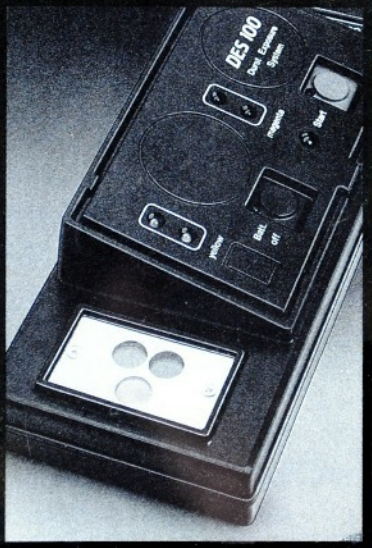
English

Durst
DES 100 CA
Information booklet



Durst

DES 100
Durst Exposure System

Modular metering and control system

COLOR ANALYZER

The DES 100 CA is a colour analyzer for the determination of the correct filtration setting when printing colour negatives.

The DES 100 CA analyzer and the remaining DES 100 components take advantage of the latest developments of our professional enlarger and printer range. The DES 100 CA is based on a system that is not, for the first time ever, part of a particular unit. Its unique design includes SFC, or low correction which, if compared to „traditional" metering systems, ensures simpler operation and a substantially higher number of first-class prints.

In this information booklet you will find a full description of this analyzer's scope of application as well as detailed indications on operation and function of its new metering technology.

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Durst DES 100 CA COLOR Analyzer

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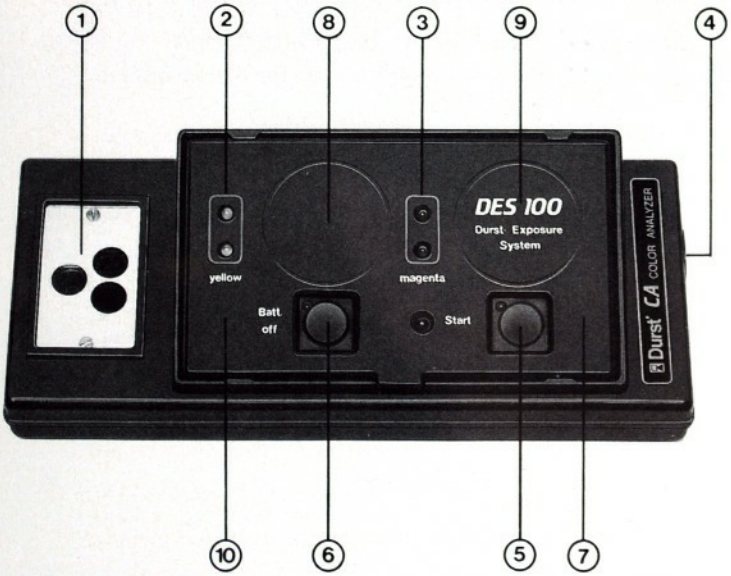

SCOPE OF APPLICATION

The DES 100 CA COLOR ANALYZER is a colour metering unit to determine colour filtration when enlarging colour negatives and colour transparencies.

Thanks to the modular design of the DES 100 metering and control system and its voltage supply via battery (no cable connections), the DES 100 CA is the perfect complement to all timers/densitometers or automatic timers for building a complete exposure system.

Since the basic component of the entire DES 100 system, i.e. the DES 100 AT AUTOMATIC TIMER, takes density readings as well, the DES 100 CA COLOR ANALYZER has been designed exclusively for the determination of filtration values.

TECHNICAL DATA

Metering cells	: 3 silicon diodes
Voltage supply	: 9 volt block battery (alkali - recommended type MN 1604)
Repeatability of colour balance	: 0.02 D
Metering system	: Integrated (diffused) readings

Starting up

Open the battery compartment	Place the unit on its back and swing inwards battery compartment cover.
Insert battery	Clip 9 volt block battery to connection lead and insert battery in space provided for this purpose.
Close battery compartment	Swing cover over battery compartment.

Switch on analyzer

To switch on the DES 100 CA, press the Start key (the unit will be switched, simultaneously, to white light metering for a duration of two seconds - see chapter ,,Metering principle of the 100 CA analyzer'').

