YOKOGAWA

Compact & Solid

Cost-effective Digital Sampling Power Analyzer

Digital Power Meter

WT200/WT130

- Fundamental accuracy of 0.2% (WT200) or 0.25% (WT130)
- DC measurement, 10 Hz to 50 kHz frequency band
- Compact design (half-rack size)
- MAX hold function (WT200)
- Built-in 5 mA range for measuring small current (WT200)
- Built-in harmonic analysis function (optional)
- Comparator function (optional) for GO/NO-GO judgement
- User calibration (by remote communication or manually)
- Sensor input(optional) for use with external current clamps and shunts

Measure anything from low standby power to rated power with a single WT200.

– Built-in wide input range of 5 mA to 20 A with WT200 –

Features of WT200

● Built-in small input range from 5 mA

The WT200's 5 mA range enables currents as low as 25µA to be measured, making it ideal for measuring small currents of intermittently controlled equipment. Furthermore, the wide current range extends from 5 mA to 20 A, so a single WT200 can measure everything from the standby power to the rated power of a device.

● MAX hold function

The maximum display values for voltage and current peak values, voltage and current rms values, active power, apparent power, or reactive power are held on the LED display. This is handy for evaluating in-rush currents or measuring the maximum consumed power resulting from load fluctuations.

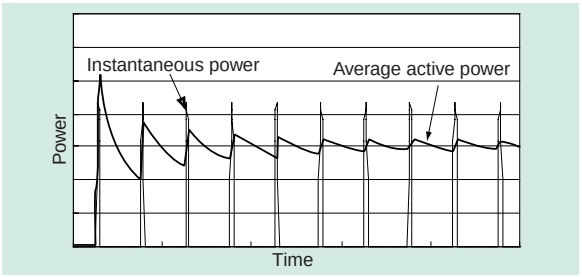
● Integrating time of one second to 10,000 hours

The integrating time can be set from one second to 10,000 hours in units of one second, thus allowing flexible analysis of a short time or within a specific period.

● Display of average active power

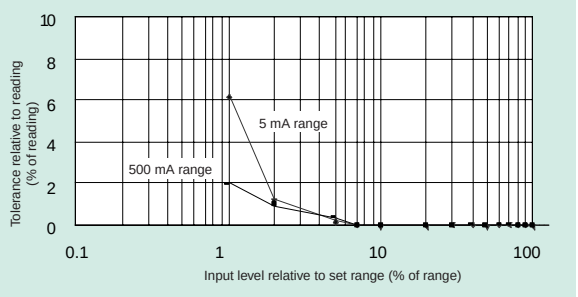
Intermittently controlled equipment intended for reducing power consumption has periods of activity and inactivity (standby), so the power value changes significantly each time the display is updated. The WT200 can display the average active power determined from the integrated power, so the integrated power of intermittently controlled equipment can be measured.

Average active power (W) =Integrated power (Wh)/Integrated elapsed time (hour)



WT200

● Example of current measurement error tolerance of WT200 (5 mA/500 mA ranges)



Basic Power Measurement Functions & Optional Functions for Broader Applications

– Outstanding Functionality and Portability –

Features of WT200/WT130

● DC Measurements

The WT200 and WT130 can measure DC, and so half-wave rectified signals containing DC components or intermittent signals can be measured without considering the input signals.

● Compact Design, Large LED Display

The ultra-compact case design allows two models to be rack-mounted side by side. And the low weight of just 3 kg for the WT200 or 5 kg for the WT130 makes light work when using the devices in the field. The new large LED display also greatly improves readability.

● Four Arithmetic Operations and Crest Factor Function

Voltage and Current Crest Factor, and the results of four arithmetic operations from the measured values of Displays A & B can be displayed on Display C. The WT130 can also calculate Efficiency.

● Storage/Recalling of Measured Data and Setting Information

Measured data can now be stored while on-site thanks to an internal memory. Data of about 600 measurements can be stored in the WT200 single-input-element model, or data of about 200 measurements in the WT130 three-input-element model. Stored data can also be read from the memory and displayed on the LED display. And up to four setting patterns can be stored.

● Bi-directional Integration function

The WT200 and WT130 are perfect for evaluating battery-operated equipment and motor-driven machines that regenerate power. This function integrates current or power in both the positive and negative directions independently.

● Harmonic Analysis Function (Optional)

Despite their low cost, the WT200/WT130 can be equipped with a harmonic analysis function for calculating and displaying voltage, current, active power, harmonic contents ratio, and phase angle relative to the fundamental signal up to the 50th order, making these power meters ideal for power supplies.

● Current Sensor Input (Optional)

The WT200/WT130 can be equipped with either a shunt input range (50/100/200 mV) or sensor input voltage range (2.5/5/10 V). The use of a current clamp allows current measurements without disconnecting the wiring of the power circuit.

