

INSTRUCTION MANUAL
CDV-44AS
For EDX-100A/EDX-2000A/EDX-3000A
STRAIN/VOLTAGE MEASUREMENT INSULATION CARD

Thank you for purchasing KYOWA's product CDV-44AS Strain/Voltage Measurement Insulation Card.
Read this Instruction Manual carefully in order to make full use of the high performance capabilities of the product.
Do not use the product in methods other than described in this Manual.

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This Manual describes the CDV-44AS Strain/Voltage Measurement Insulation Card (hereinafter referred to as the CDV-44AS).

STANDARD ACCESSORIES

The following accessories are packed with the CDV-44AS. When unpacking, check the contents to ensure that all accessories are enclosed.

Voltage Conversion Adapter (FV-2A)		1
Warranty and Test Data Sheet		1 each
Instruction Manual		1

SAFETY PRECAUTIONS

(Do not forget to read the safety precautions prior to use.)

The CDV-44AS is designed to be used according to "3. SPECIFICATIONS." Do not use the CDV-44AS in an environment exceeding the range of the above specifications of the EDX-100A/EDX-2000A/EDX-3000A. Or, system failure may result in.

PRIOR TO USE

For safe use of the CDV-44AS, do not forget to read the "Safety Precautions" prior to use.

KYOWA ELECTRONIC INSTRUMENTS CO., LTD. assumes no liability for any damage resulting from the user's failure to comply with the safety precautions.

SAFETY SYMBOLS

For safety operation of the CDV-44AS, the following "WARNING" and "CAUTION" symbols are used in SAFETY PRECAUTIONS of this manual and indicated on the product.

 WARNING	Improper operation of the system may result in death or severe injury of the operator.
 CAUTION	Improper operation of the system may result in injury of the operator and physical damage of the system.

 WARNING
● WARNING Take special notice of warning items described in the "EDX-100A Universal Recorders Instruction Manual for Hardware", "EDX-2000A Memory Recorder/Analyzers Instruction Manual for Hardware", and "EDX-3000A Memory Recorder/Analyzers Instruction Manual for Hardware."

 CAUTION
● CAUTION Take special notice of warning items described in the "EDX-100A Universal Recorders Instruction Manual for Hardware", "EDX-2000A Memory Recorder/Analyzers Instruction Manual for Hardware", and "EDX-3000A Memory Recorder/Analyzers Instruction Manual for Hardware." ● When installing or removing the CDV-44AS in/from the EDX-100A/EDX-2000A/EDX-3000A, do not touch any component parts of the CDV-44AS. Or, system failure or damage may result in. ● Use a shielded cable as an input/output cable. ● After turning OFF the EDX-100A with the CDV-44AS, wait more than 10 seconds to turn ON the power once again.

NOTATIONS USED IN THE INSTRUCTION MANUAL

INFORMATIONAL NOTES

Certain notations are used as necessary to attract your attention to information that requires special care when handling the CDV-44AS, and to information provided for reference purposes.

Examples of Notations

NOTE

Describes essential instructions when handling the CDV-44AS.

MEMO

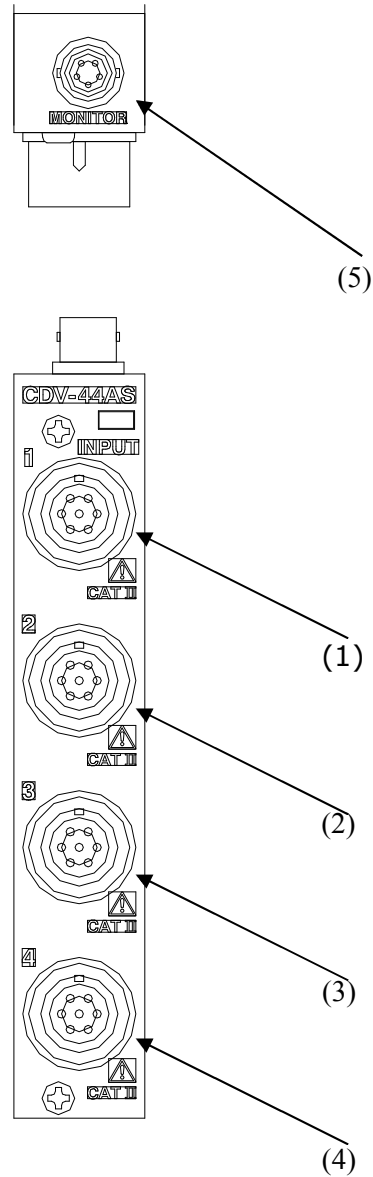
Reference items when handling the CDV-44AS.

