

AD-4379SUS

INSTRUCTION MANUAL

Stainless Steel Summing Box

AND
A&D Company, Limited



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This mark informs you about the operation of the product.

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1. INTRODUCTION

The AD-4379SUS is a stainless steel summing box, used to sum the output of up to four load cells connected in parallel. The output of each load cell can be fine-adjusted using a potentiometer.

2. SPECIFICATIONS

Material	: Stainless steel excluding the packing
Permissible temperature range	: -20°C to +75°C
Weight	: Approx. 1.5 kg
IP rating	: IP67

Summing function

- (a) Number of load cells to be connected : Max. 4
- (b) Number of terminals : Input 7, output 7 (Applicable crimp contact 1.25-3.5)
- (c) Applicable cable diameter : 4 mm to 12 mm (About cables with a diameter over 10 mm, equivalent to special cables specified by A&D.)

To be fit by selecting an applicable rubber bushing

[When shipped: The ports for the load cell cables have been sealed.]

- (d) Load cell output adjustment function

To be selected by cutting a jumper.

[When shipped: The output adjustment function has not been selected.]

- (e) Excitation voltage remote sensing

To be selected, using a short-circuit bar, from either the summing box or the load cells.

[When shipped: The summing box has been selected.]

- (f) Summing resistance

To be selected by cutting jumpers or soldering, 500 Ω , 4.3 k Ω or 0 Ω .

[When shipped: 500 Ω has been set.]

For details of each setting, see "4. Setting".

3. INSTALLATION

3-1. Installation Site

Install the summing box where it is not directly exposed to rain, wind, or sunshine. Avoid locations where the summing box may be immersed in water for a long period of time.

3-2. Cable Ports

The summing box is equipped with five ports for cables. When shipped, a rubber bushing, cover and washer have been inserted in each port and a retainer has been screwed in, to secure each port. The ports are identical. Use ports convenient for the application.

Note

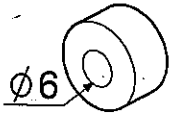
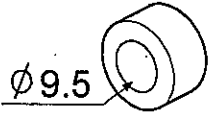
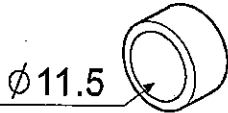
Keep ports that are not in use sealed with the retainer firmly.

Otherwise water may enter the box interior, resulting in a malfunction.

3-3. Cable Connection

Unscrew the retainer for the cable port to be used. Remove the washer, cover and rubber bushing. Among the provided rubber bushings, select one appropriate to the outside diameter of the cable used. See the table below for rubber bushing selection.

Table 1 Rubber bushing selection

Rubber bushing inside diameter	Applicable cable diameter	Description
6 mm	4 mm to 6.5 mm	
9.5 mm	6.5 mm to 10 mm	
11.5 mm	10 mm to 12 mm CEVS-6-11-1 CEVS-6-12-1	

Assemble the retainer, washer and rubber bushing onto the cable as shown below.

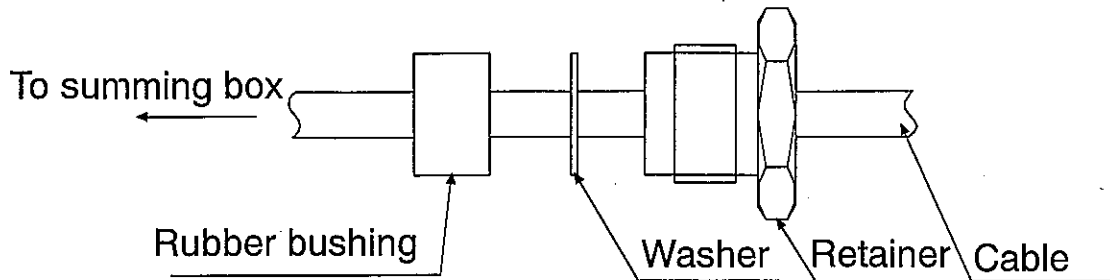


Fig. 1

Thread the cable through the cable port and connect it to the terminals on the PC board.

Table 2 Terminal arrangement

Terminal name	Signal name
RED +EXC	Load cell power supply +
ORG +SEN	Sensing +
BLK -SEN	Sensing -
WHT -EXC	Load cell power supply -
GRN +OUT	Load cell output +
BLU -OUT	Load cell output -
YEL SHD	Shield

Connect the load cells to be summed to terminals J1 to J4 (IN1 to IN4). Connect the indicator to terminal J5 (OUT).

