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AUTOMATIC BELLOWS ATTACHMENT S

INSTRUCTIONS

Please Read Before Use!

The Automatic Bellows Attachment S has been developed for the purpose of providing greater lens extensions than possible with the unaided Zenzanon-S lenses from 50 mm to 250 mm, by simply using the accessory between the Zenza Bronica SQ, SQ-A or SQ-Am camera body and the lens.

The accessory not only provides continuously variable lens extensions, from 53 mm to 153 mm, but there is no loss of automatic lens diaphragm action and electronic shutter action in the lenses which are attached in this manner. This means, of course, that operations are identical to that without the accessory, which means that operations are equally simple and trouble-free even when the accessory is used between lens and body.

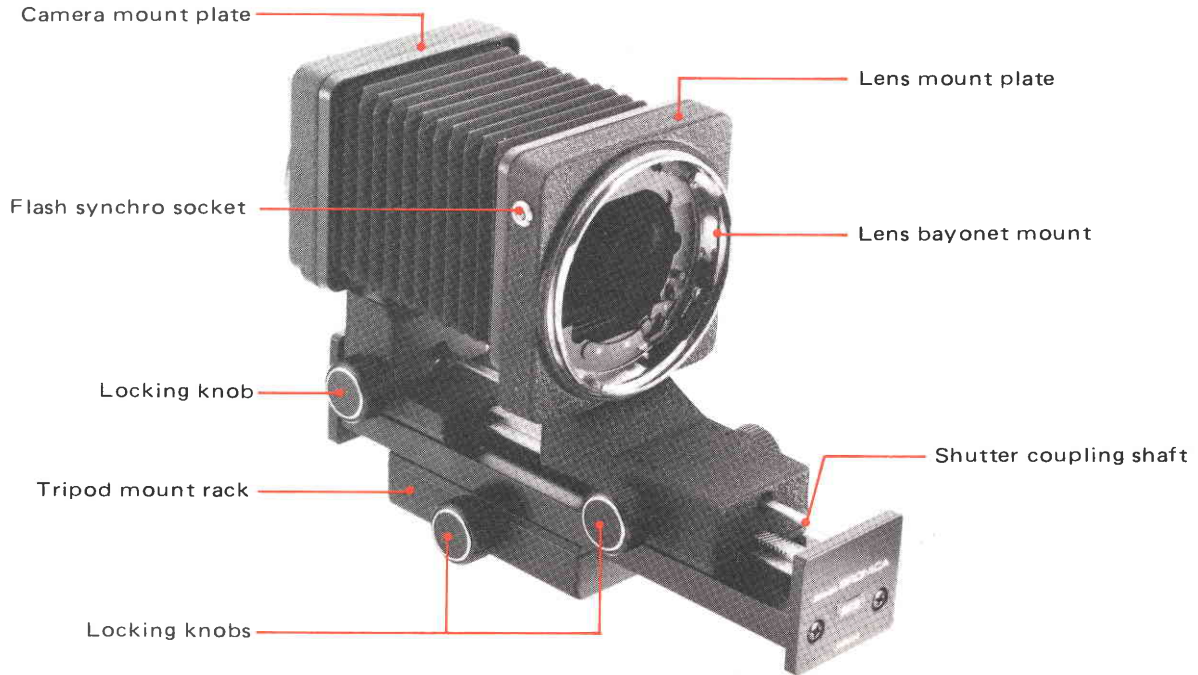
Finally, for even greater pleasure and complete freedom from troublesome exposure calculations, the use of the MF Finder S, ME Prism Finder S or AE Prism Finder S is specially recommended because manual exposure operation or complete exposure automation is retained even when the Automatic Bellows Attachment S is used.

