New 30mm(1⅛in) diameter tubes with bialkali or S20 photocathodes and 11 dynodes

Provisional Data

- Wide spectral coverage —210 to 850 nm (170–850 nm quartz version)
- High gain—typically 10^6 at 1000V
- Physically interchangeable with S10 tubes EMI 9592, 9529 and SII, EMI 9524, 9526 and 9601
- Small size—30 mm diameter envelope with 23 mm photocathode

The 9824 (previously D110) is intended to supersede the 9524S in applications requiring a tube of small physical size having a combination of low background and good "blue" response. Such applications include low energy nuclear radiation monitoring, geological studies and low light level photometry.

The D125 is a developmental tube primarily designed as an alternative to existing S10 types where higher red sensitivity is required without circuit changes. Applications include wide range spectrophotometry, photometry, laser detection, colorimetry, film scanning and automated process control.

Notes

1. Each tube is individually calibrated and supplied with a test ticket giving the cathode sensitivity in μA/lm; cathode sensitivity with filters interposed (detailed below); the overall voltage for 200A/lm and the relevant dark current (at 20°C).
   A Corning glass filter (CS-5-58 ground to half stock thickness) is used to give a measure of the 'blue' sensitivity; a Corning glass filter (CS-2-62), which passes all radiation longer than 600nm, to indicate 'red' sensitivity, and a Wratten 87 filter, which passes all radiation longer than approximately 800nm, to indicate sensitivity in the near infra-red region.
2. Test data is obtained with K to d1 held at 150V and the 'standard' dynode chain.*
3. Generally, tubes should be operated at, or near their rated overall sensitivity. Care should be taken not to exceed the maximum rated sensitivity or voltage.
4. For optimum stability under d.c. conditions, the mean anode current should not exceed 2μA.

*For recommended dynode chains, refer to groups H, I, J on page 14 of the EMI Photomultiplier Tube Catalogue ref. P001/fP70 (available on request).

Mechanical Characteristics

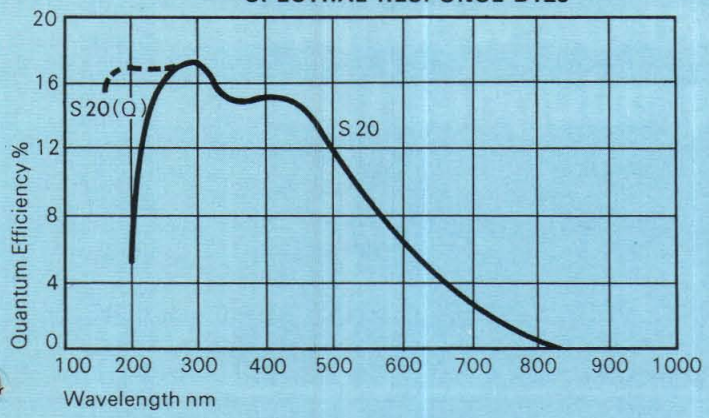
Envelope diameter:	**Maximum 29.00 mm (1.14 in)**
Cathode diameter:	**Nominal 23.00 mm (0.91 in)**
Cathode type:	**9824 Bialkali (KCs) D125 Trialkali (S20)**
Window material:	**9824B, D125, Corning 9741 9824QB, D125QB quartz (spectrosil)**
Dynodes:	**11 box and grid with Cs Sb surfaces**
Base:	**B14B low loss pressed glass (socket supplied)**

RATINGS		**9824**	**D125**
Overall sensitivity: rated		**200A/lm**	**200A/lm**
maximum		**2000A/lm**	**2000A/lm**
Voltage, cathode to d1:			
recommended		**150V**	**150V**
maximum		**300V**	**300V**
Voltage, anode to cathode: maximum		**2000V**	**2000V**
Anode current (mean): maximum		**0.1mA**	**0.1mA**
Anode dissipation: maximum		**0.1W**	**0.1W**
Cathode current: maximum (using whole area)		**0.05μA**	**1μA**
Anode pulse rise time: typical		**12 n. sec.**	**12 n. sec.**
Anode pulse f.w.h.m.: typical		**50 n. sec.**	**50 n. sec.**
Transit time: typical		**70 n. sec.**	**70 n. sec.**
Capacitance, anode to all dynodes: typical		**6 pF**	**6 pF**
Operating temperature: maximum		**60°C**	**60°C**
minimum		**—5°C**	**—180°C**
Dark current shot noise equivalent input*	**Lumens**	**8.0×10^{-14}**	**4.5×10^{-13}**
	Watts	**6.5×10^{-17}**	**8.4×10^{-16}**

