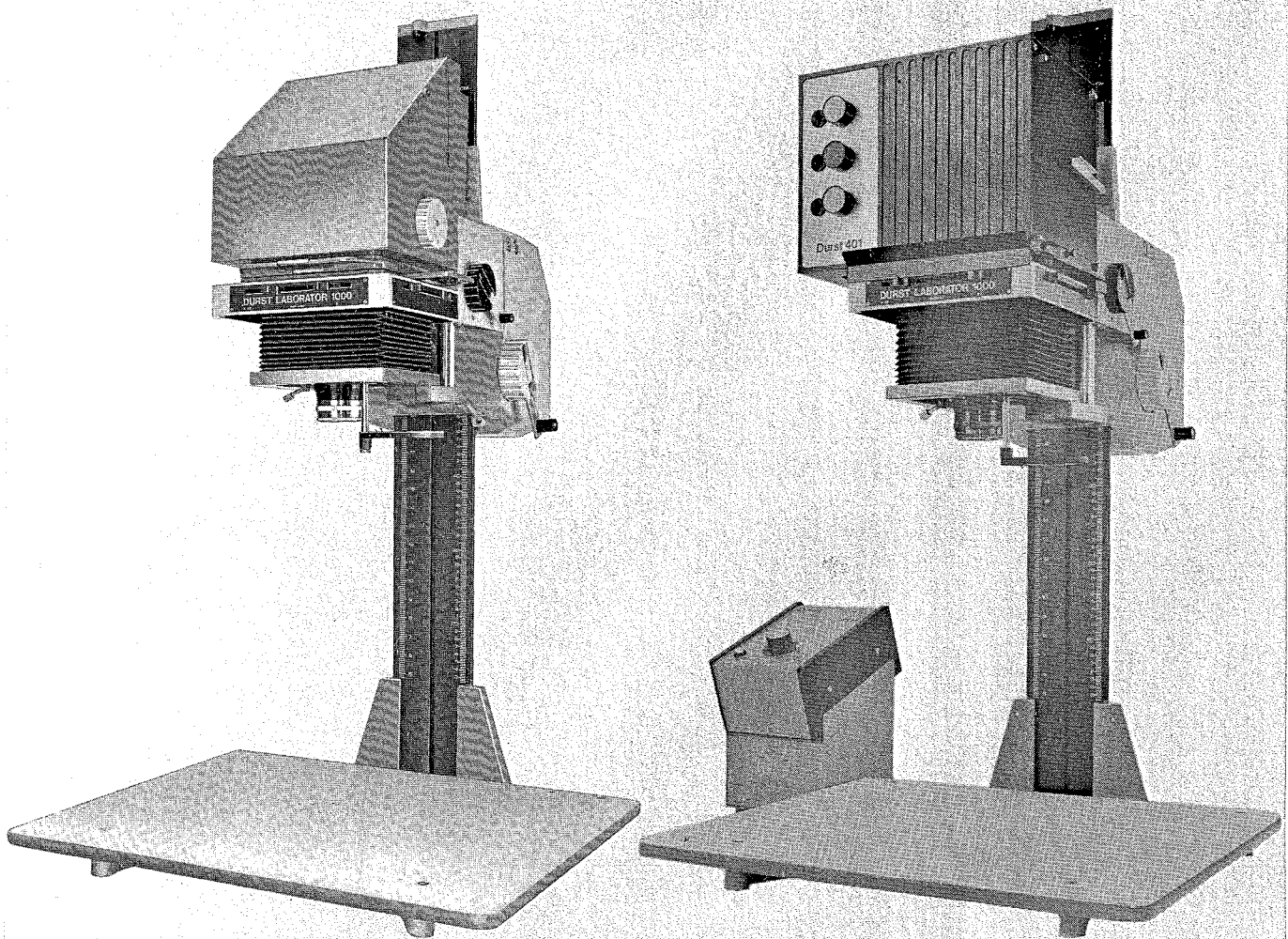


# Durst Laborator 1000

## Operating Instructions



Durst®

With the LABORATOR 1000 you have acquired a high-quality product of Durst AG, Bozen, Italy, Italy, which offers maximum precision and utmost care in workmanship and quality control. This top-class unit with its convenient features and reliable operation will serve you well for all colour and black-and-white enlarging work.

Successful operation however depends on precisely following instructions. This operating manual aims to explain systematically both the assembly and handling of your unit.

Please take the trouble to read this manual thoroughly and in detail. By becoming really familiar with all operations and controls you avoid annoying errors or even damage.

Durst AG Bozen, Italy

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### 1.0.0 General note

The Durst LABORATOR 1000 is a high-performance enlarger for the fastidious professional. It will enlarge all colour and black-and-white negatives from 24 x 36 mm up to 4 x 5 inches (10 x 12.5 cm).

Thanks to its modular design, the LABORATOR 1000 takes various alternative light sources for optimum results.

For efficient colour enlarging the LABORATOR 1000 takes a colour mixing head or an automatic colour control unit.

With appropriate supplementary equipment the LABORATOR 1000 becomes a reliable and efficient copying unit. Register accessories are available for all photographic jobs requiring accurate register. A wide range of accessories greatly extends the scope of the LABORATOR 1000 in various fields.

### 2.0.0 The outfit

#### 2.1.0 Technical data

##### Approximate magnification and reduction ranges

Focal length of lens	Linear magnification	
	Max.	Min.
150 mm with Durst adapter	5x	1x
135 mm with Durst adapter	5.8x	0.9x
105 mm with LAPLA 32 or 39 panel (depending on lens thread)	7.8x	0.6x
80 mm with LAPLA 25 or 39 panel (depending on lens thread)	11.5x	1.25x
75 mm with LAPLA 25 or 39 panel (depending on lens thread)	11.9x	1x
60 mm with TAUPLA 25 or 39 panel (depending on lens thread)	15.7x	2.6x
50 mm with TAUPLA 25 or 39 panel (depending on lens thread)	19x	3.6x
35 mm with SEIPLA 7525 or 7532 panel (depending on lens thread)	30x	11.7x
28 mm with SEIPLA 7525 panel	35.5x	14.2x

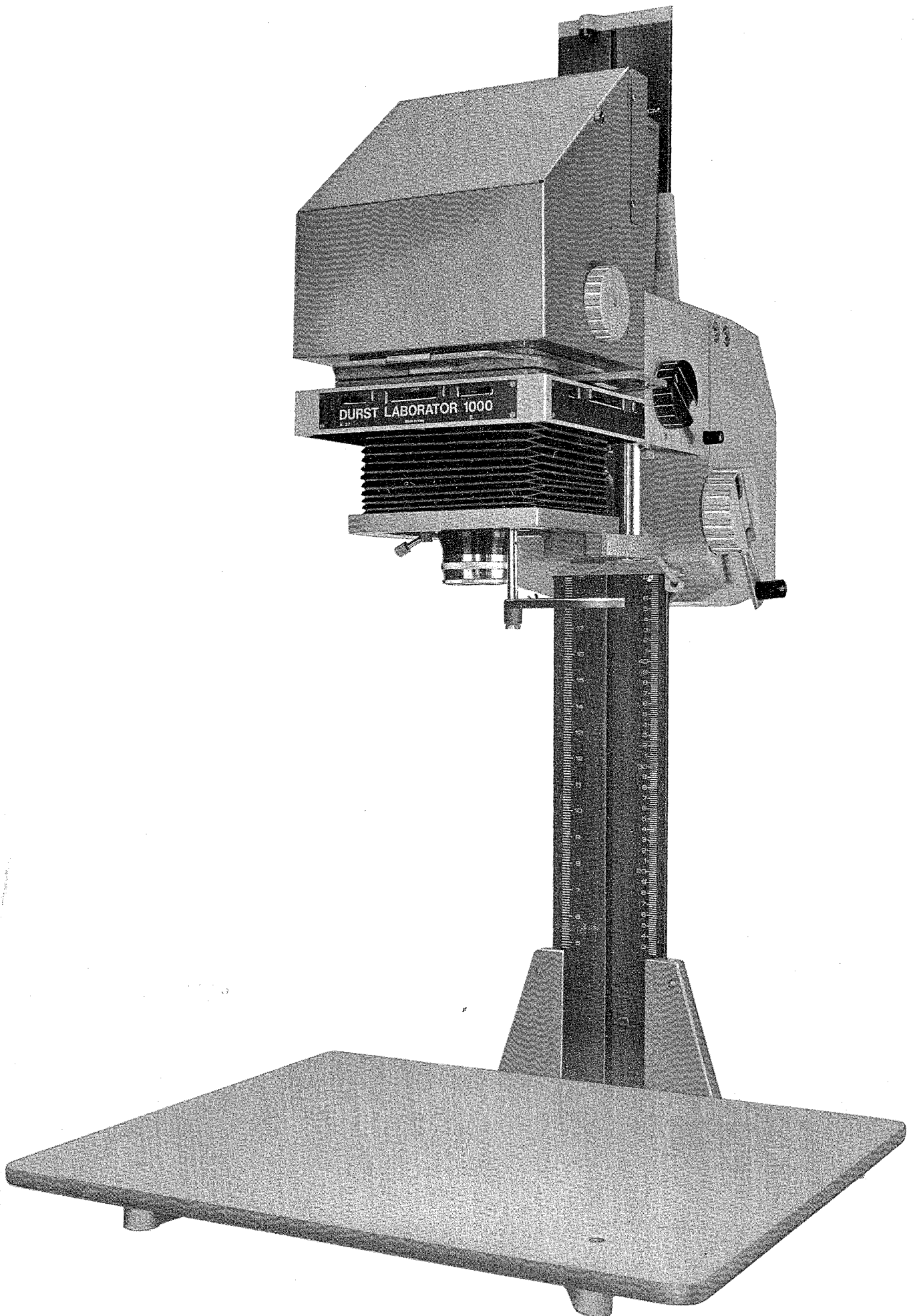
Greater reductions are possible by mounting the lenses on the DUTUB 2 extension tube.

