ZERTIFIKAT ◆ CERTIFICATE ◆ 認証書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

Italia

CERTIFICATE

according to IEC EN 61508

Certificate No.: C-IS-722239637-02

CERTIFICATE OWNER: **DBV Valve Co., Ltd.**
Tangtou Village, Oubei Street,
Yongjia County,
Wenzhou City,
PC: 325105, Zhejiang Province,
P.R. China

WE HEREWITH CONFIRM THAT

DBV-ZJHM SERIES CONTROL VALVES WITH SA SERIES PNEUMATIC ACTUATORS MEET THE SIL REQUIREMENTS DETAILED IN THE ANNEXED TABLE FOR THE SAFETY FUNCTIONS:

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 DBV-ZJHM Series Control Valves with SA Series Pneumatic Actuators were found to meet the standard defined requirements of the safety levels detailed in the following table (T-IS-722236023-02) according to IEC EN 61508, under fulfillment of the conditions listed in the Report R-IS-722239637-02 Rev.1 dated November, 02nd 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 mentioned DBV-ZJHM Series Control Valves with SA Series Pneumatic Actuators**
Official Report No.:	**R-IS-722239637-02 Rev.1**
Expiry Date	**November, 01st 2023**
Reference Standard	**IEC EN 61508:2010 Part 1, 2, 3, 4, 5, 6, 7**

Sesto San Giovanni, November, 02nd 2020

TÜV ITALIA Srl

TÜV Italia Srl Industrie Service — TÜV SÜD — Italia

TÜV ITALIA Srl
Industry Service Division
Technical Manager

Paolo Marcone

Italia

SUMMARY TABLE
T – IS – 722239637-02

E/EE/EP safety-related system (final element)	**DBV-ZJHM Series Control Valves with SA Series Pneumatic Actuators produced by DBV Valve Co., Ltd.**	
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}	9,017E-09	9,017E-09
λ_{NE}	1,483E-09	1,904E-09
λ_{SD}	1,084E-09	9,329E-10
λ_{SU}	1,712E-09	3,498E-10
$\lambda_{DD,PST}$(2)	2,728E-09	4,291E-09
$\lambda_{DU,FPT}$	2,010E-09	1,539E-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 2s	Route 2s

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 Testing.

SIL classification according to Standard IEC EN 61508:2010 for DBV-ZJHM Series Control Valves with SA Series Pneumatic Actuators produced by DBV Valve Co., Ltd.

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