

P4222

THERMAL IMAGING CAMERA

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Line Flyback Gas Pedestal

In order to improve readout efficiency, an automatic circuit detects and regulates the ion pedestal within the tube by controlling the beam current during line flyback.

Circular Blanking

Circular blanking is added to the video waveform to mask any unwanted bright video signal produced at the edges as the target is overscanned. The required masking is achieved by the adjustment of the 'size' control.

OPERATING FACILITIES

Controls

An external black level offset control, off/pan/chop switch and power supply socket are provided. Preset internal controls are available to set grid 3, grid 4, grid 1, ion pedestal, focus current, alignment, line scan linearity and shift, field scan amplitude and shift, circular blanking, internal monitor contrast and brightness. A negative-going video output can be selected.

Differential Temperature Estimating System

A calibrated black level offset control provides the means to estimate positive and negative differential temperatures in the scene. A correction facility for lens aperture and source emissivity is incorporated on auxiliary scales. Each scale is duplicated to allow estimation of negative differential temperatures. The offset control functions as a normal black level control when not required for temperature estimation.

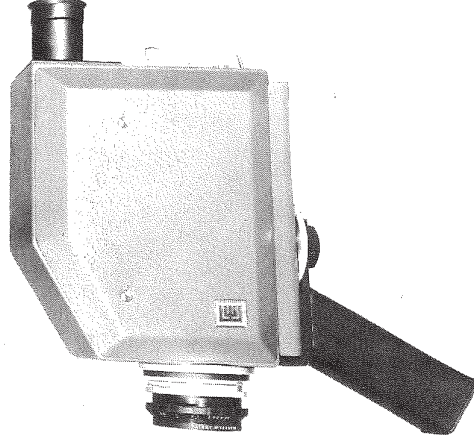
Electrode Supplies

1. V_{g2} Fixed voltage +165 V.
2. V_{g3} +100 V to +165 V normal, +10 V target discharge, recharging in 220 ms.
3. V_{g4} +100 V to +165 V normal, +10 V target discharge, recharging in 100 ms.
4. V_{g1} 0 to -50 V forward scan, +6 V to -50 V self-regulating for flyback pedestal generation.
5. V_k 0 V forward scan, +9 V flyback, blanking.
6. V target 0 V normal, -70 V CPS piling.

INTRODUCTION

The P4222 is a thermal imaging camera using the P8092 pyroelectric vidicon. It is a self-contained battery-operated unit incorporating a miniature display monitor, and is primarily intended for general industrial and technical applications for imaging of thermal variations and detection of hot areas.

The display is presented on a cathode ray tube with a diagonal screen dimension of 40 mm, and is viewed through a magnifying and collimating eyepiece. A calibrated dial is provided, from which an estimate of differential temperatures in the scene may be derived.



The camera may be operated from rechargeable or disposable batteries or from a battery substitution unit powered from a mains supply. A battery state indicator is provided.

The camera is provided with a pistol grip and is constructed to be suitable for general field use.

SPECIAL FEATURES

- Integral viewfinder/monitor gives operator a clear, TV-quality image.
- Self-contained, compact and portable for hand-held use.
- Rugged for tough conditions.
- Light weight (2.8 kg)
- Range of lens focal lengths available.
- TV signal is CCIR compatible.

- Operates continuously for one hour with one set of batteries. Optional mains operation.
- Temperature estimation read-out.
- Additional remote surveillance and recording possible (fitted with output socket).

GENERAL DATA

Dimensions

Overall dimensions:

camera unit (less hand grip)	247 x 101 x 171 mm approx 9 1/2 x 4 x 6 3/4 inches approx
mains power unit	88 x 58 x 110 mm approx 3 1/2 x 2 1/4 x 4 1/2 inches approx
Net weight:	
camera unit with hand grip,	2.8 kg (6.2 pounds) approx
25 mm lens and batteries	0.5 kg (1.1 pounds) approx
mains power unit	

Power Requirements

The power requirements are 9.2 V to 15 V d.c., 400 mA. Above 9.6 V a battery charger circuit is operative which consumes a further 50 mA.

Battery Operation 8 AA size nickel-cadmium rechargeable cells, 1 hour operating time, or 10 AA size dry cells, 2 hours operating time.

Mains Operation The mains battery charger/power unit will power the camera and charge the internal batteries when connected to a 240 V $\pm$ 10%, 50 Hz mains supply.

Video Output

CCIR compatible composite waveform, BNC output socket. Circular blanking is used to provide a circular image covering the lens field of view.

Lens

A germanium lens of 25 mm focal length at f/0.8 is normally fitted; 50 mm and 75 mm focal length lenses are available. The lens has a hard anti-reflection coating on the exposed surface, and can be cleaned as necessary with an appropriate cloth.

Spectral Response

The spectral response is determined principally by the lens material, and covers the band 8 to 14 μ m approximately.

Mechanical Environment

Vibration The camera will withstand, in consideration of carriage on vehicles, 2 g vibration from 1 to 3 Hz and 0.5 g vibration from 15 to 40 Hz.

Bump and Shock The camera will withstand 500 bumps of 10 g, 6 ms duration, at the rate of 1 bump per second.

The camera will withstand 10 shocks of 30 g, 11 ms duration.

Operating Modes

The camera may be operated in two modes, 'panned' or 'chopped'. In the panned mode the image on the monitor represents changes in the temperature differences in the field of view, and the picture will disappear if the camera steadily views a constant temperature distribution in the scene. In this mode the camera must be oscillated slightly by the user in order to maintain the image.

In the 'chopped' mode a rotating shutter in the camera chops the incoming radiation, and the image effectively represents the scene temperature distribution when the viewer is stationary.

The temperature discrimination in the chopped mode is approximately half that in the panned mode, but the need to move the camera in the panned mode is often an unacceptable inconvenience. The resolution of the camera is 200 lines per picture height for a temperature difference in the resolution element of 2 °C approximately in the chopped mode, and 1 °C approximately in the panned mode.

A selector switch on the back of the camera provides chopped or panned operation as required.

Target Discharging

To ensure correct operating conditions at the target, an automatic discharge circuit operates each time the camera is switched on.