ZENIT

ATTENTION!

The present Instruction Manual contains the basic characteristics and essential operating principles of the "Zenit" camera. Before starting to take pictures, make thorough study of the handling rules and operation procedure of the camera.

Due to ever-advancing development of the camera construction, there may occur minor differences between the text of the Manual and the construction of the camera you possess.

Do not direct the lens at the sun in order to avoid burning through the shutter because the lens acts like a powerful collecting piece.

The lens should be screwed in and out of the camera only by the knurled portion of the depth of field scale ring (the greatest diameter on the mount).

Do not touch the surface of the mirror with hands because this can damage its coating.

Do not rotate the shutter speed dial in the interval between "B" and 500.

Do not turn the release button, if not necessary, while releasing the shutter to avoid the cutting out of the shutter setting mechanism. While setting the camera shutter, always turn the setting lever up to the mechanical limit to avoid blank frames on the film. Before loading the camera open the back cover and check the shutter. To do this turn the setting lever, using one or more movements, up to a sensible stop in the camera; then press the release button.

PURPOSE

The photographic camera, type "Zenit" is a modern reflex miniature camera of single-lens construction. The camera uses motion picture (rolled) film.

The camera is intended for use in widest range of photography types and offers equally excellent service to skilled amateur photographers, cameramen and scientists.

BASIC TECHNICAL CHARACTERISTICS

Size of film, *mm* 35

Size of picture, *mm* . . . . . 24 by 36

The camera is fitted either with an „Industar-50" or with a "Helios-44" lens. The comparative characteristics of these lenses are presented in the Table below:

	"Industar-50"	"Helios-44"
Focal length, *mm*	50	58
Lens speed	1 : 3.5	1 : 2
Lens opening range	3.5 to 16	2 to 16
Working distance, *mm*	45.2	45.2
Minimum operating distance, *m*	0.65	0.5
Sunshade seating diameter, *mm*	36	55
Light filter mounting thread diameter, *mm*	33×0.5	49×0.5
Overall dimensions, *mm*	138×72×93	138×100×93
Weight, *g*	675	850
Eyepiece magnification,		5×
Film magazine capacity:		
film length, *m*		1.6
number of pictures		36
Automatic shutter speed	1/30, 1/60, 1/125, 1/250, 1/500 of a second and "B".	

CONSTRUCTION

The reflecting groundglass view-finder (Fig. 1) which operates in conjunction with lens *1* consists of swing-in mirror *2*, plano-convex lens *3* whose plane surface is ground, ridge-shaped penta prism *4*, and three-lens eyepiece *5*.

With the mirror hinged up (position 2′), the lens projects the inverted image of the object photographed on to film *6*.

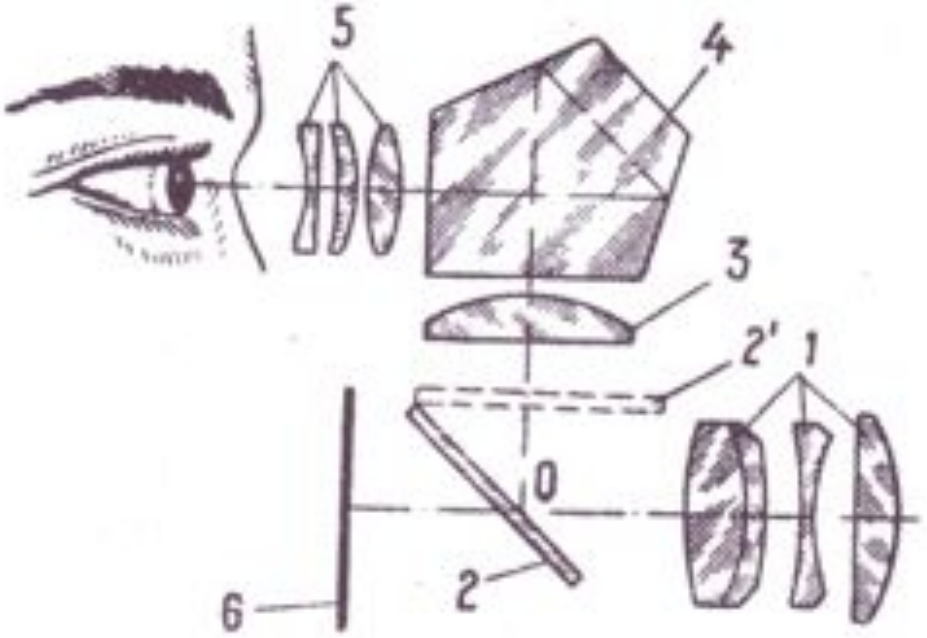


Fig. 1.

