

INSTRUCTION MANUAL

AC VOLTAGE ALARM SETTER

SVD-□-105

SVD-□-105D

(With contact delay circuit)

Thank you for purchasing DAIICHI ELECTRONICS product.

Read this instruction manual carefully before installation, wiring, and using this product.

Safety precautions

■ Environment conditions

Please be sure to use this product in a place that meets the following conditions. In places that do not meet this condition, malfunctions and failures, and performance and product life may be reduced.

- Within the range of ambient temperature -10 to +55 °C, humidity 30 to 85% RH.
- Environment with low corrosive gas, dust, salt and oil smoke. (Corrosive gas : SO₂ / H₂S, etc.)
- Environment that is not affected by vibration or shock.
- Environment with less external noise.
- Altitude 1000m or less.

■ Outdoor use conditions

- These products are not a dustproof, waterproof, and splash proof construction. Please avoid the place with much dust. Moreover, please install in the place not exposed to rain or water drop.
- Please do not install in the place where sunlight hits directly. Discoloration and degradation of a name plate, and deformation of the case by the surface temperature rise may occur.

■ Mounting and wiring

Please refer to this instruction manual for mounting and the wiring.



- Please refer to connection diagram for the wiring.
- Please avoid hot line work.
- Please use an electrical wire size suitable with the rated current.
- Please check the tightening of the screw.

■ Preparation

This product must be set before use. Please set correctly after reading this instruction manual.

■ Maintenance and inspection

- Inspection in energized state is dangerous.
- This product has no parts to replace during regular inspections.
- Please wipe off lightly with the dry soft cloth. Please do not use the organic solvent, chemicals, cleaners, etc., such as an alcohol, for cleaning.

■ Storage

Please store in a place that meets the following conditions.

- The ambient temperature within -30 to +60 °C (storage temperature).
- Daily average temperature 40 °C or less.
- Location corresponding to the usage environment and use conditions.
- Aluminum electrolytic capacitors are used in products. Please energize the power supply within one year after purchase.

■ Countermeasures against troubles

If trouble occurs within the warranty period, DAIICHI ELECTRONICS will repairs this product.

■ Disposal

Please dispose this product as industrial waste (non-combustible).
Mercury parts and a nickel-cadmium battery are not used for this product.

■ Warranty period

The warranty period of the product is one year after the date of delivery.

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1. Product outline

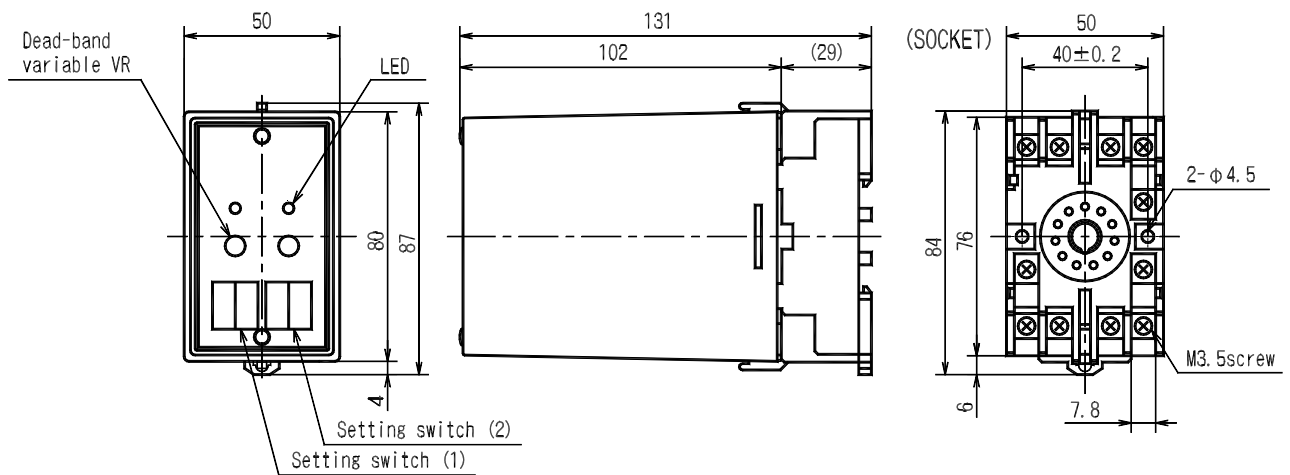
This product is a plug-in type alarm setter that receives AC voltage as an input, compares it with a preset value, detects excess or deficiency, and outputs a contact signal.

