POWER QUALITY ANALYZER

NEW ARRIVAL!!

TO CONTROL COMPLETELY POWER QUALITY AND POWER CONSUMPTION (ENERGY)!

- 12 kinds of Power Measurements for Power Control and Applicable to Power Quality Control including Harmonics Analysis.
- One click easy-to-use operation helps complicated setting and processing of large data through the setting / analyzing software provided as accessory.
- Direct communication with PC via USB cable
- Built-in Input / Output Function of external signal enables the signal transmission to alarms.
- 2-way power supply by AC and Battery, and Nickel hydrogen battery usable with rechargeable function.
- Pull / Insert of CF card possible whenever on recording under the function of memory backup device (1GB usable).
- Can monitor insulation at leakage current by using optional leak clamp sensors.
- Built-in Print Screen Function enables to record display screen (Records 512 screens by using CF card: 1 screen 40KB).
- Can display Waveform and Vector, and can confirm the wiring connection, too.
- Complies fully with International Safety Standards IEC61010-1 CAT.Ⅲ 600V.
ALL FUNCTIONS NECESSARY FOR POWER QUALITY & POWER CONSUMPTION (ENERGY) CONTROL BUILT-IN THIS COMPACT MODEL

Can Make Measurement Very Easily By One-Touch Key. Abnormal Power Quality Causes Unexpected Troubles And Defective Products. KEW6310 Very Helpful To Find Out Various Troubles And Solution to Energy Saving.

Power Source can be taken through the measured line by using optional Power Supply Adaptor

2-way power supply system by AC and Battery, and Nickel hydrogen battery usable with rechargeable function (Protect rechargeable circuit with select cover)

Can display Waveform and Vector, and can confirm the wiring connection.

Power Consumption (Energy) Control

12 Kinds of Power Measurements
Voltage, Current, Active power, Reactive power, Apparent power, Power factor, Frequency, Current flowing on the neutral line (Only on 3 phase 4 wire measurement), Active power energy, Reactive power energy, Apparent power energy, Demand measurement (with digital output alarm function available)

Can Measure Regenerative power under Power Energy Deregulation in Japan.
Can judge either demand or regenerative power. (Regenerative power: Generated by privately owned generators and supplied to power companies.)

Instantaneous value measurement / saving
Measures Current / Voltage / Instantaneous averaged value of Power etc. / Maximum value / Minimum value.

Integration value measurement / saving
Measures Active power energy / Apparent power energy / Reactive power energy.

Demand value measurement / saving
Sets Demand target value and measures Demand value from start to stop of measurement. Can warn with digital output terminal when the set value exceeds the target value.

PRINT SCREEN KEY Can save LCD's display screen in BMP (Bitmap) file. (Record 512 screens with CF card: One screen 40KB).
**Direct Data Transmission to PC via USB**

**Easy-to-use setting-up and analyzing with KEW PQ MASTER supplied.**

- **System requirements**
  - PC with CPU: Pentium3 500MHz or higher and with operating system of Windows®2000/XP
  - Memory: 64MB or more
  - Display: Resolution 800 x 600 dots, 65536 colors or more
  - Hard disk: space required 100MB or more
  - Others: with CD-ROM drive and USB driver
  * Windows® is a registered trademark of Microsoft in the United States.
  * Pentium is a registered trademark of Intel in the United States.

**Designed For Various Wiring Systems**

- Single Phase: 2 wires (4 system load measurement possible), Single Phase: 3 wires (2 system load measurement possible), Three Phase: 3 wires (2 system load measurement possible), Three Phase: 4 wires.

**Power Quality Control**

- Can measure up to 63rd Harmonics
- Can measure Swells / Dips / Instantaneous Stop, Transients, Inrush current, Unbalanced, and can simulate phase advance or condenser, too.

**Wave Range Measurement / Saving**

- Displays vector / waveform corresponding to voltage and current of each channel.

**Harmonics Measurement / Saving**

- Measures and analyzes harmonics contents of current and voltage of each phase.

