

V/O "TECHNOINTORG"



ZENIT-11

STILL CAMERA

Technical
Description



ATTENTION!

The present Description contains characteristics and essential operating principles of the ZENIT-11 camera and cannot be regarded as a handbook on photography.

Before using this camera, make thorough study of the handling rules and operating procedures given in the present Description.

Due to ever-advancing development in camera construction, minor differences may occur between the text and your camera.

USES AND ADVANTAGES

ZENIT-11 is a 35-mm single lens reflex camera intended for a broad circle of amateur photographers. It is designed for various kinds of shooting on black-and-white or color films.

The camera is fitted with a mechanism of automatic pre-set diaphragm, a built-in exposure meter, an instant return mirror, a self-timer, a shutter cocking lever and is synchronized for use with flash units.

The camera is focused by a microraster as well as a ground glass collar.

The Fresnel lens ensures uniform brightness of image over the whole field of view of the viewfinder.

With the help of extension tubes the ZENIT-11 camera can be used for making copies. It allows as well to take close-up pictures of small-size objects at short distances (macrophotography) and to take pictures with the help of a microscope (photomicrography).

The ZENIT-11 camera has the following features:

- a secret lock of the back door;
- a shutter disengaging bush;
- a tripod nut in the centre of the camera bottom;
- a shutter speed dial that is not rotating while cocking the shutter;
- a film rewinding crank;
- cable connection for flash units;
- a hot-shoe for flash units.

HANDLING RULES

The ZENIT-11 camera is a precise optical-mechanical instrument. It should be handled carefully, kept clean and protected from jolts, dust, moisture and sharp temperature fluctuations.

Do not remove the camera from its case the moment it is brought indoors from cold to avoid sweating of its parts, especially optical ones.

Do not touch with fingers the surfaces of the optical parts since it is likely to cause deterioration of their coatings. Clean the optical coated lens surfaces with a clean soft cloth or cotton wool wad slightly moistened with rectified alcohol or ether.

The surfaces of the mirror and focusing device may be cleaned only if absolutely necessary with a dry soft brush but in no case with humid cleaning agents.

Keep the camera closed in its case; in so doing the cap should be placed on the lens and the shutter released.

Do not remove the lens from the camera without need to prevent dirt and dust from getting both onto the surfaces of the lens optical parts and into the camera itself.

To screw the lens in and out take hold of it with your hand and apply the main effort to the lens mount part carrying the depth-of-field scale.

Load and unload your camera either indoors or in shade protecting it against direct sun light.

Always cock the shutter as far as it will go to avoid blank exposures.

Do not keep the camera with the shutter cocked for a long period of time since it is likely to impair the shutter operation. Do not try to wind the shutter speed dial along its short section from "500" to "B" and the film speed dial along the figureless section of scale. Do not rotate shutter speed dial and do not cock the shutter when self-timer is running in "B" mode and when setting the release button in "T" position. It is likely to cause unsticking of the shutter blinds tape.

The camera photocell is designed for a long service life. To ensure its trouble-free operation and long time service do not subject it to the direct sunlight and carry the camera in its case when you are not using it.

Keep the photocell window clean to ensure accurate operation of the exposure meter.

Since the camera is a complex instrument, its repair and adjustment should be made in repair shops only.

SPECIFICATIONS

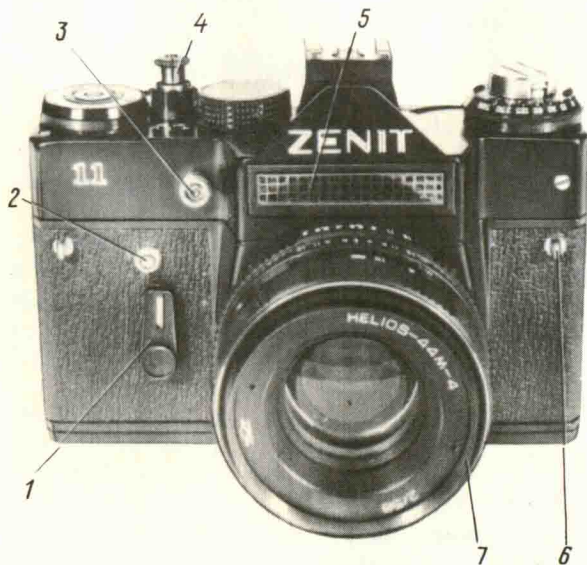
Frame size, mm		24×36
Film used		35 mm, perforated
Maximum length of film in cassette, m		1.65
Number of frames		36

