Neue Adresse - New Address

GOSSEN

Foto- und Lichtmeßtechnik GmbH

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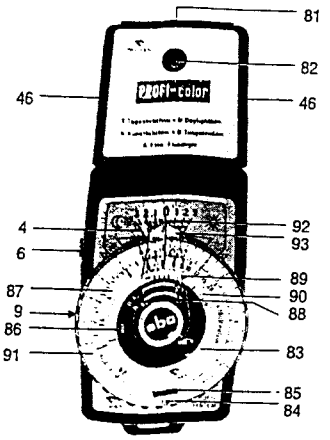
GOSSEN PROFI-color

1 Spherical diffuser of the PROFISIX
4 Indicator needle
6 Measuring button (red)
9 Button for battery test (green)
11 Extension factors
13 EV (exposure value) modificaion scale
16 Black cover for red signal
24 Computer ring
33 Front shield for accessory jacks

(see instructions for the PROFISIX)

46 Ribbed Sides
81 Measuring aperture (flat diffuser)
82 Control lamp
83 Colour Calculator
84 Setting knob
85 Locating aperture
86 Locating mark for colour calculator
87 Colour temperatur scale
88 Symbols for film types
89 Index mark for film types
90 Colour temperature correction (scale of tolerances) (page 35)
91 Filter scale (B = blue filters, R = red filters)
92 Scale value "0"
93 Transparent snap-on pointer



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General indications

All colour films are balanced for a certain type or quality of light, e.g. for daylight or for artificial light. If the light source does not correspond to the colour temperature for which the film is balanced, a blue or red colour cast will result, especially with reversal colour film. Shots taken in the shade, for instance, will have a blue cast due to the blue light of the sky.

These defects can be overcome, however, by using the appropriate colour correction filter. These filters change the "wrong light" to that for which the colour film in use has been balanced.

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Even if you want to illuminate your subject, on purpose, with the "wrong type of light" for obtaining special colour effects, it will be neccessary to measure the colour temperature of the light used.

Light consists of rays with different wave lenghts. The different wave lengths have their characteristic colours in the spectrum and are being identified by the colour temperature expressed in Kelvin (K). Please refer to page 44 for a more detailed explanation.

The PROFI-color attachment allows you to take colour temperature readings of incident light with your PROFISIX. In addition, your film's colour sensitivity can be set into the

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PROFI-color calculator and values of correction filters for the light being measured can be determined. Proper results can be obtained with any continuous spectrum sources such as daylight, tungsten lamps, etc. Non-continuous sources such as fluorescent lamps will not give proper readings with the PROFI-color.

On pages 54 to 58, we are describing the internal circuitry and the operating of the attachment. Before actually starting measuring with your PROFI-color you should carefully read these instructions and also the operating manual for the PROFISIX itself. Once you are completely familiar with the general operating of the unit, the check list on pages 8 and 9 will do.

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On pages 22 to 31 we are showing you some examples of how to use the unit correctly.

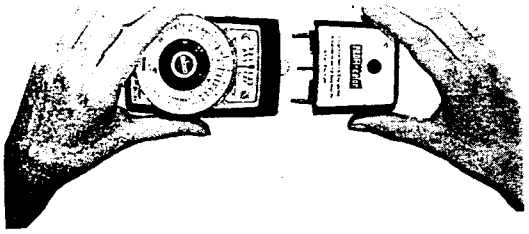
Operating check list

1. Attach PROFI-color and color calculator to the PROFISIX (please refer also to page 11).
2. With the setting knob (84) set the index mark (89) opposite the symbol (88) corresponding to the film type you are using.
3. Press measuring button (6) of the PROFISIX and release it (operate the green button for battery test from time to time (9)).

4. While the control lamp is on (82) the unit is ready for measuring.
5. Point the flat measuring aperture (81) of the PROFI-color towards the light source to be measured.
6. Take a reading, null the indicator needle (4) by rotating the computer ring (24) without changing the measuring direction.
7. The required filtration can be read on the filter scale (91) and the colour temperature on scale (87) opposite the "0" mark of the meter (9).

