

CERTIFICAT

CERTIFICADO

СЕРТИФИКАТ

認證證書

CERTIFICATE

ZERTIFIKAT



Italia

COMPLIANCE

with IEC EN 61508 and IEC EN 61511

Certificate No.: C-IS-722263906

CERTIFICATE OWNER: Galperti Engineering & Flow Control S.p.A.
Via Prati della Rosa, 17
23823 – COLICO (LC)
Italy

WE HEREWITH CONFIRM THAT

**THE ANALYSIS DEVELOPED BY GALPERTI DESCRIBED IN THE REPORT:
“Galperti – Technical SIL Report for Ball Valves Rev.2 dated September, 07th 2021”
MEETS THE SIL REQUIREMENTS DETAILED IN THE ANNEXED TABLE
FOR THE SAFETY FUNCTION:**

**“Correct switching on demand (open to closed and closed to open) and tight for
closing phase, in low demand mode of operation”**

Examination result: The above described report was found to meet the standard defined requirements of the safety levels detailed in the following tables (T-IS-722263906) according to IEC EN 61508 and IEC EN 61511, under fulfillment of the conditions listed in the Report R-IS-722263906 Rev.1 dated November, 25th 2021, on which this Certificate is based

Examination parameters: Compliance of the operational approach adopted and followed in the aforementioned report by Galperti.

Official Report No.: R-IS-722263906 Rev.1

Expiry Date November, 24th 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-722164325**

Reference Standards IEC EN 61508:2010
IEC EN 61511:2016

Sesto San Giovanni, November, 25th 2021



TÜV ITALIA Srl

TÜV ITALIA Srl
Industry Service Division
Technical Manager

Paolo Marccone



Italia

SUMMARY TABLE

T-IS-722263906

<i>E/EE/EP safety-related system (final element)</i>	Ball Valves produced by Galperti Engineering and Flow Control S.p.A.		
<i>Size (Class)</i>	1/4" ≤ NPS ≤ 4" (CLASS A)	4" ≤ NPS ≤ 14" (CLASS B)	16" ≤ NPS ≤ 60" (CLASS C)
<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) and tight for closing phase, in low demand mode of operation		
<i>Max SIL⁽¹⁾</i>	SIL3	SIL3	SIL3
λ_{TOT}	3,974E-08	1,829E-07	3,716E-07
λ_{NE}	1,721E-08	7,920E-08	1,609E-07
λ_S	0,000E+00	0,000E+00	0,000E+00
$\lambda_{DD,PST}^{(2)}$	8,267E-09	3,805E-08	7,730E-08
$\lambda_{DU,FPT}^{(3)}$	1,426E-08	6,564E-08	1,334E-07
<i>β and β_D factor</i>	1,3 h	2,5 h	4,9 h
<i>MRT</i>	10% - 5%	10% - 5%	10% - 5%
<i>Hardware Safety Integrity</i>	Route 2 _H	Route 2 _H	Route 2 _H
<i>Systematic Safety Integrity</i>	Route 2 _s	Route 2 _s	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) Portion of failure rate related to dangerous failure modes that can be detected by means of Partial Stroke Testing (DD,PST).</p> <p>(3) Portion of failure rate related to dangerous failure modes that can be detected by means of periodical Full Proof Testing (DU,FPT).</p>			

SIL classification according to Standards IEC EN 61508:2010 and IEC EN 61511:2016 for Ball Valves produced by Galperti Engineering and Flow Control S.p.A.

T-IS-722263906

NOTE: The present table is integral part of the Document: C-IS-722263906

Date: November, 25th 2021