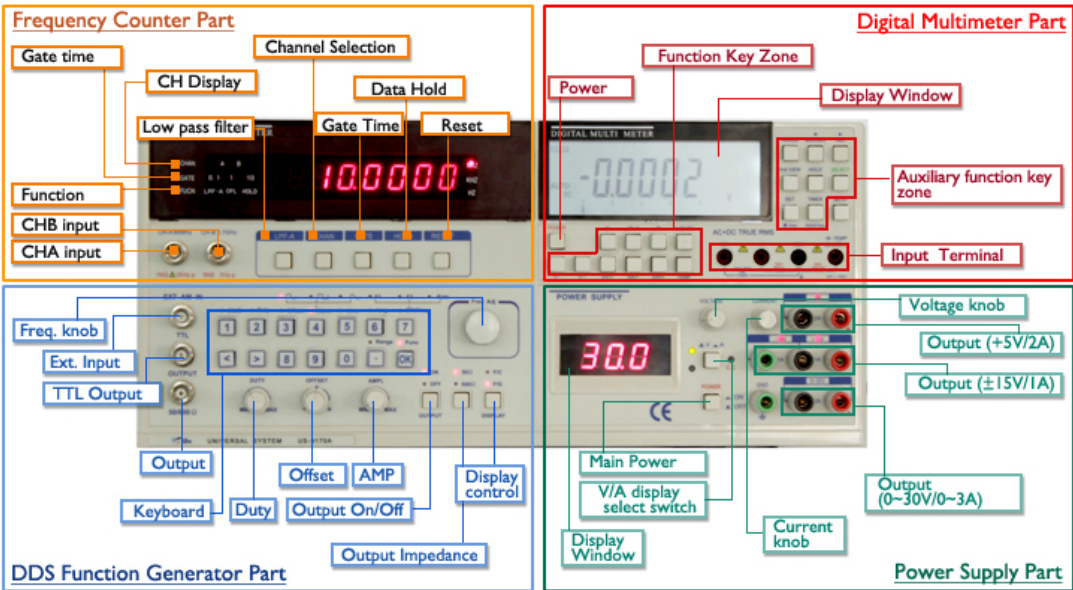
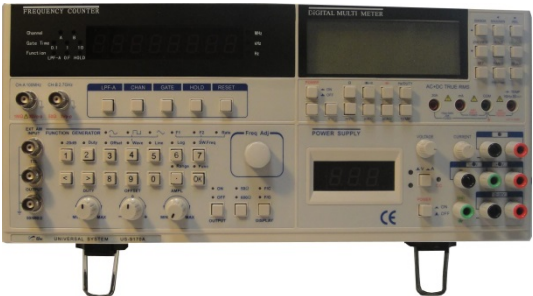


UNIVERSAL SYSTEM US-9170A

Features

- 10MHz DDS Function Generator
- 2.7GHz Frequency Counter
- Triple Output DC Power Supply
- 4 3/4-digit Digital Multimeter



Technical Specification

Digital Multimeter

DC Voltage Measurement			
Range	Resolution	Accuracy	Remark
80mV	1μV	±(0.3% +10d)	Input impedance: 80mV~800mV>1000MΩ 8V~000V : 10MΩ
800mV	10μV		
8V	0.1mV	±(0.05% +10d)	
80V	1mV		
800V	10mV	±(0.8% +10d)	
1000V	0.1V		
True RMS of AC voltage			
Range	Resolution	Accuracy	
		<80% Range:50Hz~20kHz	>80% Range:50Hz~20kHz
80mV	1μV	±(1.0% +50d)	±(5.0% +50d)
800mV	10μV	±(1.0% +50d)	±(5.0% +50d)
8V	0.1mV	±(1.0% +50d)	±(5.0% +50d)

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Remark: Input impedance: 80mV~800mV>1000MΩ ; 8V~1000V: 10MΩ, Parallel capacitance: < 100pF



DC Current			
Range	Resolution	Accuracy	Remarks
80mA	1μA	±(0.5%+10d)	Fuse: F 250V 1A(800mA range) ,
800mA	10μA		Voltage drop: ≤800mV
8A	0.1mA	±(0.8% +10d)	Max. input current: 20A (less than 15s)
20A	1mA	±(1.5% +10d)	
True RMS of AC Current			
Range	Resolution	Accuracy	Remarks
80mA	1μA	±(1.0% +20d)	Fuses : F 250V 1A S 250V 15A
800mA	10μA		Voltage drop: ≤800mV
8A	0.1mA	±(1.5% +20d)	Sensitivity : mA range is 50Hz~5kHz, A range is 50Hz~400Hz
20A	1mA	±(2.0% +20)	Max. Input Current: 20A(up to 15 seconds)
- Resistor			
Range	Resolution	Accuracy	Remarks
800Ω	0.01Ω	±(0.2% +10d)	Overload protection 250Vrms
8kΩ	0.1Ω	±(0.2% +5d)	
80kΩ	1Ω		
800kΩ	10Ω		
8MΩ	100Ω	±(0.3% rdg+10d)	
80MΩ	1kΩ	≤40MΩ : ±(1.5 % +10)	
		> 40MΩ: ±(3.0% +10)	
- Frequency			
Range	Resolution	Accuracy	Remarks
999.99Hz	0.01Hz	±(0.1% +5d)	Overload protection: 250Vrms
9.9999kHz	0.1Hz		Sensitivity: ≥200mVpp
99.99kHz	1Hz		
999.99kHz	10Hz		
6.0000MHz	100Hz		
- Capacitor			
Range	Resolution	Accuracy	Remark
1nF	1pF	±(5.0% +50d)	Overload protection: 250Vrms
10nF	10pF		
100nF	100		
	F		
1μF	1n		
10μF	10nF		
100μF	100nF		
- Temperature			
Temperature	Resolution	Accuracy	Remark
-50°C~ 1372°C	0.1°C	< 0°C or 32°F: ±(10% +5°),	K Thermocouple Type
		≥0°C or 32°F & ≤1000°C or 1832°F:	
-58°F~ 2502°F	0.1°F	> 1000°C or 1832°F : ±(3.0% +20°)	
- Diode			
Funcio	Range	Accuracy / Resolution	Remarks
Diode	3.0000V	±(3.0% +5d) / 0.0001V	Diode positive voltage drop; overload protection: 250Vrms
- dBm			
Function	Range	Accuracy	Resolution
dBm	-80.00dBm~ +80.00dBm	±1.0%	0.01dBm

