

1 **UK-TYPE EXAMINATION CERTIFICATE**

2 **Equipment or Protective System Intended for use in Potentially Explosive Atmospheres
UKSI 2016:1107 (as amended) – Schedule 3A, Part 1**

3 UK-Type Examination Certificate Number: **BAS21UKEX0558X**

4 Product: **SD**xxx Series Surge Protection Devices**

5 Manufacturer: **Eaton Electric Limited**

6 Address: **Great Marlings, Butterfield, Luton, Bedfordshire, LU2 8DL**

7 This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 SGS Baseefa, Approved Body number 1180, in accordance with Regulation 43 of the Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016, UKSI 2016:1107 (as amended), certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Schedule 1 of the Regulations.

The examination and test results are recorded in confidential Report No. **21(C)0386/34**

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0:2018 EN 60079-11:2012

except in respect of those requirements listed at item 18 of the Schedule.

10 If the sign “X” is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

11 This UK-TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Regulations apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12 The marking of the product shall include the following :

⊕ II 1G Ex ia IIC T4 Ga (-30°C ≤ Ta ≤ See Schedule)

SGS Baseefa Customer Reference No. **0703**

Project File No. **21/0386**

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R S SINCLAIR
TECHNICAL MANAGER
On behalf of SGS Baseefa Limited

13 **Schedule**

14 **Certificate Number BAS21UKEX0558X**

15 **Description of Product**

SDxxx Series**

The SD**xxx Series Surge Protection Devices are designed to protect instrumentation and electronic systems from surges and transients conducted through signal cables.

The apparatus comprises a printed circuit board (PCB) upon which are mounted all of the electrical components. The units use two and three terminal gas discharge tubes, diodes, zener diodes, resistors and inductors for operational purposes and may be optionally encapsulated. The PCB is housed within a plastic enclosure with two groups of three terminals (1, 2 & 3 and 4, 5 & 6) at either end of the enclosure, for the connection of the interconnecting cables. An earth shoe is fitted to the apparatus to enable connection of an earth bonding conductor with a cross sectional area of at least 4mm².

The SD**xxx Series comprises SD**X (two wire and earth with Li = 0.22mH) and SD**T3 (three wire and earth with Li = 0.22mH). The apparatus in each of these Series differ only in the operating voltage. The “***” in the apparatus title indicates the nominal voltage the apparatus is designed to work at. For example, a unit marked SD07R has a nominal working voltage of 7V and an operating voltage of 7.5V. The working voltage and operating voltage of the devices are not critical for the safety assessment.

The SD**xxx Series Surge Protection Devices may be located in a hazardous area. For all units the permitted input current reduces as the voltage increases and the different input power limit determines the upper limit on the permitted ambient temperature range. The Surge Protected Devices are passive and therefore the surge protected output parameters are equal to the parameters of the device connected to the field terminals.

The parameters for all of the SD**X and SD**T3 units are:

All SD**X and SD**T3 units are marked Ex ia IIC T4 Ga (-30°C ≤ Ta ≤ See below)

Input: Field Terminals

- U_i = 20V I_i = 260mA
- or U_i = 26V I_i = 175mA
- or U_i = 28V I_i = 140mA
- or U_i = 60V I_i = 65mA
- P_i = 1W (-30°C ≤ Ta ≤ 75°C)
- or P_i = 1.2W (-30°C ≤ Ta ≤ 60°C)
- or P_i = 1.3W (-30°C ≤ Ta ≤ 40°C)

C_i = 0

Li = 0.22mH

Output: Surge Protected Terminals

U_o ≤ U_i

I_o ≤ I_i

P_o ≤ P_i

The surge protected output parameters are equal to the parameters of the device connected to the field terminals.

The parameters for all of the SD**R, SD**R3 and SDrtd units are:-

All the SD**R, SD**R3 and SDrtd. units are marked Ex ia IIC T4 Ga (-30°C ≤ Ta ≤ See Below)

Input: Field Terminals

$$U_i = 60V$$

$$I_i = 260mA$$

$$P_i = 1W \quad (-30^\circ C \leq T_a \leq 75^\circ C)$$

or $P_i = 1.2W \quad (-30^\circ C \leq T_a \leq 60^\circ C)$

or $P_i = 1.3W \quad (-30^\circ C \leq T_a \leq 40^\circ C)$

$$C_i = 0$$

$$L_i = 0$$

Output: Surge Protected Terminals

$$U_o \leq U_i$$

$$I_o \leq I_i$$

$$P_o \leq P_i$$

The surge protected output parameters are equal to the parameters of the device connected to the field terminals.

SDMxxx Series**

The SD**Mxxx Series Surge Protection Devices are based on a module construction and comprise a 'module base' unit which has four options and a plug-in surge 'module insert' which has thirty options. Once the 'module insert' is installed into the 'module base' unit it is retained in place by a locking bar.

The 'module base' unit comprises three input terminals, three output terminals and a printed circuit board, all mounted in an enclosure provided with a mounting slot for the 'module insert' and a conductive foot for mounting on a standard DIN rail. With the exception of the mounting foot, this enclosure provides a degree of protection of at least IP20 for the electrical circuit irrespective of whether the 'module insert' is fitted. A gas discharge tube may be inserted in the connections 3 & 6 to the mounting foot or alternatively this is replaced by a link which directly earths the foot and these components are mounted on the base printed circuit board. The 'module base' unit offers the option of maintaining the signal connections 2 & 5 and 1 & 4 when the 'module insert' is removed or interrupting these connections.

