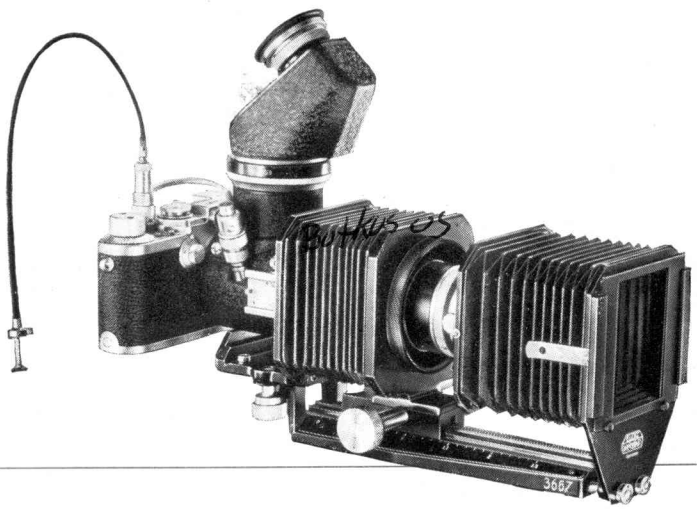
9787

THE

Leica

SYSTEM



THE UNIVERSAL FOCUSING BELLOWS

Their Use and Scope

ERNST LEITZ GMBH WETZLAR

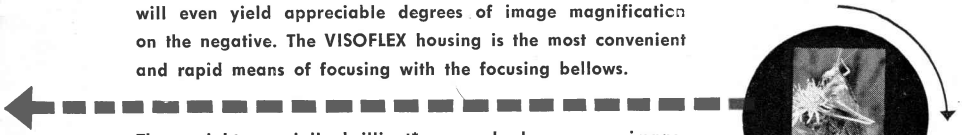
Photo by Walter Wissenbach, GDL,
with LEICA III f on focusing bellows,
13,5 cm. HEKTOR lens,
electronic flash.

Leitz

The LEITZ Universal Focusing Bellows for the LEICA extend the scope of the LEICA lenses to include the many-sided and interesting fields of close-up and macrophotography.

The variable extension permits continuous focusing within very wide limits.

With the 13.5 cm. HEKTOR lens and the LEITZ VISOFLEX reflex housing the focusing range extends from subjects at infinity to reproduction in natural size. The short-focus lenses of the LEICA will even yield appreciable degrees of image magnification on the negative. The VISOFLEX housing is the most convenient and rapid means of focusing with the focusing bellows.



The upright, specially brilliant*, ground glass screen image, enlarged by the focusing magnifier, permits an accurate check on the sharpness right up to the moment of exposure.

The following magnifiers are available for the VISOFLEX housing:

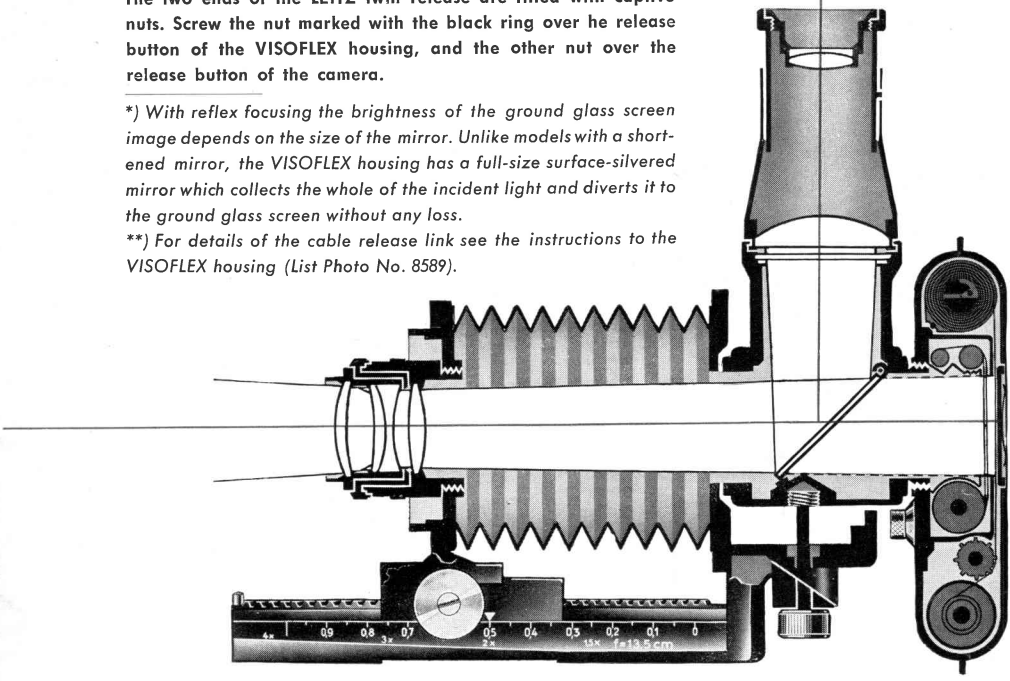
- *The vertical LVFOO magnifier yielding a magnification of 5 x.*
- *The PEGOO magnifier with the eyepiece set at an angle of 45 degrees, showing a right-way-round image magnified 4 x.*
- *The right-angle PAMOO 5 x magnifier for eye-level observation.*

