

Photomultiplier Detection System

General

For spectroscopy experiments in the ultraviolet-visible-near infrared region of the spectrum, a Photomultiplier tube (PMT) is perfect for the detection of light. Standard PMTs can be used from 185 to 900 nanometers; special PMTs can extend this wavelength range.

A PMT is extremely sensitive, allowing the measurement of very low levels of light. It has a wide dynamic range, so it can also measure high levels of light. It is very fast; so rapid spectral events can be reliably monitored. As a practical matter, PMTs are durable, long-lived, and economical. And with OBB's Photomultiplier Detection System, it is very convenient and easy to use.



The Photomultiplier Detection System 3000 from OBB Corp is built as complete system using modern design techniques and components. You won't find anything like them elsewhere. Everything needed to measure the intensity of the light is packaged in a compact, attractive housing that attaches conveniently to your experiment. There are no unsightly boxes for power supplies or a multitude of cables tangled on your bench-top.

The system incorporates a high voltage supply, detector electronics, and the controls in a compact, attractive housing that also contains the PMT. You have a choice of standard PMTs to choose from, the reason why they are not included with your system. The PMT high voltage is shown on a digital display on the housing or you can select to show the actual analog signal from the PMT with just a flip of a switch. The high voltage can be adjusting manually or controlled externally with a signal at the "External Voltage Control" BNC. Power is delivered from an external supply that is included. Computer interface and Microsoft compatible software complete the package.

Features & Benefits

- Compact Size —H 7.25 in. (18.3 cm) x W 3.75 in. (9.5 cm) x D 3.75 in. (9.5 cm.)
- Inexpensive—We make so many that the price is very low
- Complete Package—Everything is included even the software
- Wide Choice of PMTs—Will accommodate virtually any 1 1/8 in. diameter side-on PMT tubes
- Easily Compatible—Will easily mount to fit your detection needs

PMT

OBB's PMT housing will accept a wide variety of side-on 1 1/8-inch diameter photomultiplier tubes. It is optimized for PMTs with uniform dynode chains. PMTs are normally selected based on their wavelength response and their noise and/or sensitivity characteristics. OBB offers four different PMTs, as standard, for use with our PMT housing. We can and do offer special PMTs for custom applications.

Specifications

Spectral Response	185 to 650 nm	185 to 900 nm	185 to 680 nm	185 to 810 nm
Spectral Response, μm	340 nm	400 nm	400 nm	350 nm
Cooled Temperature	40 $\mu\text{A}/\text{lm}$ 48 mA/W	250 $\mu\text{A}/\text{lm}$ 74mA/W	60 $\mu\text{A}/\text{lm}$ 60 mA/W	45 $\mu\text{A}/\text{lm}$ 40 mA/W at 350 nm
Anode Sensitivity (at 1000 V)	400 A/lm	2500 A/lm	400 A/lm	100 A/lm
Luminous Radiant at 400 nm	4.8 x 10 ⁵ A/W	7.4 x 10 ⁵ A/W	4.0 x 10 ⁵ A/W	9x10 ⁴ A/W at 350 nm
Gain	1 x 10 ⁷	1 x 10 ⁷		2.2 x 10 ⁶
Low Dark Current	5 nA	3 nA	0.1 nA	2 nA

Data Acquisition Specifications

Data Rate: 1 point/100 sec to 500,000 points/sec

All units have line voltage power supply, power on/off switch, high voltage adjustment, LCD high voltage display, signal output BNC connection, external high voltage adjust input BNC connection, RF shielded case, output mode control, and socket for most 1 1/8-inch side-on photomultiplier tubes, I/O board and software.

High Voltage Power Supply Specifications

Input	± 15 VDC, 250 mA
High Voltage	-200 to -1,100 VDC manually adjustable LCD displays actual cathode voltage
External High	0 to +5 VDC (0 = -200 V, 5 = -1,100 V)
Voltage Adjust	Continuously adjustable
Input Regulation	$\pm 0.05\%$ max. (for 15 V \pm 1 V input).
Load Regulation	$\pm 0.05\%$ max.
Ripple	100 mV p-p max.
Temperature Coefficient	$\pm 0.01\%$ max. (+5 to 40°C)
Drift	$\pm 0.03\%$ /hr. max. (after 15 minute warm-up)

