



Certificate / Certificat Zertifikat / 合格証

BIS 1404017 C001

exida hereby confirms that the:

Series 3B25* and 3B37* Directional Control Valves

**BiS Valves Ltd.
Wimborne, Dorset - UK**

Have been assessed per the relevant requirements of:

IEC 61508 : 2010 Parts 1-7

and meets requirements providing a level of integrity to:

Systematic Capability: SC 3 (SIL 3 Capable)

Random Capability: Type A, Route 2_H Device

**PFH/PFD_{avg} and Architecture Constraints
must be verified for each application**

Safety Function:

The Directional Control Valve will move to the designed safe position per the actuator design within the specified safety time.

Application Restrictions:

The unit must be properly designed into a Safety Instrumented Function per the Safety Manual requirements.

The manufacturer
may use the mark:

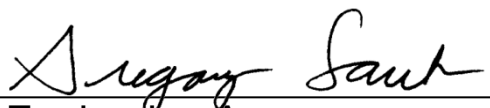



Revision 2.0 October 20, 2017
Surveillance Audit Due
November 1, 2020



ANSI Accredited Program
ISO/IEC 17065
PRODUCT CERTIFICATION BODY
#1004




Evaluating Assessor


Certifying Assessor

Systematic Capability: SC 3 (SIL 3 Capable)**Random Capability: Type A, Route 2_H Device**

**PFH/PFD_{avg} and Architecture Constraints
must be verified for each application**

Systematic Capability:

These products have met manufacturer design process requirements of Safety Integrity Level (SIL) 3. These are intended to achieve sufficient integrity against systematic errors of design by the manufacturer.

A Safety Instrumented Function (SIF) designed with this product must not be used at a SIL level higher than stated.

Random Capability:

The SIL limit imposed by the Architectural Constraints must be met for each element. This device meets *exida* criteria for Route 2_H.

IEC 61508 Failure Rates in FIT¹

Valve Type and Application	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
3B25* and 3B37* H0, H1, or H3 - Opt 1 DTT Port C Vented (includes MR option)	0	208	0	172
3B25* and 3B37* H0, H1, or H3 - Opt 2 DTT Port C Pressurized (includes MR option)	0	89	0	292
3B25* and 3B37* H0, H1, or H3 - Opt 3 ETT Port C Pressurized	0	8	0	366
3B25* and 3B37* H0, H1, or H3 - Opt 4 ETT Port C Vented	0	132	0	242
3B25* and 3B37* H0, H1, or H3 - Opt 1 DTT Port C Vented (includes MR option), w/PVST ² Diag.	196	12	152	20
3B25* and 3B37* H0, H1, or H3 - Opt 2 DTT Port C Pressurized (includes MR option), w/PVST Diag.	88	1	260	32
3B25* and 3B37* H0, H1, or H3 - Opt 3 ETT Port C Pressurized, w/PVST Diag.	8	0	333	33
3B25* and 3B37* H0, H1, or H3 - Opt 4 ETT Port C Vented, w/PVST Diag.	120	12	220	22

¹ FIT = 1 failure / 10⁹ hours

² PVST = Partial Valve Stroke Test of a final element Device

SIL Verification:

The Safety Integrity Level (SIL) of an entire Safety Instrumented Function (SIF) must be verified via a calculation of PFH/PFD_{avg} considering 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 element must be checked to assure compliance with minimum hardware fault tolerance (HFT) requirements.

The following documents are a mandatory part of certification:

Assessment Report: BIS 14/04-017 R002 V2 R1 (or later)

Safety Manual: I.0300.00.0060 Iss 1 (or later)

