



Certificate / Certificat Zertifikat / 合格証

FLO 1303024 C007

exida hereby confirms that the:

**Flowserve Rack & Pinion Actuators:
Norbro 33, 40R, & 40 Series
Worcester F39 Series
Limatorque LRP Series
Flowserve Flow Control
Haywards Heath, West Sussex - 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 Actuator 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 3.0 March 3, 2022
Surveillance Audit Due
April 3, 2025



Evaluating Assessor

Certifying Assessor

FLO 1303024 C007

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:**

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.

Versions:

Device	Description and Application
Norbro 33 Series	Spring Return & Double Acting Actuators, Sizes 25 to 50
Norbro 40R Series	Spring Return & Double Acting Actuators, Sizes 05 to 42
Norbro 40 Series	Spring Return & Double Acting Actuators, Sizes 45 & 50
Worcester F39 Series	Spring Return & Double Acting Actuators, Sizes 05 to 50
Limatorque LRP Series	Spring Return & Double Acting Actuators, Sizes 10 to 40

IEC 61508 Failure Rates in FIT¹

Device	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
Spring Return, De-energize to Trip	0	305	0	372
Double Acting	0	0	0	636

¹ FIT = 1 failure / 10⁹ 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: FLO 13/03-0024 R007 V3 R2 (or later)

Safety Manual: FLOSILNOR334040R Rev 2 (or later)



80 N Main St
Sellersville, PA 18960