

WT300 SERIES

DIGITAL POWER METER

THE 5TH GENERATION OF THE WORLD'S BEST SELLING POWER METER



High Performance and Reliability

- Basic Accuracy of 0.1% of Reading
- Low Current Measurement down to 50 micro-Amps
- DC, 0.5 Hz to 100 kHz Frequency Range
- Standard USB, and GPIB or RS232 Interfaces

For more information, go to

tmi.yokogawa.com

Test & Measurement Instruments



 3-Year Warranty 

Bulletin WT300-01EN

Yokogawa's new compact WT300 series for reliable power measurement

The WT300 series is the 5th generation of Yokogawa's compact power meter portfolio. The world's best selling power meter is the power meter of choice in multiple industries from production lines to R&D applications.



WT310(1ch)



WT310HC(1ch, MAX40A)



WT332(2ch)/WT333(3ch)

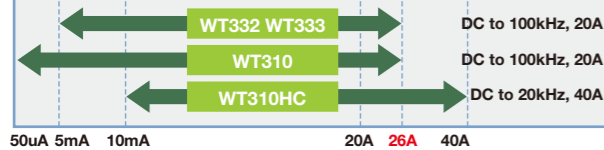
Wide current input range with high performance and reliability

Wide current input ranges

The WT300 series offers customers a wide range of current inputs from a few mA right up to 40Arms. It can measure both AC and DC.

Ranges
15.000 to 600.00V
0.5000A to 20.000A
5.0000mA to 20.000A
1.0000A to 40.000A

Current range by model



Simultaneous measurement of all parameters

A WT300 series can measure all DC and AC parameters. It can also measure harmonics and perform integration simultaneously without changing the measurement mode. The WViewerFreePlus software is used to monitor and save all these parameters.



Example of WViewerFreePlus display

Fast display and data update rate

The fast display and 100ms maximum data update rate of the WT300 series offers customers a short tact time in their testing procedures. Consistent Basic Measurement Accuracy for all input ranges.

0.1% of reading + 0.1% of range (50Hz/60Hz)

Convenient measurement functions

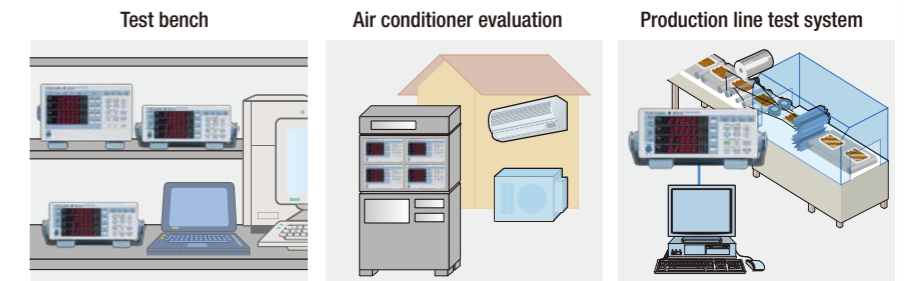
- **MAX hold function**
The maximum values of RMS/PEAK voltage & current active power, reactive power and apparent power can be held.
- **Line filter and frequency filter capability**
These filter functions will cut off unnecessary noise & harmonic components for fundamental waveform measurements.

PC, Data Logger and External Sensors connectivity

The WT300 series offers a wide range of communication interfaces such as USB, GP-IB or RS-232 (Selectable) and Ethernet (Optional).

Customers therefore have the flexibility to choose according to their application needs e.g. from production lines to engineering test benches. Customers can use WViewerFreePlus software to set up all kinds of measurements. Additionally, the numeric values, waveform display* and trend graphs of the measurement data can be displayed and saved.

* Waveform display requires the /G5 Harmonic option

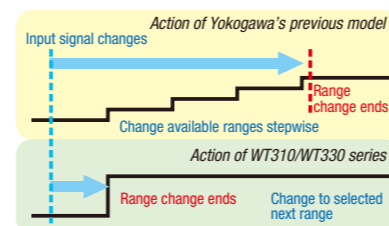


First in Class* and First in Industry*

First in class : Auto ranging function available in selected ranges

The auto-range function is used to select/change the range automatically in specific ranges. This results in shorter range changing times and thus quicker and more efficient testing.