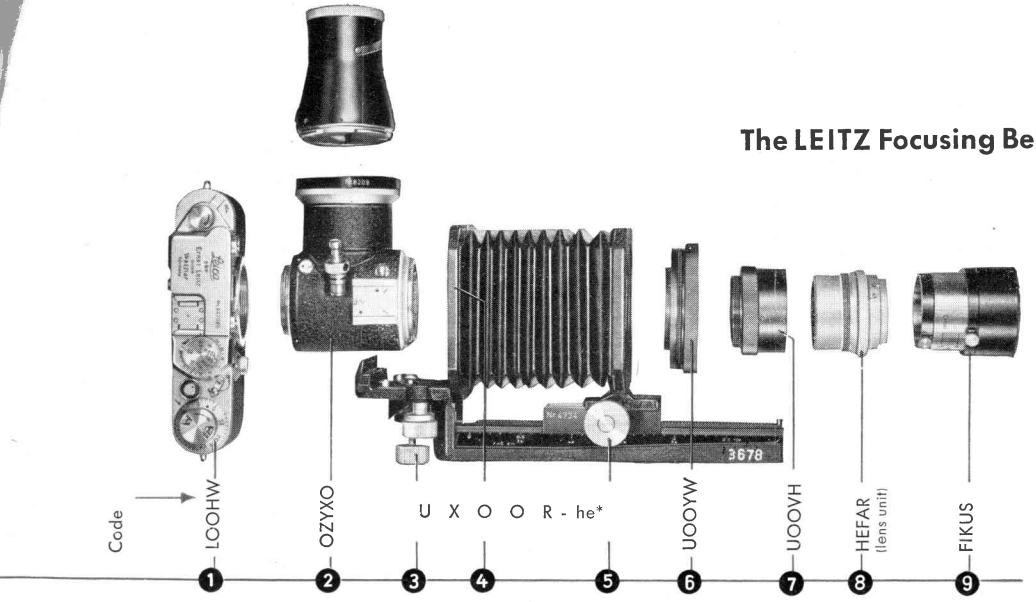
The mirror moves out of the way on operation of the camera shutter, either by means of the LEITZ twin release, or the LEITZ cable release link**.

The two ends of the LEITZ twin release are fitted with captive nuts. Screw the nut marked with the black ring over he release button of the VISOFLEX housing, and the other nut over the release button of the camera.

*) *With reflex focusing the brightness of the ground glass screen image depends on the size of the mirror. Unlike models with a shortened mirror, the VISOFLEX housing has a full-size surface-silvered mirror which collects the whole of the incident light and diverts it to the ground glass screen without any loss.*

**) *For details of the cable release link see the instructions to the VISOFLEX housing (List Photo No. 8589).*





The LEITZ Focusing Bellows

Assembling the Equipment

First screw the VISOFLEX housing (2) to the rear platform of the focusing bellows by means of the central screw (3). This presses the VISOFLEX housing against the rear panel (4) of the bellows.

Screw the LEICA body to the screw mount of the VISOFLEX housing. To rotate the camera on the VISOFLEX housing for horizontal or vertical pictures, release the catch by pressing the button at the left-hand side of the housing (as seen from behind the camera).

The screen mask automatically rotates at the same time to correspond to the format in use.

Screw the adaptor ring (6) carrying the standard LEICA thread into the thread in the front panel of the bellows. An adaptor tube (7) fits into this ring, and in turn takes the lens unit of the 13.5 cm. HEKTOR lens (8). The lens unit first has to be unscrewed from its focusing mount, as shown in the illustration on page 5.

The appropriate lens hood (9) or the bellows lens hood (see page 6) can now be fitted over the lens.

* Under this code the focusing bellows are supplied complete with the adaptor ring UOOYW and the tube UOOVH.

with VISOFLEX housing and 13.5 cm. HEKTOR lens. Standard equipment for subjects at infinity to full-size reproduction on the negative.

For use on the focusing bellows, the 13.5 cm. HEKTOR lens has to be unscrewed from its focusing mount. To do this, hold the lens unit just behind the aperture ring, and unscrew to the left, lifting it out of the coupled focusing mount or of the short focusing mount (as used with the 13.5 cm. HEKTOR lens on the VISOFLEX housing).

