FUNCTIONAL SAFETY

CERTIFICATE

CERTIFICATO – ZERTIFIKAT – CERTIFICADO – CERTIFICAT

The product:

Bolted end entry trunnion mounted ball valve series EE/ST

Manufactured by:

Cornerstone Valve
1535 Industrial Drive, Missouri City
TX 77489, United States

suitable for the following safety function(s):

Upon demand, the ball valve moves from open to closed position, or vice-versa, depending on the process Safe State, within the required response time

has been assessed per the relevant requirements of

IEC 61508:2010 Parts 1 to 2

and meets the requirements providing the following:

Systematic Capability: The compliance with the requirements for the avoidance of systematic faults and the requirements for the control of systematic faults have been achieved following the compliance route 1_S.	SC 3
Hardware Safety Integrity: The constraints on hardware safety integrity have been verified in order to achieve a sufficiently robust architecture taking into account the level of element and subsystem complexity following the compliance route 2_H.	Type A
Random Safety Integrity: The estimated safety integrity, for each safety function, due to random hardware safe and dangerous failures rates (excluding "no part" and "no effect" contribution).	See page 2

The architectural constraints and the effects of random failures (PFH/PFD_{AVG}) must be verified for each specific application and safety function implemented by the E/E/PE safety-related system.

Certified by:

BYHON

BYHON Certification Director:

Rosati Francesco

CERTIFICATE No:
CSVA-EESTV-ENS-A01
Revision: A

Issued:
December 20th, 2023

Valid until:
December 19th, 2026

The owner of a valid certificate for an assessed product is authorized to affix the following mark and relative ID number, to all recognized devices which are identical to the product assessed.

BYHON SIL
ID.N°563423EN01A

ANSI ACCREDITED
#8914
ISO/IEC 17065
Product Certification Body

The design of each Safety Instrumented Function (SIF) shall meet the requirements listed in the reference standards that shall be selected by taking into account the specific application. Specific activities necessary to investigate and reach a judgment on the adequacy of the functional safety achieved by the E/E/PE safety-related system or compliant items (elements/subsystems) has been conducted by an independent assessor.

The following failure rates data shall be used to the PFH/PFD_{AVG} estimation, taking into consideration all parameters such as redundancy, architectural constraints, diagnostic capability, also introduced by the whole system, including the considerations about the proof test and its effectiveness, mean time of restoration, up to the maintenance capability and its minimum characteristics.

Device failure rates

Valve series	Safety Function	Application	λ_S	λ_{DU}	λ_{DD}
EE	#1	Open / Close (with PST provided by an external device)	0	205	340
		Open / Close	0	544	0
	#2	Close with Tight Shut-Off (with PST provided by an external device)	0	589	340
		Close with Tight Shut-Off	0	929	0
ST	#1	Open / Close (with PST provided by an external device)	0	301	457
		Open / Close	0	759	0
	#2	Close with Tight Shut-Off (with PST provided by an external device)	0	559	457
		Close with Tight Shut-Off	0	1016	0

Note:

- All failure fates are in FIT (Failure In Time 1 FIT = 1 failure / 10^9 hours).
- The product is capable to be used in Safety Instrumented Systems (SIS) when properly designed into a Safety Instrumented Function (SIF) and configured according to the Safety Manual. The product is SIL 2 capable in simplex configuration (HFT = 0) and SIL 3 capable in case of redundancy (HFT = 1).

The prescriptions contained in the Safety Manual EP1009 shall be followed.

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The Functional Safety Assessment report no.

23-CSV-EESTV-FSA-01

dated:
December 20th, 2023

is an integral part of this certificate

Mod_12_CB Rev05

BYHON
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