type A Element**

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**SIL 2 @ HFT=0; SIL 3 @ HFT = 1; Route 2<sub>H</sub>**

**PFD<sub>AVG</sub> and Architecture Constraints  
must be verified for each application**

120 Series Pressure  
and Temperature  
Switches

**Systematic Capability:**

The product has met manufacturer design process requirements of Safety Integrity Level (SIL) 3. These are intended to achieve sufficient integrity against systematic errors of design by the manufacturer.

A Safety Instrumented Function (SIF) designed with this product must not be used at a SIL level higher than stated.

**Random Capability:**

The SIL limit imposed by the Architectural Constraints must be met for each element. This device meets *exida* criteria for Route 2<sub>H</sub>.

**Versions:**

Application	Models
Pressure / Vacuum	J120, H121, H122
Differential Pressure	J120K, H121K, H122K
Temperature	B121, B122, C120, E121, E122, F120

**IEC 61508 Failure Rates in FIT<sup>1</sup> for Single Switch<sup>2</sup>**

Application	toTrip	$\lambda_{SD}$	$\lambda_{SU}$	$\lambda_{DD}$	$\lambda_{DU}$
Pressure/Vacuum	Increase	0	122	0	210
	Decrease	0	86	0	261
Differential Pressure	Increase	0	142	0	239
	Decrease	0	90	0	307
Temperature	Increase	0	122	0	231
	Decrease	0	121	0	247

<sup>1</sup> FIT = 1 failure / 10<sup>9</sup> hours

<sup>2</sup> Includes Dual Switch units when only one of the Switches is used for the Safety Function

**SIL Verification:**

The Safety Integrity Level (SIL) of an entire Safety Instrumented Function (SIF) must be verified via a calculation of PFD<sub>avg</sub> considering redundant architectures, proof test interval, proof test effectiveness, any automatic diagnostics, average repair time and the specific failure rates of all products included in the SIF. Each element must be checked to assure compliance with minimum hardware fault tolerance (HFT) requirements.

The following documents are a mandatory part of certification:

**Assessment Report:** UEC 16/02-130 R003 V1 R2 (or later)

**Safety Manual:** MECH-SM-01



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