With the mirror lowered (position 2) the image is produced on the ground surface of lens *3*.

The distance between point "0" on the mirror and the film is equal to the distance between point "0" and the ground surface of the lens.

If the image appears sharply defined on the ground lens surface, it will be seen on the film in sharp focus too.

The inverted image of the object produced by the camera lens is erected by mirror *2* and penta prism *4*, so the photographer views the erect image of the object to be photographed.

As shutter setting lever *24* is moved back and around to the mechanical limit, the film travels

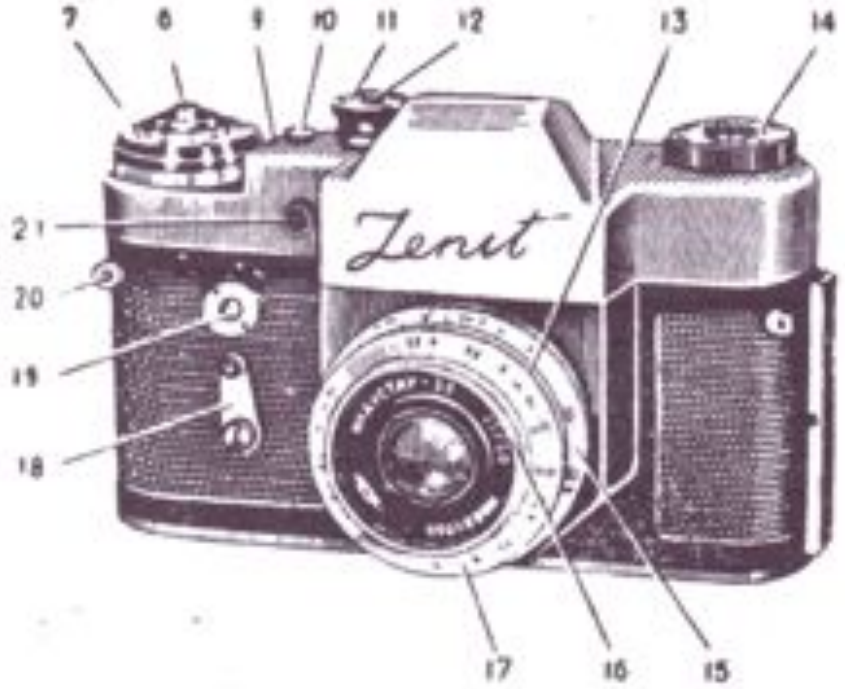


Fig. 2.

one picture forward, the view-finder mirror comes down, thus setting (winding up) the curtain-type shutter.

Exposure counter dial *7* is zeroed as a result of turning it by the knurled portion. The dial may be

turned in either direction. Exposures are counted against black index dot *9* plotted on the camera top plate.

