



Italia

COMPLIANCE

with IEC EN 61508

Certificate No.: C-IS-722131891

CERTIFICATE OWNER: CVB Valves s.r.l.
Via dell'Industria 24
20020, Arconate (MI) - Italy

**WE HEREWITH CONFIRM THAT
THE METAL SEATED BUTTERFLY VALVES QTV
MEET THE SIL REQUIREMENTS DETAILED IN THE ANNEXED TABLE
FOR THE SAFETY FUNCTIONS:**

"correct switching on demand (open to closed) and tight in closed position, in low demand mode of operation".

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

Examination result: The above reported Butterfly Valves were found to meet the standard defined requirements of the safety levels detailed in the following table (T-IS-722131891) according to IEC EN 61508, under fulfillment of the conditions listed in the Report R-IS-722131891 Rev.1 dated January, 23rd 2018 in its currently valid version, on which this Certificate is based

Examination parameters: Construction/Functional characteristics and reliability and availability parameters of the above mentioned Butterfly Valves

Official Report No.: R-IS-722131891 Rev.1

Expiry Date January, 22nd 2021

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-244055-01

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

Sesto San Giovanni, January, 23rd 2018

TÜV ITALIA Srl

TÜV ITALIA Srl
Industry Service Division
Director


Paolo Marcone

SUMMARY TABLE T – IS – 722131891

<i>E/EE/EP safety-related system (final element)</i>	Metal Seated Butterfly Valves QTV produced by CVB Valves s.r.l.	
<i>System type</i>	Type A	
<i>Class</i>	CLASS 1 3" ≤ dn ≤ 72" -46°C ≤ T ≤ +700°C OIL FLUID service	CLASS 2 3" ≤ dn ≤ 72" -46°C ≤ T ≤ +700°C GAS service
<i>Systematic Capability</i>	SC3	
<i>Safety Function Definition</i>	<i>Correct switching on demand (open to closed) and tight in closed position, in low demand mode of operation</i>	
<i>Max SIL⁽¹⁾</i>	SIL3	SIL3
λ_{TOT}	3,065E-08	6,081E-08
λ_{SD}	2,071E-10	4,110E-10
λ_{SU}	2,792E-09	6,242E-09
$\lambda_{DD,PST}^{(2)}$	9,838E-10	1,952E-09
$\lambda_{DU,EFT}$	2,667E-08	5,221E-08
<i>β and β_D factor</i>	10%	10%
<i>MTTR</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 Testing</p>		

SIL classification according to Standard IEC EN 61508:2010 for the Metal Seated Butterfly Valves QTV produced by CVB Valves s.r.l. – SIF1 considering automatic Partial Stroke testing (PST)

<i>E/EE/EP safety-related system (final element)</i>	Metal Seated Butterfly Valves QTV produced by CVB Valves s.r.l.	
<i>System type</i>	Type A	
<i>Class</i>	CLASS 1 3" ≤ dn ≤ 72" -46°C ≤ T ≤ +700°C OIL FLUID service	CLASS 2 3" ≤ dn ≤ 72" -46°C ≤ T ≤ +700°C GAS service
<i>Systematic Capability</i>	SC3	
<i>Safety Function Definition</i>	Correct switching on demand (open to closed) and tight in closed position, in low demand mode of operation	
<i>Max SIL⁽¹⁾</i>	SIL3	SIL3
λ_{TOT}	3,065E-08	6,081E-08
λ_{SD}	0,000E+00	0,000E+00
λ_{SU}	2,999E-09	6,653E-09
$\lambda_{DD,PST}^{(2)}$	0,000E+00	0,000E+00
$\lambda_{DU,FFT}$	2,765E-08	5,416E-08
<i>β and β₀ factor</i>	10%	10%
<i>MTTR</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
<i>Remarks</i>		
(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) Considering an automatic Partial Stroke Testing		

SIL classification according to Standard IEC EN 61508:2010 for the Metal Seated Butterfly Valves QTV produced by CVB Valves s.r.l. – SIF1 without considering automatic Partial Stroke testing (PST)

T – IS – 722131891

NOTE: The present table is integral part of the Documents: from C-IS-722131891

Date: January, 23rd 2018

<i>E/EE/EP safety-related system (final element)</i>	Metal Seated Butterfly Valves QTV produced by CVB Valves s.r.l.	
<i>System type</i>	Type A	
<i>Class</i>	CLASS 1 3" ≤ dn ≤ 72" -46°C ≤ T ≤ +700°C OIL FLUID service	CLASS 2 3" ≤ dn ≤ 72" -46°C ≤ T ≤ +700°C GAS service
<i>Systematic Capability</i>	SC3	
<i>Safety Function Definition</i>	Correct switching on demand (closed to open), in low demand mode of operation	
<i>Max SIL⁽¹⁾</i>	SIL3	SIL3
λ_{TOT}	3,065E-08	6,081E-08
λ_{SD}	1,290E-10	2,561E-10
λ_{SU}	2,189E-08	4,881E-08
$\lambda_{DD,PST}^{(2)}$	2,914E-09	5,783E-09
$\lambda_{DU,FFT}$	5,716E-09	5,961E-09
<i>β and β_D factor</i>	10%	10%
<i>MTTR</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		
(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) Considering an automatic Partial Stroke Testing		

SIL classification according to Standard IEC EN 61508:2010 for the Metal Seated Butterfly Valves QTV produced by CVB Valves s.r.l. – SIF2 considering automatic Partial Stroke testing (PST)

<i>E/EE/EP safety-related system (final element)</i>	Metal Seated Butterfly Valves QTV produced by CVB Valves s.r.l.	
<i>System type</i>	Type A	
<i>Class</i>	CLASS 1 3" ≤ dn ≤ 72" -46°C ≤ T ≤ +700°C OIL FLUID service	CLASS 2 3" ≤ dn ≤ 72" -46°C ≤ T ≤ +700°C GAS service
<i>Systematic Capability</i>	SC3	
<i>Safety Function Definition</i>	Correct switching on demand (closed to open), in low demand mode of operation	
<i>Max SIL⁽¹⁾</i>	SIL3	SIL3
λ_{TOT}	3,065E-08	6,081E-08
λ_{SD}	0,000E+00	0,000E+00
λ_{SU}	2,202E-08	4,907E-08
$\lambda_{DD,PST}^{(2)}$	0,000E+00	0,000E+00
$\lambda_{DU,FFT}$	8,630E-09	1,174E-08
<i>β and β_D factor</i>	10%	10%
<i>MTTR</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
<i>Remarks</i>		
(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) Considering an automatic Partial Stroke Testing		

SIL classification according to Standard IEC EN 61508:2010 for the Metal Seated Butterfly Valves QTV produced by CVB Valves s.r.l. – SIF2 without considering automatic Partial Stroke testing (PST)

T – IS – 722131891

NOTE: The present table is integral part of the Documents: from C–IS–722131891
Date: January, 23rd 2018