

**16 mm motion picture camera  
"Kinor" 16 CX – 2M**

# **Instructions manual**



# **CONTENT**

## **1. DESIGNATION**

## **2. TECHNICAL SPECIFICATIONS**

## **3. HOW IS WORKING THE CAMERA**

- Kinematic diagram
- Optical diagram
- Electrical diagram of the connections

## **4. HOW ARE WORKING THE DIFFERENT PARTS OF THE CAMERA**

- Housing of the camera with the mechanism
- Body with lens mount
- Magazines
- Lenses are moving in the transitional mountings
- Motor

## **5. INDICATION OF SAFEGUARDS**

## **6. PREPARATION OF THE CAMERA FOR FILMING**

- Loading a magazine
- Connect a magazine to the body
- Installation of the motor
- Installation of the lens
- Fastening the camera on the support
- Park the mirror in its correct position.

## **7. RUNNING THE CAMERA**

- Launching and stop the camera
- Control of the dioptric correction for your eye

## **8. MAINTENANCE**

- Cleaning
- Frequency of cleaning
- Special uses

## **1. DESIGNATION**

Kinor 16 CX-2M 16 mm motion picture single lens reflex camera for professional use.

## **2. TECHNICAL SPECIFICATIONS**

- **Advance** : by registered pin and lateral pressure plate.
- **Shutter angle** : 170°
- **Loads** : 30 m & 120 m magazines.
- **Drive** : 29 EPSS, 12 V DC motor
- **Consumption of motor** : 2,8 Ah with a 120 m mag loaded
- **Frequency** : 25 frame/s (electronically regulated)
- **Precision of speed** : + - 0,01
- **Lens mount** : Kinor 16 bayonet
- **Noise level**, in dB "A": 42. dB measured @ 2 m : less than 27
- **Maximum duration of shot** at 25 fp/s frequency : 10 minutes
- **Control of the filmstock exposed** : the indicator of the metric area of the unexposed motion picture film in the magazine
- **Support** : by screw with thread 3/8"
- **Operating range temperatures** : from - 25 ° C to + 45 ° C
- **Weight of the camera**, with a 30 m magazine, without the motion picture film, with 29EPSS motor, without the power unit, with a 10 mm prime lens : not more than 4,7 kg
- **Overall dimensions of the camera** (with the cassette of 30 m, 10 mm prime & 29 EPSS motor, without the power unit, not more :  
385 mm (length) X 210 mm (width) X 210 mm (height)



### 3. HOW IS WORKING THE CAMERA

The common form of the camera is represented in Fig. 1 and 2. The camera consists of two basic groups:

a) The camera, which consists of the following parts:

- the mechanism of camera,
- body with the lens mount and the magnifier;

b) of individual parts and aggregates, which are established they are connected up as

needed: - movie objectives in the transitional mountings,

- 30 m magazines,

- 120 m magazines,

- 29EPSS motor with stabilized speed,

- the battery.

The principle of the work of the camera is based on photographing of object or number of the phases of its motion to the filmstock during its intermittent motion with the aid of the grab mechanism. The supply of motion picture film the film gate from the feeding boss and subsequently the transportation of the motion picture film to the assuming boss exposed is accomplished with the aid of kilohms of toothed drum.

