3161 CLAMP ON POWER Hi TESTER
3171 DIGITAL PRINTER

HIOKI

CLAMP ON POWER METER

3161
3171

The Portable System For All Your Energy-Saving Power Monitoring Needs

Introducing a New Digital Printer Designed

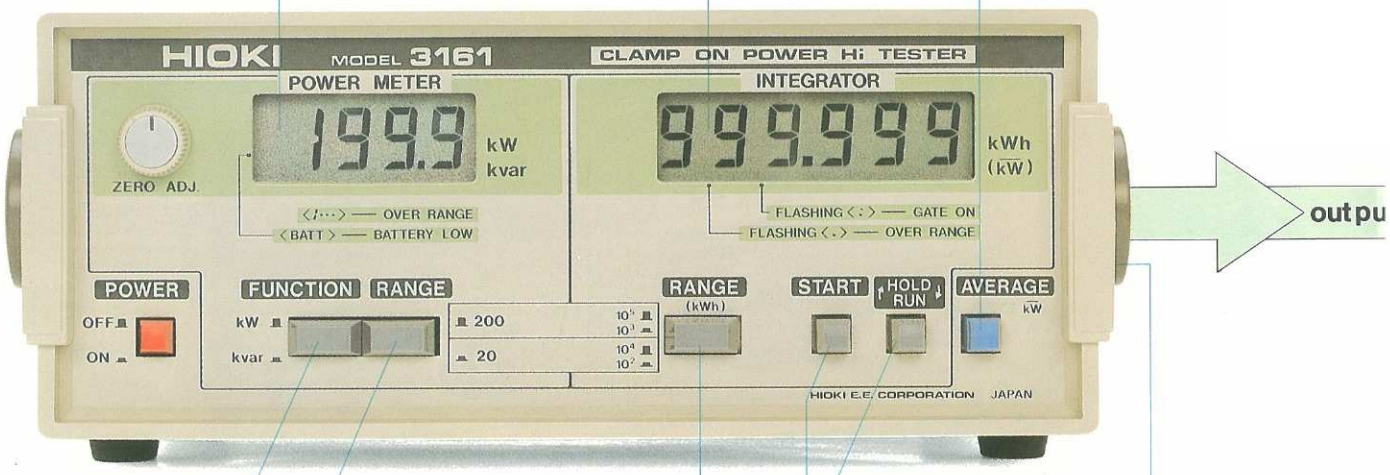
The Model 3161 Clamp-on Power Hi Tester offers the user a multi-function portable measuring and monitoring system housed in a single instrument. Single or 3-phase effective power, and 3-phase reactive power can be measured in energized circuits, eliminating the need to either break the line or to cut power to the operating equipment.

The integrator section further enhances the usefulness of the system by keeping an up-to-the-minute record of total power consumption of equipment on the line.
Another feature of the 3161 is the built-in averaging circuit designed to measure mean power. This feature will prove very beneficial where power line fluctuations normally cause a difficult to read, rapidly "rolling" display.

Power Meter Display
The 3½-digit LCD reads to 1999. Overrange is indicated by all digits going blank except the MSD "1" and decimal point.

Integrator display
The integrator display features a 6-digit LCD with a maximum reading of 999999. Counter overflow causes the MSD decimal to blink, and the count immediately starts over from 0. The colon [:] blinks when the counter is in the run status; and is extinguished on hold.

Mean power measurement
Normally difficult-to-read displays of power measurement in severely fluctuating lines are solved by the built-in averaging circuit.
Mean power value is output to a static display at 36 second intervals. A new display showing the mean power measurement will be produced every 36 seconds after this mode is set.



Function switch
Selects the effective or reactive power measurement mode.

20/200kW (kvar) range selector
Measurement range may be selected according to circuit loading.

Convenient carrying case
The instrument, clamp-on sensors, and test leads fit neatly into the carrying case.