After the cables are connected, screw in the retainers securely with the rubber bushing and washer in place in the ports. Insufficient tightening will cause water to enter the box interior and result in a malfunction.

3-4. Other Considerations

Make sure all the cable shields are grounded. Otherwise, the box performance will be unstable and readings may not be accurate. Attach the packing on the top cover in the direction as shown below. To keep the summing box watertight, fasten the top cover securely with a force of 300 N-cm.

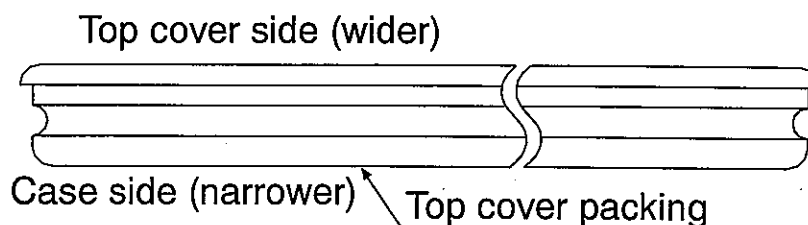


Fig.2

4. SETTINGS

4-1. Adjusting Load Cell Output

Cut jumpers JP9-JP10 to make them open. Using potentiometers VR1-VR4, adjust the load cell output. Potentiometers VR1-VR4 correspond to terminals J1-J4.

Use the load cell with the minimum output as a reference. Adjust the other load cells to match the reference load cell in such a way that the summed output will be the greatest possible. When shipped, the potentiometers have been adjusted (turned clockwise fully) to maximize the output of each load cell. Turning the potentiometer counter-clockwise will decrease the load cell output.

Turning the potentiometer may change the load cell zero point along with load cell output. If load cell output is hard to adjust because the zero point shifts greatly, cut jumpers JP1-JP8 to prevent the zero point from shifting. Before performing this, read "4-3 Summing Resistance" thoroughly.

Note

When load cell output is being adjusted (when jumpers JP9-JP19 are cut), remote sensing can not be performed from the load cells. (Refer to Table 3)

4-2. Remote Sensing

When remote sensing is to be performed from the load cells, remove short-circuit bars SB1-SB2 from the J5 (OUT) terminal. This operation is available only when the load cell output adjustment is not performed, i.e. when JP9-JP16 are connected.

If remote sensing is to be performed while load cell output is adjusted, perform remote sensing from the summing box. Under this situation, keep short-circuit bars SB1-SB2 attached.

Be sure to keep short-circuit bars SB1-SB2 attached except when the remote sensing is to be performed from the load cells.

Table 3 Load cell output adjustment

Load cell output adjustment	Remote sensing from	Short-circuit bars SB1/SB2	Jumpers JP9-JP16
Yes	Summing box	Short	Open
No	Summing box	Short	Short
	Load cells	Open	Short
	No	Short	

4-3. Summing Resistance

The summing box, when shipped, has a resistor of approx. 500 Ω installed in series with each of the load cell output terminals GRN (+OUT) and BLU (-OUT). The resistance across the output terminals is approx. 1000 Ω .

