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# N2774A 50MHz Current Probe

The N2774A is a wide-band, DC to 50MHz, active current probe. The probe features low noise and low circuit insertion loss. In conjunction with the power supply (N2775A), this probe can be used with any oscilloscope or recorder with a 1 M $\Omega$  input resistance and a BNC connector.

The N2774A two operating regions that provide a wide, flat frequency response. In the DC to low frequency AC region, the probe operation is based on the negative feedback of the amplifier system that includes the thin film Hall element as a detector. In the high frequency region, the probe operates as a current transformer.

The N2774A is ideal for acquiring high transient time signals such as those found in Motor Controllers, in Switching Power Supplies, and in Current Amplifiers driving inductive loads.

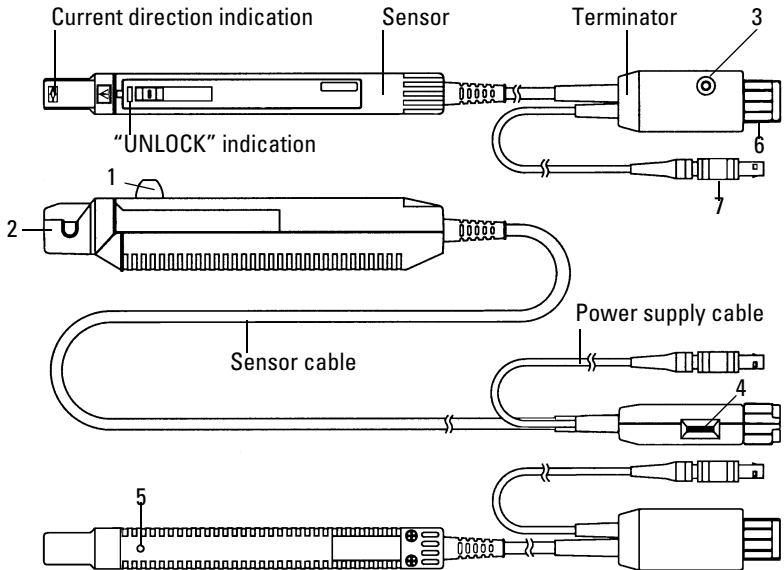
## Features

- Highly accurate current detection
- Easy current measurement
- Broadband frequency characteristics DC to 50 MHz
- Compact
- Permits measurement of low current levels
- Easy protect function at excessive input

Supplied accessories:

- User's Guide
- Carrying case

## Description of Parts



### 1 Opening lever

Operating lever for opening the sensor head. Always use this lever to open the sensor head.

### 2 Sensor head

This clamps the conductor being measured, and carries out the actual current measurement. It is a precision assembly including a molded component, a ferrite core, and a Hall effect element. It may be damaged if subjected to sudden changes in ambient temperature, or mechanical strain or shock. Care should be exercised when handling the sensor head.

### 3 Demagnetizing switch (DEMAG)

This demagnetizes the core if it has been magnetized by switching the power on and off, or by an excessive input. Always carry out demagnetizing before measurement. The demagnetizing process takes about one second. During demagnetizing, a demagnetizing waveform is output.

### 4 Zero adjustment dial (ZERO ADJ)

Use the zero adjustment dial to correct for the effect of a voltage offset or temperature drift on the unit. The probe should be always be zeroed after demagnetization.

**5 Coarse adjustment trimmer**

This adjustment should only be carried out if the probe offset is outside the range of the zero adjustment dial.

**6 BNC output connector**

The probe output sensitivity is 0.1 V/A. Connect to the BNC input connector of the waveform measuring instrument such as an oscilloscope.

**NOTE**

- The output of this unit is terminated internally. Use a high-impedance input to the measuring instrument. When connected to an instrument with an input impedance of 50  $\Omega$ , accurate measurement is not possible.
- If using BNC-banana plug adapters or similar to connect to input terminals other than BNC connectors, make sure the polarity is correct.
- Turn the collar until it clicks, and check that it is locked securely.

**7 Power plug**

Connect this to the N2775A power supply receptacle to supply power to the sensor terminator.