#### Kinematic diagram

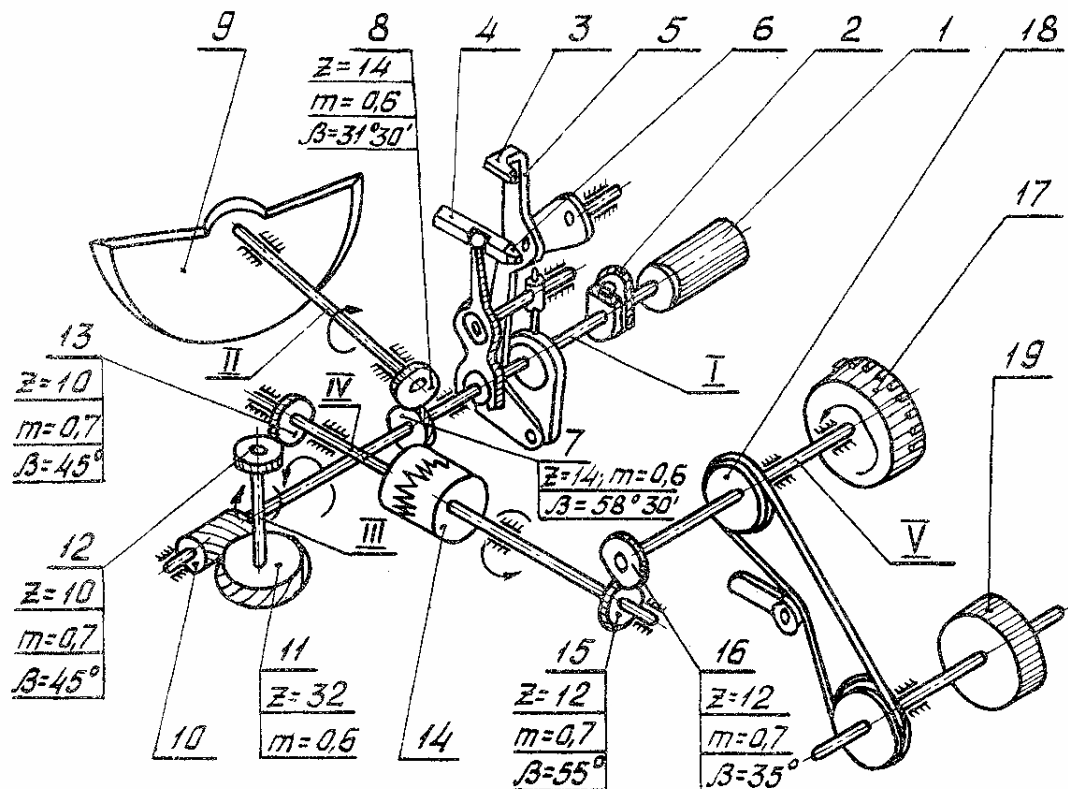


Рис. 3. Схема кинематическая

From the electric drive of 1 clutch 2 is transferred to shaft 1, kinematically connected with the mechanism of the grab 3 and registered pin 4 by means of the eccentric necks. The transportation of motion picture film by the tooth of 5 grabs and its fixation by the tooth of 6 dissents of the grab YEO the time of exposure. Through the pair of spur gears 7, 8 is transferred to shaft of the II unilobed mirror reflex shutter of 9 lower angularities of  $45^\circ$  to the optical axis. Through worm-and-worm wheel 10, 11, connecting shaft III and pair of spur gears (12), (13) rotation is transferred to the shaft to 1Y concluding with clutch (14), which achieves rigid kinematic SEYAZ' with the shaft to 1Y of the mechanism of cassette, which, in turn, through the pair of spur gears (15), (16) sets in motion the shaft u, which carries toothed drum 17 and guide pulley of 18 Passikov transfers of the drive of assuming friction clutch 19. Friction clutch revolves in the process of the winding from it of the unexposed motion picture film.

