

LOGGER KEW 5020



(Actual Size)

3 channel Data Logger for multiple parameter recording

Advanced KEW Logger

TRUE RMS **CE**

- Load/Leakage Current recording and Power Quality analysis. (Power Quality: Reference voltage, Swell, Dip, Short power Interruptions)
- The recorded data is downloadable onto a PC via USB cable.
- Variation of the measured voltage and current data can be confirmed simultaneously on the PC display monitor.
- LED flickers when the preset current / voltage value is exceeded. (Available for Trigger / Capture Recording, Power Quality Analysis modes)
- Supplied with the user friendly software "KEW LOG Soft2". This permits editing, analysis and graphical display of data.
- Simplified Power Integration. (The "KEW LOG Soft2" uses current and voltage recorded to calculate the integral power consumption)
- Various measurements are available with 4 recording modes: Normal, Trigger, Capture, Power Quality Analysis
- 60,000 data points can be recorded when using 1 channel.
- Continuous measuring time : Approx. 10 days (Alkaline Battery)
- Lowpass Filter will filter out the in higher frequency harmonics.

3 channel inputs for the simultaneous recording of Leakage Current, Load Current and Voltage

The logger can be fixed to a metal distribution board via the magnet on it's rear side



Large capacity for storing 60,000 data points

60,000 data points can be recorded when 1ch is used, and when all the three channels are used, 20,000 data points per channel can be recorded.

Max. number of recorded data

| Using all 3 channels | Using 2 channels | Using only 1 channel |
|----------------------|------------------|----------------------|
| 20,000 data | 40,000 data | 60,000 data |

Max. recording duration

| Recording interval | Using all 3 channels | Using 2 channels | Using only 1 channel |
|--------------------|----------------------|---------------------|----------------------|
| 1 sec. | 5:33:20 | 8:20:00 | 16:40:00 |
| 2 sec. | 11:06:40 | 16:40:00 | 1 day / 9:20:00 |
| 5 sec. | 1 day / 3:46:40 | 1 day / 17:40:00 | 1 day / 11:20:00 |
| 10 sec. | 2 days / 7:33:20 | 3 days / 11:20:00 | 6 days / 22:40:00 |
| 15 sec. | 3 days / 11:20:00 | 5 days / 5:00:00 | 10 days / 10:00:00 |
| 20 sec. | 4 days / 15:06:40 | 6 days / 22:40:00 | 13 days / 21:20:00 |
| 30 sec. | 6 days / 22:40:00 | 10 days / 10:00:00 | 20 days / 20:00:00 |
| 1 min. | 13 days / 21:20:00 | 20 days / 20:00:00 | 41 days / 16:00:00 |
| 2 min. | 27 days / 18:40:00 | 41 days / 16:00:00 | 83 days / 8:00:00 |
| 5 min. | 69 days / 10:40:00 | 104 days / 4:00:00 | 208 days / 8:00:00 |
| 10 min. | 138 days / 21:20:00 | 208 days / 8:00:00 | 416 days / 16:00:00 |
| 15 min. | 208 days / 8:00:00 | 260 days / 10:00:00 | 520 days / 0:00:00 |
| 20 min. | 277 days / 18:40:00 | 416 days / 16:00:00 | 833 days / 8:00:00 |
| 30 min. | 416 days / 16:00:00 | 625 days / 0:00:00 | 1250 days / 0:00:00 |
| 60 min. | 833 days / 8:00:00 | 1250 days / 8:00:00 | 2500 days / 0:00:00 |

* Max recording time is dependent on battery life (approx 10-days with Alkaline battery) Use of optional AC Adaptor is recommended for long time recording.

The logger can take external DC input via an AC/DC adaptor (Model 8320), ideal for long recording times.



LED flickers
when the preset current/voltage is exceeded

Various measurements are available with 4 recording modes



Normal recording mode

For monitoring power line status or an intermittent leakage.



Trigger recording mode

For observing an irregular operation of an ELCB/RCD, an irregular current / voltage.



Capture recording mode

For observing waveforms easily.



Power Quality Analysis Mode

For monitoring and observing voltage fluctuations.