Note: The DES 100 CA switches off automatically after two minutes; you can however switch it off immediately after its use by pressing the ,,Battery off'' key.

The following chapters will give you the opportunity to familiarize yourself with the DES 100 CA colour analyzer in a simple manner, in order to let you take advantage of its possibilities when using it in your darkroom.

This booklet is made up by a descriptive section giving general information and by step-by-step instructions for the execution of the various working steps. The step-by-step instructions list the most important steps on the left so that the entire sequence can be checked at a glance, whereas on the right the steps mentioned on the left are explained in detail as an aid to less skilled users.

Calibration and metering methods

THE CALIBRATION OR PROGRAMMING OF METERING INSTRUMENTS

The calibration of densitometers or colour analyzers is just the recording of a certain ,,light value'', i.e. of a particular amount of light in the case of densitometers and of a particular light colouring in the case of colour analyzers.
This light value is metered on the baseboard and it is influenced by several factors: lamp, film type, paper emulsion, chemicals and last but not least, enlarging paper processing.

Different calibrations

Since all these factors differ considerably from one user to the other, a particular ,,calibration'' will be required for each enlarger. This calibration is nothing but a recorded ,,light value'' to be used as a starting point for the following metering se-

quences. In the case of the DES 100 CA analyzers and all similar colour metering units, test prints must therefore be made to determine the light colouring yielding the correct colour in the print. This light colouring will then be recorded. This record is finally also the **calibration** for the materials being used (film and paper type, chemicals, etc.).

Basic values

We obtain this ,,light value'' because of particular settings on the enlarger: filtration, lens aperture, exposure time and magnification factor will be influencing this light value. The amount of light and its colouring are furthermore depending also from the negative placed in the negative carrier and through which the light is forced to travel in order to reach the enlarging paper. These values are generally known as **basic values**, basic filtration or working filtration.

Prerequisite for a correct calibration

The prerequisite for the determination of correct basic values is the use of a properly exposed negative or transparency (no under- or overexposures) having a proper colour balance (each of the three primary colours blue, green and red should be represented to the same degree).

Metering or analysing

Once the metering unit has been calibrated (recording of basic values), all following negatives must be metered or analysed. In the case of the DES 100 CA the amount of light being transmitted through no matter what kind of negative nto the baseboard will be compared to the ,,recorded amount of light'' and matched to this value by turning the filter control knobs on the colour head, i.e. the value yielding the correct light colouring in the print.

METERING METHODS

The possibilities range from spot readings, integrated readings, spot-emphasized integrated readings to multi-spot readings; spot and integrated readings certainly being the most popular metering methods.

Spot readings

When using the spot reading method, a correctly exposed print will be made first. Then a particular spot will be metered and the corresponding value recorded. When analysing the following

negatives one must however make sure to place the metering cell on a similar spot. This method ensures excellent results provided the right metering spot is selected, which can be a little difficult, especially for beginners.

Integrated readings

Integrated readings do not require the difficult selection of the correct metering spot because the metering cell will be placed always precisely in the middle of the projection, i.e. underneath the lens. By swinging a diffusing screen underneath the lens, the light exiting from the lens will be scattered, so that the metering cell will be struck by an averaged amount of light corresponding to the density of the negative. The integrated reading method yields excellent results as long as the three primary colours blue, green and red are equally distributed over the negative.

METERING PRINCIPLE OF THE DES 100 CA ANALYZER

Thanks to SFC and SBC technique taken over from Durst printers, the DES 100 CA COLOR ANALYZER metering system won't be affected by the faults listed here below. These faults are quite frequent when relying on traditional metering methods:

a) wrong metering spot selection when using the spot reading method
b) poor balancing due to channel switching
c) overcorrection of negatives having subject failures when using the integrated reading method

To point a):

The difficulty concerning metering spot selections is due to the fact that the metering cell must be placed always on a spot of the same density and colour. Whilst this metering spot selection is relatively simple when printing black-and-white negatives, this selection becomes very difficult when printing colour negatives, particularly if the same spot won't be available after a negative/subject change.
This problem could be avoided by including a grey card with each shot, but this solution requires too big an effort.

