Certificate / Certificat
Zertifikat / 合格証

AUMA 140739R1C P0038 C001

exida hereby confirms that the:

FQM(Ex) 05.1 – FQM(Ex) 12.1
Fail safe units for actuators
Product Versions SIL-V1.0.XX, SIL-V1.1.XX, SIL-V1.2.XX

AUMA Riester GmbH & Co. KG
D-79379 Müllheim, Germany

Have 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 1_H Device

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

Safety Functions:
The fail safe unit will move a connected valve to the designed
safe position within the specified safety time.
The fail safe unit indicates its end positions.

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

_____
Evaluating Assessor

_____
Evaluating Assessor

_____
Certifying Assessor

Certificate / Certificat / Zertifikat / 合格証

AUMA 140739R1C P0038 C001

Fail safe units

FQM(Ex) 05.1 – 12.1

Systematic Capability: SC 3 (SIL 3 Capable)

Random Capability: Type A, Route 1_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.

IEC 61508 Failure Rates in FIT*

FQM(Ex) 05.1 – 12.1, SIL-V1.0.XX	λ_{safe}	λ_{DD}	λ_{DU}
ESD: Safe (OPEN/CLOSE)	273	671	513
End Position Feedback	0	62	39

FQM(Ex) 05.1 – 12.1, SIL-V1.1/1.2.XX	λ_{safe}	λ_{DD}	λ_{DU}
ESD: Safe (OPEN/CLOSE)	273	784	513
End Position Feedback	0	103	42

* FIT = 1 failure / 10^9 hours
Note: The values were evaluated assuming a 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 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: Auma 14/07-139-C R002 V3R1

Safety Manuals: Y008.255/xxx/xx/4.19.Vyy, Y008.255/xxx/xx/1.20.Vyy, Y008.255/xxx/xx/2.21.Vyy

Note: xxx/xx – Country, e.g. 001/de for Germany
yy – minor changes that have no impact on the usage in safety applications (e.g. editorial changes)