### Optical diagram

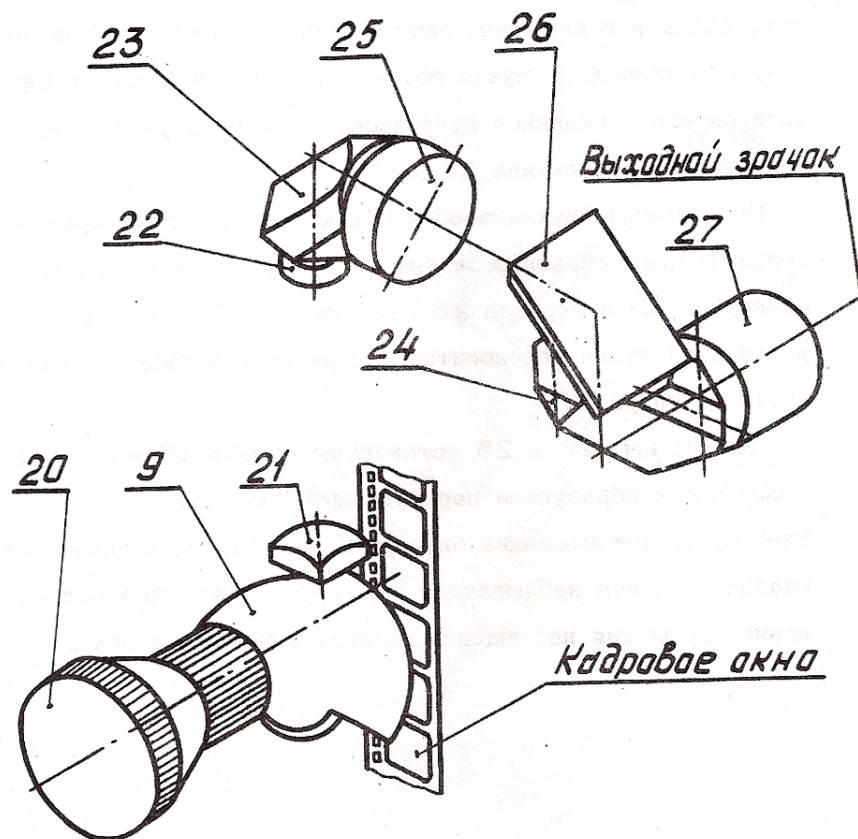


Рис. 4. Схема оптическая

Movie objective (20) constructs the image of object in to personnel the window of film gate. Through the light beam by obturator (9) image of the over- bear by its mirror surface to the flat lusterless the surface (21). With the aid of the double-lens objective 22, two roof-shaped prisms 23 and 24, three-lens objective (25) mirror (26) image with the lusterless the association is transferred into front focal plos - the bone of eyepiece (27). Objectives (22) and (25) are established thus that between them it is formed parallel course of ray, which makes possible by the displacement of the ocular part of the magnifier in the direction of the ocular basis of observer to change the position of the exit pupil of magnifier for the observation with right and left eye.

## Electrical diagram of the connections

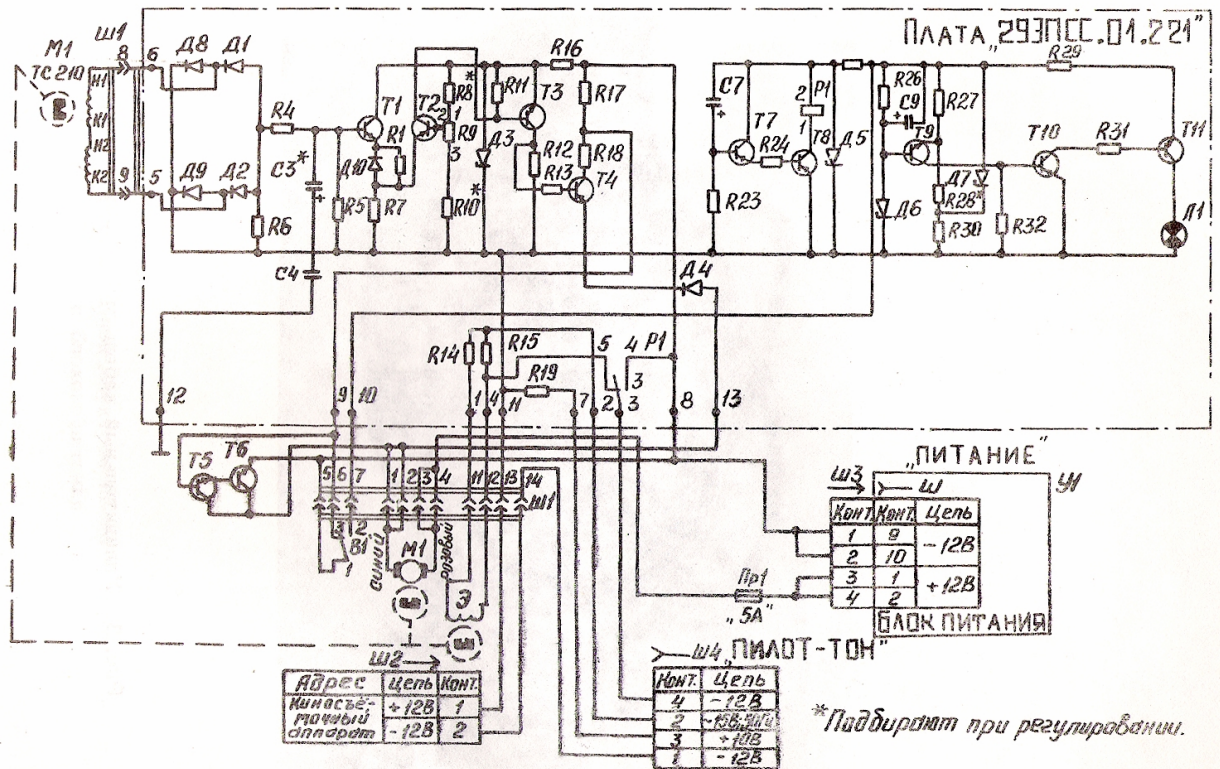


Рис. 4. Схема электрическая принципиальная.

