

INSTRUCTION MANUAL

DBV-120A-8

DBV-350A-8

ONE-TOUCH TYPE BRIDGE BOX

Thank you for purchasing KYOWA's product DBV-120A-8/DBV-350A-8 One-touch Type Bridge Box.

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 Instruction Manual describes One-touch Type Bridge Box DBV-120A-8(C) and DBV-350A-8(C) (hereinafter referred to as the Bridge Box).

STANDARD ACCESSORIES

The Bridge Box comes with the following standard accessories. After unpacking, check to be sure that they are included.

Small Screwdriver	1
Rubber Foot	4
Instruction Manual	1
Test Data Sheet and Warranty	1 each
For the DBV-120A-8 and DBV-350A-8	
N-104 Cable.....	1
For the DBV-120A-8C and DBV-350A-8C	
N-105 Cable.....	1

OPTIONS

- N-104 Cable (8 NDIS connectors equipped)
- N-105 Cable (Connector for the CDV-40B/A equipped)
- Bridge box mounting board

SAFETY PRECAUTIONS

The Bridge Box is designed in accordance with the “4. SPECIFICATIONS.”

Do not use the Bridge Box in an environment exceeding the specifications.

Or, failure of the Bridge Box may result.

PRIOR TO USE

This Instruction Manual describes detailed instructions for operating the Bridge Box.

For safe use of the Bridge Box, do not forget to read the “Safety Precautions” prior to use.

Kyowa Electronic Instruments Co., Ltd. assumes no liability for any damages resulting from user’s failure to comply with the safety precautions.

SAFETY SYMBOLS

For safety operation of the Bridge Box, the following symbol marks are used in the Instruction Manual.

 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
● Inflammable Gaseous Environment To prevent fire and explosion hazards, do not operate the Bridge Box where it is exposed to inflammable gases, inflammable vapors or inflammable dust. ● Do not use it in moisture, a dusty place, and the place where lamp soot is hit. ● Do not disassemble the Bridge Box. Or, deterioration or malfunction of the instrument may result. ● Protective Ground Be sure to ground the GND terminal. Or, it may cause an electric shock hazard, lower the performance, and cause trouble.



CAUTION

- Use the Bridge Box in the specified operating temperature range 0 to 40°C.
Use at temperatures exceeding the specified range may lower the performance and cause trouble.
If use under direct sunlight or in a cold place is inevitable, prepare a sunscreen or take proper measures to keep it warm.
- Use in the specified operating humidity range 20 to 85%.
Use in a humid place exceeding the specified range or where it is exposed to splashing water may lower the performance and cause trouble.
- Immediately stop the Bridge Box if operating environment changes abruptly.
Leave the Bridge Box as it is until it becomes adaptable to the environment.
Abrupt change in ambient temperature due to transportation, etc. may cause dew condensation result to deteriorate its performance and cause trouble.
- Do not use the Bridge Box at a location with excessive vibration and impact.
Use the Bridge Box in the specified operating range.
Or, it may deteriorate its performance and cause trouble.
Adopt vibration-proof measures such as shock absorber, etc.
- Note that it causes the breakdown when it drops or the high impact is added when it transports it.
- Do not use the Bridge Box in strong electromagnetic field.
Use the Bridge Box in a magnetic field environment where the PC may be used.
If the Bridge Box is used near devices generating strong magnetic field such as the telemetry system, microwave oven, electronic furnace, etc., its performance may be lowered and erroneous operation and trouble may result.
- Do not pull cords and cables.
Lay cords and cables with a certain allowance so that no unreasonable force is applied to the connections.
Pulling or applying unreasonable force may cause trouble or interrupt the measurement.
- Basically, the Bridge Box is designed to be used by connecting a strain gage to the input terminal.
Note that it causes the breakdown when sensors other than the strain gauge are connected.

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 Bridge Box, and to information provided for reference purposes.

Examples of Notations

NOTE

Essential precautions when handling the Bridge Box.

MEMO

Reference items when handling the Bridge Box.

1. PRODUCT OUTLINE

1-1 PRODUCT OUTLINE

The Bridge Box is 8-channel type bridge box for strain gage measurement.

