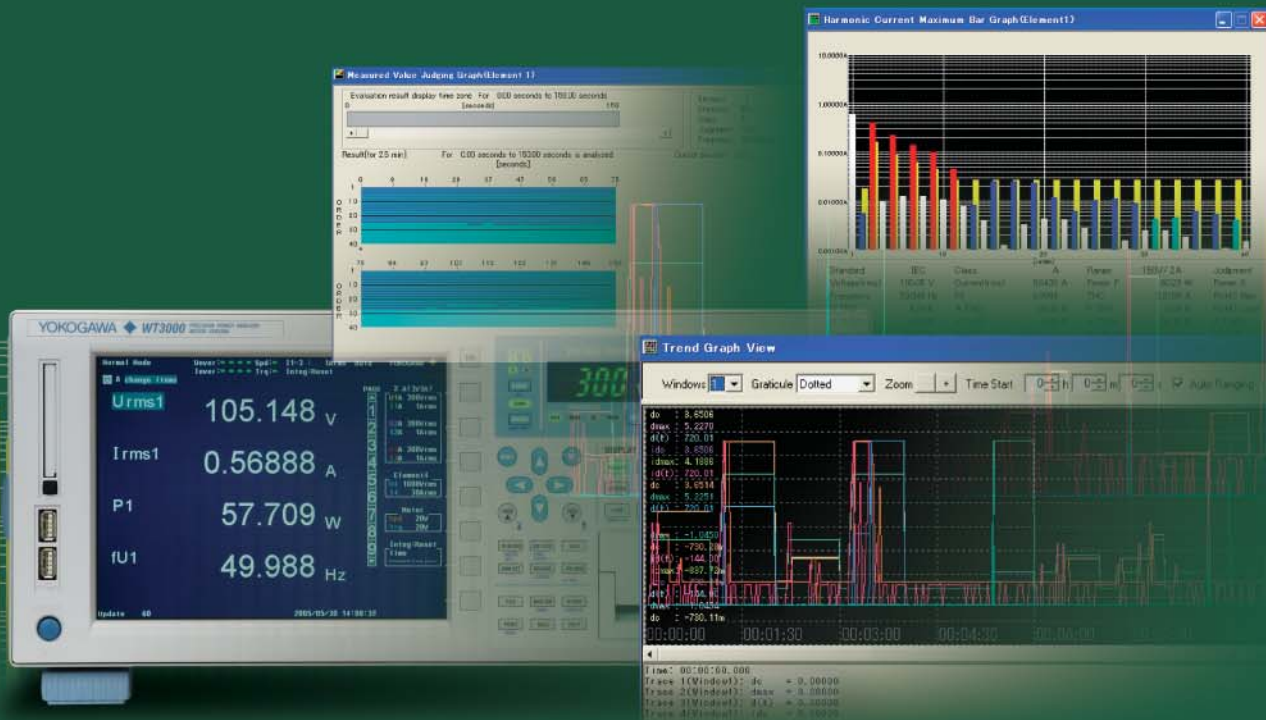


# 761922

## Harmonic/Flicker Measurement Software



### Supports Your Needs from Low Frequency EMC Testing to Creating Reports

- Supports harmonic and voltage fluctuation/flicker standards tests of the IEC and the JIS for single/three-phase applications.\*
  - Harmonics
    - EN61000-3-2 / IEC61000-3-2
    - JIS C 61000-3-2
    - EN61000-3-12 / IEC61000-3-12
  - Voltage fluctuation/flicker
    - EN61000-3-3 / IEC61000-3-3
    - EN61000-3-11 / IEC61000-3-11
- Supports the WT3000 Precision Power Analyzer with the /G6 and /FL options

\*Investigate by Yokogawa, as of December, 2007

# Reduces Time Spent on Low Frequency EMC Standard Research and Evaluation

The measurement procedures and settings for harmonic/flicker standards testing have been precisely defined. Engineers must also stay current with the specialized knowledge and up-to-date information required to periodically review the contents of the standards and perform the standards conformance tests. The model 761922 Harmonic/Flicker Measurement Software enables engineers without specialized knowledge to perform a range of operations using the WT3000 Precision Power Analyzer including judging standards compliance and outputting test reports.

