

Instruction Manual



Roundshot 28-220 Outdoor

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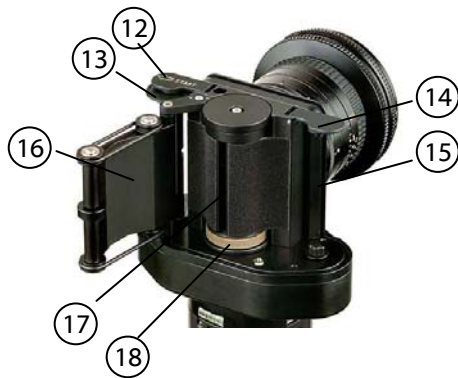
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1. System Overview

1.1 Camera system Roundshot 28-220 Outdoor



- ① Socket for viewfinder
- ② Cover release
- ③ Lens button
- ④ Lens
- ⑤ Mechanical-electrical lock
- ⑥ Water bubble indicators
- ⑦ Tripod mount (3/8")
- ⑧ Connection for power charger and external release Start/stop button
- ⑨ Selection button for degree of panorama and timer
- ⑩ Selection button for shutter speeds
- ⑪



- ⑫ Spool holder for non-exposed film
- ⑬ Spool for non-exposed film
- ⑭ Spool holder for exposed film
- ⑮ Spool for exposed film
- ⑯ Film pressure plate
- ⑰ Exposure slit
- ⑱ Film plane and drum for film transport

1.2 Accessories



Set-up

Viewfinder

In socket for viewfinder (1)

Application

Allows exact control of the image field and the positioning of the camera. Can be turned 360° and can be adjusted for shift lenses

Quick Adaptor

Between tripod (3/8") and 28-220 Outdoor

1. Quick adaptor for rapid changing of the camera off the tripod
2. Perfect positioning of the camera in its starting position through smooth turning of the upper part of the adaptor
3. Built-in water bubble indicator allows perfect calibration when the camera is held over the head
4. Optional security strap for hand-held shots



Cable for external release (1.6m)

In connection for external release (9)

Easy release of the camera if camera is in higher or inaccessible position. 3 possible functions:

1. Activate camera from "stand-by"
2. Start camera
3. Stop camera



Waterproof case (Peli-Case)

Ideal accessory for secure storage and transport of your equipment

1.3 Functioning of the camera

The camera consists of two parts: a camera head with lens and an engine with integrated control unit. The camera head rotates during exposure around its axis, while the engine and control unit remains fixed. Within the camera head the film transport system is located. When starting the shot, the release opens a small vertical exposure slit (19). The light that enters through the lens is projected on the cylindrical film plane (20). At the same time, the film transport system is activated. This device moves the film smoothly from the spool holder for non-exposed film (14) to the one for exposed film (16). The selected shutter speed defines the rotating speed of the camera.

1.4 Lenses

1.4.1 Lens mount

The camera has been conceived as a compact medium format camera and has been designed for a focal length of 28mm. The parameters for nodal point, length of film and exposure are defined exactly for a focal length of 28mm.

Important: Use only lenses with a focal length of 28mm!

Other focal lengths would require other parameters and would yield, with this camera, distorted and unsharp images.

Important: Normal (AF) lenses have a smaller image circle and lose sharpness at the upper and lower edges. The best results are achieved with shift PC lenses.

Possible lens mounts:

Nikon 28mm

To remove protecting lid: press lens button (3) in. At the same time move protecting lid counter-clockwise until its mark aligns with the button.

To mount lens: position lens on the bayonet mount and move counter-clockwise until the lens locks

To remove lens: press lens button (3) in while at the same time moving the lens clockwise.

Leica R und Contax 28mm

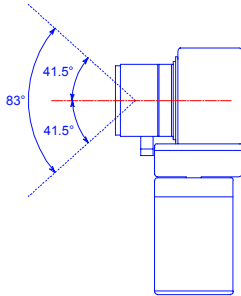
To mount lens: position lens on the bayonet mount and move counter-clockwise until the lens locks

To remove lens: press lens button (3) in while at the same time moving the lens clockwise.

