# HDS100 Series Oscilloscope Meter Technical Specifications

Standard conditions: The environment temperature is 18℃ to 28℃,the relative humidity is less than 80%.

**Note**:

When measuring AC voltage, accuracy guarantee range is 10% to 100% of the range.

When measuring DC voltage, AC/DC current or capacitance, accuracy guarantee range is 5% to 100% of the range.

## HDS120 Series Multimeter Specification

| Function | | Measurement Range | Resolution/ Frequency Range | Accuracy ± (% of reading + LSB) | |
|---|---|---|---|---|---|
| DC Voltage (V) | mV | 20.000mV | 0.001mV | ±(0.1%+20dig) | |
| | | 200.00mV | 0.01mV | ±(0.1%+6dig) | |
| | V | 2.0000V | 0.1mV | ±(0.1%+5dig) | |
| | | 20.000V | 1mV | | |
| | | 200.00V | 10mV | | |
| | | 1000.0V | 0.1V | ±(0.15%+5dig) | |
| AC Voltage (V) | mV | 20.000mV[1] | 0.001 mV | VRMS Freq range：40Hz-1000Hz | ±(0.6%+10dig) |
| | | 200.00mV | 0.01mV | | |
| | V | 2.0000V | 0.1mV | | |
| | | 20.000V | 1mV | | |
| | | 200.00V | 10mV | | |
| | | 750.0V[2] | 0.1V | | ±(0.8%+10dig) |
| DC Current (A) | μA | 200.00μA | 0.01μA | ±(0.6%+10dig) | |
| | | 2000.0μA | 0.1μA | ±(0.5%+10dig) | |
| | mA | 20.000mA | 1μA | ±(0.6%+10dig) | |
| | | 200.00mA | 10μA | ±(0.5%+10dig) | |
| | A | 2.0000A | 100μA | ±(1.0%+10dig) | |
| | | 10.000A | 1mA | ±(2.0%+10dig) | |
| AC Current (A) | μA | 200.00μA[3] | 0.01μA | VRMS Freq range：40Hz-1000Hz | ±(0.8%+10dig) |
| | | 2000.0μA | 0.1μA | | |
| | mA | 20.000mA[3] | 1μA | | |
| | | 200.00mA | 10μA | | |

| | | | | | |
|---|---|---|---|---|---|
| | A | 2.0000A[3] | 100μA | | ±(1.5%+10dig) |
| | | 10.000A [4] | 1mA | | ±(2.5%+10dig) |
| **Resistance(Ω)** | | 200.00Ω | 0.01Ω | ±(0.8%+10dig) | |
| | | 2.0000kΩ | 0.1Ω | ±(0.3%+5dig) | |
| | | 20.000kΩ | 1Ω | ±(0.3%+5dig) | |
| | | 200.00kΩ | 10Ω | | |
| | | 2.0000MΩ | 100Ω | | |
| | | 20.000MΩ | 1kΩ | ±(0.5%+5dig) | |
| | | 100.00MΩ | 10kΩ | ±(5.0%+10dig) | |
| **Capacitance(F)** | | 2.000nF | 1pF | ±(5.0%+10dig) | |
| | | 20.00nF | 10pF | ±(3.0%+10dig) | |
| | | 200.0nF | 100pF | | |
| | | 2.000μF | 1nF | | |
| | | 20.00μF | 10nF | | |
| | | 200.0μF | 100nF | | |
| | | 2.000mF | 1μF | | |
| | | 20.00mF[5] | 10μF | | |
| **Frequency[6] (Hz)** | | 200.00Hz | 0.01Hz | ±(0.1%+5dig) | |
| | | 2.0000kHz | 0.1Hz | | |
| | | 20.000kHz | 1Hz | | |
| | | 200.00kHz | 10Hz | | |
| | | 2.0000MHz | 0.1kHz | | |
| | | 20.000MHz | 1kHz | | |
| **Duty Cycle[7] (%)** | | 0.1% -99.9% (Typical：Vrms=1 V, f=100Hz) | 0.1% | ±(1.2%+3dig) | |
| | | 0.1%-99.9%(≥ 1 kHz) | | ±(2.5%+10dig) | |
| **Diode** | | 3.0000V | 0.0001V | ±(1.0%+10dig) | |
| **Continuity** | | 1000.0Ω | 0.1Ω | | |
| **Maximum Reading** | | 20000 | | | |

[1] The frequency shows 50% – 100 % of the measurement range.

