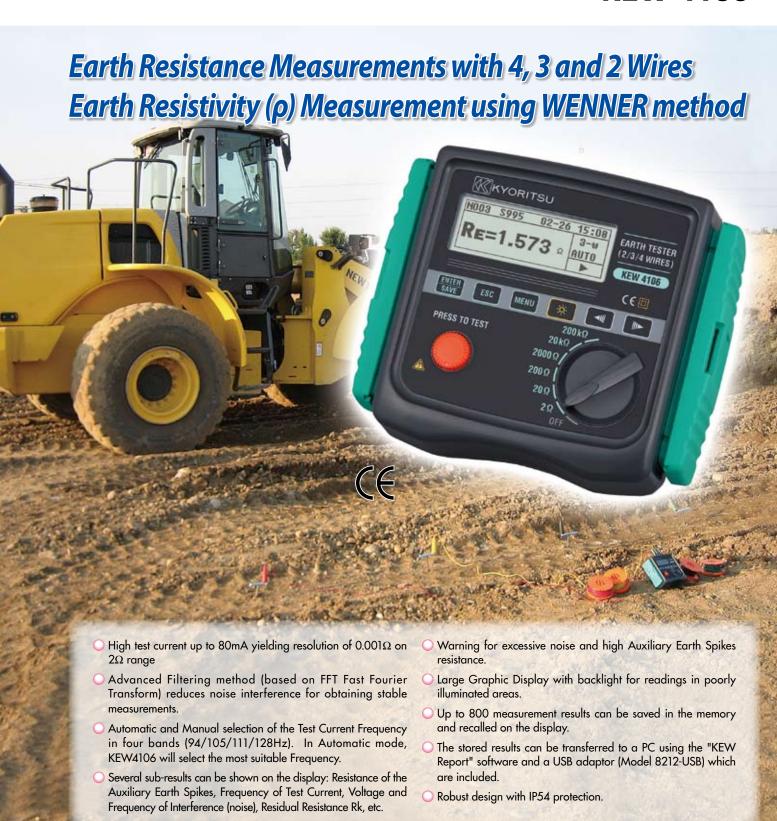


Earth Resistance & Resistivity Tester KEW 4106



Earth Resistance Measurement

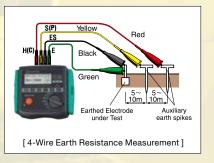
- Earth resistance measurement with 4, 3 and 2 wires and six ranges covering measurements from 0.03Ω to $200k\Omega$.
- Also ideal for large earthing systems by the considerable test current of 80mA(max) yielding a high resolution of 0.001Ω on 2Ω range.

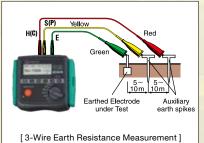


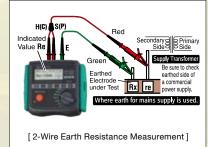


- Advanced Filtering method (based on "FFT" Fast Fourier Transform) reduces noise interference for obtaining stable measurements.
- Warnings for excessive noise and high Auxiliary Earth Spikes resistance.

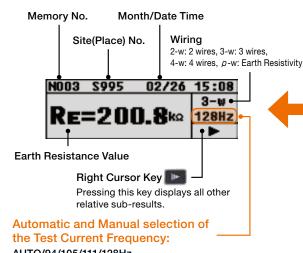
Earth Resistance Measurements with 4, 3 and 2 Wires









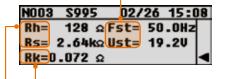


AUTO/94/105/111/128Hz

This is to minimize the noise influence of the earth voltage.

Series Interference Voltage (Earth Voltage) Measurement

Fst: Frequencies of the Earth Voltage between E-S terminals Ust: Voltages of the Earth Voltage between E-S terminals



Null Facility

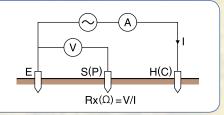
The residual test lead resistance (Rk) is stored and is deducted from the measured result. This is to ensure more accurate low Earth Resistance measurements.