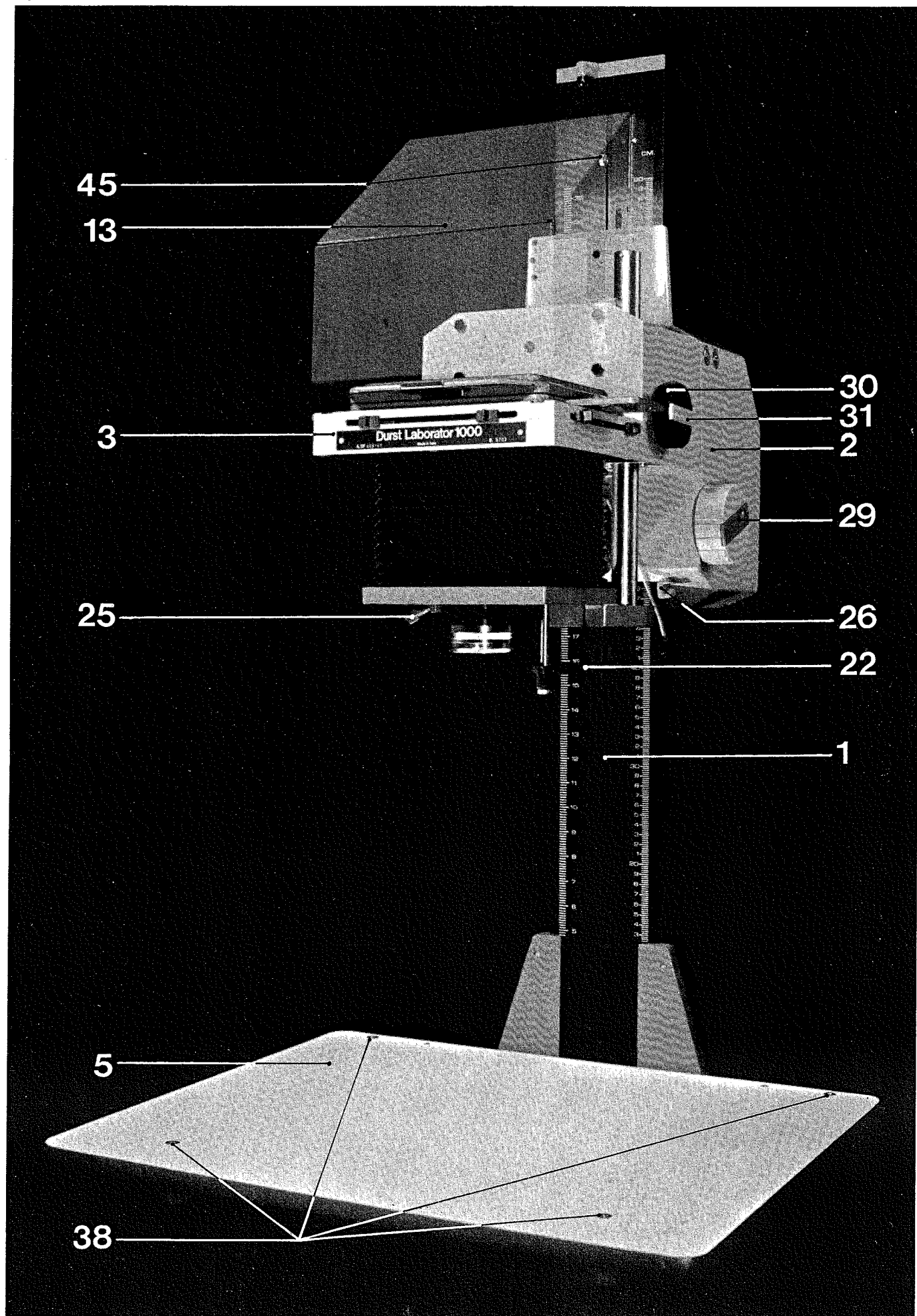
### 2.2.0 Checking out

The LABORATOR 1000 is shipped in a special break-resistant package. Before assembly, carefully clean all components with a cloth. First check that all items are present. To make the assembly instructions clearer, all components and operational controls are numbered. The parts of the enlarger packed separately for assembly are in addition marked ⊗.

#### 2.3.0 Components and controls

- ⊗ 1) Column
- 2) Carriage
- 3) Negative carrier standard
- 4) Column base
- ⊗ 5) Baseboard
- 6) Clamping jaws of base
- ⊗ 7) Hexagonal bolts to lock the column on the base
- 8) Locking knob for the carriage
- 9) Holes to engage the TAUCAP condenser housing
- 10) Hexagonal bolts to support the condenser housing and cold cathode light source
- 11) Locking knob for the condenser housing and cold cathode source
- ⊗ 12) Screws for fitting the lamphouse
- 13) Cover of condenser housing
- 14) Condenser guide rails
- 15) Holes for locating the TAUCOLI cold cathode light source
- 16) Lamphouse cover
- ⊗ 17) Lamp holder
- 18) Lead with plug
- 19) Switch
- 20) Lamphouse cover plate
- 21) Locking ring for lamp centering
- 22) Red filter
- 23) Condenser adjustment knobs
- 24) Index marks
- 25) Lens securing screw
- 26) Retaining clip for lead
- 27) Location holes in the negative carrier stage
- 28) Levelling screw
- 29) Vertical adjustment knob with crank
- 30) Focusing knob
- 31) Crank for rapid movement
- 32) Holes in carriage
- 33) Star knob to secure the negative carrier standard on carriage
- 34) Engagement pin
- 35) Locating holes for mounting the enlarger head for horizontal projection
- 36) Cover to close the filter drawer opening
- 37) Engagement holes in carriage
- 38) Cross-head screws on baseboard
- ⊗ 39) Reflecting mirror
- 40) Guide slots of reflecting mirror
- 41) Steel tape
- 42) Adjustment screws of focusing friction drive
- 43) Recesses for the screws (42)
- 44) Controls to adjust the built-in masking strips
- 45) Milled screws of condenser housing cover
- 46) Threaded shafts for adjusting the friction drive of the vertical movement
- ⊗ 47) Spanner for tightening the bolts holding the column







The basic unit consists of the following components:

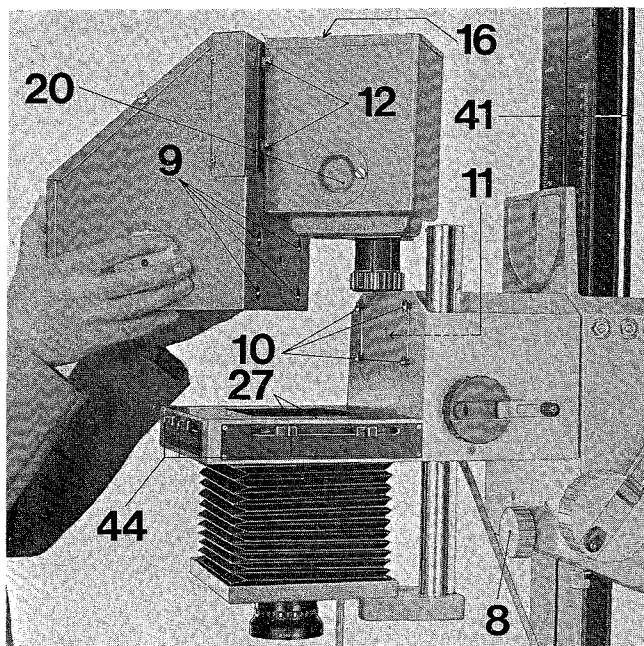
- Column with carriage and negative carrier standard
- Baseboard with column base

According to the outfit ordered, the following further components are included:

- (a) **Durst LABORATOR 1000 with condenser lighting**  
TAUCAP condenser housing  
TAULIC lamphouse  
OTONEG 2 negative carrier
- (b) **Durst LABORATOR 1000 with cold cathode lighting**  
TAUCOLI cold cathode source  
OTONEG 2 negative carrier
- (c) **Durst LABORATOR 1000 for the Durst 401 colour mixing head**  
In this version the enlarger is supplied without negative carrier and also without condenser housing or lamphouse.
- (d) Lenses, lens panel and condensers as ordered

**Important:**

When unpacking, grip the enlarger only by the column and never by the steel tape.



