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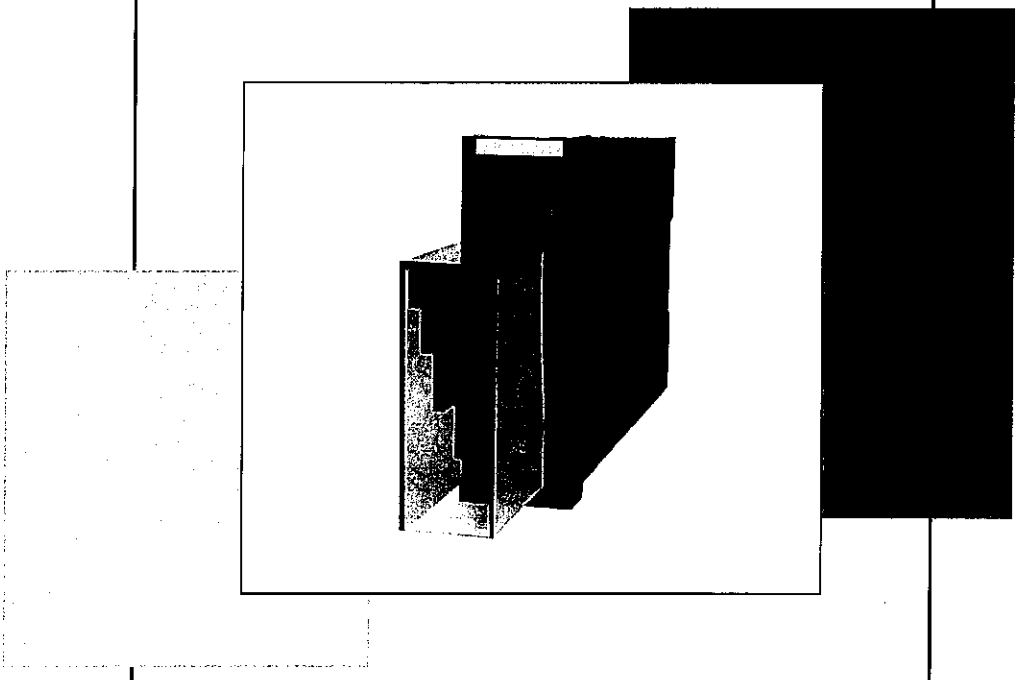
OM2-2310-0450

SystempaK (Analog, Single Case Type)

Monitor Switch Module

Model J-SSP60

Operator's Manual



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SAFETY PRECAUTIONS

■ About Icons

The safety precautions described in this manual are indicated by various icons. Please be sure you read and understand the icons and their meanings described below before reading the rest of the manual. Safety precautions are intended to ensure the safe and correct use of this product, to prevent injury to the operator and others, and to prevent damage to property. Be sure to observe these safety precautions.

⚠ **WARNING**	Warnings are indicated when mishandling this product might result in death or serious injury.
⚠ **CAUTION**	Cautions are indicated when mishandling this product might result in minor injury to the user, or only

■ Examples

	Triangles warn the user of a possible danger that may be caused by wrongful operation or misuse of this product. These icons graphically represent the actual danger. (The example on the left warns the user of the danger of electric shock.)
	White circles with a diagonal bar notify the user that specific actions are prohibited to prevent possible danger. These icons graphically represent the actual prohibited action. (Tne example on the left notifies the user that disassembly is prohibited.)
	Filled-in black circles instruct the user to carry out a specific obligatory action to prevent possible danger. These icons graphically represent the actual action to be carried out. (The example on the left instructs the user to remove the plug from the outlet.)

RESTRICTIONS ON USE

When using this product in applications requiring particular safety, or involving particularly important equipment, special care should be taken to implement a fail-safe and/or redundant design and periodic maintenance program encompassing all of the devices in the system.

Take malfunction, breakage and response lag into consideration when using this product.

Use this product within the established ranges and limits stated in the specifications.

There is no guarantee of product performance for use outside of the specifications.

⚠ WARNING

	Before mounting, removing or wiring this device, be sure to turn the power off. Failure to do so could result in electric shock.
	To avoid electric shock, be sure to ground the GND terminal to an earth ground of less than 100 Ω.
	Be sure to attach the terminal cover to this device after wiring is complete. Otherwise, touching a charged terminal accidentally could result in electric shock.
	To avoid electric shock, be sure not to touch charged terminals during maintenance and inspection.