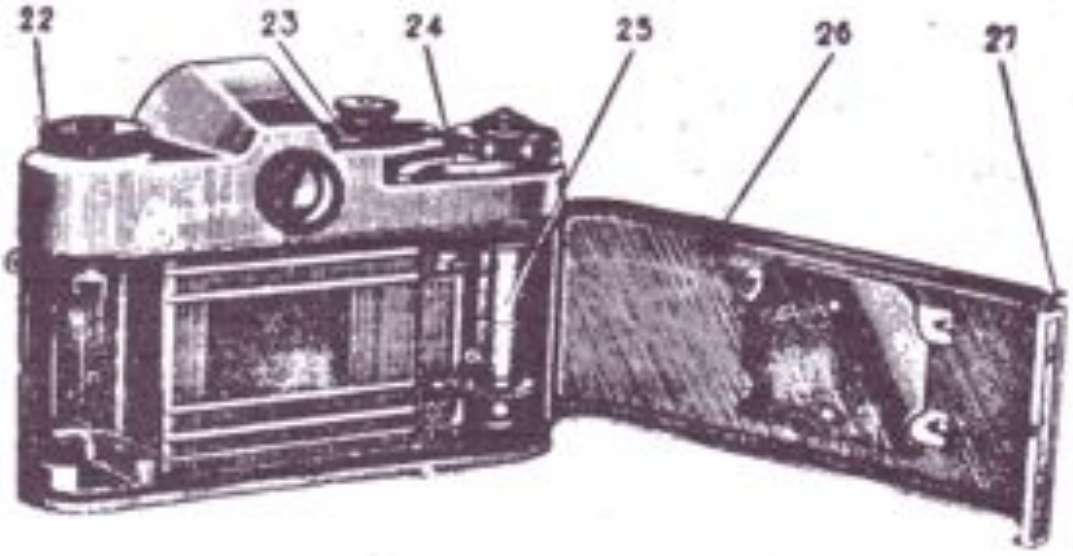


Fig. 3.

The exposure counter dial is zeroed with the shutter cocked.

Shutter release button *8* is provided with a standard taper thread for operation with a flexible releaser.

Shutter speeds can be set with the shutter both cocked and released.

To set the desired shutter speed, it is necessary to lift shutter speed dial *11* bearing the exposure

speed scale and to rotate it until the desired shutter speed graduation is aligned with index dot *12* plotted in the center part of the dial.

It is prohibited to rotate the dial in the interval between "B" and 500.

When a considerably delayed exposure is needed ("B" — exposures), finger-press shutter release button *8* and turn it all the way counter-clockwise.

The picture taken, turn the button back clockwise and release it.

To rewind the exposed film from the take-up spool back to the film magazine, act as follows:

Release the shutter.

Press button *10* down as far as it will go.

Rotate rewind knob *22* to return the film back into the film magazine.

Decreased effort applied to film rewind knob *22* indicates that the film has been rewound.

The forward panel of the camera mounts flash synchronization contact socket *21* to be used, when the camera is operated with flash bulbs and electronic flash kits of any type.

Flash advance is set by means of thumb piece *23*.

When use is being made of the self-timing mechanism, act as follows:

Cock the camera shutter, turn delayed-action setting lever *18* fully counter-clockwise, and then press delayed-action release button *19* to engage the self-timing mechanism. Eight to ten seconds later the camera shutter will be tripped automatically.

Eyepiece *5* is adjusted for normal human sight. If the operator's sight is deficient, it is advisable that use should be made of spectacle-lenses of the required correcting diopter number. The lens of 16-*mm* diameter is inserted in the eyepiece socket and is secured therein with a special ring available on the eyepiece.

The camera is attached to the tripod by means of the tripod bush threaded to 3/8" and located in the bottom part of the camera and its carrying case.

The camera body is provided with eyelets *20* to attach the strap for carrying the camera without the carrying case.

Construction of Lens, Type "Industar-50"

Lens mounting assembly *13* has a distance scale which is used for focusing when taking pictures at already known distances.

The operating distance in this case is set against the red index plotted on the depth-of-field scale ring *15*. Apart from the index ring *15* carries lens opening numbers which are used for determining the depth of field (See "Use of depth-of-field scale" page 17).

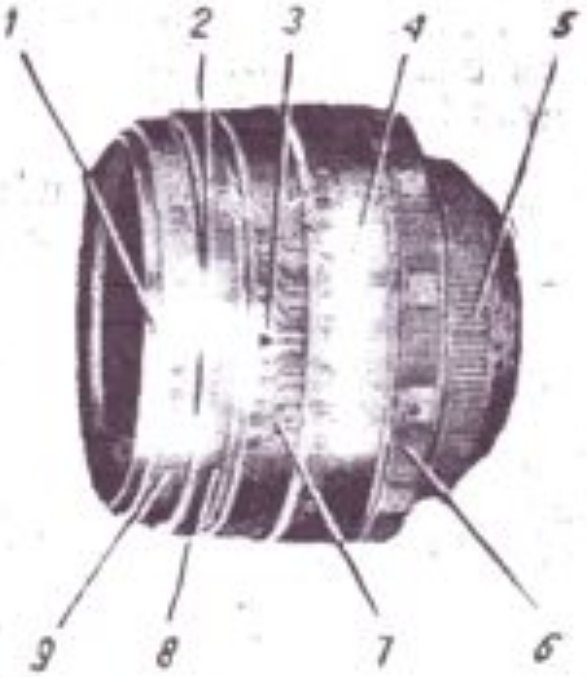
The lens opening desired is obtained by rotating front ring *16* till the index comes to stand opposite the desired lens opening number (3.5; 4; 5.6; 8; 11; or 16).

