# Certificate / Certificat
# Zertifikat / 合格証

BIF 1102075 C003

*exida* hereby confirms that the:

## SPR Series Spool Valves (1/4 to 1 inch Body Sizes)

## Bifold Fluidpower Ltd. Chadderton, Manchester - UK

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 Spool Valve will move to the designed safe position 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 2.1 December 11, 2023
Surveillance Audit Due
October 1, 2026

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

Evaluating Assessor

Certifying Assessor

# Certificate / Certificat / Zertifikat / 合格証

## BIF 1102075 C003

## 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

SPRxx-P1(or P16)-32-Nx-00 and SPRxx-P1-52-Nx-00 Series Valves

**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 $2_H$.

**IEC 61508 Failure Rates in FIT***

| Model | Application | $\lambda_{SD}$ | $\lambda_{SU}$ | $\lambda_{DD}$ | $\lambda_{DU}$ |
|---|---|---|---|---|---|
| SPRxx-P1(or P16)-32-Nx-00 | De-Energize to Trip | 0 | 137 | 0 | 205 |
| SPRxx-P1-52-Nx-00 | De-Energize to Trip | 0 | 143 | 0 | 246 |

* 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 subsystem 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 11/02-075 R002 V5R1 (or later)

Safety Manual: SIL-SM.008 Rev 8 or later

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Sellersville, PA 18960