

Digital Multimeter (portable type)

VOAC7500H Series



Isolate 2-channel input dual function
0.1µV, 509999, 5½ digits
VOAC7523H
Isolate 2-channel input dual function
1µV, 509999, 5½ digits
VOAC7520H



4-terminal resistance measurement
dual function 0.1µV, 509999, 5½ digits
VOAC7522H
4-terminal resistance measurement
dual function 1µV, 509999, 5½ digits
VOAC7521H

Digital Multimeters VOAC7523H/7522H/7520H/7521H Specifications

* Accuracy (±X% of reading +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 VOAC7523H / 7522H only.

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

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 ± 800V (continuous)

50V to 1000V range ± 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) VOAC7523H / 7520H only

Range	Resolution 4.5-digit	Input Resistance	Accuracy*	
			SLOW/MID	FAST
5V	100µV	CH-B:H to CH-B:L 10MΩ ± 3%	0.025+30	
50V	1mV	CH-B:H to CH-A:L 5MΩ ± 3%	0.025+8	
300V	10mV	CH-B:L to CH-A:L 5MΩ ± 3%	0.025+5	

Max. input voltage: ± 300V between CH-A L and CH-B ± 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 VOAC7521H / 7520H

Range	Resolution 5.5-digit	Measurement Range		Input Resistance
		SLOW	MID/FAST	
500mV	1µV			less than approx. 1MΩ // 100pF
5V	10µV	15Hz to 300kHz	200Hz to 300kHz	
50V	100µV			
500V	1mV	45Hz to 100kHz	200Hz to 100kHz	
750V	10mV	45Hz to 20kHz	200Hz to 20kHz	

Accuracy: SLOW Sample (Sine wave Amplitude at 5% to 100% of fullscale of range)

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	Crest Factor		
	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, ± 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 in above.

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	0.05+7	0.05+17	150Ω or less
50mA	100nA	1µA			15W or less
500mA	1µA	10µA	0.2+7	0.2+17	2W or less
10A	100µA	1mA			0.1Ω or less

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

Max. input current: 500mA at 5mA to 500mA ranges (FUSE 0.5A/250V)

10A at 10A range (FUSE 15A/250V)

6. AC Current (ACA, DC+ACA)

Range	Resolution 5.5-digit	Measurement Range		Input Resistance
		SLOW/MID	FAST	
5mA	10nA	15Hz to 5kHz	200Hz to 5kHz	150Ω or less
50mA	100nA			15W or less
500mA	1µA	45Hz to 5kHz		2W or less
10A	100µA			0.1Ω or less

Accuracy: SLOW Sample (Sine wave) amplitude at 5% to 100% of fullscale (10% to 100% for 10A range)

Frequency	Accuracy*	Crest Factor		
		1 to 1.5	1.5 to 2	2 to 3
15Hz to 45Hz	1+200	0.05%	0.15%	0.30%
45Hz to 1kHz	0.4+200			
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: 500mA for 5mA to 500mA ranges (FUSE 0.5A)

10A for 10A range (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 in above.

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

7. Resistance (2 WireΩ / 4 WireΩ) 4 WireΩ: VOAC7522H / 7521H only

Range	Resolution		Accuracy*		Test Current
	SLOW/MID	FAST	SLOW/MID	FAST	
50Ω	0.1mΩ	1mΩ	0.025+10	0.025+15	approx. 10mA
500Ω	1mΩ	10mΩ			
5kΩ	10mΩ	0.1Ω	0.014+3	0.014+8	approx. 1mA
50kΩ	0.1Ω	1Ω			
500kΩ	1Ω	10Ω	0.015+3	0.015+33	approx. 10µA
5MΩ	10Ω	100Ω	0.033+30	0.033+30	approx. 1µA
50MΩ	100Ω	100Ω	0.25+30	0.25+30	approx. 100nA
500MΩ	1kΩ	1kΩ	1.5+50	1.5+50	approx. 10nA

Max. input voltage: ± 500V peak Open circuit test voltage: 12V or less

The accuracy at 50Ω to 5kΩ range are specified after zero compensation through the REL operation.

