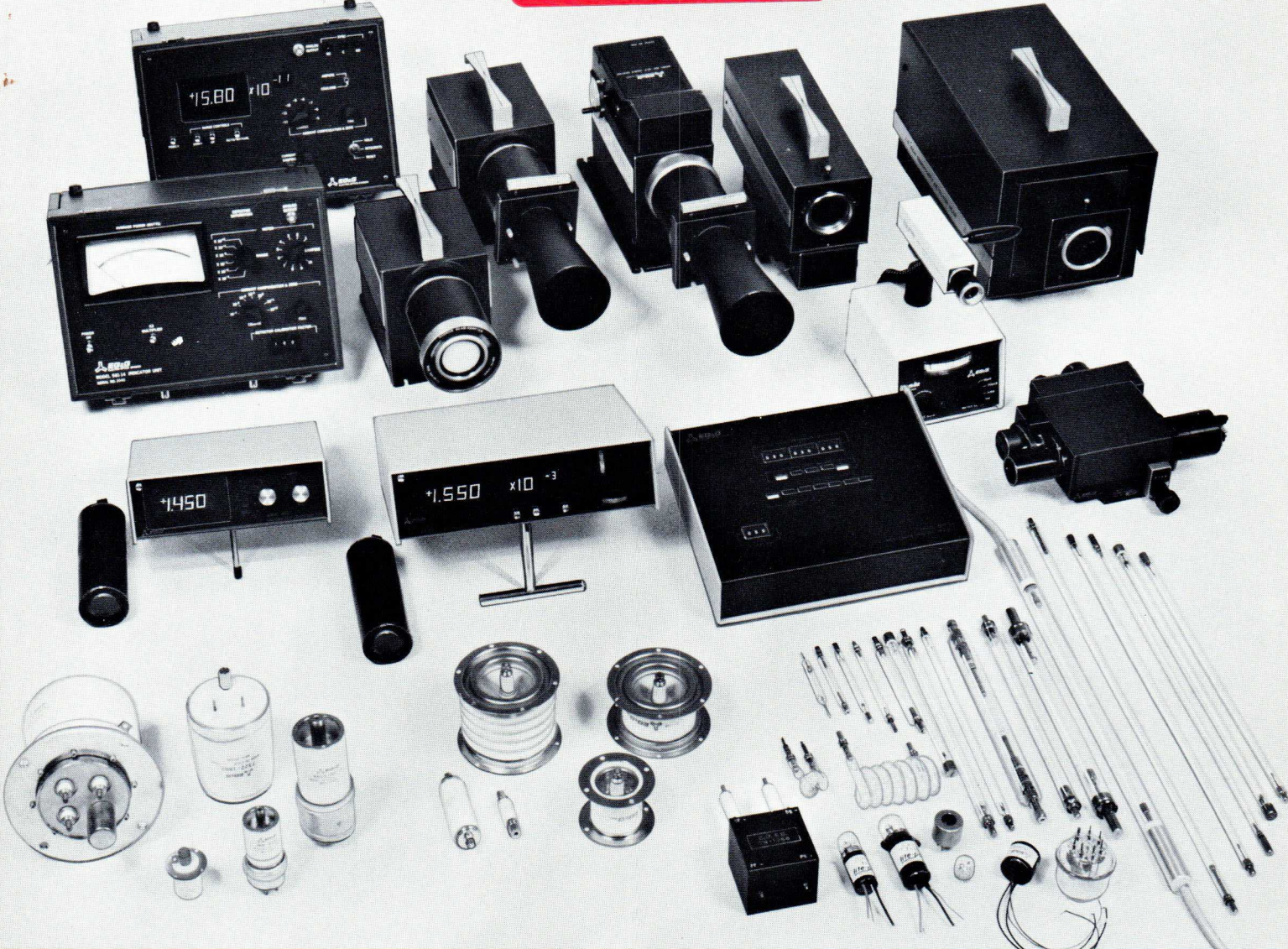
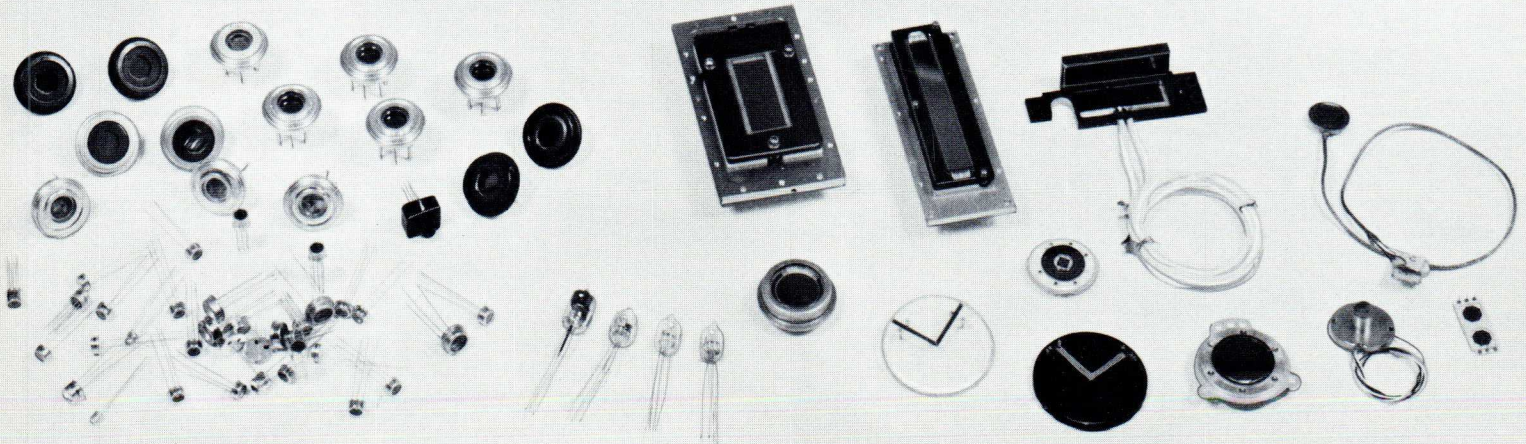


Represented in the
United Kingdom by
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 **EG&G ELECTRO-OPTICS**

CONDENSED
CATALOG





LIGHT MEASUREMENT INSTRUMENTS

Model 450 Photometer/Radiometer System

The Model 450 Photometer/Radiometer System is a lower cost version of the Model 550 System. It is similar in capability to the Model 550 except for one decade of sensitivity, fewer units of direct readout, and the lack of the autoranging feature.

Model 550 Radiometer/Photometer System

The Model 550 Radiometer/Photometer provides fast, precise measurements with direct readings in 10 photometric and radiometric units. The direct readings, which are easily taken from a 3½ digit panel meter and digital decade indicator, eliminate the need for post measurement calculations. The system is both manual and autoranging over seven full scale decades. Measurements can be obtained of both pulsed and continuous sources with excellent accuracy, repeatability, and stability. Provision for ambient compensation permits its use outside of a dark room environment. High sensitivity is achieved through the use of a single, low noise silicon multiprobe detector.

Model 550/555 Automatic Spectroradiometer

The Model 550/555 Spectroradiometer System integrates all the state-of-the-art features of the Model 550 Radiometer/Photometer with the precision and accuracy of the Model 555-61 Monochromator to yield a compact, lightweight, high-efficiency measurement system capable of providing radiometric measurements of both continuous and pulsed sources as a function of wavelength. The Model 550/555 covers a wide spectral region extending from 250 nm in the ultraviolet to 1100 nm in the near-infrared with an absolute system measurement accuracy better than ±5%. Ancillary components expand the basic manual system into an automatic measurement system with selectable wavelength scan ranges and scan speeds, automatic order-sorting filter sequencing, and interface compatibility for automatic data acquisition and printout.

Model 460 Laser Power Meter

The Model 460 Laser Power Meter is a low cost, portable system capable of providing direct measurements of a wide variety of gas, diode, and dye lasers. It is direct reading in terms of watts for average power measurements of cw or repetitively pulsed lasers. Optional accessories are available for measurements of integrated energy (joules), peak power, and pulse shape of pulsed lasers. The

spectral range extends from 200 nm in the ultraviolet to 1100 nm in the near infrared.

Model 580 Radiometer/Photometer Systems

The Model 580 Systems provide fast, accurate measurements of optical radiation in radiometric and photometric terms. The systems are inherently capable of measuring both continuous (cw) sources as well as pulsed events as fast as one nanosecond in duration. An autoranging digital panel display provides readings of average power and integrated energy. The Detector Heads also have provision for oscilloscope display of pulsed light signals so that wave shape measurements can be made, i.e., peak power, pulse duration, and rise and fall times. The spectral range is from 0.2 μm (200 nm) in the ultraviolet to 1.1 μm (1100 nm) in the near infrared.

Model 580/585 Spectroradiometer Systems

The Model 580/585 Systems add a digital grating monochromator and additional optics onto the Model 580 Radiometer Detector Head, thereby allowing absolute measurements of the power and energy of chromatic cw and pulsed light sources as a function of wavelength. A truly functional system with provision for recorder output and BCD computer interface, the 580/585 can measure over a 12-decade range of light levels. The system can also be used as a radiometer and a photometer.

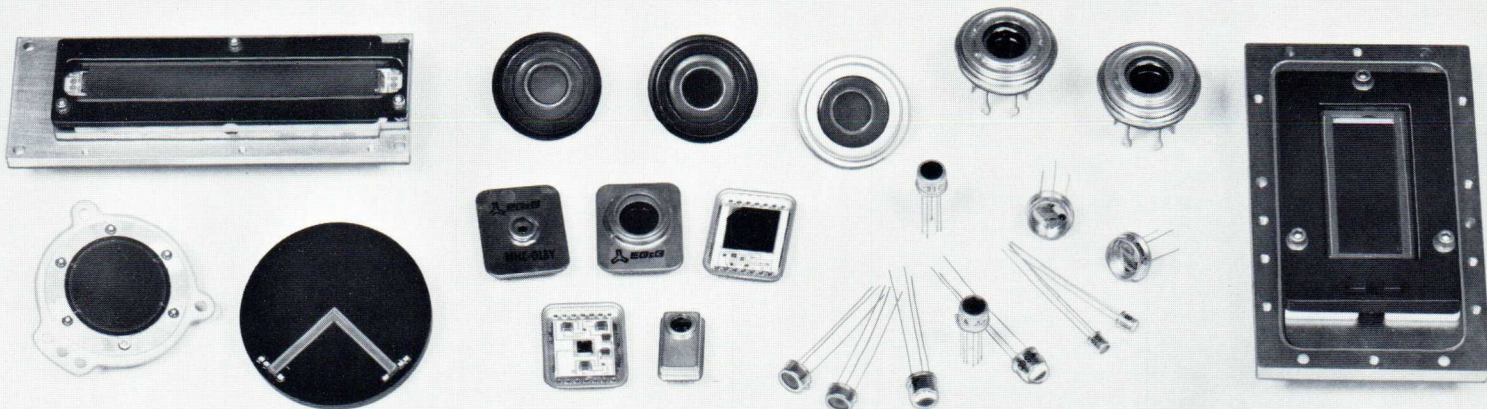
Model 581 Laser Radiometer

The Model 581 Laser Radiometer System provides absolute, direct reading measurements of the average power output of cw and repetitively pulsed lasers. Provision has also been made for oscilloscope display of pulsed laser signals for measurements of peak power, pulse duration, and rise and fall times.

Model 597-1 Calibrated Lamp Standard

The Model 597-1 Lamp Standard is provided with absolute calibration of spectral irradiance and calculated values of illuminance, luminous intensity, chromaticity coordinates (1931 CIE) and correlated color temperature. The spectral irradiance data are presented in a computer tabulated format at 193 wavelengths over the spectral range from 250 to 2500 nm. This permits maximum usage of the lamp by eliminating the errors associated with interpolation of data between points.

Other standard light measurement instruments together with accessories and optical calibration standards are available.



