

**PALPEC**

**MODEL PE-1  
EXPOSURE  
METER**



**PATON**

**ELECTRICAL PTY. LTD.**

**SYDNEY**

# THE PALEC MODEL P.E.1 PHOTOGRAPHIC EXPOSURE METER

## GENERAL DESCRIPTION

The Palec Photo-Electric Exposure Meter is a device for measuring the brightness of light reflected from a scene or subject to be photographed. Then, by means of a slide-rule computer, the indication of brightness, as shown on the meter, may be converted quickly to a range of related exposure time values and f stop, lens aperture settings suitable for the particular type of film or plate being used.

The Palec Exposure Meter complies with the provisions of British Standard Spec. 1383:1947, and also the American Standard Association Specification Z.52.22. On following pages is a more detailed description.

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1

## LIGHT METER.

The light meter indicates average brightness of the scene to be photographed in units of BRIGHTNESS — "Candles per square foot." (This unit should not be confused with the unit of ILLUMINATION—the "Foot-candle.")

The meter indicates brightness in two ranges, 0/80 and 0/800 candles per square foot. The numerals associated with the two light ranges are automatically changed on the scale as the multiplying flap is operated.

2

## MULTIPLYING FLAP AND PHOTOCELL.

The Multiplying Flap is situated in front of the photo-electric cell and baffle system. This flap is equipped with two slots which admit 1/10 of the light in the

closed position as compared to that admitted when open. In this way two ranges are provided, the lower range usually for indoor, the higher range for outdoor use.

#### **ANGLE OF ADMITTANCE OF LIGHT.**

The flap and baffle system is designed to restrict the angle of admittance of light to approximately that of the average camera lens, namely  $60^\circ$ , both horizontally and vertically.

With the flap open, that is, when using the exposure meter in dull light, the  $60^\circ$  angle is slightly exceeded. This may result in a slight deviation between readings of the same subject taken on both ranges. The discrepancy, however, is not critical, and can be disregarded.

### **3**

## **SLIDE RULE COMPUTOR.**

### **FILM SPEED SCALE.**

This scale is marked in A.S.A. exposure index values. The A.S.A. system is based on a recently developed sensitometric method of determining the exposure speed of photographic material. The method used is described in the American Standards Association Spec. Z.38.2.1 and the British Standard Spec. B.S. 1380:1947, and the exposure index may be alternatively termed A.S.A. exposure index or British Standard Arithmetical exposure index.

### **4**

### **THE CURSOR.**

This carries the light scale arrow and the film speed indicator.

**5****THE LIGHT VALUE SCALE.**

The Light Value Scale on computer is graduated in the same units as the light meter. The numerical values of all graduations of the light meter scale are shown, as well as those which may be estimated below 1 and at 1.5 candles per square foot.

**6****THE f STOP NUMBER SCALE.**

This scale carries three ranges of f stop numbers based on f/3.5, f/4 and f/4.5. The f/4 series is printed in larger characters.

**7****EXPOSURE TIME SCALE.**

This scale is calibrated in seconds and fractions of a second from 60 to 1/1000 indicating exposure times normally used. A further scale is fitted for use with motion picture cameras showing a range of frames per second calibrations.

**8****COMPARATIVE FILM SPEED RATING TABLE.**

The Comparative Film Speed Rating Table fitted to the rear of the case has provision for converting Scheiner, Weston, H. & D., and Ilford speed rating values to A.S.A. for use with the computer. A space is provided for PENCILLED notes; these can be easily erased by rubbing with the finger.

**9****THE ZERO SET ADJUSTOR.**

This is to allow adjustment of the meter needle to the zero position if at any time it should be found to have shifted. Usually the shift, if any, is very small and can be reset with a thin coin or screwdriver. Close the flap and cover the openings while adjusting the zero setting.

## OPERATION

There are only three steps in the operation of the Palec Exposure Meter for most normal applications; these are:—

- (a) Set Film Speed Indicator on Cursor (4) to the A.S.A. rating of film (see under "Film Speed Setting").
- (b) Point Exposure Meter at scene to obtain the necessary light reading on meter.
- (c) Rotate light value scale (5) of computer until the value indicated by the meter is set opposite the arrow. A range of f stop, or aperture numbers will then be indicated on computer (6) in line with a corresponding range of exposure time values (7).

The combination to use depends on the requirements of the scene. If the scene is an action one a fast shutter speed and its corresponding f stop should be chosen, whereas, if maximum depth of field is needed then a small aperture (large f stop number) is required and the shutter speed or exposure time directly opposite should be used.

### **TWO RANGES.**

It is advisable to first point the meter to the scene with the multiplying flap closed. If the indication is below 80, the flap should be opened and the low range brought into operation.

