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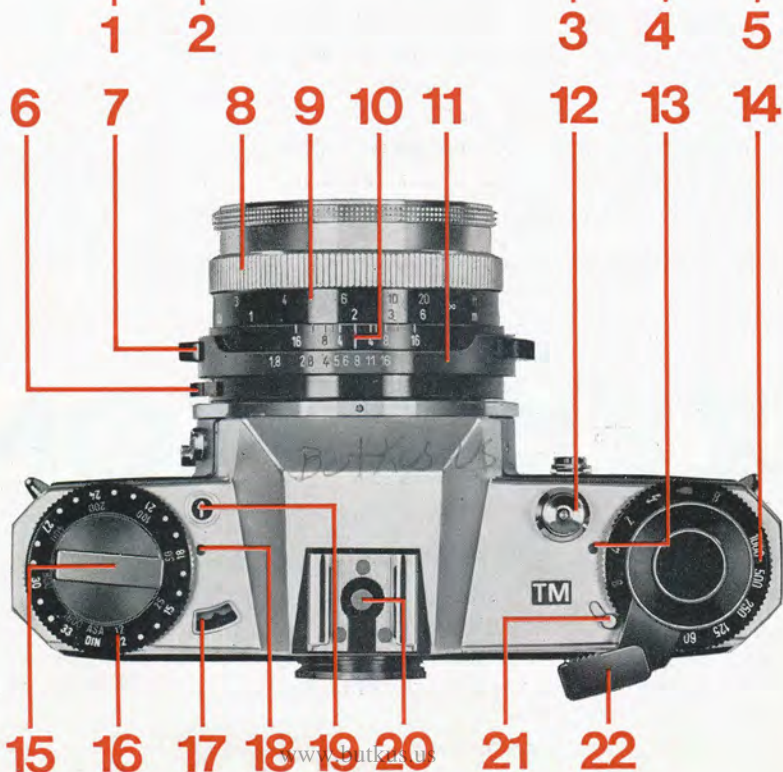
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Butkus

Instructions for use

ZEISS IKON SL 706



Controls

- 1 Lever for delayed-action mechanism (self-timer)**
Shown in working position
- 2 Release knob for delayed-action mechanism**
- 3 Diaphragm stop-down pin**
- 4 Socket for connecting flash units**
- 5 Eyelets for attaching carrying straps**
- 6 Diaphragm stop-down pin on lens**
(To check depth-of-field, if the lens is used on other cameras which are not equipped with a special diaphragm stop-down mechanism)
- 7 Aperture setting ring with grips**
- 8 Focusing ring**
- 9 Distance scale in metres and feet**
- 10 Setting mark for distance and aperture, with depth-of-field scale**
- 11 Aperture scale**
- 12 Shutter release with screw-in socket for cable release**
- 13 Setting mark for shutter speed**
- 14 Shutter speed setting ring**
- 15 Rewind knob with folding crank**
- 16 Film speed setting disc with DIN and ASA scale**
- 17 Exterior indicator of exposure meter**
- 18 Film speed setting mark**
- 19 Securing button for film speed setting**
- 20 Accessory shoe with central contact for flash units**
- 21 Main switch for power circuit**
- 22 Rapid advance lever** (swung out in working position)
The following control numbers refer to the illustrations on the rear inner flap of this booklet.
- 23 Two-pronged film winding shaft** (must engage the recesses in the base of the film cassette)
- 24 Film cassette chamber, loaded with cassette**
- 25 Viewfinder eyepiece**
- 26 Rotating viewfinder eyepiece ring for covering eyepiece**
- 27 Transport sprocket with teeth** for engaging the perforations of the film
- 28 Take-up spool with device for holding film leader**
- 29 Frame counter**
- 30 Battery compartment** (with loaded battery)
- 31 Release button for rewind locking mechanism**
- 32 Tripod socket with device to ensure perfect attachment of ZEISS IKON copying equipment**
- 33 Battery test button**
- 34 Battery compartment cover**

Loading and unloading

(Not to be carried out in direct sunlight)