● Four-channel Comparator & D/A Output (Optional)

4-channel D/A outputs can be included in addition to the 4 sets of relay contact outputs (normally opened and normally closed contacts in pairs) used to judge GO/NO-GO in production or inspection lines.

WT130

Comparison between WT200 and WT130

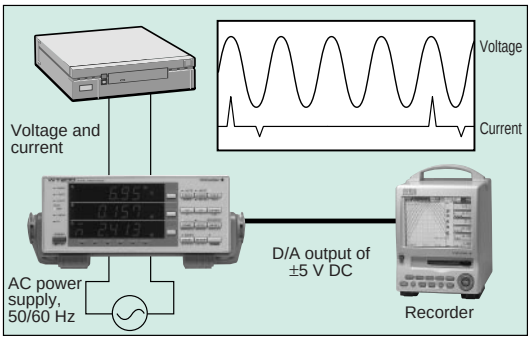
	WT200	WT130
Number of inputs	Single input element	Two or three input elements
Fundamental voltage/current accuracy	±(0.15% of rdg + 0.1% of rng)	±(0.2% of rdg + 0.1% of rng)
Fundamental power accuracy	±(0.2% of rdg + 0.1% of rng)	±(0.25% of rdg + 0.1% of rng)
Voltage range	15/30/60/150/300/600 [V]	15/30/60/150/300/600 [V]
Current range	5/10/20/50/100/200[mA] 0.5/1/2/5/10/20 [A]	0.5/1/2/5/10/20 [A]
DC measurement	Available	Available
Frequency range	DC, 10 Hz to 50 kHz	DC, 10 Hz to 50 kHz
Peak measuring function	Standard	Standard
MAX hold function	Standard	Not available
Display of average active power	Standard	Not available
Setting of integrating time	1 sec. to 10,000 hr (units of 1 sec.)	1 min. to 999 hr 59 min. (units of 1 min.)
Harmonic analysis function	Available (optional)	Available (optional)

Applications and Characteristics

Measurement of Small Current and Power of Home Appliances (WT200)

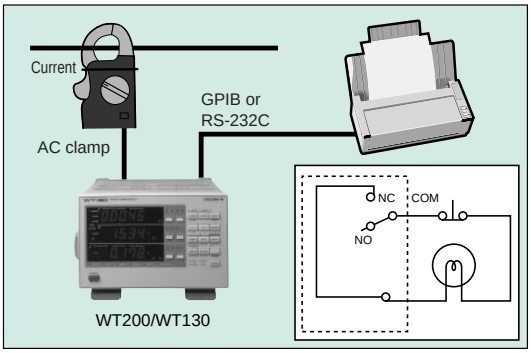
The power consumption of home appliances such as video-cassette recorders and TV sets is progressively being reduced, not only during operation but also on standby. With its low current range*1, the WT200 can precisely measure small (standby) current and power. Also, the D/A output function*2 allows measured data of voltage, current, power, etc. to be recorded in a recorder or other units.

*1 Current range of 200 mA or below (5/10/20/50/100/200 mA) is available only in the WT200.
*2 When the D/A output function is added, the WT200 has 4 D/A output channels; the WT130 has 12 D/A output channels.

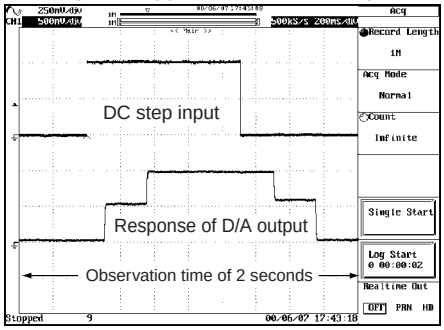


Measurements of Harmonic Current Using a Clamp Sensor

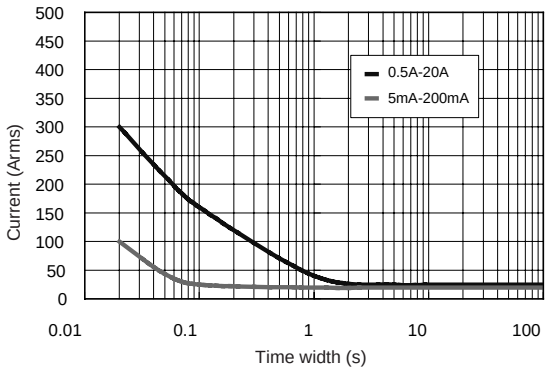
The WT200/WT130 can be equipped with an external sensor input for measuring current with a clamp sensor. This allows current to be measured in the field without releasing connections. The harmonic analysis function allows current components of up to the 50th order to be analyzed.
Data of voltage, current, and harmonic components can be output to an external printer thanks to the communication function. The comparator function (maximum of 4 channels) enables GO/NO-GO judgement of products to be made.



