



Certificate / Certificat Zertifikat / 合格証

MAG 1711051 C001

exida hereby confirms that the:

Eclipse Enhanced Model 705 3X Guided Wave Radar Level Transmitter

**Magnetrol International, Inc.
Aurora, IL - USA**

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 B Element

SIL 2 @ HFT=0; SIL 3 @ HFT = 1; Route 2_H

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

Safety Function:

The Eclipse Enhanced Model 705 3X Transmitter will measure Level within the stated safety accuracy.

Application Restrictions:

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

The manufacturer
may use the mark:

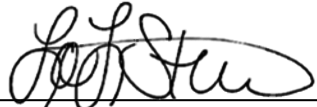


Revision 2.0 February 3, 2021

Surveillance Audit Due
January 1, 2024




Evaluating Assessor


Certifying Assessor

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Systematic Capability: SC 3 (SIL 3 Capable)

Random Capability: Type B Element

SIL 2 @ HFT=0; SIL 3 @ HFT = 1; Route 2_H

PFH/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 element meets *exida* criteria for Route 2_H.

IEC 61508 Failure Rates in FIT¹

| Device | λ_{SD} | λ_{SU} | λ_{DD} | λ_{DU} |
|---|----------------|----------------|----------------|----------------|
| Eclipse Enhanced Model 705, 705-51A* ^{***} , Low Trip | 0 | 31 | 847 | 154 |
| Eclipse Enhanced Model 705, 705-51A* ^{***} , High Trip | 0 | 55 | 847 | 130 |

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: MAG 17/11-052 R002 V2R0 (or later)

Safety Manual: 57-651.3, March 2012 (or later)



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