

Zenit TTL



This text is identical to the one in the User manual, English version, 1965 year.

1. Purpose and Advantages

ZENIT-TTL camera is intended for taking amateur pictures on black-and-white color films.

The camera is provided with a semi-automatic exposure meter operating through the lens (TTL) a self-timer and is synchronized for flash lamp operation. It accepts interchangeable lenses provided, with mounting thread of M42x1 and back focal distance of 45.5 mm.

ZENIT-TTL can be used for special kinds of photography such as reproduction works with the help of extension tubes, taking close-up pictures of small subjects at close distance (macrophotography), taking pictures with the help of a microscope (microphotography) and so on.

ZENIT-TTL camera has the following advantages:

- semi-automatic TTL exposure meter provides for correct exposure setting when taking pictures with the standard lens as well as with interchangeable lenses and extension tubes;
- instant return mirror ensures continuous viewing of a subject before and after exposure;
- high speed lens is provided with a pre-set diaphragm mechanism which automatically closes the diaphragm at the moment of the shutter operation (“A” mode); manual operation of the diaphragm is provided as well (“M” mode);
- fully open diaphragm ensures maximum brightness of the image seen in the viewfinder; this fact is very important at the moment of viewing and focusing;
- focusing can be done both by a microraster or a ground glass;
- speedy exposure setting, the system of simplified film loading, rewinding of exposed film with the shutter disengaging bush in locked position — all these features cut down the time necessary for preparing the camera for operation.

2. Specifications

Frame size — 24x36 mm

Film used — 35 mm, perforated

Length of film in cassette — 1,65 m

Number of frames — 36

Shutter speeds — from 1/30 to 1/500 s, “B” (by hand) and long exposure time

Standard lens — HELIOS-44M:

focal length — 58 mm

maximum relative aperture — f/2

diaphragm scale — from 2 to 16

distance scale — from 0,55 to “∞”

Exposure meter supply — from one battery of Mallory “PX-13” type

Film speed range — from 16 to 500 GOST units

Lens mounting thread — M42x1

Light filter thread — M52x0,75

Tripod socket thread — 1/4”

Viewfinder linear field of view — 20x28 mm

Overall dimensions without case — 138x100x93 mm

Mass — 1,01 kg

Certificates of Authorship:

No 366447 of 14 June 1972; No 150360 of 18 December 1961; No 153652 of 26 February 1952; No 102683 of 7 February 1951.

Attention!

The present Description contains the basic characteristics and essential operating principles of the camera and should not be regarded as a hand-book on photography in general.

Before using the camera, make thorough study of the operating procedure given in the present Description.

Due to ever-advancing development in camera construction minor differences may occur between the text and your camera. Load and unload the camera in faint diffused light avoiding direct sun rays.

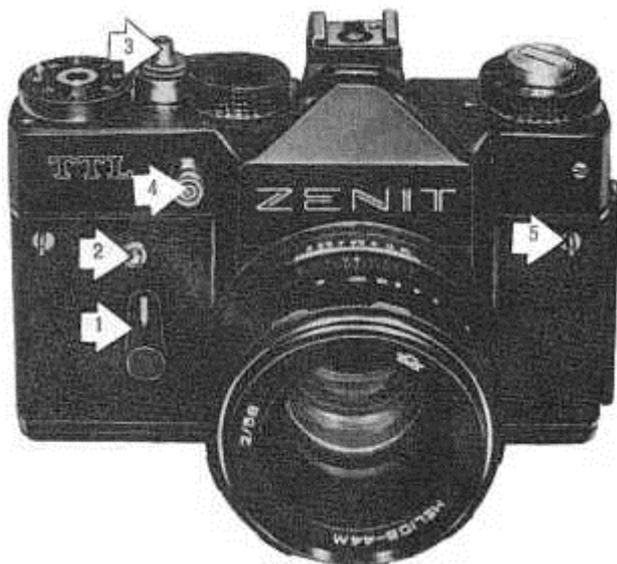
Do not rotate the shutter speed dial within the interval between "500" and "B" and the film speed setting dial within the figureless interval.

