

# EARTH TESTERS

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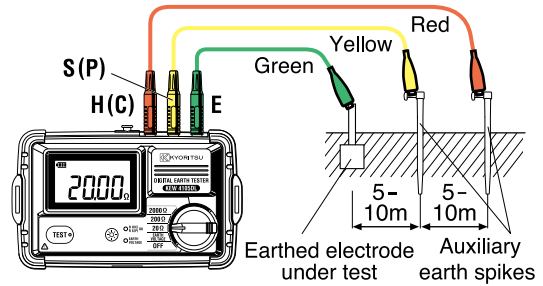


# EARTH TESTERS

## Measurement of the earth electrode resistance (3-Pole method)

[MODEL 4102A/KEW 4105A/KEW 4105DL]

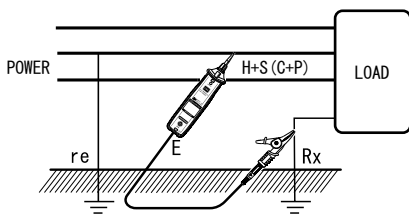
The international standard IEC 60364-6 provides information regarding the measurement of the resistance of an earth electrode for TT, TN and IT systems. This measurement shall be made by the Volt-Amperometric method using two auxiliary earth electrodes. The instrument that covers this requirement is the Earth Tester.



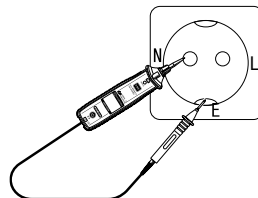
Precise Measurement

## Measurement of the simplified earth resistance (2-Pole method)

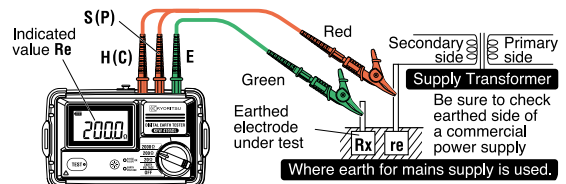
[KEW 4300/MODEL 4102A/KEW 4105A/KEW 4105DL]



Measuring the earth resistance of load



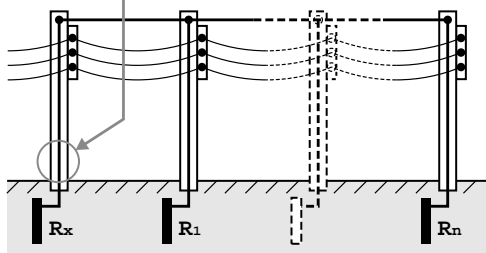
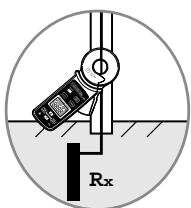
Measuring the earth resistance of wall socket



Simplified Measurement

## Measurement of the earth resistance with Earth Clamp (Why earth measurements can be found by only clamping it?)

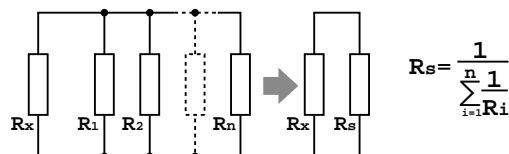
[MODEL 4200/KEW 4202]



$R_x$  is defined as earth resistance under test, and  $R_1, R_2, \dots, R_n$  are defined as earth resistance of other measuring objects.

These earth resistances,  $R_1, R_2, \dots, R_n$  can be considered that they are connected in parallel. And They can be regarded as a combined resistance  $R_s$ . The  $R_s$  can be regarded small enough against  $R_x$  since a combined resistance consists of several resistances.

Following is an equivalent circuit diagram of this circuit.



Voltage  $V$  is applied to the object (Resistance  $R_x$ ) measured from the voltage injection transformer CT1, and the current  $I$  corresponding to the earth resistance is flowed.

$$\frac{V}{I} = R = R_x + R_s$$

$$R_x \gg R_s = \frac{1}{\sum_{i=1}^n \frac{1}{R_i}}$$

The current  $I$  is detected with detection transformer CT2, and object (Resistance  $R_x$ ) measured can be put out by the calculation. (refer to the right diagram)

