

Durst *LABORATOR* *1200*

Operating manual



With the Durst LABORATOR 1200 you now own a top-quality product made by Durst Phototechnik GmbH, Bressanone, Italy, and incorporates the latest technological developments.

With its convenient handling and precise operation this enlarger will serve you well for all colour and black-and-white work.

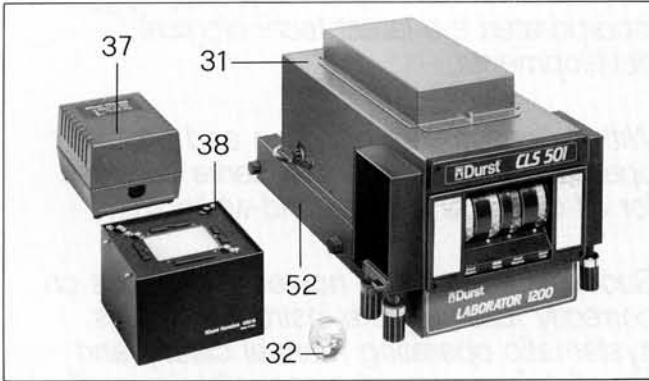
Successful operation however depends on correctly following the instructions. This systematic operating manual clearly and directly shows you the assembly as well as the operation of the unit in its different versions.

Therefore please take the trouble to read this manual thoroughly. Complete familiarity with all the operations and controls will enable you to avoid annoying failures or even damage.

We wish you every success.

OUTFITS

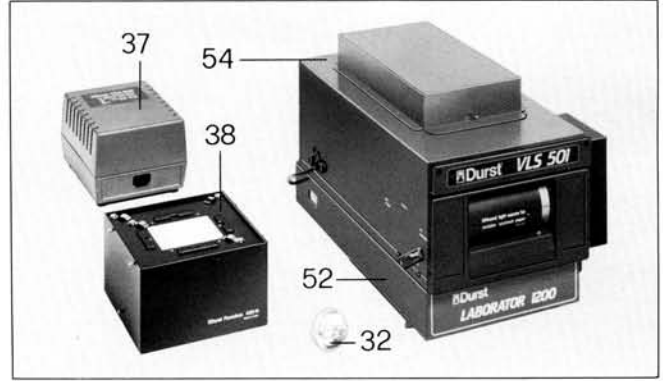
Diffused-light colour kit



- CLS 501 colour head (31)
- Adapter (37)
- 24 volt, 250 watt tungsten-halogen lamp (32)
- 10×12.5 cm (4×5 inch) mixing box (38)
- Transformer or voltage stabiliser (52)

Durst codes:
 COLIKIT 1201 ES 110
 COLIKIT 1201 TR 110
 COLIKIT 1201 ES 220
 COLIKIT 1201 TR 220
 COLIKIT 1201 ES 240
 COLIKIT 1201 TR 240

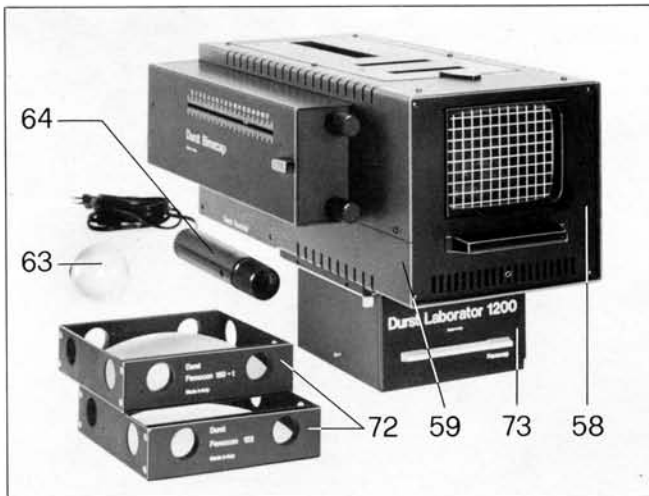
Diffused-light black-and-white kit



- VLS 501 diffused-light lamphouse (54)
- Adapter (37)
- 24 volt, 250 watt tungsten-halogen lamp (32)
- 10×12.5 cm (4×5 inch) mixing box (38)
- Transformer (54)

Durst codes:
 VALIKIT 1201/220
 VALIKIT 1201/110
 VALIKIT 1201/240

Condenser black-and-white kit



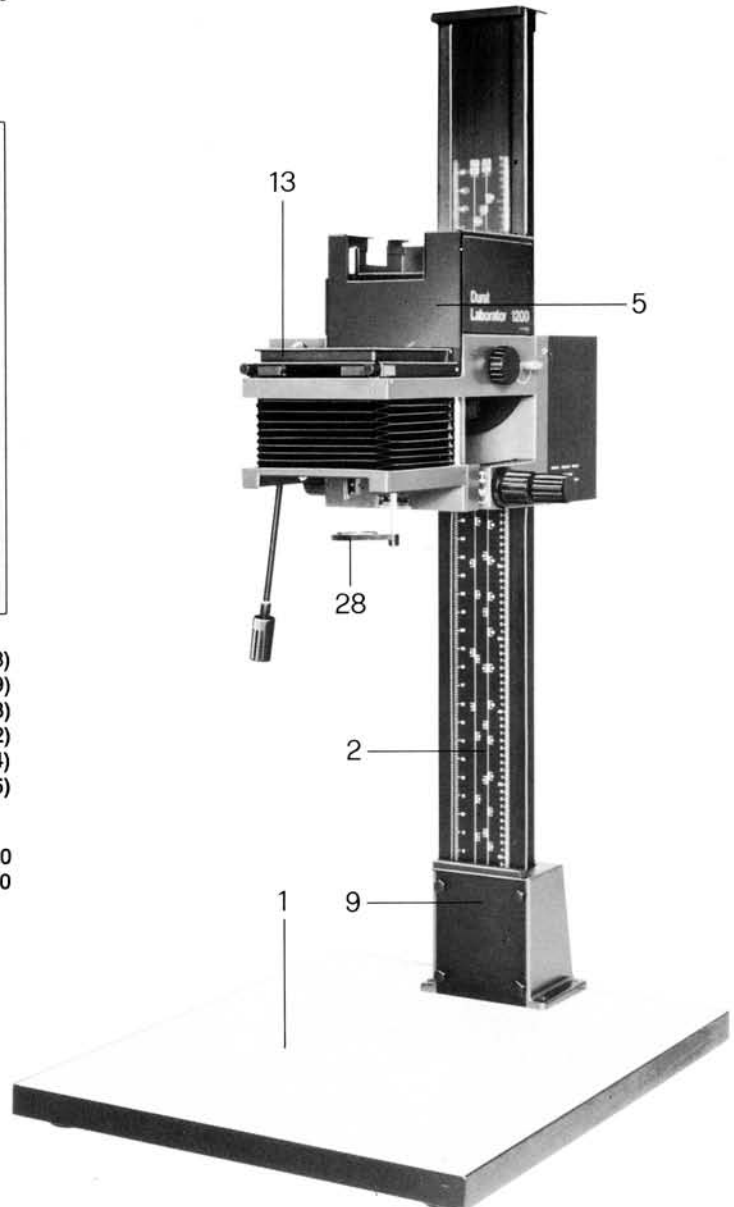
- Condenser lamphouse (58)
- Adapter (59)
- Condenser housing (73)
- Two condensers (72)
- 150 watt opal lamp (64)
- Lampholder (63)

Durst codes:
 FEMOKIT AM 110
 FEMOKIT EU 220
 FEMOKIT SAA 240

Basic enlarger

- Baseboard (1)
- Column base (9)
- Column (2)
- Enlarger head carriage (5)
- Negative carrier (13)
- Red filter (28)

Durst code: FEMO



COMPONENTS AND CONTROLS

Basic enlarger

- 1) Baseboard
- 2) Column
- 3) Magnification scale
- 4) Cm and inch scales
- 5) Enlarger head carriage
- 6) Locking knob of enlarger head carriage
- 7) Tilt scale of enlarger head carriage
- 8) Red locking levers
- 9) Column base
- 10) Hexagonal bolts
- 11) Reinforcing backing plate
- 12) Hexagonal box spanner
- 13) Negative carrier
- 14) Negative carrier glasses
- 15) Retaining springs to hold the negative carrier glasses
- 16) Mask adjustment controls
- 17) Negative carrier opening lever
- 18) Springs to engage negative carrier
- 19) Inner handgrip for quick-release vertical adjustment
- 20) Outer handgrip for fine vertical adjustment
- 23) Vertical adjustment handle
- 22) Upper focusing knob
- 23) Lower focusing knob
- 24) Lens stage
- 25) Lens stage locking knob
- 26) Index scales on lens stage
- 27) Milled retaining screws for lens panel
- 28) Red filter
- 29) Red filter fixing screw
- 30) Counterweight spring