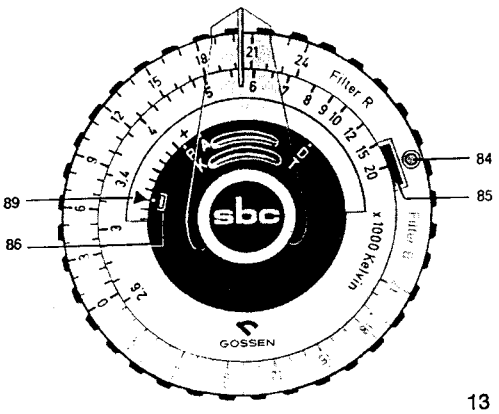
Attaching to the meter

Remove detachable front shield (33) covering the accessory jacks from your PROFISIX. With the hemispherical diffusor (1) in the centre of the PROFISIX align the PROFI-color with the front of the meter so that the plugs



on the attachment are opposite the jacks in the meter and the recess in the attachment is opposite the hemisphere. While holding the PROFI-color by its ribbed sides, push the accessory straight on to the meter.
Once the PROFI-color is attached, the internal circuitry of the PROFISIX will be automatically programmed.
The film speed set at the PROFISIX does not have any effect when measuring with the PROFI-color.
A special calculator dial (83) and a snap-on transparent pointer (93) are supplied with the PROFI-color and are stored in a special compartment of the leather carrying case.
To attach this supplementary calculator dial to the main computer dial of the meter, first

set the colour temperature index mark of the supplementary calculator opposite the locating mark. You will note that when in this position, a small aperture in the calculator is open.
Next make sure that the exposure correction dial of the PROFISIX is set to zero, i.e. the red signal must be entirely covered (16).
Align the supplementary calculator dial with the PROFISIX computer dial so that the small aperture of the calculator dial is directly over the exposure correction signal of the meter. Press the dial straight down until it locks into place. Once the calculator dial (83) is attached in this way, the combined unit PROFISIX + PROFI-color is ready for operation.



To remove the calculator dial after use, press, from below, at the sides against the calculator dial where it extends from the meter body and lift it off.

Setting the film type

Before using the PROFI-color, the calculator dial must be set for the colour balance of the film being used. With the setting knob (84) turn the dial until the index mark (89) is opposite the appropriate film symbol (88). The meaning of the film symbols is printed on the back of the PROFI-color. Please refer to page 39 for more details.

If you are using a film which is laid out for a colour temperature different from those listed on page 32, you can set the film's colour temperature into the dial by setting the black "0" of the filter scale opposite the desired colour temperature. In the illustration on page 36 that colour temperature value would be approx. 5200 K.

Battery test

As the PROFI-color is being energized by the battery of the PROFISIX meter, the battery test should be carried through with the PROFI-color mounted on the PROFISIX.

Press the red measuring button (6), hold down the green battery test button (9). The indicator needle (4) should now come to rest in the green area marked "BATT". If not, the battery must be replaced.

(Please refer to page 5 of the PROFISIX instructions.)

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Taking a reading

You **must** in all cases measure the light which is falling on the most important area of your subject, this is **from the subject towards the light source**. Briefly press the measuring button (6). As long as the control lamp (82) is on, the unit will continue measuring (approx. ½ minute). Point the flat diffuser (81) of the PROFI-color in the direction in which you are measuring, i.e. towards the light source. Note that the flat diffuser must be evenly illuminated. If part of it is shaded, incorrect readings will result.

Then null the meter – **without changing the direction by moving the unit** – by setting the indicator needle (4) exactly on the zero mark (92).

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When using the snap-on transparent pointer (93), hold the colour calculator so that it cannot move, rotate the snap-on pointer until its centre line is precisely above the scale mark "0". On the filter scale (91) you can now read which filter to use.

At the same time, the colour temperature of the light you measured can be read in Kelvin on the colour temperature scale (87).

Example (Illustrated on page 19)

Film used: daylight (D/T)
Filter: R 3
Colour temperature: 7000 K

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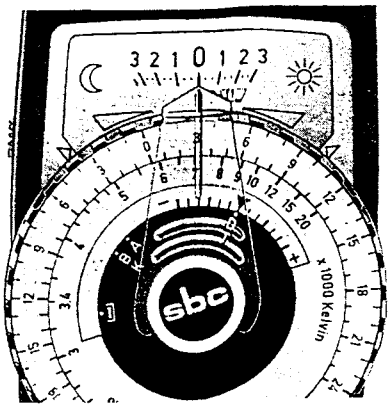

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Note that the blue figures on the colour calculator signify blue filters, the red ones red filters. Page 48 and the following ones will explain those figures in detail. You will find the commercially available filters corresponding to those figures on page 40 and following ones. The Kodak filter types are printed on the back of the PROFI-color.