### **LIGHT AND SHADE.**

The procedure above is responsive to the average brightness of the scene or subject and, for most applications, will give correct exposure; however, if it is required to bring out the "high-lights" or shadows in a scene the following procedure is recommended.

The exposure meter should be taken into the shadow or to within a few inches of the bright object requiring emphasis, care being taken not to cast a shadow on the section being measured. The readings thus obtained should be applied to computer as above.

#### **BRIGHTNESS RANGE.**

A further method of arriving at an accurate exposure is to measure the range of brightness of objects in the scene and to apply the reading midway between those indicated for the brightest and darkest sections.

#### **COLOUR PHOTOGRAPHS.**

For colour photography the same methods should be followed as described above. However, it is important to consider the brightest and darkest COLOURS and to disregard black and white, particularly when making close up measurements.

#### **FILM SPEED SETTING.**

The Film Speed Indicator on the Cursor (4) should be set to indicate the A.S.A. film speed rating corresponding to the film being used. The exposure index value appears at the base of the film speed graduation in each case. To set the Film Speed Indicator, the Light Value Scale (5) should be rotated, whilst the thumb is firmly pressed against the arrow on Cursor (4).

If the A.S.A. rating is not known this can be obtained by reference to the table of Speed Rating for various makes of films, etc.

In cases where the speed rating is known in a system other than A.S.A., for example, degrees Scheiner, conversion to A.S.A. can be readily carried out by reference to the table of Comparative Speed Ratings (8) printed on the plate fixed to the underside of the exposure meter. A

card or other straight edged object should be placed on the position of the known film speed rating, at right angles to the scale, and the corresponding A.S.A. value also lying on the straight edge will be indicated. It will be seen that for clarity in reading, only the figure corresponding to the top set on the Film Speed Scale (3) is printed on the conversion scale; however, intermediate values can be obtained by reference to the Film Speed Scale. The progression of Weston rating values also follows in the same order as the A.S.A. system and intermediate values can be obtained in the same fashion. On rare occasions when the A.S.A. Exposure Index of a film or plate is below the range of the scale, the Cursor should be set to indicate two or three times the stated index number. The exposure time obtained from the computer should then be **MULTIPLIED** by the factor used.

When the exposure index is above the scale range, the Cursor should be set at  $\frac{1}{2}$  or  $\frac{1}{3}$  of the number and the resultant exposure time **DIVIDED** by 2 or 3 respectively to obtain the correct exposure time.

#### **FILTERS.**

When using filters the exposure time should be increased by the filter factor. This may be compensated for by dividing the film speed rating (A.S.A. Exposure Index) by the filter factor and setting the Film Speed Scale to the new value thus obtained.

#### **EXTREME BRIGHTNESS.**

If the brightness of a subject exceeds the range of the high scale with the multiplying flap closed (or 800 candles per square foot), one of the flap apertures should be covered by holding a finger over it. The range under these circumstances will be 0/1600 candles per square foot. In order to apply the new range, the A.S.A. film speed setting should be doubled, and the actual meter scale indication set on the computer light scale and calculations carried out in the normal manner.



on back of meter

## PRECAUTIONS.

The Palec Exposure Meter is of rugged design and made to resist all normal operating conditions, nevertheless it should be treated with the care usually accorded precision equipment such as watches, cameras, etc. By observing the precautions set out below reliable performance should be obtained over a very long period.

**Do not drop the Exposure Meter—**Delicate springs, pivots, and jewelled bearings may be damaged by excessive shock. It is advisable to make use of the neck cord when using the meter to avoid accidental dropping.

**Keep the Exposure Meter dry—**The meter should not be exposed to rain or immersed in water, it will resist moisture to a certain extent but is not absolutely water proof. The meter should be kept in the carrying case when not in use.

**Photo-Electric Cell —** The selenium barrier layer cell used is of the highest grade available in the world, the usual life of which is not exceeded by any other make. The life of the cell may be prolonged by avoiding any undue exposure to excessively bright light, such as pointing directly to the sun with the flap open for long periods.

**Dust on Cell Window—**The window located under the multiplying flap should be kept free of dust, otherwise errors could be introduced by reduction of admitted light to the cell by dust particles.

**Effects of Heat—**It is inadvisable to subject the exposure meter to high temperatures; normal atmospheric temperatures have no effect; however, care should be taken to avoid temperatures exceeding 125° Fahrenheit.

## SPEED RATING TABLE.

For daylight applications the A.S.A. exposure index values under the "Daylight" column should be used. For illumination by incandescent or filament type lamps, including Photoflood lamps, the "Tungsten" values apply. With fluorescent or discharge type lighting, the "Daylight" column should be used.