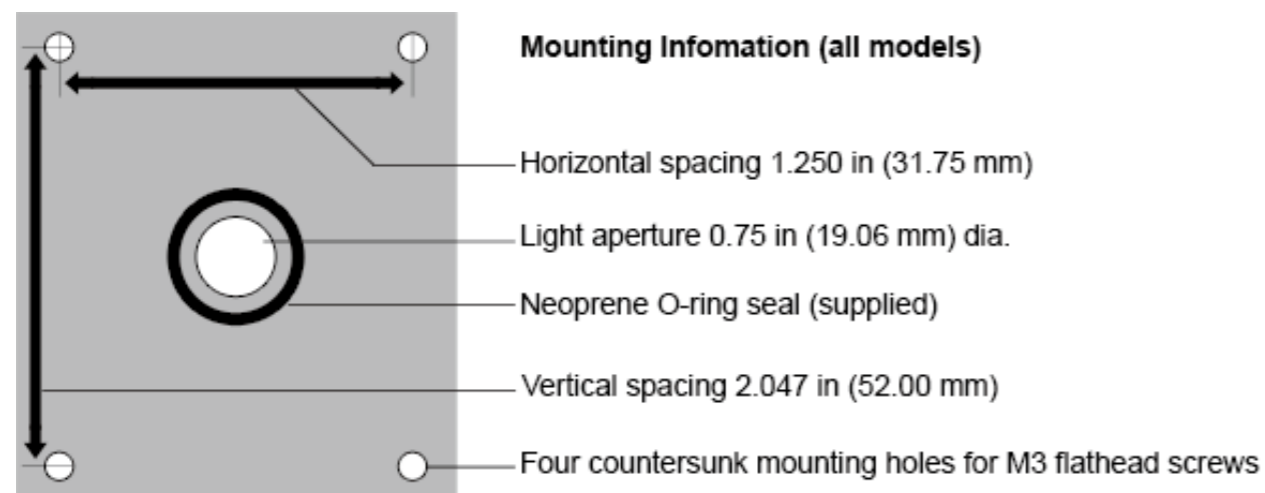
Line Voltage Power Supply Specifications

Input	115 or 220 VCA (specify at time of order)
Output	± 15 VDC, 250 mA

Analog Unit Specifications

Gain Settings	1 μ A = 1 V
	0.1 μ A = 1 V
	0.01 μ A = 1 V
	0.001 μ A = 1 V
Time Constant Settings	0.05 msec
	0.5 msec
	5 msec
	50 msec
	500 msec (0.5 sec)
Offset Correction	\pm 50 nA
Dimensions, in (mm)	H 7.25 (183) x W 3.75 (95) x D 3.75 (95)
Weight, kg (lb)	0.997 (2.2)