Diffused-light colour kit

- 31) Colour head
- 32) Tungsten-halogen lamp
- 33) Reflector
- 34) Reflector bracket
- 35) Lamphouse cover
- 36) Lamphouse cover locking stud
- 37) Transformer or voltage stabiliser
- 38) Mixing box
- 39) Supporting studs
- 40) Negative carrier retaining studs
- 41) Retaining catches
- 42) Yellow filter control knob
- 43) Magenta filter control knob
- 44) Cyan filter control knob
- 45) Density control knob

- 46) Filter scales
- 47) Density scale
- 48) Scale illumination flap
- 49) Supplementary filter slide
- 50) White-light lever
- 51) White-light indicator
- 52) Adapter
- 53) Milled screws to secure the colour mixing head onto the enlarger head carriage

Diffused-light black-and-white kit

- 54) Diffused-light lamphouse
- 55) Filter control knob for variable-contrast paper
- 56) Gradation scale
- 57) Density control lever
- 32) Tungsten-halogen lamp
- 33) Reflector
- 34) Reflector bracket
- 35) Lamphouse cover
- 36) Lamphouse cover locking stud
- 37) Transformer
- 38) Mixing box
- 39) Supporting studs
- 40) Negative carrier retaining studs
- 41) Retaining catches
- 52) Adapter
- 53) Milled screws to secure the diffused-light lamphouse onto the enlarger head carriage

Condenser black-and-white kit

- 58) Condenser lamphouse
- 59) Adapter
- 60) Milled screws to secure the condenser lamphouse onto the enlarger head carriage
- 61) Lamphouse cover
- 62) Lamphouse cover catch
- 63) Opal lamp
- 64) Lampholder
- 65) Mains lead
- 66) Swing cover of lampholder and lamp centering controls
- 67) Catch of swing cover
- 68) Fore-and-aft lamp adjustment knob
- 69) Vertical lamp adjustment knob
- 70) Lamp position scale
- 71) Filter drawer
- 72) Condensers
- 73) Condenser housing
- 39) Supporting studs
- 40) Negative carrier retaining studs
- 41) Retaining catches

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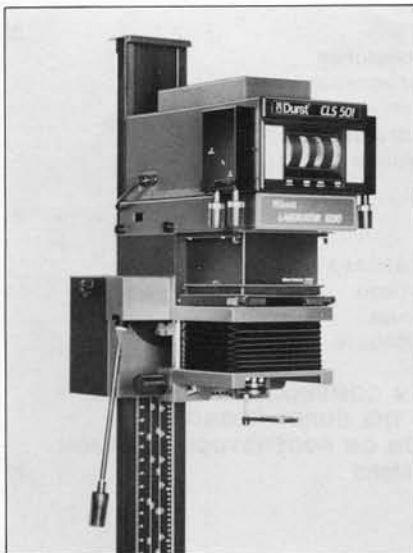
GENERAL NOTE

The Durst LABORATOR 1200 is a high-performance enlarger for the discerning professional photographer. The LABORATOR 1200 can enlarge all film sizes from 35 mm up to 10×12.5 cm (4×5 inches). In developing the LABORATOR 1200, special attention was paid to maximum ease of operation. The vertical setting permits exceptionally rapid and easy adjustment of the enlarger head.

A precise counterweight spring ensures smooth movement. The LABORATOR 1200 is shipped in special protective packing. We recommend that you check all components and clean them carefully with a cloth before assembly. To make the assembly instructions clearer, all components and controls relevant to operation are numbered.

This enlarger again reflects the traditional Durst modular system. For this reason the LABORATOR 1200 is sold only as the basic enlarger unit. The three different lighting systems are supplied in kit form and are easily mounted on the basic enlarger.

The following lighting systems can be mounted on the LABORATOR 1200:



Diffused-light colour kit

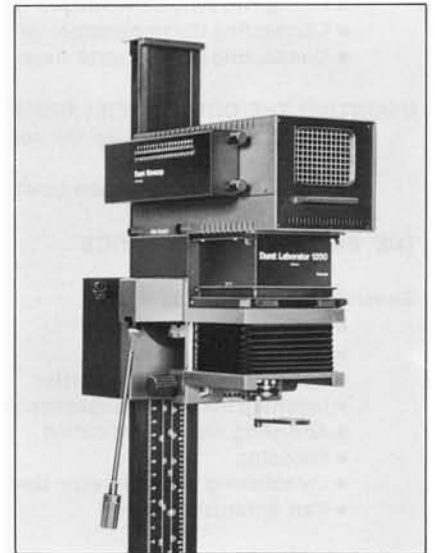
The CLS 501 colour head design provides particularly easy operation, even illumination and maximum light output. The fan, built-in as a standard feature, and the heat filter between the tungsten-halogen lamp and the colour filters prevent excessive heating of the film in the negative carrier. The diffuser in the base of the colour head incorporates an ultraviolet-absorbing filter. The stepless density control is especially significant. This exclusive Durst feature permits continuous density adjustment over a range of two f-stops (= 60 density values).



Diffused-light black-and-white kit

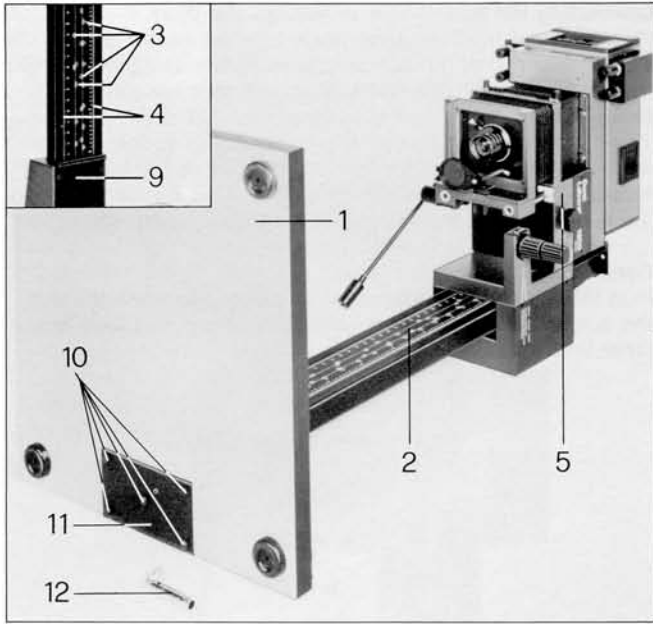
The VLS 501 diffused-light unit is particularly useful for black-and-white enlargements with variable-contrast papers. It contains a yellow and a magenta dichroic filter linked with a common mechanism for movement into the light path by a single control knob.

At the same time an automatic density control compensates for density shifts caused by the type and the extent of the filter movement. This mechanism can be disengaged for enlargements on normal (fixed-gradation) black-and-white papers.



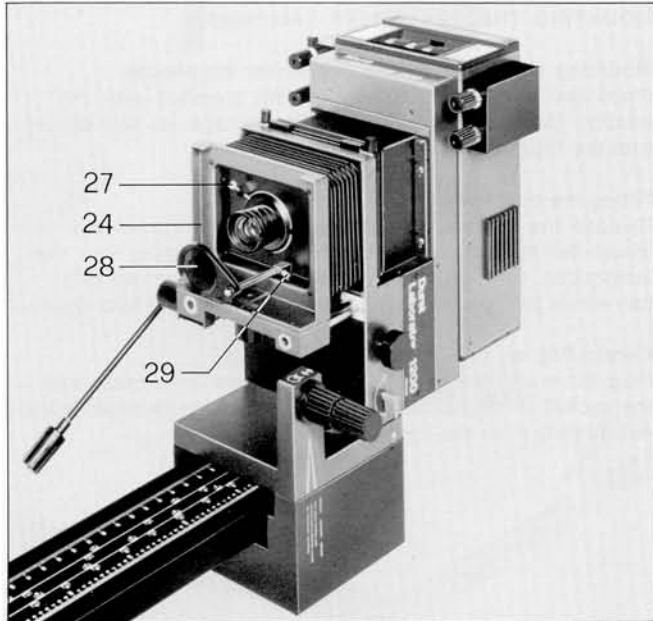
Condenser black-and-white kit

Condenser lighting provides unsurpassed definition and contrast for black-and-white enlargements. The condenser lamphouse uses the established reflex lighting system, deflecting the light through 90° onto the condensers. The mirror and the efficient ventilation system protect the film against harmful heat. The light source is an opal lamp of up to 250 watts. The double condensers are interchangeable to suit different film sizes and lenses, and are suitable for either upright or horizontal-format enlargements, ensuring even illumination of all film sizes up to 10×12.5 cm (4×5 inches).



