RIDGID

micro CA-300 Operator's Manual

micro CA-300 Inspection Camera

⚠ WARNING!

Read this Operator's Manual carefully before using this tool. Failure to understand and follow the contents of this manual may result in electrical shock, fire and/or serious personal injury.

Table of Contents

*Original Instructions - English

micro CA-300 Inspection Camera

RIDGID

micro CA-300 Inspection Camera	
Record Serial Number below and retain product serial number which is located on nameplate.	
Serial No.	

Safety Symbols

In this operator's manual and on the product, safety symbols and signal words are used to communicate important safety information. This section is provided to improve understanding of these signal words and symbols.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE NOTICE indicates information that relates to the protection of property.

This symbol means read the operator's manual carefully before using the equipment. The operator's manual contains important information on the safe and proper operation of the equipment.

This symbol means always wear safety glasses with side shields or goggles when handling or using this equipment to reduce the risk of eye injury.

This symbol indicates the risk of hands, fingers or other body parts being caught or wrapped in gears or other moving parts.

This symbol indicates the risk of electrical shock.

General Safety Information

⚠ WARNING

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

SAVE THESE INSTRUCTIONS!

Work Area Safety

- **Keep your work area clean and well lit.** Cluttered or dark areas invite accidents.
- **Do not operate equipment in explosive atmospheres, such as in the presence of flammable liquids, gases or dust.** Equipment can create sparks which may ignite the dust or fumes.
- **Keep children and by-standers away while operating equipment.** Distractions can cause you to lose control.

Electrical Safety

- **Avoid body contact with earthed or grounded surfaces such as pipes, radiators, ranges and refrigerators.** There is an increased risk of electrical shock if your body is earthed or grounded.
- **Do not expose equipment to rain or wet conditions.** Water entering equipment will increase the risk of electrical shock.

Personal Safety

- **Stay alert, watch what you are doing and use common sense when operating equipment. Do not use equipment while you are tired or under the influence of drugs, alcohol or medication.** A moment of inattention while operating equipment may result in serious personal injury.
- **Do not overreach. Keep proper footing and balance at all times.** This enables better control of the power tool in unexpected situations.
- **Use personal protective equipment.** Always wear eye protection. Protective equipment such as dust mask, non-skid safety shoes, hard hat or hearing protection used for appropriate conditions will reduce personal injuries.

Equipment Use and Care

- **Do not force equipment. Use the correct equipment for your application.** The correct equipment will do the job better and safer at the rate for which it is designed.

- **Do not use equipment if the switch does not turn it ON and OFF.** Any tool that cannot be controlled with the switch is dangerous and must be repaired.
- **Disconnect the batteries from the equipment before making any adjustments, changing accessories, or storing.** Such preventive safety measures reduce the risk of injury.
- **Store idle equipment out of the reach of children and do not allow persons unfamiliar with the equipment or these instructions to operate the equipment.** Equipment can be dangerous in the hands of untrained users.
- **Maintain equipment.** Check for missing parts, breakage of parts and any other condition that may affect the equipment's operation. If damaged, have the equipment repaired before use. Many accidents are caused by poorly maintained equipment.
- **Use the equipment and accessories in accordance with these instructions, taking into account the working conditions and the work to be performed.** Use of the equipment for operations different from those intended could result in a hazardous situation.
- **Use only accessories that are recommended by the manufacturer for your equipment.** Accessories that may be suitable for one piece of equipment may become hazardous when used with other equipment.
- **Keep handles dry and clean; free from oil and grease.** Allows for better control of the equipment.

Service

- **Have your equipment serviced by a qualified repair person using only identical replacement parts.** This will ensure that the safety of the tool is maintained.

Specific Safety Information

⚠ WARNING

This section contains important safety information that is specific to the inspection camera.

Read these precautions carefully before using the RIDGID® micro CA-300 Inspection Camera to reduce the risk of electrical shock or other serious injury.

SAVE THESE INSTRUCTIONS!

A manual holder is supplied in the carrying case of the micro CA-300 Inspection Camera to keep this manual with the tool for use by the operator.

micro CA-300 Inspection Camera Safety

- **Do not expose the display unit to water or rain. This increases the risk of electrical shock.** The micro CA-300 imager head and cable are waterproof to 10' (3 m). The hand-held display unit is not.
- **Do not place the micro CA-300 Inspection Camera anywhere that may contain a live electrical charge.** This increases the risk of electrical shock.
- **Do not place the micro CA-300 Inspection Camera anywhere that may contain moving parts.** This increases the risk of entanglement injuries.
- **Do not use this device for personal inspection or medical use in any way.** This is not a medical device. This could cause personal injury.
- **Always use appropriate personal protective equipment while handling and using the micro CA-300 Inspection Camera.** Drains and other areas may contain chemicals, bacteria and other substances that may be toxic, infectious, cause burns or other issues. **Appropriate personal protective equipment always includes safety glasses and gloves**, and may include equipment such as latex or rubber gloves, face shields, goggles, protective clothing, respirators and steel-toed footwear.
- **Practice good hygiene.** Use hot, soapy water to wash hands and other body parts exposed to drain contents after handling or using the micro CA-300 Inspection Camera to inspect drains and other areas that may contain chemicals or bacteria. Do not eat or smoke while operating or handling the micro CA-300 Inspection Camera. This will help prevent contamination with toxic or infectious material.
- **Do not operate the micro CA-300 Inspection Camera if operator or device is standing in water.** Operating an electrical

device while in water increases the risk of electrical shock.

The EC Declaration of conformity (890-011-320.10) will accompany this manual as a separate booklet when required.

If you have any question concerning this RIDGID® product:

– Contact your local RIDGID distributor.
– Visit www.RIDGID.com or www.RIDGID.eu to find your local RIDGID contact point.
– Contact RIDGID Technical Services Department at rtctechservices@emerson.com, or in the U.S. and Canada call (800) 519-3456.

Description, Specifications and Standard Equipment

Description

The RIDGID micro CA-300 Inspection Camera is a powerful handheld digital recording device. It is a complete digital platform that allows you to perform inspections and record pictures and videos in hard to reach areas. Several image manipulation features such as image rotation and digital zoom are built into the system to ensure detailed and accurate visual inspections. The tool has external memory and TV-Out features. Accessories (hook, magnet and mirror) are included to attach to the imager head to provide application flexibility.

Specifications

Recommended Use.....Indoor

Viewable Distance.....0.4" (10 mm) to ∞

Display.....3.5" (90 mm) Color TFT (320 x 240 Resolution)

Camera Head.....3/4" (17mm)

Lighting.....4 Adjustable LEDs

Cable Reach.....3' (0,9 m), Expandable to 30' (9 m) with Optional Extensions, Imager and Cable are Waterproof to 10' (3 m), IP67

Photo Format.....JPEG

Image Resolution .....640 x 480

Video Format.....MP4

Video Resolution .....320 x 240

Frame Rate.....up to 30 FPS

TV-Out .....PAL/NTSC User selectable

Built-In Memory .....235 MB Memory

External Memory.....SD™ Card 32 GB max (4 GB supplied)

Data Output.....USB Data Cable and SD™ Card

Operating Temperature .....32 to 113°F (0 to 45°C)

Storage Temperature...-4°F to 140°F (-20°C to 60°C)

Power Supply .....3.7V Li-Ion Battery AC Adapter 5 V, 1.5 Amp

Weight.....5.5 lbs (2,5 kg)

Standard Equipment

The micro CA-300 Inspection Camera comes with the following items:

- micro CA-300 Handset
- 17 mm Imager
- 3' (90 cm) USB Cable
- 3' (90 cm) RCA Cable with Audio
- Hook, Magnet, Mirror Attachments
- 3.7 V Li-Ion Battery
- Li-Ion Battery Charger with Cord
- AC Adapter
- Headset Accessory with Microphone
- 4 GB SD™ Card
- Operator's Manual Pack

Figure 1 – micro CA-300 Inspection Camera

Controls

Figure 2 – Controls

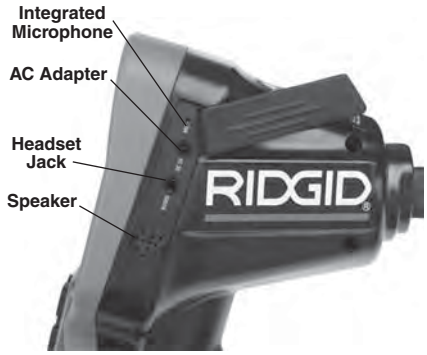

Figure 3 – Right Side Port Cover

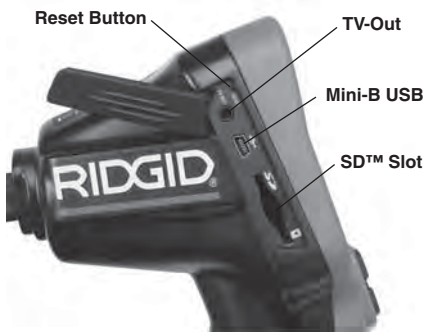

Figure 4 – Left Side Port Cover

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment OFF and ON, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Consult the dealer or an experienced radio/-TV technician for help.

Electromagnetic Compatibility (EMC)

The term electromagnetic compatibility is taken to mean the capability of the product to function smoothly in an environment where electromagnetic radiation and electrostatic discharges are present and without causing electromagnet interference to other equipment.