⚠ CAUTION

	If a hazardous condition develops in which equipment overheats or begins to emit smoke, turn off the power switch of this device and connected equipment at once.
	Make sure that wire scraps do not fall into this device. They might cause a short circuit, device failure, or fire.
	Before setting the function switching jumper, be sure to turn the equipment power off.
	When removing the chassis from the case while the monitor switches are wired, after checking the monitor condition and alarm circuit operation (for example, by turning the alarm circuit function off), turn the power off.
	Do not touch IC leads with bare hands. Internal electrical parts of the IC can be damaged by static electricity. If available, the use of a dedicated antistatic workbench is recommended.

Table of Contents

MEMO

1. General

The Monitor Switch Module (J-SSP60) is a single conversion module housed in a single case and issues an alarm contact output when an input signal exceeds the internal pre-set value by comparing the input with the pre-set value.
Complete isolation is employed between the power, input, and output circuits.

2. Specifications

Input signal:	1 to 5 V DC or 4 to 20 mA DC
Input bias current:	-1 μA or less (for voltage input)
Input impedance:	250 Ω (for current input)
Output signal:	Dry contact: SPST2-set (for 2-point)
Contact capacity:	DC 30 V, 1 A (Resistive load) AC 100 V, 0.3 A (Resistive load)
Number of alarm:	2-point
Alarm output (fixed):	Normally de-energized or normally energized, selectable
Alarm function:	Hi and Lo Hi and Hi } 2-point monitor Lo and Lo
Alarm setting range:	0 to 100 % FS, adjustable
Differential gap:	0.25 % FS or less
Alarm setting accuracy:	±0.25 % FS
Power supply:	24 V DC $^{+10}_{-15}$ %
Current consumption:	80 mA (2-point monitor) max at 24 V
Ambient temperature:	Normal operating conditions: 5 to 45 °C Operating Limit: -5 to 55 °C

Ambient humidity:	0 to 90 % RH
Mounting:	Panel, Wall, DIN rail
Color of front mask:	Black
Weight:	400 g
Operating influence:	Supply voltage effect : ±0.1 % FS/24V DC $^{+10}_{-15}$ % Temperature effect : ±0.25 % FS/±10 °C

3. Theory of Operation

The input signal is applied to the high input impedance amplifier of the input buffer section to provide a high common mode rejection ratio and then fed through the filter to eliminate the AC ripple noise component and, thus, the signal is conditioned into a stable signal of 1 - 5 V DC. This signal is compared by the comparator amplifier with the limit setpoint value which is provided by the alrm setpoint circuit. If the former exceeds the latter, the comparator amplifier drives the relay which delivers a dry contact output signal. The hysteresis circuit provides a certain amount of hysteresis in order to prevent chattering of relay.

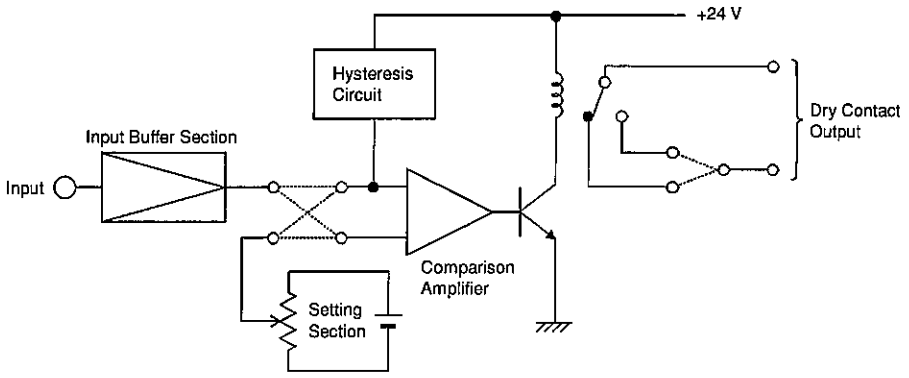


Fig. 3-1. Monitor Switch Module Block Diagram

4. Model No. Table

Basic Model Number		Selections I	Selections II	Additions I	Description
J-SSP60					Monitor Switch Module (Analog Type)
	X				No varnish coated
	C				Varnish coated
		-1			Input signal: 1 to 5 V DC
		-2			Input signal: 4 to 20 mA DC
			X		No Selections II
				-0	Without test report
				-1	With test report

Example: J-SSP60X-1X-0

Alarm types when ordering the product. (See table 6-1)

Output type	Relay (During Normal Process Operation)	Contact Output (During Normal Process Operation)
Standard (N)	De-energized	Open
A	De-energized	Closed
B	Energized	Closed
C	Energized	Open

5. Mounting

5.1 Mounting Locations

⚠ WARNING

Before mounting, removing or wiring this device, be sure to turnthe power off. Failure to do so could result in electric shock.