Non Volatile Memory

Recorded data will be retained even if the batteries are exhausted or replaced due to the presence of a nonvolatile memory (guaranteed for 10 years)

Battery power indicator

Indicates battery voltage in 4-levels. (It is possible to use the logger for a further approx 24 hours even after the warning symbol is flashing.)



Various clamp sensors are available



Voltage sensor with a built-in differential amplifier (KEW 8309: option) can measure the floating voltage (=phase to phase voltage ungrounded)

The clamp sensor and/or voltage sensors can be connected to any of the 3 channels

* The logger unit automatically identifies the sensors connected.

Recorded data can be directly transferred to PC via USB cable



The user friendly PC software "KEW LOG Soft 2" is supplied

【 System requirements 】

- PC with CPU: Pentium2 500MHz or higher and with operating system of Windows®98/Me/2000/XP
- Memory: 64Mbyte or more
- Display: Resolution 800 x 600 dots, 65536 colors or more
- Hard-disk: space required 100Mbyte or more
- Others: with CD-ROM drive and USB drive
- * Windows® is a registered trademark of Microsoft in the United States.
- * Pentium is registered trademark of Intel in the United States.



Via the software the following parameters can be set: time/date, recording intervals, the start of recording, recording methods, name of monitoring site and comments

Selection of One-time mode or Endless mode

One-time on: →

Recording will stop when memory is used up.

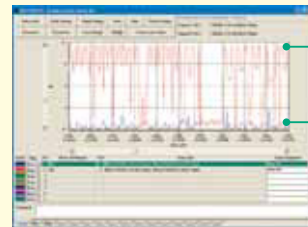
One-time off: ↻

Overwrite the old data, and store the latest data.



The Lowpass Filter can detect the harmonics

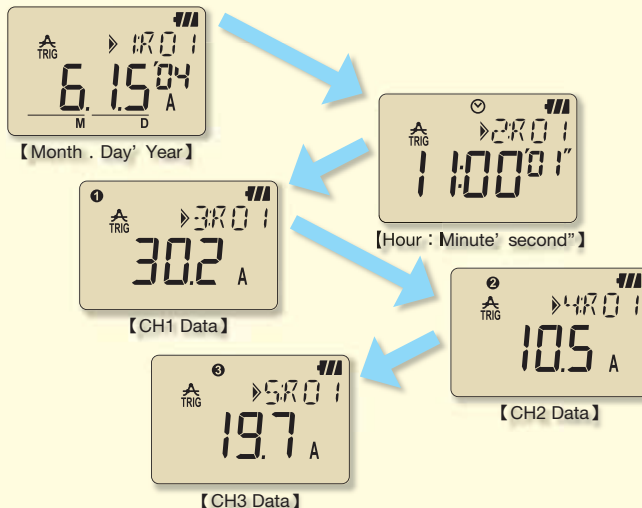
(Cutoff Frequency = Approx. 160Hz)



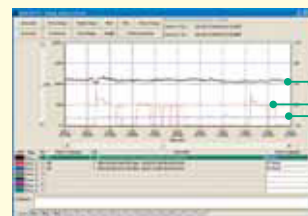
- Red : Filter is OFF (Harmonics)
- Blue : Filter is ON

CALL : Confirmation of recorded data

- The following can be displayed: number of recorded data points, (max+ min+ peak) value for each channel complete with time/date information in the Normal recording mode. (Detected values (i.e. when values are outside pre-set limits) can be displayed in other recording modes)
- RECALL: The last 10 recorded data points including time/date can be recalled on the logger display.



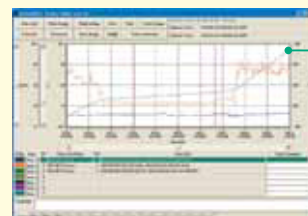
Variations of the measured voltage and current data can be displayed instantaneously on a PC display monitor (only on KEW 5020)



- Black : Voltage
- Red : L1 Current
- Blue : L2 Current

Simplified Power Integration

(The "KEW LOG Soft 2" uses current and voltage recorded to calculate the integral power consumption.)



