



COMPLIANCE

with IEC EN 61508 and IEC EN 61511

Certificate No.: C-IS-722192006

CERTIFICATE OWNER: **ORION S.p.A.**
 VIA CABOTO, 8
 I-34148 – TRIESTE (Italy)

WE HEREWITH CONFIRM THAT

THE ANALYSIS DEVELOPED BY ORION; REPORTED IN THE REPORT:
“ORION, Safety Analysis Report for Actuated Globe Valve – N° 009/2015 Rev.03
dated March, 13th 2019”

MEETS THE SIL REQUIREMENTS DETAILED IN THE ANNEXED TABLE
FOR THE SAFETY FUNCTIONS:

“Switching on demand (open to closed/closed to open) and sealing in closed position 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-722192006) according to IEC EN 61508 and IEC EN 61511, under fulfillment of the conditions listed in the Report R-IS-722192006 Rev.1 dated May, 15th 2019 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 ORION: “ORION, Safety Analysis Report for Globe Valve – N° 009/2015 Rev.03 dated March, 13th 2019”.**

Official Report No.: **R-IS-722192006 Rev. 1**

Expiry Date **May, 15th 2022**

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-722118481

Reference Standard **IEC EN 61508:2010 Part 2, 4, 6, 7**
IEC EN 61511 Part 1, 2, 3

Sesto San Giovanni, May, 16th 2019



TÜV ITALIA Srl
 Industry Service Division
 Technical Manager

Paolo Marcone

 Paolo Marcone

SUMMARY TABLE

T – IS – 722192006

<i>E/EE/EP safety-related system (final element)</i>	Globe Valves produced by ORION			
<i>System type</i>	Type A			
<i>Systematic Capability</i>	SC3			
<i>Class⁽¹⁾</i>	Class 1 / Temperature range HT (from -29°C to +400°C) Service NON-NACE		Class 2 / Temperature range HT (from -29°C to +400°C) Service NACE	
<i>Safety Function Definition</i>	<i>Switching on demand (open to closed / closed to open) and sealing in closed position in low demand mode of operation</i>			
<i>Max SIL⁽²⁾</i>	SIL 2 with HFT = 0 (single valve configuration)	SIL3 with HFT = 1 (redundant configuration)	SIL 2 with HFT = 0 (single valve configuration)	SIL3 with HFT = 1 (redundant configuration)
λ_{TOT}	1,17E-08		1,67E-07	
λ_{SD}	0,00E+00		0,00E+00	
λ_{SU}	9,08E-09		1,30E-07	
λ_{DD}	0,00E+00		0,00E+00	
λ_{DU}	2,59E-09		3,71E-08	
$\lambda_{DU,PST}^{(3)}$	1,29E-09		1,85E-08	
$\lambda_{DU,FPT}^{(4)}$	1,29E-09		1,85E-08	
<i>β and β_D factor</i>	10%		10%	
<i>MTRR</i>	24 h		24 h	
<i>Hardware Safety Integrity</i>	Route 2H		Route 2H	
<i>Systematic Safety Integrity</i>	Route 2s		Route 2s	
Remarks				
<p>(1) Category identified according to specific environment and application, in particular for fluid type and temperature range. Refer to product safety manual for detailed information on the categories.</p> <p>(2) 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>(3) Portion of the overall failure rate related to dangerous failure modes that can be detected by means of Partial Stroke Testing (DU,PST).</p> <p>(4) Portion of the overall failure rate related to dangerous failure modes that can be detected by means of Full Proof Test (DU,FPT).</p>				

SIL classification according to Standards IEC EN 61508:2010 (Chapters: 2, 4, 6, 7) and IEC EN 61511:2016 (Chapters: 1, 2, 3) for GLOBE VALVES produced by ORION S.p.A.

T – IS – 722192006

NOTE: The present table is integral part of the Document: C – IS – 722192006

Date: May, 16th 2019

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<i>β and β_D factor</i>	10%		10%	
<i>MTTR</i>	24 h		24 h	
<i>Hardware Safety Integrity</i>	Route 2 _H		Route 2 _H	
<i>Systematic Safety Integrity</i>	Route 2 _s		Route 2 _s	
Remarks				
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