## Supported Standards

### • Harmonics

**EN61000-3-2 / IEC61000-3-2**

Limits for harmonic current emissions (Equipment rated current  $\leq 16$  A per phase)

**EN61000-3-12 / IEC61000-3-12**

Limits for harmonic current emissions ( $16$  A < Equipment rated current  $\leq 75$  A per phase)

**JIS C 61000-3-2**

Limits for harmonic current emissions (Equipment rated current  $\leq 20$  A per phase)

### • Voltage fluctuation/flicker

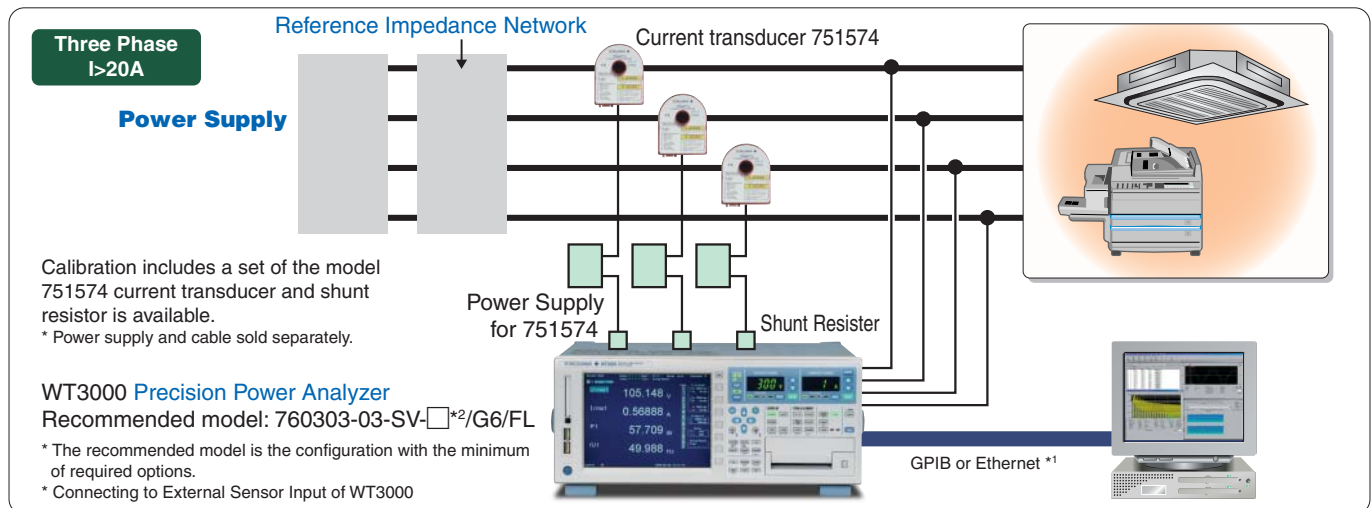
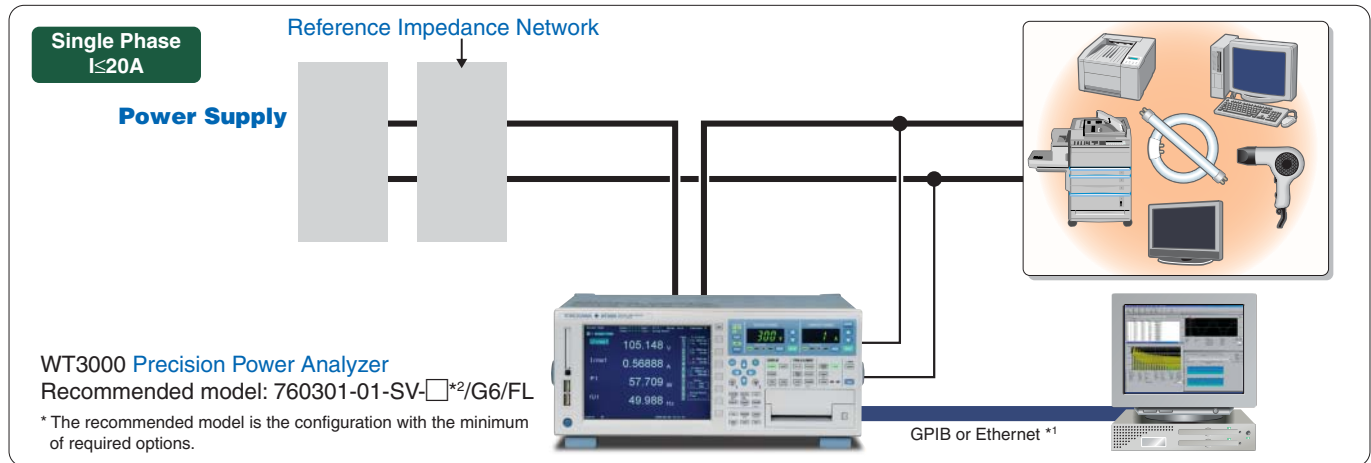
**EN61000-3-3 / IEC61000-3-3**

