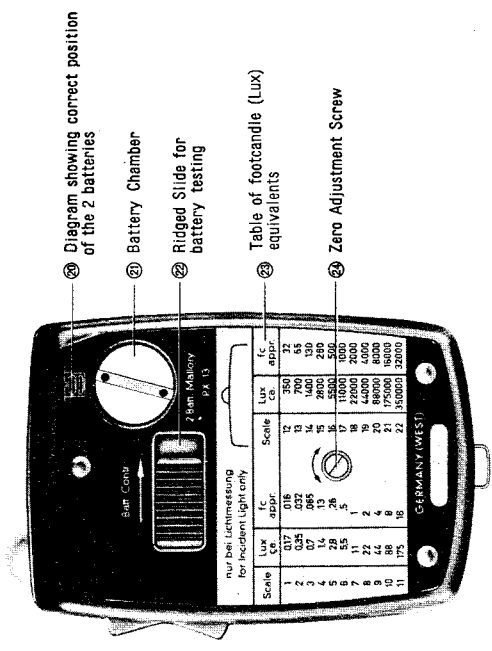
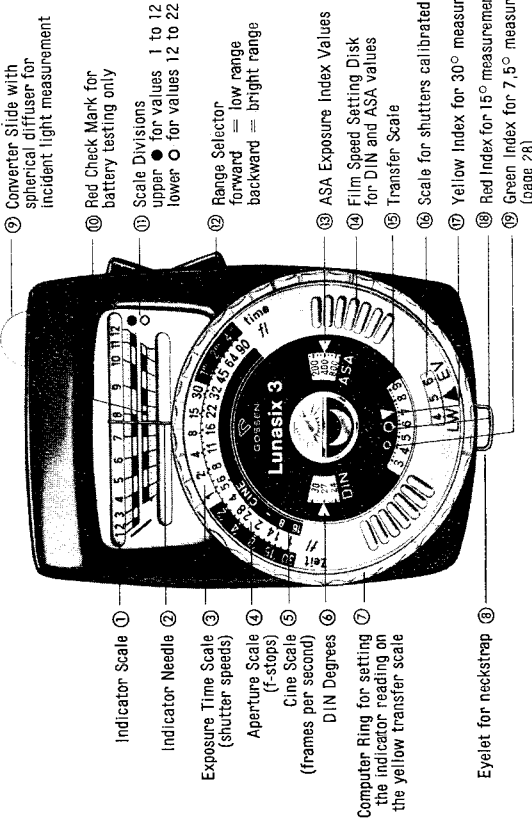


# LUNASIX 3

7909-0092Y1



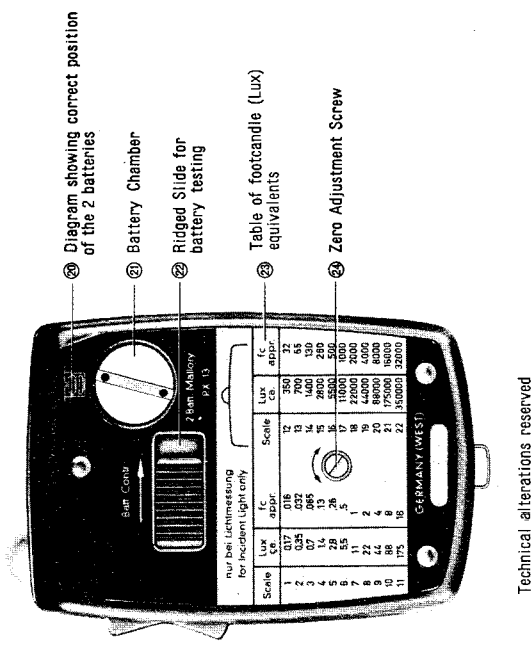
Technical alterations reserved

## CONTENTS

<b>Basic operating instructions</b>	Page	Page	
Setting the film speed . . . . .	2	The personal touch . . . . .	13
Reflected/incident measurement . . . . .	3	Motion and depth of field . . . . .	14
Light measurement (basic) . . . . .	4	<b>Technical appendix</b> . . . . .	18
Light measurement (specific) . . . . .	5	Reading the scales . . . . .	19
Testing the batteries . . . . .	7	Exposure modification . . . . .	21
Testing zero position . . . . .	7	Reciprocity effect . . . . .	23

### The LUNASIX 3 SYSTEM

<b>Thinking and measuring</b>	Expanded capabilities . . . . .	26
Reflected light measurement	8	
Measuring area of the LUNASIX 3 . . . . .	9	
"Perfect" exposure . . . . .	11	



