

<b>SPECIFICATION</b>		Specification No.	T-130440C11~16			
		Drawing No.	T-130440C11	Revision		Page
Product Name	Smart SPD® SMB-P・R-「」	Enactment Date	25.Jun.2015	Revision Date		
		Drawing Section	Sales Engineering Department			

### 1. General

This product is a SPD unit that protects equipment from abnormal voltage/current caused by lightning surge that enters via power circuit, tangent point or signal circuit of P-type, R-type fire alarm system.

With its plug-in terminal board based line connecting type, one SPD can protect many circuits.

In addition, when this SPD's function starts to deteriorate due to repeatedly exposure to lightning surge, not only surge counter and status LED will show the SPD's condition but also the SPD itself will send the alarm signal via the no-voltage alarm output to ask for a replacement.

Moreover, this SPD is designed to be mounted to DIN rail or mounted directly.

This product complies with JIS C 5381-21 Category C2, D1.

### 2. Environment Condition

- 2.1 Install Location : Indoor
- 2.2 Ambient Temperature : -25°C ~ +60°C
- 2.3 Relative Humidity : ≤96% (non-condensing)
- 2.4 Storage Temperature : -20°C ~ +60°C
- 2.5 Storage Humidity : ≤96% (non-condensing)

### 3. Structure

#### 3.1 Name and configuration

The product name and configuration is shown in Table 1

Table.1

Type	Line type	Core number		Function
SMB-P・R-K2	Control line	10(1c~10c)		・Lightning Protection ・SPD status LED ・Surge counter
SMB-P・R-NM	System line	10(1c~10c)		
SMB-P・R-NM(H)	High-voltage system line	10(1c~10c)		
SMB-P・R-H3	Normal line	10(1c~10c)		
SMB-P・R-485	RS485、Phone	10	RS485(1c~8c)	
			Phone(9c~10c)	

#### 3.2 Display

The following information is displayed clearly on each product:

- (1)Product name      (2)Manufacture name      (3)Circuit type      (4)Surge counter
- (5)SPD status LED    (6)Pin number              (7)Input and output    (8)Manufacture date

#### 3.3 Appearance, structure and size

For appearance, structure and size, refer to external view drawing T-130440A11.

### 4. Interface

Interface connector in this product is as follows:

- (1)Line input : SPT 2,5 10-V-3,5 ×1
- (2)Line Output : SPT 2,5 10-V-3,5 ×1
- (3)Operating power input : SPT 2,5 2-V-3,5 ×2
- (4)Alarm output : SPT 2,5 2-V-3,5 ×1

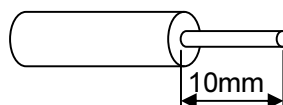
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### 5. Connection condition

Connectable cable is as follows:

- (1) Single wire, stranded wire : 0.2~1.5mm<sup>2</sup> (AWG24~16)
- (2) Bar terminal : 0.25~0.75mm<sup>2</sup>

Recommended end-point treatment of the cable connecting to the connector is as follows.



### 6. Functionality

The electrical characteristics of each product it is shown in Table 2.

- (1) Lightning protection functionality

Table.2

Item	Characteristics						Remarks
	K2	NM	H3	485		NM(H)	
				RS485	Phone		
1.Maximum Continuous Operating DC Voltage U <sub>c</sub>	DC110V	DC48V	DC27V	DC15V	DC48V	DC48V	
2.Rated load current	3A	1A	100mA	100mA	1A	1A	
3.Operating voltage L-E	280V~ 420V	74V~ 90V	31V~ 35V	16.8V~ 19.1V	74V~ 90V	74V~ 90V	K2 : 500V/s NM,H3,485, NM(H) : V1mA
4.Series resistance Between input and output	≤1Ω	≤1Ω	4~6Ω	4~6Ω	≤1Ω	≤1Ω	For each wire
5.Insulation resistance L-E	During jumper removal for testing : DC250V, ≥ 100MΩ						
6.Voltage protection Level L-E	≤1kV	≤500V	≤150V	≤100V	≤500V	≤500V	1.2/50μs,10kV <sup>N1</sup>
7.Impulse durability <sup>N2</sup> L-E	8/20μs,5kA 10times					8/20μs, 10kA 10times	JIS C 5381-21 Category C2
	10/350μs,2.5kA 2times						JIS C 5381-21 Category D1
8.Impulse current <sup>N2</sup> L-E	8/20μs,5kA					8/20μs, 10kA	