Setting Up for Exposure

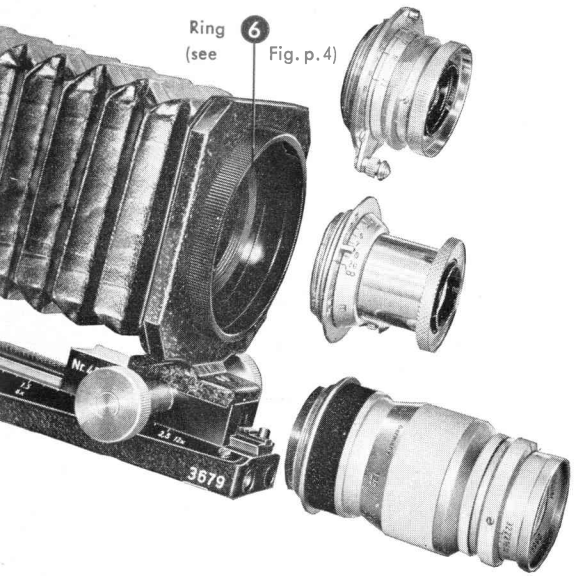
Mount the focusing bellows on a suitable firm stand with a solid ball-and-socket head. The tripod bush is fitted underneath the focusing bellows.

With the mirror in the focusing position, a circular focusing mark is visible in the centre of the ground glass screen. Focus the magnifier in use accurately on this mark. The correct setting of the magnifier eyepiece for the eye of the user can be marked once and for all by painting or scratching a small index line in the appropriate position. Then adjust the sharpness of the screen image by means of the drive knobs at the side of the rail.

Scale of Reproduction

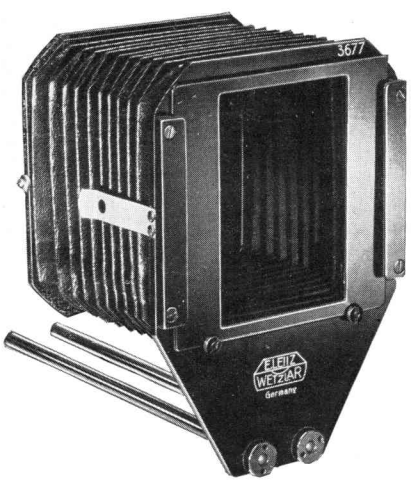
The left-hand side of the guide rail is calibrated in scales of reproduction for the outfit when used with the 13.5 cm. HEKTOR lens.

A white index line on the slide next to the pinion drive knob shows the scale of reproduction in decimal figures. For close-ups at long bellows extensions the exposure must also be increased. These exposure factors are marked in red on the same scale. (For example, when set to 0.5, the subject is reproduced in half its natural size, and the exposure factor is 2 x).



Other Lenses on the Focusing Bellows

Besides the 13.5 cm. HEKTOR, any other LEICA lens can be used on the focusing bellows. In that case the adaptor ring (6) with the LEICA lens thread remains in the front panel of the bellows, and takes the LEICA lenses in their normal focusing mount. The scales of reproduction obtained with the 3.5 cm., 5 cm., and 9 cm. lenses are shown in the tables on pages 10—11.



The Bellows Lens Hood

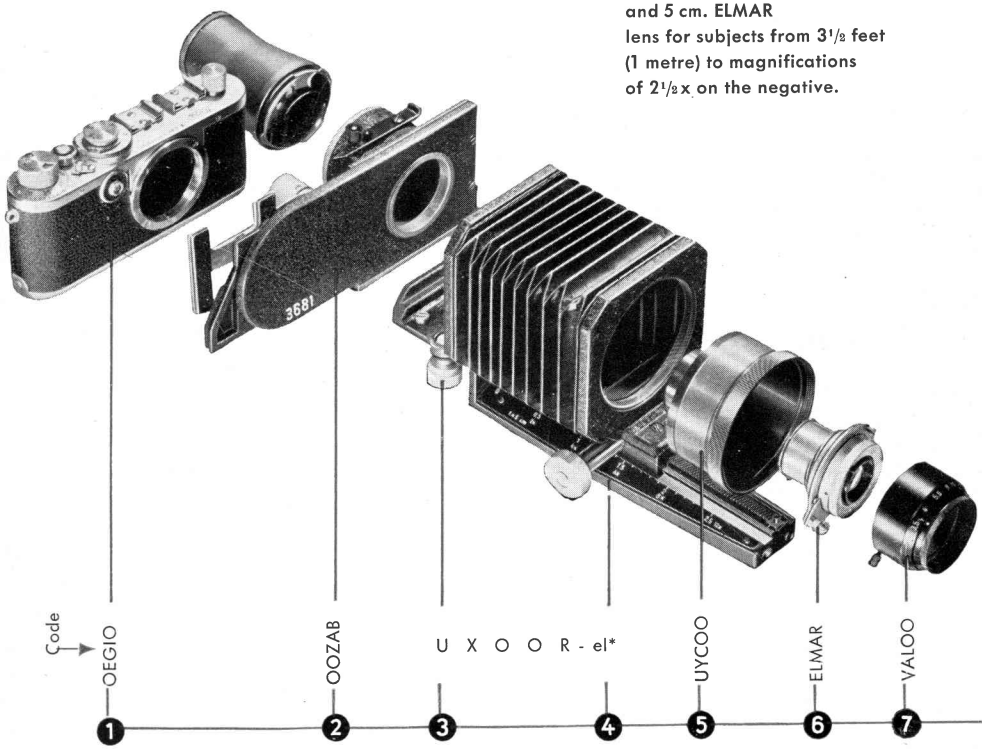
with its adjustable extension provides perfect protection against strong light from outside the subject area.