ASSEMBLING THE BASIC ENLARGER

Baseboard, column base, column and enlarger head carriage
The column base (9), column (2) and enlarger head carriage (5) are preassembled at the factory. Place these components on a table so that the column base protrudes slightly over the table edge and the scales on the column face you. Hold the baseboard (1) against the column base and from underneath screw the five hexagonal bolts (10) through the backing plate (11) into the column base, using the hexagonal box spanner (12) supplied. Check that the bolts are securely tightened so that the baseboard is firmly attached to the column base. The scales (3) on the column show the available linear magnifications with the 50, 80, 105 and 150 mm lenses at different enlarger head positions. The inch and cm scales (4) facilitate resetting of a given magnification for repeat enlargements.

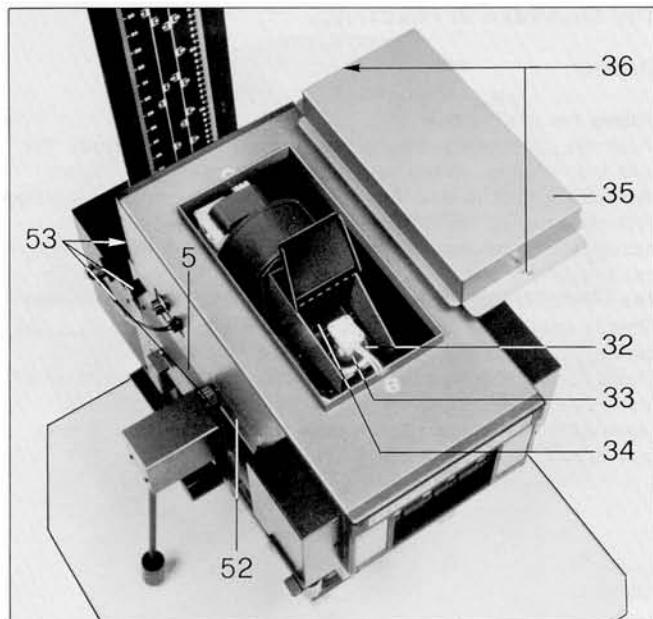


Fitting the lenses

Screw the lens fully into the appropriate panel or adapter tube. Insert the panel or tube complete with the lens into the three-point support fitting of the lens stage (24) and secure with the milled screw (27) so that the aperture scale faces forward. Lenses and appropriate panels or tubes for fitting them are available separately (see page 20).

Fitting the red filter

To fit the red filter (28) insert the red filter shaft in the appropriate hole of the enlarger head and secure with the screw (29).



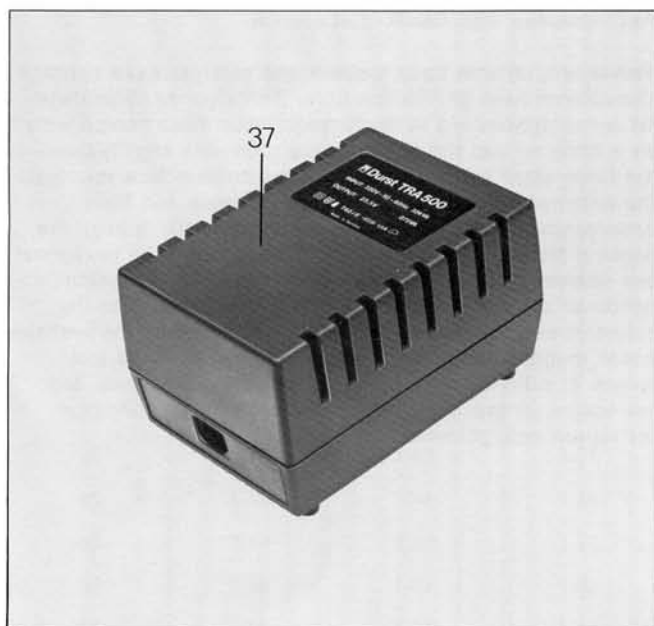
MOUNTING THE COLOUR HEAD OR DIFFUSED-LIGHT LAMPHOUSE FOR BLACK-AND-WHITE ENLARGEMENTS

Mounting and securing the colour head or diffused-light black-and-white head

Fully raise the enlarger head carriage (5). While doing this keep hold of it with both hands, for without the weight of the lamphouse the carriage can easily shoot up. Place the selected lamphouse with its adapter (52) on the enlarger head carriage (5) and secure it with the six milled screws (53).

Fitting the tungsten-halogen lamp

Press the locking stud (36) and remove the lamphouse cover (35). Inside the lamphouse the reflector bracket (34) with its protruding springs is visible. Attach the tungsten-halogen lamp (32) to the lamp fitting and push the reflector underneath the retaining springs, taking care not to touch the inside of the reflector (33) with the fingers.



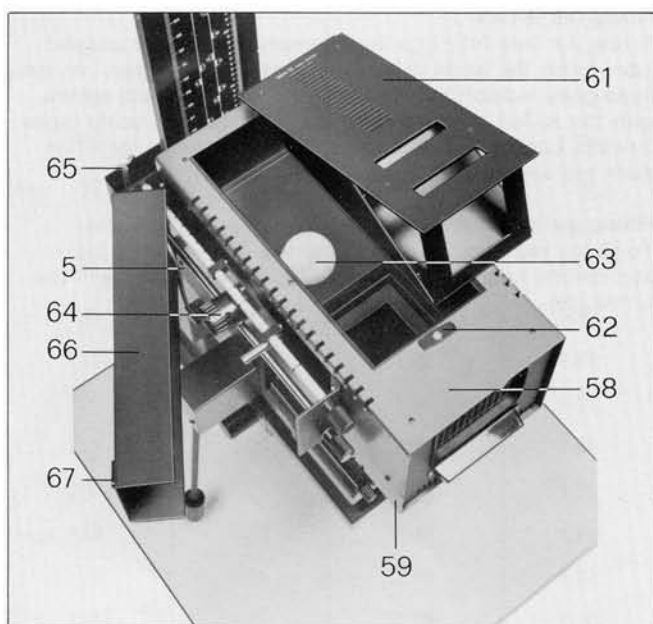
Connecting the transformer or voltage stabiliser

Plug the lead from the lamphouse into the socket of the transformer (37) or voltage stabiliser. Before switching on the transformer or voltage stabiliser check that the tungsten-halogen lamp or the exposure timer is switched off.

The TRA 500 and EST 500 are protected by a 5 amp fuse when running from a 110/120 volt supply or by a 2.5 amp fuse for 220 and 240 volt supplies. The appropriate fuse is in the fuse holder at the rear of the TRA 500 or EST 500.

Connecting an exposure timer

Plug the lead from the transformer or voltage stabiliser into the socket of the exposure timer. Plug the mains lead of the timer into a mains supply socket.



MOUNTING THE CONDENSER LAMPHOUSE

Mounting and securing the condenser lamphouse

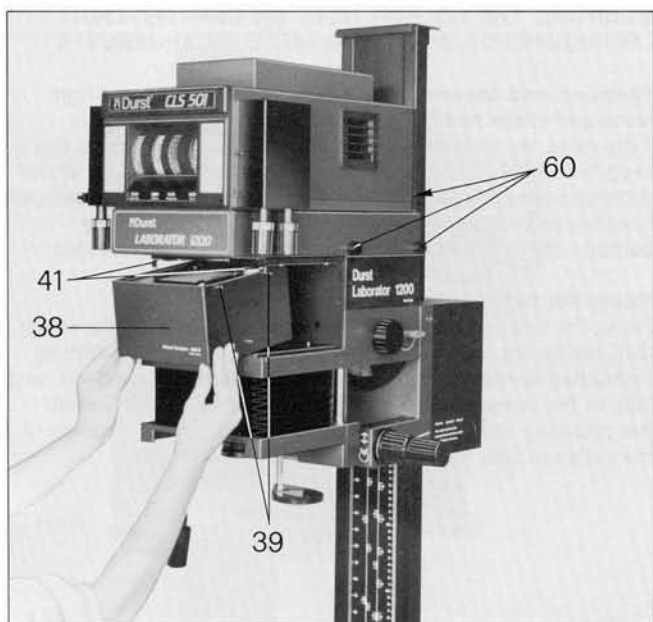
Place the condenser lamphouse (58) together with the adapter (59) on the enlarger head carriage (5) and secure with the four milled screws (60).

Fitting the opal lamp

Release the catch (67) and open the swing cover (66). Insert the lamp holder (64) through the opening into the lamphouse. On unlatching (62) the lamphouse cover (61) you can screw the opal lamp (63) into the lampholder from inside.

Connecting an exposure timer

Plug the mains lead (65) of the condenser lamphouse into the socket on the exposure timer. The exposure timer is then fed directly from the mains supply.