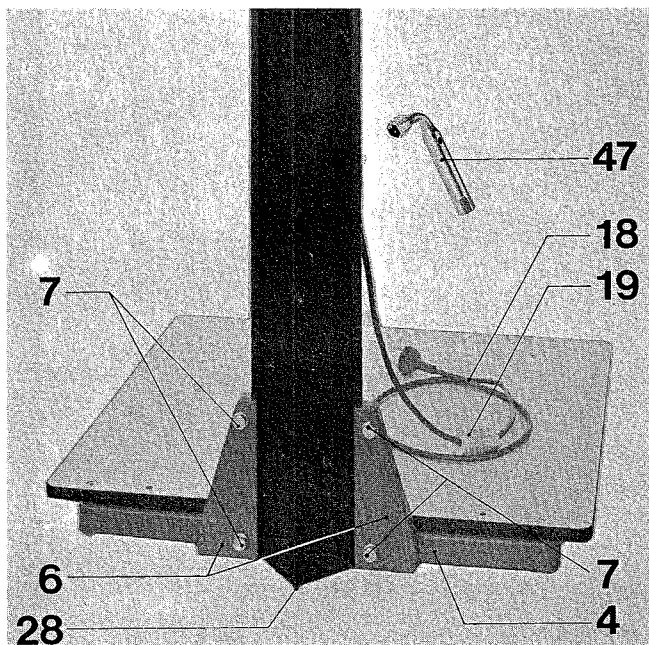
## 2.4.0 Assembly

### 2.4.1 The column and baseboard

Place the baseboard (5) with the column base (4) attached to it on the floor and push the column (1) fully home into the clamping jaws (6) of the column base. Then evenly tighten the four hexagonal bolts (7) with the spanner (47). Extend the levelling screw (28) at the bottom of the column until the unit stands completely firmly.

**Important:**

Release the locking knob (8) on the carriage (2) only after the enlarger is assembled.

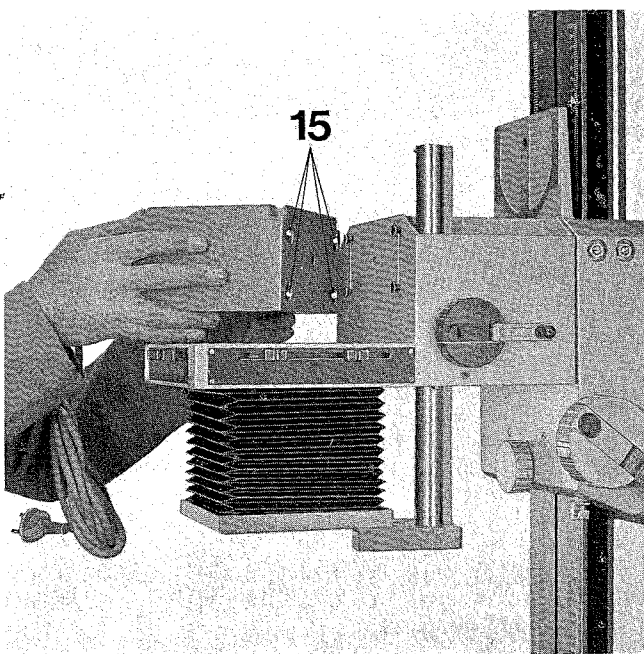


### 2.4.2 The enlarger head

- (a) If the LABORATOR 1000 was ordered with condenser lighting:

Fit the TAUCAP condenser housing so that the four holes in the back engage the four hexagonal bolts (10) of the negative carrier standard (3) and secure with the knob (11). Fit the TAULIC lamphouse at the back of the condenser housing with the four milled screws (12).

Then open the cover (13) and push the condensers, with their convex sides facing each other into the guide rails (14) of the condenser housing. Now the locking knob (8) on the carriage can be released.



(b) If the LABORATOR 1000 was ordered with cold cathode lighting:

Attach the TAUCOLI cold cathode lighting unit to the negative carrier standard so that the four hexagonal bolts (10) engage the holes at the back of the TAUCOLI unit. Then secure with the knob (11). Now the locking knob (8) on the carriage can be released.

(c) If the LABORATOR 1000 was ordered with the Durst 401 colour mixing head:

Fit the Durst 401 colour mixing head on the negative carrier standard as indicated in the Durst 401 operating manual.

#### 2.4.3 Condensers

Introduce the condensers in their metal mounts into the guide rails (14) with the convex sides facing each other.

To ensure optimum illumination, the condensers can be raised or lowered by turning the knobs (23).

The condenser combinations required for every enlarging lens are indicated at the end of this manual.

#### 2.4.4 The filter drawer

The TAUFIL filter drawer, available as an accessory, is introduced into the condenser housing of the LABORATOR 1000 after unscrewing the two screws and removing the cover panel (36). The TAUFIL drawer takes 4 3/4 x 4 3/4 inch (12 x 12 cm) colour correction or variable-contrast filters.

#### 2.4.5 The negative carrier

Fit the negative carrier glasses in the OTONEG 2 carrier, compress the pressure springs and push the carrier fully into the enlarger head. To facilitate centering of the negative carrier, the bearing surface of the carrier standard is fitted with guide channels and location holes.

### 3.0.0 Lighting systems

#### 3.1.0 Opal lamps

Remove the lamphouse cover (16) and screw an opal lamp (up to 500 watts) into the lamp holder socket. With opal lamps of 250 watts or more the LAFAN N cooling fan (see accessories) must be connected to the lamphouse.

After prolonged service, the inside of the bulb may accumulate deposits, leading to uneven illumination. So regularly check all opal lamps by holding them against a strong light source to show up such uneven deposits in good time.

For lenses of focal lengths 28 - 105 mm the opal lamp used should have a bulb diameter of at least 2 1/2 inches (65 mm); with 135 and 150 mm lenses the bulb diameter should be at least 3 1/2 inches (90 mm). Suitable lamps (Order code: OPAL) are available from Durst in 200, 300 and 500 watt versions.

#### 3.1.1 The heat filter

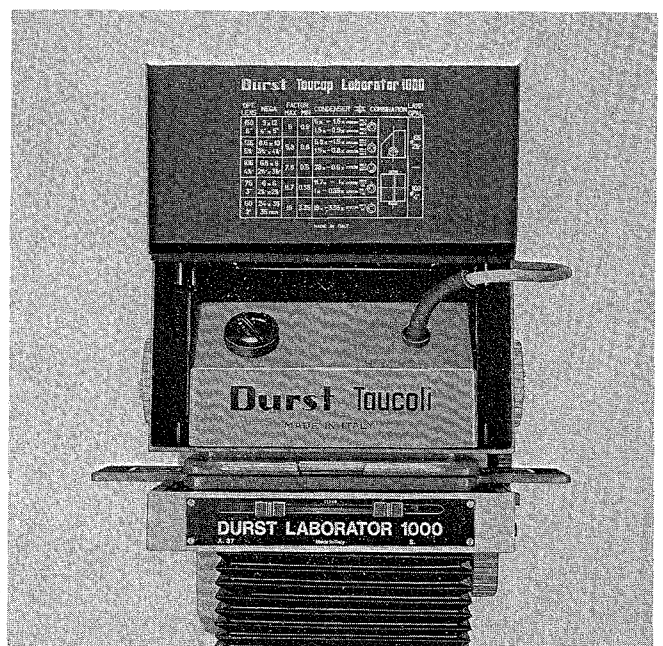
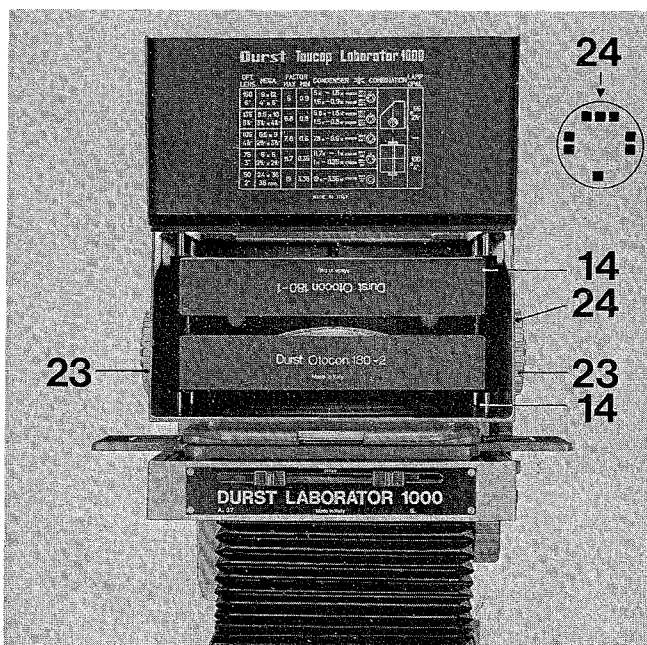
When using the glassless OTOPFE metal mask inserts, the TAUCALO heat filter should be fitted between the lamphouse and condenser housing. Unscrew the four screws and insert the filter with the protruding ledge at the top and facing the reflecting mirror. The TAUCALO filter is available from Durst as an accessory. It protects the negative against harmful heat and also prevents loss of sharpness due to film curl.