Pull out the rewind knob 15 until the camera back springs open. Then slip the end of the film leader which projects from the cassette under one of the red holding prongs, pull the cassette across the film track and insert it in the film cassette chamber 24, whereby the rewind knob 15 must again be pulled out as far as it will go. It can now be pushed down into the camera again to its original position. (If necessary, rotate slightly while pushing.) The take-up spool must now be rotated by turning the red milled ring until the perforations at both edges of the film are engaged by the teeth on the transport sprocket 27. Now close the camera back and press firmly until it locks with a click. Operate the rapid advance lever 22 and the shutter release 12 alternately until the number "1" appears under the mark of the frame counter 29. As soon as a number is visible in the frame counter window, this indicates that there is a film in the camera (loading control). If the frame counter moves on, the film has been advanced (film transport control). The frame counter always indicates the number of frames that have been exposed. After exposing the last frame — the frame counter indicates the number corresponding to the number of frames on the loaded film — do not tension with the rapid advance lever but rewind the film.

Removing the film

By pressing the button 31, release the rewind locking mechanism and turn the rewind crank 15 in the direction of the arrow until the frame counter has reached its initial position and a slight resistance is felt. The film has detached itself from the take-up spool. Only now open the camera back by pulling up the rewind knob and remove the film cassette.

Always keep the take-up spool and film guide track clean!

Setting the film speed

Immediately after loading the film set the film speed on the camera or check the speed that has already been set. The film speed in DIN or ASA is given on the film packing or in the accompanying instructions for use. Push button 19 in the direction of arrow. Turn the setting disc 16 until the film speed required is engaged at the setting mark 18.

Focusing with
split-image
rangefinder



Focusing with
microprism spot
or ground-glass
screen



Focusing

Should the viewfinder eyepiece be locked, turn ring 26.

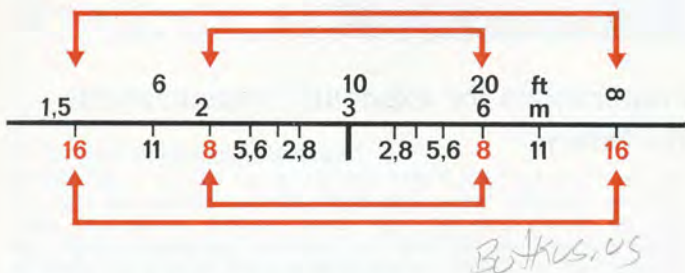
Look through the viewfinder and sight the subject, if possible, on a vertical or horizontal edge or line so that it runs exactly through the centre of the finder. By turning the focusing ring 8, the line which appears distorted in the central diagonal split-image rangefinder is straightened. The correct distance has now been found, whereby the unsharp line on the ground-glass screen and in the microprism spot is sharply defined at the same time.

The distance set can be seen on the scale 9 at the orange setting mark 10.

With subjects where there is no possibility of focusing on a straight line, the focusing can be done with the microprism spot or the ground-glass screen.

We recommend that anybody wearing spectacles should screw the appropriate correction lens (see list of accessories) into the viewfinder eyepiece.

Illustration of the principle



Aperture and depth-of-field

Pre-select the aperture by turning the setting ring 7. The f/number required must be opposite the setting mark 10. The setting of the aperture depends on the depth-of-field required. The smaller the f/number, the larger the lens aperture and the smaller the depth-of-field. The depth-of-field resulting from the choice of aperture can be read direct from the depth-of-field scale to the left and right of the setting mark 10. It covers the range from the distance opposite the set f/number on the left to the distance opposite the same f/number on the right. The depth-of-field can also be checked on the ground-glass screen in the viewfinder. By pressing the stop-down pin 3, the diaphragm is stopped down to the pre-selected value and thus makes it possible to adjust the aperture or distance exactly to the requirements of the photograph to be taken. When the stop-down pin 3 is pressed again, the diaphragm springs back to full aperture. It is then automatically stopped down to the pre-selected value when the shutter is released.

Focusing is also possible with the depth-of-field scale (recommended for snap-shots). Fix the desired depth-of-field with ring 8 and scale 10 and set the indicated f/number opposite setting mark with the setting ring 7.

