

photomultiplier HV base

HV3820AP series data sheet

1 description

The HV3820AP is a compact photomultiplier HV Base operating from a low voltage supply (+5 to +15 V). It incorporates a positive HV supply and an active MOSFET voltage divider. The HV Base is intended for use with 10-stage, 38 mm hardpin photomultipliers for applications requiring up to +2000 volts and ac coupling.

The unit is housed in a screened 30 mm cylindrical metal enclosure. Threaded mounting bushes are provided. The signal is accessible via a 0.5 m length of shielded RG174U cable and is ac coupled.

The photomultiplier operating voltage is set by using any one of three programming options as shown in section 8. The cathode is at ground potential in the HV3820AP but for applications requiring grounded anode operation, a negative polarity version is available, which is the HV3820AN series.

2 applications

The HV3820AP is designed for use in the following operating modes:

- pulsed light
- photon counting

3 features

- compact
- no high voltage cables
- low noise
- stable dynode voltages with varying anode current
- low temperature coefficient

4 specifications

| at HV = 1000V | unit | min | typ | max |
|---------------------------------------|---------|------|-----|-------|
| supply voltage | V | +5 | | +15 |
| control voltage | V | +0.1 | | +2.0 |
| output high voltage | V | +100 | | +2000 |
| output (anode) current | μ A | | | 200* |
| supply current at +5 V; | | | | |
| for anode current = 0 μ A | mA | | 70 | |
| for anode current = 100 μ A | mA | | 150 | |
| supply current at +12 V: | | | | |
| for anode current = 0 μ A | mA | | 40 | |
| for anode current = 100 μ A | mA | | 60 | |
| line regulation | %/V | | | 0.01 |
| anode load regulation: | | | | |
| for anode current 0 - 100 μ A | % | | | 0.01 |
| temperature coefficient | %/°C | | | 0.02 |
| switch-on time | s | | | 0.1 |
| switch-off time | s | | | 5 |
| anode ripple: | | | | |
| for anode load = 10 k Ω 22pF | mV(p-p) | | 2.5 | |
| weight | g | | 60 | |

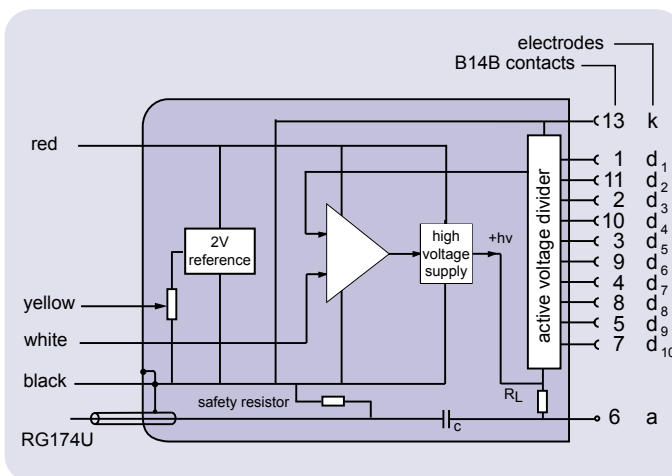
*Subject to photomultiplier limit



5 ratings

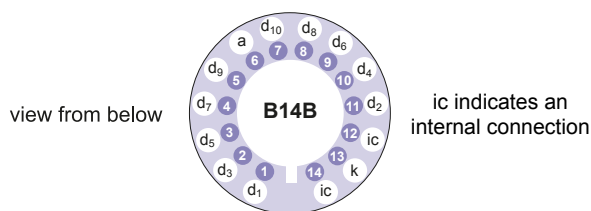
| | unit | min | typ | max |
|---|------|-----|-----|-----|
| supply voltage | V | 4.5 | | 18 |
| control voltage | V | 0 | | 3 |
| temperature (operating): at 93% RH, non-condensing | °C | -40 | | 60 |