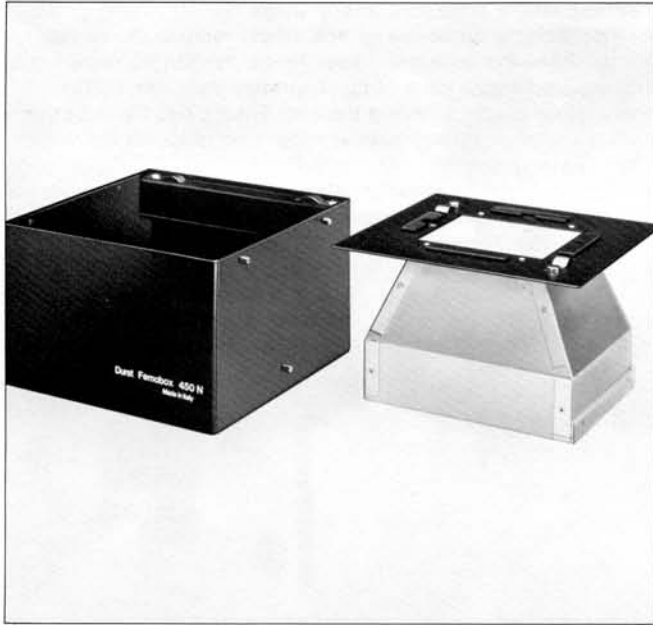
THE ENLARGER IN PRACTICE

General

Fitting the mixing boxes

Push the appropriate mixing box (38) with the four studs (39) into the recesses in the retaining catches (41) underneath the lighting unit in use. For this purpose the retaining catches (41) must be in the forward position (pull forward if necessary). After inserting the mixing box push the retaining catches to the rear.

The FEMOBOX 450 N mixing box for 10×12.5 cm (4×5 inch) films is supplied as part of the standard outfit of the CLS 501 colour head and the VLS 501 diffused-light lamphouse. Three further mixing boxes for 24×36 mm, 6×6 cm (2¼×2¼ inch) and 6×9 cm (2¼×3¼ inch) films are available separately (see page 18). Be sure to fit the correct mixing box for the film size in use.

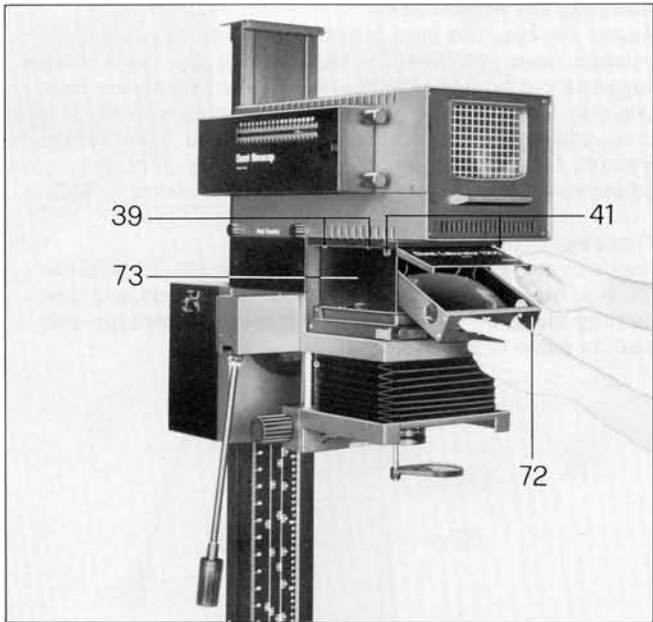


The FEMOBOX 66 N (6×6 cm), 69 N (6×9 cm) and 450 N (4×5 inches) are supplied complete with an additional low density diffuser. This diffuser permits exceptionally short exposure times with film originals where perfect colour mixing is less important.

FEMOBOX 450 N: First withdraw the inner mixing box from the main box. Lift off the sprung retaining strips to remove and replace the diffuser.

FEMOBOX 66 N and 69 N: Remove the mixing box from the main box and unscrew the two (FEMOBOX 66 N) or four (FEMOBOX 69 N) screws to remove the retaining strip of the lower diffuser. Now fit the low-density diffuser and reassemble the mixing box.

When inserting the mixing box into the main box check that the former engages into the appropriate recess before securing it with the two retaining springs. The mixing box can be inserted in a horizontal or vertical direction.

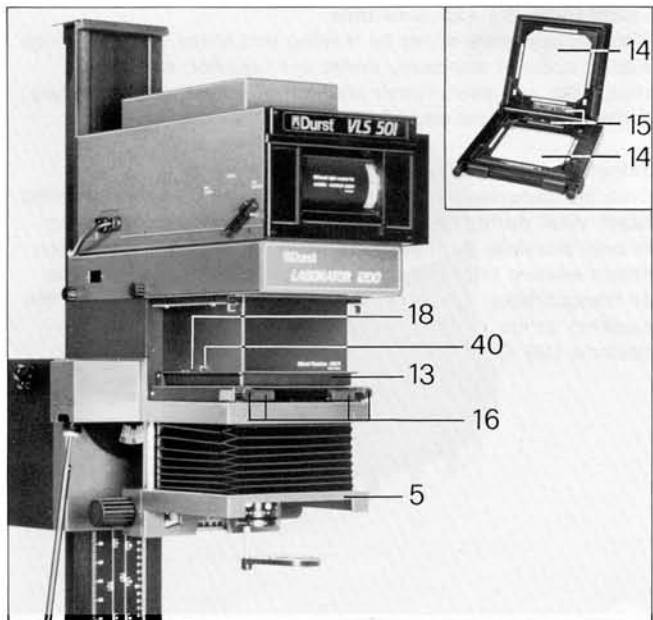


Fitting the condensers

Before inserting condensers in the condenser housing (73), fit the latter with the four studs (39) into the recesses of the retaining catches (41) underneath the condenser lamphouse. The retaining catches must be in the forward position; pull them forward if necessary. After inserting the condenser housing (73) push these catches (41) to the rear.

Now insert the condensers (72) into the condenser housing (73). Select the appropriate condenser combination for the film size being used from the table on page 20.

The condenser lamphouse is supplied complete with two condensers (FEMOCON 150-1 and FEMOCON 150-2) for 10×12.5 cm (4×5 inch) films. Other condensers for smaller film sizes are available separately (see page 18).



Inserting the negative carrier

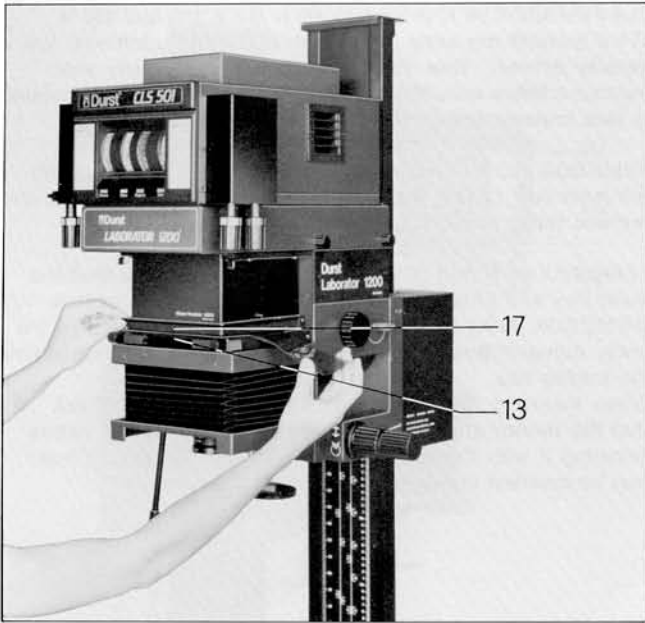
Push the negative carrier fully into the aperture between the lamphouse and the enlarger head carriage (5) so that the two springs (18) engage behind the retaining studs (40). To withdraw the carrier (13) simply pull it out.

The negative carrier (13) is normally supplied with two glasses (14) held by the retaining spring (13). Glassless metal masks in various formats are also available as an extra (see page 18).

Upon printing negatives without any film carrier glass plates you might obtain prints lacking in sharpness due to film buckling occurring during exposures.

We therefore recommend to always use an anti-Newton glass plate or a normal glass plate in place of the top glassless insert.

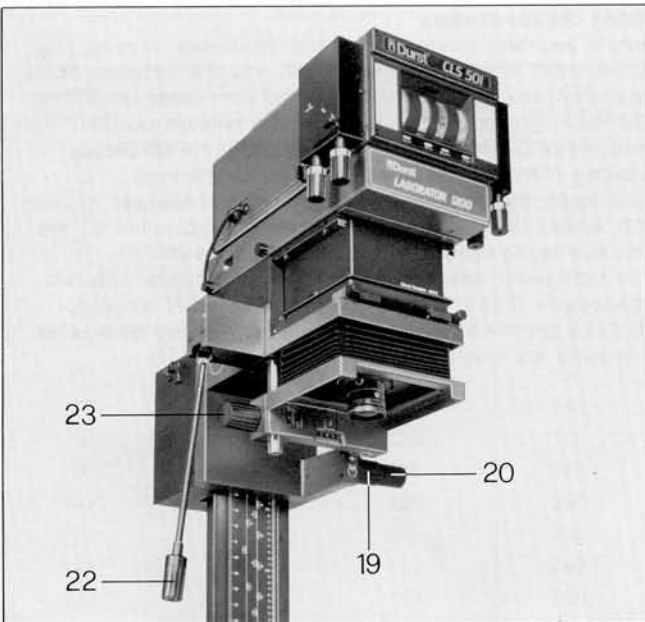
Four individually adjustable masking strips, moved by the controls (16), reduce the negative carrier area for part enlargements. The left-hand and right-hand masking strips are pushed in by sliding levers, the front and rear masking strips are moved by knobs.



