

## 8204 MICRO Hi CORDER

Temperature-to-Temperature Channel  
Current-to-Current Channel  
Temperature-to-Current Channel

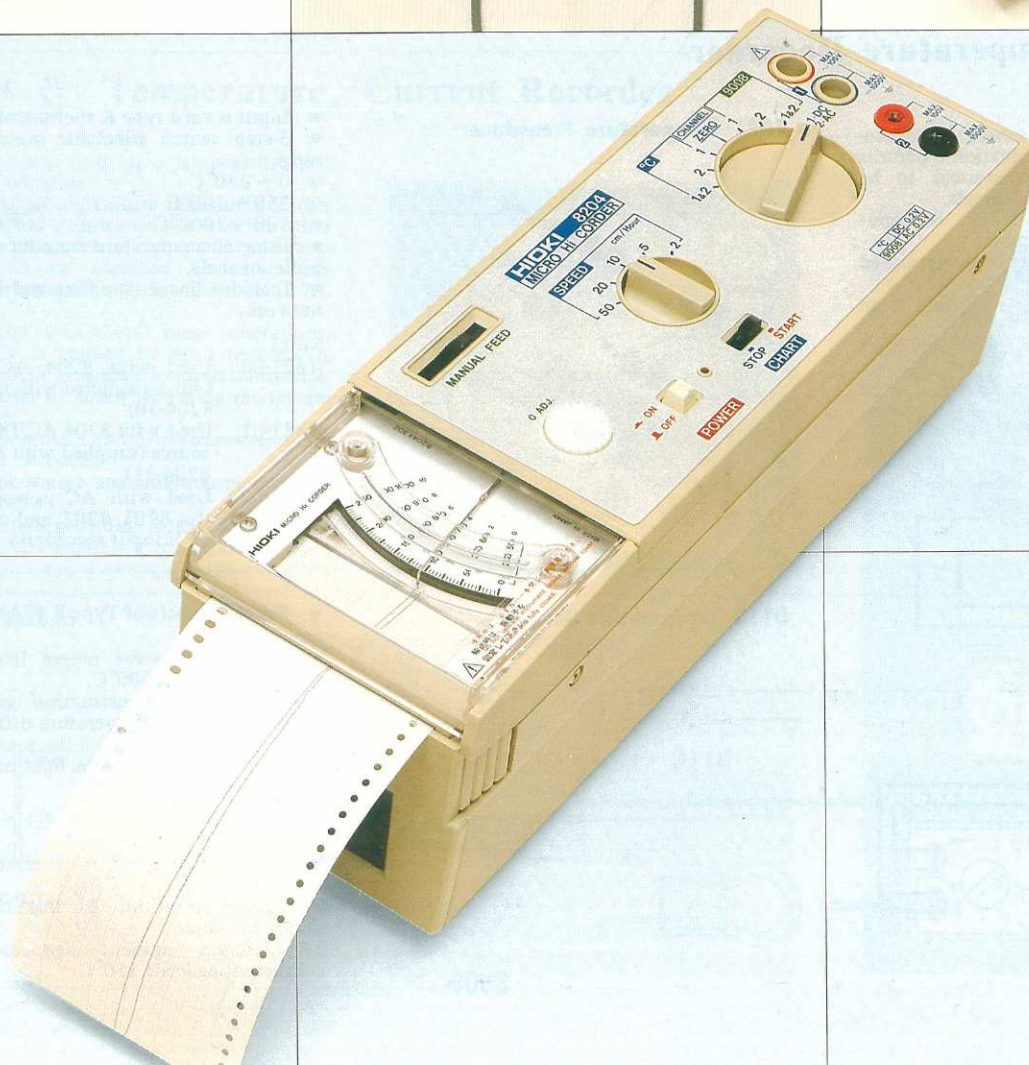
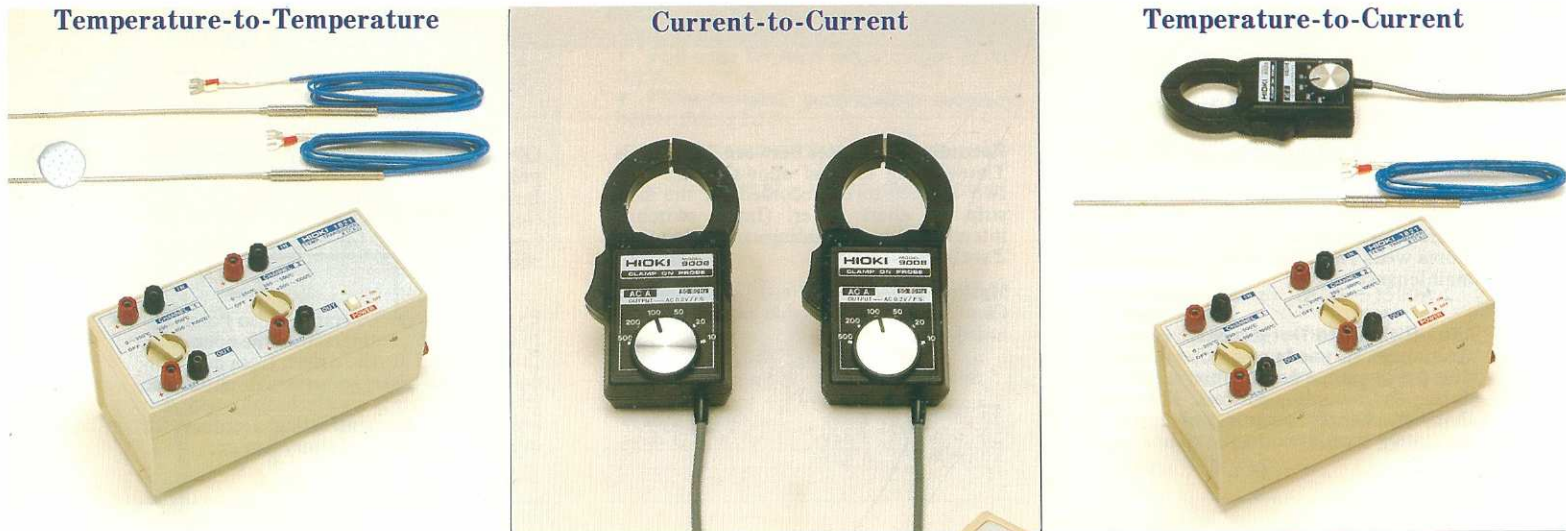
# 8204