#### 3.1.2 The red filter

The red filter allows viewing of the projected image with the black-and-white enlarging paper already in position on the baseboard. Swing the red filter into the light path by its mount. The red filter is not suitable for use with colour papers.

#### 3.2.0 Cold cathode lighting

The TAUCOLI cold cathode lighting unit fits into the condenser housing in place of the condensers. First lock the



enlarger head in position with the knob (8) and only then withdraw the condensers. Push the TAUCOLI fully into the housing, then release the locking knob.

Thanks to its soft diffused light, the TAUCOLI cold cathode lighting unit is specially suitable for enlarging high-contrast black-and-white negatives. The high light output permits short exposure times even with very dense negatives or on slow paper. The cold cathode lighting further suppresses scratches and flaws in the negatives, thus largely eliminating the need for retouching.

### 3.3.0 Point source lamps

Where maximum definition, detail rendering and short exposure times are important, the TAULAM P/PULAM/PUTRA or VARIPUT point source lighting unit (available as an accessory) is recommended. The TAULAM P lamp holder takes the 12 volt 100 watt PULAM low-voltage lamp in Edison screw mount; the lamp is run off the PUTRA or VARIPUT transformer.

When using point source lighting, a surface-coated reflecting mirror (Order code: TAUSPE T) as well as coated condensers (OTOCON T) and negative carrier glasses (OTOGLAS T) are required. The condenser combinations to be used with the point source lamps are indicated in the tables at the end of this operating manual.

### 4.0.0 Lenses and lens mounting

The lenses screw into the appropriate panels which are fitted after unscrewing and then securing the milled screw (25).

Lenses of focal lengths from 75 to 150 mm are mounted on the flat LAPLA panel. The 135 and 150 mm Schneider lenses which come complete with a connecting mount can be fitted directly to the lens standard.

50 mm lenses are mounted on the TAUPLA panel (available separately), while the SEIPLA 7525 panel takes the 28 and 35 mm lenses.

### 5.0.0 The negative carrier system

The negative carrier of the LABORATOR 1000 takes films and plates up to 4 x 5 inches or 10 x 12.5 cm. The negative carrier system includes two plane-parallel glass plates which are fitted by pressing down or pulling up the sprung clamping strips.

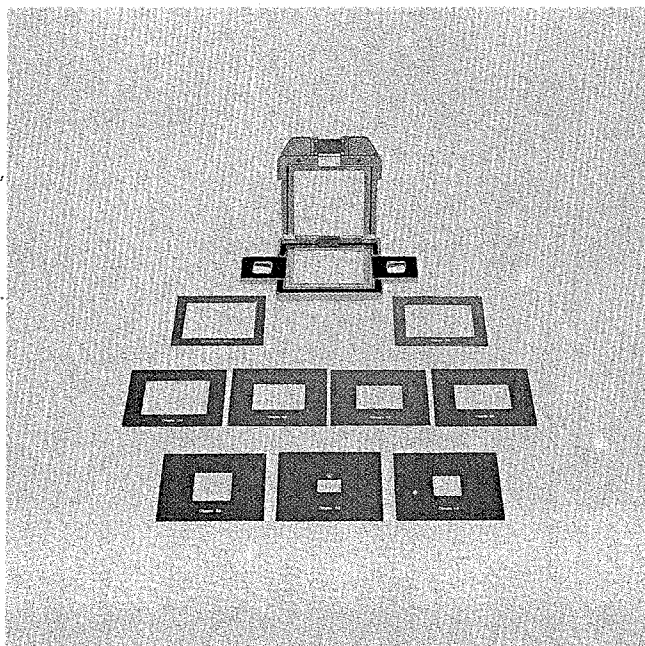
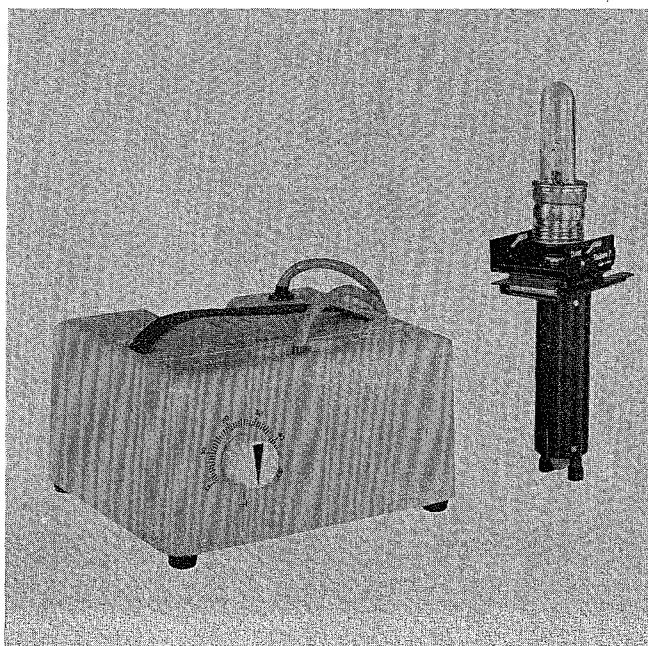
To avoid Newton's rings, the top glass plate can be replaced by a surface-treated glass (Order code: OTOGLAS AN)

To insert the negatives, remove the negative carrier from the enlarger head. The top section of the carrier is spring mounted and presses against the bottom part on insertion in the enlarger head; this holds the negatives completely flat.

The carrier does not have to be removed from the enlarger head to insert strip negatives in all sizes up to 2 1/2 x 3 1/2 inches (6.5 x 9 cm), including 70 mm films.

For glassless enlarging OTOPE masks are available in all standard inch and centimetre film sizes. These metal masks are inserted in the negative carrier in place of the two glasses, the masks with the pins going in the bottom and the masks with the corresponding locating holes in the top. With these masks even damp plates can be enlarged.

If the lower mask is turned round, roll films up to 2 1/2 x 3 1/2 inches (6.5 x 9 cm) can also be enlarged in uncut strips.





## 6.0.0 Operation (with opal lamps)

### 6.1.0 Centering the lamp

Connect the plug of the lead (18) directly (or via an exposure timer) to the mains supply. Switch on and off by the switch (19).

The reflex lighting system of the LABORATOR 1000 ensures even illumination with the double condensers, provided that the lamp has been carefully centered before enlarging. To do this, push the empty negative carrier fully into the enlarger head. Release the latter until the projected area on the baseboard appears evenly illuminated.

### 6.2.0 Clean negatives

Dust and finger prints on the negatives show up disturbingly in enlargements. So always clean dirty negatives before enlarging. Remove adhering dust preferably with a sable or anti-static brush. Finger prints can be removed by gently wiping with a fluffless cloth. Clean off obstinate dirt with a suitable film cleaning fluid. Insert the negative in the negative carrier only when completely dry. Always clean negatives very carefully to avoid scratching the emulsion surface.

### 6.3.0 Adjusting the magnification

The LABORATOR 1000 has a particularly smooth vertical adjustment of the enlarger head. The head is easily raised or lowered by the vertical adjustment knob (29) with swing-out crank. Its excellent spring-loaded counterweighting keeps the enlarger head in position at any point along the column. The head can be locked in place with the locking knob (8).

### 6.4.0 Focusing

Focus by turning the knob (30). For rapid adjustment this also carries a swing-out crank.

### 6.5.0 Making the enlargement

Adjust the enlarger head up or down to obtain a projected image of the required size on the baseboard. The exposure

time is determined either by test strips or by the use of appropriate metering equipment. Note in general that the lens is best stopped down by two stops to ensure optimum definition and even illumination.

If the magnification obtainable on the baseboard is inadequate, unscrew the star knob (33), remove the negative carrier standard (3) and refit it in its top position. First however tighten the locking knob (8) of the carriage.

### 6.5.1 Cropping

Even an experienced photographer does not always manage to frame the required field of view exactly during a camera exposure. Precise framing is only possible during enlarging. Mask down the required image area with the adjustable masks of the enlarger and with the masking strips of the paper holder.