1.1 Features of product

- This product is the high quality and high reliability and noise-proof design.
- The detection action can be confirmed with a LED.
(LED color : Red, Detection : LED ON, Non-detection : LED OFF)
- The dead-band range can do variable.
- The digital switch makes the setting clear.
- This product is compact plug-in type.

2. Handling explanation

2.1 Outline dimension



	Setting switch (1)	Setting switch (2)
HH	H1	H2
LL	L2	L1
HL	L	H
H	—	H
L	—	L

2.2 Cautions on mounting

Please install indoors in a place with low mechanical vibration, dust, and corrosive gas.

And, please select indoors that are not affected by a strong electromagnetic field by large current bus, saturable reactor etc. in the vicinity.

The product life is affected by the ambient temperature, so please avoid installing it in a hot and humid place. There is no restriction on mounting position.

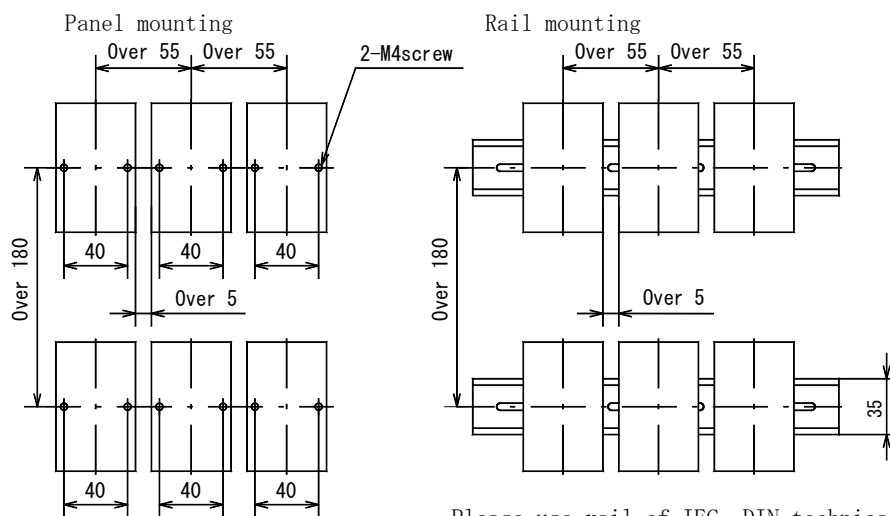
Mounting can be done on 35mm width DIN rail mounting or screw mounting.

For screw mounting, please install with M4 screw. (However, the screw is not attached. The tightening torque of a screw, M4 : 1.00 to 1.30N·m)

In consideration of heat dissipation and wiring space, provide a space equal to or greater than that in section 2.3 "Example of combination mounting dimensions" for horizontal and vertical intervals.

Please leave space between terminal and metal panel for 10mm or more.

2.3 Example of combination mounting (Unit mm)



Please use rail of IEC, DIN technical standard 35mm width rail (reinforced type).

- Consider the heat dissipation due to the natural convection of the air, and provide installation intervals greater than the above.
- If the duct for wiring is used, please detach 20 mm or more from the upper surface and the undersurface of a body.

