

# FUNCTIONAL SAFETY CERTIFICATE

CERTIFICATO – ZERTIFIKAT – CERTIFICADO – CERTIFICAT

The product:

*2 & 3 Way, DIPV and TIPV Super-H Plug Valves*

Manufactured by:

*Flowserve Flow Control Ltd  
Burrell Road, Haywards Heath  
West Sussex RH16 1TL, United Kingdom*

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*Flowserve India Controls Private Limited  
B-8, CMDA Industrial Area, Maraimalai Nagar, Chengalpattu District, Chennai, Tamil Nadu,  
India*

suitable for the following safety function(s):

Bubble tight shut-off or blow-down (2-way), change-over (3-way) and double block and bleed (DIPV & TIPV) applications in industrial and process safety.

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<sub>S</sub>.

**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 1<sub>H</sub>, 2<sub>H</sub>.

**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<sub>AVG</sub>) 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:  
**FLOW-PLUGH-ENS-A01**

Issued:  
November 14<sup>th</sup>, 2025

Valid until:  
November 13<sup>th</sup>, 2028

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

**BYHON**  
**SIL** ✓

**ANAB**

**ANSI National Accreditation Board**

**ACCREDITED**

**ISO/IEC 17065**

**PRODUCT CERTIFICATION  
BODY**

**#8914**

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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<sub>AVG</sub> 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.

**Failure rate for Super H Plug Valves**

	Close-to-Trip				Open-to-Trip			
	λSU	λSD	λDU	λDD	λSU	λSD	λDU	λDD
2Way Super H Plug Valve (size from 1/2" to 1")	0	0	173	0	277	0	87	0
2Way Super H Plug Valve (size from 1½" to 8")	0	0	190	0	193	0	107	0
2Way Super H Plug Valve (size from 10" to 36")	0	0	205	0	193	0	122	0

	Changeover			
	λSU	λSD	λDU	λDD
3Way Super H Plug Valve (size from 1/2" to 1")	0	0	206	0
3Way Super H Plug Valve (size from 1½" to 8")	0	0	223	0
3Way Super H Plug Valve (size from 10" to 36")	0	0	238	0

	Common Part				Redundant Part			
	λSU	λSD	λDU	λDD	λSU	λSD	λDU	λDD
DIPV Super H Plug Valve (size from 1/2" to 1")	23	0	2	0	0	0	164	0
DIPV Super H Plug Valve (size from 1½" to 8")	23	0	2	0	0	0	181	0
DIPV Super H Plug Valve (size from 10" to 24")	23	0	2	0	0	0	196	0
TIPV Super H Plug Valve (size from 1/2" to 1")	23	0	2	0	0	0	164	0
TIPV Super H Plug Valve (size from 1½" to 8")	23	0	2	0	0	0	181	0
TIPV Super H Plug Valve (size from 10" to 24")	23	0	2	0	0	0	196	0

**Note:**

- All failure fates are in FIT (Failure In Time 1 FIT = 1 failure / 10<sup>9</sup> hours).
- The prescriptions contained in the safety manual FLOSILSAVSH-01\_rev03 shall be followed.
- The prescription contained in the safety manual FLOSILSAVSH-01\_rev03 related to failure rates of DIPV and TIPV common and redundant part shall be followed.
- In compliance with Route 2H (see IEC 61508-2, subclause 7.4.4.3), the valves can be used in a single channel configuration (HFT = 0) up to SIL 2, and in redundant channel configuration (HFT = 1) up to SIL 3.

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The Functional Safety  
Assessment report no.

**25-FLS-PLUGH-FSA-01**

dated:  
November 14<sup>th</sup>, 2025

is an integral part of this  
certificate



Mod\_12\_CB Rev09

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