



Italia

COMPLIANCE

with IEC EN 61508

Certificate No.: TUV IT 23 SIL 0197

CERTIFICATE OWNER: Sirca International S.p.A.
Via Trieste, 8
20060 - Trezzano Rosa (MI)
Italy

**WE HEREWITH CONFIRM THAT
BUTTERFLY VALVES S301 AND S401N SERIES
MEET THE SIL REQUIREMENTS DETAILED IN THE ANNEXED TABLES
FOR THE SAFETY FUNCTION:**

SIF1: "correct switching on demand (open to closed), and tight for closing phase, in low demand mode of operation".

SIF2: "correct switching on demand (closed to open), in low demand mode of operation".

Examination result: The above reported Butterfly Valves S301 and S401N Series 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 23 SIL 0183 in its currently valid version, on which this Certificate is based

Examination parameters: Construction/Functional characteristics and reliability and availability parameters of the above Butterfly Valves S301 and S401N Series

Official Report No.: R TUV IT 23 SIL 0183

Expiry Date April, 03rd 2026

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-722199816-03 REV.1

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

Sesto San Giovanni, April, 04th 2023



TÜV ITALIA Srl

TÜV ITALIA Srl
Industry Service Division
Managing Director

Alberto Carelli



Italia

SUMMARY TABLE

<i>E/EE/EP safety-related system (final element)</i>	Butterfly Valves S301 Series produced by Sirca International S.p.A.	
<i>System type</i>	Type A	
<i>Size / Class</i>	PTFE -40°C < T < +180°C Liquid	PTFE -40°C < T < +180°C Gas
<i>Systematic Capability</i>	SC3	
<i>Safety Function Definition</i>	<i>SIF1: "Correct switching on demand (open to closed) and tight for closing phase, in low demand mode of operation"</i>	
<i>Max SIL⁽¹⁾</i>	SIL3	SIL3
λ_{TOT}	7,347E-09	1,714E-08
λ_{NE}	1,758E-09	4,102E-09
λ_S	0,000E+00	0,000E+00
$\lambda_{DD,PST}^{(2)}$	1,491E-09	3,478E-09
$\lambda_{DU,FPT}$	4,098E-09	9,563E-09
<i>β and β_D factor</i>	10%	10%
<i>MRT</i>	8 h	8 h
<i>Hardware Safety Integrity</i>	Route 2 _H	Route 2 _H
<i>Systematic Safety Integrity</i>	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) Considering an automatic Partial Stroke Test.</p>		

SIL classification according to Standard IEC EN 61508 (Chapters: 2, 4, 6, 7) for Butterfly Valves S301 Series produced by Sirca International S.p.A. – SIF1

NOTE: The present table is integral part of the Document: TUV IT 23 SIL 0197
Date: April, 04th 2023



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SUMMARY TABLE

<i>E/EE/EP safety-related system (final element)</i>	Butterfly Valves S301 Series produced by Sirca International S.p.A.	
<i>System type</i>	Type A	
<i>Size / Class</i>	BUNA - EPDM - NEOPRENE -10°C < T < +120°C Liquid	BUNA - EPDM - NEOPRENE -10°C < T < +120°C Gas
<i>Systematic Capability</i>	SC3	
<i>Safety Function Definition</i>	<i>SIF1: "Correct switching on demand (open to closed) and tight for closing phase, in low demand mode of operation"</i>	
<i>Max SIL⁽¹⁾</i>	SIL3	SIL3
λ_{TOT}	4,026E-09	5,207E-10
λ_{NE}	9,632E-10	1,246E-10
λ_S	0,000E+00	0,000E+00
$\lambda_{DD,PST}^{(2)}$	8,168E-10	1,057E-10
$\lambda_{DU,FPT}$	2,246E-09	2,905E-10
<i>β and β_D factor</i>	10%	10%
<i>MRT</i>	8 h	8 h
<i>Hardware Safety Integrity</i>	Route 2 _H	Route 2 _H
<i>Systematic Safety Integrity</i>	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) Considering an automatic Partial Stroke Test.</p>		

SIL classification according to Standard IEC EN 61508 (Chapters: 2, 4, 6, 7) for Butterfly Valves S301 Series produced by Sirca International S.p.A. – SIF1

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SUMMARY TABLE

<i>E/EE/EP safety-related system (final element)</i>	Butterfly Valves S301 Series produced by Sirca International S.p.A.	
<i>System type</i>	Type A	
<i>Size / Class</i>	SILICONE - VITON - EPDM HT -10°C < T < +160°C Liquid	SILICONE - VITON - EPDM HT -10°C < T < +160°C Gas
<i>Systematic Capability</i>	SC3	
<i>Safety Function Definition</i>	<i>SIF1: "Correct switching on demand (open to closed) and tight for closing phase, in low demand mode of operation"</i>	
<i>Max SIL⁽¹⁾</i>	SIL3	SIL3
λ_{TOT}	1,145E-09	3,164E-10
λ_{NE}	2,739E-10	7,570E-11
λ_S	0,000E+00	0,000E+00
$\lambda_{DD,PST}^{(2)}$	2,323E-10	6,419E-11
$\lambda_{DU,FPT}$	6,387E-10	1,765E-10
<i>β and β_D factor</i>	10%	10%
<i>MRT</i>	8 h	8 h
<i>Hardware Safety Integrity</i>	Route 2 _H	Route 2 _H
<i>Systematic Safety Integrity</i>	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) Considering an automatic Partial Stroke Test.</p>		