Shutter speeds	from 1/30 to 1/500 s, "B" (hand-controlled) and long exposure	
Brightness measurement range of exposure meter, cd/m^2	from 25 to 13000	
Film speed range	from 16 to 500 ГОСТ units	
Lens	HELIOS-44M or HELIOS-44M-4	
Focal length, mm	58	58
Maximum relative aperture	f/2	f/2
Distance scale, m	from 0.55 to ∞	from 0.5 to ∞
Seat for sun shade, mm	$\varnothing 54$	$\varnothing 54$
Light filter mounting thread, mm	52×0.75	52×0.75
Viewfinder field of view, mm		20×28
Eyepiece magnification		4.3x
Flange film distance, mm		45.5
Cable release thread		K $\Phi 3.5 \times 0.5$
Tripod bush thread		1/4"
Overall dimensions, mm		$136 \times 98 \times 97$
Mass, kg		0.95

Certificates of authorship:

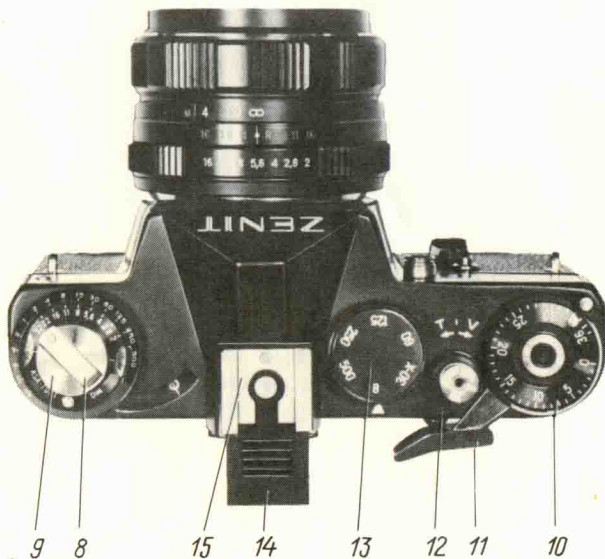
366447; 150360; 153652;
102683; 476534; 178682.

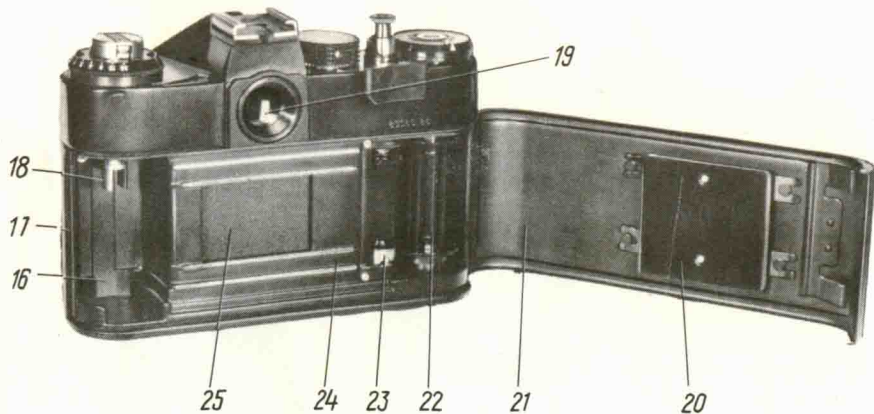
CAMERA DESIGN



- 1 — self-timer lever
- 2 — self-timer release button
- 3 — flash unit connector socket
- 4 — release button threaded for cable release
- 5 — photocell
- 6 — eyelet for strap securing
- 7 — lens

- 8—film rewind crank
- 9—film rewind knob
- 10—exposure counter dial
- 11—shutter cocking and film advance lever
- 12—shutter disengaging bush
- 13—shutter speed dial
- 14—protective strip of hot-shoe
- 15—shoe for mounting flash units and other accessories