NOTICE The RIDGID micro CA-300 Inspection Camera conforms to all applicable EMC standards. However, the possibility of it causing interference in other devices cannot be precluded.

Icons

	Battery Life Indicator – Fully charged battery.
	Battery Life Indicator – Less than 25% of battery charge remains.
	SD™ Card – Indicates an SD card has been inserted into the device.
	Still Camera – Indicates device is operating in still camera mode.
	Video Camera – Indicates device is operating in video camera mode.
	Playback Mode – Selecting this icon allows you to view and delete previously saved images and video.
	Menu – Push select on this icon to be taken to the menu screen.
	Select – Pressing select from the live screen will take you to the playback screen.
	Return – Pressing return from the live screen will switch between camera and video. Return will also back out of menu and playback mode.
	LED Brightness – Press right & left arrows to change the LED brightness.
	Zoom – Press up & down arrows to change the zoom from 1.0x to 2.0x.
	Save – Indicates image or video has been saved to memory.
	Trash – Delete confirmation icon.
	Mode – Select between image, video or playback.
	Time Stamp – Select to display or hide date and time on live screen.
	Language – Choose between, English, French, Spanish, German, Dutch, Italian, etc.
	Time and Date – Enter this screen to set time and date.
	TV – Chose between NTSC and PAL to enable TV out video format.
	Update Firmware – Use to update unit with most current software.
	Speaker/Microphone – Turns speaker and microphone ON or OFF during recording and playback.
	Automatic Power Off – Device will automatically shut down after 5, 15 or 60 minutes of inactivity.
	Factory Reset – Restore factory defaults.
	About – Displays software version.

Tool Assembly

⚠ WARNING

To reduce the risk of serious injury during use, follow these procedures for proper assembly.

Changing/Installing Batteries

The micro CA-300 is supplied without the battery installed. If the battery indicator displays ▭ , the battery needs to be recharged. Remove the battery prior to long term storage to avoid battery leakage.

1. Squeeze the battery clips *(See Figure 5)* and pull to remove battery compartment cover. If needed, slide battery out.

Figure 5 – Battery Compartment Cover

Figure 6 – Removing/Installing Battery

2. Insert contact end of battery into the inspection tool, as shown in *Figure 6*.
3. Replace battery compartment cover.

Powering with the AC Adapter

The micro CA-300 Inspection Camera can also be powered using the supplied AC Adapter.

1. Open the right side port cover *(Figure 3)*.
2. With dry hands, plug the AC adapter into the outlet.
3. Insert the AC adapter barrel plug into the port marked “DC 5V”.

Figure 7 – Powering the Unit with AC Adapter

Installing the Imager Head Cable or Extension Cables

To use the micro CA-300 Inspection Camera, the imager head cable must be connected to the handheld display unit. To connect the cable to the handheld display unit, make sure the camera socket key and display unit socket slot *(Figure 8)* are properly aligned. Once they are aligned, finger tighten the knurled knob to hold the connection in place.

Figure 8 – Cable Connections

3' (90 cm) and 6' (180 cm) cable extensions are available to increase the length of your camera cable up to 30 feet (9 m). To install an extension, first remove the camera head cable from the display unit by loosening the knurled knob. Connect the extension to the handheld as described above *(Figure 8)*. Connect the keyed end of the camera head cable to the slotted end of the extension and finger tighten the knurled knob to hold the connection in place.

Installing Accessories

The three included accessories, (Hook, Magnet, Mirror) all attach to the imager head the same way.

Figure 9 – Installing an Accessory

To connect, hold the imager head as shown in *Figure 9*. Slip the semicircle end of the accessory over the flats of the imager head. Then rotate the accessory a 1/4 turn to retain.

Installing SD™ Card

Open the left side port cover *(Figure 4)* to access the SD card slot. Insert the SD card into the slot making sure the contacts are facing towards you and the angled portion of the card is facing down *(Figure 10)* . SD cards can only be installed one way – do not force. When an SD card is installed, a small SD card icon will appear in the upper left hand portion of the screen, along with the number of images or length of video that can be stored on the SD card.

Figure 10 – Inserting the SD Card

Pre-Operation Inspection

⚠ WARNING

Before each use, inspect your Inspection Camera and correct any problems to reduce the risk of serious injury from electric shock and other causes and prevent tool damage.

1. Make sure the unit is OFF.
2. Remove the battery and inspect it for signs of damage. Replace battery if necessary. Do not use Inspection Camera if the battery is damaged.

3. Clean any oil, grease or dirt from the equipment. This aids inspection and helps prevent the tool from slipping from your grip.
4. Inspect micro CA-300 Inspection Camera for any broken, warn, missing or binding parts or any condition which may prevent safe and normal operation.
5. Inspect the camera head lens for condensation. To avoid damaging the unit, do not use the camera if condensation forms inside the lens. Let the water evaporate before using.
6. Inspect the full length of the cable for cracks or damage. A damaged cable could allow water to enter the unit and increase the risk of electrical shock.
7. Check to make sure the connections between the handheld unit, extension cables and imager cable are tight. All connections must be properly assembled for the cable to be water resistant. Confirm unit is properly assembled.
8. Check that the warning label is present, firmly attached and readable *(Figure 11)*.

Figure 11 – Warning Label

9. If any issues are found during the inspection, do not use the inspection camera until it has been properly serviced.
10. With dry hands, re-install the battery.
11. Press and hold the Power Button for one second. The imager lights should come on, then a splash screen will appear. Once the camera is ready, a live image of what the camera sees is displayed on the screen. Consult the *Troubleshooting* section of this manual if no picture appears.
12. Press and hold the Power Button for one second to turn camera OFF.

Tool and Work Area Set-Up

⚠ WARNING

Set up the micro CA-300 Inspection Camera and work area according to these procedures to reduce the risk of injury from electrical shock, entanglement and other causes and prevent tool damage.

1. Check work area for:
   - Adequate lighting
   - Flammable liquids, vapors or dust that may ignite. If present, do not work in area until sources have been identified and corrected. The micro CA-300 Inspection Camera is not explosion proof and can cause sparks.
   - Clear, level, stable, dry place for operator. Do not use the inspection camera while standing in water.
2. Examine the area or space that you will be inspecting and determine if the micro CA-300 Inspection Camera is the correct piece of equipment for the job.
   - Determine the access points to the space. The minimum opening the camera head can fit through is approximately 3/4" (19 mm) in diameter for the 17 mm camera head.
   - Determine the distance to the area to be inspected. Extensions can be added to the camera to reach up to 30' (9 m).
   - Determine if there are any obstacles that would require very tight turns in the cable. The inspection camera cable can go down to a 5" (127 mm) radius without damage.
   - Determine if there is any electrical power supplied to the area to be inspected. If so, the power to the area must be turned OFF to reduce the risk of electric shock. Use appropriate lock out procedures to prevent the power from being turned back on during the inspection.
   - Determine if any liquids will be encountered during the inspection. The cable

and imager head are waterproof to a depth of 10' (3 m). Greater depths may cause leakage into the cable and imager and cause electric shock or damage the equipment. The handheld display unit is water resistant (IP65) but should not be submerged in water.

- Determine if any chemicals are present, especially in the case of drains. It is important to understand the specific safety measures required to work around any chemicals present. Contact the chemical manufacturer for required information. Chemicals may damage or degrade the inspection camera.
- Determine the temperature of the area and items in the area. The working temperature of the inspection camera is between 32 to 130°F (0 to 55°C). Use in areas outside of this range or contact with hotter or colder items could cause camera damage.
- Determine if any moving parts are present in the area to be inspected. If so, these parts must be deactivated to prevent movement during inspection to reduce the risk of entanglement. Use appropriate lock out procedures to prevent the parts from moving during the inspection.

If the micro CA-300 Inspection Camera is not the correct piece of equipment for the job, other inspection equipment is available from RIDGID. For a complete listing of RIDGID products, see the RIDGID catalog, online at www.RIDGID.com or www.RIDGID.eu.

3. Make sure the micro CA-300 Inspection Camera has been properly inspected before each use.
4. Install the correct accessories for the application.

Operating Instructions

⚠ WARNING

Always wear eye protection to protect your eyes against dirt and other foreign objects.

Follow operating instructions to reduce the risk of injury from electrical shock, entanglement and other causes.

1. Make sure that the Inspection Camera and work area have been properly set up and that the work area is free of bystanders and other distractions.
2. Press and hold the Power Button for two seconds. The imager lights should come ON, then a splash screen will appear. This screen tells you the device is booting up. Once the product is fully powered up, the screen will automatically switch to the live screen.

Figure 12 – Splash Screen
(Note: Version will change with each firmware update.)

Live Screen

The live screen is where you will do most of your work. A live image of what the camera sees is displayed on the screen. You can zoom, adjust LED brightness and take images or video from this screen.

The screen has a status bar at the top showing the tool mode, zoom, SD™ card icon if inserted, available memory and speaker/mic ON/OFF. The bottom bar shows information about date and time if time stamp is ON.

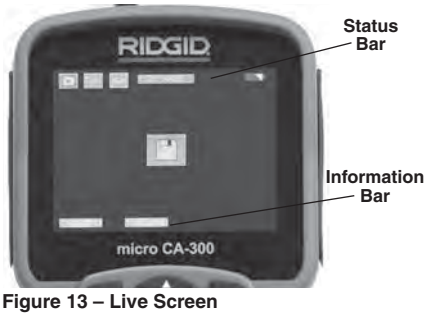

Figure 13 – Live Screen

When the Inspection Camera is turned ON, the default mode is for capturing still images.