Auxiliary Earth Spikes Measurement

Rh: Resistance of Auxiliary Earth Spike H(C) Rs: Resistance of Auxiliary Earth Spike S(P)

Principle of Earth Resistance Measurements

This instrument makes earth resistance measurements with fall-of-potential method, which is a method to obtain earth resistance value "Rx" by applying AC constant current "I" between the measurement object "E" (earth electrode) and "H(C)" (current electrode), and finding out the potential difference "V" between "E" (earth electrode) and "S(P)" (potential electrode).



Earth Resistivity Measurement

- The earth resistivity measurement is useful for soil surveys to establish the optimum earth electrode system design and site, to avoid extra cost of re-working electrode installations. It can be also suitable for geological investigations.
- Earth resistivity measurement is automatically calculated after having set the distance between Auxiliary Earth Spikes (Wenner method).

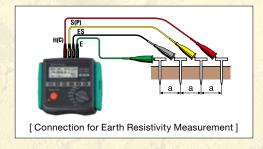


Measurement Method for Earth Resistivity (p)

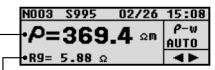
[Connection of Auxiliary Earth Spikes and Test Leads]

Stick the four Auxiliary Earth Spikes into the ground deeply. They should be aligned at an interval of 1-30m(a). The depth should be 5% or less of the interval between the spikes.

Note) The supplied Test Leads can be used for the distance between the spikes up to 20m.



Earth Resistivity (p) Measurement Display



-Rg: Earth Resistance - ρ: Earth Resistivity Value



NOO3 S995 02/26 15:08 R9= 5.88 Ω Fst= 0.0Hz Rh= 204 Ω Ust= 0.0V Rs= 99 Ω L= 10.0m ◀

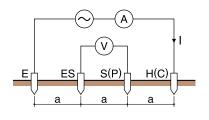
L: Distance between Auxiliary Earth Spikes a(m)

Principle of Earth Resistivity (p) Measurements

According to the Wenner 4-pole method, apply AC current "I" between the "E" (earth electrode) and "H(C)" (current electrode) to find out the potential difference "V" between the two potential electrodes "S(P)" and "ES".

To obtain the earth resistance "Rg (Ω) ", devide the potential difference "V" by AC current "I"; where the distance between electrodes is "a" (m).

Then use the formula: $\rho = 2 \cdot \pi \cdot a \cdot Rg (\Omega \cdot m)$.

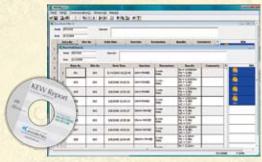


Software included (KEW Report)

The stored results can be transferred to a PC via USB adaptor (Model 8212-USB).

- Up to 800 measurement results can be saved in memory.
- Data can be converted to CSV files.





[List of data]