**Quality**

- Can measure Swells / Dips / Interruptions, Transients, Inrush current, Unbalanced, and can simulate power factor correction with capacitor banks.

**CF Card Interface Loaded**

- External Memory up to 1GB Available.

**Recordable Number of Data Point / Approx. Time**

<table>
<thead>
<tr>
<th>Capacity</th>
<th>64MB</th>
<th>128MB</th>
<th>256MB</th>
<th>512MB</th>
<th>1GB</th>
</tr>
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<tbody>
<tr>
<td>Data rate</td>
<td>1280</td>
<td>2560</td>
<td>5120</td>
<td>10240</td>
<td>20480</td>
</tr>
</tbody>
</table>

**USB Terminal**

- **Current Input Terminal** (With cover)
- **Easy-To-Use Clamp type Setting** (Clamp Sensors: Option)
  - The Instrument automatically recognizes clamp sensors connected (Easy-to-use setting).
  - Can monitor insulation at leakage current by using leakage clamp sensors (Option).

**Voltage Input Terminals**

**Digital Output Terminal**

(1ch) *Open Collector Output (P8)

**Analogue Input Terminal**

(2ch: DC 50m/500mV)

**CF Card Connector**

- Can Take Out and Put In CF Card whenever on recording under the function of memory backup device.
Improving power quality contributes to improve product quality. Simple and easy-to-use setting to power consumption (energy) control.

**Transients/Over Voltage (Impulse)**
- Can set detecting level value (threshold value).
- Easy-to-use checking the occurrence data on the display.

**Cause of Transients Over Voltage**
- Arises from defective contact etc. of Breakers, Magnets and Relays.
- Reaches highest value (peak value) of voltage in a very short time from inputting voltage and this is a unipolar type voltage change (Spike) that attenuates slowly.

**Bad Effect of Transients Over Voltage**
 Destroys the instrument's power source and causes reset action due to sudden voltage change (Spike).

**Inrush Current**
- Can set detecting level value (threshold value).
- Easy-to-use confirming the occurrence data on the display.

**Cause of Inrush Current**
Large current (Surge current) flows transiently at the time of starting of instruments etc. which have built-in motor, incandescent lamp, DC motors etc. at the time of sudden over voltage.

**Bad Effect of Inrush Current**
Causes bad effect to power switch's welding, fusing, breaker's trip and converter circuit etc. and also causes unstable power voltage.

**Harmonics Analysis**
- Can measure and analyze from 1st to 63rd Harmonics.
- Harmonics Contents (THD: Total Harmonics Distortion Display)
- Can judge inflow / outflow.
- Can set detecting level value (threshold value).

**Cause of Harmonics**
Control circuits of instruments use inverter circuit (condenser input type converter circuit) and thyristor control circuit (phase control circuit). These circuits cause distortion in the current. The distortion causes harmonics.

**Bad Effect of Harmonics**
Causes burning of phase advance condenser and reactor, heat of transformer, wrong way of breaker, flicker of TV image, noise of audio players etc.

**Swells/Dips/Instantaneous Stop**
- Can set detecting level value (threshold value).
- Easy-to-use confirming the occurrence data such as Swells/Dips/Instantaneous Stop on the display.

**Cause of Swells (Voltage rise)**
Voltage rises instantaneously by Inrush Current caused at the time of power input of the power line switchgear.

**Cause of Dips (Voltage drop)**
Voltage drop happens by Inrush Current caused at the time of starting of load of motors etc.

**Cause of Instantaneous Stop**
Power supply stops instantaneously due to thunderbolt etc. (Under 1 sec.) (Interruption of Service • Power supply stop more than 1sec.)

**Bad Effect of Swells/Dips/Instantaneous Stop**
Stops operation of instruments / welding robots and causes reset of OA appliances like PC.

**Unbalance Rate**
- One Touch Switch to Vector display and Power display
- Easy-to-use confirming phase angle difference thanks to Vector display

**Cause of Unbalance**
Specific Phase gets over loaded due to fluctuation of power line load and unbalanced equipment built. These cause distortion of voltage / current, voltage drop and antiphase voltage.

