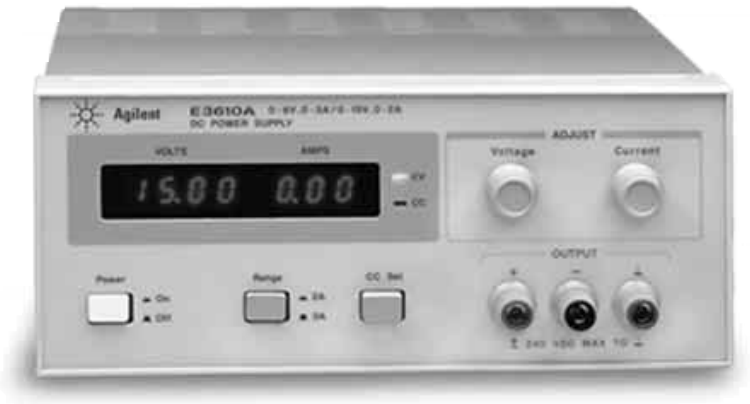
# Agilent E36XX-Series Manual dc Power Supplies

Data Sheet

- **Linear power supply**
- **Single, dual or triple output**
- **10-turn voltage and current controls**
- **Digital voltage and current meters**
- **Low noise and excellent regulation**




## Affordable, full-featured benchtop power supplies provide excellent performance and flexibility

### A whole family of low-cost power supplies to meet your needs

The E3600-series of low-cost benchtop power supplies give you the performance of system power supplies without the high price. All E3600 family members give you clean power with dependable regulation and fast transient response. E3600-series single-output models are described on this page. See page 2 for information on dual- and triple-output models.

### Single-output models

All E3600-series single-output power supplies feature separate digital-panel meters for monitoring voltage and current simultaneously, giving you precise reading and control capability. All models except the E3630A also feature 10-turn potentiometers for accurate adjustment of voltage and current output settings.

With 0.01 percent load and line regulation, these instruments keep the output steady when power line and load changes occur. The low normal-mode noise specification of less than 200µVrms ensures clean power for precision circuitry.

In all single-output models, either the positive or negative terminal can be connected to ground, providing a positive or negative voltage output. Outputs can also be floated up to 240V from ground.

These instruments also feature adjustable current limits, letting you set the safest current limit without having to short the output.

### E3610A, E3611A, and E3612A single-output models

These popular 30-watt bench supplies are designed for general laboratory use. The constant-voltage, constant-current output allows operation as either a voltage or current source. The changeover occurs automatically, based on the load. Each of these models has two ranges, allowing more current at a lower voltage. For higher output voltages, supplies can be connected in series.

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### E3614A, E3615A, E3616A and E3617A models feature overvoltage protection

These flexible 60-watt, single-range power supplies can be used as either voltage or current sources. When output terminal voltage increases to a preset shut-down level, an overvoltage protection circuit disables the output to protect the device under test (DUT) from damage. The overvoltage protection feature is easily monitored and adjusted from the front panel.

Using remote sensing capability, these instruments automatically compensate for voltage drop in the load leads, so you get accurate voltage at the DUT.

You can combine multiple units in auto-parallel, auto-series and auto-tracking configurations for greater output voltage or current capacity. Front and rear output terminals allow flexible configuration. Output voltage and current can be controlled with external 0- to10-volt analog voltage or variable resistance.

### Multi-output models

With multiple supplies in a compact unit, the E3620A and E3630A give you excellent performance while saving space on your bench. Both instruments feature tight 0.01 percent line and load regulation and a low normal-mode noise specification of less than 0.35mV to ensure clean power for precision circuitry. With a common-mode current specification of less than 1uA, both multiple-output power supplies minimize power line current injection.

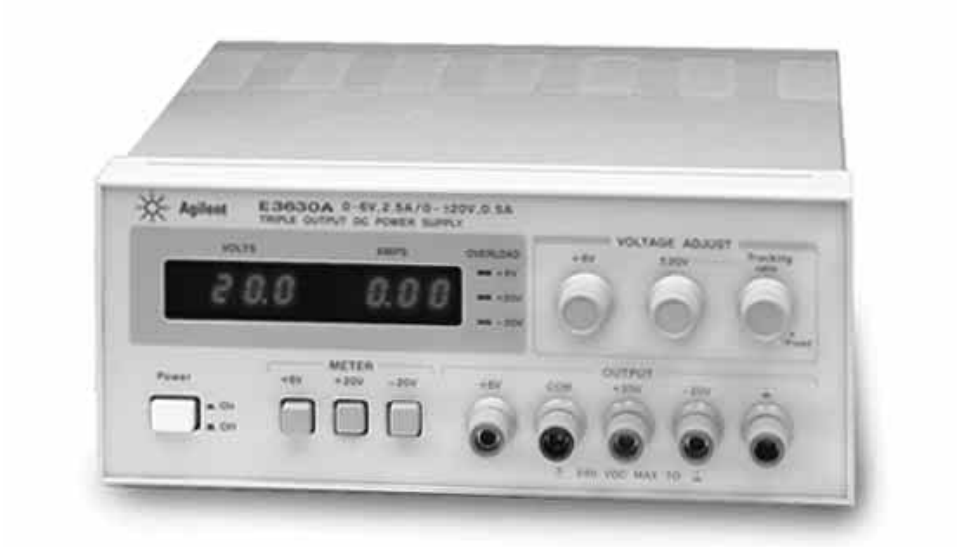
Like the single-output models in the E3600 series, the E3620A and E3630A feature separate digital panel meters so you can monitor voltage and current simultaneously. They also protect your DUT against overload and short-circuit damage. Smooth turn-on and turn-off transitions keep power spikes out of your circuits.

### E3620A dual-output power supply

The 50-watt E3620A dual-output power supply provides two 0 V to 25 Vdc outputs with the maximum current of 1 A to satisfy most bench requirements. The outputs are completely independent and isolated.

### E3630A triple-output power supply

The 35-watt E3630A triple- output power supply provides three dc outputs: 0 to 6 V with a maximum current of 1 to 2.5A and 0 to 20 V and 0 to -20 V with a maximum current of 0.5A. An autotracking feature lets you use one voltage control to adjust the +20 V and -20 V outputs simultaneously. The outputs track each other to within 1 percent, making it easy to adjust the power supply for circuits requiring balanced voltages.



## Specifications

| | E3610A | E3611A | E3612A | E3614A | E3615A | E3616A | E3617A | E3620A | E3630A |
|---|---|---|---|---|---|---|---|---|---|
| **Features** | Dual range, 10 turn pots, Constant Voltage (CV), Constant Current (CC) modes. | | | Adjustable overvoltage protection, voltage & resistance programming, remote sense, rear outputs, ten turn pots, CV, CC modes. Multiple supplies can be connected for tracking or higher power. | | | | Isolated dual outputs, 10 turn pots CV, CL | Tracking, CV, CL (±20 V) CV, CF (+6 V) |
| **Number of outputs** | 1 | | | | | | | 2 | 3 |
| **Number of output Ranges** | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| **dc Output Rating** | 8 V, 3 A<br>15 V, 2 A | 20 V, 1.5 A<br>35 V, 0.85 A | 60 V, 0.5 A<br>120 V, 0.25 A | 8 V, 6 A | 20 V, 3 A | 35 V, 1.7 A | 60 V, 1 A | 25 V, 1 A<br>25 V, 1 A | +6 V, 2.5 A<br>+20 V, 0.5 A<br>-20 V, 0.5 A |
| **Load and Line Regulation** | <0.01% + 2 mV | | | | | | | | |
| **Ripple and Noise** (20 Hz to 20 MHz) | | | | | | | | | |
| Normal mode voltage | <200 µVrms, <2 mVpp | | | <200 µVrms, <1 mVpp | | | | <350 µVrms, <1.5 mVpp | |
| Normal mode current | <200 µVrms / 1 mApp | | | <0.02%+ 3 mA | <0.02%+ 1.5 mA | <0.02%+ 1 mA | <0.02%+ 0.5 mA | – | |
| Common mode current | not specified | | | | | | | <1 µArms | |
| **Transient Response Time:** | <50 µsec following change in output current from full load to half load for output to recover to within: | | | | | | | | |
| | 10 mV | | | 15 mV | | | | | |
| **Meter Accuracy** | ±0.5% + 2 counts at 25°C ±5°C | | | | | | | | |
| **Meter Resolution** | | | | | | | | | |
| Voltage | 10 mV | 100 mV | 100 mV | 10 mV | 10 mV (0-20 V), 100 mV (>20 V) | | | | 10 mA |
| Current | 10 mA | 10 mA | 1 mA | 10 mA | 10 mA | 1 mA | 1 mA | 1 mA | 10 mA |
| **Isolation** | 240 Vdc | | | | | | | | |