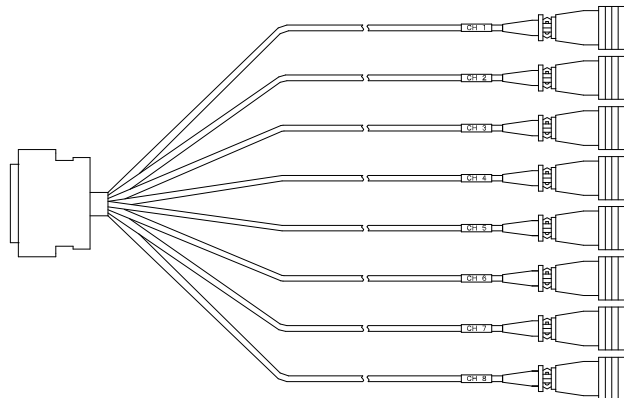
Set a gage mode with gage mode switch on the upper face of the Bridge Box and connect a strain gage to the one-touch type terminal board.

Connect the dedicated cable to an input of the strain meter for the strain gage measurement.

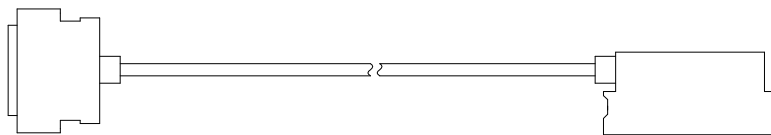
1-2 FEATURES

- User-friendly one-touch type terminal board is adopted.
- Capable of connecting 8-strain gage.
- 2-type connection cables to the strain meter are available.
Either one type is included and it is possible to buy these individually.

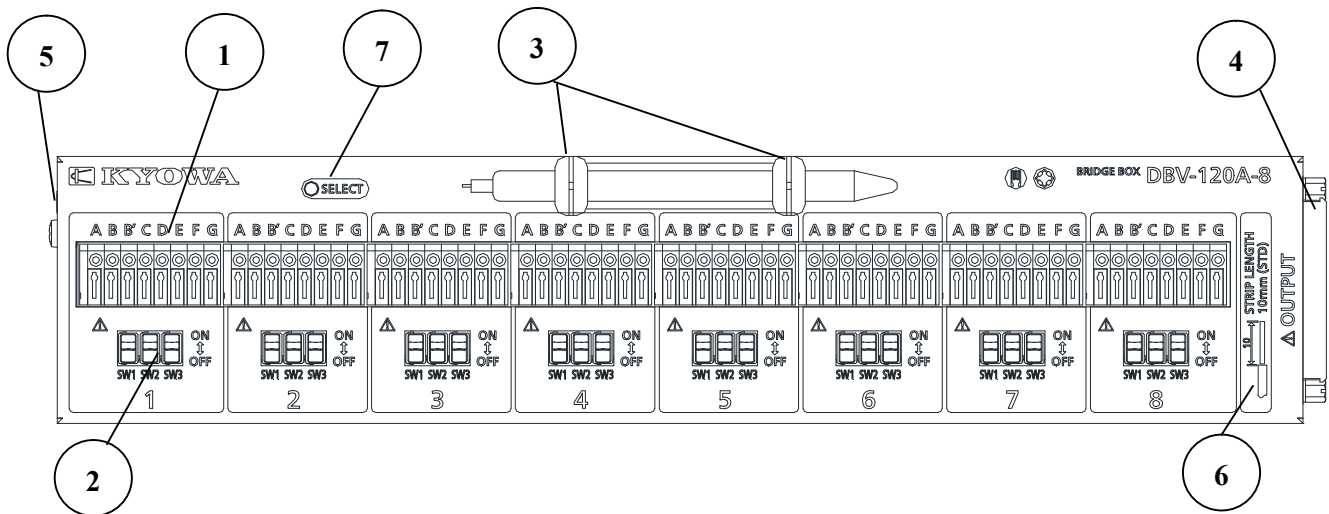
- N-104 8 NDIS connectors equipped.



- N-105 Connector for the CDV-40B/A equipped.



2. PARTS AND FUNCTIONS



1 Terminal Board for Connecting Strain Gages

One-touch type terminal board (1-CH) for connecting the lead wire of the strain gage.