Limitation of voltage fluctuations and flicker  
(Equipment rated current  $\leq 16$  A per phase and not subject to conditional)

**EN61000-3-11 / IEC61000-3-11**

Limitation of voltage fluctuations and flicker supply systems  
(Equipment rated current  $\leq 75$  A and subject to conditional)

## Wiring



\*1 Need /C7 option with WT3000

\*2 Power Cord D, F, R, Q or H

## Note Significance of Low Frequency EMC Standards Testing

### Harmonic Current

Harmonic current is generated by condenser input type switching mode power supplies and other sources. Proliferation of these types of power supplies has resulted in harmonic distortion in the commercial power supply that can cause problems such as equipment malfunction and heating of the condensers in the power supply system. Because of this, international standards have been established for equipment that emits harmonic currents.

### Voltage Fluctuation/Flicker

When large currents flow in running equipment, impedance in the power system causes the power supply voltage to drop. Because the brightness of

an incandescent light bulb is proportional to the square of the power supply voltage, this voltage drop causes the bulb to flicker. The voltage fluctuation/flicker standards were enacted to reduce this undesirable flicker.

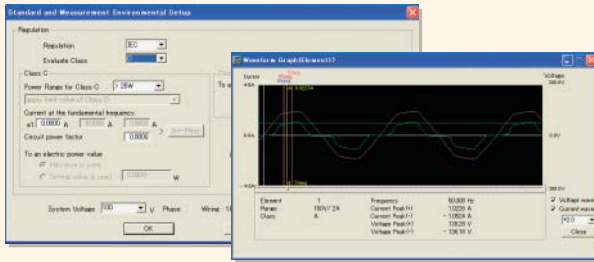
### •Enforceability

A consistent level of stability is required of products shipped to the EU market, and the governments of the EU must conform their laws to the EC directives. These directives include the Machinery Directive, ECM Compatibility Directive, and Low Voltage Directive. The items of the EMC directive include a low frequency EMC standard. Most products shipped to the EU for sale to the general consumer are subjected to low frequency EMC standards testing, and they must be checked to ensure that they are within the limits defined by the standard.

## Standards Testing

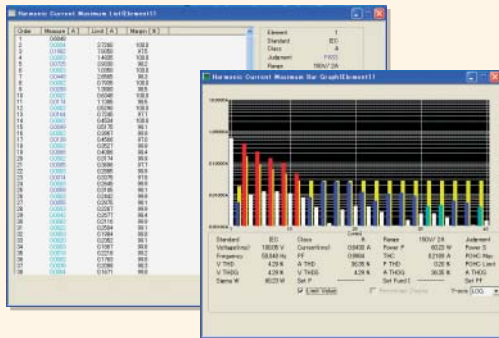
### Harmonics

● **Class judgment screen** Supports IEC/JIS standards  
You can specify class A, B, C, or D according to the DUT. Pass or Fail is automatically determined based on the judgment criteria for the specified class.