Pressing the menu button at any time will access the menu. The menu will overlay on the LIVE Screen. Use the right and left arrow ➤◄ buttons to switch to the MODE category. Use the up and down arrows ▲▼ to navigate between menu items and press select ◈ as desired.

Figure 14 – Screen Shot of Mode Selection

3. If the other inspection camera settings (Time Stamp, Language, Date/Time, TV Out, Update Firmware, Speaker/Microphone, Auto Power OFF, Factory Reset) need to be adjusted, *see Menu* Section.
4. Prepare the camera for inspection. The camera cable may need to be pre-formed or bent to properly inspect the area. Do not try to form bends less than 5" (13 cm) radius. This can damage cable. If inspecting a dark space, turn the LEDs on before inserting the camera or cable.

   Do not use excessive force to insert or withdraw the cable. This may result in damage to the inspection camera or inspection area. Do not use the cable or imager head to modify surroundings, clear pathways or clogged areas, or as anything other than an inspection device. This may result in damage to the Inspection camera or inspection area.

Image Adjustment

Adjust LED Brightness : Pressing the right and left arrow button➤◄ on the button pad (In live screen) will increase or decrease the LED brightness. A brightness indicator bar will be displayed on the screen as you adjust brightness.

Figure 15 – Adjusting LED

Zoom : The micro CA-300 Inspection Camera has a 2.0x digital zoom. Simply press the up and down arrows ▲▼ while in the live screen to zoom in or out. A zoom indicator bar will be displayed on the screen as you adjust your zoom.

Figure 16 – Adjusting Zoom

Image Rotation : If needed, the image/video seen on the screen can be rotated in 90 degree increments counter clockwise by pressing the rotate image button ⟲.

Image Capture

Capturing a Still Image

While in the live screen, make sure the still camera icon 📷 is present at the top left portion of the screen. Press the shutter button to capture the image. The save icon 💾 will momentarily appear on the screen. This indicates the still image has been saved to the internal memory or SD™ card.

Capturing a Video

While in the live screen, make sure the video camera icon 🎞 is present at the top left portion of the screen. Press the shutter button to start capturing video. When the device is recording a video, a red outline will flash

around the video mode icon and the recording duration will show at the top of the screen. Press the shutter button again to stop the video. It may take several seconds to save the video if saving to the internal memory.

The micro CA-300 features an integrated microphone and speaker for recording and playback of audio with video. A headset with integrated microphone is included and may be used instead of the integrated speaker and microphone. Plug the headset into the audio port on the right side of the camera.

5. When the inspection is complete, carefully withdraw the camera and cable from the inspection area.

Figure 17 – Video Recording Screen

Menu

Pressing the Menu button ☰ at any time will access the menu. The menu will overlay on the LIVE Screen. From the menu, the user will be able to change to the various modes or enter the settings menu.

There are different setting categories to choose from *(Figure 18)* while in the settings screen. Use the right and left arrow buttons ➤➤ to switch from one category to the next. Use the up and down arrows ▲▼ to navigate the menu items. The selected category will be highlighted with a bright red outline. Once the desired setting is reached, press select to change to the new selection. The changes are automatically saved when they are changed.

While in menu mode, you can press the Return button ⮌ to return to the previous screen or to the live screen.

Figure 18 – Settings Screen

Playback Mode

1. Pressing the Select button ⏀ in the live screen will enter playback mode. Select either Image or Video to playback the desired file. The playback mode is the interface into saved files. It will default to the last file recorded.
2. While reviewing the image the user will be able to cycle through all saved images, delete an image and display file information.
3. While reviewing a video, a user will be able to navigate through videos, pause, restart and delete. A user will only be able to playback images and video from internal memory when SD™ Card is not inserted.

   Deleting Files

   Press Menu button ☰ while in playback mode to delete the image or video. The delete confirmation dialog allows the user to delete unwanted files. The active icon is outlined in red. Navigation is done with the arrow buttons ◁◇▷ .

Time Stamp

Enable or Disable the display of the Date and Time.

Language

Select the “Language” icon in the menu and press Select. Select different languages with up/down arrow buttons ▲▼, then press Select ⏀ to save the language setting.

Date/Time

Select Set Date or Set Time to set the current date or time. Select Format Date or Time to change how the date/time is displayed.

TV-Out

Select the “NTSC” or “PAL” to enable the TV-Out for the video format required. Screen will go black and image will be transmitted to external screen. To get live image on unit, hit Power button to disable function.

Update Firmware

Select Update Firmware to install the latest version of software on the unit. Software will have to be loaded onto a SD™ Card and inserted into the unit. Updates can be found at www.RIDGID.com.

Speaker

Select the Speaker icon in the menu and press Select . Select ON or OFF with up/down button▲▼ to keep the speaker ON or OFF during video playback.

Auto Power Off

Select the Auto Power Off icon and press select. Select disable to turn OFF the automatic shut down function. Select the 5 Minutes, 15 Minutes or 60 Minutes to turn OFF the tool upon 5/15/60 minutes of non-operation. Automatic shut down setting will not be activated when recording or playing video.

Factory Reset

Select the Reset icon and press Select. Confirm the reset function by selecting Yes and press Select again. This will reset the tool to the factory set up.

About

Select the About function to display the firmware revision of the micro CA-300 as well as the software copyright information.

Transferring Images to a Computer

With the unit powered ON, connect the micro CA-300 to a computer using the USB cable. The USB connected screen is displayed on the micro CA-300. The internal memory and SD™ card (if applicable) will appear as separate drives on the computer and are now accessible as a standard USB storage device. The copy and delete options are available from computer operation.

Connecting to TV

The micro CA-300 Inspection Camera can be connected to a television or other monitor for remote viewing or recording through the included RCA cable.

Open the right side port cover *(Figure 3)*. Insert the RCA cable into the TV-Out jack. Insert the other end of the cable into the Video-In jack on the television or monitor. **Check to make sure the video format (NTSC or PAL) output is set properly.** The television or monitor may need to be set to the proper input to allow viewing. Select the appropriate TV-Out format using the menu.

Use with SeeSnake® Inspection Equipment

The micro CA-300 Inspection Camera can also be used with various SeeSnake Inspection Equipment and is specifically designed to be used with the microReel, microDrain™ and the nanoReel Inspection Systems. When used with these types of equipment, it retains all of the functionality described in this manual. The micro CA-300 Inspection Camera can also be used with other SeeSnake Inspection Equipment for viewing and recording only.

For use with SeeSnake Inspection Equipment, the imager head and any cable extensions must be removed. For the microReel, microDrain™, nanoReel and similar equipment, see the operator’s manual for information on proper connection and use. For other SeeSnake Inspection Equipment (typically a reel and monitor), an adapter must be used to connect the micro CA-300 Inspection Camera to a Video-Out port on the SeeSnake Inspection Equipment. When connected in this manner, the micro CA-300 Inspection Camera will display the camera view and can be used for recording.

When connecting to SeeSnake Inspection Equipment (microReel, microDrain™, or nanoReel), align the interconnect module connected to your reel with the cable connector on the micro CA-300 Inspection Camera, and slide it straight in, seating it squarely. *(See Figure 19)*

Figure 19 – Camera Connector Plug Installed

NOTICE Do not twist the connector plug to prevent damage.

Locating the Sonde

If used with a sonde (In-Line Transmitter), the sonde can be controlled two ways. If the reel is equipped with a sonde key, that can be used to turn the sonde ON and OFF. Otherwise, the sonde is turned ON by decreasing LED brightness to zero. Once the Sonde has been located, the LEDs can be returned to their normal brightness level to continue the inspection.

A RIDGID locator such as the SR-20, SR-60, Scout®, or NaviTrack® II set to 512 Hz can be used to locate features in the drain being inspected.

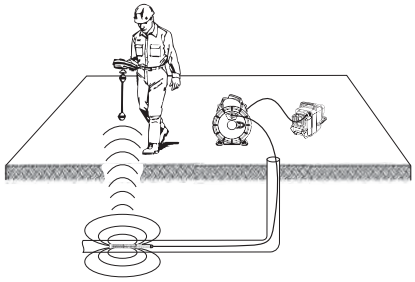

Figure 20 – Locating the Reel Sonde

To locate the Sonde, turn the locator ON and set it to Sonde mode. Scan in the direction of the Sonde's probable location until the locator detects the Sonde. Once you have detected the Sonde, use the locator indications to zero in on its location precisely. For detailed instructions on Sonde locating, consult the Operator's Manual for the locator model you are using.

Maintenance

⚠ WARNING

Remove battery before cleaning.

- Always clean the imager head and cable after use with mild soap or mild detergent.
- Gently clean the display screen with a clean dry cloth. Avoid rubbing too hard.
- Use only alcohol swabs to clean the cable connections.
- Wipe the hand held display unit down with a clean, dry cloth.

Reset Function

If the unit stops functioning and does not operate, press the Reset Button *(under the left side port cover – Figure 4)*. The unit may recover to normal operation when restarted.

