The FOCOMAT lc is the ideal enlarger with automatic focusing for miniature negative films

CONTENTS

A  ASSEMBLING

B  FILM STAGE

C  ILLUMINATION

D  LENSES

E  FILM SLIDES & NEGATIVE MASKS

F  AUTOMATIC FOCUSING

G  RANGE OF ENLARGEMENT, ENLARGING

H  COPYING WORK, REPRODUCTION DARKSLIDE

I  CORRECTING DISTORTION

J  CARE, REPAIRS

2
ASSEMBLING

The FOCOMAT 1c enlarger is supplied with the following components packed separately: baseboard with clamping lever screwed off, upright with setting pin inserted, enlarger head with focusing arrangement and clamp fitting the upright, and a spanner; film slides and single negative masks, printing board, etc., as ordered.

Slip CLAMPING LEVER underneath the metal bar on the lower surface of the baseboard in such a way that the concave side of the indented portion faces the board and then fasten lever to the screw in the baseboard using the hexagon nut and the thin washer between nut and lever.

Fit UPRIGHT to top surface of baseboard by inserting and tightening the 3 hexagon screws with washers from below after the flex projecting from the upright has been pushed through the hole in the middle of the 3 screw holes in the baseboard.

Secure LEAD WIRES tightly in connection box.
Operating Handle:

Attach Extension Spring to pin on the lower left arm of the parallelogram mechanism.

Secure Enlarger Head including its focusing arrangement on the upright so that the clamp rests on the setting pin.

For using the Printing Board, push back the clamping lever, raise the guide wedge, countersunk in the baseboard and insert it in the groove of the lower surface of the printing board so that the latter may be conveniently moved and clamped in any desired position by pulling forward the lateral lever.

For Enlarging Without Printing Board the enlarger head must be lowered after the setting pin has been withdrawn and inserted into the lower hole.

Earth Connection

Plug Socket for exposure timer.
FILM STAGE

The built-in condenser lens may be raised and lowered by means of the lateral lever on the enlarger head.

PUSH LEVER BACKWARDS
as far as it will go to raise the lens and to enable the film slide or the negative film to be inserted or withdrawn.

MOVE LEVER HALF-WAY FORWARD
to bring the lens to such a position as to enable the film to be advanced without escaping its guide.

LEVER SETTING DURING THE EXPOSURE

PULL LEVER TO ITS FRONT STOP
to lower the lens with its plane surface on to the film to keep it perfectly flat.

FOR CLEANING the condenser surface which touches the negatives swing the hinged lamphouse back using both your thumbs whilst the forefingers pull forward the spring catches on their ballheads.

NEWTON'S RINGS may prove disturbing when enlargements are made of old and very dry films which have been stored in tightly wound rolls. They can be avoided, however, by means of the special pressure frame NEWOO which is easily fitted on to the condenser lens when the lamphousing is tilted back. It is used exclusively with the film slide.
ILLUMINATION

In accordance with safety regulations the apparatus is to be earthed for which purpose the red terminal screw on the base of the upright (back) is connected to, say, a water pipe. For stationary professional use it is advised to use a three-pin plug (obtainable from us) having two pins for carrying the current and a third for the earth connection.

The LAMP HOLDER may be raised, turned and lowered and also centered by 3 screws from the outside, so that the negative frame can be completely and evenly illuminated.

The 75 WATT BULB normally supplied and used in conjunction with the condenser lens yields a diffused illumination advantageous for miniature negatives as blemishes or dust particles on the back of the film are prevented from appearing on the picture and harmonious enlargements are obtained.

CONNECTION is made direct to the lighting circuit!

Make sure that the correct lamp is used for the available MAINS VOLTAGE.

The ORANGE FILTER is swung into the path of rays for checking the image direct on the enlarging paper.

LENSES

The standard equipment of the FOCOMAT Ic includes the SPECIAL ENLARGING LENS of 5 cm (2") focal length for which the automatic focusing mechanism is properly adjusted. If it is desired, for financial reasons, to use an existing LEICA lens the automatic focusing must be specially adjusted for that particular lens. Both the ELMAR 5 cm and SUMMITAR are suitable.