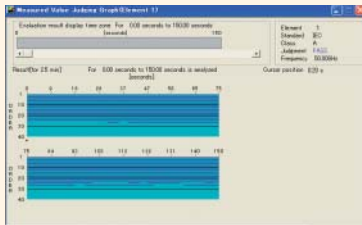
Supports the judgement by wave shape

● **Measured results screen** List/bar graph displays  
You can easily ascertain the harmonic level of the measured data relative to the limits of the standard. Test results are color coded for easy visual identification (blue: within limits; red: exceeding limits).



Judgments incorporating mitigating conditions such as POHC can be displayed in a graph

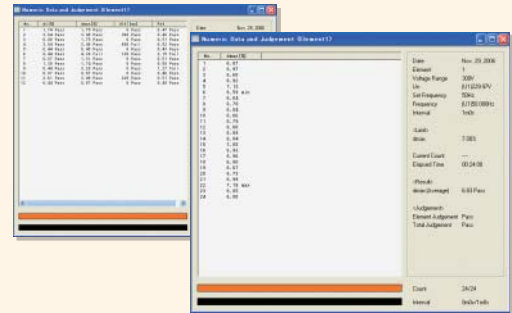
● **Trend display** Displays harmonic current in a time series  
Displays all harmonic measurement results in a time series by order. You can check all measured results at once, allowing you to identify the timing at which limits were exceeded.



● **Support for IEC61000-3-12**  
Supports calculation of the rated power  $S_{sc}$  and short-circuit ratio  $R_{sc}$  and judgement.

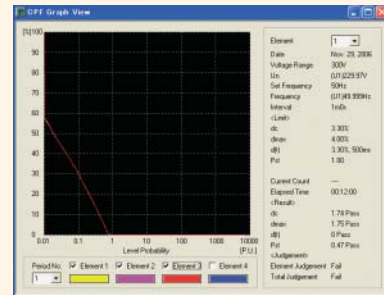
### Voltage Fluctuation/Flicker

● **Measured results screen**  
You can measure data required for flicker standards testing (including the relative steady-state voltage change  $d_c$ , maximum relative voltage change  $d_{max}$ , time at which relative voltage change exceeds threshold  $d(t)$ , short-term flicker value  $P_{st}$ , and long-term flicker value  $P_{lt}$ ) and check the results (data and Pass/Fail) in a list.



Support Average of 22 measured  $d_{max}$  values excluding the maximum and minimum values among 24 values

● **CPF graph display**  
You can determine the flicker level probability density function from the instantaneous flicker sensation (IFS), and display the cumulative probability function (CPF) representing cumulative flicker levels above a certain value. You can visually confirm the state of the flicker's fluctuations.



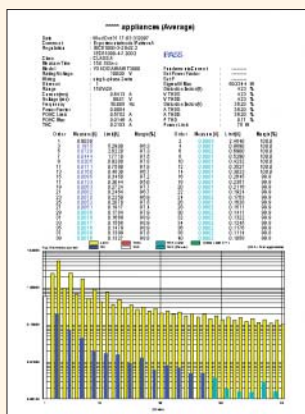
● **Trend display** Time series display of each parameter  
The time series voltage fluctuations can be shown in trend displays which are useful in creating countermeasures against flicker.



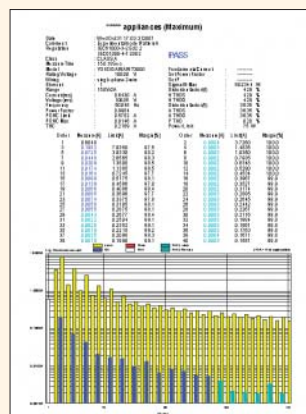
● **Support for IEC61000-3-11**  
Supports tests of supply current capacities of 100 A or more. You can set a Ztest value and convert results.

