Certificate

SIL/PL Capability

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No.: 968/V 1227.00/23

Product tested	Hydraulic 2oo3-Trip-Unit	**Certificate holder**	ABB AG Kallstadter Str. 1 68309 Mannheim Germany
Type designation	TB 2005 -H / -L		
Codes and standards	EN 61508 Parts 1-2 and 4-7:2010		
Intended application	Safety function: Depressurize the hydraulic pressure of the safety oil system when trip The hydraulic trip block with integrated redundancy is suitable for use in a safety instrumented system up to SIL 3 (low demand mode).		
Specific requirements	The instructions of the associated Installation, Operating and Safety Manual shall be considered.		

Summary of test results see back side of this certificate.

The issue of this certificate is based upon an evaluation in accordance with the Certification Program CERT FSP1 V1.0:2017 in its actual version, whose results are documented in Report No. 968/V 1227.00/23 dated 2023-02-16. This certificate is valid only for products, which are identical with the product tested. Issued by the certification body accredited by DAkkS according to DIN EN ISO/IEC 17065. The accreditation is only valid for the scope listed in the annex to the accreditation certificate D-ZE-11052-02-01.

TÜV Rheinland Industrie Service GmbH
Bereich Automation
Funktionale Sicherheit
Am Grauen Stein, 51105 Köln

Köln, 2023-02-23	Certification Body Safety & Security for Automation & Grid	Dipl.-Ing. (FH) Wolf Rückwart

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Holder: ABB AG
Kallstadter Straße 1
68309 Mannheim
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Product tested: **Hydraulic 2oo3 Trip-Block of type 2005-H & 2005-L**

Results of Assessment

Route of Assessment		2_H / 1_S
Type of Sub-system		Type A
Mode of Operation		Low Demand Mode
Hardware Fault Tolerance	HFT	1 (internal 2oo3)
Systematic Capability		**SC 3**
Safety Function	Depressurize the hydraulic system when Trip by opening of the Safety Fluid System Drain Path	

ABB TB 2005-H / -L

Dangerous Failure Rate for single valve subsystem	λ_D	1.26 E-06 / h	**1262 FIT**
Average Probability of Failure on Demand for 2oo3 system	$PFD_{avg}(T_1)$	6.58 E-05	

Assumptions for the calculations above:
DC = 0 %, T_1 = 4 weeks, T_2 = 1 year, MRT = 8 h, MTTR = 72 h, β_{2oo3} = 15 %

Origin of failure rates

The stated failure rates for low demand are the result of an FMEDA with tailored failure rates for the design and manufacturing process.
Failure rates include failures that occur at a random point in time and are due to degradation mechanisms such as ageing.
The stated failure rates do not release the end-user from collecting and evaluating application-specific reliability data.

Periodic Tests and Maintenance

The given values require periodic tests and maintenance as described in the Safety Manual.
The operator is responsible for the consideration of specific external conditions (e.g. ensuring of required quality of media, max. temperature, time of impact), and adequate test cycles.