

Safety Precautions

Make sure to comply with the safety precautions mentioned hereafter when handling the probe.
Yokogawa Meters & Instruments 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.

General definitions of safety symbols and markings



This symbol indicates the risk of injury, death of personnel, or damage to the instrument.

Be sure to refer to the corresponding explanation in the User's Manual.

WARNING

This symbol calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in injury or death of personnel.

CAUTION

This symbol calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part of the product.

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**
Make sure to connect the protective grounding of the measuring instrument.
- **Ground cable of the probe**
Make sure to connect the ground cable 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.
- **Handling of the passive probe**
Do not touch the probe's input terminal or the probe itself with wet hands.
- **Do not operate with suspected failures**
If you suspect that there is damage to this probe, contact your nearest Yokogawa dealer or sales representative.
- **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.

- Make sure not to exceed the oscilloscope's maximum input voltage in the following cases:
When the probe attenuation ratio is 1:1
When the oscilloscope's input coupling is AC
DC voltage of the same electric potential as the probe's input is applied to the oscilloscope's input.



CAUTION

Maximum input voltage

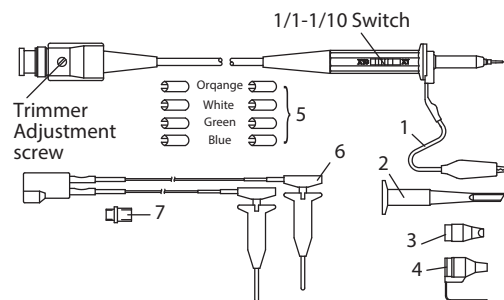
Do not supply any voltages exceeding the maximum input voltage to the probe.

Abstract

The model 701940 is a 1 MΩ passive probe with switchable attenuation ratio of 10:1 and 1:1.

Composition

This probe is composed of the probe and its accessories. Optional accessories are available to meet various applications.



Standard Accessory

Name	PartNo.
1 Ground lead	B9852CW
2 Pinchers tip	B9852CX
3 IC test tip	B9852CY
4 Ground attachment	B9852CZ
5 Marker tip	B9852DH

Optional Accessory

Name	Model
6 Miniclip converter	B9852CR
7 BNC adapter	B9852CS

Specifications

Item	Specifications	Conditions
Probe length	1.5m	
Connector type	BNC	
Input resistance ¹	10MΩ ±2%	In conjunction with an oscilloscope with an input impedance of 1MΩ ±1%.
Matching Input Capacity(at 10:1)	Approx. 17 pF to 46 pF	Oscilloscope measurement input capacity
Input capacitance		
At attenuation ratio of 10:1:	22 pF ±10%	In conjunction with an oscilloscope with an input impedance of 1MΩ ±1%.
At attenuation ratio of 1:1:	200 pF max.	Probe only
Attenuation ratio ¹	(10:1) ±2% or less	In conjunction with an oscilloscope with an input impedance of 1MΩ ±1%.
Bandwidth		
At attenuation ratio of 10:1:	10MHz (-3 dB or less)	Subject to change depending on type of oscilloscope used.
At attenuation ratio of 1:1:	DC to 6MHz (-3 dB or less, typical ²)	Subject to change depending on type of oscilloscope used and measurement conditions.
Rise time		
At attenuation ratio of 10:1:	35 ns max.	Subject to change depending on type of oscilloscope used.
At attenuation ratio of 1:1:	58 ns max. (typical ²)	Subject to change depending on type of oscilloscope used and measurement conditions.
Max input voltage ³	600V(DC+AC peak) or 42 V(DC+AC peak)	This voltage acceptable if the oscilloscope input is non-isolated (the GND part of the input has the same electric potential as the protective grounding), and the attenuation factor is 10:1. If the attenuation factor is 1:1, the acceptable voltage is the max. input voltage on the oscilloscope. .
Operating environment		
Temperature range	5 °C to 40 °C	
Humidity range	20 to 80%RH	
Storage environment		
Temperature range	20 °C to 60 °C	
Humidity range	20 to 80%RH	
Operating altitude	2,000 m or less	
Safety standard	EN61010-31 Measurement category II ⁴ 600V (DC+ACpeak) Pollution degree 2 ⁵	
Environmental standard	EN50581 Monitoring and control instrument	

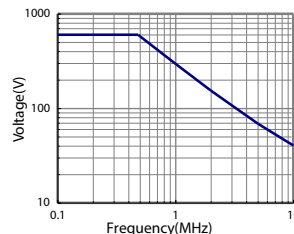
- 1: In case of selecting the attenuation as 10:1.
 2: Typical (or average) value; not guaranteed.
 3: In case of selecting the attenuation as 10:1. The maximum allowable input decreases depending on the frequency. Refer to the deleting curve
 4: The measurement category of this instrument is category II. Do not use it to measure the main power supply or for Measurement Categories III, and IV. Measurement category II applies to measurement of circuits, such as household electric appliances and portable electric tools, that are connected to low-voltage installations. Measurement category III applies to measurement of facility circuits, such as distribution boards and circuit breakers. Measurement category IV applies to measurement of power source circuits, such as entrance cables to buildings and cable systems, for low-voltage installations.
 5: Pollution Degree: Applies to the degree of adhesion of a solid, liquid, or gas which deteriorates withstand voltage or surface resistivity. Pollution Degree 2 applies to normal indoor atmospheres (with only non-conductive pollution).



WARNING

- The maximum input voltage for isolated input is more strictly limited than for non-isolated input. This is due to the fact that, unlike non-isolated input in which GND is protected by a protective grounding potential, the GND for isolated input is floating (insulated), so any protection via protective grounding is disabled.
- When using this probe for isolated input, you must use it with 42 V or less for both the H and L sides. In particular, the GND shell has exposed metal so there is a high risk of electric shock. Even when a high potential only exists on the H side, high voltage can still occur on the L side creating a very dangerous condition.
- Even when the voltage of the non-isolated input is within the maximum, to ensure that current flows to the protective grounding circuit the protective grounding (from the power supply's 3-prong terminal) of the main unit must be enabled, and for plug-in modules, the module attachment screws must be securely fastened.
- This probe has a 10:1 and 1:1 switch. Be sure to heed the following cautions when switching the probe.
 - Confirm the oscilloscope's maximum input voltage when switching the probe to 1:1. Accidentally introducing excessive input can damage the input section.
 - Do not switch the probe while voltage is being input. This is extremely hazardous.

Max Input Voltage deleting curve



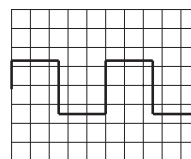
Usage

Use adequate attachment suitable for the point to measure. Before using the probe with attenuation ratio of 10:1, adjust its capacitance by tuning the trimmer.

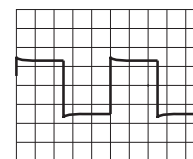
The attenuation can be selected using the 1:1-10:1 switch. Make sure the maximum input voltage of oscilloscope when the attenuation is selected as 1:1.

Adjustment

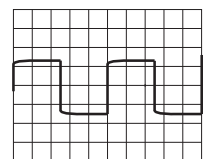
- Connect the probe connector to the input of the oscilloscope, and connect the tip of the probe to the CAL signal output terminal.
- Change the Time/Div and the V/Div to get the display shown below. And tune the trimmer to get the correct waveform.



Correct Waveform



Over Compensation



Inadequate Compensation