To attach the hood,

insert the two rods of the hood unit in the holes at the front of the guide rail. Then push the spring mounting ring on the rear panel of the hood bellows over the lens, and clamp with the screw at the side.

The Focusing Bellows

with the focusing stage and 5 cm. ELMAR lens for subjects from 3 1/8 feet (1 metre) to magnifications of 2 1/2 x on the negative.



Assembling the Equipment

Fix the focusing stage (2) by its right-hand tripod bush to the focusing bellows with the screw (3). Fix the LEICA body (1) — without lens — to the focusing stage, fitting it into the recess of the stage, and holding it in position by the spring clamp. (Depress the spring-loaded milled knob and lock by a quarter turn.) Make sure that the edge of the camera base plate is parallel to the long edge of the stage. Screw the bayonet ring (5) into the front panel of the bellows. Now fit the click-stop diaphragm ring (7) over the 5 cm. ELMAR lens (6). *The notch in the ring must engage the aperture lever of the 5 cm. ELMAR lens, with the white aperture number on the front edge corresponding to the aperture to which the lens is set. Then tighten the clamping screw at the side to hold the diaphragm ring in position.* Push the lens down into its focusing mount, and clip with its bayonet fitting into the ring (5).

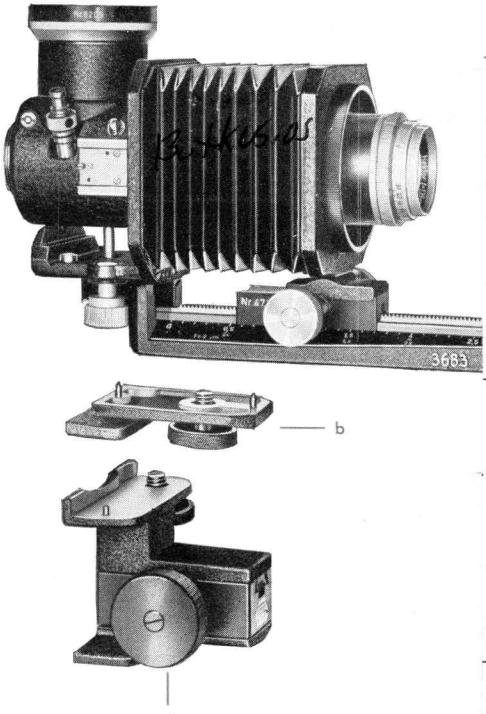
The corresponding scales of reproduction and red exposure factors for the above combination are marked on the right-hand scale of the guide rail (as seen from behind the camera). See the tables on page 10—11.

* Under this code the focusing bellows are supplied complete with the bayonet ring UYCOO.

In the same way as when the VISOFLEX housing is used, alternative LEICA lenses can also be fitted to the set-up with the focusing stage. The lenses are screwed with their focusing mount into the adaptor ring (6), as shown in the illustration on page 4.

The scales of reproduction obtained in this way are given in the tables 3, 4, and 5 on page 11.

The 9 cm. ELMAR lens can in addition be unscrewd from its focusing mount in the same way as the 13.5 cm. HEKTOR (see page 5, top), and fitted into the ring (6) with an adaptor tube (UOOWV). The scales of reproduction obtainable in this way with the focusing stage are given in table 4 on page 11.

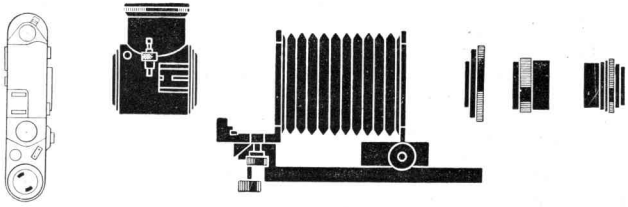


Predetermined Scales of Reproduction

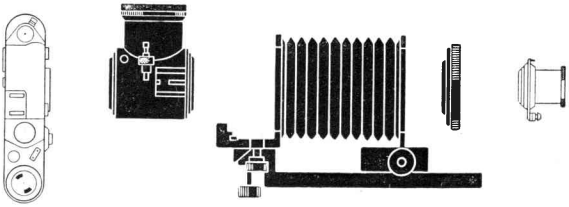
If a subject is to be photographed at a given scale of reproduction, first adjust the index line on the slide to the required figure. With the focusing bellows thus preset, approach the subject with the whole assembly until the image is completely sharp on the ground glass screen.

