FUNCTIONAL SAFETY

CERTIFICATE

CERTIFICATO – ZERTIFIKAT – CERTIFICADO – CERTIFICAT

The product:

Valves & solenoid valves with NAMUR interface series 514 and 515

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 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:
PNMX-SOV51-ENS-A01

Issued:
June 16th, 2025

Valid until:
June 15th, 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

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

Series	Ways / Positions	Configuration	Operating mode	λ_S	λ_{DU}	λ_{DD}
514	5/2	Pneumatic - Spring return	DETT	89	122	-
			ETT	55	145	-
		Pneumatic - Differential	DETT	89	117	-
		Pneumatic - Pneumatic	ETT	55	132	-
		Solenoid - Spring return	DETT	164	187	-
			ETT	65	270	-
		Solenoid - Differential	DETT	164	182	-
		Solenoid - Solenoid	ETT	65	322	-
514	4/2	Pneumatic - Spring return	DETT	122	66	-
			ETT	-	148	-
		Pneumatic - Differential	DETT	122	61	-
		Pneumatic - Pneumatic	ETT	88	77	-
		Solenoid - Spring return	DETT	197	131	-
			ETT	10	273	-
		Solenoid - Differential	DETT	197	126	-
		Solenoid - Solenoid	ETT	99	266	-
514	3/2	Pneumatic - Spring return	DETT	122	66	-
			ETT	-	148	-
		Pneumatic - Differential	DETT	122	61	-
		Pneumatic - Pneumatic	ETT	88	77	-
		Solenoid - Spring return	DETT	197	131	-
			ETT	10	273	-
		Solenoid - Differential	DETT	197	126	-
		Solenoid - Solenoid	ETT	99	266	-
515	5/2	Pneumatic - Spring return	DETT	80	113	-
			ETT	46	137	-
		Pneumatic - Differential	DETT	80	108	-
		Pneumatic - Pneumatic	ETT	46	124	-
		Solenoid - Spring return	DETT	156	178	-
			ETT	57	262	-
		Solenoid - Differential	DETT	156	173	-
		Solenoid - Solenoid	ETT	57	313	-

Note:

- All failure fates are in FIT (Failure In Time 1 FIT = 1 failure / 10^9 hours).
- Operating modes: DETT (De-Energize-To-Trip) and ETT (Energize-To-Trip).
- The prescriptions contained in the safety manual TF251001-NAM-MA-R00 shall be followed.
- 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.
  In any case, the SIL reached by the entire Safety Instrumented Function (SIF) must be verified by the System Integrator / Final User considering demand mode, architecture, proof test interval and effectiveness, availability of diagnostics.

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The Functional Safety Assessment report no.

25-PMX-SOV51-FSA-01

dated:
June 16th, 2025

is an integral part of this certificate

Mod_12_CB Rev09

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