## Supplemental Characteristics

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Control Mode** | CV/CC | | | | | | CV/CL | CV/CL (±20 V) CV/CF (+6 V) |
| **Temperature Coefficient per °C** | | | | | | | | |
| Voltage | <0.02% + 1 mV | | | <0.02% + 500 µV | | | <0.02% + 1 mV | |
| Current | <0.02% + 2 mA | | | <0.02% + 3 mA | <0.02% + 1.5 mA | <0.02% + 1 mA | <0.02% + 0.5 mA | – |
| **Output Drift** | | | | | | | | |
| Voltage | Less than 0.1% + 5 mV total drift for 8 hours after an initial warm-up of 30 minutes. | | | | | | | |
| Current | Less than 0.1% + 10 mA total drift for 8 hours after an initial warm-up of 30 minutes. | | | | | | | |
| **Temperature Range** | | | | | | | | |
| | 0 to 40°C for full rated output.<br>Derate output current 1% per °C between 40°C and 55°C | | | | | | Derate output current 3.3% per °C | |
| **Cooling** | Convection cooling | | | | | | | |
| **Isolation** | ±240 Vdc | | | | | | | |
| **AC Input** | 100 Vac ±10%, 47– 63 Hz (opt. 0E9)<br>115 Vac ±10%, 47– 63 Hz (std)<br>230 Vac ±10%, 47– 63 Hz (opt. 0E3) | | | | | | | |
| **Weight** | 3.8 kg (8.4 lb.) net,<br>5.1 kg (11.3 lbs) shipping | | | 5.5 kg (12.1 lb.) net, 6.75 kg (14.9 lbs) shipping | | | | Same as E3610A |
| **Size** | 91 mm H x 213 mm W x 319 mm D<br>3.6" H x 8.4" W x 12.6" D | | | 91 mm H x 213 mm W x 373 mm D<br>3.6" H x 8.4" W x 14.7" D | | | | |
| **Warranty** | 1 year | | | | | | | |
| **Product Regulation** | Certified to CSA 22.2 No. 231; conforms to IEC 1010-1; carries CE mark; complies with CISPR-11, Group 1, Class A | | | | | | | |

## Ordering Information

### E3600-Series Power Supplies

E3610A 30-Watt Power Supply
E3611A 30-Watt Power Supply
E3612A 30-Watt Power Supply
E3614A 48-Watt Power Supply
E3615A 60-Watt Power Supply
E3616A 60-Watt Power Supply
E3617A 60-Watt Power Supply
E3620A Dual-output Power Supply
E3630A Triple-output Power Supply

### Accessories included

Operating and service manuals and
AC power cord

### Power Options

Opt. 0E3 230 Vac ±10%
Opt. 0EM 115 Vac ±10%
Opt. 0E9 100 Vac ±10%

### Other Options

Opt. 1CM Rack-mount kit* (E3614A, E3615A, E3616A, E3617A, E3620A)
Opt. 0L2 Extra Manual

### Extra manual sets

E3610A/11A/12A Manual
(P/N 5959-5304)
E3614A/15A/16A /17A Manual
(P/N 5959-5310)
E3620A Manual
(P/N E3620-90001)
E3630A Manual
(P/N 5959-5329)

### Rack Mount Kits*

**E3610A/11A/12A/30A**
(P/N 5063-9767)

**E3614A/15A/16A/17A/20A**

To rack mount instruments side by side
Lock-link Kit (P/N 5061-9694)
Flange Kit (P/N 5063-9212)

To rack mount one or two instruments in a sliding support shelf
Support Shelf (P/N 5063-9255)
Slide Kit (P/N 1494-0015) required for support shelf
For a single instrument, also order filler panel (P/N 5002-3999)

*Rackmounting with 1CM or lock-link/flange kit requires Agilent or customer supplied support rails
Agilent Support Rails - E3663AC

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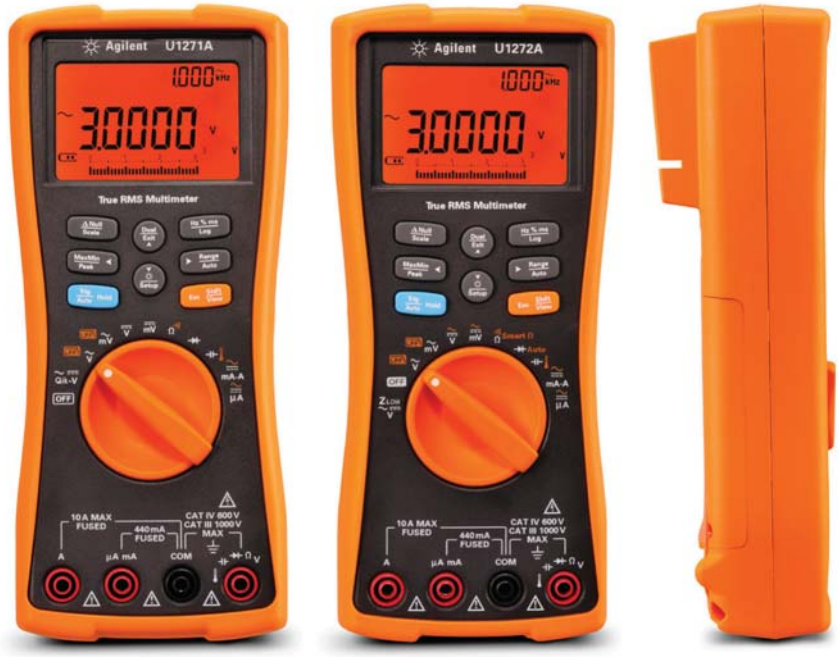
**Agilent Technologies**

# Agilent U1270 Series Handheld Digital Multimeters

## Shaped to fit, tailored to perform, built to last

Data Sheet




Features

- Intelligent features: $Z_{LOW}$*, Smart Ω*, Low Pass Filter, Qik-V**
- Visual (Backlight Alert) and audible continuity indication in noisy environments
- Ergonomic shape for better grip
- IP 54 certified – water and dust resistant
- Easy-to-operate large knob and buttons
- 30,000-count dual display
- AC + DC capability*
- CAT III 1000 V, CAT IV 600 V safety rating
- Easy maintenance – convenient fuse access
- Easy connectivity to PC with optional IR-USB cable
- Internal memory for data logging

* **U1272A only**
** **U1271A only**

## Get a better grip on your DMM

The U1270 series is shaped perfectly to fit in your hand, with or without gloves on. Its non-slip ergonomic shape enables you to carry your DMM and perform measurements on the go easily. Additionally, the controls are easy to operate due to the large knob and buttons.

## Improve productivity with intelligent features

Designed for maximum efficiency and productivity in industrial settings, these DMMs offer convenient functions such as ***$Z_{LOW}$*** to eliminate stray voltages, ***Smart Ω*** to minimize false readings due to leakage current and ***Qik-V*** to determine existence of AC and/or DC voltages.

Continuity detection in noisy and dark places is made easy with the U1270 series' loud beeper and ***Backlight Alert*** function which flashes the backlight to indicate continuity and improve safety.

When it comes to Variable Frequency Drive (VFD) troubleshooting, the U1270 series has ***Low Pass Filter*** to handle the job with ease.

## Water and dust resistant

The series' tightly sealed design helps protect against water, dust and damage. Each DMM is IP 54 certified so that you can carry out test and measurement with confidence, even in harsh working conditions.