See “3-2 CONNECTING STRAIN GAGE” for the connection.

MEMO

- Applicable lead wire Solid wire: $\phi 0.4$ mm to $\phi 1.2$ mm (UL AWG16 to 26)
Stranded wire: 0.2 mm² to 0.75 mm² (UL AWG20 to 24)

NOTE

- For connecting a strain gage, do not connect gage leads (lead wires directly connected from the strain gage) directly.
- Use a gage terminal and convert the gage leads to the applicable lead wires or use a strain gage with pre-attached lead cables.
- If you connect gage leads directly, gage leads may be broken since they are too thin.

2 Gage Mode Switch

Sets the gage mode with a combination of SW1, SW2 and SW3.

See “3-1 SETTING FORM OF GAGE MODE” or the figure on the side of the Bridge Box for the setting.

3 Driver Holder

Holder for the accessory small screwdriver that is used for connecting the strain gage to the one-touch type terminal board.

4 Cable Connecting Connector

Connect the N-104 cable or N-105 cable.

See “3-3 CONNECTING STRAIN METER.”

5 GND Terminal

A screw (M3) for the GND terminal.

NOTE

- Grounding the GND terminal
Be sure to ground the GND terminal.
Or, it may cause an electric shock hazard, lower the performance, and cause trouble.

MEMO

- For the GND terminal
Connect the GND terminal and E (S) terminal (gray) when noisy.
The noise may be reduced.

- | | | |
|---|------------------|---|
| 6 | Lead Wire Sample | Describes how long you have to peel off a coating of the lead wire that is inserted to the terminal board.
See “3-2 CONNECTING STRAIN GAGE.” |
| 7 | SELECT LED | For checking the bridge box connection.
See “4. SELECT LED.” |

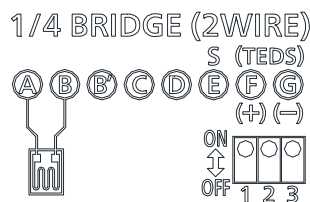
3. CONNECTING FORM

3-1 SETTING FORM OF GAGE MODE

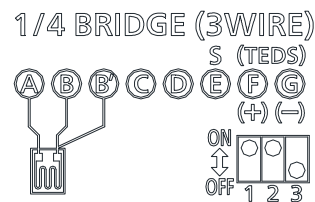
The gage mode has 5 types; 1/4 BRIDGE (2WIRE) system, 1/4 BRIDGE (3WIRE) system, 1/2 BRIDGE system, 2GAGE (OPPOSITE) system and FULL BRIDGE system.

The connecting form of the strain gage and setting of gage mode switch (SW1 to SW3) for every gage system are described as follows. In addition, the same figure is displayed on the side of the Bridge Box.

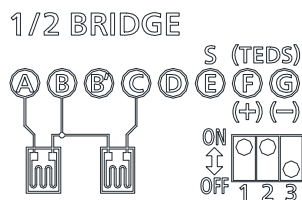
●1/4 BRIDGE (2WIRE) system



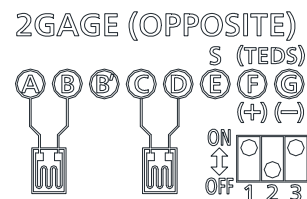
●1/4 BRIDGE (3WIRE) system



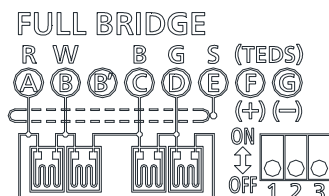
●1/2 BRIDGE system



●2GAGE (OPPOSITE) system



●FULL BRIDGE system



MEMO

- About the E (S) terminal (gray)
Connect the shield wire to the E (S) terminal if the shield wire is included in the gage lead wire.
The noise might become small.
- About the F terminal (yellow) and G terminal (blue)
The terminals are for the TEDS signal.
Connect a TEDS + signal to the F terminal and connect TEDS - signal to the G terminal.

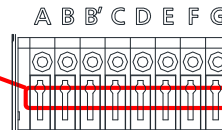
3-2 CONNECTING STRAIN GAGE

- 1) Push the button with the accessory small screwdriver.