Integrated readings with DES 100 CA

The DES 100 CA has been designed for integrated (diffused) readings. Faults caused by wrong metering point selection are thus eliminated from the beginning (see also point (c).

To point b):

With some metering systems only one colour channel can be balanced. After having it balanced one has to switch to the next channel for balancing, etc.

In cases of substantial filtration changes or voltage fluctuations it may become necessary, due to the changed amount of light, to correct the previously balanced channels.

The entire balancing sequence must therefore be repeated, which is an expenditure of time and energy and which may often cause faulty results.

The DES 100 CA with SBC technique

SBC stands for ,,simultaneous balance control''. On the DES 100 CA this is made pcssible by the three metering cells (one each for each third of the blue-green-red colour spectrum). One glance will therefore be sufficient to check whether all light scales glow uniformly, i.e. whether all channels are correctly balanced. The SBC technique doesn't therefore just increase operating ease, for it also reduces sources of errors to a minimum.

To point c):

In conjunction with conventional metering systems, the integrated reading method ensures good results as long as the negative or transparency being printed is a balanced one, i.e. as long as blue, green and red areas are equally distributed over the negative. The only ,,colour'' that may predominate in the negative is grey, for grey is nothing else than a mixture of the three primary colours blue, green, red or of the three complementary colours yellow, magenta and cyan (check the colour theory section of your enlarger's instruction manual).

If however a colour should predominate in the negative (e.g. sailing boat on blue water underneath a blue sky), the negative's colours won't be mixed into a neutral grey value by the diffusing screen, so that a predominant colour would result (predominant colour caused by subject failure).

Conventional analyzers ,,see'' the predominant colour and try to compensate for it, which leads to a complementary colour cast in the print (a yellow cast in the case of the above example). Since the average number of negatives having a predominant colour is higher by far than the number of balanced negatives, analyzers used in conjunction with integrated readings yielded only a limited amount of good prints.

In order to ensure good results even with the use of the much simpler integrated reading method, the DES 100 CA analyzer features SFC technique, which has already been successfully used in professional units for many years.

The DES 100 CA with SFC technique

SFC stands for ,,subject failure compensation''. SFC is based on a double metering sequence, for each negative is metered once with white light and once with the filters being in the light path. Thanks to this comparative metering sequence the analyzer will be able to ,,realize'' whether the negative being metered has a subject failure. The latter is then corrected at 50%, i.e. the correction values are only half of what they would be in the case of an analyzer without SFC technique. Such a ,,100%'' correction would cause a colour cast in the complementary colour of the predominant colour.

If used in conjunction with integrated readings, the SFC technique ensures simple operation and a high number of first-rate prints obtained at the first try, which is not the case for conventional analyzers used under the same conditions.

The DES 100 CA in the darkroom

Suitable negatives or transparencies for the calibration of the DES 100 CA

The ,,calibration negative'' or ,,calibration transparency'' mustn't be under- or overexposed and it will have even colour distribution, i.e. the three primary colours blue, green and red are evenly distributed over the negative, so that none of the colours will predominate. The calibration negative or calibration transparency should furthermore include an area of neutral grey which is of great help when assessing colour casts and density deviations.

Such calibration or test negatives and transparencies are commercially available. They are usually made up by a test negative or test transparency and the corresponding reference print matching the negative or transparency. ,,Durst TESTSET 35'' are kits consisting of ideal films of the most popular makes, to be used for calibration purposes. Test sets available from other manufacturers can also be used as long as they meet the requirements specified above.

Negatives and transparencies of such test sets must obviously be of the same make as the negatives or transparencies to be printed later on. A prerequisite for the determination of correct basic values and therefore a correct calibration is the necessity that the calibration negative or calibration transparency have exactly the same mask as the negatives or transparencies to be printed later, i.e. it shouldn't just be of the same type (manufacturer, sensitivity rating) but also be processed by the same lab, since also processing will influence the film mask up to a point. The above conditions should be taken into account whenever

possible, but we have found that good results can be obtained even with negatives or transparencies processed in different labs.