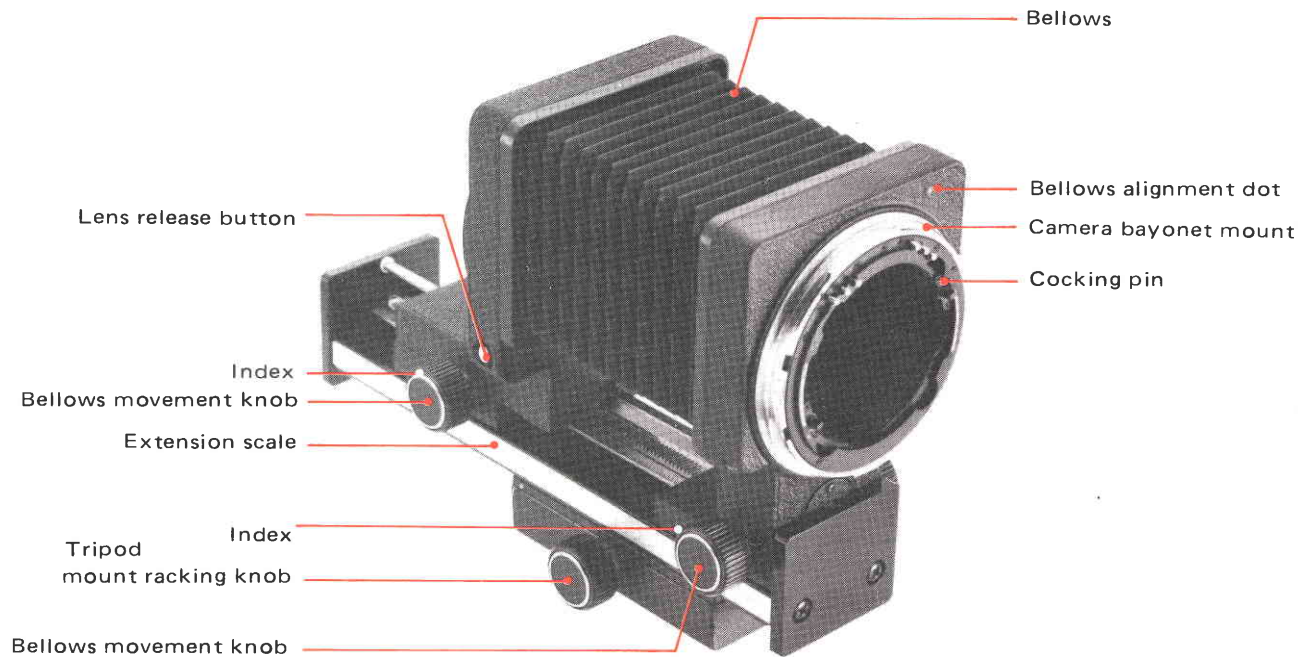
Please read the instructions through completely before you use the accessory, as you will then be able to use the accessory with greater ease and more satisfaction.

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Nomenclature

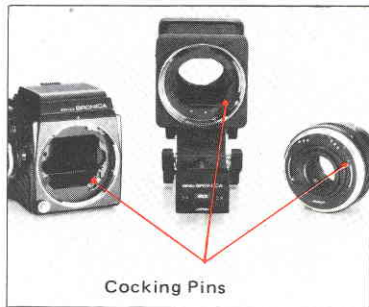




Specifications

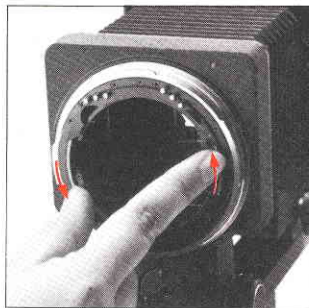
Camera	Zenza Bronica SQ, SQ-A or SQ-Am
Lens	Zenzanon-S Lenses (50 mm to 250 mm)
Extension of Lens	53 mm to 153 mm
Extension of Bellows	100 mm
Magnifications	50 mm Lens: 1.05x ~ 3.18x 80 mm Lens: 0.64x ~ 1.98x 105 mm Lens: 0.51x ~ 1.65x 150 mm Lens: 0.36x ~ 1.17x 200 mm Lens: 0.27x ~ 0.88x 250 mm Lens: 0.22x ~ 0.73x
Flash Synchro Socket	Available on lens mount plate (flash synchro socket on camera body becomes inoperable)
Other Features	Shutter operation is completely coupled to camera body for shutter cocking and release actions; MF Finder S, ME Prism Finder S or AE Prism Finder S is also completely coupled.
Dimensions	86 mm (width) x 155 mm (height) x 210 mm (length)
Weight	1,550 grams
Accessories	Camera bayonet mount cap — 1 piece. Lens bayonet mount cap — 1 piece. Flash synchro socket cap — 1 piece.

1. Attach and Detach with the Shutter Cocked



Attachment and detachment is not possible unless the cocking pins of the camera body, lens and Automatic Bellows Attachment S are all in the "cocked" condition.

The cocking pins will be set to the green-colored dot in case of camera body, and located between the green-colored dots and the red-colored bands in case of the lens and accessory when they are in the "shutter cocked" condition.

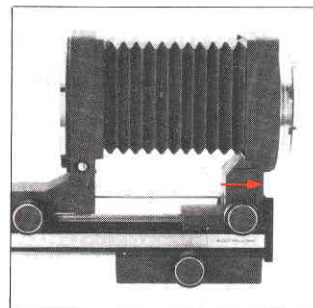


If the cocking pin is not set to the green-colored dot on the camera body, revolve the film winding crank.