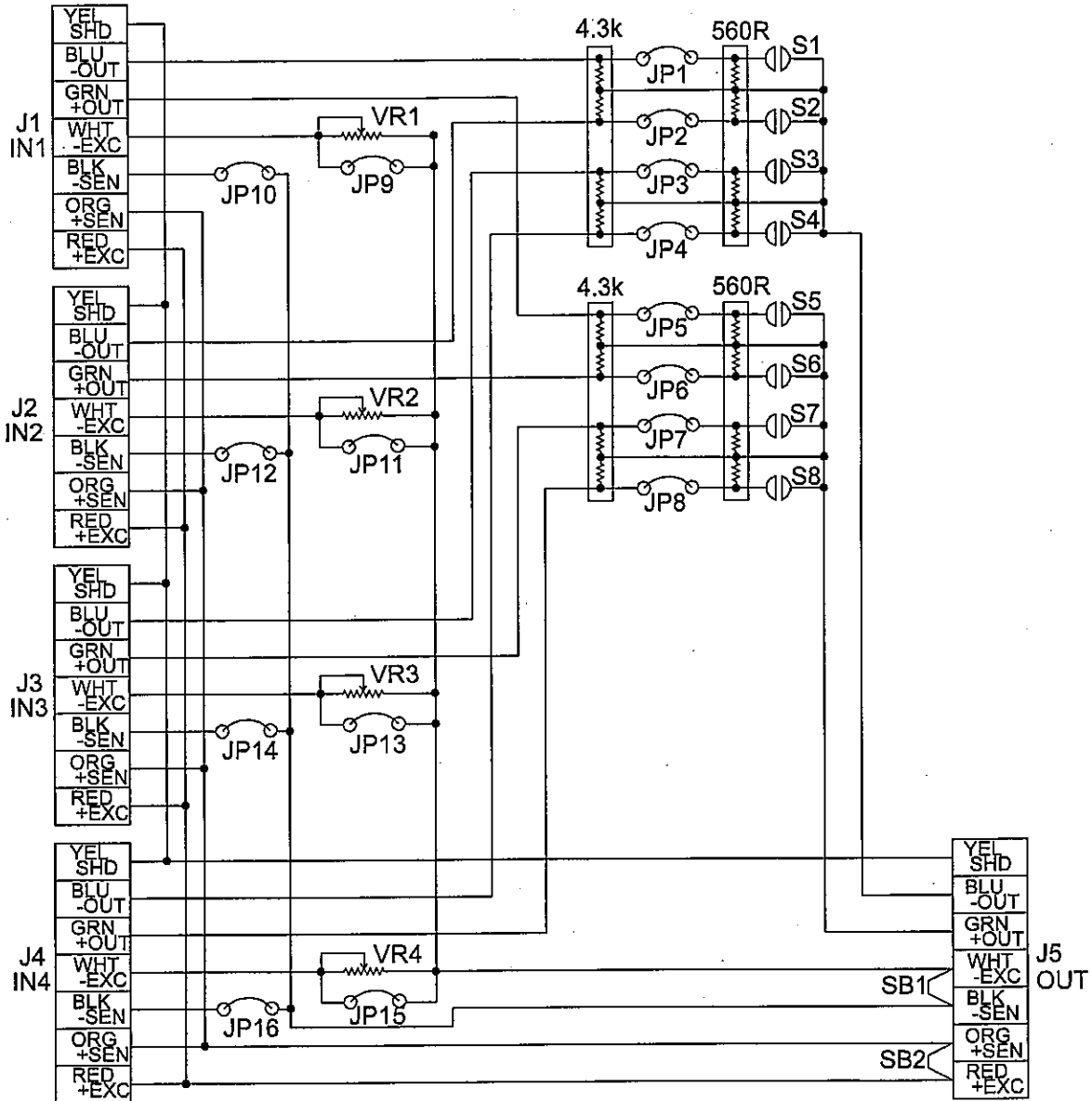
When jumpers JP1-JP8 are cut for easier load cell output adjustment, a resistor of approx. 4.3 k Ω can be installed in series with each of the load cell output terminals GRN (+OUT) and BLU (-OUT). When using this method, some indicators may not function properly. Check with the indicator manufacturer before using this method.

If the resistors on the output terminal are to be replaced by a short, e.g. to use for a junction box, solder the shorting lands S1-S8. Leave jumpers JP1-JP8 connected.