To avoid electric shock, be sure to ground the GND terminal to an earth ground of less than 100 Ω.

Be sure to attach the terminal cover to this device after wiring is complete. Otherwise, touching a charged terminal accidentally could result in electric shock.

For the place of installation of the module, select a place which meets the following requirements:

(1) Ambient temperature is normal and does not change sharply.

(2) Ambient humidity is normal and does not become abnormally high.

(3) Atmosphere does not contain corrosive gas.

(4) Atmosphere dose hot contain dust, oil fumes, or other undesirable substances.

(5) The place is less affected by electrical noise.

5.2 Mounting Method

The module can be installed in one of the following three methods:

(1) Panel mount (flush mount)

(2) Wall mount (protruding mount)

(3) DIN rail mount

- Panel Mount and Wall Mount

  Fix the L-shape mounting brackets on top and bottom of the casing by means of the fixing grooves as shown in Figs.2 and 3. For panel mount, fix the brackets at the front end positions; for wall mount, fix them at rear end positions. Fix the casing on a panel or a wall by fixing the brackets to the panel or the wall.

  For the panel cutout dimensions and the locating pitch (the interval between two adjoining modules when a number of modules are installed by side), see Fig.5-3.

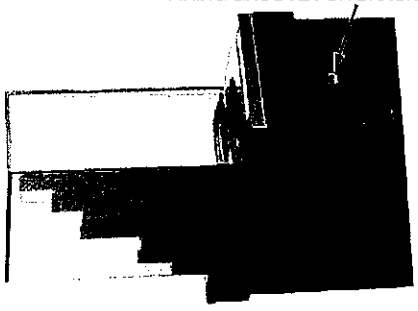


Fig.5-1

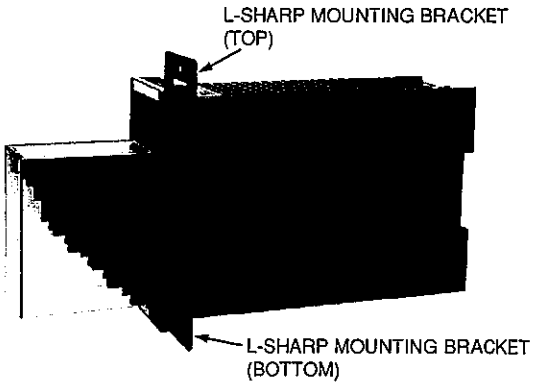
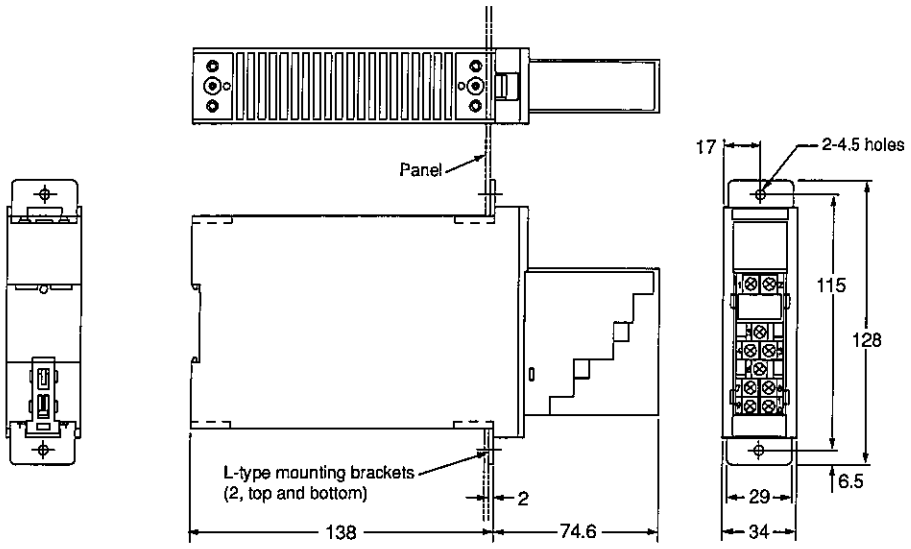
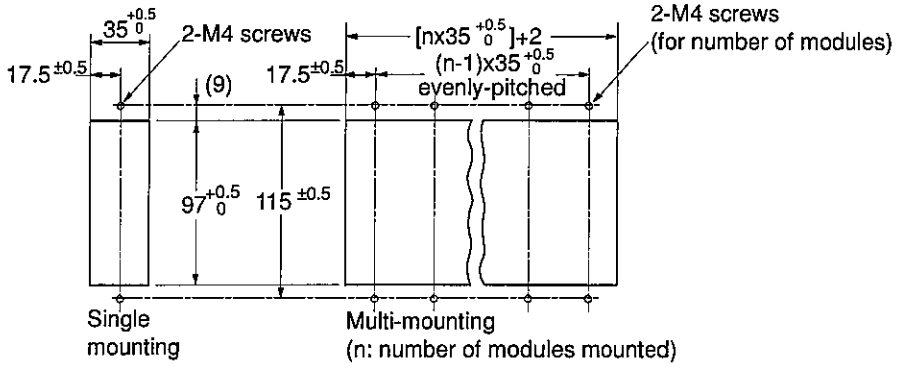


