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GOSSEN® Luna-Pro

Instruction Manual

7909-1060Y0

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Congratulations – you now own one of the classic outstanding exposure meters!

Your new Luna-PRO – yields reliable measurements under virtually any light condition, all the way from faint moonlight to brightest sunlight.

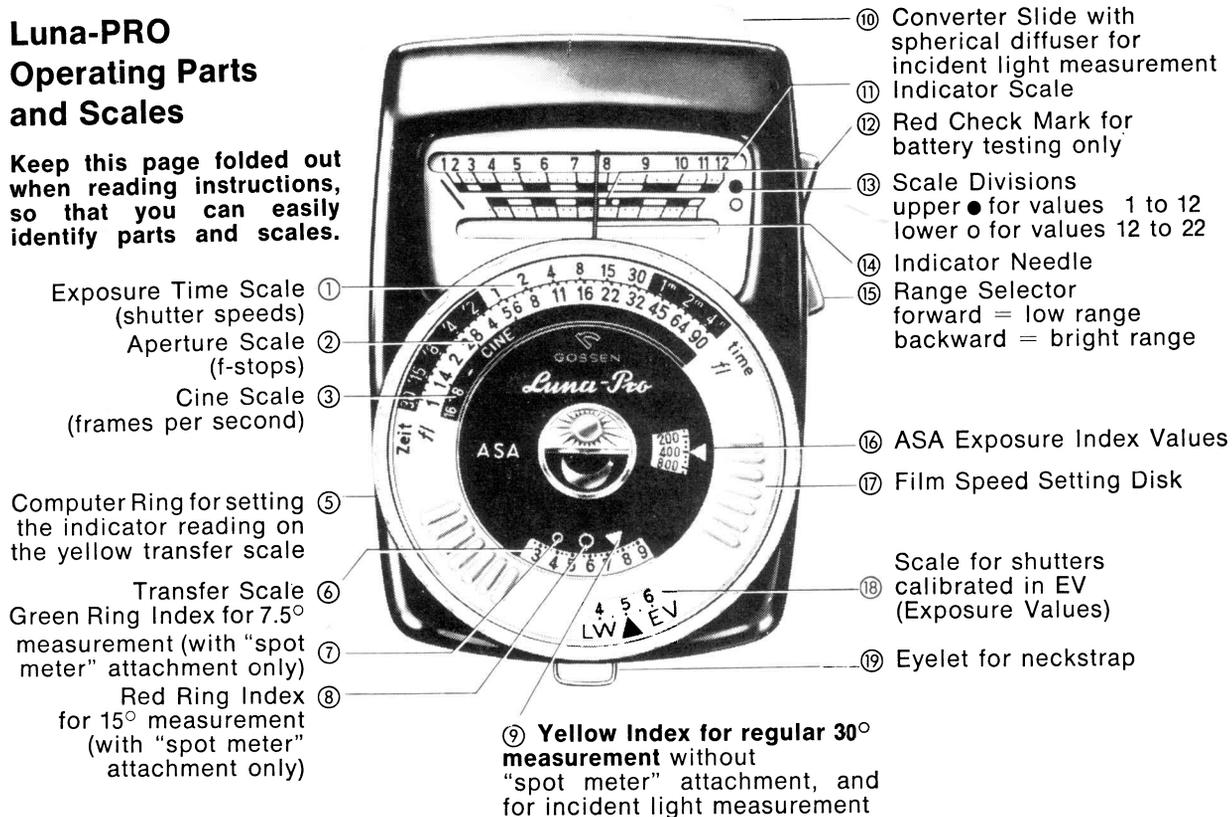
And – even more important – the Luna-PRO is the first SYSTEM EXPOSURE METER in the GOSSEN line. It enables you, by means of instant-lock-on attachments, to refine your measuring techniques not only in your camera work on location and in the studio, but in enlarging or in photomicrography.