- Integral power consumption

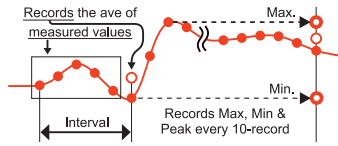
4 recording modes make various measurements possible



Normal recording mode

For monitoring power line status or an intermittent leakage.

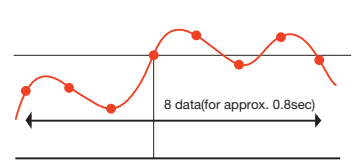
- Records the variation of the current / voltage in a given interval (For monitoring the variation of the current / voltage against time.)
- A choice of 15 recording intervals are available: 1 sec. to 60 min. (1,2,5,10,15,20,30 sec, 1,2,5,10,15,20,30,60 min.)
- The average of the measured value in every recording interval is recorded. The Max., Min. and Peak values (sampled crest value converted to sine RMS value) are recorded every 10 readings.



Trigger recording mode

For observing an irregular operation of an ELCB/RCD, an irregular current / voltage.

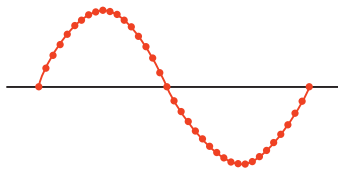
- Detects the value, time and frequency of the current / voltage when the preset value is exceeded.
- When the detection level (i.e. preset value) is exceeded, 8 data points (True RMS values for approx. 0.8 sec) and peak value are recorded before and after the preset value is exceeded.
- Inrush current or an abnormal current / voltage can be detected by sampling the inputs at every 1.6ms.
- LED flickers when the measured values exceed the preset current / voltage value.



Capture recording mode

For observing waveforms easily.

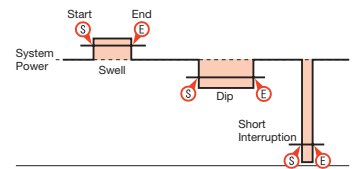
- Waveform display via a PC by sampling the inputs every 0.55ms.
- When the preset current / voltage value is exceeded, instantaneous values are recorded for 200ms (from 10(50Hz) to 12 (60Hz) waveforms) before and after preset value is exceeded.
- LED flickers when the measured values exceed the preset current / voltage value.



Power Quality Analysis Mode

For monitoring and observing voltage fluctuations.

- Detects the reference voltage, Swell, Dip and Short Interruption. Records the values detected with the start time and end time.
- Samples the inputs every 0.55ms and detects the voltage fluctuation every 10ms.
- LED flickers when the voltage fluctuation is detected.



Application Notes and Useful Tips for KEW 5010 / 5020

Insulation Level Monitoring by checking the leakage current

- Detect an intermittent leakage current as often this is unpredictable.
- Check for nuisance tripping of an RCD/ELCB due to a leakage current. Check also if RCD is tripping at its rated tripping current.
- Check for the presence of harmonics. Use 2 clamp sensors (one per channel) on same line and use the filter function on one clamp sensor. A difference in values between the 2 channels will indicate the presence of harmonics. In this way the source generating harmonics can be traced.

Monitoring the load current

- Confirm the stability of a load (eg. motor) and the distortion it causes to the current by detecting accurately the over load caused for example by an inrush (starting) current and a surge current.
- Check for phase imbalance (in a 3 phase system)
- Rate switchgear appropriately by measuring the peak current and the inrush current.

- Analyze voltage drop due to starting current and thus compensate accordingly.

Monitoring voltage fluctuation (Power quality analysis)

- Measure/ record the reference voltage, swell, dip, short interruption.
- Locate the source of voltage drop caused by the operation of large motors in industrial applications. Eg. In the event of a voltage drop at the load side:
 - If current remains stable, then the source will be upstream with respect to the load.
 - If the current increases, then the source will be downstream with respect to the load.
- Check out on machine (eg. welding robot, heavy mechanical electric machine) downtime/stoppages caused by abnormal voltage fluctuations.

Monitoring overall electrical power of production line at factories or each floor at buildings

Analyzing and processing the recorded data with a PC

The user friendly PC software "KEW LOG Soft 2" is supplied.