Diagram electrical of the connections of the camera is represented here. With the work with the movie camera is used the electric drive of direct current with the stabilized speed OF 29EPSS. The electrical circuit of the camera includes the lamp of the starting gating. The lamp of starting gating Ly serves for the light mark on the motion picture film of the beginning of synchronous advance of the camera, lamp illuminates motion picture film from the moment of the work of the camera to the moment of its entrance into the synchronism. Simultaneously with the end of the combustion of the lamp of gating from the electric drive to the sound-recording device will be given signal pilot – tone.



#### 4. HOW ARE WORKING THE DIFFERENT PARTS OF THE CAMERA

##### **Housing of the camera with the mechanism**

In the housing of the camera (Fig. b) they are placed: mechanism, obturator with the shutter, vertical shaft, the drive shaft of the magazine.

On the housing are installed the mechanism of the turning of obturator, the association, the objective of magnifier, prism E to mounting, the button (29) fixations of the shutter of obturator. On the rear wall of housing is a landing nest under the magazine and two adjusting pintles (30) for fixation and fastening of the magazine.



##### **Body with lens mount**

The plate (32) serves as the protective housing of the mechanism of the camera and bears on itself objective holder and magnifier. From the right side of head is nest "and" and a knob (33) locks of fastening electric motor. In the upper part are a nest "b" for fastening of device, a nest "in" for the installation of illuminating lamp and two ears (34) for fastening of shoulder strap or movable knob.

Magnifier (37) gives the straight increased (9,5 X) image of the removed object. It gives the possibility of the control of the image obtained on the motion picture film both during the preparation for the survey and during the survey on the frosted glass with the use of the reflecting surface of the mirror reflex shutter. Magnifier in the advanced position can be turned on 360°. The fixation of magnifier in the assigned position is achieved by lock (38).

Dioptric correction is  $\pm 5$ .

### **Magazines**

Magazines have overall cavity for that feeding.

Capacity of the magazines is 30 (100 ft) and 120 m (400 ft). Under the protective housing of the scythes are placed shaft to (1Y) of the drive (17) friction drive to assuming, the lever (40) bolts of magazine. For regulating the tension is located idler (41).

On the magazines there is a meter counter (47) which indicates the quantity of remained motion picture film. The installation of the magazine on the camera occurs automatic connection with the magazine drive shaft. Then, the clutch (49) is connected with the main drive shaft. Because of opacity of the magazine, the charging of the camera with motion picture film is produced on the light by way install dawn of the magazine into the camera.

### **Lenses are moving in the transitional mountings**

Each lens has speckled similar mounting supplied with snow-fence blend. Focusing is produced with the aid of outer ring (50). The distance scales are substituted on the transitional mountings. Aperture or closing of the lenses is produced with the aid of the ring of diaphragm (51). A complete set of neutral light filters can be screwed on the lenses.

### **Motor**

The camera is completed by the 29EPSS DC motor with stabilized speed at 25 fps frequency (Fig. 11). 29EPSS motor ensures the normal work of the camera at the frequency of 25 frame(s)/s at a temperature of ambient air from minus 25 to + 45 °C. The motor works with a 12V battery, with a minimum of 2,8 Ah.

29EPSS motor ensures the delivery of synchronizing signal pilot - tone with the frequency of survey 25 frame/s. A fuse with a 5A resistance is installed in the motor

## **5. INDICATION OF SAFEGUARDS**

Movie camera 16 CX-2M is calculated to be used by professional cameramen. With the preparation of the camera for the work, with the preventive inspection, and also during its repair it is necessary that it would be **opened from the power source**.

## **6. PREPARATION OF THE CAMERA FOR FILMING**

Before filming with the camera you will examine all parts of the set to be sure there is no dangerous dust, moisture or missing screws.