There is however a simple way of avoiding the problem of differing film masks, namely by making one's own calibration negative or calibration transparency:

Making the ideal calibration negative or calibration transparency

A simple way of getting an ideal test negative or test transparency is making a reproduction of a neutral grey area. For this you may use a grey area being already available or you may make a photograph, using your favourite film, of a colour chart containing a grey area. As long as you process this film (or have it processed) exactly as your other films, you will be getting a test negative or test transparency meeting your requirements fully.

Note: Test negatives or test transparencies should ideally be made with diffused daylight (under cloudy skies). If however the larger proportion of your negatives or transparencies has been made with the aid of a flash unit, also the calibration negative or calibration transparency should be made using a flash unit (to avoid reflections incline the original to be photographed).

DETERMINING THE BASIC CALIBRATION

Factory calibration

The DES 100 CA analyzer is supplied with a Durst factory precalibration. This calibration yields faultless results when using Kodak VR 100 film, Kodak paper and Kodak EP 2 chemistry. Factory or precalibration values are noted on the red calibration card underneath the unit cover. Since many other factors (see chapter „The calibration or programming of measuring instruments") may influence the correct calibration, we assume that this precalibration is going to need a correction in order to ensure proper colours in the prints made in your darkroom. The following clearly laid out working steps will show you how to match the precalibration to the materials you are using in your darkroom and how to arrive at „your" calibration:

Set up enlarger for the first exposure	Place test or calibration negative in negative carrier. Select a medium magnification factor. Focus.

Note: Same procedure both for negatives and transparencies.

Set to factory calibration values

Remove unit cover from analyzer. Turn calibration controls until arrows match the values shown on red calibration card.

Replace unit cover

① Taking a colour reading of the negative

Place the DES 100 CA on the baseboard

Place the analyzer on the baseboard (or masking frame) so that the metering cells are exactly underneath the lens.

Open lens aperture

Attention: Colour readings are to be made at the largest aperture always

Swing diffusing screen underneath lens

Take a white light reading

Use white-light lever to swing colour filters out of light path. Press the Start key (red) for white-light reading.
Attention: If the Start key has been pressed already before, same must be pressed again in the white-light mode (filters are out of light path).
(Red LED lights up during white-light metering phase: 2 sec. approximately).

Swing filters into light path again

Swing in the colour head filter as soon as the red LED goes out.

Analyse negative

Turn colour head yellow and magenta filter knobs until the analyzer's yellow and magenta light scales light up uniformly

Note: If in extreme cases a cyan filtration should become necessary, either the yellow or magenta filtration will be at zero. Increase the cyan filtration until the light scale of the filter being at zero lights up. Balance then the second light scale with the corresponding filter.

Close lens aperture

Stop down lens aperture three or four times (to f 8 or f 11).

Determine negative or transparency density

1st possibility:

In the DES 100 AUTOMATIC TIMER or any other density metering unit is used, take the reading as explained in instruction manual.

2nd possibility:

If a timer without density metering facility is used, make density test exposure series using different exposures (e.g. 2, 4, 8, 16 seconds).

② Making an exposure

Make a test print

Swing diffusing screen out of light path.
Remove analyzer from baseboard.
Switch off continuous light
Place enlarging paper on baseboard or masking frame and expose.

Print to be processed, rinsed and dried

Judge print

Check whether print has correct colours and density.

Note: Colours can only be judged if the density is more or less correct, for a substantial density correction results in a colour shift.

1st possibility:
Correct colours (and density)

In this case no manual corrections will be necessary. So disregard the following working steps until chapter ⑤ **Analysing other negatives.**

2nd possibility:
Wrong colours (and/or density)

In this case ,,manual corrections'' will have to be made until a print of correct colour and density is obtained; the basic values that have been determined can be recorded only after that (calibration for your darkroom). To do this follow the working steps listed here below:

③ Correcting the print

Correct colour (and density) (see following table)

Density corrections and their effects when printing black-and-white or colour negatives

Density in print	Correction on timer	Effect in print	Effect in print of over-correction
Print too light	Increase exposure	More density	Print too dark
Print too dark	Reduce exposure	Less density	Print too light