If the cocking pins are not set between the green-colored dots and red-colored bands in case of lens and accessory, rotate the cocking pins manually (by hand) to the position.

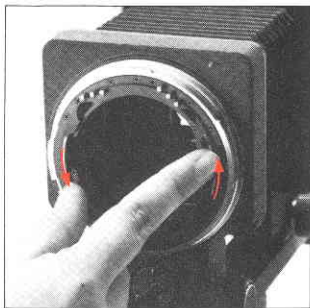
The following instructions are based on the "shutter cocked" condition.

2. Attachment of Camera Body

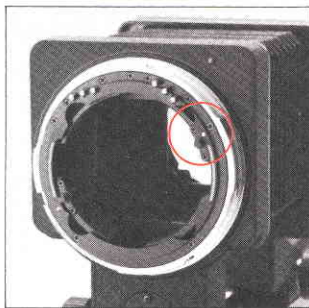


1. When attaching the camera body to the Automatic Bellows Attachment S, be sure that camera mount plate of the accessory is at its very rear end.

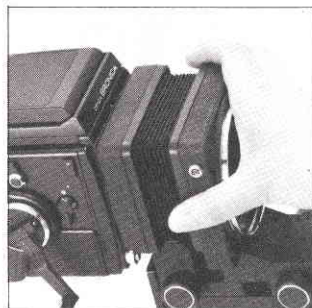
* The attachment or detachment of the camera body and lens can be in reverse order as have been explained in the following paragraphs.



2. First, check whether the cocking pins of the accessory, on the rear surface, are located between the green-colored dots and the red-colored bands. If not, move the pins to the required positions with your finger.



* The accessory cannot be attached when the cocking pins are not located between the green dots and the red bands.



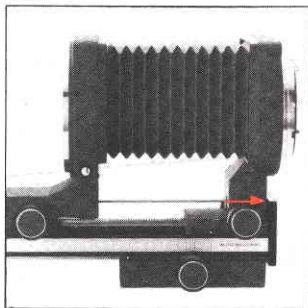
3. The accessory is attached to the body in the same manner that the lens is attached to the body. (See "Exchanging Lenses" of Instructions for SQ, SQ-A or SQ-Am). First, rotate the film winding crank and cock the lens shutter. Next, align the orange dot on the body with the red dot on the accessory and insert the latter. Then, rotate in the counter-clockwise direction until it stops with an audible click.

3. Attachment of Lens



When attaching the lens to the accessory, first, check whether the cocking pins are located between the green dots and red bands. Then, align the orange dot on the accessory with the red dot on the lens and insert the latter in fully. Then, rotate in the counter-clockwise direction until it stops with an audible click indicating that it is securely attached.

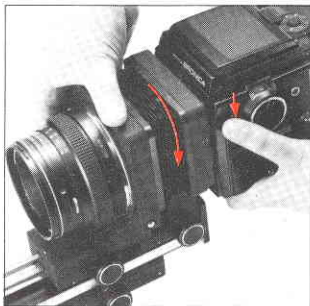
4. Detachment of Camera Body



1. When detaching the camera body from the Automatic Bellows Attachment S, be sure that camera mount plate of the accessory is at its very rear end.

2. Rotate the film winding crank and cock the lens shutter, in order to detach the camera body from Automatic Bellows Attachment S.

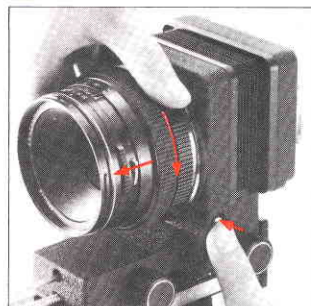
5. Detachment of Lens



3. In order to detach the accessory from the body, press the lens release button (on the left side of the body) down and, at the same time, rotate the accessory in the clockwise direction until it makes a full stop and can be detached.

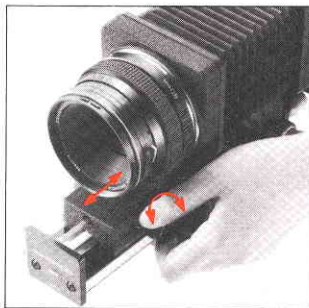


1. Since the cocking pins of the accessory will return slightly in the releasing direction, upon detachment from the body, move the cocking pins to their proper locations with your finger.



2. Then, depress the lens release button, in the arrow-indicated direction, and, at the same time, rotate the lens in the clockwise direction until it makes a full stop, at which point it will be possible to detach it.

