

CERTIFICATE

No. 8604988



In compliance with requirements for SIL Verification according to the International Standards and Conformity Assessment for all electrical, electronic and related technologies, this certificate applies to the products listed below:

DAMPER

Systematic Integrity: **Refer to Annex Page**

Probability of Failure on Demand: **Refer to Annex Page**

Report No.: **EUFI29-23003655-I1**

Specific requirements: **Complies maximum SIL 2 according to IEC 61508:2010 Parts 1-7 and maximum PL d according to EN ISO 13849-1:2023.**

Applied Codes & Standards: **IEC 61508:2010 Parts 1-7 EN ISO 13849-1:2023**

produced by or for



Halton Ventilation (Shanghai) Co.,Ltd

Building 7, No. 55 Feidu Road, Lingang New Area, China (Shanghai) Pilot Free Trade Zone,,
201306 Shanghai, P.R. China

and produced in the manufacturing plant(s)

Halton Ventilation (Shanghai) Co.,Ltd

Building 7, No. 55 Feidu Road, Lingang New Area, China (Shanghai) Pilot Free Trade Zone,,
201306 Shanghai, P.R. China

The Annex is an integral part of this certificate.


This certificate attests that all provisions of the described in relevant parts of the standard

IEC 61508:2010

SIL are addressed in the accompanying technical file.

The certificate has been issued under No. **19 May 2025** and is valid until **18 May 2030** and will remain valid as long as the test methods and/or factory production control requirements included in the international standard/standards, used to assess the performances of the declared essential characteristics, do not change, and the construction product, and the manufacturing conditions in the plant are not modified significantly, unless suspended or withdrawn by the product certification body. The initial certification date of issue is 19 May 2025.

Prague, 19 May 2025


Ing. Lukáš Turza, Ph.D, IWE
Deputy Head of CB



Check the validity of this certificate using this code at **www.ll-c.info**

LL-C (Certification) Czech Republic a.s. | Pobřežní 620/3, 186 00 Praha 8

Annex to certificate

No. 8604988

Halton Ventilation (Shanghai) Co.,Ltd

Building 7, No. 55 Feidu Road, Lingang New Area, China (Shanghai) Pilot Free Trade Zone, 201306 Shanghai

VAT: 91310115775759266K



Standard

IEC 61508:2010

Product type & Assessment Report reference

Product type	Assessment Report reference
DAMPER	EUF129-23003655-I1

Disclaimer

The use of the product must obey the required rules to conservation of SIL properties. These rules are recalled in the §6 of the Assessment Report reference.

Product version of hardware components used for validation and type tests

Component	Model
DAMPER	FDA, FDB2, FDH, FDO, UTA, UTG, UTP

Environmental constraints

Document of reference	Remark
EUF129-23003655-I1	These elements must be checked for each integration operation of the product

SIL - capable certified Safety Instrumented Function

Product	Safety Instrumented Function (1)	Safety Instrumented Function (2)	Safety Instrumented Function (3)
DAMPER	SF1: protected control circuit	N/A	N/A

Calculation Hypothesis for architecture

Component architecture	SIL Capability	Demand frequency	PFD
Table 1 Architectural constraints	SIL 2	Low Demand Mode The values in this table have been calculated supposing that mean time to dangerous failure (MTTFd) is 7 years, which is the source data collection time. See Annex 2 of EUFI29- 23003655-I1.	Type A HFT = 0 SFF = 83% Proof Test Interval = 720 h MTTR = 2 h
Random hardware failures		No diagnostics. See Annex 2 of EUFI29- 23003655-I1.	$\lambda_{DD} = 0$ $\lambda_{DU} = 0,000014$ $\lambda_{SD} = 0$ $\lambda_{SU} = 0,000071$
Probability of failure on demand	SIL 2	Calculated using approximate formula of EN 50495. See Annexes 2 and 6 of EUFI29- 23003655-I1.	PFD _{AVG} = 0.0051 (Low Demand Mode)
Hardware safety integrity compliance Systematic safety integrity compliance	Route 1H Route 1S	See Annex 6 of EUFI29-23003655-I1. See Annexes 3 and 6 of EUFI29-23003655-I1.	
Overall SIL-capability achieved	SIL 2		

Calculation Hypothesis for safety

Safety function	Failure rate	Undetected dangerous failure rate	Tests intervals	MTTR
SF1	0,000085	0,000014	720 h	2h
To close the controlled damper via pneumatic actuation	PL reached d	Category 2	DC 60%	PFHD [1/h] 5,8E-7 See report EUFI29-23003655-I1.
To close the controlled damper via electrical actuation	PL reached c	Category 1	DC 0	PFHD [1/h] 1,1E-6 See report EUFI29-23003655-I1. MTTFd 10 years has been used for actuators.

To close the controlled damper via electrical actuation	PL reached b	Category 2	DC 60%	PFHD [1/h] 7,9E-6 See report EUFI29-23003655-I1. MTTFd 10 years has been used for actuators
To close the controlled damper via pneumatic actuation	PL reached a	Category 1 NOTE: Conditions of category structure and requirements expressed in EN ISO 13849-1:2015 shall be followed.	DC 0	PFHD [1/h] 1,1E-5 See report EUFI29-23003655-I1.

Disclaimer

The Safety Integrated Level of the safety function using the product shall be calculated taking into account the characteristics of the whole system

The certificate has been issued on **8604988** and is valid 19 May 2025 until 18 May 2030.



Approved by

THIS ANNEX IS NOT VALID WITHOUT MAIN CERTIFICATE

Verification code: **2AC5039F-F9D**
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