[2] The frequency shows 15% – 100 % of the measurement range.

[3] The frequency shows 50% – 100 % of the measurement range.

[4] When measuring current, for 10A the measuring duration should not be over 2 minutes within 10 minutes, and in this 10 minutes, no other current should flow through except within the measuring duration.

[5] When measuring capacitance, for the 20.00mF range, the measuring duration should be over 30 seconds.

[6] When measuring frequency, the typical waveform is Square or Sine. The signal meets the following conditions:

| Frequency | Amplitude(rms) |
|---|---|
| 1 Hz – 20 MHz | ≥ 1 V |

[7] When measuring duty cycle, the typical waveform is Square.

**Note: when measuring resistance and capacitance, the influence of the resistance reactance of the pen itself on the measured value should be considered.**

# HDS160 Series Multimeter Specification

| Function | Measurement Range | Resolution/ Frequency Range | Accuracy ± (% of reading + LSB) | |
|---|---|---|---|---|
| DC Voltage (V) | 60.000 mV | 0.001 mV | ±(0.10%+10dig) | |
| | 600.00 mV | 0.01 mV | ±(0.05%+5dig) | |
| | 6.0000 V | 0.0001 V | | |
| | 60.000 V | 0.001 V | | |
| | 600.00 V | 0.01 V | ±(0.10%+5dig) | |
| | 1000.0 V[3] | 0.1 V | ±(0.10%+10dig) | |
| AC Voltage (V) | 60.000 mV | 0.001 mV | Freq. : 20 Hz – 45 Hz | ±(1.0%+30dig) |
| | 600.00 mV | 0.01 mV | | |
| | 6.0000 V | 0.0001 V | | |
| | 60.000 V | 0.001 V | | |
| | 600.00 V | 0.01 V | | |
| | 750.0 V | 0.1 V | | |
| | 60.000 mV | 0.001 mV | Freq. : 45 Hz – 65 Hz | ±(0.5%+30dig) |
| | 600.00 mV | 0.01 mV | | |
| | 6.0000 V | 0.0001 V | | |
| | 60.000 V | 0.001 V | | |
| | 600.00 V | 0.01 V | | |

| | | | | |
|---|---|---|---|---|
| | 750.0 V | 0.1 V | | |
| | 60.000 mV | 0.001 mV | Freq. : 65 Hz – 1 kHz | ±(0.7%+30dig) |
| | 600.00 mV | 0.01 mV | | |
| | 6.0000 V | 0.0001 V | | |
| | 60.000 V | 0.001 V | | |
| | 600.00 V | 0.01 V | | |
| | 750.0 V | 0.1 V | | |
| **DC Current (A)** | 600.00 uA | 0.01 uA | ±(0.15%+20dig) | |
| | 6000.0 uA | 0.1 uA | ±(0.15%+10dig) | |
| | 60.000 mA | 0.001 mA | ±(0.15%+20dig) | |
| | 600.00 mA | 0.01 mA | ±(0.15%+10dig) | |
| | 6.0000 A | 0.0001 A | ±(0.50%+10dig) | |
| | 10.000 A | 0.001 A | | |
| **AC Current (A)[1]** | 600.00 uA | 0.01 uA | Freq. : 20 Hz– 1 kHz | ±(0.5%+20dig) |
| | 6000.0 uA | 0.1 uA | | |
| | 60.000 mA | 0.001 mA | | |
| | 600.00 mA | 0.01 mA | | |
| | 6.0000 A | 0.0001 A | | ±(1.5%+20dig) |
| | 10.000 A | 0.001 A | | |
| **Resistance (Ω)** | 600.00 Ω | 0.01 Ω | ±(0.15%+10dig) | |
| | 6.0000 kΩ | 0.0001 kΩ | ±(0.15%+5dig) | |
| | 60.000 kΩ | 0.001 kΩ | | |
| | 600.00 kΩ | 0.01 kΩ | | |
| | 6.0000 MΩ | 0.0001 MΩ | ±(0.30%+5dig) | |
| | 60.000 MΩ | 0.001 MΩ | ±(1.00%+10dig) | |
| **Diode** | 3.0000 V | 0.0001 V | ±(1.0%+10dig) | |
| **Continuity** | 1000.0 Ω | 0.1 Ω | Threshold can be adjusted, step by 1.0Ω | |
| **Frequency [2]** | 60.000 Hz | 0.001 Hz | ±(0.2%+10dig) | |
| | 600.00Hz | 0.01 Hz | | |
| | 6.0000 kHz | 0.0001 kHz | | |
| | 60.000 kHz | 0.001 kHz | | |
| | 600.00 kHz | 0.01 kHz | | |
| | 6.0000 MHz | 0.0001 MHz | | |
| | 60.000 MHz | 0.001 MHz | | |
| **Capacitance[3]** | 6.0000 nF | 0.0001 nF | ±(4.0%+50dig) | |
| | 60.000 nF | 0.001 nF | ±(2.5%+20dig) | |