Exact data on depth-of-field are given in the enclosed list of tables.

Setting the shutter speed

Turn ring 14 until the shutter speed required for the exposure engages above setting mark 13. Intermediate speeds cannot be set.

The shutter speed depends on the lighting conditions and the rate at which the subject is moving. The faster the movement, the shorter the exposure time. The numbers on ring 14 denote fractions of a second ($60 = 1/60$ sec., and so on). The orange numbers indicate that a tripod should be used.

Shutter speed and aperture are inter-dependent. The shorter the exposure time, the larger the aperture must be, and vice-versa. The speed-aperture combination is determined by the film speed, the general brightness and, when using colour filters, their filter factor.

Preparations for exposure measurements

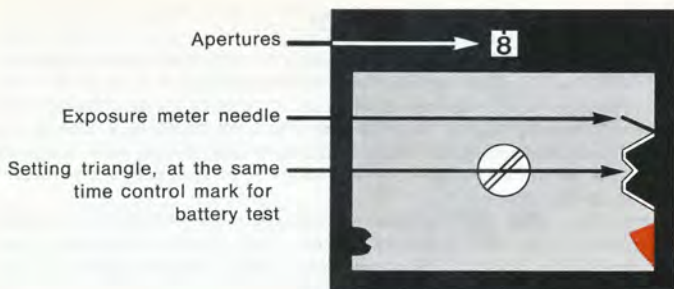
The battery

The Mallory type PX 625 battery inserted in the camera to operate the exposure meter will last for about one year with normal use.

Hold the camera towards a light source so that the exposure meter needle comes to rest in about the middle of the setting triangle (see also the illustration of the viewfinder on page 9). Now press briefly on the battery test button 33. If the needle wanders out of the setting triangle within 1 to 2 secs., the battery must be changed. New batteries are obtainable from photographic dealers.

Changing the battery

It is accommodated in the battery compartment 30 under the cover 34, which can be removed after being turned to the left. When inserting the new battery, make sure that it is poled according to the signs in the cover.



Exposure measurement

Do not forget to set the film speed!

To operate the exposure meter, the main switch 21 must be switched on by swinging out the rapid advance lever 22 into the working position. When using the ZEISS lenses which can be supplied for the SL 706, the diaphragm stop-down pin 3 must not be pressed in! (Open aperture measurement.) With other lenses, however, the diaphragm stop-down pin is to be pushed in before measuring. (Working aperture measurement.)

After pre-selecting the shutter speed, view the subject with the camera held horizontally, even if the exposure is to be made with the camera in the vertical holding position. Now turn the aperture ring 7 until the exposure meter needle in the viewfinder or under window 17 on the camera is exactly in the centre of the triangular mark. The aperture thus set is indicated on the lens barrel or in the viewfinder.

If a definite aperture is required for the exposure, pre-select this aperture and then turn the shutter speed ring 14 to set the exposure meter needle in the centre of the triangle. Only a click-in shutter speed must be used and this may mean slightly adjusting the aperture setting. On changing to longer exposure times, a certain point will be reached, depending on the speed of the film, which marks the lower measuring limit of the exposure meter (referred to the completely open lens). For example, with 21 DIN and full aperture on changing from $\frac{1}{4}$ sec to $\frac{1}{2}$ sec, or with 24 DIN between $\frac{1}{8}$ sec and $\frac{1}{4}$ sec, etc.

In order to avoid any unintentional crossing of this limit, a red field is pushed across the triangular mark in the viewfinder. As soon as the red field covers the centre of the triangular mark, it is no longer possible to make adjustments.

On setting to the flash symbol and B, the exposure meter cannot be used at all.

If the exterior exposure meter indicator 17 is used, when using a tripod, for example, the viewfinder eyepiece must be covered, otherwise stray light can influence the exposure measurement and result in under-exposure. In this case, turn the viewfinder eyepiece ring 26 to the left. The exposure metering has standard calibration. It will indicate the correct exposure setting under average lighting conditions. Correction is however necessary for against-the-light exposures, dark subjects against a bright background or for subjects of low contrast (overcast sky, snow landscapes).