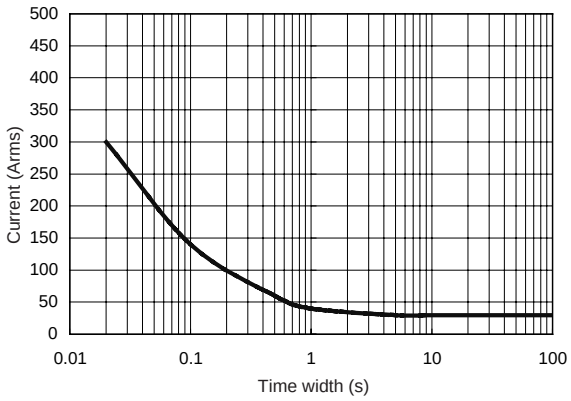
Example of Application of D/A Output



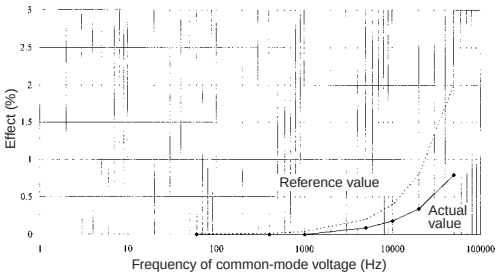
Example of Surge Withstand Characteristics for Current Input of WT200



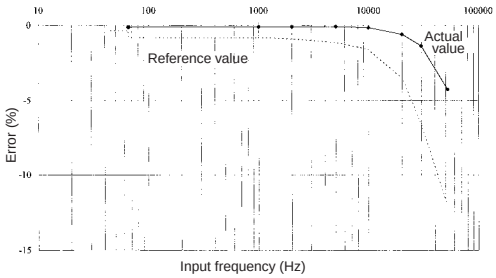
Example of Surge Withstand Characteristics for Current Input of WT130



Influence of Common-mode Voltage on the Reading



Accuracy Characteristics of Frequency - Power



Specifications

Input

Item	Voltage V	Current A
Input circuit type	Floating input	
	Resistance voltage divider	Shunt input
Rated inputs (range)	15/30/60/150/300/600V	Direct input: 5/10/20/50/100/200 mA (for WT200 only) 0.5/1/2/5/10/20 A (for WT200/WT130) External input (optional): 2.5/5/10 V or 50/100/200 mV
Equipment loss (input resistance)	Input resistance: Approx. 2 MΩ, Input capacitance: Approx. 13 pF	Direct input: Approx. 6 mΩ + approx. 0.1 μH (0.5 to 20 A, WT200/WT130),Approx. 500 mΩ (5 mA to 200 mA, WT200) External input: 2.5/5/10 V - approx. 100 kΩ or 50/100/200 mV - approx. 20 kΩ
Instantaneous maximum allowable input for one cycle, 20 ms	Peak voltage of 2.8 kV or rms of 2.0 kV, whichever is less	0.5 to 20 A (WT200/WT130): Peak current of 450 A or rms of 300 A, whichever is less 5 to 200 mA (WT200): Peak current of 150 A or rms of 100 A, whichever is less For external input, the peak value is equal to or less than 10 times range.
Instantaneous maximum allowable input for 1 sec.	Peak voltage of 2.0 kV or rms of 1.5 kV, whichever is less	0.5 to 20 A (WT200/WT130): Peak current of 150 A or rms of 40 A, whichever is less 5 to 200 mA (WT200): Peak current of 30 A or rms of 20 A, whichever is less For external input, the peak value is equal to or less than 10 times range.
Continuous maximum allowable input	Peak voltage of 1.5 kV or rms of 1.0 kV, whichever is less	0.5 to 20 A (WT200/WT130): Peak current of 100 A or rms of 25 A, whichever is less (WT200) Peak current of 100 A or rms of 30 A, whichever is less (WT130) 5 to 200 mA (WT200): Peak current of 30 A or rms of 20 A, whichever is less For external input, the peak value is equal to or less than 5 times range.
Continuous maximum common-mode voltage (at 50/60 Hz input)	600 Vrms (with the output connector protective cover used) CAT II, 400 Vrms (with the output connector protective cover removed) CAT II	
Common-mode rejection ratio at 600 Vrms between input terminal and case	With voltage input terminals short and current input terminals open, 50/60 Hz, -80 dB or more (±0.01% of range or less) Reference value: 50 kHz max., ±{(maximum range rating)/(range rating) × 0.001 × 1% of rng} or less (voltage range, 0.5 A to 20 A current range) ±{(maximum range rating)/(range rating) × 0.0002 × 1% of rng} or less (WT200, 5 mA to 200 mA range) 0.01% or more. The unit of "f" is kHz.	
Input terminals	Binding posts	Direct input: Large binding posts, External input: Safety terminals
A/D conversion	Simultaneous conversion of voltage and current inputs, Resolution: 12 bits, Maximum conversion rate: Approx. 26 μs (at approx. 38 kHz)	
Range switching	Range can be selected manually, automatically, or by communication control.	
Automatic range switching	Range up: When the measured value exceeds 110% of the rated range or the peak value exceeds approximately 300% of the rated range Range down: When the measured value becomes less than 30% of the rated range and the peak value is less than approximately 300% of the subordinate range	
Measurement mode switching	One of the following modes can be set (manually or by communication control): RMS: True RMS measurements for both voltage and current; V MEAN: Rectified mean calibrated to an RMS sine wave measurement for voltage, and true RMS measurement for current; DC: Mean value measurement for both voltage and current	