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# Key functions

## Low Impedance ($Z_{LOW}$)

The U1272A is a dual input impedance digital multimeter. The DMM's high input impedance is preferred in most electrical measurements because it would not load the circuit under test. However, to obtain accurate measurements on circuits that may contain stray voltages, the U1272A's 2 kΩ low impedance function comes in handy. Stray voltages are usually found in non-energized electrical wiring adjacent to powered wires due to capacitive or inductive coupling between these wires. When a pair of test leads is placed between the open circuit and neutral conductor, the circuit is then complete and forms a voltage divider in conjunction with the input impedance of the multimeter. High input impedance multimeter is sensitive enough to measure voltage coupled into the disconnected conductor, thus giving an inaccurate indication of a live conductor. The low impedance function serves to eliminate false readings by dissipating the stray voltages, thus improves safety and measurement efficiency during voltage.

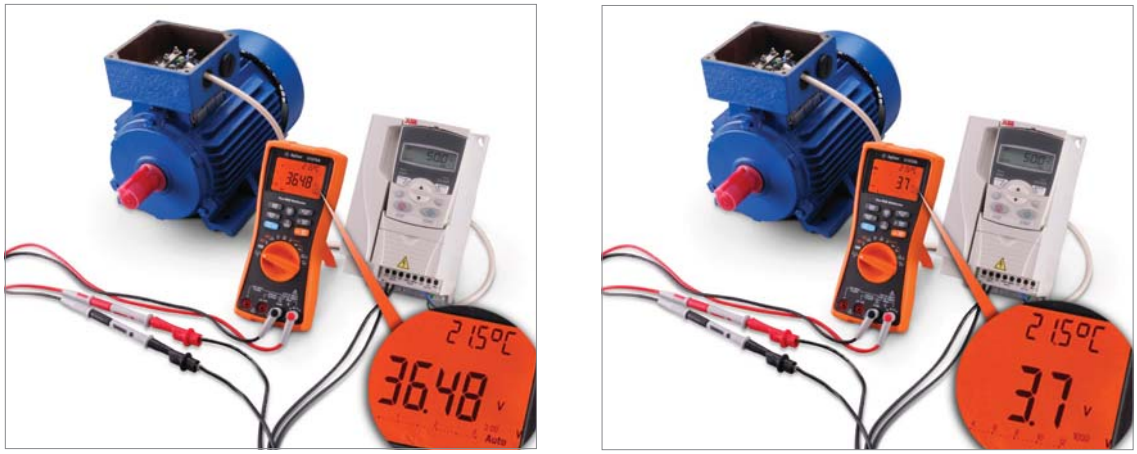



*Figure 1: U1272A helps you identify the presence of stray voltage on a disconnected wire running parallel with the wire powering up the VFD to an industrial motor. The image on the right shows the U1272A in low impedance mode.*

## Low Pass Filter (LPF)

The U1270 series offers a 1 kHz LPF or Low Pass Filter to provide accurate Variable Frequency Drive (VFD) output measurement. This function eliminates high frequency noise and harmonics. This ensures the efficiency of your motor filter as well.

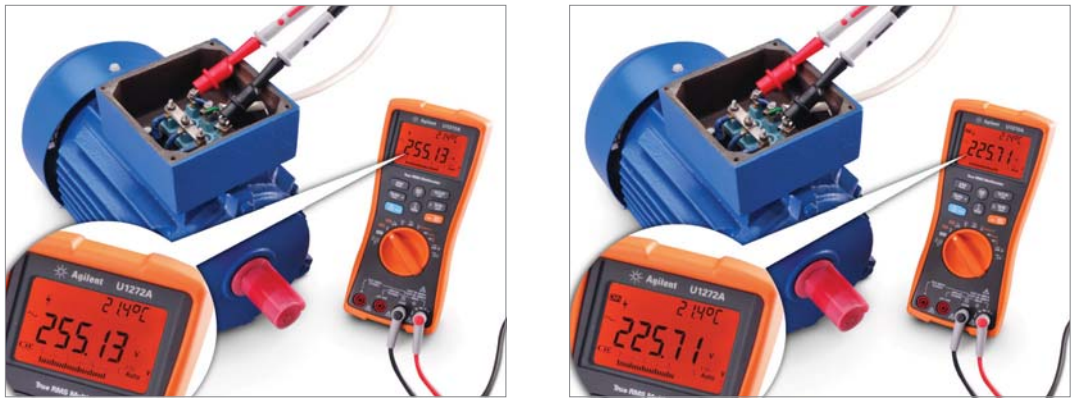



*Figure 2: Comparison of voltage output from industrial motor VFD without and with Low Pass Filter functionality.*

## Smart Ω

The U1272A provides an additional 30 Ohm range for low resistance measurement. This Smart Ω function is available for ranges of 30 Ohm to 300 kOhm. It enhances measurement accuracy with offset compensation by removing residual DC voltages of up to 1000 mV induced by ground current and thermal EMF. This function also enables 'live' resistance measurement without isolating the measurement circuit. With this, you will be able to obtain leakage current using the secondary display.

