

ROTHENBERGER



ROCAM[®] mobile

6.9400, 6.9410, 6.9413

CMS

Industrial Equipment Company

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Specifications / Fields of application

Description.....	ROCAM® <i>mobile</i>
Video input.....	BNC 1 k
Video output.....	BNC 75
Power consumption.....	550 mA
Ambient temperature.....	-10 ... +50 °C
Storage temperature.....	-30 ... +50 °C
Dimensions (L x W x H).....	510 x 415 x 365 mm
Weight inc. battery.....	12 kg
Monitor.....	monochrome display screen 5.5"
Camera module.....	type CCIR b/w
Camera head diameter.....	∅ 33 mm
Reel cable length.....	36 m
Reel cable diameter.....	∅ 4.5 mm
Battery voltage.....	18 V
Battery capacity.....	1.4 Ah
Tube ∅.....	50-150 mm
Tube ∅ with mini module (optional).....	40-100 mm

Scope of supply: TV inspection system, guide pieces, instruction manual, video cable (SCART), battery, power supply unit – electrical connection: 100 to 240 V~ / 50 to 60 Hz
Equipment voltage: 18 V- DC / 670 mA. Equivalent power supply unit as an alternative

Prescribed use

The ROCAM® TV inspection system is intended exclusively for inspecting vacant and clean tubes, hollow bodies and cavities, as stated under „Specifications / Fields of application“. No other use is permissible.

All applicable standards and regulations must be complied with.

More specifically, these include:

- Law governing technical equipment (equipment safety law) and appurtenant regulations
- Low voltage directive
- UVV VBG 1 "General regulations"
- UVV VBG 4 "Electrical installations and operating equipment"
- Directives governing work in containers and restricted areas (BG rule 77), directive on display workstations.

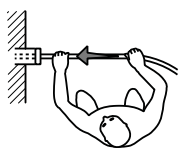
Special safety instructions

Safety gloves must be worn at all times.

The inside of the equipment must not be tampered with in any way! Internal work is the exclusive domain of trained personnel only (customer service)!

The TV inspection system is not authorised for use in medical applications of any kind!

Do not use force to pull the camera and reel cable out of the tube!



It is essential to stand beside the tube-cable "axis" to avoid injury!

The reel cable is rigid and is therefore under mechanical stress! Hold it when uncoiling it from the reel!

The brightness and/or contrast must be set by the user and adjusted to individual sight-related

requirements and ambient conditions. The minimum viewing distance must be 50 cm (average 64 cm) to comply with UVV.

Used removable batteries must not be thrown in the fire or in the household rubbish. Old batteries can be taken to your specialist dealer who will dispose of them in conformity with environmental regulations.

Do not store batteries with metal objects (danger of short circuit).

The battery should only be charged in the ROCAM®; no other charging devices should be used.

Batteries and chargers should not be opened. They should only be stored in dry areas and protected from damp.

Battery fluid may leak from damaged removable batteries under conditions of extreme load or extreme temperatures. Any areas that have come into contact with battery fluid should be washed immediately with soap and water. If battery fluid comes into contact with the eyes rinse them thoroughly for at least 10 minutes and consult a doctor immediately.

Operating instructions

Do not buckle the reel cable as it may break!

Do not pull the reel cable over sharp edges as they may damage the cable!

Never aim jets of water on the front (display screen/control panel) of the equipment!

Power connection

Fig. A

A new battery must be charged prior to using it for the first time (approx. 7h).

If the battery is running low, the power supply unit should be connected. The charging process takes less time if the equipment is switched off.

The power supply unit can be connected

permanently. The battery cannot be overcharged. Once the battery is sufficiently charged, the system automatically switches to float charging.

When the power supply unit is connected the battery-charge warning lamp is illuminated.
 Red: Battery discharged (< 70%) -> fast charge.
 Green: Battery charged (> 70%) -> float charging.

When the ROCAM® is switched on the device always switches to float charging irrespective of the degree of charge or discharge of the battery.

The equipment can function independent of the mains for approx. 2.5 hours with a fully charged battery.

New batteries reach their full capacity after 4-5 charge and discharge cycles. Batteries which have not been used for a long time should be recharged before use.

Temperatures in excess of 50°C reduce the battery's performance. Avoid long periods of exposure to sun or heat.

Operating controls/displays **Fig. B**

Rotary ON/OFF knob:	Device on/off, Lighting control
POWER	Display screen on/off
CONTRAST	Contrast
BRIGHT	Brightness
A■/B■	■ Output video signal ■ Input video signal
★ ■ /) ■	■ Light tube ■ Dark tube
Battery-charge-warning-lamp	red -> fast charge green -> float charging
Metre counter (optional): overlay of distance already travelled by camera on monitor. Reading can be forwards or backwards. Can be zeroed at any point with the reset button.	
<ul style="list-style-type: none"> During initialisation immediately after switching on there may, in certain circumstances, be indeterminate inserts. If this is the case, switch off the equipment and wait for approx. 5 seconds before switching it back on. 	

Changing the battery **Fig. C**

Insert battery in the fixture on the rear until it latches into place. To remove, press both catches and extract battery.

Connecting recording equipment **Fig. D**

Tube inspections can be documented with external recording equipment.

Connect video recorder using SCART cable. During recording "button A■/B■" in position ■. During playback via the ROCAM® screen display "button A■/B■" in position ■.

Connect computer by means of USB cable. During recording "button A■/B■" in position ■.