1 OUTLINE OF PRODUCT

1.1 OUTLINE OF CDV-44AS

- The CDV-44AS is a signal conditioner card for a strain gage, strain gage transducer, and voltage output type sensor.
- The CDV-44AS is isolated between input and case (output) as well as between channels.
- Capable of 4-channel measurement with one CDV-44AS.
- Monitor output of CHs is ± 5 V with full scale of each range,
- The CDV-44AS can load TEDS built-in sensor information. Based on the loaded sensor information, the CDV-44AS automatically sets the most preferable channel conditions. Before using the TEDS built-in sensor, refer to separate volume of "Instruction Manual for Loading TEDS Sensor Information" and "EDX-100A Instruction Manual for Hardware" and "DCS-100A Instruction Manual for EDX-100A." For using the EDX-2000A or EDX-3000A, refer to separate volumes of "Instruction Manual for Hardware" and "Instruction Manual for Software."

1.2 PARTS NAMES & FUNCTIONS



(1) Input connector 1

Input connector of the 1st channel

(2) Input connector 2

Input connector of the 2nd channel

(3) Input connector 3

Input connector of the 3rd channel

(4) Input connector 4

Input connector of the 4th channel

(5) Monitor output Connector

Monitor output connector

Monitor voltage is $\pm 5V$ with full scale of each range.

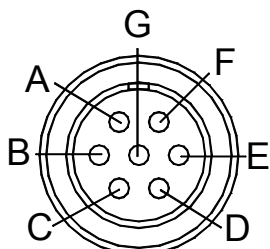
Monitor output cable is connected.

1.3 PIN ASSIGNMENT

[Pin assignment]

① Input connector

Pin assignment of input connectors (Common to both connectors)



Pin	Signal Name
A	+ Bridge Excitation Voltage
B	- Input
C	- Bridge Excitation Voltage
D	+ Input
E	ACOM
F	ID signal +
G	FG

Channel No. of the input connector shall be as follows according to slot into which the CDV-44AS is installed in the EDX-100A/EDX-2000A/EDX-3000A.

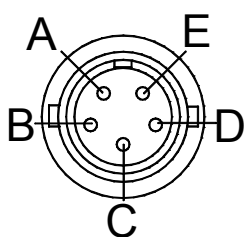
Slot Input connector	1	2	3	4	5	6	7	8
1	CH1	CH9	CH17	CH25	CH33	CH41	CH49	CH57
2	CH2	CH10	CH18	CH26	CH34	CH42	CH50	CH58
3	CH3	CH11	CH19	CH27	CH35	CH43	CH51	CH59
4	CH4	CH12	CH20	CH28	CH36	CH44	CH52	CH60

* Slot No. 1: EDX-100A/EDX-2000A-32 power supply connector side.

* Slot 5 to slot 8: Specified only from EDX-2000A-64/EDX-3000A.

② Monitor output connector

Pin assignment of monitor output connectors



Pin	Signal Name
A	Monitor output of the 1st CH
B	Monitor output of the 2nd CH
C	Monitor output of the 3rd CH
D	Monitor output of the 4th CH
E	Monitor output of COM

When the CDV-44AS is installed in each slot, pin assignment of the monitor output connectors shall be as described in the following table.