# Front and back panel description

***Backlight Alert*** flashes the backlight to provide visual indication in continuity test

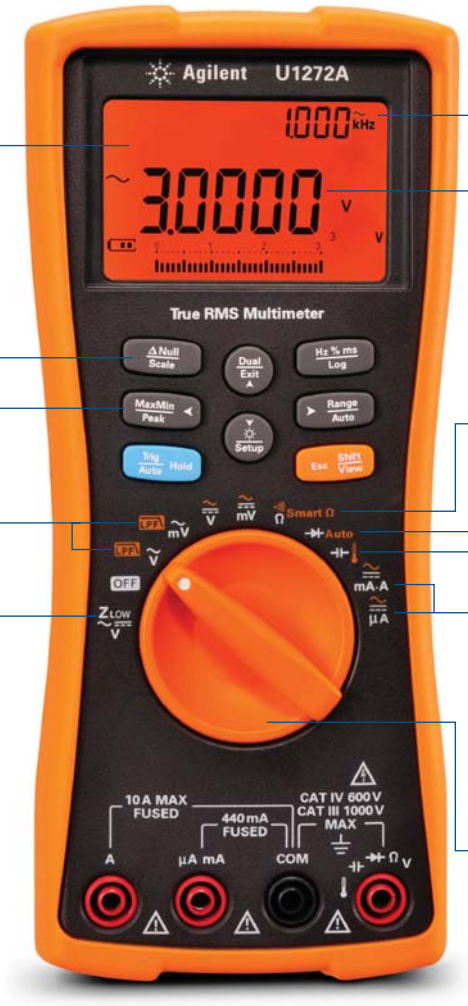
Large buttons

***Peak detect*** records transients as fast as 250µs

***Low Pass Filter (LPF)*** removes unwanted high frequency signals

***$Z_{LOW}$*** ** provides both high and low impedance modes to eliminate stray voltages


***Qik-V**** allows AC+DC measurement to quickly check for energized voltage




Front panel

Dual display

30,000 counts resolution

***Smart Ω**** ** removes residual voltage of up to 1000 mV

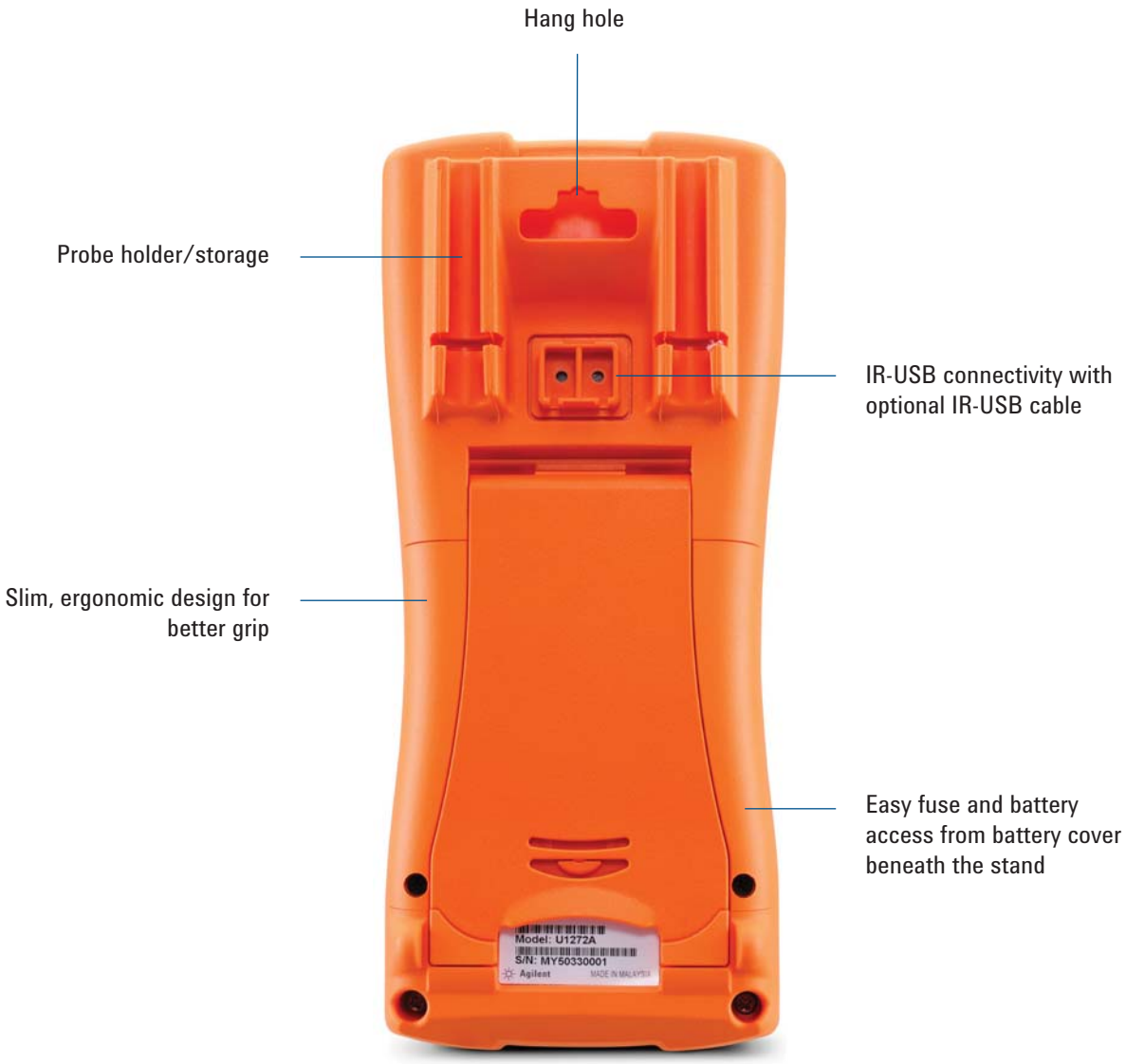
***Auto diode**** ** automatically determines diode polarity

Temperature measurement: J type thermocouple -200 to 1200 °C**, K type thermocouple -200 to 1732 °C

***AC + DC**** ** capability

Large knob for ease of use

* **U1271A only**
** **U1272A only**


Hang hole
Probe holder/storage
IR-USB connectivity with optional IR-USB cable
Slim, ergonomic design for better grip
Easy fuse and battery access from battery cover beneath the stand
Model: U1272A
S/N: MY50330001
Agilent

Back panel

# Choose between these two models

| | | U1271A | U1272A |
|---|---|---|---|
| **Basic Features** | | | |
| Display resolution | | 30,000 | 30,000 |
| Auto/manual ranging | | Yes | Yes |
| Analog bar graph | | Yes | Yes |
| Backlight | | Yes | Yes |
| AC bandwidth | | 20 kHz | 100 kHz |
| True RMS | | AC | AC + DC |
| **Measurements** | | | |
| Voltage DC | Range<br>Accuracy | 300 mV to 1000 V<br>0.05% + 2 cnts | 30 mV to 1000 V<br>0.05% + 2 cnts |
| Voltage AC | Range<br>Accuracy<br>Bandwidth | 300 mV to 1000 V<br>0.7% + 20 cnts<br>45 Hz to 20 kHz | 30 mV to 1000 V<br>0.6% + 20 cnts<br>45 Hz to 100 kHz |
| Current DC | Range<br>Accuracy | 300 µA to 10 A<br>0.2% + 5 cnts | 300 µA to 10 A<br>0.2% + 5 cnts |
| Current AC | Range<br>Accuracy<br>Bandwidth | 300 µA to 10 A<br>0.9% + 25 cnts<br>45 Hz to 2 kHz | 300 µA to 10 A<br>0.6% + 25 cnts<br>45 Hz to 2 kHz |
| Resistance | Range<br>Accuracy | 300 Ω to 100 MΩ<br>0.2 % + 5 cnts | 30 Ω to 300 MΩ<br>0.2% + 5 cnts |
| Frequency | Range<br>Accuracy | 99.999 Hz to 999.99 kHz<br>0.005% + 5 cnts | 99.999 Hz to 999.99 kHz<br>0.005% + 5 cnts |
| Capacitance | Range<br>Accuracy | 10 nF to 10 mF<br>1% + 2 cnts | 10 nF to 10 mF<br>1% + 2 cnts |
| Temperature | Range<br>Accuracy | K: -200 to 1372 °C<br>1% + 1°C | K: -200 to 1372 °C<br>J: -200 to 1200 °C<br>1% + 1 °C |
| Continuity with beeper | | Yes | Yes |
| Diode test | | Yes | Yes |
| **Data Management** | | | |
| Min/Max Recording | | Yes | Yes |
| Display Hold | | Yes | Yes |
| Peak Hold | | Yes | Yes |
| Manual Datalogging | | Yes | Yes |
| Null | | Yes | Yes |
| PC Connectivity | | IR-USB | IR-USB |
| % scale of 4-20 mA | | Yes | Yes |

| | U1271A | U1272A |
|---|---|---|
| **Special Features** | | |
| Beep + Backlight Alert | Yes | Yes |
| Low Pass Filter (LPF) | Yes | Yes |
| $Z_{LOW}$ - Low impedance mode | - | Yes |
| Smart Ω | - | Yes |
| Qik-V | Yes | - |
| **Safety and Regulatory** | | |
| Over-voltage safety protection | CAT III 1000 V, CAT IV 600 V | CAT III 1000 V, CAT IV 600 V |
| EN/IEC 61010-1:2001 compliance | Yes | Yes |
| **General** | | |
| Battery | 4x AAA | 4x AAA |
| Operating temperature | -20 °C to 55 °C, 0 to 80% R.H | -20 °C to 55 °C, 0 to 80% R.H |
| Standard Accessories | Standard test leads, test probes with 19-mm and 4-mm tips, K-type thermocouple and adapter, 4x AAA batteries, Certificate of Calibration, test report, Quick Start Guide | Standard test leads, test probes with 19-mm and 4-mm tips, K-type thermocouple and adapter, 4x AAA batteries, Certificate of Calibration, test report, Quick Start Guide |

# General Specifications

| | |
|---|---|
| Display | Liquid crystal display (LCD) (with maximum reading of 33000 counts) |
| Power consumption | 460 mVA maximum (with backlight enabled) |
| Battery Type | • 4 × 1.5 V Alkaline battery (ANSI/NEDA 24A or IEC LR03), or<br>• 4 × 1.5 V Zinc Chloride battery (ANSI/NEDA 24D or IEC R03) |
| Battery Life | • 300 hours typical (based on new Alkaline batteries for dc voltage measurement)<br>• Low battery indicator will flash when the battery voltage drops below 4.4 V (approximately) |
| Fuse | • 10 × 35 mm 440 mA/1000 V 30 kA fast-acting fuse<br>• 10 × 38 mm 11 A/1000 V 30 kA fast-acting fuse |
| Operating Environment | • Operating temperature from –20 to 55 °C, 0 to 80% RH<br>• Full accuracy up to 80% RH for temperatures up to 30 °C, decreasing linearly to 50% RH at 55 °C<br>• Altitude up to 2000 meters<br>• Pollution degree II |
| Storage Compliance | –40 to 70 °C, 0 to 80% RH |
| Safety Compliance | • CAN/CSA-C22.2 No. 61010-1-04<br>• EN/IEC 61010-1:2001<br>• ANSI/UL 61010-1:2004 |
| Measurement Category | CAT III 1000 V/ CAT IV 600 V |
| Electromagnetic Compatibility (EMC) | Commercial limits compliance with EN61326-1 |
| Ingress Protection Rating | IP-54 |
| Temperature Coefficient | 0.05 × (specified accuracy) / °C (from –20 to 18 °C, or 28 to 55 °C) |
| Common Mode Rejection Ratio (CMRR) | >120 dB at DC, 50/60 Hz ± 0.1% (1 kΩ unbalanced) |
| Normal Mode Rejection Ration (NMRR) | >60 dB at 50/60 Hz ± 0.1% |
| Dimensions (W x H x D) | 92 × 207 × 59 mm |
| Weight | • U1271A: 518 grams (with batteries)<br>• U1272A: 520 grams (with batteries) |
| Warranty | • Three years for product<br>• Three months for product's accessories |
| Calibration Cycle | One year |

