ภาคผนวก ก

หัววัดพลังงาน P-444 และเครื่องแสดงผลพลังงาน รุ่น R-752

หัววัดพลังงาน P-444 สำหรับวัดพลังงานมีรายละเอียดดังนี้

-ตอบสนองในย่านรังสีอัลตราไวโอเลตถึงอินฟราเรดไกล ช่วงความยาวคลื่นตั้งแต่ 350 นาโนเมตรถึง 2 ไมโครเมตร ค่าความผิดพลาด 3 %

-วัดพลังงานได้ในช่วง 10 ไมโครจูล ถึง 1 จูล แบ่งเป็น 6 ช่วง

-สัญญาณรบกวนน้อยกว่า $5X10^{-8}$จูล

-อัตราการทำซ้ำมากที่สุด 75 ครั้งต่อวินาที

-ช่วงเวลาขาขึ้นของการตอบสนอง 1 นาโนวินาที

-ความเข้มที่ทนได้ 1 เมกกะวัตต์ต่อตารางเซนติเมตร

-พื้นที่การรับแสงมากที่สุด 0.5 นิ้ว หรือ 1.27 เซนติเมตร

-ความกว้างพัลส์น้อยกว่า หรือเท่ากับ 2 มิลลิวินาที

-ขนาด 4.5X3X2 นิ้ว

-น้ำหนัก 1.5 ปอนด์

เครื่องแสดงผลพลังงาน รุ่น R-752

-แสดงค่าพลังงานได้ในช่วง 50 นาโนจูล ถึง 1จูล และกำลังในช่วง 20 มิลลิวัตต์ถึง 100 วัตต์

-เป็นระบบดิจิตอล

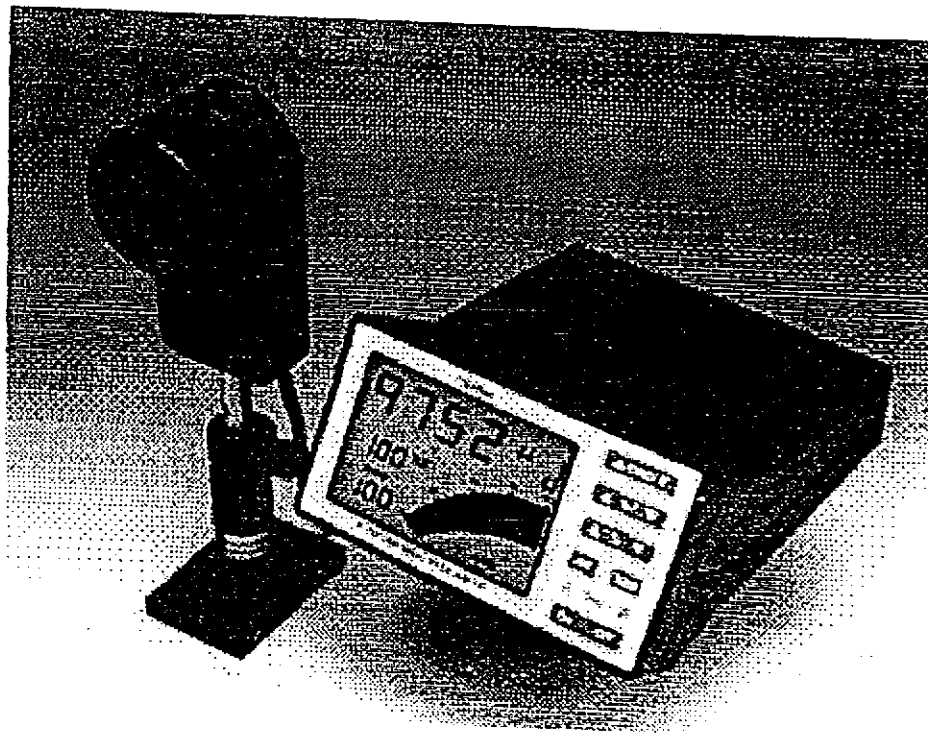
-ตอบสนองในย่าน รังสีอัลตราไวโอเลต ถึงอินฟราเรดไกล

-ความเข้มที่ทนได้มากที่สุดคือ 2.5 kW/cm^3

DigiRad

R-752

UV to Far IR Radiometer for both Power and Energy Measurements



Benefits:

Measures both Power and Energy with One Probe
High Damage Threshold-2.5KW/
Wide Dynamic Range

- **64 pre-set Wavelength Calibration Factors in NVRAM**
- **High visibility Analog Bar Graph Display**
- **Built-in Backlighting**
- **One Part in 10,000 Display Resolution**
- **Digital Event Averaging**
- **Light and Portable, AC or Battery Operation**

The R-752 Universal Radiometer represents a significant advancement over existing laboratory light measurement instrumentation.

Unlike the slow response of thermopile based instruments, the R-752's unique pyroelectric detector/power head design measures CW power from 20 microwatts to 100 watts - in 1/30th of a second - from UV to Far IR. In addition to its fast response, it can withstand power densities exceeding 2.5 KW/cm².

For energy measurement, it provides a dynamic range of 50nJ to one Joule and digital event averaging up to 1000 events - throughout the entire spectrum. Unsurpassed for quick response, the R-752 integrates, digitizes, computes and displays the energy of individual pulses at rates exceeding 120 pps. The R-752 can also sum the energiesof up to 1000 events to a level of 1 KJ.

