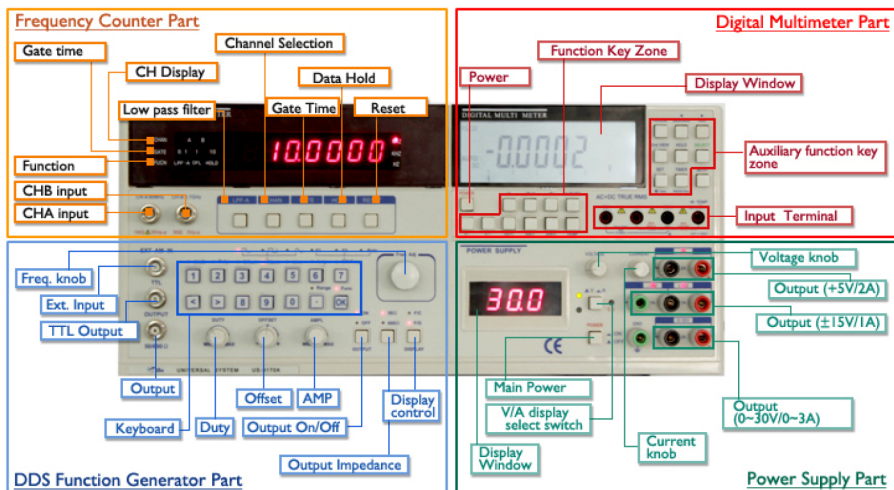


UNIVERSAL SYSTEM US-9170A



FEATURES

- ◆ **DDS Function Generator:**
 - It adopts digital synthetic technology which can generate 5 waves of sine, square, triangle pulse and TTL.
 - The frequency range is 0.1Hz~10MHz.
- ◆ **Frequency Counter:**
 - The frequency range is 1Hz~2.7GHz(CHA : 1Hz~110MHz, CHB :110MHz~2.7GHz) with high measurement accuracy and can realize equal accuracy measurement.
- ◆ **DC Power Supply:**
 - It is composed of four groups outputs
0~30V/0~3A adjustable voltage output,
+ 15V/1A fixed voltage output, - 15V/1A fixed voltage output and
+ 5V/2A fixed voltage output.
- ◆ **Digital Multimeter:**
 - It has about 50 kinds of measuring functions with multi display:
(Master display 80000, Sub-display 80000 and 21 segment of bar graph)
 - Max. AC/DC voltage: 1000VDC / 750VAC
 - Max. DC/AC current: 20A / Resistor: 0.1Ω~80MΩ
 - Capacitor: 1pF~100μF
 - Temperature: -50℃~1372℃ (-58°F~2502°F)
 - It has 16 kinds of frequency (0.5Hz~5kHz) and adjustable pulse waveform output of 1%~99% duty. It has RS232 interface which can be communicated with PC.



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		
80 V	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)
80V	1m	±(1.0% +50d)	±(5.0% +50d)
750V	10mV	50Hz~1kHz: <90% Range:±(1.0% +50d) & >90% Range:±(3.0% +50)	

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

- DC Current

Range	Resolution	Accuracy	Remark
80mA	1μA	±(0.5%+10d)	Fuse: F 250V 1A(800mA range) , S 250V 15A (20A range) Voltage drop: ≤800mV Max. input current: 20A (less than 15s)
800mA	10μA		
8A	0.1mA	±(0.8% +10d)	
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 Voltage drop: ≤800mV Sensitivity : mA range is 50Hz~5kHz, A range is 50Hz~400Hz Max. Input Current: 20A (up to 15 seconds)
800mA	10μA		
8A	0.1mA	±(1.5% +20d)	
20A	1mA	±(2.0% +20)	

- Resistor

Range	Resolution	Accuracy	Remark
800Ω	0.01Ω	±(0.2% +10d)	Overload protection 250Vrms
8kΩ	0.1Ω	±(0.2% +5d)	
80kΩ	1Ω		
800kΩ	10Ω	±(0.3% rdg+10d)	
8MΩ	100Ω		
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 Sensitivity: ≥200mVpp
9.9999kHz	0.1Hz		
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°), ≥0°C or 32°F & ≤1000°C or 1832°F: ±(2.0% +2°) > 1000°C or 1832°F: ±(3.0% +20°)	type K thermocouple
-58°F~ 2502°F	0.1°F		

- Diode

Function	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/1250H/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.