## Report

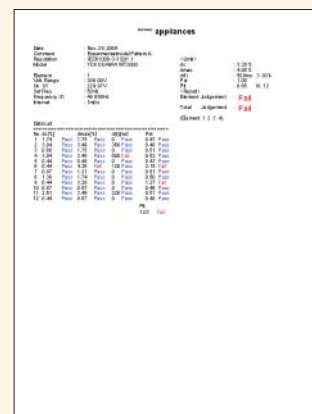
Results of harmonic/flicker measurements can be displayed in a numerical list or graph, printed, or saved as screen images. Values needed for judgments or reports can be displayed (in English) and used as-is in test reports.



Harmonic judgment report (average value)



Harmonic judgment report (max. value)



Voltage fluctuation/flicker judgment report



## Precision Power Analyzer WT3000

### • IEC Harmonic Measurement

Item	Specifications
Measured source	Select an input element or an $\Sigma$ wiring unit
Format	PLL synchronization method
Frequency range	Fundamental frequency of the PLL source is in the range of 45 Hz to 66 Hz.
PLL source	<ul style="list-style-type: none"> <li>Select the voltage or current of each input element (external current sensor range is greater than or equal to 500 mV) or the external clock (fundamental frequency).</li> <li>Input level                             <ul style="list-style-type: none"> <li>Greater than or equal to 50% of the measurement range rating when the crest factor is 3</li> <li>Greater than or equal to 100% of the measurement range rating when the crest factor is 6</li> </ul> </li> <li>Be sure to turn the frequency filter ON.</li> </ul>
Window length	10 cycles at 50 Hz 12 cycles at 60 Hz
Processing word length	32 bits
Window function	Rectangular
Anti-aliasing filter	Set using a line filter (5.5 kHz).
Interharmonic measurement	Select OFF, Type1, or Type2.

### • Normal Flicker Measurement Mode

Item	Specifications
Measurement Items (Measurement Functions)	dc Relative steady-state voltage change dmax Maximum relative voltage change d(t) The time during which the relative voltage change during a voltage fluctuation period exceeds the threshold level Pst Short-term flicker value Plt Long-term flicker value The maximum value within a observation period is displayed for the items above.
One observation period	30 min to 15 s
Observation period count	1 to 99

### • Measurement of dmax Caused by Manual Switching Mode

Item	Specifications
Measurement (Measurement Functions)	dmax Maximum relative voltage change
One observation period	1 minute
Observation period count	24
Averaging	Average of 22 measured dmax values excluding the maximum and minimum values among 24 values

Model	Suffix Codes	Description
760301		WT3000 1 input element model
760302		WT3000 2 input elements model
760303		WT3000 3 input elements model
760304		WT3000 4 input elements model
Element number	-01	30A input element
	-02	
	-03	
	-04	
Version	-SV	Standard Version
	-MV	Motor Version
Power cord	-D	UL/CSA Standard
	-F	VDE Standard
	-R	SAA Standard
	-Q	BS Standard
	-H	GB Standard
Options	/G6	Advanced Computation (IEC standard testing*, harmonic, FFT, Waveform computation)
	/B5	Built-in Printer
	/DT	Delta Calculation
	/FQ	Add-on Frequency Measurement
	/DA	20ch D/A output
	/V1	VGA Output
	/C2	Serial (RS-232) Interface
	/C12	USB port (PC)
	/C5	USB port (Peripheral)
	/C7	Ethernet function
	/CC	Cycle by Cycle
/FL	Voltage Fluctuation, Flicker	