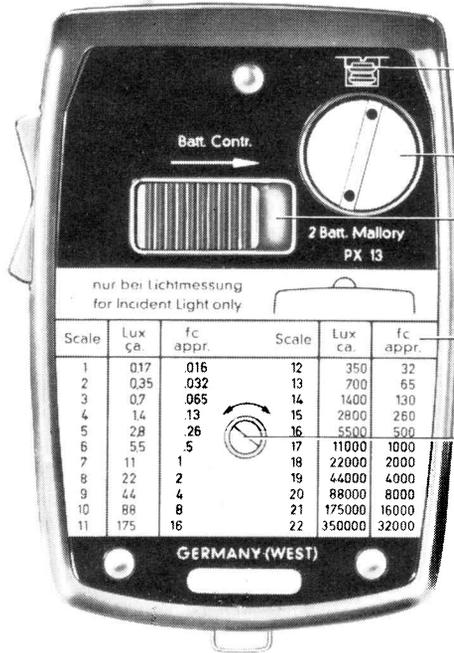
The Luna-PRO represents a most significant development by GOSSEN GMBH, Erlangen, West Germany, Europe's largest manufacturers of precision electrical instruments since 1919, and one of the outstanding pioneers in exposure meter design since 1932.

Your Luna-PRO is so easy to use that, within a short time, its operation will become almost "automatic". Please acquaint yourself with this fine instrument by reading the following pages with the Luna-PRO at hand, thus getting off to a good start for consistently good results.

Luna-PRO Operating Parts and Scales

Keep this page folded out when reading instructions, so that you can easily identify parts and scales.





⑩ Diagram showing correct position of the 2 batteries

⑪ Battery Chamber

⑫ Ridged Slide for battery testing

⑬ Table of Footcandle (Lux) equivalents

⑭ Zero Adjustment Screw

nur bei Lichtmessung
for Incident Light only

Scale	Lux ca.	fc appr.	Scale	Lux ca.	fc appr.
1	0.17	.016	12	350	32
2	0.35	.032	13	700	65
3	0.7	.065	14	1400	130
4	1.4	.13	15	2800	260
5	2.8	.26	16	5500	500
6	5.5	.5	17	11000	1000
7	11	1	18	22000	2000
8	22	2	19	44000	4000
9	44	4	20	88000	8000
10	88	8	21	175000	16000
11	175	16	22	350000	32000

GERMANY (WEST)

Basic Operating Instructions

Setting the film speed

Look up the ASA Exposure Index of the film in use (you will find it on the film box or film instruction sheet) and turn the Plexiglas® film-speed setting disc (17) by the raised bars, until the ASA Index number in the film speed window is lined up against the triangular white marker.

You will find a detailed ASA film-speed table in the technical appendix on page 24.





Reflected Light Measurement: Move the converter slide (10) all the way to the right; this uncovers the round window. The Luna-PRO is ready when the converter slide has clicked into position. Point the Luna-PRO toward the subject, as indicated by the arrow in the illustration.



Incident Light Measurement: Move the converter slide (10) so that the spherical diffuser is centered over the round window. The Luna-PRO is ready when the converter slide has clicked into position. Point the Luna-PRO from the subject towards the camera, as indicated by the arrow in the illustration.

Light Measurement – (basic steps)

Press the range selector (15) **backward** and release it when the indicator needle (14) stops moving. This locks the reading in for convenient reference.

If the indicator needle is deflected only slightly (below 12 on the scale), take a new reading by pressing the range selector **forward**. You have now switched the Luna-PRO to the low light range. Wait again until the needle stops, and lock the reading in by releasing the selector.

If the light is so poor that you cannot observe the movement of the needle, simply hold down the selector for several seconds. After releasing it, you have locked in the correct reading and can take the Luna-PRO to better light, or use a flashlight to read the scale.

As you press the selector forward, the values 1 to 12 appear in the upper frame, and the upper scale divisions apply; when you press the selector backward, the values 12 to 22 appear in the lower frame to which the adjacent lower scale divisions apply. When you release the selector, only the scale values applicable to the measuring range which you just selected, remain visible.

Thus, the Luna-PRO always shows the correct scale!

After taking the measurement, turn the computer ring (5) until the obtained reading is set at the triangular yellow index (9) of the transfer scale (6). The green and red ring indexes apply only for measurements with the Variable Angle "spot meter" attachment. See page 17.

The Luna-PRO now gives you complete exposure information in combinations of f-stops and exposure times (2 and 1), EV settings (18) or frames per second for motion picture cameras (3).

You will find additional information about all scale values on **page 24**.

Light Measurement – more specific

In **reflected light measurement**, the Luna-PRO measures the light reflected by objects within a certain area. The resultant reading, therefore, depends not only on the intensity of the illumination, but also on the color and brightness of the objects themselves. Thus, under identical illumination, the indicator needle will be deflected less by dark objects than by bright ones. In an over-all measurement the Luna-PRO will read the average brightness of all subjects in a scene.