Note 1) Apply voltage to all lines at the same time

Note 2) Sum of currents of all lines

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(2) Surge detection function

Table.3

Item	Characteristics	Remarks
1.Surge detection sensitivity current	$\geq \pm 30A$	8/20 $\mu$ s
2.Maximum tolerable surge current	$\pm 10kA$	8/20 $\mu$ s
3.LED	LED	Green, yellow, red
	7-segment LED	Double digits
4.LED display time	External power supply	LED and 7-segment LED <sup>N1</sup>
	Battery supply	
5.SPД condition	OK	Green
	Replacement recommended	Yellow
	Replacement	Red
6.Switch operation (Press once)	<ul style="list-style-type: none"> <li>•SPD status display</li> <li>•Number of operations Display</li> <li>•Battery exchange display</li> </ul>	External power supply: Always-on
7.Insulation test mode	Buzzer and "tt" display on LED screen	During jumper removal test
8.Power	DC24V $\pm 15\%$	For external power supply
	Button battery (CR1632) 1 piece. Battery life : 10 years <sup>N2</sup>	For battery supply
9.Current consumption (external power supply)	About 80mA (DC24V input)	When an external power supply
10.Battery exchange detection	Alarm output : $\leq 2.5V$	"BT" is displayed and signal is sent to alarm output
11.Alarm output	No-voltage "a" output	For replacement recommendation, compulsory replacement or battery exchange (maintenance)
12.Alarm capacity	AC125V, 0.5A DC30V, 1A	Max permissible power: 62.5VA (AC), 30W (DC) Min applicable load (for reference): 10 $\mu$ A, 10mV (DC)

Note 1) Except for insulation test mode.

Note 2) Depend on the operating environment and conditions.

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**(3) Replacement recommendation and deterioration indicator**

This product detects the surge currents flowed through then recommends the replacement before the SPD loses its protective function via its deterioration indicator. Moreover, it can count the number of surges that flowed through and also has the ability to suggest battery replacement.

SPD status LED, surge counting and battery change recommendation functions are shown in table. 4

Table.4

Item	Operation	Display ※1	Content
1.SPД is working normally	Press once	Green turns once	It is working normally, no need to replace
2.SPД should be replaced		Yellow turns once	The surge surpassing our standard is detected. An immediate replacement is recommended
3.SPД needs to be replaced		Red turns once	A SPD is heavily deteriorated. Please replace as soon as possible.
4.Surge counter		7-segment LED	Displayed with 7-segment LED (2 digits) “FL” is displayed for over 99 times
5.Need to change the battery		7-segment LED	On the 7-segment LED screen “BT” is displayed
6.Insulation test	Remove the test jumper	7-segment LED Buzzer (During jumper's removal)	On the 7-segment LED screen “tt” is displayed Buzzer alarm

Note 1) SPD status LED measures the current applied to the SPD then recommend replacement or compulsory replacement based on our standard. Therefore, it does not guarantee a complete deterioration state of the SPD.

Note 2) When external power supply is used, 7-segment LED and status LED light up all the time. When the battery supply is used, they will light up only when the button is pressed. Besides, for the isolation test mode, the SPD will light up continuously no matter which power source is being used.

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### 7. Testing condition

The testing of electrical characteristics, appearance and size are shown in Table. 5

Table. 5

Item	Test type	Characteristics	
1.Operating voltage	Sampling	According to Table 2	
2.Series resistance			
3.Insulation resistance			
4.Voltage protection level $U_p$	Type <sup>N2</sup>		
5.Impulse durability			
6.Impulse current withstand capability			
7.Surge detection sensitivity current	Sampling	According to Table 3	
8.Maximum discharge surge current	Type <sup>N2</sup>		
9.LED display	Sampling		
10.SPД condition	Type <sup>N3</sup>		
11.Operation	Sampling		
12.Insulation test mode			
13.Power			
14.Current consumption	Type <sup>N3</sup>		According to T-130440A11
15.Battery exchange detection	Type <sup>N3</sup>		
16.Alarm output	Sampling		
17.Appearance			
18.Display			
19.Size	Sampling <sup>N4</sup>		

Note 1) Sampling test based on ISO2859 (sampling procedure and number) for 1 time sampling, sampling standard I with AQL=1.0

Note 2) For this test, a sample of the product being sold is made and used only for the test. After the test the sample will not be shipped.