For better convenience in diaphragm-setting, ring *17* carries three diaphragm scales, three indexes on ring *16* corresponding to them.

To avoid damage, the lens should be screwed in and out only by the knurled portion of the ring *15*.

Construction of Lens Type "Helios-44"

The construction of the "Helios-44" lens and its operating are somewhat different from those of "Industar-50" lens, described on page 9-10.



The "Helios-44" unlike "Industar-50" has a pre-set diaphragm stopping ring *9*.

Therefore if the camera is fitted with a "Helios-44" lens, align the corresponding number (2,

2.8, 4, 5.6,8, 11 or 16) engraved on ring *9* with index *1* so that the desired lens opening number could be set. Actual irising is done by rotating ring *2* until it will go.

The lens mount *4* carries the distance scale, which is used for focusing when taking pictures at already known distances. The operating distance in this case is set against the red index *3* on the depth-of-field scale ring *7*. Apart from the index *7* the ring *6* carries lens opening numbers, which are used for determining the depth of field (see "Use of depth-of-field scale" on page 18).

To avoid damage, the lens should be screwed in and out only by the knurled portion of the ring *5*.

CAMERA OPENING

To open the back cover of the camera, proceed as follows:

Remove the carrying case from the camera having undone the tripod bush.

Pull latch *27* up and open the camera back cover. To close the camera, reverse the opening procedure.

FILM MAGAZINE DESCRIPTION AND LOADING PROCEDURE

The film magazine used with the "Zenit" camera (Fig. 4) consists of three elements: outer casing, inner casing and central spool.

Fig. 4.
Film Magazine
1—inner casing; *2*—central spool; *3*—outer casing.

To load the magazine:

Pull the inner casing to withdraw it from the outer casing having outpowered the action of the leaf spring.

Cut the end of the film to the shape shown in Fig. 5.

Pass the film end into one of the spool slits from its wider side (Fig. 5). Bend the film end which emerges from the opposite (narrower) side of the slit and insert it in the second slit, from its narrower side. Then bend the film end threefold, and pull the film out to have the film end wedged in the slit.

Wind the film around the spool with the emulsion face down.

Place the spool with the film rolled on it in the inner casing so that the spool head would fit into the opening in the inner case bottom.

A 8 to 10-*cm* length of the film should be left free out of the inner casing.

Insert the inner case with the spool in the outer casing, and see to it that the assembly is fixed with the spring.