**Loading a magazine** (see fig. 9)

**WARNING !** : Both 30 and 120 m magazines must be loaded IN TOTAL DARKNESS.



- Open the magazine by simultaneously press the 2 button up and down the pressure plate.
- Push the film gauge to its opened position.



- Open the closure rollers (45) by pressing and turning clockwise on its head.
- Install the film roll with emulsion inner side.
- Put the film through the main sprocket (17) by the upper way.
- When the film is out, then put it through the down side of the sprocket, by turning the sprocket clockwise.
- Clip the film to a regular 16 mm plastic core.



- Install this core when turning from right to left. The film must be rather tended.
- Close the closure rollers.
- Check the correct movement by turning the main sprocket and feel with a finger if the film is winding smoothly.
- If yes, close the door of the magazine and check the closing is OK, trying to re-open the door with your nail.
- Open the light or put out the magazine from the changing bag.

#### **Connect a magazine to the body**

Push gently and straight the magazine in front of the gate. Be aware of putting 2 holes of the magazine to the upper and down connectors. Then, press with your thumb the closing

button (40) and push gently until connecting the magazine. Now, if properly engaged, the magazine may not move anymore. Then close the magazine latch (58) to be sure the magazine will not move. If the closing latch is hard to close, don't force on it. It means the magazine drive shaft is not properly connected to the camera. If forced this may occur a damage on the drive shaft.

After closing the latch check the magazine is strongly connected to the camera body.



**Installation of the motor** (if not already installed)

With the installation of the motor put the clutch of cohesion into the nest, existing on the camera. With the combination of protrusions on the clutch of the cohesion of the motor with the grooves of clutch on the camera the motor sends the remainder to the support. By the turning of knob 33 (see Fig. 7) eccentric lock you will accomplish its fastening on the camera.

## Installation of the lens



Before the installation of the lens, check if the filter holder is in its correct position. It may not touch the rear of the lens. Turn the eccentric closure of the mount ( 59) (see Fig. 1) clockwise reverse. Take lens in your hand and put it on the mount, being aware of putting the bayonet in its hole. Then push gently. The helicoids of the lens must seat inside the eccentric closure. After this, turn this eccentric closure clockwise to the fastening of the lens. Then, check if the lens is not moving. To remove the lens, turn to the reverse side the eccentric closure.

### Fastening the camera on the support

Fastening the camera on the support accomplish by a screw the sharp pain battle 3/8". The camera allows installation and fastening on any the support, which has screw with thread 3/8"

### Park the mirror in its correct position.

When watching through the viewer, push with your thumb the mirror button (63). The mirror turns to stop in front of the ground glass. Then you are able see the complete field.

## 7. RUNNING THE CAMERA

### Launching and stop the camera



First connect the battery to the camera on socket.

Launching and the stop of the camera achieve by the starting button (61), located on the handgrip. You can push this starting button and keep you thumb, and when you remove it, it stops the camera. You can also fix this button by slightly pull it. Then the camera runs. Push this button and the camera will stop.

### Control of the dioptric correction for your eye

Unlock the first barrel of the viewer.

Watch in the viewfinder

Turn the second barrel of the finder until the ground glass markings look sharp.

Then close the first barrel at this value.

## 8. MAINTENANCE

### Cleaning

For safety, the open metallic parts (gate, mount, magazine pressure, ..) must not stay without protection. The magazines have plastic protection. The gate must always be covered by a magazine engaged into the camera.

All metallic parts must NEVER be touched by any metallic tool !

All parts (gate, magazine & optics) must be cleaned with dry air.



In case of heavy dust (or microscopic glued parts) glued, the gate and magazine pressure can be cleaned with a soft plastic or a soft chamois or a fine cotton clothe.

The optical parts must not be touched with fingers and only cleaned with proper and soft material & liquid.

### **Frequency of cleaning**

The gate and the magazines must be inspected and shortly cleaned after each roll shot.

Every 10000 m of film shot, the camera must be completely serviced :

- Cleaning of the pin and registrated pin and the gate
- Removing the grease from the complete mechanism.
- Re-lube the mechanism
- Cleaning of all the optical parts

### **Special uses**

In case of very low temperature (under -25 °C) the grease of the camera must be removed and replace by a special grease for this purpose.

In case of high humidity environment (more than 75 %) the camera must also be completely serviced as described above.