In this case, after the measurement has been taken open the aperture by $\frac{1}{2}$ to 1 stop. With subjects of very high contrast, especially very bright subjects against dark backgrounds, close the aperture by $\frac{1}{2}$ to 1 stop after taking the initial measurement.

In order to avoid unnecessary battery drain during long pauses between use, the exposure meter should be switched off.

To do this, press back the main switch 21 into its initial position with the rapid advance lever.

The exposure

When taking a shot, the release button 12 should be pressed down rapidly. The mirror swings up, the diaphragm closes down to the pre-set lens aperture and the focal-plane shutter travels at the shutter speed. The mirror then returns immediately to its position for viewfinder focusing and the diaphragm springs back to full lens aperture. When the diaphragm stop-down pin is pressed in, however, the diaphragm always remains at the set value, after release and tensioning.

When the shutter has been released, a warning mark appears in the bottom left-hand corner of the viewfinder to indicate that the camera must be tensioned for the next exposure. When doing this, always swing the rapid advance lever 22 through as far as it will go.

Exposures with the self-timer

Tension the shutter beforehand with the rapid advance lever and then press lever 1 upwards as far as it will go. On pushing the release knob 2 in the direction indicated by the arrow, about 8 seconds elapse before automatic exposure. During this time the lever returns to its initial position.

Time exposures (shutter setting "B") are not possible with the delayed-action mechanism.

Exposures with filters

The yellow, green, orange and red filters which are available for the SL 706 can only be used with black-and-white film, whereas the UV, Ikolor-A, Ikolor-B, skylight and CONTAPOL filters can also be used with

colour material. The filters, with a bayonet mount fitting B 50, fit all lenses which are available for the SL 706, from 35–135 mm.

The through-the-lens light metering system means that the filter factor is usually adjusted automatically. Only when using the more dense colour filters for black-and-white film is it advisable after exposure measurement to either open the aperture by one stop or increase the exposure time by one full value (corresponding to filter factor 2x).

The CONTAPOL polarizing filter

(Filter factor 3x)

The main purpose of this filter is to subdue or suppress annoying reflections from the subject being photographed, as well as for special individual effects, particularly with colour film, without falsifying the colours. Mount the CONTAPOL in front of the lens and observe its effect through the viewfinder. The filter effect can be altered by turning the milled wheel on the front of the CONTAPOL. If reflections cannot be sufficiently subdued, alter your position until the camera points at an angle of about 35 degrees to the reflecting surface.

Exposures with flash

Set one of the flash symbols at the setting mark 13 with the ring 14, according to the type of flash unit which is going to be used. For electronic flash units the flash symbol, for flashbulb guns using type AG bulbs the flashbulb symbol. The shutter speed in both cases is $\frac{1}{40}$ sec. With the setting of the flash symbol, the contact is so controlled that the various flashbulbs and electronic flash units are fired at the correct moment.

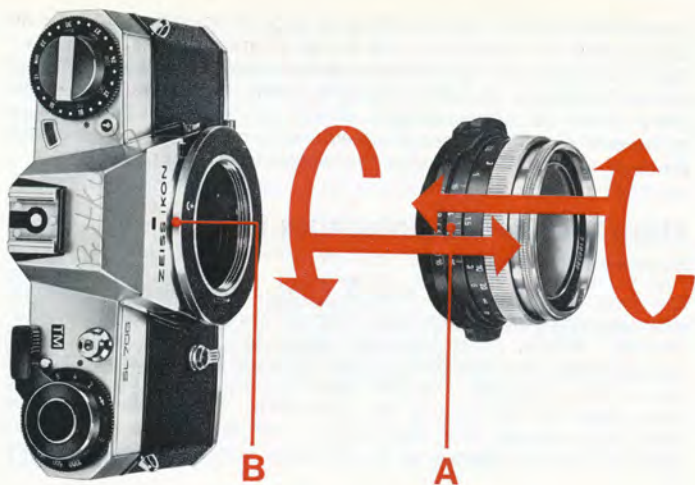
The flash unit itself can either be slipped into the accessory shoe 20 or attached to the camera with a bracket screwed into the tripod socket 32. When using flash units with an M-contact (without cable), the electrical connection to the camera is directly via the contact in the accessory shoe.