Integration measurements to 100,000kWh
Range switch selection on the power, meter and integrator are used in combination to provide a minimum resolution of 0.0001kWh, and range to a maximum reading of 100,000kWh.

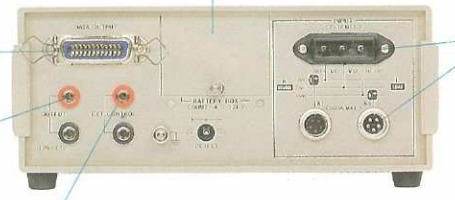
Integration start button
This button starts integrator operation; clearing counter run, hold, or mean power measurement status first. (Power readings preceded by a minus sign will not be integrated.)

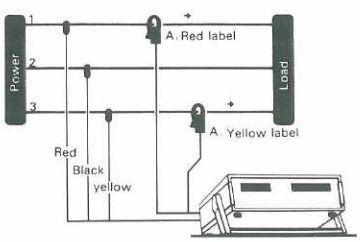
Battery powered for portability
The instrument can be used on four "C" cell batteries for 48 hours – meaning that measurements may be made where an AC outlet is not available.

12-position handle
The large bucket-bail type handle can be locked in any of 12 positions within a 360° arc.

Integrator display HOLD-RUN
Depressing this button stops the display for a reading of total power integration since integration start. The counter however, continues to increment, so when the button is released the display will once again show present counter contents.

Two-wattmeter method for measurement fidelity
Effective power measurements are accurate even in unbalanced circuits, and measurement fidelity is maintained even in lines containing higher harmonics, HIOKI's unique clamp-on sensor assures unparalleled accuracy in power measurement.





Records of power consumption
A printer may be connected to data output to obtain hard-copy results of integration data or mean power measurements.

Output terminal
A 2V DC output for full scale value (2000 count) in each power meter range is transmitted through the output terminal, and may be used to drive a recorder for obtaining hard-copy results of power line fluctuations.

Externally controllable integration time

Exclusively for the 3161 Power Meter-Integrator

Measurement of production-line power consumption

Power consumption monitoring in high-usage facilities, etc.

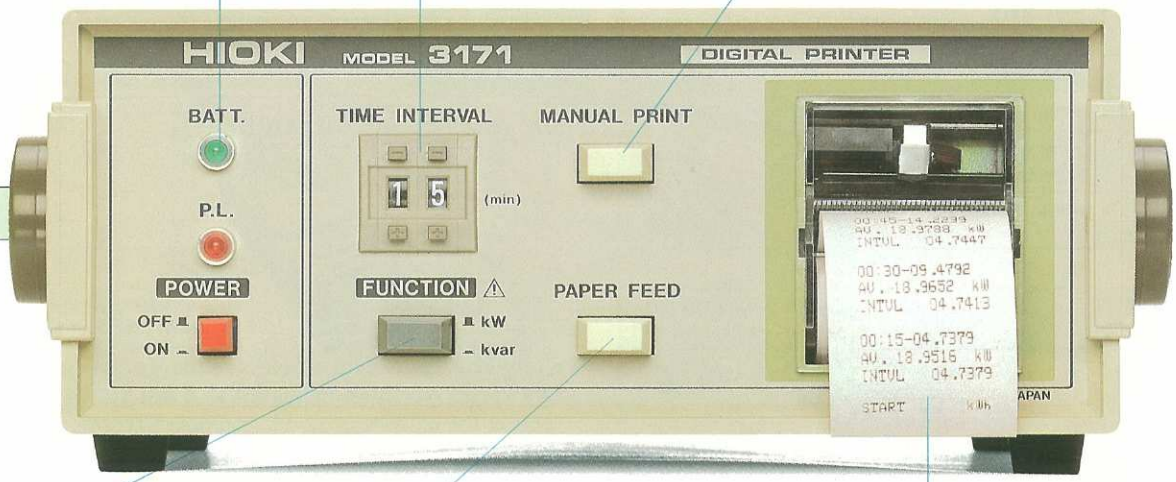
The Model 3171 Digital Printer is designed specially for use with the Model 3161 Clamp-On Power Meter-Integrator. Print-out can be set for automatic operation at any interval between one and 99 minutes. (Setting Unit: 1 min.)
A variety of print functions are available, listing elapsed time, and cumulative integrated power and demand data; and a comment line has been added to provide the user with the ideal format for subsequent data analysis.