NOTE

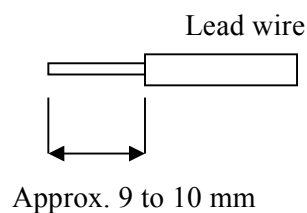
- Press the following position.

**Be sure to press the above position
with the accessory small screwdriver.**



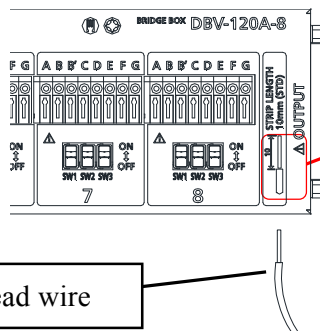
- For connection, always use the accessory small screwdriver or an object with a fine head.

- 2) Insert the lead wire with its coating peeled off approx. 10 mm all the way to its end into the round hole of the input terminal, with the button pressed.



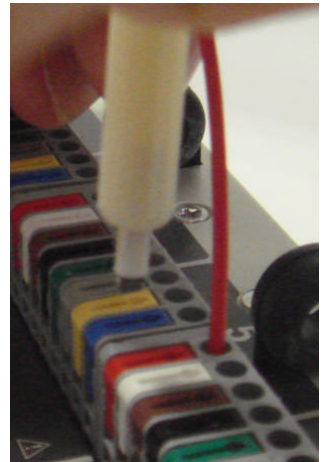
MEMO

- About length in which the coating of the lead is peeled off.
Sample of the applicable peeled off lead wire is described on the Bridge Box with actual size.
You can check that the actual lead wire is correctly peeled off approx. 10 mm by placing it.



3) Release the lock button with the lead wire held in position.

4) Gently pull the lead wire to check if it is securely inserted.



MEMO

For connection, always use the accessory small screwdriver or an object with a fine head.

3-3 CONNECTING STRAIN METER

Use the following connector to connect the strain meter.

For the strain meter with NDIS connector. N-104

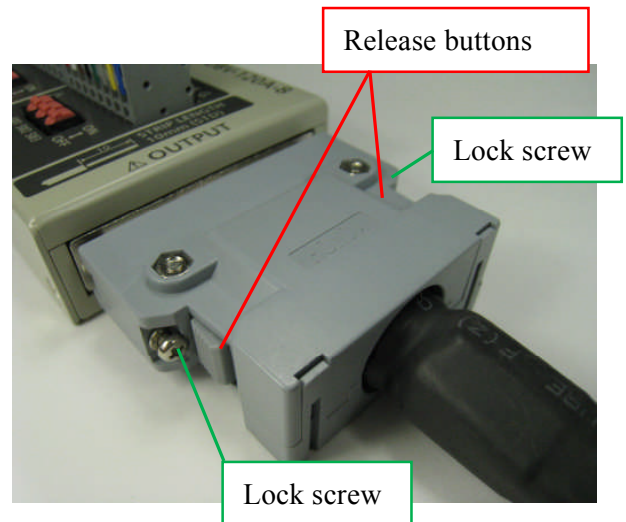
For the strain meter CDV-40B/A. N-105

Each cable length is 1.5 m.

Since the N-104 or N-105 connector has a lock function to prevent itself from falling off, the N-104 or N-105 connector is locked just by inserting it. For releasing, pull the connector with clipping the release buttons on both sides of the connector.

In addition, the lock screws are also equipped. You may fix the lock screws with a Phillips-head screw driver for M2.6.

Connector is not released if you fasten the lock screws even if the release buttons are clipped.