The use of a fine focusing slide permits rapid and accurate focusing. It becomes indispensable at same-size and larger scales of reproduction. (Normally the fine focusing slide is used for fine adjustment of the focusing stage.) This slide can be mounted on the bottom of the focusing bellows by means of the adaptor plate (b). When set up on a firm stand, this arrangement allows focusing even at preset scales of reproduction; the sharpness of the image is then adjusted by means of the black pinion drive (c) of the fine focusing slide.

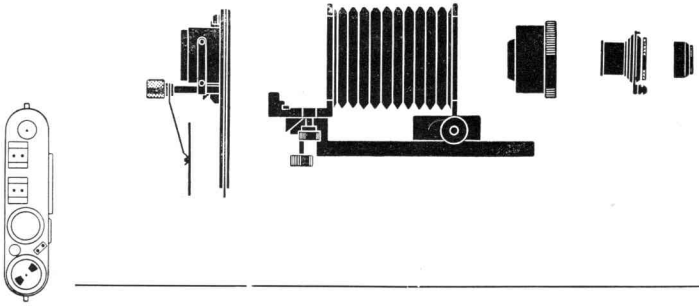
∞ to 1 : 1
LEICA body
VISOFLEX housing
Focusing bellows
UOOYW adaptor ring
UOOWV adaptor tube
13.5 cm. HEKTOR lens unit
without mount



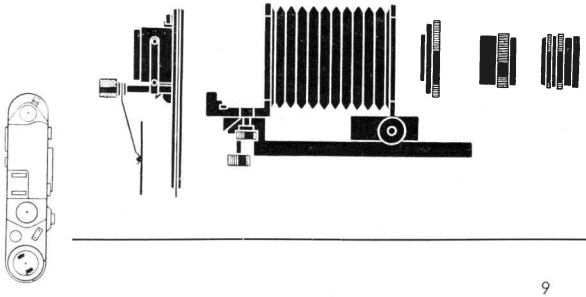
Magnifications of 2.3 to 4.2×
LEICA body
VISOFLEX housing
Focusing bellows
UOOYW adaptor ring
5 cm. ELMAR lens
(Up to 6.2x with SUMMARON lens)



3½ feet (1 metre) to magnification of 2,5×
LEICA body
Focusing stage
Focusing bellows
UYCOO bayonet ring
5 cm. ELMAR lens
VALOO diaphragm ring



∞ to magnification of 1.4×
LEICA body
Focusing stage
Focusing bellows
UOOYW adaptor ring
UOOWV adaptor tube
9 cm. ELMAR lens unit
without mount



Using the Tables

For example, a subject is to be reproduced in four times its natural size on the negative with a 5 cm. lens and the VISOFLEX housing. How far must the LEICA be from the subject?

In the last row but one of table 3 (for 5 cm. lenses), in the column "scale of reproduction" we find the figure 3.94 (approximately 4). The required subject-film distance in therefore 12¾ inch.

FOCUSING BELLOWS WITH REFLEX HOUSING VISOFLEX

Scales of reproduction in individual tables correspond to these settings on the scale marked f = 13.5 cm.

Setting on Scale Marked f=13.5 cm.	Table 1 13.5 cm. **HEKTOR** without Focusing Mount			Table 2 3.5 cm. **SUMMARON** screwed into adaptor ring (6)		
	Scale of Reproduction	Subject-Film Distance (in.)	Field Size (in.)	Scale of Reproduction	Subject-Film Distance (in.)	Field Size (in.)
0	—	∞	∞	2.36	6.70	0.40×0.60
0.05	0.05	117	18.9×28.4	2.55	6.90	0.37×0.55
0.1	0.10	64.2	9.46×14.2	2.75	7.13	0.34×0.51
0.2	0.20	38.4	4.74×7.10	3.13	7.60	0.30×0.45
0.3	0.30	30.1	3.15×4.74	3.51	8.10	0.27×0.40
0.4	0.40	26.2	2.36×3.55	3.90	8.60	0.24×0.36
0.5	0.50	24.0	1.89×2.84	4.28	9.10	0.22×0.33
0.6	0.60	22.8	1.58×2.35	4.66	9.60	0.20×0.30
0.7	0.70	22.1	1.35×2.02	5.05	10.1	0.18×0.28
0.8	0.80	21.6	1.18×1.77	5.43	10.6	0.17×0.26
0.9	0.90	21.5	1.05×1.58	5.82	11.1	0.16×0.24
1.0	1.0	21.5	0.95×1.42	6.20	11.6	0.15×0.23

UNIVERSAL FOCUSING BELLOWS WITH FOCUSING STAGE

Scales of reproduction in individual tables correspond to these settings on the scale marked f=5 cm.