Image of Range skip (configuration) function operation



First in industry : Integration measurement auto ranging function

Conventionally, when power meters operate in an integration mode to measure power consumption and standby power, the measuring ranges need to be fixed. However, if the level of the input exceeds the maximum of the selected range, the results will be incorrect and the test will need to be repeated with higher ranges applied.

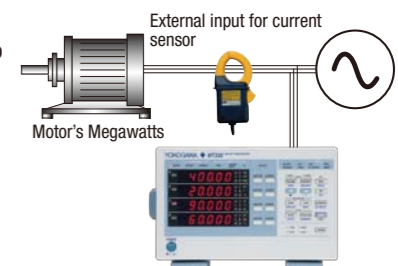
The WT300 series has a high speed automatic ranging capability in integration mode which removes this need to repeat the test and integration is continuous and accurate.

This function is not only available for +/- Wh but also for Ah and DC current.



Current sensor input

Customers have the option to select either 2.5V to 10V range (/EX1 option) or 50mV to 2V range (/EX2 option) inputs for measuring large currents using current clamps or current sensors with voltage outputs.



* According to YOKOGAWA survey by Dec, 2012

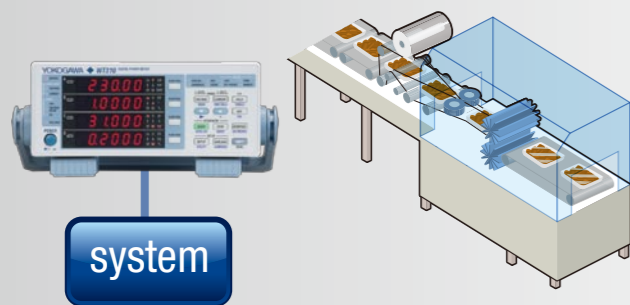
WT300 power meters are easy to use, cost effective and accurate for a wide range of applications in Production, Testing, Evaluation and R&D.

For Home appliances and Office equipment

Production line or QA testing of electric Devices

- Compact half rack mount size helps customers build smaller test systems with a better Return on Investment (ROI).
- D/A output function for data recording
- Multiple communication interfaces. USB, RS-232 or GP-IB and Ethernet capability.

The simultaneous measurement of power consumption parameters such as U, I, P, frequency, Power Factor and Harmonics for production line or QA testing results in reduced tact times. Thus testing is faster and cheaper. The DA output and communication interfaces enable data to be remotely and flexibly captured.

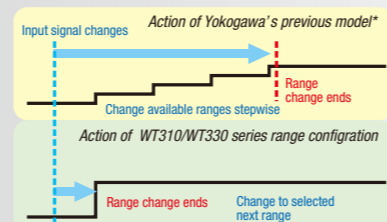


Development and evaluation tool for home appliances

- 5mA range helps small current measurement (WT310)
- Auto ranging function under Integration mode
- Range skip (range configuration) function provides the ability to select the usable ranges in advance. Auto ranging enables the WT300 series to rapidly adapt to changing input conditions.

The range skip function reduces the range change transition period. The WT310 can measure both large and small currents accurately in a single test. This can reduce the total evaluation period or removes the need to use two rather than one power meters for the application, thereby saving capital cost.

Image of range configuration function for WT300 series



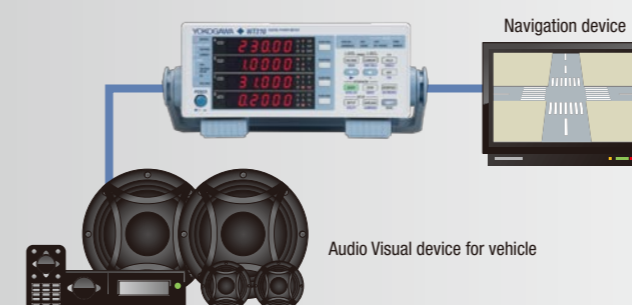
* Comparison with Yokogawa's previous model WT210/WT230

For Industrial equipment and Transportation

Automotive - Battery or DC driven device evaluation

- Accurate DC measurement: 0.3% total (WT310HC: 0.5% total)
- Direct high current measurement up to 40A without any external current sensor (WT310HC).
- Charge/Discharge (+/-Wh, +/-Ah) energy measurement for batteries