Accessories

⚠ WARNING

To reduce the risk of serious injury, only use accessories specifically designed and recommended for use with the RIDGID micro CA-300 Inspection Camera such as those listed below. Other Accessories suitable for use with other tools may be hazardous when used with the micro CA-300 Inspection Camera.

micro CA-300 Inspection Camera Accessories

Catalog No.	Description
37108	3' (90 cm) Cable Extension
37113	6' (180 cm) Cable Extension
37103	Imager Head and Cable - 17 mm
37098	1m length 6mm diameter imager
37093	4m length 6mm diameter imager
37123	17mm Accessory Pack (Hook, Magnet, Mirror)
40028	AC Adapter
40623	Headset Accessory with Microphone

Further information on accessories specific to this tool can be found in the RIDGID Catalog and online at www.RIDGID.com or www.RIDGID.eu.

Storage

The RIDGID micro CA-300 Inspection Camera must be stored in a dry secure area between -4°F (-20°C) and 158°F (70°C) and humidity between 15% and 85% RH.

Store the tool in a locked area, out of the reach of children and people unfamiliar with the micro CA-300 Inspection Camera.

Remove the battery before any long period of storage or shipping to avoid battery leakage.

Service and Repair

⚠ WARNING

Improper service or repair can make the RIDGID micro CA-300 Inspection Camera unsafe to operate.

Service and repair of the micro CA-300 Inspection Camera must be performed by a RIDGID Independent Authorized Service Center.

For information on your nearest RIDGID Independent Service Center or any service or repair questions:

- Contact your local RIDGID distributor.
- Visit www.RIDGID.com or www.RIDGID.eu to find your local RIDGID contact point.
- Contact RIDGID Technical Services Department at rtctechservices@emerson.com, or in the U.S. and Canada call (800) 519-3456.

Disposal

Parts of the RIDGID micro CA-300 Inspection Camera contain valuable materials and can be recycled. There are companies that specialize in recycling that may be found locally. Dispose of the components in compliance with all applicable regulations. Contact your local waste management authority for more information.

For EC Countries: Do not dispose of electrical equipment with household waste!

According to the European Guideline 2002/96/EC for Waste Electrical and Electronic Equipment and its implementation into national legislation, electrical equipment that is no longer usable must be collected separately and disposed of in an environmentally correct manner.

Troubleshooting

SYMPTOM	POSSIBLE REASON	SOLUTION
Display turns ON, but does not show image.	Loose cable connections.	Check cable connections, clean if required. Re-attach.
	Imager is broken.	Replace the Imager.
	Imager head covered by debris.	Visually inspect imager head to make certain it is not covered by debris.
LEDs on imager head are dim at max brightness, display switches between black and white, color display turns itself OFF after a brief period.	Battery low on power.	Replace battery with charged battery.
Unit will not turn ON.	Dead battery.	Replace with charged battery.
	Unit need to be reset.	Reset unit. *See "Maintenance" Section.*

Battery Pack/Battery Charger Safety

⚠ WARNING

To reduce the risk of serious injury, read these precautions carefully before using the battery charger or battery

Battery Charger Safety

- **Charge only the RIDGID rechargeable battery listed in the Accessories Section with the RIDGID Battery Charger.** Other types of batteries may burst causing personal injury and property damage.
- **Do not probe battery charger with conductive objects.** Shorting of battery terminals may cause sparks, burns or electrical shock.
- **Do not insert battery into charger if charger has been dropped or damaged in any way.** A damaged charger increases the risk of electrical shock.
- **Charge battery in temperatures above 32°F (0°C) and below 122°F (50°C).** Store charger in temperatures above -4°F (-20°C) and below 104°F (40°C). Storage for a long time at temperatures above 104°F (40°C) can reduce the capacity of the battery. Proper care will prevent serious damage to the battery. Improper care of the battery may result in battery leakage, electrical shock and burns.
- **Use an appropriate power source.** Do not attempt to use a step-up transformer or an engine generator, doing so may cause damage to the charger resulting in electrical shock, fire or burns.
- **Do not allow anything to cover the charger while in use.** Proper ventilation is required for correct operation of the charger. Allow a minimum of 4" (10 cm) of clearance around the charger for proper ventilation.
- **Unplug the charger when not in use.** This reduces the risk of injury to children and untrained persons.
- **Unplug the charger from outlet before attempting any maintenance or cleaning.** Reduces the risk of electrical shock.
- **Do not charge battery in damp, wet or explosive environment.** Do not expose to rain, snow or dirt. Contaminants and moisture increase the risk of electrical shock.
- **Do not open the charger housing.** Have repairs performed only at authorized locations.
- **Do not carry charger by power cord.** Reduces the risk of electrical shock.
- The RIDGID Battery Charger is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the RIDGID Battery Charger by a person responsible for their safety.
- **Keep children and by-standers away while operating equipment.** Distractions can cause you to lose control.
- **Have your equipment (including power supply cord) serviced by a qualified repair person using only identical replacement parts. If the equipment is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.** This will ensure that the safety of the tool is maintained.

Battery Safety

- **Properly dispose of the battery.** Exposure to high temperatures can cause the battery to explode, so do not dispose of in a fire. Place tape over the terminals to prevent direct contact with other objects. Some countries have regulations concerning battery disposal. Please follow all applicable regulations.
- **Do not insert the battery with cracked case into charger.** Damaged batteries increase the risk of electrical shock.
- **Never disassemble battery.** There are no user-serviceable parts inside the battery. Disassembling batteries may cause electrical shock or personal injury.
- **Avoid contact with fluids oozing from defective battery.** Fluids may cause burns or skin irritation. Thoroughly rinse with water in case of accidental contact with fluid. Consult doctor if fluid comes into contact with eyes.

Description and Specifications

Description

The RIDGID Battery Charger (Catalog Number 37088), when used with appropriate batteries (Catalog Number 37083) listed in the Accessories section, is designed to charge a 3.7V Li-Ion RIDGID battery in approximately 4-5 hours. This charger requires no adjustments.

Figure 21 – Battery and Charger

Specifications

Input .....100-240 VAC, 50/60 Hz
Output.....4.2 V DC
Battery Type .....3.7 V Li-Ion
Battery Capacity.....4.2Ah
Input Current .....0.3A (AC) / 1A (DC)
Weight .....0.4 lbs (0,02 kg)
Charging Time.....4 to 5 Hrs
Cooling .....Passive Convection Cooling (No Fan)

Charger Inspection and Set-Up

⚠ WARNING

Before use, inspect the charger and batteries and correct any problems. Set up charger according to these procedures to reduce the risk of injury from electrical shock, fire, and other causes and prevent tool and system damage. Always wear eye protection to protect your eyes against dirt and other foreign objects.

1. Make sure the charger is unplugged. Inspect the power cord, charger and battery for damage or modifications, or broken, worn, missing, misaligned or binding parts. If any problems are found, do not use charger until the parts have been repaired or replaced.
2. Clean any oil, grease or dirt from the equipment as described in the *Cleaning Instructions* section, especially handles and controls. This helps prevent the equipment from slipping from your grip and allows proper ventilation.
3. Check to see that all warning labels and decals on the charger and battery are intact and readable. *(See Figures 22 & 23.)*

Figure 22 – Label on Charger

Figure 23 – Label on Battery

4. Select an appropriate location for the charger before use. Check work area for:
   - Adequate lighting.
   - Clear, level, stable, dry place for charger. Do not use the device in wet or damp areas.
   - Proper operating temperature range. The charger and battery must both be between 32°F (0°C) and 122°F (50°C) for charging to begin. If the temperature of either is outside of this range at any point during charging, the operation will be suspended until brought back to the correct temperature range.

- Appropriate power source. Check to see that the plug fits correctly into the desired outlet.
- Sufficient ventilation. The charger needs a clearance of at least 4" (10 cm) on all sides to maintain a proper operating temperature.

5. Plug cord into charger.
6. With dry hands, plug charger into the appropriate power source.

Charging Procedure/Operating Instructions

⚠ WARNING


Always wear eye protection to protect your eyes against dirt and other foreign objects.

Follow operating instructions to reduce the risk of injury from electrical shock.

NOTE! New batteries reach their full capacity after approximately 5 charging and discharging cycles.

1. Set up charger according to the *Charger Inspection and Set Up* section.
2. The charger conducts a 1-second life test during which the LED blinks from red to green. The charger then goes into standby mode in which the LED is OFF.
3. With dry hands, insert the battery pack onto the charger. The battery pack will begin charging automatically. While the battery is charging, the red LED will glow solid.
4. When the battery is fully charged, the green LED glows solid. Remove the battery. Once the battery is charged, it may remain on the charger until it is ready to be used. There is no risk of over-charging the battery. When the battery has been fully charged, the charger automatically switches to retention charging.
5. With dry hands, unplug the charger from the outlet once charging is complete.

Cleaning Instructions

⚠ WARNING

Unplug the charger before cleaning. Do not use any water or chemicals to clean charger or batteries to reduce the risk of electrical shock.

1. If present, remove battery from charger.
2. Remove any dirt or grease from the exterior of the charger and battery with a cloth or soft non-metallic brush.

Accessories

⚠ WARNING

To reduce the risk of serious injury, only use accessories specifically designed and recommended for use with the RIDGID Li-Ion Battery Charger such as those listed below. Other Accessories suitable for use with other tools may be hazardous when used with the RIDGID Li-Ion Battery Charger.

Catalog No.	Description
37088	micro CA-300 Charger
37083	micro CA-300 3.7V Li-Ion Battery
30758	microEXPLORER Charger
30198	microEXPLORER 3.7V Li-Ion Battery

Further information on accessories specific to the charger can be found in the RIDGID Catalog and online at www.RIDGID.com or www.RIDGID.eu.