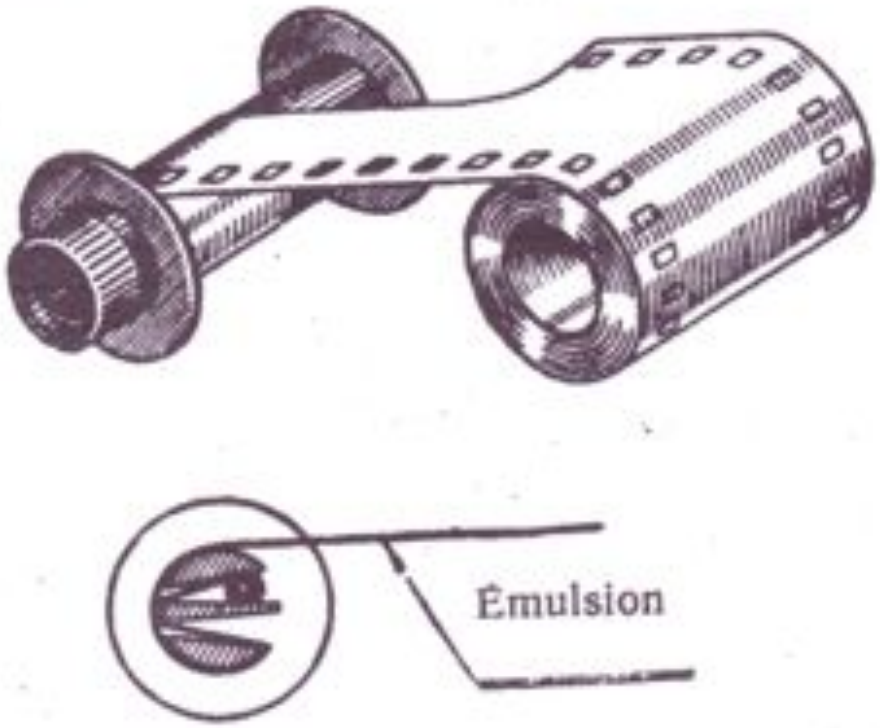


Fig. 5.
Fixation of the film on the spool.

All the film magazine loading operations are performed in complete darknees. Loading over, the further operations may be carried out by daylight.

CAMERA LOADING

The camera is loaded by daylight. To load, act as follows:

Cut straight the film end emerging from the film magazine.

Open back cover *26* of the camera, insert the film end tight under the spring of take-up spool *25*, and then place the film magazine in its recess. When placing the magazine in the camera, or when removing it from the camera, see that the film rewind knob is in the lifted position. With the camera loaded, the knob should be lowered.

Close the camera back cover, and force the latch down.

The film rewind knob mounts film reminder dial (film speed indicator) *14*.

Rotate the dial by applying finger pressure to its notchings, and retaining film rewind knob *22* by its knurled portion with the other hand to bring the speed designation of the film loaded in the camera against the dial index.

The silhouettes of a bulb and the sun with rays next to the inscription ЦВЕТНАЯ (COLOURED) indicates colour film used in artificial illumination or daylight conditions, respectively. Figures 11, 22,

45, 90 and 180 denote film speeds in units according to the USSR State Standards.

When loading the camera, for instance, with a black-and-white film of sensitivity 65, the index should be brought to the division mark between figures 45 and 90 of the dial.

To transport non-exposed film to the film gate after loading the camera, cock the shutter three times, each time pressing shutter release button *8* (see Fig. 2). When setting the shutter, see to it that film rewind knob *22* spins. If the knob does not spin, check the camera for correct loading with the film. It should be remembered that the rewind knob may fail to rotate during the first shots if the film is much shorter than the normal length. The knob will start rotating as soon as the film tension on the spool has become normal.

Set the "0" of the exposure counter dial against index dot *9* on the camera top plate turning the dial by its knurled portion. This done, the camera loading is considered over.

OPERATION OF FLASH SYNCHRONIZER

Use of flash bulbs and electronic flashes calls for employment of a device which synchronizes the flash moment with the shutter operating moment. For this purpose, the "Zenit" camera is provided with a flash synchronizer.

If the camera is operated with a single-action flash bulb, flash synchronizer thumb piece *14* should

be placed so that the thumb piece index would rest against mark "M" on the camera top plate. This position corresponds to an advance of 20±4 milliseconds.

When operating with an electronic flash kit, it should be remembered that its lag (inertia) is, in practice, close to zero.

Therefore electronic flash kits should be operated with flash synchronizer thumb piece *23* placed against mark "X" made on the camera top plate (Fig. 3).

Only shutter speeds of 1/30 *sec* and slower ("B") (when the gating is full) may be used in the "Zenit" camera when photographing with either flash bulbs or electonic flash.

TAKING THE PICTURE

The "Zenit" camera may be operated hand-held or tripod-mounted, depending on the exposure speeds used.

When preparing to take the picture:

Unbutton and flap out the cover of the camera carrying case.

Remove the lens cap.

If the picture is being taken in poor illumination conditions, mount the camera on the tripod and screw the flexible releaser to the shutter release button.

If the operating conditions require the use of a light filter, screw the appropriate light filter into the lens.

Obtain full lens operating by rotating lens ring *16* as far as it will go.

To take the picture:

Cock the shutter by throwing the shutter setting lever (see Fig. 3) fully back and around.

Set the desired shutter speed on dial *11* (see Fig. 2).

Focus the lens watching through the eyepiece *5* (Fig. 1) and rotating simultaneously the lens mounting *13* (Fig. 2) till on the ground surface of lens *3* (Fig. 1) the object image appears most sharply focused.

Imoortant.