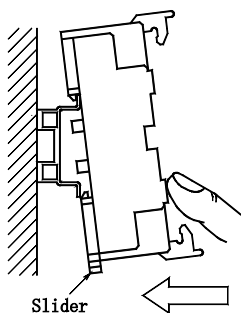
2.4 Installation

2.4.1 The mount to DIN rail, and the method of detachment

<Note> If it insert and remove the body section from a socket, please carry out after shutting down a power supply and an input signal.

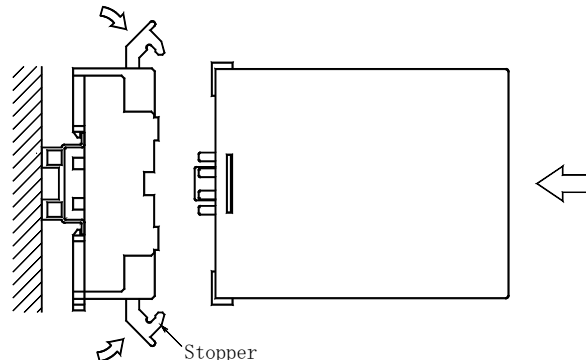
(1) How to fix a socket.

Set the base socket so that its slider is at the bottom. Position the upper hook at the rear side of base socket on the DIN rail and push in the lower.



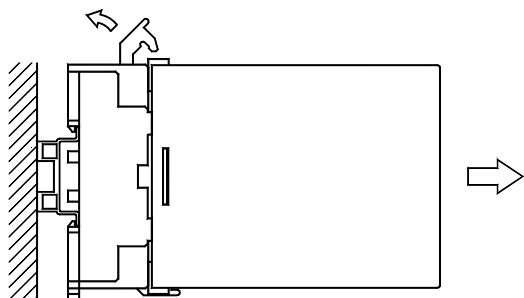
(2) How to fix a body to a socket.

Do in the direction which can read a label character correctly, and insert a body straightly. After inserting it all the way in, please fix the main body with the yellow stopper of the socket.



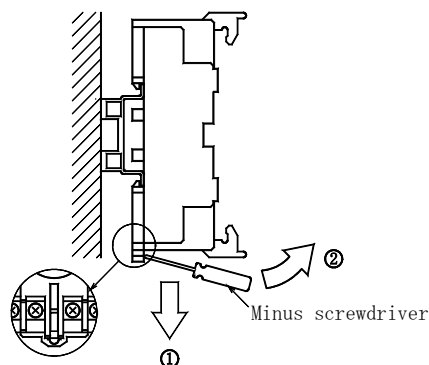
(3) How to remove a body from a socket.

Remove the stopper of the socket from the main body. Please pull a body to straight near side.



(4) How to remove a socket.

Push down the slider utilizing a minus screwdriver and pull.



<Note>

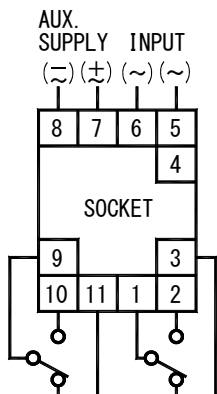
If a transducer body is taken out and inserted aslant, the terminal of a body will bend and a loose connection etc. will occur.

(2) Mounting by screws

Remove the stopper of the socket from the main body. Please pull a body to straight near side. Install the socket with M4 screw and attach the main unit after wiring.

(However, screws are not included, tightening torque of screw M4 : 1.0 to 1.3 N·m)