Filter correction effects when enlarging colour negatives

Colour cast in print	Required correction on colour mixing head	Effect in print	Effect in print of over-correction
Yellow cast	+ Yellow	Less yellow	Blue cast
Magenta cast	+ Magenta	Less magenta	Green cast
Red cast	+ Yellow/ + magenta	Less red	Cyan cast
Cyan cast	+ Cyan or − yellow/ − magenta	Less cyan	Red cast
Blue cast	+ Magenta/ + cyan (= blue) or − yellow	Less blue	Yellow cast
Green cast	+ Yellow/ + cyan (= green) or − magenta	Less green	Magenta cast

Density corrections and their effects when printing colour transparencies

Density in print	Correction on timer	Effect in print	Effect in print of over-correction
Print too light	Reduce exposure	More density	Print too dark
Print too dark	Increase exposure	Less density	Print too light

Filter correction effects in enlargements from colour transparencies

Colour cast in print	Required correction on colour mixing head	Effect in print	Effect in print of over-correction
Yellow cast	+ Magenta/ + cyan or − Yellow	Less yellow	Blue cast
Magenta cast	+ Yellow/ + cyan or − magenta	Less magenta	Green cast
Red cast	+ Cyan or − yellow/ − magenta	Less red	Cyan cast
Cyan cast	+ Yellow/ + magenta or − cyan	Less cyan	Red cast
Blue cast	+ Yellow or − magenta/ − cyan	Less blue	Yellow cast
Green cast	+ Magenta or − yellow/ − cyan	Less green	Magenta cast

For colour corrections the colour mixing head has three built-in filters:

(1) Yellow (Y)
(2) Magenta (M)
(3) Cyan (C)

The other filter colours (red, green and blue) are obtained by combining two filter colours in the colour head.

Red:
By setting equal values of yellow and magenta

Green:
By setting equal values of yellow and cyan

Blue:
By setting equal values of cyan and magenta

For example:
10 red = 10 yellow + 10 magenta

Before you use these filters or filter combinations you must know something of their effect. So remember the following filter rules:

Rule 1
A colour cast in an enlargement is removed by a filter or filter combination of the same colour.

Rule 2
Excessive correction causes a cast in the complementary colour; reducing that filtration again restores colour balance.

Rule 3
Use only one or two, never three filter colours. A third filter colour adds grey density which does not modify the filter effect but only increases the exposure time required.

Rule 4
The stronger the cast, the higher must be the corrective filter density.

Rule 5
The higher the filter setting, the more the exposure time increases. This applies especially to magenta and cyan.

Rule 6

It is necessary to mark the filter setting, the exposure time and lens aperture on the back of every test and every print and to number each test, in order to be able to always go back to a result achieved previously.

Rule 7

Colour effects should always be judged, if possible, by daylight or by a daylight-matching light source.

Make a new test print	Set timer and enlarger controls to correction values established before. Switch off continuous light. Insert enlarging paper and trigger the exposure.
	Note: For a quicker determination of correct basic values one should make several test prints using different filtration and timer settings.
Test print to be processed, rinsed and dried	
Judge print	Check whether print has correct colours and density.
1st possibility: Correct colour and density	In this case disregard the following working steps until ④ **Calibrating the metering electronics.**
2nd possibility: Wrong colours and/or density	In this case further corrections will have to be made (until a print of correct colour and density is otbained). For this go back to chapter ③ **Correcting the print.**

④ Calibrating the metering electronics

As soon as a good print has been obtained from the negative chosen for the calibration, the metering electronics can be calibrated. Proceed as follows:

Prepare density metering unit for calibration sequence	Do not change the settings of the last exposure. Switch on the continuous light. Place the density metering unit on the baseboard so that the metering cell is exactly underneath the lens.
Swing the diffusing screen underneath the lens	
Calibrate the metering electronics of the density metering unit	Proceed as explained in the instruction manual of your timer/exposure meter or DES 100 AT AUTOMATIC TIMER.
Prepare DES 100 CA for calibration sequence	Place the analyzer on the baseboard or masking frame so that the metering cells are exactly underneath the lens.
Open the lens aperture fully	**Attention:** The colour is to be recorded at the largest lens aperture.
Swing diffusing screen underneath the lens	
Carry out white-light sequence	Use white-light lever to swing colour head filters out of light path. Press the Start key for the white-light sequence.
Note:	If Start key has been pressed abready before, same must be presse dagain in the white-light mode (filters are out of light path). (The red LED lights up during the white-light sequence for about two seconds).
Swing filters into the light path again	Swing in the colour head filters as soon as the red LED goes out.

