FUNCTIONAL SAFETY CERTIFICATE

This is to certify that the

PH1 – Pull Handle Call Point

manufactured by

Eaton MEDC
Unit B
Sutton Parkway
Oddicroft Lane
Sutton in Ashfield
NG17 5FB
United Kingdom

have been assessed by CSA Group Testing with reference to the CASS methodologies and found to meet the requirements of

IEC 61508-2:2010
Routes 1_H & 1_S
Systematic Capability (SC2)

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

SIL 1 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 : 19th July 2019
This certificate re-issued : 16th July 2024
Renewal date : 06th June 2029

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Product description and scope of certification

The PH1 double action pull handle call point has been designed for use in flammable atmospheres and harsh environmental conditions. The GRP enclosure is suitable for use offshore or onshore where light weight combined with a high level of corrosion resistance is required.
The large "Lift" and "Pull" GRP handles require double action to raise the alarm, preventing accidental activation.

Figure 1: Typical Assembly of the PH1 – Pull Handle Call Point

Element Safety Function

The element safety functions of the PH1 - Pull Handle Call Point are defined as follows:

To open a normally closed contact (and close an N/O contact) upon the "PULL" handle being pulled.

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.

As part of the product assessment and supporting evidence of conformity with respect to 'hardware safety integrity' against the requirements of IEC 61508-2; Eaton MEDC have submitted the PH1 - Pull Handle Call Point for FMEA assessment to attain SIL capability. The component failure rates and modes for the PH1 - Pull Handle Call Point have been extracted from or calculated using Quanterion Automated Databook, Item Toolkit and Faradip 3.0. Table 2 summarises the FMEA assessment for the PH1 - Pull Handle Call Point.

The results in Table 1 summarize the PH1 – Pull Handle Call Point FMEA assessment and achieved safety integrity level.

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Table 1: Summary of assessment for the PH1 – Pull Handle Call Point

Safety Function: *To open a normally closed contact (and close an N/O contact) upon the "PULL" handle being pulled.*		
Summary of IEC 61508-2 Clauses 7.4.2 and 7.4.4		PH1 – Pull Handle Call Point
Architectural constraints & Type of product A/B		**HFT = 0** **Type A**
Safe Failure Fraction (SFF)		**49%**
Random hardware failures: [h^{-1}]	λ_{DD} λ_{DU}	0.00E-00 2.32E-07
Random hardware failures: [h^{-1}]	λ_{SD} λ_{SU}	0.00E-00 2.22E-07
Diagnostic coverage (DC)		0%
PFD @ PTI = 8760 Hrs. MTTR = 8 Hrs.		**1.02E-03**
Hardware safety integrity compliance		Route 1_H
Systematic safety integrity compliance		Route 1_S **See report R80000492B**
Systematic Capability (SC1, SC2, SC3, SC4)		**SC 2**
Hardware safety integrity achieved		**SIL 1** **limited to SIL 1 due to architectural constraints (SFF)**

Note 1: The failure data:

1) The PFD_{AVG} figure shown is for illustration only assuming a proof test interval of 8760 hours and MTTR of 8 hours. Refer to IEC 61508-6 for guidance on PFD_{AVG} calculations from the failure data.
2) The verified failure rates used in the safe failure fraction and diagnostic coverage do not include (λ no parts or no effect) failures in the calculation.

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

Table 2: Base information for the PH1 – Pull Handle Call Point

1	Product identification:	PH1 – Pull Handle Call Point
2	Functional specification:	*To open a normally closed contact (and close an N/O contact) upon the "PULL" handle being pulled.*
3-5	Random hardware failure rates:	Refer to table 1 of this certificate.
6	Environment limits:	Operating temperature: Standard components able to operate at +70°C.
7	Lifetime/replacement limits:	20 years
8	Proof Test requirements:	Refer to safety manual – TM230 PH1
9	Maintenance requirements:	Refer to safety manual - TM230 PH1
10	Diagnostic coverage:	0% diagnostic coverage.
11	Diagnostic test interval:	Refer to safety manual - TM230 PH1
12	Repair constraints:	Refer to safety manual - TM230 PH1
13	Safe Failure Fraction:	49%
14	Hardware fault tolerance (HFT):	See Table 1 above
15	Highest SIL (architecture/type A/B):	Type A, SIL1

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16	Systematic failure constraints:	The hardware safety integrity assessment was based on a proof test interval of 1 year. For further information refer to safety manual - TM230 PH1
17	Evidence of similar conditions in previous use:	Not applicable.
18	Evidence supporting the application under different conditions of use:	Not applicable.
19	Evidence of period of operational use:	Not applicable.
20	Statement of restrictions on functionality:	See systematic report R80000492B.
21	Systematic capability (SC1, SC2, SC3)	SC2 - See systematic report R80000492B.
22	Systematic fault avoidance measures:	Compliance with techniques and measures from IEC 61508-2 Annex B to SIL 2 - See systematic report R580000492B.
23	Systematic fault tolerance measures:	See hardware safety integrity report R80000492A.
24	Validation records:	All documents that have been used in support of the hardware have been documented in section 5.26 of report R80000492A; this includes the FMEA document and insertion tests.

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 R80000492B.

Identification of certified equipment

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

Table 3: Certified documents

Document No.	Pages	Rev	Date	Document description
303-103	1 to 5	F	26 Nov 11	PH1 Production General Assembly Drawing
PH1 BOM	-	-	26 Nov 11	PH1 Bill of Materials

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. CSA 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. CSA 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. CSA 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 CSA in accordance with 'Regulations Applicable to the Holders of CSA Certificates'.

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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 in regard to all relevant functional safety aspects such as application of use, installation, operation, maintenance, proof tests, maximum ratings, environmental conditions, and repair.
2. Selection of this product for use in safety function 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 safety device is to have an independent power supply, it must not share the same power supply as non-safety devices that may cause a fault to the safety device.
5. A proof test interval of 1 year.

General Conditions and Notes

1. This certificate is based upon a functional safety assessment of the product described in CSA Test & Certification Assessment Report R80000492A and any further reports referenced (R80000492B).
2. If the certified product or system is found not to comply, CSA Certification Service should be notified immediately at the address shown on this certificate.
3. The use of this Certificate and the CSA Certification Mark that can be applied to the product or used in publicity material are subject to the 'Regulations Applicable to the Holders of CSA Certificates' and 'Supplementary Regulations Specific to Functional Safety Certification'.
4. This document remains the property of CSA and shall be returned when requested by the issuer.
5. No part of the Functional safety related aspects stated in the instruction manual shall be changed without approval of the certification body.
6. This certificate will remain valid subject to completion of two surveillance audits within the five year certification cycle, and upon receipt of acceptable response to any findings raised during this period. This certificate can be withdrawn if the manufacturer no longer satisfies scheme requirements.

Certificate History

Issue	Date	Report no.	Comment
00	19/07/2019	R800000492A R800000492B	The release of prime certificate.
01	16/07/2024	R80213231B	Certificate re-issued after successful recertification audit.

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