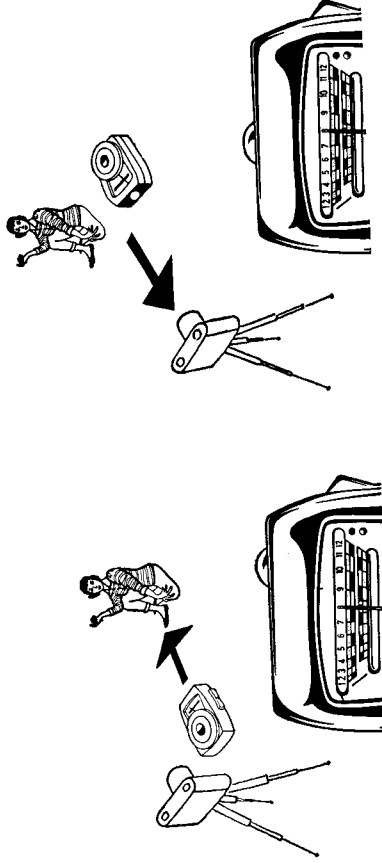
## Introduction to the LUNASIX 3

The LUNASIX 3 is the finest in the line of "SIX" Exposure and Colour Temperature Meters - the SIXTUS, SIXTOMAT, SIXON, BISIX, SIXTINO, POLYSIX and SIXTICOLOR - made by the worldfamous manufacturers

# GOSSEN

LUNASIX 3 is the name given to this finest of all Exposure Meters because the LUNASIX 3 can measure reliably any light from the palest moonlight to the brightest sunlight. And - even more important - the LUNASIX 3 is the first SYSTEM EXPOSURE METER. 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, photography through terrestrial telescopes and for selective and density measurements.

1



**Reflected Light Measurement:** Move the converter slide (9) all the way to the right; this uncovers the round window. The LUNASIX 3 is ready when the converter slide has clicked into position. Point the LUNASIX 3 toward the subject, as indicated by the arrow in the illustration.

**Incident Light Measurement:** Move the converter slide (9) so that the spherical diffuser is centered over the round window. The LUNASIX 3 is ready when the converter slide has clicked into position. The LUNASIX 3 is pointed from the subject towards the camera, as indicated by the arrow in the illustration.

3

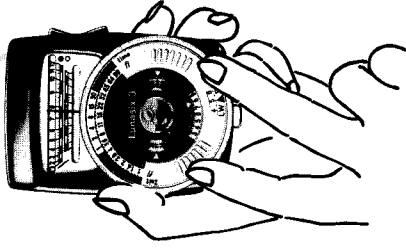
## Basic Operating Instructions

### Setting the film speed

Look up the DIN or ASA Exposure Index of the film in use (you will find it on the film box or film instruction sheet) and turn the plexiglass film-speed setting disc (14) by the raised bars, until the DIN or ASA Index number is lined up against the triangular white marker in the respective window.

You will find a detailed DIN-ASA film-speed table in the technical appendix on page 20.

2



### Light Measurement -- (basic steps)

Press the range selector (12) **backward** and release it when the indicator needle (2) 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 LUNASIX 3 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 LUNASIX 3 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 LUNASIX 3 always shows the correct scale!

After taking the measurement, turn the computer ring (7) until the obtained reading is set at the triangular yellow index (17) of the transfer scale (15). The green and red ring indexes apply only for measurements with the Variable Angle "spot meter" attachment. See page 28.

4

The LUNASIX 3 now gives you complete exposure information in combination of f-stops and exposure times (4 and 3), EV settings (16) or frames per second (5) for motion picture cameras. You will find additional information about all scale values on page 19.

### Light Measurement – more specific

In **reflected light measurement**, the LUNASIX 3 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 colour 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 LUNASIX 3 will read the average brightness of all subjects in a scene.

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

To measure the important areas, get closer to the subject but not so close that your own shadow or that of the LUNASIX 3 falls on the subject. This method is called: **close-up reading**.

In **incident light measurement** – from the subject towards the camera – the LUNASIX 3 measures all the light falling on that part of the subject which faces the camera. Naturally, neither the colour nor the brightness of the subject itself is considered by this measurement.

5

### Testing the Batteries

With normal use of the LUNASIX 3, 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 (12)**. During the battery test, the indicator needle (2) should point to the red check mark (10). 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. Make sure you use only **Mallory PX 625, PX 13** or **Varta 7002** batteries in your LUNASIX 3.

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

The batteries are available at most camera shops.

### Testing Zero Position

To test the zero position of the indicator needle, first remove both batteries from the LUNASIX 3. Then press the range selector (12) forward or backward. The indicator needle should now rest on the check line to the left of the scale divisions (11).

