Keysight Technologies

U3606B versus U3606A Digital Multimeter | DC Power Supply

Compatibility, differences, enhancements, and additional features

Application Note

KEYSIGHT TECHNOLOGIES

Introduction

In the test and measurement world, performing tests on a device under test (DUT) requires a power source, which is typically provided by a power supply. For power measurement, a multimeter is used. As an alternative to using both a power meter and a multimeter, Keysight Technologies, Inc. offers an all-in-one unit called a digital multimeter|power supply. It combines a 5½ digit digital multimeter (DMM) and 30-W power supply, which operate simultaneously and independently.

This ability means each digital multimeter|power supply is capable of powering your DUT while you simultaneously measure voltage, current, frequency, or other operations. It also provides fast, accurate, efficient, and affordable testing while saving space on your bench or in a rack.

The original Keysight multimeter|power supply model was the U3606A. Recently the U3606B was released as a compatible replacement to the U3606A. For those looking to migrate from the U3606A to the U3606B, this application note explains the similarities between the units. It also highlights the differences between their capabilities, as well as the enhancements and additional features available in the U3606B.

Compatibility Between the U3606A and U3606B

There are many factors to keep in mind when you want to replace a U3606A with the U3606B. Below are the areas where U3606B is compatible with U3606A.

Measurements, features, and resolution

As Table 1 shows, the U3606B shares many of the same measurement, output, and features as the U3606A.

Table 1. Similarities between the U3606A and U3606B

Similarities	U3606A	U3606B
DCV and ACV	▲	▲
2- and 4-wire resistance	▲	▲
Frequency and period	▲	▲
Continuity and diode	▲	▲
Capacitance	▲	▲
DCI, ACI, and 2- and 4-wire	▲	▲
Single-output dual range of 30 V / 1 A or 8 V / 3 A	▲	▲
0.01% + 3 mV load regulation	▲	▲
OVP and OCP	▲	▲
4.8 kHz square-wave generator, auto ramp, and scan capability	▲	▲
Universal AC input (100 to 240 V, 45 to 66 Hz)	▲	▲
Kensington lock slot to prevent theft or misplacement	▲	▲
3-year warranty	▲	▲

Mechanical dimensions

The dimensions of the U3606A and U3606B are identical. As a direct replacement for the U3606A, the U3606B can be used without changing any rack mount kits, or rack cabinets or systems where the instrument's rack mount configuration is either side-by-side or standalone (with filler). Like the U3606A, the size of the U3606B is well suited for system integration because it is a half of the standard rack width (215 mm without bumper).

Connectivity

Both U3606A and U3606B have the same connectivity such as GPIB (IEEE-488) and standard USB-TMC488.2, and the connection ports are located in the same position on each unit.

Accessories

Items and accessories included in standard U3606A shipments are also included with U3606B shipments. The items and accessories are the same and compatible with each other.

Manufacturing

Both U3606A and U3606B are produced to the same rigorous quality standards and manufacturing process controls.

Service and support from Keysight

Our global technical support teams are available to help you with any questions related to the instrument. You also can send your digital multimeter | power supply to your nearest Keysight Service Center to calibrate and repair your instrument.

Differences Between DC Power Supply Ranges

The best way to understand the differences between the U3606A's and U3606B's DC power supply ranges is to perform a side-by side comparison. Table 2 indicates these differences.

Table 2.

DC Power Supply		U3606A	U3606B
Power supply range (resolution)	Constant voltage (CV) mode		
	30 V	30.000 V / 1 A	30.000 V / 1 A
	8 V	8.000 V / 3 A	8.000 V / 3 A
	1 V	Not available	1.0000 V / 3 A
	Constant current (CC) mode		
	3 A	3.0000 A / 8 V	3.0000 A / 8 V
	1 A	1.0000 A / 30 V	1.0000 A / 30 V
	100 mA	Not available	100.00m A / 30 V

Digital Multimeter Differences

Both the U3606A and U3606B have the capability to do 4-wire, low-resistance measurement. However, as Table 3 shows, the U3606B's resistance measurement range is wider.

Table 3. Differences between digital multimeters

Digital Multimeter		U3606A	U3606B
4-wire, low-resistance	Available range		
	100 mΩ	▲	▲
	1000 mΩ	▲	▲
	10 Ω	▲	▲
	100 Ω	Not available	▲
	1000 Ω	Not available	▲

General Differences

The U3606B also provides some general attribute advantages.

Additional SCPI programming commands

All the SCPI programming commands in the U3606A are supported by the U3606B however there are additional SCPI programming commands available only in U3606B. The commands exclusive to the U3606B are listed in Table 4. (Please refer to the programming guide for example and detail information.)

Table 4. Differences in supported SCPI commands

SCPI command	U3606A	U3606B
SYSTem:DATA:INTerval	Not available	▲
SYSTem:DATA:LOOP	Not available	▲
[SOURce:]SSTart:STEP	Not available	▲
[SENSe:] LRESistance:COMPensation	Not available	▲
CALibration:LEVel {MAX|MIN|LOAD1|LOAD2|LOAD3|LOAD4}	Not available	▲

Specification and feature enhancements

As noted in Table 5, the two units differ in respect to some specifications.

Table 5. Specification differences between units.

Features	U3606A	U3606B
Ripple and noise	< 2 mVrms, < 30 mVpp 20 Hz to 1 MHz	< 2 mVrms, < 30 mVpp, 20 Hz to 20 MHz
Transient response time	50 mV (300 ms)	15 mV (100 µs)
Voltage programming speed	300 to 400 ms	40 to 50 ms
Soft start output	Not available	New feature

Soft start output

The soft start output is a new feature exclusive to the U3606B. When used, the option to soft start the DC power supply output allows you to select a value from 1 to 10,000 steps for the soft start output. This feature is useful especially when starting a DC motor.

Example: Starting a DC motor using 30 V

The armature resistance in a DC motor is approximately zero. Therefore, it will generate a very large start current if you directly apply 30 V DC to the DC motor. To prevent the armature from tripping the DC motor during start up due to the large start current, the U3606B's new soft start output feature lets you incrementally ramp-up the start current over a range of 1 to 30 V.

Price

There is no price increase for U3606B even though enhancements have been made and new features have been added. In fact, the pricing of U3606B is lower than U3606A's pricing.

Conclusion

The U3606B digital multimeter | power supply is a compatible replacement for the U3606A and has additional enhancements and new features. You can migrate from the U3606A to the U3606B easily because all of the functionality in the U3606A is identical in the U3606B. By switching to the U3606B you benefit from the easy-to-use enhancements and new features. Compared to the U3606A you also get the added value at a lower price.

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