



Italia

COMPLIANCE

with IEC EN 61508:2010

Certificate No.: C-IS-722131143-01

CERTIFICATE OWNER
and MANUFACTURER: ATOS S.p.A.
Via alla Piana, 57
21018 – SESTO CALENDE (VA) - ITALY

WE HEREWITH CONFIRM THAT THE SOLENOID VALVES
DHW-*, 06*267(8)(9) DHW-* AND XXXXXXXX DHW-*

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

SIF 1: "Solenoid energization by external signal"
and
SIF 2: "Solenoid de-energization by external signal"

Examination result: The above reported Solenoid Valves were found to meet the standard defined requirements of the safety levels detailed in the following table (T – IS – 722131143-01-01/02) according to IEC EN 61508:2010, under fulfillment of the conditions listed in the Report R-IS-722131143-01 Rev.1 dated May, 16th 2017 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 Solenoid Valves

Official Report No.: R-IS-722131143-01 Rev.1

Expiry Date May, 15th 2020

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- 266963

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

Sesto San Giovanni, May, 16th 2017

TÜV ITALIA Srl

TÜV ITALIA Srl
Industry Service Division
Director



Paolo Marcone



Italia

SUMMARY TABLE T – IS – 722131143-01-01

<i>E/EE/EP safety-related system (final element)</i>	SOLENOID VALVES produced by ATOS S.p.A.	
<i>Type</i>	DHW-*, 06*267(8)(9) DHW-* AND XXXXXXXX DHW-*	
<i>Safety Function Definition</i>	<i>Solenoid energization by external signal</i>	
<i>Systematic Capability (SC)</i>	SC 3	
<i>Max SIL⁽¹⁾</i>	SIL3	SIL3
<i>System Type</i>	Type A	
Additional requirements for the max SIL classification	<i>Execution of Full Functional Proof Test without Partial Stroke Test</i>	<i>Execution of Partial Stroke Test and Full Functional Proof Test</i>
λ_{TOT}	4,378E-09	4,378E-09
λ_{SD}	0,000E+00	3,518E-09
λ_{SU}	3,590E-09	7,179E-11
$\lambda_{DD,PST}$	0,000E+00	7,722E-10
$\lambda_{DU,FFT}$	7,880E-10	1,576E-11
<i>β and β_D factor</i>	10%	10%
<i>MTTR</i>	0,25 h	0,25 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>	

SIL classification according to Standards IEC EN 61508:2010 (Chapters: 2, 4, 6, 7) for Solenoid Valves produced by ATOS S.p.A. – SIF 1

T – IS – 722131143-01 – 01

NOTE: The present table is integral part of the Documents: from C-IS-722131143-01
Date: May, 16th 2017



Italia

SUMMARY TABLE

T – IS – 722131143-01 -02

<i>E/EE/EP safety-related system (final element)</i>	SOLENOID VALVES produced by ATOS S.p.A.	
<i>Type</i>	DHW-*, 06*267(8)(9) DHW-* AND XXXXXXXX DHW-*	
<i>Safety Function Definition</i>	<i>Solenoid de-energization by external signal</i>	
<i>Systematic Capability (SC)</i>	SC 3	
<i>Max SIL⁽¹⁾</i>	SIL3	SIL3
<i>System Type</i>	Type A	
<i>Additional requirements for the max SIL classification</i>	<i>Execution of Full Functional Proof Test without Partial Stroke Test</i>	<i>Execution of Partial Stroke Test and Full Functional Proof Test</i>
λ_{TOT}	6,566E-09	6,566E-09
λ_{SD}	0,000E+00	5,663E-09
λ_{SU}	5,778E-09	1,156E-10
$\lambda_{DD,PST}$	0,000E+00	7,722E-10
$\lambda_{DU,FFT}$	7,880E-10	1,576E-11
<i>β and β_D factor</i>	10%	10%
<i>MTTR</i>	0,25 h	0,25 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>	<p>(1) The Safety Integrity Level (SIL) of the entire Safety Instrumented Function (SIF) must be verified via a calculation of PFDAVG 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>	

SIL classification according to Standards IEC EN 61508:2010 (Chapters: 2, 4, 6, 7) for Solenoid Valves produced by ATOS S.p.A. – SIF 2

T – IS – 722131143-01 – 02

NOTE: The present table is integral part of the Documents: from C-IS-722131143-01
Date: May, 16th 2017