Notes: Direct input and external sensor input of current cannot be used simultaneously. When the input is switched for use, note that the ± terminals are shared.

Measurement Functions

Item	Voltage/current	Active power
Method	Digital sampling method and summation averaging method	
Frequency range	DC, 10 Hz to 50 kHz	
Crest factor	"3" at rated input	
Display accuracy Accuracy (within 3 months after calibration) Conditions: Temperature: 23 ± 5°C Humidity: 30 to 75% R.H. Supply voltage: 100 V ± 5% Input waveform: Sine wave Common-mode voltage: 0 V DC Filter: ON at 200 Hz or less Scaling: OFF After CAL is performed, accuracy is assured by YOKOGAWA calibration system. Note: The unit of "f" in accuracy expressions is kHz.	DC: ± (0.2 % of rdg + 0.2 % of rng)* 10Hz ≦ f < 45Hz : ± (0.3 % of rdg + 0.2 % of rng) 45Hz ≦ f ≦ 66Hz : ± (0.15 % of rdg + 0.1 % of rng) 66Hz < f ≦ 1kHz : ± (0.3 % of rdg + 0.2 % of rng) 1kHz < f ≦ 10kHz : ± (0.2 % of rdg + 0.3 % of rng) ± {(0.05 ×)% of rdg} 10kHz < f ≦ 20kHz ± (0.5 % of rdg + 0.5 % of rng) ± [{0.15 × (f-10)}% of rdg] Reference value 20kHz < f ≦ 50kHz : ± (0.5 % of rdg + 0.5 % of rng) ± [{0.15 × (f-10)}% of rdg] *DC: ±0.2% of range is added if the 0.5/1 A range is selected (WT130 only)	DC: ± (0.3 % of rdg + 0.3 % of rng)* 10Hz ≦ f < 45Hz : ± (0.5 % of rdg + 0.3 % of rng) 45Hz ≦ f ≦ 66Hz : ± (0.2 % of rdg + 0.1 % of rng)(WT200) ± (0.25 % of rdg + 0.1 % of rng)(WT130) 66Hz < f ≦ 1kHz : ± (0.5 % of rdg + 0.3 % of rng) 1kHz < f ≧ 10kHz : ± (0.3 % of rdg + 0.5 % of rng) ± {(0.08 × f)% of rdg} 10kHz < f ≦ 20kHz : ± (0.8 % of rdg + 0.8 % of rng) ± [{0.19 × (f-10)}% of rdg] Reference value 20kHz < f ≦ 50kHz : ± (0.8 % of rdg + 0.8 % of rng) ± [{0.25 × (f-10)}% of rdg] *DC: ±0.2% of range is added if the 0.5/1 A range is selected (WT130 only)
Effect of power factor Note: The unit of "f" in accuracy expressions is kHz.	———	cosφ = 0 45 Hz ≦ f ≦ 66 Hz: Add ±0.25% of range to display accuracy. Reference data (50 kHz max.): ±{(0.23 + 0.4 x f)% of rng} 1 > cosφ > 0 Add the value of the influence of cosφ = 0 times tanφ to display accuracy. Note that φ represents the phase angle between voltage and current.
Effective input range	For the input range of 10% to 110%, the above specified accuracy is valid. For the input range of 110% to 130%, the above specified reading accuracy increased by 0.5 times is added to the accuracy.	
Accuracy (within 12 months after calibration)	The above specified reading accuracy increased by 0.5 times is added to the accuracy (within 3 months after calibration).	
Temperature coefficient	±0.03% of range/°C at 5 to 18°C and 28 to 40°C	
Display update rate	4 times/s	

Note: "rdg" means reading and "rng" means range.

Frequency Measurement

Input: One of V1, V2, V3, A1, A2, and A3 is selected.
Operating principle: Reciprocal counting method
Frequency range: 10 Hz to 50 kHz
Accuracy: ±(0.1% of rdg + 1 digit)
Minimum input is more than 30% of rated range.
When an input frequency is less than 200 Hz, FILTER must be ON to obtain the specified accuracy.
Minimum input frequency is more than 20% of frequency measurement range.