Slot Pin	1	2	3	4	5	6	7	8
A	CH1	CH9	CH17	CH25	CH33	CH41	CH49	CH57
B	CH2	CH10	CH18	CH26	CH34	CH42	CH50	CH58
C	CH3	CH11	CH19	CH27	CH35	CH43	CH51	CH59
D	CH4	CH12	CH20	CH28	CH36	CH44	CH52	CH60

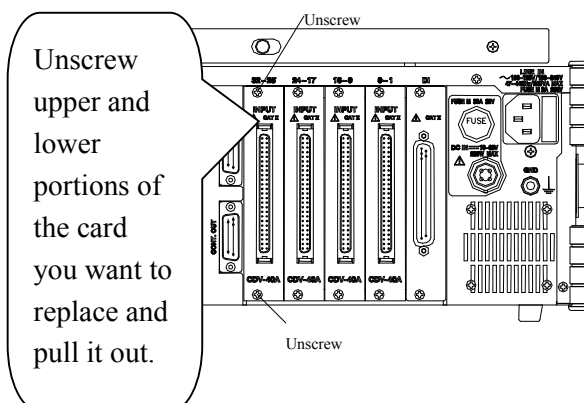
MEMO

- Monitor output cable (H-10296) connected to the monitor output connector is optional.
For details, see "4. OPTIONAL ACCESSORIES."

1.4 INSTALLATION OF CDV-44AS

Always turn OFF the power before installing the CDV-44AS.

- a) Unscrew upper and lower portions of the already installed card or dummy panel.
- b) Remove the already installed conditioner card or dummy panel.
- c) Slowly insert the CDV-44AS in the EDX-100A along the guide rail and tightly fasten the upper and lower screws.
- d) After inserting the CDV-44AS, turn ON the power switch and confirm the startup screen by referring the "DCS-100A Instruction Manual for EDX-100A." If the "Card Type" is displayed in the Slot No. column, the card is correctly installed.
If "DISABLE" or "UNKNOWN" is displayed as the "Card Type," it is required to update the EDX-100A firmware or DCS-100A.



For the EDX-2000A and EDX-3000A, turn ON the power switch and confirm the startup screen by referring the "EDX-2000A Instruction Manual for software" and "EDX-3000A Instruction Manual for Software."

If "DISABLE" or "UNKNOWN" is displayed as the "Card Type," it is required to update the EDX-2000A firmware or EDX-3000A firmware.

For detailed information on the update, visit KYOWA's website <http://www.kyowa-ei.co.jp>. Contact KYOWA or our representative for updating the firmwares.

NOTE

When installing the CDV-44AS in/from the EDX-100A/EDX-2000A/EDX-3000A, do not touch any component parts of the CDV-44AS. Or, system failure or damage may result in.

The sampling frequency of the CDV-44AS is max. 100 kHz.

If you mount the CDV-44AS into the EDX-3000A and set the sampling frequency of the EDX-3000A to 200 kHz, you will get 2 continuous data per cycle.

