

Scintillation Detectors with Integrally Mounted PMT

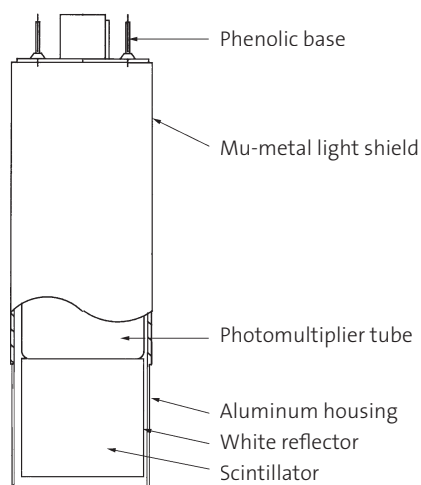
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In this integral design, the photomultiplier tube (PMT) is optically coupled directly to the scintillator. The scintillator is mounted in a container (usually aluminum), and a mu-metal magnetic shield is fitted over the PMT. The scintillator container and mu-metal shield are sealed together to form a low-mass and light-tight housing for the detector.

This design usually yields better and more consistent energy resolution than others. Therefore, these detectors are of choice for spectroscopy and radioisotope assay.

Design Notes –

- The detector package is hermetically sealed when NaI(Tl) or another hygroscopic scintillator is used.
- The maximum scintillator size is 127mm (5") in diameter or on the diagonal.



Advantages –

- Compact assembly
- Direct PMT-to-crystal mounting
- PMT is matched and tested with scintillator
- Consistent, superior energy resolution

Options –

- End well and through well geometries
- Scintillator containers of low-background stainless steel or copper
- Thin aluminum or beryllium radiation entrance windows
- PMTs selected for low background, premium resolution, fixed HV use, or gain matching
- Special flanges, mounting fixtures or other modifications
- Integrated, low-background voltage divider and preamplifier bases
- Square, hexagonal or other cross-sections

Other Configurations –

- Waterproofed assemblies
- Ruggedized and high-temperature detectors
- Detectors with side or end wells
- Assemblies using thin crystals for low-energy gamma and X-ray detection

Note: configuration is historically known as:

Bicron Monoline
example model 2M2/2

Crismatec Scintibloc
example model 51551

Harshaw
example model 858/2



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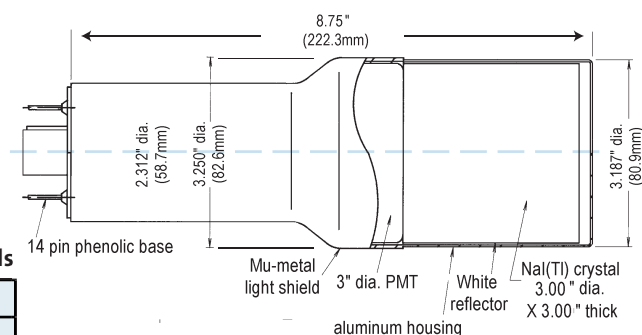
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Scintillation Detectors with Integrally Mounted PMT

Popular Configurations –

Solid detectors are commonly used for gamma ray spectroscopy, radon canister counting, thyroid uptake measurements, and health physics applications.

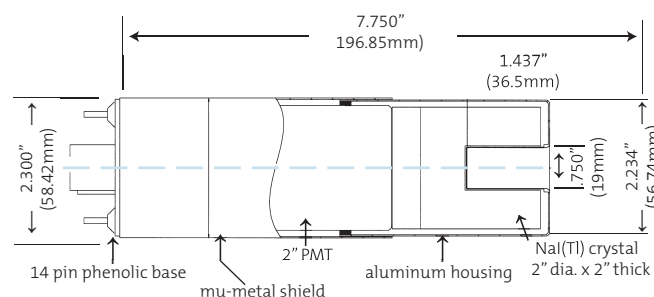


Model 3M3/3

Typical Solid Crystal Monoline Models

Model	Crystal Size	PMT Size
1M1/1.5	1" x 1"	1.5"
1M2/2	1" x 2"	2"
1.5M1.5/2	1.5" x 1.5"	2"
2M2/2	2" x 2"	2"
3M3/3	3" x 3"	3"
4M4/5	3" x 4"	5"
5M5/5	5" x 5"	5"

The end well configuration is the most efficient and is used for radioimmunoassay, wipes and sample counting.

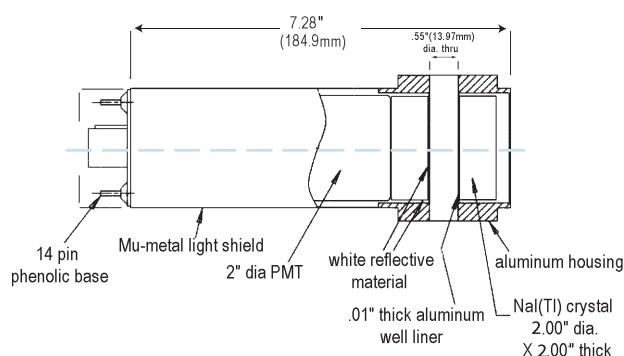


Model 2MW2/2

Typical End Well Crystal Models

Model	Crystal Size	PMT Size
2MW2/2	2" x 2"	2"
3MW3/3	3" x 3"	3"
3MW4/3	3" x 4"	3"

Through-side well detectors are ideal when space is limited and is the second most efficient configuration; and are ideal for radioimmunoassay and fuel rod monitoring.



Model 2MSW2/2

Typical Side Well Crystal Models

Model	Crystal Size	PMT Size
2MSW2/2	2" x 2"	2"
3MSW3/3	3" x 3"	3"
3MSW4/3	3" x 4"	3"

Detectors can be built with a wide range of well sizes. Please discuss your requirements with your sales representative. The drawing dimensions are nominal and subject to change. Call the factory for current values.

Manufacturer reserves the right to alter specifications.

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