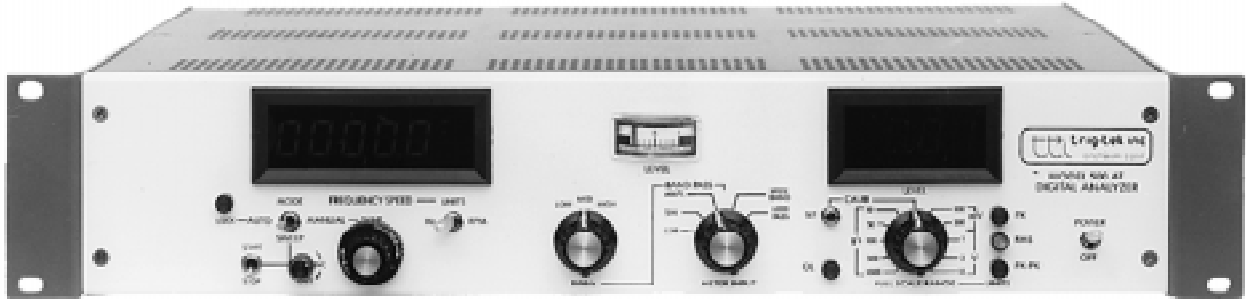


Model 500AT

TRACKING PHASE ANALYZER



- **NARROWBAND SWEEP, MANUALLY TUNED or TRACKING ANALYSIS**
- **LINEAR and LOG OUTPUTS**
- **SIN-COS OUTPUTS (PHASE)**
- **SINE REJECT OUTPUT**
- **AMPLITUDE in g's or VOLTS**
- **FREQUENCY INDICATOR**
- **LEVEL INDICATOR**

The Model 500AT Phase Analyzer is designed to provide amplitude, frequency and phase information obtained from complex wave forms as may be encountered by sensors used to measure vibration. It is a multi-function analyzer that can operate as a tracking filter or it can be used as a swept or manually tuned spectrum analyzer. It provides linear and logarithmic outputs for driving analog X-Y recorders, as well as sine and cosine outputs for balancing rotating equipment and special outputs for control feedback.

The amplitude and frequency components of the data input signal as well as the phase shift between the reference and data signals are displayed in large digits that are easy to view at a distance. Switches provide full scale amplitude ranges from 100mV to 10 Volts or 10g's to 1000g's. Amplitude is displayed on a 3½ digit DVM. Bandwidth is selectable and amplitude can be measured in peak, RMS or peak-to-peak units. A supplementary analog meter allows the operator to manually tune to spectral peak and to observe trends in changing signal levels. The analyzer can also read the overall level of broadband signals. An overload indicator alerts the operator if the signal level exceeds the range of the input amplifier. Frequency is displayed in RPM or Hz on a 6-digit counter which updates every 600 milliseconds or RPM every 750 milliseconds. When used as a swept frequency analyzer, the sweep rate is variable by a front panel control.

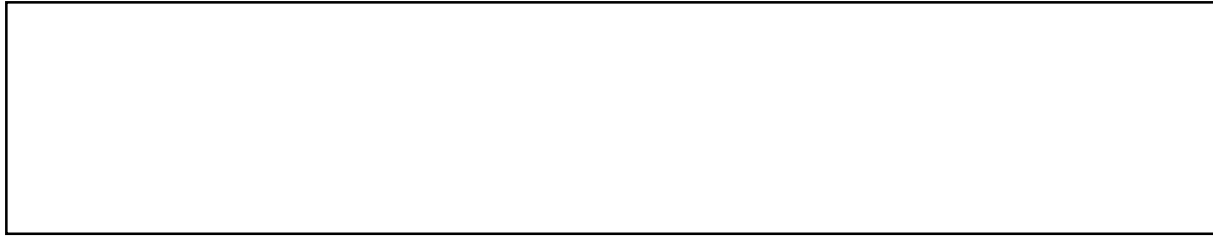
In the AUTO (Automatic) mode, the 500AT "locks on" and automatically tracks the changing reference signal. To accommodate a variety of applications, it will accept a wide range of reference amplitudes and waveforms. For example, the reference signal can be the sine wave from a sweep oscillator, a square wave from a frequency divider or a pulse from the key phasor of a rotating shaft. The AUTO mode is also used to make phase measurements between the DATA INPUT and the REF INPUT signals. The SIN and COS outputs on the rear panel provide the rectangular components of the data signal. When displayed on an X-Y recorder, they produce a polar plot of the phase and amplitude vectors of the data signal, using the reference input as a phase reference. This is used in "Trim- Balancing" of rotating equipment.

