



Technical Manual for the Heat Detector HD1 – Exd IIC

Please note that every care has been taken to ensure the accuracy of our technical manual. We do not, however, accept responsibility for damage, loss or expense resulting from any error or omission. We reserve the right to make alterations in line with technical advances and industry standards.

1.0 INTRODUCTION

The HD1 heat Detector has been designed for use in flammable atmospheres and harsh environmental conditions. The marine grade alloy Exd version is suitable for use offshore or onshore, where light weight combined with corrosion resistance and strength is required.

2.0 INSTALLATION

The Heat Detector is mounted via 4 X Ø9mm fixing holes in feet on the base of the unit.

The fixing holes have been designed to accept an M8 caphead screw or bolt.

MEDC recommend the use of stainless steel fasteners.

The Heat Detector will operate in any attitude

2.1 Removing the Cover

Unscrew the 4 x M6 cover fixing screws and lift the cover clear of the enclosure.

See 2.2 Cable Termination.

After cable termination has been completed the cover can be replaced and secured to the enclosure.

2.2 Cable Termination

Cable termination should be in accordance with specifications applying to the application. MEDC recommend that all cables and cores should be fully identified.

Ensure that only the correct certified glands are used and that the assembly is shrouded and correctly earthed.

All cable glands should be of an equivalent IP rating to that of the Heat Detector.

In order to maintain the IP rating, the glands should be sealed to the Heat Detector using a sealing washer or sealing compound.

The internal earth terminal must be used for the equipment grounding connection and the external terminal is for a supplementary bonding connection where local codes or authorities permit or require such connection.

2.3 General

When installing and operating explosion-proof electrical equipment, the relevant national regulations for installation and operation (e.g. EN60079-14 and IEE Edition Wiring Regulations) must be observed.

Ensure that all nuts, bolts and fixings are secure.

Ensure that only the correct certified stopping plugs are used to blank off unused gland entry points. We recommend the use of 'HYLOMAR PL32 COMPOUND' on the threads of the stopping plugs in order to maintain the IP or NEMA rating of the unit.

3.0 OPERATION

The Heat Detector consists of a sealed element containing a single normally open (N.O.) thermal switch which operates at a fixed temperature. The sensor element is fully sealed and no attempt must be made to modify this in any way. Adjustment of the temperature setting is not possible.

4.0 MAINTENANCE

During the working life of the Heat Detector it should require little or no maintenance. However, if abnormal or unusual environmental conditions occur due to plant damage or accident etc., then visual inspection is recommended.

If a fault should occur, then the unit can be repaired by MEDC.

UNDER NO CIRCUMSTANCES SHOULD ANY ATTEMPT BE MADE TO EITHER UNSCREW THE HEAT DETECTOR ELEMENT FROM THE ENCLOSURE OR GAIN ACCESS TO THE INSIDE OF THE HEAT DETECTOR ELEMENT.

EITHER OF THESE ACTIONS WILL RESULT IN THE ASSEMBLY BECOMING UNSAFE FOR USE IN A POTENTIALLY EXPLOSIVE ATMOSPHERE.

If you have acquired a significant quantity of Heat Detectors, then it is recommended that spares are also made available, (please discuss your requirements with MEDC's Technical Sales Engineers).

5.0 CERTIFICATION

Certified to EN60079-0:2006, EN60079-1:2004, EN62141-0:2006, EN61241-1:2004
Exd IIC tD A21 IP6X T85°C (Tamb = -20°C to +55°C).

ATEX Certificate Number: Baseefa 08ATEX0320

The ATEX certificate and the product label carry the ATEX group and category marking:

 II 2GD

Where:

 signifies compliance with ATEX

II signifies suitability for use in surface industries

2 signifies suitability for use in a zone 1 area

G signifies suitability for use in the presence of gases

D signifies suitability for use in the presence of dust

A21 signifies suitability for use in the presence of dust in a zone 21 area

The product label also carries the following mark:



This signifies unit compliance to the relevant European directives, in this case 2014/34/EU, along with the number of the notified body issuing the EC type examination certificate.

6.0 FUNCTIONAL SAFETY

Introduction

The HD1 Heat Detector has been designed for use in flammable atmospheres and harsh environmental Conditions. The marine grade alloy (Exd version) or Glass Reinforced Polyester (Exem and Exia versions) are suitable for use offshore or onshore, where light weight combined with corrosion resistance and strength is required.

The safety function of the Heat Detector is to detect when a predefined temperature is reached. Under No fault (Normal) operating conditions the Heat Detector contacts are normally open

Under fault conditions the failure mode of the Heat Detector is a failure to activate when a predefined temperature is reached. For the failure rate associated with this failure mode please refer to the table below.

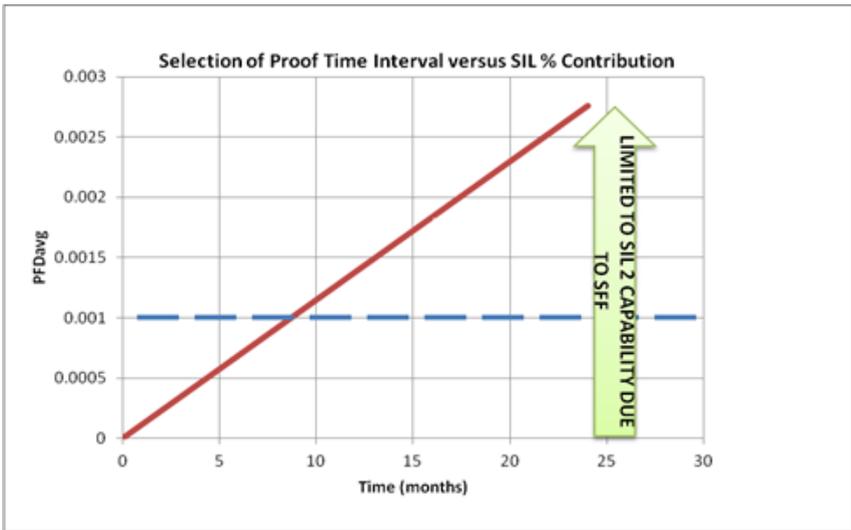
Assessment of Functional Safety

The HD1 Heat Detector is intended for use in a safety system conforming to the requirements of IEC61508

Sira Test & certification has conducted a failure Modes Effect and Diagnostic Analysis (FMEDA) of the HD1 Heat Detector against the requirements of IEC61508-2 using a proof test interval of 8760 hours.

The HD1 Heat Detector is classed as a Type A device.

HD1 Heat Detector			
Safety Function of HD1 Heat Detector: 'To detect when the device reaches a predefined temperature'			
Architectural constraints:	Type A HFT=0 SFF = 78%		SIL 2
Random hardware failures:	$\lambda_{DD} = 0$ $\lambda_{SD} = 0$ $\lambda_{DU} = 3.15E-07$ $\lambda_{SU} = 1.18E-06$		
Probability of failure on demand:	PFD _{AVG} =1.38E-03 (Low Demand Mode)	Assuming: - PTI = 8760 Hrs MTTR = 8Hrs	SIL 2
Probability of Dangerous failure on safety function:	PFH = 3.15E-07 (High Demand Mode)		SIL 2
Hardware safety integrity compliance	Route 1 _H		
Systematic safety integrity compliance	Route 1 _S		
Systematic Capability	SC 2 (Ref to 56A24816B)		
Overall SIL-capability achieved	SIL 2 (Low Demand) SIL 2 (High Demand)		



Conditions of Safe Use

1. The user shall comply with the requirements given in the manufacturer's user documentation (Safety Manual) 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 this safety manual.

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