



The manufacturer
may use the mark:



Revision 1.7 March 5, 2024
Surveillance Audit Due
March 1, 2027



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 1-2

and meets requirements providing a level of integrity to:

Systematic Capability: SC 3 (SIL 3 Capable)

Random Capability: Type A Element

SIL 2 @ HFT=0; SIL 3 @ HFT = 1; Route 2_H

**PFH/PFD_{avg} 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

UEC 1602130 C002

Systematic Capability: SC 3 (SIL 3 Capable)**Random Capability: Type A Element****SIL 2 @ HFT=0; SIL 3 @ HFT = 1; Route 2_H****PFH/PFD_{avg} 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 element meets *exida* criteria for Route 2_H.

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 FIT¹ for Single Switch²

Application	to Trip	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
Pressure/Vacuum	Increase	0	122	0	242
	Decrease	0	86	0	293
Differential Pressure	Increase	0	142	0	270
	Decrease	0	90	0	339
Temperature	Increase	0	122	0	263
	Decrease	0	121	0	279

¹ FIT = 1 failure / 10⁹ hours

² 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 PFH/PFD_{avg} 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 V3 R1 (or later)

Safety Manual: MECH-SM-01 (or later)



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