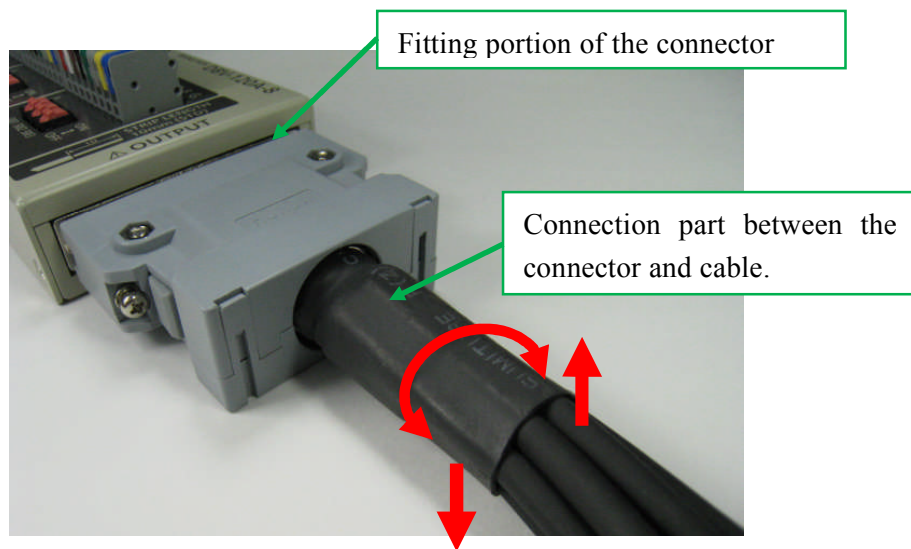


MEMO

- About the lock screw.
Usually, the connector is not released since it attaches the lock function even if the lock screws are not fastened.
However, it is recommended to fasten the lock screws when vibration is applied or to prevent the connector from nearly falling off when you accidentally touch the release buttons.

MEMO

- About the connection part between the N-104 or N-105 connector and cable.
The connector having wide range of connection movement between the connector and cable is used for the cable.
Therefore, the cable moves up, down, left, or right direction at the connection part.
This is used to release the extra force that is transmitted to the fitting portion of the connector from the cable.
There's no need to worry.



4. SELECT LED

4-1 OUTLINE

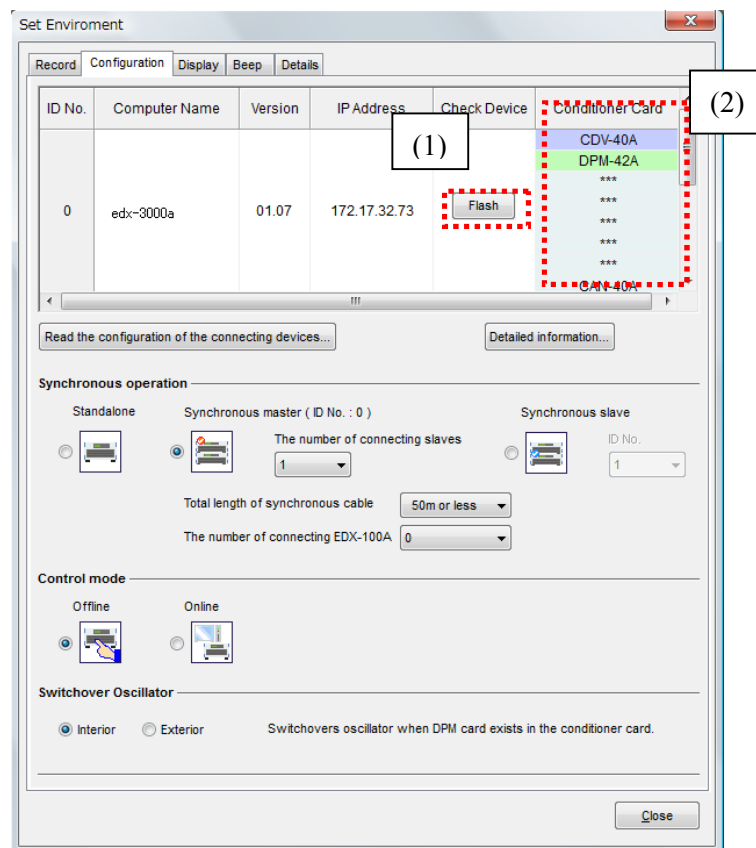
When using multiple Bridge Boxes, by lightening the SELECT LEDs, you can identify which Bridge Boxes are connected to the target CDV-40B/A.

Connect the Bridge Box to the CDV-40B/A with the N-105 cable for using the SELECT LED.

