

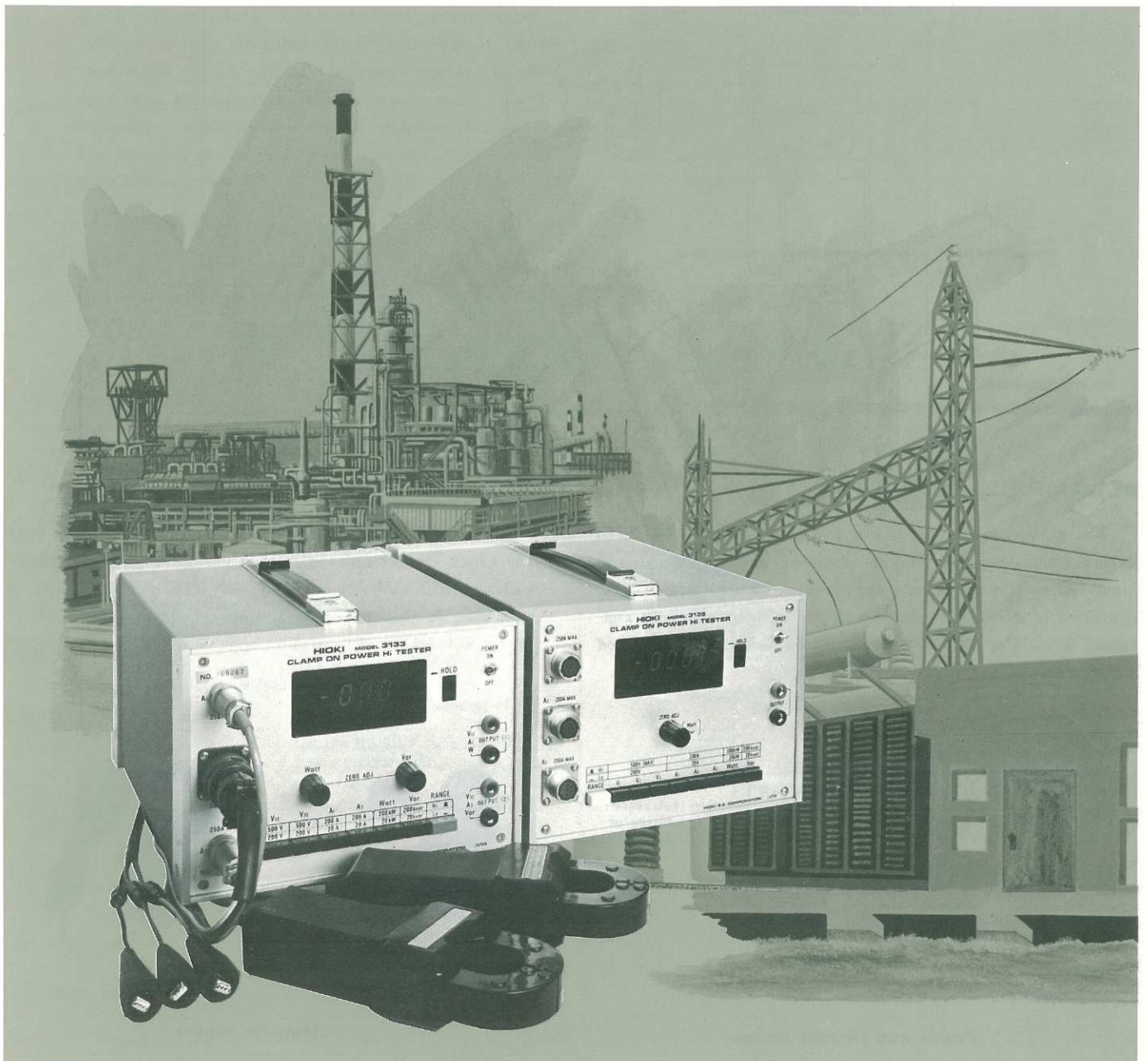
HIOKI

CLAMP ON POWER HI TESTER

3130 SERIES

Single phase	•3131	100kW (250A-500V)
	•3132	500kW (1000A-500V)
Three phase	•3133	200kW (250A-500V)
three wire	•3134	1000kW (1000A-500V)
Three phase	•3135	200kW (250A-600V)
four wire	•3136	1000kW (1000A-600V)