KEW 4106 Specification

Function	Range	Resolution	Measuring range	Accuracy
Earth resistance Re (Rg at ρ measurement)	2Ω	0.001Ω	0.03~2.099Ω	±2%rdg±0.03Ω
	20Ω	0.01Ω	0.03~20.99Ω	±2%rdg±5dgt ⁻¹
	200Ω	0.1Ω	0.3~209.9Ω	
	2000Ω	1Ω	3~2099Ω	
	20kΩ	10Ω	0.03~20.99kΩ	
	200kΩ	100Ω	3~209.9kΩ	
Auxiliary earth resistance	200002	10012	0~200.5Kt2	
Rh , Rs				8% of Re+Rh+Rs
Earth resistivity o	2Ω		0.2~395.6Ω·m	ρ=2×π×a×Rg "²
	20Ω	$\begin{array}{ccc} & 0.2{\sim}3956\Omega{\cdot}m \\ & 0.1\Omega{\cdot}m{\sim}1\Omega{\cdot}m & 20{\sim}39.56k\Omega{\cdot}m \\ & Autoranging & 0.2{\sim}395.6k\Omega{\cdot}m \\ & & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & \\ & & & & \\ & & \\ & & \\ & & & \\ $	0.2~3956Ω·m	
	200Ω		20~39.56kΩ·m	
	2000Ω		0.2~395.6kΩ·m	
	20kΩ		2.0~1999kΩ·m	
	200kΩ			
Series interference voltage	50V	0.1V	0~50.9Vrms	±2%rdg±2dgt (50/60Hz)
Ust (A.C only) ⁺³	300	-		±3%rdg±2dgt (40~500Hz)
Frequency Fst	Autoranging	0.1Hz 1Hz	40Hz~500Hz	±1%rdg±2dgt
Measuring method	Earth resistance: Fall-of-potential method (currents and voltages measured via the Probes)			
	Measurement method of Earth Resistivity (ρ): Wenner 4-pole method			
	Series interference voltage (earth voltage): RMS Rectifier (between the E-S Terminals)			
Memory capacity	800 data			
Communication interface	Model 8212USB Optical Adaptor			
LCD	Dot-matrix 192×64, monochrome			
Over-range Indication	"OL"			
Overload Protection	between E-S(P) and between E-H(C) terminals AC280V / 10 sec.			
Withstand voltage	between the electrical circuit and enclosure AC3540V(50/60Hz) / 5 sec.			
Applicable standards	IEC 61010-1 CAT.II 300V, CAT.IV 150V Pollution degree 2			
	IEC 61010-031, IEC 61557-1,5, IEC 61326-1(EMC), IEC 60529(IP54)			
Power source	DC12V : sizeAA manganese dry battery (R6P) x 8 (Auto power off: approx. 5 minutes)			
Dimensions	167(L)×185(W)×89(D)mm			
Weight	approx. 900g (including batteries) 7229(Precision measurement test leads), 7238(Simplified measurement test leads),			
Accessories	8032(Auxiliary earth spikes [2 spiks/set]) \times 2 sets (4 spikes in total), 8200-04(Cord reel [4 reels]) \times 1 set ,			
	8212-USB(USB adaptor with "KEW Report(Software)"), 9121(Shoulder strap), 9125(Carrying case),			
	R6P×8, Instruction manual, Calibration certificate			
Optional	8212-RS232C(RS232C adaptor with "KEW Report(Software)")			
	OZ Z NOZOZO GODIO WITH NEW HOPOT (CONTRACT)			

^{*1:} Auxiliary earth resistance is 100Ω with Rk correction

EVERYTHING YOU NEED.....

KEW4106 comes with everything you need for testing the Earth Resistance and Soil Resistivity.

A full set of accessories is included: four auxiliary spikes, four cable reels and four test leads(Red:40m, Yellow/Black/Green:20m) for Earth and Resistivity measurements. It is also supplied with particular test leads with relative probes and crocodile clips dedicated for simplified measurements. PC software for downloading and interpreting of data and an interface cable are included.

The instrument also comes in a soft carry case, a quick reference guide is attached to the case lid, and it is supplied with a calibration certificate.





Please read the "Safety Warnings" in the instruction manual supplied with the instrument thoroughly and completely Safety Warnings: If the Institution of the Completely Safety Warnings and Completely Safety Warnings and Completely Safety Warnings and Completely Safety Warnings. to operate the instrument on a correct power supply and voltage rating marked on each instrument.

For inquires or orders:



KYORITSU ELECTRICAL INSTRUMENTS WORKS, LTD.

No.5-20, Nakane 2-chome, Meguro-ku, Tokyo, 152-0031 Japan Phone:81-3-3723-0131

Fax:81-3-3723-0152

E-mail:info@kew-ltd.co.jp

Factory: Ehime, Japan

http://www.kew-ltd.co.jp





^{*2:} Depending on the measured Rg. Interval [a] between auxiliary earth spikes is 1.0~30.0m

^{*3:} This instrument is NOT designed to measure line voltages on commercial powers.