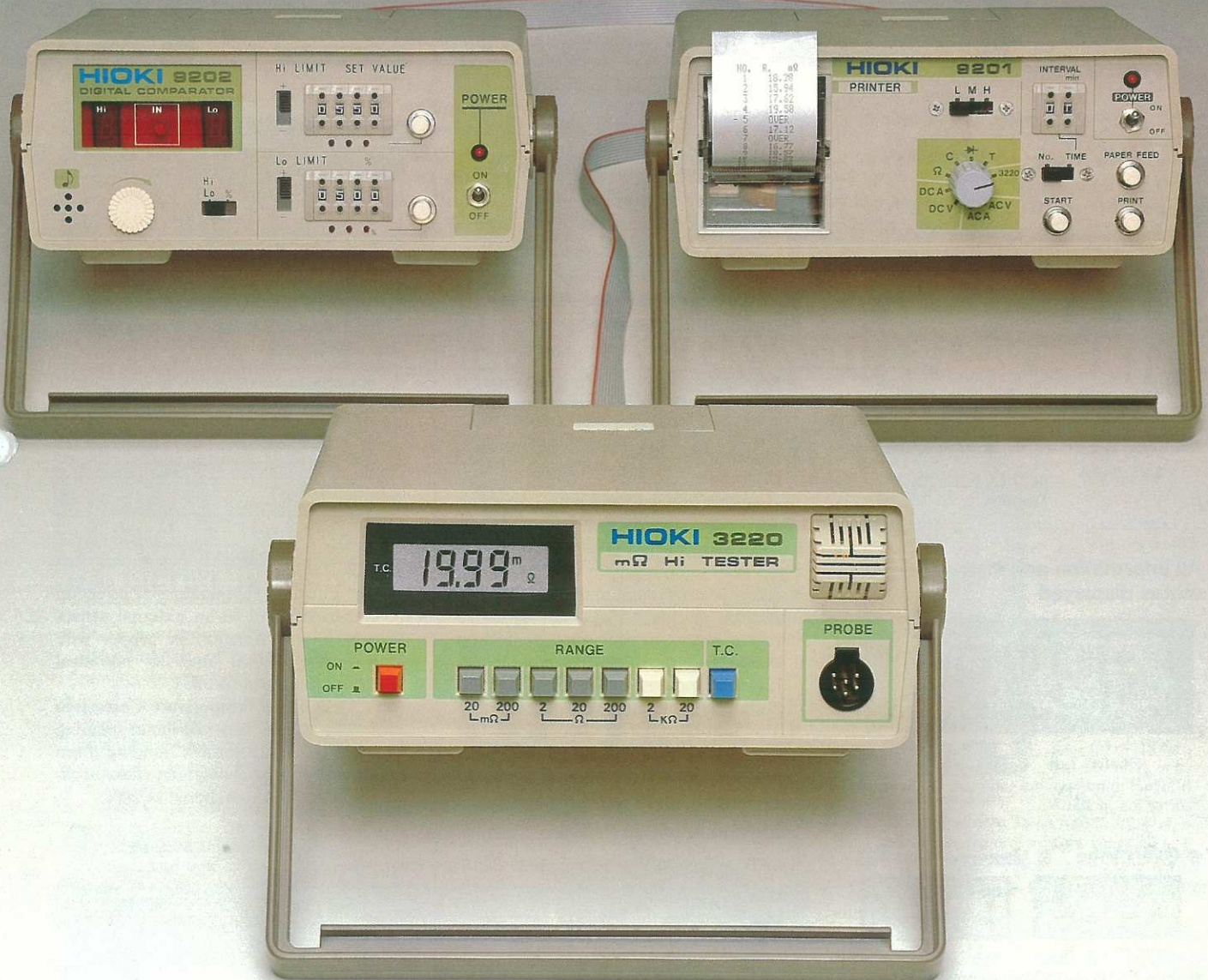


3220 mΩ Hi TESTER  
9201 PRINTER  
9202 DIGITAL COMPARATOR



3 2 2 0  
9 2 0 1  
9 2 0 2

# mΩ-Ω-kΩ Resistance Measurement-Recording-Qualification



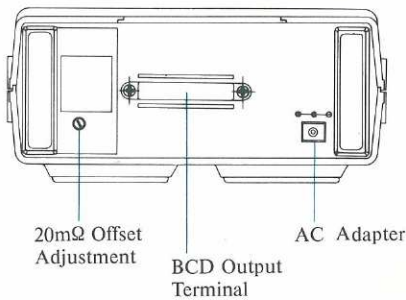
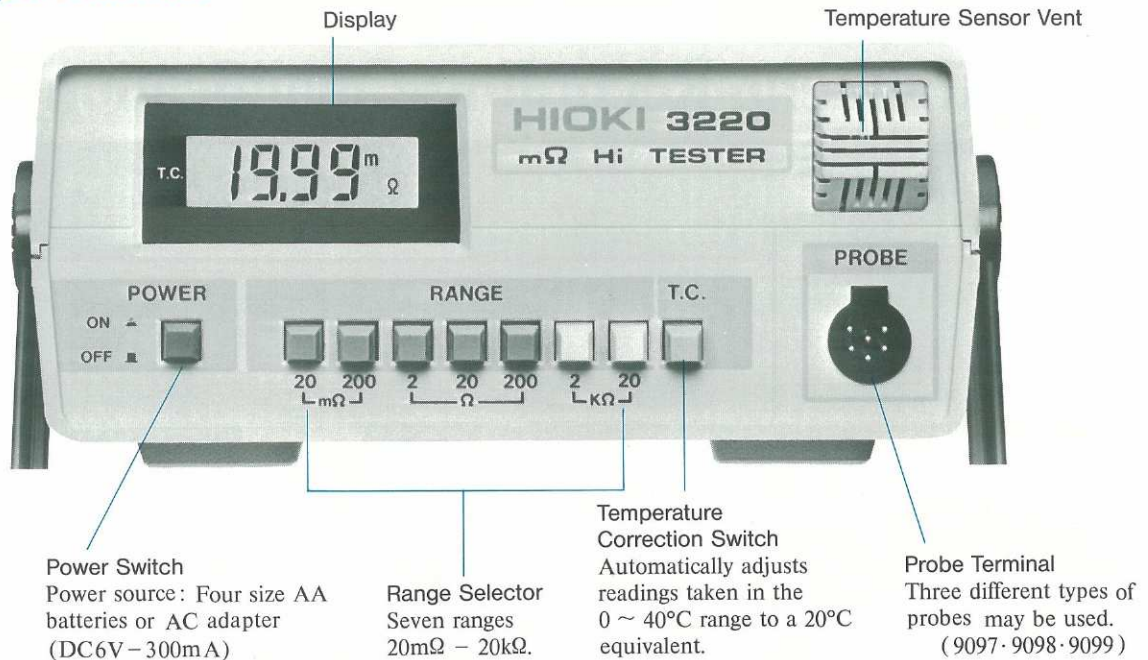


# Milliohmmeter with a lowest range of 20mΩ — Resolution of 0.01mΩ

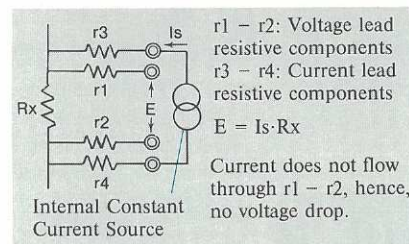
**3220 mΩ Hi TESTER**

Measures resistance values to 20kΩ

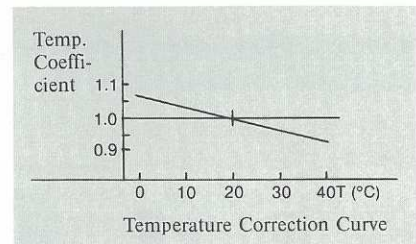
**Includes Temperature Correction and BCD Output Functions**



### Four-terminal method assures measurement accuracy



### Temperature-corrected copper wire resistance values may also be displayed



### All information and instrument states displayed



Blinking minus symbol indicates temperature correction in effect

### Overrange Measurement NG



- Only the "1" in the MSD column will appear in the 4-terminal measurement display when a condition such as open current probes, or contact resistance disabling constant current flow causes an unacceptable instrument status for accurate measurements.

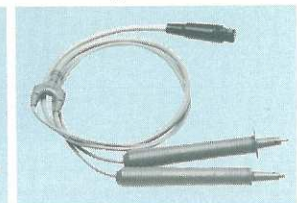
- Using the conventional two-terminal method in measuring low resistance values results in an erroneous reading due to the internal resistance of the test leads and the contact resistance at probe point and terminal jacks.
- The four-terminal method allows test lead resistive components to be eliminated – they will not affect the reading.

