

CERTIFICATE



QUIFER 1107060 P0020 C001

exida Certification S.A. hereby confirms that the

QUIFER Rack & Pinion KP/KPM series actuators

QUIFER Actuators S.L.

Figueres (Girona), Spain

Has been assessed according to the relevant requirements of

IEC 61508:2010

Parts 1 - 2, and meets requirements providing a level of integrity to

Systematic Integrity : SIL 3 Capable

Random Integrity : Type A device, 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 within the specified safety time.

Application Restrictions

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



Assessor



Certifying Assessor

Date: 5 March 2012

exida Certification SA, Nyon, Switzerland



Systematic Integrity: SIL 3 Capable

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. For a Rack & Pinion actuator used in final element assembly, SIL must also be verified for the specific application using the following failure data:

Summary for the Rack & Pinion KP/KPM actuators :

	Type A device, IEC 61508 failure rates					
	Without PVST			With PVST		
	λ_{safe}	λ_{dd}	λ_{du}	λ_{safe}	λ_{dd}	λ_{du}
Rack & Pinion KP 3 - 20 actuators (double acting)	0	0	536	0	429	107
Rack & Pinion KP 30 - 200, 370 actuators (double acting)	0	0	536	0	429	107
Rack & Pinion KP 140, 250, 500 actuators (double acting)	0	0	582	0	459	123
Rack & Pinion KPM 3 - 20 actuators (spring return)	383	0	325	383	215	110
Rack & Pinion KPM 30 - 200, 370 actuators (spring return)	383	0	345	383	227	118
Rack & Pinion KPM 140, 250, 500 actuators (spring return)	383	0	481	383	308	173

PVST - Partial Valve Stroke Test
All failure rates are given in FIT=10⁻⁹/h

Double acting actuator operation may only be considered in specific application cases as an adequate safety design. Spring-return operation is the highly recommended mode for safety applications. For more details see the safety manual or the assessment report.

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 mandatory parts this certificate:

- QUIFER 1107-060-C R003 V1R0 Assessment report.
- QUIFER Safety Manual Rev1 -12/2011