

This probe is in compliance with IEC-1010.1, IEC-1010.2-031 CAT.III, Pollution Degree 2.

Safety Precautions

Make sure to comply with the safety precautions mentioned hereafter when handling the probe.

YOKOGAWA ELECTRIC Co. assumes no responsibility for any consequences resulting from failure to comply with these safety precautions.

Also, read the User's Manual of the measuring instrument thoroughly so that you are fully aware of its specifications and handling, before starting to use the probe.

- The following symbols are used on this instrument.



To avoid injury, death of personnel or damage to the instrument, the operator must refer to an explanation in the User's Manual or Service Manual.

- Make sure to comply with the following safety precautions in order to prevent accidents such as an electric shock which impose serious health risks to the user and damage to the instrument.



WARNING

- **Grounding of the measuring instrument**

The protective grounding terminal of the measuring instrument must be connected to ground.

- **Earth cable of the probe**

Make sure to connect the earth cable of the probe to the ground (grounding potential).

- **Connecting the object of measurement**

Make sure to avoid an electric shock when connecting the probe to the object of measurement. Do not remove the probe from the measuring instrument after the object of measurement is connected.

- **Do not operate with suspected failures**

If you suspect that there is damage to this probe, have it inspected by a service personnel.

- **Observe maximum working voltage**

To avoid any injury, do not use the probe above 1000V peak between each input lead and earth or between the two inputs. This voltage rating applies to both 1/10 and 1/100 settings.

- **Must be grounded**

This probe must be grounded with the BNC shell and an auxiliary grounding terminal, through the grounding conductor of the power cord of the measuring instrument or other appropriate grounding conductor.

Before making connections to the input terminals of the product, ensure that the output connector is attached to the BNC connector of the measuring instrument and the auxiliary grounding terminal is connected to a proper ground, while the measuring instrument is properly grounded.

- **Do not operate without cover**

To avoid electric shock or fire hazard, do not operate this probe with the cover removed.

- **Do not operate in wet/damp conditions**

To avoid electric shock, do not operate this probe in wet or damp conditions.

- **Do not operate in explosive atmosphere**

To avoid injury or fire hazard, do not operate this probe in an explosive atmosphere.

- **Avoid exposed circuitry**

To avoid injury, remove jewelry such as rings, watches, and other metallic objects. Do not touch exposed connections and components when power is present.



CAUTION

- **Maximum input voltage**

Do not apply any voltages exceeding the maximum input voltage to the probe.

- **Correct use of the power supply**

Power the probe with either 4 AA dry cells, a 6 VDC/200 mA or 9 VDC/150 mA external power supply, or by connecting the probe's power cable to a probe power supply terminal on a DL series measuring instrument or to the 700938 or 701934. Operating the probe under a power supply greater than the voltage specified above may cause damage to the instrument.

- **Connecting the external power supply to the probe**

Always turn OFF the probe's power switch when connecting or disconnecting the external power supply. Also, do not install AA batteries when using an external power supply.

- Terms appear in this manual



WARNING

Affixed to the instrument. Indicates danger to personnel or instrument and the operator must refer to the User's Manual. The symbol is used in the User's Manual to indicate the reference.

Describes precautions that should be observed to prevent serious injury or death to the user.

CAUTION

Describes precautions that should be observed to prevent minor or moderate injury, or damage to the instrument.

Note

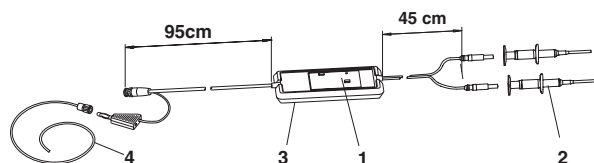
Provides important information for the proper operation of the instrument.

1 Description

By using this device, oscilloscopes with single-ended input can be easily used as oscilloscopes with differential inputs.

2 Appearance

The differential probe looks as follows and consists of the following equipment supplied.



Supplied equipment

- 1 Probe
- 2 Pinchers tips
- 3 Rubber case
- 4 Ground extension lead (length=100cm)

Accessories

- Pinchers tip black B9852MF
- Pinchers tip red B9852MG
- Power cable* B9852MJ

*Power can be supplied from the DL, 700938 or 701934.