With units without M-contact, the flash lead is plugged into the connection socket 4.

The aperture required results from the flash guide number and the distance of the flash from the subject.

Exposures with Monocular 8x30 B

When using the Monocular 8x30 B, which can be attached in front of the ZEISS TESSAR 2.8/50 lens with an adapter ring, the lens is stopped down optically to a fixed smaller aperture. For this reason, the aperture ring must be set at the largest aperture during exposure measurement. The measurement is carried out by turning the shutter speed setting ring 14.



Changing the lens

The lenses are fitted to the camera by means of a thread mount. **When removing or attaching the lens, the diaphragm stop-down pin 3 must be in its neutral position**, in order to avoid damage to the diaphragm stop-down mechanism.

Removing the lenses

Unscrew anti-clockwise.

Attaching the lenses

Do not cant! Place on straight and screw in clockwise as far as it will go. Lenses and accessories with no stopping groove must be screwed in until the index mark A on the lens and the red spot B on the camera coincide.

Close-ups

In addition to the focusing range of the lenses, close-ups up to an image scale of 3:1 are possible with supplementary lenses, extension tubes and a bellows focusing device. **Besides all the necessary tables,**

the booklet of tables also contains a diagram showing the exposure ranges that can be obtained in this way. As the reduced depth-of-field in close-up photography requires additional stopping down, which in most cases results in longer exposure times, the use of a tripod and cable release are recommended.

In this context, we draw your attention to our copying units REPROPHOT 1 and 2.

Exposure measurements for close-ups

Only with pressed-in diaphragm stop-down pin 3 (working aperture measurement). If the extension tubes 1:4 and 1:1, the bellows focusing device, the Luminars or the micro-attachment are used, exposure measurement is in principle the same as described above.

The exposure factors given in the booklet of tables for extension tubes, the bellows focusing device and the Luminars only apply when a separate exposure meter is used.

Supplementary lenses

With their bayonet fitting ϕ B 50 they fit all lenses available for the SL 706 from 35 to 135 mm. In order to obtain a sufficient depth-of-field, the lens should be stopped down to at least f/5.6. If filters are used, these are to be mounted in front of the supplementary lens. Special supplementary lenses can also be fitted to the Monocular 8x30 B. The image scales that can be obtained in this manner are to be found in the diagram in the tables booklet. All other data are to be found in the instructions for use for this piece of equipment.

Extension tubes

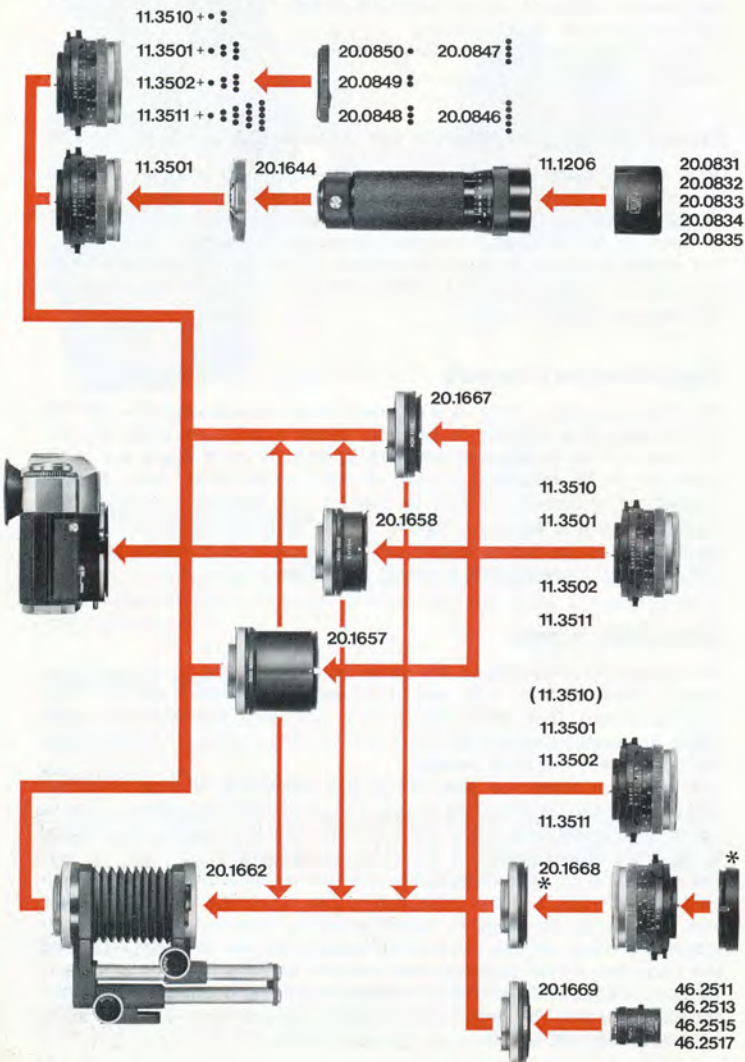
The extension tubes extend the focusing range of the SL 706 up to an image scale of 1:4, 1:2 and 1:1 (especially advantageous when copying slides). The given scales 1:4, 1:2, and 1:1 are only applicable, however, to exposures taken with the 50 mm lenses. These values are not correct for other lenses.

