

\* Accuracy X% of reading  $\pm$  Y digits indicated by X+Y

The measuring accuracy indicated below can be obtained for a year following the calibration of the instrument.

#### 1. Typical Sample Rate and Resolution

Sample Rate	Resolution	Reading Rate	Hum Rejection
SLOW	5.5-digit	approx. 4 times/sec	Yes
MID	5.5-digit	approx. 20 times/sec	Yes
FAST	4.5-digit	approx. 100 times/sec	N/A

#### 2. DC Volt (DCV) 50mV range is for the VOAC7523/7522 only.

Range	Resolution		Input Resistance	Accuracy*	
	5.5-digit	4.5-digit		SLOW/MID	FAST
50mV	0.1 $\mu$ V	1 $\mu$ V	100M $\Omega$ or more	0.025+10	0.025+15
500mV	1 $\mu$ V	10 $\mu$ V	1000M $\Omega$ or more	0.012+5	0.012+10
5V	10 $\mu$ V	100 $\mu$ V		0.012+2	0.012+7
50V	100 $\mu$ V	1mV		0.016+5	0.016+10
500V	1mV	10mV	approx. 10M $\Omega$	0.016+2	0.016+7
1000V	10mV	100mV			

The accuracy in the 50mV and 500mV ranges is specified after zero compensation through the REL operation.

Sample rate in the 50mV range

SLOW/MID: Approx. 0.5 times/sec, FAST: Approx. 50 times/sec

Max. input voltage: 50mV to 5V range  $\pm$  800V (continuous)  
50V to 1000V range  $\pm$  1100V (continuous)

Resolution and noise rejection

Resolution	Sample Rate	NMRR	CMRR
5.5-digit	SLOW	55dB or more	120dB or more
5.5-digit	MID	55dB or more	120dB or more
4.5-digit	FAST	0dB	55dB or more

#### 3. CH-B DC Volt (DCV) VOAC7523/7520 only

Range	Resolution	Input Resistance	Accuracy*	
			SLOW/MID	FAST
5V	100 $\mu$ V	CH-B: H to CH-B: L 10M $\Omega$ $\pm$ 3%		0.025+30
50V	1mV	CH-B: H to CH-A: L 5M $\Omega$ $\pm$ 3%	0.025+2	0.025+8
300V	10mV	CH-B: L to CH-A: L 5M $\Omega$ $\pm$ 3%		0.025+5

Max. input voltage:  $\pm$  300V between CH-A L and CH-B  $\pm$  300V

Resolution and noise rejection

Resolution	Sample Rate	NMRR	CMRR	Isolation between CH-A and CH-B
4.5-digit	SLOW/MID	55dB or more	120dB or more	56dB or more
4.5-digit	FAST	0dB	55dB or more	

#### 4. AC Volt (ACV, DC+ACV) detection of True RMS

Up to 100kHz for VOAC7520/7521A

Range	Resolution	Measurement Range		Input Resistance
		SLOW	MID/FAST	
500mV	1 $\mu$ V			less than approx. 1M $\Omega$ // 100pF
5V	10 $\mu$ V	15Hz to 300kHz	200Hz to 300kHz	
50V	100 $\mu$ V			
500V	1mV	45Hz to 100kHz	200Hz to 100kHz	
750V	10mV	45Hz to 20kHz	200Hz to 20kHz	

Accuracy: SLOW Sample (Sine wave)

Frequency	Accuracy*
15Hz to 45Hz	0.5+150
45Hz to 100Hz	0.25+150
100Hz to 30kHz	0.2+150
30kHz to 100kHz	0.5+300
100kHz to 300kHz	2.5+1000

Coefficient to input other than sine wave

Crest Factor	Frequency
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	1 to 1.5	1.5 to 2	2 to 3
15Hz to 30kHz	0.05%	0.15%	0.30%
30kHz to 300kHz	0.20%	-	-

Response time

	Sample Rate	Resolution	Reading Rate	Response Time
SLOW		5.5-digit	4 times/sec	less than 3 sec
MID/FAST		5.5-digit	20 times/sec	less than 2 sec

Max. input voltage: 780Vrms,  $\pm$  1100V DC (continuous)

In the case of DC+ACV, 500 (less than 45Hz) or 300 (45Hz or higher) must be added to the value of Accuracy digit.

