



Certificate / Certificat Zertifikat / 合格証

AZ 170660 P0039 C001

exida hereby confirms that the :

**Plug Valves (STANDARD / ISO-
STANDARD / EXTRA / ISO-EXTRA /
STANDARD A / ISO-STANDARD-A)**

**AZ-Armaturen
Mönchweiler, Germany**

Has been assessed per the relevant requirements of:

IEC 61508:2010 Parts 1 and 2

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 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:



Revision 2.0 August 4, 2023

Surveillance Audit Due
September 1, 2026



Evaluating Assessor

Certifying Assessor

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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 FIT*, Plug Valves

Variant	without PVST				with PVST†			
	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
V1	0	0	0	399	0	0	126	273
V2	0	0	0	742	0	0	126	616
V3	0	106	0	293	105	1	126	167
V4	0	0	0	755	0	0	239	563
V5	0	0	0	1453	0	0	239	1214
V6	0	212	0	563	210	2	239	324

- V1 Full Stroke, Clean Service
- V2 Tight Shutoff, Clean Service
- V3 Open on Trip, Clean Service
- V4 Full Stroke, Severe Service
- V5 Tight Shutoff, Severe Service
- V6 Open on Trip, Severe Service

* FIT = 1 failure / 10⁹ hours

† PVST = Automated Partial Valve Stroke Test

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: AZ 17/06-060-C R001 V2 R0 Assessment Report

Safety Manual: AZI-027; Storage / Installation / Operation / Maintenance / Safety Valves AZ



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