



COMPLIANCE

with IEC EN 61508:2010

Certificate No.: C-IS-722160583-02

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

**WE HEREWITH CONFIRM THAT
 THE PNEUMATIC ROTARY ACTUATORS
 SCOTCH YOKE DOUBLE ACTING & SPRING RETURN
 (HD-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-722160583-02) according to IEC EN 61508:2010, under fulfillment of the conditions listed in the Report R-IS-722160583-02 Rev.1 dated May, 02nd 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-722160583-02 Rev.1

Expiry Date May, 01st 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-253327-02**

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

Sesto San Giovanni, May, 02nd 2018



TUV ITALIA Srl
Industry Service Technical
Manager

Paolo Marcone

Paolo Marcone



Italia

SUMMARY TABLE T – IS – 722160583–02

<i>E/EE/EP safety-related system (final element)</i>	Pneumatic Rotary Actuators Scotch Yoke Double Acting & Spring Return HD-type produced by Trutorq Italia S.r.l.
<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}	6,599E-07
λ_{SD}	2,023E-07
λ_{SU}	2,234E-07
$\lambda_{DD,PST}^{(2)}$	1,448E-07
$\lambda_{DU,FPT}$	8,941E-08
<i>β and β_D factor</i>	10%
<i>MRT</i>	8 h
<i>Hardware Safety Integrity</i>	Route 2 _H
<i>Systematic Safety Integrity</i>	Route 2 _S
Remarks	
<p>(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.</p> <p>(2) Considering an automatic Partial Stroke Testing</p>	

SIL classification according to Standards IEC EN 61508:2010 (Chapters: 2, 4, 6, 7) for the Pneumatic Rotary Actuators HD-type produced by Trutorq Italia S.r.l.