【System requirements】

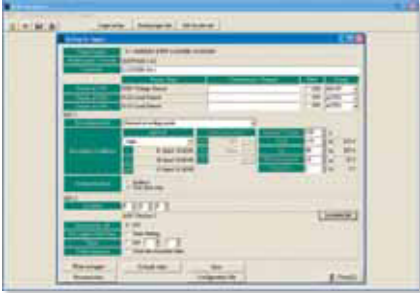
PC with CPU: Pentium2 500MHz or higher and with operating system of Windows® 98/Me/2000/XP
 Memory: 64Mbyte or more
 Display: Resolution 800 x 600 dots, 65536 colors or more

Hard-disk: space required 100Mbyte or more
 Others: with CD-ROM drive and USB drive

* Windows® is a registered trademark of Microsoft in the United States.
 * Pentium is registered trademark of Intel in the United States.



Easy to set up with a PC



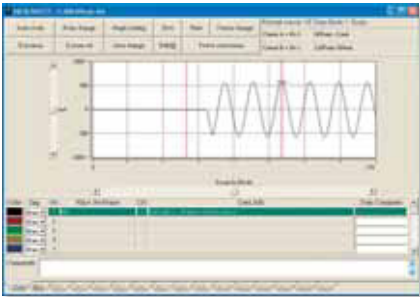
(Normal and Trigger recording modes can be set up through the logger itself.)

Large data can be easily processed

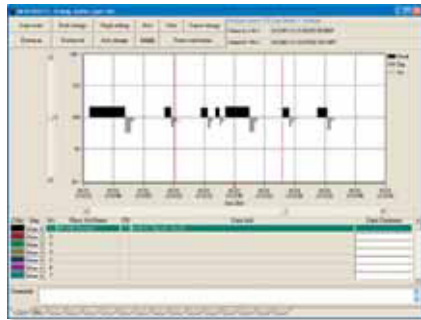


- The type of the sensor connected to the logger will be automatically recognized.
- Just click appropriate dialog boxes for set up if it is not required to input any comments.
- By using commercially available USB hub, multiple loggers can be connected to a PC and can set the synchronized time.

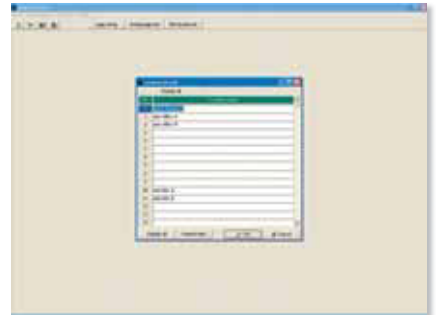
A graph can be made by just one click



Display of Power Quality

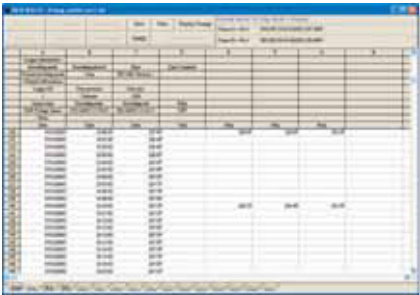


Capable of registering the names of 1,000 sites



Simplified Power Integration

1. Data collection under Normal Recording mode



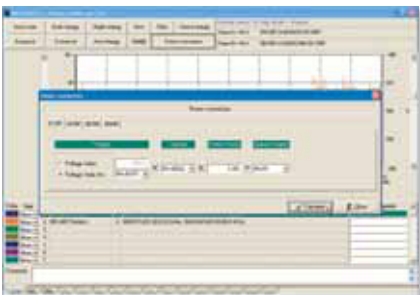
2. Click the "Simplified Power Integration".



- The PC software "KEW LOG Soft 2" provides easy calculation of integral power consumption. (Single-phase 2-wire, Single-phase 3-wire, Three-phase 3-wire, Three-phase 4-wire)

* Simplified power integration function is available for the data recorded under Normal Recording mode.