Note 3) Test is performed on the first LOT when a new production session starts or when there is a change in important materials or in manufacturing process. However the test may be abridged for products of the same type with confirmable functions.

Note 4) Sampling test is independent of the size of the LOT, always with n=5, Ac=0, Re=1

Note 5) For temperature and humidity at test time, based on JIS Z 8703 (environment standard for testing site), the standard temperature is 20±15°C, humidity is 65±20%.

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### 8.Environmental Tests

Table 6 shows the environmental test conditions of this product.

Table 6

Item	Test Condition	Test Time
1.Low temperature test	Ta=-30±3°C	1000h
2.High temperature test	Ta=+70±2°C	1000h
3.Temperature cycle test		30 cycles
4.Vibration test	JIS C 60068-2-6 Acceleration amplitude:20m/s <sup>2</sup> Frequency:10~55Hz Sweep rate:1oct/min	10 cycles/3axis

### 9. Packaging and Marking

#### 9.1 Packaging

Packaged in a manner that prevents deformation or damage to the product under normal condition.

#### 9.2 Marking

The following items are marked on a package

(1) Product Name/type (2) Test type (3) Manufacture date (4) Quantity (5) Manufacturer

### 10. Quality Assurance and Warranty Period

The warranty period of this product is one year since delivery date.

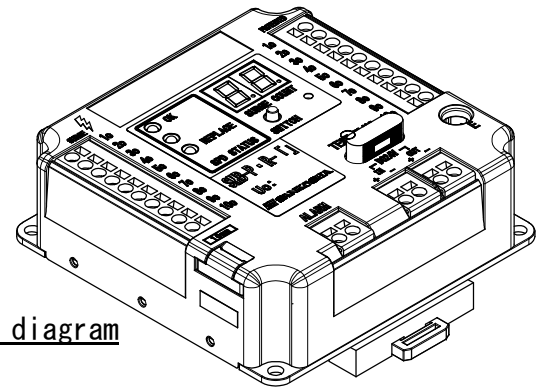
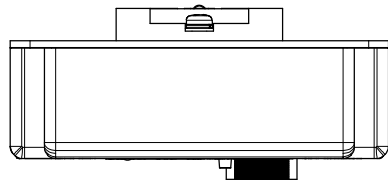
If defective product claims are found to be justifiable, replacement of the same product will be provided.