Storage

Store the charger and the batteries in a dry, secured, locked area that is out of reach of children and people not familiar with proper charger operation.

The batteries and charger should be protected against hard impacts, moisture and humidity, dust and dirt, extreme high and low temperatures and chemical solutions and vapors.

Long-term storage in temperatures above 104°F (40°C) can permanently reduce the capacity of the batteries.

Service and Repair

⚠ WARNING

Improper service or repair can make the RIDGID micro CA-300 Inspection Camera unsafe to operate.

There are no user-serviceable parts for this charger or batteries. Do not attempt to open charger or battery cases, charge individual battery cells or clean internal components.

Service and repair of the charger must be performed by a RIDGID Independent Authorized Service Center.

For information on your nearest RIDGID Independent Service Center or any service or repair questions:

- Contact your local RIDGID distributor.
- Visit www.RIDGID.com or www.RIDGID.eu to find your local RIDGID contact point.
- Contact RIDGID Technical Services Department at rtctechservices@emerson.com, or in the U.S. and Canada call (800) 519-3456.

Disposal

RIDGID® is licensed with the Call2Recycle® program, operated by the Rechargeable Battery Recycling Corporation (RBRC). As a licensee, RIDGID pays the cost of recycling RIDGID rechargeable batteries.

In the U.S. and Canada, RIDGID and other battery suppliers use the Call2Recycle program network of over 30,000 collection locations to collect and recycle rechargeable batteries. This helps protect the environment and conserve natural resources. Return your used batteries to a collection location for recycling. Call the toll-free number found on the RBRC recycling seal (1.800.822.8837) or visit www.call2recycle.org for collection locations.

For EC Countries: Defective or used battery packs/batteries must be recycled according to the guideline 2006/66/EEC.

RIDGID

Operator's Manual

SeeSnake® nanoReel™

⚠ WARNING!

Read this Operator's Manual carefully before using this tool. Failure to understand and follow the contents of this manual may result in electrical shock, fire and/or serious personal injury.

SeeSnake® nanoReel™	
Record product serial number below as it appears on the nameplate.	
Serial No.	

Table of Contents

Safety Symbols

In this operator's manual and on the product, safety symbols and signal words are used to communicate important safety information. This section is provided to improve understanding of these signal words and symbols.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE NOTICE indicates information that relates to the protection of property.

This symbol means read the operator's manual carefully before using the equipment. The operator's manual contains important information on the safe and proper operation of the equipment.

This symbol means always wear safety glasses with side shields or goggles when handling or using this equipment to reduce the risk of eye injury.

This symbol indicates the risk of electrical shock.

General Safety Rules

⚠ WARNING

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

SAVE THESE INSTRUCTIONS!

Work Area Safety

- **Keep your work area clean and well lit.** Cluttered or dark areas invite accidents.
- **Do not operate equipment in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust.** Equipment can create sparks which may ignite the dust or fumes.
- **Keep children and bystanders away while operating equipment.** Distractions can cause you to lose control.

Electrical Safety

- **Avoid body contact with earthed or grounded surfaces such as pipes, radiators, ranges, and refrigerators.** There is an increased risk of electrical shock if your body is earthed or grounded.
- **Do not expose equipment to rain or wet conditions.** Water entering equipment will increase the risk of electrical shock.
- **Do not abuse the cord.** Never use the cord for carrying, pulling, or unplugging the power tool. Keep cord away from heat, oil, sharp edges, and moving parts. Damaged or entangled cords increase the risk of electric shock.
- **If operating equipment in a damp location is unavoidable, use a ground fault circuit interrupter (GFCI) protected supply.** Use of a GFCI reduces the risk of electric shock.
- **Keep all electrical connections dry and off the ground.** Do not touch equipment or plugs with wet hands to reduce the risk of electrical shock.

Personal Safety

- **Stay alert, watch what you are doing, and use common sense when operating equipment.** Do not use equipment while you are tired or under the influence of drugs, alcohol, or medication. A moment of inattention while operating equipment may result in serious personal injury.
- **Use personal protective equipment.** Always wear eye protection. The appropriate use of protective equipment such as a dust mask, non-skid safety shoes, a hard hat, and hearing protection will reduce personal injuries.
- **Do not overreach.** Keep proper footing and balance at all times. This enables better control of the equipment in unexpected situations.
- **Dress properly.** Do not wear loose clothing or jewelry. Keep your hair, clothing, and gloves away from moving parts. Loose clothes, jewelry, and long hair can be caught in moving parts.

Equipment Use and Care

- **Do not force equipment.** Use the correct equipment for your application. The correct equipment will do the job better and safer at the rate for which it is designed.

- **Do not use equipment if the power switch does not turn it ON and OFF.** Any equipment that cannot be controlled with the power switch is dangerous and must be repaired.
- **Disconnect the plug from the power source and/or the battery pack from the equipment before making adjustments, changing accessories, or storing.** Preventive safety measures reduce the risk of injury.
- **Store idle equipment out of the reach of children and do not allow persons unfamiliar with the equipment or these instructions to operate the equipment.** Equipment can be dangerous in the hands of untrained users.
- **Maintain equipment.** Check for misalignment or binding of moving parts, missing parts, breakage of parts, and any other condition that may affect the equipment's operation. If damaged, have the equipment repaired before use. Many accidents are caused by poorly maintained equipment.
- **Use the equipment and accessories in accordance with these instructions; taking into account the working conditions and the work to be performed.** Use of the equipment for operations different from those intended could result in a hazardous situation.
- **Use only accessories that are recommended by the manufacturer for your equipment.** Accessories that may be suitable for one piece of equipment may become hazardous when used with other equipment.
- **Keep handles dry, clean, and free from oil and grease.** This allows for better control of the equipment.

Service

Ensure a qualified repair person services your equipment using only identical replacement parts to maintain the safety of the tool. Remove the batteries and refer servicing to qualified service personnel under any of the following conditions:

- If liquid has been spilled or objects have fallen into product.
- If the product does not operate normally when following the operating instructions.
- If the product has been dropped or damaged.
- When the product exhibits a distinct change in performance.

Specific Safety Information

⚠ WARNING

This section contains important safety information that is specific to the nanoReel. Read these precautions carefully before using the nanoReel to reduce the risk of electrical shock, fire, or other serious personal injury.

SAVE ALL WARNINGS AND INSTRUCTIONS FOR FUTURE REFERENCE!

Keep this manual with the equipment for use by the operator.

SeeSnake nanoReel Safety

- **An improperly grounded electrical outlet can cause electrical shock and/or severely damage equipment.** Always check work area for a properly grounded electrical outlet. Presence of a three-prong or GFCI outlet does not ensure that the outlet is properly grounded. If in doubt, have the outlet inspected by a licensed electrician.
- **Do not operate this equipment if operator or nanoReel is standing in water.** Operating the nanoReel while in water increases the risk of electrical shock.
- **The nanoReel system camera and push cable are waterproof.** The monitor and other electrical equipment and connections are not waterproof. To decrease the risk of electrical shock, do not expose the equipment to water or rain.
- **Do not use where a danger of high voltage contact is present.** The equipment is not designed to provide high voltage protection and isolation.
- **Read and understand this operator's manual, the reel operator's manual, the instructions for any other equipment in use and all warnings before operating the nanoReel.** Failure to follow all instructions and warnings may result in property damage and/or serious personal injury.
- **Always use appropriate personal protective equipment when handling and using equipment in drains.** Drains may contain chemicals, bacteria, and other substances that may be toxic, infectious, cause burns or other issues. Appropriate personal protective equipment always includes safety glasses and may include drain cleaning gloves or mitts, latex or rubber gloves, face shields, goggles, protective clothing, respirators, and steel toed footwear.
- **If using drain cleaning equipment at the same time as drain inspection equipment, only wear RIDGID drain cleaning gloves.** Never grasp the rotating drain cleaning cable with anything else, including other gloves or a rag which can become wrapped around the cable and cause hand injuries. Only wear latex or rubber gloves under RIDGID drain cleaner

gloves. Do not use damaged drain cleaning gloves.

- **Practice good hygiene.** Use hot, soapy water to wash hands and other body parts exposed to drain contents after handling or using drain inspection equipment. To prevent contamination from toxic or infectious material, do not eat or smoke while operating or handling drain inspection equipment.

The information supplied with this product cannot cover all possible conditions and situations that may occur, and should be used in conjunction with appropriate training, sound judgment, and good work practices. These factors cannot be built into the product, but must be supplied by the operator.

The EC Declaration of Conformity (890-011-320.10) will accompany this manual as a separate booklet when required.

Description, Specifications, and Standard Equipment

Description

The nanoReel is a modern, portable SeeSnake diagnostic reel and camera that has the flexibility and adaptability to view small pipes, tubes, voids, and conduits. It contains a unique, removable cable drum which makes cleaning and replacing push cables convenient. Since the nanoReel comes with a removable system cable, it can be used with any SeeSnake camera control unit or with the hand-held micro CA-300 inspection camera.

The nanoReel uses an advanced push cable design and a proprietary small radius camera design which allows camera inspection through pipes with very small diameters, P-traps, and very small radius bends which conventional inspection systems often cannot inspect.