| | | | | |
|---|---|---|---|---|
| | 600.00 nF | 0.01 nF | ±(2.0%+20dig) | |
| | 6.0000 uF | 0.0001 uF | | |
| | 60.000 uF | 0.001 uF | | |
| | 600.00 uF | 0.01 uF | | |
| | 6000.0 uF | 0.1 uF | ±(4.0%+20dig) | |
| | 60.000 mF | 0.001 mF | ±(5.0%+20dig) | |
| **Cycle duty[4]** | 0.1% ~ 99.9%, Vrms=1V | 0.10% | 1 kHz | ±(1.2%+3dig) |
| | | | >1 kHz | ±(2.5%+3dig) |
| **Maximum Reading** | 60000 | | | |

[1] When measuring current, for 10A the measuring duration should not be over 2 minutes within 10 minutes, and in this 10 minutes, no other current should flow through except within the measuring duration.

[2] When measuring frequency, the typical waveform is Square or Sine. The signal meets the following conditions:

| Frequency | Amplitude(rms) |
|---|---|
| 1 Hz – 20 MHz | ≥ 1 V |

[3] When measuring capacitance, for the 20.00mF range, the measuring duration should be over 10 seconds.

[4] When measuring duty cycle, the typical waveform is Square.

**Note: when measuring resistance and capacitance, the influence of the resistance reactance of the pen itself on the measured value should be considered.**

# Oscilloscope Specification

| **Characteristics** | **Instruction** |
|---|---|
| **Analog bandwidth[1]** | 1MHz (only ACV scale) |
| **Maximum sample** | 5.0MSa/s |
| **Channel** | 1 |
| **Input impedance** | approximately 10MΩ |
| **Time base range** | 2.5us~10s/grid |
| **Time base accuracy** | ±(0.01% + 0.1div) |
| **Voltage vertical sensitivity range** | 30mV~500V/grid |

| | |
|---|---|
| **Current vertical sensitivity range** | 100μA~5A/grid |
| **DC Gain Accuracy** | ±(5% + 0.2div) |
| **Maximum voltage limit** | 1000V DC+AC Peak value |
| **Maximum current limit** | 15A DC+AC Peak value |
| **Trigger mode** | Auto/Normal/Single |
| **Autoset** | Time base/Vertical amplitude/Trigger value |
| **Trigger edge** | Rise edge/Fall edge |
| **Measurement function** | Vmax,Vmin,Vpp,Vavg,Vrms,Freq |

**[1]: The simulated bandwidth of 1MHz attenuates to -5 dB.**

# General Specification

| **Characteristics** | **Instruction** |
|---|---|
| **Sleep Mode** | √ |
| **Low battery indication** | √ |
| **Backlight** | √ |
| **Input Protection** | √ |
| **Input Impedance** | ≥ 10 MΩ |
| **Battery** | Single 18650 3.7v |
| **Display** | 2.8 inch<br>IPS:320*240 resolution |
| **Weight** (without package) | Approx. 0.33kg(without battery) |
| **Dimension** | 188mm(Length)* 93mm(Width)*41.5mm(Depth) |
| **Working temperature** | 0℃ to 40℃ |
| **Storage temperature** | －10℃ to 60℃ |
| **Relative Humidity** | ≤ 80% |
| **Altitude** | Operating: 3,000 meters<br>Non-operating: 15,000 meters |

**Interval Period of Adjustment:** One year is recommended for the calibration interval period.

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