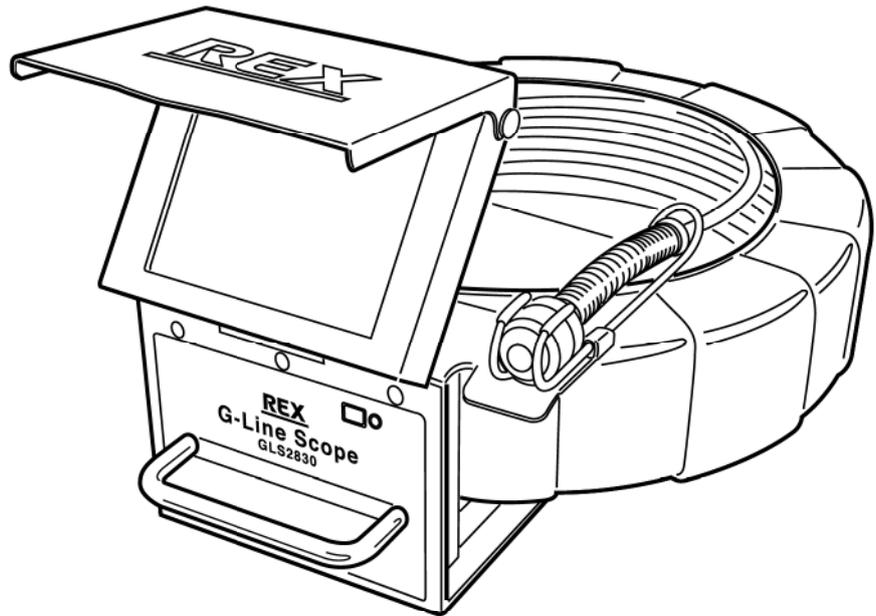


**REX**

# Pipe Inspection Camera **G-LINE SCOPE**

**GLS2830**

**Operation Manual**



Be sure to read this  
Operation Manual before  
using the machine

-Note-

- Be sure to give this Operation Manual to the person who will actually use the machine
- To ensure safe and efficient use, read this manual carefully before use.
- Be sure to keep the manual readily available so that the operator can refer to it whenever necessary.

Date of purchase :

Year

Month

Sales agent :

- To prevent fire, electric shock or any other accident or injury, be sure to observe the precautions listed in the section entitled "Safety Considerations".
- Before you use the product, read the "Safety Considerations" section carefully from beginning to end, and follow the instructions to ensure proper use of the product.
- Do not use the product in any manner other than described in this manual.

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## CONTENTS

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Safety considerations .....	1~2
When using the G-LINE SCOPE GLS2830 .....	3
Warranty, Applications, Limitation of Liability .....	4
Names of Parts, Standard accessories .....	5
Standard Specifications .....	6
Preparation .....	7~8
■ Transport and Installation	
■ Connecting to a Power Supply	
Operation .....	8~11
■ Procedures for Operation	
■ Displaying the length of the cable extension	
■ What to do if you have problems focusing the camera	
Recording and Storing Images .....	12
Daily Inspections and Maintenance .....	13~14
Troubleshooting .....	15
Servicing and Repairs .....	16
Options .....	16

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Meanings of **▲ WARNING** and **▲ CAUTION** labels

Cautionary notes in this manual are divided into two categories : **▲ WARNING** and **▲ CAUTION**.  
 These are defined as follows : **▲ WARNING** : Warnings that, if not observed, may lead to user death or injury  
**▲ CAUTION** : Cautions that, if not observed, may lead to user injury or property damage  
 Matters noted under **▲ CAUTION** may also lead to serious consequences depending on the circumstances. Both **WARNING** and **CAUTION** contain important safety information, so be sure to observe the precautions in both of these.

- In the event that this instruction manual is lost or damaged, you should immediately order a replacement copy from REX or your dealer.
- Due to our continuing efforts to improve quality, performance and safety, product specifications are subject to change without notice. In such cases, the content of this manual, the illustrations or other items contained herein may differ from the actual product.

