

FUNCTIONAL SAFETY CERTIFICATE

CERTIFICATO – ZERTIFIKAT – CERTIFICADO – CERTIFICAT

The product:

Mechanical valves series Steel Line

Manufactured by:

PNEUMAX S.p.A.
*Via Cascina Barbellina 10
24050 Lurano (BG) – Italy*

suitable for the following safety function(s):

The valve moves to the predefined safe state when de-energized (if operating in DETT mode) or when energized (if operating in ETT mode)

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 Routes 1_H and 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
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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:

Francesco Rosati

Rosati Francesco

CERTIFICATE No:
PNMX-MEC35-ENS-A01
Revision: A

Issued:
October 18th, 2024

Valid until:
October 17th, 2027

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.



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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_{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

Models	Description	Operating mode	λ_s	λ_{DU}	λ_{DD}
#SS1432C1101## #SS1232C1101## #SS3432C1101## #SS1132C1101##	3/2 monostable	DETT	167	109	-
ETT		5	318	-	
#SS145201101## #SS125201101## #SS345201101## #SS115201101##	5/2 monostable	DETT	215	289	-
ETT		166	321	-	
#SS1432C0001##	3/2 monostable tappet	DETT	126	104	-
		ETT	-	271	-
#SS145200001##	5/2 monostable tappet	DETT	173	284	-
		ETT	161	274	-
#SS1432C0401##	3/2 monostable lever & roller	DETT	225	117	-
		ETT	-	397	-
#SS145200401##	5/2 monostable lever & roller	DETT	273	298	-
		ETT	161	400	-
#SS1432C1114## #SS1232C1114##	3/2 monostable manual reset	DETT	167	122	-
#SS145201114## #SS125201114##	5/2 monostable manual reset	DETT	215	302	-
#SS1432C1115## #SS1232C1115##	3/2 monostable inverse manual reset	ETT	5	319	-
#SS145201115## #SS125201115##	5/2 monostable inverse manual reset	ETT	166	322	-
#SS1432C1111## #SS1232C1111## #SS3432C1111## #SS1132C1111##	3/2 bistable	ETT	119	136	-
#SS145201111## #SS125201111## #SS345201111## #SS115201111##	5/2 bistable	ETT	166	317	-
#SS1432C0411##	3/2 bistable lever & roller	ETT	119	145	-
#SS145200411##	5/2 bistable lever & roller	ETT	166	325	-

Note:

- All failure rates are in FIT (Failure In Time 1 FIT = 1 failure / 10⁹ hours).
- Operating modes: DETT (De-Energize-To-Trip) and ETT (Energize-To-Trip).
- The device 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 device can be used in applications up to SIL 2 with HFT=0, and in applications up to SIL 3 with HFT=1.

The prescriptions contained in the Safety Manual no. TF231011-MEC-MA shall be followed.

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The Functional Safety
Assessment report no.

24-PMX-MEC35-FSA-01

dated:
October 18th, 2024

is an integral part of this
certificate



Mod_12_CB Rev08

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