

CERTIFICATE

according to IEC EN 61508

Certificate No.: TUV IT 23 SIL 0225

CERTIFICATE OWNER: Ascend Torque Flow Controls Co., Ltd.

No.28, Chengtang Road,

Chang'an Street, Huishan District,

Wuxi City,

PC:214174, Jiangsu Province,

P.R. China

WE HEREWITH CONFIRM THAT
AY SERIES PNEUMATIC ACTUATORS
MEET THE SIL REQUIREMENTS DETAILED IN THE ANNEXED TABLE
FOR THE SAFETY FUNCTION:

Correct switching on demand (open to closed and closed to open), in low demand mode of operation

Examination result: The above reported AY Series Pneumatic Actuators

were found to meet the standard defined requirements of the safety levels detailed in the following table according to IEC EN 61508, under fulfillment of the conditions listed in the Report R TUV IT 22 SIL 0149 in its currently valid version, on

which this Certificate is based

Examination parameters: Construction/Functional characteristics and

reliability and availability parameters of the above

mentioned AY Series Pneumatic Actuators

Official Report No.: R TUV IT 22 SIL 0149

Expiry Date June, 06th 2026

THE PRESENT DOCUMENT SUBSITUTES AND REPEALS THE DOCUMENT C-IS-72223459

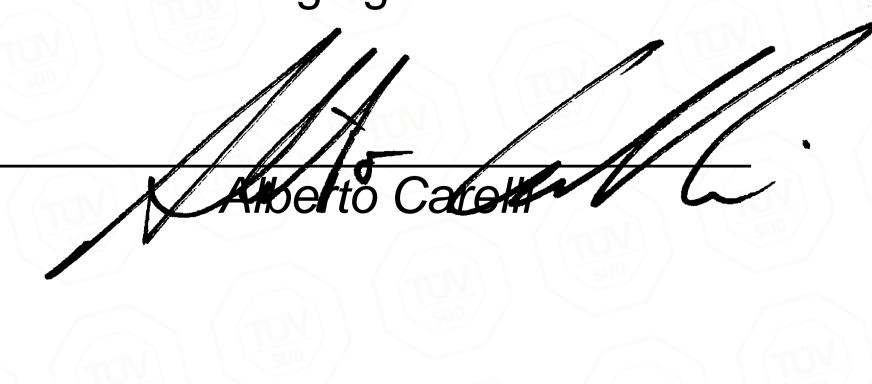
Reference Standard IEC EN 61508:2010 Part 2, 4, 6, 7

Milan, June, 07th 2023

TÜV ITALIA Srl

TÜV ITALIA Srl Industrie Service Division Managing Director





SUMMARY TABLE



| E/EE/EP safety-related system (final element) | AY Series Pneumatic Actuators produced by Ascend Torque Flow Controls Co., Ltd. |
|---|--|
| System type | Type A |
| Systematic Capability | SC3 |
| Safety Function Definition | Correct switching on demand (open to closed and closed to open), in low demand mode of operation |
| Max SIL ⁽¹⁾ | SIL3 |
| λ_{TOT} | 9,310E-08 |
| λ_{NE} | 0,000E+00 |
| λ_{SD} | 0,000E+00 |
| $\lambda_{ m SU}$ | 6,006E-08 |
| $\lambda_{DD,PST}^{(2)}$ | 2,043E-08 |
| λ _{DU,FPT} | 1,261E-08 |
| β and β_D factor | 10% |
| MRT | 8 h |
| Hardware Safety Integrity | Route 2 _H |
| Systematic Safety Integrity | Route 2 _S |

Remarks

SIL classification according to Standard IEC EN 61508:2010 for AY Series Pneumatic Actuators produced by Ascend Torque Flow Controls Co., Ltd.

NOTE: The present table is integral part of the Document TUV IT 23 SIL 0225 Date: June, 07th 2023

⁽¹⁾ The Safety Integrity Level (SIL) of the entire Safety Instrumented Function (SIF) must be verified via a calculation of PFD_{AVG} considering the 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 subsystem must be checked to assure compliance with the minimum hardware fault tolerance (HFT) requirements.

⁽²⁾ Considering an automatic Partial Stroke Test.