When using the nanoReel with an appropriate SeeSnake control unit, the operator can connect an external line transmitter and use a standard locator to line-trace the path of the nanoReel push cable in a pipe.

Specifications

Table 1
SeeSnake nanoReel Specifications

Weight:	
with micro CA-300 inspection camera	14.65 lb [6.6 kg]
without micro CA-300 inspection camera	9.15 lb [4.1 kg]
Dimensions:	
Length	13.25 in [33.6 cm]
Depth	6.6 in [16.7 cm)
Height	14.2 in [36 cm]
Frame diameter	12.75 in [32 cm]
Camera specifications:	
Length	0.88 in [22.5 mm]
Diameter	0.61 in [15.5 mm]
Sonde	512 Hz
Lighting	6 LEDs
Resolution:	
NTSC	656 × 492 pixels
PAL	768 × 576 pixels
Push cable:	
Length	82 ft [25 m]
Diameter	0.25 in [6.3 mm]
Bend radius	1 in [25 mm]
Pipe capacity*	1 in [25 mm]
Operating environment:	
Temperature	32°F – 115°F [0°C – 46°C]
Storage temperature	–4°F – 158°F [–20°C – 70°C]
Humidity	5% – 95% RH
Waterproof depth	225 ft [70 m]

* The nanoReel will traverse a 1 in [25 mm] straight pipe, but its ability to go past 90-degree turns will depend on the material and construction of individual pipes and joints. Test the material you intend to inspect to ensure the camera can pass through turns successfully. Some fittings in small diameter joints will allow passage of the camera in only one direction.

Standard Equipment

- nanoReel
- Operator's Manual
- Instructional DVD
- Ball Guides (two sizes)

nanoReel Components

Figure 1 – Front View (SeeSnake Configuration)

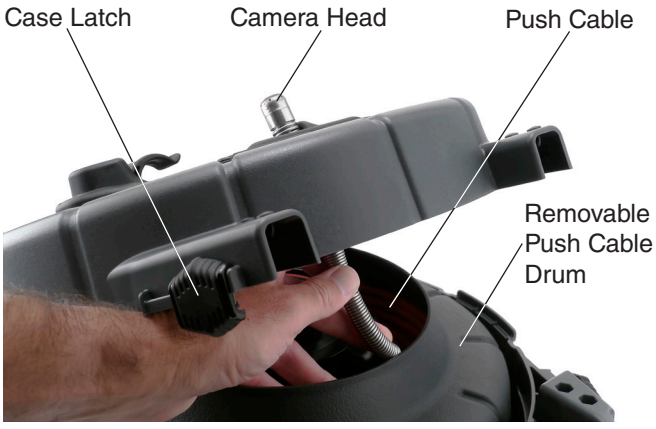

Figure 2 – Inside Case

Figure 3 – Rear View (with the micro CA-300 inspection camera)

Icon Legend

Table 2
micro CA-300 Icons

Icon	Meaning
	Return Key
	Shutter Key
	Select Key
	Arrow Keys
	Power Key
	Rotate Image Key
	Menu Key

Assembly

⚠ WARNING

To reduce the risk of serious injury, properly assemble the nanoReel in accordance with these procedures.

Camera Head Routing

1. Set the unit on a level surface and lay it on its back.
2. Unfasten the case latches on either side of the nanoReel (*See Figure 4)*.

Figure 4 – Unlatching the nanoReel Case

3. Open the front case and locate the camera head in the push cable drum.
4. Route the camera head out through the push cable guide in the front of the case (*See Figure 5).*
5. Secure the camera head in the provided clip (*See Figure 6).*
6. Close and relatch the case.

Figure 5 – Routing the Camera Head

Figure 6 – Camera Head Properly Routed

Installing System Cable

NOTICE **Do not touch the contact pins inside the slip-ring module or insert any tool inside the well where the pins are located. Avoid stressing or breaking the contact pins.**

To avoid breaking the contact pins, do not press sideways on the pins (*See Figure 7).*

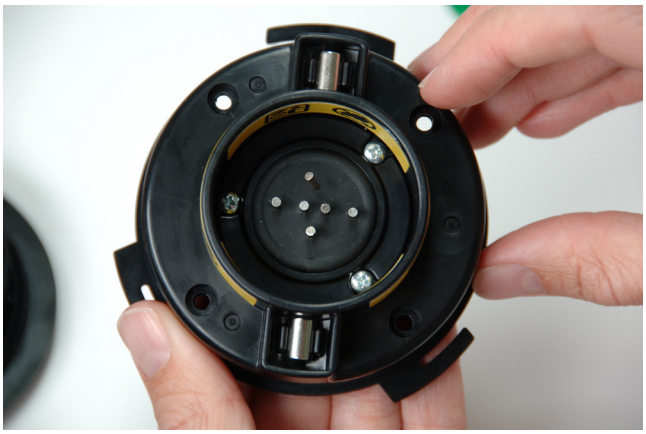

Figure 7 – Broken Contact Pin

If the system cable slip-ring module is not installed, insert the slip-ring module into the hub *(See Item 1, Figure 8)*. Twist the slip-ring module clockwise until it locks into position *(See Item 2, Figure 8)*.

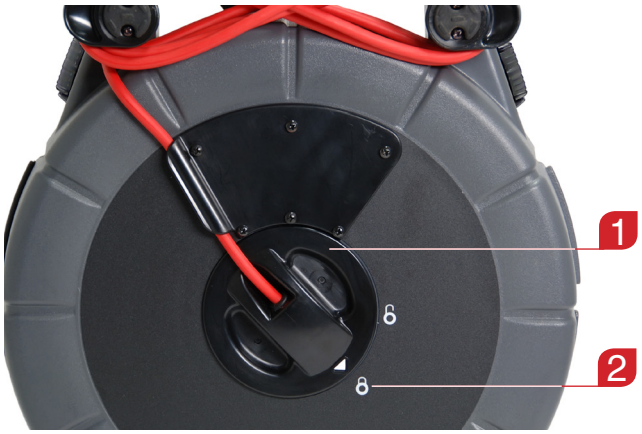

Figure 8 – Locking the Slip-Ring Module Cover

Reversing/Installing the Display Cradle (micro CA-300 Inspection Camera)

If using the nanoReel with the micro CA-300, it may be more convenient to face the micro CA-300 display the other way when seated in its cradle. To reverse the orientation of the cradle, perform the following:

1. Remove the micro CA-300 from the cradle *(See Item 1, Figure 9)*. Use a Philips screwdriver to remove the four screws holding the cord wrap arms and the cradle's support arms to the case openings *(See Item 2 and Item 3, Figure 9)*. Remove the cord-wrap arms after removing the screws.

Figure 9 – Cradle Support and Cord-Wrap Arms

2. Use one of the screws to remove the nuts from the backside of the cradle. The nuts are friction-fitted into the holes on the opposite side of the cradle from the cord-wrap arms. Extract the nut by inserting a screw from the back and threading it two or three turns into the nut.
3. Without taking the nut off, insert the screw and nut into the hole on the opposite side of the case. Tap the screw firmly with the handle of the screwdriver to seat the nut into the friction-fit at the bottom of the hole.
4. Unthread the screw. Repeat for each of the remaining three nuts.
5. Position the cord-wrap arm and cradle on the same side of the case, facing in the opposite direction. Make sure the cord-wrap horns point outward.
6. Start each screw into its nut by hand. Tighten the screws hand-tight with a screwdriver.
7. Replace the display unit in the cradle.

Install the display cradle using a similar process.

Connecting the micro CA-300 Inspection Camera to the nano*Reel* System

Align the micro CA-300 Camera Connector Plug with the plug on the micro CA-300 Camera, slide it straight in, and seat it squarely. The curved face of the connector plug on the system cable faces upward, sliding under the forward edge of the micro CA-300 camera monitor when fully seated (*See Figure 10)*.

NOTICE **To prevent damaging the plug, do not twist the connector plug.**

Figure 10 – Connecting the micro CA-300 Camera Monitor

nanoReel Ball Guides

Ball guides help center the camera in pipes and keeps the camera clear of bottom sludge in the pipe. Ball guides also improve picture quality, allows the camera to see equally in all directions, and keeps the lens free of sludge by bringing the camera closer to the center of the pipe.

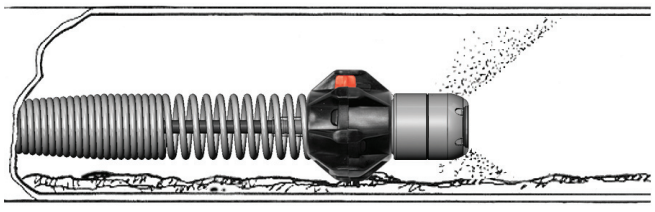

Figure 11 – Ball Guide in Use

Use ball guides whenever possible to reduce wear and tear on the camera system. Ball guides can be easily removed or adjusted to allow for better movement in pipes as needed. For example, placing two ball guides near the front end of the camera may bias the camera head upward to allow better viewing of the top of the pipe during an inspection. Ball guides can also help negotiate some passages, such as those shown in the Operating Instructions of this manual.

The nanoReel has two different ball guides: a clip-on ball guide and a smaller guide called a Camera Head Pipe Guide.