Inserting single negatives or film strips

To insert single negatives or film strips, remove the negative carrier from the enlarger head. Place the single negative or the required frame of a strip accurately over the carrier opening, carefully centering the film. Then close the negative carrier and push it back between the lamphouse and enlarger head carriage.

Film strips can be advanced after raising the opening lever (17). On releasing the opening lever (17) the film strip is firmly located in the negative carrier (13) and cannot be moved.

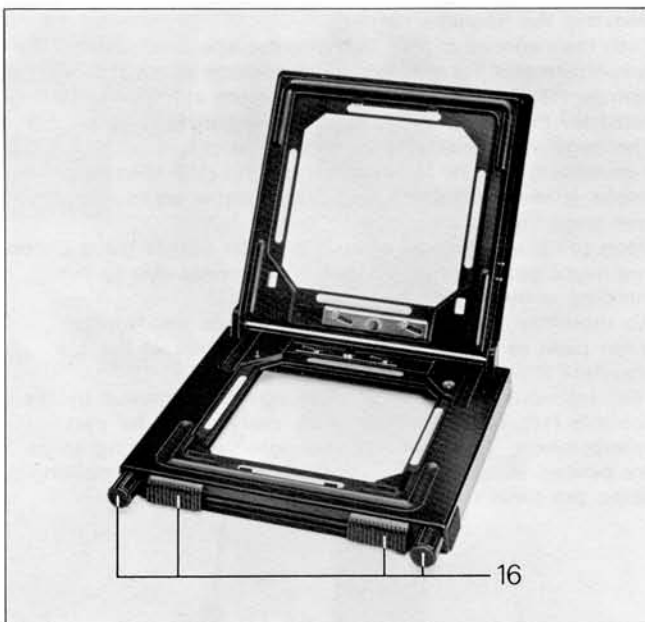


Adjusting the magnification

Adjust the required print size by raising or lowering the enlarger head with the grips (19) and (20). For quick vertical adjustment disengage the mechanism by turning the inner grip (19). If you hold the grip (23) on the other side at the same time, raising and lowering the enlarger head is quick and smooth. Lock the head by turning the inner grip; fine adjustment is then possible with the outer handgrip (20).

Focusing

Focus by either of the two knobs (22 and 23). Turning the lower knob (23) only moves the lens carriage up and down. Turning the upper knob (22) moves the lens carriage and also its guide rails.

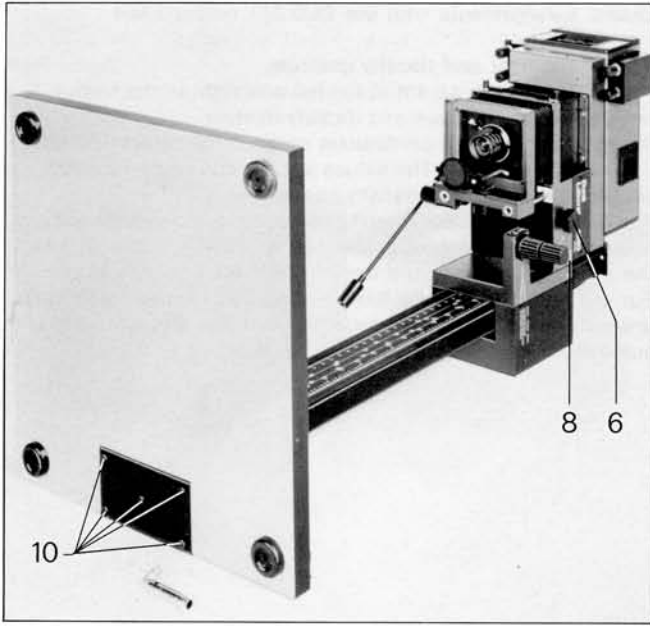


Establishing the exposure time

Find the exposure either by making test strips or by readings with a suitable exposure meter system. For maximum sharpness and even illumination stop down the lens by two stops below its maximum aperture.

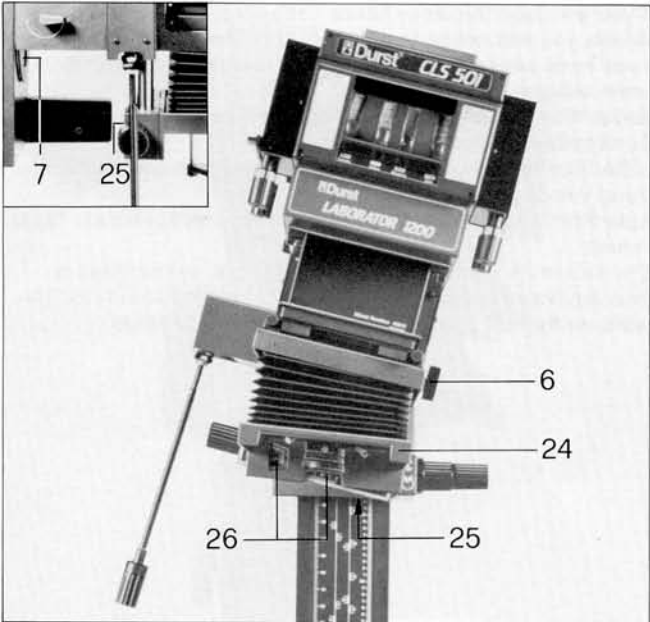
Selective enlargements

Even the experienced photographer cannot always frame the exact view during the camera exposure. Precise framing is only possible during enlarging. That way you can often obtain several interesting enlargements from one negative or transparency. Define the required image portion by the masking strips in the negative carrier, adjusted by the controls (16).



Giant enlargements

For giant enlargements project on to the floor or a wall. First unscrew the four hexagonal bolts (10) that secure the column base to the baseboard. Then slacken the central bolt and turn the column base with the column and enlarger head through 180°. Secure the column base to the baseboard again with the hexagonal bolts. To prevent the enlarger from overbalancing, weigh down the baseboard or secure it with a carpenter's clamp. For wall projection loosen the locking knob (6) and turn the red locking levers (8) to allow the enlarger head to tilt to the left or right through 90°. Operate the appropriate locking lever (8) at either side to allow the enlarger head to engage in the 90° position. Then secure the enlarger head again with the locking knob (6).



Correcting converging verticals

Converging verticals are caused by tilting the camera during the exposure. If for instance you photograph a high building against the sky from street level, the verticals in the film converge upwards if the camera has no movements for perspective control. This unwanted effect can be corrected by tilting the enlarger head, the lens stage (24) and the masking frame or paper holder.

To tilt the enlarger head, slacken the locking knob (6). This allows you to tilt the lens stage about its axis and move it sideways.

The scales (26) and (7) on the lens stage and the enlarger head carriage enable you to precisely reset the enlarger to the same position on any later occasion.

To keep the image sharp over its whole area with the enlarger head tilted, stop down the lens by more than two stops for increased depth of focus.

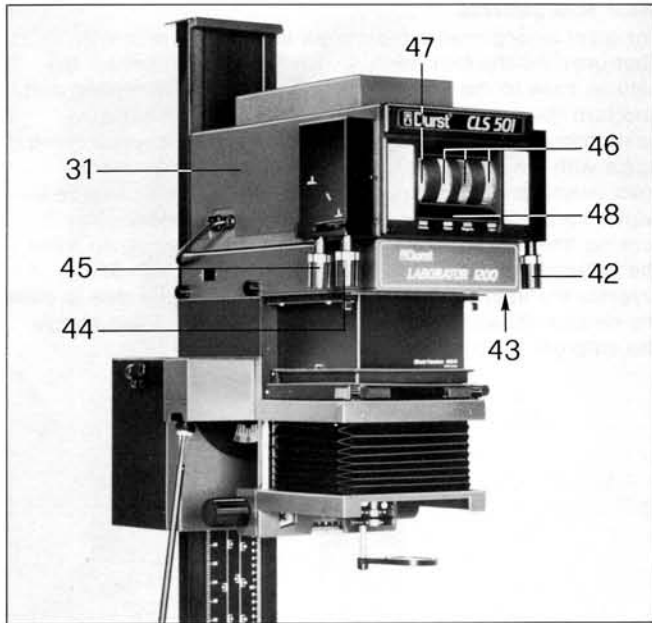


The degree of distortion control is limited by the depth of focus of the lens and by the exposure variation across the image being corrected. With the enlarger head tilted, part of the enlarging paper receives a greater projected light intensity (and hence exposure). This can be corrected by shading that section during the exposure.

