Italia

COMPLIANCE

with IEC EN 61508 and IEC EN 61511

Certificate No.: TUV IT 24 SIL 0515

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.3 dated October, 23rd 2024"**

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 table according to IEC EN 61508 and IEC EN 61511, under fulfillment of the conditions listed in the Report R TUV IT 24 SIL 0472 in its currently valid version, 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 TUV IT 24 SIL 0472**
Expiry Date	**December, 18th 2027**

IT IS TO BE INTENDED THAT THE ABOVE OFFICIAL REPORT AND ITS ANNEXES ARE AN INTEGRAL PART OFTHIS DOCUMENT
THE PRESENT DOCUMENT SUBSITUTES AND REPEALS THE DOCUMENT C-IS-722263906 REV.1

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

Milan, December, 19th 2024

TÜV ITALIA Srl

TÜV Italia Srl Industrie Service
TÜV SÜD
Italia

TÜV ITALIA Srl
Industrie Service Division
Managing Director

Alberto Carelli

SUMMARY TABLE

Italia

E/EE/EP safety-related system (final element)	**Ball Valves produced by Galperti Engineering and Flow Control S.p.A.**		
Size (Class)	1/4” ≤ NPS ≤ 4” (CLASS A)	4” ≤ NPS ≤ 14” (CLASS B)	16” ≤ NPS ≤ 60” (CLASS C)
System Type	Type A		
Systematic Capability	*SC3*		
Safety Function Definition	*Correct switching on demand (open to closed and closed to open) and tight for closing phase, in low demand mode of operation*		
Max SIL(1)	**SIL3 for HFT=1 SIL2 for HFT=0**	**SIL3 for HFT=1 SIL2 for HFT=0**	**SIL3 for HFT=1 SIL2 for HFT=0**
λ_{TOT}	3,014E-08	1,302E-07	2,624E-07
λ_{NE}	1,305E-08	5,636E-08	1,136E-07
λ_{S}	0,000E+00	0,000E+00	0,000E+00
$\lambda_{DD,PST}$(2)	6,270E-09	2,708E-08	5,459E-08
$\lambda_{DU,FPT}$(3)	1,082E-08	4,671E-08	9,418E-08
MRT	1,3 h	2,5 h	4,9 h
β and β_D factor	10% - 5%	10% - 5%	10% - 5%
Hardware Safety Integrity	Route 2_H	Route 2_H	Route 2_H
Systematic Safety Integrity	Route 2_S	Route 2_S	Route 2_S

Remarks

(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.

(2) Portion of failure rate related to dangerous failure modes that can be detected by means of Partial Stroke Test (DD,PST).

(3) Portion of failure rate related to dangerous failure modes that can be detected by means of periodical Full Proof Test (DU,FPT).

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.

NOTE: The present table is integral part of the Document: TUV IT 24 SIL 0515
Date: December, 19th 2024