SILICON PHOTODIODES

SILICON PIN PHOTODIODES High Speed Photoconductive

- Spectral Range: 0.35 to 1.15 μm
- Responsivity: 0.5 A/W at 0.9 μm ;
0.42 A/W at 1.06 μm (YAG Series)
- Linearity of Response: Within 5% over
7 Decades
- Operating Voltage: 0 to 180 Volts

Type No.	Active Area (mm ²)	Package (JEDEC)	Dark Current (nA)	NEP $\lambda, 600, 1$ (watts)	Rise Time (ns)	Capacitance (pf)	Test Voltage (V)
SGD-040A	0.82	TO-5	3	9.6×10^{-14} at 0.9 μm	3	2	100
SGD-040B	0.82	TO-46	3	9.6×10^{-14} at 0.9 μm	3	2	100
SGD-040L	0.82	TO-5/Lens	3	9.6×10^{-14} at 0.9 μm	3	2	100
SGD-100A	5.1	TO-5	10	1.0×10^{-13} at 0.9 μm	4	4	100
SGD-160	13	TO-8	50	3.0×10^{-13} at 0.9 μm	7	8	100
SGD-200	20	TO-8	75	1.6×10^{-13} at 0.9 μm	8	18	100
SGD-444	100	TO-36	200	5.9×10^{-13} at 0.9 μm	10	80	100
SGD-444-2		Same as SGD-444 but in bi-cell configuration					
SGD-444-4		Same as SGD-444 but in quad-cell configuration					
YAG-100A	5.1	TO-5	20	2.2×10^{-13} at 1.06 μm	8	3.5	180
YAG-444	100	TO-36	200	5.6×10^{-13} at 1.06 μm	8	35	180
YAG-444-4		Same as YAG-444 but in quad-cell configuration					
DT-25	5.1	TO-5	30	3.5×10^{-13} at 0.9 μm	5	7	90
DT-110	100	TO-36	400	9.5×10^{-13} at 0.9 μm	10	100	90
FND-100	5.1	TO-5	25	1.0×10^{-13} at 0.9 μm	<1	5	100
FOD-100	5.1	Special	25	1.0×10^{-13} at 0.9 μm	<1	5	100

SILICON PHOTOVOLTAIC DETECTORS — Low Noise

- Spectral Range: 0.35 to 1.15 μm (PV Series); 0.20 to 1.15 μm (UV Series)
- Responsivity: 0.60 A/W at 0.95 μm ;
0.10 A/W at 0.2 μm (UV Series)
- Linearity of Response: Within 1% over
7 Decades
- Operating Mode: Photovoltaic — no bias

Type No.	Active Area (mm ²)	Package (JEDEC)	Min Shunt Resistance (M Ω)	NEP ($\lambda, 600, 1$) (watts)	Rise Time (ns)	Capacitance (pf)
PV-040	0.82	TO-46	500	1.0×10^{-14} at 0.95 μm	12	25
PV-100A	5.1	TO-5	100	3.2×10^{-14} at 0.95 μm	25	150
PV-215	23.6	TO-8	50	4.3×10^{-14} at 0.95 μm	30	700
PV-444A	100	TO-36	10	9.0×10^{-14} at 0.95 μm	45	2800
UV-040	0.82	TO-5	1000	4×10^{-14} at 0.23 μm	12	25
UV-100B	5.1	TO-5	100	2.3×10^{-13} at 0.23 μm	25	150
UV-215B	23.6	TO-8	50	2.5×10^{-13} at 0.23 μm	30	700
UV-250	21	TO-5	50	2×10^{-13} at 0.23 μm	30	650
UV-360	36	TO-8	20	4×10^{-13} at 0.23 μm	35	925
UV-444B	100	TO-36	10	5.0×10^{-13} at 0.23 μm	45	2800

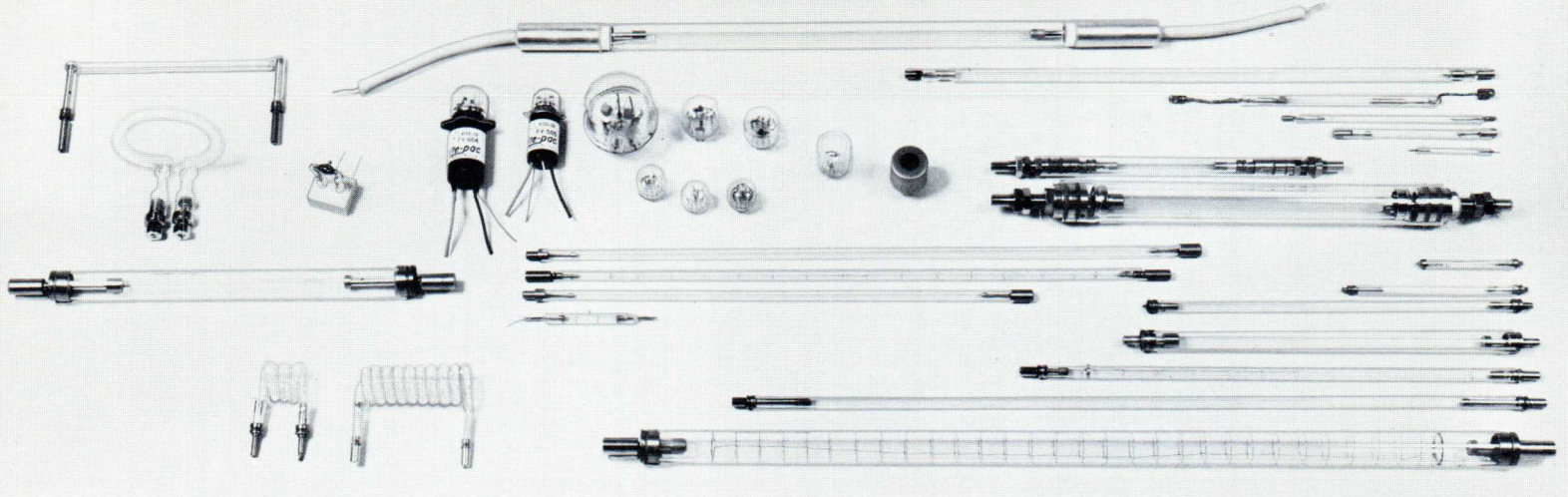
SILICON DETECTOR/ AMPLIFIER COMBINATIONS

- Spectral Range: 0.35 to 1.15 μm (except HUV Series); 0.20 to 1.15 μm (HUV Series)
- Supply Voltage: ± 15 Volts

Type No.	Active Area (mm ²)	Package (JEDEC)	Responsivity $R_r = 200 \text{ M}\Omega$ (V/W)	NEP ($\lambda, f, 1$) (watts)	Gain Bandwidth Product (MHz)	Slew Rate (V/ μsec)
HAD-1000A	5.1	TO-5	10^8 at 0.9 μm	1.5×10^{-13} at 0.95 μm at 400Hz	2.0	6
HAV-1000	5.1	TO-5	10^8 at 0.9 μm	1.1×10^{-13} at 0.95 μm at 400Hz	1.0	6
HAV-4000A	100	Modified DIP	10^8 at 0.9 μm	9.0×10^{-14} at 0.95 μm at 400Hz	0.1	5
HUV-1000B	5.1	TO-5	10^7 at 0.23 μm	7.0×10^{-13} at 0.23 μm at 400Hz	1.0	6
HUV-2000B	24	Modified DIP	10^7 at 0.23 μm	6.5×10^{-13} at 0.23 μm at 400Hz	0.1	5
HUV-4000B	100	Modified DIP	10^7 at 0.23 μm	6.0×10^{-13} at 0.23 μm at 400Hz	0.1	5
MHZ-018	5.1	Modified DIP	10^8 at 0.9 μm	4.7×10^{-11} at 0.95 μm at 18MHz	100	
MHZ-018Y	5.1	Modified DIP	5×10^8 at 1.06 μm	5.9×10^{-11} at 1.06 μm at 18MHz	100	
MHZ-016	13	Modified DIP	10^8 at 0.9 μm	6.8×10^{-11} at 0.95 μm at 16MHz	100	

Custom Photodiodes

In addition to these standard photodiode products, E G & G engineering and production capabilities permit the design and fabrication of custom photodiode devices. Special configurations such as larger and smaller areas, circular and rectangular active areas, arrays, and matrices can be manufactured per specific customer requirements. Inquiries for both small and OEM quantities are welcome.



XENON FLASHTUBES

Xenon flashtubes, dc krypton arc lamps, long arc Xenon and short arc dc mercury lamps are available from EG&G in a wide variety of configurations and envelope materials. Tubes are available in linear, bulb type, helical, "U" shape, coaxial, and air or liquid designs. Envelope materials include quartz, UV inhibiting quartz, and hard glass with a wide range of bore and arc length sizes. Custom configurations are available upon request. All linear tube types can be supplied with water-cooled designs by specifying "C." Pressure fills up to 4 atmospheres in either Xenon or Krypton gas, changes in arc length and mechanical configurations are all available upon request.

Common applications involve the use of these lamps as the primary light source for:

Laser stimulation • Photocopy systems • Phototypesetting machines • Microfiche systems • Strobos • UV curing of polymers • Marine, aircraft and satellite beacons • Warning beacons • Photoresist exposure • Large area indoor and outdoor lighting

Linear Xenon Flashtubes

Type No.	Bore Size I.D. x O.D.	Arc Length	Max. Energy 1.0 msec	Min. Operating Voltage	Min. Trigger Voltage	Avg. Power at 25°C Ambient
	(mm)	(inches)	(joules)	(kv)	(kv)	(watts)
FX-147C-2	3 x 5	2	420	0.5	15	15
FX-33C-1.5	4 x 6	1.5	420	0.5	15	10
FX-195C-1.5	4 x 6	1.5	420	0.5	15	10
FX-33C-2	4 x 6	2	560	0.6	15	15
FX-38C-2	4 x 6	2	560	0.6	15	15
FX-103C-2	4 x 6	2	560	0.6	15	15
FX-38C-3	4 x 6	3	840	0.7	15	20
FX-103C-3	4 x 6	3	840	0.7	15	20
FX-195C-3	4 x 6	3	840	0.7	15	20
FX-1C-6	4 x 6	6	1680	0.7	20	40
FX-5C-9	4 x 6	9	2520	1.2	20	50
FX-98C-3	5 x 7	3	1050	0.8	15	30
FX-52C-3	7 x 9	3	1490	1.0	20	60
FX-227C-3	7 x 9	3	1490	1.0	20	60
FX-55C-6	7 x 9	6	2980	1.1	20	80
FX-227C-6	7 x 9	6	2980	1.1	20	80
FX-81C-4	10 x 12	4	3080	1.0	25	80
FX-81C-6.5	10 x 12	6.5	5000	1.0	25	90
FX-81C-8	10 x 12	8	6160	1.0	25	100
FX-47C-3	13 x 15	3	2040	1.0	20	75
FX-47C-6.5	13 x 15	6.5	5500	1.0	25	100
FX-47C-12	13 x 15	12	8160	1.3	25	125
FX-47C-18	13 x 15	18	12,240	1.6	25	135
FX-77C-4	19 x 22	4	5040	1.0	25	125
FX-77C-8	19 x 22	8	10,000	1.2	25	150
FX-77C-12	19 x 22	12	15,000	1.4	25	190
FX-77C-13	19 x 22	13	15,400	1.5	25	200

Linear Watercooled Xenon Flashtubes (Complete)

Type No.	Bore Dia. I.D.	Arc Length	Max Energy 1.0 msec	Average Power	Operating Voltage	Trigger Voltage Range
	(mm)	(inches)	(joules)	(kw)	(kv)	(kv)
FX-195C-1.5C	4	1.5	420	0.5	1.2-1.8	25-30
FX-195C-3C	4	3	840	1.0	1.2-2.5	25-30
FX-203C-3C	5	3	1050	1.5	1.3-2.5	25-30
FX-227C-3C	7	3	1490	4.0	1.5-2.5	25-30
FX-227C-6C	7	6	2980	8.0	1.5-2.5	25-30
FX-81C-6.5C	10	6.5	5000	9.0	1.6-2.7	25-30
FX-47C-6.5C	13	6.5	5500	10	1.7-3.0	25-30
FX-77C-12C	19	12	15000	15	2.0-3.5	25-30