Clamp-On Power Meters

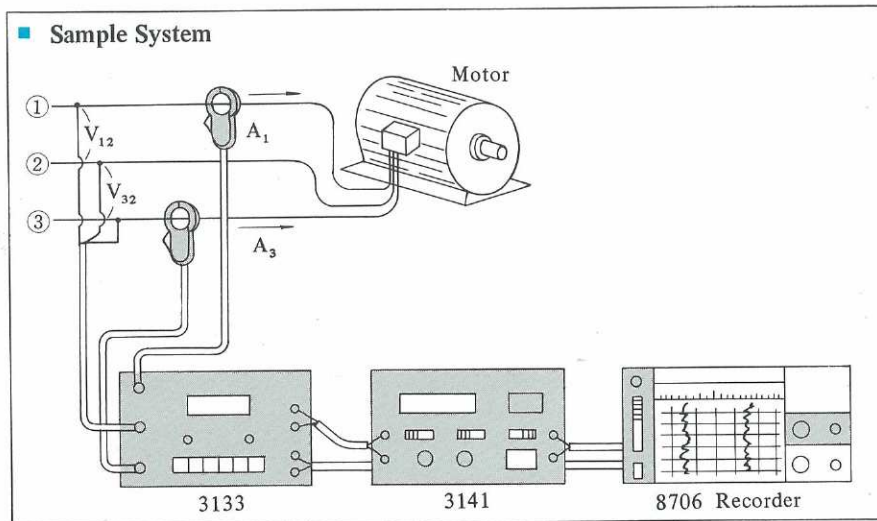


Ideal for energy saving power supervision and electrical appliance testing and maintenance and inspection

In measuring power, it is necessary to find both voltage and amperage, and while it is easy to connect the meter in parallel with the circuit to measure voltage, series connection is needed to measure amperage, so that up to the present time it has been necessary to interrupt the circuit and to interrupt operation of the electrical appliance to ensure safety while taking readings, thus requiring a good deal of time and trouble and it was in fact not possible to obtain readings for equipment or appliances that could not be switched off in order to take readings.

These testing instruments simplify this normally time-consuming amperage measuring procedure by employing a clamp-on system to eliminate the need to interrupt the line and this is done with an instrument incorporating a power meter structure. This removes the drawbacks referred to and greatly reduces the time and work required. It is also possible to measure power without stopping operation of electrical appliances or equipment.

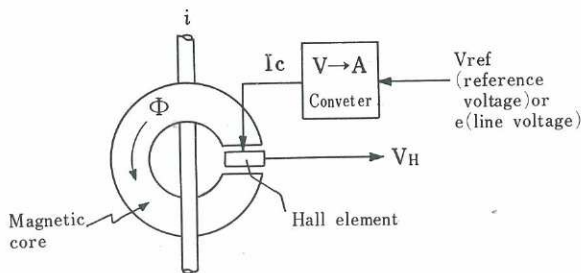
Simple switch operation gives the required voltage, amperage, effective power and reactive power (3-phase) readings. This means that these instruments are ideally suited to characteristics tests and maintenance inspection of electrical facilities and appliances and by taking advantage of the ease with which readings are taken, it is not hard to get a clear picture of power usage by various items of equipment and to effectively control consumption. This makes these instruments very useful in energy conservation. The output terminals directly connected to the display unit make it possible to connect recorders and various special accessory analyzers, so that a wide field for future development of these instruments is opened up.



●CLAMP-ON SENSOR

The clamp sensor used in clamp type wattmeters has been designed and developed by this company and incorporates a highly efficient magnet core and direct (voltage) \times (current) operation is carried out by means of the hole elements contained in it. For this reason, phase characteristics are good

and outstanding linearity is obtained throughout a wide operating range. Because of the method used to grip the conductor, reading variation is minimized and frequency response are good, etc., so that it is a well-equipped clamp sensor.



Power and current sensor



9001
(for 3131 · 3133 · 3135)



9002
(for 3132 · 3134 · 3136)

Clamp-on sensor

3131·3132

SINGLE-PHASE CLAMP-ON POWER METERS

Because small and powered by dry cell batteries, the instrument is portable and easy to use in confined spaces.