4-2 WITH THE EDX-3000A/B

Click the Environment icon and select the Configuration tab on the EDX-3000A/B. Double click the target CDV-40B/A with a Bridge Box on the Conditioner Card column (1) to light up the SELECT LED in green (the LED will light off in seconds).

Click the (2) Flash button to blink the all SELECT LEDs connected to the EDX-3000A/B in green.



5. SPECIFICATIONS

1)	Model Name	DBV-120A-8	(For gage resistance 120 ohm, accessory cable N-104).	
		DBV-350A-8	(For gage resistance 350 ohm, accessory cable N-104).	
		DBV-120A-8C	(For gage resistance 120 ohm, accessory cable N-105).	
		DBV-350A-8C	(For gage resistance 350 ohm, accessory cable N-105).	
2)	Number of Channels	8		
3)	Corresponding Input	DBV-120A-8(C)		
		120 ohm	For 1/4 BRIDGE (2WIRE) system	
		120 ohm	For 1/4 BRIDGE (3WIRE) system	
		60 to 1k ohm	For 1/2 BRIDGE system	
		120 ohm	For 2GAGE (OPPOSITE) system	
		60 to 1k ohm	For FULL BRIDGE system	
		DBV-350A-8(C)		
		350 ohm	For 1/4 BRIDGE (2WIRE) system	
		350 ohm	For 1/4 BRIDGE (3WIRE) system	
		60 to 1k ohm	For 1/2 BRIDGE system	
		350 ohm	For 2GAGE (OPPOSITE) system	
		60 to 1k ohm	For FULL BRIDGE system	
4)	Gage Connection Terminal	One-touch type terminal board		
5)	SELECT LED	For checking the bridge box connection.		
6)	Accessory Cable	N-104: 1.5-m long	8 NDIS connectors equipped at the tip. Dedicated connector for the CDV-40B/A equipped.	
		N-105: 1.5-m long		
7)	Operating Temperature and Humidity Range 0 to 40°C, 20 to 80% (noncondensing)			
8)	Vibration Resistance	29.4 m/s ² (3G), 5 to 200 Hz		
9)	Dimensions	286 (W) × 22 (H) × 61.4 (D) mm (excluding protrusion)		
10)	Weight	Approx. 480 g		
11)	Available wires	Solid wire	φ 0.4mm to φ 1.2mm (UL AWG16 to 26)	
		Stranded wire	0.2mm ² to 0.75mm ² (UL AWG20 to 24)	

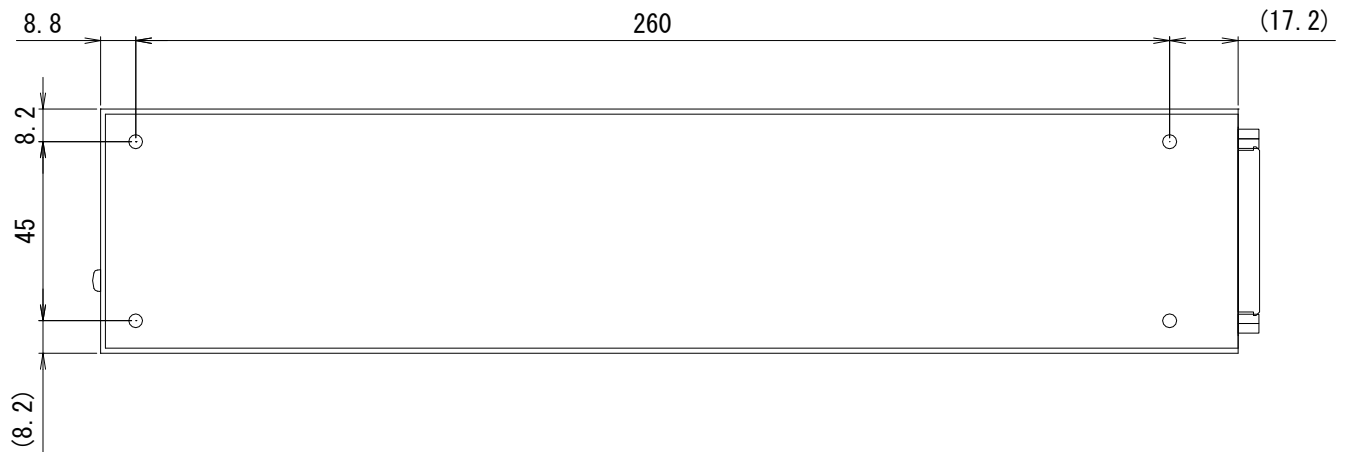
6. FOR SCREW HOLES ON BOTTOM PANEL

Four holes for M3 screws are arranged on the bottom panel of the Bridge Box.

