



Certificate / Certificat Zertifikat / 合格証

VIR 091221 C002

exida hereby confirms that the:

Series TriTork Triple Offset Valve

Virgo Valves and Controls Private Limited Pune, India

The manufacturer
may use the mark:



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_H Device

**PFD_{AVG} and Architecture Constraints
must be verified for each application**

Valid until July 1, 2017
Revision 3.0 June 30, 2014

Safety Function:

The Valve will move to the designed safe position per the actuator design within the specified safety time.

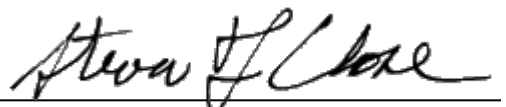
Application Restrictions:

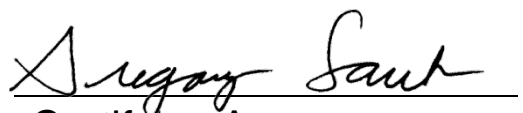
The unit must be properly designed into a Safety Instrumented Function per the Safety Manual requirements.



ANSI Accredited Program
PRODUCT CERTIFICATION
#1004




Evaluating Assessor


Certifying Assessor

VIR 091221 C002

Systematic Capability: SC 3 (SIL 3 Capable)

Random Capability: Type A, Route 2_H Device

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.

IEC 61508 Failure Rates, clean service in FIT*

Application	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
Full Stroke	0	0	0	682
Tight Shut-Off	0	0	0	1481
Open to Trip	0	214	0	468
Full Stroke with PVST **	0	0	234	448
Tight Shut-Off with PVST	0	0	222	1259
Open to Trip with PVST	214	0	234	234

*FIT = 1 failure / 10⁹ hours

**PVST = Automatic Partial Valve Stroke Test

SIL Verification:

The Safety Integrity Level (SIL) of an entire Safety Instrumented Function (SIF) must be verified via a calculation of 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: VIR 06-09-10 R007 V4R1

Safety Manual: TriTork Triple Offset Valves Safety Manual SM-005

Series TriTork Triple Offset Valves



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Sellersville, PA 18960