

REED

Model R9000

HD Video Inspection Camera System



Instruction Manual

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Safety

Read all safety warnings and instructions. Failure to follow warnings and instructions may result in electric shock, fire and/or serious injury.

- Save this operation manual for future reference.
- Do not operate this device in explosive atmospheres, such as in the presence of flammable liquids, gases, hazardous chemicals, superheated liquid or heavy dust. It may create sparks which may ignite the dust or fumes.
- The camera head and the push cable are waterproof, however, the battery pack, DVR and connector cable are not. Do not expose them to water or rain. This increases the risk of electrical shock.
- Avoid using the device in environments of extreme cold, heat or humidity as it may damage the device.
- Do not drop or press hard on the device.
- Always backup your data before connecting your SD memory card to this system. The manufacturer is not responsible for any data of damage on your SD memory card for any reason.
- Do not disconnect the unit while recording or playing back. It may damage the unit and/or the SD memory card.

- Only qualified person are allowed to repair this device. Service or maintenance performed by unqualified person could result in injury.
- Do not use this device in places where there is high voltage equipment. The device doesn't contain high voltage protection and isolation.
- Check or maintain this device regularly, repair it or replace new parts if there is any damage.

BATTERY PACK SAFETY AND USING GUIDE

Using safety

Read the following battery precautions before using the battery and charger, to reduce the risk of electrical shock.

- Recharge batteries with accessory charging units.
- Check the power units and battery pack every time before using the equipment, be sure no problem, use of unauthorized parts may result in electrical shock, fire and/ or serious personal injury or damage other instruments and system.
- Never connects the car charger to any 24 volt cigarette lighter slot. It will harm the battery pack and DVR.
- Do not short circuit, it may cause fire, electrical shock.
- Do not charge the battery under rain or wet conditions. Water entering the charger will increase the risk of electrical shock.
- If the charger and battery are damaged, do not use or stop to charge. It may cause electrical shock.
- Don't disassemble the battery and case of power adapter, only qualified repair per son can repair and maintenance.
- Properly dispose of the battery. Exposure to high temperatures can cause the battery to explode. So do not dispose of in a fire. Some countries have regulations concerning battery disposal. Please follow all applicable regulations.
- Do not touch anything which out from battery, which would burn or damage the skin, once touches please flush with water. If in eyes, immediately get medical help fast.

Using Guide

Follow the steps as below to reduce the injury of the electric shock.

- Plug the power adapter to the AC outlet, and insert the other end into the DC inlet on top of the battery pack, charging LED will be red during charging, will be turned to green when charged fully. If battery empty for a long term, it will pre-charge the battery automatically in 10 minutes, and charging LED will be blinking in red.
- Turn on the power of the battery pack, the battery will supply the system, the battery level will be displayed by the indicator, each green LED indicators mean 25% percent of the battery.
- It needs about 8 hours to charge the battery fully. The battery can charge online, charging and supplying of work will not increase charging times.

Tips

User can use a power adaptor or car charger to charge the battery pack. Also can directly supply the system without battery pack.

If no use in a long term, take a recharge per 6 month, to ensure the battery in normal working status.

Features

- Complete video inspection system built in a hard carrying case
- Camera and video functions save high resolution images and records video/audio
- Twelve high visibility LED lights provide illumination in dimly lit environments
- Scratch-resistant sapphire lens and durable stainless steel camera housing
- 65.6ft (20m) cable mounted on cable reel
- High resolution 16:9 7" TFT LCD display
- Video and audio output
- Rechargeable lithium-ion battery and car charger

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- Sun visor is included to act as a sun shield for outdoor inspections
- 90° mirror rotation and low battery indicator
- Includes camera head, 20m cable reel and push cable, remote control, hard carrying case with built-in DVR, battery pack and cable, car charger, 2 fuses, 2 ball guides, plastic skid, 2 screws, 2 nuts, waterproof ring and adapters and screwdriver

APPLICATION

- Suitable for pipes at diameter of 25mm-200mm. Ability to go through 90° bend places with diameter at 50mm.