- A clamp-on system making it possible to measure power in a live line
- More convenient, powered by dry cell batteries to improve portability
- Only two readings required to measure three-phase power

Based on the two power measuring system, only two readings are required when measuring three-phase power, ideal for maintenance inspection work because of its portability.

- Gives individual voltage and amperage readings as well as power
- Easy-to-read power meter renders multiplication factor calculations unnecessary

It is sufficient to take a reading with reference to the range maximum indicated by the selector switch, eliminating the need for multiplication calculations employing the multiplication factor or amperage value or the need for terminal or plug changes of the kind required in older type power meters.

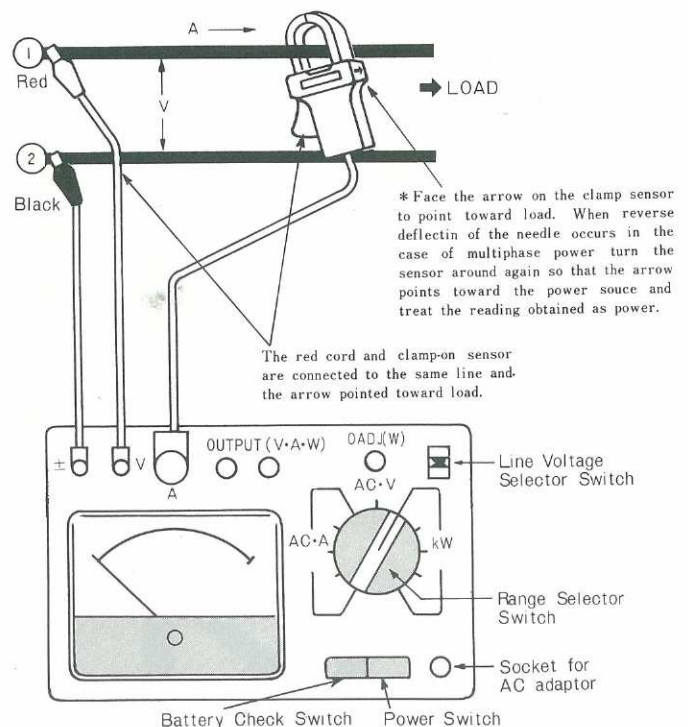
- Output terminal with a wider range of uses

The instrument is equipped with a recorder terminal connected to the meter. Various accessories can be connected to widen the range of application.

- Analog (meter) display makes possible quick detection of any change in the reading



		3131	3132
Power	400V	5/10/20/50/100kW	20/50/100/200/500kW
	200V	2.5/5/10/25/50kW	10/25/50/100/250kW
	100V	1/2/4/10/20kW	4/10/20/40/100kW
Voltage (V)		100/250/500	
Current (A)		10/20/50/100/250	50/100/250/500/1000
Accuracy		±2.5% of full scale (at cos φ=1)	
Max. Input Voltage for use		500V	
Output Terminal		0~1V (Input Resistance 100Ω)	
Clamp-on Sensor		9001	9002
DIA. of Clamp Part		Max. DIA. 30mm	Max. DIA. 46mm
Sensor Dimensions		175H×85W×40Dmm	180H×90W×40Dmm
Weight and Cord Length		Approx. 600g Approx. 2m	Approx. 650g Approx. 2m
Frequency Response		; 40Hz~500Hz ±1% (at cos φ=1)	
Influence of Power Factor		; ±2% (at cos φ=0.5)	
Operating Temperature		; -10°C~+50°C	
Temperature Coefficient		; ±0.1%/°C from 0°C~40°C	
Influence by outside magnetic field;		; ±2% for 400AT/m	
Influence by position of lead wire;		; What-ever position within the clamp core, ±1% deviation of the full scale value.	
Power Source		; SUM-2 Batteries (Size C) ×4(6V) 150mW (about 75 hours of continuous use)	
Dimensions, Weight		; 115H×200W×135Dmm. Approx 1.5kg	
Accessories		; Clamp on sensor Sensor case Voltage cord Spare fuse 0.3A	



3133·3134

THREE-PHASE CLAMP-ON POWER METERS

Easy to operate and the digital display is very clear.

