1. GENERAL

Type 2505 Digital AC Meter is used in 3-phase 4-wire circuit for measuring true rms value of voltage and current, and power all at ± 0.25% accuracy. Merely by depressing front-panel pushbutton, Type 2505 provides direct digital reading of voltage (4 ranges from 100 to 600 V), current (4 ranges from 2 to 20 A) or power (from 200 W to 12 kW) in each phase, or total power (from 600 W to 36 kW) by means of three-wattmeter method. Incorporating the patented "feedback time division multiplier" of excellent stability and noise performance in each phase, this instrument solves the perplexing problems of accurate measurement for 3-phase 4-wire circuit, sinusoidal and non-sinusoidal (distorted) waves, and of measurement at low power factor.

This instrument is also usable for accurate measurements of 3-phase 3-wire and single-phase circuits, as well as for unbalanced 3-phase 4-wire circuit.

Type 2505 Digital AC Meter is adaptable for analog recording instrument and data processing system since it provides ten analog outputs (voltage, current and power per phase, and total power), BCD output and remote control.

1-1. Features.

- **Direct Digital Reading of Power in 3-Phase 4-Wire Circuit (or Voltage, Current and Power in Each Phase)**
  V-A-W measurements are also available for 3-phase 3-wire and single phase circuits.
- **±0.25% Accuracy**
- **Accurate Reading Even for Unbalanced 3-Phase Circuit**
- **Precision Power Measurement by Patented Feedback Time Division Multipliers(Three-Wattmeter Method)**
  Type 2505 incorporates the internationally-accepted principle of operation named "feedback time division multiplier" fully proven in YEW Type 2885 Standard Watt Converter with a laboratory standard accuracy of 0.02%.
- **True RMS Measurement by Log RMS-to-DC Conversion System**
  Provides a wide dynamic range. Therefore, the instrument is especially suited for accurate measurement of complex, distorted waves.
- **Voltage and Current Overrange Indicator in Each Phase**
- **Minimized Instrument Loss**
  Instrument loss is negligible so that it is particularly valuable for the measurement at extremely low power factor.
- **Foolproof Front-Panel Push-Button Operation**
- **Easy-to-Read, Long-Life LED (Light-Emitting Diode) Display**
- **Analog/BCD Outputs and Remote Control (Standard)**
  For simultaneous monitoring, recording and data processing.
- **Also Usable as a Digital Watthour or Ampere-Hour Meter**
  By mating with an optional combination unit of Type 2513 Digital Integrator.