The screw holes are for fixing the Bridge Box with the fixing screws.

Depth of the screw holes are 6 mm.

In addition, put the accessory rubber feet (4) when not using the holes.



(Unit: mm)

NOTE

The screw hole sizes are M3, 6-mm depth.

Do not use screws longer than the recommended size.

Or, it may cause trouble.

7. FOR OUTSIDE DRAWING AND DIMENSIONS OF BRIDGE BOX MOUNTING BOARD

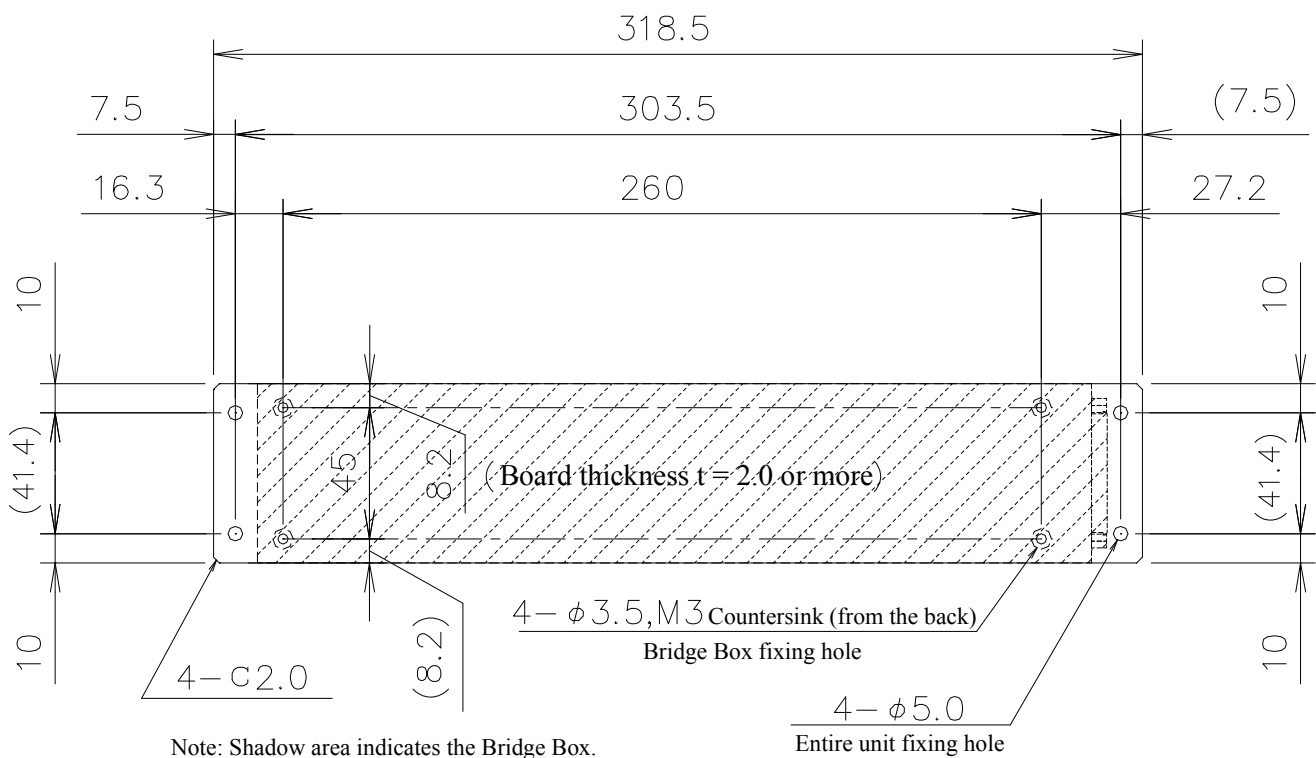
The following figure is an example of the bridge box mounting board using the screw holes on the bottom panel of the Bridge Box.

