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ZENZA BRONICA GS-1

AUTOMATIC EXTENSION TUBE G

INSTRUCTIONS

Printed in Japan
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Read Before Use, Please!

The Automatic Extension Tube G has been developed for the purpose of providing greater lens extensions than possible with the unaided Zenzanon-PG lenses (from 50mm to 250mm focal lengths), without loss of the automatic lens diaphragm and electronic shutter actions in the lenses. Thus, operations are identical to that without the automatic extension tube which means that operations are very simple and trouble-free, even when the accessory is used between the Zenzanon-PG lens and GS-1 body.
Two automatic extension tubes are available, or G-18 with 18mm extension and G-36 with 36mm extension. These automatic extension tubes can only be used singly and must never be used together. On the other hand, for extensions greater than 36mm, the use of the Automatic Bellows Attachment G is recommended because it can provide greater, variable lens extensions.
Finally, for greater pleasure and freedom from troublesome exposure calculations, the use of the AE Prism Finder G is recommended since they provide the user with coupled exposure measurements.
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.
Two attachment and detachment methods are possible with the accessory. In Method 1, the accessory and lens are attached separately and also detached separately. In Method 2, the lens and accessory are, first, attached together and then attached to the body, with detachment in the reverse order.

G-18

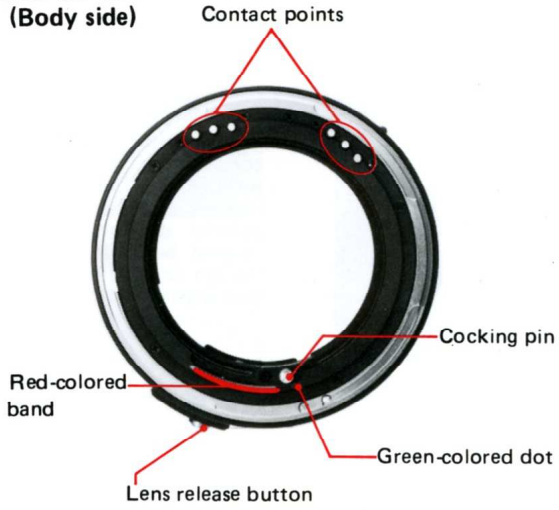
G-36

Contents

Nomenclature

Front surface (Lens side)

Rear surface (Body side)



1. Attachment/Detachment of the Accessory (Method 1)

In Method 1, the Automatic Extension Tube and lens are attached separately.

Attachment

A. First, check whether the cocking pin of the accessory, on the rear surface, is located between the green-colored dot and the red-colored band. If not, move the pin to the required position with your finger.

* The accessory cannot be attached when the cocking pin is not located between the green dot and the red band.

B. The accessory is attached to the body in the same manner that the lens is attached to the body. (See page 22 of the Instructions for the GS-1.) First, rotate the film winding crank and cock the lens shutter. Next, align the white 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.

C. In the same manner, when attaching the lens to the accessory, first, check whether the cocking pin is located between the green dot and red band. Then, align the white 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.

Detachment

A. Rotate the film winding crank and cock the lens shutter, in order to detach the lens.

B. Then, slide 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.

C. 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 clock-wise direction until it makes a full stop and can be detached.

2. Attachment/Detachment of the Accessory (Method 2)

In Method 2, the Automatic Extension Tube and lens are attached together and then attached to the body.

Attachment

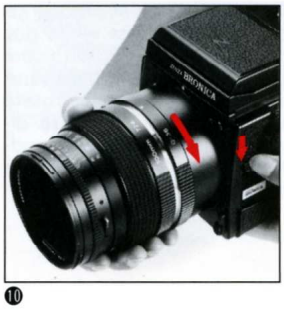
A. First, check whether the cocking pin on the rear surface of the accessory and lens mount is located between the green dot and red band. If not, it must be moved to the correct position with your finger.

* Attachment will not be possible when the cocking pin is not located properly between green dot and red band.

B. To attach the accessory to the lens, align the white dot on the accessory with the red dot on the lens and insert the latter. Then, rotate in the counter-clockwise direction until there is an audible click, which will indicate attachment.

C. The accessory, with lens attached to it, is attached to the body in the same manner that the lens is attached. Or, first, rotate the film winding crank and cock the lens shutter. Next, align the white dot on the body with the red dot on the accessory and insert the latter. Finally, rotate counter-clockwise fully, until there is an audible click which will indicate attachment.

Detachment



A. First, rotate the film winding crank and cock the shutter. Then, push 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, at point it will be possible to detach the accessory and lens.

B. Since the cocking pin of the accessory will return slightly in the releasing direction, upon detachment from the body, move the cocking pin to its proper location with your finger.

C. Next, rotate the lens release button of the accessory in the arrow-indicated direction and, at the same time, rotate the lens in the clockwise direction until it stops, at which point, it will be possible to separate the lens and accessory.

* It will not be possible to slide the lens release button of the accessory, when the cocking pin is not located between the green dot and red band, and, therefore, it will not be possible to take off the lens.

3. Pointers for Close-Up Photography

A. Focusing with the split-image or microprism spot may be found rather difficult in close-up shooting because of a decrease in the actual brightness through the lens, as will be explained later. Therefore, in such cases, focus with the matte screen area.
Or, focusing screens with a central matte area, such as the Matte Screen-G or the Grid-line Screen-G should be used.

B. When using the 250mm focal length lens, there may be some darkening in the corners of the frame area, of about 2mm or so.

C. When the 50mm and 65mm focal length lenses are used, there will be certain magnifications between the G-18 and G-36 tubes which it will not be possible to use, due to the amount of extensions possible with the helical focusing systems of these lenses.