Specifications

Camera Resolution	800 x 480
Camera Diameter	0.91" (23mm)
Camera Length	4.7" (120mm)
Lens/Housing Material	Saphire / Stainless Steel
Viewing Distance	7.9 to 39.4" (20 to 100cm)
Depth of Field	100cm to infinity
Viewing Angle	0 to 140°
Display	7" Color TFT LCD (16x9)
Display Resolution	800 x 480
Frames per Second (FPS)	30
Standard Gooseneck/	
Cable Length	65.6' (20m)
Cable Diameter	0.2" (5.2mm)
Rotate Display	Yes (90°)
Playback	Photo, Video and Audio
Memory	Internal / SD Card
TV Out	PAL / NTSC

Data Output	USB / SD Card
LED Brightness Adjustment	Yes (12 white LEDs)
Low Battery Indicator	Yes
Power Supply	Rechargeable Li-ion Battery, AC Adapter, Car Charger
Supported Languages	English, German, French, Spanish, Italian, Chinese, Japanese, Russian, Portuguese
Product Certifications	CE, IP67 (Camera Head)
Operating Temperature	14 to 122°F (-10 to 50°C)
Storage Temperature	4 to 140°F (-20 to 60°C)
Operating Humidity	30 to 90%
Dimensions	22.7 x 10.4 x 20.4" (575 x 265 x 520 mm)
Weight	22lbs (10kg)
Optional Accessories	Replacement Camera Head (R9000-RCH) Cable, 131.2' (40m) (R9000-40M) Camera head with 512hz Transmitter (R9000-CAMT) Receiver, 512hz (R9000-RCV) 4GB SD Memory Card (SD-4GB)

Instrument Description

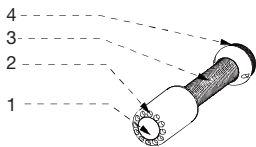
The pipe inspection system includes the following four main parts: Camera head, cable reel, battery pack and DVR.

The camera head includes 12 high-light white LEDs and a highly scratch-resistant sapphire lens cover; this coupled with stainless steel housing allow the camera to withstand repeated hits in various pipes.

Flexible stainless steel spring and associated components make the camera head possible to go through bend pipes. Also the cable reel is mounted and rotatable in the case therefore the fiberglass rod cable can be pushed in and out without the need to hold the reel. Further, the battery pack provides power supply for the system and the DVR monitor can record video and take photos.

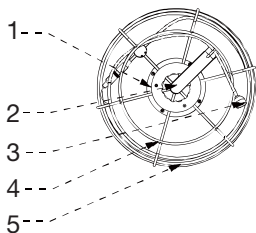
Camera Head

1. Sapphire Lens
2. White Leds
3. Spring
4. Gold Connector



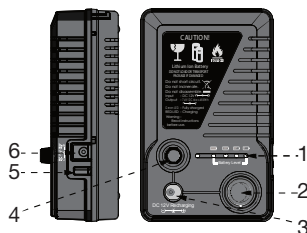
Cable wheel and push cable

1. Rotation Mechanism
2. Handle
3. Cable Connector (To Camera)
4. Cable Wheel
5. Push Cable



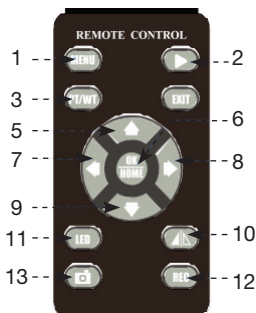
Battery Pack

1. LED (battery level indicator)
2. Power Switch
3. DC 12V Recharging
4. Fuse
5. USB Output (DC 5V)
6. DC 7.4V Output



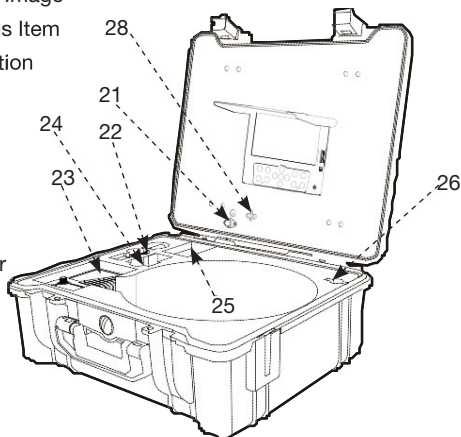
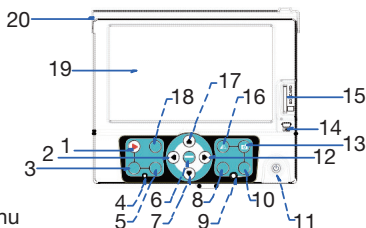
Remote control