Program the DES 100 CA electronics	Remove calibration wheel cover. Turn yellow and magenta **calibration** wheels (not filter knobs!) until the yellow and magenta light scales glow uniformly.
Note:	The ,,new'' calibration setting just obtained is the setting ensuring correct colours for your materials.
Make a note of calibration setting	Remove the red calibration card and mark the yellow and magenta calibration wheel settings on the white calibration card so that even after changing the calibration wheel settings you may always go back to the calibration established previously.
Note:	Five white calibration cards are provided for making notes of different calibration settings (for various materials). Mark type of material on calibration card to avoid mix-ups. By making photostat copies of empty calibration cards you obtain virtually unlimited recording possibilities.
Replace cover	By fitting the cover you make sure that all controls not needed during the course of a normal working cycle are covered and thus protected against unintentional adjustments.

⑤ Analysing other negatives

Once you have established the ,,correct'' calibration for your materials, you may start printing other negatives. The metering or analysing of each negative ensures correct colours in the print at the first try. The density must be determined by a separate density metering unit. This can be done with the aid of any timer/exposure meter, and especially with the AUTOMATIC TIMER designed for the DES 100 CA system.

Place another negative in negative carrier

As soon as the calibration sequence has been completed, the calibration negative can be removed from the negative carrier and replaced against a new negative.

Note: All enlarger settings can be changed at will, for by metering the negatives you will obtain correct colours (and density) automatically in the print.

Position the DES 100 CA

Place the analyzer on the baseboard or masking frame so that the metering cells are located exactly underneath the lens.

Open the lens aperture fully

Attention: The colour is to be metered at full aperture always.

Swing the diffusing screen underneath the lens

Take the white-light reading

Use the white-light lever to swing colour head filters out of light path.
Press the Start key (red) for white-light metering.
Attention: If the Start key has already been pressed before, same must be pressed again in the white-light mode (filters are out of light path).
(The red LED lights up during the white-light metering sequence for approx. two seconds).

Swing filters into light path again

Once the red LED goes out, the colour head filters must be returned into light path.

Analyse negative	Turn yellow and magenta colour head filter knobs until the yellow and magenta light scales glow uniformly on the analyzer.
	Note: If in extreme cases a cyan filtration should become necessary, either the yellow or magenta filtration will be at zero. Increase the cyan filtration until the light scale of the filter being at zero lights up. Balance then the second light scale with the corresponding filter.
Close lens aperture	Stop down lens aperture three or four times (to f 8 or f 11).
Determining negative or transparency density	**1st possibility:** If the DES 100 AUTOMATIC TIMER or any other density metering unit is used, take the reading as explained in the instruction manual. **2nd possibility:** If a timer without density metering facility is used, make a density test exposure series using different exposures (e.g. 2, 4, 8, 16 seconds).

⑥ Exposing enlarging paper

Insert enlarging paper and expose	Swing diffusing screen out of light path. Remove metering units from baseboard. Switch off continuous light. Place enlarging paper on. baseboard or masking frame. Trigger the exposure.
Print to be processed, rinsed and dried	

⑦ Making other prints

Insert following negative, analyse and expose

Proceed exactly as explained in preceding chapters. ⑤ **Analysing other negatives** and ⑥ **Exposing enlarging paper.**

FAULTY RESULTS CAUSED BY TOO SHORT OR TOO LONG EXPOSURE TIMES AND HOW TO AVOID SAME:

Glowing phase of lamp

Tungsten-halogen and opal lamps, which are mainly used in colour and black-and-white enlargers respectively, emit a certain light value during their switching on and switching off phases. This light value differs from the value emitted during the ,,normal'' burning phase.

The light value ,,used'' for the calibration however originates from the normal burning phase. In order to avoid faulty readings, the normal burning phase must be considerably longer than the switching on and switching off phases. You should therefore avoid exposures that are shorter than **5 or 6 seconds**.

Reciprocity failure of enlarging paper

If the exposure time used for the calibration is lengthened too much (doubling, trebling), the percentage value of the exposure time increase does not match the percentage value of the density increase (e.g. doubling the exposure time does **not** result in a doubling of the density in the print).

