

CERTIFICAT

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# CERTIFICATE

according to IEC EN 61508

Certificate No.: TUV IT 22 SIL 0136

**CERTIFICATE OWNER:** Nutork Corp.  
5th Floor, Building 4, No. 530, Zhao Jiajing Road,  
Chedun Town,  
Songjiang District,  
Shanghai City,  
P.R. China

**WE HEREWITH CONFIRM THAT  
NK/NS 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 NK/NS 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 Report R TUV IT 22 SIL 0088 Rev.1 dated July, 28<sup>th</sup> 2022 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 NK/NS Series Pneumatic Actuators

**Official Report No.:** Report R TUV IT 22 SIL 0088 Rev.1

**Expiry Date** July, 28<sup>th</sup> 2025

**Reference Standard** IEC EN 61508:2010

Sesto San Giovanni, November, 10<sup>th</sup> 2022

TÜV ITALIA Srl



TÜV ITALIA Srl  
Industry Service Division  
Managing Director

Alberto Carelli



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## SUMMARY TABLE

<i>E/EE/EP safety-related system (final element)</i>	<b>NK/NS Series Pneumatic Actuators produced by Nutork Corp.</b>
<i>System type</i>	Type A
<i>Size / Class</i>	Cylinder size: 40 mm - 400 mm Pressure range: 0,3 MPa - 0,8 MPa Temperature range: -40°C - +150°C
<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>
$\lambda_{TOT}$	4,349E-08
$\lambda_{NE}$	0,000E+00
$\lambda_{SD}$	0,000E+00
$\lambda_{SU}$	3,984E-08
$\lambda_{DD,PST}^{(2)}$	2,467E-09
$\lambda_{DU,FPT}$	1,178E-09
<i><math>\beta</math> and <math>\beta_D</math> factor</i>	10%
<i>MRT</i>	24 h
<i>Hardware Safety Integrity</i>	Route 2 <sub>H</sub>
<i>Systematic Safety Integrity</i>	Route 2 <sub>S</sub>
<b>Remarks</b>	
<p>(1) The Safety Integrity Level (SIL) of the entire Safety Instrumented Function (SIF) must be verified via a calculation of <math>PFDAVG</math> 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 Test.</p>	

*SIL classification according to Standard IEC EN 61508:2010 for NK/NS Series Pneumatic Actuators produced by Nutork Corp.*

NOTE: The present table is integral part of the Document TUV IT 22 SIL 0136  
Date: November, 10<sup>th</sup> 2022