Fig.5-2

Panel-mounting



Panel-cutout



Wall-mounting

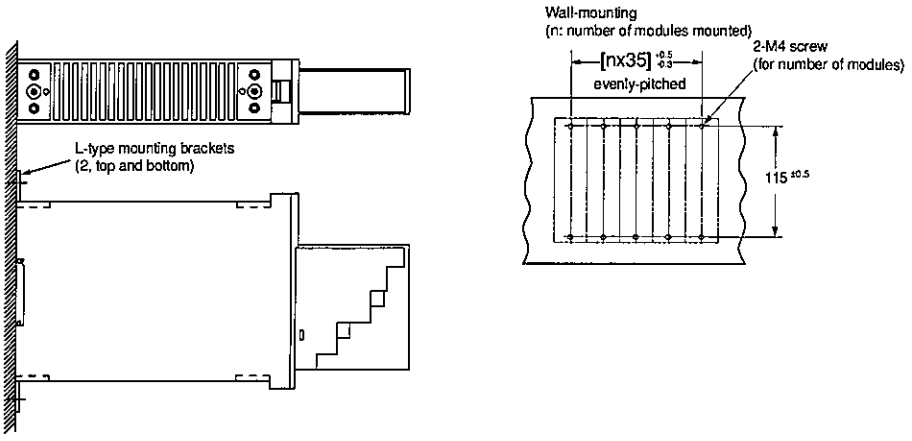


Fig.5-3 Dimensions for Panel Mount and Wall Mount

- Mounting/Dismounting with DIN Rail

Notes 1. The following models of DIN rails and side clamps are recommended.

Rails: Model DAS-4 (Toyo Giken Co., Ltd.)*
Side clamps: ATO-19 (Toyo Giken Co., Ltd.)*

Notes 2. Fix the rail with M4 screws at 200-mm intervals. Put the side clamps on both ends of the rail before fixing the rail.

* Or equivalent

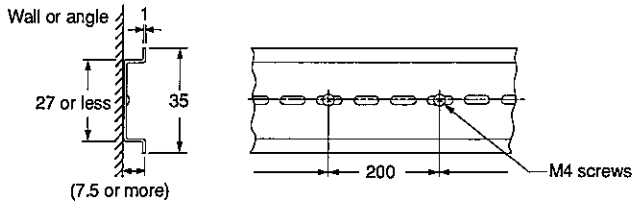


Fig.5-4

(1) Install the module by engaging the top of the DIN rail mount indent of the rear panel of the module with the DIN rail as shown in Fig.5-5.