What may also happen is a colour shift towards red since the paper emulsion's sensitivity is not the same for all three colours of the spectrum. In case of such a substantial time increase it is not just the density that must be compensated, but also the colour.

On some units this reciprocity failure can be compensated via fixed factors which will, however, only compensate the density/exposure time relation, but not the colour response of the different enlarging papers. This kind of compensation can't therefore be regarded as the optimum solution.

(On professional enlargers/printers the enlarging papers' response in case of extreme exposure time prolongations will be covered by a double calibration for short and very long exposure times. This response is recorded and then taken into account always. This way it is possible to avoid density and colour deviations caused by reciprocity failures).

A much simpler system will eliminate this undesired effect as well:

A combined (density) balance with lens aperture and exposure time to avoid (density and) colour deviations in cases of extreme exposure time prolongation.

The maximum exposure time setting is not to exceed the minimum exposure time setting by more than 100% (to avoid reciprocity failures).

For example: The shortest exposure time amounts to 6 sec., the longesto 12 sec.; the calibration exposure time setting should amount to 9 sec. (adjust with lens aperture). The exposure time latitude will in this case go from 6 up to 12 sec.

If in extreme cases (very small or very large magnifications and overexposed negative) this latitude should prove to be insufficient, the density balance can be carried out using the lens aperture:

Opening the lens aperture by one value (from f 8 to f 5.6) or closing same will halve and double respectively the original exposure value.

For example: The following lens aperture/exposure combinations will yield the same density in the print:

5 seconds at f 8
10 seconds at f 11

If now an exposure time being beyond the selected range should be required, set the time to the upper resp. lower range limit and balance then the density channel light scale with the lens aperture.

To obtain optimum resolution from the lens being used, the lens aperture should always be stopped down at least twice (to f 5.6 in the case of a lens having f 2.8 as largest aperture).

Note: If you are going to use mainly large magnifications or require part enlargements, the exposure time latitude should be somewhat higher.

Trouble shooting table

Fault	Cause	Remedy
DES 100 CA doesn't work	Spent battery	Fit new battery
Balance can't be achieved because one LED keeps going off	Reading being influenced by strong voltage fluctuations Flickering tungsten-halogen lamp due to oxidized lamp contact pins	Use voltage stabiliser Check contacts, lamp and socket and replace lamp, if necessary
Same colour cast occurs upon enlarging several different negatives	DES 100 CA hasn't been programmed properly	Select negative/print of balanced colour from test exposure series, make corrections and reprogram DES 100 CA
Upon analysing, yellow or magenta knob of colour head at zero without obtaining balance	Cyan cast to be removed using cyan filter	Turn cyan filter knob until light scale of the filter being at zero lights up. Then balance second channel using corresponding filter.
Balance can't be achieved upon programming or analysing	White-light reading taken with filters in light path Colour balance made with filters out of light path	Swing out filters and repeat white-light reading Swing in filters
Colour deviation in print	Diffusing screen not in light path during white-light metering Metering cells aren't positioned properly Sensitivity range has been exceeded (lack of light)	Swing in diffusing screen for white-light metering Metering cells to be positioned exactly in the centre of the projection Open lens aperture during colour metering sequence

EXTENDING THE SYSTEM

The DES 100 CA colour analyser is the ideal complement to the automatic DES 100 AT timer. These two units form a timer/ analyser combination which doesn't only determine density and colour, but which will also be yielding - thanks to the new metering principle - a higher number of good prints at the first try.

The timer and analyser of the DES 100 CA range can be completed with the new DES 100 TPA TESTPRINT ANALYZER:

The DES 100 TPA works like a professional incident light densitometer and yields basic or basic filtration values automatically; these values are required for the calibration of all darkroom metering systems such as DES 100 AT and DES 100 CA.

DES 100 TPA eliminates the difficult assessment of colour casts and density faults in test prints, so that even darkroom operators lacking colour processing experience will be able, for the first time ever, to make colour prints.

DES 100 TPA will however also be appreciated by experienced colour darkroom operators, for it ensures quicker and safer determination of basic values without guessing and it will therefore be saving time and money.

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