**Bad Effect of Unbalance**
Causes unbalance of voltage / current, uneven turning of motor, antiphase voltage, harmonics etc.
IMPROVING POWER QUALITY CONTRIBUTES TO IMPROVE PRODUCTS QUALITY / SIMPLE AND EASY-TO-USE SETTING TO POWER CONSUMPTION (ENERGY) CONTROL

Phase Advance Condenser
● Selects Best Capacity of Phase Advance Condenser by Referring to Loaded Capacity and Power Factor of Transformer.

Wave Range (Waveform Display)
● Check fluctuation of voltage and current simultaneously in each phase.
● Easy-to-Use Switching to Vector display and Waveform display.
● Built-in Function Confirming Wiring Connection

Abnormal Power Quality Causes; Power down on On-Line in life lines, Defective products in production lines, Fire and Electric shock affecting damage directly to person. Be sure to monitor power lines to prevent troubles in the power lines.

POWER CONSUMPTION (ENERGY) CONTROL
● 12 kinds of Power Measurements
  Voltage, Current, Active power, Reactive power, Apparent power, Power factor, Frequency, Current flowing on the neutral line (Only on 3 phase 4 wire measurement), Active power energy, Reactive power energy, Apparent power energy, Demand measurement (with digital output function & buzzer warning)

● Monitors in Leakage Current by Using Leakage Clamp Sensors.
● Easy-to-use Confirming Wire Connection and Setting
● Designed to Various Wiring System
  Single Phase 2 Wires (4 system load measurement possible), Single Phase 3 Wires (2 system load measurement possible), Three Phase 3 wires (2 system load measurement possible), Three Phase 4 wires.

● Easy-to-Use One-Touch Switch for Display of W (Instantaneous value) / Wh (Integration power consumption) / Demand and Can down load all these data at single operation.

● Monitors Power Consumption and Power Factor in each Phase.
  Can recognize working status in each phase.

● Measures Regenerative Power under Power Deregulation (Ex. in Japan).
  Can distinguish either Demand or Regenerative power.
  (Regenerative power: Generated by privately owned generators and supplied to power companies.)

● Enlarged Screen Function (Setting possible at option)
● Visual Function Helps Check Demand Transition.
SIMPLY CONNECT KEW6310 AND PC VIA USB, THEN ONE CLICK FOR EASY-TO-USE SETTING!
BUILT-IN NAVIGATION FUNCTION (W / HELP FUNCTION) HELPS YOU WHENEVER YOU NEED.

**SETTING FUNCTION**

Can go to specific fields anytime by only recalling saved setting if setting of the measurement is saved depending on the specific field.

Checks Wiring Connection on Screen

**EASY-TO-USE CLICK SYSTEM FOR COMPLICATED SETTINGS**

Eliminates harmonics element by filter

Recognizes clamp sensors automatically

Records necessary data only

Easy-to-use pre-setting with calendar function

Downloaded CSV file data can be processed easily with spreadsheet like Excel etc.

Instrument Reset
- Reset tone
- Reset the frequency
- Reset the offset setting

Finish the instrument reset

*The present time synchronizes with PC.

**Options**

**SMALL TYPE SAFETY CLIP**

**MODEL 7198**

Length: 650mm
The measuring terminal of voltage test lead (7141) is downsized.
Can connect it to M5 size screw on breaker terminals.

**CARRYING CASE WITH MAGNET**

**MODEL 9132**

Easy-to-use setting with magnet on the steel plate etc. of switch board

**POWER SUPPLY ADAPTOR**

**MODEL 8312**

Power source can be taken through the measured line (100~240V)
Analysis Soft Supplied!