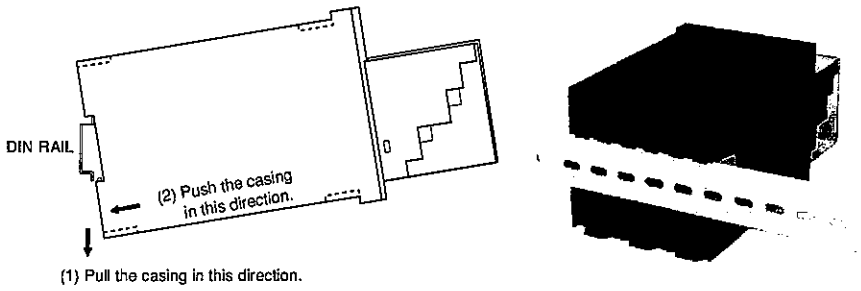


Fig.5-5

Note	When installing two or more modules, install them being closely contacted side by said.

(2) After installing the modules, fix the side clamps supporting the right or left ends of the outer-most modules as shown in Fig.5-6.

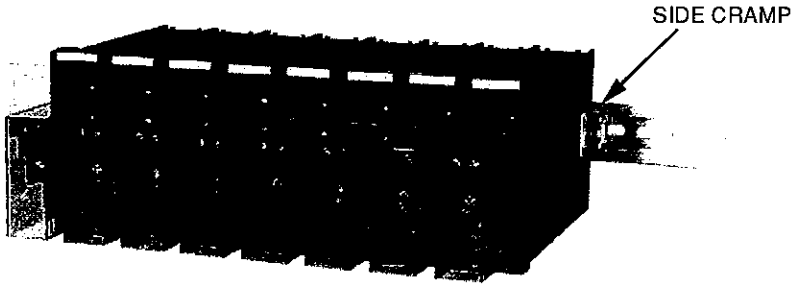


Fig.5-6

(3) To remove the module, observe the instructions given in Fig.5-7.

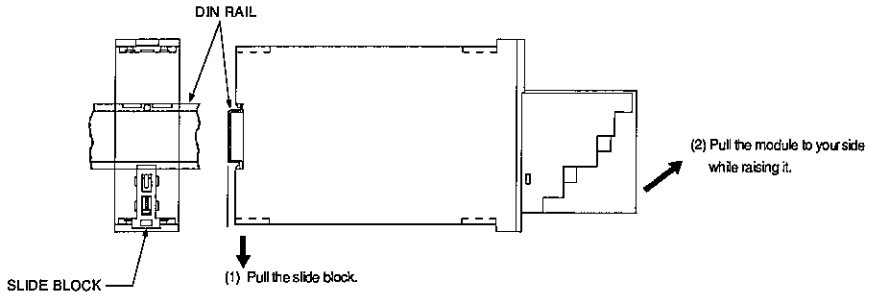


Fig.5-7

6. Alarm Action Selection

Alarm actions are selectable with the jumper pins on the card as shown in Fig.6-2 and Table 6-1. To select the larm actions, pull out the module from its casing.