Bulb Type Xenon Flashtubes

Type No.	Max. Energy	Average Power	Operating Voltage Range	Min. Trigger Voltage	Max. Rep. Rate	Arc Discharge Length
	(joules)	(watts)	(volts)	(kv)	(pps)	(inches)
FX-6A, FX-6AU, FX-48, FX-101, FX-108, FX-108AU	5	7	400-1000	2.5	500	5/16
FX-199 *	5	7	300-1500	4.0	500	5/16
FX-6B, FX-6BU, FX-35B, FX-101B, FX-102, FX-108B, FX-108BU	5	7	500-1000	4.0	2500	5/16
FX-127	5	7	500-1000	4.0	2500	1/8
FX-198 *	5	7	300-1500	4.0	500	1/8
FX-76, FX-133, FX-138	20	20	500-1500	5.0	2500	5/16
FX-201 *	20	15	300-1500	5.0	500	5/16
FX-124, FX-137	15	20	500-1500	5.0	2500	1/8
FX-200 *	20	15	300-1500	5.0	500	1/8
FX-132	200	100	100-1500	7.0	500	3/8
FX-193 **	30	50	300-1500	4.0	500	1/8

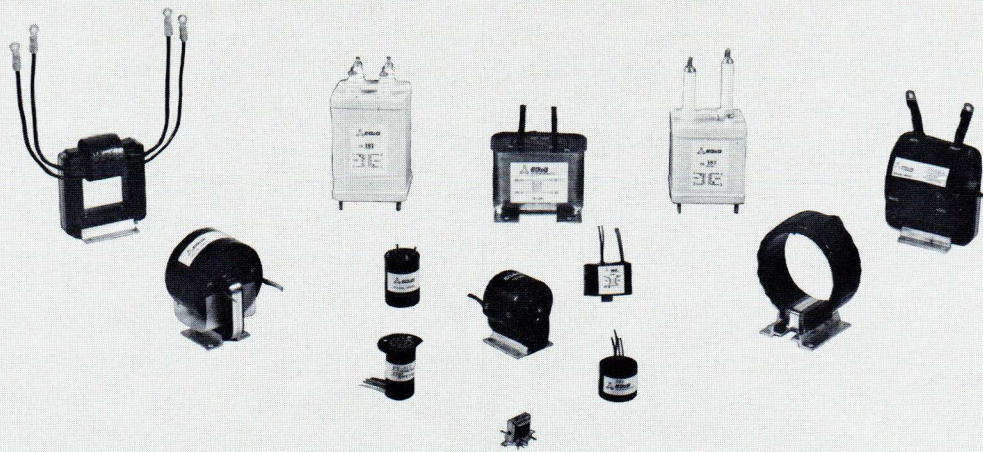
*HIGH EFFICIENCY DESIGN **METAL CAN TYPE

DC Krypton Arc Discharge Tubes

Type No.	Bore Dia. I.D.	Arc Length	Ave. Power Water Cooled	Steady State Voltage Current		Static Impedance	Min. Anode Voltage	Min. Trigger Voltage
	(mm)	(in.)	(kw)	(Vdc)	(Adc)	(Ohms)	(kvdc)	(kv)
FK-99C-2	4	2	2750	81	34	2.3	1-1.5	15-20
FK-99C-3	4	3	4000	125	32	3.9	1-1.5	15-20
FK-111C-2	7	2	4000	80	50	1.6	1-1.5	15-20
FK-111C-3	7	3	6000	115	52	2.2	1-1.5	15-20
FK-125C-2	5	2	3500	81	43	1.9	1-1.5	15-20
FK-125C-3	5	3	5000	115	44	2.6	1-1.5	15-20
FK-128C-3	10	3	8000	97	84	1.2	1-1.5	15-20
FK-128C-10	10	10	15000	276	56	4.9	1-1.5	15-20

Xenon Flashtubes for Pulsed Dye Lasers

Type No.	Bore Dia. I.D.	Arc Length	Max. Energy	Operating Voltage	Pulse Width
	(mm)	(inches)	(joules)	(kv)	(μs)
FX-139C-3.5	3.5	3.5	10	10	1
FX-140C-3.5	5.0	3.5	25	10	2
FX-141C-3.5	7.0	3.5	100	10	3
FX-142C-3.5	7.0	3.5	200	20	6
FX-143C-6.0	15.0	6.0	1000	20	12



TRIGGER TRANSFORMERS & CHOKES

E G & G Trigger Transformers provide reliable triggering of Xenon flashtubes, krytrons, and triggered spark gaps. Standard and custom designs are available for a wide range of input and output voltage requirements. All transformers are designed to meet MIL specifications.

E G & G Series Injection Trigger Transformers are ideal for applications requiring the series triggering of Xenon flashtubes. These transformers feature sub-microsecond rise times and very low values of saturable inductance of the secondary.

E G & G chokes may be used in the operation of Xenon flashtubes for limiting and shaping the current pulse.

Trigger Transformers

Type No.	Peak Output Range (kv)	Input Range (v)	Primary Peak Current (A)	Rise Time 10%-90% (μ s)	Pulse Width-50% Ampl. (μ s)	Turns Ratio
TR-36A	3-6	130-250	35	1.0	5.0	15:1
TR-76A	2.5-6.0	14-25	30	2.0	3.0	188:1
TR-90A	2.5-5.5	10-20	23	3.0	4.0	250:1
TR-130	0.38-1.4	10-30	46	0.8	3.8	40:1
TR-131	0.38-1.4	10-30	40	0.5	0.45	40:1
TR-132C	8-20	150-350	60	2.25	2.5	72:1
TR-148A	5-12	200-400	192	0.35	0.5	30:1
TR-149	0.38-1.0	15-30	17	0.7	0.7	32:1
TR-153	12-35	250-600	100	0.5	0.5	51:1
TR-165	0.35-0.7	7-14	17	1.0	1.5	50:1
TR-180B	10-20	100-200	110	1.0	1.5	112:1
TR-181	5	5000	835	0.1	2.0	1:1
TR-1843	4-10	15-30	40	1.5	1.2	250:1
TR-1700	15-30	200-400	70	0.75	1.5	70:1

Series Injection Trigger Transformers

Type	Max. Peak Output Voltage (kv)	Max. Input Voltage (kv)	Primary Peak Current (A)	Rise Time 10%-90% (μ s)	Pulse Width-50% Ampl. (μ s)	Secondary Saturated Inductance (μ H)	Max. Secondary RMS Current (A)
TS-136B	40	1.5	1100	0.5	1.0	110	80
TS-146A	30	1.5	660	0.5	0.5	100	25
TS-170	20	2.0	150	0.15	0.5	18	20
TS-179	15	0.8	100	0.4	0.7	80	12
TS-185	30	0.6	60	0.48	1.0	550	15

Chokes

Type	Inductance (μ H)	D.C. Resistance (Ω)	Max. Voltage (kv)	Max. Peak Current-1.0ms (A)	Max. RMS Current (A)
TC-70	300	0.19	5	2000	8
TC-71	600	0.25	5	2000	8
TC-79	550	0.031	5	5000	35
TC-80	850	0.055	5	5000	27
TC-102	300	0.025	5	5000	35
TC-196	22	0.046	5	2000	8
TC-198	775	0.270	2.5	1000	4
TC-201	150	0.013	5	5000	40
TC-202	100	0.05	5	2000	10
TC-203	200	0.05	5	2000	10

TRIGGER MODULES

TM-Series of Trigger Modules

The TM-Series of Trigger Modules are line voltage operated, compact instruments which contain the necessary circuitry required for initiating fast triggering. The TM-11A provides a 1.0 μ s risetime pulse of up to 30KV for triggering of Xenon flashtubes and triggered spark gaps. The TM-12A, with a 0.3 μ s risetime pulse of up to 30KV, is designed for series triggering of Xenon flashtubes. Both the TM-11A and TM-12A can be operated by push-button control from the front panel, or by a low impedance pulse generator connected through the front panel oscillator input jack. A voltage control provides variable output from 20-30KV.

The TM-27 & TM-29 are designed to drive the grid of E G & G Thytrons. The TM-27 may be used with all thyatron types except the HY-5, and the TM-29 is used with the HY-5. Both modules feature an internal pulse rate of 1-2000 pps and a typical output risetime of 150 ns.

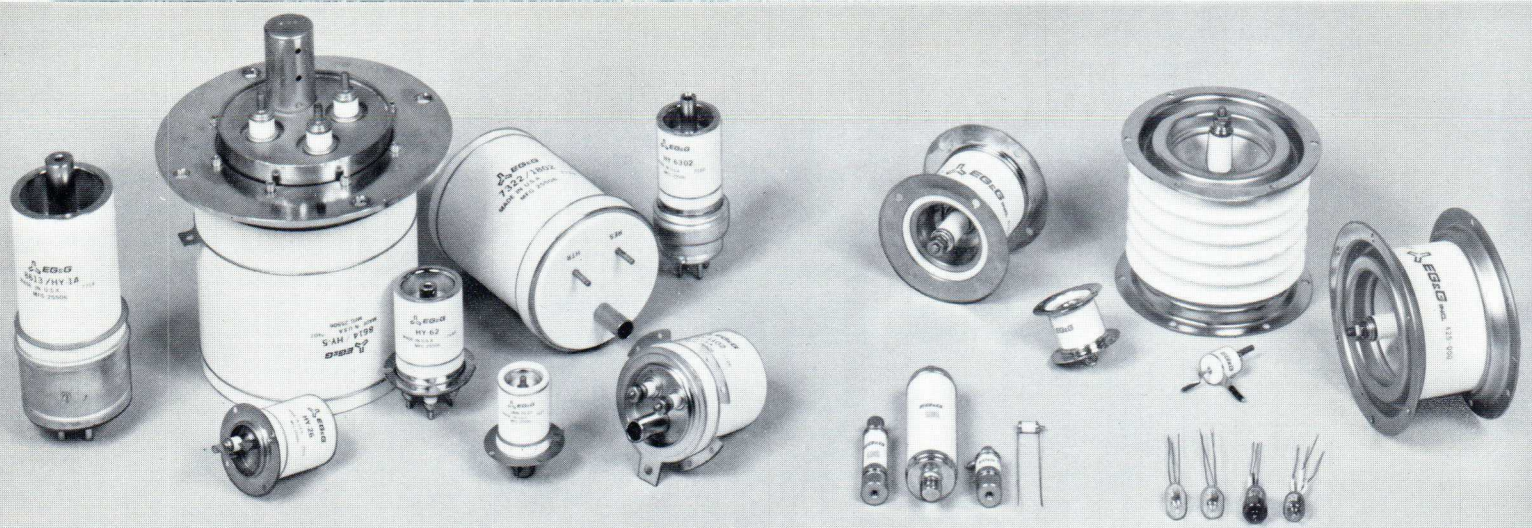
Lite Pacs

The E G & G Lite-Pac* Trigger Module combines a trigger transformer, coupling capacitors and resistors, and a mounting socket into a compact, potted package which is ideal for the triggering of all bulb type Xenon flashtubes. The FY-500 Lite-Pac* series is designed for use with the 9 pin tubes; the FY-600 series for the 12 pin tubes, the FY-7 for the FX-132 and FY-700 series for the metal can tubes.

*Registered EG&G trademark

FLASHTUBE POWER SUPPLIES

E G & G designs and manufactures flashtube power supplies. These power supplies are produced primarily for OEM applications and designed per customer requirements. E G & G power supplies are currently being used in photocopy equipment, microfiche duplication, optical printers, and high intensity obstruction lighting. PS-302, bulb type power supply, is available as a standard supply to operate all bulb type flashtubes up to 20 watts average and 300 Hz.



THYRATRONS & SPARK GAPS

Ceramic-Metal Thyratrons

E G & G's Thyratrons are high voltage, high current switch tubes which can operate at frequencies up to 50 KHz. Utilizing ceramic-metal construction, the tubes feature small size and extended life, and are qualified to MIL specifications. Applications include radar modulators, spark chambers, linear accelerators, and pulsed lasers.

Grounded Grid Thyratrons (Ceramic-Metal)

Grounded Grid Thyratrons are negatively pulsed cathode switching devices, designed for use in circuits requiring faster switching times and higher peak currents than are obtainable with conventional positive grid thyratrons. The HY-13 is primarily used in spark chamber applications. The HY-1102 and HY-3202 are used in pulsed CO₂, TEA, and nitrogen lasers.

