

1. Before Use

- Thank you for purchasing the HIOKI "8954 VOLTAGE/TEMP UNIT". To obtain maximum performance from the device, please read this manual first, and keep it handy for future reference.
- The 8954 is the voltage and temperature unit for the MEMORY HiCORDERs. Always install this device on a Memory HiCORDER for use. For the detailed installation procedure, refer to Main unit manual.
- The device can be used with 8855 MEMORY HiCORDERs equipped with ROM Ver. 1.10 or later. For detail, contact your dealer or Hioki representative.
- 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 AC (Alternating Current).
	• 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 8954 input terminal and main unit frame, and between input terminals of other input modules) is 370 V max. AC/DC. To avoid the risk of electric shock and damage to the device, take care that voltage between 8954 input terminal and main unit frame, and between input terminals of other input modules does not exceed these ratings.

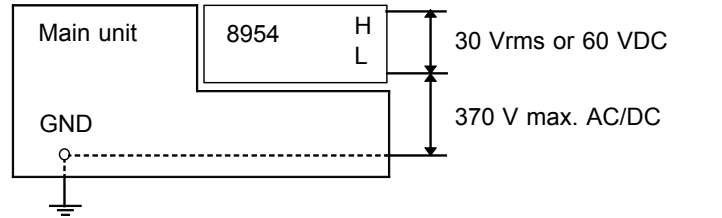
The maximum input voltage is 30 V rms or 60V DC. Attempting to measure voltage in excess of the maximum input could destroy the device and result in personal injury or death.

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 device in such conditions could cause an electric shock, so contact your dealer or Hioki representative for replacements (Model 9198).

A common GND is used for voltage and temperature input on all channels. Never input voltage and temperature simultaneously, since doing so could result in damage to the sample being tested.

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

Use the thermocouple at a voltage of less than 30 V rms or 60 V DC. For details on using the thermocouple to measure voltages that exceed 30 V rms or 60 V DC, consult your thermocouple manufacturer.



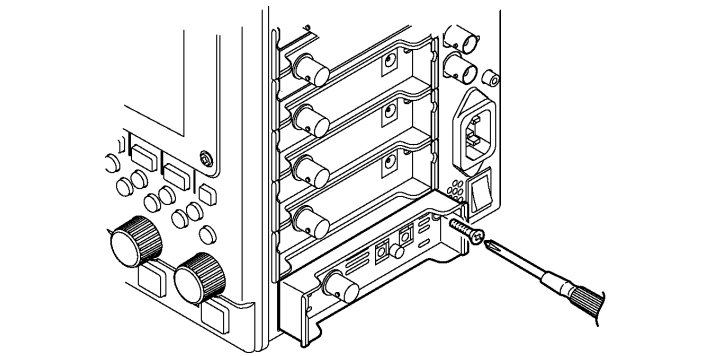
4. Replacement Procedure

To avoid electric shock accident, before removing or replacing an input module, confirm that the instrument is turned off and that the power cord, thermocouples, and connection cords 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 8954 VOLTAGE/TEMP 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 BNC connector and pull the device out.



To avoid the danger of electric shock, never operate the device with an input module removed. To use the device 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 main unit internal temperature becomes unstable and consequently the specifications are not met.

Do not change the DIP switch settings. Doing so will make measurement impossible.

ON

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5. Specifications

Accuracy at 23°C±5°C, 30% to 80% RH after auto-balancing (voltage range), after 1-hour warming-up time. Accuracy guaranteed for 1 year.

Voltage input	
Measurement ranges	500 μ V/DIV, 1, 2, 5, 10, 20, 50, 100, 200, 500 mV/DIV, 1, 2 V/DIV
Zero position setting range	-100 to 150% of the recording width (in full-size representation of the vertical axis)
DC amplitude accuracy	$\pm 0.2\%$ f.s. (filter 5 Hz ON, averaging, after zero adjustment)
Zero position accuracy	$\pm 0.2\%$ f.s. (filter 5 Hz ON, averaging, after zero adjustment)
Temperature characteristic	• Gain: $\pm 0.02\%$ f.s./°C
Frequency characteristic	• Zero position: $\pm 0.02\%$ f.s./°C
Frequency characteristic	DC to 20 kHz ⁺¹ ₋₃ dB
Noise	75 μ Vp-p typical, 120 μ Vp-p max.
Input terminals	BNC terminal
Input resistance	1 M Ω ±1%
Input capacitance	60 pF±20 pF (at 10 kHz)
Input coupling	DC, GND, AC
Low-pass filter	1, 5, 50, 500±50% (Hz) (-3 dB)

Temperature input	
Measurement ranges	10, 100°C/DIV
Measurement input range	K: -200°C to 1350°C J: -200°C to 1100°C N: -200°C to 1300°C S: 0°C to 1700°C W: 0°C to 2000°C
	E: -200°C to 800°C T: -200°C to 400°C R: 0°C to 1700°C B: 300°C to 1800°C

Zero position setting range	-100 to 100% f.s. (in full-size representation of the vertical axis)
Temperature measurement accuracy	K, E, J, T, N: $\pm 0.1\%$ f.s.±1.0°C $\pm 0.1\%$ f.s.±2.0°C (-200°C to 0°C) R, S, W: $\pm 0.1\%$ f.s.±3.0°C B (effective measurement range: 400°C to 1800°C): $\pm 0.1\%$ f.s.±4.0°C
Reference junction compensation	Selectable internal or external
Reference junction compensation accuracy	$\pm 0.1\%$ f.s.±1.5°C (with internal reference contact compensation and input terminal in state of temperature equilibrium)
Temperature characteristic	$\pm 0.02\%$ f.s./°C (sensor: K, E, J, T, N) $\pm 0.1\%$ f.s./°C (sensor: R, S, B, W)
Frequency characteristic	DC to 1 kHz ⁺¹ ₋₃ dB (data update rate: Internal reference junction compensation 90 μ s±60% External reference junction compensation 240 μ s±30%)
Input terminals	2-terminal terminal block
Input resistance	4.8 M Ω or over
Low-pass filter	1, 5, 50, 500±50% (Hz) (-3 dB)

Common specifications	
Common mode rejection ratio	80 dB minimum (at 50/60 Hz and with signal source resistance 100 Ω maximum)
Input type	Unbalanced (input isolated from output)
A/D resolution	16 bits
Maximum sampling speed	100 kS/s (However, update rate differs with temperature input.)
Maximum input voltage	30 V rms or 60 VDC (Both voltage input and thermocouple input)
Maximum rated voltage to earth	370 V max. AC/DC (Both voltage input and thermocouple input)
Operational ranges for temperature and humidity	Same as the MEMORY HiCORDER in which the 8954 is installed
Operating place	Same as the MEMORY HiCORDER in which the 8954 is installed
Temperature and humidity ranges for storage	Temperature: -10°C to 50°C Relative humidity: 20% to 90% (with no condensation)
Dimensions	Approx. 104 W x 28 H x 163 D mm (4.09" W x 1.10" H x 6.42" D) (excluding projections)
Mass	Approx. 160 g, (5.6 oz.)
Accessory	Instruction manual
Effect of radiated radio-frequency electromagnetic field	±15 %f.s. at 3 V/m
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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