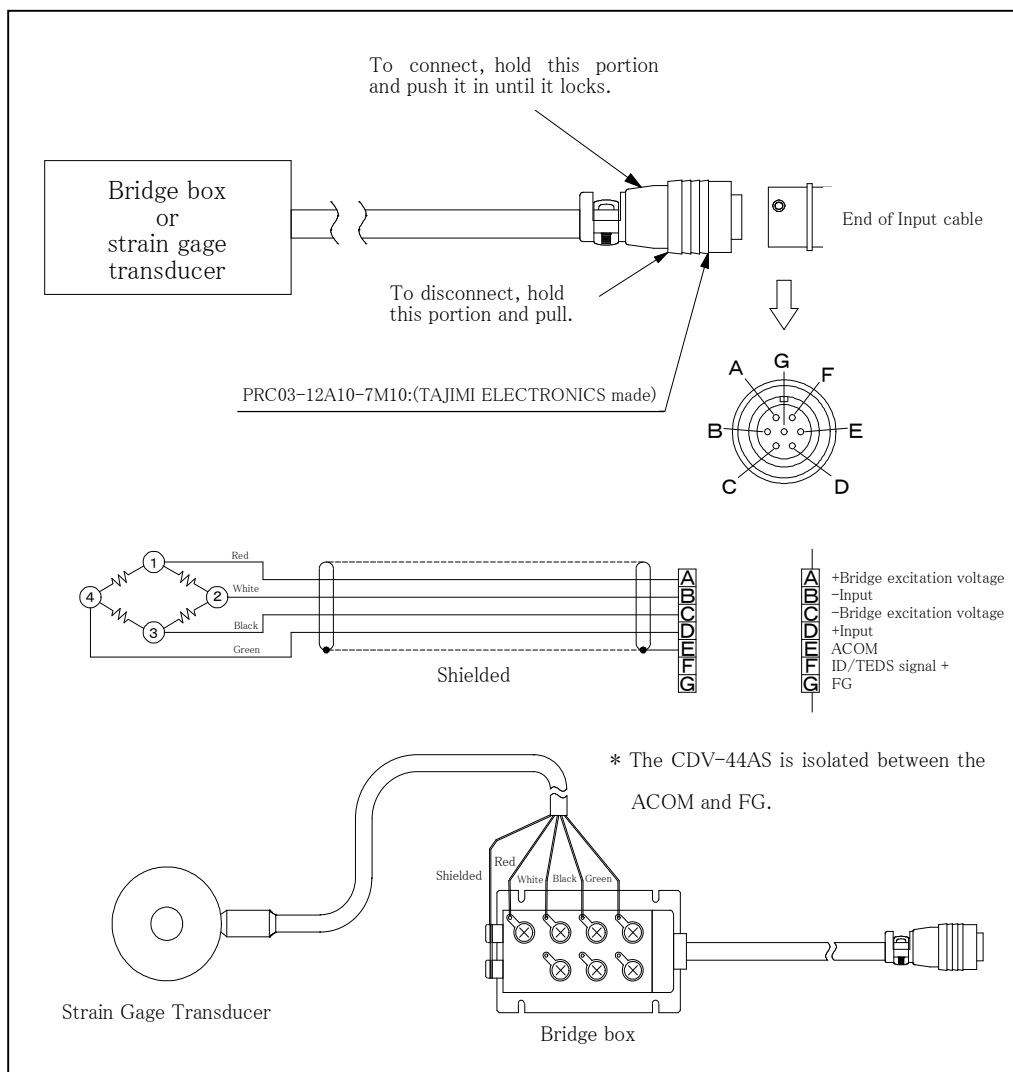
1.5 CONNECTION METHOD

For details, see as follows.

a) When connecting a bridge box or strain gage transducer to the input connector.

For how to connect the CDV-44AS to a bridge box, see "Measurement Memo: How to Assemble a Bridge Gage Bridge" in KYOWA's union catalog or bridge box instruction manual.

When one end of the strain gage transducer is equipped with no plug, there are 2 ways for connecting the strain gage transducer to the CDV-44AS. One is to connect conductors to a plug in advance and the other is to connect by using a bridge box. How to connect conductors is described in the following figure.