(Contax: press from above inwards)

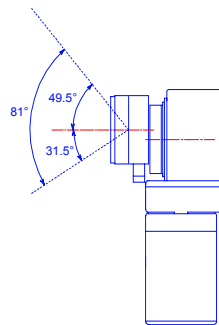
1.4.2 Vertical height of image

Normal lenses



Height of image: 83°

Shift lenses



Height of image: 81°

For example: Nikon PC Shift: +/- 8mm

The same applies when the lens is shifted downwards

1.5 Viewfinder

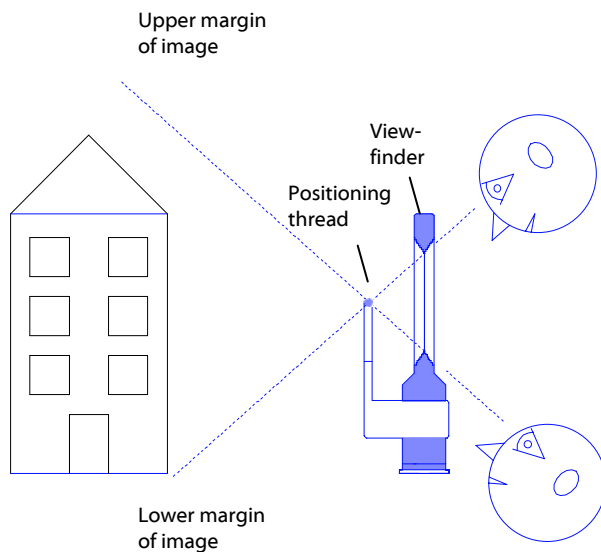
1.5.1 Insert viewfinder

The viewfinder can be fitted easily in the socket (1). For this the trimming on the viewfinder needs to point forward. Slide viewfinder in until it clicks to lock. The viewfinder can be rotated by 360°.

Important: do not turn the camera head. This can transport film when the mechanical-electrical lock (5) is off.

1.5.2 Determine image field with the viewfinder

Turn the smaller part of the viewfinder with the positioning thread towards the object. The vertical image field can be determined as follows:



Look through viewfinder from above until the upper limit of the viewfinder aligns with the positioning thread. The corresponding point in space is the lower margin of the image.

Look through viewfinder from below until the lower limit of the viewfinder aligns with the positioning thread. The corresponding point in space is the upper margin of the image.

When using a shift lens the viewfinder can be shifted upwards and downwards by 8mm. To do this, slide the L-shaped part (with the positioning thread) up or down.

1.5.3 Remove the viewfinder

Turn viewfinder until you can see a small indent. Then slide viewfinder from socket (1). Removing the viewfinder is advisable especially for fast shutter speeds and for transport.

2. Control and Functions

2.1 Main switch

The mechanical-electrical lock (5) serves as the main switch for the camera. In the upper position of the lock, the camera head is locked and the camera system turned off. To activate the camera press lock (5) down and press start/stop button (9) once. The camera goes into standby mode 2 minutes after the last selection is done.

We recommend locking the camera after taking images. To do this press mechanical-electrical lock (5) upwards and move camera head clockwise until it locks. This activates the transport lock and prevents unintended rotations of the camera.

2.2 Start/stop button

The start/stop button (9) releases the shot and stops it if the button is pressed before the end of the shot. It also serves to release or to stop the 10 second timer.

2.3 Control unit

2.3.1 Selection button for degree of panorama and timer

The selection button for degree of panorama and timer (10) has 3 positions:

- Middle position: Degree of panorama 450°
- Right position: Degree of panorama 90°
- Left position: 10 second timer for degree of panorama 450°

If the start-/stop button in right position remains pressed (degree of panorama 90°), the camera completes 90° rotations until the start/stop button is released.