- An integral Temperature Correction Circuit coupled to an external sensor cancels any variation in copper wire resistance values due to non-ideal ambient temperatures.
- A flick of the Temperature Correction Switch causes any resistance reading taken at temperatures ranging from 0° to 40°C to be converted to the resistance value of the material at 20°C.

### Wide Selection of Probes

9097 Four-Terminal Test Leads 9099 Clip-Type Test Leads

(Accessories available)  
9098 Pin-Type Test Leads





# BCD Output to Printer and Comparator

Ideal for use on the Production line or in the R & D lab.

System applications include hard-copy data acquisition and quality checks.

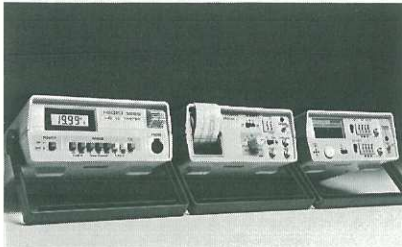
BCD OUTPUT

to printer

to comparator

## 3220 SYSTEM

- 3220 + 9201
- 3220 + 9202
- 3220 + 9201 + 9202



Models 9201 and 9202 purchased prior to the release date of the 3220 are intended for use with the 3209, and in some cases cannot be connected to the 3220. Consult your dealer for further information.

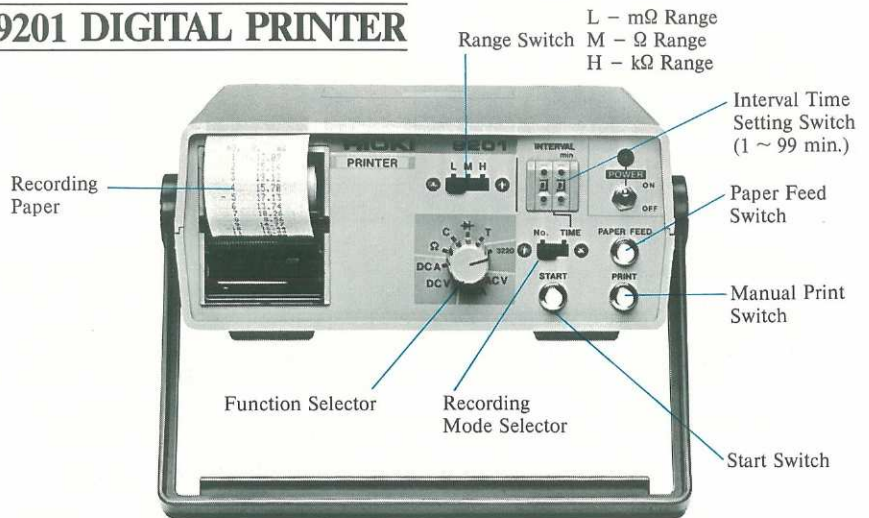
For measuring resistance values over 20kΩ . . . .

## 3209 DIGITAL HI TESTER

- BCD Output allows the 9201 Printer and 9202 Comparator to be connected with no special interfaces.
- In addition to resistance measurements, current and voltage (both AC and DC) may also be measured.
- Ω Range: 200, 2000, 20k, 200k, 2M, 20MΩ
- Voltage Range: 200m, 2000m, 20, 200, 1000V
- Current Range: 200μ, 2000μ, 20m, 200m, 2A