Communication

Either GP-IB or RS-232-C is selected.
GP-IB
Electrical and mechanical specifications: IEEE Std. 488-1978 (JIS C 1901-1987)
Functional specifications: SH1, AH1, T5, L4, SR1, RL1, PR0, DC1, DT1, C0
Protocol: IEEE Std. 488.2-1987
Code used: ISO (ASCII) code
Address: 0 to 30 talker/listener addresses are settable.
RS-232-C
Transmission mode: Start-stop synchronization
Baud rate: 75, 150, 300, 600, 1200, 2400, 4800, 9600 bps

		Active power (W)	Apparent power (VA)	Reactive (var)	Power factor (PF)	Phase angle (deg)
Computation	1-phase 2-wire	W	$VA=V\times A$	$\sqrt{(VA)^2-W^2}$	$\frac{W}{VA}$	$\cos^{-1}(\frac{W}{VA})$
	1-phase 3-wire	W_i i=1, 3 $\Sigma W = W_1+W_3$	$VA_i=V_i\times A_i$ i=1, 3 $\Sigma VA = VA_1+VA_3$	$var_i=\sqrt{(VA_i)^2-W_i^2}$ i=1, 3 $\Sigma var = var_1+var_3$	$PF_i=\frac{W_i}{VA_i}$ i=1, 3 $\Sigma PF=\frac{\Sigma W}{\Sigma VA}$	$\varphi_i=\cos^{-1}(\frac{W_i}{VA_i})$ i=1, 3 $\Sigma\varphi=\cos^{-1}(\frac{\Sigma W}{\Sigma VA})$
	3-phase 3-wire (two-power-meter method)	W_i i=1, 3 $\Sigma W = W_1+W_3$	$VA_i=V_i\times A_i$ i=1, 3 $\Sigma VA=\frac{\sqrt{3}}{2}\times(VA_1+VA_3)$	$var_i=\sqrt{(VA_i)^2-W_i^2}$ i=1, 3 $\Sigma var = var_1+var_3$	$PF_i=\frac{W_i}{VA_i}$ i=1, 3 $\Sigma PF=\frac{\Sigma W}{\Sigma VA}$	$\varphi_i=\cos^{-1}(\frac{W_i}{VA_i})$ i=1, 3 $\Sigma\varphi=\cos^{-1}(\frac{\Sigma W}{\Sigma VA})$
	3-phase 3-wire (three-power-meter method)	W_i i=1, 2, 3 (Note that W_2 does not have physical meaning.) $\Sigma W = W_1+W_3$	$VA_i=V_i\times A_i$ i=1, 2, 3 $\Sigma VA=\frac{\sqrt{3}}{3}\times(VA_1+VA_2+VA_3)$	$var_i=\sqrt{(VA_i)^2-W_i^2}$ i=1, 2, 3 $\Sigma var = var_1+var_3$	$PF_i=\frac{W_i}{VA_i}$ i=1, 2, 3 $\Sigma PF=\frac{\Sigma W}{\Sigma VA}$	$\varphi_i=\cos^{-1}(\frac{W_i}{VA_i})$ i=1, 2, 3 $\Sigma\varphi=\cos^{-1}(\frac{\Sigma W}{\Sigma VA})$
	3-phase 4-wire	W_i i=1, 2, 3 $\Sigma W = W_1+W_2+W_3$	$VA_i=V_i\times A_i$ i=1, 2, 3 $\Sigma VA = VA_1+VA_2+VA_3$	$var_i=\sqrt{(VA_i)^2\times W_i^2}$ i=1, 2, 3 $\Sigma var = var_1+var_2+var_3$	$PF_i=\frac{W_i}{VA_i}$ i=1, 2, 3 $\Sigma PF=\frac{\Sigma W}{\Sigma VA}$	$\varphi_i=\cos^{-1}(\frac{W_i}{VA_i})$ i=1, 2, 3 $\Sigma\varphi=\cos^{-1}(\frac{\Sigma W}{\Sigma VA})$
Computing range		Depends on selected V and A ranges.	Depends on selected V and A ranges.	Same as apparent power (var ≧ 0)	–1 to 0 to 1	–180 to 0 to 180
Display resolution		9999*	9999*	9999*	± 1.000*	± 180.0
Computing accuracy (relative to the value calculated from measured values)		—	±0.005% of VA range	±0.005% of var range	0.0005	Resolution (power factor ±0.0005)

Note 1: The apparent power (VA), reactive power (var), power factor (PF), and phase angle (deg) measurements in this instrument are computed digitally from the voltage, current, and active power. If the input is non-sinusoidal, the measured values may differ from those obtained with instruments employing different measurement principles.

Note 2: When the current or voltage is less than 0.5% of the range, VA and var will be displayed as 0, and PF/deg will be displayed as an error.

Note 3: The Lead and Lag are displayed for V and A input at 50% or more of the rated range. The detected lead/lag accuracy is ±5 degrees over the frequency range of 20 Hz to 2 kHz.