The extension tubes are attached to the camera as already described in the paragraph on changing lenses. The diaphragm stop-down pin must not be depressed here either. In the same way, the lenses are attached to the front thread mount of the extension tubes.

The possibility of pre-selecting the aperture or controlling the depth-of-field with the pin 3 is not impaired by the extension tubes. The tubes can, of course, be used in combination or attached to the bellows focusing device. In the booklet of tables you will find an illustrated chart showing all the possible combinations with the TESSAR 2.8/50 mm. There is also a simplified table which shows the depth-of-field for the set image scale. The exposure correction factors also included apply when working with a separate exposure meter.

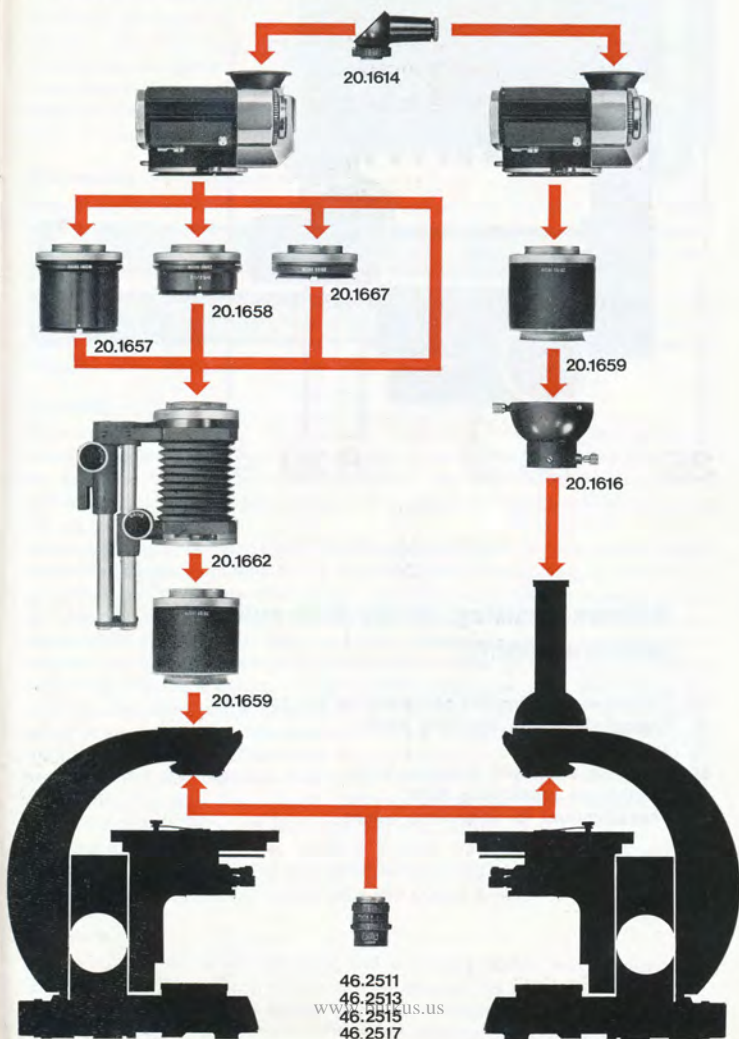
Accessories for close-ups

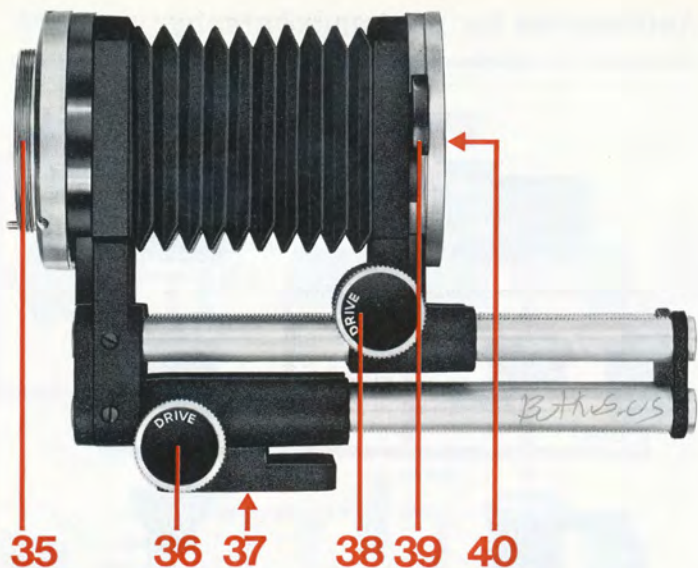
(Explanation of catalogue numbers see accessories)



Accessories for photomicrography

(Explanation of catalogue numbers see accessories)





Bellows focusing device with automatic aperture control

- 35 Thread-mount ring for screwing on the camera
- 36 Tripod slide with focusing knob
- 37 Tripod socket
- 38 Focusing slide with focusing knob
- 39 Diaphragm tensioning lever
- 40 Thread-mount for attaching lenses

The bellows focusing device extends the scope of the SL 706 in the field of close-ups and macrophotography. This unit makes it possible to take pictures at a slightly reduced scale, in natural size or on a magnified scale of reproduction. The bellows focusing device increases the distance between the lens and the film and thus sets the lens to a shorter distance than would be the case if the lens was attached directly to the camera.