The 'module insert' comprises an encapsulated printed circuit board (PCB) upon which are mounted the electrical components. The modules use two and three terminal gas discharge tubes, diodes, zener diodes, LEDs, resistors and inductors for operational purposes mounted on the module printed circuit board and housed within a plastic module, which when fitted in the 'module base' unit, provides a degree of protection of at least IP20 for the electrical circuit. The 'module insert' is asymmetrical and the PCB edge connector is arranged so that the connections 3 & 6 makes first and breaks last when inserted or removed. Depending on the module two plug in external links may be available to disconnect the signal connections 2 & 5 and 1 & 4.

The SD**Mxxx Series Surge Protection Devices are available in a number of differing configurations and operating voltages. The "***" in the apparatus title indicates the nominal voltage the apparatus is designed to work at. For example, a unit marked SD07Mxxx has a nominal working voltage of 7V and an operating voltage of 7.5V. The differing configurations, working voltage and operating voltage of the device are not critical for the safety assessment.

The SD**Mxxx Series Surge Protection Devices may be located in a hazardous area. For all units the permitted input current reduces as the voltage increases and the different input power limit determines the upper limit on the permitted ambient temperature range. The Surge Protected Devices are passive and therefore the surge protected output parameters are equal to the parameters of the device connected to the field terminals.

It is intended that the 'module base' and the 'module insert' are combined before being supplied for installation and if the 'module insert' fails in service it may be easily replaced by an identical unit. However since the differing configurations, working voltage and operating voltage of the assembly are not critical for the safety assessment it is not significant if a different 'module insert' is fitted or if the 'module base' is installed without a 'module insert.'

All SD**Mxxx Series Surge Protection Devices are marked Ex ia IIC T4 Ga. For the Ambient Temperature limits, see below:

Input: Field Terminals:

$$U_i = 20V \quad I_i = 260mA$$

or $U_i = 26V \quad I_i = 175mA$

- or $U_i = 28V$ $I_i = 140mA$
- or $U_i = 60V$ $I_i = 65mA$
- or $U_i = 75V$ $I_i = 40mA$
- $P_i = 1W$ $(-30^{\circ}C \leq T_a \leq 75^{\circ}C)$
- or $P_i = 1.2W$ $(-30^{\circ}C \leq T_a \leq 60^{\circ}C)$
- or $P_i = 1.3W$ $(-30^{\circ}C \leq T_a \leq 40^{\circ}C)$

$C_i = 0$

$L_i = 0.22mH$ (All SD**Mxxx units are treated as if $L_i = 0.22mH$ irrespective of if L1 and L2 are fitted.)

Output: Surge Protected Terminals:

$U_o \leq U_i$

$I_o \leq I_i$

$P_o \leq P_i$

The surge protected output parameters are equal to the parameters of the device connected to the field terminals.

The safe use of the SD**Mxxx range of Surge Protection Devices is not dependent upon the nominal working voltage, but on the combination of input voltage and current from a certified intrinsically safe source. To accommodate the SD75Mxxx Series Surge Protection Device, the existing input parameters, which are applicable to all SD**Mxxx units within the range, are extended by the addition the higher combination of $U_i = 75V$ and $I_i = 40mA$. The full Modular Range is shown below:

Modular Options Only						Model
SD						
	VV					Nominal Working Voltage 07V, 16V, 32V, 55V & 75V
		M				Modular
			F			Fuse
				D		Disconnect Links fitted for maintenance Not now available with "Normally Off with Failure On" option.
					L	LED "Normally Off with Failure On"

Module Insert Options

Working Voltage 7V	Working Voltage 16V	Working Voltage 32V	Working Voltage 55V	Working Voltage 75V	Series Impedance	Disconnect Links	LED
SD07MXX	SD16MXX	SD32MXX	SD55MXX		<0.5Ω		
SD07MXL	SD16MXL	SD32MXL	SD55MXL	SD75MXL	<0.5Ω		Fitted
SD07MDX	SD16MDX	SD32MDX	SD55MDX		2-2.4 Ω	Fitted	
SD07MFX	SD16MFX	SD32MFX	SD55MFX		2-2.4 Ω	Disconnect Fuse Fitted	

Module Base Options

'Module Base' Type	GDT connects 3 & 6 to the mounting foot	Maintains the signal connections 2 & 5 and 1 & 4 with 'module insert' removed
SDBE-BCN	Not fitted	Maintains the signal connections, with insert removed
SDBE-BDN	Not fitted	Disconnects signal connections, with insert removed
SDBE-BCG	Fitted	Maintains the signal connections, with insert removed
SDBE-BDG	Fitted	Disconnects signal connections, with insert removed

16 Report Number

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17 Specific Conditions of Use

1. The Plastic enclosure may present an electrostatic risk and must not be rubbed in service.
2. The range of SD**xxx Series Surge Protection Devices will not meet the 500V insulation requirements to earth, therefore suitable precautions must be taken when installing the apparatus.

18 Essential Health and Safety Requirements

In addition to the Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9, the following are considered relevant to this product:

Clause	Subject	Compliance
13	Protection against other hazards (LVD type requirements, etc.)	Manufacturer responsibility
14	Overloading of equipment (protection relays, etc.)	User/Installer responsibility
22(1)	External effects	User/Installer responsibility
22(2)	Aggressive substances, etc.	User/Installer responsibility

19 Drawings and Documents

Number	Sheet	Issue	Date	Description
CISDXX-1	1 to 9	2	06SEP21	SD RANGE CERTIFICATION DRAWING
CISDXXM-1	1 to 10	2	09SEP21	SDXXM CERTIFICATION DRAWING

For other current drawings not re-submitted for this assessment see Baseefa02ATEX0211X.