## 2-Channel Alternating Recorder

Temperature-to-Temperature

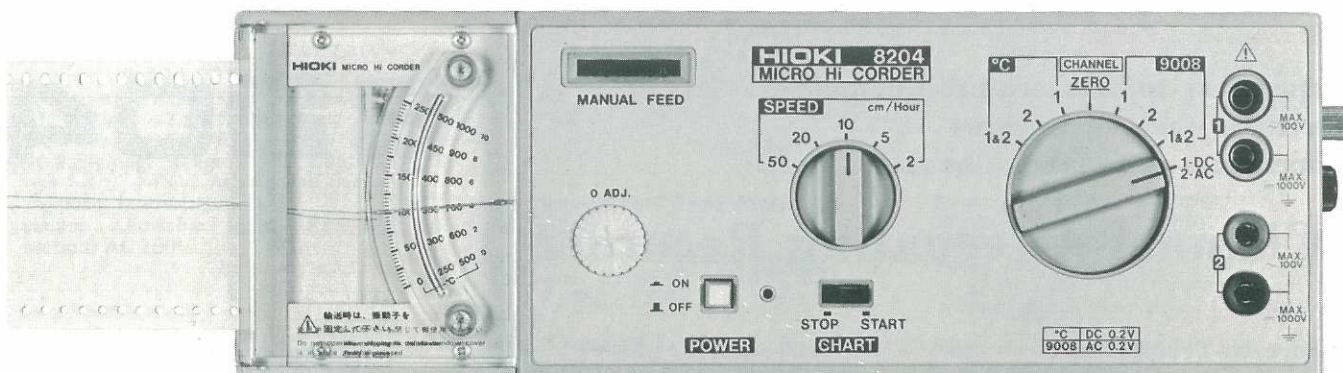
Current-to-Current

Temperature-to-Current



# Applicable to a wide range of uses

## 8204-<sup>00</sup>/<sub>01</sub> Recorder (Main unit)



### Electrical-Discharge Stylus – No Messy Ink

The electrical-discharge method gives you instant action at the flick of a switch. Chart paper is stable with age, copies and stores well. The total system is practically maintenance free.

### Ultra-High Speed Dot Recorder

Recordings are made at a dot-speed of 32 dots-per-second, plus the pen won't lock during the recording process. This means that all changes occurring at input are accurately transferred to the chart.

**Recording Alternates Between 2-Channels**  
Time-sharing method allows events from two sources to be recorded on the same strip of chart paper. (Input switching interval: 4 sec.; recording each channel for 2 sec.)