Do not turn the shutter release button if not necessary to avoid disengagement of the shutter cocking mechanism.

Always wind the shutter (by two or three strokes of the lever) 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 affect the shutter operation. When taking pictures in frosty weather (below -10°C), keep the camera under your street-clothes but not in the open air and take it out only for the moment of photographing.

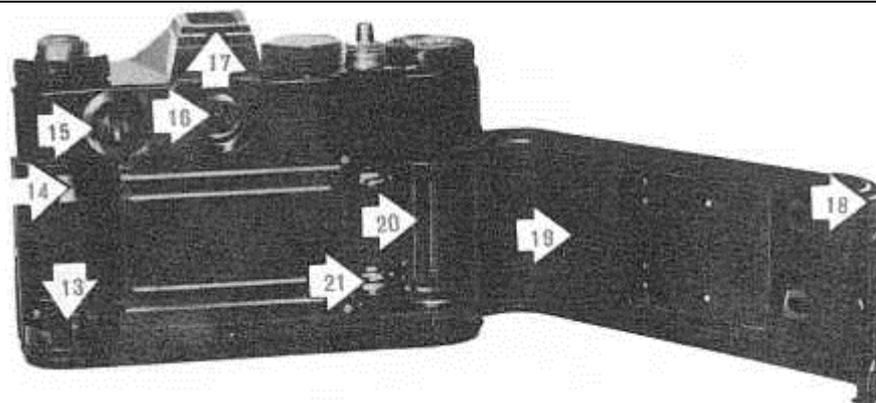
3. Main Assemblies and Details



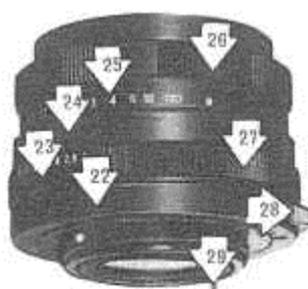
- 1 — self-timer lever
- 2 — self-timer release button
- 3 — release button threaded for cable release
- 4 — flash unit connector socket
- 5 — eyelets for strap securing

- 6 — film rewind crank
- 7 — film speed dial
- 8 — shutter speed dial
- 9 — shutter disengaging bush
- 10 — exposure counter dial
- 11 — shutter cocking and film advance lever
- 12 — protective strip





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| 13 — cassette chamber | 18 — lock latch |
| 14 — cassette spool guide | 19 — folding back door |
| 15 — cap of compartment for battery of Mallory PX-13 type | 20 — take-up spool |
| 16 — viewfinder eyepiece | 21 — sprocket |
| 17 — accessory shoe for mounting flash lamp and other accessories | |



HELIOS-44M

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| 22 — lens mounting ring |
| 23 — diaphragm scale |
| 24 — depth-of-field scale |
| 25 — distance scale |
| 26 — focusing ring |
| 27 — diaphragm setting ring |
| 28 — diaphragm mode selector switch |
| 29 — diaphragm mechanism pusher |

4. Preparing for picture taking

4.1. Loading the camera

Put a battery of Mallory PX-13 type into the compartment in the way indicated in Section “Changing the Power Source of Exposure Meter Electric Circuit”.

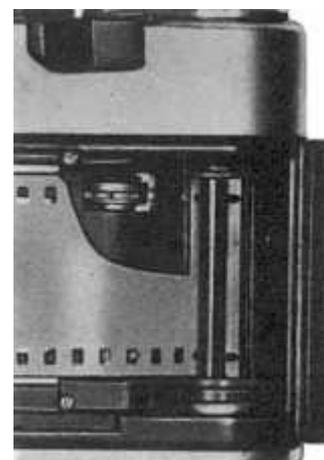
Load the camera in faint diffused light in the following way:

- pull lock latch 18 upwards and open back door 19;
- lift crank 6 and pull out the rewind knob;
- put a loaded cassette into chamber 13;
- return the rewind knob to its initial position and fold crank 6;
- pull out the film leader as long as to reach the camera edge and insert it into the take-up spool 20 slot; in so doing be sure to engage a perforation hole with a tooth of sprocket 21;
- close the back door;
- cock the shutter by turning lever 11 as far as it will go. Press release button 3. As the shutter is cocked, the film is advanced by one frame. To transport a nonexposed portion of film to the film gate, cock the shutter two times pressing the release button after each cocking.

