



Certificate / Certificat Zertifikat / 合格証

BIS 1409090 C001

exida hereby confirms that the:

ST Solenoid Valve Series

BiS Valves Ltd.

Wimborne, Dorset - UK

The manufacturer
may use the mark:



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 when the Solenoid is De-energized (or Energized) within the specified safety time.

Application Restrictions:

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

Revision 2.0 November 30, 2021

Surveillance Audit Due
November 30, 2024



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.

Versions:

Valve Types		Description and Application
2/3AS*-ST*- or 2/2AS*-ST*-	Opt 1 & Opt 2	Series ST Solenoid with 3/2 (or 2/2) Pneumatic or Hydraulic Valve, De-energize To Trip (DTT), including MO/MR and Latching options
	Opt 3 & Opt 4	Series ST Solenoid with 3/2 (or 2/2) Pneumatic or Hydraulic Valve, Energize To Trip (ETT)
2/5AS*-ST*-	DTT	5/2 Pneumatic or Hydraulic Valve, Solenoid Actuator, De-energize To Trip (DTT), including MO/MR and Latching options
	ETT	5/2 Pneumatic or Hydraulic Valve, Solenoid Actuator, Energize To Trip (ETT)
2/*DS01*-ST*- or 2/*DS01*-STSW*-	Opt 1 & Opt 2	Series ST Solenoid with 3/2 (or 2/2) Hydraulic Valve, De-energize To Trip (DTT), MO/MR and Latching options only included for Topside Models
	Opt 3 & Opt 4	Series ST Solenoid with 3/2 (or 2/2) Hydraulic Valve, Energize To Trip (ETT)

IEC 61508 Failure Rates in FIT¹

Valve Types		No Diagnostics			
		λ _{SD}	λ _{SU}	λ _{DD}	λ _{DU}
2/3AS*-ST*- or 2/2AS*-ST*-	DTT Opt 1	0	421	0	105
	DTT Opt 2	0	354	0	192
	ETT Opt 3	0	23	0	298
	ETT Opt 4	0	105	0	232
2/5AS*-ST*-	DTT	0	380	0	155
	ETT	0	66	0	266
2/*DS01*-ST*- or 2/*DS01*-STSW*-	DTT Opt 1	0	373	0	117
	DTT Opt 2	0	347	0	196
	ETT Opt 3	0	33	0	259
	ETT Opt 4	0	99	0	237

¹ FIT = 1 failure / 10⁹ hours

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 14/09-090 R002 V2 R1 (or later)

Safety Manual: I.0100.00.0383 Issue 1 (or later)

ST Solenoid Valve Series



80 N Main St
Sellersville, PA 18960