

CERTIFICAT

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СЕРТИФИКАТ

認證證書

CERTIFICATE

ZERTIFIKAT



Italia

COMPLIANCE

with IEC EN 61508

Certificate No.: C-IS-722258685-03

CERTIFICATE OWNER: WireMatic Trutorq AB
Krossgatan 22B
SE-162 50 Vällingby (Stockholm) - Sweden

MANUFACTURER: Trutorq Italia S.r.l.
Via Stelvio 20/22/24
25038 Rovato (BS) - Italy

**WE HEREWITH CONFIRM THAT
PNEUMATIC ROTARY ACTUATORS
RACK & PINION DOUBLE ACTING & SPRING RETURN
(WM WIREMATIC S-TYPE, C-TYPE, E-TYPE)
MEET THE SIL REQUIREMENTS DETAILED IN THE ANNEXED TABLES
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 Pneumatic Rotary Actuators were found to meet the standard defined requirements of the safety levels detailed in the following table (T-IS-722258685-03) according to IEC EN 61508, under fulfillment of the conditions listed in the Report R-IS-722258685-03 Rev.1 dated October, 07th 2021 in its currently valid version, on which this Certificate is based

Examination parameters: Construction/Functional characteristics and reliability and availability parameters of the above Pneumatic Rotary Actuators

Official Report No.: R-IS-722258685-03

Expiry Date October, 06th 2024

**IT IS TO BE INTENDED THAT THE ABOVE OFFICIAL REPORT AND ITS ANNEXES ARE AN INTEGRAL PART OF THIS DOCUMENT
THE PRESENT DOCUMENT SUBSTITUTES AND REPEALS THE DOCUMENT C-IS-722160583-03**

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

Sesto San Giovanni, October, 07th 2021



TÜV ITALIA Srl

TÜV ITALIA Srl
Industry Service Division
Technical Manager

Paolo Marcone



Italia

SUMMARY TABLE

T-IS-722258685-03

<i>E/EE/EP safety-related system (final element)</i>	Pneumatic Rotary Actuators Rack & Pinion WM S-Type, WM C-Type, WM E-Type produced by Trutorq Italia S.r.l.		
<i>Type</i>	WM S-Type	WM C-Type	WM E-Type
<i>System type</i>	Type A		
<i>Systematic Capability</i>	SC3		
<i>Safety Function Definition</i>	Correct switching on demand (open to closed and closed to open), in low demand mode of operation		
<i>Max SIL⁽¹⁾</i>	SIL3		
λ_{TOT}	1,603E-08	7,646E-09	1,080E-08
λ_{NE}	0,000E+00	0,000E+00	0,000E+00
λ_{SD}	0,000E+00	0,000E+00	0,000E+00
λ_{SU}	1,034E-08	4,932E-09	6,970E-09
$\lambda_{DD,PST}^{(2)}$	3,517E-09	1,678E-09	2,371E-09
$\lambda_{DU,FPT}$	2,172E-09	1,036E-09	1,464E-09
<i>β and β_D factor</i>	10%	10%	10%
<i>MRT</i>	8 h	8 h	8 h
<i>Hardware Safety Integrity</i>	Route 2 _H		
<i>Systematic Safety Integrity</i>	Route 2 _s		
Remarks			
(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.			

SIL classification according to Standards IEC EN 61508 (Chapters: 2, 4, 6, 7) for Pneumatic Rotary Actuators Rack & Pinion WM S-Type, WM C-Type, WM E-Type produced by Trutorq Italia S.r.l.

T-IS-722258685-03

NOTE: The present table is integral part of the Document: C-IS-722258685-03

Date: October, 07th 2021