1. Menu: Select Menu
2. Playback: Playback Mode
3. Pt / Wt: Reserve Function
4. Exit: Exit Menu
5. Up: Select Up/Previous Item
6. OK & Home: Confir m/ Select Menu
7. Left: Select Left Item
8. Right: Select Right Item
9. Down: Select Down/Next Item
10. Mirror: Mirror And Flip Image
11. LED: Adjust The Led Brightness
12. REC: Start / Stop Recording
13. Photo: Take Photo



DVR AND TOOL BOX

1. Playback: Playback Mode
2. Left: Select Left Item
3. Menu: Select Menu
4. Power Indicator LED
5. Exit: Exit Menu
6. OK & Home: Confirm/ Select Menu
7. Down: Select Down/Next Item
8. LED: Change The Led Brightness
9. IR For Remote Control
10. REC: Start / Stop Recording
11. Power Switch
12. Right: Select Right Item
13. Photo: Take Photo
14. USB 2.0 To PC
15. SD Card Slot
16. Mirror: Mirror And Flip Image
17. Up: Select Up/Previous Item
18. Pt / Wt: Reserve Function
19. Color TFT LCD
20. Sun Visor
21. DC In
22. Camera Head
23. Battery Box
24. Adapter & Car Charger
25. DC 12V Cable
26. Remote Control
27. Aviation Socket
28. Video & Audio Out

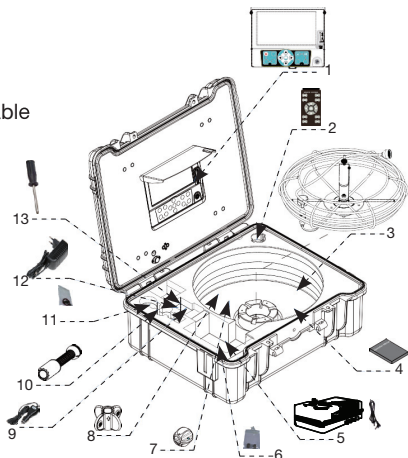


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Package Contents

1. Toolbox with DVR
2. Remote control
3. Cable wheel and push cable
4. Operation manual
5. Battery pack and cable
6. Fuse (2x)
7. 46 Support guides
8. 80 Support guides
9. Car charger
10. Camera
11. Screw (2x), nut (2x) and waterproof -ring
12. Adapter
13. Screw Driver

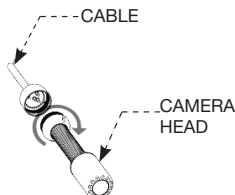
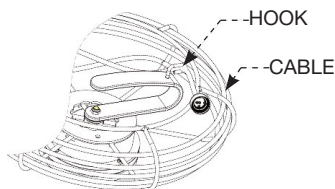


Operating Instructions

INSTALLATION

Install Camera Head

Put the cable into the hook of the handle, Hold the cable connector in one hand, then screw the camera and fix it on the cable tightly.

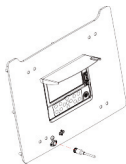


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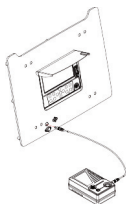
Install aviation cable

Plug the cable into the socket of the panel and screw tightly.



Install power cable

Connect the power cable to battery and panel.

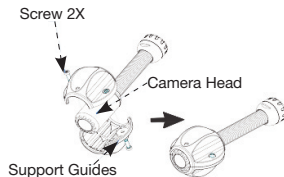


Install guide fitting

Support Guide are designed to help position the camera towards the middle of the pipe. There are 2 kinds of guides, choose guides properly per application requirement.