## SPEED RATINGS OF VARIOUS TYPES OF FILMS AND PLATES EXPRESSED IN A.S.A. EXPOSURE INDEX NUMBERS.

	A.S.A.	
	Exposure Index Daylight	Tungsten
<b>ROLL FILMS</b>		
Super-XX .. .. .	100	80
Verichrome .. .. .	50	25
<b>35 mm. (MINIATURE CAMERA)</b>		
Super XX Panchromatic .. .. .	100	80
Plus X Panchromatic .. .. .	50	32
Panatomic X .. .. .	25	16
<b>16 mm. (MOTION PICTURE)</b>		
Super XX Panchromatic .. .. .	100	80
Super X Panchromatic .. .. .	40	32
<b>8 mm. (MOTION PICTURE)</b>		
Super X Panchromatic .. .. .	40	32
Panchromatic .. .. .	10	8
<b>SHEET FILMS</b>		
Super Panchro. Press Sports Type .. .. .	250	200
Super-XX .. .. .	125	100
Super Green Hyperchrome .. .. .	50	25
Orthochromatic .. .. .	15	7.5
Photomechanical .. .. .	3	1.5
Process Panchromatic .. .. .	10	8

COLOUR	Daylight	Tungsten
Kodachrome Daylight (35 mm. & Bantam)	10	4(*)
Kodachrome Type A (8 mm. & 16 mm. Motion Picture)	10(**)	16
Ektachrome Sheet Film Daylight	8	—
Ektachrome Sheet Film Type B	6(***)	10

(\*) With Kodachrome Filter for Photoflood.  
 (\*\*) With Kodachrome Type A Filter for Daylight (No. 85).  
 (\*\*\*) With Wratten Filter No. 85B.

PLATES

Super-XX	125	100
Ortho-X	125	64
Panatomic-X	64	50
Orthochromatic	15	7.5
Supertone Panchromatic	10	8
Ordinary	10	5
Process Panchromatic	3	2.5
Process	1	0.5
Transparency	1	0.5
Lanterns: Regular and Extra Contrast	1	0.5

	Day- light	Tung- sten
<b>ROLL FILMS</b>		
Panchromatic H.P.3	64	50
Panchromatic F.P.3	20	16
Selochrome	40	32
<b>SHEET FILMS</b>		
Panchromatic H.P.3	64	50
Hyperchromatic	100	80
Commercial Ortho.	20	16
<b>PLATES</b>		
Auto Filter	8	5
Isozenith	12	8
Selochrome	40	32
Press Ortho. (Series 2)	50	25
Special Rapid Pan.	12	8
Soft Gradation Pan.	25	12
Dupont Superior Pan. 2	64	40
Ensign Ortho.	32	20
Ensign Fine Grain Pan.	20	16
Gevaert Superchrome	32	16
Gevacolor (Daylight)	12	—
Gevacolor (Artificial)	—	12

	Day- light	Tung- sten
<b>ROLL FILMS AND PACKS</b>		
Superpan. Press .. .. .	125	80
Superpan. Supreme .. .. .	64	40
Plenachrome .. .. .	64	40
<b>35 mm. (MINIATURE CAMERA)</b>		
Ultra Speed Pan. .. .. .	125	80
Supreme .. .. .	64	40
<b>16 mm. (MOTION PICTURE)</b>		
Triple S. Pan. Rev. .. .. .	125	80
Hypan Rev. .. .. .	40	32
Supreme Negative .. .. .	64	40
<b>8 mm. (MOTION PICTURE)</b>		
Hypan Rev. .. .. .	40	32
<b>COLOUR FILMS</b>		
Reversible 16 mm. .. .. .	10	16
Reversible 35 mm. .. .. .	12	12
Reversible Sheet Film .. .. .	10	10
Reversible Roll Film .. .. .	12	12
<b>SHEET FILMS</b>		
Triple S. Pan. .. .. .	250	160
Triple S. Ortho. .. .. .	125	80
Isopan .. .. .	64	40
Superpan Portrait .. .. .	64	40
S.S. Plena .. .. .	64	32
Commercial Pan. .. .. .	32	16
Commercial Ortho. .. .. .	32	16
Commercial .. .. .	36	8
Process .. .. .	16	5

## ADDITIONAL DATA

	Day- light	Tung- sten
<b>DUFAY</b>		
Colour .. .. .	8	—
<b>ILFORD</b>		
Colour Film D .. .. .	10	4
<b>FERRANIA</b>		
<b>35 mm. (MINIATURE CAMERA)</b>		
S.2 Fine Grain .. .. .	100	80
P.3 Fine Grain .. .. .	40	32
<b>ROLL FILM</b>		
Ultrachrom .. .. .	50	32
Superpan. (Fine Grain) .. .. .	40	32
<b>BAUCHET (Roll Film)</b>		
Hyperchromatic .. .. .	40	32
Hyperpanchromatic .. .. .	64	50





**PATON ELECTRICAL PTY. LTD**  
**90 VICTORIA STREET. ASHFIELD. N.S.W.**