

CLARKE - HESS MODEL 5500-2

DIGITAL PHASE STANDARD

SIMPLE TO USE • EXTREMELY ACCURATE • NIST TRACEABLE



- 1 m° Phase Resolution
- 5 m° Phase Accuracy
- 1 Hz to 200 kHz
- Phase Accuracy Maintained for 1000:1 Amplitude Ratios
- 50 mV to 120 V rms Outputs
- Amplitude Accuracy 0.3% to 100kHz
- -80 dB Typical Distortion

EXTREMELY VERSATILE

The combination of excellent phase accuracy, excellent amplitude accuracy and low distortion from each channel make the Model 5500-2 an ideal source for calibrating Phase Meters, Vector Voltmeters, broadband Watt meters and Power Analyzers, and other Phase Sensitive Instruments.

USER FRIENDLY

Only single keystrokes on clearly labeled keys are required to enter all of the parameters into the Model 5500-2. A large bright display shows Phase, Frequency and both output Amplitudes at all times.

CONTINUOUS PHASE CALIBRATION

The Model 5500-2 contains an Autozero function which measures the output phase at $\pm 90^\circ$ and makes an internal correction to remove any phase errors between the two output channels. The 0.25 second Autozero operation is activated automatically each time an amplitude or frequency is changed. It may also be activated manually.

DIGITAL PRECISION

Both output sine waves are generated digitally with the result that the basic parameters of Phase and Frequency require no adjustments to maintain their superior accuracy. Only the output amplitudes are internally adjustable.

LOAD IMMUNITY

The extremely low output impedance of the Model 5500-2 coupled with its ability to Autozero with an external load in place, makes the phase accuracy of the instrument completely insensitive to loading.

EXTENSIVE SELF TEST

The Model 5500-2 has an internal SELF TEST capability which checks the output frequency for all frequency ranges, checks all of the digital sine wave generation circuitry, checks the output levels of all amplitude ranges for both channels and checks the Autozero function. If an error is found it is reported in a fashion that leads to quick repair and restoration of the instrument to service.



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EASY TO CALIBRATE

The complete specifications for the Model 5500-2 may be checked with an accurate ac/dc (true rms) Multimeter, an accurate Frequency Counter, a good Distortion Analyzer and the Clarke-Hess Model 5002 Phase Verification Bridge Set. This completely passive bridge set may be sent either to Clarke-Hess or directly to NIST for annual recertification.

AUTOMATED ADJUSTMENTS

Many of the internal potentiometers in the Model 5500-2 can be calibrated electronically. If adjustment is required during annual recertification, the operator just turns the "pot" until a value indicated on the display is obtained. The ability to operate the instrument over the IEEE-488.2 interface makes other adjustments equally straight forward.

SPECIFICATIONS

MODEL 5500-2 PHASE ANGLE STANDARD

DESCRIPTION

The Model 5500-2 is a crystal controlled phase angle calibration standard. It produces two digitally synthesized, low distortion sine waves. The relative phase angle between these two sine waves may be varied in 0.001° steps over the range from -999.999° to 999.999° . The amplitudes of the two outputs may be individually adjusted from 50 mV to 120 V rms. Parameters may be entered either from the front panel controls or via the optically isolated IEEE-488.2 interface. Phase angle outputs of the Model 5500-2 are traceable to NIST via the Model 5002 Phase Verification Bridge Set.

PHASE ANGLE

Range: 0.000° to $\pm 999.999^\circ$

Resolution: 0.001° from 1 Hz to 200 kHz

Accuracy: 1 Hz - 1 kHz:: $\pm 5 \text{ m}^\circ$
1 kHz - 6.25 kHz:: $\pm 10 \text{ m}^\circ$
6.25 kHz - 50 kHz:: $\pm 15 \text{ m}^\circ$
50 kHz - 200 kHz:: $\pm 40 \text{ m}^\circ$

The phase accuracy is specified after the Standard has been Autozeroed with the device under test in place.

OUTPUT FREQUENCY

Range: 1 Hz to 200 kHz

Resolution: 1 Hz from 1 Hz to 6250 Hz
10 Hz from 6250 Hz to 50 kHz
20 Hz from 50 kHz to 200 kHz

Accuracy : Better than ± 100 parts per million

Output: Rear Panel, TTL compatible output

OUTPUT AMPLITUDE

Range: 50 mV rms to 120 V rms

Resolution: 1 mV from 50 mV to 0.5 V
2 mV from 0.5 V to 8 V
33.33 mV from 8V to 100 V
100 mV from 100 V to 120 V

Accuracy: $\pm 0.5\%$ $\pm 5 \text{ mV}$ from 1Hz to 50 kHz
 $\pm 1\%$ $\pm 25 \text{ mV}$ from 50 kHz to 100 kHz
 $\pm 5\%$ $\pm 50 \text{ mV}$ from 100 kHz to 200 kHz

TOTAL HARMONIC DISTORTION

Less than 0.02% (-74 dB) from 1 Hz to 1000 Hz
Less than 0.05% (-66 dB) from 1000 Hz to 20k Hz
Less than 0.13% (-58dB) from 20 kHz to 50 kHz
Less than 0.30% (-50dB) from 50 kHz to 200 kHz

NOISE

Less than 0.05 mV from dc to 200 kHz

OUTPUT DC OFFSET: Less than 0.5% of the ac Output

OUTPUT CURRENT CAPABILITY: 15 mA minimum

OUTPUT IMPEDANCE: Less than 0.5Ω

MAXIMUM EXTERNAL LOAD CAPACITANCE

Less than 5000 pF

IEEE-488 1978 SUBSETS: SH1, AH1, T6, L4, SRI, RL1, PR0, DC1, DT0

WARMUP TIME: Less than 5 minutes.

TEMPERATURE RANGE

Operating: $25^\circ\text{C} \pm 15^\circ\text{C}$

Storage: -40°C to 75°C

RELATIVE HUMIDITY

Less than 95% between 10°C and 30°C

Less than 75% between 30°C and 40°C

LINE VOLTAGE, FREQUENCY AND POWER CONSUMPTION

$100 \text{ V} \pm 10\%$, $120 \text{ V} \pm 10\%$, $220 \text{ V} \pm 10\%$, $240 \text{ V} \pm 10\%$.
50 Hz or 60 Hz. 1 MDL Fuse for 120 V operation. Power Consumption less than 75 W (60 Hz-120 V).

PHYSICAL

Rack or bench mount

Weight: 28 pounds/ 12.7 kilograms

Size: 19" x 7" x 15"/48.3 x 17.8 x 38.1 cm