6. Operations



1. Picture-taking operations are same as when not using the Automatic Bellows Attachment S.

2. Use the bellows movement knobs or the focusing ring of the lens to focus the subject.

3. The bellows is extended or contracted by rotating the bellows movement knobs which are located on the left side, as seen from the camera side. The bellows are fixed at any extension with the locking knobs on the opposite or right side. The locking knob or knobs must always be loosened when extending or contracting the bellows.



4. The tripod mount rack should be moved to the center of gravity of the equipment, with the tripod mount racking knob, and then fixed securely with its locking knob, before attachment on top of the tripod. The tripod mount rack can, of course, be shifted while attached on top of the tripod, too.



5. For focusing the subject at a predetermined magnification, move the complete set-up forward or backward with the tripod mount racking knob, while fixed on top of the tripod.

6. See "Extension" on page 14 for the required extension and then set it to the extension scale of the Automatic Bellows Attachment S.

7. To determine the correct exposure, find the exposure factor for the required extension and increase the exposure by the required step.
See "Exposure Factor" on page 16.

7. Pointers on Close-Up Photography

• Focusing

There will be a decrease in the actual brightness through the lens in close-up photography, as can be seen in "Exposure Factor" on page 16. Thus, it will be found rather difficult to focus with the split-image or microprism spot of the focusing screen. Therefore, use the surrounding matte screen area for focusing, in such cases.

Or, use the optional Matte Focusing Screen S or Grid Focusing Screen S, which have central matte areas, for this purpose.

• Depth of Field

The depth of field will also become more shallow as the magnification is increased in close-up photography.

It is imperative, therefore, that focusing be done as carefully as possible. At the same time, stop the lens down as much as permissible in order to increase the depth of field.

A slow shutter speed will be the rule, in most cases. Therefore, use a strong, rugged tripod for holding the equipment, in order to minimize camera vibration and, at the same time, use a cable release whenever possible. In case of SQ-A or SQ-Am camera, use of Mirror Lock-up device will help to prevent camera vibration.



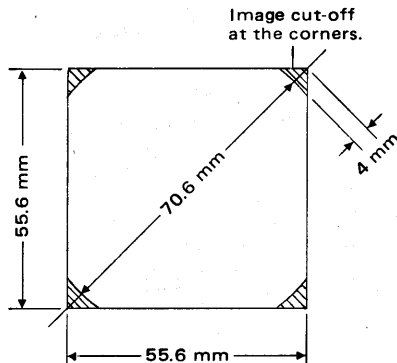
• Flash Synchro Socket

Use the flash synchro socket on top of the lens mount plate for flash photographs with the Automatic Bellows Attachment S.

Do not use the hot shoe of the Speed Grip S or SQ-Am because there will be no flash illumination, when using the Automatic Bellows Attachment S.

● Use of the 250 mm Lens

There may be some decrease in peripheral illumination and/or image cut-off in the four corners of the frame area, of about 4 mm or so, when using the 250 mm focal length lens. Important parts of the subject should, therefore, be composed in the central area with a safety area left around the border. (See illustration at right.)