3 Specifications

Frequency bandwidth*¹

Input type

Attenuation ratio

Output offset voltage*¹ *²

Input resistance and capacity

Differential allowable voltage (between + - terminal)

Max common mode voltage

Max input voltage (to ground)

CMRR (typical)¹

Output voltage*¹

Output impedance

Gain accuracy*¹ *²

Ambient operating temperature

Ambient storage temperature

Power requirements³

DC - 15MHz (-3dB)

Balancing difference input

switched ratios of 10:1 and 100:1

±7.5 mV

4 MΩ + 10 pF each side to ground

±500 V (DC + ACpeak) or 350 Vrms at 100:1 attenuation

±50 V (DC + ACpeak) or 35 Vrms at 10:1 attenuation

±500 V (DC + ACpeak) or 350 Vrms

±1000 V (DC + ACpeak) or 700 Vrms

60 Hz: less than -86 dB; 20 kHz: less than -66 dB;

200 kHz: less than -56 dB; 1 MHz: less than -40 dB

±5 V (DC or ACpeak)

Using 1 MΩ input system oscilloscope

±2% (not include offset and noise)

-10 to 40°C

-30 to 70°C

Internal battery: four dry cells (R6P, SUM-3)

External power supply: 6 VDC/200 mA or more, or 9 VDC/150 mA or more

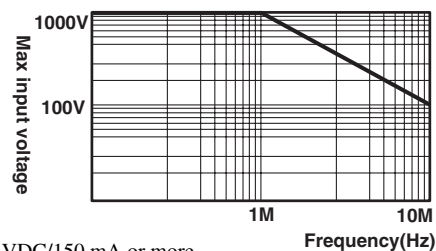
From the DL series instrument's probe power supply or the 700938 using the probe's power supply cable.

In continuous duty, approx. 8 hours

170 mm × 63 mm × 20 mm (excluding rubber case, connector and cable)

Approx. 290g (excluding rubber case)

2000 VACrms (between input terminal and BNC-ground), for 5 minutes



Battery life time

Dimensions

Weight

Withstanding voltage

*¹ When the power supply voltage from the dry cell is 5 V or more, or when using an external power supply.

*² Ambient temperature 23±5°C

*³ When the capacity of dry cells goes down LED blinks. In such a case, replace the batteries. Also, do not install AA batteries when using an external power supply.

4 Installing / Replacing the Batteries

After having removed the outer rubber case, shift the lid at the back side of the probe and install / replace the four dry cells. Batteries are not installed on receipt of the instrument.

5 Operation

1. Install four AA cells. When using an external power supply, do not install batteries (drycells). Supply power only through the external power supply.
2. Simply plug-in the BNC output connector to the vertical input of a oscilloscope, and connect the auxiliary grounding terminal to a proper ground. If necessary, use a ground extension lead.
3. Select the proper range setting. For higher resolution and less noise when measuring signals below 50 V, switch the attenuation to 1/10. Otherwise, set the attenuation to 1/100 when measuring signals above 50 V.
4. Using the appropriate probe accessories, connect the input to the circuits under measurement.



WARNING

- To protect against electric shock the ground side of the output cable (the shielded side of the BNC connector) must be grounded.
- When disconnecting the BNC connector, always first separate the probe from the high voltage parts of the circuit under measurement.
- When replacing the batteries or connecting the external power supply, always first remove the test lead from the circuit under measurement.



CAUTION

- This probe is to carry out differential measurement between two points on the circuit under measurement. This probe is not for electrically insulating the circuit under measurement and the measuring instrument.
- Use a soft cloth to clean the dirt. Prevent damage to the probe.
 - Avoid immersing the probe.
 - Avoid using abrasive cleaners.
 - Avoid using chemicals contains benzene or similar solvents.

- Connect the BNC connector to the input terminal of the oscilloscope and for two point measurement (differential measurement), connect both input leads. Because the performance declines in case you carry out measurements with only one input lead connected, make sure to always connect both.

Note

Accurate measurement may not be possible near objects with strong electric fields (such as cordless equipment, transformers, or circuits with large currents).