Should the film be wound tightly in the cassette, the film rewind knob will rotate when the shutter is being cocked. If the film is loose in the cassette, the rewind knob will fail to rotate at the first frames;

- bring figure “0” of exposure counter dial 10 to the index mark. Set the exposure counter only with the shutter cocked;
- set the film speed value by turning dial 7 till it aligns with the index mark on the camera shield; in so doing you will feel the dial is locked.

Note: Dashes engraved between figures on the film speed dial enable to set intermediate values of film speed in accordance with the Reference Table.

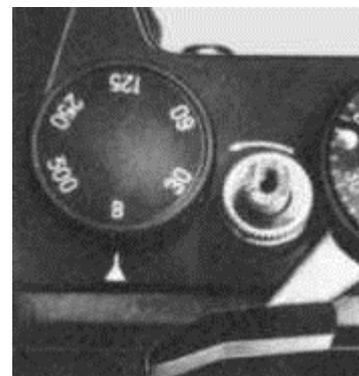


Reference table of film speed units

GOST	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	.	.	16	.	.	19	.	.	22	.	.	25	.	.	28

4.2. Shutter speed setting

Turn the shutter speed dial round its axis until a selected shutter speed figure sets against the index mark. In so doing the dial will be found in locked position. Figures on the shutter speed dial denote corresponding fractions of a second and “B” indicates a hand-controlled shutter speed. Shutter speeds can be set both with cocked and released shutter. With the shutter speed dial set at “B” the shutter stays open as long as the release button is kept depressed. To obtain a long exposure turn the release button to the left as far as it will go. The exposure over, return the button to its normal position by turning it as far as it will go in the reverse direction. For long exposures and hand-controlled shutter speeds one is recommended to use a cable release which can be screwed into the release button thread. In so doing the camera should be mounted on a tripod.



4.3. Diaphragm setting

Set a selected diaphragm value against the index mark by turning diaphragm setting ring 27.

The diaphragm is capable of operating in two modes:

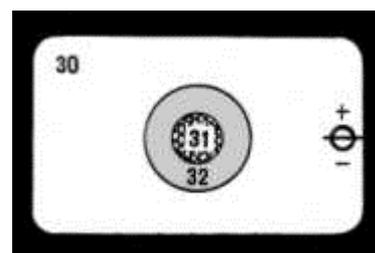
— in automatic one (the selector switch in “A” position) turning of diaphragm setting ring 27 does not result in lens diaphragming but sets preliminarily the aperture value to which the diaphragm will close down at the moment the release button is pressed;

— in manual one (the selector switch in “M” position) the lens diaphragm is set manually by turning ring 27.



4.4. Focusing

In the camera viewfinder there is Fresnel lens 30 with microraster centre spot 31 surrounded with ground glass circle 32. Watching the subject being photographed turn focusing ring 26 to obtain the sharpest image in the microraster or the ground glass circle. For this purpose perform focusing with the diaphragm fully open. The best sharpness can be obtained when the image appears distinct and without ripples within the microraster.



The ground glass circle is mainly used for micro- and macrophotography as well as for taking pictures with small apertures when microraster loses its sensitivity.

Focusing can be done as well without looking through the viewfinder. For this purpose turn focusing ring 26 and making use of distance scale 25 set the value corresponding to the distance from the subject being taken to the film against the large index mark of scale 24 (the small index mark denoted by Latin letter “R” is used when taking pictures on some infra-red photographic material).

With the lens focused, one can determine the distance from the film to the near and far depth-of-field limits by making use of scales 24 and 25.