**FOR EASY-TO-USE SETTING AND ANALYZING!**

**ANALYSIS FUNCTION**

1. Open necessary data file
2. Start analyzing measured data
3. Select necessary data
4. Data List Display
5. Graph Display

**LOAD CURRENT DETECTING TYPE FLEXIBLE CLAMP SENSOR**

**KEW 8129**
- 8129-01 (for 1ch)
- 8129-02 (for 2ch)
- 8129-03 (for 3ch)

**FLEXIBLE CLAMP SENSOR CAN MEASURE UPTO AC3000A HIGH CURRENT**

- **Conductor size**: max. φ150mm
- **Rated current**: 300/1000/3000A
- **Output voltage**: 300A Range: AC1500mA/AC250mA (1.67mV/A)
  1000A Range: AC1500mA/AC1000A (1.5mV/A)
  3000A Range: AC1500mA/AC3000A (0.5mV/A)
- **Accuracy**: ±1.0% (d=56Hz)
- **Phase Shift**: within ±1°
- **Withstand voltage**: AC2500V for 5 seconds
- **Cable length**: Sensor part: approx. 2m
  Output cable: approx. 1m
- **Output connector**: MINI-DIN 8P8C
- **Operating temperature/humidity range**: 0–50°C, relative humidity 85% or less (no condensation)
- **Output impedance**: 100Ω or less
- **Applicable standards**: IEC 61010-1; IEC 61010-2-032; CAT.II 600V Pollution degree2; IEC 61326
- **Dimensions**: 111.2 x 61.0 x 43.1 mm (except for accessories)
- **Weight**: Approx. 410g
- **Accessories**:
  - Instruction Manual
  - 7199 (Output Cable) x 1
  - 9137 (Carrying Case)

*The display screen designs and functions are subject to change without prior notice.*

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Specifications

**Instantaneous measurement ([ ] Range)**

- **Voltage Vi [V]**
  - Range: 150V/300V/600V/1000V
  - Allowable input: 10 – 110% of each range
  - Display range: 5% – 100% of each range
  - Crest factor: 2.5 or less (100% or less of each range)
  - Accuracy: ± 0.2% + 0.01% x (shunt range, 45 – 65Hz)

- **Instantaneous overload**
  - 120Vrms (169Vpeak) for 10 sec

- **Effective Current AI [A]**
  - **Active Power PI [W]**
    - Range: Depending on combinations of (Range) x (Range)
    - Accuracy: ± 0.1% + 0.02% x (Power factor, 1, line wave 45 – 65Hz)
    - Influence of power factor: ±1.5% (reading at power factor 0.5 against power factor 1)
    - Polarity indication: Consumption + (no main) + Regenerating -

- **Frequency [Hz]**
  - Accuracy: ± 0.2% + 0.5% x (Frequency)

- **Analog output (DCI) [V]**
  - Number of output: 2 channels (0 – 1.25V)
  - Range: 50mV/50mV/5V (selectable at each channel)
  - Accuracy: ± 0.5% ± 2mV

- **Input resistance**
  - approx. 22kΩ

- **Apparent power P VAR, Reactive power Q VAR, Power factor PF, Neutral current**

- **The measurement range ([ ] Range)**

- **Active power quantity WP [W]**
  - Display range: 0.000W – 999999999W
  - Display digit and unit are unified to the bigger ones of [WP] + [W] –[W] –

- **Apparent power quantity WP [W]**
  - Display range: 0.000W – 999999999W
  - Display digit and unit are unified to the bigger ones of [WP] + [W] –[W] –

- **Reactive power quantity QP [VAR]**
  - Display range: 0.000VAR – 999999999VAR
  - Display digit and unit are unified to the bigger ones of [QP] + [VAR] –[VAR] –

- **Effective time / time passed from the start of recording**
  - Display item: [HHH:mm:ss] (Hour: Minute: Second)
  - Display range: 0000:00:00 – 9999:59:59

- **Demand measurement ([ ] Range)**
  - **Target value (DEM Target)**
    - Display range: Set fixed value (1000W ± 999.97W)
  - **Predictive value (DEM Guess)**
    - Display range: Same decimal point place and unit to target value
  - **Demand value (present value) (SDEM)**
    - Display range: Same decimal point place and unit to target value
  - **Load factor**
    - Display range: 0.00 – 999.999% (100% is displayed when exceeding this range)