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SUMMARY TABLE

<i>E/EE/EP safety-related system (final element)</i>	Butterfly Valves S401N Series produced by Sirca International S.p.A.	
<i>System type</i>	Type A	
<i>Size / Class</i>	PTFE -40°C < T < +200°C Liquid	PTFE -40°C < T < +200°C Gas
<i>Systematic Capability</i>	SC3	
<i>Safety Function Definition</i>	<i>SIF1: "Correct switching on demand (open to closed) and tight for closing phase, in low demand mode of operation"</i>	
<i>Max SIL⁽¹⁾</i>	SIL3	SIL3
λ_{TOT}	5,981E-08	1,238E-08
λ_{NE}	1,431E-08	2,962E-09
λ_S	0,000E+00	0,000E+00
$\lambda_{DD,PST}^{(2)}$	1,214E-08	2,512E-09
$\lambda_{DU,FPT}$	3,336E-08	6,906E-09
<i>β and β_D factor</i>	10%	10%
<i>MRT</i>	8 h	8 h
<i>Hardware Safety Integrity</i>	Route 2 _H	Route 2 _H
<i>Systematic Safety Integrity</i>	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) Considering an automatic Partial Stroke Test.</p>		

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<i>System type</i>	Type A	
<i>Size / Class</i>	PTFE -40°C < T < +180°C Liquid	PTFE -40°C < T < +180°C Gas
<i>Systematic Capability</i>	SC3	
<i>Safety Function Definition</i>	SIF2: "Correct switching on demand (closed to open), in low demand mode of operation"	
<i>Max SIL⁽¹⁾</i>	SIL3	SIL3
λ_{TOT}	7,347E-09	1,714E-08
λ_{NE}	2,513E-09	5,865E-09
λ_S	0,000E+00	0,000E+00
$\lambda_{DD,PST}^{(2)}$	3,557E-09	8,300E-09
$\lambda_{DU,FPT}$	1,276E-09	2,978E-09
<i>β and β_D factor</i>	10%	10%
<i>MRT</i>	8 h	8 h
<i>Hardware Safety Integrity</i>	Route 2 _H	Route 2 _H
<i>Systematic Safety Integrity</i>	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) Considering an automatic Partial Stroke Test.</p>		

SIL classification according to Standard IEC EN 61508 (Chapters: 2, 4, 6, 7) for Butterfly Valves S301 Series produced by Sirca International S.p.A. – SIF2

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SUMMARY TABLE

<i>E/EE/EP safety-related system (final element)</i>	Butterfly Valves S301 Series produced by Sirca International S.p.A.	
<i>System type</i>	Type A	
<i>Size / Class</i>	BUNA - EPDM - NEOPRENE -10°C < T < +120°C Liquid	BUNA - EPDM - NEOPRENE -10°C < T < +120°C Gas
<i>Systematic Capability</i>	SC3	
<i>Safety Function Definition</i>	SIF2: "Correct switching on demand (closed to open), in low demand mode of operation"	
<i>Max SIL⁽¹⁾</i>	SIL3	SIL3
λ_{TOT}	4,026E-09	5,207E-10
λ_{NE}	1,377E-09	1,782E-10
λ_S	0,000E+00	0,000E+00
$\lambda_{DD,PST}^{(2)}$	1,949E-09	2,521E-10
$\lambda_{DU,FPT}$	6,993E-10	9,046E-11
<i>β and β_D factor</i>	10%	10%
<i>MRT</i>	8 h	8 h
<i>Hardware Safety Integrity</i>	Route 2 _H	Route 2 _H
<i>Systematic Safety Integrity</i>	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) Considering an automatic Partial Stroke Test.</p>		

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<i>System type</i>	Type A	
<i>Size / Class</i>	SILICONE - VITON - EPDM HT -10°C < T < +160°C Liquid	SILICONE - VITON - EPDM HT -10°C < T < +160°C Gas
<i>Systematic Capability</i>	SC3	
<i>Safety Function Definition</i>	SIF2: "Correct switching on demand (closed to open), in low demand mode of operation"	
<i>Max SIL⁽¹⁾</i>	SIL3	SIL3
λ_{TOT}	1,145E-09	3,164E-10
λ_{NE}	3,917E-10	1,082E-10
λ_S	0,000E+00	0,000E+00
$\lambda_{DD,PST}^{(2)}$	5,543E-10	1,532E-10
$\lambda_{DU,FPT}$	1,989E-10	5,496E-11
<i>β and β_D factor</i>	10%	10%
<i>MRT</i>	8 h	8 h
<i>Hardware Safety Integrity</i>	Route 2 _H	Route 2 _H
<i>Systematic Safety Integrity</i>	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) Considering an automatic Partial Stroke Test.</p>		

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<i>Size / Class</i>	PTFE -40°C < T < +200°C Liquid	PTFE -40°C < T < +200°C Gas
<i>Systematic Capability</i>	SC3	
<i>Safety Function Definition</i>	SIF2: "Correct switching on demand (closed to open), in low demand mode of operation"	
<i>Max SIL⁽¹⁾</i>	SIL3	SIL3
λ_{TOT}	5,981E-08	1,238E-08
λ_{NE}	2,046E-08	4,235E-09
λ_S	0,000E+00	0,000E+00
$\lambda_{DD,PST}^{(2)}$	2,896E-08	5,994E-09
$\lambda_{DU,FPT}$	1,039E-08	2,150E-09
<i>β and β_D factor</i>	10%	10%
<i>MRT</i>	8 h	8 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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