Note 4: In a Σvar calculation, the var value of each phase is calculated as a negatively signed value when the phase of the current input is advanced with respect to the voltage input, and is calculated as a positively signed value when the phase is lagging.

* The WT200 can provide 5-digit display (note that the resolution is 20000).

Display Function

Display type: 7-segment LED
Number of displays: 3

Display	Displayed value	Maximum Reading
A	V, A, W, VA, var (each element), elapsed integrating time	V, A, W: 9999
B	V, A, W, PF, deg (each element), % (contents ratio in %, THD)	Wh, Ah: 999999
C	V, A, W, V · AHz, ±Wh, ±Ah (each element), Vpk, Apk, MATH	V, AHz : 9999

* In the WT200 either 4 or 5 digits for display can be selected.

Unit: m, k, M, V, A, W, VA, var, Hz, h±, deg, %
Display update rate: 4 times/s
Response time: Approx. 0.5 s (time for displayed value to settle within specified accuracy of final value after step change from 0% to 10% or 100% to 0% of rated range)
Display scaling function
  Significant digits: Selected automatically according to significant digits in the voltage and current ranges
  Setting range: 0.001 to 9999 (WT200), 0.001 to 1000 (WT130)
Averaging function:
  Either of the following two algorithms can be selected:
  Exponential averaging
  Moving averaging
  Response can be set; for exponential averaging, the attenuation constant can be selected and for moving averaging, the number of averages (N) can be set to 8, 16, 32, or 64.
Peak over-range display
  The alarm LED will light up if the rms value is greater than 140% of the range or the peak value is greater than 300% of the range.
MAX hold function (WT200 only)
  Capable of storing the maximum values for V, A, W, VA, var, Vpk, and Apk.

MATH function
  Method: When the DISPLAY C function is set to MATH, the efficiency (WT130 only) and input crest factor can be measured, and the results of four arithmetic operations of measured values can be displayed on Displays A and B as well as the average active power after time-conversion of integrating power (WT200 only).

Integrator Function

Display resolution: Depending on integrated value, the resolution will be changed (for WT200).
  Depending on elapsed time value, the resolution will be changed (for WT130).
Maximum display: –99999 to 999999 MWh/MAh
Modes: Standard integration mode (timer mode)
  Continuous integration mode (repeat mode)
  Manual integration mode
Timer: When the timer is set, integration will be stopped automatically.
  Setting range: 000 h:00 min:00 sec to 10000 h:00 min:00 sec (WT200)
  Setting range: 000 h:00 min to 999 h:59 min (WT130)
  (When set time is 0, the manual integration mode is automatically selected.)
Type: Standard type Adds active power and current value of normal measurements.
  Advanced type (WT200 only) Integrates active power and current values in short time intervals, not depending on input signal period.
Count overflow: If the integration count exceeds 999999 MWh/MAh or -999999 MWh/MAh, integration stops and the elapsed time is held on the display.
Accuracy: ± (display accuracy + 0.2% of rdg)
Timer accuracy: ±0.02%
Remote control: Start, stop, and reset can be remotely controlled by an external contact signal. Note that this is available only when the /DA4 or /DA12 option has been installed.

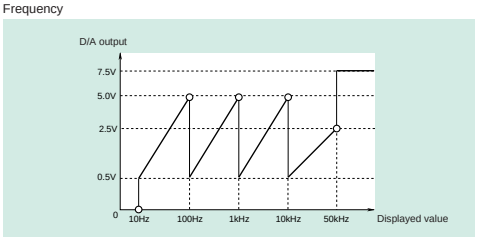
Internal Memory Function

Measurement data: Number of data that can be stored: WT200 (253421): 600 blocks
  WT130 (253502): 300 blocks
  WT130 (253503): 200 blocks
  Writing interval: 250 ms, or 1 s to 99 h:59 min:59 sec
  Reading interval: 250 ms, or 1 s to 1 h (both intervals can be set in units of second)
Panel setup information: Four-pattern information can be written/read.

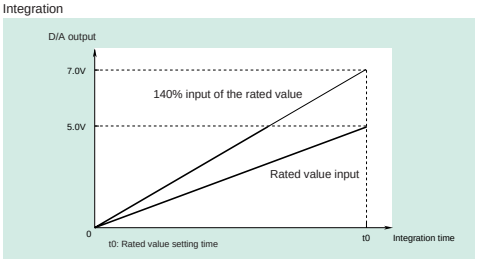
D/A Converter (Optional)

Output voltage: ±5 V DC FS (approx. ±7.5 V maximum) at rated value or range
Number of output channels: 12 when the /DA12 option is installed; 4 when the /DA4 option is installed
Output data selection: Can be selected for each channel.
Accuracy: ± (display accuracy + 0.2% of range)
Update rate: Same as display update rate
Temperature coefficient: ±0.05% of f.s./°C
Output format

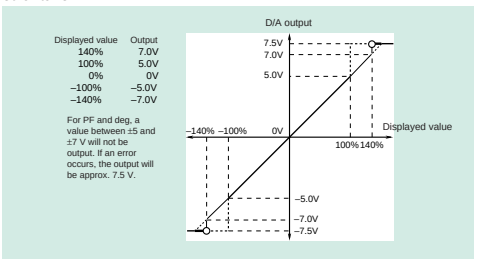
Frequency



Integration



Other items



External Input (Optional)

Either /EX1 or /EX2 can be selected as a voltage-output-type current sensor.