Mounting the filter

Attach the filter indicated by the PROFISIX + PROFI-color to the camera lens. If you do not have available the filter indicated (for example R 9), use the next weaker filter. A filter value indicated on the calculator can also be obtained by using together several filters, their values will add up, for example R 6 + R 3 = R 9.

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Filter factors (extension factors) or extension values

When using filters on the camera, the exposure time must be extended. The extension factors or extension values are normally indicated on the filter mount, for example "x4" or "2/3". The dial marked "VF x/EF" (11) or LW/EV (13) of your PROFISIX allows you to programme these extension factors or values into your PROFISIX. Proper results can be obtained and the exposure time indicated directly used without further calculations.

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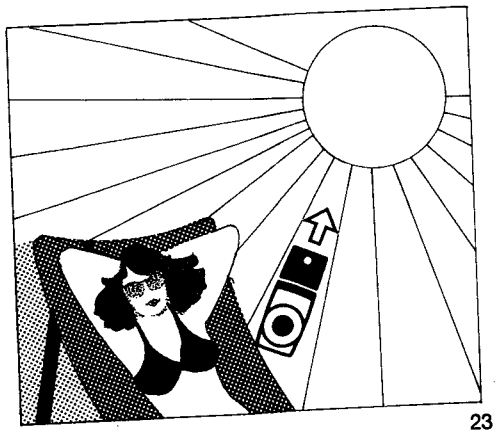
Examples for measuring

Subject in sunlight:

Point unit towards the sun. Note that the colour temperature of the sun's light will change in the course of the day. Do not eliminate special sunlight effects creating moods, for example reddish light at sunset, by using colour balancing filters (see also page 33).



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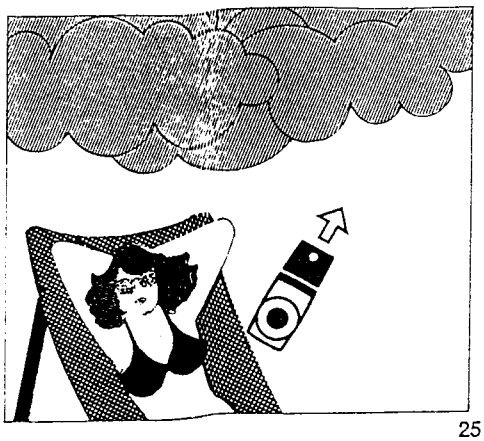
Overcast sky (no sun):

For measuring point the PROFI-color at a slanted angle upwards towards the sky. Note that with drifting clouds (also with an entirely clouded sky): the colour temperature may change very rapidly, producing different readings. Therefore the picture should be taken very quickly after the measuring.



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Subject in the shade:

In this instance, the colour temperature will be especially high. Point unit at a slanted angle towards the sky and take care not to get any direct sun light on the flat diffuser (81), as that would cause a too low colour temperature reading.

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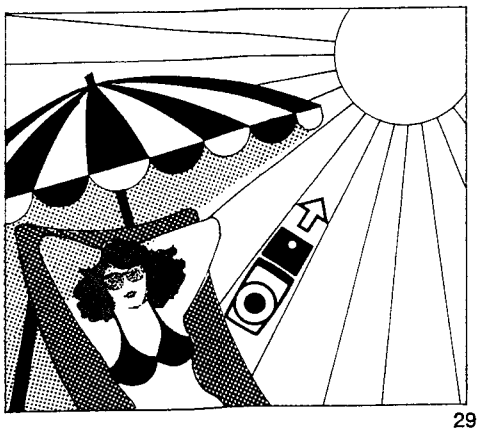
Subject both with sun and shade:

Measure the light falling on the most important area of your subject. In most cases, this will be the light of the sun. With such light conditions, a colour cast will practically be inevitable in the areas you did not measure. This is due to the very great differences in colour temperature and could be avoided only by using additional artificial light. The colour temperature of the additional lamps would have to match that of the main light source.