Sample rate of FAST becomes the same values as MID (approx. 20 times/sec).

#### 5. DC Current (DCA)

Range	Resolution		Accuracy*		Input Resistance
	5.5-digit	4.5-digit	SLOW/MID	FAST	
5mA	10nA	100nA			less than 150 $\Omega$
50mA	100nA	1 $\mu$ A	0.05+7	0.05+17	less than 15 $\Omega$
500mA	1 $\mu$ A	10 $\mu$ A			less than 2 $\Omega$
10A	100 $\mu$ A	1mA	0.2+7	0.2+17	less than 0.1 $\Omega$

Auto range is not available at 5mA to 500mA range and 10A range because of using different input terminals.

Max. input current: 5mA to 500mA range 500mA (FUSE 0.5A/250V)  
10A range 10A (FUSE 15A/250V)

#### 6. AC Current (ACA, DC+ACA)

Range	Resolution	Measurement Range		Input Resistance
		SLOW/MID	FAST	
5mA	10nA	15Hz to 5kHz		less than 150 $\Omega$
50mA	100nA		200Hz to 5kHz	less than 15 $\Omega$
500mA	1 $\mu$ A	45Hz to 5kHz		less than 2 $\Omega$
10A	100 $\mu$ A			less than 0.1 $\Omega$

Accuracy: SLOW Sample (Sine wave) 5% or more against the range

Frequency	Accuracy*	Crest Factor		
		1 to 1.5	1.5 to 2	2 to 3
15Hz to 45Hz	1+200			
45Hz to 1kHz	0.4+200	0.05%	0.15%	0.30%
1kHz to 5kHz	5.0+200			

Response time

	Sample Rate	Resolution	Reading Range	Response time
SLOW		5.5-digit	4 times/sec	less than 3 sec
MID/FAST		5.5-digit	20 times/sec	less than 2 sec

Max. input current: 5mA to 500mA range 500mA (FUSE 0.5A)  
10A range 10A (FUSE 15A)

DC Component on input current must be included in the Max. input current.

In the case of 10A range at 45Hz to 1kHz, 0.3 must be added to %.

In the case of DC+ACA, 500 (less than 45Hz) or 300 (45Hz or higher) must be added to the value of Accuracy digit.

Sample rate of FAST becomes the same value as MID (approx. 20 times/sec).

#### 7. Resistance (2 Wire $\Omega$ /4 Wire $\Omega$ ) 4 Wire $\Omega$ : VOAC7522/7521A only

Range	Resolution		Accuracy*		Test Current
	SLOW/MID	FAST	SLOW/MID	FAST	
50 $\Omega$	0.1m $\Omega$	1m $\Omega$	0.025+10	0.025+15	approx. 10mA
500 $\Omega$	1m $\Omega$	10m $\Omega$			approx. 10mA
5k $\Omega$	10m $\Omega$	0.1 $\Omega$	0.014+3	0.014+8	approx. 1mA
50k $\Omega$	0.1 $\Omega$	1 $\Omega$			approx. 100 $\mu$ A
500k $\Omega$	1 $\Omega$	10 $\Omega$	0.015+3	0.015+33	approx. 10 $\mu$ A
5M $\Omega$	10 $\Omega$	10 $\Omega$	0.033+30	0.033+30	approx. 1 $\mu$ A
50M $\Omega$	100 $\Omega$	100 $\Omega$	0.25+30	0.25+30	approx. 100nA
500M $\Omega$	1k $\Omega$	1k $\Omega$	1.5+50	1.5+50	approx. 10nA

Max. input voltage:  $\pm$  500V peak

Open circuit test voltage: less than 12V

The accuracy at 50 $\Omega$  to 5k $\Omega$  range are specified after zero compensation through the REL operation.