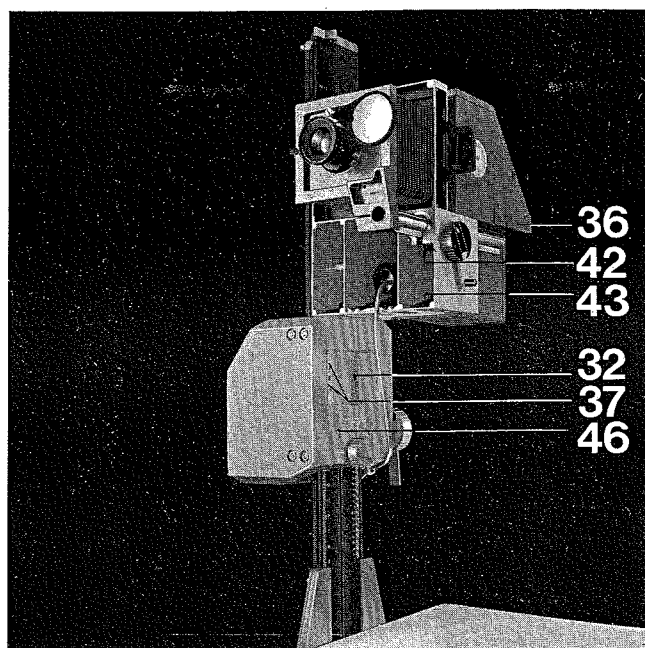
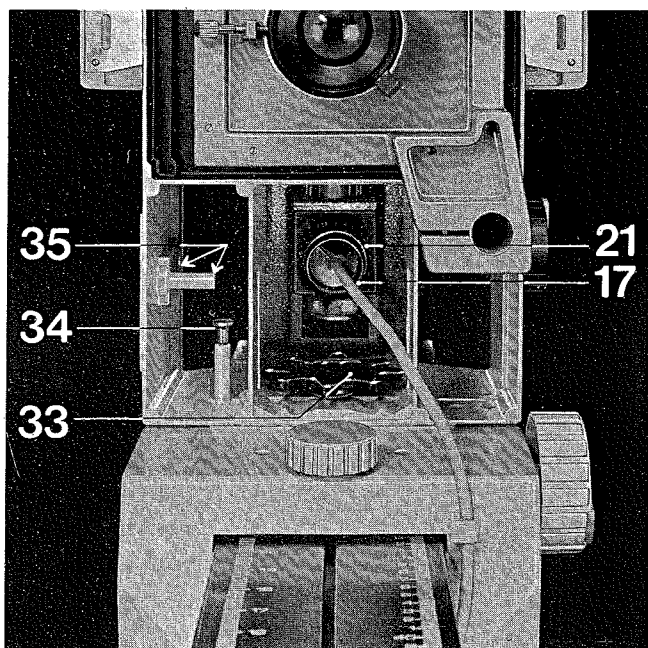
### 6.5.2 Giant enlargements

For giant enlargements project on the floor or on a wall. For floor projection first stabilize the baseboard with suitable weights or clamp it to the bench with a joiner's clamp. Then slack off the hexagonal bolts of the column base, pull out the column and re-insert it turned round through 180°. Finally retighten the four hexagonal bolts.

For projection on a wall, first fix the enlarger head in its upper position on the carriage. Then slack off the star knob (33), withdraw the engagement pin (34) and swing the enlarger head to the right through 90°. The head is correctly positioned when the engagement bolt slides into the centre of the three engagement holes. If a negative has to be projected horizontally proceed as follows:

(a) Lock the carriage with the locking knob (8) and remove the condensers, negative carrier and lens.

(b) Remove the enlarger head from the carriage after unscrewing the star knob (33), then remove the knob and engagement pin. (The engagement pin can be withdrawn after unscrewing the handle).



(c) Refit the engagement pin and star knob in the opening provided in the left hand side of the enlarger head. The head can now be fitted to the upper holes of the carriage.

(d) Swing the enlarger head into its horizontal position to make the engagement pin engage the middle hole of the three locating holes.

(e) Fit the condensers, negative carrier and lens, and unlock the knob (8).

**Important:**

The Durst 401 colour mixing head cannot be used with the enlarger head in this position.

### 6.6.0 Distortion control

Converging verticals are the result of tilting the camera when taking the picture. If, for instance, you shoot a high building from street level by pointing the camera up against the sky, the vertical lines will converge in the negative if the camera has no perspective control adjustment. This undesirable effect can be compensated by tilting the enlarger head and the masking frame. To keep the image sharp over the whole area with the enlarger head tilted, stop down the lens by two stops or more for increased depth of focus.

The enlarger head can be tilted to the left or right after slacking off the star knob (33) and withdrawing the engagement pin. Then lock the enlarger head again by tightening the star knob (33). If this degree of distortion control is insufficient, tilt the masking frame on the baseboard in the opposite direction. Complete correction of converging verticals is however only possible by using the TAUBA distortion control panel (available separately — see accessories).

### 6.7.0 Reductions

For reductions use a lens whose focal length is approximately equal to the image diagonal of the required reduced format. For instance for a 4 x 5 inch original to be

reduced to 2 1/2 x 3 1/2 inches (6.5 x 9 cm) use a lens of about 105 mm focal length.

For greater reductions fit the DUTUB 2 extension tube (see accessories).

## 6.8.0 Copying

### 6.8.1 The copying outfit

The copying outfit for plates and sheet films up to 4 x 5 inches, available as an accessory for the LABORATOR 1000, consists of:

(a) The OTOKA copying adapter. The OTOKA is a rigid frame with a ground glass screen supported on springs. Plate holders and sheet film adapters are available separately for 2 1/2 x 3 1/2 inch (6.5 x 9 cm), 3 1/4 x 4 1/4 inch, 9 x 12 cm, and 4 x 5 inch film.

(b) The RILU lighting unit. This consists of two chrome plated lamp supporting arms of adjustable height. The two arms each take two separately switchable lamp holders which are adjustable laterally and can tilt vertically. The lamp holders take opal lamps up to 150 watts. Each holder carries a graduated diffuser for even illumination of the original. When not in use, the lamp supporting arms swing back out of the way while enlarging. For even illumination of originals larger than 12 x 16 inches or 30 x 40 cm, RILAR extension arms are available and fit between the two clamping sockets on the baseboard and the lamp supporting arms of the RILU.

To fit the RILU lamp units, first unscrew the two cross-head screws at the rear of the baseboard. Place the connecting jaws over the screw holes and attach to the baseboard by the screws previously in position plus the two screws supplied with the RILU outfit.

An alternative and more economically priced lighting unit is the CAMFLUD 2 or CAMFLUD 4. The CAMFLUD consists of two lamp support arms which can each carry one (CAMFLUD 2) or two (CAMFLUD 4) lamp holders. The holders take flood lamps up to 150 watts, which are laterally adjustable and can tilt about their axis to adjust the angle of the incident light. Suitable holes have to be drilled into the baseboard of the LABORATOR 1000 to fix the lamp support arms.

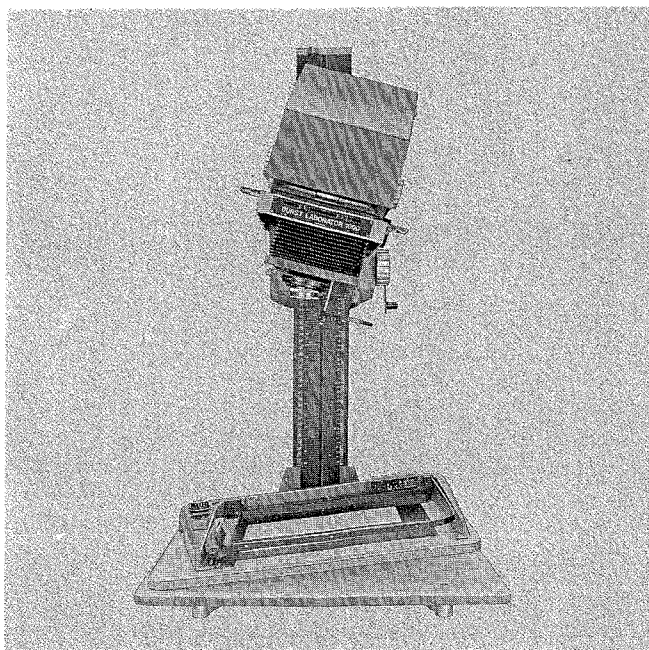
### 6.8.2 Copying procedure

Push the OTOKA copying adapter into the enlarger head in place of the negative carrier and secure it with the screw at the front. The image size and focus can now be adjusted as follows:

(a) By viewing through the mirror. Unscrew the two milled screws of the condenser housing cover and remove the latter. Withdraw the mirror from its fitting and push it into the guide slots of the enlarger head with the silvered side downwards. Now switch on the copying lighting — the original and the framing lines of the ground glass screen are visible in the viewing mirror. Adjust the image size and focus by raising or lowering the enlarger head. The original must appear evenly illuminated without glare when viewed from above.

