

1. Introduction

- Thank you for purchasing the HIOKI "8953-10 HIGH RESOLUTION UNIT". To obtain maximum performance from the device, please read this manual first, and keep it handy for future reference.
- The 8953-10 is the input module for the MEMORY HiCORDERs. Always install this device on a Memory HiCORDER for use. For the detailed installation procedure, refer to Main unit manual.
- Follow carefully the advice of "3. Notes on Use."

2. Safety Notes



This device is designed to comply with IEC 61010 Safety Standards, and has been thoroughly tested for safety prior to shipment. However, mishandling during use could result in injury or death, as well as damage to the device. Be certain that you understand the instructions and precautions in the manual before use. We disclaim any responsibility for accidents or injuries not resulting directly from device defects.

Safety symbol

This manual contains information and warnings essential for safe operation of the device and for maintaining it in safe operating condition. Before using the device, be sure to carefully read the following safety notes.

	• The symbol printed on the device indicates that the user should refer to a corresponding topic in the manual (marked with the symbol) before using the relevant function. • In the manual, the symbol indicates particularly important information that the user should read before using the device.
	Indicates a grounding terminal.
	Indicates DC (Direct Current).
	Indicates both DC (Direct Current) and AC (Alternating Current).

The following symbols are used in this Instruction Manual to indicate the relative importance of cautions and warnings.

	Indicates that incorrect operation presents an extreme hazard that could result in serious injury or death to the user.
	Indicates that incorrect operation presents a significant hazard that could result in serious injury or death to the user.
	Indicates that incorrect operation presents a possibility of injury to the user or damage to the device.



3. Notes on Use



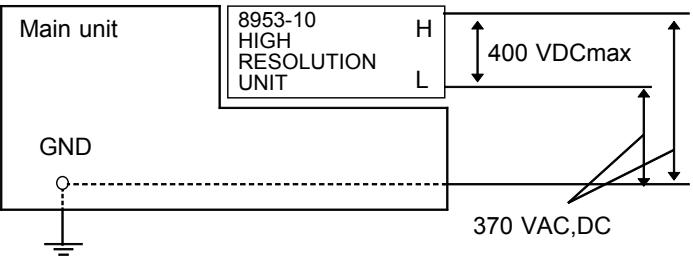
- **The maximum rated voltage to earth (voltage between 8953-10 input terminal and main unit frame, and between input terminals of other high resolution units) is 370 V AC/DC. To avoid the risk of electric shock and damage to the device, take care that voltage between 8953-10 input terminal and main unit frame, and between input terminals of other high resolution units does not exceed these ratings.**
- **The maximum input voltage is 400 VDC. Attempting to measure voltage in excess of the maximum input could destroy the device and result in personal injury or death.**



- The maximum rated voltage to earth rating applies also if an input attenuator or similar is used.
- When measuring voltages in power lines with high current capability, always connect the probe to the secondary side of the circuit breaker, to avoid the risk of electric shock and damage to the device.
- The power terminal is especially for use with the 9322 DIFFERENTIAL PROBE. Use the 9328 POWER CORD to supply power to the 9322. To avoid personal injury or damage to the device, do not connect anything except the 9322 to the power terminal.
- Before using the device, make sure that the insulation on the connection cords is undamaged and that no bare conductors are improperly exposed. Using the product in such conditions could cause an electric shock, so contact your dealer or Hioki representative for replacements. (Model 9197 or 9198 CONNECTION CORD)



For safety reasons, only use the specified 9197 or 9198 CONNECTION CORD for measurement.



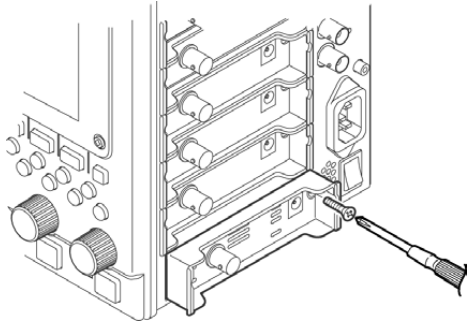
4. Replacement Procedure



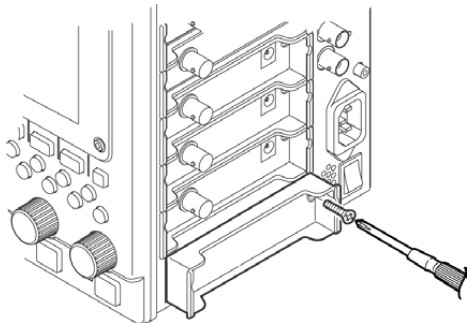
- **To avoid electric shock accident, before removing or replacing an input module, confirm that the instrument is turned off and that the all connection cords and power cord are disconnected.**
- **The mounting screws must be firmly tightened or the input module may not perform to specifications, or may even fail.**