Reduction

For reduction select a lens of a focal length matching the diagonal of the reduced print size required. For instance use a 105 mm lens for a 9×12 cm (3¹/₄×4¹/₄ inch) original to be reduced to 6.5×9 cm.

For greater reductions use the DUTUB 2 reducing tube. For same size reproductions with the 150 mm lens, the FEMOTUB lens tube has to be used.



Colour enlargements with the CLS 501 colour head

Setting the filter and density controls

The knobs (42, 43, 44, 45) at the left and right of the colour head (31) set the filters and density control.

The head provides a continuous range of densitometric filter values from 0 to 130. The values set are shown on the filter scales (46) and on the density scale (47).

The control knobs are so arranged that the more frequently used yellow and magenta filter controls are at the right and the cyan filter control and density adjustment at the left.

For easier reading of the filter and density values the scales are illuminated. When not required, you can close down the scale lighting with the flap (48).

Filter values			
Durst densities	CC/CP densities	CIBA densities	Agfa densities
0	0	0	0
10	15	15	20
20	30	30	40
30	45	45	60
40	60	60	80
50	75	75	100
60	90	90	120
70	105	105	140
80	120	120	160
90	135	135	180
100	150	150	200
110	165	165	220
120	180	180	240
130	195	195	260

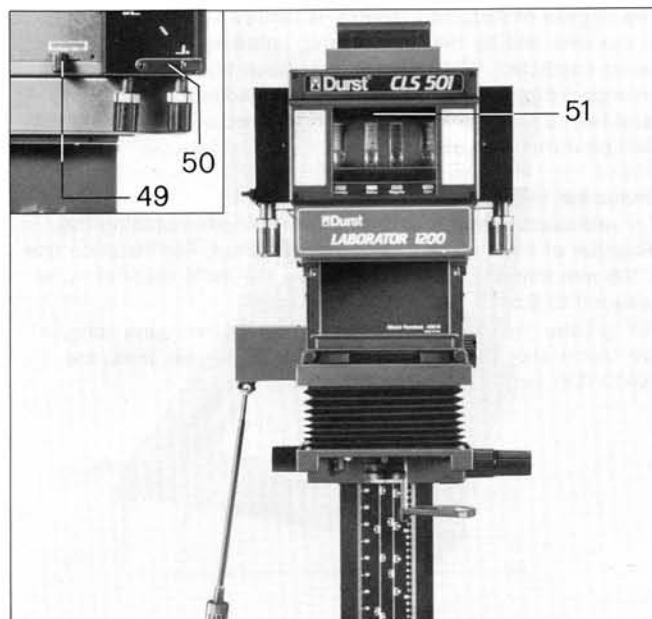
If you are used to colour heads calibrated in CP or CC filter values, you will notice that the filters of the CLS 501 colour head have considerably higher filter densities at equivalent scale settings.

Kodak filter values need to be 1.5 times as high as equivalent Durst values for the same effect.

CIBA filter values need to be 1.5 times as high as equivalent Durst values.

Agfa filter values need to be twice as high as equivalent Durst values.

The maximum filter density of the CLS 501 colour head is thus equivalent to a CP or CC filter density of about 195. The table on the left shows equivalents at other settings.

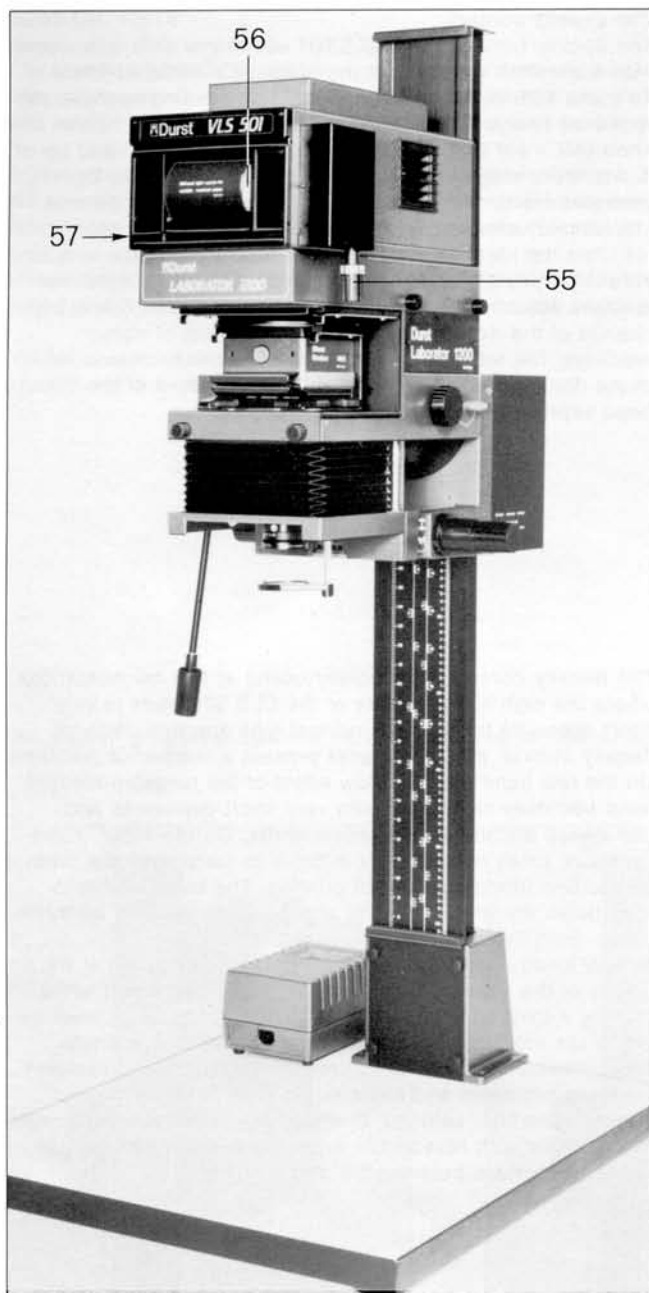


Supplementary filters

If the yellow and magenta filter densities are not sufficient, a supplementary filter can be moved into the light path by means of a sliding lever (49). This is equivalent to approx. 40 yellow + 25 magenta and is also useful for enlarging unmasked colour negatives.

The white-light setting

The white-light lever (50) moves all the filters and the density control shutter out of the light path. This allows clearer viewing of the projected negative or transparency when operating with high filter and density settings. It also facilitates manual focusing. The white-light indicator (51) shows that the filters and density control are moved out of the light path.



Black-and-white enlargements on variable-contrast papers

(I) With the VLS 501 diffused-light lamphouse

The diffused-light lamphouse has a filter system for contrast control. This consists of a dichroic yellow/magenta filter on a support. The filter control knob (55) moves this filter steplessly across the light path. The gradation set is shown on the gradation scale (56). Thus if you move from position 2.5 towards 0, a yellow filter of increasing density moves into the light path. If you move from position 2.5 towards 5, a magenta filter moves in to increase the magenta density.

If you turn the filter control knob (55) towards yellow (from 2.5 towards 0) the contrast becomes gradually lower, i.e. the print will be softer. If you turn the filter control towards magenta (from 2.5 towards 5) the contrast is increased and the print becomes harder. To permit exposures at the optimum working aperture and exposure time without requiring exposure tests after every adjustment of the filter setting, the VLS 501 has an automatic density control. As filters absorb light, the job of the density control is to maintain a constant effective density. When the gradation scale (56) is at 2.5 (white light) the density control diaphragm is closed. When you turn towards one of the two filters (yellow or magenta), the density diaphragm automatically opens to keep the amount of light reaching the baseboard constant. For repeat enlargements or when using conventional fixed gradation papers you can disengage the density control with the lever (57) for maximum light output.

