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## **SIL Declaration of Conformity acc. to IEC 61508-2:2010**

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### **Description of the equipment:**

Electric actuators

### **ECON Fig.7907 ELA80 up to ELA3000**

**with a supply voltage of:**

- 12V/24V DC
- 110V AC 1Ph
- 220V AC 1 Ph and 3Ph
- 380V AC 3 Ph
- 440V AC 3 Ph

**Certificate basis:** Sira FSP 20015/00

We herewith declare that the ECON Electric Actuators Fig. 7907 are in accordance with the configuration specified in IEC 61508-2:2010, Routes 1H & 1S and Systematic Capability (SC3) and are suitable for the use in safety related systems performing safety functions up to and including:

**SIL 2 capable with HFT=0 (1oo1)**

**SIL 3 capable with HFT=1 (1oo2) in a redundant architecture.**

### **Element Safety Function**

The element safety function of the Electric Actuators ECON Fig.7907 are defined as follows:

**“Upon loss of power, the actuator will stop at its current position with worm and pinion mechanism.”**

### **Certified Data in support of use in safety functions**

The assessment has been carried out with reference to the Conformity Assessment of Safety-related Systems (CASS) methodology using the Route 1h approach.

As part of the product assessment and supporting evidence of conformity in with respect to “hardware safety integrity” against the requirements of IEC 61508-2; the Electrical Actuator was submitted for FMEA assessment to attain SIL capability. The component failure rates and modes for the actuator have been extracted from or calculated, using Quanterion Automated Databook, Item Toolkit and Faradip 3.0. Table 1 summarizes the FMEA assessment of the Electric Actuators ECON Fig.7907.

**Table 1: Summary of assessment for the Electric Actuators ECON Fig.7907 (1oo1)**

<b>Safety Function:</b>		
<b>Upon loss of power, the actuator will stop at its current position with worm and pinion mechanism.</b>		
<b>Summary of IEC 61508-2 Clauses 7.4.2 and 7.4.4</b>		<b>Electric Actuators ECON Fig. 7907</b>
Architectural constraints & Type of products A/B		<b>HFT = 0 Type A</b>
Safe Failure Fraction (SFF)		<b>85%</b>
Random hardware Failures [h <sup>-1</sup> ]	$\lambda_{DD}$ $\lambda_{DU}$	<b>0.00E+00 3.25E-07</b>
Random hardware Failures [h <sup>-1</sup> ]	$\lambda_{SD}$ $\lambda_{SU}$	<b>0.00E+00 1.85E-06</b>
Diagnostic coverage (DC)		<b>0%</b>
PFD @ PTI = 8760 Hrs. MTTR = 24 Hrs.		<b>1.43E-03</b>
Probability of Dangerous failure (High Demand - PFH) [h <sup>-1</sup> ]		<b>3.25E-07</b>
Hardware safety integrity compliance		<b>Route 1<sub>H</sub></b>
Systematic safety integrity compliance		<b>Route 1<sub>S</sub> See report R80038016B</b>
Systematic Capability (SC1, SC2, SC3, SC4)		<b>SC 3</b>
Hardware safety integrity achieved		<b>SIL 2</b>

Note: The failure data:

1. The PFD<sub>AVG</sub> figure shown is for illustration only assuming a proof test interval of 8760 hours and MTTR of 24 hours. Refer to IEC 61508-6 for guidance on PFD<sub>AVG</sub> calculations from the failure data.
2. The verified failure rates used in the safe failure fraction and diagnostic coverage do not include ( $\lambda$  no parts or no effect) failures in the calculation.

This certificate is based upon a functional safety assessment of the product described in Sira Test & Certification Assessment Report R800038016A and any further reports referenced (R80038016B).

**Certificate History**

Issue	Date	Report no.	Comment
0	04/03/2021	R80036016A R80038016B	The release of prime Certificate



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