



COMPLIANCE

with IEC EN 61508 and IEC EN 61511

Certificate No.: C-IS-250138-02

CERTIFICATE OWNER: BELVEN N.V.
 Blokhuisstraat 24
 B-2800 Mechelen - Belgium

WE HEREWITH CONFIRM THAT
THE BALL VALVES
MEET 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 reported Ball Valves were found to meet the standard defined requirements of the safety levels detailed in the following table (T-IS-250138-02) according to IEC EN 61508 and 61511, under fulfillment of the conditions listed in the Report R-IS-250138-01 Rev.1 dated October, 07th 2014 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 Ball Valves

Official Report No.: R-IS-250138-01 Rev.1

Expiry Date October, 06th 2017

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-234895-01

Reference Standard IEC EN 61508:2010 Part 2, 4, 6, 7 - IEC 61511:2003 Part 1, 2, 3
 Sesto San Giovanni, October, 07th 2014



TÜV ITALIA Srl
 Industry-Service Division
 Director

 Genaro Oliva



Italia

SUMMARY TABLE T – IS – 250138 – 02

E/EE/EP safety-related system (final element)	Ball valves			
	A		A	
Type	Ball Valve series BV4, gasket PTFE, PN16/A150 (Class 1)		Ball valves series BV4, gasket RTFE, PN40/A300 (Class 2)	
Class	Ball Valve series BV4, gasket PTFE, PN16/A150 (Class 1)		Ball valves series BV4, gasket RTFE, PN40/A300 (Class 2)	
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 claimable	SIL 2 (with HFT = 0)	SIL 3 (with HFT = 1)	SIL 2 (with HFT = 0)	SIL 3 (with HFT = 1)
Additional requirements for the max SIL classification	Execution of Partial Stroke Test with time interval not higher than 12 months and Full Functional Proof Test with time interval not higher than 36 months		Execution of Partial Stroke Test with time interval not higher than 12 months and Full Functional Proof Test with time interval not higher than 36 months	
λ_{TOT}	1,650E-07		3,909E-07	
λ_{SD}	0,000E+00		0,000E+00	
λ_{SU}	1,476E-07		3,497E-07	
λ_{DD}	0,000E+00		0,000E+00	
λ_{DU}	1,740E-08		4,124E-08	
λ_{FFT}	3,382E-09		8,014E-09	
λ_{FST}	1,402E-08		3,323E-08	
PPD ⁽¹⁾	1,059E-04		2,508E-04	
β and β_D factor	10%		10%	
MTTR	8 h		8 h	
Hardware Safety Integrity	Route 2 _H		Route 2 _H	
Systematic Safety Integrity	Route 2 _S		Route 2 _S	
Remarks	<p>(1) PFD of reference calculated on the basis of a Full Functional Proof Test with time interval reported in the line Additional requirements for the max SIL classification for HFT = 0 configuration. This time intervals are considered by TÜV as reasonably consistent with the implementation of the equipment for safety related-applications, with reference to the overall range of results shown in the report, where other possible combination of time intervals adequate for a classification up to SIL 2 are reported. Note that, concerning Full Proof Tests, time intervals for higher than 36 months are considered by TÜV as not adequate and consistent for equipment for safety related applications.</p>			

Table 1 – SIL classification according to Standards IEC EN 61508:2010 (Chapters: 2, 4, 6, 7)



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NOTE : The present table is integral part of the Documents: from C-IS-250138-02
Date : October, 07th 2014