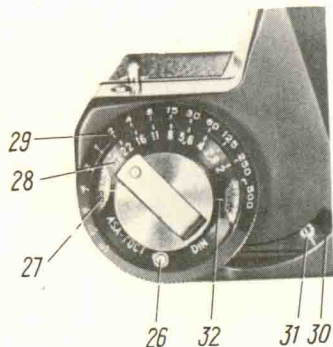




- 16—cassette chamber
- 17—lock latch
- 18—cassette spool guide
- 19—viewfinder eyepiece
- 20—pressure plate

- 21—back door
- 22—take-up spool
- 23—sprocket
- 24—film frame slides
- 25—film gate

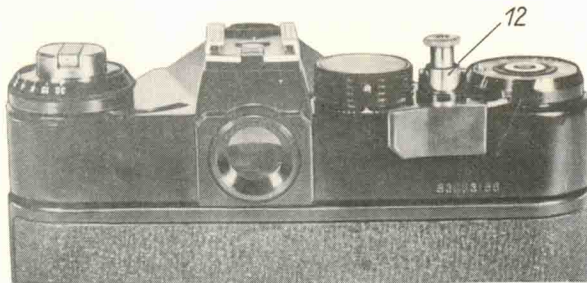
HELIOS-44M-4 lens



- 26—aperture scale guide
- 27—film speed scale
- 28—aperture scale of calculator
- 29—shutter speed scale of calculator
- 30—exposure meter needle
- 31—calculator pointer
- 32—film speed scale index mark



- 33—lens mounting ring
- 34—aperture scale
- 35—depth-of-field scale
- 36—distance scale
- 37—focusing ring
- 38—aperture setting ring
- 39—control pin



OPERATING PROCEDURES

LOADING THE CAMERA

Load the camera in the following procedure:

- pull film rewind knob 9 upwards; as a result back door 21 should open;
- holding knob 9 in the upper position, place a cassette loaded with film into chamber 16;
- return film rewind knob 9 completely home to its locked position;
- draw out a film leader from the cassette and insert it into the slot of take-up spool 22; in so doing ensure that a sprocket tooth engage a sprocket hole in film;
- turn shutter cocking lever 11 as far as it will go to make sure that sprocket 23 teeth have properly engaged sprocket holes in film;
- close back door 21;

—fire the shutter by pressing release button 4. While cocking the shutter, the film is advanced by one frame. To transport a non-exposed portion of film to the film gate, cock and fire the shutter twice by turning lever 11 and pressing button 4. Bring figure "0" of exposure counter dial 10 to the index mark before the second shutter firing. Should the film be wound tightly in the cassette, knob 9 with film rewind crank 8 will rotate when the shutter is being cocked. If the film is slack in the cassette, the rewind knob will fail to rotate with the first few frames.

FILM SPEED SETTING

The film speed scale has figures 16, 32, 65, 130, 250, 500 showing film speed in ISOCT-ASA units. Under figure 32 there are marked two dots: the left-hand one corresponds to a film speed of 25 ISOCT-ASA units and the right-hand one to 32 ISOCT-ASA units. The opposite side of the scale has figures 13, 16, 19, 22, 25, 28, showing film speed in DIN grades.

The film speed scale figures can be seen in curved windows of the aperture scale; the windows are fitted with setting index marks. To set a required film speed (for example, 65 ISOCT-ASA units), turn aperture scale 28 to bring the setting index mark to figure 65. The same procedure should be followed in setting film speed if it is calibrated in DIN grades.



Reference Table of Film Speed Units

FOCT	16	22	32	45	65	90	130	180	250	350	500
ASA	16 20	25 32	40 50	64 80	100 125	160 200	250 320	400 500			
DIN	13 14	15 16	17 18	19 20	21 22	23 24	25 26	27 28			

EXPOSURE DETERMINING

Direct the camera at an object to be photographed. Turn shutter speed scale 29 to line up calculator pointer 31 with exposure meter needle 30. By scales 28 and 29 you can read now a number of combinations of shutter speeds and aperture values appropriate for a given scene and speed of the loaded film. With any of these combinations you can obtain an image of proper density.