## 9201 DIGITAL PRINTER



### TIME Setting    EVENT NO. Setting

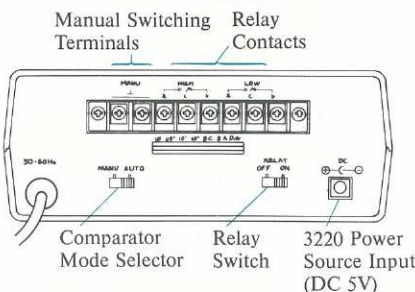
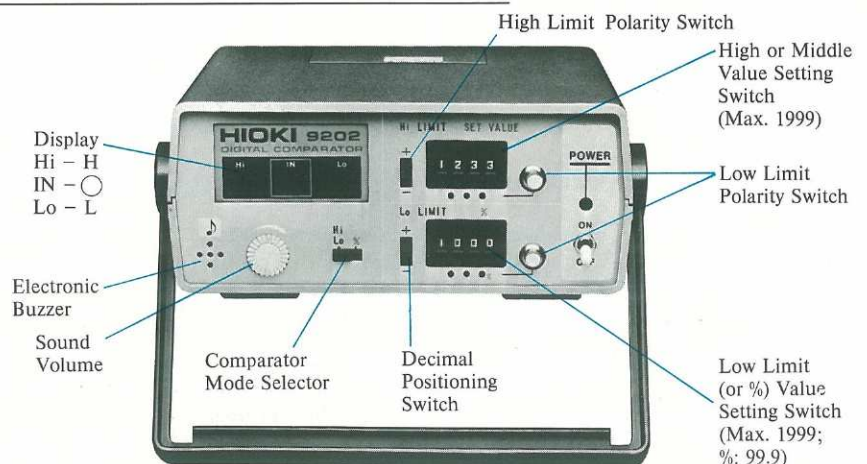
TIME	R.	Ω	NO.	R.	mΩ
00:00		9.01	1		17.69
00:01		9.01	2		17.68
00:02		9.00	3		OVER
00:03		9.00	4		..... NG marking
00:04		9.01	5	T	17.65
00:05		9.01	6	T	17.64
00:06		9.01	7	T	OVER
00:07		9.01	8	T	.....

Mark at every 5th event    Over marking  
Temperature Correction marking

- Additional information printed out includes 3220 overrange (OVER), NG (.....), and temperature correction (T).

- Data may be recorded using either the Elapsed Time Print-Out or the Event Number Print-Out mode.
- The Elapsed Time Print-Out mode is based on the 24-hour clock, and may be set to occur at any interval from one to 99 minutes.
- The Event Number Print-Out mode may be set from 1 to 100, repeatable.
- Zero Suppression eliminates all unnecessary zeroes from the print-out data.
- The first print line at the time the START button is pressed includes information on recorder mode (TIME - No.), function (R), and unit (mΩ, Ω, kΩ)

## 9202 DIGITAL COMPARATOR



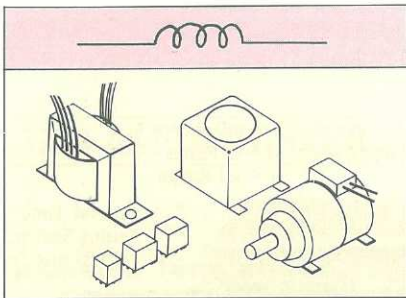
- A Manual Switching Terminal is provided for operator control of the comparator.

- The comparator range may be set using a high and low limit value, or as a ±% deviation from a middle value.
- The Decimal Point Positioning Switch permits settings to be made for high accuracy.
- The comparator results are output using a Hi, IN, and Lo LED, audibly via an electronic buzzer, and by relay contacts.
- When used in conjunction with the 9201 Printer, devices whose value goes outside the set limits may be marked on the print-out.

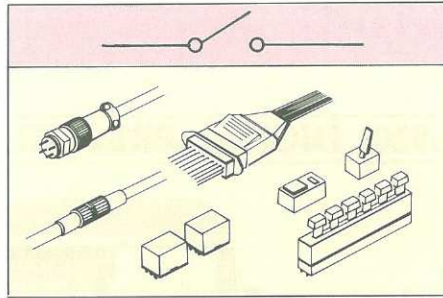


## ■ Applications

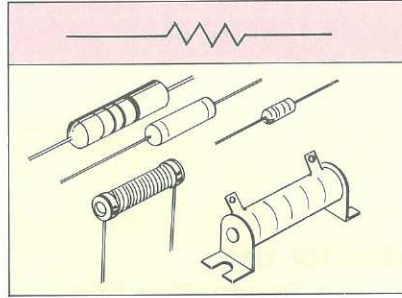
Coil resistance measurements in motors, transformers, relays.