Installing Ball Guides

The ball guides are designed to slip easily onto the camera spring and lock into place. The ball guide has two red sliding locks and two blue latches (*See Figure 12).*

Figure 12 – Ball Guide Installation

Install the ball guides in accordance with the following:

1. Slide the red sliding locks away from the blue latches on both sides of the guide.
2. Press the small tabs on the blue latches so they click outward (away from each other).
3. Slide the ball guide into position over the camera head.
4. Press down on the shoulders of the blue latches so the latches are pressed in toward each other and lock into the spring.
5. Slide the two red sliding locks back over their respective blue latches so they cannot pop out while in use.

For smaller pipes, tubes, or voids, the Camera Head Pipe Guide may be installed in lieu of the clip-on ball guide. To install the Camera Head Pipe Guide perform the following.

1. Unscrew the two securing screws holding the two halves of the ball guide together.
2. Seat the two halves around the camera head with their screw-holes aligned.
3. Fasten the two halves together with the two screws provided. Do not over-tighten.

Pre-Operation Inspection

⚠ WARNING

Before each use, inspect your nanoReel and correct any problems to reduce the risk of serious injury from electrical shock or other causes and prevent machine damage.

1. Confirm that the power is OFF. If using the nanoReel with a camera control unit (CCU) other than the micro CA-300, confirm that the CCU is not connected to the unit. Inspect the system cable and connectors for damage or modification.
2. Clean any dirt, oil, or other contamination from the nanoReel to aid in inspection and to prevent the unit from slipping from your grip during transport or use.
3. Inspect the nanoReel for any broken, worn, missing, misaligned, or binding parts, or any other condition that might prevent safe, normal operation. Confirm that the unit is properly assembled. Make sure that the drum turns freely. Inspect the push cable for any cuts, breaks, kinks, or ruptures.
4. Inspect any other equipment being used to ensure it is in good, usable condition as specified by the manufacturer.
5. Correct any problems before use.

Work Area and Equipment Set Up

⚠ WARNING

Set up and operate the nanoReel and work area in accordance with these procedures to reduce the risk of injury from electrical shock, fire, crushing injuries, and other causes, and to prevent damage to the nanoReel.

Always wear eye protection to protect your eyes against dirt and other foreign objects.

1. Check work area for the following:
   - Adequate lighting.
   - Flammable liquids, vapors, or dust that may ignite. If present, do not work in area until sources have been identified and corrected. The nanoReel is not explosion

proof. Electrical connections can cause sparks.

- Clear, level, stable dry place for machine and operator. Do not use the machine while standing in water. If required, remove the water from the work area. Ensure the nanoReel is stable.
- Clear path to electrical outlet if used for monitor, that does not contain any potential sources of damage for the power cord.

2. If possible, inspect the work to be done. Determine the drain access points, sizes, and lengths, and the presence of chemicals. If chemicals are present, understand the specific safety measures required to work around those chemicals. Contact the chemical manufacturer for required information.
3. If needed, remove fixtures such as the water closet or sink, to obtain better access.
4. Determine the correct equipment for the application. The nanoReel is designed for lines no greater than 80 ft [24.4 m] long and for lines with diameters from 1 in to 3 in [25.4 mm to 76.2 mm].
5. Properly inspect all equipment.
6. Evaluate the work area and use barriers to keep bystanders away as needed. Bystanders can distract the operator during use. If working near traffic, erect cones or other barriers to alert drivers.

Setting Up the nanoReel

Connections

When using the nanoReel with a micro CA-300, no additional connections beyond those described in the assembly section are needed when setting up the unit for an inspection.

To use the nanoReel with a SeeSnake CCU perform the following:

1. Unwrap the SeeSnake System Cable from its holder, pull back the locking sleeve, and match the System Cable plug to the matching SeeSnake System Connector on the CCU *(See Item 1, Figure 13)*.
2. To join the connectors, align the guide pin to the guide socket, push the connector straight in. A guide ridge molded into the top of the cable connector will point up when the plug is correctly aligned *(See Item 2, Figure 13)*.
3. Tighten the outer locking sleeve.

Figure 13 – Connecting to a SeeSnake CCU

NOTICE When connecting or disconnecting the System Cable, twist only the locking sleeve! To prevent damage to pins, never bend or twist the connector or cable!

The nanoReel can be used with any SeeSnake CCUs by changing the system cable as specified in the assembly section.

Set up the micro CA-300 or CCU in accordance with its instructions. If using the micro CA-300 or a battery powered CCU, make sure that the required batteries are fully charged and installed.

Placement

1. Place the micro CA-300 or CCU monitor next to the push cable entry point or other area to allow easy viewing while manipulating the push cable and camera. The location should not be wet or allow the monitor unit to get wet during use.
2. Set the nanoReel approximately 6 ft [2 m] from the entry point to provide ample room to grasp and manipulate the push cable without allowing excess cable to drag on the ground. When properly located, the push cable will only come off the nanoReel when pulled.
3. Preferably, lay the nanoReel on its back with the camera unit and push cable on top. The foot pads on the cord wrap will cushion the nanoReel when placed on its back. This position provides the greatest stability and prevents the nanoReel from tipping during use.

Operating Instructions

⚠ WARNING

Always wear eye protection to protect your eyes against dirt and other foreign objects.

When inspecting drains that might contain hazardous chemicals or bacteria, wear appropriate protective equipment, such as latex gloves, goggles, face shields, and respirators to prevent burns and infections.

Do not operate this equipment if operator or machine is standing in water. Operating the machine while in water increases the risk of electrical shock. Rubber soled, non-slip shoes can help prevent slipping and electric shock, especially on wet surfaces.

Perform the following to reduce the risk of injury from electrical shock and other causes:

1. Make sure all equipment is properly set up.
2. Pull several feet of push cable from the nanoReel. Make sure the camera window is clean. In some cases, placing a slight film of detergent on the window can minimize debris sticking to the window. Place the camera unit into the line to be inspected.
3. Turn the CCU ON. Adjust the camera head LED lighting brightness and the display image as specified by the CCU operator's manual. Make adjustments to the brightness as necessary. For instance, white PVC pipe requires less light than black PVC. Slight adjustments in lighting brightness can highlight issues discovered during an inspection. Always use the least amount of lighting to maximize picture quality and reduce heat buildup.
4. To record the inspection, follow the instructions in the specific CCU operator's manual.
5. If possible, run water through the system during the inspection to help keep the system clean, to make pushing the push cable easier, and to help orient the image at the bottom of the pipe. This can be done by placing a hose down the line or turning on a fixture (for example: flushing a toilet). Shut off water flow as needed for viewing.
6. Grip the push cable and carefully feed it into the drain to be inspected. Use rubber gripper type gloves to manipulate the push cable to improve grip and to help keep hands clean.

NOTICE **Use of the nanoReel camera in porcelain appliances scratch the surface finish of the porcelain. To avoid scratching, use a curved non-marking pipe segment (such as PVC or ABS pipe) to lead the camera past the porcelain bowl and into the drain. See the "Using Guide Tubes" section in this Operator's Manual for more information.**

Figure 14 – Performing an Inspection

When pushing the push cable in to the line, keep the push cable clear of any sharp edges on the inlet that could cut, grab, or damage the push cable. Grasp and push short sections of push cable at a time and keep your hands near the inlet to better control the push cable and to prevent it from folding over, snapping, cutting or otherwise damaging the push cable jacket. Cutting the push cable jacket could increase the risk of electrical shock.

When feeding the push cable into the line, watch the monitor to see what is coming. When the lights are set at less than maximum setting, it may help to occasionally turn the brightness up to see what is coming further down the line.

Be aware of obstructions (such as crushed pipe) or excessive hard build up in the line that could prevent retrieval of the camera. Do not try to use the camera head to clear obstructions. The nanoReel 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, preventing removal.

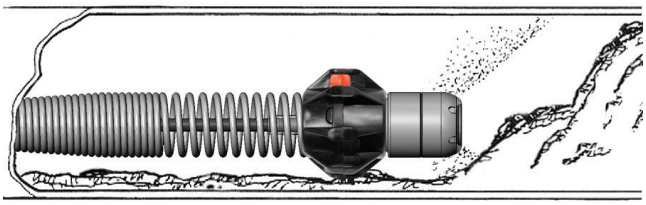

Figure 15 – Encountering an Obstruction: Do Not Use Camera Head to Clear Obstructions

A slow steady push through the system works best. At changes in direction such as P-traps, Tees, Ys, and elbows use a quick push to “pop” the camera head around the bend by pulling the camera head back from the bend approximately 8 in [20 cm] and then quickly thrusting it through the bend. Be as gentle as possible and do not use more force than required. Excessive force can damage the camera head. Do not hammer or snap the camera through bends. Do not force the camera head through if there is a large amount of resistance. Be especially careful through Tees, as the push cable could fold over in the Tee and make retrieval difficult or impossible.

Watch to make sure that the drum does not hang up during use. If the drum hangs up and the push cable continues to be pulled from the nanoReel, the push cable will tighten around the hub of the drum, jam inside the drum, and stress the push cable.