The shutter speed and the appropriate lens stop, chosen depending on conditions of photographing, should be correspondingly set on the camera and the lens.

Figures from 500 to 2 on shutter speed scale 29 show shutter speeds in fractions of a second and those from 1 to 30 show whole seconds. Figures within the interval from 500 to 30, indicating fractions of a second, on the shutter speed scale 29 of the calculator correspond to those on the shutter speed scale of the shutter 13.

For example, figure 125 of the calculator shutter speed scale aligns with figure 5.6 of the aperture scale. It means that with the lens stop of $f/5.6$, the shutter speed of $1/125$ s should be used, with the lens stop of $f/4$ the shutter speed should be that of $1/250$ s; with the lens stop of $f/8$ — $1/60$ s and so on. If necessary, it is possible to set a required lens stop by a selected shutter speed.

Should the marks of the scales fail to align by half an interval, the lens aperture ring should be set in a half-stop click-stop position between corresponding values of the aperture scale.

Cases of sharply heterogeneous illumination of a scene require special attention:

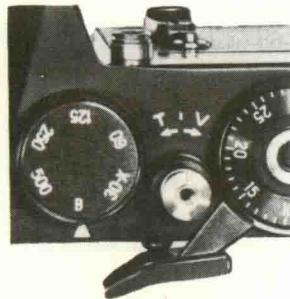
1) the main object of a scene is less illuminated than the background. Such a case usually takes place when taking pictures against snow, sky or water background lighted with the sun. To obtain correct exposure of the main (dark) object, open the diaphragm 1 or 2 steps more as compared with the exposure meter reading;

2) the main object is more illuminated than the background (when taking a picture of an illuminated face of a person against a dark background and so on). In such a case step down the lens by 1 or 2 steps.

SHUTTER SPEED SETTING

Turn shutter speed dial 13 to bring a selected shutter speed value opposite to the index mark. In so doing the dial is click-stopped. Figures on the shutter speed dial show shutter speeds in corresponding fractions of a second and "B" indicates a hand-controlled shutter speed. Shutter speeds may be set both with the shutter cocked and released. When taking pictures at "B" the shutter remains open while the release button is pressed. To obtain a long exposure turn the depressed release button counter-clockwise as far as it will go to fix it in this position. The exposure over, return the release button to its normal position.

To take a picture with "B" or long exposures use should be made of a tripod.



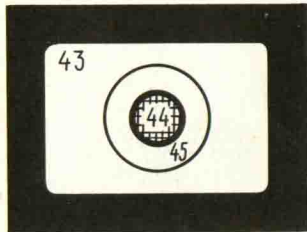
STOP SETTING

To obtain a selected aperture on HELIOS-44M-4 lens align with the index mark one of the figures (2, 2.8, 4, 5.6, 8, 11, 16) of aperture scale 34 engraved on aperture setting ring 38.

This procedure will not result in lens stop setting but will set preliminarily the aperture value to which the diaphragm will close down at the moment the release button is pressed.

The same should be done to set an aperture on HELIOS-44M lens. But in so doing the diaphragm mode selector switch of the lens should be set to "A" position.

FOCUSING



The camera viewfinder is provided with Fresnel lens 43 in the centre of which there are two focusing devices: microraster 44, arranged in the centre of the field, and ground glass collar 45. Watching an object to be photographed, turn focusing ring 37 to obtain a sharp image on the microraster or the ground glass collar. Focusing is better done with the diaphragm fully open. The best sharpness is obtained when the image in the microraster is clear, without ripples. The ground glass collar is used

mainly for photomicrography and macrophotography or with the smallest lens stops.

Focusing can be done as well without looking in the viewfinder. To do this turn

focusing ring 37 and, making use of distance scale 36, set the distance between the object and the film plane against the big index mark of scale 35.

When infrared film is used, the red dash with letter "R" serves as a reading index of the distance scale. After focusing the lens the distance scale value set against the standard index mark on the lens, should be set against the red dash with letter "R"

DEPTH OF FIELD DETERMINING

Making use of scales 35 and 36, you can determine the distances from the film to the front and back limits within which all the objects will be sharp on film. For example, the lens is focused at 3 m and an aperture of $f/8$ is selected. In this case you can read on scale 36 against two figures "8" of scale 35 two figures 2.3 and 4.5. It means that objects placed at a distance from 2.3 to 4.5 metres from the camera will be sharp on film.