Mounting Information



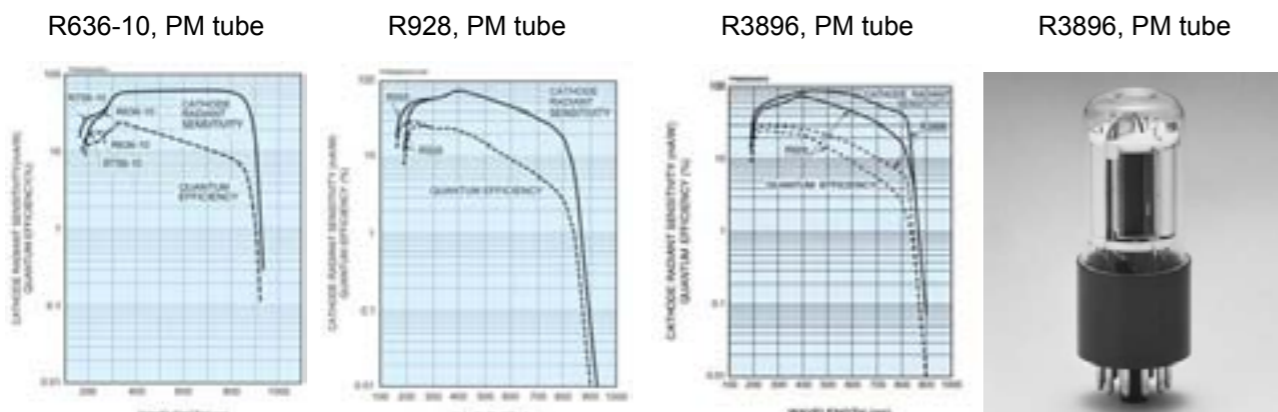
PMT Detectors & Acquisition

PDS-1, PMT Detector

- PDS-01, PMT Detector Ass y. Incl. Housing, PMT Tube and High Voltage Power supply Universal Photomultiplier Tube Housing for standard 1.125 side window photomultiplier tubes. For analog PMT housing with separated Gain settings(V/):1,10 readout/control 4 digit LCD display, HV/signal switch includes 0-1200V HV power supply. include PMT R928.
- PMT-928 Hamamatsu R928 side window PM tube, 185-900nm
- PMT-446 Hamamatsu R446 side window PM tube, 185-870nm
- PMT-4220 Hamamatsu R4220, High sensitivity, low dark current PMT, 185-710nm
- PMT-636 Hamamatsu R636-10, High quantum efficiency PMT, 185-930nm
- PMT-3896 Hamamatsu R3896 side window High QE Multialkali PM Tube 185-900nm



PHOTOMULTIPLIER TUBES Typical Spectral Response



DAD1602, 16bit Analog to Digital Converter

High speed(40kHz) for spectral data acquisition, low signal to noise and light research applications. The DAD1602P and DAD1602U automatically controls monochromator scanning and data acquisition and storage

Model No.	DAD-1602P PCI Board	DAD-1602U USB Unit
A/D Resolution	16 bit	
A/D Sampling rate	250 _{KHz}	500 _{KHz}
Input Current range	1uA / 10nA / 100nA	
Input Voltage range	1V / 10V	
Input signal port	Voltage(8CH) Current(2CH) / Voltage(8CH) Current(2CH)	
Interface	PCI	USB



DAD-1602U



DAD-1602P

Single channel Detectors

Single channel UV/VIS/IR Cooled Detectors

All detectors include its necessary power supply and TEC controller and the mount for DM series monochromator.

- **SI-100-1** UV Enhanced Si photodetector, non cooled type
Wavelength Range:200nm to 1100nm
Active Area:1mm dia.
- **IGA-300-T2** 2 Stage TEC InGaAs Detector
Operating Temperature:22 to -30 deg/C by two stage TEC
Wavelength Range:900nm to 1700nm
Active Area:3mm dia.
Responsivity:0.9 @ 1.3um A/W
- **PBSE-300-T2** 2 Stage TEC PbSe Detector
Operating Temperature:22 to -30 deg/C by two stage TEC
Wavelength Range:1um to 4.5um
Active Area:3mm dia.
Responsivity:5x10⁴ A/W
- **PBS-200-T2** 2 Stage TEC PbS Detector
Operating Temperature:22 to -30 deg/C by two stage TEC
Wavelength Range:1um to 2.8um
Active Area:2mm dia.
Responsivity:1x10⁶ V/W
- **MCT-200-LN** LN Cooled HgCdTe Detector
Includes power supply, LN2 Dewar and pre-amplifier.
Operating temperature:77K
Responsivity, 105V/W @ pk=200-10000 15um
Wavelength range:2-20um
Active Area:2mm dia.
Dark resistance:50-100 Ohm(typ.)
Time Constant:0.3-0.6usec
- **MCT-200-T2** 2 Stage TEC HgCdTe Detector
Operating temperature:-30C
Wavelength range:2-15um
Active Area:2mm dia.
Responsivity, 103V/W @pk=4.8um:500
Cooler current:0.75A
Time constant:2usec



Si detector



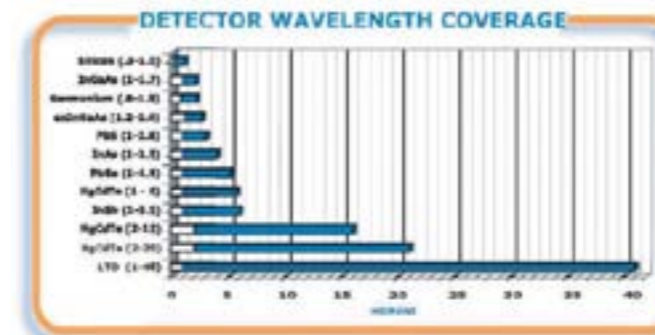
TEC InGaAs Detector



TEC PbS Detector



TEC UV/VIS/IR Cooled Detectors & power supply



Spectroscopes
· Imaging
· CCD Cameras
· Semiconductors
· Communications
· Lighting
· Solar Cells
· Tests
· Instruments
· Sensors
· Detection
· Components
· Positioning
· Lasers
· Light Sources