### Multiple Speed Chart Feed

Chart speed is selectable in five steps as noted below.

Speed	Operating Time (approx.)	Speed	Operating Time (approx.)
50 cm/hr.	1 day	5 cm/hr.	12 days
20 cm/hr.	3 days	2 cm/hr.	31 days
10 cm/hr.	6 days		

### Compact, Lightweight – Easily Transported

Instrument compactness, plus the clean electrical-discharge method makes the 8204 convenient for use anywhere it is needed.

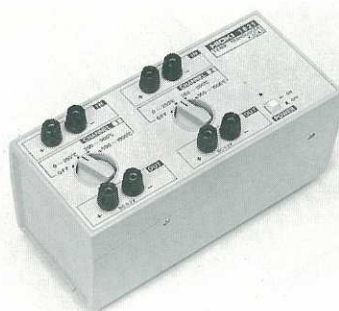
### External Battery Operation Also Possible

In addition to commercial mains operation, the 8204 can also be driven from an external DC 12V battery source. An automatic shut-off feature is also included to prevent low voltage from affecting accuracy, or over-discharging the battery source.

## 8204-<sup>10</sup>/<sub>11</sub> Temperature Recorder

- Using a temperature sensor – temperature transducer combination permits temperatures from two sources to be recorded separately in 2 channels.
- Temperature (°C) range is input through the DC 0.2V terminal.
- Temperature recording is accomplished in the following modes:
  - °C range 1: Continuous recording from input terminal 1
  - °C range 2: Continuous recording from input terminal 2
  - °C range 1 & 2: Alternate recording from input terminal 1 & 2

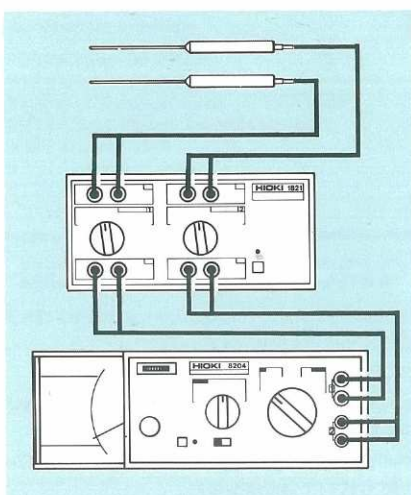
### 1821 Temperature Transducer



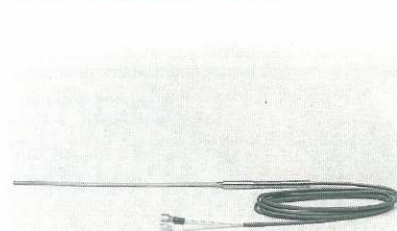
- Input is via a type K thermocouple.
- 3-step switch selectable measurement range
  - 0 ~ 250°C
  - 250 ~ 500°C
  - 500 ~ 1000°C
- Integral temperature transducer covers both channels.
- Includes linear amplifier and isolation network.

#### Note:

- 1821-00: Used with 8204 AC power source (supplied with 8204-10, 8204-30)
- 1821-01: Used with 8204 AC/DC power source (supplied with 8204-11, 8204-31)
- 1821-02: Used with AC power source (for 8201, 8202, and other DC 0.2V input recorders)



### 9113 Temperature Sensor



- Sensor consists of Type K (CA) thermocouple.
- Two types cover ranges from 0 to 800°C, and 0 to 1000°C.
- Sheath type construction gives fast readings of small temperature differences, sensitive response to small fluctuations.
- Flexible sheath may be bent or formed to suit the application.

\*CA: Chromel-Alumel

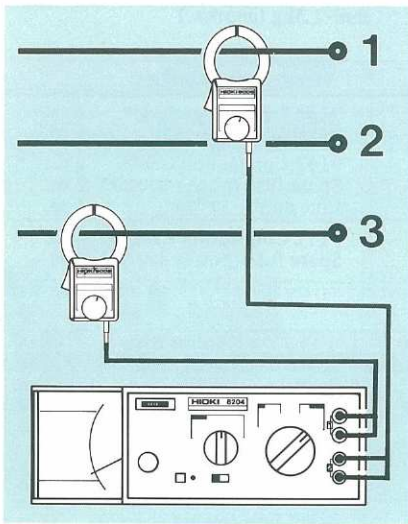
#### Note:

- Minimum bend radius: At least 5-times sheath diameter
- Sample insertion: At least 15-times sheath diameter
- Maximum ambient temperature of compensating lead: 150°C

# Three mode configurations possible

## 8204-<sup>20</sup>/<sub>21</sub> Current Recorder

- 2-channel AC current may be recorded in the alternating mode using the 8204 in combination with the 9008 Clamp-On Probe.
- Current measurements (with range set on the 9008) are applied to the AC 0.2V input. An integral RMS rectifier assures accurate measurements even when high harmonic distortion is present in the waveform.
- Current recording is accomplished in the following modes:
  - Range 1: Continuous recording from input terminal 1.
  - Range 2: Continuous recording from input terminal 2.
  - Range 1 & 2: Alternate recording from input terminal 1 & 2.



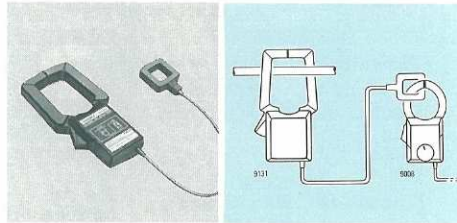
### 9008 Clamp-on Probe



- AC current measurement possible up to 500A.
- Six measurement ranges cover current from 10 to 500A.
- Full-scale for each range output as AC 0.2V.
- Probe-recorder combination accuracy better than  $\pm 2.5\%$ .

Magnifies current – Clamps over busbars

### 9131 Clamp-on Adapter



### For small current measurement 3107-01 Clamp-on Leak Hi Tester



- Specifications
- Measurement Range:  
AC 0.2, 2, 20, 200A
- Output Voltage:  
DC 0.2V f.s.
- Accuracy:  
 $\pm 1\%$  rdg.  $\pm 0.3\%$  f.s.
- Frequency Range:  
40 ~ 500Hz

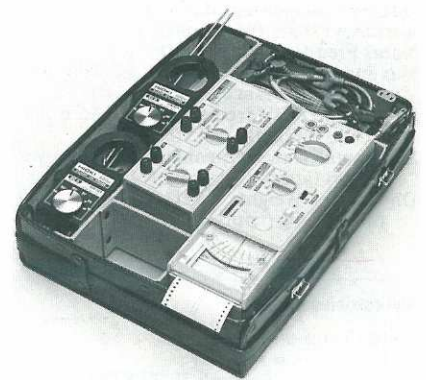
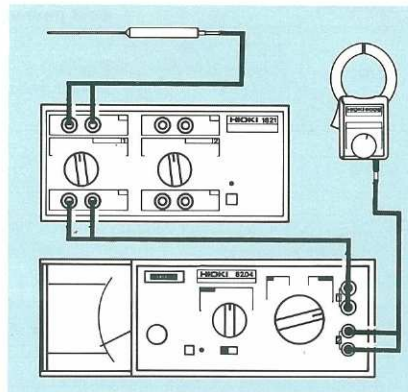
- Maximum DUT Circuit Voltage: AC 600V  
Maximum Jaw Opening: Clamps over 35mm (approx.) conductor  
Power Source: One 006P battery  
Dimensions/Weight: 230H x 64W x 37D (mm)/550g (approx.)  
(8204 used in °C range)
- \*DUT: Device Under Test

### Specifications

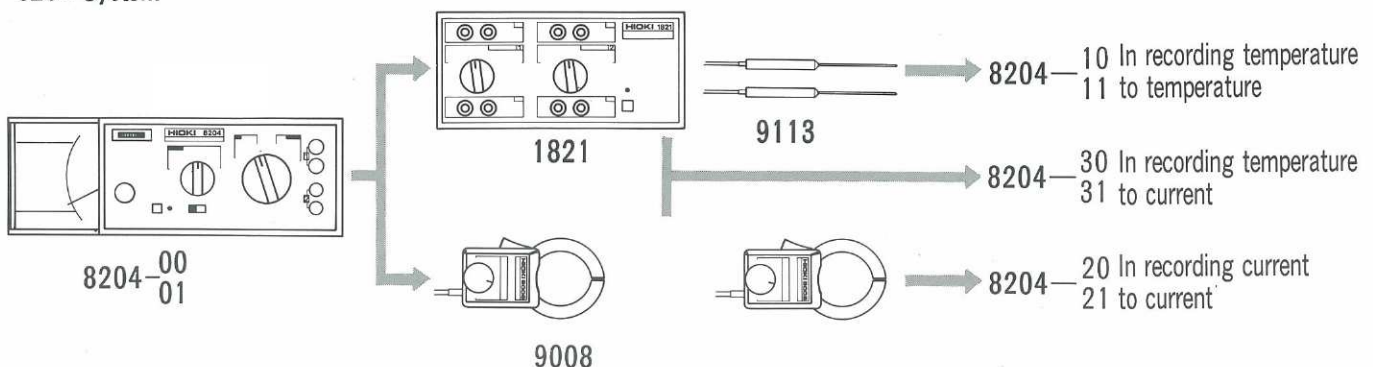
- Measurement Range: AC 0 ~ 1500A  
CT Ratio: 10:1  
Accuracy:  $\pm 3\%$  rdg. (100A to 1500A)  
Frequency Range: 20 ~ 1000Hz  
Maximum DUT Circuit Voltage: AC 600V  
Maximum Jaw Opening: Clamps over 55mm conductor or 80mm wide busbar  
Dimensions/Weight: 192H x 99W x 33D (mm)/450g (approx.)