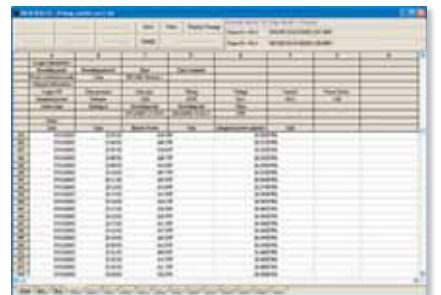
3. Check the wiring system and input the power factor



4. Integral power consumption will be displayed in a graph



5. The values of integral power consumption will be automatically input in the data spreadsheet



* Input any power factor. Also input any voltage value in case of KEW5010.

Optional Accessories

Voltage Sensor

KEW 8309

Floating voltage can be measured

*Floating voltage: phase to phase voltage not grounded



* KEW 5020-01 : KEW 5020 logger with KEW 8309 (1pce.)

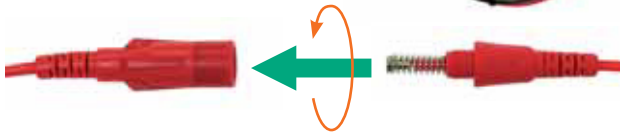
Option : Small Clips adaptor

MODEL 7197

Length : 650mm

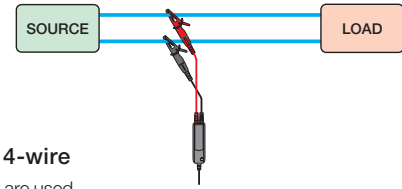
Adaptor to convert the crocodile clips of the voltage sensor (8309) to smaller ones.

* Can be connected to the M5 size screw used at the terminals of standard RCD/ELCB's.



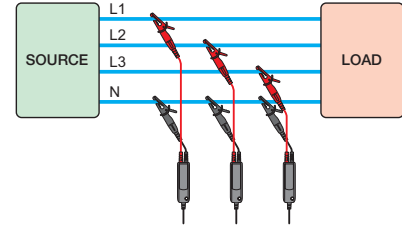
Examples of connection

Singe-phase 2-wire



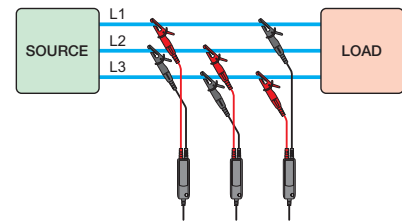
Three-phase 4-wire

3 voltage sensors are used.



Three-phase 3-wire

Measuring the floating voltage using 3 voltage sensors.



| | |
|---|--|
| Max. input voltage | AC600Vrms (sin), 848.4V Peak |
| Input system | Differential input (can measure floating voltage) |
| Output voltage | AC 0~60mV (output/input : 0.1mV/V) |
| Measuring ranges | 6~600V |
| Accuracy (Frequency range) | ±1.0%rdg 0.1mV (50/60Hz) |
| Operating Temperature and Humidity Ranges | -10~50°C ,relative humidity 85% or less (no condensation) |
| Input impedance | Approx.3.4MΩ |
| Output impedance | Approx.180Ω |
| Location for use | Altitude up to 2000m, Indoors |
| Applicable standards | IEC/EN 61010-1:2001 CAT.Ⅲ 600V, pollution degree 2 IEC/EN 61010-031:2002 IEC 61326 (EMC) |
| Withstand Voltage | 5350V rms 50/60Hz) for 5 sec., between measuring terminal and enclosure. |
| Dimensions | 87 (L) × 28 (W) × 7 (D) mm (excluding protrusions) |
| Weight | Approx.135g |
| Total length | Approx.2m |
| Output connector | MINI DIN 6PIN |
| Accessories | Instruction manual |
| Option | 7185 (Extension cord) , 7197 (Small safety clip) |

AC Adaptor (External Power Supply)

MODEL 8320

• Appropriate for a longer period of recording.

• Complies to 90~264V(45~66Hz).