Triggered Spark Gaps

E G & G's Triggered Spark Gaps are three element, gas filled switch tubes with ceramic-metal construction. They are capable of switching stored energies up to 4 kilojoules per shot (critically damped) with a conducted charge of up to 5 coulombs per shot with voltages up to 120KV and peak currents up to 100 kiloamps. Applications include spark chambers, EBW systems, crowbar protection of TWT's and Klystrons, Kerr cell switches, flashtubes, Marx generators, and pulsed lasers.

Triggered Vacuum Gaps

For high energy crowbar applications which require a switch with a very wide operating voltage range, E G & G's Triggered Vacuum Gaps are an ideal choice. For example, one type will operate in a range from 0.3 to 50KV, while a second type operates from 1 to 100KV. These gaps are capable of switching stored energies up to 30 kilojoules per shot (critically damped) with a conducted charge of up to 2 coulombs per shot. Types are GPV-63, 6301, 6303 and 7004.

Overvoltage Gaps

Overvoltage Gaps are two element devices designed specifically for overvoltage protection of solid state circuitry, gas and vacuum tubes, and pulse transformers. These units are available in a wide variety of small configurations utilizing rugged and reliable ceramic to metal construction. Operating voltages range from 400 to 120,000 volts. Types are OGP-64, 0.4-9KV; OGP-44, 9-25KV; OGP-67, 25-120KV; PB-23, 0.4-4KV.

Type	Peak Power Output	Peak Anode Voltage	Peak Anode Current	Average Current	Plate Breakdown Factor	Dimensions Height x Dia.
	(Mw)	(kv)	(a)	(A)	(P ₀ x 10 ⁹)	(inches)
7621/HY-2	.35	8	100	0.1	2.7	1.6 x 1.2
HY-26	1.0	12	175	0.15	5	1.8 x 1.4
7782/HY-6	2.8	16	350	0.5	5	1.9 x 1.4
7665/HY-60	2.8	16	350	0.5	5	2.4 x 1.4
HY-61	2.8	16	350	0.5	5	3.6 x 1.4
8765/HY-63	2.1	12	350	0.5	5	4.1 x 1.6
HY-6301	2.8	12	350	0.5	5	4.1 x 1.6
HY-6302	2.8	12	350	0.5	5	4.1 x 1.6
8613/HY-1A	5.0	20	500	0.5	10	5.0 x 2.4
HY-10	5.0	20	500	0.5	10	3.5 x 2.3
HY-11	5.0	20	500	0.5	10	2.4 x 2.3
8354/HY-31	20	25	1000	2.2	25	4.1 x 3.4
HY-32	20	35	1500	2.2	50	4.1 x 3.4
7322/1802	20	25	1500	2.2	50	4.1 x 3.4
8614/HY-5	100	40	5000	8.0	160	5.4 x 4.5
HY-53*	100	40	5000	8.0	160	5.7 x 4.5
HY-5301**	175	70	5000	8.0	160	6.3 x 4.8
HY-7***	800	40	40,000	50	400	15 x 10

* Auxiliary Grid — 250 ns Delay Time ** Auxiliary Grid and Gradient Grid

*** Auxiliary Grid, Gradient Grid and Control Grid

Type	Peak Anode Voltage	Peak Anode Current	Coulombs Per Shot	Current Rise Time	Dimensions Height x Dia.
	(kv)	(ka)	(x 10 ⁻³)	(ns)	(inches)
HY-13	15	120	1.5	7	5.0 x 2.0
HY-1102	20	120	1.5	7	3.1 x 2.0
HY-3202	35	120	5.0	7	5.9 x 3.1

Type	Operating Range	Static Breakdown Voltage	Peak Current (Ringing)	Discharge Energy (Underdamped)	Minimum Trigger Pulse	Dimensions Height x Dia.
	(kv)	(kv)	(ka)	(Joules)	(kv)	(inches)
GP-89	0.7-2.1	2.6	5	25	5	1.2 x 0.6
GP-90	1.3-3.4	4.2	5	25	5.5	1.2 x 0.6
GP-91	4.4-10	12.5	5	25	7	1.2 x 0.6
GP-92	8-20	25	5	25	7	1.4 x 0.9
GP-82B	0.4-1.6	2	15	200	7	1.2 x 1.6
GP-31B	2-6	7.5	15	200	10	1.2 x 1.6
GP-20B	3.5-11	14	15	200	10	1.2 x 1.6
GP-46B	8-20	25	15	200	10	1.6 x 1.6
GP-85	2-6	8	100	2000	20	2.3 x 3.0
GP-86	6-15	20	100	2000	20	2.3 x 3.0
GP-87	10-24	30	100	2000	20	2.3 x 3.0
GP-70	12-36	42	100	2000	20	2.3 x 3.0
GP-30B	2-6	7.5	100	2500	20	2.3 x 3.0
GP-22B	6-15	19	100	2500	20	2.4 x 4.3
GP-12B	10-24	30	100	2500	20	2.4 x 4.3
GP-14B	12-36	42	100	2500	20	2.4 x 4.3
GP-41B	12-36	42	100	4000	20	2.4 x 4.3
GP-32B	20-48	60	100	4000	20	3.6 x 4.3
GP-15B	25-69	86	100	4000	20	3.6 x 4.3
GP-74B	40-100	120	100	4000	20	3.6 x 4.3
GP-81B	40-100	120	100	4000	20	4.5 x 4.3

STROBES AND SENSITOMETERS

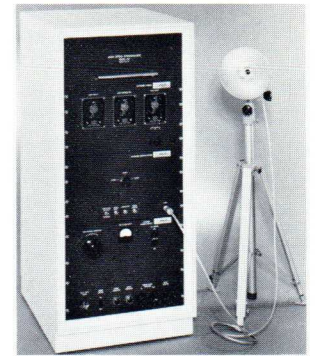
Model 501 High-Speed Stroboscope

Features

- High Flashing Rate up to 6,000 Flashes per Second
- Short Flash Duration as Low as 1.2 Microseconds
- Simple Strobe Triggering from Camera, Oscillator, or Contactor
- Accurate Synchronization Time Jitter less than 10^{-7} second
- Built-in-Controls Camera Start Event Delay Lamp Starting Delay Lamp Running Time

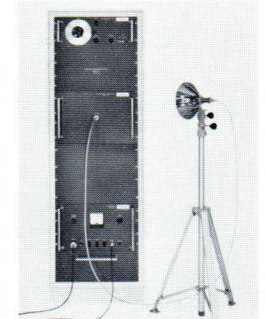
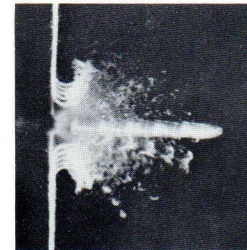
Stroboscopic light stops the motion of rapidly moving subjects and permits accurate measurements of form, velocity, and acceleration. Easily synchronized with either streak-type or rotating prism-type high speed cameras, the 501 Stroboscope gives many times better definition than incandescent light, a particular advantage where frame-by-frame inspection of the film is to be made for purposes of analysis by measurement. The relative coolness of stroboscopic light is a further advantage in those cases where the subject is liable to damage by heat.

The 501 High-speed Stroboscope has been designed to produce flashes of light at rates up to 6000 Hz, with a minimum flash duration of 1.2 microseconds. This type of performance is necessary for the quantitative study of fast-moving phenomena such as shock waves and the flight of projectiles.



Model 502 Multiple Microflash

The EG&G Model 502 Multiple Microflash is a stroboscopic light system designed for photographic instrumentation. It provides up to fifteen 1 microsecond light pulses at a controlled pulse interval. This permits up to 15 exposures at known time intervals to be recorded on a single photographic plate. An enlargement of the photographic plate then provides a basis for qualitative or quantitative studies of the event. For quantitative measurements, distances can be scaled on the photographic plate and distance/time graphs can be plotted. From these graphs it is a routine matter to calculate velocities and accelerations. The 502 multiflash system as provided consists of a rack mounted on casters containing a power supply, firing control unit, and 1 to 15 flash modules depending on customer requirements. The system also includes a flash tube, 8 inch parabolic reflector and all interconnecting cabling.

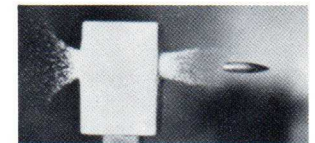


Model 549 Microflash®

The EG&G 549 Microflash® System is a small, portable light source for ultrafast stop-motion photography. Its high peak light output and very short flash duration (0.5 μ sec) make it singularly useful in photographing bullets in flight, spalling particles, fragmenting materials, parts of high-speed machines, and other non-luminous, high-velocity subjects. Several Microflash® Systems can be arranged in series and triggered in succession at predetermined time intervals to photograph several events on the same negative.

The 549 Microflash® System has two basic components, the Model 549-11 Flash Unit and the Model 549-21 Driver Unit. A Model 549-21-11 Microphone is also supplied as part of the basic system. The Model 549-11 Flash Unit houses the air flashtube (guided sparkgap light source) and reflector, the rectifier circuit, energy-storage capacitors, and trigger transformer.

The Model 549-21 Driver Unit houses two small power supplies, a photoelectric tube, and two thyatron tubes and associated circuitry. Operating controls on the front panel permit varying of the trigger sensitivity, the time delay, and the method of triggering. The Driver Unit can be triggered either by light or by sound by means of the built-in photoelectric tube or the Model 549-21-11 Microphone.



Mark VI and VII Xenon Sensitometers

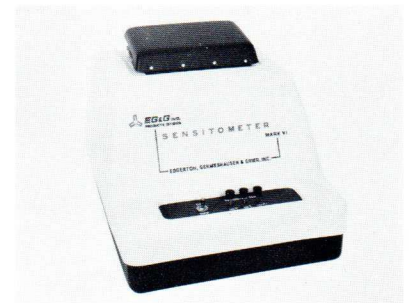
Features

- Daylight Spectral Source
- 10 Milliseconds to 1 Microsecond
- 3% Exposure Repeatability
- Simplicity of Operation
- Compact Design

The Mark VI and Mark VII Sensitometers are compact, precision instruments for testing photosensitive materials. Regular use of a sensitometer will permit quality photographic work and more economical use of photographic materials and time, thus affording financial savings in the darkroom.

These instruments, with single exposures, produce a gray scale on the photosensitive material. Given normal development, the image densities can then be read on the densitometer and plotted step-for-step against the original densities of a master scale such as a Kodak No. 2 Photographic 21-Step Tablet.

The resultant information may be used by photo-processors and laboratories to determine degree of development (gamma); freshness of the developer; effectiveness of development techniques; neutral balance of color films; background fog; film speed and latitude; and to make running checks on developer life. For scientific and industrial photography, the Mark VI and Mark VII Sensitometers provide effective instruments for investigating exposure reciprocity effects in films.



KRYTRONS

Krytrons and Sprytrons

Krytrons are cold cathode, gas filled switch tubes that can operate up to 8KV and 3000 amps peak. These devices are used as a trigger switch for Xenon flashtubes, triggered spark gaps, bubble chambers, EBW systems, and Kerr cells. Krytrons are also used for generating square wave pulses, pulsing GaAs lasers and pockel cells, and as crowbar protection devices. Sprytrons are vacuum switch tubes designed primarily for radiation-hardened applications.

Krytron-Pacs

A Krytron-Pac combines a krytron and its associated trigger transformer into a single, rugged miniature package. They are available using the full line of krytrons produced by E G & G and offer maximum flexibility in applications requiring an extremely reliable miniature high energy switching device.