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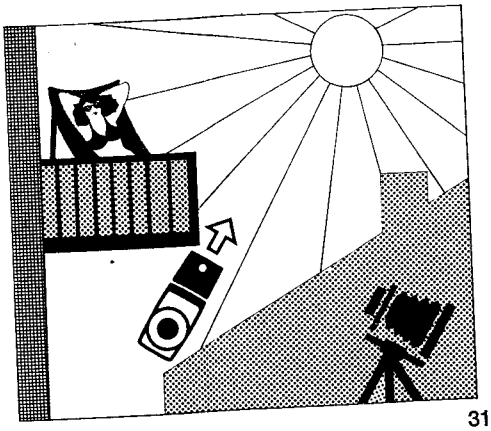
Subject not accessible:

If subject is not accessible, measure from a substitute point getting the same light as your subject.



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Film types
The most popular type of colour film is the **Daylight colour film** (PROFI-colour symbol T, english D) and the best colour reproduction is obtained under conditions where the colour temperature is approximately 5,8000 K. This type of film can also be used with electronic flash and blue flash bulbs.
Colour films for **artificial light** are available in two types:

B or K for pictures with photo lamps with a colour temperature of approx. 3,200 K

A for pictures with photo lamps with a colour temperature of approx. 3,400 K.

If a different colour temperature will produce

better colour prints, set the black "0" of the filter scale (91) to that colour temperature value.

Use your filters correctly!
The colour filters indicated by the PROFI-color convert the colour temperature of the measured light to that for which the colour film is balanced.
The colour balancing filters indicated by the PROFI-color correct only those colour casts which would have occurred, if the film were used under colour temperature conditions for which it was not balanced. The filters naturally do not compensate colour casts due to other causes, for example too long storage of the film or incorrect processing of the film.

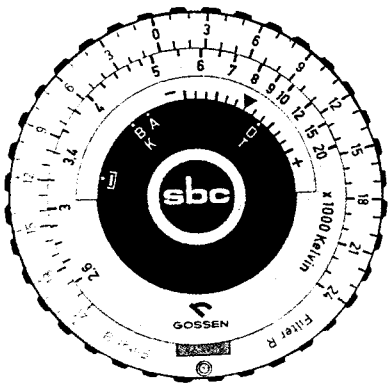
If you want to create a special mood, for example with sunset scenes, use a filter weaker than the value indicted by the PROFI-color or no filter at all, depending on the effect you want to create or your experience.

In case of doubt, use the next weaker filter!

Colour balancing filters of different manufacturers, although bearing the same number (i.e. the same R or B value), may look different and also have **different exposure extension factors.** Therefore the instructions supplied by the manufacturers with the colour balancing filters should be carefully studied. Pictures taken at conditions where different types of light are mixed may create problems.

As each colour film is balanced for a particular colour temperature, such mixed light cannot be coped with by the film.

Preprogrammed colour temperature correction
Filters from different manufacturers may have a different affect on films produced by different makers. In case such difficulties occur, corrections can be made by using the lines on either side of the colour index mark (90).
Each mark represents a shift equivalent to one decamired value and are marked "+" and "–". A change to the "+" side will result in warmer or redder pictures, while changes to the "–" side will result in cooler or bluer pictures.



Example:
You obtained a reading of R 4 and found out that when using a filter R 3 with a certain film type a blue colour cast will result. With the same light conditions, you will then take pictures with the filters R 6 and R 9. The picture taken with R 6 proves to be the best. This means that a difference in filtration of R 2 is existing which you can preprogramme on the colour calculator (83).
Set the symbol of the film you are using (88) with the setting knob (84) opposite the second scale mark on the "+" side of the colour temperature correction scale (90). This is shown in the illustration on the opposite page. Thus you correct the film type setting by +2 filter values ((3 + 2 = R 5). Note that

this correction will be valid as long as you continue working with the same film type and filter.

Designation of filters
The filters of the firms listed below are indexed in the same way as the filter scale on the PROFI-color:

Agfa-Gevaert
B+W-Filterfabrik
Cenei
Göttinger Farbfilter
Hama
Hasselblad
Lifa
Rollei-Werke
Summer ("Heliopan")

Normally a filter set of two weak R filters and one weak B filter will be sufficient for the amateur.