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

8. Low-Power Resistance (2 WireΩ)

Range	Resolution SLOW/MID/FAST	Accuracy*		Test Current
		SLOW/MID	FAST	
500Ω	10mΩ	0.1+5	0.1+15	approx. 1mA
5kΩ	0.1Ω			
50kΩ	1Ω	0.2+30	0.2+40	approx. 10µA
500kΩ	10Ω			
5MΩ	100Ω	0.2+30	0.2+30	approx. 1µA
50MΩ	1kΩ	1.5+30	1.5+30	approx. 10nA

Max. input voltage: ± 500V peak Open circuit test voltage: 12V or less

The accuracy at 500Ω to 5kΩ range are specified after zero compensation through the REL operation.

Sample rate of FAST at 5MΩ to 500MΩ 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	12V or less	± 500V peak

10. Temperature

Thermocouple	Temperature Range to be Measured	Accuracy*	Resolution	Max. Input Voltage
R	-50°C to 0°C	0.2+70	0.1°C	± 500V peak
	0°C to +100°C	0.2+50		
	+100°C to +1768°C	0.2+30		
K(CA)	-200°C to -100°C	0.15+50	0.1°C	± 500V peak
	-100°C to 0°C	0.15+35		
	0°C to +1372°C	0.15+20		
T(C)	-200°C to -100°C	0.15+50	0.1°C	± 500V peak
	-100°C to 0°C	0.15+35		
	0°C to +400°C	0.15+20		
J(C)	-200°C to -100°C	0.15+50	0.1°C	± 500V peak
	-100°C to 0°C	0.15+35		
	0°C to +1200°C	0.15+20		
E(CRC)	-200°C to -100°C	0.15+50	0.1°C	± 500V peak
	-100°C to 0°C	0.15+35		
	0°C to +1000°C	0.15+20		

The above accuracy values do not include the thermocouple accuracy.

± 0.1°C/C is added (for all thermocouples) with the operating ambient temperature of this product at 0°C to +18°C and +28°C to +50°C.

accuracy is not specified. In the temperature range to be measured at -200°C or lower,

The reference thermo electric force is calculated by the "broken line approximation" according to JIS C 1602-1995.

If this product and the thermocouple are connected via a plug, an error for contact temperature compensation is added.

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 15,000Hz to 1,000,000MHz	0.02+2
MID	approx. 4 times/sec (100ms)	5-digit 15,000Hz to 1,000,000MHz	
FAST	approx. 10 times/sec (10ms)	4-digit 150,00Hz to 1,000MHz	

AC couple: Crest factor ≤ 3

AUTO range of ACV must be used with input attenuator.

Max. input voltage: 780 Vrms, ± 1100V peak

12. Chart for combination of Dual Function

	DCV	CH-B DCV ^(*)	ACV	DC+ACV	ACA	AGA	DC+ACA	2 WireW	4 WireW ^(*)	Hz	°C
DCV	X	○	△	△	△	△	△	X	X	△	△
CH-BDCV ^(*)	○	X	○	○	○	○	○	-	-	○	○
ACV	△	○	X	○	○	○	○	X	X	○	X
DC+ACV	△	○	○	X	○	○	○	X	X	○	X
DCA	△	○	○	○	X	△	△	△	△	○	X
ACA	△	○	○	○	△	△	X	△	△	△	X
DC+ACA	△	○	○	○	△	△	○	X	△	△	X
2 WireW	X	○	X	X	△	△	△	X	△	X	X
4 WireW ^(*)	X	-	X	X	△	△	△	△	X	X	X
Hz	△	○	○	○	○	△	△	X	X	X	X
°C	△	○	X	X	X	X	X	X	X	X	X

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

(*) CH-B DCV: VOAC7523H / 7520H only (**) 4 WireW: VOAC7522H / 7521H only

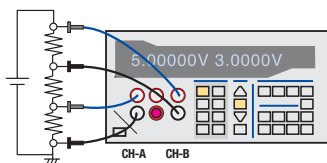
13. General

MATH		Moving Average, Scale, Decibel (dBm, dBu), Difference, Statistics (MAX, MIN, X, S), Comparison (COMP), Arithmetic Calculation between Dual Function
Memory	DATA SET UP	Max. 3000 data with 10 msec resolution time mark (Elapsed time)
Interfaces (Full Remote)	Standard	RS-232
	Option	LAN, GPIB
Power Supply	Voltage	AC100V, 110V, 220V, 240V
	Frequency	50Hz, 60Hz
	Power Consumption	21 VA (includes options) or less

