Agilent U3606A Multimeter | DC Power Supply

Data Sheet

The real two instruments in one box

Features

- Two independent instruments in one box
- Nine basic measurements as well as 4-wire milliohm measurement and eight math functions
- Measurement speed: up to 37 readings/s
- Low error rate: up to 0.025% DCV accuracy
- 30-W dual-range power supply with remote sensing
- Excellent load regulation: up to 0.01%+3 mV
- OVP and OCP load protection
- Auto scan and ramp, and built-in 4.8 kHz square-wave generator
- USB-TMC488.2 and GPIB connectivity
- Kensington lock slot security

Pick both

Digital multimeter (DMM) *and* power supply? Simultaneous *and* independent? Small *and* cost-effective? Get all this and more in the Agilent U3606A multimeter | DC power supply. This convenient new hybrid combines a 5½-digit DMM and 30-W dual-range supply in a single unit. Operating simultaneously and independently, the instruments provide efficient, affordable testing while saving space on the bench or in a rack.

The 5.5-digit DMM

The 5.5-digit DMM includes nine essential multimeter capabilities as well as 4-wire milliohm measurement and eight built-in math functions. The DMM also provides a fast measurement speed of up to 37 readings/s, and a low error rate of up to 0.025% DCV accuracy.

Physical security and seamless system integration

Instruments may be at risk of theft or misplacement when left unattended on the bench. With the hybrid multimeter's rear Kensington lock slot, you can secure your instrument and be assured that it is where you expect it to be for your continued testing the next day. The rackmountable U3606A also enables seamless integration into your system via popular GPIB and USB-TMC488.2 interfaces, programmable with standard SCPI commands.

Agilent Technologies

The 30-W DC power supply

The 30-W DC power supply provides a dual-range output of 30 V/1 A and 8 V/3 A, with an excellent load regulation of up to 0.01%+3 mV. The power supply adds overvoltage and overcurrent load protection (OVP and OCP), a built-in square-wave generator, and auto scan and ramp for multilevel DC bias testing. Remote sensing capability further ensures accurate supply of power at load end.

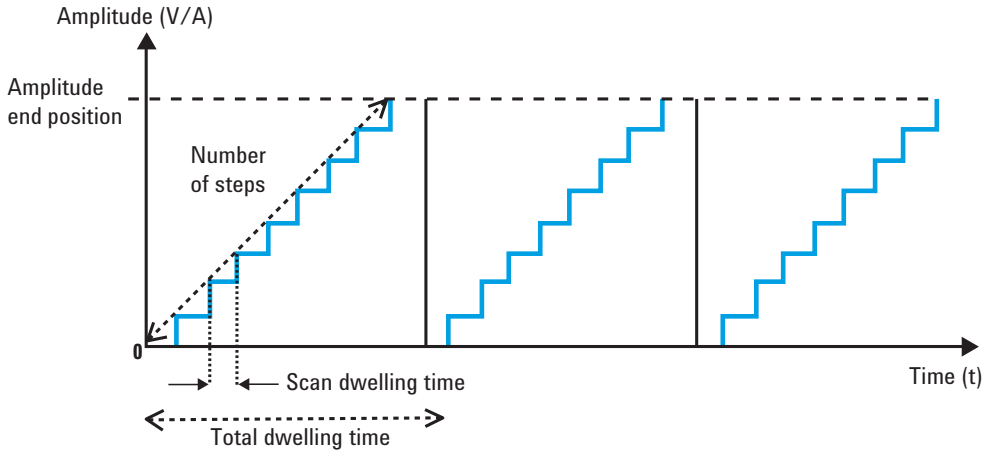
Square-wave generator

Square-wave output is a unique function for many applications, such as pulse-width modulation (PWM) output, adjustable voltage control, and synchronous clock (baud rate generator). You can also use this function to check and calibrate flowmeter displays, counters, tachometers, oscilloscopes, frequency converters, frequency transmitters, and other frequency input devices. The U3606A's square-wave output provides selectable frequencies up to 4.8 kHz with variable duty cycles and amplitudes.