/EX1:	2.5/5/10 V
/EX2:	50/100/200 mV
Specifications:	See the “Input” item.

Comparator Output (Optional)

Output method:	Normally open and normally closed relay contact outputs (in pairs)
Number of output channels and channel setup:	4 (settable for each channel)
Contact capacity:	24 V/0.5 A
D/A output (4 channels):	See the “D/A Converter (Optional)” item.

External Control and Input Signals (only when the D/A or /CMP option has been installed)

External control and input/output signals:
EXT-HOLD, EXT-TRIG, EXT-START, EXT-STOP, EXT-RESET, INTEG-BUSY
Note: That the /DA4 or /DA12 option must be installed.
Note: Only EXT-HOLD and EXT-TRIG are available when the / CMP option has been installed.

Input level: TTL negative pulse

General Specifications

EMI standard:	EN55011 Group 1 Class A EN50082-2: 1995
Safety standards:	EN61010-1 Overvoltage Category II Pollution degree 2
Warm-up time:	Approx. 30 min.
Operating temperature and humidity range:	5 to 40°C, 20 to 80% R.H. (no condensation)
Storage temperature:	–25 to 60°C (no condensation)
Operating altitude:	2000 m or less
Insulation resistance:	Between voltage input terminals and case Between current input terminals and output terminals Between voltage input terminals and current input terminals Between voltage input terminals of each element Between current input terminals of each element Between voltage input terminals and power plug Between current input terminals and power plug Between case and power plug The above values must be 50 MΩ or more at 500 V DC.
Withstanding voltage:	Between voltage input terminals and case Between current input terminals and output terminals Between voltage input terminals and current input terminals Between voltage input terminals of each element Between current input terminals of each element Between voltage input terminals and power plug Between current input terminals and power plug The above values must be 3700 V for 1 minute at 50/60 Hz. Between case and power plug: 1500 V for 1 minute at 50/60 Hz
Power supply:	Any power supply voltage between 100 and 240 V; frequency: 50/60 Hz
Vibration test conditions:	Sweep test - Frequency: 8 to 150 Hz sweep, all three directions for 1 minute Endurance test - Frequency: 16.7 Hz, all three directions; amplitude of 4 mm for 2 hr
Impact conditions:	Impact test: Acceleration of 490 m/s^2, all three directions Free-fall test - Height:100 mm, 1 time for each of four sides
Power consumption:	WT200: 35 VA max., WT130: 50 VA max. (for power supply of 240 V) WT200: 25 VA max., WT130: 32 VA max. (for power supply of 100 V)
External dimensions:	WT200: Approx. W × H × D: 213 × 88 × 350 (mm) (not including projections) 8-3/8 × 3-1/2 × 13-3/4 (inch) (not including projections) WT130: Approx. W × H × D: 213 × 132 × 350 (mm) (not including projections) 8-3/8 × 5-3/16 × 13-3/4 (inch) (not including projections)
Weight:	WT200: Approx. 3.0 (kg), 6.6 (lbs.) WT130: Approx. 5.0 (kg), 11.0 (lbs.)
Accessories:	Power cord: UL/CSA, VDE, SAA or BS standard, 1 pc.

Harmonic Analysis Function (Optional)

Method:	Synchronization to the fundamental frequency by using a phase locked loop (PLL) circuit
Frequency range:	Fundamental frequency between 40 Hz and 440 Hz
Display resolution:	9999 (WT130), 9999 or 20000 (WT200)
Items analyzed:	V, A, W, deg (WT200); V1, V2, V3, A1, A2, A3, W1, W2, W3, deg1, deg2, deg3 (WT130), each harmonic component, total Vrms, total Arms, total active power, PF of the fundamental wave, phase-angle of fundamental wave, total harmonic distortion ratio in %, and contents ratio in %

Note that simultaneous analysis can be made for one specified input mode.
Sampling speed/method:
The sampling speed depends on the fundamental frequency to be input:

Input frequency range	Sampling frequency	Window up to the n'th harmonic	Order
40≦f<70Hz	f×512Hz	1 period of f	50
70≦f<130Hz	f×256Hz	2 period of f	50
130≦f<250Hz	f×128Hz	4 period of f	50
250≦f≦440Hz	f×64Hz	8 period of f	30

FFT number of points:	512 points FFT
FFT calculation accuracy:	32 bits
Window:	Rectangular window
Display update interval:	Approx. 3 sec.
Accuracy:	±0.2% of range is added to the normal display accuracy.