(b) By projection. Switch on the enlarger lamp to project the frame line markings of the ground glass screen onto the original. Adjust the enlarger head so that the frame markings just enclose the original. Then focus for maximum sharpness.

If the LABORATOR 1000 was supplied with the TAUCOLI cold cathode lighting unit, proceed as follows for focusing when copying:



First lock the carriage and remove the TAUCOLI cold cathode lighting unit after releasing its locking knob. Switch on the copying light and adjust the image size and sharpness as described under (a) above but view the image on the ground glass screen. While adjusting the enlarger for the size of the original, keep a firm hold on the negative carrier standard as it would otherwise shoot upwards.

To make an exposure, first move the guide rod fully to the left. Push the plate or film holder, loaded with an appropriate sheet film or plate, underneath the ground glass screen frame with the draw slide of the plate holder facing downwards. Engage the plate holder in the clip of the guide rod and fully pull this to the right, so moving the plate holder completely underneath the ground glass screen. To permit withdrawal of the draw slide for the exposure, secure the plate holder by pushing in the latch at the left hand side. To open the draw slide, push the guide rod fully to the left. The opening travel of the draw slide is adjustable by turning the milled knob of the guide rod. Now expose by switching the copying light on and off again.

To ensure optimum sharpness for copying stop down the lens by at least two stops.

After the exposure pull the draw-slide to the right again with the guide rod, withdraw the latch securing the plate holder and push the guide rod to the left again. This pulls the closed plate holder out from underneath the ground glass screen frame.

## 7.0.0 Colour enlarging

### 7.1.0 The colour mixing head

The Durst 401 colour mixing head was primarily developed for use with the LABORATOR 1000. This powerful colour mixing head carries infinitely variable dichroic correction filters which do not fade even after prolonged use. These filters are swung into the light path by three knobs. The head yields diffused lighting.

Fitting and operation on the Durst 401 colour head are described in detail in the appropriate operating manual.

### 7.2.0 The automatic Durst CCU 100 control unit

The Durst CCU 100 is an automatic colour control unit for precise, rapid and correct colour balance and exposure of colour enlargements. The unit consists of a colour mixing head, a measuring head, a control unit and a calibrating probe. With condenser illumination the unit can enlarge negatives from 24 x 36 mm up to 4 x 5 inches (10 x 12.5 cm). Negatives up to 2 1/2 x 3 1/2 inches (6.5 x 9 cm) can also be enlarged if desired with diffused lighting; in this case the OTOCAP adapter and the AUTOBOX 66 and AUTOBOX 69 mirror boxes are used.

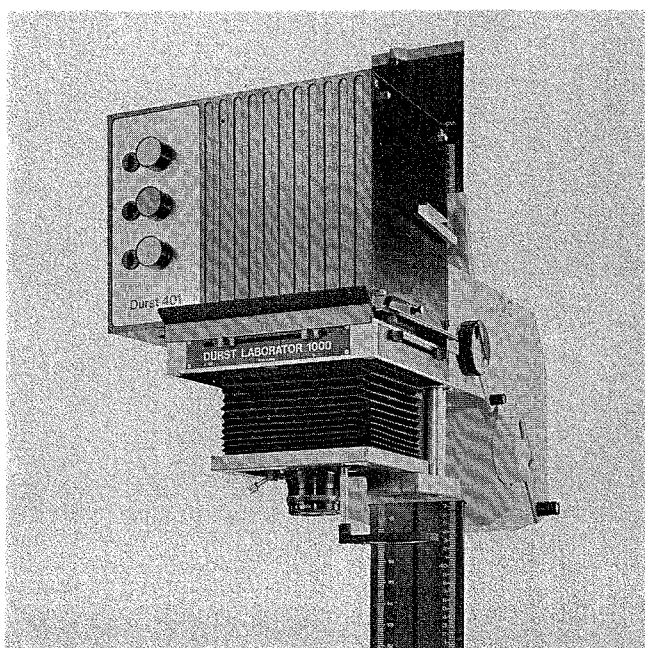
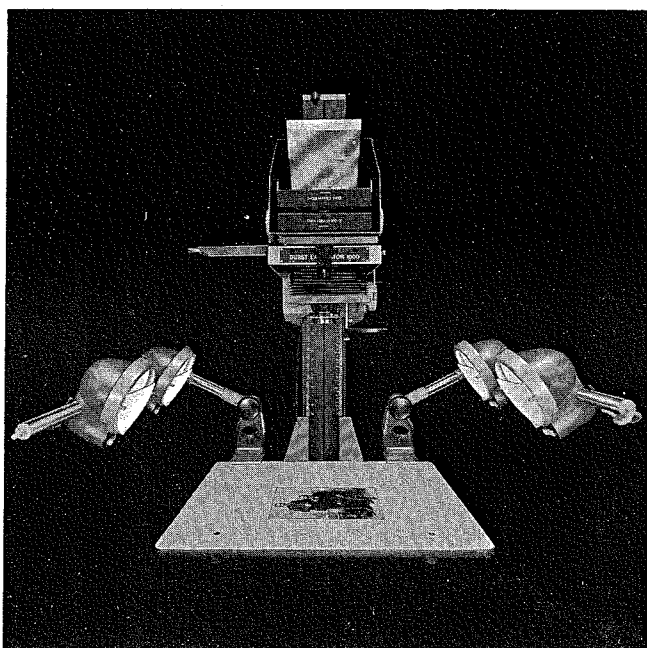
Assembly and operation are described in detail in the CCU 100 operating manual.

### 7.3.0 The TAUFIL filter drawer

To fit the TAUFIL filter drawer -- available separately -- remove the cover panel after unscrewing its two screws and push the filter drawer into the aperture uncovered by the panel. The TAUFIL drawer takes 4 3/4 x 4 3/4 inches (12 x 12 cm) colour correction or variable-contrast filters.

### 7.4.0 The LATIRAD filter turret

The LATIRAD filter turret is provided for colour printing by the additive exposure system. The LATIRAD has four openings to take up to three colour filters of 70 mm diameter; the fourth aperture is used for white light exposures. The LATIRAD replaces the red filter on the shaft of the latter.



## 8.0.0 Accessories

### 8.1.0 The filter drawer

The TAUFIL filter drawer takes 4 3/4 x 4 3/4 inch (12 x 12 cm) colour correction or variable-contrast filters.

### 8.2.0 The filter turret

The LATIRAD filter turret is mounted on the shaft of the red filter in place of the latter. The LATIRAD has four circular apertures to take three filters of 70 mm diameter. The fourth opening is left clear for white-light exposures.

The LATIRAD can be used for colour enlargements by the additive exposure process, for enlargements on variable-contrast papers and for making colour separations.

If more than three filters are required, up to two supplementary filter wheels (Order code: LAZURAD) can be used in conjunction with the LATIRAD.

### 8.3.0 The tilting lens panel

The TAUBA tilting panel can be used with lenses of all focal lengths from 75 to 150 mm. The TAUBA is fitted in place of the normal lens panel in the lens standard of the enlarger after releasing the milled screw. The lenses are mounted in the distortion control panel via suitable TAURING adapter rings according to the lens thread. For distortion control the lens can now tilt in any direction and can be clamped in position by the milled screw.

### 8.4.0 Wall mounting system

The UNIWAL wall mounting system permits projection on the floor or on a roll paper magazine. When projecting on the floor, the maximum magnification obtainable is just over double that on the baseboard. The maximum image size is about 40 x 48 inches (100 x 120 cm), permitting for instance re-enlargement of unperforated 35 mm microfilm negatives (32 x 45 mm) to the A0 format (33 x 47 inches or 841 x 1189 mm) or to the American or British E (34 x 34 inches) or D (30 x 40 inches) sizes respectively.

### 8.5.0 Extension tubes

The DUTUB 2 is an adjustable extension tube for reductions and macrophotography. The DUTUB 2 is mounted on the lens standard of the enlarger in place of the normal lens panel and in turn takes the lens mounted on the standard panel.

