Certificate / Certificat
Zertifikat / 合格証

BIF 1705128 C001

exida hereby confirms that the:

FP01, FP02, FP03, FP04, FP05, FP03P, FP06P, FP10P and FP15 Series Solenoid Valves

Bifold Fluidpower Ltd.
Chadderton, Manchester – UK

Have 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 release/vent the service port pressure when de-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 2.5 January 12, 2024
Surveillance Audit Due
October 1, 2026

ANSI National Accreditation Board
ACCREDITED
ISO/IEC 17065
PRODUCT CERTIFICATION BODY
#1004

exida Certification

Evaluating Assessor

Certifying Assessor

Certificate / Certificat / Zertifikat / 合格証

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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

FP01, FP02, FP03, FP04, FP05, FP03P, FP06P, FP10P & FP15 Series Solenoid Valves

Systematic Capability :

These products have 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.

Version Overview

FP01, FP02, FP03, FP04 and FP05	3 Port, 2 Position Normally Closed/Open Direct-Acting Hydraulic Solenoid Valves
FP02G and FP05G	3 Port, 2 Position Normally Closed/Open Solenoid Valve for Gas Service
FP03P, FP06P and FP10P	3 Port, 2 Position Normally Closed/Open Direct-Acting Pneumatic Solenoid Valves
FP15	3 Port, 2 Position Normally Closed/Open 2 Stage Hydraulic Solenoid Valve
Options Included for the above Models:	Single Type 74, 77 and 78 or Type 58 Solenoid Operator DC or AC (Wiring Option 1) Coil up to 10W Up to 690 Bar Max Working Pressure Spring Return and Detented Manual Override

IEC 61508 Failure Rates in FIT*

Device/Application/Configuration	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
FP01, FP02, FP03, FP04, FP05, FP02G and FP05G; NC, DTT	0	179	0	137
FP01, FP02, FP03, FP04, FP05, FP02G and FP05G; NC, ETT	0	36	0	274
FP03P, FP06P and FP10P; NC, DTT	0	142	0	104
FP03P, FP06P and FP10P; NC, ETT	0	30	0	212
FP15; NC, DTT	0	266	0	227
FP15; NC, ETT	0	106	0	381
FP01, FP02, FP03, FP04, FP05, FP02G and FP05G; NO, DTT	0	128	0	183
FP01, FP02, FP03, FP04, FP05, FP02G and FP05G; NO, ETT	0	104	0	207
FP03P, FP06P and FP10P; NO, DTT	0	125	0	117
FP03P, FP06P and FP10P; NO, ETT	0	72	0	170
FP15; NO, DTT	0	163	0	325
FP15; NO, ETT	0	157	0	335

* FIT = 1 failure / 10^9 hours

SIL Verification:

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:
BIF 17/05-128 R002 V2 R4 (or later)

Safety Manual
SM.004 R5 or SM.001 R6 (or later)

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Sellersville, PA 18960