If the scene contains **strong contrasts** in brightness or color, it is preferable to measure that part of the scene which requires the most accurate exposure. For black-and-white or color negative films, this is usually a darker area which is to show details in the final print; for reversal color (slide or movie) films, however, the lighter areas are usually favored.

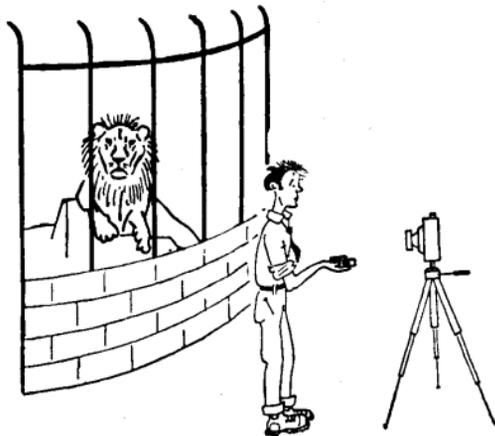
To measure the important areas, get closer to the subject but not so close that your own shadow or that of the Luna-PRO falls on the subject. This method is called: **close-up reading**.

In **incident light measurement** – from the subject towards the camera – the Luna-PRO measures all the light falling on that part of the subject which faces the camera. Naturally, neither the color nor the brightness of the subject itself is considered by this measurement.

With inaccessible subjects, take the incident light measurement at a substitute spot which receives the same illumination as the subject. However, instead of pointing the Luna-PRO towards the camera, you point it parallel to an imaginary line from the object to the camera.

Incident light measurement at a substitute spot of equal illumination is also convenient for many regular outdoor scenes. Frequently, the spot where you stand with the camera receives the same illumination as the scene which you intend to photograph, in which case you merely do "about face" with your Luna-PRO and measure the light exactly opposite to the direction of the camera.

More about this on page 8-11.



Testing the Batteries

With normal use of the Luna-PRO, the Mallory mercury batteries supplied with it have a life of about two years.

It is advisable to check the condition of the batteries from time to time, as follows: Push the ridged slide (22) in the direction of the arrow **without pressing the range selector (15)**. During the battery test, the indicator needle (14) should point to the red check mark (12). Otherwise, fresh batteries must be used.

To replace the batteries, unscrew the cover of the battery chamber (21) — a coin will be useful for this. **Mallory PX 13** or **PX 625** batteries may be used.

After inserting fresh batteries, immediately make the battery test described above.

Testing Zero Position

To test the zero position of the indicator needle, first remove both batteries from the Luna-PRO. Then press the range selector (15) forward or backward. The indicator needle should now rest on the check line to the left of the scale divisions (13).

To adjust the indicator needle to the zero check line, turn the zero adjustment screw (24) on the underside of the Luna-PRO, **while holding down the range selector (15)**.

Thinking and Measuring

One thing the Luna-PRO can not do: It cannot think for you! Even the most advanced "electronic brain" is helpless without the scientist who phrases his problems so that they can be processed by the computer. The Luna-PRO, too, answers exposure questions all the more precisely, if you ask more carefully! You will find this quite easy once you become familiar with your Luna-PRO.

Above all, you must know how your Luna-PRO sees the world that you want to get on your film. This world is made up of many parts, which differ considerably in size, color and brightness. In the case of **reflected light measurement**, the Luna-PRO collects, within a certain angle, the light which is reflected from these many individual parts of the scene; it adds up all the light and strikes an average for which it indicates a suitable exposure time. And, normally, the exposure indicated in this manner is perfectly correct. (Reflected Light Measurement, see also pages 3 and 5.)

Anything unusual which you – as attentive (!) observer – will easily notice, may not be "seen" by the Luna-PRO in quite the same manner. If the scene includes a large very bright area – far from the "average" that the Luna-PRO would normally calculate with – it

will indicate a shorter exposure time than it would for a large very dark area. But you want to see the very light, or very dark area in the finished picture again as "very light" or "very dark" – not as "grey"! What to do? Your judgment has to guide the Luna-PRO: If there are extensive very bright or very dark areas in the scene, steer the Luna-PRO away from them and take the measurement from the "average" parts of the scene.