### 11. Environmental Correspondence (RoHS compliant)

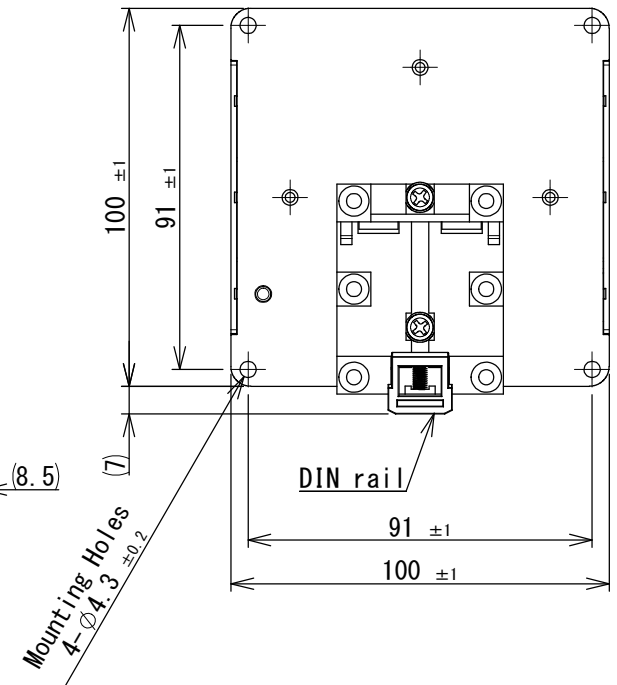
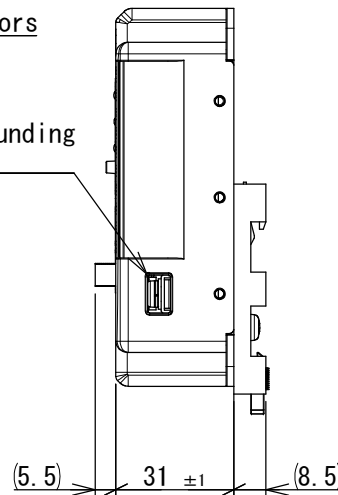
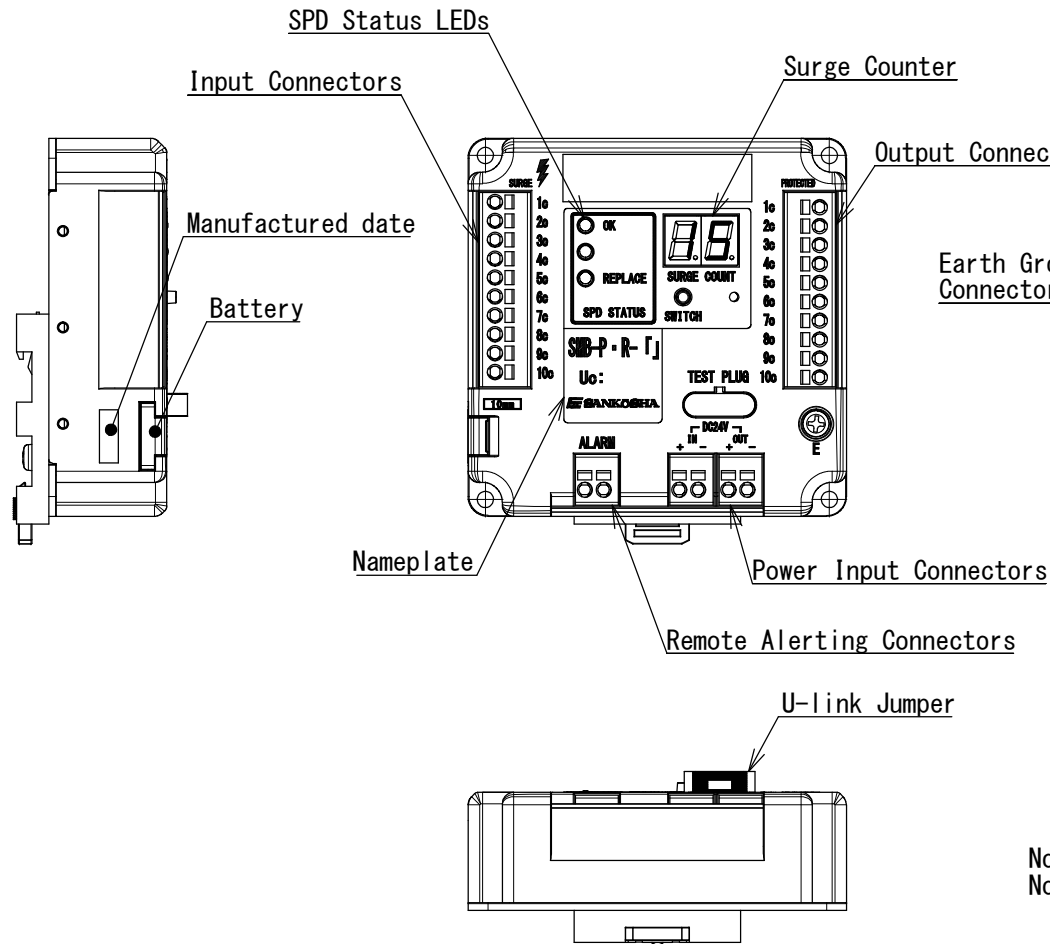
This product does not contain "lead", "mercurial", "hexavalent chromium", "cadmium", "PBB" (Polybrominated biphenyl), "PBDE" (Polybrominated diphenyl ether) intentionally.

### 12. Accessories

- Driver(wiring) ..... one
- DIN rail mounting plate ..... one



3D Reference diagram



Note1) Within the 「Γ」, each line type:K2, NM, H3, 485, you will NM(H).  
 Note2) For Uc, it will be on the performance value of each line type.

DSN	S. E. D	Jun. 25 '15	UNIT	mm		TITLE SMB-P-R-「Γ」 Outline dimensions
DWG	K. Idota	Jun. 25 '15	SCALE	1:2		
CHK	Y. Asada	Jun. 25 '15			DWG No.	T-130440A11
						REV.