The ability to measure both continuous and pulsed radiation, with one detector, is one of the outstanding benefits of the R-752. (No need to go to the expense of buying and stocking a cabinet full of probes.) Now, for the first time, you can have a truly universal radiometer designed to meet virtually all your power and energy measurement requirements with one probe.

Compare the R-752's quick response and wide dynamic range to any UV to Far IR radiometer in the industry. You'll find that the R-752 is unmatched for value, performance, versatility and convenience.

The R-752's large 32 segment analog bar graph and built-in audio tone facilitates accurate laser tuning from across the lab.

The large digital display provides easy reading of the radiation levels. The R-752's display, with built-in backlighting, is highly visible under all conditions. For added convenience, the R-752 operates on AC or batteries. The R-752 also features auto-ranging, auto-triggering and NVRAM storage of wavelength calibration factors.

The R-752 is a result of fifteen years experience in the design and development of optical radiation instruments.

R-752 Specifications

Digirad reserves the right to change specifications w/o notice

Using:	S-444 YAG Enhanced U-444 UV Enhanced	P-444 Pyroelectric Probe	P-444 with PH-30 Power Head
Ranges	10 pJto 1 µJ in six ranges	10 µJto 1J in six ranges	10 mW to 100 W in five ranges
Spectral Range	430 - 1064 nm, 250-1000 nm	350 nm to 2 µm, ± 3%, 200 nm to 20 µm, +3, −12%	350 nm to 2 µm, ± 3%, 200 nm to 20 µm, +3, −12%
Detector Uniformity	± 2% for 2 mm beam	± 3% for 2 mm beam	± 3% for 2 mm beam
Noise Level	< 8 x 10^{-14} J	< 5 x 10^{-8} J	< 2 x 10^{-5} W
Maximum Rep-Rate	120/sec	75/sec	30 measurements/sec**
Averaging Modes	Digital Averaging of 10, 100, 1000 Events plus EXPOSURE mode for summing up to 1000 Events	Digital Averaging of 10, 100, 1000 Events plus EXPOSURE mode for summing up to 1000 Events	Digital Averaging of 10, 100, 1000 Events plus EXPOSURE mode for summing up to 1000 Events
Max. Beam Diameter	0.444 inches, 1.13 cm	0.5 inches, 1.27 cm	0.5 inches, 1.27 cm
Damage Threshold	5W/cm^2	1 MW/cm^2(100nS Pulse)	2.5 KW/cm^2
Window & Spectral	Window Transmission Digitally Selectable From 10 to 100% in 1 % increments	Window Transmission Digitally Selectable From 10 to 100% in 1 % increments	Window Transmission Digitally Selectable From 10 to 100% in 1 % increments
Compensation	64 spectral cal. points stored in U, S-444 NVRAM	64 spectral cal. points stored in U, S-444 NVRAM	64 spectral cal. points stored in U, S-444 NVRAM
Display Resolution	1 part in 10000 maximum	1 part in 10000 maximum	1 part in 10000 maximum
Bar Graph Display	32 Element, 2 mS Response Time	32 Element, 2 mS Response Time	32 Element, 2 mS Response Time
Event Counter Display	3 Digit	3 Digit	3 Digit
Optical Pulsewidth	≤ 2 mS, P-444, ≤ 0.5 mS, S-444, U-444	≤ 2 mS, P-444, ≤ 0.5 mS, S-444, U-444	CW
Calibration Uncertainty @ λ = 633 nm	± 3%, 10 µJ range	± 3%, 10 µJ range	± 4%, 10 mW range
Power Requirements	120/240 VAC, 50-60 Hz, or Built-in Ni-Cad batteries	120/240 VAC, 50-60 Hz, or Built-in Ni-Cad batteries	120/240 VAC, 50-60 Hz, (PH-30 - VAC only)
Operating Temperature	0 to 40 C	0 to 40 C	0 to 40 C
Size	4.5 " h x 3 "d x 2"w	4.5 " h x 3 "d x 2 " w	4.5 "h x 3 "d x 2" w
Weight	1.5 lbs.	1.5 lbs.	2.3 lbs.

C-2: Rs-232C Interface Cable, Modular plug to DB-25.* RM-2: Operating Manual* RT-2: Hard Plastic Carrying/Storage Case
M-2: Window/filter holder, accepts a one inch diameter optical window or filter.*
C-4: Five foot SMB to BNC 50 ohm coax for connection to high speed monitor detector.*

* one is supplied with each instrument
**readout is updated 3 times/sec.

I-444, S-444 Silicon Probes

Icon probes are ideal the measurement of tremely low level ised radiation. Each tector is supplied with individual spectral ibration that is stored he probe's NVRAM.

P-444 Pyroelectric Probe

This probe is used for both power and energy measurements.The P-444 measures radiation from Uv to the Far IR. It permits measurments over six decades of dynamic range.

PH-30 Power Head w/P-444

The quartz crystal controlled phase-locked-loop optical sampler delivers precisely timed samples of the input radiation to the P-444 Pyroelectric detector. Sensors located in the P-444 inform the readout that the units are mated causing the results to be displayed as watts

DigiRad

Division of Terahertz Technologies Inc.

169 Clear Road
Oriskany, New York 13424
Tel: (315) 736-3642 Fax: (315) 736-4078
Web Site: www.borg.com/~tti/
E-mail: tti@borg.com