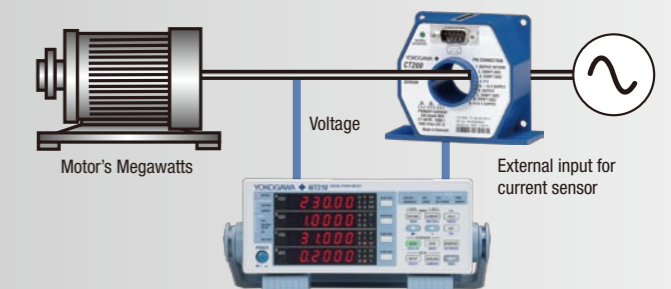
The WT310HC can measure currents up to 40A directly. This provides a cost effective and accurate method for testing DC driven devices in vehicles without having to use extra sensors.



Duration testing and efficiency measurement for industrial motors and rotating machinery

- Integration measurement for long period
- D/A output function for data recording
- DC, 0.5Hz to 100kHz broad bandwidth capability

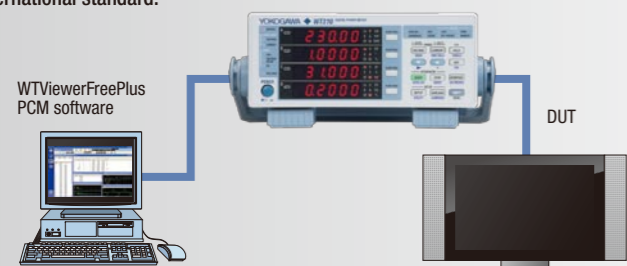
The WT300 series provides reliable current integration (Ah) and Energy (Wh) measurement for up to 10,000 hours (approx. 1 year). The D/A option is used to save and monitor the measurement results (WT310/WT310HC: 4ch, WT332/WT333: 12ch). An external recorder or data logger like, a ScopeCorder, can be used to save this D/A function data along with other parameters such as temperatures, torque and rotation speed.



Testing to international standards, such as IEC62301, Energy Star and SPECpower

- The WT310 has a high measurement resolution of Max. 100µW under the 5mA range setting.
- Simultaneous measurement of normal power parameters, harmonic components and THD.
- Dynamic input capability of crest factor Max 300 (Peak value / minimum effective RMS value)
- Free PCM software for IEC62301 testing

The WT310 together with the power consumption measurement (PCM) software enables users to perform standby power testing according to international standard.



Evaluation of large current equipment such as Induction Heaters/Cookers

- Direct high current measurement up to 40Arms without using external current sensors (WT310HC).
- Auto ranging function for Integration mode

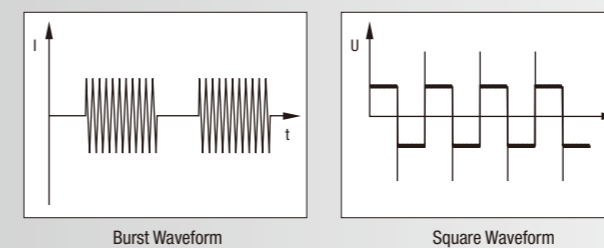
The WT310HC allows 40Arms to be directly inputted without the requirement to use current clamps or current sensors. This not only provides more precise measurement but also saves on investment costs. The wide current ranges are from 1A to 40A and voltage ranges are from 15 V to 600 V. Customers can use it for the evaluation of special waveform driven devices such as IH cookers and heaters.



Evaluation testing of special waveform driven devices and distorted waveforms (including DC component)

- DC, 0.5Hz to 100kHz broad bandwidth capability
- Average active power measurement under integration mode

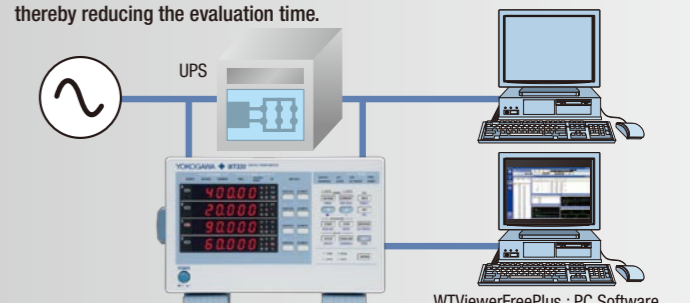
The WT300 series has a broad frequency capability of DC and from 0.5Hz to 100kHz. It can measure the RMS value of distorted waveforms like square waveforms or special waveform driven devices. The average active power measurement function gives accurate power consumption data for fluctuating power devices such as burst waveform operated devices. Therefore the customer can perform accurate distorted waveform measurements without using special mode settings.