Type	Operating Range	Max. Peak Current	Pulse Duration	Minimum Trigger	Max. Delay	Jitter
	(kv)	(a)	(μ s)	(V)	(μ s)	(μ s)
KRYTRONS						
KN-2, KN-2A	0.3-4	500	5	200	0.2	0.02
KN-26	0.4-5	2500	10	250	0.3	0.03
KN-6, KN-6A	0.7-5	3000	10	250	0.25	0.03
KN-6B	0.7-8	3000	10	250	0.5	0.05
KN-9	0.3-4	500	5	200	0.2	0.02
KN-14	0.6-3	2000	10	250	0.2	0.03
KN-22	0.4-5	100	0.04	750	0.04	0.005
KN-22B	0.4-8	100	0.04	750	0.04	0.005
SPRYTRONS						
KN-11B	1-6	3000	1	500	1.0	0.3
KN-25	1-6	3000	1	500	1.0	0.3



Leaders in the design, development and manufacture of

LIGHT MEASUREMENT INSTRUMENTS

Radiometers
Photometers
Spectroradiometers
Calibrated Lamps
Laser Power Meters

PHOTODIODES

XENON FLASH TUBES

DC KRYPTON ARC LAMPS

HIGH ENERGY SWITCHES

Krytrons
Thyratrons
Triggered Spark Gaps

TRIGGER TRANSFORMERS AND CHOKES

STROBES

SENSITOMETERS

MERCURY LAMPS

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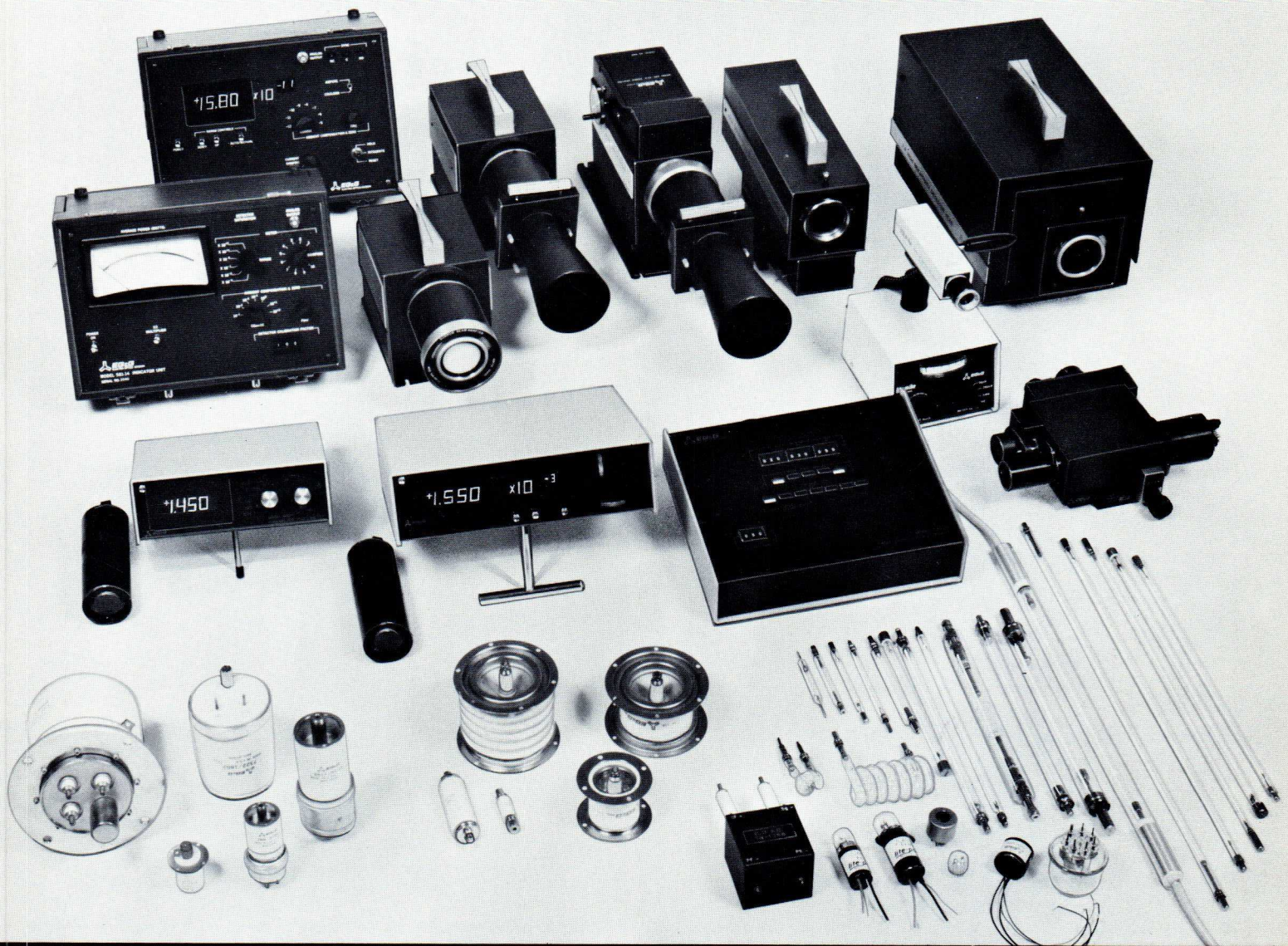
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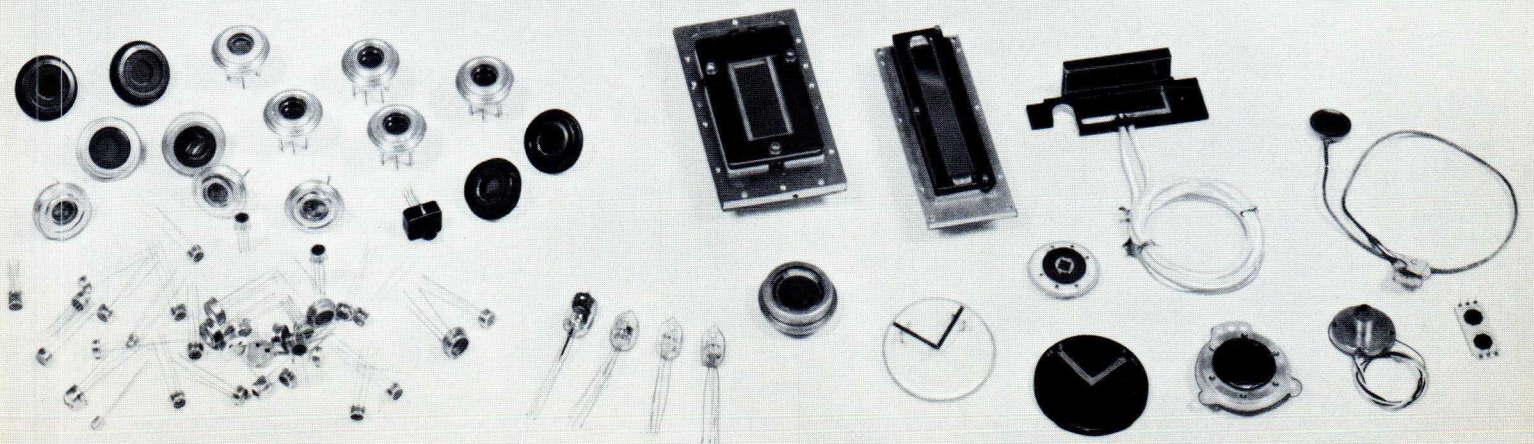
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EG&G ELECTRO-OPTICS

**CONDENSED
CATALOG**





LIGHT MEASUREMENT INSTRUMENTS

Model 450 Photometer/Radiometer System

The Model 450 Photometer/Radiometer System is a lower cost version of the Model 550 System. It is similar in capability to the Model 550 except for one less decade of sensitivity, fewer units of direct readout, and the lack of the autoranging feature.

Model 550 Radiometer/Photometer System

The Model 550 Radiometer/Photometer provides fast, precise measurements with direct readings in 10 photometric and radiometric units. The direct readings, which are easily taken from a 3½ digit panel meter and digital decade indicator, eliminate the need for post measurement calculations. The system is both manual and autoranging over seven full scale decades. Measurements can be obtained of both pulsed and continuous sources with excellent accuracy, repeatability, and stability. Provision for ambient compensation permits its use outside of a dark room environment. High sensitivity is achieved through the use of a single, low noise silicon multiprobe detector.

Model 550/555 Automatic Spectroradiometer

The Model 550/555 Spectroradiometer System integrates all the state-of-the-art features of the Model 550 Radiometer/Photometer with the precision and accuracy of the Model 555-61 Monochromator to yield a compact, lightweight, high-efficiency measurement system capable of providing radiometric measurements of both continuous and pulsed sources as a function of wavelength. The Model 550/555 covers a wide spectral region extending from 250 nm in the ultraviolet to 1100 nm in the near-infrared with an absolute system measurement accuracy better than ±5%. Ancillary components expand the basic manual system into an automatic measurement system with selectable wavelength scan ranges and scan speeds, automatic order-sorting filter sequencing, and interface compatibility for automatic data acquisition and printout.

Model 460 Laser Power Meter

The Model 460 Laser Power Meter is a low cost, portable system capable of providing direct measurements of a wide variety of gas, diode, and dye lasers. It is direct reading in terms of watts for average power measurements of cw or repetitively pulsed lasers. Optional accessories are available for measurements of integrated energy (joules), peak power, and pulse shape of pulsed lasers. The

spectral range extends from 200 nm in the ultraviolet to 1100 nm in the near infrared.

Model 580 Radiometer/Photometer Systems

The Model 580 Systems provide fast, accurate measurements of optical radiation in radiometric and photometric terms. The systems are inherently capable of measuring both continuous (cw) sources as well as pulsed events as fast as one nanosecond in duration. An autoranging digital panel display provides readings of average power and integrated energy. The Detector Heads also have provision for oscilloscope display of pulsed light signals so that wave shape measurements can be made, i.e., peak power, pulse duration, and rise and fall times. The spectral range is from 0.2 μm (200 nm) in the ultraviolet to 1.1 μm (1100 nm) in the near infrared.

Model 580/585 Spectroradiometer Systems

The Model 580/585 Systems add a digital grating monochromator and additional optics onto the Model 580 Radiometer Detector Head, thereby allowing absolute measurements of the power and energy of chromatic cw and pulsed light sources as a function of wavelength. A truly functional system with provision for recorder output and BCD computer interface, the 580/585 can measure over a 12-decade range of light levels. The system can also be used as a radiometer and a photometer.

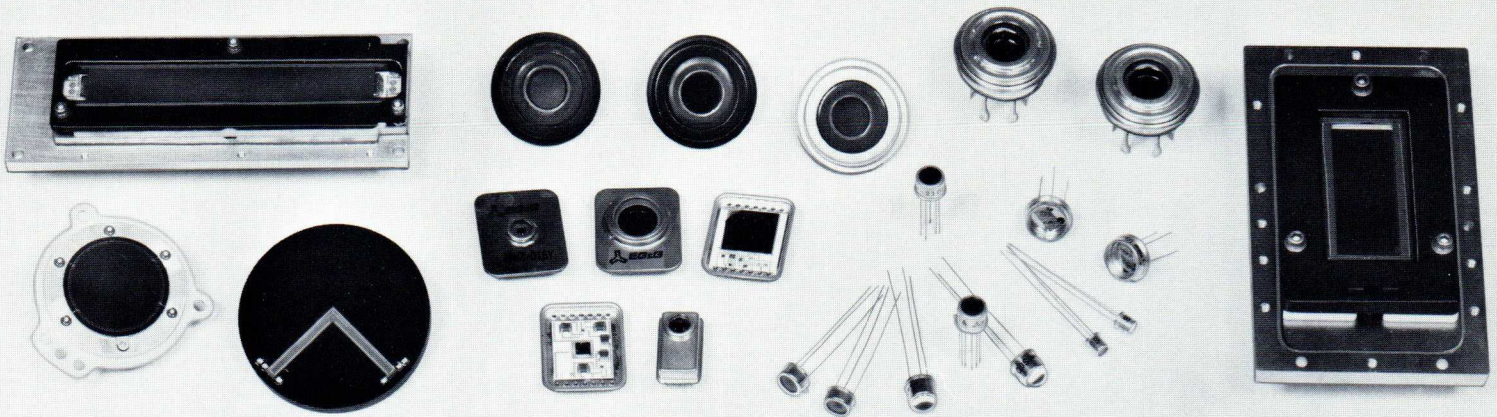
Model 581 Laser Radiometer

The Model 581 Laser Radiometer System provides absolute, direct reading measurements of the average power output of cw and repetitively pulsed lasers. Provision has also been made for oscilloscope display of pulsed laser signals for measurements of peak power, pulse duration, and rise and fall times.

Model 597-1 Calibrated Lamp Standard

The Model 597-1 Lamp Standard is provided with absolute calibration of spectral irradiance and calculated values of illuminance, luminous intensity, chromaticity coordinates (1931 CIE) and correlated color temperature. The spectral irradiance data are presented in a computer tabulated format at 193 wavelengths over the spectral range from 250 to 2500 nm. This permits maximum usage of the lamp by eliminating the errors associated with interpolation of data between points.

Other standard light measurement instruments together with accessories and optical calibration standards are available.