### 8.6.0 Register accessories

The register accessories available for the LABORATOR 1000 consist of:

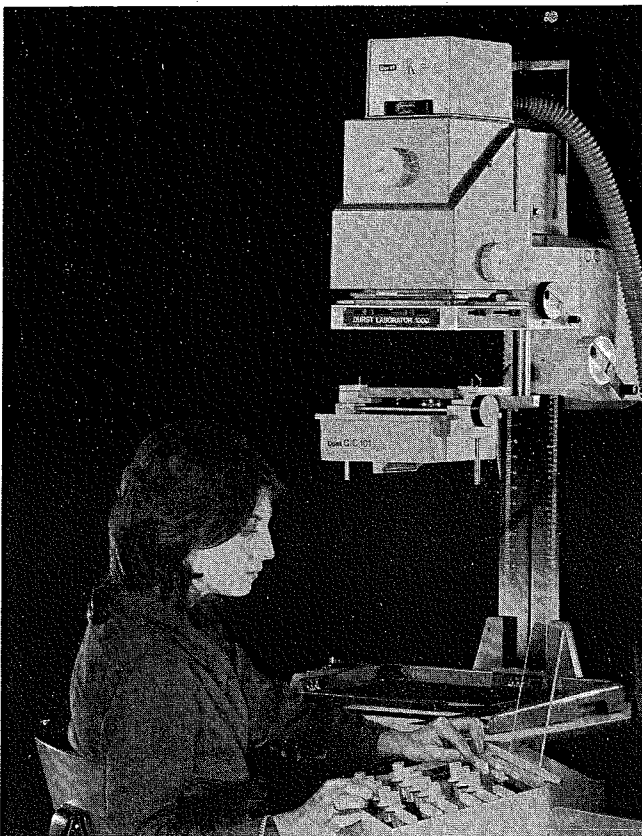
- The OTOHAL 45 — precision locating frame
- The OTOGRA 45 — negative carrier for negatives up to 4 x 5 inches (10 x 12.5 cm)
- The GRADAP 45 — pin register bar
- The MIVALO — precision punch

The OTOHAL 45 is inserted into the enlarger in place of the OTONEG negative carrier and locked in position. On pushing the OTOGRA 45 in, this is automatically centered in the locating frame. The GRADAP 45 register pin bar carries two micro-register pins for attaching the film punched with the MIVALO punch. Two plane-parallel glasses complete the outfit.

### 8.7.0 The cooling fan

When using opal lamps of greater power than 250 watts, the LAFAN N cooling fan must be connected to the lamphouse. An outlet opening is provided in the right hand side.

The LAFAN N is available for 220 volt single-phase AC, 50 - 60 Hz. For operation at other voltages, a 100 watt transformer is required.





#### **8.8.0 Voltage stabilizers**

The Durst voltage stabilizers, available in versions for 500, 1000 and 2000 watts, are indispensable to avoid wrong exposures, especially in colour, when the mains voltage is subject to frequent fluctuations. The Durst voltage stabilizers keep the voltage constant within  $\pm 2\%$  and compensate fluctuations up to  $+10\%$  and  $-20\%$ . They are available for an input voltage of 250 volts, and output voltages of 220 volts, 50 Hz or 110 volts, 60 Hz.

#### **8.9.0 The darkroom lamp**

The PENTACOLOR darkroom lamp contains five interchangeable filters — orange, ruby, olive green, and deep green safelight filters and a white light screen.

The filters are mounted on a rotating turret for easy switching of the different types of darkroom illumination. A heat filter protects the safelights against fading. The lamp unit can tilt for direct as well as indirect illumination. The lamp may be mounted on the wall or stand on a bench.

#### **8.10.0 Masking frame**

The Durst 243 masking frame takes paper sizes up to 10 x 12 inches or 24 x 30 cm. The Durst 243 consists of a solid cast frame with independently adjustable masking strips. With these strips and a paper stop — adjustable by a milled knob — enlargements can be made with white margins of any width between 4 and 35 mm. The frame is easily switched over from inch to metric format markings. At extra cost it is available with a plastic laminated base-board.

#### **8.11.0 Focusing negatives**

24 x 36 mm and 2 1/2 x 3 1/2 inch (6.5 x 9 cm) focusing negatives are available for checking sharp focus.

#### **9.0.0 Care and maintenance**

The Durst LABORATOR 1000 requires very little maintenance. The only requirement is to wipe the steel tape from time to time carefully with an oily rag.

De-dust the negative carrier glasses, condensers and reflector with an antistatic brush or antistatic cloth.

When the enlarger is not in use, cover it with the AUTOCUF dust cover (available as an accessory).

If after prolonged use the focusing knob becomes too loose or too stiff, simply tighten or slack off respectively the four screws accessible through the recesses.

The friction drive for the vertical adjustment of the enlarger head can be reset with the two threaded shafts to the left and right of the locking knob.

Condenser Combinations Table when Using Rodenstock—Rodagon Lenses with Opal Lamps

VERTICAL PROJECTION

Lens f = $\frac{\text{mm}}{\text{inch}}$	Negative size $\frac{\text{mm}}{\text{inch}}$	Linear magnification factors min. max.	Condenser combinations
135	100 x 125	1.5x — 5.9x	$\frac{180-1}{180-2}$
5 1/4	4 x 5	0.6x — 1.5x	$\frac{180-1}{180-1}$
105	85 x 100	1.2x — 7.8x	$\frac{180-2}{180-2}$
4 1/8	3 1/4 x 4 1/4	0.3x — 1.2x	$\frac{180-2}{180-1}$
80	56 x 72 65 x 90	2 x — 10.8x	$\frac{160}{130}$
3 1/4	2 1/2 x 3 1/2	0.4x — 2 x	$\frac{180-2}{180-2}$
60	60 x 60	3.2x — 15 x	$\frac{160}{130}$
2 3/8	2 1/4 x 2 1/4	0.5x — 3.2x	
50	32 x 45 40 x 40	4.6x — 18.7x	$\frac{160}{90}$
2	1 1/2 x 1 1/2	2 x — 4.6x	$\frac{160}{90}$
		0.6x — 2 x	$\frac{160}{130}$

Condenser combinations table when using Schneider-Componon lenses with opal lamps

Vertical projection

Lens f = $\frac{\text{mm}}{\text{inch}}$	Negative size $\frac{\text{mm}}{\text{inch}}$	Linear magnification factors min. max.	Condenser combinations
150	100 x 125	1.5x — 5 x	$\frac{180-1}{180-2}$
6	4 x 5	0.9x — 1.5x	$\frac{180-1}{180-1}$
135	85 x 100	1.5x — 5.8x	$\frac{180-1}{180-2}$
1/4	3 1/4 x 4 1/4	0.8x — 1.5x	$\frac{180-1}{180-1}$
105 4 1/8	56 x 72 65 x 90 2 1/2 x 3 1/2	0.6x — 7.8x	$\frac{180-2}{180-1}$
80	60 x 60	3.6x — 11.6x	$\frac{160}{130}$
3 1/4	2 1/4 x 2 1/4	1 x — 3.6x	$\frac{180-2}{130}$
		0.4x — 1 x	$\frac{180-1}{160}$
60	32 x 45 40 x 40	5.6x — 16 x	$\frac{130}{130}$
2 3/8	1 1/2 x 1 1/2	0.4x — 5.6x	$\frac{130}{130}$
50 2	24 x 36 35 mm	3.35x — 19 x	$\frac{180-2}{90}$
35 1 3/8	18 x 24	11.7x — 30 x	$\frac{130}{90}$
28 1 1/8	12 x 17	8 x — 36 x	$\frac{130}{90}$

Condenser Combinations Table when Using Rodenstock—Rodagon and Schneider—Component Lenses with Opal Lamps

HORIZONTAL PROJECTION

Lens f = $\frac{\text{mm}}{\text{inch}}$	Negative size $\frac{\text{mm}}{\text{inch}}$	Linear magnification factors min. — max.	Condenser combinations
150 6	100 x 125 4 x 5	5.0x — 29.3x	$\frac{180-1}{180-2}$
135 5 1/4	85 x 100 3 1/4 x 4 1/4	5.8x — 39.0x	$\frac{180-1}{180-2}$
105 4 1/8	56 x 72 65 x 90 2 1/2 x 3 1/2	7.8x — 43.8x	$\frac{180-2}{180-1}$
80 3 1/4	60 x 60 2 1/2 x 2 1/4	11.0x — 68.0x	$\frac{180-2}{130}$
60 2 3/8	32 x 45 40 x 40 1 1/2 x 1 1/2	14.3x — 105.3x	$\frac{130}{130}$
50 2	24 x 36 35 mm	19.0x — 106 x	$\frac{180-2}{90}$

Condenser Combinations Table when Using Rodenstock—Rodagon Lenses with Point—Light Lamps

VERTICAL PROJECTION

Lens f = $\frac{\text{mm}}{\text{inch}}$	Negative size $\frac{\text{mm}}{\text{inch}}$	Linear magnification factors min. — max.	Condenser combinations
150 6	100 x 125 4 x 5	2.6x — 5.0x 1.2x — 2.7x 0.95x — 1.4x	$\frac{180-1}{180-2}$ $\frac{180-1}{180-3}$ $\frac{180-1}{180-1}$
135 5 1/4	85 x 100 3 1/4 x 4 1/4	1.8x — 5.9x 0.85x — 1.9x	$\frac{180-1}{160}$ $\frac{180-1}{180-3}$
105 4 1/8	56 x 72 65 x 90 2 1/2 x 3 1/2	1.9x — 8.2x	$\frac{180-2}{160}$
80 3 1/4	60 x 60 2 1/4 x 2 1/4	3.5x — 11.3x	$\frac{160}{130}$
60 2 3/8	32 x 45 40 x 40 1 1/2 x 1 1/2	5.5x — 15.6x	$\frac{180-1}{90}$
50 2	24 x 36 35 mm	7.1x — 19.7x	$\frac{180-2}{90}$

