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Italia

COMPLIANCE

with IEC EN 61508 and IEC EN 61511

Certificate No.: C-IS-722222940

CERTIFICATE OWNER: **OMB Valves S.p.A.**
24069 - Cenate Sotto (BG) - Italy

WE HEREWITH CONFIRM THAT

BSE BALL VALVES

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 BSE Ball Valves were found to meet the standard defined requirements of the safety levels detailed in the following table (T-IS-722222940) according to IEC EN 61508, under fulfillment of the conditions listed in the Report R-IS-722222940 Rev.1 dated April, 16th 2020 in its currently valid version, on which this Certificate is based**
Examination parameters:	**Construction/Functional characteristics and reliability and availability parameters of the above BSE Ball Valves**
Official Report No.:	**R-IS-722222940 Rev.1**
Expiry Date	**April, 15th 2023**

IT IS TO BE INTENDED THAT THE ABOVE OFFICIAL REPORT AND ITS ANNEXES ARE AN INTEGRAL PART OFTHIS DOCUMENT
THE PRESENT DOCUMENT SUBSTITUTES AND REPEALS THE DOCUMENT C-IS-722115592

Reference Standard	**IEC EN 61508:2010 Part 2, 4, 6, 7** **IEC EN 61511:2016 Part 1, 2, 3**

Sesto San Giovanni, April, 16th 2020

TÜV ITALIA Srl

TÜV Italia Srl Industrie Service Italia

TÜV ITALIA Srl
Industry Service Division
Technical Manager

Paolo Marcone

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Italia

SUMMARY TABLE

T-IS-722222940

E/EE/EP safety-related system (final element)	**BSE Ball Valves produced by OMB Valves S.p.A.**	
Class (size)	**Class 1 – NPS ≤ 6”**	
System type	Type A	
Systematic Capability	SC3	
Safety Function Definition	*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”*
Max SIL(1)	**SIL3**	**SIL3**
λ_{TOT}	1,671E-07	1,671E-07
λ_{NE}	7,998E-09	1,269E-07
λ_{S}	0.000E+00	0.000E+00
$\lambda_{DD,PST}$(2)	8,644E-08	3,446E-08
$\lambda_{DU,FPT}$	7,269E-08	5,806E-09
β and β_D factor	10%	10%
MRT	8 h	8 h
Hardware Safety Integrity	Route 2_H	Route 2_H
Systematic Safety Integrity	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 Test

SIL classification according to Standards IEC EN 61508 (Chapters: 2, 4, 6, 7) and IEC EN 61511 (Chapters 1, 2, 3) for BSE Ball Valves produced by OMB Valves S.p.A. – Class 1

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SUMMARY TABLE

T-IS-722222940

E/EE/EP safety-related system (final element)	**BSE Ball Valves produced by OMB Valves S.p.A.**	
Class (size)	**Class 2 – NPS > 6”**	
System type	Type A	
Systematic Capability	SC3	
Safety Function Definition	*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”*
Max SIL(1)	**SIL3**	**SIL3**
λ_{TOT}	3,249E-08	3,249E-08
λ_{NE}	1,660E-09	2,769E-08
λ_{S}	0.000E+00	0.000E+00
$\lambda_{DD,PST}$(2)	1,814E-08	3,649E-09
$\lambda_{DU,FPT}$	1,269E-08	1,150E-09
β and β_D factor	10%	10%
MRT	8 h	8 h
Hardware Safety Integrity	Route 2_H	Route 2_H
Systematic Safety Integrity	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 Test

SIL classification according to Standards IEC EN 61508 (Chapters: 2, 4, 6, 7) and IEC EN 61511 (Chapters 1, 2, 3) for BSE Ball Valves produced by OMB Valves S.p.A. – Class 2

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Italia

COMPLIANCE

with IEC EN 61508 and IEC EN 61511

Certificate No.: C-IS-722264443-01

CERTIFICATE OWNER:	**OMB Valves S.p.A.** **24069 - Cenate Sotto (BG) - Italy**

WE HEREWITH CONFIRM THAT

BTE BALL VALVES

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 BTE Ball Valves were found to meet the standard defined requirements of the safety levels detailed in the following table (T-IS-722264443-01) according to IEC EN 61508, under fulfillment of the conditions listed in the Report R-IS-722264443-01 Rev.1 dated September, 22nd 2021 in its currently valid version, on which this Certificate is based**
Examination parameters:	**Construction/Functional characteristics and reliability and availability parameters of the above BTE Ball Valves**
Official Report No.:	**R-IS-722264443-01 Rev.1**
Expiry Date	**September, 21st 2024**