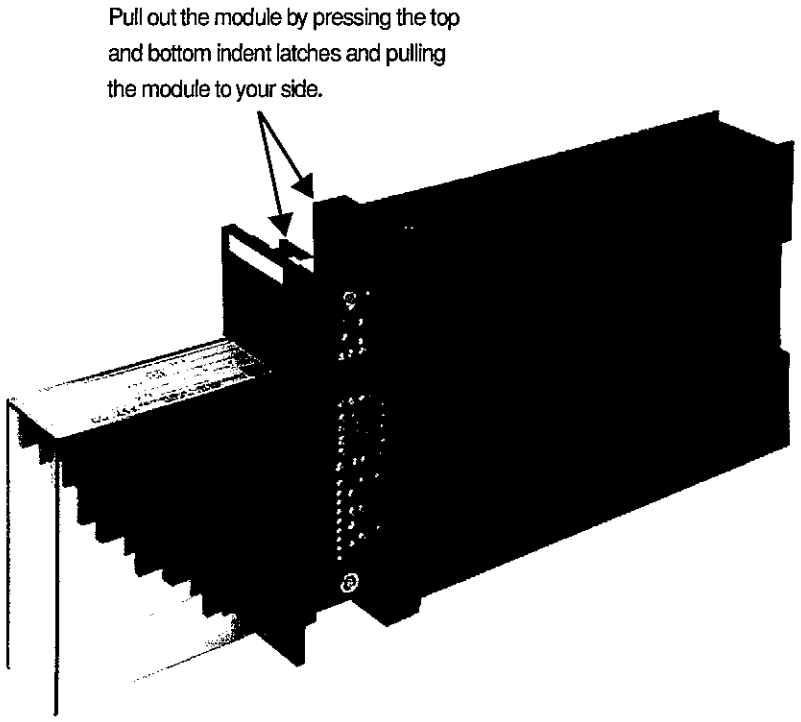


Fig.6-1. Pulling Out the Module

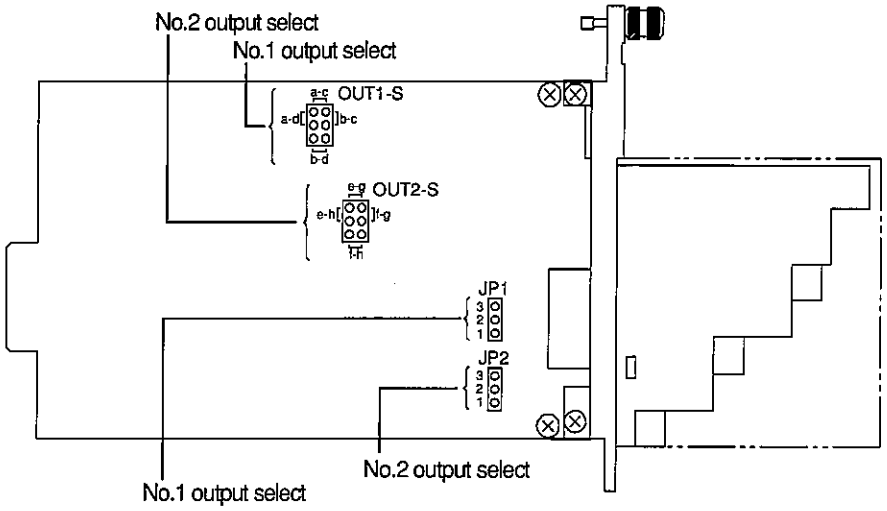


Fig.6-2. Locations of Alarm Selectors

Table 6-1. Settings of Alarms

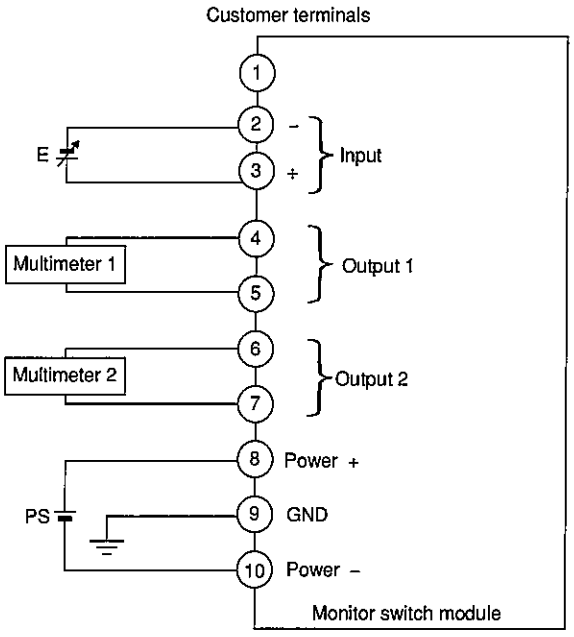
Type	Normal operation		Alarm action	No.1 output select		No.2 output select	
	Relay	Output contact		OUT1-S	JP1	OUT2-S	JP2
N (*1)	Normally de-energized	Broken	High limit	a-c,b-d (default) 	1-2 (default) 	e-g,f-h 	1-2 (default) 
			Low limit	a-d,b-c 		e-h,f-g (default) 	
A	Normally de-energized	Made	High limit	a-c,b-d 	2-3 	e-g,f-h 	2-3 
			Low limit	a-d,b-c 		e-h,f-g 	
B	Normally energized	Made	High limit	a-d,b-c 	1-2 	e-h,f-g 	1-2 
			Low limit	a-c,b-d 		e-g,f-h 	
C	Normally energized	Broken	High limit	a-d,b-c 	2-3 	e-h,f-g 	2-3 
			Low limit	a-c,b-d 		e-g,f-h 	

*1: If "N" is specified (or no specification is made) by the customer when ordering, the instrument is shipped in this state.