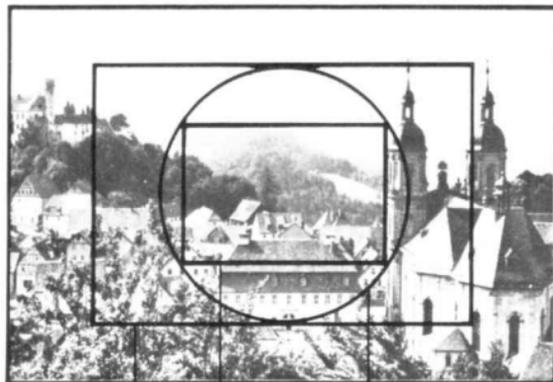
Consider the Measuring Area of the Luna-PRO

You can see in the viewfinder, or on the groundglass of your camera exactly what will be included in your picture. The Luna-PRO cannot orient itself! Of course, you'll want to know what parts of a scene are included in a **reflected light measurement**.

The camera, with your help, selects its "rectangle" or "square"; the Luna-PRO covers a measuring "circle". Whatever lies outside of these variously shaped areas remains unseen! But you can easily estimate the size of the Luna-PRO measuring area by comparison with the finder or groundglass image. The illustrations on page 10 show the relation for 35 mm cameras (24×36 mm) with various focal length lenses, and for 2¼ × 2¼" cameras, when reflected light measurements are made from the camera position.

The normal measuring area of the Luna-PRO corresponds to a light acceptance angle of 30°.

For 35 mm cameras (24 × 36 mm)



35 mm lens
50 mm lens
90 mm lens
Normal Measuring Area

For 2 1/4 × 2 1/4" cameras



80 mm lens
135 mm lens
Normal Measuring Area

The normal measuring area of the Luna-PRO corresponds to a light acceptance angle of 30°. Still narrower angles (15° or 7.5°) can be measured when the Luna-PRO is used with the Variable Angle "spot meter" Attachment. (See page 17.)

The small measuring areas permit very accurate, carefully aimed measurements for exposures with longer lenses, and selective readings of various parts of a scene or subject when normal lenses are used. The lively Indicator Needle of your Luna-PRO tells you very clearly whether a scene has uniform distribution of brightness or not. That's especially important for close-up measurements.

Incident Light Measurement (see also pages 3 and 5)

In this measuring method, your Luna-PRO "sees" only the light falling on that part of the scene which is facing the camera – in other words: the part which will be photographed. The result of this measurement does not consider the color or brightness of the scene itself. Thus, incident light measurement is ideal for the previous example with extensive very bright or very dark areas – it will give you perfect results.

Perfect Exposure

The correct exposure for any scene that can be photographed, can be determined with the Luna-PRO! But, when is a scene "perfectly" exposed? – That's not always so easy to

answer! For the amateur, especially the beginner, the over-all impression is usually decisive. But soon the demands become more stringent, especially when results are compared. "Perfect Exposure" normally means: The brightest portions of a color transparency, the darkest portions of a black-and-white or color print, should still show some detail!

For color slide or movie film – which, as you know, requires more critical exposure – the lighter portions of a scene usually determine the exposure. Therefore, keep an eye on such lighter areas and preferably expose a little shorter rather than longer, to get more brilliant colors.

For black-and-white or color negative film, however, the shadow portions which are to have some detail in the finished print must be given consideration. Therefore, watch the darker areas and expose a little longer rather than too little.

Most important: Be critical of your results! Analyze your prints and color transparencies for possible mistakes or errors in judgment. Learn from your experience: Failures properly analyzed will soon lead to consistent successes!

Remember that, when there are extreme contrasts in a scene, the film may not be able to cope with them! Don't blame your Luna-PRO! You will have to compromise with the limitations of the film by exposing a step more or less than indicated by the Luna-PRO. About "exposure steps" see page 26. However, it is easy to **give your LUNA-PRO your Personal Touch** by harmonizing it with the tolerances of your camera, your favorite film, your developing methods (or those of your finisher). Here is how:

The Personal Touch

Do you really have to expose very critically every time? There are two answers to this question:

- (1) On black-and-white or color negative film you will get good negatives almost without exception and without fuss.
- (2) Reversal color film is more critical. Deviations from correct exposure will produce transparencies that are either too light or too dark; you may also get distortion of colors.