SILICON PHOTODIODES

SILICON PIN PHOTODIODES High Speed Photoconductive

- Spectral Range: 0.35 to 1.15 μm
- Responsivity: 0.5 A/W at 0.9 μm ;
0.42 A/W at 1.06 μm (YAG Series)
- Linearity of Response: Within 5% over
7 Decades
- Operating Voltage: 0 to 180 Volts

Type No.	Active Area (mm ²)	Package (JEDEC)	Dark Current (nA)	NEP $\lambda, 600, 1$ (watts)	Rise Time (ns)	Capacitance (pf)	Test Voltage (V)
SGD-040A	0.82	TO-5	3	9.6×10^{-14} at 0.9 μm	3	2	100
SGD-040B	0.82	TO-46	3	9.6×10^{-14} at 0.9 μm	3	2	100
SGD-040L	0.82	TO-5/Lens	3	9.6×10^{-14} at 0.9 μm	3	2	100
SGD-100A	5.1	TO-5	10	1.0×10^{-13} at 0.9 μm	4	4	100
SGD-160	13	TO-8	50	3.0×10^{-13} at 0.9 μm	7	8	100
SGD-200	20	TO-8	75	1.6×10^{-13} at 0.9 μm	8	18	100
SGD-444	100	TO-36	200	5.9×10^{-13} at 0.9 μm	10	80	100
SGD-444-2		Same as SGD-444 but in bi-cell configuration					
SGD-444-4		Same as SGD-444 but in quad-cell configuration					
YAG-100A	5.1	TO-5	20	2.2×10^{-13} at 1.06 μm	8	3.5	180
YAG-444	100	TO-36	200	5.6×10^{-13} at 1.06 μm	8	35	180
YAG-444-4		Same as YAG-444 but in quad-cell configuration					
DT-25	5.1	TO-5	30	3.5×10^{-13} at 0.9 μm	5	7	90
DT-110	100	TO-36	400	9.5×10^{-13} at 0.9 μm	10	100	90
FND-100	5.1	TO-5	25	1.0×10^{-13} at 0.9 μm	<1	5	100
FOD-100	5.1	Special	25	1.0×10^{-13} at 0.9 μm	<1	5	100

SILICON PHOTOVOLTAIC DETECTORS — Low Noise

- Spectral Range: 0.35 to 1.15 μm (PV Series); 0.20 to 1.15 μm (UV Series)
- Responsivity: 0.60 A/W at 0.95 μm ;
0.10 A/W at 0.2 μm (UV Series)
- Linearity of Response: Within 1% over
7 Decades
- Operating Mode: Photovoltaic — no bias

Type No.	Active Area (mm ²)	Package (JEDEC)	Min Shunt Resistance (M Ω)	NEP ($\lambda, 600, 1$) (watts)	Rise Time (ns)	Capacitance (pf)
PV-040	0.82	TO-46	500	1.0×10^{-14} at 0.95 μm	12	25
PV-100A	5.1	TO-5	100	3.2×10^{-14} at 0.95 μm	25	150
PV-215	23.6	TO-8	50	4.3×10^{-14} at 0.95 μm	30	700
PV-444A	100	TO-36	10	9.0×10^{-14} at 0.95 μm	45	2800
UV-040	0.82	TO-5	1000	4×10^{-14} at 0.23 μm	12	25
UV-100B	5.1	TO-5	100	2.3×10^{-13} at 0.23 μm	25	150
UV-215B	23.6	TO-8	50	2.5×10^{-13} at 0.23 μm	30	700
UV-250	21	TO-5	50	2×10^{-13} at 0.23 μm	30	650
UV-360	36	TO-8	20	4×10^{-13} at 0.23 μm	35	925
UV-444B	100	TO-36	10	5.0×10^{-13} at 0.23 μm	45	2800

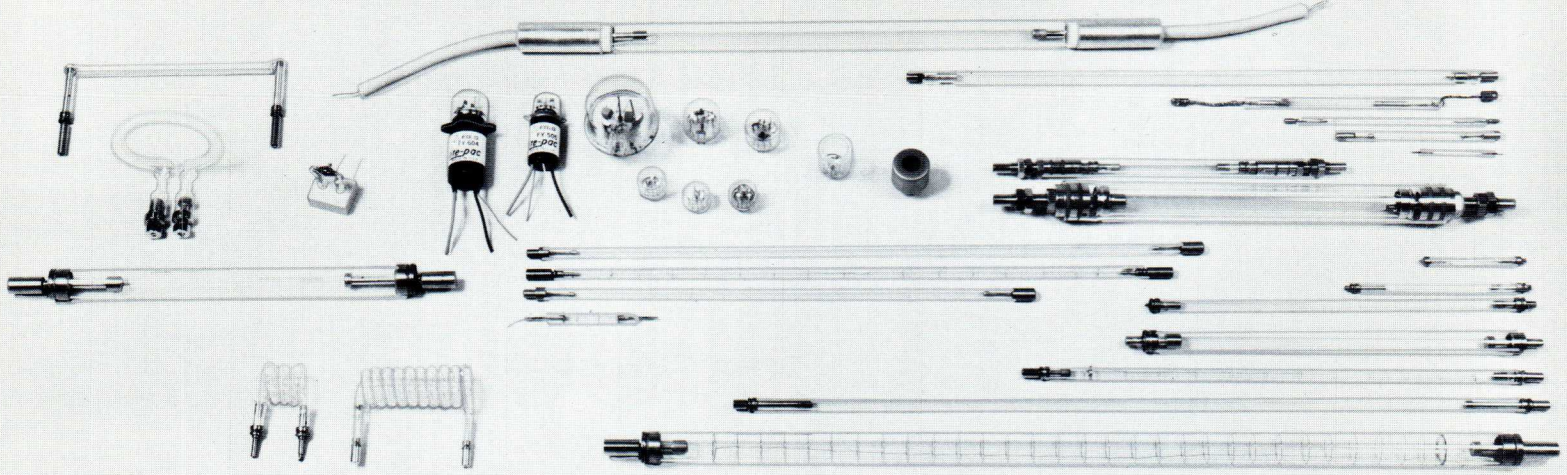
SILICON DETECTOR/ AMPLIFIER COMBINATIONS

- Spectral Range: 0.35 to 1.15 μm (except HUV Series); 0.20 to 1.15 μm (HUV Series)
- Supply Voltage: ± 15 Volts

Type No.	Active Area (mm ²)	Package (JEDEC)	Responsivity $R_f = 200 \text{ M}\Omega$ (V/W)	NEP ($\lambda, f, 1$) (watts)	Gain Bandwidth Product (MHz)	Slew Rate (V/ μsec)
HAD-1000A	5.1	TO-5	10^6 at 0.9 μm	1.5×10^{-13} at 0.95 μm at 400Hz	2.0	6
HAV-1000	5.1	TO-5	10^6 at 0.9 μm	1.1×10^{-13} at 0.95 μm at 400Hz	1.0	6
HAV-4000A	100	Modified DIP	10^6 at 0.9 μm	9.0×10^{-14} at 0.95 μm at 400Hz	0.1	5
HUV-1000B	5.1	TO-5	10^7 at 0.23 μm	7.0×10^{-13} at 0.23 μm at 400Hz	1.0	6
HUV-2000B	24	Modified DIP	10^7 at 0.23 μm	6.5×10^{-13} at 0.23 μm at 400Hz	0.1	5
HUV-4000B	100	Modified DIP	10^7 at 0.23 μm	6.0×10^{-13} at 0.23 μm at 400Hz	0.1	5
MHZ-018	5.1	Modified DIP	10^6 at 0.9 μm	4.7×10^{-11} at 0.95 μm at 18MHz	100	
MHZ-018Y	5.1	Modified DIP	5×10^6 at 1.06 μm	5.9×10^{-11} at 1.06 μm at 18MHz	100	
MHZ-016	13	Modified DIP	10^6 at 0.9 μm	6.8×10^{-11} at 0.95 μm at 16MHz	100	

Custom Photodiodes

In addition to these standard photodiode products, E G & G engineering and production capabilities permit the design and fabrication of custom photodiode devices. Special configurations such as larger and smaller areas, circular and rectangular active areas, arrays, and matrices can be manufactured per specific customer requirements. Inquiries for both small and OEM quantities are welcome.



XENON FLASHTUBES

Xenon flashtubes, dc krypton arc lamps, long arc Xenon and short arc dc mercury lamps are available from EG&G in a wide variety of configurations and envelope materials. Tubes are available in linear, bulb type, helical, "U" shape, coaxial, and air or liquid designs. Envelope materials include quartz, UV inhibiting quartz, and hard glass with a wide range of bore and arc length sizes. Custom configurations are available upon request. All linear tube types can be supplied with water-cooled designs by specifying "C." Pressure fills up to 4 atmospheres in either Xenon or Krypton gas, changes in arc length and mechanical configurations are all available upon request.

Common applications involve the use of these lamps as the primary light source for:

- Laser stimulation • Photocopy systems • Phototypesetting machines • Microfiche systems • Strobes • UV curing of polymers • Marine, aircraft and satellite beacons • Warning beacons • Photoresist exposure • Large area indoor and outdoor lighting**

Linear Xenon Flashtubes

Type No.	Bore Size I.D. x O.D. (mm)	Arc Length (inches)	Max. Energy 1.0 msec (joules)	Min. Operating Voltage (kv)	Min. Trigger Voltage (kv)	Avg. Power at 25°C Ambient (watts)
FX-147C-2	3 x 5	2	420	0.5	15	15
FX-33C-1.5	4 x 6	1.5	420	0.5	15	10
FX-195C-1.5	4 x 6	1.5	420	0.5	15	10
FX-33C-2	4 x 6	2	560	0.6	15	15
FX-38C-2	4 x 6	2	560	0.6	15	15
FX-103C-2	4 x 6	2	560	0.6	15	15
FX-38C-3	4 x 6	3	840	0.7	15	20
FX-103C-3	4 x 6	3	840	0.7	15	20
FX-195C-3	4 x 6	3	840	0.7	15	20
FX-1C-6	4 x 6	6	1680	0.7	20	40
FX-5C-9	4 x 6	9	2520	1.2	20	50
FX-98C-3	5 x 7	3	1050	0.8	15	30
FX-52C-3	7 x 9	3	1490	1.0	20	60
FX-227C-3	7 x 9	3	1490	1.0	20	60
FX-55C-6	7 x 9	6	2980	1.1	20	80
FX-227C-6	7 x 9	6	2980	1.1	20	80
FX-81C-4	10 x 12	4	3080	1.0	25	80
FX-81C-6.5	10 x 12	6.5	5000	1.0	25	90
FX-81C-8	10 x 12	8	6160	1.0	25	100
FX-47C-3	13 x 15	3	2040	1.0	20	75
FX-47C-6.5	13 x 15	6.5	5500	1.0	25	100
FX-47C-12	13 x 15	12	8160	1.3	25	125
FX-47C-18	13 x 15	18	12,240	1.6	25	135
FX-77C-4	19 x 22	4	5040	1.0	25	125
FX-77C-8	19 x 22	8	10,000	1.2	25	150
FX-77C-12	19 x 22	12	15,000	1.4	25	190
FX-77C-13	19 x 22	13	15,400	1.5	25	200

Linear Watercooled Xenon Flashtubes (Complete)

Type No.	Bore Dia. I.D. (mm)	Arc Length (inches)	Max Energy 1.0 msec (joules)	Average Power (kw)	Operating Voltage (kv)	Trigger Voltage Range (kv)
FX-195C-1.5C	4	1.5	420	0.5	1.2-1.8	25-30
FX-195C-3C	4	3	840	1.0	1.2-2.5	25-30
FX-203C-3C	5	3	1050	1.5	1.3-2.5	25-30
FX-227C-3C	7	3	1490	4.0	1.5-2.5	25-30
FX-227C-6C	7	6	2980	8.0	1.5-2.5	25-30
FX-81C-6.5C	10	6.5	5000	9.0	1.6-2.7	25-30
FX-47C-6.5C	13	6.5	5500	10	1.7-3.0	25-30
FX-77C-12C	19	12	15000	15	2.0-3.5	25-30

