North Atlantic Industries
Instruments Division

Model 2250

Digital Analyzing Voltmeter

- **± 0.05 % Phase Angle and ratio accuracy (NIST traceable)**
- **10 Hz to 100 kHz frequency response**
- **Size: 18" W x 5.21" H x 15.50" D (458mm x 132mm x 394mm)**

GENERAL

The Model 2250 is one of the most versatile AC measurement tools in the market. The instrument employs a microprocessor-based design that combines many of the capabilities of today's network/waveform analyzers in a digital voltmeter configuration.

One touch makes highly accurate ratio measurements in both phase-sensitive and voltage modes; measures percent Total Harmonic Distortion and the magnitude and phase of selected harmonic; computes the percent deviation of a signal from a selected nominal value, plus more. The magnitude of the signal can be displayed in db (20 log 10) relative to either the reference input or a selected value.

SPECIFICATIONS

Resolution	*Voltage Modes* 4-1/2 digits *Phase Angle* 0.01° *Frequency Display* 3 digits
Signal Scale Range	*Voltage Modes* 20mV - 300V in 6 ranges or autoranging *Phase Angle Mode* 0.00° - 360.00° or ±180.00°
Reference Range	2mV - 300V, autoranging
Ratio Range	±1 x 10^6 to ±1 x 10^4 with overrange
Signal & Reference Autoranging	Upranges at approximately 108% FS; down ranges at approximately 9.9% FS. Note: the above assumes sine wave input. Levels will vary with crest factor on non-sine waves.
Displays	*Primary* Sign plus 5-digit, 0.5" high, 7-segment red LED *Secondary*

- *Lock Freq. (in kHz)* 3-digit, 0.28" high, 7-segment red LED
- *Harmonic Order* 2-digit, 0.28" high, 7-segment red LED
- *Null Meter* Zero center scale, moving LED, log scaled, 5/8" long. Covers dynamic range of scale selected with center having 1 LSB sensitivity.

Frequency Range	10 Hz - 100 kHz
Input Impedance	*Signal & Reference* 2 megohms shunted by 180pF (typical)
Nulling Sensitivity	1µV
Harmonic Order	Frequency Bands — Max. HMNC Measurement 10 Hz to 3.16 kHz — 30th 3.16 kHz to 10.6 kHz — 10th 10.6 kHz to 28.5 kHz — 3rd 28.5 kHz to 100 kHz — Fundamental
Common Mode Rejection (Zero source impedance)	10 Hz - 999.9 Hz — 116 db min. 1 kHz - 5 kHz — 100 db min. >5 kHz - 32 kHz — 90 db min. >32 kHz - 54 kHz — 81 db min.
Signal & Reference Channel Isolation	1000 MW shunted by 2 pF Hi w/r case (guard driven) 1000 MW shunted by 10 pF Lo w/r case (guard driven) 1000 MW shunted by 2000 pF between guard and case.
Harmonic Rejection	60 db all even and odd order Harmonics
Data Refresh	25 Hz and above 40 ms nominal l/f ms max below 25 Hz
Remote Control	IEEE-488 1978 standard GPIB (Selectable MATE (CIIL) or 225 DPAV compatibility)
Recorder Output	±2.0 VDC ±.15% (SEL ±8.75 VDC). In-Phase and Quad Outputs
Power Requirements	115/220 Vrms ±15%, 47-67 Hz, 70 VA, Fused 2A at 115 Vrms; 1A at 220 Vrms
Weight	35 lb (15.9 kg)
Mating Connectors (Connector kit #789005 available)	*Sig Input* - MS3106A-14S-2S *Ref Output*- MS3106A-14S-2S *Rec Output* - MS3106A-14S-2P *Trigger*- BNC (Male)

Accuracy
TOTAL (sum)*, FUND, PHASE SENSITIVE MODES**

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FREQUENCY	**200V/2000V* Range (*300V RMS MAX)**	**20mV Range**	**ALL OTHER RANGES**	**PHASE**
10 Hz to 30 Hz	0.1% Full Scale +0.1% Reading	0.15% Full Scale +0.05% Reading	0.1% Full Scale +0.05% Reading	±0.1°
>30 Hz to 1.5 kHz	0.05% Full Scale +0.1% Reading	0.10% Full Scale +0.05% Reading	0.05% Full Scale +0.05% Reading	±0.05°
>1.5 kHz to 5 kHz	0.06% Full Scale +0.12% Reading	0.12% Full Scale +0.06% Reading	0.06% Full Scale +0.06% Reading	±0.05°
>5 kHz to 20 kHz	0.06% Full Scale +0.21% Reading	0.18% Full Scale +0.12% Reading	0.06% Full Scale +0.12% Reading	±f (in kHz)° /100
>20 kHz to 32 kHz	0.12% Full Scale +0.34% Reading	0.15% Full Scale +0.19% Reading	0.12% Full Scale +0.19% Reading	±f (in kHz)° /100
>32 kHz to 54 kHz	0.12% Full Scale +0.8%	0.15% Full Scale +0.5% Reading	0.12% Full Scale +0.5% Reading	±f (in kHz)° /100

	Reading			
>54 kHz to 100 kHz	0.12% Full Scale +1.2% Reading	0.15% Full Scale +0.75% Reading	0.12% Full Scale +0.75% Reading	±f (in kHz)° /100

TOTAL (Avg) #	**0 to 1/2 SCALE**	**1/2 SCALE to F.S.**
10 Hz to 26 Hz	0.25% Full Scale	0.5% rdg.
>26 Hz to 10 kHz	0.125% Full Scale	0.25% rdg.
>10 kHz to 30 kHz	0.25% Full Scale	0.5% rdg.
>30 kHz to 100 kHz	0.50% Full Scale	1.0% rdg.

* TOTAL (sum) = fundamental + harmonics
# TOTAL (Avg) = Average RMS of fundamental + harmonics + noise
** Not including phase errors

2250-F1 = Native IEEE Interface

2250-F3 = 225 Emulation*

*An optional adapter cable p/n:548792 can be purchased which allows the 2250 to become a direct replacement for the 225.