2.5 Connections

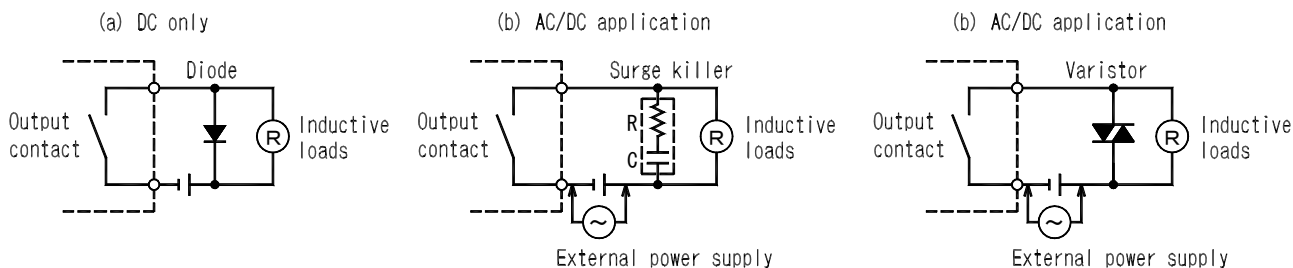


HH	H1	H2
LL	L2	L1
HL	L	H
H	—	H
L	—	L

2.6 Cautions on connections

- (1) An external connection terminal is M3.5 screw terminal.
Please use a solderless contact for connection with a terminal.
The tightening torque of a screw is 0.7 to 0.9N·m.
- (2) When connecting an inductive load such as an electromagnetic relay to the contact output, we recommend installing a diode or surge killer near the load, as shown in the example below.

《 An example of a spark elimination circuit 》



2.7 Handling explanation


The usage of this product should check the name plate and specification of actual goods, and should perform the right handling.

2.7.1 Settings

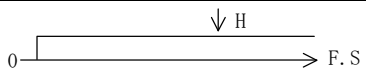
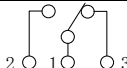
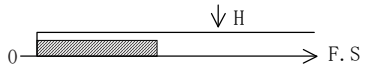
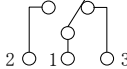
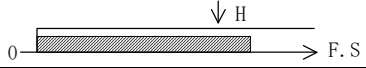
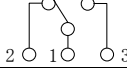
- (1) The setup of operation value.
Please set to needed operation value in a front digital switch.
It can set to 10 to 99% (1% step), using rated voltage as 100%.

<Caution> If a digital switch is set in the state of power-supply applying, detection action may be done even if it does not exceed set value. (This is not a product defect.)

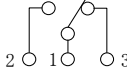
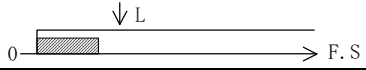
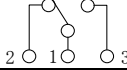
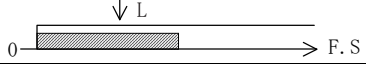
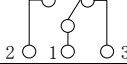
- (2) Variable of dead band.
The dead band variable VR can continuously vary the dead band from 0.5 to 5%.

2.8 Control output conditions ( : Input)

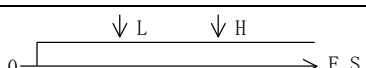
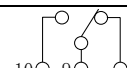
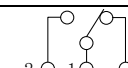
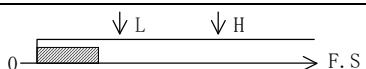
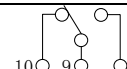
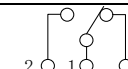
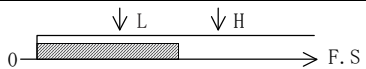
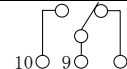
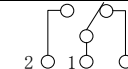
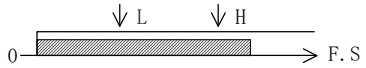
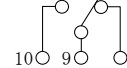
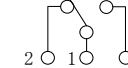
■ H type

Auxiliary supply / Input	Input state	Contact state	LED status
Auxiliary supply OFF Not based on input.			H ○ OFF
Auxiliary supply ON INPUT < H			H ○ OFF
Auxiliary supply ON H ≤ INPUT			H ● ON

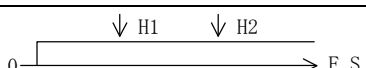
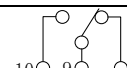
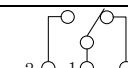
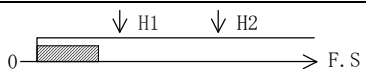
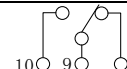
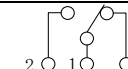
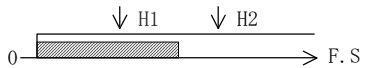