Setting on Scale Marked f=5 cm.	Table 1 5 cm. **ELMAR** fitted in bayonet ring			Table 2 3.5 cm. **SUMMARON** screwed into adaptor ring (6)		
	Scale of Reproduction	Subject-Film Distance (in.)	Field Size (in.)	Scale of Reproduction	Subject-Film Distance in.)	Field Size (in.)
0.05	0.05	45.0	18.9×28.4	1.07	5.60	0.88×1.33
0.1	0.10	24.6	9.46×14.2	1.14	5.64	0.83×1.24
0.2	0.20	14.8	4.74×7.10	1.29	5.68	0.73×1.10
0.3	0.30	11.5	3.15×4.74	1.44	5.80	0.65×0.98
0.4	0.40	10.0	2.36×3.55	1.58	5.90	0.60×0.90
0.5	0.50	9.20	1.89×2.84	1.73	6.04	0.54×0.82
0.6	0.60	8.70	1.58×2.37	1.88	6.15	0.50×0.75
0.7	0.70	8.45	1.35×2.02	2.02	6.30	0.46×0.70
0.8	0.80	8.30	1.18×1.77	2.17	6.45	0.43×0.65
0.9	0.90	8.20	1.05×1.58	2.32	6.62	0.40×0.60
1.0	1.0	8.15	0.94×1.42	2.46	6.80	0.38×0.57
1.5	1.5	8.50	0.63×0.94	3.20	7.68	0.29×0.44
2.0	2.0	9.20	0.47×0.71	3.93	8.65	0.24×0.36
2.5	2.5	10.0	0.38×0.57	4.66	9.60	0.20×0.30

Approximate Values

Table 3 All **5 cm.** lenses screwed into adaptor ring (6)			Table 4 **9 cm.** ELMAR screwed into adaptor ring (6)			Table 5 **9 cm.** ELMAR without focusing mount, with special adaptor tube		
Scale of Reproduction	Subject-Film Distance (in.)	Field Size (in.)	Scale of Reproduction	Subject-Film Distance (in.)	Field Size (in.)	Scale of Reproduction	Subject-Film Distance (in.)	Field Size (in.)
1.60	8.67	0.59×0.89	0.93	14.3	1.02×1.52	0.50	15.9	1.85×2.80
1.73	8.85	0.55×0.82	1.00	14.3	0.95×1.42	0.58	15.3	1.62×2.46
1.86	9.02	0.51×0.76	1.08	14.3	0.87×1.32	0.65	14.9	1.45×2.16
2.12	9.40	0.44×0.67	1.23	14.4	0.77×1.15	0.80	14.4	1.18×1.77
2.38	9.85	0.40×0.59	1.38	14.6	0.68×1.03	0.95	14.3	0.98×1.50
2.64	10.3	0.35×0.53	1.53	14.9	0.62×0.93	1.11	14.3	0.87×1.32
2.90	10.8	0.32×0.48	1.68	15.2	0.56×0.84	1.26	14.4	0.77×1.15
3.16	11.3	0.30×0.45	1.83	15.5	0.52×0.77	1.41	14.6	0.68×1.03
3.42	11.7	0.28×0.41	1.98	15.9	0.47×0.71	1.56	14.9	0.59×0.89
3.68	12.2	0.25×0.38	2.13	16.3	0.44×0.66	1.71	15.2	0.56×0.84
3.94	12.7	0.24×0.36	2.28	16.8	0.41×0.62	1.86	15.6	0.52×0.77
4.20	13.2	0.22×0.33	2.43	17.2	0.39×0.58	2.01	16.0	0.47×0.71

Approximate Values

Table 3 All **5 cm.** lenses screwed into adaptor ring (6)			Table 4 **9 cm.** ELMAR without focusing mount, with special adaptor			Table 5 **9 cm.** ELMAR screwed into adaptor ring (6)		
Scale of Reproduction	Subject-Film Distance (in.)	Field Size (in.)	Scale of Reproduction	Subject-Film Distance (in.)	Field Size (in.)	Scale of Reproduction	Subject-Film Distance (in.)	Field Size (in.)
0.73	8.45	1.30×1.93	0.00	∞	∞	0.42	17.1	2.25×3.38
0.77	8.35	1.23×1.84	0.03	137	35.0×52.3	0.45	16.6	2.11×3.15
0.87	8.30	1.09×1.63	0.08	49.3	11.2×20.8	0.51	15.9	1.85×2.78
0.97	8.25	0.97×1.46	0.14	32.5	6.65×9.90	0.56	15.4	1.69×2.53
1.07	8.25	0.88×1.33	0.20	25.5	4.74×7.10	0.62	15.0	1.53×2.29
1.17	8.30	0.81×1.22	0.26	21.8	3.66×5.52	0.68	14.8	1.38×2.09
1.27	8.35	0.74×1.12	0.31	19.5	3.00×4.50	0.74	14.5	1.28×1.92
1.37	8.45	0.69×1.03	0.37	17.9	2.56×3.87	0.79	14.4	1.19×1.79
1.47	8.50	0.64×0.96	0.43	16.9	2.21×3.32	0.85	14.3	1.11×1.67
1.57	8.65	0.60×0.89	0.49	16.1	1.93×2.92	0.91	14.2	1.04×1.56
1.67	8.80	0.57×0.85	0.54	15.6	1.73×2.60	0.97	14.2	0.97×146
2.16	9.50	0.43×0.65	0.83	14.5	1.14×1.69	1.25	14.4	0.76×1.13
2.66	10.3	0.35×0.53	1.12	14.2	0.82×1.26	1.54	14.9	0.61×0.92
3.16	11.2	0.30×0.45	1.41	14.6	0.67×1.03	1.83	15.5	0.51×0.77