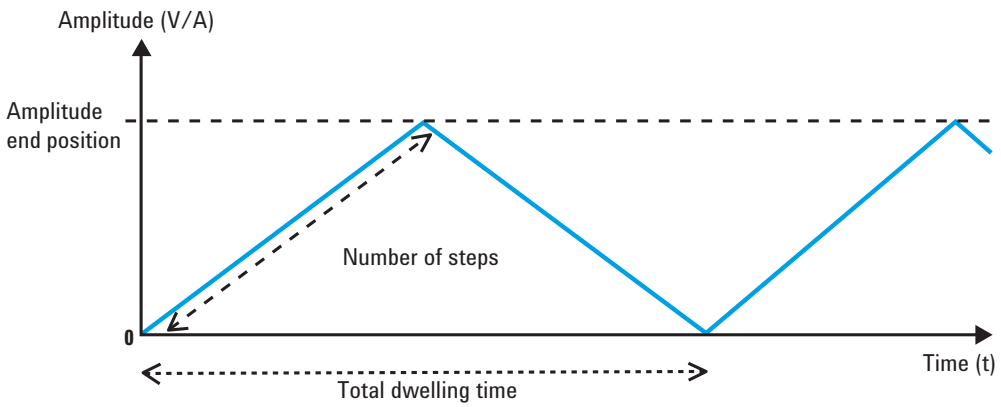
Sweep functions

Sweep functions in the U3606A are auto ramp and scan outputs for low-speed multilevel DC bias tests, such as margin tests, power cycling tests and relay control. Both functions are conveniently configurable from the front panel to sweep up to 100 steps for scan and 10,000 steps for ramp, programmable to 105% of full scale.

Auto scan output



Auto ramp output



Take a closer look

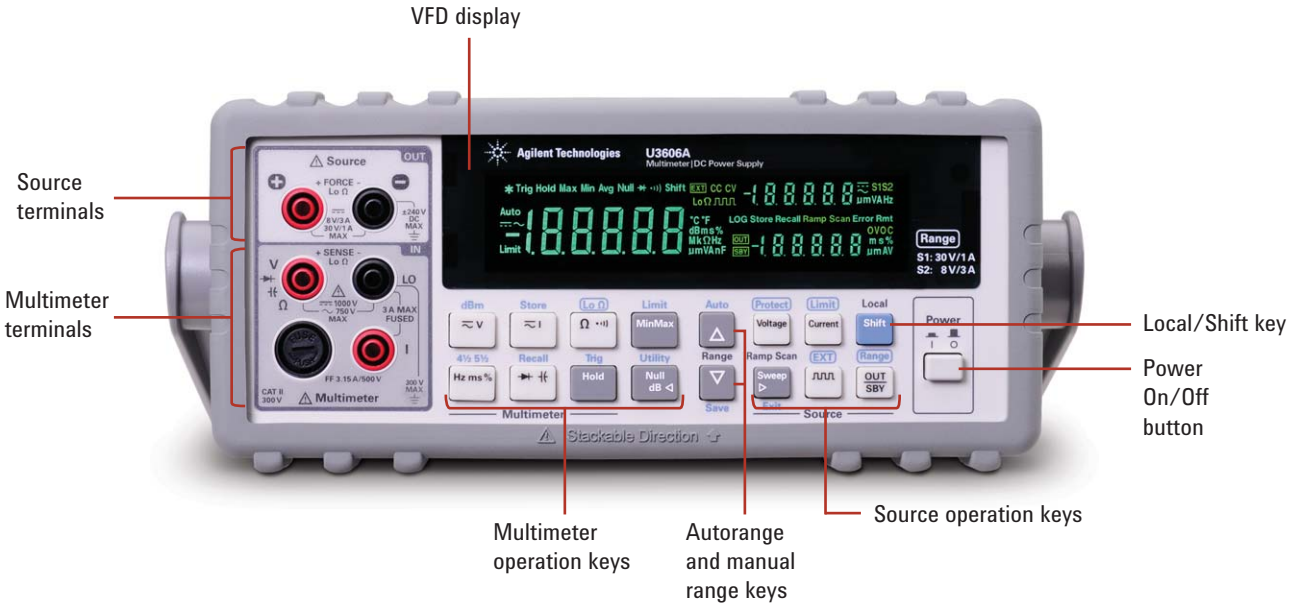


Figure 1. Front panel of the U3606A.

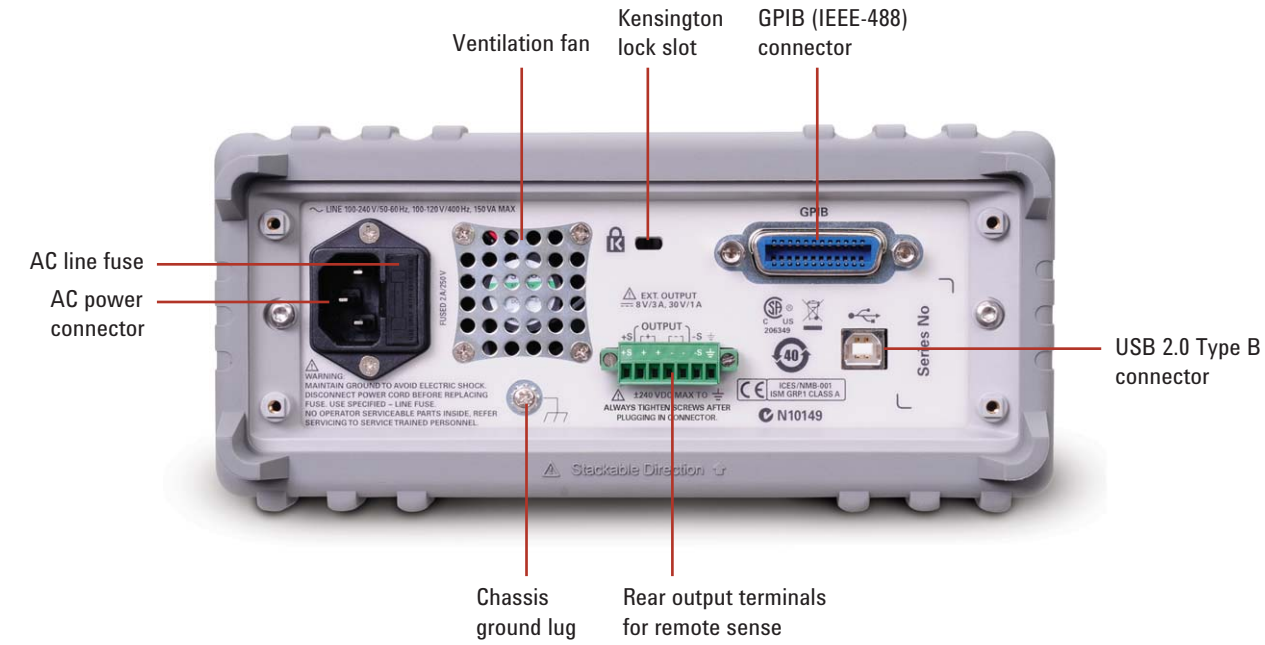


Figure 2. Rear panel of the U3606A.

Digital multimeter specifications

Specification assumptions:

- Specifications stated are after 60-minutes of warm-up and for 5½-digit resolution
- One-year calibration cycle, with calibration temperature of 18 °C to 20 °C
- Operating temperature: 18 °C to 28 °C (64.4 °F to 82.4 °F)
- Accuracy is expressed as ±(% of reading + % of range)
- Temperature coefficient: Add [0.1 x (the specified accuracy) / °C] for 0 °C to 18 °C and 28 °C to 55 °C
- Relative humidity (RH) up to 80% at 30 °C, proportional to 50% for 30 °C to 55 °C

DC specifications

Function	Range[1]	Test current or burden voltage	Accuracy ±(% of reading + % of range) 24 hours[2] 23 °C ± 1 °C	90 days 23 °C ± 5 °C	1 year 23 °C ± 5 °C	Temperature coefficient 0 °C to 18 °C 28 °C to 55 °C
DC voltage	100.000 mV	–	0.012 + 0.008	0.015 + 0.008	0.025 + 0.008	0.0015 + 0.0005
	1.00000 V	–	0.012 + 0.005	0.015 + 0.005	0.025 + 0.005	0.0010 + 0.0005
	10.0000 V	–	0.012 + 0.005	0.015 + 0.005	0.025 + 0.005	0.0020 + 0.0005
	100.000 V	–	0.012 + 0.005	0.015 + 0.005	0.025 + 0.005	0.0015 + 0.0005
	1000.00 V	–	0.012 + 0.005	0.015 + 0.005	0.025 + 0.005	0.0015 + 0.0005
DC current[3]	10.0000 mA	< 0.2 V	0.05 + 0.015	0.05 + 0.015	0.05 + 0.015	0.0060 + 0.0005
	100.000 mA	< 0.2 V	0.05 + 0.005	0.05 + 0.005	0.05 + 0.005	0.0060 + 0.0005
	1.00000 A	< 0.3 V	0.05 + 0.007	0.05 + 0.007	0.15 + 0.007	0.0100 + 0.0005
	3.0000 A	< 0.7 V	0.05 + 0.007	0.05 + 0.007	0.15 + 0.007	0.0150 + 0.0010
Resistance[4]	100.000 Ω	0.83 mA	0.04 + 0.008	0.04 + 0.008	0.05 + 0.008	0.0050 + 0.0005
	1000.00 Ω	0.83 mA	0.04 + 0.005	0.04 + 0.005	0.05 + 0.005	0.0050 + 0.0005
	10.0000 kΩ	100 µA	0.04 + 0.005	0.04 + 0.005	0.05 + 0.005	0.0050 + 0.0005
	100.000 kΩ	10 µA	0.04 + 0.005	0.04 + 0.005	0.05 + 0.005	0.0050 + 0.0005
	1.00000 MΩ	900 nA	0.05 + 0.005	0.05 + 0.005	0.06 + 0.005	0.0050 + 0.0005
	10.0000 MΩ	205 nA	0.20 + 0.005	0.20 + 0.005	0.25 + 0.005	0.0150 + 0.0005
	100.000 MΩ	205 nA || 10 MΩ	1.60 + 0.005	1.60 + 0.005	2.00 + 0.005	0.1500 + 0.0005
Continuity	1.0000 kΩ	0.83 mA	0.04 + 0.005	0.04 + 0.005	0.05 + 0.005	0.0050 + 0.0005
Diode[5]	1.0000 V	0.83 mA	0.04 + 0.005	0.04 + 0.005	0.05 + 0.005	0.0050 + 0.0005
Capacitance[6]	1.000 nF	0.75 µA	–	–	2.0 + 0.8	0.02 + 0.001
	10.00 nF	0.75 µA	–	–	1.0 + 0.5	0.02 + 0.001
	100.00 nF	8.3 µA	–	–	1.0 + 0.5	0.02 + 0.001
	1.000 µF	83 µA	–	–	1.0 + 0.5	0.02 + 0.001
	10.00 µF	83 µA	–	–	1.0 + 0.5	0.02 + 0.001
	100.0 µF	83 µA	–	–	1.0 + 0.5	0.02 + 0.001
	1000 µF	0.83 mA	–	–	1.0 + 0.5	0.02 + 0.001
	10000 µF	0.83 mA	–	–	2.0 + 0.5	0.02 + 0.001

1. *20% over-range on all ranges, except for 1000 V_{dc} range.*
2. *Relative to calibration standards.*
3. *Any current measurement greater than 500 mA will have a temporary thermo-effect. If you wish to measure a lower current or offset current immediately after a high-current measurement, ensure that the U3606A has cooled down.*
4. *Specifications stated are for 2-wire resistance measurements using Null math operation. Without Null, add a 0.2 Ω error. To eliminate noise interference which may be induced by the test leads, a shielded test cable is recommended for resistances above 100 kΩ.*
5. *Specifications stated are for the voltage measured at the input terminals only. The test current (1 mA) is typical. Variation in the current source will create some variation in the voltage dropped across a diode junction.*
6. *Specifications stated are for open test lead measurements with film capacitor or better, using Null math operation.*

Digital multimeter specifications (continued)

Low-resistance specifications

Range	Test current	Accuracy ±(% of reading + % of range)[1] 1 year (23 °C ± 5 °C)
100 mΩ	1.0000 A	0.25 + 0.05
1000 mΩ	0.1000 A	0.25 + 0.03
10 Ω	0.1000 A	0.25 + 0.03

1. *Four-wire measurement method is used. Test current is sent from the FORCE terminals and resistance is measured at the SENSE terminals.*

AC specifications

Function	Range[1]	Frequency range	Accuracy ±(% of reading + % of range) 24 hours[2] 23 °C ± 1 °C	90 days 23 °C ± 5 °C	1 year 23 °C ± 5 °C	Temperature coefficient 0 °C to 18 °C 28 °C to 55 °C
True rms AC voltage[3]	100.000 mV to 750.00 V[4]	20 Hz to 45 Hz	0.60 + 0.1	0.60 + 0.1	1.00 + 0.1[5]	0.02 + 0.02
		45 Hz to 10 kHz	0.16 + 0.1	0.16 + 0.1	0.20 + 0.1	0.02 + 0.02
		10 kHz to 30 kHz	0.80 + 0.1	0.80 + 0.1	1.00 + 0.1[6]	0.02 + 0.02
		30 kHz to 100 kHz[7]	3.00 + 0.2	3.00 + 0.2	3.00 + 0.2[8, 9]	0.05 + 0.02
True rms AC current	10.0000 mA to 3.0000 A[10]	20 Hz to 45 Hz	0.80 + 0.1	0.80 + 0.1	1.50 + 0.1	0.02 + 0.02
		45 Hz to 1 kHz	0.40 + 0.1	0.40 + 0.1	0.50 + 0.1	0.02 + 0.02
		1 kHz to 10 kHz[11]	2.00 + 0.2	2.00 + 0.2	2.00 + 0.2	0.02 + 0.02

1. *20% over-range on all ranges, except for 750 V_{ac} range.*
2. *Relative to calibration standards.*
3. *Specifications stated are for input signals greater than 5% of range.*
4. *Available ranges: 100.000 mV, 1.00000 V, 10.0000 V, 100.000 V, 750.00 V.*
5. *For 750 V range accuracy is specified for input less than 200 V_{rms}.*
6. *For 100 mV range, the 10 kHz to 30 kHz accuracy is 1.5 + 0.3.*
7. *Additional error 0.003% of full scale per kHz to be added when signal input changes less than 10% of range.*
8. *For 100 mV range, the 30 kHz to 100 kHz accuracy is 5 + 0.3.*
9. *For 750 V range accuracy is specified for input less than 300 V_{rms}.*
10. *Available ranges: 10.0000 mA, 100.000 mA, 1.00000 A, 3.0000 A.*
11. *For 1 A and 3 A ranges, the accuracy is specified for frequencies less than 5 kHz.*

Digital multimeter specifications (continued)

Frequency specifications

Function	Input range	Frequency range: minimum input frequency = 1 Hz	Accuracy ±(% of reading + % of range) 1 year (23 °C ± 5 °C)	Temperature coefficient 0 °C to 18 °C 28 °C to 55 °C
Frequency	Voltage: 100 mV to 750 V[1]	< 2 Hz	0.18 + 0.003	0.005
		< 20 Hz	0.04 + 0.003	0.005
		20 Hz to 100 kHz	0.02 + 0.003	0.005
		100 kHz to 300 kHz	0.02 + 0.003	0.005
	Current: 10 mA to 3 A	< 2 Hz	0.18 + 0.003	0.005
		< 20 Hz	0.04 + 0.003	0.005
		20 Hz to 10 kHz	0.02 + 0.003	0.005

	Minimum frequency sensitivity for voltage measurement (RMS sine wave)		
Input range[2]	20 Hz to 100 kHz	100 kHz to 300 kHz	300 kHz to 1 MHz
100 mV	50 mV	50 mV	0.5 V
1.0 V	100 mV	120 mV	0.5 V
10 V	1 V	1.2 V	–
100 V	10 V	12 V	–
750 V	100 V	–	–

	Minimum frequency sensitivity for current measurement (RMS sine wave)
Input range	20 Hz to 100 kHz
10 mA	1 mA
100 mA	10 mA
1 A	100 mA
3 A	300 mA

1. *For 100 mV and 1 V ranges, the measurable frequency is up to 1 MHz at 0.5 V input signal.*
2. *Maximum input for the specified accuracy = 10 x range or 1000 V_{dc}.*

All frequency counters are susceptible to errors when measuring low-voltage, low-frequency signals. Shielding inputs from external noise pickup is critical for minimizing measurement errors.

Duty cycle and pulse width specifications

Function	Range	Resolution	Accuracy at full scale
Duty cycle	100.000%[1]	0.001%	0.3% + 0.2% per kHz
Pulse width	199.999 ms[2]	0.001 ms	Duty cycle/frequency
	1999.99 ms[2]	0.01 ms	Duty cycle/frequency

1. *The range is from {10 µs × frequency × 100%} ~ {[1 – (10 µs × frequency)] × 100%}. For example, a 1 kHz signal can be measured from 1% ~ 99%.*
2. *The positive or negative pulse width must be greater than 10 µs. The range of the pulse width is determined by the frequency of the signal.*

Digital multimeter specifications (continued)

Measurement speeds (typical)

Function	Rate	Reading speed[1] (readings/second)	Reading speed over USB[2] (readings/second)	Reading speed over GPIB[3] (readings/second)
DC voltage (10 V)	Slow (5½ digits) Fast (4½ digits)	15 70	17 31	17 32
DC current (1 A)	Slow (5½ digits) Fast (4½ digits)	15 70	17 37	17 36
AC voltage (10 V at 1 kHz)	Slow (5½ digits) Fast (4½ digits)	15 70	17 31	17 32
AC current (1 A at 1 kHz)	Slow (5½ digits) Fast (4½ digits)	15 70	16 37	17 37
Resistance (100 kΩ)	Slow (5½ digits) Fast (4½ digits)	15 70	17 27	17 31
Capacitance (10 µF)	Slow/Fast (3½ digits)	5	4.4	4.6
Frequency (voltage path at 10 V, 1 kHz)	Slow (5½ digits) Fast (4½ digits)	9 9	2.7 2.7	2.7 2.7
Frequency (current path at 10 V, 1 kHz)	Slow (5½ digit) Fast (4½ digit)	9 9	2.7 2.7	2.7 2.7

1. *Reading rate of the A/D converter.*
2. *Number of measurements per second that can be read through USB using SCPI "READ?" command.*
3. *Number of measurements per second that can be read through GPIB using SCPI "READ?" command.*

Supplementary specifications

DC voltage	
Measurement method	Sigma Delta A-to-D converter
Maximum input voltage	1000 V_{dc} on all ranges
Input impedance	10 MΩ ± 2% range (typical) in parallel with capacitance < 120 pF
Input protection	1000 V_{rms} on all ranges, < 0.3 A short circuit
Response time	Approximately 0.15 s when the displayed reading reaches 99.9% DC value of the tested input signal at the same range

DC current	
Measurement method	Sigma Delta A-to-D converter
Maximum input current	10 mA to 3.0 A DC
Burden voltage and shunt resistance	• < 0.2 V, 10 Ω for 10 mA range • < 0.2 V, 1 Ω for 100 mA range • < 0.3 V, 0.1 Ω for 1 A range • < 0.7 V, 0.01 Ω for 3 A range
Input protection	Protected with 3.15 A/500 V, FF fuse
Response time	Approximately 0.15 s when the displayed reading reaches 99.9% DC value of the tested input signal at the same range

Digital multimeter specifications (continued)

Supplementary specifications

AC voltage	
Measurement method	AC coupled true rms
Maximum input voltage	750 V_{rms}/1200 V_{peak}/3 x 10^7 V-Hz of product
Input impedance	1 MΩ ± 2% range (typical) in parallel with capacitance < 120 pF
Input protection	750 V_{rms} on all ranges
Crest factor	For < 5:1 errors included. Limited by the peak input and 100 kHz bandwidth. Maximum 3.0 at full scale.
Peak input	300% of range. Limited by maximum input.
Response time	Approximately 2.5 s when the displayed reading reaches 99.9% AC rms value of the tested input signal at the same range.
Overload ranging	Will select higher range if peak input overload is detected during auto range. Overload is reported in manual ranging.

AC current	
Measurement method	AC coupled true rms
Maximum input current	10 mA to 3.0 A DC or AC rms
Burden voltage and shunt resistance	• < 0.2 V, 10 Ω for 10 mA range • < 0.2 V, 1 Ω for 100 mA range • < 0.3 V, 0.1 Ω for 1 A range • < 0.7 V, 0.01 Ω for 3 A range
Input protection	Protected with 3.15 A/500 V, FF fuse
Crest factor	For < 5:1 errors included. Limited by the peak input and 100 kHz bandwidth. Maximum 3.0 at full scale.
Peak input	300% of range. Limited by maximum input.
Response time	Approximately 2.5 s when the displayed reading reaches 99.9% AC rms value of the tested input signal at the same range.

Resistance	
Measurement method	Two-wire, open-circuit voltage limited to < 5 V
Open circuit voltage	< +5.0 V_{dc}
Input protection	1000 Vrms on all ranges, < 0.3 A short circuit
Response time	Approximately 0.15 seconds for 1 MΩ and ranges below 1 MΩ

Low-resistance	
Measurement method	Four-wire; test current is sent from the FORCE terminals and resistance measured at the SENSE terminals.
Input protection	• FORCE terminals: 3.15 A/250 V • SENSE terminals: 1000 V_{rms} on all ranges, < 0.3 A short circuit

Continuity	
Measurement method	0.83 mA ± 0.2% constant current source
Open circuit voltage	< +5.0 V_{dc}
Audible tone	Continuous beeping when reading is less than the threshold resistance of 10 Ω at 1.0 kΩ range
Input protection	1000 V_{rms} on all ranges, < 0.3 A short circuit

Digital multimeter specifications (continued)

Supplementary specifications

Diode	
Measurement method	0.83 mA ± 0.2% constant current source
Open circuit voltage	< +5.0 V_{dc}
Audible tone	• Continuous beeping when level is below +50 mV DC • Single tone for normal forward-biased diode or semiconductor junction where 0.3 V ≤ reading ≤ 0.8 V
Input protection	1000 V_{rms} on all ranges, < 0.3 A short circuit

Capacitance	
Measurement method	Computed from constant current source charge time, typical 0.2 V to 1.4 V_{ac} signal level
Maximum voltage at full scale	• For 1 nF to 10 µF range: < 1.5 V • For 100 µF to 10000 µF: 0.33 V
Input protection	1000 V_{rms} on all ranges, < 0.3 A short circuit
Response time	Approximately 1 s for 100 µF and ranges below 100 µF
Charge and discharge voltage	5 V_{pp} (approximately from +3 V to –2 V)

Frequency	
Measurement method	Reciprocal counting technique
Signal level	0.2 V to 1.4 V
Input protection	• Voltage path: 1000 V_{rms} on all ranges, < 0.3 A short circuit • Current path: Protected with 3.15 A/500 V, FF fuse