Table 5 Resistor selection

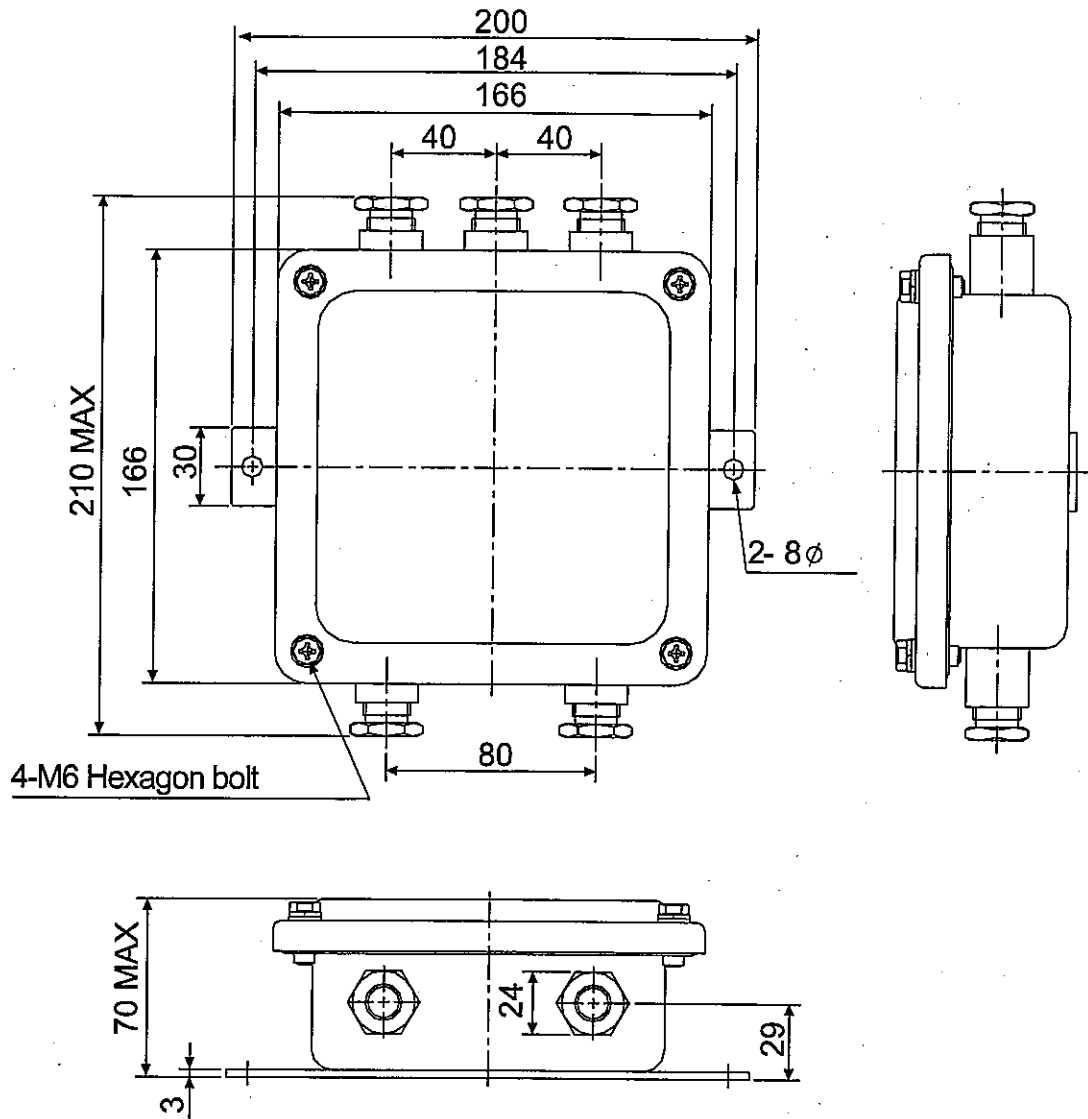
Jumpers JP1-JP8	Shorting lands S1-S8	Output terminal resistor (one side)
Short	Open	500 Ω
Open	Open	4.3 k Ω
Short	Short	0 Ω

4-4. Circuit Diagram



- JP1-JP8 Jumpers for selecting summing resistance
- JP9-JP16 Jumpers for selecting output adjustment
- S1-S8 Shorting lands for summing resistance
- SB1-SB2 Short-circuit bars for selecting sensing
- VR1-VR4 Potentiometers for output adjustment
- J1-J4 Terminals for load cell
- J5 Terminal for indicato

5. EXTERNAL DIMENSIONS



[Unit: mm]

6. STORAGE/MAINTENANCE

6-1. Storage

Store the summing box in a cool dry place.

6-2. Maintenance

If the indicator connected to the summing box is not stable or has other problems, check the insulation resistance of the summing box as follows:

1. Remove the top cover from the summing box. Disconnect all the cables from the summing box terminals.

Note

Be sure to disconnect all of the cables before measuring insulation resistance. Measuring insulation resistance with cables connected will cause damage to the load cells and the indicator connected to the summing box.

2. Use an insulation resistance tester to measure the insulation resistance between each terminal (total seven terminals) and the case. Confirm that the insulation resistance between each terminal and the case is 100 M Ω or greater.
3. If the insulation resistance is less than 100 M Ω , take the following actions.
 - (a) Insulation deterioration due to liquid inside the summing box
Dry the summing box, to eliminate liquid, by using a dryer or oven with temperatures between 40°C and 50°C. Insulation resistance will be restored.
 - (b) Insulation deterioration due to other causes such as corrosion on terminals or PC board
Replace the summing box with a new one.