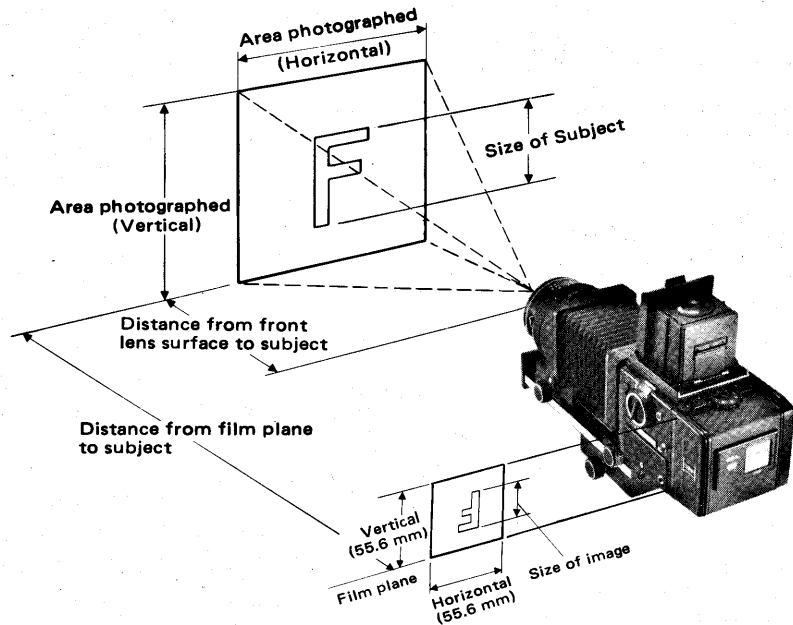
● Illumination

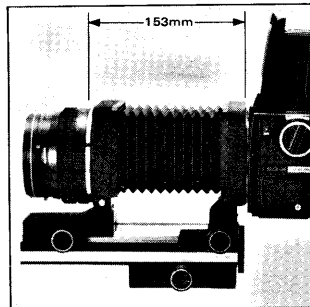
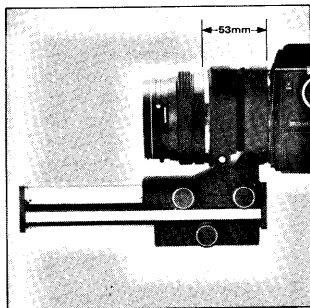
In general, use the same rules and methods of illumination (lighting) for close-up photography, as for general photography.

However, lighting is a very important when something special is required, as, for example, when emphasizing the surface texture or when delineating transparent glass articles and, therefore, special care will be required in these instances. At the same time, because of the short distances involved, it will be necessary, at all times, to exercise special care in preventing shadows being cast on the subject by the photographer and/or equipment.

Test shooting with the Polaroid Pack Film Back S, in such cases, will be very helpful because it will give the user instant data on the exposure, lighting and depth of field and, thus, eliminate mistakes in the actual shot.

8. Close-Up Shooting Data





● Extension

Magnification in close-up shooting increases in relation to the distance the lens is extended away from the film plane.

With greater extension, shooting will gradually move into the world of macrophotography.

The distance from the rear or camera bayonet mount of the accessory to the front or lens bayonet mount is the extension provided by the Auto-matic Bellows Attachment S. It is a minimum 53 mm, when the bellows are contracted, and a maximum 153 mm, when the bellows are fully extended, which means that the bellows provide a 100 mm extension.

When both lens mount plate and camera mount plate are racked back as far as possible towards the camera body (minimum extension of the accessory), the index of camera mount plate points 0, while the index of lens mount plate points 53 on the extension scale indicating the minimum bellows extension of 53 mm.

● Magnification

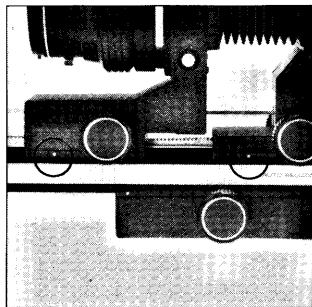
Magnification is the relationship between the size of the subject and the size of the image on the film.

It can also be considered the relationship between the size (one side) of the subject area being photographed and the size (one side) of the square negative frame area.

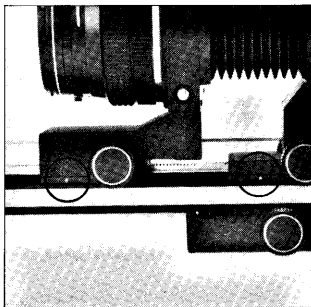
$$\text{Magnification} = \frac{\text{Image Size}}{\text{Object Size}} = \frac{\text{One Side of Square Negative Frame}}{\text{One Side of Subject Area}}$$

As the size of negative frame area is fixed as 55.6 x 55.6 mm;

$$\text{Magnification} = \frac{55.6 \text{ mm}}{\text{One Side of Subject Area}}$$



For example, the reading of lens mount plate index indicates bellows extension when camera mount plate being positioned with index pointing at 0.



Or, depending on the shooting conditions, the camera mount plate may also be moved forward, in which case, the scale graduation for the camera mount plate should be subtracted from that for the lens mount plate to find the actual bellows extension.

- **Subject Area**

The subject area is the size of the area that will be photographed in the full negative frame, as indicated by the length of one side of square format.

The interchangeable finders for the Zenza Bronica SQ, SQ-A or SQ-Am shows 94% of the one side of square negative frame.

- **Object-To-Film Plane Distance**

The position of the film plane is indicated on the left side of the camera by the ϕ indication.

- **Object-To-Front Lens Surface Distance**

The front lens surface is the front edge of the filter screw mount of each Zenzanon-S lens.

● Exposure Factor

The aperture markings or F/ numbers on the aperture scale of the lens are for use when shooting at infinity and are no longer correct when the lens is extended for close-up shooting. (Theoretically there is also a small amount of extension when the lens is focused at the minimum focusing distance, with its helical focusing system, but this can be disregarded for all practical purposes.)