DEPTH OF FIELD AT SCALES OF REPRODUCTION FROM 1:20 to 10:1

The values are based on a ciercle of confusion of $^1/_{750}$ inch

Scale	Depth of Field Zone at (inches)				
	f/4	f/5.6	f/8	f/11	f/16
1 : 20	4.41	6.18	8.85	12.1	17.7
1 : 18	3.59	5.05	7.17	9.94	14.4
1 : 17	3.22	4.50	6.43	8.85	12.8
1 : 16	2.86	4.02	5.72	7.90	11.4
1 : 15	2.52	3.53	5.05	6.95	10.1
1 : 14	2.21	3.09	4.41	6.08	8.84
1 : 13	1.91	2.68	3.83	5.28	7.66
1 : 12	1.64	2.30	3.28	4.50	6.55
1 : 11	1.39	1.94	2.77	3.82	5.56
1 : 10	1.15	1.62	2.32	3.18	4.62
1 : 9	0.945	1.32	1.89	2.60	3.78
1 : 8	0.758	1.06	1.51	2.08	3.03
1 : 7	0.588	0.825	1.18	1.62	2.36
1 : 6	0.441	0.620	0.885	1.21	1.77
1 : 5	0.315	0.440	0.632	0.867	1.26
1 : 4	0.209	0.296	0.422	0.580	0.840
1 : 3	0.126	0.178	0.252	0.347	0.505
1 : 2	0.063	0.087	0.126	0.173	0.252
1 : 1.5	0.039	0.055	0.079	0.110	0.158
1 : 1.33	0.031	0.047	0.067	0.091	0.134
1 : 1	0.020	0,031	0.043	0.059	0.083
1.5 : 1	0.012	0.016	0.023	0.032	0.047
2 : 1	0.008	0.011	0.016	0.022	0.032
3 : 1	0.005	0.007	0.010	0.013	0.018
4 : 1	0.003	0.005	0.007	0.009	0.013
5 : 1	0.002	0.004	0.005	0.007	0.010
6 : 1	0.002	0.003	0.004	0.006	0.008
6.5 : 1	0.002	0.003	0.004	0.005	0.007
7 : 1	0.002	0.002	0.004	0.005	0.007
8 : 1	0.002	0.002	0.003	0.004	0.006
9 : 1	0.001	0.002	0.003	0.004	0.005
10 : 1	0.001	0.001	0.002	0.003	0.005

E R N S T L E I T Z G M B H W E T Z L A R

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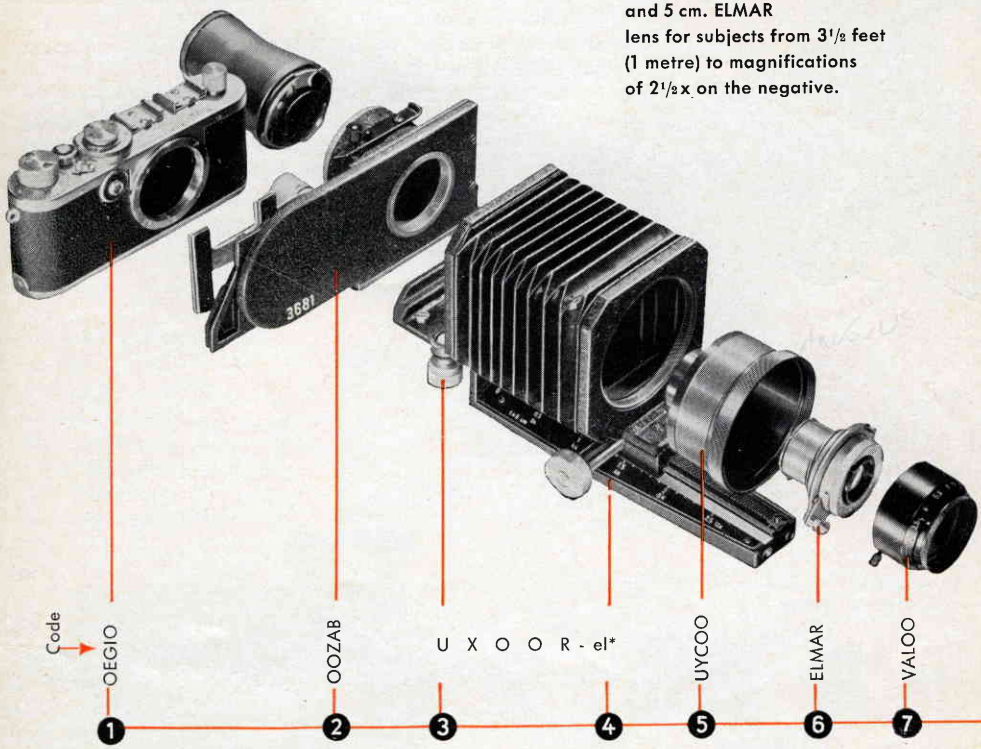
The Focusing Bellows