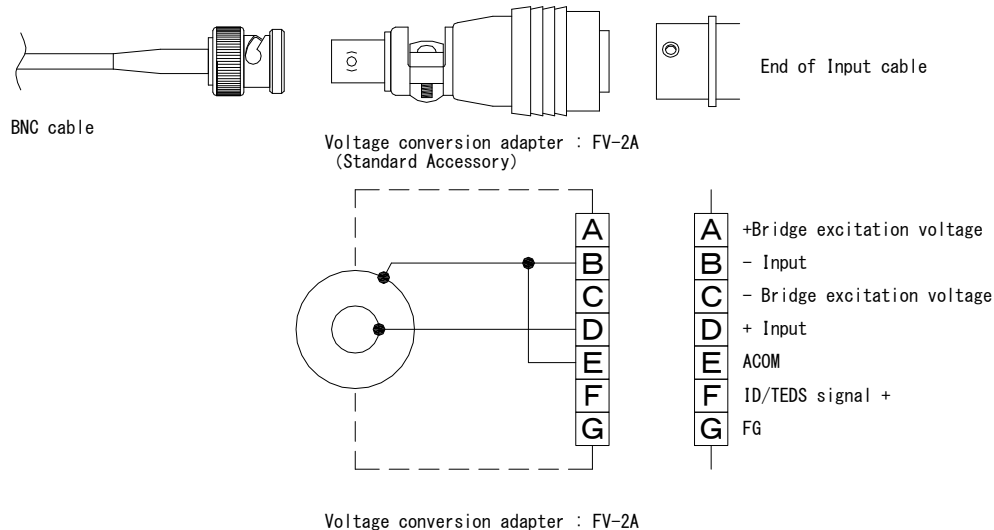


NOTE

- The F terminal of each channel input for the CDV-44AS is intended for sensor ID signals. Connecting any other signal to this terminal may prevent the EDX-100A/EDX-2000A/EDX-3000A from recognizing all conditioners installed in the system. If the EDX-100A/EDX-2000A/EDX-3000A does not recognize the conditioners, the startup screen will display "UNKNOWN" when it should display the name of the conditioner (e.g. CDV-44AS) in the normal state, resulting to unstable the measurement.
- Strain generator, CAB-120E, 350E, and WDS-10 are not available because the F and A terminals are short-circuited.
- It should be noted that when using a transducer with a remote sensing function, always connect by locating the connection cable (N-81 to N-85) between the CDV-44AS and the transducer.
- For using an extension cable between an input cable and bridge box or between an input cable and strain gage transducer, use the connection cable from N-81 to N-85.

b) When connecting the Input Conversion Adapter FV-2A

When measuring the voltage, connect the FV-2A input conversion adapter (optional) to a connector using the BNC connector. Select the voltage mode to perform monitoring.



NOTE

● Maximum Input Voltage Range for Measurement

Do not apply an input voltage exceeding the range specified for the CDV-44AS. Failure to do so will pose the risk of electric shock, deteriorated performance and system failure.

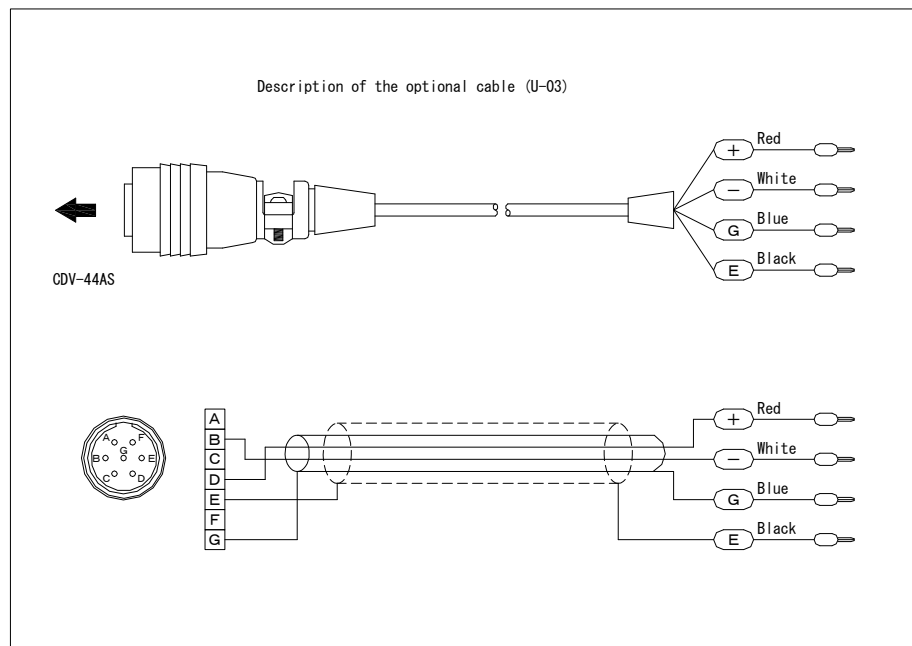
See the following precautions when measuring the DC voltage of a battery, power supply, etc.

- Use a tester or the like to measure the voltage between negative sides of the DC voltage and confirm that the voltage is approximately 0 V.
- When connecting an input, correctly connect the positive and negative sides.
- Maximum input voltage of the CDV-44AS is ± 50 V. Do not apply an input voltage exceeding that range.