■ Model and Suffix Codes

Model	Suffix Code	Description	
253421		WT200, 1-input element model	
Power cord	-D	UL/CSA standard	
	-F	VDE standard	
	-R	SAA standard	
	-Q	BS standard	
Optional features	/C1	GP-IB communication function	Select one.
	/C2	RS-232-C communication function	
	/EX1	External input 2.5/5/10 V	Select one.
	/EX2	External input 50/100/200 mV	
	/HRM	Harmonic analysis function	
	/DA4	4-channel D/A output	Select one.
	/CMP	Comparator & D/A, each of 4 channels	

Note: The WT200 communication feature cannot be modified or provided later after delivery of the product.

Model	Suffix Code	Description	
253502		WT130, 2-input element model	
253503		WT130, 3-input element model	
Interface	-C1	GP-IB communication function	Select one.
	-C2	RS-232-C communication function	
Supply voltage	-0	Any power supply voltage between 100 and 240 V	
Power cord	-D	UL/CSA standard	
	-F	VDE standard	
	-R	SAA standard	
	-J	BS standard	
Optional features	/EX1	External input 2.5/5/10 V	Select one.
	/EX2	External input 50/100/200 mV	
	/HRM	Harmonic analysis function	
	/DA12	12-channel D/A output	Select one.
	/CMP	Comparator & D/A, each of 4 channels	

■ Wiring and Model

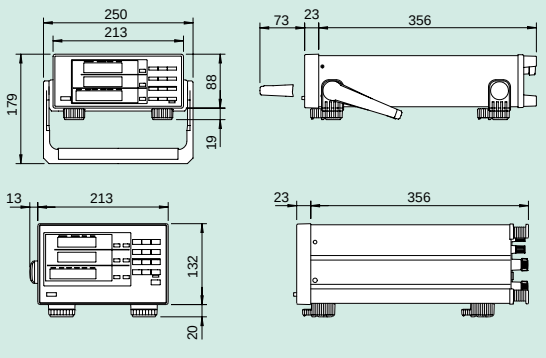
Wiring \ Model	253421	253502	253503
Single-phase, 2-wire	○	○	○
Single-phase, 3-wire	-	○	○
Three-phase, 3-wire (2-power-meter method)	-	○	○
Three-phase, 3-wire (3-power-meter method)	-	-	○
Three-phase, 4-wire	-	-	○

■ Accessories

Name	Model or Part Number	Specifications	Order Quantity
Rack-mount kit	751533-E2	Single-mounted WT200 for EIA	1
Rack-mount kit	751533-J2	Single-mounted WT200 for JIS	1
Rack-mount kit	751534-E2	Dual-mounted WT200 for EIA	1
Rack-mount kit	751534-J2	Dual-mounted WT200 for JIS	1
Rack-mount kit	751533-E3	Single-mounted WT130 for EIA	1
Rack-mount kit	751533-J3	Single-mounted WT130 for JIS	1
Rack-mount kit	751534-E3	Dual-mounted WT130 for EIA	1
Rack-mount kit	751534-J3	Dual-mounted WT130 for JIS	1

■ External Dimension

Unit: mm



Related Products

■ WT2010/WT2030 Digital Power Meter

Enhanced power meter, incorporating a total harmonic analysis function conforming to the IEC standard.

- Outstanding performance: 0.03%/DC, 2 Hz to 500 kHz
- High accuracy: 0.08% (45 to 66 Hz)
- Total harmonic current/Flicker conforming to IEC1000-3-2 and -3 can be measured.

■ WT1010/WT1030/WT1030M Digital Power Meter

General-purpose mid-class models suitable for a wide range of applications

- Frequency response: DC, 0.5 Hz to 300 kHz
- High accuracy: 0.2% (45 to 66 Hz)
- Overall efficiency of a motor can be measured by using the motor evaluation function (only WT1030M).

■ PZ4000 Power Analyzer

New concept power meter capturing power fluctuations as waveforms

- Frequency response: DC to 2 MHz
- Sampling speed: 5 MS/s maximum
- Fundamental power accuracy: ±(0.1% of rdg + 0.025% of rng)
- Voltage and current waveform display and analysis function
- Motor evaluation function (when equipped with 253771 module)

■ DL708E/DL716 Digital Scope

For simultaneous measurement of voltage, temperature, distortion, and logic

- Inputs of up to 8 analog channels (DL708E)/16 analog channels + 32 logic bits (DL716)
- Eight types of mixed plug-in input units
- Record length of 64M words maximum (DL716's 16M words/ch. model)
- Built-in HDD (optional)

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