DIGITAL HARMONICS TESTER

Model HWT-1000

The HWT-1000 is a harmonics tester that measures harmonic components on a power line and generating direction of these components.
It has one channel each of voltage and current input, and the PT ratio and CT ratio can be set to enable the display of the conversion value as primary measuring value.
The HWT-1000 is capable of measurements from the fundamental frequency up to the 40th harmonic.
Measurements can be made on single-phase, single -phase/3-wire, three-phase/3-wire, and three-phase/4-wire power lines for following measurements.

- Measurements and digital display for voltage/current, active/reactive power, phase angle and power factor.
- Waveform display for voltage and current
  - * Spectrum display for harmonics on voltage and current
  - * Harmonic power and spectrum display for harmonic direction
  - * List of phase difference and contents ratio of each harmonics
  - * List of phase difference and rms value of each harmonics

Specification

Input

Voltage Input

Number of input channels : 1ch.
Input ranges : 150/500 V rms
Measuring ranges : 150V rms range ; 10 to 160 V rms
500V rms range ; 30 to 500 V rms
Ranging : Manual
Input impedance : 1MΩ

Current Input

Number of input channels : 1ch.
Input ranges : 0.5/5/50/300 A rms
Measuring ranges : 0.5A rms range ; 0.05 to 0.6 A rms
5A rms range ; 0.5 to 6 A rms
50A rms range ; 5 to 60 A rms
300A rms range ; 30 to 300 A rms
Ranging : Manual
Input method : CT sensor
Fundamental frequency input ranges : 45 to 65 Hz
Synchronous method : Voltage (input priority)
(Synchronous of current is also available)

Measurements

AC conversion : True rms responding
Maximum input peak voltage/current : 1.7 times of each range value

Accuracy (23℃±5℃ and Less than 80%RH)

Function	Range	Resolution	Accuracy
AC current	0.5A	0.1mA	±1.5% rdg±5 dgts
	5A	1mA	
	50A	10mA	
	300A	100mA	
AC voltage	150V	0.1V	±0.5% rdg±3 dgts
	500V		

Harmonic Analysis

Harmonics range : Fundamental to 40th harmonics
Analysis display : RMS value of each harmonics on voltage & current and Vn - In phase difference
Contents ratio of each harmonics on voltage & current and Vn - In phase difference
Reference for analysis : Voltage (or current when only current input is used)
Analysis accuracy specified : Fundamental input level should be more than 30% of the input range

Input voltage	Fundamental to 10th harmonic	: ±1.5% rdg±3 dgts
	11th to 20th harmonic	: ±5% rdg±3 dgts
	21st to 30th harmonic	: ±10% rdg±3 dgts
	31st to 40th harmonic	: ±20% rdg±3 dgts
Input current	Fundamental to 10th harmonic	: ±3% rdg±3 dgts
	11th to 20th harmonic	: ±6% rdg±3 dgts
	21st to 30th harmonic	: ±15% rdg±3 dgts
	31st to 40th harmonic	: ±30% rdg±3 dgts

Phase difference
(Accuracy is specified when the fundamental input level is more than 30% of the input range)

1st to 10th harmonic	: ±3 deg.
11th to 20th harmonic	: ±5 deg.
21st to 30th harmonic	: ±15 deg.
31st to 40th harmonic	: ±30 deg.

Power Measurements

Measurement display items : Active power, reactive power, phase angle, power factor
Analysis results display : Each harmonics power and spectrum direction display for each harmonics.

Waveform Display

Analog display : One cycle waveform display for voltage and current
Digital display : Distortion ratio of voltage and current
Peak value of voltage and current

Other Function

A/D conversion resolution	: 16 bits
Sampling rate	: 256 samplings/period
Averaging	: Selectable from 1, 2, 4, 8, 16 periods
Three phase measurement	: Power and phase compensation is provided for 3 phase/3 wire and 3 phase/4 wire power system.
Auto power off function	: Power is shut off approx. 15 minutes later.

General Specifications

Power supply	: Ni-Cad battery or AC adaptor (Charger)
Continuous operation	: Approx. 16 hours after full battery charge.
Operating temperature	: Temperature ; 5 to 35℃
	Humidity ; 80%RH max.(Without condensation)
Storage temperature	: Temperature ; −10 to +50℃
	Humidity ; 70%RH max. (Without condensation)
Withstanding voltage	: AC 2KV for 1 minute
	(Between all measurement terminals and case)
Insulation resistance	: More than 10 MΩ (Measured by 500VDC insulation tester)
Size	: 200 (W)×100 (H)×81 (D) mm (Main unit)
Weight	: Approx. 1.7 kg (Main unit)

Accessories	: Carrying case Instruction manual Voltage input cable set Current input CT
Optional accessories	: Charger LAD - 1000H High voltage clamp adaptor