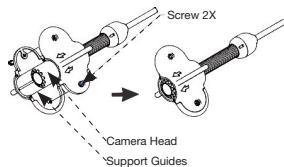
A. Installing 46 Support Guides

Sleeve the camera heads with 46 Support guide.

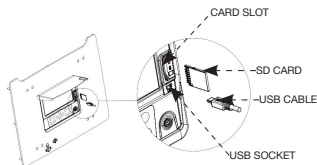


B. Install 80 Support Guides

Mount the 80 support guide onto the stainless steel camera head. Then tighten the screw by screwdriver.



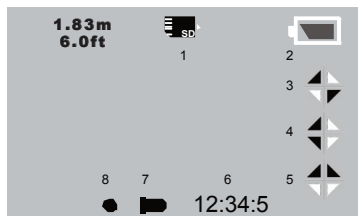
Install SD Card



Turn on the battery pack and DVR



DVR Icon

1. SD Card
2. Battery Level
3. Image Reverse
4. Image Reverse & Mirror
5. Image Mirror
6. Timestamp
7. LED Brightness
8. Record
9. Meter Counter (optional function)



FUNCTION GUIDE

Live video

Press  to turn on/ off DVR to enter the live video mode, then press  to enter playback mode.









Press  to start / stop recording.

Press  to mirror or / and reverse the image.

Press  adjust the brightness of camera LEDs.


Press  to take a picture.

Video Option






Press  to enter the video option menu. Press  and  to select items that you need, press  to confirm the selection. Press  or  to change the value. Press  to save the setting. Press  to exit video option and save.

- Size D1 (720*576) / VGA (640*480) / QVGA (320*240)
- Video Seg: 10min/ 20min/ 30min/ 40min/OFF. Set 10- 40min to restrict files length and open cycle-cover. Elder files will be covered by new files when SD card is full. Set OFF to close this function.
- Meter Counter: Reserve function.
- Sound: Turn on/ off the local sound in Video Recording.
- Timestamp: Enable/Disable time stamp on screen.

Playback






Press  the button to enter the playback, the user can browse, preview and playback media files.

Press  and  to browse and select media files.



Press  to confirm the selection and preview media file. Press  to preview the previous file. Press  to preview the next file. Press  to playback video. Press  to enter the play setting.

- Delete: Delete media files.
- Slide Show: 3sec/5sec/10sec. To set interval time of the slide shows.
- Protection: To protect important media files.
- Thumbnail: Browse 9 media files per page.
- File List: Browse 3 media files per page.
- LCD: LCD brightness.

Playing Movie

 Pause/Play movie,  Stop play movie,  Rewind,  For ward, you can press  to set speed rate of rewind/ for ward.

SETUP

Press  to enter the preferences of Record/Playback. Press  enters Setup menu. The following items are in the setup menu.

- Format: format SD card.
- LCD: LCD brightness.
- Language: English, German, French, Spanish, Italian, Chinese, Japanese, Russian, Portuguese.
- Sys. Reset: Reset all setting.
- Light frequency, 50Hz/60Hz, specifying your ambient light frequency.
- TV output: PAL/NTSC.
- Date input: To set date and time.

At the Job Site

Always wear rubber gloves to operate the camera for health and safety reasons. Properly positioning the cable reel will save time and strength to push out and in the cable, and minimize the rate of equipment damage.

- When pushing, the end of your stroke should be as close to the entry as possible. Standing too far back with an excess of cable between your hands and the entry may cause the cable to fold on it self outside the entry and damage the cable.
- Try to keep the push cable away from sharp edge of a pipe entry because this may cause damage. If the camera does not seem to go any further, **DO NOT FORCE TO PUSH THE CAMERA!** Try another entry if possible.

NOTE! Hands should be close to the line opening. DO NOT catch the cable on the edge of an entry and continue to push.

Always try to run water down the pipe under going inspection. This will keep the system much cleaner, and allow you to push noticeably further with less friction. If the water is preventing you from seeing an area of importance, temporarily turn it off.

When push the push cable through the pipeline by steady and slowly, a short distance entry per time, keeps the hands at the entrance, so that can control the push cable and prevent it stuck, bent or scratch.