For example, the lens is focused for 3 m and the aperture value, which is to be used, is that of “8”.

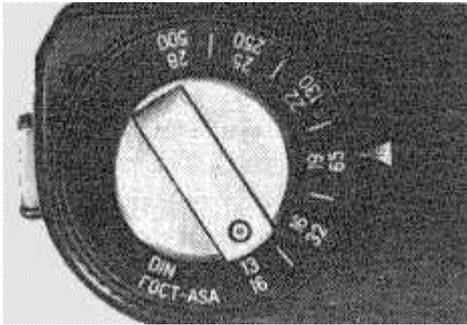
In such a case one can read by scale 25 against two figures “8” of scale 24 that the image will be sharp within the distance limits from 2,3 m to 4,5 m.

With the lens focused and aperture value set one can visually determine approximate depth-of-field limits in the following way:

— with the diaphragm operated in automatic mode, one should press release button 3 till a definite stop and estimate the image sharpness within the ground glass circle in the viewfinder;

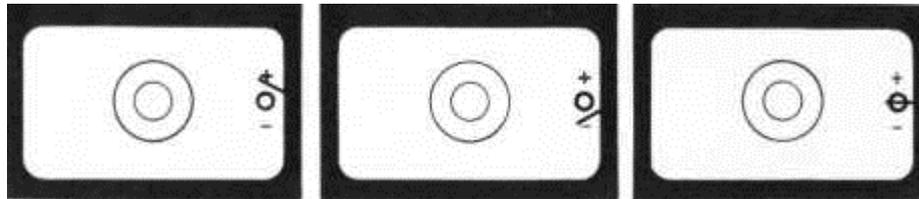
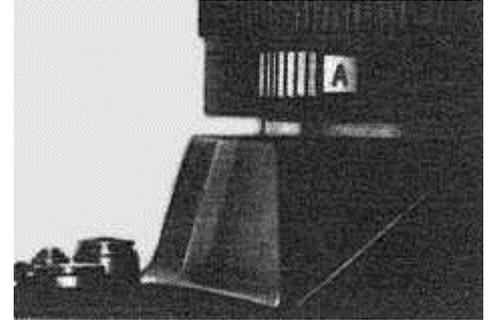
— in manual mode one can estimate the image sharpness within the ground glass circle without pressing the release button.

4.5. Exposure setting with the aid of the exposure meter



Semi-automatic exposure meter of your camera measures the light getting into the camera through the lens (TTL system). As a result you can set the exposure with the high degree of accuracy depending upon the brightness of the subject and the speed of photographic material by varying the shutter speed and aperture value.

The system operates as well with interchangeable lenses, light filters, supplementary lenses and extension tubes. Turn the film speed setting dial and set the speed value of the film loaded in the camera against the index mark on the camera shield. Set the diaphragm mode selector switch in "A" mode.



Watching in the viewfinder eyepiece in such a way that the whole of its frame would be clearly seen, press release button 3 till a definite stop but not till the shutter operation, should it be cocked.

With the release button depressed, the exposure is excessive if the needle deflects from the index mark to sign "+", and insufficient if it deflects to sign "-".

Keep the release button depressed and turn diaphragm setting ring 27 or shutter speed dial 8 till you match the needle with the index mark. Should you fail to match the needle with the index mark with all possible combinations of diaphragm and shutter speed values, you should either change the subject illumination or use a film of a different speed.

5. Picture taking

5.1. Picture taking

Having prepared the camera for picture taking, cock the shutter, make sure of correct focusing and exposure setting, and smoothly press release button 3 to take a picture.

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

5.2. Unloading the camera

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

- disengage the shutter by turning shutter disengaging bush 9 as far as it will go in the direction of the arrow on the camera shield;
- lift crank 6 and rotate the film rewind knob in the arrow direction until the film leaves the take-up spool;
- pull out the film rewind knob as far as it will go, open the back door, and take the cassette out of the camera;
- turn the shutter disengaging bush clockwise to return it into the initial position.