## Harmonic/Flicker Measurement Software 761922

Functions	Retrieve and load the measured data to be judged <ul style="list-style-type: none"> <li>Set the WT measurement conditions</li> <li>Retrieve measured data from the WT connected online (On-Line mode)</li> <li>Load measured data already saved (Off-Line mode)</li> </ul>
Measure mode	<ul style="list-style-type: none"> <li>Normal voltage fluctuation and flicker measurement                             <ul style="list-style-type: none"> <li>Calculates all the voltage fluctuation and flicker values of dc, dmax, d(t), Pst, and Plt, compares them to the preset limits, and indicates the total judgement.</li> </ul> </li> <li>Measurement of dmax caused by manual switching                             <ul style="list-style-type: none"> <li>Measures the maximum relative voltage change, dmax, when the EUT switch is manually turned ON and OFF, determines the average over 24 measurements, and compares and judges against the limit.</li> </ul> </li> </ul>
Set the WT measurement conditions	Set the measurement conditions of the voltage fluctuation and flicker measurement that is defined in IEC 61000-3-3 Edition 1.1.
Set the WT judgement conditions	Set the judgement conditions of the voltage fluctuation and flicker measurement that is defined in IEC 61000-3-3 Edition 1.1.
Set the title and comment of reports	Set the title/comment of reports. Printed along with the measured data.
Start/stop the measurement	Measurement can be started in On-Line mode.
Numeric data and judgement	Display the judgement result indicating whether the measured data of voltage fluctuation and flicker measurement is within the specified limits as well as the measured data.
Trend graph view	Display the trend graph of the normal voltage fluctuation and flicker measurement (dc, dmax, d(t), idc, idmax, id(t), and IFS).
CPF graph view	Display the CPF graph of the normal voltage fluctuation and flicker measurement.
Save and load the setting information and measured data	<ul style="list-style-type: none"> <li>Save and load the setting information</li> <li>Save various types of setting information including measurement conditions, judgement conditions, title and comment of reports. Loading of the setting information is also possible.</li> <li>Save and load the measured data</li> <li>Save the measured data of the voltage fluctuation and flicker to files. The setting information above is also saved. The voltage fluctuation and flicker measurement data and setting information saved to a file can also be loaded.</li> </ul>
Save the numeric data, trend data, and CPF data in CSV format	Save the numeric data, trend data, "CPF data" to a file in CSV format. The saved data can be loaded in a software application on the PC.
Print display images and reports	Print the display image and report.

### PC system requirements

- PC
- CPU
    - Pentium III 1 GHz or equivalent or faster
  - Memory
    - 256 MB or more
  - Hard disk
    - Free space of at least 2 GB
- Operating system
- Windows 2000 Professional, Windows XP Home Edition, or Windows XP Professional
- Communications card
- GP-IB
    - PCI-GPIB/PCI-GPIB+/PCMCIA-GPIB/PCMCIA-GPIB+
  - by National Instruments with NI-488.2M driver version 1.60 or later
  - Ethernet
    - A 10BASE-T or 100BASE-TX Ethernet port

Model	Description
761922	Harmonic/Flicker Measurement software

## 751574

### Current Transducer DC to 100 kHz/600Apk

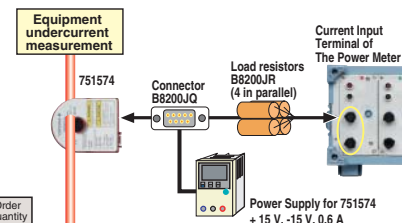
- Wide measurement frequency range: DC and up to 100 kHz (-3 dB)
- High-precision fundamental accuracy:  $\pm(0.05\% \text{ of reading} + 40 \mu\text{A})$
- Wide dynamic range: 0-600 A (DC)/600 A peak (AC)
- $\pm 15 \text{ V DC}$  power supply, connector, and load resistor required.

For detailed information, see Power Meter Accessory Catalog Bulletin 7515-52E.

Calibration includes a set of the model 751574 current transducer and shunt resistor is available for measurements of 30 A or more. Contact us for details.

### Connection Information

The 751574 is used in a one-to-one configuration. Use 1 for single-phase, and 3 for three-phase. Power supply and cable sold separately.



### Accessories (sold separately)

Product	Part no.	Specifications	Order quantity
Output connector	B8200JQ	D-SUB 9-pin, with 2 screws	1

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