When inspecting a pipe, most of the time a slow steady push through the system works the best. At changes in direction such as P- traps, Tee's, Y's, Elbows, etc. It is usually necessary to give a little extra push in the bends. Back the camera head approximately 8" (20cm) from the bend, if necessary, and give it a quick push, "popping" the camera through a turn, using the least amount of force required. Try to be as gentle as possible, and do not hammer or snap the camera head through corners. After some practice, you may learn that the best way to inspect a section of pipe is to push the camera through quickly. Then draw the camera back home slowly and evenly.

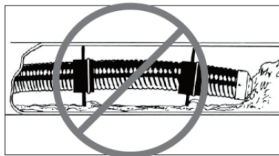
Make sure the sapphire window is clean prior to entry. Some users claim that a slight film of detergent on the lens minimizes the possibility of grease sticking to the port. If necessary, take advantage of any standing water in the pipe to wash the front of the camera by jiggling it in the water.

When you place the camera head into the pipe remember, as the materials of pipe vary, it will be necessary to adjust the lighting settings to maximize picture quality.

The system can travel through multiple 45 and 90 degree bends and wyes. Do not, however, try to force it through a P-trap or tee if there is a large amount of resistance.

NOTE! Do not try to use the camera head to clear obstructions.

This System is a diagnostic tool, not a drain cleaner. Using the camera head to clear obstructions could damage the camera head or cause it to be caught in the obstruction.



Do not at tempt to remove or stores push cable on the reel solely by turning the reel it self. You can manually push or pull cable from the reel and wind or unwind it.

If the camera sits in a pipe, or an enclosed environment, heat will build-up. This may lead to the camera head overheating which will cause fuzzy lines to appear on the monitor. In the event, this happens, turn off the system, remove the camera from the pipe (or enclosed environment) and let the camera head cool for 10 to 15 minutes. Running water into the line will also help cool the camera head. Always use the minimum illumination required to maximize picture quality and to avoid excessive heat build-up.

NOTE! The camera head can get HOT! When finished with your inspection, or if taking a prolonged break in the middle of the inspection, turn off the system.

Retrieving the push cable

Once the inspection has been completed, pull the push cable back with slow, steady force. Do not force the push cable or exert excessive force. This could damage the camera or push cable. The push cable may get hung up while being retrieved, and may need to be manipulated as did during insertion.

Once the inspection has been completed, pull the push cable back with slow, steady force. Do not force the push cable or exert excessive force. This could damage the camera or push cable. The push cable may get hung up while being retrieved, and may need to be manipulated as did during insertion.

Note! NEVER USE SOLVENTS to clean any part of the system. Substances like acetone and other harsh chemicals can cause cracking of the camera ring, which could affect waterproofing.

Storing the push cable into the cable reel. One hand holds the push cable, the other hand close to the cable wheel. Slowly and gently push the push cable slide via the hook of the handle, cable reel will rotate and store the push cable inside.

Note! The hands should be close to the cable wheel when storing the push cable. Push the push cable a small piece every try. Push a long distance can cause the push cable bend or broken.

Troubleshooting

Problem	Probable fault location	Solution
Meter is not accurate	Knurled wheel slip	Fit glassfiber cable into the guide slot and hook
	Not set to zero	Press reset button to set zero
No Battery level indicate	No power completely	To charge the battery
	Fuse burned	Change the fuse
No image	Cable connection faulty or loosely	Check cable connection, clean and reconnect if necessary
	Camera connector soiled	Clean the camera connector
	Wrong SD memory card	Turn off power and replace SD card
	Wrong setting	Enter the setup menu and select reset
Can not input Characters	The wireless keyboard low battery	Change battery
	Wireless Keyboard or Receiver fault	Check the Keyboard and the keyboard on a PC
The deviation of MC more 0.5%	Select the wrong total length	Re-select the correct total length. You can then press F2 key when the machine boot within 5 sec to enter background to select it
	Pull out cable more than 3 meters before turning on the system	Turn on the system before pulling out the push cable from the cable reel

For service on this or any other REED product or information on other REED products, contact REED Instruments at info@reedinstruments.com.

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