Now, you must remember that the accurate exposure information which your Luna-PRO gives you may not even be fully utilized because all sorts of "tolerances" must be reckoned with:

- (a) The actual sensitivity of a film may differ from the one indicated on the film package.
- (b) The actual speeds of your camera may differ from the values engraved on the shutter.
- (c) The actual apertures may differ from those engraved on your camera f-stop scale.
- (d) The film development may not always be identical.
- (e) In addition, purely subjective considerations and matters of taste enter into the evaluation of the finished print or slide. If you make several exposures of the same scene or subject with various exposure times, you will almost never get complete agreement among different judges as to which negative or which slide received "perfect" exposure!

However, you can adapt **your** Luna-PRO exposure readings to the characteristics of **your** camera, **your** favorite film, **your** type of processing, **your** projector – in other words to **your personal touch**.

Use a reversal color film; select several "normal" scenes; take careful reflected and incident light measurements and shoot! But – each time make a series of 5 exposures; in addition to the one at the indicated exposure time, make one each at a full step and one-half step more and less than indicated by your Luna-PRO. Make complete notes of the readings and of any special conditions. When you have your finished transparencies, select the ones which, in your judgment, are "perfect" and compare them with your notes concerning exposure measurements, etc.

If they're O.K. – and in most cases they will be – everything is fine. Otherwise, determine by how much you need to increase or decrease future exposure readings to get the best results. With this adjustment you have then gained your "Personal Touch".

Sharpness for Motion and Depth of Field

After you have taken a light measurement, the computer scales of your Luna-PRO may line up something like this:

time	$1/1000$	$1/500$	$1/250$	$1/125$	$1/60$	$1/30$	$1/15$	$1/8$ sec.
f/	2	2.8	4	5.6	8	11	16	22

Eight combinations of which you may really use only one! Now, which combination might be "the best"? The Luna-PRO has done its best giving you so many equivalent pairs so that you may select a really suitable one. After all, a properly exposed picture must also be in sharp focus – which means that you have to ignore some aperture (f-stop) settings and some shutter speeds.

Motion calls for a short exposure to prevent a blurred image. (Your camera instruction book or any good photographic manual will give you information about "slowest permissible shutter speeds" for moving objects). Needless to say, sports pictures demand the shortest exposures ($1/250$ to $1/1000$ sec.) and normal motion can be stopped with medium speeds ($1/60$ to $1/250$ sec.) while, for still scenes, the slower speeds ($1/30$ to $1/4$ sec.) are adequate. Of course, for the slow speeds, you'll need a good tripod or other camera support to avoid lack of sharpness due to camera shake.

Depth of Field. Since, usually, you will want to have near and distant objects equally sharp in your pictures, you'll have to "close down" the lens. How much? The depth-of-field scale of your lens, or a separate depth-of-field table will tell you. A smaller lens opening gives you the desired greater depth but – it calls for a longer exposure!

The conflicting demands of motion and depth of field reduce the choice of f-stops and shutter speeds to such an extent that, generally, only a few possible choices remain. Let's say you need a shutter speed of a least $1/60$ sec. to stop motion in a scene and, to get adequate depth of field, you need a lens opening of f/5.6 or smaller. With the exposure reading shown opposite, you would only have the choice between using f/8 with $1/60$ sec., or f/5.6 with $1/125$ sec.

Occasionally you must make a compromise because existing light conditions may allow using neither the ideal f-stop nor the ideal shutter speed. On the one hand you risk subject motion; on the other, less depth of field – provided it is important to you to take the picture at all!

The Luna-PRO System

Thanks to its unique design as a SYSTEM EXPOSURE METER, your Luna-PRO provides you with an adaptability and universality previously unknown in exposure meters.

Used alone, the Luna-PRO continues the superb tradition of the Gossen Lunasix as a very sensitive, wide range (1:2,000,000) exposure meter. It converts instantly, and without accessories, from reflected to incident light measurement — and you'll find its one-hand operation (even with a glove on) a great boon when moments count on location, or in the studio.

Now, whenever the need arises, you can greatly expand the capabilities of the Luna-PRO by using one of the following exclusive accessory attachments.

Luna-PRO Variable Angle "spot meter" Attachment (see page 17)

Luna-PRO Enlarging Attachment (see page 18)

Luna-PRO Microscope Attachment (see page 19)

Luna-PRO Fibre Optics Probe (see page 20)

Luna-PRO Copy Attachment (see page 21)

A built-in instant-lock-on device holds each attachment firmly on the Luna-PRO.