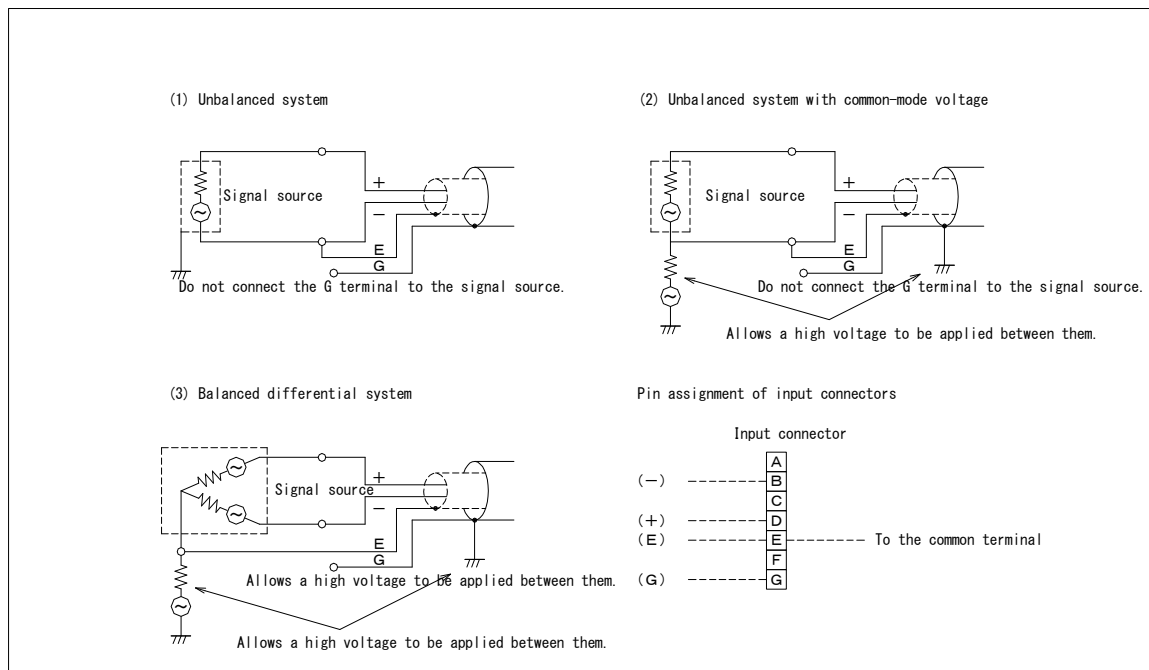
● Use the attached voltage conversion adapter (FV-2A).

The KYOWA's similar product (voltage conversion adapter: FV-1A) is not available.

c) When connecting an U-03 (optional) to an input connector



There are three connection types.



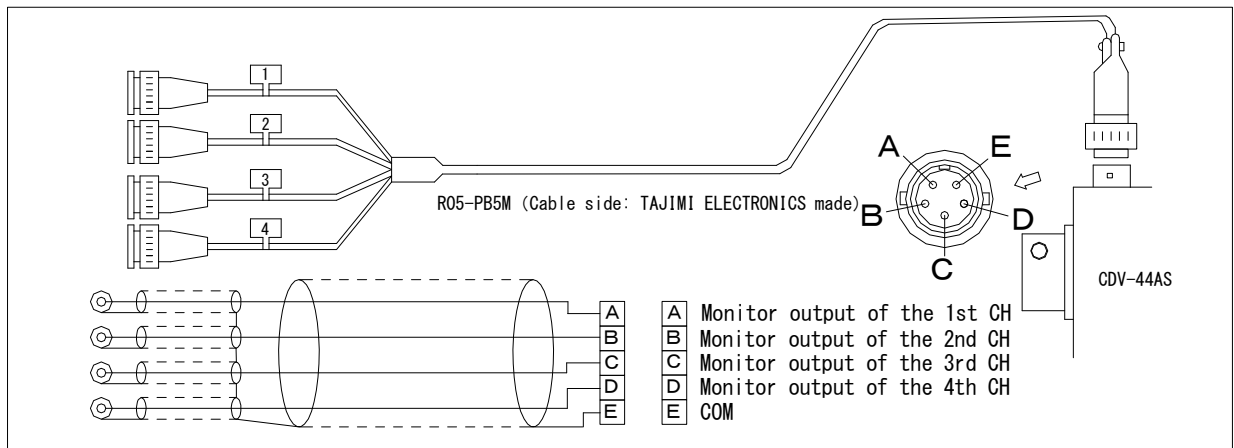
d) When connecting a monitor output cable (optional) to a monitor output connector

Connect the optional monitor output cable [H-10296].

How to connect the monitor output cable is described in the following figure.

The output connector is BNC connector.

The monitor output range is ± 5 V.