Square wave output	
 OUT	Description
Voltage Amplitude	3V approx.
Frequency	0.5Hz/1.0Hz/2.0Hz/10Hz/50Hz/60.24Hz/74.63Hz/100Hz/151.5Hz/200Hz/303Hz/606.6Hz/1250Hz/1666Hz/2500Hz/5000Hz
Duty cycle	1% ~99%
RS232 Communication for DMM	
It has function of RS232 communication which can make user record and save measured data conveniently.	
The user should setup RS232 software disc to PC and connect to PC with RS232 cables.	

■ DDS Function Generator

Waveform characteristics		
Waveform type	Sine, Triangle, Square	
Sine harmonious wave distortion(1Vpp, 50Ω)	<20kHz: -50dBc / 20kHz~1MHz: -40dBc / 1MHz~10MHz: -35dBc	
Sine wave distortion	≤1%(0.1Hz~100kHz)	
Square wave Rise/Fall time	≤50n (1MHz, 50Ω, output voltage 5Vpp)	
Square overshot:	≤5%	
Square duty variable range	15%~85%(≤10kHz)	
Waveform asymmetry	<1.5% + 20ns of period(≤100kHz)	
Triangle linearity	< 1% (≤100kHz)	
Frequency characteristics		
Frequency range	Sine wave	0.1Hz~10MHz
	Square wave	0.1Hz~2MHz (100mVpp~10Vpp,50Ω)
		2MHz~5MHz (100mVpp~2Vpp,50Ω)
	Other waveform	0.1Hz~1MHz (TTL : 100KHz)
Frequency accuracy	±(5×10 ⁻⁵ + 80mHz)	
Frequency stability	±50ppm(Long Term)	
Max. resolution	0.01Hz	
Amplitude Characteristics		
Output amplitude range	100mVpp~20Vpp(High Impedance)	
Amplitude flatness	±10%	
Output impedance	50Ω±10%/600Ω±10%	
Overshot Characteristic		
DC offset range(Vpp AC + DC)	±10V(High Impedance) / ±5V(50Ω)	
Sweep Frequency Characteristics		
Type	Linearity or Log	
Sweep frequency	Negative or positive	
Sweep range	1Hz~10MHz	
Sweep frequency velocity	0.01Hz~100Hz	
Attenuation		
Attenuation	20dB / - Error: ±5%(±0.5dB)(open)	

External amplitude	
Input impedance	1k Ω
Ext amplitude freq range (Inner impedance 50 Ω of modulation source)	0.1Hz~20kHz
Amplitude sensitivity	0~5Vpp $\pm$ 5%
Amplitude depth	0~100%
TTL Output:	
Output amplitude	Low level $\leq$ 0.3V/high level $\geq$ 3.3V
Output impedance	50 Ω $\pm$ 10%

■ Frequency Counter

Freq measurement range	CHA: 1Hz~110MHz / CHB: 110MHz~2.7GHz
Input sensitivity	CHA: 40mVrms or 100mVpp(1Hz~80MHz), 70mVrms or 200mVpp (80MHz~110MHz)
	CHB: 40mVrms(110MHz~2.0GHz), 70mVrms(2.0GHz~2.7GHz)
Measurement accuracy	$\pm 1 \times 10^{-7}/s \pm$ time base error $\pm$ trigger error
Time base	10MHz, $\leq \pm 5 \times 10^{-6}$ (5ppm)
Max. Input voltage	CHA: 35Vpp, CHB: 3Vpp
Input impedance	CHA: 1M Ω , CHB: 50 Ω
Resolution	$[(\pm 1 \times 10^{-7}/s) \text{ measured signal frequency}]/$ Strobe time

■ DC Power Supply

CH1 output (output port)	
Output voltage	0~30V
Output current	0~3A
Ripple and noise	$\leq$ 3mVrms
Load effect	0.1% + 30mV
Source effect	0.1% + 15mV
Max. output current	3.1A
Display accuracy	Voltage: $\pm 1\%$ + 2digit, Current: $\pm 2\%$ + 2digit
CH2 output (output port)	
Output voltage	$\pm 15V$ fixed
Output current	1A
Ripple and noise	$\leq$ 3mVrms
Load effect	0.1% + 50mV
Source effect	0.1% + 30mV
Max. output current	1.1A
CH3 output (output port)	
Output voltage	+5V fix $\pm 3\%$
Ripple and noise	2A
Output current	$\leq$ 3mVrms
Load effect	0.1% + 70mV
Source effect	0.1% + 60mV
Max. output current	21.1A