

Table 5-3. Specifications

DC VOLTAGE

Input Characteristics:

Range	Maximum Reading (5% Digit)	Resolution		
		5% Digit	4% Digit	3% Digit
.3V	±.301000V	1μV	10μV	100μV
3V	±3.01000V	10μV	100μV	1mV
30V	±30.1000V	100μV	1mV	10mV
300V	±301.000V	1mV	10mV	100mV

Input Resistance:

.3V, 3V ranges: $> 10^{10}\Omega$
 30V, 300V ranges: $10M\Omega \pm 1\%$

Maximum Input Voltage: (non-destructive)

Hi to Lo: 301 Vrms or 450V peak
 Hi or Lo to Earth Ground: $\pm 500V$ peak

Measurement Accuracy:

$\pm (\% \text{ of reading} + \text{number of counts})$
 Auto-zero ON

5% Digit Mode:

Range	Cal. Temp $\pm 1^\circ C$	Cal. Temp. $\pm 5^\circ C$	
	24 Hours	90 Day	1 Year
.3V	0.005 + 4	0.009 + 5	0.02 + 5
3V	0.0035 + 2	0.007 + 2	0.018 + 2
30V	0.005 + 3	0.009 + 3	0.02 + 3
300V	0.0055 + 2	0.009 + 2	0.02 + 2

4% and 3% Digit Mode:

Accuracy is the same as 5% digit mode for % of reading; use 1 count for number of counts.

The Cal. Temp. (Calibration Temperature) is the temperature of the environment where the 3468A/B was calibrated. Calibration should be performed with the temperature of the environment between $20^\circ C$ and $30^\circ C$.

Auto-Zero Off:

(5% digit) for a stable environment ($\pm 1^\circ C$), for < 24 hrs., add 11 counts to accuracy specification for .3V and 30V ranges, 3 counts for 3V and 300V ranges. For 4% or 3% digits, multiply counts by 0.1.

Temperature Coefficient:

$0^\circ C$ to (Cal. Temp. $- 5^\circ C$), (Cal. Temp. $+ 5^\circ C$) to $55^\circ C$
 5% digit display, auto-zero ON
 $\pm 1\%$ of reading + number of counts/ $^\circ C$

Range	Temperature Coefficient
.3V, 30V	0.0008 + .5
3V, 300V	0.0007 + .05

Noise Rejection:

In dB, with 1k Ω imbalance in Lo lead. AC rejection for 50, 60Hz $\pm 0.1\%$. Auto-zero ON.

Display	AC CMRR	AC ECMR	DC CMR
5 1/2 digits	80	150	140
4 1/2 digits	59	130	140
3 1/2 digits	0	70	140

Maximum Reading Rates: (readings/sec)

First reading is correct within .1 count of final value, when on correct range, triggered coincident with step input.

The reading rates are dependent on the speed of the controller being used.

Line Frequency	Auto Zero	Resolution		
		3% Digits	4% Digits	5% Digits
60Hz	Off	32	21	3.7
	On	25	13.4	2
50Hz	Off	32	19	3.1
	On	25	12	1.7

Maximum Reading Rate with 41CV:

2 readings/sec

Display Rate: (readings/sec)

For 50 or 60 Hz operation.

	5% Digits	4% or 3% Digits
Auto Zero off	4	4
Auto Zero On	2	4

RESISTANCE (2-wire Ω , 4-wire Ω)

Input Characteristics:

Range	Maximum Reading (5% Digit)	Resolution		
		5% Digit	4% Digit	3% Digit
300 Ω	301.000 Ω	1m Ω	10m Ω	100m Ω
3 k Ω	3.01000 k Ω	10m Ω	100m Ω	1 Ω
30 k Ω	30.1000 k Ω	100m Ω	1 Ω	10 Ω
300 k Ω	301.000 k Ω	1 Ω	10 Ω	100 Ω
3M Ω	3.01000M Ω	10 Ω	100 Ω	1 k Ω
30M Ω	30.1000M Ω	100 Ω	1 k Ω	10 k Ω

Input Protection: (non-destructive)

Hi source to Lo source: $\pm 350V$ peak
 Hi sense to Lo sense: $\pm 350V$ peak
 Hi or Lo to Earth Ground: $\pm 500V$ peak

Measurement Accuracy:

$\pm (\% \text{ of reading} + \text{number of counts})$
 Auto-zero ON, 4-wire ohms.

5% Digit Mode:

Range	Cal. Temp $\pm 1^\circ C$	Cal. Temp. $\pm 5^\circ C$	
	24 Hours	90 Day	1 Year
300 Ω	0.0040 + 3	0.012 + 4	0.017 + 5
3k - 300k Ω	0.0040 + 2	0.011 + 2	0.016 + 2
3M Ω	0.0050 + 2	0.011 + 2	0.016 + 2
30M Ω	0.036 + 2	0.066 + 2	0.078 + 2

Table 5-3. Specifications (Cont'd)

RESISTANCE (2-wire Ω , 4-wire Ω) (Cont'd)

2-Wire Ohms Accuracy:

Same as 4-wire ohms, except add a maximum of 200m Ω offset. On the 3M Ω range add an additional offset of 0.0016% of reading. On the 30M Ω range add an additional offset of 0.0083% of reading.

Auto-Zero Off:

15% digit) for a stable environment ($\pm 1^\circ\text{C}$), for <24 hrs., add 11 counts to accuracy specification for 300 Ω range 3 counts for 3k Ω through 300k Ω ranges, 8 counts for 3M Ω range, and 33 counts for 30M Ω range.

Temperature Coefficient:

0°C to (Cal. Temp. - 5°C), (Cal. Temp. + 5°C) to 55°C
5% digit display, auto-zero ON
 $\pm$ (% of reading + number of counts)/°C

AC VOLTAGE (true rms responding)

Input Characteristics:

Range	Maximum Reading (5% Digit)	Resolution		
		5% Digit	4% Digit	3% Digit
.3V	.301000V	1 μV	10 μV	100 μV
3V	3.01000V	10 μV	100 μV	1mV
30V	30.1000V	100 μV	1mV	10mV
300V	301.000V	1mV	10mV	100mV

Input Impedance:

1M $\Omega \pm 1\%$ shunted by <60pF

Maximum Input Voltage: (non-destructive)

Hi to Lo: 301Vrms or 450V peak
Hi or Lo to Earth Ground: $\pm 500\text{V}$ peak

Measurement Accuracy:

$\pm$ (% of reading + number of counts)
Auto-zero ON. 5% digit display. Accuracy is specified for sine-wave inputs only, >10% of full scale.
1 Year, Cal. Temp. $\pm 5^\circ\text{C}$

Frequency	Ranges		
	.3V	3V, 30V	300V
20Hz-50Hz	1.14 + 163	1.14 + 102	1.18 + 102
50Hz-100Hz	0.46 + 163	0.46 + 103	0.5 + 102
100Hz-20kHz	0.29 + 163	0.26 + 102	0.33 + 102
20kHz-50kHz	0.56 + 247	0.41 + 180	0.55 + 180
50kHz-100kHz	1.74 + 882	1.05 + 825	1.26 + 825
100kHz-300kHz		10.1 + 3720 (30V range only)	

DC CURRENT

Input Characteristics:

Range	Maximum Reading (5% Digit)	Resolution		
		5% Digit	4% Digit	3% Digit
3A	$\pm 3.01000\text{A}$	10 μA	100 μA	1mA

Maximum Input: (non-destructive)

3A from <250V source; fuse protected

Range	Temperature Coefficient
300 Ω	0.0009 + 0.5
3k - 300k Ω	0.0009 + 0.05
3M Ω	0.0021 + 0.05
30M Ω	0.021 + 0.05

Current Through Unknowns:

Range:	300 Ω	3k Ω	30k Ω	300k Ω	3M Ω	30M Ω
Current:	1mA	1mA	100 μA	10 μA	1 μA	100nA

Maximum Open Circuit Voltage:

6.5V

Maximum Reading Rates:

Same as dc volts, except for 3M Ω and 30M Ω ranges. For 3M Ω range, add 20ms; for 30M Ω range, add 200ms per reading.

Auto-Zero Off:

(5% digits) for a stable environment ($\pm 1^\circ\text{C}$), for <24 hrs., add 10 counts to accuracy specifications for all ranges.

Temperature Coefficient:

0°C to (Cal. Temp. - 5°C), (Cal. Temp. + 5°C) to 55°C,
5% digit display, auto-zero ON.
For frequencies <20kHz, $\pm$ (0.016% of reading + 10 counts)/°C
For frequencies >20kHz, $\pm$ (0.04% of reading + 10 counts)/°C

Creep Factor:

>4:1 at full scale.

Common Mode Rejection:

With 1k Ω imbalance in Lo lead, >70dB, dc to 60Hz.

Maximum Reading Rates: (readings/sec)

First reading is correct within 70 counts of final value, when on correct range, triggered coincident with step input. Add 0.6 seconds for each range change.

For 50 or 60Hz operation, auto-zero ON or OFF.
3% or 4% digits: 1.4 readings/sec
5% digits: 1.0 readings/sec

Measurement Accuracy:

$\pm$ (% of reading + number of counts)
Auto-zero ON. 5% digit display.

Range	Cal. Temp. $\pm 5^\circ\text{C}$	
	90 Days	1 Year
3A, <1A input	0.14 + 6	0.17 + 6
3A, >1A input	1.0 + 30	1.0 + 30

Table 5-3. Specifications (Cont'd)

DC CURRENT (Cont'd)

Auto-Zero Off:

(5½ digit) for a stable environment ($\pm 1^\circ\text{C}$), for <24 hrs., add 11 counts to accuracy specification for 5½ digit mode.

Temperature Coefficient:

0°C to (Cal. Temp. -5°C), (Cal. Temp. $+5^\circ\text{C}$) to 55°C
5½ digit display, auto-zero ON
 $\pm (0.012 \text{ of reading} + 0.5 \text{ counts})/^\circ\text{C}$

Maximum Burden at Full Scale:

1V

Maximum Reading Rates:

Same as dc volts

AC CURRENT (true rms responding)

Input Characteristics:

Range	Maximum Reading (5½ Digit)	Resolution		
		5½ Digit	4½ Digit	3½ Digit
.3A	.301000A	1µA	10µA	100µA
3A	3.01000A	10µA	100µA	1mA

Maximum Input: (non-destructive)

3A from <250V source; fuse protected

Measurement Accuracy:

$\pm 1\%$ of reading + number of counts
Auto-zero ON. 5½ digit display. Accuracy specified for sine-wave inputs only > 10% of full scale.
1 YEAR, CAL. TEMP. $\pm 5^\circ\text{C}$

Frequency	Ranges	
	300mA	3A
20Hz – 50Hz	1.77 + 163	2.5 + 163
50Hz – 1kHz	1.1 + 163	1.8 + 163
1kHz – 10kHz	1.0 + 163	1.7 + 163
10kHz – 20kHz	1.14 + 163	1.84 + 163

Auto-zero Off:

(5½ digits) for a stable environment ($\pm 1^\circ\text{C}$), for <24 hrs., add 10 counts to accuracy specification.

Temperature Coefficient:

0°C to (Cal. Temp. -5°C), (Cal. Temp. $+5^\circ\text{C}$) to 55°C.
5½ digits, auto-zero ON.
 $\pm (0.021\% \text{ of reading} + 10 \text{ counts})/^\circ\text{C}$

Maximum Burden at Full Scale:

1V

Crest factor:

> 4:1 at full scale

Maximum Reading Rates:

Same as dc volts

GENERAL INFORMATION

Operating Temperature:

0 to 55°C

Humidity Range:

95% R.H., 0 to 40°C

Storage Temperature:

-40°C to 75°C
except for battery option, -40°C to $+65^\circ\text{C}$

Warm-up Time:

1 hr. to meet all specifications.

Integration Time:

Number of Digits	Line Frequency	
	50Hz	60Hz
5½	200ms	166.7ms
4½	20ms	16.67ms
3½	2ms	1.667ms

Power:

AC Line 48 – 440Hz; 86 – 250V, (see configuration)

Battery: (Option 001)

Rechargeable lead-acid: minimum continuous operation for 5 hours at 25°C; recharge time is 16 hours with 3468A/B off and 35 hours with 3468A/B on.

Maximum Power:

< 13 VA

Size:

88.4mm H x 238.1mm W x 276.2mm D
(3.88 in H x 9.38 in W x 10.88 in D)

Weight:

3468A - 2.1 kg (4.63 lbs.)
3468A with Option 001 - 3.1 kg (6.83 lbs.)