Condenser Combinations Table when Using Schneider—Component Lenses  
with Point—Light Lamps

VERTICAL PROJECTION

Lens $f = \frac{\text{mm}}{\text{inch}}$	Negative size $\frac{\text{mm}}{\text{inch}}$	Linear magnification factors min. max.	Condenser combinations
150	100 x 125	2.5x — 5.0x	$\frac{180 - 1 \text{ I}}{180 - 2 \text{ T}}$
6	4 x 5	1.0x — 2.7x	$\frac{180 - 1 \text{ I}}{180 - 3 \text{ T}}$
135	85 x 100	1.8x — 5.8x	$\frac{180 - 1 \text{ I}}{160 \text{ T}}$
5 1/4	3 1/4 x 4 1/4	0.85x — 1.85x	$\frac{180 - 1 \text{ I}}{180 - 3 \text{ T}}$
105 4 1/8	56 x 72 65 x 90 2 1/2 x 3 1/2	1.7x — 7.9x	$\frac{180 - 2 \text{ I}}{180 - 2 \text{ T}}$
80 3 1/4	60 x 60 2 1/4 x 2 1/4	3.5x — 11.5x	$\frac{160 \text{ I}}{130 \text{ T}}$
60 2 3/8	32 x 45 40 x 40 1 1/2 x 1 1/2	5.6x — 16.1x	$\frac{180 - 1 \text{ I}}{90 \text{ T}}$
50 2	24 x 36 35 mm	6.9x — 19.2x	$\frac{180 - 2 \text{ I}}{90 \text{ T}}$
35 1 3/8	18 x 24	11.3x — 29.2x	$\frac{130 \text{ I}}{90 \text{ T}}$
28 1 1/8	12 x 17	14.0x — 50.0x	$\frac{130 \text{ I}}{90 \text{ T}}$

Condenser Combinations Table when Using Rodenstock—Rodenstock and  
Schneider—Component Lenses with Point—Light Lamps

HORIZONTAL PROJECTION

Lens $f = \frac{\text{mm}}{\text{inch}}$	Negative size $\frac{\text{mm}}{\text{inch}}$	Linear magnification factors min. max.	Condenser combinations
150 6	100 x 125 4 x 5	5.0x — 27.2x	$\frac{180 - 1 \text{ I}}{180 - 2 \text{ T}}$
135	85 x 100	14.5x — 37.4x	$\frac{180 - 2 \text{ I}}{160 \text{ T}}$
5 1/4	3 1/4 x 4 1/4	5.5x — 14.5x	$\frac{180 - 1 \text{ I}}{160 \text{ T}}$
105 4 1/8	56 x 72 65 x 90 2 1/2 x 3 1/2	6.8x — 44.3x	$\frac{180 - 2 \text{ I}}{160 \text{ T}}$
80 3 1/4	60 x 60 2 1/4 x 2 1/4	10.2x — 71.0x	$\frac{160 \text{ I}}{130 \text{ T}}$
60 2 3/8	32 x 45 40 x 40 1 1/2 x 1 1/2	15.2x — 103.5x	$\frac{180 - 3 \text{ I}}{90 \text{ T}}$
50 2	24 x 36 35 mm	17.4x — 110.0x	$\frac{160 \text{ I}}{90 \text{ T}}$



Condenser Combinations Table when Using Rodenstock—Rodagon Lenses  
with Durst CCU 100

VERTICAL AND HORIZONTAL PROJECTION

Lens $f = \frac{\text{mm}}{\text{inch}}$	Negative size $\frac{\text{mm}}{\text{inch}}$	Linear magnification factors		Condenser combinations	
		min.	max.	Vertical projection	Horizontal projection
150  6	100 x 125  4 x 5	2.0x	5.1x	$\frac{180-2}{180-2}$	
		1.1x	2.0x	$\frac{180-1}{180-2}$	
		5.1x	29.0x		$\frac{180-2}{180-2}$
135  5 1/4	85 x 100  3 1/4 x 4 1/4	0.85x	5.8x	$\frac{180-2}{180-2}$	
		5.8x	38.5x		$\frac{180-2}{180-2}$
		1.8x	8.0x	$\frac{180-2}{130}$	
105  4 1/8	56 x 72  65 x 90  2 1/2 x 3 1/2	+0.6x	1.8x	$\frac{180-1}{130}$	
		8.0x	44.0x		$\frac{180-2}{130}$
		3.45x	11.5x	$\frac{160}{130}$	
80  3 1/8	60 x 60  2 1/4 x 2 1/4	+0.4x	3.5x	$\frac{160}{130}$	
		11.5x	51.5x		$\frac{160}{130}$

Lens $f = \frac{\text{mm}}{\text{inch}}$	Negative size $\frac{\text{mm}}{\text{inch}}$	Linear magnification factors		Condenser combinations	
		min.	max.	Vertical projection	Horizontal projection
60  2 3/8	32 x 45  40 x 40  1 1/2 x 1 1/2	5.4x	15.5x	$\frac{130}{130}$	
		* 1.6x	5.4x	$\frac{130}{130}$	
		15.5x	76.5x		$\frac{130}{130}$
50  2	24 x 36  35 mm	7.1x	19.5x		$\frac{130}{90}$
		* 2.4x	7.1x	$\frac{130}{90}$	
		19.5x	98.0x		$\frac{130}{90}$

\* with raised support 175 mm (approx. 7 in.)      \* with raised support 240 mm (approx. 9 1/2 in.)

IMPORTANT: For an optimum illumination, TAUFARB has to be adjusted in height for the different magnification factors.

Condenser Combinations Table when Using Schneider—Componon Lenses  
with Durst CCU 100

VERTICAL AND HORIZONTAL PROJECTION

Lens f = $\frac{\text{mm}}{\text{inch}}$	Negative size $\frac{\text{mm}}{\text{inch}}$	Linear magnification factors		Condenser combinations	
		min.	max.	Vertical projection	Horizontal projection
150  6	100 x 125  4 x 5	2.0x	5.0x	$\frac{180-2}{180-2}$	
		0.95x	2.0x	$\frac{180-1}{180-2}$	
		5.0x	29.0x		$\frac{180-2}{180-2}$
135  5 1/4	85 x 100  3 1/4 x 4 1/4	0.8x	5.8x	$\frac{180-2}{180-2}$	
		5.8x	38.5x		$\frac{180-2}{180-2}$

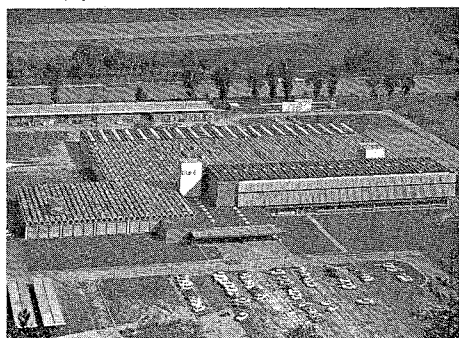
Lens f = $\frac{\text{mm}}{\text{inch}}$	Negative size $\frac{\text{mm}}{\text{inch}}$	Linear magnification factors		Condenser combinations	
		min.	max.	Vertical projection	Horizontal projection
105  4 1/8	56 x 72  65 x 90  2 1/2 x 3 1/2	1.6x	7.8x	$\frac{180-2}{130}$	
		*0.6x	1.6x	$\frac{180-1}{130}$	
		7.8x	43.5x		$\frac{180-2}{130}$
80  3 1/8	60 x 60  2 1/4 x 2 1/4	3.6x	11.6x	$\frac{160}{130}$	
		*0.6x	4.0x	$\frac{160}{130}$	
		11.6x	52.5x		$\frac{160}{130}$
60  2 3/8	32 x 45  40 x 40  1 1/2 x 1 1/2	5.6x	16.0x	$\frac{130}{90}$	
		*1.7x	5.6x	$\frac{130}{130}$	
		16.0x	76.0x		$\frac{130}{90}$
50  2	24 x 36  35 mm	7.0x	19.2x	$\frac{130}{90}$	
		*2.45x	7.5x	$\frac{130}{90}$	
		19.2x	97.0x		$\frac{130}{90}$

\* with 175 mm spacer (approx. 7 in.)      \* with 240 mm spacer (approx. 9 1/2 in.)

IMPORTANT: For an optimum illumination, TAUFARB hast to be adjusted in height for the different magnification factors.

Durst®

Durst Inc.  
P.O.Box 445  
39100 BOLZANO, Italy



Studio Durst GA 2.7/273 (e) Printed in Italy