Bulb Type Xenon Flashtubes

Type No.	Max. Energy (joules)	Average Power (watts)	Operating Voltage Range (volts)	Min. Trigger Voltage (kv)	Max. Rep. Rate (pps)	Arc Discharge Length (inches)
FX-6A, FX-6AU, FX-48, FX-101, FX-108, FX-108AU	5	7	400-1000	2.5	500	5/16
FX-199 * FX-6B, FX-6BU, FX-35B, FX-101B, FX-102, FX-108B, FX-108BU	5	7	300-1500	4.0	500	5/16
FX-127	5	7	500-1000	4.0	2500	1/8
FX-198 *	5	7	300-1500	4.0	500	1/8
FX-76, FX-133, FX-138	20	20	500-1500	5.0	2500	5/16
FX-201 *	20	15	300-1500	5.0	500	5/16
FX-124, FX-137	15	20	500-1500	5.0	2500	1/8
FX-200 *	20	15	300-1500	5.0	500	1/8
FX-132	200	100	100-1500	7.0	500	3/8
FX-193 **	30	50	300-1500	4.0	500	1/8

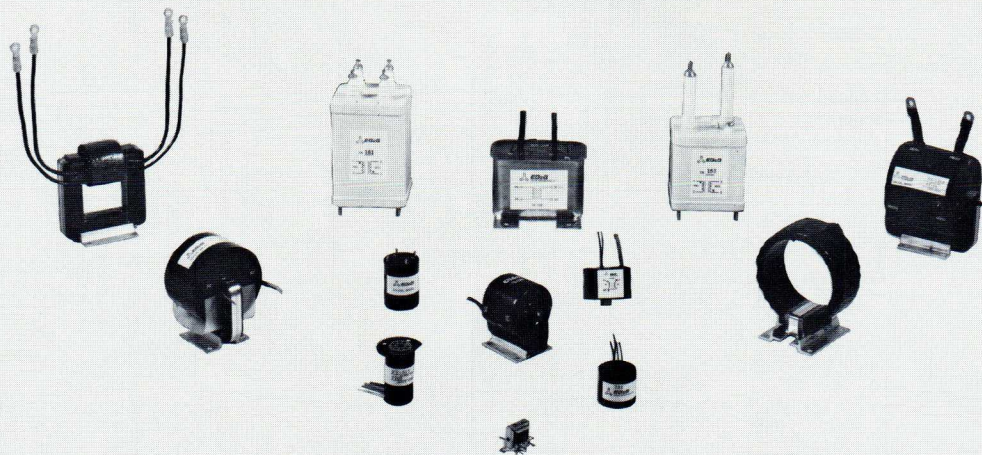
*HIGH EFFICIENCY DESIGN **METAL CAN TYPE

DC Krypton Arc Discharge Tubes

Type No.	Bore Dia. I.D. (mm)	Arc Length (in.)	Ave. Power Water Cooled (kw)	Steady State Voltage (Vdc)	Current (Adc)	Static Impedance (Ohms)	Min. Anode Voltage (kvdc)	Min. Trigger Voltage (kv)
FK-99C-2	4	2	2750	81	34	2.3	1-1.5	15-20
FK-99C-3	4	3	4000	125	32	3.9	1-1.5	15-20
FK-111C-2	7	2	4000	80	50	1.6	1-1.5	15-20
FK-111C-3	7	3	6000	115	52	2.2	1-1.5	15-20
FK-125C-2	5	2	3500	81	43	1.9	1-1.5	15-20
FK-125C-3	5	3	5000	115	44	2.6	1-1.5	15-20
FK-128C-3	10	3	8000	97	84	1.2	1-1.5	15-20
FK-128C-10	10	10	15000	276	56	4.9	1-1.5	15-20

Xenon Flashtubes for Pulsed Dye Lasers

Type No.	Bore Dia. I.D. (mm)	Arc Length (inches)	Max. Energy (joules)	Operating Voltage (kv)	Pulse Width (μs)
FX-139C-3.5	3.5	3.5	10	10	1
FX-140C-3.5	5.0	3.5	25	10	2
FX-141C-3.5	7.0	3.5	100	10	3
FX-142C-3.5	7.0	3.5	200	20	6
FX-143C-6.0	15.0	6.0	1000	20	12



TRIGGER TRANSFORMERS & CHOKES

E G & G Trigger Transformers provide reliable triggering of Xenon flashtubes, krytrons, and triggered spark gaps. Standard and custom designs are available for a wide range of input and output voltage requirements. All transformers are designed to meet MIL specifications.

E G & G Series Injection Trigger Transformers are ideal for applications requiring the series triggering of Xenon flashtubes. These transformers feature sub-microsecond rise times and very low values of saturable inductance of the secondary.

E G & G chokes may be used in the operation of Xenon flashtubes for limiting and shaping the current pulse.

Series Injection Trigger Transformers

Type	Max. Peak Output Voltage (kv)	Max. Input Voltage (kv)	Primary Peak Current (A)	Rise Time 10%-90% (μ s)	Pulse Width-50% Ampl. (μ s)	Secondary Saturated Inductance (μ H)	Max. Secondary RMS Current (A)
TS-136B	40	1.5	1100	0.5	1.0	110	80
TS-146A	30	1.5	660	0.5	0.5	100	25
TS-170	20	2.0	150	0.15	0.5	18	20
TS-179	15	0.8	100	0.4	0.7	80	12
TS-185	30	0.6	60	0.48	1.0	550	15

Trigger Transformers

Type No.	Peak Output Range (kv)	Input Range (v)	Primary Peak Current (A)	Rise Time 10%-90% (μ s)	Pulse Width-50% Ampl. (μ s)	Turns Ratio
TR-36A	3-6	130-250	35	1.0	5.0	15:1
TR-76A	2.5-6.0	14-25	30	2.0	3.0	188:1
TR-90A	2.5-5.5	10-20	23	3.0	4.0	250:1
TR-130	0.38-1.4	10-30	46	0.8	3.8	40:1
TR-131	0.38-1.4	10-30	40	0.5	0.45	40:1
TR-132C	8-20	150-350	60	2.25	2.5	72:1
TR-148A	5-12	200-400	192	0.35	0.5	30:1
TR-149	0.38-1.0	15-30	17	0.7	0.7	32:1
TR-153	12-35	250-600	100	0.5	0.5	51:1
TR-165	0.35-0.7	7-14	17	1.0	1.5	50:1
TR-180B	10-20	100-200	110	1.0	1.5	112:1
TR-181	5	5000	835	0.1	2.0	1:1
TR-1843	4-10	15-30	40	1.5	1.2	250:1
TR-1700	15-30	200-400	70	0.75	1.5	70:1

Chokes

Type	Inductance (μ H)	D.C. Resistance (Ω)	Max. Voltage (kv)	Max. Peak Current-1.0ms (A)	Max. RMS Current (A)
TC-70	300	0.19	5	2000	8
TC-71	600	0.25	5	2000	8
TC-79	550	0.031	5	5000	35
TC-80	850	0.055	5	5000	27
TC-102	300	0.025	5	5000	35
TC-196	22	0.046	5	2000	8
TC-198	775	0.270	2.5	1000	4
TC-201	150	0.013	5	5000	40
TC-202	100	0.05	5	2000	10
TC-203	200	0.05	5	2000	10

TRIGGER MODULES

TM-Series of Trigger Modules

The TM-Series of Trigger Modules are line voltage operated, compact instruments which contain the necessary circuitry required for initiating fast triggering. The TM-11A provides a 1.0 μ s risetime pulse of up to 30KV for triggering of Xenon flashtubes and triggered spark gaps. The TM-12A, with a 0.3 μ s risetime pulse of up to 30KV, is designed for series triggering of Xenon flashtubes. Both the TM-11A and TM-12A can be operated by push-button control from the front panel, or by a low impedance pulse generator connected through the front panel oscillator input jack. A voltage control provides variable output from 20-30KV.

The TM-27 & TM-29 are designed to drive the grid of E G & G Thyratrons. The TM-27 may be used with all thyatron types except the HY-5, and the TM-29 is used with the HY-5. Both modules feature an internal pulse rate of 1-2000 pps and a typical output risetime of 150 ns.

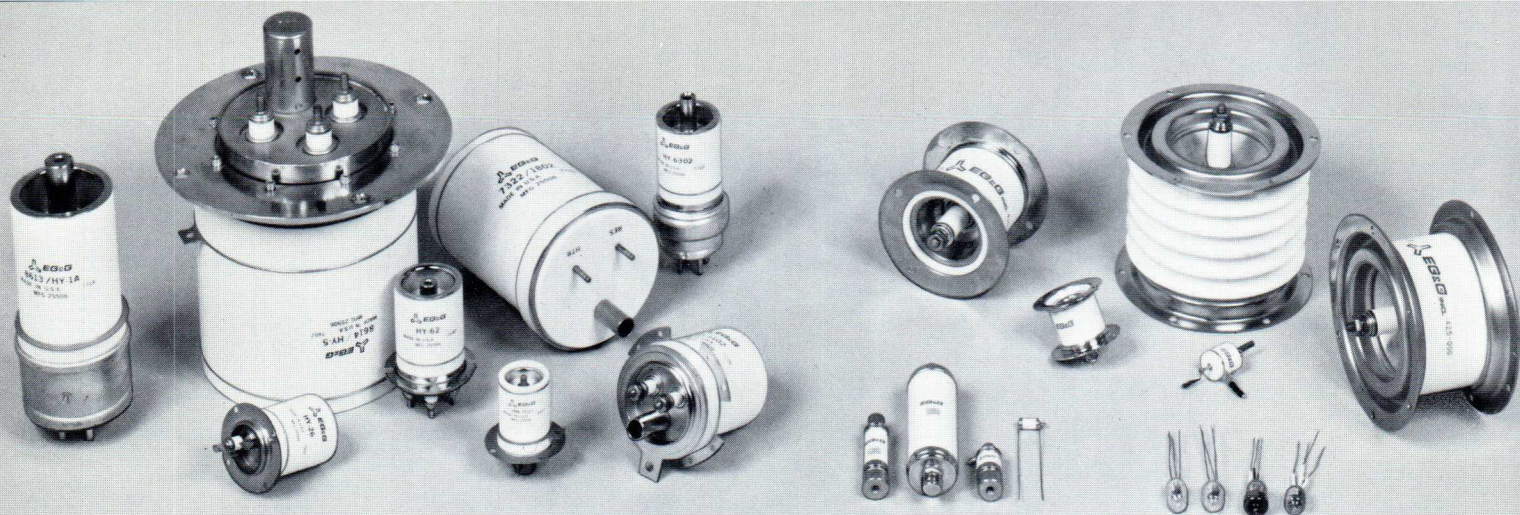
Lite Pacs

The E G & G Lite-Pac* Trigger Module combines a trigger transformer, coupling capacitors and resistors, and a mounting socket into a compact, potted package which is ideal for the triggering of all bulb type Xenon flashtubes. The FY-500 Lite-Pac* series is designed for use with the 9 pin tubes; the FY-600 series for the 12 pin tubes, the FY-7 for the FX-132 and FY-700 series for the metal can tubes.

*Registered EG&G trademark

FLASHTUBE POWER SUPPLIES

E G & G designs and manufactures flashtube power supplies. These power supplies are produced primarily for OEM applications and designed per customer requirements. E G & G power supplies are currently being used in photocopy equipment, microfiche duplication, optical printers, and high intensity obstruction lighting. PS-302, bulb type power supply, is available as a standard supply to operate all bulb type flashtubes up to 20 watts average and 300 Hz.



THYRATRONS & SPARK GAPS

Ceramic-Metal Thyratrons

E G & G's Thyratrons are high voltage, high current switch tubes which can operate at frequencies up to 50 KHz. Utilizing ceramic-metal construction, the tubes feature small size and extended life, and are qualified to MIL specifications. Applications include radar modulators, spark chambers, linear accelerators, and pulsed lasers.

Grounded Grid Thyratrons (Ceramic-Metal)

Grounded Grid Thyratrons are negatively pulsed cathode switching devices, designed for use in circuits requiring faster switching times and higher peak currents than are obtainable with conventional positive grid thyratrons. The HY-13 is primarily used in spark chamber applications. The HY-1102 and HY-3202 are used in pulsed CO₂, TEA, and nitrogen lasers.