Maximum display counts (excluding frequency)	
5½ digits	120,000
4½ digits	12,000

Noise rejection	
Common mode rejection ratio (CMRR) for 1 kΩ unbalanced in LO lead	• DC: 140 dB • AC: 70 dB
Normal mode rejection ratio (NMRR)	• 60 Hz ± 0.1%: 5½ digits: 65 dB, 4½ digits: 0 dB • 50 Hz ± 0.1%: 5½ digits: 55 dB, 4½ digits: 0 dB

Power supply specifications

Specification assumptions:

- Specifications stated are after 60-minutes of warm-up with no load
- Operating temperature: 18 °C to 28 °C (64.4 °F to 82.4 °F)
- Accuracy is expressed as ±(% of output + offset) at 23 °C ± 5 °C
- Temperature coefficient: Add [0.1 x (the specified accuracy) / °C] for 0 °C to 18 °C and 28 °C to 55 °C
- Relative humidity (RH) up to 80% at 30 °C, proportional to 50% for 30 °C to 55 °C

DC power supply specifications

Output ratings	• Range S1: 0 V to 30 V, 0 A to 1 A • Range S2: 0 V to 8 V, 0 A to 3 A
Programming accuracy 1 year (@ 23 °C ± 5 °C), ±(% of output + offset)	• 0.05% + 5 mV • 0.15% + 3 mA
Readback accuracy 1 year over GPIB and USB or front panel with respect to actual output (@ 23 °C ± 5 °C), ±(% of output + offset)	• 0.05% + 5 mV • 0.15% + 3 mA
Ripple and noise With outputs ungrounded, or with either output terminal grounded, 20 Hz to 1 MHz[3]	• < 2 mV_{rms}; < 30 mV_{pp} • < 1 mA_{rms}
Front terminal load regulation ±(% of output + offset)	• < 3 mV[1] • < 0.03% + 0.3 mA
Rear terminal load regulation ±(% of output + offset)	• < 0.01% + 3 mV • < 0.03% + 0.3 mA
Line regulation	Voltage: 3 mV Current: 1.5 mA
Programming resolution	1 mV, 0.1 mA
Readback resolution	1 mV, 0.1 mA
Front panel resolution	1 mV, 0.1 mA
Transient response time	Less than 450 ms for output to recover to within 50 mV following a change in output current from full load to half load or vice versa
Command processing time	Average time for output voltage to begin to change after receipt of digital data when instrument is connected directly to the USB or GPIB is less than 100 ms
Overvoltage protection (for CC mode)	• Accuracy: 0.5% + 0.5 V • Activation time[2]: < 2ms
Overcurrent protection (for CV mode)	• Accuracy: 0.5% + 0.05 A • Activation time[2]: < 2 ms

1. *Contacts and leads resistance may contribute an additional error of 6 mV/A (typical).*
2. *Average time for the detection of OVP or OCP condition.*
3. *Refer to U3606A User's and Service Guide (U3606-90013); CV noise effect measurement on page 166.*

Power supply specifications (continued)

Sweep specifications

Function		Range	Amplitude[1]	Step	Dwelling time
Scan	Constant voltage	S1 (30 V/1 A) S2 (8 V/3 A)	0 to 31.500 V 0 to 8.4000 V	1 step to 100 steps	1 s to 99 s
	Constant current	S1 (30 V/1 A) S2 (8 V/3 A)	0 to 1.0500 A 0 to 3.1500 A	1 step to 100 steps	1 s to 99 s
Ramp	Constant voltage	S1 (30 V/1 A) S2 (8 V/3 A)	0 to 31.500 V 0 to 8.4000 V	1 step to 10,000 steps	300 ms/step (typical)
	Constant current	S1 (30 V/1 A) S2 (8 V/3 A)	0 to 1.0500 A 0 to 3.1500 A	1 step to 10,000 steps	300 ms/step (typical)

1. *Amplitude start position is fixed at 0 (V or A) by default.*

Square-wave output specifications

Parameter	Range	Resolution	Accuracy
Frequency	0.5, 2, 5, 6, 10, 15, 25, 30, 40, 50, 60, 75, 80, 100, 120, 150, 200, 240, 300, 400, 480, 600, 800, 1200, 1600, 2400, 4800 Hz	0.01 Hz	0.005% + 1 count
Duty cycle	0.39% to 99.60%	0.39%[1]	0.4%[1, 2]
Pulse width	1/frequency	Range/256	Duty cycle/frequency[1, 3]
Amplitude	S1 (30 V/1 A) S2 (8 V/3 A)	1 mV 1 mV	0.2 V 0.2 V

1. *Specification applies when the positive or negative pulse width is greater than 50 µs.*
2. *For frequency signals greater than 100 Hz, an additional 0.1% per 100 Hz is to be added.*

$$Accuracy = 0.4\% + \left(\frac{frequency}{100} - 1\right) \times 0.1\%$$

3. *The accuracy of pulse width could also be calculated as [0.4% + (frequency/100 – 1) × 0.1%]/frequency.*

Rise/fall time is less than 25 µs. Specifications are based on a resistive load.

Supplementary specifications

Output programming range			
Range	Output programming	OV/OC	OVP/OCP
S1	0 V to 31.500 V/0 A to 1.05 A	31.500 V/1.05 A	33.000 V/1.1 A
S2	0 V to 8.4 V/0 A to 3.15 A	8.4 V/3.15 A	8.8 V/3.3 A

Remote sensing capability	
Range S1 (30 V/1 A)	Up to a 0.75-volt drop per load lead
Range S2 (8 V/3 A)	Up to a 0.5-volt drop per load lead

Temperature coefficient: ± (% of output + offset)/ °C for 0 °C to 18 °C and 28 °C to 55 °C	
Voltage	0.005% + 0.5 mV/°C
Current	0.02% + 1 mA/°C

Voltage programming speed (excludes command processing time)	
Up	300 ms (full load and no load)
Down	400 ms (full load and no load)

General characteristics

Power supply	• Universal 100 V_{ac} to 240 V_{ac} ±10% • AC line frequency 45 Hz to 66 Hz (360 Hz to 440 Hz for 100/120 V operation)
Power consumption	150 VA maximum
Current Input Fuse	3.15 A, 500 V FF fuse (on front panel)
Display	Highly visible vacuum-fluorescent display (VFD)
Operating environment	• Operating temperature from 0 °C to +55 °C • Relative humidity up to 80% at 30 °C RH (non-condensing) • Altitude up to 2000 meters • Pollution degree 2 • For indoor use only
Storage compliance	–40 °C to 70 °C
Safety compliance	Certified with: • IEC 61010-1:2001/EN61010-1:2001 (2nd Edition) • Canada: CAN/CSA-C22.2 No. 61010-1-04 • USA: ANSI/UL 61010-1:2004
EMC compliance	Certified with: • IEC61326-1:2005 / EN61326-1:2006 • CISPR 11:2003 / EN55011:2007 (Group 1 Class A) • Canada: ICES/NMB-001:2004 • Australia/New Zealand: AS/NZS CISPR11:2004
Shock and vibration	Tested to IEC/EN 60068-2
Remote interface	• GPIB IEEE-488 • Full Speed USB 2.0 (Type B) • USBTMC 488.2 Class device • USB-CDC
Programming language	Standard Commands for Programmable Instruments (SCPI)
Measurement category	• CAT II, 300 V • CAT I, 1000 V_{dc}, 750 V_{ac} rms • 2500 V_{pk} transient over voltages
Dimensions (H × W × D)	105 × 255 × 329 mm (with rubber bumpers) 87 x 215 x 312 mm (without rubber bumpers)
Weight	3.775 kg (with rubber bumpers) 3.535 kg (without rubber bumpers)
Warranty	One year
Calibration cycle	One year
Warm-up time	60 minutes

Ordering information

Standard shipped items

- Quick Start Guide
- Product Reference CD
- Agilent IO Library Suite
- Certificate of Calibration
- U8201A Combo Test Lead Kit
- USB 2.0 High-Speed Type-A to Type-B cable
- AC power cord

Warranty options

- R-51B-001-3C Extended warranty from one year to three years
- R-51B-001-5C Extended warranty from one year to five years

I/O connectivity options

For control via GPIB interface

- 82350B/82351A PCI/PCIe high-performance GPIB interface card
- 82357B USB/GPIB converter
- E5810A LAN/GPIB gateway
- 10833D/A/B/C/F/G GPIB cables
- 10834A GPIB-to-GPIB adapter

For control via USB interface

- E5813A networked 5-port USB hub

Optional accessories

U8201A Combo Test Lead Kit

U3606A-1CM Rack Mount Kit

U8202A Electronic Test Lead Kit (for DMM function)

34133A Precision Electronic Test Leads (for DMM function)

34330A Current Shunt (30 A) (for DMM function)

34136A 40 kV high-voltage probe (for DMM function)

11059A Kelvin Probe Set and 11062A Kelvin Clip Set (for DMM function)

E3600A-100 Test Lead Kit (for DC power supply function)

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Product specifications and descriptions in this document subject to change without notice.

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