Battery alarm indicator
This indicator blinks at 5 second intervals (1 sec. ON; 4 sec. OFF) for as long as battery back-up is good. It remains extinguished when the batteries are too low for proper operation.

Time-interval print-out
Print-out may be set in one minute increments to occur at any desired interval ranging from one to 99 minutes. A "00" setting allows the 3171 to be used in the manual print mode.

Manual print-out
Manual operation allows print-out to be executed at any time.

o digital printer



Kilowatt or kilovar data
A function selector switch provides data print-out in either kW or kvar units.

Paper feed button
PAPER FEED is used when loading the recording paper or to advance it for quick visual inspection.

Wide selection of print functions
Approximately 2280 lines can be printed on one roll of recording paper. Print functions include cumulative integrated power and demand occurring over an elapsed time period, integated power and demand occurring through a selected interval, and average power determined at each print-out event.

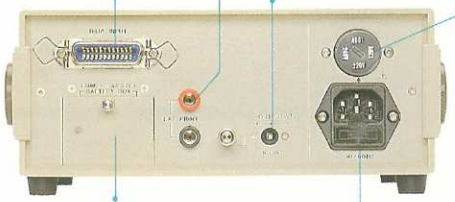
A comment line provides instrument status information (on both the 3161 and 3171) by printing such data as START, INTVL (interval), MANUAL, EXT. PRINT, OVER, ov AV, and ERROR on the leading line. This is accompanied by function selector data (kW, kWh, kvar, kvarh) and time unit data (sec).

External print terminal
An external signal applied to this terminal initiates print-out of integration data present at the point of terminal closure. Ideal for electrical characteristics testing timed to a machine cycle.

Source Voltage Selector lets you use the 3171 in any part of the world your operations take you.

Data input connector
Model 3161 is interfaced through a connector cable. Disconnecting this cable disables print operation.

DC 6 V output terminal
Using the connector cable with power plug (provided) allows the 3161 to be driven from the 3171.



Data protected through power failures
Battery back-up assures that all memory contents are held, and that proper circuit operation is maintained in the event of a power failure. Three size AA (SUM-3) batteries will last approximately 100 hours in back-up service.

Filtered AC input
Minimizes effects of power source noise on printer operations. Built-in safety feature requires that the line cord be unplugged before the fuse can be changed.

Cumulative integrated power (kWh) occurring between 00:00 and 00:45 min. printed out on same line as elapsed time

Average power (kW) consumed in the interval between 00:30 and 00:45 min. based on (present data) 128.754 − 85.839 (previous data) × 60/15 min.

Integrated power (amount of demand) in kWh between 00:30 and 00:45 min.

3161 START button ON. . . . START and kWh printed out on the comment line. (3171 function selector: kW)

3171 EXT. PRINT terminal closed. . . . EXT. PRINT and elapsed time (in seconds) are printed as comments along with integrated power.

3171 MANUAL PRINT button pressed. . . . MANUAL and elapsed time (in seconds) are printed as comments along with integrated power.

Normal time interval print-out.

