



COMPLIANCE

with IEC EN 61508

Certificate No.: C – IS – 722213162

CERTIFICATE OWNER: Valbia S.r.l.
 Via Industriale, 30
 25065 - Lumezzane (BS)
 Italy

WE HEREWITH CONFIRM THAT
PNEUMATIC ROTARY ACTUATORS DOUBLE ACTING & SPRING RETURN
(DA-TYPE, SR-TYPE – SERIES 82,84)
MEET THE SIL REQUIREMENTS DETAILED IN THE ANNEXED TABLES
FOR THE SAFETY FUNCTIONS:

“complete switching on demand (open to closed & closed to open) with correct torque as for technical data sheets in low demand mode of operation”

Examination result: The above reported Pneumatic Rotary Actuators DA and SR Type were found to meet the standard defined requirements of the safety levels detailed in the following table (T-IS-722213162) according to IEC EN 61508, under fulfillment of the conditions listed in the Report R-IS-722213162 Rev.1 dated December, 10th 2019 in its currently valid version, on which this Certificate is based

Examination parameters: Construction/Functional characteristics and reliability and availability parameters of the above Pneumatic Rotary Actuators DA and SR Type

Official Report No.: R-IS-722213162 Rev.1

Expiry Date December, 09th 2022

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-722117103

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

Sesto San Giovanni, December, 10th 2019



TÜV ITALIA Srl
 Industry Service Division
 Technical Manager

Paolo Marcone
 Paolo Marcone

SUMMARY TABLE T – IS – 722213162

<i>E/EE/EP safety-related system (final element)</i>	Pneumatic Rotary Actuators DA Type produced by Valbia S.r.l.		
System type	Type A		
Class	<i>DA32 Type</i>	<i>DA52 – DA75 Type</i>	<i>DA85 – DA125 Type</i>
Systematic Capability	SC3		
Safety Function Definition	<i>“complete switching on demand (open to closed & closed to open) with correct torque as for technical data sheets in low demand mode of operation”</i>		
Max SIL⁽¹⁾	SIL3	SIL3	SIL3
λ_{TOT}	1,628E-09	2,433E-09	6,612E-09
λ_{NE}	0,000E+00	0,000E+00	0,000E+00
λ_{SD}	9,983E-11	4,827E-10	1,600E-09
λ_{SU}	1,102E-10	3,871E-10	9,595E-10
$\lambda_{DD,PST}^{(2)}$	7,146E-11	1,068E10	2,902E-10
$\lambda_{DU,FPT}$	1,347E-09	1,456E-09	3,762E-09
β and β_D factor	10%	10%	10%
MRT	8 h	8 h	8 h
Hardware Safety Integrity	Route 2 _H	Route 2 _H	Route 2 _H
Systematic Safety Integrity	Route 2 _S	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 $PF_{D_{AVG}}$ 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 Test.</p>			

SIL classification according to Standard IEC EN 61508:2010 (Chapters: 2, 4, 6, 7) for Pneumatic Rotary Actuators DA Type produced by Valbia S.r.l.

SUMMARY TABLE T – IS – 722213162

<i>E/EE/EP safety-related system (final element)</i>	Pneumatic Rotary Actuators DA Type produced by Valbia S.r.l.	
System type	Type A	
Class	<i>DA140 – DA200 Type</i>	<i>DA230 – DA330 Type</i>
Systematic Capability	SC3	
Safety Function Definition	<i>“complete switching on demand (open to closed & closed to open) with correct torque as for technical data sheets in low demand mode of operation”</i>	
Max SIL⁽¹⁾	SIL3	SIL3
λ_{TOT}	1,977E-08	3,301E-08
λ_{NE}	0,000E+00	0,000E+00
λ_{SD}	1,212E-09	1,012E-08
λ_{SU}	5,292E-09	1,117E-08
$\lambda_{DD,PST}^{(2)}$	8,675E-10	7,243E-09
$\lambda_{DU,FPT}$	1,240E-08	4,472E-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		
<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 Test.</p>		

SIL classification according to Standard IEC EN 61508:2010 (Chapters: 2, 4, 6, 7) for Pneumatic Rotary Actuators DA Type produced by Valbia S.r.l.

SUMMARY TABLE

T – IS – 722213162

<i>E/EE/EP safety-related system (final element)</i>	Pneumatic Rotary Actuators SR Type produced by Valbia S.r.l.	
System type	Type A	
Class	<i>SR52 – SR75 Type</i>	<i>SR85 – SR125 Type</i>
Systematic Capability	SC3	
Safety Function Definition	<i>“complete switching on demand (open to closed & closed to open) with correct torque as for technical data sheets in low demand mode of operation”</i>	
Max SIL⁽¹⁾	SIL3	SIL3
λ_{TOT}	2,187E-09	3,987E-09
λ_{NE}	0,000E+00	0,000E+00
λ_{SD}	2,683E-10	3,831E-10
λ_{SU}	3,495E-10	5,473E-10
$\lambda_{DD,PST}^{(2)}$	2,303E-10	3,137E-10
$\lambda_{DU,FPT}$	1,336E-09	2,743E-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		
<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 Test.</p>		

SIL classification according to Standard IEC EN 61508:2010 (Chapters: 2, 4, 6, 7) for Pneumatic Rotary Actuators SR Type produced by Valbia S.r.l.

SUMMARY TABLE T – IS – 722213162

<i>E/EE/EP safety-related system (final element)</i>	Pneumatic Rotary Actuators SR Type produced by Valbia S.r.l.	
System type	Type A	
Class	<i>SR140 – SR200 Type</i>	<i>SR230 – SR330 Type</i>
Systematic Capability	SC3	
Safety Function Definition	<i>“complete switching on demand (open to closed & closed to open) with correct torque as for technical data sheets in low demand mode of operation”</i>	
Max SIL⁽¹⁾	SIL3	SIL3
λ_{TOT}	1,251E-08	5,103E-08
λ_{NE}	0,000E+00	0,000E+00
λ_{SD}	7,671E-10	1,564E-08
λ_{SU}	8,471E-10	1,728E-08
$\lambda_{DD,PST}^{(2)}$	5,491E-10	1,120E-08
$\lambda_{DU,FPT}$	1,035E-08	6,915E-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		
<p><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.</i></p> <p><i>(2) Considering an automatic Partial Stroke Test.</i></p>		

SIL classification according to Standard IEC EN 61508:2010 (Chapters: 2, 4, 6, 7) for Pneumatic Rotary Actuators SR Type produced by Valbia S.r.l.