FUNCTIONAL SAFETY CERTIFICATE

This is to certify that the

XB15 Xenon Beacon

manufactured by

Eaton MEDC Ltd

Unit B
Sutton Parkway
Oddicroft Lane
Sutton-In-Ashfield
NG17 5FB
UK

has been assessed by Sira Certification Service with reference to the CASS methodologies and found to meet the requirements of

IEC 61508-1:2010 (Clause 6)
IEC 61508-2:2010

The product as an element/subsystem suitable for use in safety related systems performing safety functions up to and including

SIL 2 capable with HFT=0 (1oo1) *

when used in accordance with the scope and conditions of this certificate.

*This certificate does not waive the need for further functional safety verification to establish the achieved safety integrity level (SIL) of the safety related system

Certification Decision:

James Lynskey

Initial Certification:	31st January 2012
This certificate issued:	22nd January 2024
Renewal date:	06th June 2024

This certificate may only be reproduced in its entirety, without any change.

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Table 1: Summary of proven in use assessment of the XB15

Parameter name	Symbol	Equation / source	Results
Hardware Fault Tolerance	HFT	Architecture of the valve	0
Proof Test Interval	T	Proof test in hours	8760 (1 yr)
Mean Time To Repair	MTTR	Mean time to repair in hours	3
Type A/B	Type A	Product classification	Type B
Dangerous undiagnosed failures	λ_{DU}	From return data (Route 2_H)	2.50E-08
PFD_{AVG}	PFD_{AVG}	λ_{DU} (T / 2+MTTR)	1.10E-04
SIL capability (Low demand mode)			**SIL 2**

Note: As per Route 2H clause 7.4.4.3.1 of IEC61508-2; a hardware fault tolerance of 1 for a specified safety function for SIL 3 unless the conditions in clause 7.4.4.3.2 are met, must apply. Clause 7.4.4.3.2 indicates that the hardware fault tolerance can be reduced if the sum of all dangerous failures does not exceed 1% of the target failure measure. This requires for the PFD value to be <1.00E-05, therefore in failing to meet this requirement the device is limited to SIL 2 with HFT = 0.

Product description and scope of certification

The XB15 Xenon Beacon has been designed for use in potentially explosive atmospheres and harsh environmental conditions. The enclosures are suitable for use either onshore or offshore, as the light weight yet corrosion resistant design is required.

The housing of the Beacon is manufactured completely from UV stable, glass reinforced polyester and stainless steel fittings.

The XB15 Xenon Beacon can be assembled with two variants of rear housing depending on the mounting configuration set by the end user.

Certified Data in support of use in safety functions

The assessment has been carried out with reference to the *Conformity Assessment of Safety-related Systems* (CASS) methodology using the Route 1_H approach.

Element Safety Function

The Safety Function of the XB15 Xenon Beacon is: *'To provide a cycled visual warning light when energized'.*

The element safety function is intended for use in low demand *Mode of Operation*[1] as indicated by the certified failure data overleaf.

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Identification of certified equipment

The certified equipment and its safe use are defined in the manufacturer's documentation listed in Table 2 below.

Table 2: Certified drawings

Document no.	Rev	Date	Document description
276-378_A	D	10-07-2012	Circuit schematic of the XB15 Xenon Beacon.
276-116	K	14-01-2003	XB15 production drawing
276-123	F	28-05-2002	XB15 ATEX wiring diagram

The failure data above is supported by the base information given in Table 3 below.

Table 3: Information supporting the failure rate data

1	Product identification:	XB15 Xenon Beacon as described in manufacturer's product catalogue 6DS120 and page 3 of this certificate.
2	Functional specification:	Refer to paragraph above 'Element safety function'.
3-5	Random hardware failure rates:	Refer to summary table above
6	Environment limits:	Temperature range: -50 to +70°C operational
7	Lifetime/replacement limits:	Refer to XB15 Technical and Safety manual TM246.
8	Proof Test requirements:	Refer to XB15 Technical and Safety manual TM246.
9	Maintenance requirements:	Refer to XB15 Technical and Safety manual TM246.
10	Diagnostic coverage:	0%
11	Diagnostic test interval:	No diagnostic test interval
12	Repair constraints:	Refer to XB15 Technical and Safety manual TM246.
13	Safe Failure Fraction:	62%
14	Hardware fault tolerance (HFT):	0
15	Highest SIL (architecture/type A/B):	SIL2, Type B
16	Systematic failure constraints:	Refer to R56A24816B
17	Evidence of similar conditions in previous use:	Not used
18	Evidence supporting the application under different conditions of use:	Not used
19	Evidence of period of operational use:	Not used
20	Statement of restrictions on functionality:	Not used
21	Systematic capability:	Refer to R56A24816B
22	Systematic fault avoidance measures:	Refer to R56A24816B
23	Systematic fault tolerance measures:	Refer to R56A24816B
24	Validation records:	Refer to R56A24816B

Management of functional safety

The assessment has demonstrated that the product is supported by an appropriate functional safety management system that meets the relevant requirements of IEC 61508-1:2010 clause 6. See report R56A24816B.

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Conditions of Certification

The validity of the certified base data is conditional on the manufacturer complying with the following conditions:

1. The manufacturer shall analyse failure data from returned products on an on-going basis. Sira Certification Service shall be informed in the event of any indication that the actual failure rates are worse than the certified failure rates. (A process to rate the validity of field data should be used. To this end, the manufacturer should co-operate with users to operate a formal field-experience feedback programme).
2. Sira shall be notified in advance (with an impact analysis report) before any modifications to the certified equipment or the functional safety information in the user documentation is carried out. Sira may need to perform a re-assessment if modifications are judged to affect the product's functional safety certified herein.
3. On-going lifecycle activities associated with this product (e.g., modifications, corrective actions, field failure analysis) shall be subject to surveillance by Sira in accordance with 'Regulations Applicable to the Holders of Sira Certificates.

Conditions of Safe Use

The validity of the certified base data in any specific user application is conditional on the user complying with the following conditions:

1. The user shall comply with the requirements given in the manufacturer's user documentation (referred to in Table 3 above) in regard to all relevant functional safety aspects such as application of use, installation, operation, maintenance, proof tests, maximum ratings, environmental conditions, repair, etc;
2. Selection of this equipment for use in safety functions and the installation, configuration, overall validation, maintenance and repair shall only be carried out by competent personnel, observing all the manufacturer's conditions and recommendations in the user documentation.
3. All information associated with any field failures of this product should be collected under a dependability management process (e.g., IEC 60300-3-2) and reported to the manufacturer.
4. The unit should be tested at regular intervals to identify any malfunctions; in accordance with the safety manual TM246.

General Conditions and Notes

1. This certificate is based upon a functional safety assessment of the product described in Sira Test & Certification Assessment Report R56A28505Av1.1 and any further reports referenced in that report (under previous Sira projects).
2. If certified product or system is found not to comply, Sira Certification Service should be notified immediately at the address shown on this certificate.
3. The use of this Certificate and the Sira Certification Mark that can be applied to the product or used in publicity material are subject to the 'Regulations Applicable to the Holders of Sira Certificates' and 'Supplementary Regulations Specific to Functional Safety Certification'.
4. This document remains the property of Sira and shall be returned when requested by the issuer.

Certificate History

Issue	Date	Project No.	Comment
04	20/02/2017	70105191	Certificate re-issued after successful recertification.

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Issue	Date	Project No.	Comment
05	07/06/2019	R80000491A	Certificate updated to align all Eaton MEDC certificate expiry dates.
06	22 Jan 2024	80161666 R56A28505 v2.0	Updated to include Route 2H (PIU) calculations

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