



Certificate / Certificat Zertifikat / 合格証

DUN 2312104 C004

exida hereby confirms that the:

**Spool Type Solenoid Valves
(DPV-09, DPV-12, DPV-13, DPV-15,
DPV-21, DPV-24)**

**Duncan Engineering Limited
Maharashtra - India**

Has been assessed per the relevant requirements of:

IEC 61508 : 2010 Parts 1-2

and meets requirements providing a level of integrity to:

Systematic Capability: SC 3 (SIL 3 Capable)

Random Capability: Type A, Route 2_H Device

**PFH/PFD_{avg} and Architecture Constraints
must be verified for each application**

Safety Function:

The solenoid valve will move to the designed safe position when de-energized / energized 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 1.0 April 30, 2024
Surveillance Audit Due
May 01, 2027



Evaluating Assessor

Certifying Assessor

DUN 2312104 C004

Systematic Capability: SC 3 (SIL 3 Capable)**Random Capability: Type A, Route 2_H Device****PFH/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.

Versions:

Group	Valve Series	Description
DPV-09	X53014, X53114, X53214 - Single Solenoid, DTT or ETT	5/2, 2-9W or 9-16W Coils
	X53024, X53124, X53224 - Double Sol.	
DPV-12	X43114NM, X43214NM, X53114NM, X53214NM, Single Sol. - DTT or ETT	3/2 or 5/2, 2-9W or 9-16W Coils
	X43124NM, X43224NM, X53124NM, X53224NM - Double Sol.	
	G454ANM - Namur Poppet Valve	3/2 2-9W or 9-16W Coils
DPV-13	X53114NM3C, X53214NM3C, Single Sol. - DTT or ETT	5/2 Adaptable to 3/2, 2-9W or 9-16W Coils
	X53124NM3C, X53224NM3C - Double Sol.	
DPV-15	X53113NM, X53113NM, Single Sol. - DTT or ETT	4/2, 2-9W or 9-16W Coils
	X53123NM, X53123NM - Double Sol.	
DPV-21	X43014, X43114, X43214, Single Sol. - DTT or ETT	5/2, 2-9W or 9-16W Coils
	X43024, X43124, X43224 - Double Sol.	
DPV-24	XM12014, XM12114, XM12214, XM38014, XM38114, XM38214, Single Sol. - DTT or ETT	5/2, 2-9W or 9-16W Coils
	XM12024, XM12124, XM12224, XM38024, XM38124, XM38224 - Double Sol.	

IEC 61508 Failure Rates in FIT*

DPV-09, DPV-12*, DPV-13, DPV-15, DPV-21, DPV-24	λ_{SD}	λ_{Su}	λ_{DD}	λ_{Du}
Single Solenoid, DTT, 2-9 W, Class F	0	188	0	303
Single Solenoid, ETT, 2-9 W, Class F	0	159	0	392
Single Solenoid, DTT, 2-9 W, Class H	0	183	0	303
Single Solenoid, ETT, 2-9 W, Class H	0	159	0	376
Single Solenoid, DTT, 9-16 W, Class F	0	225	0	303
Single Solenoid, ETT, 9-16 W, Class F	0	159	0	634
Single Solenoid, DTT, 9-16 W, Class H	0	215	0	303
Single Solenoid, ETT, 9-16 W, Class H	0	159	0	524
Double Solenoid, 2-9 W, Class F	0	104	0	655
Double Solenoid, 2-9 W, Class H	0	99	0	639
Double Solenoid, 9-16 W, Class F	0	141	0	897
Double Solenoid, 9-16 W, Class H	0	131	0	787

* Only includes spool style DPV-12 valves, not poppet style DPV-12. Refer FMEDA report DUN 2312104 R009 V1R1 (or later) for Failure Rate details of poppet style DPV-12, Valve Series G45ANM

SIL Verification:* FIT = 1 failure / 10⁹ hours

The Safety Integrity Level (SIL) of an entire Safety Instrumented Function (SIF) must be verified via a calculation of PFH/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: DUN 23-12-104 R015 V1R1 (or later)

Safety Manual: DEL-SSM-ENG-02 R0 (or later)

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80 N Main St
Sellersville, PA 18960

T-109, V5R2

**Spool Type Solenoid
Valves -**

DPV-09, DPV-12,
DPV-13, DPV-15,
DPV-21, DPV-24