

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.

--

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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)

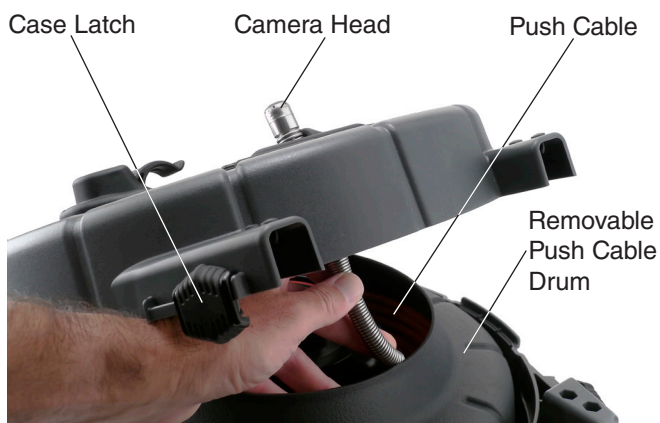


Figure 2 – Inside Case



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).

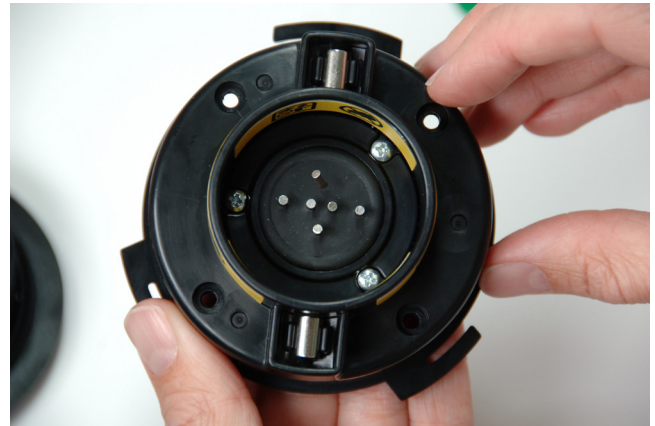


Figure 7 – Broken Contact Pin

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).

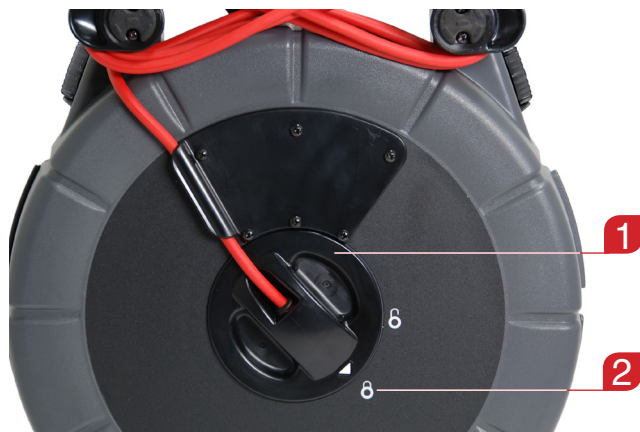


Figure 8 – Locking the Slip-Ring Module Cover

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 nanoReel 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.

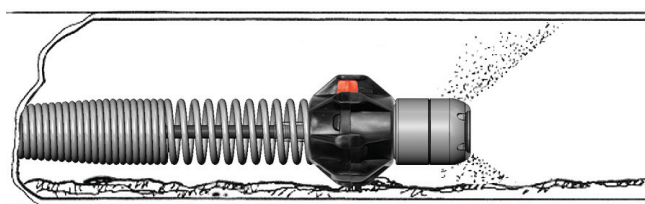


Figure 11 – Ball Guide in Use

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.

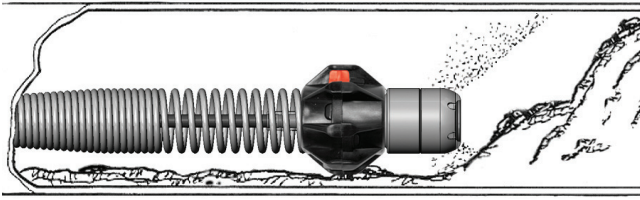


Figure 15 – Encountering an Obstruction: Do Not Use Camera Head to Clear Obstructions

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.

