



## FUNCTIONAL SAFETY CERTIFICATE

This is to certify that the

### ***BG Break Glass Unit***

manufactured by

### ***Eaton MEDC Ltd***

Unit B  
Sutton Parkway  
Oddcroft 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 and its associated data contained herein can be considered for use in the design of safety functions up to and including

### **SIL 2\***

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

\* The Product that has been certified is not implicit of the achieved Safety Integrity Level (SIL) of the safety related system

Certification Decision:

James Lynskey

Initial Certification: 31<sup>st</sup> January 2012  
This certificate issued: 25<sup>th</sup> September 2020  
Renewal date: 06<sup>th</sup> June 2024

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



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Form 7016 issue 2  
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## Product description and scope of certification

Manual alarm call points are designed for the purpose of raising an alarm manually once verification of a fire or emergency condition exists, by operating the push button or break glass the alarm signal can be raised.

The BG Break glass unit can be constructed in several different configurations depending on the application, the worse case considered as part of this analysis is for the encapsulated end of line resistor to be included within the BG Breakglass Unit.

The BG Breakglass unit can also include a S/Steel flap to protect the glass facia from inadvertent operations, this simple mechanical device has been included as part of this FMEDA assessment due to its intrusive nature on the Safety Function.



## 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<sub>H</sub> approach.

A Failure Mode, Effect and Diagnostic Analysis (FMEDA) has established the failure modes and failure rates shown in Table 1 below. Failure sources have been taken from RIAC NPRD/FMD and Faradip Three Version 6.5.

**Table 1: FMEDA results**

<b>BG BREAKGLASS UNIT</b>		
Safety Function of BG Break Glass Unit: <i>'To raise the alarm upon breaking the glass'</i>		
Architectural constraints:	Type A HFT=0 SFF= 97%	SIL3
Random hardware failures:	$\lambda_{DD} = 0$ $\lambda_{DU} = 5.72E-07$	$\lambda_{SD} = 0$ $\lambda_{SU} = 2.04E-05$
Probability of failure on demand:	$PFD_{AVG} = 2.51E-03$ (Low Demand Mode)	SIL2
Probability of Dangerous failure on safety function:	$PFH = 5.72E-07$ (High Demand Mode)	SIL2
Hardware safety integrity compliance <sup>[1]</sup>	Route 1 <sub>H</sub>	
Systematic safety integrity compliance <sup>[1]</sup>	Route 1 <sub>S</sub>	
Systematic Capability <sup>[2]</sup>	SC 2	
Overall SIL-capability achieved <sup>[3]</sup>	SIL 2 (Low Demand) SIL 2 (High Demand)	

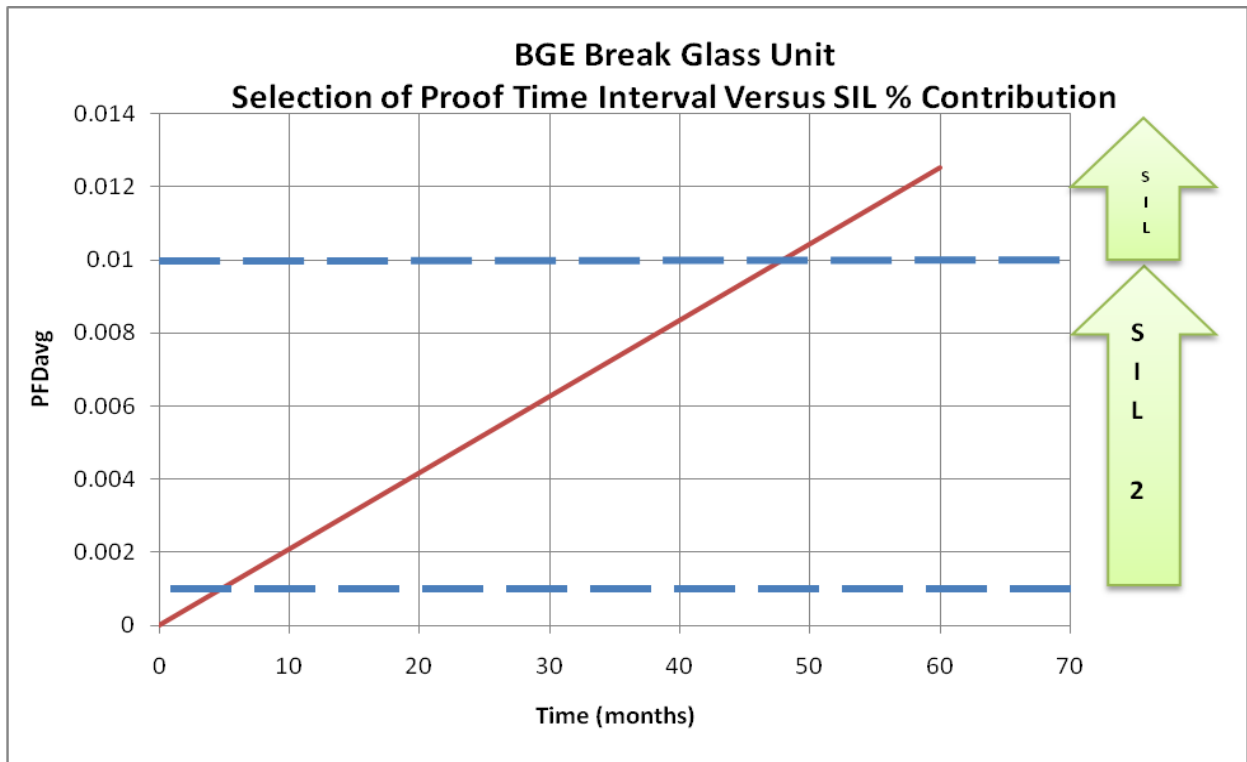
<sup>[1]</sup> These are new parameters used in IEC61508 Part 2 Sections 7.4.2 & 7.4.4.