# Specification Assumptions

- Accuracy is given as ±(% of reading + counts of least significant digit) at 23 °C ± 5 °C, with relative humidity less than 80% RH.
- AC V and AC µA/mA/A specifications are ac coupled, true RMS and are valid from 5% of range to 100% of range.
- The crest factor may be up to 3.0 at full- scale except for the 1000 V range where it is 1.5 at full scale.
- For non- sinusoidal waveforms, add (2% reading + 2% full scale) typical, for crest factors up to 3.
- After $Z_{LOW}$ voltage measurements, wait at least 20 minutes for thermal impact to cool before proceeding with any other measurement.

# Electrical specifications

## DC specifications for U1271A and U1272A

| Function | Range | Resolution | Accuracy ±(% of reading + counts of least significant digit) | | Test current/ Burden voltage |
|---|---|---|---|---|---|
| | | | U1271A | U1272A | |
| Voltage [1] | 30 mV | 0.001 mV | - | 0.05 + 20 | |
| | 300 mV | 0.01 mV | 0.05 + 5 | 0.05 + 5 | - |
| | 3 V | 0.0001 V | 0.05 + 5 | 0.05 + 5 | - |
| | 30 V | 0.001 V | 0.05 + 2 | 0.05 + 2 | - |
| | 300 V | 0.01 V | 0.05 + 2 | 0.05 + 2 | - |
| | 1000 V | 0.1 V | 0.05 + 2 | 0.05 + 2 | - |
| | $Z_{LOW}$ (low input impedance) enabled, applicable for 1000 V range and resolution only. | | - | 1 + 20 | |
| Resistance [2] | 30 Ω | 0.001 Ω | - | 0.2 + 10 | 0.65 mA |
| | 300 Ω | 0.01 Ω | 0.2 + 5 | 0.2 + 5 | 0.65 mA |
| | 3 kΩ | 0.0001 kΩ | 0.2 + 5 | 0.2 + 5 | 65 mA |
| | 30 kΩ | 0.001 kΩ | 0.2 + 5 | 0.2 + 5 | 6.5 mA |
| | 300 kΩ | 0.01 kΩ | 0.5 + 5 | 0.5 + 5 | 0.65 mA |
| | 3 MΩ | 0.0001 MΩ | 0.6 + 5 | 0.6 + 5 | 93 nA//10 MΩ |
| | 30 MΩ | 0.001 MΩ | 1.2 + 5 | 1.2 + 5 | 93 nA//10 MΩ |
| | 100 MΩ | - | 2.0 +10 | - | 93 nA//10 MΩ |
| | 300 MΩ | 0.01 MΩ | - | 2.0 % + 10 @ <100 MΩ<br>8.0 % + 10 @ >100 MΩ | 93 nA//10 MΩ |
| | 300 nS | 0.01 nS | 1 + 10 | 1 + 10 | 93 nA//10 MΩ |
| Current [3] | 300 µA | 0.01 µA | 0.2 + 5 | 0.2 + 3 | <0.04 V/ 100 Ω |
| | 3000 µA | 0.1 µA | 0.2 + 5 | 0.2 + 3 | <0.4 V/ 100 Ω |
| | 30 mA | 0.001 mA | 0.2 + 5 | 0.2 + 3 | <0.08 V/ 1 Ω |
| | 300 mA | 0.01 mA | 0.2 + 5 | 0.2 + 3 | <1.00 V/ 1 Ω |
| | 3 A | 0.0001 A | 0.3 +10 | 0.3 +10 | <0.1 V/ 0.01 Ω |
| | 10 A | 0.001 A | 0.3 +10 | 0.3 +10 | <0.3 V/ 0.01 Ω |
| Diode Test [4] | 3 V | 0.0001 V | 0.5 + 5 | 0.5 + 5 | Approximately 1 to 2 mA |
| | Auto | 0.0001 V | - | 0.5 + 5 | Approximately 0.1 to 0.3 mA |

1. *Notes for voltage specifications:*
   - *The accuracy of the 30 to 300 mV range is specified after the Null function is used to subtract the thermal effect (by shorting the test leads).*
   - *For $Z_{LOW}$ measurements, autoranging is disabled and the multimeter's range is set to 1000 volts in the manual ranging mode.*
2. *Notes for resistance specifications:*
   - *Overload protection: 1000 Vrms for short circuits with <0.3 A current.*
   - *Maximum open voltage is <+3.3 V*
   - *Built-in buzzer beeps when the resistance measured is less than 25 Ω ± 10 Ω. The multimeter can capture intermittent measurements longer than 1 ms.*
   - *The accuracy of the 300 Ω to 3 kΩ range is specified after the Null function is used to subtract the test lead resistance and thermal effect (by shorting the test leads).*
   - *For the ranges of 30 MΩ and 100 MΩ, the RH is specified for <60%.*
   - *The accuracy for ranges <50 nS is specified after the Null function is used on an open test lead.*
   - *The temperature coefficient of the 100 MΩ and 300 MΩ range is 0.1 × (specified accuracy)/°C (from -20 °C to 18 °C or 28 °C to 55 °C)*

3. *Notes for current specifications:*
   - *Overload protection for 300 µA to 300 mA range: 0.44 A/1000 V; 10 × 35 mm 30 kA fast-acting fuse*
   - *Overload protection for 3 A to 10 A range: 11 A/1000 V; 10 × 38 mm 30 kA fast-acting fuse*
   - *Specification for 300 mA range: 440 mA continuous.*
   - *Specification for 10 A range: 10 A continuous. Add 0.3% to the specified accuracy when measuring signals >10 to 20 A for 30 seconds maximum. After measuring currents >10 A, cool down the multimeter for twice the duration of the mea-sured time before proceeding with low current measurements.*
4. *Notes for diode specifications:*
   - *Overload protection: 1000 Vrms for short circuits with <0.3 A current.*
   - *Built-in buzzer beeps continuously when the voltage measured is less than 50 mV and beeps once for forward-biased di-ode or semiconductor junctions measured between 0.3 V and 0.8 V (0.3 V ≤ reading ≤ 0.8 V).*
   - *Open voltage for diode: <+3.3 V DC*
   - *Open voltage for Auto diode: <+2.5 V DC and > -1.0 V DC*