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## Characteristics

### Measurement Characteristics and Specifications<sup>1</sup>

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Probe Bandwidth	DC to 50MHz (-3 dB)
Accuracy* (Probe Only)	±1% of reading ±1mV(DC or 45Hz to 66Hz)
Risetime <sup>2</sup>	≤ 7ns
Maximum continuous current	15 A (DC + ACrms) continuous (Refer to frequency derating curve, Fig. 2)
Maximum peak current	50 A (for Pulse Widths ≤ 10µs)
Probe sensitivity	0.1 V/A
Noise	≤ 2.5mArms (with 20 MHz Bandwidth limiting)
Insertion impedance	Refer to Fig. 3
Temperature coefficient	≤ ±2% (0° C to 40° C)
Effect of external magnetic fields	Equivalent to ≤ 20 mA (for a 400 A/m magnetic field, DC to 60 Hz)
Maximum circuit voltage	300 V Cat I (refer to safety considerations and product compliances)

\* Denotes warranted specification. All others are typical.

1. Requires 1 MΩ termination. Valid for 23° C ±3° C (73° F ±5° F), at least 30 minutes after power on.

2. Rise time is calculated as:  $T_r = 0.35/\text{Bandwidth}$ .

### Power Supply Characteristics

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DC supply voltage requirements	±12Vdc ±1V
Probe power consumption	Increases with measured current. 3 VA when measuring 15 A

**Characteristics****Mechanical Characteristics**


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Maximum cable diameter	5 mm (0.2 inch)
Sensor cable length	1.5 m (59 inches)
Power cable length	1 m (39 inches)
Dimensions	Sensor: 175 mm x 18 mm x 40 mm 6.89 in. x 0.71 in. x 1.6 in.
	Terminator: 27 mm x 55 mm x 18 mm 1.06 in. x 2.17 in. x 0.71 in.
Weight	230g (8.1 oz.)
Accessories supplied	User's Guide, storage case, calibration certificate

**Environmental Characteristics<sup>3</sup>**


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Operating temperature range	0°C to 40°C (32°F to 104°F)
Storage temperature range	-10°C to 50°C (14°F to 122°F)
Maximum relative humidity (operating or storage)	80% (no condensation)
Vibration	10 to 55 Hz: 30 min/axis 10 octave/min Amplitude 0.3 mm
	55 Hz: 30 min/axis Amplitude 0.3 mm Acceleration 17.91 m/s <sup>2</sup>
Maximum Altitude	2000 m

3. This probe is intended for indoor use only.

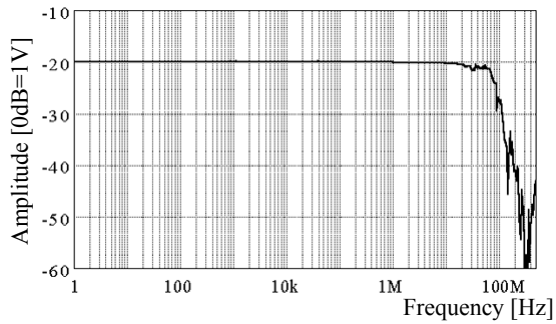


Fig. 1 Frequency characteristic

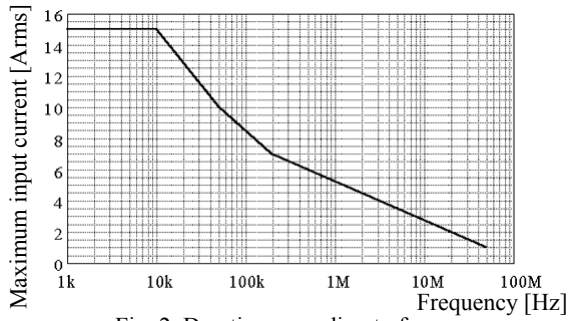


Fig. 2 Derating according to frequency

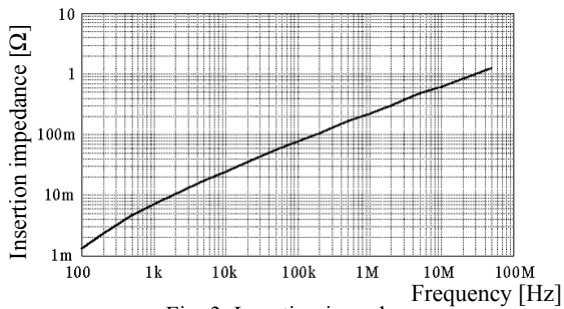


Fig. 3 Insertion impedance