- A clamp-on system making it possible to measure power in a live line
- Easy-to-read digital display

LED display to a maximum 1999 and simple Lo-Hi range selection. The only other necessary operation required is to push the item switch. Display hold is also possible.

- Measures voltage, amperage and reactive power as well as overall power

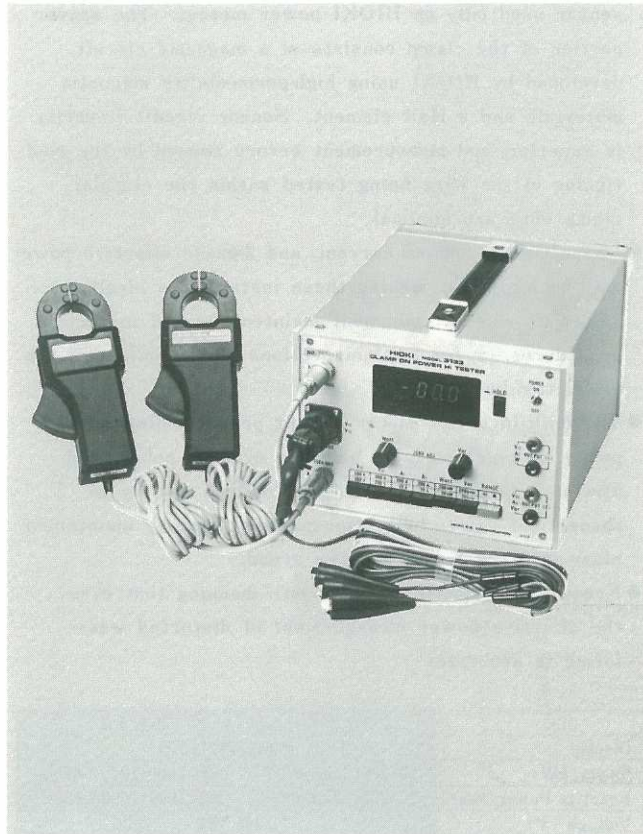
The two power measuring method is used in measuring power so that each channel (two-phase voltage and amperage) and also reactive power can be measured.

- Two channel output terminals

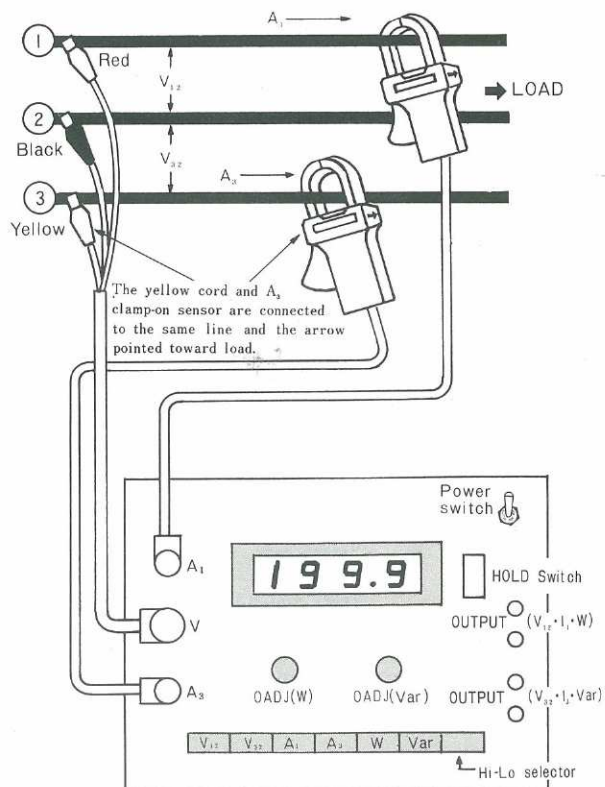
Provided with an output terminal for instantaneous measurement of both channels during taking of readings by the two power method (independent of the display). When used in combination with a recorder, comparison and analysis of the individual channels is possible.