In other words, the aperture markings are no longer correct because the light has to travel a greater distance than necessary when the lens is used at infinity or at normal helical extensions. The intensity of the light falling on the film, therefore, decreases compared to an equal lens opening at infinity (because the intensity of the light decreases with the square of the distance). This means, therefore, that the exposure must be compensated

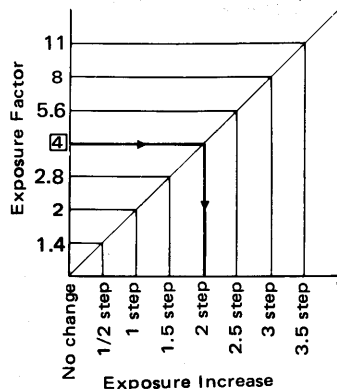
or increased to take into account the decrease in light intensity.

The exposure factor is the amount by which the F/number or exposure must be increased and can be found in the "Tables for Close-Up Data". The following table shows the increase that must be made in the aperture or shutter speed setting for obtaining a correct exposure with the exposure factors.

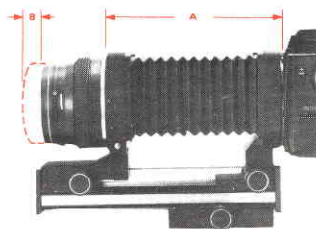
Note:

It should be noted, however, that automatic exposure operations, or manual exposure operations are possible, without considering exposure factors, when the AE Prism Finder S or MF Finder S/ME Prism Finder S, with its through-the-lens metering system, is used.

EXAMPLE: An exposure factor of 4 means that the aperture has to be increased by two steps. Or, the shutter speed can be increased by an equal amount.



9. How to Use the Tables for Close-Up Data



A: Extension of bellows
B: Extension of lens
A + B: Total extension

Depending on shooting requirements, it will usually be necessary to determine, first of all, the magnification to be used, or the subject area to be photographed or the distance from the subject to the front lens surface. This means that the extension is usually predetermined by the magnification, subject area or subject-to-front lens surface distance.

The distances noted in the following tables are all based on

the lens being used at infinity. Should the lens be extended with its helical focusing system, therefore, it will be necessary to add such extension to arrive at the total amount of extension.

• Deciding on the Magnification

If it is necessary to photograph the subject at a predetermined size on the film, it will be necessary to determine the magnification that must be used, first of all.

Example: A 15 mm size object must be photographed at 24 mm size on the film. The magnification is found from the following:—

$$\text{Magnification} = \frac{\text{Image Size}}{\text{Object Size}} = \frac{24}{15} = 1.6x$$

If the 80 mm lens is being used, it can be seen from Table 2 that the extension of the accessory must be 133 mm.

Incidentally, it can also be confirmed from the same table that the subject area, in this case, will be 3.48 x 3.48 cm.

• Determining the Subject Area

If an object of specific dimension must be photographed, measure the length of one side of its square format and determine the required extension.

Example: If an object of 4.5x4.5 cm must be photographed, it can be seen from Table 2, when the 80 mm lens is being used, that the extension must be less than about 103 mm while the magnification will be within 1.24x.

• Determining the Subject-to-Front Lens Surface Distance

If it is not possible to approach the subject beyond a certain distance, first, measure the closest distance that it will be possible to use.

Next, look through the tables and choose a lens which fits, since the distance to the subject will differ with the focal length of the lens. On the other hand, it can also be seen from the table that a lens with a longer focal length can be used at a longer distance from the subject.

10. Tables for Close-Up Data

Table 1. Zenzanon-S 50 mm Lens

Bellows Extension	Magnification	Subject Area	Object-to-Film Plane Distance	Object-to-Front Lens Surface Distance	Exposure Factor	With Focusing Ring of Lens at Infinity
53 mm	1.05	5.30 x 5.30 cm	24.1 cm	4.1 cm	2.5	
63	1.25	4.46 x 4.46	24.4	3.4	2.8	
73	1.44	3.85 x 3.85	24.8	2.8	3.2	
83	1.64	3.39 x 3.39	25.4	2.4	3.6	
93	1.84	3.02 x 3.02	26.0	2.0	4.0	
103	2.04	2.73 x 2.73	26.8	1.8	4.4	
113	2.24	2.49 x 2.49	27.6	1.6	4.9	
123	2.43	2.28 x 2.28	28.4	1.4	5.4	
133	2.63	2.11 x 2.11	29.2	1.2	5.9	
143	2.83	1.97 x 1.97	30.1	1.1	6.4	
153	3.03	1.84 x 1.84	31.0	1.0	7.0	
160.9	3.18	1.75 x 1.75	31.7	0.9	7.5	
	Note: (1) Values with maximum bellows extension plus maximum lens extension with helical focusing ring. (2) Extension possible with helical focusing is 7.9 mm with the 50 mm lens.					

