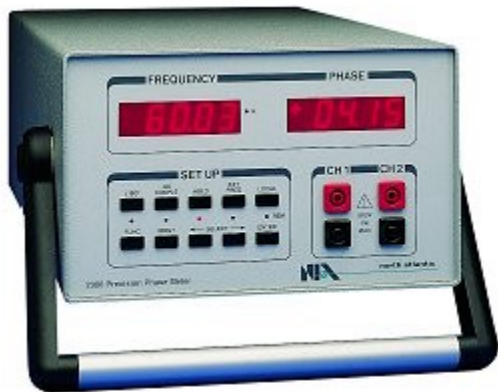


2000 Precision Phase Meter



- Wide Frequency range from 0.01 Hz to 700 kHz
- Accuracy $\pm 0.1\%$ (NIST traceable)
- Sensitivity from 0.001 Vpk to 500 Vpk
- Size: 8.5" W x 5.7" H x 15.4" D (215mm x 144mm x 390mm)

The Model 2000 Precision Phase Meter utilizes digital techniques to achieve its exceptionally high accuracy, even with input signals that are not clean sinusoids. The ability to take accurate phase readings on "dirty" signals, such as DAC output or sonar echo, makes the Model 2000 an ideal instrument for use not only as a laboratory standard, but in real-world situations where clean sine waves are not common.

Phase measurements to $\pm 0.02^\circ$ can be made on signals with over 200% total harmonic distortion (THD) - distortion over twice as high as the signal itself. Likewise the unit is unaffected by noise 100 times as great as the signal itself. Such noise usually completely masks the signal on an oscilloscope and makes phase measurements impossible using traditional zero-crossing analog techniques.

INPUT SPECIFICATIONS

Signals	2 floating inputs, galvanically isolated 2 kV DC from ground
Sensitivity	1 mVpk to 500 Vpk (see Options for current)
Autoranging	7 ranges from 12 mVpk to 500 Vpk full scale for each input
Bandwidth	0.01 Hz to 700 kHz
Impedance	2 MW, 10 pf

MEASUREMENT SPECIFICATIONS

Frequency readings	0.01 Hz to 700 kHz, accurate to $\pm 0.1\%$ ^a	
Phase readings	$\pm 180.00^\circ$ or 0.00 - 360.0° between inputs; resolution 0.001° using printout for 10 Vpk sinewave signals, at $23 \pm 5^\circ \text{ C}^b$; unaffected by 200% THD or noise 40 db > signal	
Phase accuracy	5 Hz to 100 Hz	$\pm 0.02^\circ$
	100 Hz to 1 kHz	$\pm 0.03^\circ \pm 0.005^\circ/\text{kHz}$
	1 kHz to 100 kHz	$\pm 0.04^\circ \pm 0.005^\circ/\text{kHz}$
	100 kHz to 700 kHz	$\pm 0.25^\circ \pm 0.005^\circ/\text{kHz}$
Phase repeatability	$\pm 0.01^\circ$	
Self-calibration	stored correction constants are applied automatically (see Option -F2)	
Interfaces	IEEE-488, RS232 and parallel printer	

GENERAL SPECIFICATIONS

Isolation	2 kV AC 50/60 Hz for 1 minute from signal inputs to case or to AC line, or from power supply to case
Operating Temperature	0°C to $+50^\circ\text{C}$
Storage Temperature	-40°C to $+70^\circ\text{C}$
Humidity	10% to 90% relative non-condensing
Power	110/220 $\pm 10\%$ VAC; 50/60 Hz; 25 VA
Weight	14.3 lbs (6.5 kg)
Size (without handle)	8.5" (215 mm) W x 5.7" (144 mm) H x 15.4" (390 mm) D

PART NUMBER DESIGNATION

2000-F _ - XXX

Improved accuracy by installing additional correction constants at specified frequencies (example: Model 2000-F1-50,60 is additionally calibrated at 50 Hz and 60 Hz)

1 = Standard
2 = Rear Input Terminals

Accessories

Model 20-100A -- Current transformer, 20-100 A

Model 20-1000A -- Current transformer, 20-1000 A

Model 20-100AX -- Current transformer with characterization^c

Model 20-1000AX -- Current transformer with characterization^c

Model 20-RAC -- Rack mount kit

^aassuming a stable input frequency, 30 minute warm-up, and 10 second settling time for averaging; ambient $23 \pm 5^\circ$

^bwhen within the 1 year re-calibration period; calibration certified as traceable to NIST

^cmust be ordered with unit, which then compensates for transformer phase angle error as a function of frequency, typically down to $\pm 0.05^\circ$