- **Wavelength measurement ([ ] Range)**
  - Displayed data: 256 points (256 points)
  - Scale change: 0.1/0.2/0.5/1.0/2.0/3.0 times of rating

- **Harmonic measurement ([ ] Range)**
  - **Meas. Method**
    - PLL synchro system
  - Measuring range: 45 – 65Hz
  - Analysis order: 1 – 63rd
  - Window width: 2 cycles
  - Window type: Rectangular
  - Analyse data: 512 points
  - Analyzing rate: approx. once / 2 sec
  - Display item: 20) Voltage at CH / Current, THD, Frequency
  - 21) Voltage / Rate of content / Phase angle at each order

- **Power quality ([ ] Range)**
  - **Meas. Method**
    - Calculate RMS values based on an overlapped waveform at every half waveform.

**Transients measurement ([ ] Range)**

- **Meas. Method**
  - Sampling at every 10μs, and calculating the max value at every 2ms
  - Judging the presence of events at every 1s

- **Inrush current measurement**
  - **Meas. Method**
    - Calculate RMS values based on an overlapped waveform at every half waveform.

- **Unbalance ratio measurement**
  - **Save item**
    - (Measurement data at W Range) ± (Unbalance ratio)

- **Measurable wiring configuration**
  - **Capacitance calculation**
  - **Display item**
    - Same to W Range (except for the change from PA to C)
  - **Save item**
    - (Measurement data at W Range) = (calculated capacitance value)

**AC power supply**

- **Voltage range**
  - 100V~240V ±10%

- **Frequency**
  - 46 – 65Hz

- **Power output**
  - 20VA max

**DC power supply**

- **Type**
  - Dry battery

- **Charging range**
  - 10V (1A)

- **Current consumption**
  - 500mA typ. (IRRH)

- **Maximum charging time**
  - 4h (at 23℃)

**Digital output function**

- **Output voltage**
  - Open collector output

- **Max. output**
  - 30V/50mA max.

- **Output voltage**
  - HI Level: ±5V ±0.5V

- **Logic Level**
  - LOW: 0 – 0.5V

- **Excitation**
  - ±10V (0.2A)

**General specification**

- **Indication renewal**
  - every 1 sec

- **Temperature & humidity range**
  - 23±2℃, Relative humidity 85% or less

- **Operating temperature accuracy**
  - ±1℃(±2℃

- **Humidity range**
  - 0%RH – 90%RH

- **Storage temperature & humidity range**
  - -20℃~+70℃, Relative humidity 85% or less

- **Applicable standards**
  - IEC61010-1, Measurement CAT II 60V, Pollution degree 2, IEC 61010-031, IEC61326

- **Dimension**
  - 175L x 120W x 68H (mm)

- **Weight**
  - approx 900g (including batteries)

**Accessories**

- (7141) Voltage test lead (6 kinds) x 1 pcs.
  - (8307) Compact Flash card (128MB)
  - (8319) Card reader
  - KEW PQ&A MASTER (Software)
  - Cable tester, quick manual
  - Alkaline size AA battery (LR6) x 6 pcs.

- **Optional items**
  - (1965) Small type safety case
  - (8306) Compact Flash card (64MB)
  - (8322) Compact Flash card (256MB)
  - (8323) Small Flash card (1GB)
  - (8124, 8125, 8126, 8127, 8128) Load current clamp sensor
  - (8130) Flexible clamp sensor
  - (8146, 8147, 8148) Leakage & Load current clamp sensor
  - (8141, 8142, 8143) Leakage current clamp sensor
  - (8310) Power supply adapter
  - (9130) Carrying case (for instrument)

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**Safety Warnings**:

Please read the “Safety Warnings” in the instruction manual supplied with the instrument thoroughly and completely for correct use. Failure to follow the safety rules can cause fire, trouble, electrical shock, etc. Therefore, make sure to operate the instrument on a proper current supply and voltage rating marked on each instrument.

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**For inquiries or orders**

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