## AC specifications for U1271A

| Function | Range | Resolution | Accuracy | | | |
|---|---|---|---|---|---|---|
| | | | 45 Hz to 65 Hz | 30 Hz to 1 kHz | 1 kHz to 5 kHz | 5 kHz to 20 kHz |
| True RMS AC Voltage [1] | 300 mV | 0.01 mV | 0.7 + 20 | 1.0 + 25 | 2.0 + 25 | 2.0 + 40 |
| | 3 V | 0.0001 V | 0.7 + 20 | 1.0 + 25 | 2.0 + 25 | 2.0 + 40 |
| | 30 V | 0.001 V | 0.7 + 20 | 1.0 + 25 | 2.0 + 25 | 2.0 + 40 |
| | 300 V | 0.01 V | 0.7 + 20 | 1.0 + 25 | 2.0 + 25 | - |
| | 1000 V | 0.1 V | 0.7 + 20 | 1.0 + 25 | - | - |
| | LPF (low pass filter) enabled, applicable for all voltage ranges and resolution | | 0.7 + 20 | 1.0 + 25 @ <200 Hz<br>5.0 + 25 @ <440 Hz | - | - |

| Function | Range | Resolution | Accuracy | Burden voltage/Shunt |
|---|---|---|---|---|
| | | | 45 Hz to 2 kHz | |
| True RMS AC Current [2] | 300 µA | 0.01 µA | 0.9 + 25 | <0.04 V/ 100 Ω |
| | 3000 µA | 0.1 µA | 0.9 + 25 | <0.4 V/ 100 Ω |
| | 30 mA | 0.001 mA | 0.9 + 25 | <0.08 V/ 1 Ω |
| | 300 mA | 0.01 mA | 0.9 + 25 | <1.00 V/ 1 Ω |
| | 3A | 0.0001 A | 1.0 + 25 | <0.1 V/ 0.01 Ω |
| | 10 A | 0.001 A | 1.0 + 25 | <0.3 V/ 0.01 Ω |

1. *Notes for voltage specifications:*
   - *Overload protection: 1000 Vrms. For millivolt measurements, 1000 Vrms for short circuits with <0.3 A current.*
   - *Input impedance: 10 MΩ (nominal) in parallel with <100 pF.*
2. *Notes for current specifications:*
   - *Overload protection for 300 µA to 300 mA range: 0.44 A/1000 V; 10 × 35 mm 30 kA fast-acting fuse*
   - *Overload protection for 3 A to 10 A range: 11 A/1000 V; 10 × 38 mm 30 kA fast-acting fuse*
   - *Specification for 300 mA range: 440 mA continuous.*
   - *Specification for 10 A range: 10 A continuous. Add 0.3% to the specified accuracy when measuring signals >10 to 20 A for 30 seconds maximum. After measuring currents >10 A, cool down the multimeter for twice the duration of the measured time before proceeding with low current measurements.*

## AC specifications for U1272A

| Function | Range | Resolution | Accuracy | | | | |
|---|---|---|---|---|---|---|---|
| | | | 45 to 65 Hz | 20 Hz to 1 kHz | 1 kHz to 5 kHz | 5 kHz to 20 kHz | 20 kHz to 100 kHz |
| True RMS AC Voltage [1] | 30 mV | 0.001 mV | 0.6 + 20 | 0.7 + 25 | 1.0 + 25 | 1.0 + 40 | 3.5 + 40 |
| | 300 mV | 0.01 mV | 0.6 + 20 | 0.7 + 25 | 1.0 + 25 | 1.0 + 40 | 3.5 + 40 |
| | 3 V | 0.0001 V | 0.6 + 20 | 1.0 + 25 | 1.5 + 25 | 2.0 + 40 | 3.5 + 40 |
| | 30 V | 0.001 V | 0.6 + 20 | 1.0 + 25 | 1.5 + 25 | 2.0 + 40 | 3.5 + 40 |
| | 300 V | 0.01 V | 0.6 + 20 | 1.0 + 25 | 1.5 + 25 | 2.0 + 40 | - |
| | 1000 V | 0.1 V | 0.6 + 20 | 1.0 + 25 | 1.5 + 25 | - | - |
| | LPF (low pass filter) enabled, applicable for all voltage ranges and resolution | | 0.6 + 20 | 1.0 + 25 @ <200 Hz 5.0 + 25 @ <440 Hz | - | - | - |
| | $Z_{Low}$ 1000 V | | 2.0 + 40 | 2 + 40 @ <440 Hz | - | - | - |

| Function | Range | Resolution | Accuracy | | Burden voltage/ Shunt |
|---|---|---|---|---|---|
| | | | 45 to 65 Hz | 20 Hz to 2 kHz | |
| True RMS AC Current [2] | 300 µA | 0.01 µA | 0.6 + 25 | 0.9 + 25 | <0.04 V/ 100 Ω |
| | 3000 µA | 0.1 µA | 0.6 + 25 | 0.9 + 25 | <0.4 V/ 100 Ω |
| | 30 mA | 0.001 mA | 0.6 + 25 | 0.9 + 25 | <0.08 V/ 1 Ω |
| | 300 mA | 0.01 mA | 0.6 + 25 | 0.9 + 25 | <1.00 V/ 1 Ω |
| | 3A | 0.0001 A | 0.8 + 25 | 1.0 + 25 | <0.1 V/ 0.01 Ω |
| | 10 A | 0.001 A | 0.8 + 25 | 1.0 + 25 | <0.3 V/ 0.01 Ω |

1. *Notes for voltage specifications*
   - *Overload protection: 1000 Vrms. For millivolt measurements, 1000 Vrms for short circuits with <0.3 A current.*
   - *Input impedance: 10 MΩ (nominal) in parallel with <100 pF.*
   - *$Z_{Low}$ impedance: 2 kΩ (nominal)*
   - *The input signal is lower than the product of 20,000,000 V×Hz.*
   - *For 20 to 100 kHz accuracy: Three counts of the LSD per kHz of additional error is to be added for frequencies >20 kHz and signal inputs <10% of range.*
2. *Notes for current specifications*
   - *Overload protection for 300 µA to 300 mA range: 0.44 A/1000 V; 10 × 35 mm 30 kA fast-acting fuse*
   - *Overload protection for 3 A to 10 A range: 11 A/1000 V; 10 × 38 mm 30 kA fast-acting fuse*
   - *Specification for 300 mA range: 440 mA continuous.*
   - *Specification for 10 A range: 10 A continuous. Add 0.3% to the specified accuracy when measuring signals >10 to 20 A for 30 seconds maximum. After measuring currents >10 A, cool down the multimeter for twice the duration of the measured time before proceeding with low current measurements.*

## AC + DC specifications for U1272A

| Function | Range | Resolution | Accuracy | | | | |
|---|---|---|---|---|---|---|---|
| | | | 45 Hz to 65 Hz | 20 Hz to 2 kHz | 1 kHz to 5 kHz | 5 kHz to 20 kHz | 20 kHz to 100 kHz |
| True RMS AC + DC Voltage [1] | 30 mV | 0.001 mV | 0.7 + 40 | 0.8 + 45 | 1.1 + 45 | 1.1 + 60 | 3.6 + 60 |
| | 300 mV | 0.01 mV | 0.7 + 25 | 0.8 + 30 | 1.1 + 30 | 1.1 + 45 | 3.6 + 45 |
| | 3 V | 0.0001 V | 0.7 + 25 | 1.1 + 30 | 1.6 + 30 | 2.1 + 45 | 3.6 + 45 |
| | 30 V | 0.001 V | 0.7 + 25 | 1.1 + 30 | 1.6 + 30 | 2.1 + 45 | 3.6 + 45 |
| | 300 V | 0.01 V | 0.7 + 25 | 1.1 + 30 | 1.6 + 30 | 2.1 + 45 | - |
| | 1000 V | 0.1 V | 0.7 + 25 | 1.1 + 30 | 1.6 + 30 | - | - |

| Function | Range | Resolution | Accuracy | | Burden voltage/ Shunt |
|---|---|---|---|---|---|
| | | | 45 Hz to 65 Hz | 20 Hz to 2 kHz | |
| True RMS AC + DC Current [2] | 300 µA | 0.01 µA | 0.8 + 30 | 1.1 + 30 | <0.04 V/100 Ω |
| | 3000 µA | 0.1 µA | 0.8 + 30 | 1.1 + 30 | <0.4 V/100 Ω |
| | 30 mA | 0.001 mA | 0.8 + 30 | 1.1 + 30 | <0.08 V/1 Ω |
| | 300 mA | 0.01 mA | 0.8 + 30 | 1.1 + 30 | <1.00 V/1 Ω |
| | 3A | 0.0001 A | 0.9 + 35 | 1.3 + 35 | <0.1 V/0.01 Ω |
| | 10 A | 0.001 A | 0.9 + 35 | 1.3 + 35 | <0.3 V/0.01 Ω |

1. *Notes for voltage specifications:*
   - *Overload protection: 1000 Vrms. For millivolt measurements, 1000 Vrms for short circuits with <0.3 A current.*
   - *Input impedance: 10 MΩ (nominal) in parallel with <100 pF.*
   - *For 20 to 100 kHz accuracy: Three counts of the LSD per kHz of additional error is to be added for frequencies >20 kHz and signal inputs <10% of range.*
2. *Notes for current specifications:*
   - *Overload protection for 300 µA to 300 mA range: 0.44 A/1000 V; 10 × 35 mm 30 kA fast-acting fuse*
   - *Overload protection for 3 A to 10 A range: 11 A/1000 V; 10 × 38 mm 30 kA fast-acting fuse*
   - *Specification for 300 mA range: 440 mA continuous.*
   - *Specification for 10 A range: 10 A continuous. Add 0.3% to the specified accuracy when measuring signals >10 to 20 A for 30 seconds maximum. After measuring currents >10 A, cool down the multimeter for twice the duration of the measured time before proceeding with low current measurements.*

## Temperature specifications [1] - [6]

| Thermocouple type | Range | Resolution | Accuracy | |
|---|---|---|---|---|
| | | | U1271A | U1272A |
| K | -200 to 1372 °C | 0.1 °C | 1% + 1 °C | 1% + 1 °C |
| | -328 to 2502 °F | 0.1 °F | 1% + 1.8 °F | 1% + 1.8 °F |
| J | -200 to 1200 °C | 0.1 °C | - | 1% + 1 °C |
| | -328 to 2192 °F | 0.1 °F | - | 1% + 1.8 °F |

1. *The specifications above is specified after 60 minutes of warm-up time.*
2. *The accuracy does not include the tolerance of the thermocouple probe.*
3. *Do not allow the temperature sensor to contact a surface that is energized above 30 Vrms or 60 V DC. Such voltages poses a shock hazard.*
4. *Ensure that the ambient temperature is stable within ±1 °C and that the Null function is used to reduce the test lead's thermal effect and temperature offset. Before using Null function, set the multimeter to measure temperature without ambient compensation (°C) and keep the thermocouple probe as close to the multimeter as possible (avoid contact with any surface that has a different temperature from the ambient temperature).*
5. *When measuring temperature with respect to any temperature calibrator, try to set both the calibrator and multimeter with an external reference (without internal ambient compensation). If both the calibrator and multimeter are set with internal reference (with internal ambient compensation), some deviations may show between the readings of the calibrator and multimeter, due to differences in ambient compensation between the calibrator and multimeter. Keeping the multimeter close to the output terminal of calibrator will help reduce the deviation.*
6. *The temperature calculation is specified according to the safety standards of EN/IEC-60548-1 and NIST175.*

## Capacitance specifications [7][8]

| Range | Resolution | Accuracy | |
|---|---|---|---|
| | | U1271A | U1272A |
| 10 nF | 0.001 nF | 1% + 5 | 1% + 5 |
| 100 nF | 0.01 nF | 1% + 2 | 1% + 2 |
| 1000 nF | 0.1 nF | 1% + 2 | 1% + 2 |
| 10 µF | 0.001 µF | 1% + 2 | 1% + 2 |
| 100 µF | 0.01 µF | 1% + 2 | 1% + 2 |
| 1000 µF | 0.1 µF | 1% + 2 | 1% + 2 |
| 10 mF | 0.001 mF | 1% + 2 | 1% + 2 |

7. *Overload protection: 1000 Vrms for short circuits with <0.3 A current.*
8. *The accuracy for all ranges is specified based on a film capacitor or better, and after the Null function is used to subtract the test lead resistance and thermal effect (by shorting the test leads).*

## Frequency specifications [1][2]

| Range | Resolution | Accuracy | Minimum input frequency |
|---|---|---|---|
| 99.999 Hz | 0.001 Hz | 0.02% + 5 | 0.5 Hz |
| 999.99 Hz | 0.01 Hz | 0.005% + 5 | |
| 9.9999 kHz | 0.1 Hz | 0.005% + 5 | |
| 99.999 kHz | 1 Hz | 0.005% + 5 | |
| 999.99 kHz | 0.01 kHz | 0.005% + 5 | |
| >1 MHz | 0.1 kHz | 0.005% + 5 @ <1 MHz | |

1. *Overload protection: 1000 V; input signal is <20,000,000 V × Hz (product of voltage and frequency).*
2. *The frequency measurement is susceptible to error when measuring low-voltage, low-frequency signals. Shielding inputs from external noise pickup is critical for minimizing measurement errors. Turning on the low pass filter may help you to filter out the noise and achieve a stable reading.*

## Duty Cycle [3]

| Mode | Range | Accuracy at full scale |
|---|---|---|
| DC Coupling | 99.99% | 0.3 % per kHz + 0.3 % |
| AC Coupling | 99.99% | 0.3 % per kHz + 0.3 % |

## Pulse Width [4]

| Range | Resolution | Accuracy at full scale |
|---|---|---|
| 999.99 ms | 0.01 ms | (duty cycle accuracy/frequency) + 0.01 ms |
| 2000.0 ms | 0.1 ms | (duty cycle accuracy/frequency) + 0.1 ms |

3. *Notes for duty cycle specifications:*
   - *The accuracy for duty cycle and pulse width measurements is based on a 3 V square wave input to the dc 3 V range. For ac couplings, the duty cycle range can be measured within the range of 10% to 90% for signal frequencies >20 Hz.*
   - *The range of the duty cycle is determined by the frequency of the signal: {10 µs × frequency × 100%} to {[1 – (10 µs × frequency)] × 100%}.*
   - *The pulse width (positive or negative) must be >10 µs. The range of the pulse width is determined by the frequency of the signal.*
4. *Notes for pulse width specifications:*
   - *The accuracy for duty cycle and pulse width measurements is based on a 3 V square wave input to the dc 3 V range.*
   - *The pulse width (positive or negative) must be >10 µs. The range of the pulse width is determined by the frequency of the signal.*

## Frequency sensitivity for voltage measurements [1][2][3]

| Input range | Minimum sensitivity (RMS sine wave) | | | Trigger level for dc coupling | |
|---|---|---|---|---|---|
| | 15 Hz to 100 kHz | 0.5 Hz to 200 kHz | Up to 1 MHz | 0.5 Hz to 200 kHz | |
| | | | | U1271A | U1272A |
| 30 mV | 3 mV | 3 mV | - | - | 5 mV |
| 300 mV | 6 mV | 8 mV | 40 mV | 10 mV | 15 mV |
| 3 V | 0.12 V | 0.2 V | 0.4 V | 0.15 V | 0.15 V |
| 30 V | 0.6 V | 0.8 V | 2.6 V | 1.5 V | 1.5 V |
| 300 V | 6 V | 8 V @ <100 kHz | - | 9 V @ <100 kHz | 9 V @ <100 kHz |
| 1000 V | 50 V | 50 V @ <100 kHz | - | 90 V @ <100 kHz | 90 V @ <100 kHz |

1. *Maximum input for specified accuracy, refer to "AC specifications" on page 9.*
2. *30 mV range applicable for U1272A only.*
3. *200 kHz to 1 MHz range applicable for U1272A only.*

## Frequency sensitivity for current measurements [4]

| Input range | Minimum sensitivity (RMS sine wave) |
|---|---|
| | 2 Hz to 30 kHz |
| 300 µA | 100 µA |
| 3000 µA | 70 µA |
| 30 mA | 1.2 mA |
| 300 mA | 12 mA |
| 3 A | 0.12 A |
| 10 A | 1.2 A |

4. *Maximum input for specified accuracy, refer to "AC specifications" on page 9.*

## Peak hold

| Signal width | Accuracy for DC Voltage and Current |
|---|---|
| Single event >1 ms | Specified accuracy + 400 |
| Repetitive >250 µs | Specified accuracy + 1000 |

## Decibel (dB) for U1272A [1] - [3]

| dB base | Reference | Default reference |
|---|---|---|
| 1 mW (dBm) | 1 to 9999 Ω | 50 Ω |
| 1 V(dBV) | 1 V | 1 V |

1. *The reading of dBm is indicated in decibels of power above or below 1 mW, or decibels of voltage above or below 1 V. The formula is calculated according to the voltage measurement and specified reference impedance. Its accuracy is depended on the accuracy of the voltage measurement. See Decibel (dBV) accuracy table below.*
2. *Auto-ranging mode is used.*
3. *The bandwidth is according to voltage measurement.*

## Decibel (dBV) accuracy

| Range | dBV range | | Accuracy | | | | |
|---|---|---|---|---|---|---|---|
| | Minimum | Maximum | 45 to 65 Hz | 20 Hz to 1 kHz | 1 Hz to 5 kHz | 5 kHz to 20 kHz | 20 Hz to 100 kHz |
| 30 mV | -56.48 | -30.46 | 0.06 | 0.07 | 0.09 | 0.1 | 0.32 |
| 300 mV | -36.48 | -10.46 | 0.06 | 0.07 | 0.09 | 0.1 | 0.32 |
| 3 V | -16.48 | +9.54 | 0.06 | 0.09 | 0.14 | 0.19 | 0.32 |
| 30 V | +3.52 | +29.54 | 0.06 | 0.09 | 0.14 | 0.19 | 0.32 |
| 300 V | +23.52 | +49.54 | 0.06 | 0.09 | 0.14 | 0.19 | - |
| 1000 V | +33.98 | +60 | 0.06 | 0.09 | 0.14 | - | - |

## Measurement rate (approximate)

| Function | Times/second | |
|---|---|---|
| | U1271A | U1272A |
| ACV | 7 | 7 |
| DCV | 7 | 7 |
| Ω | 14 | 14 |
| Ω with offset compensation | - | 3 |
| Diode | 14 | 14 |
| Auto Diode | - | 3 |
| Capacitance | 4 (<100 µF) | 4 (<100 µF) |
| DCI | 7 | 7 |
| ACI | 7 | 7 |
| Temperature | 7 | 7 |
| Frequency | 2 (>10 Hz) | 2 (>10 Hz) |
| Duty cycle | 1 (>10 Hz) | 1 (>10 Hz) |
| Pulse width | 1 (>10 Hz) | 1 (>10 Hz) |

# Ordering Information

U1271A U1272A

# Standard Shipped Accessories

Standard test leads, test probes with 19-mm and 4-mm tips, K-type thermocouple and adapter, 4x AAA batteries, Certificate of Calibration, test report, Quick Start Guide

# Optional Accessories

## Measuring Accessories (non-temperature)

### U1160A Standard test lead kit

Includes two test leads (red and black), alligator clips, fine-tip test probes, SMT grabbers and mini grabber (black).

- Test leads: CAT III 1000 V, 15 A
- Alligator clips: CAT III 1000 V, 10 A
- Fine-tip test probes: CAT II 300 V, 3 A
- SMT grabbers: CAT II 300 V, 3 A
- Mini grabber: CAT II 300 V, 3 A

### U1161A Extended test lead kit

Includes two test leads (red and black), two test probes, medium-sized alligator clips and 4-mm banana plugs.

- Test leads: CAT III 1000 V, CAT IV 600 V, 15 A
- Test probes: CAT III 1000 V, 15 A
- Medium-sized alligator clips: CAT III 600 V, 10 A
- 4-mm banana plugs: CAT II 600 V, 10 A

### U1162A Alligator clips

- One pair of insulated alligator clips (red and black). Recommended for use with Agilent standard test leads.
- Rated CAT III 1000 V, 10 A.

### U1163A SMT grabbers

- One pair of SMT grabbers (red and black). Recommended for use with Agilent standard test leads.
- Rated CAT II 300 V, 3 A.

### U1164A Fine-tip test probes

- One pair of fine-tip test probes (red and black). Recommended for use with Agilent standard test leads.
- Rated CAT II 300 V, 3 A.

### U1165A Test probe leads

- Rated CAT III 1000 V, 15 A

## Measuring Accessories (non-temperature)

### U1168A Standard test lead kit

Includes two test leads (red and black), 19-mm and 4-mm test probes, alligator clips, fine-tip test probes, SMT grabbers and mini grabber (black).

- Test leads: CAT III 1000 V, CAT IV 600 V, 15 A
- Test probes (19-mm tip): CAT III 1000 V, CAT IV 600 V, 15 A
- Test probes (4-mm tip): CAT III 1000 V, CAT IV 600 V, 15 A (highly recommended for CAT IV environment)
- Alligator clips: CAT III 1000 V, 10 A
- Fine-tip test probes: CAT II 300 V, 3 A
- SMT grabber: CAT II 300 V, 3 A
- Mini grabber: CAT II 300 V, 3 A

### U1169A Test probe leads

Includes two test leads (red and black), and a pair each of 19-mm and 4-mm test probes.

- Test leads: CAT III 1000 V, CAT IV 600 V, 15 A
- Test probes (19-mm tip): CAT III 1000 V, CAT IV 600 V, 15 A
- Test probes (4-mm tip): CAT III 1000 V, CAT IV 600 V, 15 A (highly recommended for CAT IV environment)

### U1583B AC current clamp

- Dual range: 40 A and 400 A
- Rated CAT III 600 V
- BNC-to-banana-plug adapter provided for use with DMMs

## Measuring Accessories (temperature)

### U1180A Thermocouple adapter+lead kit, J and K types

Includes thermocouple adapter, thermocouple bead J-type and thermocouple bead K-type.

- T/C adapter J/K-type
- T/C bead J-type: –20 °C to 200 °C
- T/C bead K-type: –20 °C to 200 °C

### U1181A Immersion temperature probe

- Type-K T/C for use in oil and other liquids
- Measurement range: –50 °C to 700 °C
- Includes adapter U1184A for connection to DMM

### U1182A Industrial surface temperature probe

- Type-K T/C for use on still surfaces
- Measurement range: –50 °C to 400 °C
- Includes adapter U1184A for connection to DMM

### U1183A Air temperature probe

- Type-K T/C for use in air and non-caustic gas
- Measurement range: –50 °C to 800 °C
- Includes adapter U1184A for connection to DMM

### U1184A Temperature probe adapter

- Mini-connector-to-banana-plug adapter for use with DMM

### U1185A J-type thermocouple and adapter

- T/C adapter J/K-type
- T/C bead J-type: –20 °C to 200 °C

### U1186A K-type thermocouple and adapter

- T/C adapter J/K-type
- T/C bead J-type: –20 °C to 200 °C

## Cable

**U1173A IR-to-USB cable**

- For remote control and data logging to PC
- Max. baud rate: 19,200 bits per second

**U1174A Soft carrying case**

The convenient way to carry your DMM and essential accessories

- Dimension: 9″ (H) x 5″ (W) x 3″ (D)

## Hanging Kit

**U1171A Magnetic hanging kit**

For fastening of DMM to a steel surface so both hands are free.

## Probe Clip Light

**U1176A LED Probe Clip Light**

- 3 inches in length
- To be clipped onto test probes to increase visibility
- Comes with one AAA battery

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| Hong Kong | 800 938 693 |
| India | 1 800 112 929 |
| Japan | 0120 (421) 345 |
| Korea | 080 769 0800 |
| Malaysia | 1 800 888 848 |
| Singapore | 1 800 375 8100 |
| Taiwan | 0800 047 866 |
| Thailand | 1 800 226 008 |

**Europe & Middle East**

| | |
|---|---|
| Austria | 43 (0) 1 360 277 1571 |
| Belgium | 32 (0) 2 404 93 40 |
| Denmark | 45 70 13 15 15 |
| Finland | 358 (0) 10 855 2100 |
| France | 0825 010 700* |
| | *0.125 €/minute |
| Germany | 49 (0) 7031 464 6333 |
| Ireland | 1890 924 204 |
| Israel | 972-3-9288-504/544 |
| Italy | 39 02 92 60 8484 |
| Netherlands | 31 (0) 20 547 2111 |
| Spain | 34 (91) 631 3300 |
| Sweden | 0200-88 22 55 |
| Switzerland | 0800 80 53 53 |
| United Kingdom | 44 (0) 118 9276201 |

Other European Countries:
www.agilent.com/find/contactus

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