Table 2. Zenzanon-S 80 mm Lens

Bellows Extension	Magnification	Subject Area	Object-to-Film Plane Distance	Object-to-Front Lens Surface Distance	Exposure Factor	With Focusing Ring of Lens at Infinity
53 mm	0.64	8.72 x 8.72 cm	34.5 cm	15.5 cm	2.4	
63	0.76	7.34 x 7.34	33.4	13.4	2.8	
73	0.88	6.33 x 6.33	32.9	11.9	3.2	
83	1.00	5.57 x 5.57	32.8	10.8	3.5	
93	1.12	4.97 x 4.97	32.9	9.9	4.0	
103	1.24	4.49 x 4.49	33.2	9.2	4.4	
113	1.36	4.09 x 4.09	33.6	8.6	4.8	
123	1.48	3.76 x 3.76	34.1	8.1	5.3	
133	1.60	3.48 x 3.48	34.7	7.7	5.8	
143	1.72	3.23 x 3.23	35.3	7.3	6.4	
153	1.84	3.02 x 3.02	36.0	7.0	6.9	
164.6	1.98	2.81 x 2.81	36.8	6.7	7.6	
	Note: (1) Values with maximum bellows extension plus maximum lens extension with helical focusing ring. (2) Extension possible with helical focusing is 11.6 mm with the 80 mm lens.					

Table 3. Zenzanon-S 105 mm Lens

Bellows Extension	Magnification	Subject Area	Object-to-Film Plane Distance	Object-to-Front Lens Surface Distance	Exposure Factor	With Focusing Ring of Lens at Infinity
53 mm	0.51	10.9 x 10.9 cm	45.6 cm	25.8 cm	2.3	
63	0.60	9.21 x 9.21	43.3	22.5	2.6	
73	0.70	7.94 x 7.94	42.0	20.2	2.9	
83	0.80	6.99 x 6.99	41.2	18.4	3.3	
93	0.89	6.24 x 6.24	40.8	17.0	3.6	
103	0.99	5.63 x 5.63	40.6	15.8	4.0	
113	1.08	5.13 x 5.13	40.7	14.9	4.4	
123	1.18	4.71 x 4.71	40.9	14.1	4.8	
133	1.28	4.36 x 4.36	41.2	13.4	5.2	
143	1.37	4.06 x 4.06	41.7	12.9	5.7	
153	1.47	3.79 x 3.79	42.2	12.4	6.2	
171.7	1.65	3.38 x 3.38	43.3	11.6	7.1	
	Note: (1) Values with maximum bellows extension plus maximum lens extension with helical focusing ring. (2) Extension possible with helical focusing is 18.7 mm with the 105 mm lens.					

Table 4. Zenzanon-S 150 mm Lens

Bellows Extension	Magnification	Subject Area	Object-to-Film Plane Distance	Object-to-Front Lens Surface Distance	Exposure Factor	With Focusing Ring of Lens at Infinity
53 mm	0.36	15.4 x 15.4 cm	75.3 cm	55.4 cm	2.4	
63	0.43	13.0 x 13.0	69.8	48.9	2.7	
73	0.50	11.2 x 11.2	66.1	44.2	3.1	
83	0.56	9.85 x 9.85	63.5	40.6	3.4	
93	0.63	8.79 x 8.79	61.7	37.8	3.8	
103	0.70	7.94 x 7.94	60.5	35.6	4.2	
113	0.77	7.24 x 7.24	59.6	33.7	4.7	
123	0.84	6.65 x 6.65	59.1	32.2	5.1	
133	0.90	6.15 x 6.15	58.7	30.9	5.6	
143	0.97	5.72 x 5.72	58.6	29.7	6.1	
153	1.04	5.34 x 5.34	58.6	28.7	6.6	
171.7	1.17	4.76 x 4.76	58.9	27.2	7.6	
	Note: (1) Values with maximum bellows extension plus maximum lens extension with helical focusing ring. (2) Extension possible with helical focusing is 18.7 mm with the 150 mm lens.					