Carry Bag

MODEL 9135

Dimensions : 250 (L) × 270 (W) × 216 (D) mm



Clamp Sensor Series

Leakage current & Load current detection types

KEW 8146



KEW 8147



KEW 8148



| | KEW 8146 | KEW 8147 | KEW 8148 |
|---------------------------------|--|--|---|
| Conductor size | φ 24 | φ 40 | φ 68 |
| Rated current | AC 30A | AC 70A | AC 100A |
| Output voltage | AC 1500mV/30A(AC 50mV/A) | AC 3500mV/70A(AC 50mV/A) | AC 5000mV/100A(AC 50mV/A) |
| Accuracy | 0~15A ±1.0%rdg±0.1mV(50/60Hz) ±2.0%rdg±0.2mV(40Hz~1kHz) 15~30A ±5.0%rdg(50/60Hz) ±10.0%rdg(45Hz~1kHz) | 0~40A ±1.0%rdg±0.1mV(50/60Hz) ±2.0%rdg±0.2mV(40Hz~1kHz) 40~70A ±5.0%rdg(50/60Hz) ±10.0%rdg(45Hz~1kHz) | 0~80A ±1.0%rdg±0.1mV(50/60Hz) ±2.0%rdg±0.2mV(40Hz~1kHz) 80~100A ±5.0%rdg(50/60Hz) ±10.0%rdg(45Hz~1kHz) |
| Withstand voltage | AC3540V for 5 sec. | | |
| Cable length : Output connector | Approx. 2m : MINI DIN 6pin | | |
| Operating temperature ranges | -0~50°C, less than 85% RH(without condensation) | | |
| Output impedance | Approx. 90Ω | Approx. 100Ω | Approx. 60Ω |
| Applicable standards | IEC 61010-1 : 2001, IEC 61010-2-032 : 2002 CAT.Ⅲ 300V pollution degree 2 | | |
| Dimensions | 100(L)×60(W)×26(D)mm | 128(L)×81(W)×36(D)mm | 186(L)×129(W)×53(D)mm |
| Weight | Approx. 150g | Approx. 240g | Approx. 510g |
| Accessories | 9095(Portable case) | Instruction manual Cable marker | 9094(Portable case) Instruction manual Cable marker |
| Options | 7146(Banana φ 4 adjuster plug) 7185(Extension cable) | | |

Load current detection types

KEW 8121



KEW 8122



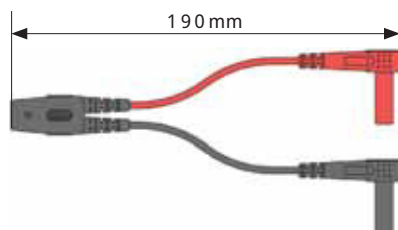
KEW 8123



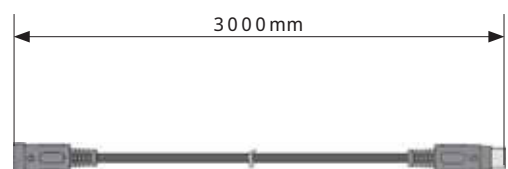
| | KEW 8121 | KEW 8122 | KEW 8123 |
|---------------------------------|---|---------------------------------|---|
| Conductor size | φ 24 | φ 40 | φ 55 |
| Rated current | AC 100A | AC 500A | AC 1000A |
| Output voltage | AC 500mV/100A(AC 5mV/A) | AC 500mV/500A(AC 1mV/A) | AC 500mV/1000A(AC 0.5mV/A) |
| Accuracy | ±2.0%rdg±0.3mV(50/60Hz) ±3.0%rdg±0.5mV(40Hz~1kHz) | | |
| Withstand voltage | AC3540V for 5 sec. | AC5350V for 5 sec. | |
| Cable length : Output connector | Approx. 2m : MINI DIN 6pin | | |
| Operating temperature ranges | -0~40°C, less than 85% RH(without condensation) | | |
| Output impedance | Approx. 9.5Ω | Approx. 1.9Ω | Approx. 1.5Ω |
| Applicable standards | IEC 61010-1 : 2001, IEC 61010-2-032 : 2002 CAT.Ⅲ 300V pollution degree 2 | | |
| Dimensions | 97(L)×59(W)×26(D)mm | 128(L)×81(W)×36(D)mm | 170(L)×105(W)×48(D)mm |
| Weight | Approx. 150g | Approx. 260g | Approx. 360g |
| Accessories | 9095(Portable case) | Instruction manual Cable marker | 9094(Portable case) Instruction manual Cable marker |
| Options | 7146(Banana φ 4 adjuster plug) 7185(Extension cable) | | |