NOTE

The CDV-44AS is isolated between the E terminal of the monitor output and E terminal (ACOM) of every input channel.

In addition, the E terminal of the monitor output and G terminal (FG) of every input channel is connected.

2 HOW TO SET THE CDV-44AS

This chapter describes method of setting the CDV-44AS.

a) Channel Cond

Item	1) MEAS CH	2) Mode	3) Range	4) Hi Pass Filter	5) Lo Pass Filter	6) BAL	7) CAL	8) CAL Range
Selections	Measure/ Not measure	Strain ON OFF	500 $\mu\text{m/m}$ 1k $\mu\text{m/m}$ 2 $\mu\text{m/m}$ 5k $\mu\text{m/m}$ 10k $\mu\text{m/m}$ 20k $\mu\text{m/m}$ OFF	OFF 0.2Hz	FLAT 1 kHz 300 Hz 100 Hz 30 Hz 10 Hz	ON OFF(*1)	ON OFF	100 % 50 %
		Voltage ON OFF	1 V 2 V 5 V 10 V 20 V 50 V OFF					

*1: If the both strain mode and voltage mode are OFF, the BAL 6) is OFF only.

MEMO

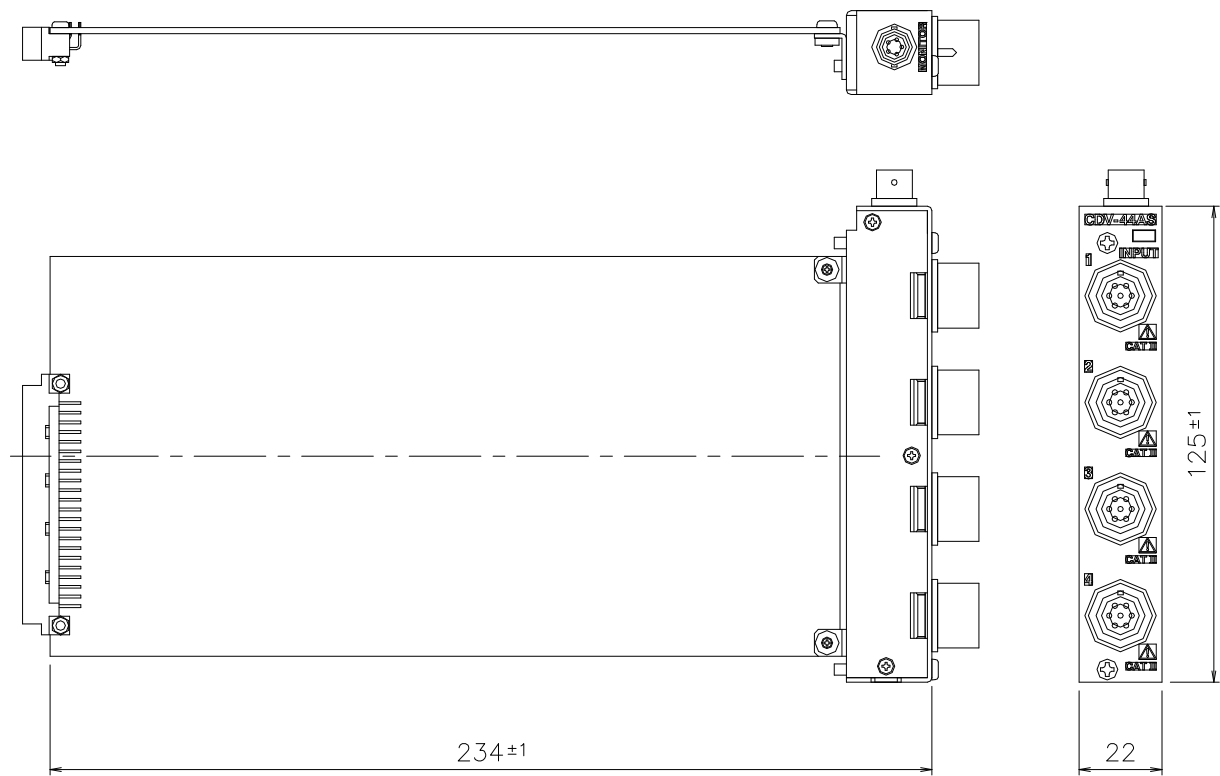
- For measuring an original strain without balancing, set the strain mode to OFF.
- For measuring a voltage without conducting the zero suppression, set the voltage mode to OFF.
- For installing the CDV-44AS to the EDX-100A, refer to "DCS-100A Instruction Manual for EDX-100A operation."
- For installing the CDV-44AS to the EDX-2000A or EDX-3000A, refer to separate volumes of "Instruction Manual for Hardware" and "Instruction Manual for Software."