Approximate depth of field limits with a certain aperture set on the lens can be determined visually as well. To do this press release button 4 till a definite stop and evaluate the image sharpness visually on the ground glass collar in the viewfinder.

PICTURE TAKING

Having prepared the camera for picture taking, cock the shutter, make sure of correct focusing and exposure setting and smoothly press the release button to take a picture.

REMEMBER that sharp pressure on the release button results in camera shaking at the moment of exposure and thus in blurring of the picture.

To take a picture make sure that marks on release button 4 and the camera top plate (between index marks "T" and "V") align.

UNLOADING THE CAMERA



When the exposure counter shows figure 36, rewind the film into the cassette. To do this:

- release the shutter by pressing the release button 4;
- set the shutter speed dial at any shutter speed but "B" and long exposure;
- disengage the shutter by pressing down bush 12 against the stop;
- lift crank 8 and rotate it in the arrow direction until the film leaves the take-up spool;
- pull out the film rewind crank as far as it will

go; as a result the back door will open. Holding knob 9 in the upper position, remove the cassette.

If necessary, the camera can be unloaded after exposing any number of frames.

OPERATING THE SELF-TIMER

To use the self-timer mount the camera on a tripod, then do the following:

- focus the lens;
- set an exposure (shutter speed and aperture);
- press button 4 till a definite stop and turn it clockwise. With HELIOS-44M lens instead of pressing the button, set the diaphragm mode selector switch to "M" position;
- cock the shutter;
- wind the self-timer by turning the self-timer setting lever 1 down as far as it will go;
- press self-timer release button 2 completely home;
- take your place in front of the lens.

The shutter will operate in no less than 7 seconds after pressing the button.



TAKING FLASH PICTURES

The camera shutter is synchronized for use with various types of flash units (X-synchronization). To connect a flash unit with the camera the latter is fitted with a socket on the front wall of the camera. The camera is provided as well with a hot-shoe.

Flash pictures can be taken at a shutter speed of 1/30 s only.

INTERCHANGEABLE LENSES

The camera accepts various interchangeable lenses intended for ZENIT type of reflex cameras with a roller-blind shutter.

The interchangeable lenses likewise the standard ones are mounted on the camera by means of M42×1 thread. The flange/film distance of the lenses is 45.5 mm.

When using a TAIR-3A interchangeable lens the left-hand and the right-hand edges as well as the upper one of the image on negative may be slightly cut off.

The camera does not allow to use its exposure meter when use is made of 3M-5A or MC MTO-1000 AM interchangeable lenses as the outer mounts of these lenses shade the photocell.

When interchangeable lenses having no automatic pre-set diaphragm are used, the diaphragm is set manually.

CLOSE-UP SHOOTING

With the help of a special stand the ZENIT-II camera can be used for making copies of drawings, manuscripts, photographs, etc. To make copies use should be made of extension tubes that go between the camera casing and the lens. One tube or a combination of tubes can be used to achieve the magnification wanted. Reproduction scale depends on the length and number of tubes.

When use is made of HELIOS-44M-4 lens, extension tubes fitted with control pins (YT3T) should be used. Other interchangeable lenses accept extension tubes without control pins (YT3). In such a case the diaphragm is set manually.

Interchangeable Lenses

Lens name	Main specifications			
	focal length, mm	relative aperture	angle of field of view	minimum focusing distance, m
Mir-10A	28	f/3.5	75°	0.20
Mir-1	37	f/2.8	60°	0.24
MC Industar-61 $\pi/3$	50	f/2.8	45°	0.30
Jupiter-9	85	f/2	28°	1.00
Helios-40-2	85	f/1.5	28°	0.80
Tair-11A	135	f/2.8	18°	1.20
Jupiter-6-2	180	f/2.8	14°	2.00
Jupiter-21A	200	f/4	12°	1.70
Tair-3A	300	f/4.5	8°	2.20
3M-5A	500	f/8	5°	4.00
MC MTO-1000 AM	1000	f/10	2°30'	10.00

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