<sup>[2]</sup> This is a new measurable scale for the systematic safety integrity level; refer to IEC61508 Part 4 Section 3.5.9.

<sup>[3]</sup> This is determined by the lowest SIL indicated by each of the parameters given above.

<sup>[4]</sup> These figures are used only for demonstration purposes.





<b>BG BREAKGLASS UNIT WITH OPTIONAL MONITOR M501M<sup>[1]</sup></b>		
Safety Function of BG Break Glass Unit: <i>'To raise the alarm upon breaking the glass'</i>		
Architectural constraints:	Type B HFT=0 SFF= 97%	SIL2
Random hardware failures:	$\lambda_{DD} = 3.57E-07$ $\lambda_{DU} = 7.06E-07$	$\lambda_{SD} = 0$ $\lambda_{SU} = 2.04E-05$
Probability of failure on demand:	$PFD_{AVG} = 3.10E-03$ (Low Demand Mode)	SIL2
Probability of Dangerous failure on safety function:	$PFH = 7.06E-07$ (High Demand Mode)	SIL2
Hardware safety integrity compliance <sup>[1]</sup>	Route 1 <sub>H</sub>	
Systematic safety integrity compliance <sup>[1]</sup>	Route 1 <sub>s</sub>	
Systematic Capability <sup>[2]</sup>	SC 2 (Ref to 56A24816B)	
Overall SIL-capability achieved <sup>[3]</sup>	SIL 2 (Low Demand)	
	SIL 2 (High Demand)	

<sup>[1]</sup> The optional Monitor has previously been certified. Results for this unit are shown in TAI-FS-C-20-0025 certificate. Sum of previous break glass failures have been included to provide a full evaluation assessment along with the optional monitor.



## Element Safety Function(s)

- BG Break glass Unit – Safety Function of the BG Break glass Unit is to raise the alarm.

The *Safe State* of the *EUC* is to be achieved when the product provides an audible warning.

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

The failure data above is supported by the base information given in Table 2 below.

**Table 2: Information supporting the failure rate data**

1	Product identification:	BG Break Glass Unit as described in manufacturer's product catalogue
2	Functional specification:	Refer to paragraph above 'Use in safety functions' and full specification in manufacturer's product catalogue.
3-5	Random hardware failure rates:	Refer to FMEDA summary table above
6	Environment limits:	Temperature range: -50 to +70°C operational
7	Lifetime/replacement limits:	Refer to Installation, Operation and Maintenance Manual
8	Proof Test requirements:	Refer to user manual
9	Maintenance requirements:	Refer to user manual
10	Diagnostic coverage:	The BG has no form of diagnostics
11	Diagnostic test interval:	The BG has no form of diagnostics
12	Repair constraints:	Refer to user manual
13	Safe Failure Fraction:	97% (See FMEDA summary table above)
14	Hardware fault tolerance (HFT):	0
15	Highest SIL (architecture/type A/B):	SIL2, Type A
16	Systematic failure constraints:	Refer to 56A24816B
17	Evidence of similar conditions in previous use:	Refer to 56A24816A
18	Evidence supporting the application under different conditions of use:	Refer to 56A24816A
19	Evidence of period of operational use:	Compliance Route 2 <sub>H</sub> (proven-in-use) not used
20	Statement of restrictions on functionality:	Compliance Route 2 <sub>H</sub> (proven-in-use) not used
21	Systematic capability:	Refer to Systematic Assessment report R56A24816B
22	Systematic fault avoidance measures:	Refer to Systematic Assessment report R56A24816B
23	Systematic fault tolerance measures:	Refer to Systematic Assessment report R56A24816B
24	Validation records:	Refer to Systematic Assessment report R56A24816B



## Identification of certified equipment

The certified equipment and its safe use are defined in the manufacturer's documentation listed in Table 3 below.

**Table 3: Certified drawings**

Document no.	Pages	Rev	Date	Document description
180-177	1	F	13-03-1992	Wiring Diagram BG/I/W/UL & PBE/I/W/UL
180-179	1	D	01-05-1992	Wiring Diagram BG, Single Pole Switch & Resistor
180-274	1	E	09-09-1993	Wiring Diagram BG C/W Series Resistor
180-275	1	G	18-07-1995	Wiring Diagram BG C/W Series & EOL Resistor
180-381	1	A	26-07-1994	BG Wiring Diagram LED & Series Resistor
480-434	1	C	10/05/2016	Production G.A BGW, I & E (Redesign)
180-479	1	D	08-09-1996	Insert G.A BG/BG

## 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.



## General Conditions and Notes

1. This certificate is based upon a functional safety assessment of the product described in Sira Test & Certification Assessment Report R56A24816A 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
03	20/02/2017	70105191	Certificate re-issued after successful recertification.
04	07/06/2019	R80000491A	Certificate updated to align all Eaton MEDC certificate expiry dates.
05	25/09/2020	R56A24816A	Certificate updated to include additional (optional) Monitor M501M.