6. Self-timer, synchro socket, lens changing, operating the self-timer

6.1. Operating with self-timer

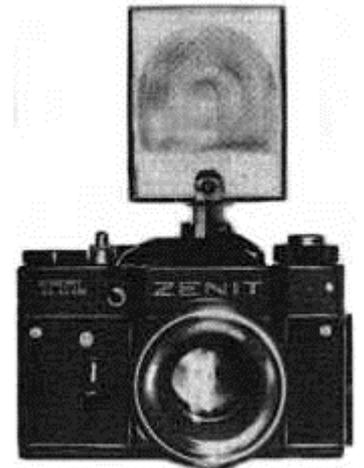
To use the self-timer mount the camera on a tripod. Then do the following:

- a) focus the lens;
- b) set the exposure;
- c) cock the shutter;
- d) wind the self-timer mechanism by turning lever 1 downwards as far as it will go;
- e) change diaphragm selector switch 28 from “A” (Automatic) to “M” (Manual) position;
- f) press self-timer release button 2 and take your place in front of the lens. The shutter will operate in no less than 7 seconds after pressing the button.



6.2. Taking flash pictures

The camera shutter is synchronized for use with different types of electronic flashes (X-synchronization). Before taking flash pictures remove protective strip 12. To connect an electronic flash with the camera, the latter is provided with socket 4 located on the front wall of the camera. The camera design provides as well for cableless connection of electronic flashes. The shutter speed of 1/30 s. only can be used for flash photography.

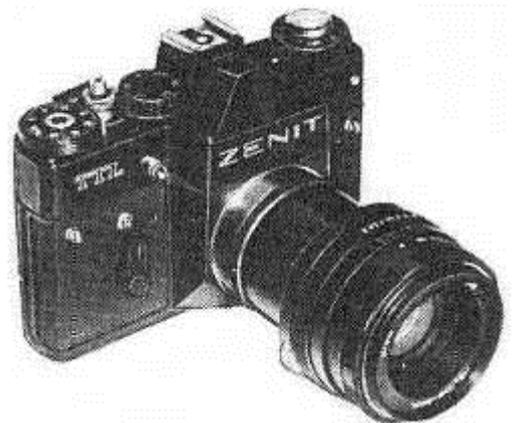


6.3. Using interchangeable lenses and taking pictures at close distance

The camera accepts interchangeable lenses provided with M42x1 mounting thread and flange/film distance of 45,5 mm.

If an interchangeable lens has no automatic diaphragm mechanism, the diaphragm can be handled manually. When long focus lenses are used, a slight cutting of the left or right edges of the image on negative is likely to take place. With the help of a special stand the ZENIT-TTL camera can be used for making reproductions of drawings, manuscripts, photographs. When making reproduction works, use should be made of extension tubes by setting them between the camera body and the lens. To obtain a necessary scale either one tube or a combination of some tubes can be used.

The extension tubes without pushers being used, the lens diaphragm should be operated manually and the diaphragm mode selector switch should be set to “M” mode.



6.4. Changing the power source if exposure meter electric circuit

To change a Mallory PX-13 battery do the following: turn cap 15 in the counter-clockwise direction as far as it will go without applying excessive effort and take out the exhausted battery; Put a new one into the compartment with sign “+” outwards. Cap the compartment. In the closed position of the cap its slot should be placed vertically.

6.5. Handling and care of the camera

The ZENIT-TTL camera is a precise optical mechanical instrument. Handle the camera carefully, keep it clean and protected from shocks, dust and sharp changes of temperature.

Keep the camera closed in its case. In so doing the lens should be capped and the shutter and self-timer should be released. Do not touch the optical details with hands since this is likely to damage their coating. Clean the coated optical surfaces only from outside with a clean soft piece of fabric or cotton wool slightly moistened with rectified alcohol or ether. The mirror and Fresnel lens may be cleaned only if absolutely necessary with a very soft brush but in no case with humid cleaning agents.

Since the camera is a complex instrument, any repair and corresponding adjustments should be performed only in repair shops.