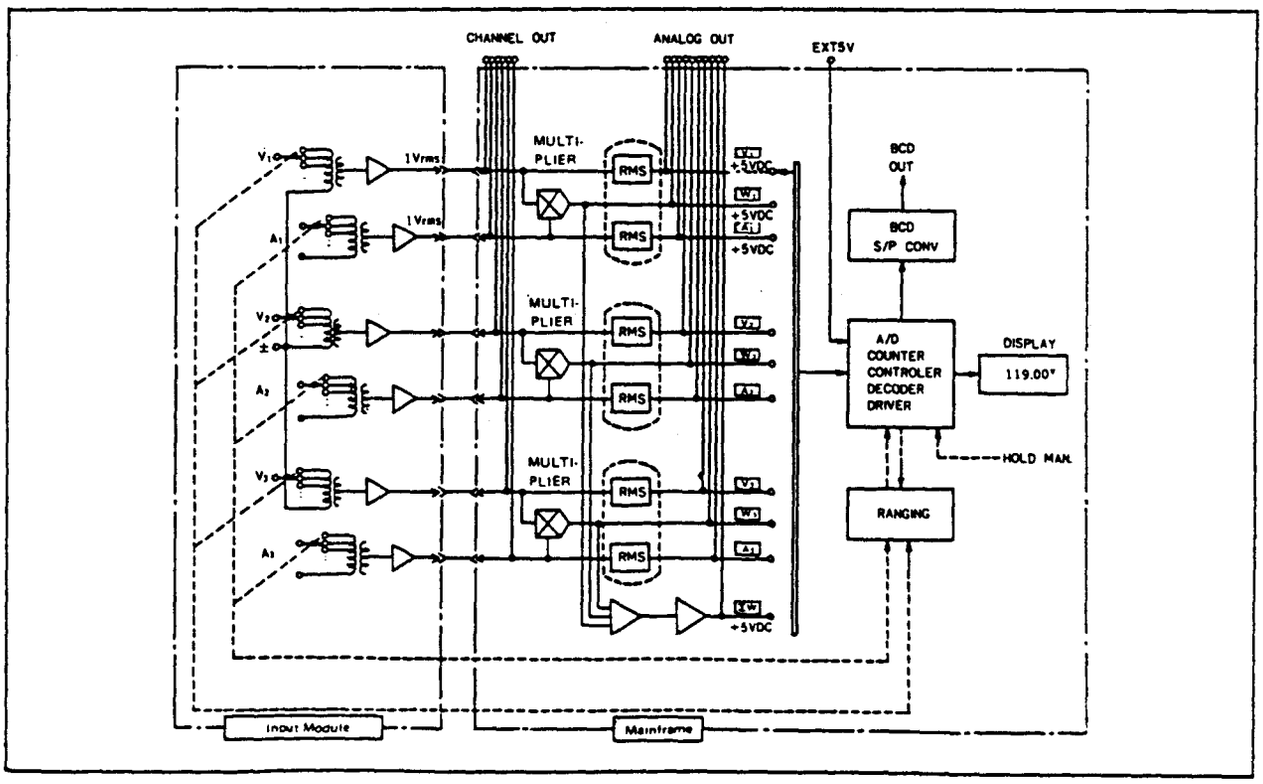

Figure 1. Block Diagram.

1-2. Specifications.

● Voltage/Current/Power.

Measurement Functions	Voltage	Current	Power (single-phase circuit)	Power (3-phase 4-wire circuit)
Input Ranges (Code 251447)	100V/150V/300V/600V	2A/5A/10A/20A	200W to 12kW (voltage range x current range)	600W to 36kW (voltage range x current range); (100V x 2A x 3) to (600V x 20A x 3)
Type of Input	Potential transformer	Current transformer	Corresponds to V and A measurements	
Resolution	10mV/digit	1mA/digit	100mW/digit	100mW/digit
Frequency Range	25Hz to 2kHz	25Hz to 2kHz	40Hz to 1.2kHz	40Hz to 1.2kHz
Crest Factor	Up to 2, or 1,000V pk at rated value (whichever is less)	Up to 3, or 50A pk at rated value (whichever is less)	Corresponds to V and A measurements	
Accuracy (sine wave, 3-month calibration cycle, temperature range of 23 ± 3°C, humidity range of 45 to 75%)	±(0.25% of reading + 0.05% of range) for 47 to 63Hz, ±(0.5% of reading + 0.1% of range) for 25 to 47Hz and 63Hz to 2kHz	±(0.25% or reading + 0.05% of range) for 47 to 63Hz, ±(0.5% of reading + 0.1% of range) for 25 to 47Hz and 63Hz to 2kHz	At cos ϕ = 1, ±(0.25% of reading + 0.05% of range) for 47 to 63Hz, ±(0.5% of reading + 0.1% of range) for 40 to 47Hz and 63Hz to 1.2kHz	At cos ϕ = 1, ±(0.25% of reading + 0.05% of range) for 47 to 63Hz, ±(0.5% of reading + 0.1% of range) for 40 to 47Hz and 63Hz to 1.2kHz
Effect against Variation of Power Factor (cos ϕ = 0.5, at 50 or 60Hz. Test method is specified in Japanese Industrial Standard JIS C1102)	—	—	Less than ±0.25% of reading	Less than ±0.5% of reading
Temperature Coefficient (temperature range of 5 to 20°C and 26 to 40°C, and at 50Hz to 1kHz)	Less than ±0.05% of range/°C	Less than ±0.05% of range/°C	Less than ±0.05% of range/°C	Less than ±0.05% of range/°C
Input Impedance or Power Consumption (approx. value at 50Hz)	50kΩ on 100V range 100kΩ on 150V range 400kΩ on 300V range 1.5MΩ on 600V range	0.1VA on 2A range 0.4VA on 5A range 1VA on 10A range 2VA on 20A range	Corresponds to V and A measurements	
Max. Allowable Input (continuous)	3 x range (peak value), or 1,000V pk (whichever is less)	3 x range (peak value), or 50A pk (whichever is less)		
Max. Allowable Input (for less than one second)	3.5 x range (peak value) or 1,500V pk (whichever is less)	10 x range (peak value), or 70A pk (whichever is less)		
Common Mode Voltage	1,000V	1,000V		
Common Mode Rejection or Effect of Common Mode Voltage (1,000V applied between input terminals and case)	More than 80dB ±0.025% of range	±0.025% of range	±0.025% of range	±0.025% of range