7. Calibration

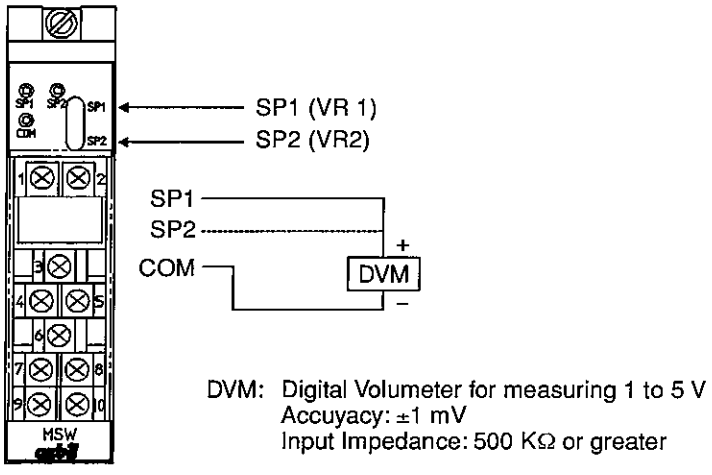
7.1 Preparation

Prepare a calibration setup as shown in Figs.7-1 and 7-2, where a module of voltage input type (1 - 5 V DC) with two alarm outputs is assumed.



PS : 24 V DC Power source (0.5 A or greater)
E : Reference Voltage Generator (for 1 to 5 V input)
Multimeter : Resistance Range

Fig.7-1. Calibration Setup



DVM: Digital Volumeter for measuring 1 to 5 V
Accuyacy: ±1 mV
Input Impedance: 500 KΩ or greater

Fig.7-2. SP Setting Location and DVM Connection

7.2 Calibration and Adjustment

(1) Connect the digital voltmeter to the checking terminals, SP1 and COM on the panel front face.

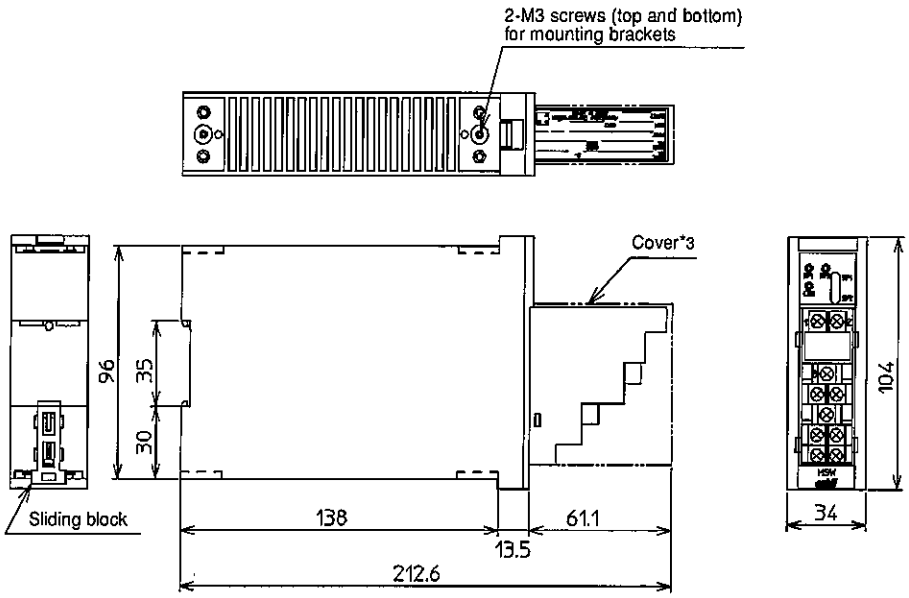
(2) Turn the variable resistor (VR1) on the panel front face to set the SP1 at a given value.

(3) Check with Multimeter 1 that the relay is activated ro output a contact signal when the reference voltage generator produces SP1 setpoint ±10 mV.

(4) Fllow steps (1) to (3) above for calibration and adjustment of the two-alarm Module. Use Multimeter 2 to check the contact output. (Use terminals SP2 and COM, and variable resistor VR2.)

8. Dimension Drawing and Wiring Daiagram

Unit: mm



No.	Description
1*1	———
2*1	Input (–)
3	Input (+)
4	Output 1
5	Output 1
6	Output 2*2
7	Output 2*2
8	24V (PS+)
9	GND
10	OV (PS–)

*1: 250 Ω resistor is added for current input.
*2: Two alarm points only.
*3: Operate the Module with a cover.
*4: Terminal screws: M3.5
*5: Use the pressured terminals with insulation sheath.

Fig.8-1.

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