Conformance and evaluation testing of uninterruptable power supplies (UPS)

- Maximum order setting for THD calculations
- Efficiency measurements using a single power meter
- Average active power measurement under integration Mode

The WT300 series enables users to conduct conformity tests according to UPS performance testing standards. The WT300 series is used to measure and calculate input & output levels, the efficiency, frequency and THD. The average active power data also provides accurate values of power consumption. The WT300 series along with the WTViewerFreePlus software helps to simultaneously measure all the necessary parameters required to test a UPS thereby reducing the evaluation time.



Please visit the URL below which shows many applications and examples. It will be regularly updated with the latest applications.

<http://tmi.yokogawa.com/technical-library/application-notes/>

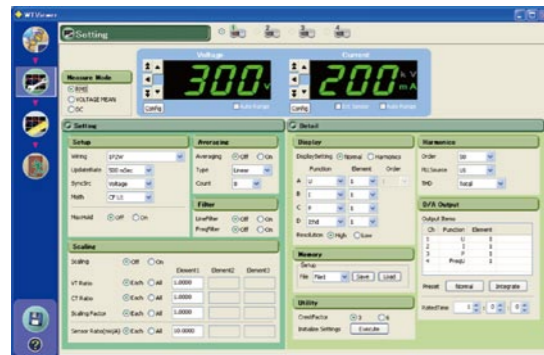
Easy set up and display of Numeric data, Trend graphs and Waveforms using PC application software

WTViewerFreePlus For WT300 Series (included)

The WTViewerFreePlus software can capture measured numeric values, harmonic values and waveform data. The data can be transferred to a PC via a USB, GP-IB/RS-232 or Ethernet communication interface, and it can be displayed* and saved on the PC.

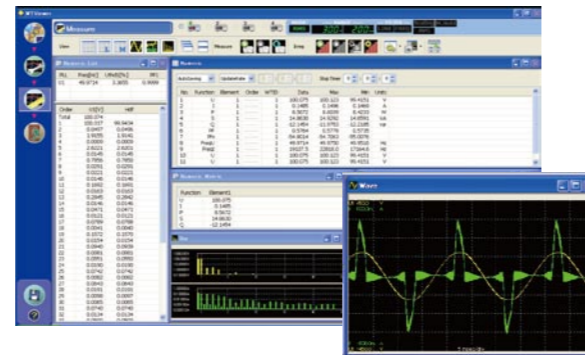
* Waveform display requires /G5 Harmonic option.

Setting Window



As well as using the WT300 series front panel to setup the powermeter, you can use the software to quickly set up your favorite conditions. It also shows all the setting parameters and the status at a glance. In particular, you can set up the range-skip function (range-configuration setting) and specify the maximum order used for the THD calculation.

Measurement Window



The software can display items which cannot be shown on the display of the WT300 series, such as multiple numeric measurement parameters, the harmonics data of each order, bar graphs, trend graphs and voltage & current waveforms. The free software thus adds additional performance to the WT300 series.

* Please check the Instruction manual in the CD for more information.

Standby power measurement conforming to IEC62301 Ed2.0

Power Consumption Measurement Software (Free)

The Power Consumption Measurement Software together with a WT310 (or another WT series instrument) provides a trustworthy power measurement solutions for testing the standby and off mode power of household products and office equipment.

The solution enables testing to be performed according to the IEC62301 Ed1.0 and Ed2.0 standards which specify the use of special algorithms for determining the power stability in the device under test. The software thus gathers all the required measurement data from the WT310, which includes not only voltage/ current/ power/ frequency but also the total harmonic distortion (THD) and the crest factor (CF) of the AC power supply. We therefore also recommend that the WT310 is installed with the harmonic option (/G5) and that a low distortion power supply is used for the test.