---

# Safety Considerations



## WARNING

- (1) If you notice an abnormal odor, overheating or smoke, immediately turn off the power and remove the plug from the outlet.
  - Continued use may result in fire, electric shock or damage to the product. Order repairs from your dealer or the nearest REX office. Never attempt to repair the machine yourself, as this is very dangerous.
- (2) If the screen goes blank or any other failure occurs, immediately turn off the machine and remove the plug from the socket.
  - Continued use may result in fire, electric shock or damage to the equipment. Order repairs from your dealer or the nearest REX office. Never attempt to repair the machine yourself, as this is very dangerous.
- (3) If water or foreign matter or the like should get inside the machine, immediately turn off the machine and remove the plug from the outlet.
  - Continued use may result in fire, electric shock or damage to the equipment. Order repairs from your dealer or the nearest REX office. Never attempt to repair the machine yourself, as this is very dangerous.
- (4) If you should happen to drop the machine, or if the case should break, turn off the power and remove the plug from the outlet.
  - Continued use may result in fire, electric shock or damage to the equipment. Order repairs from your dealer or the nearest REX office. Never attempt to repair the machine yourself, as this is very dangerous.
- (5) Do not insert or remove the plug from the outlet when your hands are wet.
  - Doing so may result in electric shock.
- (6) Never attempt to disassemble, repair or modify the machine yourself.
  - Doing so may result in failure or malfunction and could lead to accidents. Order repairs from your dealer or the nearest REX office.
- (7) Do not use with any voltage other than that specified.
  - Doing so may result in fire or electric shock. (Input voltage: AC 100 – 240 V with AC adaptor; DC 12 V for DC)
- (8) Do not use or install the machine where the atmosphere contains flammable gases (inspecting gas pipes that still contain gas, for example), in places that may subject it to oily fumes or steam, or in very dusty places.
  - The machine is not explosion-proof; exposure to gases etc. could result in fire, explosion, electric shock, heat generation etc.
- (9) Do not place vases, potted plants, cups, cosmetics, medicines, and containers with water or small metal objects on top of the machine.
  - Fire or electric shock may result if water should spill and get inside the machine.
- (10) Do not insert or drop metal objects, flammable materials or other foreign objects into any openings in the machine.
  - Doing so may result in fire or electric shock.
- (11) Do not damage, break or try to remodel the power cord in any way; do not bend, pull, twist or bind it with excessive force. Also, do not place heavy objects on top of, or apply heat to it.
  - If you do so, the power cord may break, resulting in fire or electric shock. If the power cord becomes damaged, order repairs from your dealer or the nearest REX office.Do not remove the rear or front cover from the machine.
- (12) •Doing so may result in electric shock. For internal inspection, adjustment or repair of the machine, consult your dealer or the nearest REX office.  
Do not touch the machine or the plug in the event of lightning.
- (13) •Doing so may result in electric shock.



## WARNING

- (14) To ensure safety, remove the plug from the outlet when performing maintenance or when the machine is not going to be used for an extended period of time.
  - Failure to do so may result in fire or electric shock.
- (15) Check to make sure the POWER switch is set to the OFF position before connecting other equipment to the machine.
  - Failure to do so may result in electric shock.
- (16) When removing the plug from the outlet, hold the plug and not the cord.
  - Pulling the cord may damage it, resulting in fire or electric shock.
- (17) Do not obstruct the ventilation ports on the machine by placing a cloth over or placing other equipment too close to the machine.
  - Doing so may cause the temperature inside the machine to rise, resulting in fire.
- (18) Do not place heat-generating machines near the machine or the power cord.
  - Doing so may result in burns or warping, or cause the switch or power cord sheath to melt, resulting in fire or electric shock.
- (19) Do not use benzene, paint thinner or the like to clean the machine.
  - Doing so may cause the paint or markings to peel or otherwise be damaged.
- (20) Have the interior of the machine inspected approximately once each year.
  - Failure to do so may make it impossible to detect problems or failures in advance, resulting in fire or accident.
- (21) Do not use excessive force when extending or retracting the cable.
  - Doing so may damage the cable; in addition, your hand may get caught in the cable drum, resulting in injury.
- (22) Check to make sure that the power is off before inserting or removing connectors.
  - Failure to do so may result in electric shock or injury.
- (23) Do not use the machine in hot places ( $> + 40^{\circ}\text{C}$ ;  $>104^{\circ}\text{F}$ ) or places exposed to direct sunlight.
  - This may cause the temperature inside the machine to rise (resulting in burnout or fire) or warp the cable drum take-up frame.
- (24) When moving the machine, set the POWER switch to the OFF position and be sure to remove the plug from the outlet, and remove any external connecting cables.
  - Moving the machine with the power on or cables connected may damage the power cord or cables, resulting in fire or electric shock.
- (25) Do not sit on the machine.
  - Not only may this damage the machine, it may also result in injury if the machine should move, topple over or break.
- (26) Do not place the machine on wobbly stands, inclined surfaces or other unstable places.
  - The machine may topple over, resulting in injury.
- (27) Do not insert the cable into hot water pipes or other hot water environments exceeding  $40^{\circ}\text{C}$  ( $104^{\circ}\text{F}$ ).
  - The camera head may be damaged if it gets too hot.
- (28) When the machine is moved from a cold location to a warm location, condensation may form on the surface of the machine, or the monitor screen may cloud over.
  - In such cases, leave the machine as is for an hour or so and wait for it to dry before using it again.
  - Never point the lens side of the camera head toward the sun or other powerful light source. The image pickup device may be damaged if shone into direct sunlight.