When the 10 second timer is activated (by pressing the start/stop button (9)) the green LED flashes once every second. 3 seconds prior to the shot this frequency doubles.

2.3.2 Selection button for shutter speeds

- Left position: Shutter time 1/125
- Middle position: Shutter time 1/250
- Right position: Shutter time 1/60

2.3.3 Film counter

The Roundshot 28-220 Outdoor has no film counter. The detection of available frames is done by the photographer. The following number of panorama shots can be done (examples):

- 120 film: 4 x 360°
- 220 film: 8 x 360°

For more details see chapter 3.3: Length of film and number of panoramas per film

2.3.4 Spooling film to end

Put selection button for degree of panorama and timer (10) to the right (90°), the selection button for shutter speeds (11) to the left (1/125). Press start/stop button (9) until the film is fully spooled.

2.3.5 Insert new film

Open cover release (2) and lift off cover. Swing film pressure plate (16) backwards. Open spool holder for exposed film (14) and remove exposed film and take off spool of exposed film (15).

Remove empty film spool (13) and place in spool holder for exposed film (14). Insert new film in spool holder (12), pull paper edge of film between camera and film pressure plate (16) with black surface towards exposure slit (17). Attach film to empty spool (14).

Release mechanical-electrical lock (5) and move film counter-clockwise until „Start“ mark of non-exposed film (13) aligns with start mark of spool holder (12). Then swing back film pressure plate (16) until securely fastened.

Put on cover and close cover release (2).

Put selection button for degree of panorama and timer (10) to the middle position (450°), the selection button for shutter speeds (11) to the left (1/125). Press start/stop button (9). The camera spools the non-exposed film to the exposure slit (17).

The camera is now ready for exposure.

2.4 Battery status

The model 28-220 Outdoor has no battery status indicator. With a complete power load up to 100 films can be exposed, depending on speed of operation and temperature. To load the battery connect the camera to a power source with the universal speed charger unit. The maximum loading time is 4 hours, which is indicated by the blinking of the green LED of the universal speed charger.

2.5 Calibration with water bubble indicators

If you want to portray the horizon as a straight line it is important to hold the camera steady. To do this, the camera is calibrated with 2 water bubble indicators that are positioned at the upper end of the engine body. Holding the camera at a significant angle results in a wave-like horizon.

2.6. Light metering

The reading of the exact aperture and shutter time can be done with an external light meter. For optimum results the section of the panorama with most relevance should be taken as a reference. During daylight the section with bright sunlight should not be taken as the primary reading as this may lead to under-exposure of the panorama. The obtained light reading can be set on the lens (aperture) and using the shutter speed function. Some lenses, such as the Nikon AF 28mm, reach optimum image circle only after aperture 11. When selecting lower apertures with this lens a reduction in light and sharpness on the upper or lower margins may occur.

2.7 Distance setting on the lens

The camera system requires exact setting of the lens. The system is optimised for an average distance of 7 metres, i.e., at this distance optimum sharpness can be reached, normally 3 to 5mm after the infinity setting of the lens. Thanks to the slit-scan technology very high depth of field can be reached.

Depending on lens brand and type small differences in focal length and distance markings can occur. That is why we recommend to test the lens in use under different distance settings.

To do this, place the camera on a tripod placed 7 metres away from an object with smaller and larger letters. Ideally leave the aperture open, optionally reduce by one „f-stop“ and correct shutter speed accordingly. Take different shots of the object, varying the distance setting slightly each time from infinity to 5 metres. Plot shutter speeds, apertures and distance parameters on a notepad or on a display table.

After film development choose optimum distance setting and mark this value on the lens.

3. Tips and Resources

3.1 Film spools

Always use identical film spools for non-exposed and exposed film, as different brands have different spool dimensions.