**Variable Angle "spot meter"
Attachment
for the Luna-PRO**

Although the normal 30° acceptance angle of the Luna-PRO is ideally suited for all-around use, you may want to measure smaller areas when using long telephoto lenses, or "spot" areas within the field covered by shorter lenses.

With the Variable Angle Attachment, the Luna-PRO takes readings of 15° and 7.5° measuring angles. The built-in reflex finder with delineated "target" areas lets you pick out the exact portion to be measured.

Thus, the Luna-PRO System gives you a practical choice of 30° , 15° , 7.5° angles for maximum versatility.



Enlarging Attachment for the Luna-PRO

Converts the Luna-PRO to an efficient enlarging exposure meter for black-and-white or color enlargements. It permits you to measure very small areas of the projected image for maximum utilization of paper contrast and color range. Built-in light conductor (instead of a mirror) for greater accuracy and efficiency.





**Microscope Attachment
for the Luna-PRO**

A great aid in photomicrography.
Fits the ocular of all microscopes
for exact exposure determination.

Also useful in controlling light
intensity for fluorescence micro-
scopy.

**Flexible Fibre Optics Probe
for the Luna-PRO**

With its 5 mm probe on a flexible 14 $\frac{1}{4}$ " light conductor, this attachment enables you to take light measurements of otherwise inaccessible small areas and subjects, or directly on the ground glass of your camera; also suitable for negative contrast and similar densitometric measurements.



**Repro "Copy" Attachment
for the Luna-Pro**

The copy attachment makes it possible to obtain the necessary exposure values for reproduction and for effecting transillumination measurements. It is corrected to give accurate measurement values in the plane of the original.



Your Gossen Luna-PRO

is a valuable precision instrument, made with great care and accurately calibrated. It deserves your good care! The enormous measuring range – down to faint moonlight – which you get in your Luna-PRO, is due to its unique photo resistor element. Like the highly sensitive nerves of your own eyes, the photo resistor should not be exposed **unnecessarily** to bright light for extended periods. While the element does not change its permanent properties under long exposure to light, it tends to retain the impression of light for a while. If the previous impression was "dark", you can be sure of utmost measuring accuracy. Therefore, always keep your Luna-PRO in its case when you are not actually using it!

The battery and zero position tests described on page 7 enable you to check the proper functioning of your Luna-PRO.

Measuring comparisons of your Luna-PRO with similar or other types of exposure meters cannot be made properly without special laboratory equipment (optical bench).

Do not attempt to open or repair your Luna-PRO. See Service information on following page.

Service

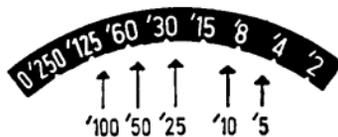
The Gossen Luna-PRO Electronic Exposure Meter is guaranteed to the original registered owner as shown on the guarantee certificate supplied with each new meter.

Should your Luna-PRO require service, send the meter (directly or through an authorized dealer), in the original packing, if possible, prepaid and insured to:

Bogen Photo Corp.
17-20 Willow St., P.O.Box 712,
Fair Lawn, N.J. 07410-0712
Telephone (201) 794-6500

A brief description of the reason for sending the Luna-PRO should accompany the package.

Reading the Scales

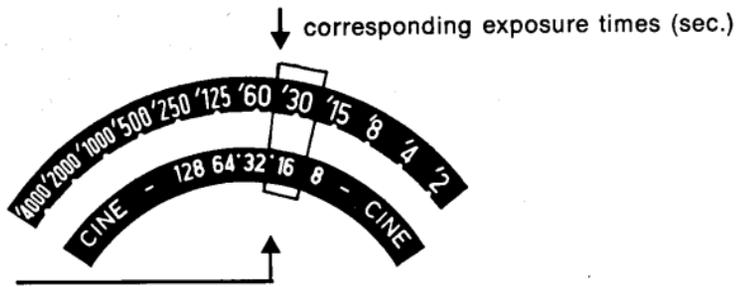


'2 '4 '8 etc. are fractions of seconds: $\frac{1}{2}$ - $\frac{1}{4}$ - $\frac{1}{8}$ sec. etc.

Un-marked numerals 1, 2, 4 are full seconds.

1m 2m 4m etc. are minutes

1h 2h 4h etc. are hours



Cine frames per second

Note: On certain motion picture cameras, the exposure time at normal speed (16 f.p.s.) is not $\frac{1}{30}$ second. Check the instructions for your camera!

