

**2.1 Voltage (V)**

<b>Range (Auto or Manual)</b> <b>(12 ranges 1-2-5 sequence)</b>		0.5V to 2000Vpk (1400V rms)
<b>Scaling Factors</b>		0.001 to 99999
<b>Computation</b>		True rms or rectified mean
<b>Crest Factor</b>		Up to 20
<b>Frequency Range</b>		DC and 0.1Hz to 500kHz
<b>Accuracy 23° ± 5°C</b> <b>(0.2V - 1000Vrms)</b>	45Hz - 450Hz and DC 0.1Hz-500kHz	±0.05% rdg ±0.05% range ± 20mV ±0.1% rdg ±0.05% range ±0.02%/kHz ±20mV
<b>Effect of Common</b> <b>Mode Voltage</b>	1000Vrms 60Hz: 100Vrms 100kHz:	< 20mV < 200mV
<b>Maximum Input</b>	Continuous: 1 second:	2000Vpk 5000Vpk
<b>Input Impedance</b>		1 MΩ in parallel with 10pF on all ranges

**2.2 Current (A)**

<b>Range (Auto or Manual)</b> <b>(12 ranges 1-2-5 sequences)</b>	INT: EXT:	0.05A to 200Apk (30A rms) 6.25mV to 2.5Vpk (1.5Vrms)
<b>Scaling Factor</b>	INT: EXT:	0.00001 to 99999 0.8uA/mV to 8000A/mV
<b>Computation</b>		True rms or rectified mean
<b>Crest Factor</b>		Up to 20
<b>Frequency Range</b>		DC and 0.1Hz to 500kHz
<b>Accuracy 23° ± 5°C</b> <b>20mA to 30Arms</b>	45 - 450Hz DC DC (option 002) 0.1Hz-500kHz	±0.05% rdg ±0.05% range ± 1mA ±0.05% rdg ±0.05% range ± 3mA* ±0.05% rdg ±0.05% range ± 9mA* ±0.1% rdg ±0.05% range ±0.04%/kHz ± 1mA
<b>Effect of Common</b> <b>Mode Voltage</b>	1000Vrms 60Hz: 100Vrms 100kHz:	< 2mA rms < 20mA rms
<b>Maximum Input</b>	Continuous: 1 second:	30Arms (must be limited by external fuses or CT's) 1000Apk
<b>Input Impedance</b>	INT: EXT: INT (Option 002): EXT (Option 002):	12.5 mΩ on all ranges 1MΩ in parallel with 10pF on all ranges 3.5mΩ on all ranges 10kΩ in parallel with 10pF on all ranges

\* Specification using auto-zero. User may also perform a manual zero to cancel offset. Refer to section 4.2.6.

**2.3 Power (W)**

<b>Ranges (Auto or Manual)</b> <b>(144 ranges corresponding to V &amp; A)</b>	25mW to 400kWpk (with scaling to 100,000MW)
<b>Accuracy(23 ± 5°C, sinewave)</b> 45Hz to 450Hz	± 0.1% rdg ± 0.1% range ± (0.06/PF)% ± 1mW
0.1Hz to 500kHz	± 0.2% rdg ± 0.1% range ± (0.06/PF)%/kHz ± 1mW
<b>Polarity</b>	+ = Positive powerflow - = Negative powerflow

**2.4 Apparent Power (VA)**

<b>Ranges (Auto or Manual)</b> <b>(144 ranges corresponding to V &amp; A)</b>	25mVA to 400kVApk (with scaling to 100,000MVA)
<b>Accuracy(23 ± 5°C, sinewave)</b> 45Hz to 450Hz	± 0.1% rdg ± 0.1% range ± 1mVA
0.1Hz to 500kHz	± 0.2% rdg ± 0.1% range ± 0.06%/kHz ± 1mVA

**2.5 Reactive Power (VAr)**

<b>Ranges (Auto or Manual)</b> <b>(144 ranges corresponding to V&amp;A)</b>	25mVAr to 400kVArpk (with scaling to 100,000MVAr)
<b>Accuracy(23 ± 5°C, sinewave)</b> 45Hz to 450Hz	± 0.1% rdg ± 0.1% range ± [0.06/(1-PF <sup>2</sup> ) <sup>0.5</sup> ] ± 1mVAr
0.1Hz to 500kHz	± 0.2% rdg ± 0.1% range ± [0.06/(1-PF <sup>2</sup> ) <sup>0.5</sup> ]/kHz ± 1mVAr
<b>Polarity</b>	+ = Inductive load - = Capacitive load

**2.6 Power Factor (PF)**

<b>Range</b>	± 0.000 to ± 1.000
<b>Accuracy 23 ± 5°C</b>	± 0.002 ± (kHz x 0.001/PF)
<b>Polarity</b>	+ = Leading - = Lagging

**2.7 Crest Factor (CF)**

<b>Range</b>	1.000 to 19.999
<b>Basic Accuracy 23 ± 5°C</b>	± 0.005

**2.8 Inrush Current**

<b>Range</b>	0.1A to 200Apk (with scaling to 20MA)
<b>Accuracy 23 ± 5°C</b>	0.5% of selected range
<b>Sampling Interval</b>	1Ø2 wire: 3.6 µS 1Ø3 wire/3Ø3 wire: 6.8 µS 3Ø4 wire: 10 µS

## 2.9 Impedance

<b>Range</b>		0.0001 $\Omega$ to 9.999 M $\Omega$
<b>Accuracy 23 <math>\pm</math> 5<math>^{\circ}</math>C</b>	45 - 450Hz:	$\pm$ 0.5% rdg
	0.1Hz-500kHz:	$\pm$ 0.5% $\pm$ (0.05 $\div$ PF)%/kHz

## 2.10 Frequency

<b>Range</b>	Int Source	5Hz to 1MHz
	Ext Source	0.1Hz to 1MHz
<b>Accuracy 23 <math>\pm</math> 5<math>^{\circ}</math>C</b>		$\pm$ 0.1%

## 2.11 Fundamental

<b>Range</b>		0.2V - 1000Vrms 20mA - 30Arms
<b>Accuracy 23 <math>\pm</math> 5<math>^{\circ}</math>C</b>	Option 002:	20mA - 30Arms $\pm$ 0.1% rdg $\pm$ 0.1% rng $\pm$ 0.02%/kHz $\pm$ 20mV (Voltage) $\pm$ 0.1% rdg $\pm$ 0.1% rng $\pm$ 0.04%/kHz $\pm$ 1mA (Current)
	Option 002:	$\pm$ 0.1% rdg $\pm$ 0.1% rng $\pm$ 0.04%/kHz $\pm$ 1mA (Current)

## 2.12 Harmonic

<b>Range</b>	DC fundamental to 99th harmonic for voltage and current. Freq Max Harmonic = 1MHz
<b>Accuracy 23 <math>\pm</math> 5<math>^{\circ}</math>C Fundamental</b>	$\pm$ (0.1 $\pm$ 0.05/kHz)% of Fundamental

## 2.13 THD

<b>Range</b>	0.2V - 1000Vrms 20mA - 30Arms
<b>Accuracy 23 <math>\pm</math> 5<math>^{\circ}</math>C</b>	$\pm$ (0.2 $\pm$ 0.01/kHz)% ; Harmonic Series (DC Excluded)

## 2.14 Integrator

<b>Range</b>	0.001 Whr to 100,000MWhr
<b>Integration Interval</b>	1 Second
<b>Elapsed Time Display</b>	7 Digit, Floating Decimal Point

## 2.15 Bandwidth

<b>Unfiltered Bandwidth</b>	DC - 500kHz
An anti-aliasing filter is applied at power-up. The filter response is flat to the specified cut-off frequency, and thereafter zero. It can be deselected using the BANDWIDTH key.	
<b>Filtered Bandwidth:</b>	
PM3300 STD:	DC-25kHz (Specified Accuracies Achieved to 12.5kHz)
PM3300 002:	DC-5kHz (Specified Accuracies Achieved to 2.5kHz)

**2.16 Analogue Outputs**

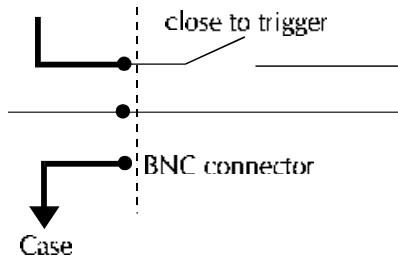
<b>Functions</b>	Volts, Amps and Neutral.
<b>No. of Outputs</b>	8
<b>Output levels</b>	0 to +5V; 5mA max

**2.17 External Frequency Source**

<b>Input</b>	4 - 50Vpk to pk 0.1Hz - 1MHz 10kΩ input impedance Negative inputs see a reverse diode (very high) impedance.
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**2.18 External Integrator Input (Datalog Trig)**

Closed switch to pass 5mA.



**2.19 Operating Temperature and Humidity**

10 - 90% RH non condensing  
0 - 50°C

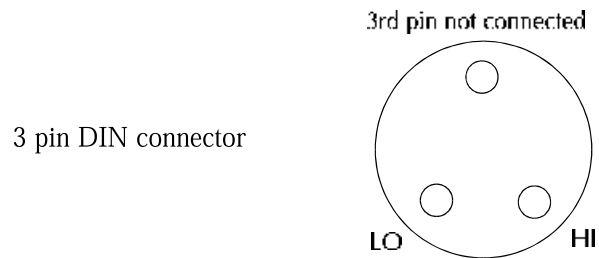
**2.20 Dielectric Strength**

<b>Input - case</b>	4kV AC 50/60Hz
<b>Inputs - power supply</b>	1 minute
<b>Input - input</b>	2kV AC 50/60 Hz
<b>Power supply - case</b>	1 minute

**2.21 Power Source**

<b>AC Input voltage</b>	100 -220V ± 20% (48 -440Hz)
<b>Protection</b>	Fuse 20mm 1AT
<b>Consumption</b>	40W, 60VA max

## 2.22 External Shunt Input



## 2.23 Auxiliary Inputs A and B (Torque and Speed):<sup>1</sup>

<b>Input</b>	0 - 1V DC 0 - 10V DC (software selectable)
<b>Type</b>	BNC rear panel connector
<b>Accuracy</b>	0.5% rdg $\pm$ 0.5% rng
<b>Input Impedance</b>	20k $\Omega$ in the normal operating range.

Note 1: This specification is valid only when inputs are used in PWM Motor Drive Mode

**Note :** All stated accuracies are based upon a minimum AVERAGING DEPTH setting of 8.  
(The default on power-up is 16).