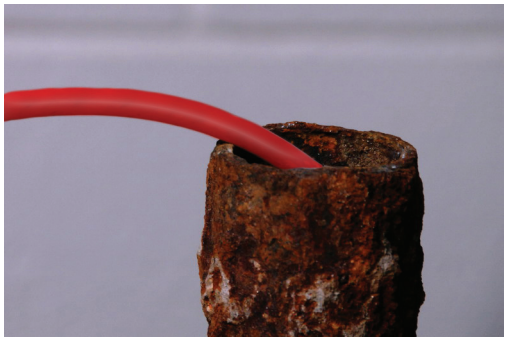

Figure 16 – Avoid Pulling at Sharp Angles

When inspecting the line, try moving the camera head past the area to be inspected and slowly pull it back for better results. Pulling the camera head back may provide more controlled and consistent viewing. When pulling the push cable, keep clear of sharp edges and do not pull at sharp angles to the inlet to prevent damage to the push cable. If needed, jiggle the camera head in standing water to rinse any debris from the camera window.

Depending on what is encountered during the inspection, it may help to add, remove, or change the position of ball guides on the camera head. Ball guides may be able direct the camera towards a section of the line (such as the top), raise the camera head out of the liquid in the pipe, and help negotiate bends; especially at tight turns such as in a toilet flange (*See Figure 17, Figure 18, and Figure 19).* See the “Installing Ball Guides” section in this Operator’s Manual for more information.

Figure 17 – Camera Head Blocked in Turn

Figure 18 – Camera Head with Ball Guide in Turn

Figure 19 – Successful Passage

Locating the nanoReel Sonde

The nanoReel is equipped with a Sonde, built into the camera head, which transmits a locatable 512 Hz signal, allowing you to detect the camera's location underground.

Controlling the Sonde from a SeeSnake CCU is described in the operator's manual for the CCU and depends on the model being used. Typically, the Sonde can be turned ON and OFF from the CCU. If using the nanoReel with the micro CA-300, activate the Sonde by turning the LED brightness control down to zero. Once the Sonde has been located, the LEDs can be returned to normal brightness to continue the inspection.

When the nanoReel Sonde is turned ON, a locator such as the RIDGID-SeekTech SR-20, RIDGID-SeekTech SR-60, Scout, or NaviTrack® II set to 512 Hz can detect it.

To locate the camera using the Sonde, run the SeeSnake push cable from 5 ft to 10 ft [1.5 m to 3 m] into the pipe and use the locator to find the Sonde's position. If desired, extend the SeeSnake push cable from 5 ft to 10 ft [1.5 m to 3 m] further down-pipe and locate the Sonde again starting from the previous located position. To locate the Sonde, turn the locator ON and set it to Sonde mode. Scan in the direction of the Sonde's probable location until the locator detects the Sonde.

Once you have detected the Sonde, use the locator indications to zero in on its location precisely. For detailed instructions on Sonde locating, consult the operator's manual for the locator model you are using.

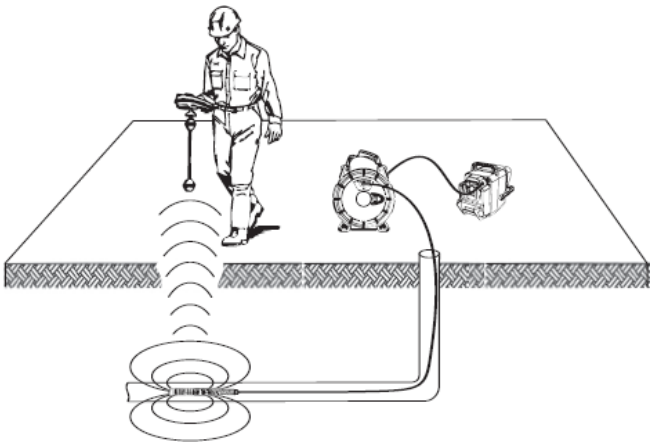

Figure 20 – Locating the nanoReel Sonde

Retrieving the Camera

After completing the inspection, pull the push cable back with slow, steady force. If possible, continue running water down the line to help clean the push cable. Use a towel to wipe off the push cable as it is withdrawn.

Pay attention to the force required to withdraw the push cable. The push cable may get hung up while being retrieved and may need to be manipulated as done during insertion. Do not force the push cable or exert excessive force to avoid damaging the camera or push cable. When pulling the push cable, keep clear of any sharp edges and do not pull at sharp angles to the inlet to prevent damage to the push cable.

NOTICE **Always use short strokes to feed back small lengths of the push cable back into the drum. Pushing back longer lengths of push cable or forcing the push cable may cause it to loop, kink and break (See Figure 21). Lay the nanoReel drum on its back for more stability when retrieving the push cable.**

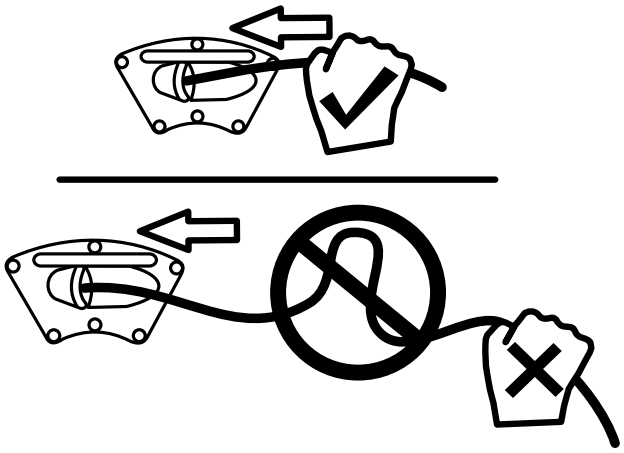

Figure 21 – Putting Back the Push Cable

Using Guide Tubes

Use guide tubes, such as PVC or flexible tubing, to avoid marring or scratching porcelain surfaces (*See Figure 22).*

Figure 22 – Guide Tubes

Use PVC pipe and conduit to form a guide tube with a curved access tube at the bottom to guide the push cable past the porcelain without damage (*See Figure 23).*

Figure 23 – Using a PVC Guide Tube

Use ribbed flexible conduit to fashion a flexible guide tube similar to the PVC guide tube (*See Figure 24*).

Figure 24 – Using the Flexible Guide Tube

Cleaning

⚠ WARNING

Maintain equipment in accordance with these procedures to reduce the risk of serious injury and damage to the machine.

Disconnect the system cable from the CCU before cleaning to reduce the risk of electrical shock.

Clean the micro CA-300 or CCU in accordance with its operator's manual. Before cleaning the nanoReel, remove the micro CA-300 from the display cradle. Do not allow the micro CA-300 or CCU to get wet during cleaning.

Use a soft, damp cloth to wipe the nanoReel clean. Do not use any solvents to clean the nanoReel. If desired, use a disinfectant to clean the nanoReel.

The drum and cable may be removed and the interior of the drum may be washed off with a hose or pressure wash. Avoid hosing the contact board on the back of the drum.

Accessories

⚠ WARNING

The following RIDGID products have been designed to function with the nanoReel. Other accessories suitable for use with other tools may become hazardous when used with the nanoReel. To reduce the risk of serious injury, only use accessories specifically designed and recommended for use with the nanoReel.

- nanoReel SlipRing Cartridge (Interconnect for SeeSnake)
- nanoReel SlipRing Cartridge (Interconnect for micro CA-300)
- RIDGID-SeekTech or NaviTrack Locators
- RIDGID-SeekTech or NaviTrack Transmitters
- RIDGID SeeSnake Camera Control Units
- RIDGID micro CA-300
- nanoReel Ball Guides
- nanoReel Camera Head Guides

Transport and Storage

Keep the equipment indoors or well-covered in wet weather. Store the machine in a locked area, out of the reach of children and people unfamiliar with its operation. This machine could cause serious injury in the hands of untrained users. Do not expose to heavy shocks or impacts during transport.

Store electrical devices in a dry place to reduce the risk of electrical shock. Store in temperatures from –4°F to 158°F [–20°C to 70°C]. Store the unit away from heat sources such as radiators, heat registers, stoves, and other products (including amplifiers) that produce heat.

Service and Repair

⚠ WARNING

Improper service or repair can make the nanoReel unsafe to operate.

Service and repair of the SeeSnake nanoReel must be performed at a RIDGID Independent Authorized Service Center.

For information on your nearest RIDGID Independent Service Center or any service or repair questions:

- Contact your local RIDGID distributor.
- Visit www.RIDGID.com or www.RIDGID.eu to find your local Ridge Tool contact point.
- Contact RIDGID Technical Services Department at rtctechservices@emerson.com or, in the U.S. and Canada, call 800-519-3456.

Disposal

Parts of the nanoReel contain valuable materials that can be recycled. Companies that specialize in recycling may be found locally. Dispose of the components in compliance with all applicable regulations. Contact your local waste management authority for more information.

For EC Countries: Do not dispose of electrical equipment with household waste!

According to the European Guideline 2002/96/EC for Waste Electrical and Electronic Equipment and its implementation into national legislation, electrical equipment that is no longer usable must be collected separately and disposed of in an environmentally correct manner.

Table 3
Troubleshooting

Problem	Probable Fault Location	Solution
Camera image not seen	No power to SeeSnake CCU or micro CA-300 camera monitor connector	Check power cord is correctly plugged in
		Check the switch on monitor/display unit
	Connections faulty	Check alignment and pins of connection to the nanoReel system unit from CCU or display unit.
		Check orientation, seating, and pin condition in the SeeSnake connection.
	Monitor set to wrong source	Set video source as described in display unit operator's manual.
	Batteries low	Recharge or replace batteries.
"SOS" code blinking on LCD*	No video signal	Check source setting of monitor and reseat cable connection.

* The light on the LCD will only blink the "SOS" code on some SeeSnake CCUs.

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