The 500AT also provides outputs required for feedback control of shakers and other frequency response test systems. In sine or sine on random testing, the FILTER output provides a "clean" filter feedback signal to the sine controller. In sine on random testing, the REJECT output filters out the sine component and feeds back the random portion of the input signal to the random controller. The FILTER and REJECT outputs are available simultaneously, enabling the 500AT to process both the sine and random components in composite signals.

The analyzer can be used with either single-ended or differential inputs. It can provide 0.3 to 15mA for powering sensors having integral electronics. It also provides separate $\pm 5V$ and $\pm 10V$ power for accessories.

The Model 500AT Digital Analyzer employs state-of-the-art designs. For ease of checkout and calibration, chassis components are modularized through use of plug-in connectors and flexible cables on all printed circuit cards. Its solid-state design and digital CMOS circuitry ensures low power consumption, long service life and trouble free operation.

DIGITAL ANALYZER Model 500AT



Specifications

Inputs

Impedance 300k ohms
Common Mode 40dB at 60Hz
Connectors BNC

Data

Level 0-10V rms; single-ended or differential.
Input guarded up to 150V rms.
Frequency 5Hz to 5kHz.
Current Source Adjustable 0.3 to 15mA.
UNIT Switch (Rear) PEAK, RMS or PEAK to PEAK
MODE Switch (Rear) .. Single Ended, Differential or Current select

Reference

Level 10mV- 20Vrms; single-ended or differential.
Input guarded up to 150V rms.
Frequency 5Hz to 5kHz
Waveform Sine, square, triangle or pulse (20µs or wider).

Outputs

Impedance Less than 50 ohms.
Connectors BNC

Linear DC of Frequency

Level 5V at 5kHz
Accuracy ±0.5% of indication, plus 0.1% FS.
Response Time 100 milliseconds

Linear DC of Level

Level 10V Full Scale
Accuracy ±2% of indication, plus 0.2% FS.

Log DC of Frequency & Level

Level 1V Full Scale
Conformity ±0.5dB

AC

Filter 10V max. Unity gain of filtered DATA input.
Reject 10V max. Unity gain less filtered components.
REF X1 Direct output of REF input.
REF Multiplied Reference input multiplied by 32 or 64 times.

Phase (Sine and Cosine)

Level ±10V Full Scale
Quadrature 90° ±0.5° between sine and cosine outputs
of filtered signal.
Offset 0 ±10mV (zero input, 100Hz)

Differential phase shift between Reference and Data inputs is ±2°
from 10Hz to 3kHz.

Controls

Mode Switch

Auto Analyzer automatically "locks on" and
tracks the REF INPUT.
Sweep Analyzer sweeps up with an adjustable
sweep rate and a Start/Stop switch.
Manual Analyzer can be manually tuned from
3Hz to 5kHz with 10-turn knob.

Frequency / Speed Switch

Hz Sets counter to indicate 0 to 5000Hz.
RPM Sets counter to indicate 0 to 300,000 RPM.

Full Scale Range Knob

Volts Settings Provides full scale reading in volts.
g's Settings Provides full scale readings in g's
(10mV/g sensitivity).
Calib Connects internal calibration oscillator to
DATA INPUT for setting gain to 10g's FS.

Meter Input Knob

Sin Displays sine of filtered signal.
Cos Displays cosine of filtered signal.
Wideband Displays unfiltered DATA signal 5Hz to 7.5kHz.
Low Pass Displays DATA signal through low pass filter.
Ampl Selects bandpass filter selector (BWHZ).

BW Hz Knob

Low 2Hz
Med 5Hz
High 15Hz

Indicators

Frequency 6-Digit Meter indicates Hertz and RPM.
Level (Digital) 3½ Digit Meter indicates in Volts or g's.
Level (Analog) Provides coarse indication of amplitude trends.
PK (LED) Illuminates when PEAK is selected.
RMS (LED) Illuminates when RMS is selected.
PK-PK (LED) Illuminates when Peak-to-Peak is selected.
OL (LED) Indicates an Overload condition occurs.

Dimensions

Size 19" Wide x 3.5" High x 12" Deep
(48.26 x 8.89 x 30.48cm).
Power 115 or 230 Volts 50-400Hz, 10 watts.
Weight 15lbs. (6.8kg)