Paper grade	Filter settings on colour head for Ilfospeed Multigrade II			Paper grade	Filter settings on colour head for Kodak Polycontrast II		
	Y	M	C		Y	M	C
0	121	22	—	0	84	0	—
0.5	108	24	—	0.5	73.5	6	—
1	95	26	—	1	63	12	—
1.5	79.5	31.5	—	1.5	53	20	—
2	64	37	—	2	43	28	—
2.5	52	43.5	—	2.5	34	36.5	—
3	40	50	—	3	23	43	—
3.5	28	62	—	3.5	12	58	—
4	16	74	—	4	6	80	—
4.5	0	130	—	4.5	0	130	—

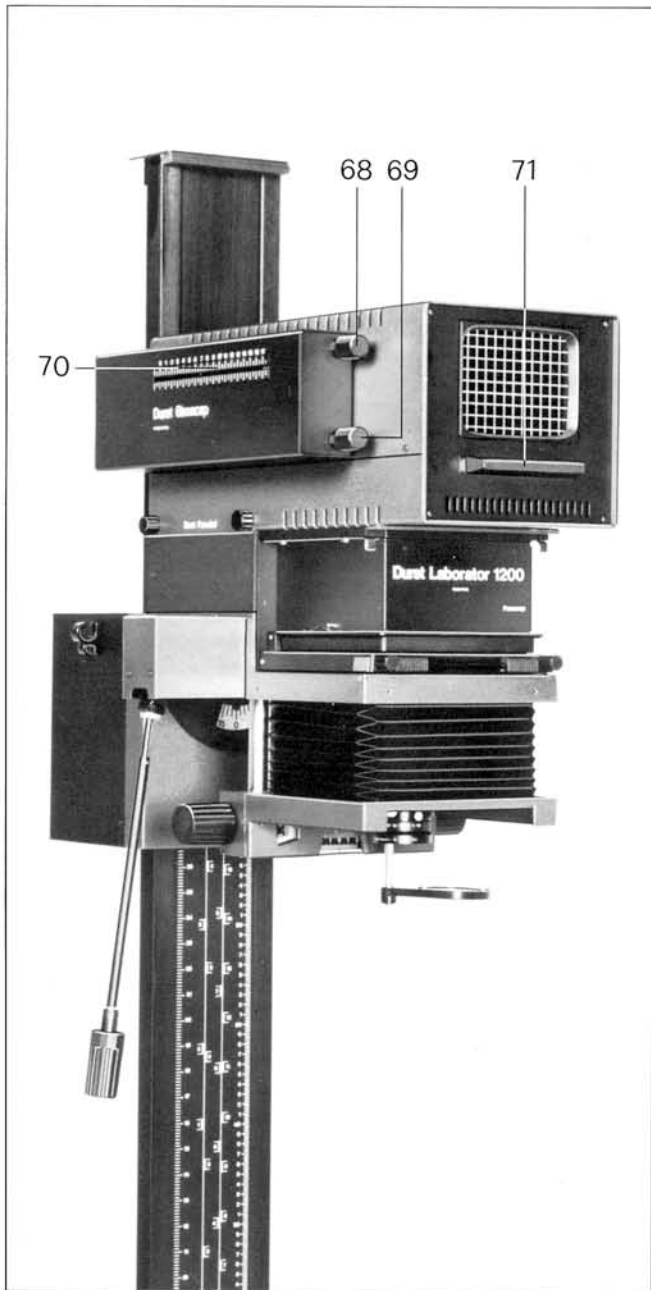
Indicative values

(II) With the CLS 501 colour head

You can print on variable-contrast papers also with the CLS 501 colour head. The required contrast is obtained by an appropriate use of the filters, as variable-contrast papers permit contrast control by the use of yellow and magenta filters. With a yellow filter the gradation becomes flatter; with a magenta filter the gradation becomes steeper. The higher the filter value, the larger the contrast modification. The table alongside shows the required filter settings to obtain the different paper grades.

With the above filter settings the exposure time is automatically compensated, so that exposures can remain constant.

To ensure correct exposure compensation, the first test prints must be made at the highest contrast setting (Ilfospeed Multigrade: - 125 -; Kodak Polycontrast II: - 130 -).



Black-and-white enlargements with the condenser lamphouse

Centering the lamp

Before inserting a film, check the quality of the illumination on the baseboard. Switch on the enlarging lamp: If the projected area shows dark sections or hot spots, center the lamp by rotating it or moving it in and out until the lighting is fully even. This is done with the adjustment knobs (68) and (69). The knob (68) moves the lamp backwards and forwards, while the knob (69) adjusts it vertically.

The scale (70) shows the actual lamp position.

After a few operating hours check the opal lamp for deposits on the inside of the lamp envelope, and if necessary recenter.

Black-and-white enlargements on fixed-gradation papers

The LABORATOR 1200 with condenser lamphouse is the ideal unit for black-and-white enlarging.

The condenser illumination yields optimum tone and image detail. The print gradation is controlled by using different enlarging paper grades.

Black-and-white enlargements on variable-contrast papers

Instead of stocking a range of black-and-white paper grades for contrast control, you can also manage with a single grade of a variable-contrast paper and with variable-contrast filters. Such yellow and magenta filters (12×12 cm large) are available from photo dealers in various densities and can be placed in the filter drawer (71). A yellow filter makes prints softer and a magenta filter yields harder (more contrasty) prints.



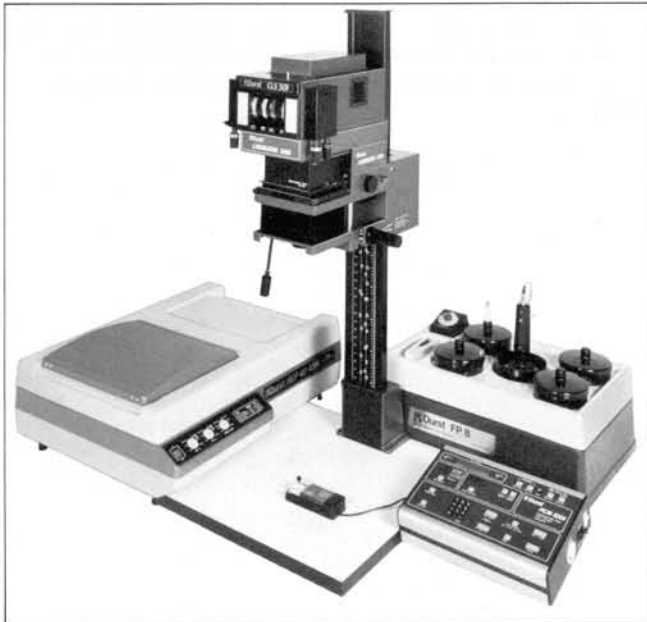
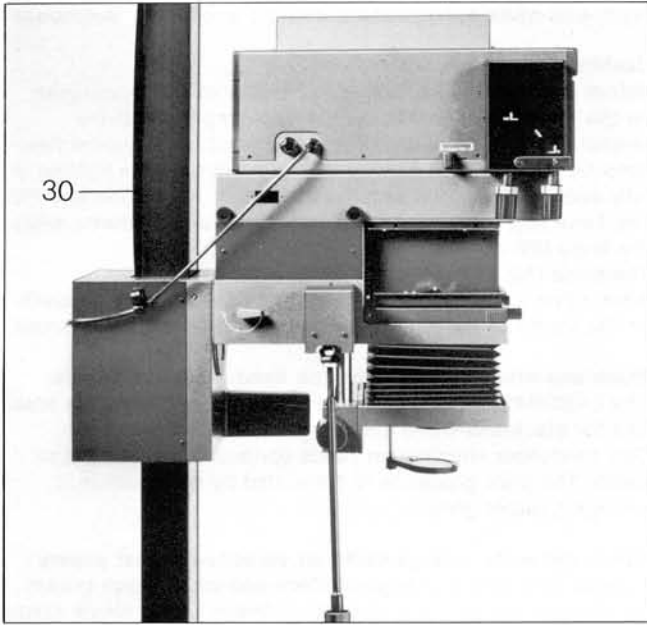
COPYING

The Durst LABORATOR 1200 can be used for copying flat or solid originals. The copying outfit (available extra) for sheet films up to 10×12.5 cm or 4×5 inches consists of:

- (a) The FEMKA copying film holder
- (b) Sheet film holders as follows:
 - FILMKA 450 for 4×5 inch sheet films
 - FILMKA 92 for 9×12 cm (3½×4¼ inch) sheet films
 - FILMKA 65 for 6.5×9 cm (2½×3½ inch) sheet films
- (c) One of the following lighting units:
 - REBELUX: For photoflood lamps up to 150 watts each
 - REBENIT: For Nitraphot lamps of up to 500 watts each
 - REBEHAL: For tungsten-halogen lamps up to 800 watts each

All three lighting systems give glare-free illumination and differ only in their colour temperature and intensity.

The appropriate instruction manual indicates how to fit and use the copying film holder.



MAINTENANCE

The LABORATOR 1200 with its different lighting systems is designed to meet highest demands with a minimum of maintenance. It preserves its high efficiency even with constant heavy-duty operation.

Occasionally lubricate the counterweight spring (30) at the rear of the enlarger column with vaseline or mineral oil. This spring is subject to constant wear as the head is raised and lowered. Depending on the amount of use of the enlarger, it can eventually develop cracks along the edges. Regularly check the counterweight spring by moving the enlarger head to the bottom of the column.

Important: If the spring shows damage, get the service department of our agency in your country to change it as soon as possible. This avoids accidents and possible injury to the operator.

Periodically clean the negative carrier glasses and lenses with a chamois leather or an antistatic brush or cloth to remove dust. The lenses carry an anti-reflection coating; so wipe carefully to avoid scratching this coating.