- This section describes how to replace the 8953-10 HIGH RESOLUTION UNIT.
- The following procedure describes how to remove the input module.
- Install the devices by reversing the procedure for removal.

1. Remove the connection cords from all input modules.
2. Power off the main unit, and disconnect the power cord.
3. Remove the two fixing screws with a Phillips screwdriver, as shown in the figure below.
4. Grasp the handle and pull the device out.



To avoid the danger of electric shock, never operate the instrument with an input module removed. To use the instrument after removing an input module, install a blank panel over the opening of the removed module.



Do not measure with a blank panel removed. Otherwise, the device internal temperature becomes unstable and consequently the specifications are not met.

5. Specifications

Accuracy at 23°C±5°C, 30% to 80% RH after zero adjustment after 30-minutes warming-up time. Accuracy guaranteed for 1 year.

Measurement ranges	5, 10, 20, 50, 100, 200, 500 mV/DIV 1, 2, 5, 10, 20 V/DIV
DC amplitude accuracy	±0.2% f.s. (filter 5 Hz ON, averaging)
Zero position accuracy	±0.1% f.s. (filter 5 Hz ON, averaging, after zero adjustment)
Temperature characteristic	Gain: ±0.025%f.s./°C Zero position: ±0.02%f.s./°C (after zero adjustment)
Frequency characteristic	DC to 100 kHz ±3 dB (DC coupling) 7 Hz to 100 kHz ±3 dB (AC coupling, low cut-off frequency: 7 Hz±50%)
Noise	500 µVp-p typical, 1 mVp-p max. (sensitivity range, with input shorted)

Common mode rejection ratio	80 dB minimum (at 50/60 Hz and with signal source resistance 100 Ω maximum)
Low-pass filter	OFF,5,50,500,5 k,50 k ±50% (Hz) -3 dB
Anti-aliasing filter	Cutoff frequency (fc) : 20, 40, 80, 200, 400, 800, 2 k, 4 k, 8 k, 20 k, 40 k (Hz) These frequencies are automatically set when the anti-aliasing filter is set to ON. Attenuation characteristic: -66 dB, min. (at 1.5 fc)
Input type	Unbalanced (floating)
Input coupling	AC, DC, GND
Input resistance	1 MΩ±1%
Input capacitance	40 pF±10 pF (at 100 kHz)
A/D resolution	16 bits
Maximum sampling speed	1 MS/s
Input terminals	BNC terminal
Power supply terminal	Especially for use with the 9322 DIFFERENTIAL PROBE +12 V±8% (Shares the ground of power terminals of other mounted modules.)
Maximum input voltage	400 V DC max.
Insulation resistance, Withstand voltage	Amplifier - Main unit, each amplifier: 3.7 kV AC for 1 minute 100 MΩ or over / 500 V DC
Maximum rated voltage to earth	370 V max. AC/DC (between each input channel and main unit, and between input channels)
Operational ranges for temperature and humidity	Same as the Memory HiCorder in which the 8953-10 is installed
Operating Environment	Same as the Memory HiCorder in which the 8953-10 is installed
Temperature and humidity ranges for storage	Temperature: -10°C to 50°C (14°F to 122°F) Relative humidity: 80% RH maximum (with no condensation)
Dimensions	Approx. 107.4 W x 28 H x 164.5 D mm (4.23" W x 1.10" H x 6.48" D)
Mass	Approx. 150 g (5.3 oz.)
Effect of radiated radio-frequency electromagnetic field	±15% f.s. at 3V/m (max.)
Effect of conducted radio-frequency electromagnetic field	±2% f.s. at 3V (max.)

Standard Applying	
Safety	EN 61010 Pollution Degree 2, measurement category II (anticipated transient overvoltage 4000 V)
EMC	EN 61326, Class A

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