Triggered Spark Gaps

E G & G's Triggered Spark Gaps are three element, gas filled switch tubes with ceramic-metal construction. They are capable of switching stored energies up to 4 kilojoules per shot (critically damped) with a conducted charge of up to 5 coulombs per shot with voltages up to 120KV and peak currents up to 100 kiloamps. Applications include spark chambers, EBW systems, crowbar protection of TWT's and Klystrons, Kerr cell switches, flashtubes, Marx generators, and pulsed lasers.

Triggered Vacuum Gaps

For high energy crowbar applications which require a switch with a very wide operating voltage range, E G & G's Triggered Vacuum Gaps are an ideal choice. For example, one type will operate in a range from 0.3 to 50KV, while a second type operates from 1 to 100KV. These gaps are capable of switching stored energies up to 30 kilojoules per shot (critically damped) with a conducted charge of up to 2 coulombs per shot. Types are GPV-63, 6301, 6303 and 7004.

Overvoltage Gaps

Overvoltage Gaps are two element devices designed specifically for overvoltage protection of solid state circuitry, gas and vacuum tubes, and pulse transformers. These units are available in a wide variety of small configurations utilizing rugged and reliable ceramic to metal construction. Operating voltages range from 400 to 120,000 volts. Types are OGP-64, 0.4-9KV; OGP-44, 9-25KV; OGP-67, 25-120KV; PB-23, 0.4-4KV.

Type	Peak Power Output	Peak Anode Voltage	Peak Anode Current	Average Current	Plate Breakdown Factor	Dimensions Height x Dia.
	(Mw)	(kv)	(a)	(A)	(P _e x 10 ⁶)	(inches)
7621/HY-2	.35	8	100	0.1	2.7	1.6 x 1.2
HY-26	1.0	12	175	0.15	5	1.8 x 1.4
7782/HY-6	2.8	16	350	0.5	5	1.9 x 1.4
7665/HY-60	2.8	16	350	0.5	5	2.4 x 1.4
HY-61	2.8	16	350	0.5	5	3.6 x 1.4
8765/HY-63	2.1	12	350	0.5	5	4.1 x 1.6
HY-6301	2.8	12	350	0.5	5	4.1 x 1.6
HY-6302	2.8	12	350	0.5	5	4.1 x 1.6
8613/HY-1A	5.0	20	500	0.5	10	5.0 x 2.4
HY-10	5.0	20	500	0.5	10	3.5 x 2.3
HY-11	5.0	20	500	0.5	10	2.4 x 2.3
8354/HY-31	20	25	1000	2.2	25	4.1 x 3.4
HY-32	20	35	1500	2.2	50	4.1 x 3.4
7322/1802	20	25	1500	2.2	50	4.1 x 3.4
8614/HY-5	100	40	5000	8.0	160	5.4 x 4.5
HY-53*	100	40	5000	8.0	160	5.7 x 4.5
HY-5301**	175	70	5000	8.0	160	6.3 x 4.8
HY-7***	800	40	40,000	50	400	15 x 10

* Auxiliary Grid — 250 ns Delay Time ** Auxiliary Grid and Gradient Grid

*** Auxiliary Grid, Gradient Grid and Control Grid

Type	Peak Anode Voltage	Peak Anode Current	Coulombs Per Shot	Current Rise Time	Dimensions Height x Dia.
	(kv)	(ka)	(x 10 ⁻³)	(ns)	(inches)
HY-13	15	120	1.5	7	5.0 x 2.0
HY-1102	20	120	1.5	7	3.1 x 2.0
HY-3202	35	120	5.0	7	5.9 x 3.1

Type	Operating Range	Static Breakdown Voltage	Peak Current (Ringing)	Discharge Energy (Underdamped)	Minimum Trigger Pulse	Dimensions Height x Dia.
	(kv)	(kv)	(ka)	(Joules)	(kv)	(inches)
GP-89	0.7-2.1	2.6	5	25	5	1.2 x .6
GP-90	1.3-3.4	4.2	5	25	5.5	1.2 x .6
GP-91	4.4-10	12.5	5	25	7	1.2 x .6
GP-92	8-20	25	5	25	7	1.4 x 0.9
GP-82B	0.4-1.6	2	15	200	7	1.2 x 1.6
GP-31B	2-6	7.5	15	200	10	1.2 x 1.6
GP-20B	3.5-11	14	15	200	10	1.2 x 1.6
GP-46B	8-20	25	15	200	10	1.6 x 1.6
GP-85	2-6	8	100	2000	20	2.3 x 3.0
GP-86	6-15	20	100	2000	20	2.3 x 3.0
GP-87	10-24	30	100	2000	20	2.3 x 3.0
GP-70	12-36	42	100	2000	20	2.3 x 3.0
GP-30B	2-6	7.5	100	2500	20	2.3 x 3.0
GP-22B	6-15	19	100	2500	20	2.4 x 4.3
GP-12B	10-24	30	100	2500	20	2.4 x 4.3
GP-14B	12-36	42	100	2500	20	2.4 x 4.3
GP-41B	12-36	42	100	4000	20	2.4 x 4.3
GP-32B	20-48	60	100	4000	20	3.6 x 4.3
GP-15B	25-69	86	100	4000	20	3.6 x 4.3
GP-74B	40-100	120	100	4000	20	3.6 x 4.3
GP-81B	40-100	120	100	4000	20	4.5 x 4.3

STROBES AND SENSITOMETERS

Model 501 High-Speed Stroboscope

Features

- High Flashing Rate
up to 6,000 Flashes per Second
- Short Flash Duration
as Low as 1.2 Microseconds
- Simple Strobe Triggering
from Camera, Oscillator, or
Contactor
- Accurate Synchronization
Time Jitter less than 10^{-7} second
- Built-in-Controls
Camera Start
Event Delay
Lamp Starting Delay
Lamp Running Time

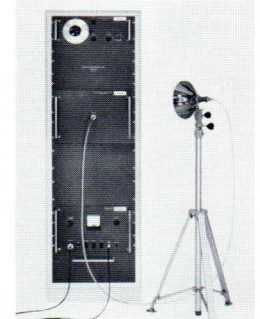
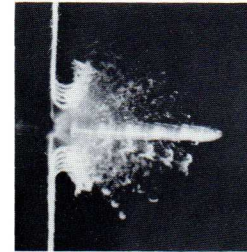
Stroboscopic light stops the motion of rapidly moving subjects and permits accurate measurements of form, velocity, and acceleration. Easily synchronized with either streak-type or rotating prism-type high speed cameras, the 501 Stroboscope gives many times better definition than incandescent light, a particular advantage where frame-by-frame inspection of the film is to be made for purposes of analysis by measurement. The relative coolness of stroboscopic light is a further advantage in those cases where the subject is liable to damage by heat.

The 501 High-speed Stroboscope has been designed to produce flashes of light at rates up to 6000 Hz, with a minimum flash duration of 1.2 microseconds. This type of performance is necessary for the quantitative study of fast-moving phenomena such as shock waves and the flight of projectiles.



Model 502 Multiple Microflash

The EG&G Model 502 Multiple Microflash is a stroboscopic light system designed for photographic instrumentation. It provides up to fifteen 1 microsecond light pulses at a controlled pulse interval. This permits up to 15 exposures at known time intervals to be recorded on a single photographic plate. An enlargement of the photographic plate then provides a basis for qualitative or quantitative studies of the event. For quantitative measurements, distances can be scaled on the photographic plate and distance/time graphs can be plotted. From these graphs it is a routine matter to calculate velocities and accelerations. The 502 multiflash system as provided consists of a rack mounted on casters containing a power supply, firing control unit, and 1 to 15 flash modules depending on customer requirements. The system also includes a flash tube, 8 inch parabolic reflector and all interconnecting cabling.

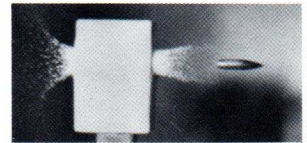
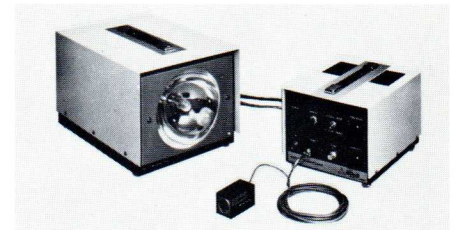


Model 549 Microflash®

The EG&G 549 Microflash® System is a small, portable light source for ultrafast stop-motion photography. Its high peak light output and very short flash duration (0.5 μ sec) make it singularly useful in photographing bullets in flight, spalling particles, fragmenting materials, parts of high-speed machines, and other non-luminous, high-velocity subjects. Several Microflash® Systems can be arranged in series and triggered in succession at predetermined time intervals to photograph several events on the same negative.

The 549 Microflash® System has two basic components, the Model 549-11 Flash Unit and the Model 549-21 Driver Unit. A Model 549-21-11 Microphone is also supplied as part of the basic system. The Model 549-11 Flash Unit houses the air flashtube (guided sparkgap light source) and reflector, the rectifier circuit, energy-storage capacitors, and trigger transformer.

The Model 549-21 Driver Unit houses two small power supplies, a photoelectric tube, and two thyatron tubes and associated circuitry. Operating controls on the front panel permit varying of the trigger sensitivity, the time delay, and the method of triggering. The Driver Unit can be triggered either by light or by sound by means of the built-in photoelectric tube or the Model 549-21-11 Microphone.



Mark VI and VII Xenon Sensitometers

Features

- Daylight Spectral Source
- 10 Milliseconds to 1 Microsecond
- 3% Exposure Repeatability
- Simplicity of Operation
- Compact Design

The Mark VI and Mark VII Sensitometers are compact, precision instruments for testing photosensitive materials. Regular use of a sensitometer will permit quality photographic work and more economical use of photographic materials and time, thus affording financial savings in the darkroom.

These instruments, with single exposures, produce a gray scale on the photosensitive material. Given normal development, the image densities can then be read on the densitometer and plotted step-for-step against the original densities of a master scale such as a Kodak No. 2 Photographic 21-Step Tablet.

The resultant information may be used by photo-processors and laboratories to determine degree of development (gamma); freshness of the developer; effectiveness of development techniques; neutral balance of color films; background fog; film speed and latitude; and to make running checks on developer life. For scientific and industrial photography, the Mark VI and Mark VII Sensitometers provide effective instruments for investigating exposure reciprocity effects in films.



KRYTRONS

Krytrons and Sprytrons

Krytrons are cold cathode, gas filled switch tubes that can operate up to 8KV and 3000 amps peak. These devices are used as a trigger switch for Xenon flashtubes, triggered spark gaps, bubble chambers, EBW systems, and Kerr cells. Krytrons are also used for generating square wave pulses, pulsing GaAs lasers and pockel cells, and as crowbar protection devices. Sprytrons are vacuum switch tubes designed primarily for radiation-hardened applications.

Krytron-Pacs

A Krytron-Pac combines a krytron and its associated trigger transformer into a single, rugged miniature package. They are available using the full line of krytrons produced by E G & G and offer maximum flexibility in applications requiring an extremely reliable miniature high energy switching device.

Type	Operating Range	Max. Peak Current	Pulse Duration	Minimum Trigger	Max. Delay	Jitter
	(kv)	(a)	(μ s)	(v)	(μ s)	(μ s)
KRYTRONS						
KN-2, KN-2A	0.3-4	500	5	200	0.2	0.02
KN-26	0.4-5	2500	10	250	0.3	0.03
KN-6, KN-6A	0.7-5	3000	10	250	0.25	0.03
KN-6B	0.7-8	3000	10	250	0.5	0.05
KN-9	0.3-4	500	5	200	0.2	0.02
KN-14	0.6-3	2000	10	250	0.2	0.03
KN-22	0.4-5	100	0.04	750	0.04	0.005
KN-22B	0.4-8	100	0.04	750	0.04	0.005
SPRYTRONS						
KN-11B	1-6	3000	1	500	1.0	0.3
KN-25	1-6	3000	1	500	1.0	0.3



Leaders in the design, development and manufacture of

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Radiometers
Photometers
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Calibrated Lamps
Laser Power Meters

PHOTODIODES

XENON FLASHTUBES

DC KRYPTON ARC LAMPS

HIGH ENERGY SWITCHES

Krytrons
Thyratrons
Triggered Spark Gaps

TRIGGER TRANSFORMERS AND CHOKES

STROBES

SENSITOMETERS

MERCURY LAMPS

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