The adjustment must also be made if the special enlarging lens is supplied at a later date. (See Section F).

For conveniently adjusting and reading the diaphragm setting when using the LEICA ELMAR 5 cm we supply the slip-on ring VALOO. To attach this, set the lens diaphragm to F/3.5 so that the square cut-out of the ring engages the small diaphragm lever of the lens.

When enlarging the following relationship between diaphragm stops and exposure times should be taken into consideration:

<table>
<thead>
<tr>
<th>Diaphragm figure</th>
<th>3,5</th>
<th>4</th>
<th>4,5</th>
<th>5,6</th>
<th>6,3</th>
<th>8</th>
<th>9</th>
<th>11</th>
<th>12,5</th>
<th>16</th>
<th>18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative exposure time</td>
<td>0,75</td>
<td>1</td>
<td>1,25</td>
<td>2</td>
<td>2,5</td>
<td>4</td>
<td>5</td>
<td>8</td>
<td>10</td>
<td>16</td>
<td>20</td>
</tr>
</tbody>
</table>

For enlarging stop to a medium aperture (F/5.6 to F/8). Stopping down too much may reduce contrast.
FILM SLIDES AND NEGATIVE MASKS

These are provided for film strips and single negatives respectively and have apertures up to 4 x 4 cm. They have 3 guiding pins on their under surface. With the condenser lens fully raised the slide or mask, with the two of the three lower pins turned away from the operator, is pushed into the film stage as far as it will go and until the single pin sliding in a groove settles into a hole thus ensuring the correct position.

FILM SLIDE 24 x 36 mm.
for LEICA film strips (LEICA picture size): Raise condenser lens fully and insert film strip with its sensitized side facing downwards into the stage where it will slide into the correct position over the two guide blocks on the front of the film slide. Then lower the lens so that the film is adequately flattened. To avoid scratching the film while it is moved in its guide the condenser is slightly raised by pushing the lateral lever halfway back. (See also section B).

SINGLE NEGATIVE MASK 24 x 36 mm.
with hinged double glass plate: Insert the single negative or negative strip sensitized side downwards, into the double glass plate. Raise the condenser lens fully and slip the glass plate from the front into the negative stage, then lower the lens after the negative has been properly located to the aperture of the mask. Note carefully that the side of the double glass plate marked OBEN is always facing the condenser.

ACCESSORIES FOR OTHER NEGATIVE SIZES UP TO 4 x 4 cm.
For each negative size a special film slide is supplied, and for the sizes 3 x 4 cm. and 4 x 4 cm. single negative masks with hinged double glass plate 5 x 16 cm. are also available.

For these slides and masks no locating clamps are provided on the lens mount (see section F). The lens is focused by hand with the enlarger head set to magnification 10 x. Thereby automatic focusing is established through the entire range of enlargement.
AUTOMATIC FOCUSING

The automatic focusing arrangement of all FOCOMAT enlargers leaves the Works complete with lens is adjusted to the utmost accuracy.

1. Slip film slide into negative stage, insert a Leica film strip with negatives of crisp definition and good contrast and lower the condenser lens by means of its lever.
2. Switch on lamp using trigger switch on the side of the baseboard.
3. Swing the enlarger head upwards (to approx. 10 x magnification).
4. Screw in lens a tightly. When using a Leica lens pull out its barrel and lock it in the infinity position (∞). Open lens diaphragm fully; only the SUMMITAR needs stopping down to F/4.
5. Carefully focus the image by turning the focusing mount b.
6. Loosen grooved locating clamp c and move it along the focusing mount b until it engages the spring catch f while the lens setting is retained; then secure clamp c by using a screw-driver or pin.
7. Swing the enlarger head down to approx. 2.5 x magnification as read off on the lateral scale (not lowering it to its final stop).
8. Give screw d half a turn to the left thus releasing the guiding cam.
9. Adjust cam by means of screw a so that the image is in perfect focus also in the lower position (it is advisable to use a magnifier).
10. Tighten screw d.