Examples: R 3, R 6 and B 3
R 2, R 5 and B 2

Two or more filters can be used together to obtain additional filter values, for example R 3 + R 6 = R 9.

The following tables show the correspondence between the readings of the PROFI-color and Agfa and Kodak-Wratten filter designations:

PROFI-color reading	Agfa filters
B 1,2	CTB 1
B 2,4	CTB 2
B 4,8	CTB 4
B 9,6	CTB 8
B 14,4	CTB 12
B 19,2	CTB 16

These filters increase the colour temperature.

PROFI-color reading	Agfa filters
R 1,2	CTO 1 B
R 2,4	CTO 2 B
R 4,8	CTO 4 B
R 9,6	CTO 8 B
R 14,4	CTO 12 B
R 19,2	CTO 16 B
R 24	CTO 20 B

These filters reduce the colour temperature.

PROFI-color reading	Kodak-Wratten filters
B 3	82 B
B 6	82 + 82 C
B 9	82 C + 82 C
B 12	80 B
B 15	80 B + 82 A
B 18	80 B + 82 C
B 21	80 B + 82 B + 82 C

These filters increase the colour temperature.

PROFI-color reading	Kodak-Wratten filters
R 1,5	1 A
R 3	81 B
R 6	81 EF + 81
R 9	85 C
R 12	85
R 15	85 B
R 18	85 B + 81 B
R 21	85 B + 81 EF
R 24	85 B + 81 EF + 81 D

These filters reduce the colour temperature.

Colour temperature

The term colour temperature is a way of expressing the special energy distribution of light. Light is composed of different wave-lengths. The different wave-lengths have their characteristic colours in the spectrum. From the shorter to the longer wave-lengths the colours appear as follows: blue, green, yellow, orange, and red. The proportion of rays (and therefore the amount of any particular colour) in the various spectral regions differs in accordance with the type of light. For instance, the light from incandescent lamps contains more red than blue. In daylight the blue rays are predominant.

The "spectral composition" of light has a great influence on the colour rendering of the colour film. For instance, a photograph taken in the shade under a blue sky will result in a blue tinge on the picture. The human eye is not able to judge critically the colour of light (that is to say its spectral composition) because our subjective vision constantly accomodates itself to the prevailing colour of light. For this reason we need an "objective" measuring instrument which measures the respective colours. This "composition of the light" which is so important in colour photography is known as "colour temperature".

The relation between "colour" and "temperature" is defined by the characteristics of the light of an object heated until it glows. With such heated objects the spectral composition of the light (the "colour" of the light) is directly proportional to the temperature. This temperature is called the "colour temperature" and is expressed in Kelvin = K. Kelvin temperature is equivalent to Celsius temperature + 273 (K = °C + 273).

The expression colour temperature is also used for light not directly emitted by glowing objects. When measuring a colour temperature of 10,000 K for a blue sky, you could then assess that a glowing object at 10,000 K would emit the same light as the blue sky.

The PROFI-color allows you to take colour temperature readings of all types of lights important to photography.

Proper results can be obtained with any continuous spectrum sources such as daylight, tungsten lamps etc. Non-continuous sources such as fluorescent lamps, sodium vapor lamps, mercury vapor lamps as well as all coloured or tinted light sources will not give any proper readings with the PROFI-color. The same is true also for certain types of "mixed light". This problem exists when measuring and when taking the picture, because the types of light mentioned do have a spectral composition different from that of the light of glowing objects.

The filter scale

Colour temperature is measured not only in "Kelvin" but also in "mired" values:

$$\text{mired value} = \frac{1{,}000{,}000}{\text{K value}}$$

MIRED = MIcro REciprocal Degree.

In practice smaller values are used, and this smaller value is known as the "decamired" value. To obtain the decamired value: divide the mired value by 10, i.e. 10 mired = 1 decamired.

Example:

5,000 K = 200 mired = 20 decamired.

These mired and decamired values permit the definite identification of the filters, as one and the same filter will always change the colour temperature by the same decamired value, regardless of how high the basic colour temperature was. The "conversion value" expressed in K is, however, in each case a different one.