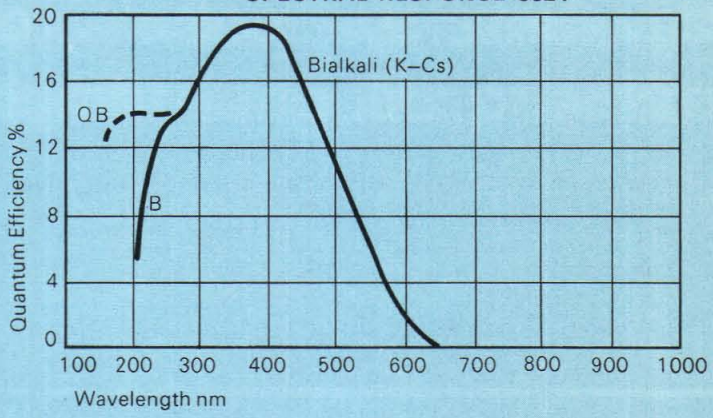
* Calculated from typical performance data using Q.E. at λ peak and assuming Δf of 1 Hz and enhancement factor of unity.

Tube Type Number	Cathode Sensitivity				Overall Sensitivity						
					200A/lm				2000A/lm		
	uA/lm		Corning Blue		V. Overall		Dark Current nA		V. Overall		Dark Current nA
	Min.	Typ.	Min.	Typ.	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.
9824B 9824QB	—	50	5.0	7.5	1150	—	0.2	2.0	1550	—	2.0
D125B D125QB	80	120	—	—	1050	—	5.0	25	1450	—	50

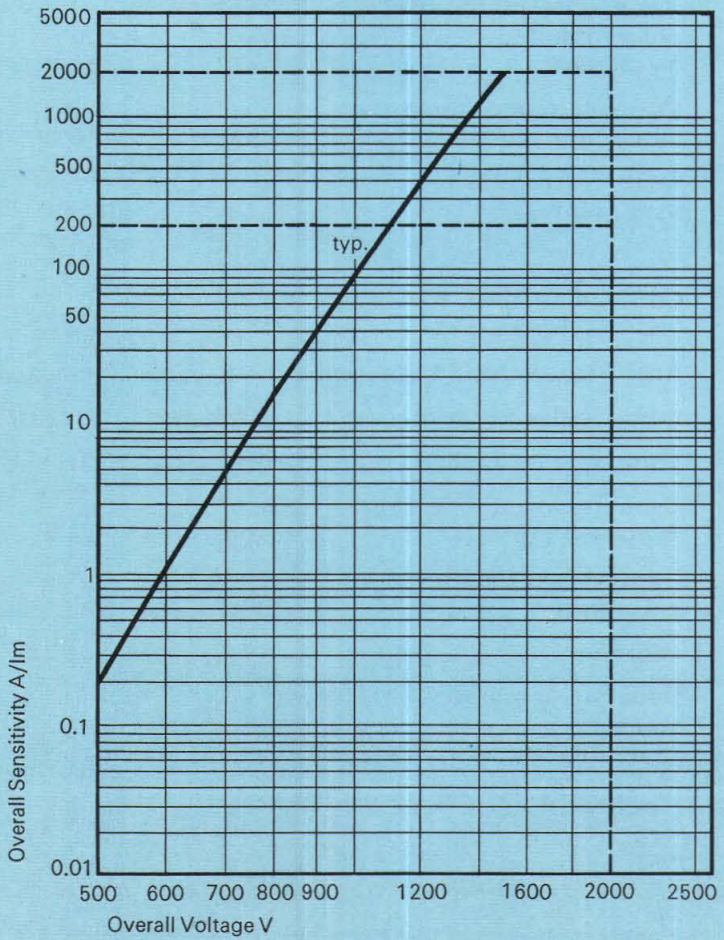
SPECTRAL RESPONSE D125

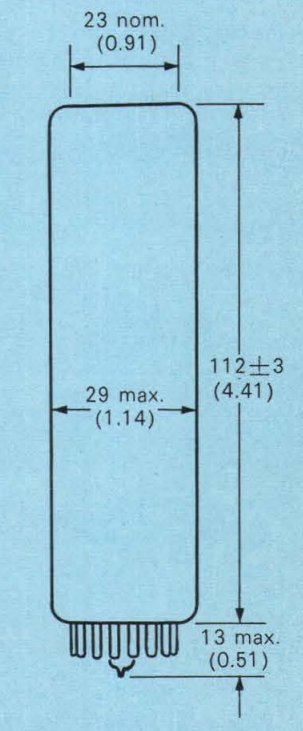


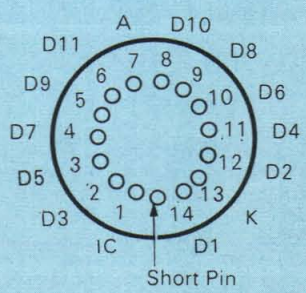
SPECTRAL RESPONSE 9824



OVERALL SENSITIVITY vs OVERALL VOLTAGE







Pin connections Type D125, 9824
B14B Socket
(Viewed from below)

All dimensions are in millimetres with inches shown in parentheses.