Technical Specification – continued

■ Function Generator

- Waveform characteristics

Waveform type	Sine, Triangle, Square
Sine harmonious wave distortion(1Vpp, 50Ω)	<20 kHz: -50dBc / 20 kHz~1 MHz: -40dBc / 1 MHz~10 MHz: -35dBc
Sine wave distortion	≤1%(0.1Hz~100 kHz)
Square wave Rise/Fall time	≤50n (1 MHz, 50Ω, output voltage 5Vpp)
Square overshoot:	≤5%
Square duty variable range	15%~85%(≤10 kHz)
Waveform asymmetry	<1.5% + 20ns of period(≤100 kHz)
Triangle linearity	< 1% (≤100 kHz)

-Frequency characteristics

Frequency range	Sine wave	0.1 Hz~10 MHz
	Square wave	0.1 Hz~2 MHz (100mVpp~10Vpp,50Ω) 2 MHz~5 MHz (100mVpp~2Vpp,50Ω)
	Other waveform	0.1Hz~1 MHz (TTL : 100KHz)
Frequency accuracy	±(5×10 ⁻⁵ + 80mHz)	
Frequency stability	±50ppm(Long Term)	
Max. resolution	0.01 Hz	

- Amplitude Characteristics

Output amplitude range	100mVpp~20Vpp(High Impedance)
Amplitude flatness	±10%
Output impedance	50Ω±10%/600Ω±10%

- Overshoot Characteristic

DC offset range(Vpp AC + DC)	±10V(High Impedance) / ±5V(50Ω)
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- Sweep Frequency Characteristics

Type	Linearity or Log
Sweep frequency	Negative or positive
Sweep range	1 Hz~10 MHz
Sweep freq velocity	0.01 Hz~100 Hz

- Attenuation

Attenuation	20dB / - Error: ±5%(±0.5dB)(open)
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- External amplitude

Input impedance	1kΩ
Ext amplitude freq range (Inner impedance 50Ω of modulation source)	0.1 Hz~20 kHz
- Amplitude sensitivity	0~5Vpp±5%
Amplitude depth	0~100%

- TTL Output:

Output amplitude	Low level ≤0.3V/high level ≥3.3V
Output impedance	50Ω ±10%

■ Frequency Counter

Freq measurement range	CHA: 1Hz~110 MHz / CHB: 110 MHz~2.7 GHz
Input sensitivity	- CHA: 40mVrms or 100mVpp(1 Hz~80 MHz), 70mVrms or 200mVpp (80 MHz~110 MHz) - CHB: 40mVrms(110 MHz~2.0 GHz), 70mVrms(2.0 GHz~2.7 GHz)
Measurement accuracy	±1×10 ⁻⁷ /s ± time base error ± trigger error
Time base	10MHz, <±5×10 ⁻⁶ (5ppm)
Max. Input voltage	CHA: 35Vpp, CHB: 3Vpp
Input impedance	CHA: 1MΩ, CHB: 50Ω
Resolution	[(±1×10 ⁻⁷ /s) measured signal frequency]/ Strobe time

■ DC Power Supply

- CH1 output (output port)

Output voltage	0~30V
Output current	0~3A
Ripple and noise	≤3mVrms
Load effect	0.1% + 30mV
Source effect	0.1% + 15mV
Max. output current	3.1A
Display accuracy	Voltage: ±1% + 2digit Current: ±2% + 2digit

- CH2 output (output port)

Output voltage	±15Vfixed
Output current	1A
Ripple and noise	≤3mVrms
Load effect	0.1% + 50mV
Source effect	0.1% + 30mV
Max. output current	1.1A

- CH3 output (output port)

Output voltage	+ 5V fix ±3%
Ripple and noise	2A
Output current	≤ 3mVrms
Load effect	0.1% + 70mV
Source effect	0.1% + 60mV
Max. output current	21.1A

■ General

- Accessories

1	Power cord	1pcs
2	User manual	1pcs
3	BNC-BNC cable	1pcs
4	BNC-Crocodile clip cable	1pcs
5	Connection cable	2pairs
6	50 ohm matching equipment	1pcs
7	F 250V 1A(6×30mm)fuse	2pcs
8	S 250V 15A(6×30mm)fuse	2pcs
9	T 250V 4A(5×20mm)fuse	2pcs
10	T 250V 8A(5×20mm)fuse	2pcs
11	Test leads(red, black)	1pair
12	TP01 temperature probe	1pcs
13	RS232 disc for DMM	1pcs
14	RS232 cable for DMM	1pcs

- AC Power Equipment

Rated voltage	AC220V / AC110V
Working voltage	AC198V~242V / AC100V~121V
Power fuse	AC220V -S 250V 4A/ AC100V -S 250V 8A Shape: 5×20mm, Type: slow-blow\
DMM fuse	mA current: F 250V 1A, Shape: 6×30mm, Type: fast-blow
20A current division	S 250V 15A, Shape: 6×30mm Type: slow-blow

- Operation & Storage Environment

Temperature	5°C to 40°C / <80% R.H
Operating Temperature	10°C to 40°C
Storage Temperature	10°C to 50°C
Pollution degree	II

- Dimension & Weight

370(W) x 350(D) x 175(H) mm, approx. 13kgs