## 8204-<sup>30</sup>/<sub>31</sub> Temperature/Current Recorder

- Functions both as a temperature and current recorder.
- Using a temperature transducer in one channel and a clamp-on probe in the other permits temperature and current measurements to be recorded by alternating between channels. (Using the 1-DC/2-AC range.)
- During 1-DC/2-AC range operations, DC 0.2V is applied to input terminal 1, and AC 0.2V is applied to input terminal 2.
- A total of seven recording modes are available:
  - Single-source and dual-source temperature: 3 modes
  - Single-source and dual-source current: 3 modes
  - Alternate recording from a temperature and AC current source: 1 mode



### 8204 System



### 8204 Specifications

#### Measurement Range

Temperature: 0 ~ 250°C, 250 ~ 500°C,  
500 ~ 1000°C (Output using 1821  
Temp. Transducer is DC 0.2V)  
AC Current: 10, 20, 50, 100, 200, 500A  
(Output using 9008 Clamp-on Probe is  
AC 0.2V)

AC Voltage: AC 0.2V

DC Voltage: DC 0.2V

Rectification Method: RMS

#### Accuracy

Temperature: ±2.5% f.s. (Using 1821)  
AC Current: ±2.5% f.s. (Using 9008)  
AC Voltage: ±2.5% f.s.  
DC Voltage: ±2.5% f.s.

Input Switching: Range 1 or 2; Continu-  
ous 1 & 2; 1-DC/2-AC; 4 sec. (Channel  
recording interval: 2 sec.)

Maximum Allowable Input: (Recorder  
section) AC 100V

### General Specifications

Writing Span: 50mm curvilinear

Operating Method: Direct dot recording

Recording Method: Electrical-discharge  
stylus

Recording Chart: 70mm x 15m roll

Recording Chart Feed Method: Pulse-  
motor drive

Chart Feed Speed: 50, 20, 10, 5, 2 cm/hr

Zero Setting Adjustment: Adjustable to  
any point within the writing span

Pen Damping: 70% at 1Hz

Input Resistance: 1-megohm (fixed)

Frequency Response: -3dB, 10Hz to  
30kHz

Operating Temperature: 0 ~ 45°C

Power Source: AC 110 ~ 120V, 210 ~  
230V, 230 ~ 250V available, 50/60Hz  
(less than 10VA) or DC 12V (approx.  
7W, 8204-01)

Dimensions/Weight: 94H x 96W x 280L  
(mm)/1.7kg (approx.)

Accessories Furnished: 9093 Input Cable,  
2 ea; 9073 Chart paper, 1 roll (15m);  
Spare fuse (power source), 1 ea; Spare  
fuse (AC/DC only), 1 ea; Line cord,  
1 ea.

Fuse Rating: AC 110 ~ 120V 0.2A  
AC 210 ~ 250V 0.1A

### 9008 Specifications

Measurement Range: AC 10, 20, 50, 100,  
200, 500A

Output Voltage: AC 0.2V f.s.

Accuracy: ±3% (basic unit)

Mains Frequency: 50/60Hz

Maximum Allowable Input: AC 1000A/1  
min. (500A range)

Maximum DUT Circuit Voltage: AC 600V

Dielectric Strength: AC 1500V

Maximum Jaw Opening: Clamps over  
46mm (approx.) conductor

Dimensions/Weight: 152H x 80W x 33D  
(mm)/400g (approx.)