6 schematic diagram



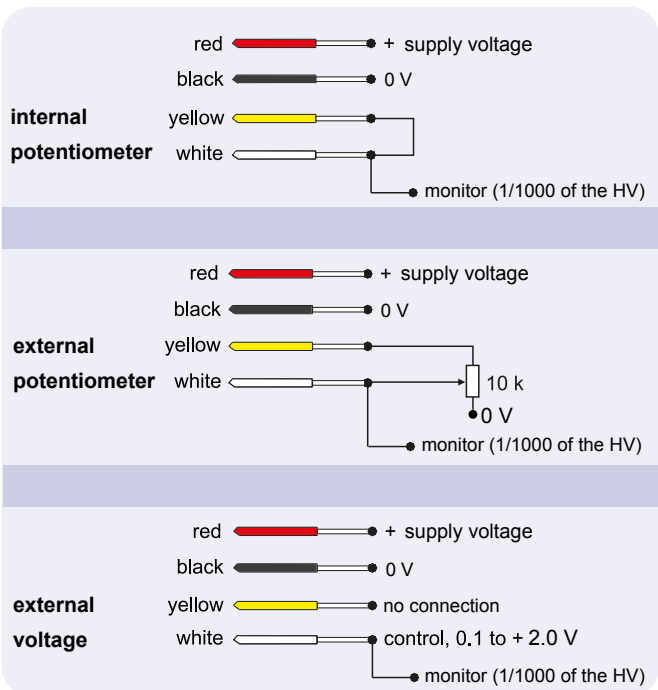
7 voltage distribution

The photomultiplier pin configuration for this HV base is given below. The voltage distribution for an applied HV of V volts is shown in the table. Note that an anode load resistor (R_L) of 100k Ω is included. A 10M Ω safety resistor is connected between signal output and ground to maintain the output close to 0 V.



| k | d ₁ | d ₂ | ... | d ₉ | d ₁₀ | a |
|-------|----------------|----------------|-----|----------------|-----------------|-------|
| 2/12V | 1/12V | | | | 1/12V | 1/12V |

8 programming options

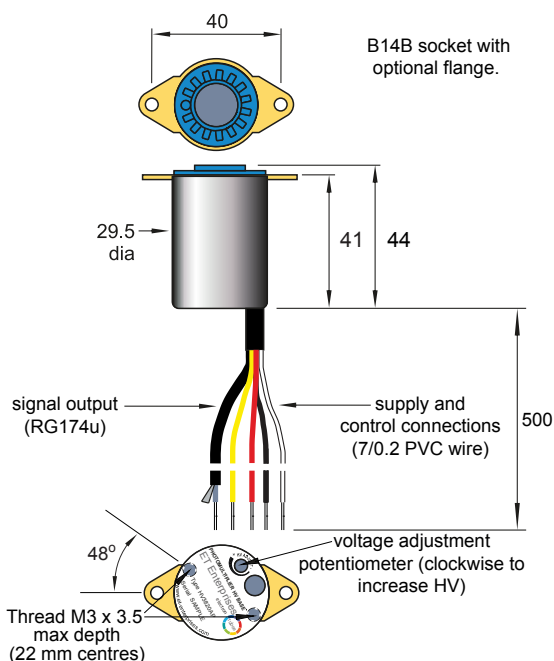


9 dimensions and photomultiplier options

The HV3820AP series HV base can be used with the following photomultipliers:

9102B, 9902B and 9903B

all dimensions in mm



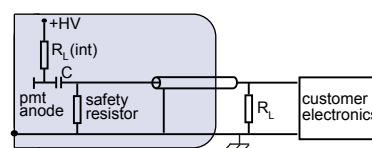
10 linearity

Linearity performance is dependent on the particular photomultiplier being used with the HV Base. It is measured as the % deviation in either peak pulse current, or average current, depending on the mode of operation.

Please refer to the corresponding photomultiplier data sheet for further information.

11 output configuration

The photomultiplier anode is internally ac coupled to ground via a 10 M Ω safety resistor. An internal load resistor, R_L (int), of 100 K Ω is also provided. An external load resistor, R_L , can be added if required.



C = internal coupling capacitor
 R_L (int) = internal load resistor
 R_L = external load resistor (optional)

12 ordering information

| item | ordering code |
|----------------|---------------|
| without flange | HV3820AP |
| with flange | HV3820APF |

13 warning

High voltages generated by these products present an electrical shock hazard and appropriate precautions must be taken.

Installation must be by qualified personnel and operation must remain within the specified ratings.

All units are despatched with the internal potentiometer set to zero.

Do not operate outside the quoted ratings of the HV3820AP or those of the photomultiplier. This may result in loss of performance, permanent damage, or both.

ET Enterprises Limited
 45 Riverside Way
 Uxbridge UB8 2YF
 United Kingdom
 tel: +44 (0) 1895 200880
 fax: +44 (0) 1895 270873
 e-mail: sales@et-enterprises.com
 web site: www.et-enterprises.com

ADIT Electron Tubes
 300 Crane Street
 Sweetwater TX 79556 USA
 tel: (325) 235 1418
 toll free: (800) 399 4557
 fax: (325) 235 2872
 e-mail: sales@electron tubes.com
 web site: www.electrontubes.com

an ISO 9001 and ISO 14001 registered company

The company reserves the right to modify these designs and specifications without notice. Developmental devices are intended for evaluation and no obligation is assumed for future manufacture. While every effort is made to ensure accuracy of published information the company cannot be held responsible for errors or consequences arising therefrom.

ET Enterprises
 electron tubes

© ET Enterprises Ltd, 2014
 DS_HV3820AP Issue 1 (23/10/14)