

CERTIFICAT

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СЕРТИФИКАТ

認證證書

CERTIFICATE

ZERTIFIKAT



Italia

# 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, 06<sup>th</sup> 2026

THE PRESENT DOCUMENT SUBSTITUTES AND REPEALS THE DOCUMENT C-IS-722223459

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

Milan, June, 07<sup>th</sup> 2023

TÜV ITALIA Srl

TÜV ITALIA Srl  
Industrie Service Division  
Managing Director



Alberto Cattell

## SUMMARY TABLE



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<i>E/EE/EP safety-related system (final element)</i>	<b>AY Series Pneumatic Actuators produced by Ascend Torque Flow Controls Co., Ltd.</b>
<i>System type</i>	Type A
<i>Systematic Capability</i>	SC3
<i>Safety Function Definition</i>	<i>Correct switching on demand (open to closed and closed to open), in low demand mode of operation</i>
<i>Max SIL<sup>(1)</sup></i>	<b>SIL3</b>
$\lambda_{TOT}$	9,310E-08
$\lambda_{NE}$	0,000E+00
$\lambda_{SD}$	0,000E+00
$\lambda_{SU}$	6,006E-08
$\lambda_{DD,PST}^{(2)}$	2,043E-08
$\lambda_{DU,FPT}$	1,261E-08
<i><math>\beta</math> and <math>\beta_D</math> factor</i>	10%
<i>MRT</i>	8 h
<i>Hardware Safety Integrity</i>	Route 2 <sub>H</sub>
<i>Systematic Safety Integrity</i>	Route 2 <sub>S</sub>
<b>Remarks</b>	
(1) <i>The Safety Integrity Level (SIL) of the entire Safety Instrumented Function (SIF) must be verified via a calculation of PFD<sub>AVG</sub> 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.</i>	
(2) <i>Considering an automatic Partial Stroke Test.</i>	

*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, 07<sup>th</sup> 2023