Cleaning **Fig. E**

It is essential to clean the equipment after every tube inspection.

Switch off the equipment, remove the battery and, where applicable, disconnect the power supply unit. Close the cover ensuring that it locks into place.

Clean the reel cable on the base with water (spray jet). Clean the camera head with water (spray jet) before inserting it into the bracket.

- Never aim the jet of water at the front of the equipment (display screen/control panel).

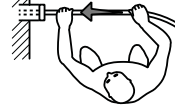
Operating the equipment **Fig. F**

Clean the tube system before inspecting the tubes.

- Press the button and open the cover, ensuring that it locks into place.
- Switch on the equipment using the rotary button. Switch on the display screen using the "POWER" button.
- Remove the camera head from the bracket and uncoil the reel cable from the reel.
The reel cable is rigid and under mechanical stress. Therefore hold the reel cable tight when uncoiling it from the reel!
- Insert the camera head in the tube system and feed it in carefully with the reel cable.
Do not kink the reel cable or pull it over sharp edges!

⚠ Wear protective gloves!

Always stand beside the reel cable!



For tube ø greater than 80 mm mount the guide pieces. The guide pieces can be adjusted to the tube ø by cutting off the margins.

- The reel cable can form loops while being fed in constituting a risk of fracture!
- The camera picture can turn upside down while being fed through several bends in the tube – this is a normal occurrence and does not mean that the system is defective.

Upon completion of work pull the reel cable out of the tube and roll it directly onto the reel.

Clean the camera head under flowing water (spray jet – not pressure jet)

Replace camera head in bracket.

Close cover. Display screen switches off automatically.

Replacing the protective camera glass **Fig. G**

If scratched, the protective camera glass can be easily replaced.

- Proceed with extreme caution and care when replacing the protective camera glass! The

camera head and the cable to the lighting ring can sustain damage.

- 1** Unscrew the union nut (SW 32). Use a second open-end spanner (SW 17) to provide counter-force, gently making an opening in the spring to grip with this spanner.
- 2** Carefully remove the protective camera glass. Attach new protective camera glass together with O-ring.
- 3** Screw the union nut back on using an open-end spanner. Use a second open-end spanner to provide counter-force and observe correct tightening torque!

ROCAM® Mini Module (optional) Fig. H

Tubes with diameters from 40-100mm can be inspected using the ROCAM® Mini Module.

The reel cable is secured for transportation with cable ties. Do not remove the cable ties until the reel holder has been assembled.

- 1** Secure the reel holder to the ROCAM® reel with 3 screws.
- 2** Undo the cable ties and remove the ROCAM® Mini Module reel cable.
- 3** Remove the ROCAM® camera head by unscrewing the union nuts, partially removing the camera head and loosening the cable gland.
- 4** Affix the ROCAM® Mini Module adapter.
The adapter must be seated in the spring groove!

After finishing work unscrew the ROCAM® Mini Module again. Lay the ROCAM® Mini Module reel cable in the reel holder. Lock the camera and the adapter in position in the reel holder.

- ☛ When rolled up the diameter must not be less than 300 mm!
- ☛ The camera should only be pushed or pulled lengthwise!
- ☛ Too small a radius and crosswise pushing and pulling can cause the cable to fracture!

ROCAM® location (optional) Fig. I

A locating probe integrated in the camera head transmits magnetic fields which are detected by the locating receiver and are optically and acoustically translated.

In addition to brickwork, stone, wood and plastic, the low-frequency measuring system can penetrate metal. The location of the probe can therefore even be detected in cast iron pipes.

The intensity of the signals changes depending on the position and range of the probe.

- 1** Prior to inserting the camera head and locating probe into the tube system, test the equipment:
Switch the receiver on with the rotary button and set the volume at a moderate level.

Hold the receiver near the camera head and observe the signal!

Test 1: Hold the receiver as shown in the left-hand picture and change the distance. The further the distance from the camera head, the weaker the signal.

Test 2: Slowly turn the receiver 90° as illustrated in the right-hand picture without changing the distance. The further the receiver is turned to an angle of 90° the weaker the signal.

Test 3: Leave the receiver at a 90° angle to the camera head, maintaining the same distance, and move the receiver parallel to the camera head. If the receiver head is at exactly the same height as the locating probe the signal will die out. The signal will be restored by moving the receiver again.

These techniques are used to "track" down the locating probes in the tube system.

Memorise the sound of the signal in order to be able to distinguish it from other interference noises.

- ☛ Avoid interference fields, Wherever possible, switch off sources of electric current conduction, transformers, motors, contactor relays, monitors, fluorescent lamps and energy-saving lamps.

2 Locating the probe.

Turn the receiver and observe the pointer throw. Move in the direction where the signal is strongest. When the pointer throw is at maximum (from approx. 1 m away from the probe) continue the fine locating acoustically.

- ☛ Locating from longer range – optical
Locating at shorter range – acoustic

Acoustic locating is more precise but can only be used at short range because of interference noise.

3 Calculate the exact position by minimum localisation.

The probe can be located more precisely by means of minimum localisation (loss of signal at a certain point). The camera head is located approx. 11 cm from the receiver head lengthwise.

General points:

Ensure that the batteries in the transmitter have sufficient capacity. If the red LED is lit up replace the batteries.

The sound can be transmitted via the built-in speaker or via headphones. The speaker switches off automatically if the headphone cable is plugged in.



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