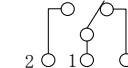
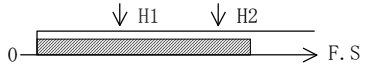


■ L type

Auxiliary supply / Input	Input state	Contact state	LED status
Auxiliary supply OFF Not based on input.			L ○ OFF
Auxiliary supply ON INPUT ≤ L			L ● ON
Auxiliary supply ON L < INPUT			L ○ OFF

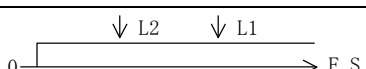

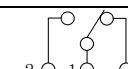
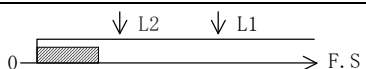
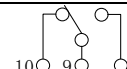
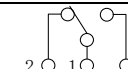
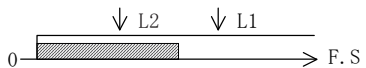
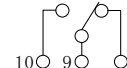
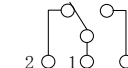
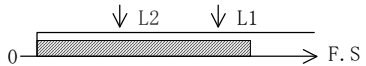

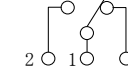
■ HL type

Auxiliary supply / Input	Input state	Contact state		LED status
		L	H	
Auxiliary supply OFF Not based on input.				L H ○ ○ OFF OFF
Auxiliary supply ON INPUT ≤ L				L H ● ○ ON OFF
Auxiliary supply ON L < INPUT < H				L H ○ ○ OFF OFF
Auxiliary supply ON H ≤ INPUT				L H ○ ● OFF ON

■ HH type

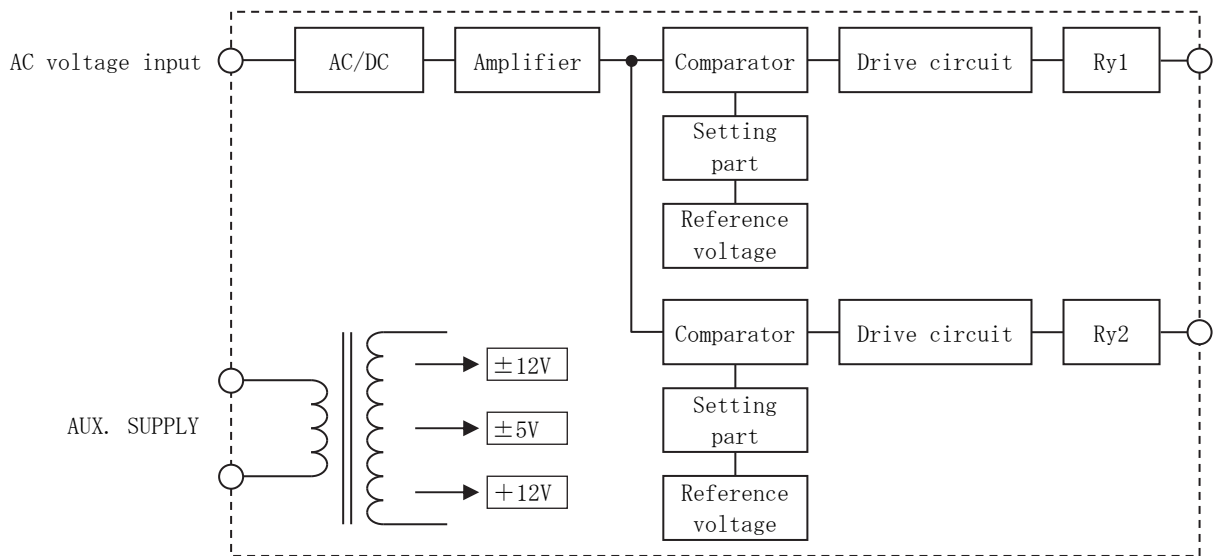
Auxiliary supply / Input	Input state	Contact state		LED status
		H1	H2	
Auxiliary supply OFF Not based on input.				H1 H2 ○ ○ OFF OFF
Auxiliary supply ON INPUT ≤ H1				H1 H2 ○ ○ OFF OFF
Auxiliary supply ON H1 < INPUT < H2				H1 H2 ● ○ ON OFF
Auxiliary supply ON H2 ≤ INPUT				H1 H2 ● ● OFF ON