with the focusing stage

and 5 cm. ELMAR

lens for subjects from 3½ feet (1 metre) to magnifications of 2½x on the negative.

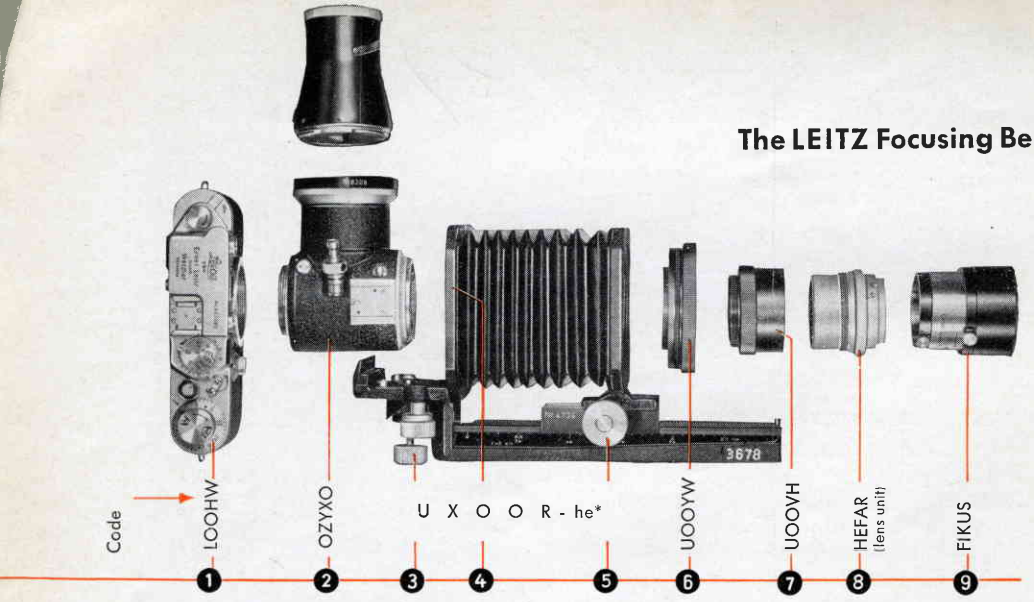


Assembling the Equipment

Fix the focusing stage (2) by its right-hand tripod bush to the focusing bellows with the screw (3). Fix the LEICA body (1) — without lens — to the focusing stage, fitting it into the recess of the stage, and holding it in position by the spring clamp. (Depress the spring-loaded milled knob and lock by a quarter turn.) Make sure that the edge of the camera base plate is parallel to the long edge of the stage. Screw the bayonet ring (5) into the front panel of the bellows. Now fit the click-stop diaphragm ring (7) over the 5 cm. ELMAR lens (6). *The notch in the ring must engage the aperture lever of the 5 cm. ELMAR lens, with the white aperture number on the front edge corresponding to the aperture to which the lens is set. Then tighten the clamping screw at the side to hold the diaphragm ring in position.* Push the lens down into its focusing mount, and clip with its bayonet fitting into the ring (5).

The corresponding scales of reproduction and red exposure factors for the above combination are marked on the right-hand scale of the guide rail (as seen from behind the camera). See the tables on page 10—11.

* Under this code the focusing bellows are supplied complete with the bayonet ring UYCOO.



Assembling the Equipment

First screw the VISOFLEX housing (2) to the rear platform of the focusing bellows by means of the central screw (3). This presses the VISOFLEX housing against the rear panel (4) of the bellows.

Screw the LEICA body to the screw mount of the VISOFLEX housing. To rotate the camera on the VISOFLEX housing for horizontal or vertical pictures, release the catch by pressing the button at the left-hand side of the housing (as seen from behind the camera).

The screen mask automatically rotates at the same time to correspond to the format in use.

Screw the adaptor ring (6) carrying the standard LEICA thread into the thread in the front panel of the bellows. An adaptor tube (7) fits into this ring, and in turn takes the lens unit of the 13.5 cm. HEKTOR lens (8). The lens unit first has to be unscrewed from its focusing mount, as shown in the illustration on page 5.

The appropriate lens hood (9) or the bellows lens hood (see page 6) can now be fitted over the lens.

* Under this code the focusing bellows are supplied complete with the adaptor ring UOOYW and the tube UOOVH.