- Power measurement faithful to theory

Since this is a two power system, even when there is imbalance in the effective power, the power measurement is obtained with a measuring system which is true to theory and faithful reading of power which includes high harmonics also is possible. (measurement of reactive power is by means of a circuit for balanced three-phase.)



	3133	3134
Display	3-1/2 digit (1999) LED	
Power (kW)	20/200 (250A-500V)	200/1000 (1000A-500V)
Reactive Power (kvar)	20/200 (250A-500V)	200/1000 (1000A-500V)
Voltage (V)	200/500	
Current (A)	20/200	200/1000
Accuracy (23° ± 5°C)	± 1% rdg. ± 0.5% f.s.	
Max. Input Voltage for use	500V	
Output Terminal	0~2V (Input Resistance 50Ω) × 2	
Clamp-on Sensor	9001	9002
DIA. of Clamp Part	Max. DIA. 30mm	Max. DIA. 46mm
Sensor Dimensions	175H × 85W × 40D mm	190H × 90W × 40D mm
Sensor Weight	Approx. 600g	Approx. 650g
Cord Length	3 m	3 m
Frequency Response	; 40Hz~500Hz ± 1% (at cos φ = 1)	
Influence of Power Factor	; ± 2% (at cos φ = 0.5)	
Operating Temperature	; -10°C ~ +50°C	
Temperature Coefficient	; ± 0.1% / °C from 0°C ~ 40°C	
Influence by outside magnetic field	; ± 2% for 400AT/m (In the case of watt: ± 0.5%)	
Influence by position of lead wire	; What-ever position within the clamp core, ± 1% deviation of the full scale value.	
Power Supply	; AC 100V 50Hz or 60Hz about 2.5W	
Dimensions, Weight	; 150H × 215W × 300D mm Approx 5.5kg	
Accessories	; Clamp on sensor Sensor case Voltage cord Spare fuse 0.3A 0.5A	

