2 - Specifications

VOLTAGE

Five DC and AC Ranges:

- 15, 30, 150, 300 & 600 Volts DC & Volts rms.

Remote Voltage Sensing:

- Differential input - 110 dB CMRR.
- Maximum of 30 Volts peak, volts low terminal to amps output terminal.

CURRENT

Five DC and AC Ranges:

- 2, 5, 10, 20 and 50 Amps DC and Amps rms.

METER IMPEDANCE

Voltage, DC or AC:

- 3 Megohm load on each voltage range.

Current, DC or AC Ranges:

- 0.011 Ohm shunt resistance in the 2, 5, 10 and 20 Amp ranges.
- 0.001 Ohm shunt resistance in the 50 Amp range.

RESOLUTION

Processing resolution is 16 binary bits.

Voltage Display:

- All ranges $\leq$ 9.999 V is $\pm$ 0.001 Volt.
- Ranges $\geq$10 V and $\leq$ 99.9 V is $\pm$ 0.01 Volt.
- Ranges $\geq$ 100 V is $\pm$ 0.1 Volt.

Current Display:

- All ranges $\leq$ 9.999 A is $\pm$ 0.001 Amp.
- Ranges $\geq$ 10 A and $\leq$ 50 A is $\pm$ 0.01 Amp.

Power Display:

- $\pm$ 0.01% of active Volts and Amps range
- GPIB - Amps, Volts and Watts
  Same as display resolution.

ISOLATION

1500 Vrms break down from input circuit to chassis (ground).

DISPLAY AUTO ZERO

When the A and V, display indication is less than 0.5 % of range, the displayed value is set to ZERO.
Refer to SECTION 5 - SPECIAL FUNCTIONS to disable the AUTO ZERO function.

ANALOG OUTPUTS

This is an optional feature.

Analog AMPS, VOLTS and WATTS output signals are a relative value of approximately 5 Volts DC for full scale on each range selected. These outputs are calibrated to 5.00 Volts DC $\pm$ 0.2% for full scale input on the 10 Amp current range and 150 Volt voltage range (1500 Watt range). Ripple is less than 5 mV.

The outputs are operational amplifiers with an impedance of < 1 Ohm and current capacity of < 4 mA. Each output signal and common is electrically isolated from the measured circuit by 750 Volts continuous and 2500 Volts test breakdown. Leakage current is less than 0.3 μA at 240 Vrms, 60 Hz.

DATA ACQUISITION

ANALOG

The conversion of true rms to DC is expressed as:

$$V_{rms} \equiv \sqrt{\frac{1}{T}\int_0^T v^2(t)\ dt}$$

- Rms to DC conversion averaging time constant:
  Volts and Amps time constant TC $\cong$ 60 msec.
  Watts time constant TC $\cong$ 120 msec.
  Watts = V $\times$ I $\times$ cos θ (instantaneous)

DIGITAL

- Processing:
  Integration period = 0.10 second.
  Display update time = 2 readings per second.
- IEEE-488 (GPIB):
  Synchronized = 0.1 sec. per reading
  Non-synchronized is 0.04 to 0.07 sec per reading.

MEASUREMENT ACCURACY

Specified test conditions: Ambient temperature of 72° ± 10°F and power factor of 0.1 to 1.0, lead or lag.

VOLTAGE - DC	± (0.1% of reading + 0.2% of range)
VOLTAGE - AC:	
10 Hz to < 20 Hz	± 1.0% of range
20 Hz to < 45 Hz	± (0.2% of reading + 0.3% of range)
45 Hz to < 10 kHz	± (0.1% of reading + 0.2% of range)
10 kHz to 20 kHz	± (0.2% of reading + 0.3% of range)
CURRENT - DC	**2, 5, 10, 20 and 50 Amp Ranges**
	± (0.1% of reading + 0.2% of range)
CURRENT - AC:	**2, 5, 10 and 20 Amp Ranges**
10 Hz to < 20 Hz	± 1.0% of range
20 Hz to < 45 Hz	± (0.2% of reading + 0.3% of range)
45 Hz to < 1 kHz	± (0.1% of reading + 0.2% of range)
1 kHz to < 5 kHz	± (0.2% of reading + 0.3% of range)
5 kHz to < 10 kHz	± 1.0% of reading
10 kHz to 20 kHz	± 2.0% of reading
	50 Amp Range
10 Hz to < 1 kHz	same as 20 Amp range
1 kHz to 2 kHz	± 2.0% of range
POWER - DC	± (0.1% of reading + 0.3% of VA range)
POWER - AC	± (0.1% of reading + 0.2% of VA range)
POWER FACTOR	± (VA error ± W error)
DISPLAY	Digital display error ± 1 LSB
CREST FACTOR	Exceeds 3:1 (at 50% of range full scale)
TEMPERATURE COEFFICIENT	± 0.01% of range per deg. C. max

ACCURACY CERTIFICATION

All instruments are shipped with a CERTIFICATE of CALIBRATION from MAGTROL Inc. Magtrol policies and procedures comply with MIL-STD-45662A. Measurement standards are traceable to the National Institute of Standards and Technology (NIST).

Instrument calibration every six calendar months is necessary to maintain full compliance with all specifications.

If a one year calibration cycle is used, all accuracy specifications are reduced by 0.1%. After one calendar year, the instrument is considered to be out of calibration.