

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

Description of the equipment

Switch Boxes

ECON Fig.no.79653

Certificate basis: Sira FSP 20007/00

We herewith declare that the ECON Switch Boxes Fig. 79653 is in accordance with the configuration specified in IEC 61508-2:2010, Routes 1_H & 1_S 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 ECON Switch Boxes Fig.79653 is defined as follows:

“To provide an indication of the monitored valve position.”

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 1_H 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 Switch Box was submitted for FMEA assessment to attain SIL capability. The component failure rates and modes for the Switch Boxes have been extracted from or calculated, using Quanterion Automated Databook, Item Toolkit and Faradip 3.0. Table 1 summarizes the FMEA assessment of the ECON Switch Boxes Fig.79653.

Table 1: Summary of assessment for the ECON Switch Boxes Fig.79653 (1oo1)

Safety Function:		
To provide an indication of he monitored valve position.		
Summary of IEC 61508-2 Clauses 7.4.2 and 7.4.4		ECON Switch Boxes Fig. 79963
Architectural constraints & Type of products A/B		HFT = 0 Type A
Safe Failure Fraction (SFF)		70%
Random hardware Failures [h ⁻¹]	λ_{DD} λ_{DU}	0.00E+00 2.33E-07
Random hardware Failures [h ⁻¹]	λ_{SD} λ_{SU}	0.00E+00 5.53E-07
Diagnostic coverage (DC)		0%
PFD @ PTI = 8760 Hrs. MTTR = 24 Hrs.		1.02E-03
Probability of Dangerous failure (High Demand - PFH) [h ⁻¹]		2.33E-07
Hardware safety integrity compliance		Route 1_H
Systematic safety integrity compliance		Route 1_S See report R80046984B
Systematic Capability (SC1, SC2, SC3, SC4)		SC 3
Hardware safety integrity achieved		SIL 2

Note: The failure data:

rev.2

Dated March 2021

1. The PFD_{AVG} 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_{AVG} calculations from the failure data.
2. The verified failure rates used in the safe failure fraction and diagnostic coverage do not include (λ 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 R800046984A and any further reports referenced (R80046984B).

Certificate History

Issue	Date	Report no.	Comment
0	04/03/2021	R80046984A R80046984B	The release of prime Certificate

ERIKS Flow Control

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