



Italia

COMPLIANCE

with IEC EN 61508:2010

Certificate No.: C-IS-722160583-03

CERTIFICATE OWNER: WIREMATIC TRUTORQ A.B.
Krossgatan 22B
SE-162 50 Vällingby (Stockholm) - SWEDEN

MANUFACTURER: Trutorq Italia S.r.l.
Via Stelvio, 20/22/24/26
25038, Rovato (BS) - Italy

WE HEREWITH CONFIRM THAT
THE 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:

“Complete switching on demand (open to closed & closed to open) with correct torque as for technical data sheets 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-722160583-03) according to IEC EN 61508:2010, under fulfillment of the conditions listed in the Report R-IS-722160583-03 Rev.1 dated July, 20th 2018 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 PNEUMATIC ROTARY ACTUATORS

Official Report No.: R-IS-722160583-03 Rev.1

Expiry Date July, 19th 2021

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 DOCUMENTS C-IS-253327-03

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

Sesto San Giovanni, July, 20th 2018

TÜV ITALIA Srl



TÜV ITALIA Srl
Industry Service Division
Technical Manager

Paolo Marcone
Paolo Marcone



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SUMMARY TABLE T – IS – 722160583–03

<i>E/EE/EP safety-related system (final element)</i>	Pneumatic Rotary Actuators Rack & Pinion Double Acting & Spring Return 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>	<i>Complete switching on demand (open to closed & closed to open) with correct torque as for technical data sheets in low demand mode of operation</i>		
<i>Max SIL⁽¹⁾</i>	SIL3		
λ_{TOT}	3,218E-08	1,057E-08	6,838E-09
λ_{SD}	9,863E-09	3,239E-09	2,096E-09
λ_{SU}	1,089E-08	3,577E-09	2,315E-09
$\lambda_{DD,PST}^{(2)}$	7,060E-09	2,318E-09	1,501E-09
$\lambda_{DU,FFT}$	4,359E-09	1,432E-09	9,266E-10
<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 2H		
<i>Systematic Safety Integrity</i>	Route 2s		
Remarks			
<p><i>(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.</i></p> <p><i>(2) Considering an automatic Partial Stroke Testing</i></p>			

SIL classification according to Standard IEC EN 61508:2010 (Chapters: 2, 4, 6, 7) for the Pneumatic Rotary Actuators Rack & Pinion WM Wirematic S, C, E-Type produced by Trutorq Italia S.r.l.