



# Certificate / Certificat Zertifikat / 合格証

VEL 1405020 C001

*exida* hereby confirms that the:

## TORQSEAL Triple-Offset Butterfly Valves

**Velan**

**Montreal, QC - Canada**

Has been assessed per the relevant requirements of:

**IEC 61508 : 2010 Parts 1-7**

and meets requirements providing a level of integrity to:

**Systematic Capability: SC 3 (SIL 3 Capable)**

**Random Capability: Type A, Route 2<sub>H</sub> Device**

**PFD<sub>AVG</sub> and Architecture Constraints  
must be verified for each application**

### Safety Function:

The Valve will move to the designed safe position per the actuator design 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 2.0 June 21, 2018  
Surveillance Audit Due  
June 1, 2021



ANSI Accredited Program  
ISO/IEC 17065  
PRODUCT CERTIFICATION BODY  
#1004



Evaluating Assessor

Certifying Assessor

VEL 1405020 C001

**Systematic Capability: SC 3 (SIL 3 Capable)**

**Random Capability: Type A, Route 2<sub>H</sub> Device**

**PFD<sub>avg</sub> 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<sub>H</sub>.

**IEC 61508 Failure Rates in FIT\***

Application	$\lambda_{SD}$	$\lambda_{SU}$	$\lambda_{DD}$	$\lambda_{DU}$
Full Stroke	0	0	0	647
Tight Shut-Off	0	0	0	1507
Open on Trip	0	235	0	412
Full Stroke with PVST	0	0	212	435
Tight Shut-Off with PVST	0	0	212	1295
Open on Trip with PVST	235	0	212	201

\* FIT = 1 failure / 10<sup>9</sup> hours

† PVST = Partial Valve Stroke Test of a final element Device

**SIL Verification:**

The Safety Integrity Level (SIL) of an entire Safety Instrumented Function (SIF) must be verified via a calculation of PFD<sub>avg</sub> 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:** VEL 14-05-020 Velan Assessment Report R003 V2R1  
Safety Valves IEC 61508 Assessment (or later)

**Safety Manual:** SIL-BF-01-16

TORQSEAL Triple-Offset Butterfly Valves



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