Table 5. Zenzanon-S 200 mm Lens

Bellows Extension	Magnification	Subject Area	Object-to-Film Plane Distance	Object-to-Front Lens Surface Distance	Exposure Factor	With Focusing Ring of Lens at Infinity
53 mm	0.27	20.6 x 20.6 cm	120.9 cm	97.4 cm	2.4	
63	0.32	17.3 x 17.3	110.3	85.8	2.7	
73	0.37	15.0 x 15.0	102.9	77.4	3.0	
83	0.42	13.2 x 13.2	97.5	71.0	3.4	
93	0.47	11.8 x 11.8	93.5	66.0	3.8	
103	0.52	10.6 x 10.6	90.5	62.0	4.2	
113	0.57	9.67 x 9.67	88.1	58.6	4.6	
123	0.63	8.89 x 8.89	86.4	55.9	5.1	
133	0.68	8.22 x 8.22	85.0	53.5	5.5	
143	0.73	7.64 x 7.64	84.0	51.5	6.0	
153	0.78	7.14 x 7.14	83.2	49.7	6.5	
172.7	0.88	6.33 x 6.33	82.3	46.8	7.6	
	Note: (1) Values with maximum bellows extension plus maximum lens extension with helical focusing ring. (2) Extension possible with helical focusing is 19.7 mm with the 200 mm lens.					

Table 6. Zenzanon-S 250 mm Lens

Bellows Extension	Magnification	Subject Area	Object-to-Film Plane Distance	Object-to-Front Lens Surface Distance	Exposure Factor	With Focusing Ring of Lens at Infinity
53 mm	0.22	25.6 x 25.6 cm	172.7 cm	146.0 cm	2.1	
63	0.26	21.5 x 21.5	155.9	128.2	2.4	
73	0.30	18.6 x 18.6	144.0	115.3	2.6	
83	0.34	16.3 x 16.3	135.1	105.4	2.9	
93	0.38	14.6 x 14.6	128.4	97.7	3.2	
103	0.42	13.2 x 13.2	123.2	91.5	3.5	
113	0.46	12.0 x 12.0	119.1	86.4	3.9	
123	0.50	11.0 x 11.0	115.8	82.1	4.2	
133	0.55	10.2 x 10.2	113.2	78.5	4.6	
143	0.59	9.49 x 9.49	111.0	75.3	4.9	
153	0.63	8.87 x 8.87	109.3	72.6	5.3	
178.7	0.73	7.59 x 7.59	106.3	67.0	6.4	
	Note: (1) Values with maximum bellows extension plus maximum lens extension with helical focusing ring. (2) Extension possible with helical focusing is 25.7 mm with the 250 mm lens.					

11. Care and Maintenance

- * The shutter coupling shaft transmits functions taking place in the camera body to the lens and, therefore, is a very important part of the Automatic Bellows Attachment S. Since misalignments in the shutter coupling shaft will lead to serious troubles, do not apply pressure or shock during use, as well as during attachment and detachment, and, of course, when carrying it about.
- * Keep the contact points on the camera mount plate and lens mount plate clean at all times, as otherwise, dirty contact points will lead to poor contact and misoperations of the lens shutter, flash synchronization and/or automatic exposure operations.
- * Keep the lens bayonet mount and camera bayonet mount covered with their caps during storage and/or when carrying the attachment, in order to guard the contact pins from damage and/or dirt.
- * Clean the attachment with a clean soft hair brush, rubber-ball air-blower and/or silicon cloth only. Do not use alcohol, thinner or other solvents on the lacquered surfaces and/or bellows.
- * When SQ or SQ-A with Speed Grip S attached and the SQ-Am camera is attached, camera mount plate can not be moved forward.
- * When the Polaroid Film Back S is attached to SQ or SQ-A camera body, there will be certain restriction on movement of camera mount plate.
- * Please use the Automatic Bellows Attachment S singly, but never in combination with the Automatic Extension Tubes S.

How to Use the Nomograph

The extensions for the attachment is indicated along the horizontal axis at the bottom edge, the magnifications along the vertical axis at the left border while the heavy lines slanting upwards to the right inside the graph indicate the lenses that can be used.

The figures on the slanting heavy lines for the lenses indicate the exposure factors at these points. The extensions indicated in the horizontal axis will coincide with the total extension of the Automatic Bellows Attachment S only when the lens is used at infinity. In addition to the extension of the attachment, the lens itself can be extended with its helical focusing system and the total extension possible, in this case, is indicated by the heavy broken lines which continue at the end of the heavy lines for the lenses.

Example: The 80 mm lens is used with an extension of 14 cm. Move along the bottom line horizontally to 14, then directly upward to the heavy line for the 80 mm lens, which indicates an exposure factor of 6.4. Finally, move from that point horizontally to the left where a magnification of approximately 1.7x will be indicated.

13. Nomograph of the Magnification and Exposure Factor

