



530 Main Street, Acton, MA 01720

**Phone:** (978)263-3584, **Fax:** (978)263-5086

**Web Site:** [www.acton-research.com](http://www.acton-research.com)

**Operating Instructions  
for  
PD-473-1  
Photon Counting Detector**

# Acton Research Corporation Model PD-473-1 Photon Counting Detector

## Description:

The Acton Research Corporation PD-473-1 Photon Counting Detector is designed for use with the ARC SpectraPro Monochromators and the SpectraSense /NCL Data Acquisition System. The PD-473-1 is a self contained assembly which includes a photomultiplier tube detector, high voltage power supply, amplifier-discriminator and TTL logic level converter. The voltage level of the high voltage power supply and the discriminator level of the amplifier-discriminator are factory set for optimum values and are not adjustable. The cable for connecting to the NCL module is an integral part of the PD-473-1. Refer to the block diagram below for the functions of the PD-473-1.

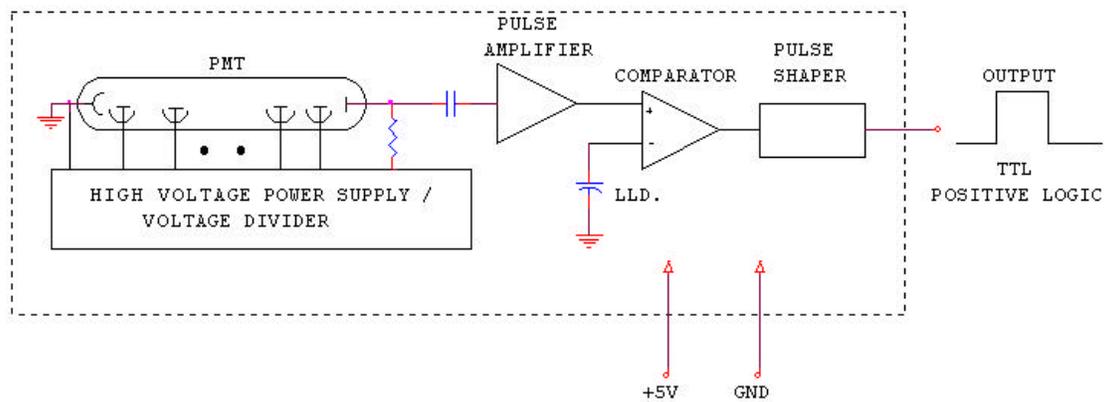


Figure 1. PD-473-1 Block Diagram

## Mounting Instructions:

The PD-473-1 mounts directly to the exit slit of the ARC SpectraPro series Monochromators. The detector should be positioned with the labels upright since the optical axis is not vertically centered. The PD-473-1 is mounted directly against the exit slit such that the four mounting holes of the mounting flange align correctly with the tapped mounting holes of the exit slit. Insert the four 8-32 mounting screws and tighten. The detector should now be mounted correctly.

Connect the control cable attached to the PD-473-1 to the channel 1, 2 or 3 CONTROL input on the NCL. This connection carries both signal and power; no additional signal cable is necessary. The PD-473-1 is now ready for use.

Note: If the PD-473-1 is to be used with the FA-448 filter wheel at the exit slit, the mounting procedure requires three (3) 8-32 screws 1.375 inches long supplied with the filter wheel. Insert the three screws into the detector flange, through the filter wheel, and into the tapped holes of the slit or adapter plate. Tighten the screws to secure the accessories. The FA-448 Filter Wheel is, however, more often attached to the entrance slit.

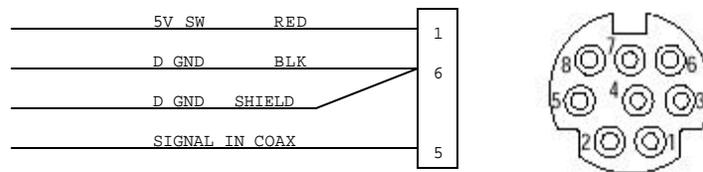
**Specifications:** ( at 25 °C )

Effective Area:	4X20 mm
Spectral Response:	185 to 850nm
Dark Count:	80 cps typical 200 cps maximum
Counting Linearity:	2.5 Mcps ( at -10% deviation from linear )
Pulse Pair Resolution:	35 ns
Output Pulse Width:	30 ns
Output Logic:	TTL
Input Voltage:	+5Vdc
Input Current at 2.5 Mcps :	80mA max

Operating temperature range: +5 °C to 40 °C

For test data on the enclosed PMT detector, refer to the manufacturer's test sheet on the following page.

**Output Connections:**



**Final Test Data:**

1. Serial Number \_\_\_\_\_
2. Cathode Luminous Sensitivity ( $\mu\text{A/Lm}$ ) \_\_\_\_\_
3. Cathode Red Sensitivity Ratio ( $\times 10^{-3}$ ) \_\_\_\_\_
4. Anode Luminout Sensitivity ( $\text{A/Lm}$ ) \_\_\_\_\_
5. Anode Dark Current (nA) \_\_\_\_\_
6. Dark Counts (cps) \_\_\_\_\_

Notes:

- 2, 3, 4 Light source: Tungsten filament lamp operated at 2856K.
- 3 Filter: Toshiba R-68
- 4, 5, 6 Supply Voltage: -1000 VDC
- All Temperature: 25°C