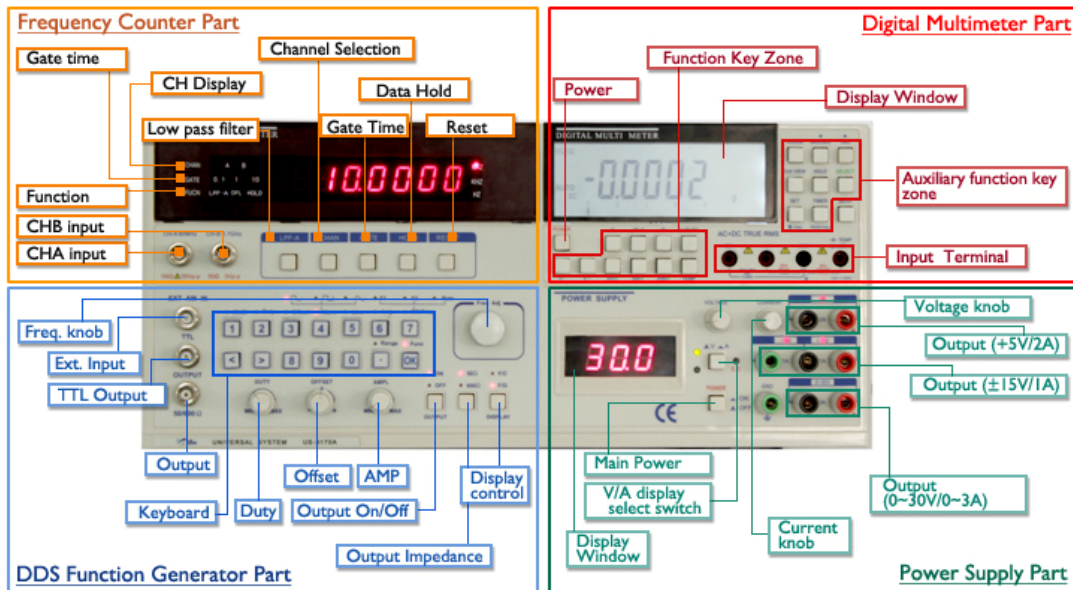


# ALL-IN-ONE UNIVERSAL SYSTEM

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	Remarks
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)
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

## US-9170A

DC Current			
Range	Resolution	Accuracy	Remarks
80mA	1μA	±(0.5%+10d)	Fuse: F 250V 1A(800mA 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	Remarks
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°),	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			
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.	

## ■ 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 overshoot:	≤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 <sup>-5</sup> + 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)	

<b>External amplitude</b>	
Input impedance	1kΩ
Ext amplitude freq range (Inner impedance 50Ω of modulation source) : 0.1Hz~20kHz	
Amplitude sensitivity	0~5Vpp±5%
Amplitude depth	0~100%
<b>TTL Output:</b>	
Output amplitude	Low level ≤0.3V/high level ≥3.3V
Output impedance	50Ω ±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	±1×10 <sup>-7</sup> /s ± time base error ± trigger error
Time base	10MHz, <±5×10 <sup>-6</sup> (5ppm)
Max. Input voltage	CHA: 35Vpp, CHB: 3Vpp
Input impedance	CHA: 1MΩ, CHB: 50Ω
Resolution	[(±1×10 <sup>-7</sup> /s) measured signal frequency]/ Strobe time

### ■ DC Power Supply

<b>CH1 output (output port)</b>	
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
<b>CH2 output (output port)</b>	
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
<b>CH3 output (output port)</b>	
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