3161 START button pressed.

Specifications

3161-01

	Power Meter Section	Integrator Section
Display	3½-digit LCD	6-digit LCD
Measurement functions	Single/3-phase effective power; 3-phase reactive power	Integrated power (watt-hours); mean power

Range

Effective power	20/200kW	10^2, $10^4/10^3$, 10^5kWh
Reactive power	20/200kvar	(10^2, $10^4/10^3$, 10^5kvarh)
Accuracy (at 23 ±5°C)	±1.0% of rdg ±0.5% f.s. (cosø/sinø = 1)	±1.0% of rdg ±1 dgt (at 1/40~6/5 f.s.)
Frequency response	less than ±3%, 40~500Hz (cosø = 1.0)	
Power-factor induced error	less than ±3% of rdg when cosø = 0.5	
Conductor positioning error	within ±1% at any conductor position within the sensor core	
Maximum Input Voltage	500V RMS	
Current rating	500A RMS	
Max. dia. of DUT	30mm	
Output terminal voltage	2V at maximum indicated value (f.s.) in each range	
Temperature induced error	within ±3%, 0~40°C	within ±2% (at f.s.) 0~40°C

Logic level

Remote control terminal		OFF: open (or Hi: 6V) ON: shorted (or Lo: 0V)
Data output terminal		Hi: 6V Lo: 0V CMOS logic
Mean power sampling interval		36 ±0.1 sec.
Power source	Four size C dry cells (life: approx. 48 hrs.), AC adapter (6V – 300mA)	
Battery voltage induced error	within specified accuracy until BATT mark displayed (approx. 4V)	

Dimensions/Weight

Main unit	85H×250W×220D (mm)/approx. 2kg
Clamp-on sensors	175H×85W×40D (mm)/600g
Test lead length	3m
Accessories	Carrying case, 1 ea; Instruction manual, 1 vol; 9003 Clamp-on sensor, 2 ea.; 9092 Line cord, 1 ea.; Midzet fuse (0.3A), 1 ea.

Accessories available

CT-101A Line Splitter
9220 Thermal recording paper

3171

Printing method	5×7 dot-matrix thermal printer, 15 cpl
Recording paper	38mm×8m roll, black print
Print functions	Time (23 hours 59 min. 59 sec.); Cumulative integrated power; Power (amount of demand) occurring over an interval; Average power at specified interval; Appropriate comments (START, EXT. STOP, EXT. PRINT, MANUAL, AVERAGE, OVER, ov, ERROR, INTERVAL AV.); Appropriate units (kW, kWh, kvar, kvarh, sec)
Operating functions	Paper feed; Manual print; Time interval (1~99 min.); Unit selection (Watt – var)
Accessory functions	External print terminal; DC 6V output terminal (to 3161); Power failure battery back-up; Battery alarm; Ground (earth) terminal; Source voltage selector
Power requirements	100, 120, 220, or 240VAC (50/60Hz); Printing consumption: approx. 10W; Idle consumption: approx. 7.7W
Accessories	Connector cable, 1 ea.; Line cord/plug, 1 ea.; Cable (for 3161); 1 ea.; Carrying case, 1 ea.; Instruction manual, 1 ea.; Thermal recording paper, 5 rolls
Dimensions/Weight	85H×250W×220D (mm)/2.6 kg

8201 – 8202 MICRO Hi CORDER

94H×96W×280L (mm); approx. 1.7kg

- Compact, lightweight electric-discharge dot recorder. Dot speed has been increased to a fast 32 dots per second for extremely good response to input fluctuations.
- 1MΩ input impedance.
- Speed selectable in 5 steps.

Measurement range:
8201: 10mV~50V DC – 0.1mA~10mA DC
8202: 0.1V~500V DC/AC – 1mA~100mA AC/DC
Line voltage requirements:
8201-00 – 8202-00: 110V~120V, 210V~230V, 230V~250V, 50/60Hz AC
8201-01 – 8202-01: 110V~120V, 210V~230V, 230V~250V, 50/60Hz AC or 12V DC (approx. 7W)

3161, 3171

	Sets	N.W.(kg)	G. W.(kg)	cft
Standard Packing (double carton box)	3	16 3171:12	18 3171:14	3.3

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