To check the correct adjustment it is recommended to make 3 test enlargements. Make the first described above and the second enlargement after having adjusted the cam as follows: Loose a quarter-turn to the right and tighten screw d again. The original setting of the milled by the engraved red dot. Before making the third test enlargement again loosen screw d, give a quarter turn beyond its original setting, and tighten screw d. The guiding cam is finally set to the position of the above 3 positions at which the enlargement obtained showed the best definition.

The adjustment of the focusing mechanism becomes necessary only when a LEICA lens is used or the special enlarging lens is fitted at a later date. A lens for which the adjustment has been made may be unscrewed from the enlarger and replaced without any detrimental effect, but other lenses will always require special adjustment.

Also the film slides and single negative masks supplied with the enlarger should not be confused with those of other equipment.

If a film slide 24 x 36 mm. or a double glass plate are obtained subsequently as replacements, it may be necessary to readjust the lens and the appropriate grooved clamp, the guiding cam remaining unaffected.

Note:

Film slide 24 x 36 mm. — grooved clamp on the right. Single negative mask 24 x 36 mm. — grooved clamp on the left.

For other negative slides and masks, the focus lens on knurled mount independently of the two grooved locating clamps while the enlarger head is in its top position. Automatic focusing is thus obtained for the whole range of enlargement. When replacing the film slide or single negative mask 24 x 36 mm. the lens mount has to be turned until the appropriate grooved clamp engages the spring catch.
At test enlargement with the cam setting on screw d once more, give the screw headed screw e can be easily checked on screw e a half-turn to the left, i.e. a led and the screw d tightened at one

**Single Negative Mask**

11. Replace film slide by single negative mask and the appropriate hinged double glass plate (with its lettering facing upwards and the sensitized side of the film downwards).

12. Raise enlarger head.

13. Focus image by turning lens mount b and disengaging (right) clamp c from the spring catch.

14. While maintaining lens focusing mount in its position move the second grooved clamp h under the spring catch f and tighten its screw. After these operations the automatic focusing arrangement is perfectly adjusted.
RANGE OF ENLARGEMENT

The ratio of enlargement desired is obtained by vertical adjustment of the enlarger head on its parallelogram arrangement.

By pressing the operation handle the self-clamping device is released and the enlarger head may be vertically moved at will only one hand being required. The head is automatically clamped in its position the moment the hand is withdrawn.

Focusing is automatic for enlargements from 2 up to 10 times.

A scale on the right hand side of the head shows the ratio of enlargement for the various settings.

To obtain higher magnifications clamp enlarger head higher up on the upright or swing it back so that it projects on to a surface suitably arranged at a lower level. In this case focusing is carried out by hand on the knurled lens mount. To revert to automatic focusing (2 - 10x) readjust lens until the appropriate grooved clamp engages the spring catch again.

magnification
17x approx.

An upright 1.2 m (4 ft.) long may be supplied on request.

Before swinging round the enlarger head a sufficient counterweight must be placed on the baseboard.
ENLARGING

7 operations have to be carried out in the sequence as indicated by the numbered arrows:

1. Switch off illumination
2. Insert film negative, sensitized side down
3. Set ratio of enlargement by pressing handle and vertical movement
4. Adjust printing board to desired picture area
5. Switch on illumination
6. Expose
7. Put in photographic paper
COPYING WORK
WITH THE REPRODUCTION DARKSLIDE

With the FOCOMAT Ic it is possible to make reproductions from documents, drawings etc. with the aid of the reproduction darkslide which is available to special order. This accessory is, of course, less convenient in its use and not so versatile than are our SPECIAL COPYING EQUIPMENTS.

The application of the reproduction darkslide in the FOCOMAT is as follows:

1. Take a Leica test negative or positive, one that is not too dense, place it with its sensitized side downwards in the reproduction darkslide and put on the accompanying glass plate.

2. Slip reproduction slide into negative stage in place of the standard film slide and lower the condenser lens as far as it will go.