3.2 Panorama images

At shutter speeds 1/250 to 1/60 hand-held shots are possible. To do this, hold the engine and control unit firmly in your hands above your head as to avoid to be in the picture.

For shots on a tripod place the camera on the 3/8" mount on the tripod. To avoid to be in the picture choose slow shutter speeds or use the 10 second timer.

3.3 Length of film and number of panoramas per film

The number of possible shots with the 28-220 Outdoor camera are displayed in the following table. We recommend using a larger degree of the panorama than actually necessary (for instance 450° for a 360° shot). This allows to choose the best section of the image later.

Length of film used

Film length (mm) = Focal length x 2 x π / 360 x degree of shot

Focal length	Degree of shot				
	90	180	270	360	450
28	44.8	89.5	134.3	179.0	223.8

Available film length (mm)

120 medium format	780
220 medium format	1,560

Number of panoramas per film

Example 28-220 Outdoor (28mm lens)

Film	Degree of shot				
	90	180	270	360	450
120er	17.4	8.7	5.8	4.4	3.5
220er	34.9	17.4	11.6	8.7	7.0

Example 28-220 Outdoor:
(28mm lens)

Film for a 360° shot with 28-220 camera (28mm lens) is 17.9 cm long
 Number of shots per 120 film (780mm long): 4 x 360°
 Number of shots 220 film (780mm long): 8 x 360°

3.4 Maintenance

The exposure slit (18) of the camera must be kept clean at all times. Remove dust particles with sticky scotch tape to prevent horizontal stripes on the film. The lower, brown rubber ring (film transport) may not be oily or lubricated. If necessary clean rubber ring with spirit or similar liquid.

More tips and resources are available on our website www.roundshot.ch

3.5 Return of equipment / recycling

Your Roundshot product and the accessories are produced from highest quality materials and parts and will provide you continued pleasure. Should you nevertheless want to dispose of your Roundshot equipment one day, it should not be placed in normal waste. The correct disposal of your old equipment is a contribution to preventing possible negative causes for the environment.



For optimum recycling we kindly ask you to return us your camera (with accessories) to the following address:

Seitz Phototechnik AG
Environment & Recycling Department
Hauptstr. 14
8512 Lustdorf / Switzerland

This return shipment to the manufacturer is **free of charge**.
The service is available **worldwide**.

Please contact us to arrange the return shipment and prepare the materials for the delivery. Your camera and accessories will be picked up by our courier service and will be recycled in our factory.



We wish you continued success and fun with your Roundshot 28-220 Outdoor!

4. Technical Data

Filmformat	120/220 medium format
Lens	28mm
Lens mount	Bayonet für 28mm
Lens brands	Nikkor 2.0, 2.8; PC Nikkor 3.5; AF Nikkor 1.4, 2.8; Leica Elmarit R 2.8, Contax Distagon T 2.8; more on demand
Shift	+/- 8mm with PC Shift
Maximum height of image	84° (vertical); 50mm
Length of image at 360°	180mm
360° shots per film	8 x mit 220 Film, 4 x mit 120 Film
Viewfinder	Telrad viewfinder
Distance setting	Optimum at 7m, depending on lens
Slit	2.0 mm
Light meter	-
Fastest scan for 360°	0.7 seconds
Exposure variation (bracketing)	manual
Dimensions (L x W x H)	67 x 116 x 200 mm
Weight	1.4 kg
Control	Selection buttons (speed, degree of panorama, timer)
Display	-
Shutter speeds	1/250, 1/125 and 1/60
Degree of panorama	Selectable in increments of 90° from 90° to infinity
Density exposure	-
Timer	10 seconds with bright LED
Power supply	NiMh Akku 4.8V 3.5A
Film transport	Automatic
Power charger	Universal speed charger 100-240V
Calibration	2 water bubble indicators
Film transport lock	Mechanical-electrical
Standard accessories	Power charger, NiMh battery
Possible further accessories	Telrad viewfinder, quick adapter, cable for external release, waterproof case