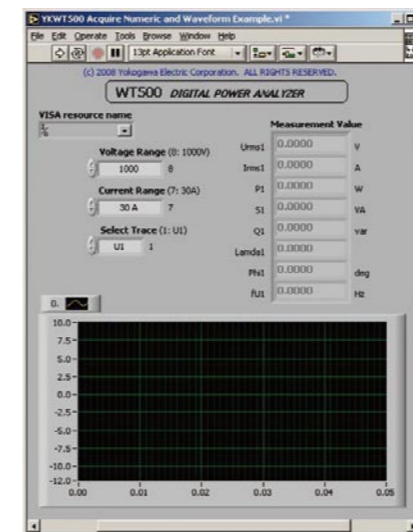
Configuring and Establishing a New Connection between the WT310 and a PC



Test Report

Support tools for creating dedicated programs!

LabVIEW Drivers



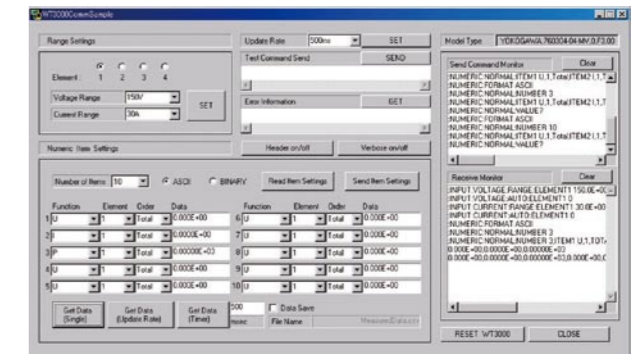
Data acquisition is possible using LabVIEW. LabVIEW drivers can be downloaded from our Web site. (Free of charge)

Coming soon

* LabVIEW is a registered trademark of NATIONAL INSTRUMENTS Corporation in the U.S.A.

Programming tool samples

To help you create dedicated programs for your system, we provide sample programs which support Visual Basic/Visual C++/Visual Basic .NET and Visual C# *. The sample programs support communication via USB, GP-IB/RS-232 or Ethernet interfaces and can be downloaded from our Web site.



* Visual Basic, Visual C++, Visual Basic .NET and Visual C# are registered trademarks of MICROSOFT Corporation in the U.S.A.

Comparison between WT210/230 series and WT310/330 series

	WT310/WT332/WT333	WT310HC	WT210/WT230
DC power measurement accuracy	0.1% of reading+0.2% of range	0.3% of reading+0.2% of range	0.3% of reading+0.2% of range
Current range	5m/10m/20m/50m/100m/200m/0.5/1/2/5/10/20[A] (WT310) 0.5/1/2/5/10/20[A] (WT332/WT333)	1/2/5/10/20[A]	5m/10m/20m/50m/100m/200m/0.5/1/2/5/10/20[A] (WT210) 0.5/1/2/5/10/20[A] (WT230)
External current input	EX1: 2.5/5/10[V] EX2: 50m/100m/200m/500m/1/2[V] (OP)	EX1: 2.5/5/10[V] EX2: 50m/100m/200m/500m/1/2[V] (OP)	EX1: 2.5/5/10[V] EX2: 50m/100m/200m/500m/1/2[V] (OP)
Effective input range for voltage & current (CF=3)	1% to 130%	1% to 100% (40A range only)	1% to 130%
Maximum displaying value for voltage & current (CF=3)	1% to 140%	1% to 110% (40A range only)	1% to 140%
0<PF<1	Power reading x (power reading error + (power range / apparent power reading) + tanθ x (influence when PF = 0)) %	Power reading x (power reading error + (power range / apparent power reading) + tanθ x (influence when PF = 0)) %	Add the power reading x (tanθ x (influence when PF = 0))%.
Simultaneous measurement of RMS, VoltageMEAN & DC	Yes **	Yes **	No
Frequency measurement	2 channels (voltage and current)	2 channels (voltage and current)	selected voltage or current (one)
Number of display item	4 items	4 items	3 items
Sampling rate	Approximately 100 kS/s	Approximately 100 kS/s	Approximately 50 kS/s
Harmonic measurement	Yes (OP, /G5)	Yes (OP, /G5)	Yes (OP, /HRM)
THD calculation maximum order setting	Yes (OP, 1-50th)	Yes (OP, 1-50th)	No
Auto ranging of integration	Yes	Yes	No
Communication interface	USB GP-IB RS-232 Ethernet	Yes GP-IB or RS-232 Yes GP-IB or RS-232 Yes (OP) Yes (OP)	Yes (OP) GP-IB or RS-232C Yes (OP) GP-IB or RS-232C No No
IEEE standard for GP-IB	IEEE488.2	IEEE488.2	IEEE488.1 and IEEE488.2
Comparator function	No	Yes	No
Viewer software (setting & data capturing)	Free (included)	Free (included)	Free (download)