IT IS TO BE INTENDED THAT THE ABOVE OFFICIAL REPORT AND ITS ANNEXES ARE AN INTEGRAL PART OFTHIS DOCUMENT
THE PRESENT DOCUMENT SUBSTITUTES AND REPEALS THE DOCUMENT C-IS-722173138

Reference Standard	**IEC EN 61508:2010 Part 2, 4, 6, 7** **IEC EN 61511:2016 Part 1, 2, 3**

Sesto San Giovanni, September, 22nd 2021

TÜV ITALIA Srl

TÜV Italia Srl Industrie Service
Italia

TÜV ITALIA Srl
Industry Service Division
Technical Manager

Paolo Marcone

Italia

SUMMARY TABLE

T-IS-722264443-01

E/EE/EP safety-related system (final element)	**BTE Ball Valves produced by OMB Valves S.p.A.**	
System type	Type A	
Systematic Capability	SC3	
Safety Function Definition	*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"*
Max SIL(1)	**SIL3**	**SIL3**
λ_{TOT}	2,078E-07	2,078E-07
λ_{NE}	1,989E-08	1,531E-07
λ_{S}	0,000E+00	0,000E+00
$\lambda_{DD,PST}$(2)	1,687E-08	4,025E-08
$\lambda_{DU,FPT}$	1,711E-07	1,444E-08
β and β_D factor	10%	10%
MRT	8 h	8 h
Hardware Safety Integrity	Route 2_H	Route 2_H
Systematic Safety Integrity	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 Test

SIL classification according to Standards IEC EN 61508 (Chapters: 2, 4, 6, 7) and IEC EN 61511 (Chapters 1, 2, 3) for BTE Ball Valves produced by OMB Valves S.p.A.

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COMPLIANCE

with IEC EN 61508 and IEC EN 61511

Certificate No.: C-IS-722264443-02

CERTIFICATE OWNER: **OMB Valves S.p.A.**
24069 - Cenate Sotto (BG) - Italy

WE HEREWITH CONFIRM THAT

TRIPLE OFFSET BUTTERFLY VALVES (TOBV)

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 Triple Offset Butterfly Valves were found to meet the standard defined requirements of the safety levels detailed in the following table (T-IS-722264443-02) according to IEC EN 61508, under fulfillment of the conditions listed in the Report R-IS-722264443-02 Rev.1 dated September, 22nd 2021 in its currently valid version, on which this Certificate is based**
Examination parameters:	**Construction/Functional characteristics and reliability and availability parameters of the above Triple Offset Butterfly Valves**
Official Report No.:	**R-IS-722264443-02 Rev.1**
Expiry Date	**September, 21st 2024**

IT IS TO BE INTENDED THAT THE ABOVE OFFICIAL REPORT AND ITS ANNEXES ARE AN INTEGRAL PART OFTHIS DOCUMENT
THE PRESENT DOCUMENT SUBSTITUTES AND REPEALS THE DOCUMENT C-IS-722172951

Reference Standard	**IEC EN 61508:2010 Part 2, 4, 6, 7** **IEC EN 61511:2016 Part 1, 2, 3**

Sesto San Giovanni, September, 22nd 2021

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TÜV Italia Srl Industrie Service
Italia

TÜV ITALIA Srl
Industry Service Division
Technical Manager

Paolo Marcone

Italia

SUMMARY TABLE

T-IS-722264443-02

E/EE/EP safety-related system (final element)	**Triple Offset Butterfly Valves produced by OMB Valves S.p.A.**	
System type	Type A	
Systematic Capability	SC3	
Safety Function Definition	*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"*
Max SIL(1)	**SIL3**	**SIL3**
λ_{TOT}	4,436E-07	4,436E-07
λ_{NE}	4,246E-08	3,269E-07
λ_{S}	0,000E+00	0,000E+00
$\lambda_{DD,PST}$(2)	3,600E-08	8,591E-08
$\lambda_{DU,FPT}$	3,651E-07	3,082E-08
β and β_D factor	10%	10%
MRT	8 h	8 h
Hardware Safety Integrity	Route 2_H	Route 2_H
Systematic Safety Integrity	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 Test

SIL classification according to Standards IEC EN 61508 (Chapters: 2, 4, 6, 7) and IEC EN 61511 (Chapters 1, 2, 3) for Triple Offset Butterfly Valves produced by OMB Valves S.p.A.

T-IS-722264443-02
NOTE: The present table is integral part of the Document: C-IS-722264443-02
Date: September, 22nd 2021