Speed Values

ASA Exposure Index	ASA Exposure Index
6	400
8	500
10	650
12	800
16	1 000
20	1 250
25	1 600
32	2 000
40	2 500
50	3 200
64	4 000
80	5 000
100	6 400
125	8 000
160	10 000
200	12 500
250	16 000
320	20 000
	25 000

The ASA scales (16) show only the values listed here in bold types; the intermediate values are indicated by dots on the scales.

Doubling or halving an ASA Exposure Index value is equivalent to one step;

Increasing or decreasing the EV number by 1 is equivalent to one step.

When **exposure modification** is in order (see page 12), you simply choose one (and only one!) of the following adjustments:

For Example:	One Step	
	More Exposure	Less Exposure
If actual Luna-PRO reading is:	requires a change to:	
Indicator Scale 16	15	17
EV Scale 10	9	11
Shutter Speed $1/30$	$1/15$	$1/60$
Lens Aperture f/5.6	4	8

Note: The ASA setting remains unchanged.

Footcandle Table

The table on the back of the Luna-PRO shows footcandle and Lux values (1 ft-cd = 10.76 Lux) corresponding to the Luna-PRO scale readings obtained by the **incident light measuring method**. However, the Luna-PRO should not be considered a full-fledged footcandle meter because, strictly speaking, footcandles of illumination can be measured only by means of a flat interception screen. The spherical diffusing screen of the Luna-PRO is specifically designed to achieve superior collection of the photographically

effective illumination, since photographic subjects are usually three-dimensional, and illuminated from many different directions (sun, sky, reflections from buildings, trees, ground, etc.) On the other hand, the footcandle table can be of practical value for measuring direct light beams (arc light, spots).

Reciprocity Effect

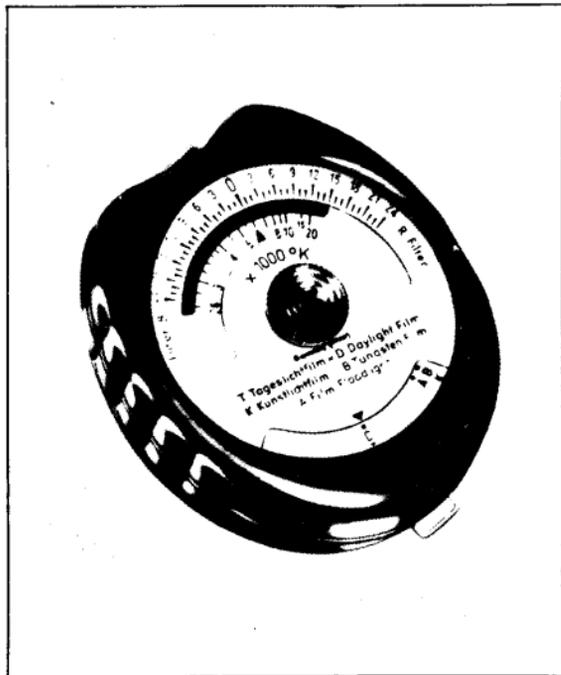
Film manufacturers base the "speed ratings" of photographic emulsions on average conditions of exposure times and illumination under which such emulsions are "normally" intended to be used. However, photography under poor light conditions may call for "abnormally" long exposure times.

Black-and-white films, generally, tolerate moderate deviations from normal conditions. On the other hand, color films – because of their limited latitude – not only lose "speed" but their color balance is also affected.

The reason for this divergence lies in the fact that the effective sensitivity of every photographic emulsion is at a maximum at some specific level of illumination. With variations in illumination and exposure time, the effective sensitivity also varies, a phenomenon which is called the "reciprocity effect".

Films of various types and makes react differently to extended exposure times, and it is impractical to incorporate the many possible variations in the Luna-PRO scales.

It is advisable to write to the film manufacturer for information concerning the necessary exposure correction and filtering for color correction of the specific film which you are using with extended exposure times.



GOSSEN SIXTICOLOR

Color Temperature Meter and Filter Indicator

Eliminates costly trial exposures and "off color" results under daylight or tungsten light. At a glance, this compact instrument shows the color temperature of the light source (2,600 to 20,000 K) and, simultaneously indicates the correction filter required for correct color balance with any type of color film. The Gossen SIXTICOLOR is an important aid for every user of color film in still or motion picture photography.

Ask your dealer for a demonstration!