To adjust the indicator needle to the zero check line, turn the zero adjustment screw (24) on the underside of the LUNASIX 3, **while holding down the range selector (12)**.

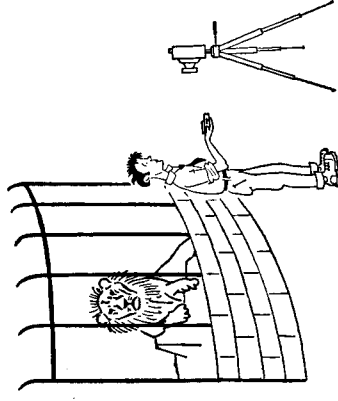
7

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 LUNASIX 3 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 LUNASIX 3 and measure the light exactly opposite to the direction of the camera.

More about this on page 8-11.

6



### Thinking and Measuring

One thing the LUNASIX 3 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 LUNASIX 3, 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 LUNASIX 3.

Above all, you must know how your LUNASIX 3 sees the world that you want to get on your film. This world is made up of many parts, which differ considerably in size, colour and brightness. In the case of **reflected light measurement**, the LUNASIX 3 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 LUNASIX 3 in quite the same manner. If the scene includes a large very bright area – far from the "average" that the LUNASIX 3 would normally calculate with – it

8

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 LUNASIX 3: If there are extensive very bright or very dark areas in the scene, steer the LUNASIX 3 away from them and take the measurement from the "average" parts of the scene. Keep in mind the

## Measuring Area of the LUNASIX 3

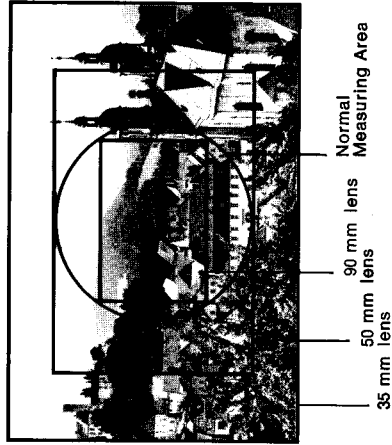
You can see in the viewfinder, or on the groundglass of your camera exactly what will be included in your picture. The LUNASIX 3 cannot orient itself! Of course, you'll want to know what parts of a scene are included in a **reflected light measurement**.

The camera, with your help, selects its "rectangle" or "square"; the LUNASIX 3 covers a measuring "circle". Whatever lies outside of these variously shaped areas remains unseen! But you can easily estimate the size of the LUNASIX 3 measuring area by comparison with the finder or groundglass image. The illustrations on page 10 show the relation for 35 mm cameras (24 x 36 mm) with various focal length lenses, and for 2 1/4" x 2 1/4" cameras, when reflected light measurements are made from the camera position.

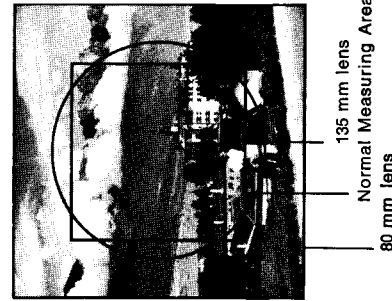
9

The normal measuring area of the LUNASIX 3 corresponds to a light acceptance angle of 30°

For 35 mm cameras (24 x 36 mm)



For 2 1/4" x 2 1/4" cameras



10

The normal measuring area of the LUNASIX 3 corresponds to a light acceptance angle of 30°. Still narrower angles (15° or 7.5°) can be measured when the LUNASIX 3 is used with the Variable Angle "spot meter" Attachment. (See page 28.)

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 LUNASIX 3 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 LUNASIX 3 "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 colour 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 LUNASIX 3! But, when is a scene "perfectly" exposed? – That's not always so easy to

11

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 colour transparency, the darkest portions of a black-and-white print, should still show some detail!

For colour 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 colours.

For black-and-white or colour 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 LUNASIX 3! You will have to compromise with the limitations of the film by exposing a step more or less than indicated by the LUNASIX 3. About "exposure steps" see page 21. However, it is easy to give your LUNASIX 3 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:

12

## 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 colour negative film you will get good negatives almost without exception and without fuss.
- (2) Reversal colour 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 colours. Now, you must remember that the accurate exposure information which your LUNASIX 3 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 LUNASIX 3 exposure readings to the characteristics of your camera, your favorite film, your type of processing, your projector – in other words to **your personal touch**.

13

**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 ( $1/1250$  to  $1/1000$  sec.) and normal motion can be stopped with medium speed ( $1/60$  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 our 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 at 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!