D. The depth of field will become more shallow as the magnification is increased in close-up shooting. Therefore, focus as carefully as possible and, at the same time, stop down the lens as much as possible in order to increase the depth of field. And, since a slow shutter speed will be the rule, in this case, use a strong, rugged tripod for holding the camera set-up, in order to eliminate camera vibrations. And, at the same time, use a cable release.
It should also be noted that the photographer or camera,

or both, may cast shadows on the subject, in close-up shooting, because of the extremely short distance. Great care should, therefore, be exercised in properly illuminating the subject.
A longer focal length lens will help in this case, as the photographer and camera will be positioned at a farther distance. On the other hand, of course, the depth of field will become even more shallow.

4. Care and Maintenance

A. The contact points on the front and rear surfaces of the accessory must always be clean, as otherwise, there will be faulty contact upon attachment. This might cause troubles in shutter operation, flash synchronization and coupling with the AE Finder-G.

B. Always cover the front and rear surfaces with their caps to protect the contact points and pin from damage and/or dust, during storage or when carrying the accessories around.

C. The G-18 and G-36 Automatic Extension Tubes must be used singly and never in combination.

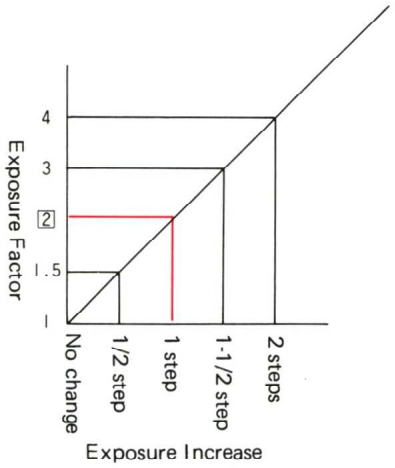
5. Formulas for Macrophotography

The close-up working datas for the various lenses which can be used with the automatic extension tubes are to be found in the tables which follow.
Magnification is the relationship between the size of the subject and the size of the image on the film, as in the following formula:-

$$\text{Magnification} = \frac{\text{Image size}}{\text{Object size}}$$

Exposure factor is the amount by which the F/number or exposure must be increased to take into account the decrease in light with extension of the lens, as less light will fall on the film plane when the lens is extended with the automatic extension tube. (Of course, there is also a small amount of extension when the lens is focused on a near subject with its helical focusing system, but this can be disregarded for all practical purposes.)
The following table shows the increase that must be made in the aperture or shutter speed for obtaining a correct exposure with these exposure factors.

Example:
An exposure factor of 2 means that the aperture or shutter speed should be increased by one step, or F8 should be increased to F5.6 and 1/60 sec. should be increased to 1/30 sec. When the AE Finder G is used, however, the exposure factor can be disregarded since coupled exposure measurements will be possible with through-the-lens metering.



6. Close-Up Working Datas

With Automatic Extension Tube G-18 (Unit:cm)

Lens Used	Focusing Ring Setting	Magnification	Area Photographed	Object-to-Film Plane (Distance)	Object-to-Front Lens (Surface)	Exposure Factor
100mm	∞ Infinity	0.18	30.9×38.3	76.5	59.5	1.4
	Max. Extension	0.37	15.1×18.7	50.0	31.0	1.8
50mm	∞ Infinity	0.36	15.4×19.2	30.5	12.8	1.4
	Max. extension	0.51	10.9×13.5	27.2	8.7	1.6
65mm	∞ Infinity	0.28	20.1×24.9	41.1	23.7	1.4
	Max. Extension	0.43	12.9×16.0	33.7	15.3	1.6
Macro 110mm	∞ Infinity	0.17	33.4×41.4	86.9	68.8	1.3
	Max. Extension	0.42	13.2×16.3	50.5	29.6	2.0
150mm	∞ Infinity	0.12	46.3×57.5	157	140	1.4
	Max. Extension	0.25	22.2×27.6	93.5	75.1	1.9
200mm	∞ Infinity	0.09	60.5×75.1	255	235	1.3
	Max. Extension	0.22	25.3×31.4	133	111	1.9
250mm	∞ Infinity	0.07	75.7×93.9	385	361	1.3
	Max. Extension	0.18	31.6×39.2	194	167	1.7

With Automatic Extension Tube G-36 (Unit:cm)

Lens Used	Focusing Ring Setting	Magnification	Area Photographed	Object-to-Film Plane (Distance)	Object-to-Front Lens (Surface)	Exposure Factor
100mm	∞ Infinity	0.36	15.4×19.2	50.6	31.7	1.8
	Max. extension	0.55	10.1×12.6	42.9	22.2	2.3
50mm	∞ Infinity	0.72	7.7× 9.6	25.4	5.9	1.9
	Max. Extension	0.87	6.4× 7.9	24.9	4.7	2.1
65mm	∞ Infinity	0.55	10.0×12.5	31.2	12.0	1.8
	Max. Extension	0.71	7.8× 9.7	29.6	9.4	2.0
Macro 110mm	∞ Infinity	0.33	16.7×20.7	56.3	36.4	1.7
	Max. Extension	0.59	9.4×11.7	45.0	22.3	2.4
150mm	∞ Infinity	0.24	23.2×28.8	95.9	77.6	1.9
	Max. Extension	0.37	15.0×18.6	75.8	55.6	2.4
200mm	∞ Infinity	0.18	30.3×37.6	150	128	1.7
	Max. Extension	0.31	17.8×22.1	109	84.4	2.3
250mm	∞ Infinity	0.15	37.8×47.0	220	194	1.6
	Max. Extension	0.25	22.3×27.7	154	126	2.1