**1: Simultaneous, mode independent measurement using the WTViewerFreePlus PC software.

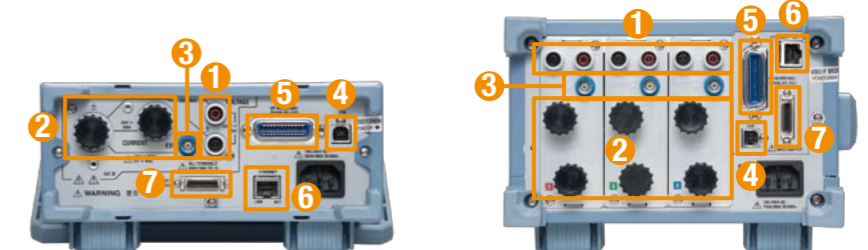
*A command compatible mode for the previous WT200 series is prepared. (IEEE488.2 only)

In that mode, the WT300 series works identically to a WT200 series except for the Store (and recall operation) and the Compare functions.

Superior points
Changed points

Rear View

- 1 Voltage input terminals
- 2 Current Input terminals
- 3 External current sensor input
- 4 USB communication interface
- 5 GP-IB/RS-232 (Standard)
- 6 Ethernet (Optional)
- 7 D/A output connector



Specification

General Specifications

Item	Specifications
Warm-up time	Approx. 30 minutes
Operating environment	Temperature: 5°C to 40°C Humidity: 20%RH to 80%RH (No condensation) Elevation: 2000m or less
Installation location	Indoors
Storage environment	Temperature: -25°C to 60°C Humidity: 20%RH to 80%RH (No condensation)
Rated supply voltage	100 VAC to 240 VAC
Permitted supply range voltage	90 VAC to 264 VAC
Rated supply frequency	50/60 Hz
Permitted supply voltage frequency range	48 Hz to 63 Hz
Maximum power consumption	WT310, WT310HC: 50VA, WT332/WT333: 70VA
External dimensions (excluding protrusions.)	WT310, WT310HC: Approx. 213 (W) × 88 (H) × 379 (D) mm WT332/WT333: Approx. 213 (W) × 132 (H) × 379 (D) mm
Weight	WT310, WT310HC: Approx. 3 kg WT332/WT333: Approx. 5 kg
Battery backup	Setup parameters are backed up with a lithium battery.

Rack Mount

Model/parts number	Product	Description	Order Q'ty
751533-E2	Rack mounting kit	For WT310 series EIA standalone installation	1
751533-J2	Rack mounting kit	For WT310 series JIS standalone installation	1
751534-E2	Rack mounting kit	For WT310 series EIA connected installation	1
751534-J2	Rack mounting kit	For WT310 series JIS connected installation	1
751533-E3	Rack mounting kit	For WT330 series EIA standalone installation	1
751533-J3	Rack mounting kit	For WT330 series JIS standalone installation	1
751534-E3	Rack mounting kit	For WT330 series EIA connected installation	1
751534-J3	Rack mounting kit	For WT330 series JIS connected installation	1

Ask Yokogawa for information on rack mounts in which WT310 and WT330 str combined.

Accessory (sold separately)

Model/parts number	Product	Description	Order Q'ty
758917	Test lead set	A set of 0.8 m long, red and black test leads	1
758922	Small alligator-clip	Rated at 300 V and used in a pair	1
758929	Large alligator-clip	Rated at 1000 V and used in a pair	1
758923	Safety terminal adapter	(spring-hold type) Two adapters to a set	1
758931	Safety terminal adapter	(screw-fastened type) Two adapters to a set 1.5 mm hex Wrench is attached	1
758924	Conversion adapter	BNC-banana-jack (female) adapter	1
366924	BNC-BNC cable	1 m	1
366925	BNC-BNC cable	2 m	1
758921	Fork terminal adapter	Banana-fork adapter, Two adapters to a set	1
B9284LK	External sensor cable	Current sensor input connector, Length 0.5 m	1
705926	Connection Cable	1 m, For DA4, DA12 option	1

▲ Due to the nature of this product, it is possible to touch its metal parts. Therefore, there is a risk of electric shock, so the product must be used with caution.