3 SPECIFICATIONS

3.1 HARDWARE SPECIFICATIONS

Name	Strain/Voltage Measurement Insulation Card
Applicable Sensors	Strain Gage, Strain Gage Transducer, Voltage
The Number of Input Channels	4
Input Mode	Balanced differential (strain mode) Unbalanced (voltage mode)
Input resistance	Approx. 10M ohm + 10M ohm (strain mode) Approx. 1M ohm (voltage mode)
IMRR	120 dB (in 500 $\mu\text{m/m}$ range)
Response Frequency Range	DC coupling: DC to 5 kHz Deviation: Within +1 dB or -3 dB DC cut (AC coupling): 0.2 Hz (see the High Pass Filter)
Gage Factor	2.00 fixed (strain mode)
Bridge Excitation Voltage	Within 2 VDC $\pm 2\%$ (strain mode)
Applicable Bridge Resistance	120 to 1000 ohm (strain mode)
Measuring Range	7 steps of 500, 1k, 2k, 5k, 10k, 20k $\mu\text{m/m}$ and OFF (strain mode) 7 steps of 1, 2, 5, 10, 20, 50 V and OFF (voltage mode)
Range Accuracy	Within 0.3% FS
Balance Range	Resistance: Within $\pm 2.4\%$ ($\pm 12000 \mu\text{m/m}$) (strain measurement) Within $\pm 5 \text{ V}$ (voltage measurement)
ZERO Accuracy	Within $\pm 0.3\%$ FS (voltage mode: OFF)
Non-Linearity	Within $\pm 0.1\%$ FS
CAL Value (CAL)	$\pm 100\%$ and $\pm 50\%$ of each range are output Accuracy: Within $\pm 0.3\%$ FS
Low Pass Filter	Second order butterworth Cutoff frequency: 6 steps of 10, 30, 100, 300, 1 kHz and FLAT Cutoff accuracy: Within -3dB $\pm 1\text{dB}$ Attenuation: Within -12dB $\pm 1\text{dB/oct.}$
High Pass Filter	Cutoff frequency: 0.2 Hz Attenuation: Within -6dB/oct $\pm 1\text{dB/oct.}$
A/D Converter Resolution	16 bits
Monitor Output	Accuracy: Within $\pm 5 \text{ V}$ $\pm 0.5\%$ FS ($\pm 5\text{V}$ with full scale of each range)
Withstand Voltage	500 VDC for 1 minute between input and cas 500 VDC for 1 minute between input and output 500 VDC for 1 minute between channels
Additional Function	Reading information of TEDS-installed sensor
Sampling Frequency	Max. 100 kHz

3.2 EXTERNAL VIEWS

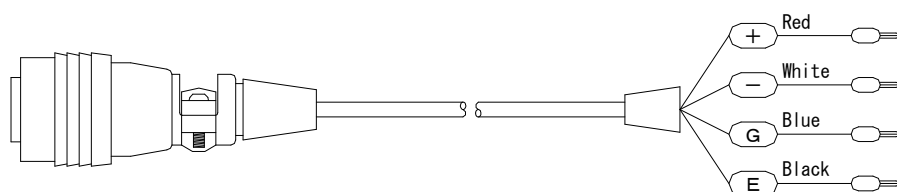


4 OPTIONAL ACCESSORIES

Optional accessories are as follows.

a) Input cable (U-03)

By connecting to an input connector, this input cable is capable of inputting voltage in noisy conditions.
For details, see “1.3 PIN ASSIGNMENT.”



b) Monitor Output Cable <H-10296>

By connecting to a monitor BNC connector, this monitor output cable is capable of monitoring data for every CH. (Length: Approx. 2 m)
For details, see “1.3 PIN ASSIGNMENT.”