Sample rate of FAST at 5M $\Omega$  to 500M $\Omega$  range becomes the same value as MID (approx. 20 times/sec).

8. Low-Power Resistance (2 Wire $\Omega$ )

Range	Resolution SLOW/MID/FAST	Accuracy*		Test Current
		SLOW/MID	FAST	
500 $\Omega$	10m $\Omega$			approx. 1mA
5k $\Omega$	0.1 $\Omega$	0.1+5	0.1+15	approx. 100 $\mu$ A
50k $\Omega$	1 $\Omega$			approx. 10 $\mu$ A
500k $\Omega$	10 $\Omega$		0.2+40	approx. 1 $\mu$ A
5M $\Omega$	100 $\Omega$	0.2+30		approx. 100nA
50M $\Omega$	1k $\Omega$	1.5+30	1.5+30	approx. 10nA

Max. input voltage:  $\pm$  500V peak

Open circuit test voltage: less than 12V

The accuracy at 500 $\Omega$  to 5k $\Omega$  range are specified after zero compensation through the REL operation.

Sample rate of FAST at 5M $\Omega$  to 500M $\Omega$  range becomes the same value as MID (approx. 20 times/sec).

Indications are in 4.5 digits for SLOW, MID, and FAST.

## 9. Diode

Test Current	Measurement Range	Accuracy*	Open Circuit Test Voltage	Max. Input Voltage
approx. 1mA or 10mA	0.1mV to 5.0999V	0.014+13	less than 12V	$\pm$ 500V peak

## 10. Temperature

Thermo Couple	Measurement Range	Resolution	Accuracy*	Max. Input Voltage
R	-50 to +1768 $^{\circ}$ C		0.2+30	
K(CA)	-270 to +1372 $^{\circ}$ C		0.1+15	
T(CC)	-270 to +400 $^{\circ}$ C	0.1 $^{\circ}$ C		$\pm$ 500V peak
J(IC)	-210 to +1200 $^{\circ}$ C		0.15+15	
E(CRC)	-270 to +1000 $^{\circ}$ C			

Resolution: 4.5-digits, Sample rate at SLOW/MID/FAST: approx. 2 times/sec

## 11. Frequency (AC couple, Crest Factor: less than 3)

Sample Rate	Reading Rate (Gate time)	Display Digits and Measurement Range	Accuracy*
SLOW	approx. 0.5 times/sec (1s)	6-digit 15.0000Hz to 1.00000MHz	
MID	approx. 4 times/sec (100ms)	5-digit 15.000Hz to 1.0000MHz	0.02+2
FAST	approx. 10 times/sec (10ms)	4-digit 150.00Hz to 1.000MHz	

AUTO range of ACV must be used with input attenuator.

Max. input voltage: 780 Vrms,  $\pm$  1100V peak

## 12. Chart for combination of Dual Function

	DCV	CH-B DCV (*)	ACV	DC+ ACV	DCA	ACA	DC+ ACA	2 Wire $\Omega$	4 Wire $\Omega$ (**)	Hz	$^{\circ}$ C
DCV	×	○	△	△	△	△	△	×	×	△	△
CH-B DCV (*)	○	×	○	○	○	○	○	○	-	○	○
ACV	△	○	×	○	○	△	△	×	×	○	×
DC+ACV	△	○	○	×	○	△	△	×	×	○	×
DCA	△	○	○	○	×	△	△	△	△	○	×
ACA	△	○	△	△	△	×	○	△	△	△	×
DC+ACA	△	○	△	△	△	○	×	△	△	△	×
2 Wire $\Omega$	×	○	×	×	△	△	△	×	△	×	×
4 Wire $\Omega$ (**)	×	-	×	×	△	△	△	△	×	×	×
Hz	△	○	○	○	○	△	△	×	×	×	×
$^{\circ}$ C	△	○	×	×	×	×	×	×	×	×	×

○: Available    △: have a limitation    ×: N/A    -: not provided

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