* Use these products with low-voltage circuits (42 V or less).

AC/DC Current sensor /Clamp on Probe

Model	Product Name	Description
CT1000	AC/DC Current sensor	DC~300 kHz, ±(0.05% of reading +30uA), 1000 Apk
CT200	AC/DC Current sensor	DC~500 kHz, ±(0.05% of reading +30uA), 200 Apk
CT60	AC/DC Current sensor	DC~800 kHz, ±(0.05% of reading +30uA), 60 Apk
751552	Clamp-on probe	30 Hz~5 kHz, 1400 Apeak(1000 Arms)
96030	Clamp-on probe	20 Hz~20 kHz, ±0.5% reading, 200 Arms
751574	AC/DC Current sensor	DC~100 kHz, 600 Apeak(400 Arms)

* CT series do not conform CE Marking.

* For detailed information, see Power Meter Accessory Catalog Bulletin CT1000-00E

Model and Suffix Codes

Model	SuppfixCode	Description
WT310		1 Input element model
Power Cord	-D	UL, CSA standard, PSE
	-F	VDE standard
	-R	AS standard
	-Q	BS standard
	-H	GB standard
	-N	NBR standard (for Brazil)
	-IB	GP-IB
Communication Interface	-C1	select one
	-C2	select one
	/C7	Ethernet interface
	/EX1	select one
	/EX2	select one
	/G5	Harmonics Measurement
	/DA4	D/A- output(4CH)
Model	Suppfix-Code	Describe
WT310HC		1 Input element/High current model
Power Cord	-D	UL, CSA standard, PSE
	-F	VDE standard
	-R	AS standard
	-Q	BS standard
	-H	GB standard
	-N	NBR standard (for Brazil)
	-IB	GP-IB
Communication Interface	-C1	select one
	-C2	select one
	/C7	Ethernet interface
	/EX1	select one
	/EX2	select one
	/G5	Harmonics Measurement
	/DA4	D/A- output(4CH)
Model	Suppfix-Code	Describe
WT332		2 Input elements model
WT333		3 Input elements model
Power Cord	-D	UL, CSA standard, PSE
	-F	VDE standard
	-R	AS standard
	-Q	BS standard
	-H	GB standard
	-N	NBR standard (for Brazil)
	-IB	GP-IB
Communication Interface	-C1	select one
	-C2	select one
	/C7	Ethernet interface
	/EX1	select one
	/EX2	select one
	/G5	Harmonics Measurement
	/DA12	D/A- output(12CH)

Standard accessories

Power cord(1set), Rubber foot(1set), Current input protective cover(each 1 set), Start up guide(1set), Connector (provided only with /DA4 or /DA12, each 1set), Safety terminal adapter 758931(provided two adapters in a set times input element number), CD (1piece, included the startup guide, user guide, instruction manual and the communication manual by PDF data, and Viewer Software)



758917 Test lead set
Two leads in a set. Use 758917 in combination with 758922 or 758929. Total length: 75 cm
Rating: 1000 V, 32 A



758922 Small alligator adapters
For connection to measurement leads (758917). Two in a set.
Rating: 300 V



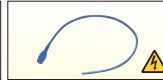
758929 Large alligator adapters
For connection to measurement leads (758917). Two in a set.
Rating: 1000 V



758923 *1
Safety terminal adapter set (spring-hold type) Two adapters in a set.



758931 *1
Safety terminal adapter set
Screw-fastened adapters. Two adapters in a set. 1.5 mm Allen wrench included for tightening.



B9284LK *2
External Sensor Cable
For connection the external input of the WT500 to current sensor.
Length: 50 cm



705926
26-pin cable for options DA4 and DA12

Due to the nature of this product, it is possible to touch its metal parts. Therefore, there is a risk of electric shock, so the product must be used with caution.

*1 Maximum diameters of cables that can be connected to the adapters 758923 core diameter: 2.5 mm or less; sheath diameter: 4.8 mm or less 758931 core diameter: 1.8 mm or less; sheath diameter: 3.9 mm or less

*2 The coax cable is simply cut on the current sensor side. Preparation by the user is required.

YOKOGAWA
Yokogawa Meters & Instruments Corporation



Notice
Before operating the product, read the user's manual thoroughly for proper and safe operation.

Represented by: