

# FLUKE®

## Instruction Sheet

# 80i-600

### AC Current Probe

#### INTRODUCTION

The Model 80i-600 is a clamp-on ac current probe designed to extend the current measuring capability of an ac current meter to 600 amperes. A clamp-on, 1000-turn coil designed into the probe allows measurements to be made without breaking the circuit under test. The coil serves as the secondary of a current transformer. The current carrying conductor being measured serves as the primary. Because of a high efficiency, quadrature type of winding used, wire size and the position of the wire within the probe jaws does not effect accuracy.

#### SPECIFICATIONS

**Input Current Range:** 1A to 600A

**Output:** 1 milliamp per ampere of input current (1mA/A)

**Accuracy:** Accuracy:  $\pm 2\%$  of reading, 50 Hz to 1 kHz  
 $\pm 3\%$  of reading (typical), 30 Hz to 50 Hz or 1 kHz to 10 kHz.

**Working Voltage:** 750V ac rms maximum

**Maximum Conductor Size:** 50.8 mm (2 inch.)

**Shunt (load) Resistance:** less than 12 ohms at multimeter input to maintain specified accuracy

**Typical Bandwidth:**  $-10\%$  at 10 Hz and 50 kHz (1A, 400 Hz reference, excludes multimeter response)

**Usable Current Range:** 0.1A to 2000A, 5 seconds maximum above 600A

**Safety:** Protection Class Class II as defined in IEC 348 and ANSI C39.5

#### MULTIMETER COMPATIBILITY

The 80i-600 is compatible with any multimeter capable of reading ac current equal to 1/1000 of the current to be measured. To take full advantage of the probe's accuracy, a multimeter ac current accuracy of  $\pm 0.75\%$  or better is recommended. A voltmeter fitted with an external shunt will qualify as a suitable current meter. However, to ensure the probe's accuracy, the shunt (or multimeter input resistance in ac current) should be less than 12 ohms. This requirement is met on Fluke DMM's when using a current range of 20 mA or greater.

When making a measurement, the current-carrying conductor is not broken, and remains electrically isolated from the current meter input terminals. As a result, the current meter's INPUT LO or COM terminal may be either floated (isolated) or grounded.

### METER READINGS

When the 80i-600 is connected to a compatible current meter and clamped around a single current-carrying conductor, the meter reading will be one 1000th of the actual current in the conductor. For example, a 5-ampere (A) input current will be transformed into a 5 milliampere (mA) output current (see Figure 1).

When measuring current in an ac line cord, the jaws should be clamped around only one conductor (the black or hot wire in a three wire cord). If the jaws are clamped around both current carrying conductors, the currents will cancel and produce a zero reading.

If the probe is clamped around two wires carrying current in the same direction, the sum will be read. Reversing one of the wires causes the difference to be read.

### LOW-LEVEL CURRENT MEASUREMENTS

The 80i-600 AC Current Probe is specified to measure currents of 1A or greater. Currents less than 1A will produce meter readings that are below the true value. Low-level currents can be measured by looping the input wire through the jaws so that the sum of the current through the jaws is greater than 1A. The actual current can then be calculated by dividing the meter reading by the number of turns looped through the jaws.

For example, to measure a current of 400 mA (0.4A), form a 10-turn loop and clamp the jaws of the 80i-600 around all 10 turns. The meter reading will be 4 mA, which corresponds

to a primary current of 4A. The actual current in the conductor is 4A divided by 10-turns, or 400 mA.

### NOTE

*The range selection on the meter should always be 20 mA or greater (12 ohm shunt or lower). Lower ranges with higher shunt values will cause reading errors.*

### OPERATION

1. Connect the 80i-600 output connectors between the common and the appropriate current input jack of a suitable meter, then switch the meter on.

### NOTE

*Refer to Table 1 to determine the appropriate input jack and proper function setting for use with a Fluke handheld DMM.*

2. Select a 20 mA ac or greater current range.
3. Clamp the probe around the current-carrying conductor to be measured (see Figure 1). Make sure the probe jaws are tightly closed around the conductor.

### NOTE

*Wire size and the position of the wire within the probe jaws does not affect measurement accuracy.*

4. Multimeter readings displayed in milliamps (mA) can be read directly as amperes of input current. Readings displayed in amperes (A) must be multiplied times 1000 to obtain the amperes of input current.

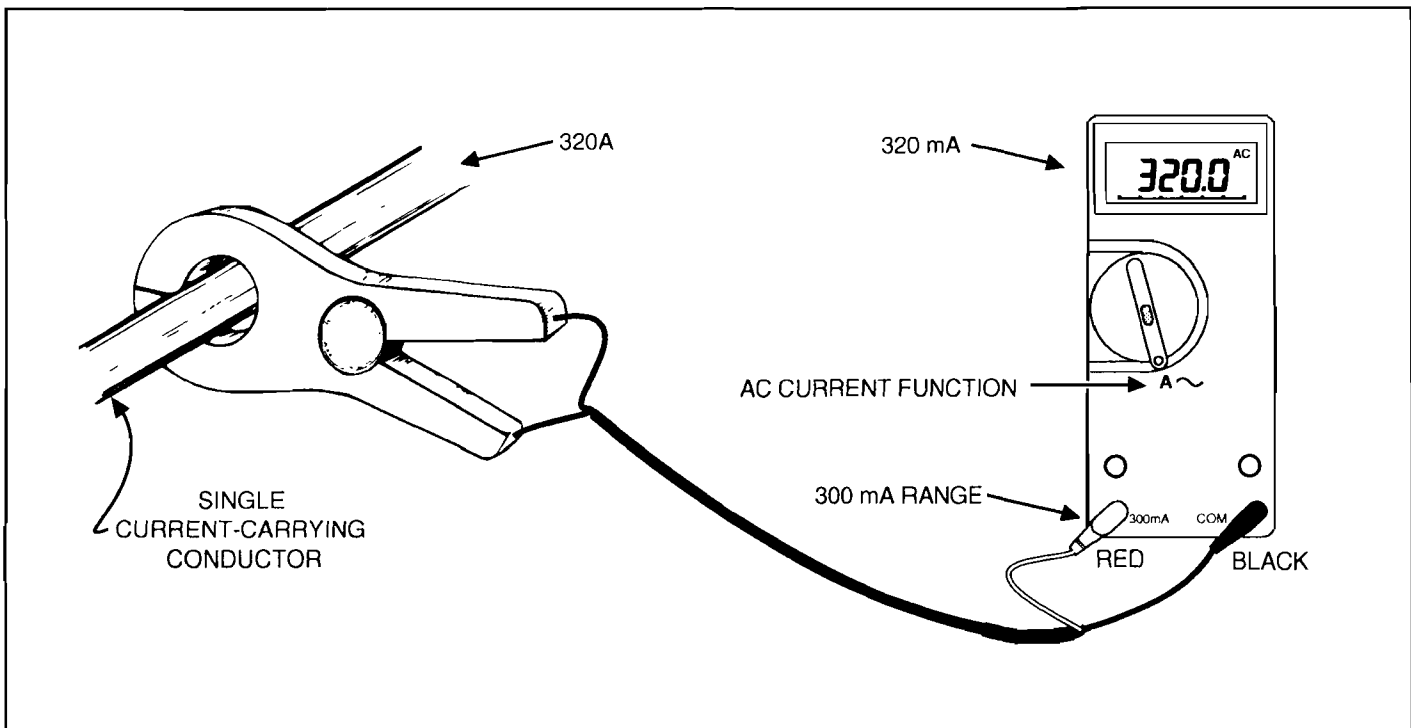


Figure 1. Typical 80i-600 Using a Typical Meter

## MAINTENANCE

### Performance Test

Verify the probe accuracy by measuring the output of a 20A ( $\pm 0.2\%$ ), 60 Hz current source (Fluke 5100B and 5220A or equivalent). When used with a compatible DMM with  $\pm 0.75\%$  or better ac current accuracy (Fluke 8060A or equivalent), the probe should measure  $20.00A \pm 0.40A$  (20.00 mA,  $\pm 0.40$  mA). No calibration adjustments are required.

### Cleaning

Use a soft cloth dampened in a mild solution of detergent and water to clean the 80i-600. Do not use solvents unless absolutely necessary. A light coating of driplless oil on the jaw surfaces will prevent corrosion.

**Table 1. Clamp/Meter Setup Guide**

FLUKE MODEL	INPUT JACK (for red lead)	FUNCTION
21	10A (limited to 320A)	A~
23, 21 Series II, 23 Series II	300 mA (10A on Model 23, Series II Models 21 & 23 for > 320A)	A~
25,27	mA $\mu$ A	mA/A~
75,77, 75 Series II, 77 Series II	300 mA (10A on all Models 75 & 77 for > 320A)	A~
29,79 Series II	40 mA (10A for $\geq 40A$ )	A~
83,85,87	mA $\mu$ A	mA/A~
8060A,8062A	A	AC~,A *
8020A,8020B, 8021B,8022A, 8024A,8024B, 8026B	mA	AC~, mA *
* 20mA range for up to 20A 200mA range for up to 200A 2000mA range for up to 600A		