The 35 mm lens cannot be used with the bellows focusing device, because the subject to be photographed would then lie within the guide bars of the device.

Assembling the components

The focusing bellows device is attached to the camera in the same way as the lens with its thread-mount ring 35. The lens is also attached in this way to the bellows unit with the thread-mount 40. The diaphragm stop-down pin must not be pressed in here either.

Should the camera not be exactly horizontal to the focusing bellows, you can loosen the three adjusting screws in ring 35, using a screwdriver not more than 1.5 mm in width, until the SL 706 is correctly aligned. Now re-tighten the screws.

Focusing

Focusing is carried out through the viewfinder by turning the left-hand knob marked "DRIVE" of the focusing slide 38, whereby the lens with its focusing mount can also be used. The right-hand knob (LOCK) serves to lock the focused setting if it is turned in the direction indicated by the arrow.

Whenever possible, focus with the diaphragm open. If it is closed, push down the diaphragm tensioning lever 39. After tensioning, it returns to its initial position. The diaphragm stop-down pin on the camera must not be pushed in during this operation, unless you wish to check the depth-of-field, which is only possible, however, when the subject is brightly illuminated. Owing to the fact that close-up focusing by simply extending the bellows can lead to difficulties, because extending the bellows also involves a change in the subject distance, it is advisable when using a tripod to use the tripod slide 36 for focusing. This permits the SL 706 to be moved forwards or backwards with the focusing bellows device whilst the bellows extension remains the same. Adjustment is made with the right-hand knob (DRIVE), whilst the tripod slide can be fixed in position with the left-hand knob (LOCK).