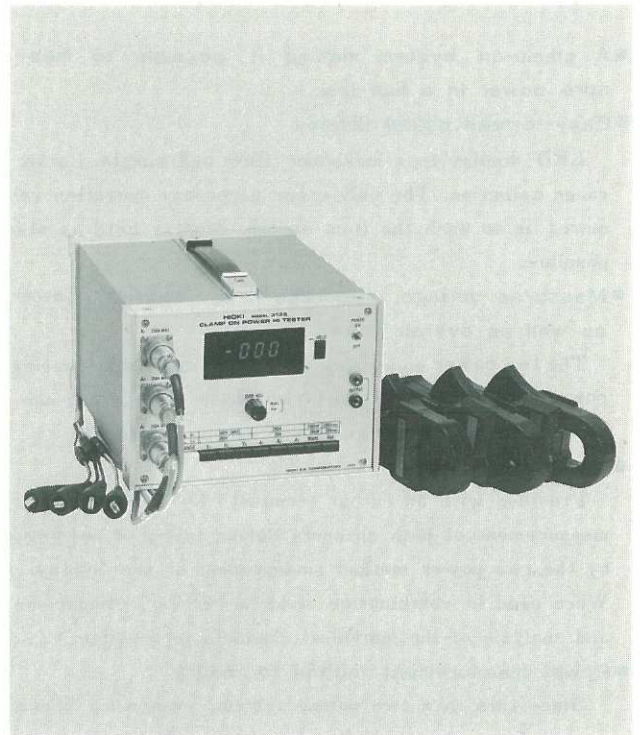


3135·3136

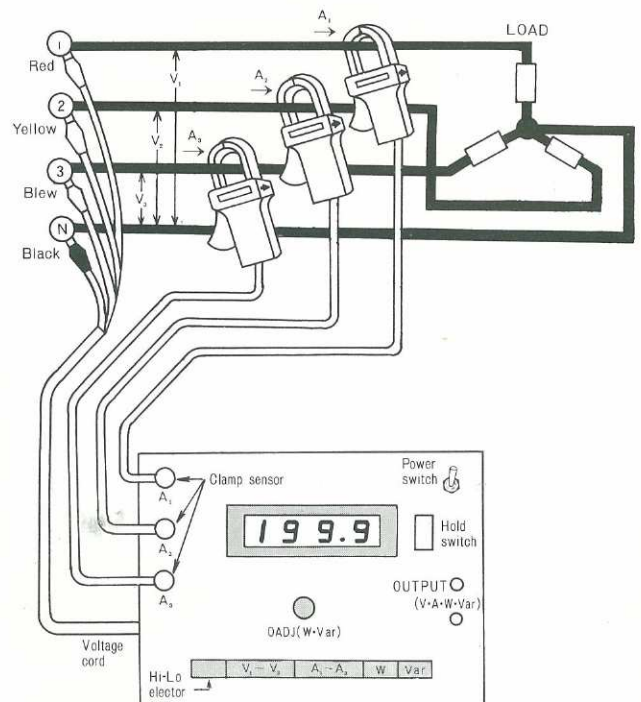
THREE-PHASE, FOUR-WIRE CLAMP-ON POWER METERS

Phase voltage, phase current, and 3-phase effective power may be measured.

- Measurements easily made on current-carrying wires—no need to interrupt power to equipment under test.
- Power (or current) is sensed by a special clamp-on sensor used only on HIOKI power meters. The sensor portion of the clamp consists of a magnetic circuit developed by HIOKI using high-permeability magnetic materials and a Hall element. Sensor circuit linearity is superior, and measurement errors caused by the positioning of the wire being tested within the circular clamp core are minimal.
- Phase voltage, phase current, and 3-phase effective power may be measured, making these instruments ideally suited for use in equipment maintenance and inspection procedures, or for final inspections of equipment off the production-line.
- The built-in power meter circuit permits effective power measurements to be made even on unbalanced circuits. Power measurements conform closely to theoretical values, with measurement fidelity maintained clear into the high frequency areas.
- Frequency response is excellent—meaning that even the effective power measurement of distorted wave-forms is accurate.



	3135	3136
Display	3-1/2 digit(1999)LED	
Power(kW)	20/200(250A-600V)	200/1000(1000A-600V)
Reactive Power(kvar)	20/200(250A-600V)	200/1000(1000A-600V)
Voltage (V)	200/600	
Current (A)	20/200	200/1000
Accuracy(23°±5°C)	±1%rdg. ±0.5%f.s.	
Max. Input Voltage for use	350V/600V(phase voltage/AC Voltage)	
Output Terminal	0~2V (Input Resistance 50Ω)×2	
Clamp-on Sensor	9001	9002
DIA. of Clamp Part	Max. DIA. 30mm	Max. DIA. 46mm
Sensor Dimentions	175H×85W×40Dmm	190H×90W×40Dmm
Sensor Weight	Approx. 600g	Approx. 650g
Cord Length	3 m	3 m
Frequency Response	; 40Hz~500Hz ±1% (at cos φ=1)	
Influence of Power Factor	; ±2% (at cos φ=0.5)	
Operating Temperature	; -10°C~+50°C	
Temperature Coefficient	; ±0.1%/°C from 0°C~40°C	
Influence by outside magnetic field	; ±2% for 400AT/m (In the case of watt: ±0.5%)	
Influence by position of lead wire	; What-ever position within the clamp core, ±1% deviation of the full scale value.	
Power Supply	; 100,120,220,240V AC±15%; 50/60Hz	
Dimensions, Weight	; 150H×215W×300Dmm Approx 5.5kg	
Accessories	; Clamp on sensor Sensor case Voltage cord Spare fuse 0.3A 0.5A	



ACCESSORIES AVAILABLE

3141 INTEGRATOR



OUT LINE

This integrator has been designed to display totals of readings taken over a given period of time with 3133, 3134, 3135 and 3136 Clamp-On Hi Testers, total wattage, amperage, etc., being shown on a digital display which is very easy to read.

A time setting for operation of the integrator can be made on the built-in timer.

When the totals for power (kWh) and load (Ah) are found, it is possible to obtain a clear picture of power conditions related to the electrical equipment being tested and to use the figures in supervision and analysis.