15

Use a reversal colour 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 LUNASIX 3. 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 LUNASIX 3 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 LUNASIX 3 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.

14

## The LUNASIX 3 as an Aid in Good Lighting

With effective lighting you can achieve outstanding pictures, either by dramatically increasing or lowering contrasts. But contrasts should not be overdone, because the film may not be able to cope with them.

**Balance your lighting with the LUNASIX 3:** Take a measurement of the key light, and then of the – weaker – general light. Now, simply compare the two indicator scale readings (f-stops and shutter speeds are not involved in this method): For black-and-white film, the difference between the two readings should not exceed 3 steps; for colour film 2 steps at the most.

If you want to achieve soft lighting with little or no contrast – as in high-key subjects or copy work – arrange your lights so that you get identical meter readings at different areas of the subject and background (if any). This type of lighting is usually preferred in colour photography.

## Night Mood

If you want to retain the character of the night with "darkness" and a minimum of visible detail, simply use a shorter exposure than indicated by your LUNASIX 3; otherwise your "night" scene might resemble a daytime scene. Frequently, however, the "reciprocity effect" produces the same result as a shorter exposure. There are no hard and fast rules about this. To gain experience, you might start off by using, without modification, the exposure times indicated by your LUNASIX 3.

**Reciprocity Effect** For more information, see page 23.

16

## COLOUR

For street scenes at night, in moonlight and for illuminated signs, use daylight film. Scenes illuminated by incandescent light (ordinary light bulbs) demand tungsten film; in borderline cases the daylight type film will usually produce more agreeable colours.

## Snow

It is simpler to use the

### Reflected Light Measurement

In a snow-covered landscape, the measuring circle of your LUNASIX 3 is almost entirely filled by great brightness. The indicated exposure would be too short, particularly when there are people, animals, or trees in the foreground. Exposure modification of  $\frac{1}{2}$  to 1 step should be made.

### Incident Light Measurement

because it indicates correct exposure almost directly. If you want to get special effects - for instance the subtle shadows in the snow - decrease the indicated exposure by  $\frac{1}{2}$  to 1 step. Naturally, in this case, dark foreground will show somewhat less detail and, in colour, have strongly saturated colours.

17

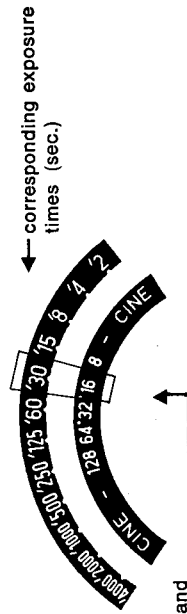
## Reading the Scales

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 etc. are full seconds.

1m 2m 4m etc. are minutes

1h 2h 4h etc. are hours



Cine frames per second and

**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!

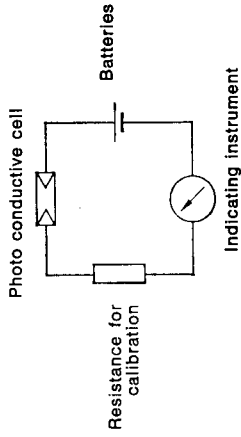
19

## Technical Appendix

### The LUNASIX 3 Principle

Unlike exposure meters whose photoelectric cell consists of a selenium element, the LUNASIX 3 has a photo-conductive cell and is powered by tiny mercury batteries. While a selenium element converts light into electric energy, the photo-conductive cell merely changes its conductivity in the presence of light. The electrical energy which powers the precision mechanism of the LUNASIX 3 to deflect the indicator needle is here supplied by batteries.

Diagram of the LUNASIX 3



18

ASA Degrees	ASA Exposure Index	ASA Degrees	ASA Exposure Index	DIN Exposure Index
1°	6	7°	400	27
1.5°	8	7.5°	500	28
2°	10	8°	650	29
2.5°	12	8.5°	800	30
3°	16	9°	1000	31
3.5°	20	9.5°	1250	32
4°	25	10°	1600	33
4.5°	32	10.5°	2000	34
5°	40	11°	2500	35
5.5°	50	11.5°	3200	36
6°	64	12°	4000	37
6.5°	80		5000	38
	100		6400	39
	125		8000	40
	160		10000	41
	200		12000	42
	250		16000	43
	320		20000	44
			25000	45

The DIN (6) and ASA (13) scales show only the values printed here in bold types; the intermediate values are indicated by dots on the scales.

Doubling or halving an ASA Exposure Index value entails a change of 1 stop. It has the same effect as changing the EV by 1 or the DIN value by 3.