Options

MODEL 7146 Banana 4 mm adjuster plug



MODEL 7185 Extension cable



Specifications

Normal Recording Mode(AC 50/60Hz, Sine wave, Input: 10% or more of the range at CH1)

| Range | RMS Accuracy |
|--------------|--|
| 100.0mA | $\pm 2.0\%rdg \pm 0.9\%f.s.$ + Accuracy of Sensor |
| Other ranges | $\pm 1.5\%rdg \pm 0.7\%f.s.$ + Accuracy of Sensor |
| Crest Factor | 2.5 or less :RMS accuracy(sine) $\pm 2\%rdg \pm 1\%f.s.$ |

*Max, Min and Instant Peak values in Normal Recording mode are just reference values; their accuracies aren't guaranteed.

Trigger Recording Mode(AC 50/60Hz sine wave)

| Range | Accuracy |
|--------------|---|
| 100.0mA | $\pm 3.5\%rdg \pm 2.2\%f.s.$ + Accuracy of Sensor |
| Other ranges | $\pm 3.0\%rdg \pm 2.0\%f.s.$ + Accuracy of Sensor |

Capture/ Power Quality Analysis Recording Mode

| Range | Accuracy |
|--------------|---|
| 100.0mA | $\pm 3.0\%rdg \pm 1.7\%f.s.$ + Accuracy of Sensor |
| Other ranges | $\pm 2.5\%rdg \pm 1.5\%f.s.$ + Accuracy of Sensor |

| | KEW 5010 | KEW 5020 |
|--|---|---|
| Recording Mode | Normal, Triger, Capture | Normal, Triger, Capture, Power Quality Analysis |
| Operating system | Successive Approximation(CH1 single synchronized sampling) | |
| Rated max. working voltage | AC9.9Vrms, 14V peak value | |
| Number of input channel | 3ch | |
| Measuring method | True RMS | |
| RMS measuring interval | approx. 100ms. | |
| Sampling interval | Normal / Trigger mode | approx. 1.65ms/CH |
| | Capture mode | approx. 0.55ms(waveform: at every 1.1ms) |
| | P.Q.A mode | approx. 0.55ms |
| Low battery warning | Battery mark display(in 4 levels) | |
| Over-range indication | "OL" mark is displayed when exceeding the measuring range | |
| Auto power off | Power-off function operates automatically after a switch remains for 3min. (when recording is stopped) | |
| Location for use | Indoor use, Altitude up to 2000m | |
| Operating temperature & humidity range | -10°C~50°C / Relative humidity 85% or less(no condensation) | |
| Battery | DC6V : Alkaline battery(LR6) $\square 4$ pcs / External supply DC9V(Special AC Adapter) | |
| Possible measurement time | Approx. 10days (with alkaline LR6 batteries) | |
| Applicable standards | IEC 61010-1:2001 CAT.III 300V Pollution degree2 | |
| | IEC 61326(EMC standard) | |
| Withstand voltage | AC3540V(RMS 50/60Hz) for 5sec. | |
| Dimension | 111(L) $\square 60$ (W) $\square 42$ (D)mm | |
| Weight | Approx. 265g | |
| Accessories | Alkaline battery LR6 $\square 4$ pcs 911 \square Carrying case) | |
| | PC software "KEW LOG Soft 2" 714 \square USB cable) Instruction manual Quick manual Install manual USB Notice sheet | |
| Option | 8146/8147/814 \square Leakage & Load current Clamp Sensor) | |
| | 8121/8122/812 \square Load current Sensor) | |
| | 830 \square Voltage Sensor : only KEW5020) 832 \square AC Adapter) | |
| | 9135(Carrying Bag) 911 \square Hard Case) 7185(Extension cord for sensor) | |



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 correct power supply and voltage rating marked on each instrument.

**COSINUS Messtechnik - Ihr Partner für Messlösungen
in allen elektrischen und physikalischen Anwendungen**

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