Periodically also clean the colour filters of the colour head or the special variable-contrast filter of the diffused-light lamphouse with a pad of cotton wool soaked in alcohol. From time to time clean also the tungsten-halogen of the mixing boxes, the heat filter below the tungsten-halogen lamp of the colour head or the diffused-light unit and the condensers of the condenser lamphouse.

Before opening the colour head, the diffused-light lamphouse or the condenser lamphouse for servicing or for changing the tungsten-halogen or opal lamp, always check that the unit is disconnected from the mains supply. Preferably unplug the mains lead from the supply socket.

SPECIAL ACCESSORIES

Accessories for light source system

- FEMOBOX 69 N : Mixing box for film sizes up to 6×9 cm (2½×3½ inches)
- FEMOBOX 66 N : Mixing box for film sizes up to 6×6 cm (2¼×2¼ inches)
- FEMOBOX 35 N : Mixing box for film sizes up to 24×36 mm
- FEMOCON 80 : Double condenser for 60 and 80 mm lenses
- FEMOCON 50 : Supplementary condenser for the FEMOCON 80 for use with 28 to 50 mm lenses
- FEMOCON 151 : Condenser for 100 and 105 mm lenses
- BIMABOX 69 N : Mixing box for film sizes up to 6×9 cm (2¼×3¼ inches) in conjunction with the FEBIDAP
- BIMABOX 66 N : Mixing box for film sizes up to 6×6 cm (2¼×2¼ inches) in conjunction with the FEBIDAP
- BIMABOX 35 N : Mixing box for film sizes up to 24×36 mm in conjunction with the FEBIDAP
- BIMACON 80 : Double condenser for film sizes up to 6×6 cm (2¼×2¼ inches) in conjunction with the FEBIDAP
- FEMOCON 50 : Supplementary condenser for the BIMACON 80 for 50 mm lenses
- VARIPOINT 1200 : Point light system

Negative carrier accessories

- FEMOGLA AN : Special anti-Newton glass to avoid Newton's rings. This replaces the upper glass of the FEMONEG negative carrier.
- FEMOMASK 450 : Pair of glassless metal masks for 10×12,5 cm (4×5 inch) films. For glassless enlarging these can be used in the FEMONEG negative carrier in place of the glasses.
- FEMOMASK 92 : As above, for 9×12 cm (3½×4¾ inch) films
- FEMOMASK 69 N : As above, for 6×9 cm (2¼×3¼ inch) films
- FEMOMASK 67 N : As above, for 6×7 cm (2¼×2¾ inch) films
- FEMOMASK 66 N : As above, for 6×6 cm (2¼×2¼ inch) films
- FEMOMASK 45 N : As above, for 4,5×6 cm (1¾×2¼ inch) films
- FEMOMASK 35 N : As above, for 24×36 mm films
- FEMOMASK S : As above, for special film sizes. When ordering, please enclose a developed film (only standard ASA or DIN film sizes). Delivery approx. 30 days.

- BINEMA 69** : Pair of glassless film format masks for 6×9 cm (2¹/₄×3³/₄ inch) films. Can be used in place of the glasses in the BIMANEG negative carrier.
- BINEMA 67** : As above, for 6×7 cm (2¹/₄×2³/₄ inch) films
- BINEMA 66** : As above, for 6×6 cm (2¹/₄×2¹/₄ inch)
- BINEMA 45** : As above, for 4,5×6 cm (1³/₄×2¹/₄ inch) films
- BINEMA 35** : As above, for 24×36 mm films
- BINEMA S** : As above, for special film sizes. When ordering please enclose a developed film (only standard ASA or DIN film formats). Delivery approx. 30 days.
- BIDIA** : Metal format mask for mounted 35 mm (5×5 cm) slides. This is used in the BIMANEG negative carrier in place of the lower glass.
- BIMAGLA AN** : Special anti-Newton glass, fits the BIMANEG negative carrier in place of the upper glass.
- FEBIDAP** : Special adapter and BIMANEG negative carrier with two glasses for film sizes up to 6×9 cm (2¹/₄×3³/₄ inches). Depending on the light source, this adapter is used with the BIMACON 80 and FEMOCON 50 or with the BIMABOX 35N, 66N and 69N. This arrangement permits more convenient operation with roll film. The negative carrier also rotates which is important when using roll paper magazines. Stop pins – adjustable for 24×36 mm and 6×6 cm films – facilitate insertion of film strips. The negative carrier also has individually adjustable masking strips.

Assembly: The adapter consists of an upper and a lower section. The upper section with its four supporting studs is pushed into the appropriate cutouts of the retaining catches underneath the lamphouse in use and secured by pushing the catches to the rear.

Now push the lower section into the upper part of the adapter and screw to the enlarger head carriage with two countersunk screws at the front and two milled screws at the back. Push the BIMANEG negative carrier fully into the adapter to engage. To remove, slightly raise the negative carrier at the front.

Copying accessories

- FEMKA** : Precision copying holder for plates and sheet films. It fits the enlarger in place of the FEMONEG negative carrier. The image is focused with the aid of a special glass plate supplied. The standard outfit does not include sheet film holders
- FILMKA 65** : Sheet film holder for 6,5×9 cm (2¹/₂×3¹/₂ inch) sheet films
- FILMKA 92** : Sheet film holder for 9×12 cm (3¹/₂×4³/₄ inch) films
- FILMKA 450** : Sheet film holder for 4×5 inch (10×12.5 cm) films

Lens standard accessories

- LAPLA 50** : Lens panel for 100 to 150 mm lenses with M 50 screw thread
- LAPLA 42** : Lens panel for 135 and 150 mm lenses with M 42 screw thread
- LAPLA 39** : Lens panel for 28 to 135 mm lenses with M 39 screw thread
- FLARING** : Adapter ring for lenses with M 25 thread for use in lens panels and tubes with M 39 thread.
- SETOPLA 2839** : Lens panel for 28 and 35 mm lenses with M 39 thread
- SEIPLA 7539** : Lens panel for 28 mm lenses with M 39 thread. This panel can only be used in conjunction with the FEBIDAP.
- FEMOTUB** : Lens tube for same size reproduction and reductions
- DUTUB 2** : Lens tube for extreme reduction ratios

General accessories

- FEMOWAL N** : Wall mounting unit, especially useful when working with roll paper magazines
- LACUF** : Dust cover

TECHNICAL DATA

Basic enlarger

- Column height 136 cm
 Maximum height with fully raised enlarger head 166 cm
 Baseboard size 4×64×69 cm (1.6×25.2×27.2 inches)
 Usable baseboard size 64×57 cm (25.2×22.4 inches)
 Optical axis/column base distance 31 cm (12.2 inches)
 Net weight Approx. 45 kg (99 lbs)

Linear magnifications (approx.)

Lens	Film size	Magnification	
		Minimum	Maximum
150 mm	100×125 mm (4×5 in.)	1.5 ×	5.5 ×
135 mm	85×100 mm (3 ¹ / ₄ ×4 in.)	1.1 ×	6.3 ×
105 mm	65×90 mm (2 ¹ / ₂ ×3 ¹ / ₂ in.)	0.8 ×	8.7 ×
100 mm	65×90 mm (2 ¹ / ₂ ×3 ¹ / ₂ in.)	0.7 ×	9.0 ×
80 mm	56×72 mm (2 ¹ / ₄ ×2 ⁷ / ₈ in.)	2.5 ×	12.1 ×
50 mm	24×36 mm	5.4 ×	19.8 ×
35 mm	18×24 mm	9.0 ×	30.6 ×
28 mm	12×17 mm	11.0 ×	36.8 ×

CLS 501 colour head

- Light source 24 volt, 250 watt tungsten-halogen lamp
- Mains supply – Via TRA 500 transformer: 110/120, 220 or 240 volts, 50-60 Hz
 – Via voltage stabiliser EST 500: 110-140 or 180-260 volts, 50-60 Hz
 Output voltage 24 volts ±2%
- Filters Dichroic yellow, magenta and cyan filters
- Filter densities 130 densitometric units (D 1.3)
- Supplementary filter Approx. 40 yellow +25 magenta
- Density control Densitometric 0-60 (D 0.6)
- Size 530×290×300 mm
- Weight Approx. 16 kg

VLS 501 lamphouse

- Light source 24 volt 250 watt tungsten-halogen lamp
- Mains supply Via TRA 500 transformer: 110/120, 220 or 240 volts, 50-60 Hz
- Gradation range From soft to hard
- Size 450×290×270 mm
- Weight Approx. 9 kg

Condenser lamphouse

- Light source 150 watt opal lamp (250 watts for short periods)
- Mains supply 110, 220 and 240 volts
- Illumination Via mirror and condensers
- Cooling Convection
- Filter drawer 120×120 mm (4¹/₄×4¹/₄ inches)
- Size 340×295×190 mm (13.4×11.6×7.5 inches)
- Weight Approx. 9.8 kg (21.6 lbs)