● General Specifications.

Operating Principle: Log rms-to-DC conversion system (V and A measurements), feedback time division multiplier (W measurement)
Type of Input: Floating
Display: LED (light-emitting diode) display
Sample Rate: Approx. 1.5 times per second (remote control possible)
Maximum Reading: 11900
Range Selection: Manual
Function Selection: Manual (remote control possible)
Unit Marks: V, mA, A, W and kW
Effective Measuring Range: 30 to 110% of input range (V and A ranges)
Response Time: Approx. 2 seconds (for reading within specified accuracy against the input variation from 30 to 100% of range, or from 100 to 30% of range)
Operating Temperature Range: 5 to 40°C (41 to 104°F)
Humidity Range: 20 to 80% (relative humidity)
Warmup Time: Approx. 20 minutes (for reading within specified accuracy)
Analog Output: 0 to 5V DC, 5V DC for rated input, Accuracy; ±0.3% of range for 47 to 63Hz, ±0.6% of range for other frequency ranges, Max. load current; 1mA, Max. load capacitance; 0.05μF
Channel Output: 1V rms for rated input, Max. load current; 1mA, Max. load capacitance; 50pF
BCD Output and Remote Control: BCD (1-2-4-8) code, unit marks, decimal point and overrange signal [remote control possible by using an external selector (to be prepared by user)]
Power Supply Voltage: 100, 115, 200, 215 or 230V AC, 50 or 60Hz, (need be specified)
Effect of Power Supply Voltage Fluctuation: ±0.05% of range against power supply voltage fluctuation of ±10% of rated value

Dielectric Voltage: 2,200 V AC, 50 or 60 Hz for one minute between input terminals and case, between input and output terminals, between voltage and current terminals, and between current terminals
1,500 V AC, 50 or 60 Hz for one minute between case and power line, and between output terminals and power line

Insulation Resistance: More than 50 MΩ at 500 V DC between input terminals and case, between input and output terminals, between current terminals, between output terminals and power line, and between case and power line

Power Consumption: Approx. 25 VA

Dimensions: Approx. 149 x 228 x 365 mm (5-7/8 x 9 x 14-3/8")

Weight: Approx. 16.3 kg (35.9 lbs)

Front Panel Color: Light grey (Munsell N7)

Accessories supplied at no extra cost:

Power cord (2- or 3-pin system) ..... 1 set
Fuses (1 A) ..... 2 pcs.
Analog output connectors (AMPHENOL 57-30140) ..... 3 pcs.
BCD output and remote control connectors (AMPHENOL 57-30500) ..... 2 pcs.
Instruction manual ..... 1 copy

Composition:

Name	Composition	Code	Description
Digital AC Meter (for 3-phase 4-wire circuit)	Mainframe	250531	Voltage, current and wattage measurements (with analog output, BCD output and remote control)
	Multi-range input module	251447	Input ranges: 100 V /150 V/300 V/600 V, 2 A/5 A/10 A/20 A
	Mainframe Multi*-range input module	250534	250531 + 251447