FEATURES

- The LED digital display shows a maximum of six digits (999 999) and at the rated (2V) input it is possible to obtain total for up to 500 hours of continuous operation.
- Operating time, in either hours or minutes, according to the selection made at the beginning of the count, is shown on a two digit LED display.
- Total operating time from 1 to 99 in minutes or hours can be preset on the time setting dial (for automatic operation).
- The decimal point setting linked to the range switch eliminates the need for conversion and allows the actual figure to be directly read off.
- The integrator is equipped with a count limit alarm and total hold function.

SPECIFICATIONS

Integrator Unit

Display: LED six digit (Max. 999999)
 Input Voltage: Rated 2V; maximum 3V
 Accuracy: $\pm 1.0\%$ rdg. ± 1 dgt. (at 1/40~6/5 of rated 2Vinput)
 Temperature Coefficient: 0.05% not over 1°C (0~40°C)
 Integration Start: Manual start
 Integration Stop: Both automatic and manual control possible
 Other Specifications: Visual alarm given when counting limit is reached Reading hold capability

Timer Unit

Display: 2-digit LED to a maximum of 99
 Time Units: Either minutes or hours are able to be recorded, as required
 Setting Range: 1~99 minutes or hours
 Set Time Accuracy: 0.07% ± 1 sec.

Other

Power Supply: 100V AC $\pm 10\%$, 50/60Hz (approx. 2W)
 Dimensions: 150H \times 215W \times 300D mm
 Weight: Approx. 3 kg

REORDERS



8701 8701

8705 • 8706

Type	Desk top
Writing span	100mm
Writing system	Disposable ink cartridge (fiber pen)
Input mode	Floating
Servo system	DC servo
Max. input voltage	500V DC
Input resistance	1M Ω
Sensitivity	Max. 1mV/full scale
Zero set	Adjustable within full scale
Pen speed	0.6 sec./f.s.
Resolution	0.2%/f.s.
Linearity	$\pm 0.3\%$ /f.s.
Chart speeds	2 speed for 1-5mm/sec. 1-5mm/min. 6-30mm/min. 6-30mm/hr.
Chart paper	Z fold type <9078(10m)>
Pen-up	Manual
Operating temperature	-5°C~40°C
Dimensions	Approx. 144H \times 144W \times 202D mm
Weight	Approx. 3.5 kg
Power supply	100, 110, 200, 220, 230, 240V $\pm 10\%$ 50/60Hz
Power consumption	Approx. 7.5VA

8705 • 8706

Models	8705 (1 ch) • 8706 (2 ch)
Type	Desk top
Writing span	250mm
Writing system	Hot stylus (IC pen)
Color-shade on chart paper	Available by heat controller
Chart paper	Heat sensitive chart paper Z-fold (1Pen: PZ105B, 2Pen: PZ105T)
Chart drive	Pulse motor (Pitch: 0.05mm)
Chart speed	7.5, 15, 30, 60, 120mm/min & hr and ext
Circuit system	DC servo system
Measuring ranges	14 ranges { 10, 20, 50, 100, 200, 500, 1000mV/full scale & 1, 2, 5, 10, 20, 50, 100V/full scale
Range accuracy	$\pm 0.3\%$
Input impedance	1M Ω constant
Span vernier	Continuously adjustable within each range
Zero setting	Adjustable within full scale range
Calibration voltage	Half the voltage of range value
Input mode	Floating above ground (with guard shield)
Common mode rejection ratio	150dB (DC) 130dB (AC)
Max. pen response speed	100cm/sec (2.5G)
Linearity	0.15% full scale
Resolution	0.1% full scale
Operating temperatures	-5°C~45°C 30~85% RH
Power supply	AC100, 115, 200, 220, 240V 50/60Hz
Power consumption	(1 ch) 18VA(AVE) 25VA(MAX) (2 ch) 25VA(AVE) 50VA(MAX)

HIOKI

HIOKI E.E. CORPORATION

Head Office : P.O. Box 1, Sakaki, Nagano, 389-06 Japan
 Tlx: 3327508 HIOKI J / Cable: HEWLOV, Ueda
 Telephone: (02688)2-3030

Tokyo Office : 2-23-24 Shiba Nakata, Kawaguchi, Saitama 332
 Telephone: (0482)61-2401

Hioki New York Corp. : P.O. Box 275 Douglaston, N.Y. 11363 U.S.A.
 Telephone: (212)224-2404