■ LL type

Auxiliary supply / Input	Input state	Contact state		LED status
		L2	L1	
Auxiliary supply OFF Not based on input.				L2 L1 ○ ○ OFF OFF
Auxiliary supply ON INPUT ≤ L2				L2 L1 ● ● ON OFF
Auxiliary supply ON L2 < INPUT < L1				L2 L1 ○ ● OFF ON
Auxiliary supply ON L1 ≤ INPUT				L2 L1 ○ ○ OFF OFF

3. Principle of operation

3.1 Block-diagram



3.2 Explanation of operation

After than AC-voltage input is transforming into DC voltage, constant value is made to amplify and it considers as the input of comparator.

And, the reference voltage obtained from the control power source is divided in a setting part's digital switch, this is considered as the input of the comparator of another side, and voltage comparison is performed.

An output operates a relay through a drive circuit.

4. Specifications and performance

4.1 Specifications

Item	Specification	
Input (Input current)	① 0 to 300V (1mA) 50/60Hz	
	② 0 to 220V (1mA) 50/60Hz	
	③ 0 to 173.2V [$300/\sqrt{3}$] (1mA) 50/60Hz	
	④ 0 to 150V (1mA) 50/60Hz	
	⑤ 0 to 127V [$220/\sqrt{3}$] (1mA) 50/60Hz	
	⑥ 0 to 110V (1mA) 50/60Hz	
	⑦ 0 to 86.6V [$150/\sqrt{3}$] (1mA) 50/60Hz	
	⑧ 0 to 63.5V [$110/\sqrt{3}$] (1mA) 50/60Hz	
Auxiliary supply	① AC·DC80 to 264V (AC100/110V 50/60Hz, AC200/220V 50/60Hz, DC100/110V) AC power : 5.7VA, DC power : 2.2W	
	② DC19 to 29V (DC24V) 2.2W	
Output	Contact output	Change over contact (1c contact)
	Contact capacity	Maximum switching load : AC250V 2A ($\cos\phi=1$), DC110V 100mA (L/R=7ms)
		Minimum switching load : DC5V 10mA
	Relay	G6C-2114PUS (OMRON Corporation)
		Mechanical life : 50 million times (Switching frequency, 300 times/minute)
	Electric life : 100,000 times (Switching frequency, 30 times/minute)	
Setting range	H	H : 10 to 99% (1% step) , L : —
	L	H : — , L : 10 to 99% (1% step)
	HL	H : 10 to 99% (1% step) , L : 10 to 99% (1% step)
	HH	H1 : 10 to 99% (1% step) , H2 : 10 to 99% (1% step)
	LL	L1 : 10 to 99% (1% step) , L2 : 10 to 99% (1% step)
Dead band	0.5 to 5% continuation variable	
Starting delay time ⁽¹⁾	0.5 second (Standard) (Production is possible in 0.5~10s in 0.5s step.)	
Contact delay ⁽¹⁾	Option (Production is possible in 0.5~10s in 0.5s step.)	
Operating temperature limits	-10 to +55°C ,	
Operating humidity limits	30 to 85% RH	
Storage temperature limits	-30 to +60°C	
Accessories	Socket : 11PFA or 11PFA-W (OMRON Corporation)	
Material	Main body	ABS (V-0)
	Socket	PBT resin
Case color	Black (Munsell N1.5)	
Mass	Approx. 320g	
Warranty period	One year	

Note⁽¹⁾ Starting delay and contact delay (option) cannot be designated simultaneously.