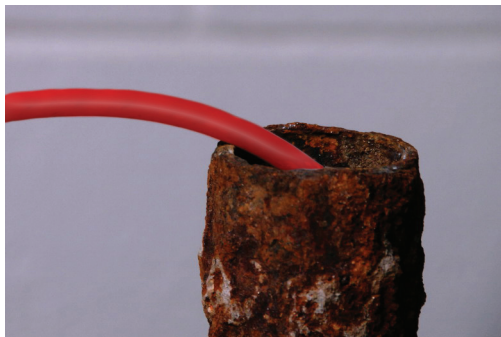


Figure 16 – Avoid Pulling at Sharp Angles

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 to 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.

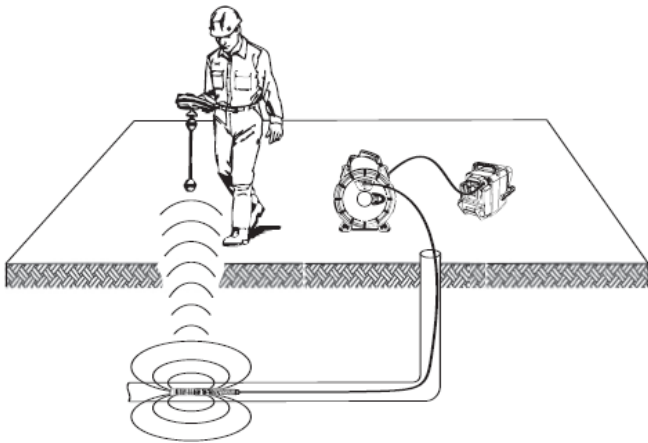


Figure 20 – Locating the nanoReel Sonde

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.

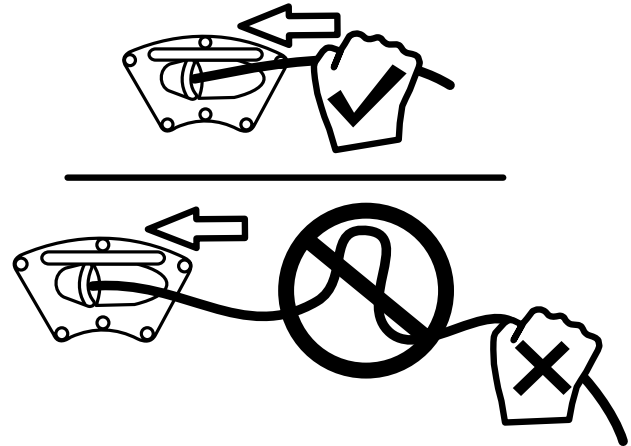


Figure 21 – Putting Back the Push Cable

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).

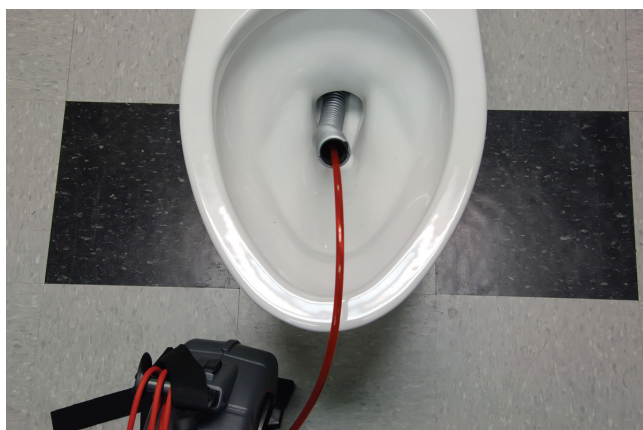


Figure 24 – Using the Flexible Guide Tube

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 rttechservices@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 reseal cable connection.

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

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