### Accessories available

9008 Clamp-on Probe  
9131 Clamp-on Adapter  
3107-01 Clamp-on Leak Hi TESTER  
9073 Chart Paper, 10 rolls per box  
9093 Input Cable  
9111 Carrying Case  
9112 Connection Cable

### (Accessories available)

### 9113 Temperature Sensor

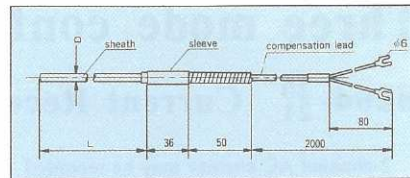
Thermocouple Material: Type K (CA)

Contact Type: Ungrounded

Thermoelectric emf Characteristics:

Conform to JIS C-1602 (Grade 0.75)  
Standard

Compensation Lead Length: 2m



Model	Temperature Range	Sheath Dia.	Sheath Length	Sheath Material	Thermocouple Resistance Ω/m
9113-01	0 ~ 800°C	φ3.2 mm	200 mm	SUS-316	5.23 ± 10%
9113-02	0 ~ 800°C	"	500 mm	"	"
9113-03	0 ~ 1000°C	"	"	INCONEL-600	"

(9113-01 fits in 9111 Carrying Case.)

\*emf: electromotive force

### 1821 Temperature Transducer Specifications

Input: From Type K thermocouple

Measurement Range: 0 ~ 250°C, 250 ~  
500°C, 500 ~ 1000°C (3 switch posi-  
tions)

Sample Resistance Range: Up to 1 kΩ  
connectable

Output Voltage: DC 0 ~ 0.2V

Accuracy: ±1% of input range

Number of Circuits: 2 (Two)

Ambient Temperature Range: 0 ~ 45°C

Power Source: AC 110 ~ 120V, 210 ~  
230V, 230 ~ 250V available, 50/60Hz  
(less than 10VA) or DC 12V (approx.  
7W, 1821-01)

Dimensions/Weight: 118H x 96W x 221L  
mm•1.5kg (approx.)

Model	Power Source	Accessories
1821-00	Used with AC power source 8204-10, -30	9112 Connection Cable 2 ea. Spare fuse 1 ea.
1821-01	Used with AC/DC dual power source 8204-11, -31	9112 Connection Cable 2 ea. Spare fuse (power source) 2 ea. Line cord 1 ea.
1821-02	Used with AC power source for other recorders	9112 Connection Cable 2 ea. Spare fuse (power source) 1 ea.

### Please indicate the No. when ordering

Model	Application	Power Source	Accessories
8204-00	Main unit only	For AC power source	Spare fuse (power source) 1 ea.
*8204-01	"	For AC/DC dual power source	" (8204-01) 2 ea. Line cord 1 ea.
8204-10	2-CH temperature recording	For AC power source	1821 Temperature Transducer 1 ea. (8204-10 → 1821-00) (8204-11 → 1821-01) 9111 Carrying Case 1 ea. 9112 Connection Cable 2 ea. Spare fuse (power source) 2 ea.
*8204-11	"	For AC/DC dual power source	" (8204-11) 4 ea. Line cord (8204-10) 1 ea. " (8204-11) 2 ea.
8204-20	2-CH current recording	For AC power source	9008 Clamp-on Probe 2 ea. 9111 Carrying Case 1 ea. Spare fuse (power source) 1 ea.
*8204-21	"	For AC/DC dual power source	" (8204-21) 2 ea. Line cord 1 ea.
8204-30	2-CH temperature current recording	For AC power source	1821 Temperature Transducer 1 ea. (8204-30 → 1821-00) (8204-31 → 1821-01) 9008 Clamp-on Probe 2 ea. 9111 Carrying Case 1 ea. 9112 Connection Cable 2 ea.
*8204-31	"	For AC/DC dual power source	Spare fuse (power source) 2 ea. " (8204-31) 4 ea. Line cord (8204-30) 1 ea. " (8204-31) 2 ea.

\*Equipped with external battery connector terminal

Accessories common to all units:  
9073 Chart paper, 15m roll  
9093 Input Cable, 2 ea.

Standard Packing (Double carton box)	Model	Sets	N.W.	G.W.	M <sup>3</sup>
	8204-00, 01	6	14 kg	16 kg	0.10
-10, 11	2	13 kg	15 kg	0.10	
	3	19 kg	22 kg	0.13	
-20, 21	2	10 kg	12 kg	0.10	
	3	15 kg	18 kg	0.13	
-30, 31	2	14 kg	16 kg	0.10	
	3	21 kg	24 kg	0.13	

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