Refer to the following figure.

Use four flat countersunk screws M3 with length (board thickness (t) + 4 to 6 mm) for mounting the following mounting board to the Bridge Box.

(Example)

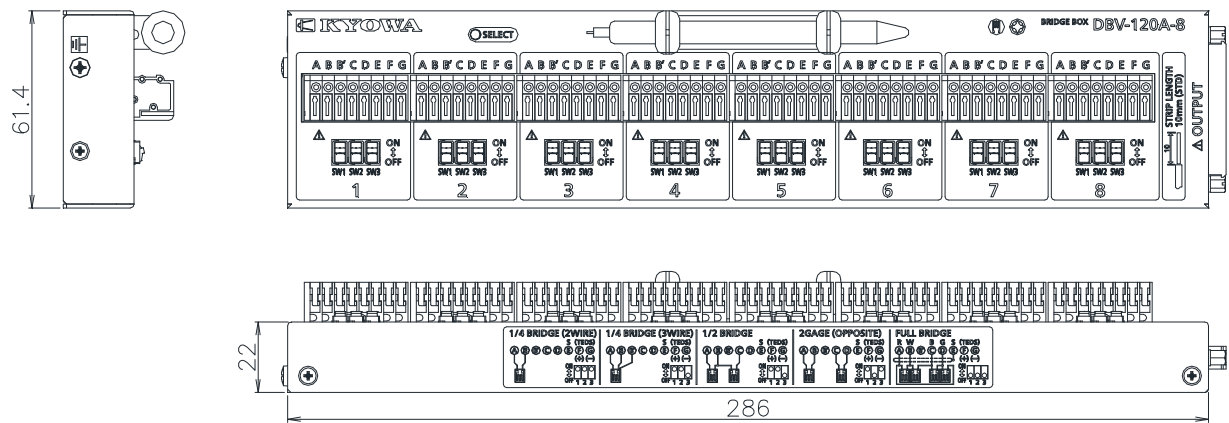
For the board thickness (t) = 2 mm, the screw length should be within 6 to 8 mm.



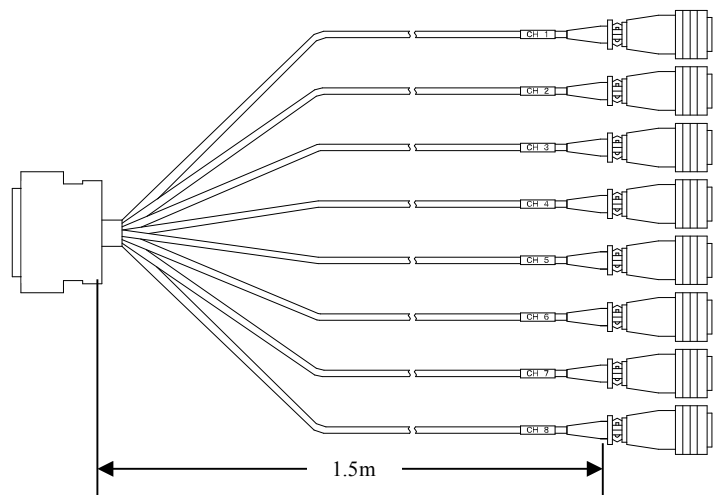
(Unit: mm)

8. OUTSIDE DRAWING

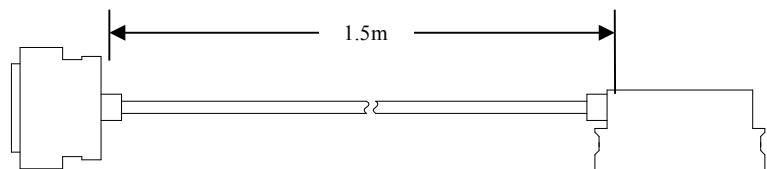
DBV-120A-8 and DBV-350A-8 (Unit: mm)



N-104 Cable



N-105 Cable





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