

## Introduction

Photomultiplier tubes are used to convert flashes of light into an electrical signal whose integrated area is proportional to the number of photons in the flash of light. Also, the time at which the electrical pulse is produced can be used to infer the arrival time of the light pulse. The light can come from a distant source, such as a fluoresced sample in single-photon counting experiments, or from a scintillator that is tightly coupled to the PMT photocathode and excited by nuclear radiation.

Scintillation detectors produce light as they absorb energy, and these light flashes result in the release of a proportionate number of photoelectrons at the cathode of a photomultiplier tube (PMT). The PMT amplifies this signal, producing a current pulse that is larger in amplitude at each of its successive dynodes, and culminating in an output signal at its anode.

Each of the ORTEC Photomultiplier Tube Bases is designed to accommodate a particular type of PMT to distribute the operating voltages to all its elements, and to derive signals from its anode and from a selected dynode. The high-voltage accommodation in a PMT base is adequate for the requirements of any of the compatible tubes listed in the Comparison Chart; the tube types listed represent those most commonly used in these applications.

The Model 276 Photomultiplier Tube Base incorporates an integral low-noise preamplifier, and an anode output for either timing or auxiliary energy analysis. The Model 296 ScintiPack has all the features of the Model 276, but adds an integral high-voltage bias supply with active dynode voltage regulation. The ScintiPack is ideal for high counting rates and portable applications. Both the Model 276 and the Model 296 are compatible with Model 905 Series Scintillation Detectors.

The other photomultiplier tube bases in this group also include two outputs: a signal obtained from the anode and a signal obtained from a dynode. The anode signal is typically used for time measurements. The dynode is intended for making energy measurements through a preamplifier and a pulse-shaping amplifier.

# Photomultiplier Tube Bases

## Photomultiplier Tube Base Comparison Chart

Model	High Voltage (V <sub>max</sub> )	Bleeder Current (mA)	PM Output Signals		Control	Compatible with PMT Type	Dimensions
			Anode	Dynode			
265A PMT Base	-3000	≤2	Neg. timing signal, 0.5 A; max, 50 Ω dc-coupled	Pos linear signal Z <sub>o</sub> ~ 1MΩ ; capacitive coupling	Voltage adj for focus and 2nd and 12th dynodes	12-stage PMTs that fit standard 21-pin sockets, including Hamamatsu R329 R1332, and R1333. Burle (formerly RCA) 8575, 8850 8852, and C31000M.	7.6-cm (3-in.) diam, 20.3-cm (8-in.) length
266 PMT Base	+2500	≤1.67	Negative signals Z <sub>o</sub> ~ 1.1 MΩ; capacitive coupling	Pos signals Z <sub>o</sub> ~ 1.2 MΩ; capacitive coupling	External control for focus voltage	All 10-stage PMTs that fit standard 14-pin socket including: Hamamatsu PM55, R208, R550, R594, R877, R878, R1507, R1512, R1513, R1612, R1791, R1836, R1847-07, R1848-07, and 7696. Burle (formerly RCA) 4900, 5819, 6342A, 6655A, S83006E, S83013F, S83019F, S83020F, S83021E, S83022F, S83025F. Philips XP2202B, XP2203B, XP2412B. ADIT B51B01, L51B01, V51B01, B51D01, B51C01, B76B01, V76B01, B76C01 B89B01, B89C01, B89D01, B133D01, B133C01, V133B01.	5.6-cm (2.2-in.) diam, 10.2-cm (4-in.) length
269 PMT Base	-3000	≤2	Negative timing signal, 0.5 A; max, 50 Ω dc-coupled	Pos linear signal Z <sub>o</sub> ~ 1 MΩ; capacitive coupling	Voltage adjust for focus and deflection and 14th dynode	14-stage PMTs that fit standard 20-pin sockets, including: Hamamatsu R1823-01, R2059. Phillips XP2020, XP2020Q, XP2040, XP2040Q, XP2041, XP2041Q, XP2212B, XP2230B, XP2233B, XP2262B. EMI 9813K.	7.6-cm (3-in.) diam, 20.3-cm (8-in.) length
276 PMT Base with Preampfier	+2000	≤1.67	Negative signals Z <sub>o</sub> ~ 1 kΩ; capacitive coupling	Preampfier internally connected to dynode 10; dc-coupled output	External control for focus voltage	Same as Model 266	5.6-cm (2.2-in.) diam, 10.2-cm (4-in.) length
296 ScintiPack PMT Base with Preampfier and HV Supply	+1100	Active dynode voltage regulation	Negative signals Z <sub>o</sub> ~ 1 kΩ; capacitive coupling	Preampfier internally connected to dynode 10; ac-coupling	Internal HV supply adjustable from +600 V to +1100 V. Focus voltage is 1/2 of dynode 1 voltage.	Same as Model 266	5.6-cm (2.2-in.) diam, 17-cm (6.7-in.) length

Specifications subject to change  
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