The manufacturer may use the mark:

Certificate / Certificat
Zertifikat / 合格証

ROT 1004018 C002

exida hereby confirms that the:

ECF, SSF, and ECV Series Rack & Pinion Valve Actuators

Rotex Manufacturers & Engineers Private Limited Dombivli, Maharashtra - INDIA

Has been assessed per the relevant requirements of:

IEC 61508 : 2010 Parts 1-7

and meets requirements providing a level of integrity to:

Systematic Integrity: SIL 3 Capable

Random Integrity: Type A Element

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

Safety Function:
The Actuator will move the Valve 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.

Reports:
ROT 10/04-018 R002 V1 R1 Assessment Report
ROT 10/04-018 R001 V1 R2 FMEDA Report

Validity:
This assessment is valid for the ECF, SSF, and ECV Series Valve Actuators, Sizes 32 to 350

This assessment is valid until January 1, 2015.

Revision 1.0 December 9, 2011

Evaluating Assessor

Certifying Assessor

Certificate / Certificat / Zertifikat / 合格証

ROT 1004018 C002

Systematic Integrity: SIL 3 Capable

Random Integrity: Type A Element

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

ECF, SSF, and ECV Series Valve Actuators, Sizes 32 to 350

Rotex Manufacturers & Engineers Pvt. Ltd. Dombivli, Maharashtra - India

SIL 3 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 without “prior use” justification by end user or diverse technology redundancy in the design.

IEC 61508 Failure Rates in FIT*

Device	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
ECF/SSF Actuator, Spring Return,	0	399	0	312
ECF/SSF Actuator, Spring Return w/PVST†	399	0	165	147
ECF/SSF Actuator, Double Acting	0	0	0	448
ECF/SSF Actuator, Double Acting w/PVST†	0	0	283	165

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.

* FIT = 1 failure / 10^9 hours

† PVST = automated Partial Valve Stroke Test

exida® Certification Services
64 N Main St
Sellersville, PA 18960

Form	Version	Date
C61508	2.7-3	Mar 2011