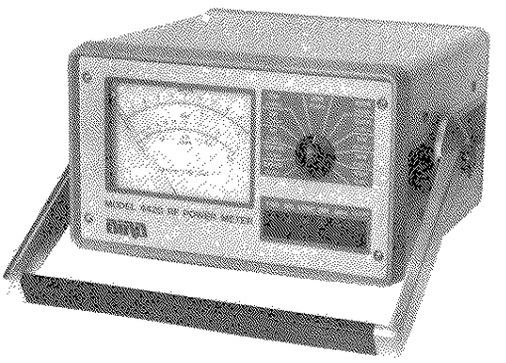
THRULINE® High Accuracy RF Power Meters

Model 4420 Analog
Model 4421 Digital
4020-series Sensors

- ± 3%-of-Reading Acurracy
- Analog or Digital Display
- IEEE-488 or RS-232 Interface (option - digital model only)

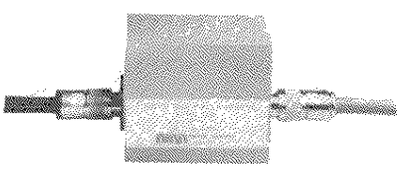


ANALOG MODEL 4420

Circuitry: microprocessor-based operation and analog display control.
Functions: Forward Power in watts or dBm, Reflected power in watts or dBm, VSWR, Return loss in dB, Minimum and Maximum value of any parameter on display.
Display: fast-response analog movement. Motor-driven pointer with near-zero parallax. No overshoot or undershoot.
Display Accuracy: ±0.25% of full scale.
Power Ranges: 11 overlapping, switch-selectable ranges with .1/.3/1/3/10/30/100/300/1000/3000/10000 scaling. Dynamic range of each sensor covers 7 of the 11 available power ranges. With model 4021 or model 4022 sensors, ranges include 1/3/10/30/100/300/1000 watts full-scale.
VSWR Range: 1.0-3.0
Overrange Indication: audible warning when RF power input exceeds 120% of sensor's maximum power range.
Operating Power: 115/230VAC, 50/60Hz.
Nominal Size incl. connectors: $10^{15}/_{16}$"L x $12^{5}/_{32}$"W x $6^{19}/_{32}$"H (262mm x 309mm x 167mm)
Weight: 9 lbs. (4kg).

DIGITAL MODEL 4421

Circuitry: microprocessor-based operation with digital display.
Functions: Forward Power in watts or dBm, Reflected power in watts or dBm, VSWR, Return loss in dB, Minimum and Maximum value of any parameter on display.
Display: $3^{1}/_{2}$ digit liquid crystal display with annunciator for mode, measurement units, battery condition, programming status, and input signal increase/decrease. Switchable backlight.
Power Range: 1w — 10kW FS now available, soon to be 100mW — 10kW FS
VSWR Range: 1.0-199.9
Ranging: selectable manual or autoranging.
Overrange Indication: audible warning when RF power input exceeds 120% of sensor's maximum power range.
Operating Power: 3-way operation from AC mains or batteries. 115/230VAC, 50/60Hz, 8 nickel cadmium 1.2V C cells (NEDA type 10014), or 8 alkaline-manganese dioxide 1.5V C cells (NEDA type 14A). Built-in charger easily disabled for operation with non-rechargeable cells.
Nominal Size incl. connectors: $12^{9}/_{32}$"L x $12^{5}/_{32}$"W x $4^{31}/_{32}$"H (312mm x 309mm x 126mm)
Weight incl. batteries: 11 lbs. (5kg).



RF POWER SENSORS

ALL MODELS

Type: Thruline® design for direct insertion in 50-ohm line.
Circuitry: microprocessor-based measurement and conversion.
Frequency/Power Coverage: single power sensor covers specified power and frequency range; no additional plug-in elements required.
Bidirectional Operation: pick-up of RF power in precision 50.00 ohm line.
Connectors: QC-type. Female N normally supplied; 25 other coaxial-type connectors available.
Minimum Directivity: 30dB.
Accuracy: ±3% of reading from rated maximum range down to 30% of full scale on the most sensitive range.
Signal Purity for rated accuracy: no more than 1% AM; harmonics -50dB or less.
Calibration Technique: calibration-vs-frequency curve stored in non-volatile memory within each sensor. Sensor output corrected at frequency of measurement within rated stage.
Sampling Rate: approximately 2 readings/second.
Ambient Temperature Range: temperature compensated for rated accuracy from 0°C to 50°C (32°F to 122°F).
Nominal Size incl. connectors $5^{7}/_{32}$" x $3^{1}/_{4}$" x $2^{1}/_{2}$" x (132.5 x 83 x 64mm).
Weight: 1 lb. 11 oz. (0.76kg).

MODEL 4021
Power Input: 300mW-1000W (1200W maximum).
Frequency Range: 1.8MHz to 32MHz.
VSWR: 1.05 max.

MODEL 4022
Power Input: 300mW-1000W (1200 maximum).
Frequency Range: 25MHz to 1000MHz.
VSWR: 25-512MHz 1.05 max., 512-1000MHz 1.10 max.

MODEL 4024
Power Input: 3W-10kW (12kW maximum)
Frequency Range & Insertion VSWR: 1.5MHz to 32MHz, 1.05 max.
VSWR Range: 1.00 to 2.00

IEEE-488

INTERFACES (Model 4421 only)

Type: field-installable IEEE-488 or RS-232 serial interface.
Card Dimensions: 4½" x 6½" (114 x 165mm).
Compatible Display: model 4421 digital display with 4020-series sensor. Use of either interface requires AC operation.