Example:

A filter R 6 reduces the colour temperature by 6 decamired, this means,

for example 8,900 K (11.2 decamired)
to 5,800 K (17.2 decamired)

or 3,960 K (25.3 decamired)
to 3,200 K (31.3 decamired)

In both cases, the decamired value difference is the same – i.e. 6, though the difference in K is different (3,100 K and 760 K).

The figures on the filter scale (91) of the PROFI-color signify decamired values. At scale mark "0" (92) the decamired difference between the colour temperature measured and the colour temperature value for which the film is balanced is indicated.

For instance, the illustration on page 19 shows a filter reading of R 3 and a colour temperature of 7,000 K. The index mark for the film (89) is set to D and T, this meaning an average value of 5,800 K for which daylight films are being balanced. That value is opposite the black "0" on the colour temperature scale (87); the decamired difference being 17.2 decamired (5,800 K) minus 14.2 decamired (7,000 K) = 3 decamired, corresponding to a filter R 3.

The filters B (bluish) raise the K value of the colour temperature and the filters A (reddish) will reduce it.

PROFI-color specifications

Under normal measuring conditions the reading tolerance is smaller than ± 1 decamired. To assure the a. m. reading accuracy, the following minimum light intensities are necessary. You should use your PROFISIX to check the intensity of the light, while using the incident light method or attaching the PROFI-lux.

For incandescent lamps, including photo lamps and daylight

light intensity read on the lux scale of the PROFI-lux	reading of the PROFISIX, when set at 18 DIN
approx. 10 lux	approx. EV 1

When using the PROFI-lux attachment together with the PROFISIX, these values can be read directly on the circular lux-scale. With light intensities from these minimum values up to approx. 100,000 lx, the reading of the PROFI-color is practically independent of the light intensity. If the intensity of the light being measured goes beyond those levels, reading errors may occur.

Block diagram and circuitry

The **block diagram** showing the **functioning principle** of the PROFI-color will explain what is happening within the unit while you are operating it. After the measuring button of the PROFISIX is pressed, the control lamp (F) will come on. Now the PROFI-color will be in a state ready for measuring for approx. 1/2 min. After that period the PROFISIX switches off automatically.

The light to be measured enters through the measuring aperture (flat diffuser of the PROFI-color) into two separate compartments and produces, after repeated filtration, the currents J_{red} or J_{blue} in the photodiodes A + B. These currents are proportional to the red

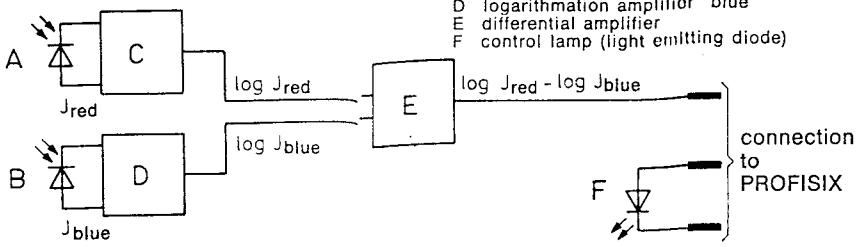
and blue components of the light being measured. The logarithmation amplifiers C + D will turn these currents into logarithmic currents log J_{red} and log J_{blue}; they are then fed to the differential amplifier E.

At its output side a current is supplied which is the difference of the two currents log J_{red} – log J_{blue}. This difference being directly proportional to the decamired values of the filter scale (91).

The current (log J_{red} – log J_{blue}) is lead through the jacks to the PROFISIX, passes through the amplifying circuit and causes the deflection of the indicator needle.

Subject to modifications

Block diagram
A silicon photo diode (sbc) "red"
B silicon photo diode (sbc) "blue"
C logarithmation amplifier "red"
D logarithmation amplifier "blue"
E differential amplifier
F control lamp (light emitting diode)



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If repair or adjustment should ever become necessary, send your PROFI-color, carefully packed, to:

~~GOSSEN GMBH~~
~~Servicestelle B~~
~~Nägelsbachstrasse 25~~
~~D-8520 Erlangen~~

or to the GOSSEN agency in your own country.

To expedite handling please send your PROFI-color **only — without case and neck strap or other accessories.**