

CERTIFICAT

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СЕРТИФИКАТ

認證證書

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ZERTIFIKAT



Italia

COMPLIANCE

with IEC EN 61508

Certificate No.: TUV IT 24 SIL 0437

CERTIFICATE OWNER: Atos S.p.A.
Via alla Piana 57
21018 Sesto Calende (VA)
Italy

WE HEREWITH CONFIRM THAT
HYDRAULIC CYLINDERS CH AND CK 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 Hydraulic Cylinders CH and CK Type 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 24 SIL 0380 in its currently valid version, on which this Certificate is based

Examination parameters: Construction/Functional characteristics and reliability and availability parameters of the above Hydraulic Cylinders CH and CK Type

Official Report No.: R TUV IT 24 SIL 0380

Expiry Date September, 01st 2027

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-722238763

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

Milan, September, 02nd 2024

TÜV ITALIA Srl

TÜV ITALIA Srl
Industrie Service Division
Managing Director



Alberto Carelli



Italia

SUMMARY TABLE

<i>E/EE/EP safety-related system (final element)</i>	Hydraulic Cylinders CH and CK Type produced by Atos S.p.A.
<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⁽¹⁾</i>	SIL3
λ_{TOT}	4,042E-09
λ_{NE}	0,000E+00
λ_{SD}	0,000E+00
λ_{SU}	3,124E-09
$\lambda_{DD,PST}^{(2)}$	6,822E-10
$\lambda_{DU,FPT}$	2,357E-10
<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	
(1) <i>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>	
(2) <i>Considering an automatic Partial Stroke Test.</i>	

SIL classification according to Standards IEC EN 61508 (Chapters: 2, 4, 6, 7) for Hydraulic Cylinders CH and CK Type produced by Atos S.p.A.

NOTE: The present table is integral part of the Document: TUV IT 24 SIL 0437
Date: September, 02nd 2024