



Certificate / Certificat Zertifikat / 合格証

BIS 1410085 C001

exida hereby confirms that the:

Series 3BC25* and 3BC37* Directional Control Valves

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

Has 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

**PFD_{AVG} and Architecture Constraints
must be verified for each application**

Safety Function:

The Directional Control Valve will move to the designed safe position 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:

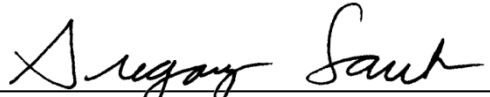


Valid until September 1, 2018
Revision 1.0 July 31, 2015



ANSI Accredited Program
PRODUCT CERTIFICATION
#1004




Evaluating Assessor


Certifying Assessor

BIS 1410085 C001

Systematic Capability: SC 3 (SIL 3 Capable)

Random Capability: Type A, Route 2_H Device

**PFD_{AVG} and Architecture Constraints
must be verified for each application**

Systematic Capability :

The product has 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}
3BC25* and 3BC37* H0, H1, or H3 - Opt 1 DTT Port C Vented	0	334	0	194
3BC25* and 3BC37* H0, H1, or H3 - Opt 2 DTT Port C Pressurized	0	157	0	352
3BC25* and 3BC37* H0, H1, or H3 - Opt 3 ETT Port C Pressurized	0	10	0	514
3BC25* and 3BC37* H0, H1, or H3 - Opt 4 ETT Port C Vented	0	197	0	307
3BC25* and 3BC37* H0, H1, or H3 - Opt 1 DTT Port C Vented, w/PVST ² Diag.	315	19	176	18
3BC25* and 3BC37* H0, H1, or H3 - Opt 2 DTT Port C Pressurized, w/PVST Diag.	155	2	309	43
3BC25* and 3BC37* H0, H1, or H3 - Opt 3 ETT Port C Pressurized, w/PVST Diag.	10	0	467	47
3BC25* and 3BC37* H0, H1, or H3 - Opt 4 ETT Port C Vented, w/PVST Diag.	178	19	290	17

¹ FIT = 1 failure / 10⁹ hours

² PVST = Automated 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 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 14/10-085 R002 V1 R1

Safety Manual: I.0300.00.0061

Series 3BC25* and
3BC37* Directional
Control Valves



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Sellersville, PA 18960