If the image remains sharp as the ring is being turned through out a certain length of its operating range, stop mounting *13* in the mid-point of this interval.

Set the desired diaphragm by rotating ring *16*.

Take the picture by smoothly pressing the shutter release button.

ATTENTION! When taking pictures with the camera being in its carrying case take care that the cover of the camera carrying case did not obstruct the lens.

Especially be careful while taking pictures with vertical arrangement of frames.

Camera operation over:

Cap the lens.

If the camera is operated in the carrying case, button up the case cover.

Important.

Never forget to close the carrying case cover after the camera operation is ended, as otherwise:

a) dust and moisture getting on to the camera optics and mechanical elements are liable to affect the camera functioning and reduce the service life of the camera;

b) direct sun rays getting into the lens may burn through the shutter curtains because the lens acts like a powerful collecting piece;

c) the film may become fogged by stray light when the camera is exposed to light for a long period of time.

At the same time, the case offers good protection of the camera against accidental impacts and shocks.

CAMERA UNLOADING

As soon as the exposure counter dial has come to indicate 36 exposures, rewind the film into the film magazine, and remove the magazine from the camera.

To unload the camera:

Cap the camera lens.

Press button *10* and, retaining it in the depressed position, rotate film rewind knob *22* in the direction of the arrow until the film end is forced out of the spring of the take-up spool. (The end moment will be indicated by the increased effort applied to force out the film end).

Open the camera back cover.

Lift film rewind knob *22* and remove the film magazine from the camera.

USE OF DEPTH-OF-FIELD SCALE

The depth of field is the distance between the closest and most remote objects of the scene to appear sharp in the picture.

Therefore when taking pictures of objects elongated in depth or a group of objects located at different distances from the camera, use should be made of depth-of-field scale *15* (see Fig. 2).

This scale is located next to the distance scale plotted on mounting *13* and carries the diaphragm numbers spaced on either side of the distance indicating mark (index). The lens focussed, the depth-of-field scale indicates the depth-of-field limits for the selected lens opening.

The depth of field is read between identical lens opening numbers on both sides of the distance indicating mark.

For instance, the lens is focussed at a distance of 4 *m* with a lens opening of 16; in this case the

image will appear sufficiently sharp within distances ranging between 2 *m* and infinity " ∞ ".

For the same focussing at the distance of 4 *m* but with a lens opening of 5.6, the image will stand sharply defined within the range of 3 to 7 *m*.

It will be noted that the depth of field decreases considerably with the increase of the lens opening.

The tolerated diameter of the diffusion disc specified for the depth-of-field scale of the "Zenit" camera is 0.05 *mm*.

HANDLING THE COATED OPTICS OF LENS AND EYEPIECE

1. Anti-flare optical surfaces are coated with extra-fine films of fluoric magnesium or silicon and titanium oxides (film thickness being about 0,1 micron). In a reflected light, such a film tints the coated surfaces violet or light-blue.

2. Due to the small thickness of the film it is easily damageable if cleaned carelessly. In order to preserve the coating film it is necessary to protect coated surfaces from fouling thus minimising the cleaning operations.

3. It is recommended that the coated surfaces should be cleaned as follows:

a) Remove dust with a clean soft brush, a clean (well-washed) flannel, calico or cambric cloth, or a cotton wool flock without applying undue pressure to the surface cleaned.

b) Greasy stains and other fouling such as finger-prints, fogging and the like, are successfully removed with a clean (well-washed) flannel, calico or cambric cloth, or a cotton wool flock lightly soaked in rectified alcohol, and petroleum or sulfuric ether. Use may be also made of toilet Eau-de-Cologne. No excessive effort should be applied to the treated surface in this case, either.

Traces of dried up solvent will be removed after cleaning with the aid of a clean cloth.

c) Moisture adversely affects coated optics resulting in stains and even complete deterioration of the coating film if the camera is operated or kept in unfavourable conditions for a long period of time.

When changing from cold to warm, never open the case and expose the optics immediately to avoid the fogging of the camera. Let the camera warm up in the closed case.

4. If due to careless handling or through any other reason the coating film gets deteriorated, the translucency and image contrast rendition of such a camera lens still remain higher than those of a non-coated lens of the same type.

The same is applicable to the eyepiece, too.

CONTENTS

Ord. 1693