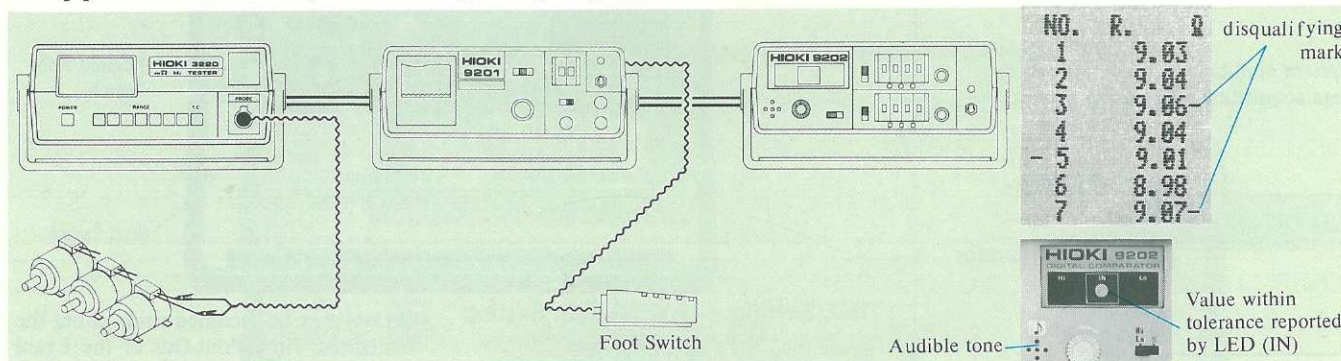
Contact resistance measurements in relays, switches, connectors.



Measurement of resistance devices to 20kΩ.



## ■ Application Example Recording and qualifying electric motor coil resistance.



## ■ 3220 Specifications

Range	Max. Reading	Unit	Resolution	Nominal Applied Current	Max. Voltage Across Unknown (Full-Scale)	Accuracy (23 ±5°C, RH<80%)	Measurement Method
20mΩ	19.99	mΩ	10μΩ	100mA	2mV	± (0.2%rdg. +7dgt.)	4-terminal
200mΩ	199.9	mΩ	100μΩ	100mA	20mV	± (0.2%rdg. +4dgt.)	"
2Ω	1.999	Ω	1mΩ	10mA	"	"	"
20Ω	19.99	Ω	10mΩ	1mA	"	"	"
200Ω	199.9	Ω	100mΩ	100μA	"	"	"
2kΩ	1.999	kΩ	1Ω	100μA	200mV	"	2-terminal
20kΩ	19.99	kΩ	10Ω	10μA	"	"	"

## ■ General Specifications

Display: LCD, Max. reading: 1999

Overrange Indication:

↵ appears in display

Battery Low Indication:

[B] appears in display

Temperature Correction Indication:

Minus sign (-) blinks

Sampling Rate: 2.5 times per second

Open-Circuit Voltage: 1.5V (approx.)

Environmental Requirements:

Operating: 0 ~ 40°C, 80% RH or less

Storage: -10 ~ 50°C

Power Source: Four size AA (SUM-3) batteries

Power Consumption: Normal: 150mW;  
Max: 750mW (20, 200mΩ range)

Dimensions 82H × 177W × 211D (mm)

Weight: 1kg (approx.)

BCD Output: Digit-serial; Bit-parallel

Accessories: 9097 Four-Terminal Test

Leads; 9099 Clip-Type Test Leads

### Accessories available

9098 Pin - Type Test Leads

9201 PRINTER

9202 DIGITAL COMPARATOR

9204 Recording paper 1 pack (5 pcs.)

9205 Connector cable

(for set of three instruments)

EXPORT ST. PACKING: 10pcs./3.3cft.

N.W. 14kg/G.W. 16kg (double carton box)

## ■ 9201 Specifications

Printer Type: Electric-Discharge recording

Print/Format Specifications:

7 × 5 dot-matrix;

Character size: 2.7 × 1.3mm;

Line spacing: 3.55mm

Recording Paper: 36mmW × 10m long;

Roll dia: 26.5mm;

Print capacity: approx. 2,800 lines

Printing Speed:

1.2 lines-per-second (approx.)

Printer Head Life: 500,000 lines (approx.)

Accessories:

9204 Recording Paper, 5 rolls

## ■ 9202 Specifications

Setting Range:

Hi - Lo setting: (-1999 ~ +1999);

±% value setting: (0 ~ 99.9)

Comparator Accuracy:

±1 dgt. of effective setting value

Relay Rating: 120VAC, 3A; 30VDC, 3A

## ■ Common Specifications

Environmental Requirements:

Operating: 0 ~ 40°C, 80% RH or less;

Storage: -10 ~ 50°C

Power Source/Power Consumption:

120/220/240V AC available,

50-60Hz/6W (approx.)

Dimensions: 82H × 177W × 220D (mm)

Weight: 1.5kg (approx.)

Accessories: Connector cable, 1 ea.;

Line cord w/plug, 1 ea.

# HIOKI E.E. CORPORATION

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