[In case of starting delay designation.] (TYPE : SVD-□-105)

Contact delay is set to below 0.3 seconds of input-and-output response of product.

[In case of contact delay designation.] (TYPE : SVD-□-105D)

Starting delay becomes almost the same as the time of contact delay.

4.2 Performance

Item	Specification	
Setting accuracy	$\pm 1.0\%$ (% of maximum input value)	
Repeatability	$\pm 1.0\%$ (% of maximum input value)	
Response time	Operating time	90 \leftrightarrow 110% of step input to operation value. Less than 300ms
	Reset time	110 \leftrightarrow 90% of step input to operation value. Less than 300ms
Influence of temperature	Error of operation value : 1.0% (% of maximum input value)	By 23 \pm 20 $^{\circ}$ C
	Error of operation time and contact delay : 10.0%	
Influence of auxiliary supply	Error of operation value : 1.0% (% of maximum input value)	Within the auxiliary supply range
	Error of operation time and contact delay : 10.0%	
Influence of frequency	Error of operation value : 1.0% (% of maximum input value)	By 45 to 65Hz
	Error of operation time and contact delay : 10.0%	
Influence of distorted wave	Error of operation value : 1.0% (% of maximum input value)	3rd-harmonic, 15% mixing
	Error of operation time and contact delay : 10.0%	
Overload capacity	Voltage input	2 times 10 seconds, 1.2 times continuation of rated voltage.
	Auxiliary supply	1.5 times 10 seconds of rated voltage. Upper limit of the auxiliary supply voltage range is continued.
Insulation resistance	Between electric circuit and case.	Above 50M Ω at DC500V.
	Between input terminals and auxiliary supply terminals and contact output terminals.	
Withstand voltage	Between electric circuit and case.	AC2000V (50/60Hz) 1 minute.
	Between input terminals and auxiliary supply terminals and contact output terminals.	
Impulse withstand voltage	Between electric circuit and case.	5kV 1.2/50 μ s. Both positive and negative polarity, for 3 times each.
	Between auxiliary supply terminals.	3kV 1.2/50 μ s. Both positive and negative polarity, for 3 times each.
Noise-capacity	Oscillatory surge voltage If a vibration damping waveform (1 to 1.5MHz, Peak voltage : 2.5 to 3kV) is repeated and added, there is no malfunction. Auxiliary supply circuit (Normal / Common) AC input circuit (Normal / Common) Contact output circuit (Common)	
	Square wave impulse noise If a noise (1 μ s, 100ns width) is repeated and added, there is no malfunction. Auxiliary supply circuit (Normal / Common) Over 1.5kV AC input circuit (Normal / Common) Over 1.5kV Contact output circuit (Common) Over 1.0kV	
	Electric wave noise If intermittence irradiation of the electric wave of a 150, 400MHz band is done by (1W, 1m), there is no malfunction.	
	Electrostatic noise ± 8 kV (at the case of energization) is that there is no malfunction. ± 10 kV (at the case of no-voltage) should not have damage or the abnormalities of parts.	
Vibration	Malfunction : Frequency 16.7Hz, Double amplitude 1mm to X, Y, Z direction for 10 minute.	
	Durability : Frequency 10 to 25Hz, Double amplitude 2mm to X, Y, Z direction for 2 hours.	
Shock	Malfunction : Shock of 98m/s ² to X,Y,Z direction for 3 times.	
	Durability : Shock of 294m/s ² to X,Y,Z direction for 3 times.	

5. Composition of type

SVD-(1)-105(2)

Mark	Contents
H	High limit setting
L	Low limit setting
HL	High and low limit setting
HH	2 steps of high limit setting
LL	2 steps of low limit setting

Mark	Contents
-	With no contact delay circuit
D	With contact delay circuit

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