Operation Temperature and Humidity	0°C to +50°C (less than 80%RH) no condensation, 70%RH or less at +40°C to +50°C	
Storage Temperature and Humidity	-20°C to +60°C (70%RH or less) no condensation, includes operation temperature	
Size	Dimensions (mm)	210(W) x 99(H) x 353(D) (Options are built into the main unit)
	Weight	3.5kg (includes options) or less
Standard Accessories	Fuse, Test Leads, Alignment Screwdriver, Operation Manual(CD-ROM), Power cable	

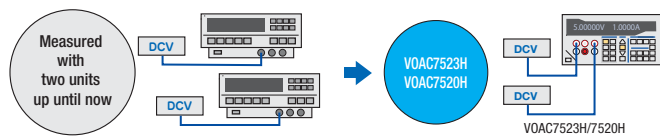
Isolate 2-channel input (VOAC7523H/7520H)

- If the CH-A and CH-B input is from an insulated VOAC7523H or 7520H, the electrical potential for different circuits can be measured simultaneously.

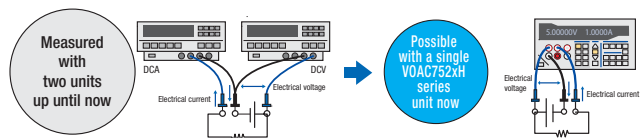


Dual Channels

- Measurements that conventionally require two oscilloscopes can now be performed simultaneously with a single unit to greatly improve efficiency. A connection example is shown below. Simultaneous display and simultaneous measurements are being performed here



Dual Display / Dual Function



Accurate Root-Mean-Square (RMS)

- Accurate root-mean-square values for AC voltage and AC current can be measured. Root-mean-square values for direct current can also be measured (DC+AC) V, (DC+AC) A

Options

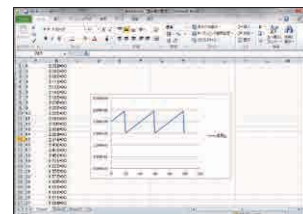
Product Name	Part Number	Image of Product
LAN interface *1	SC-351	
DIO interface *2	SC-352	
GPIB interface *1	SC-353	
D/A Converter interface *2	SC-354	
RS232-USB Converter (WindowsXP, Vista, 7)	SC-525	
4-wire kelvin test leads	SC-005	
High-voltage probe 30kVdc max. (can be used only in the Zin of 10MW range)	SC-003	
Clamp-on current probe DC ± 200A MAX AC150A rms MAX (40Hz to 500Hz)	SC-011	
Sheath-type thermocouple (Type K) -200°C to +800°C	SC-0107	
Surface thermocouple (Type K) 0°C to +500°C	SC-0116	

Abundant Interfaces

- **LAN Interface: SC-351**
10BASE-T (cannot be connected at the same time as the GPIB)
 - **GPIB Interface: SC-353**
To create a familiar system
 - **DIO Interface: SC-352**
Useful for judging acceptable and non-acceptable waveforms. Open collector output.
 - **D/A Output: SC-354**
Output can be selected from three patterns of 10V, 1V and 0.1V. Cannot be connected at the same time as the DIO.
- See the following website for further details.
www.iti.iwatsu.co.jp/products/voac/voac752xh_opt.html
- **RS USB Converter: SC-525**
USB can be used when connected with a RS-232 connector.

Trend Graphs Using the Interface

Data can be loaded into Excel and other spreadsheet software when connected to a PC with the interface. This enables trend graphs, etc., to be easily made.



Programming not required!
 Download the software from the following.
[Click here for the sample software](http://www.iti.iwatsu.co.jp/)
 URL <http://www.iti.iwatsu.co.jp/> Support

Product Name	Part Number	Image of Product
Banana plug (Can be used to connect a thermocouple)	POMONA1286	
High-resistance test lead	SC-004	
Test leads	SC-020	
Arrow clip For SC-020 (AC30V/DC60V/DC3A)	SC-021	
Alligator clip For SC-020 (AC30V/DC60V/DC10A)	SC-022	
Alligator clip H For SC-020 (600Vrms, CAT II/10A)	SC-023	

*1 The LAN interface SC-351 and GPIB interface SC-353 cannot be installed at the same time.
 *2 The DIO interface SC-352 and D/A Converter interface SC-354 cannot be installed at the same time.

Digital Multimeter (Handy type)

1μV, 50000, 4½ digits
VOAC22



100μV, 9999, 4-digit at full scale
VOAC87