For technical reasons, the camera cannot be swung into an upright position when attached to the bellows focusing unit.

This adjustment must be made with the tripod head.

Exposure

Please take care, when adjusting the exposure meter, not to open the lens aperture too wide, in order not to reduce the already small depth-of-field even further. It is better to select a longer exposure time, if this is possible. There are 2 possibilities for making the exposure:

- 20.1668 Retro-ring with diaphragm stop-down ring
 - 20.1662 Bellows focusing unit with automatic aperture control for 50 and 135 mm lenses
 - 20.1659 Extension tube for microscope
 - 20.1616 Attachment head for microscope
 - 20.1669 Adapter ring for Luminars
 - 46.2511 ZEISS Luminar 1:2.5/16 mm
 - 46.2513 ZEISS Luminar 1:3.5/25 mm
 - 46.2515 ZEISS Luminar 1:4.5/40 mm
 - 46.2517 ZEISS Luminar 1:4.5/63 mm
- } CARL ZEISS
order numbers

Supplementary lenses for ZEISS Monocular 8x30 B

- 20.0831 $f = 1$ m 1 dptr. up to image scale 1 :1.2
- 20.0832 $f = 0.5$ m 2 dptrs. up to image scale 1.2:1
- 20.0833 $f = 0.35$ m 3 dptrs. up to image scale 1.7:1
- 20.0834 $f = 0.2$ m 5 dptrs. up to image scale 2.5:1
- 20.0835 $f = 0.12$ m 8 dptrs. up to image scale 3.6:1

Cases and sundry accessories

- 23.0017 Ever-ready case, in soft leather
- 23.0016 Ever-ready case, standard finish
- 23.0013 Ever-ready case, de-luxe finish
- 23.0215 Small universal case
- 23.0207 Universal case
- 23.0211 Carrying straps (real leather) with clip rings for camera without case
- 23.1004 Leather case for 35 and 50 mm lens (optional) and 1 filter or 1 supplementary lens
- 23.1005 Leather case for Super-Dynarex 135 and 1 filter or 1 supplementary lens
- 23.1012 Leather case for ZEISS Monocular 8x30 B
- 23.2007 Case for 3 filters or 3 supplementary lenses
- 20.0633 Rear lens cover

Copying devices

- 20.1853 **Reprophot 1** universal copying unit
 - 20.1855 **Reprophot 2** universal copying unit
- consisting of
- 20.1854 { 20.1833 Base board, columns and slides
 - 20.1839 Camera adapter
 - 20.1840 Focusing device with 12 V / 50 W lamp and spiral cable

- 20.1834 Illumination device without lamps
- 20.1835 **Voltage switching device 1**, for switching
- 20.1841 { from 110 to 235 V / 50 and 60 Hz
- for illumination and focusing device
- 20.1837 Foot switch

Care of the camera

We recommend that from time to time the film guide track and film transport bearing of the ZEISS IKON SL 706, as well as the inside of the camera back should be carefully cleaned with a soft hair brush. (Attention! Do not scratch the shutter blind while doing this!) Dust or threads on the focusing screen or mirror can be carefully removed with a soft hair brush when the lens is screwed off. Fingermarks on the surface of the lens and the viewfinder eyepiece should be carefully wiped off with a soft linen cloth. Dust particles must be removed beforehand with a soft hair brush.

Serial number

Every ZEISS IKON SL 706 carries on its base a serial number. Every lens also has its number. We advise you to make a note of these numbers, so that you can establish your ownership in the case of loss or a misunderstanding.

Some further advice:

Your photographic dealer or the photographic advisory service of ZEISS IKON AG, 7 Stuttgart 1, Postfach 540, will be pleased to advise you free of charge, if you have any photographic problems or require any information.

ZEISS IKON offer a world-wide guarantee — a valuable service covering all countries and frontiers. A guarantee booklet accompanies every new camera. Make sure that your photographic dealer confirms the date of purchase with his signature on the back of the booklet. In your own interest, please take good care of the booklet, as it contains a list of workshops throughout the world which repair ZEISS IKON products.

