

# POWER METERS

## Power Sensors, Range Calibrator, and Power Sensor Cables

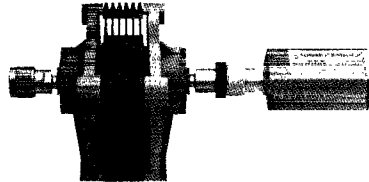
HP 8481A/B/D/H, 8482A/B/H, 8483A, 8485A/D, R/Q 8486A/D, W8486A, 8487A/D, 11683A, 11730A-F



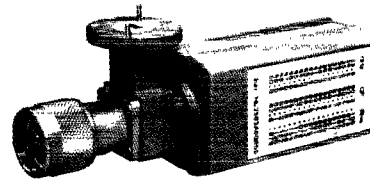
HP 8481A



HP 8485A



HP 8481B



HP Q8486A

### HP 8480 Power Sensor Family

The HP 8480 power sensors are designed for use with the HP 435B, 436A, 437B, 438A, 70100A, and E1416A power meters. These thermocouple and diode power sensors provide extraordinary accuracy, stability, and SWR over a wide range of frequencies (100 kHz to 110 GHz) and power levels (-70 to +44 dBm).

#### Best SWR in the Industry

Mismatch uncertainty is usually the largest single source of error in power measurements. The HP 8480 power sensor family gives you extremely low SWR even at mm-wave frequencies. For example, the HP W8486A power sensor has a specified SWR of less than 1.08:1 over its entire 75 to 110 GHz frequency range. This low SWR translates into minimum mismatch uncertainty and optimum measurement accuracy.

#### Accurate Calibration and Traceability

Each power sensor in the HP 8480 family is individually calibrated and traceable to the U.S. National Institute of Standards and Technology (NIST, formerly NBS). The uncertainty in this calibration factor is your link to NIST. The cal factor measurement system used by HP Standards Lab provides you with minimum cal factor uncertainty.

#### True-RMS Reading Sensors

Hewlett-Packard high-sensitivity diode power sensors (HP 8481D/5D/6D/7D) are always operated inside the square-law region. This means that the sensor will act as a true-RMS reading device over its entire -70 to -20 dBm dynamic range. The benefit to you: HP sensors provide you with accurate readings even if your test signal is subjected to multitone environments, modulated carriers, or carriers with high harmonics.

#### Millimeter-Wave Sensor Calibration

A 50 MHz calibration port is included in HP waveguide power sensors for calibration with the power meter. This calibration provides traceability to NIST at millimeter-wave frequencies, and it eliminates the uncertainties due to temperature changes and the variance in making measurements with different meter/sensor combinations.

#### Accurate Accessories Included

With HP power sensors, you can start making measurements right away. No more hunting around for attenuators or adapters. HP sensors include all the accessories you need to optimize accuracy and save time.

### HP 11683A Range Calibrator

The HP 11683A range calibrator is specifically designed for use with the HP 435B, 436A, 437B, 438A, 70100A, and E1416A power meters. It allows verification of full-scale meter readings on all ranges, as well as meter tracking. Simply connect the cable between the power meter and calibrator. The CAL ADJ control on the power meter is used to set the meter to full scale on the 1 mW range. The calibrator and meter are then stepped through the other ranges verifying accuracy within  $\pm 1$  percent plus noise and drift. The HP 11683A also has a polarity switch that tests the auto-zero circuit. The HP 11683A is not HP-IB compatible.

#### HP 11683A Range Calibrator Specifications

**Calibration Functions:** Outputs corresponding to meter readings of 3, 10, 30, 100, and 300  $\mu$ W; 1, 3, 10, 30, and 100 mW

**Calibration Uncertainty:**  $\pm 0.25\%$  in all ranges

**Power:** 100, 120, 220, or 240 Vac  $\pm 5\%$ ,  $-10\%$ , 48 - 440 Hz, less than 10 V  $\cdot$  A

**Size:** 133 mm W  $\times$  89 mm H  $\times$  216 mm D (5.25 in  $\times$  3.5 in  $\times$  8.5 in)

**Weight:** Net, 1.13 kg (2.5 lb); shipping, 1.9 kg (4.2 lb)

### HP 11730A-F Power Sensor Cables

The HP 11730 series power sensor cables are for use with the HP 435B, 436A, 437B, 438A, 70100A, and E1416A power meters and the HP 8480 series of thermocouple and diode power sensors. These cables are designed to reduce RFI effects on low power readings with an improved shielding design in the cable itself. Cables may be ordered individually or in pairs in any combination desired for single and dual-channel measurements.

The HP 11730A cable is the standard cable for the HP 435B, 436A, 437B, 438A (2 cables shipped), 70100A, and E1416A meters. To order a nonstandard cable, select Option 004 for the meter in question, and order the desired cable from below.

#### Key Literature

Thermocouple and Diode Power Sensor Family Brochure, p/n 5959-8751.

#### Ordering Information

**HP 11683A** Range Calibrator

**HP 11730A** 1.5 Meter (5 ft) Sensor Cable

**HP 11730B** 5.0 Meter (10 ft) Sensor Cable

**HP 11730C** 6.1 Meter (20 ft) Sensor Cable

**HP 11730D** 15.2 Meter (50 ft) Sensor Cable

**HP 11730E** 30.5 Meter (100 ft) Sensor Cable

**HP 11730F** 61.0 Meter (200 ft) Sensor Cable