3. Place the document or other flat object on printing board and adjust enlarger head until the projected image coincides with the object field to be reproduced. Open diaphragm and turn lens mount until the test negative is in focus on the object, then stop down to a medium diaphragm aperture.

4. Remove reproduction slide, switch off FOCOMAT lamp and take off top half of lamphousing to have it available for illuminating the object to be photographed.
THE FINAL MANIPULATIONS MUST BE CARRIED OUT WITH THE APPROPRIATE DARKROOM LIGHT ON.

5. Load the reproduction slide with a piece of film for a single Leica negative or with a 5 x 5 cm. (2” x 2”) lantern plate (sensitized side downwards) and put on black metal cover. Push darkslide into negative stage and lower the condenser on to it.

6. To expose the negative, illuminate the object as evenly as possible by using the top-half of the lamphousing as a hand lamp. The reproduction negative is ready for removal from the apparatus and for development after the lamp has been switched off.
CORRECTING DISTORTION

Converging lines such as appear on photographs taken with the camera tilted upwards or downwards can be corrected in enlarging by the special DISTORTION ELIMINATING DEVICE in conjunction with an additional arrangement for inclining the printing board. The device proper fits the negative stage in place of the film slide and is firmly held on the lower plate of the stage by 2 screws, the opening of the spring holders for the double glass plate facing the operator.

The following modifications have to be made: Remove top half of lamphousing and bayonet ring and spring holding the condenser lens. Lift and turn the latter until it rests with the locating pins of its mount on the sliding sleeve.

The double glass plate is used not only for single negatives but also film strips.

If the FOCOMAT is fitted with the special enlarging lens DOOIT the rear collar of its mount is to be screwed off. Thereby the correct distance between the lens and the negative now accommodated at a higher level in the double glass plate is re-established.

In this instance the LEICA ELMAR 5 cm. cannot be screwed to the enlarger in the usual way but necessitates the interposition of the bayonet collar VBHO into which the lens barrel is locked, the screw thread remaining unused.

The enlarger head is now raised along its upright to such a level as to compensate for the extra height involved by the tilting arrangement for the printing board.

The double glass plate with negative inserted is slipped into the spring holders which may be adjusted vertically and also tilted to enable the negative to be slanted at will. The latter movement must be in a direction opposite to the tilt of the printing board until the enlarged image is freed from distortion and shows even definition over the entire image area with the lens not stopped down. For the exposure a medium lens setting should be employed as usual in order to ensure optimum definition.
CARE OF THE APPARATUS

Dust is the enemy of miniature photography.

Remove dust with a damp cloth in order to prevent it from swirling up and settling down where it is wanted even less. When the FOCOMAT is not in use, place over it a cover of suitable cloth or plastic material that does not collect the dust.

When the apparatus is in continuous use, clean the condenser lens at least once a week: Remove top-half of enlarger head, release bayonet ring by turning it to the left and take out the spiral spring and the lens with its mount. After cleaning, replace these parts in their original positions (plane side of lens downwards) and lock the bayonet ring by turning it to the right.

The rear surface of the enlarging lens must also be dusted from time to time with a piece of soft chamois leather or soft linen. If several enlargers are installed make sure that each enlarger is fitted again with the particular lens with which it was supplied.

The lower surface of the condenser lens which comes in touch with the negative film and keeps it flat should be cleaned more frequently since it is exposed to dust particles in the air and those on the films. The latter must also be kept clean and not marked with a soft pencil which might smear them and the lens. (For further instructions also see section B.) To remove dust particles which settle down whilst enlarging apply a soft clean brush specially kept for the purpose.

The lateral film troughs must also be kept absolutely clean as the ends of the film accommodated in them would draw dust and dirt with them.

All bare metal parts, with the exception of the braking arc should, from time to time, be protected by a thin film of vaseline.

If, after prolonged use, the self-clamping device for the vertical adjustment does not function satisfactorily give a slight left turn to the bolt to increase its friction on the braking cam.

REPAIRS If, due to any external effects, a repair should become necessary, it is recommended to send the FOCOMAT to our Works or one of our agents. It can easily be taken apart in accordance with the instructions given in section B of this booklet.