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COMPLIANCE

with IEC EN 61508:2010

Certificate No.: C – IS – 275318 –01

CERTIFICATE OWNER: FLUID HANDLING TECHNOLOGY S.A.
Pol.Ind. Elkatergi modulo 26
48810 Alonsotegi – Bizkaia
Spain

WE HEREWITH CONFIRM THAT
TRUNNION BALL VALVES

MEET THE SIL REQUIREMENTS DETAILED IN THE ANNEXED TABLES
FOR THE SAFETY FUNCTIONS:

SIF 1: correct switching on demand (open to closed), and tight for closing phase, in low demand mode of operation”

SIF 2: correct switching on demand (closed to open) in low demand mode of operation”

Examination result: The above described valves were found to meet the standard defined requirements of the safety levels detailed in the following table (T-IS-275318-01) according to IEC EN 61508:2010, under fulfillment of the conditions listed in the Report R-IS-275318-01-Rev.1 dated September 13th 2016 in its currently valid version, on which this Certificate is based

Examination parameters: Construction/Functional characteristics and reliability and availability parameters of the above ball valves

Official Report No.: R-IS-275318- 01 Rev. 1

Expiry Date September, 12th 2019

IT IS TO BE INTENDED THAT THE ABOVE OFFICIAL REPORT AND ITS ANNEXES ARE AN INTEGRAL PART OF THIS DOCUMENT

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

Date of emission: September, 13th 2016



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SUMMARY TABLE T – IS – 275318 – 01

<i>E/EE/EP safety-related system (final element)</i>	Trunnion Ball valves produced by FLUID HANDLING TECNOLOGY	
<i>Class</i>	Trunnion Ball valves 1/2" – 20"	
<i>Systematic Capability</i>	SC3	
<i>Safety Function Definition</i>	<i>"Correct switching on demand (open to closed), and tight for closing phase, in low demand mode of operation"</i>	<i>"Correct switching on demand (closed to open) in low demand mode of operation"</i>
<i>Max SIL²</i>	SIL3	SIL3
λ_{TOT}	7,162E-07	7,162E-07
λ_{SD}	3,016E-07	3,016E-07
λ_{SU}	2,525E-08	2,525E-08
$\lambda_{DD,PST}$	2,695E-07	3,403E-07
$\lambda_{DU,FPT}$	1,198E-07	4,904E-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		
<ol style="list-style-type: none"> 1. <i>Considering an automatic Partial Stroke Testing</i> 2. <i>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.</i> 		

SIL classification according to Standards IEC EN 61508:2010 (Chapters: 2, 4, 6, 7) for the Trunnion ball valves produced by FHT



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NOTE : The present table is integral part of the Document: C – IS – 275318–01

Date : September, 13th 2016