# When using the G-LINE SCOPE GLS2830



## WARNING

- The machine may be used within a temperature range of 0°C - +40°C (32°F - 104°F). Do not use the machine outside this temperature range. Also, be particularly careful when using the machine in direct sunlight in summer. If the machine is operated under these conditions for an extended period of time, it will become extremely hot, and this may shorten the life of the machine. Place the machine in the shade and, as far as possible, make every effort to prevent it from getting hot.
- When the LCD monitor is used at low temperatures, it may go dark. This is normal; wait a few minutes and the normal display will return. However, be advised that extended use at low temperatures may shorten the life of the monitor.
- If the camera head gets caught on something when passing the cable through elbow bends in the pipe, do not push or pull it with excessive force. Twist the camera cable and, at the same time, push (or pull) gently. Applying excessive force may damage the cable joints.
- The cable drum and AC adaptor are not waterproof. The cable drum and main machine are designed to withstand small quantities of water dripping on them from directly overhead. However, under no circumstances should the machine be left out in the rain or used in places where sheets of water may splash onto it.  
Also, make sure no water gets on the AC adaptor.  
Always be aware of the weather and other ambient conditions when using the machine.
- In some cases, the image on the LCD monitor may become abnormal if the POWER switch is turned on or off too quickly. In such cases, turn the power off and then turn it on again more slowly.
- Especially in the summer time, do not leave the machine inside a car exposed to direct sunlight, as this may cause the cable, cable drum or other parts to warp or degenerate. If you must leave the machine inside a car, be sure to place the machine inside a box or cover it to protect it from the sunlight.
- Do not insert your hands or fingers between the frame and the moving parts. Your hand may become caught, leading to injury.
- Do not touch the camera head, as it gets very hot and you may be burned.

# Warranty, Applications, Limitation of Liability

## Warranty

- The product warranty covers defects in manufacture for a period of twelve (12) months from the date of purchase.
- In the event of a problem caused by design or manufacture (not caused by the user) that occurs within the warranty period, the product will be repaired by REX free of charge, and parts required for servicing will be provided at no charge. However, even during the warranty period, a charge shall be made for the repair of faults or problems resulting from user error, "acts of God" or other factors that do not result from the design or manufacture of the product.
- Schedules, procedures, methods, etc. for maintenance, repairs and other on-site operations will be determined based on discussions with the customer.

## Applications

- When using the product under the following conditions or in the following environments, please take the proper safety precautions and contact REX.
  1. Use of the product under conditions or in environments other than those described in the specifications.
  2. Use of the product for applications that are predicted to have a major impact on persons and assets, and for which there are particularly stringent safety requirements.
- Use of this product is subject to various conditions; if it is necessary to determine the suitability of the product for use with specific equipment, then testing and analysis should be performed in advance by the designer of such equipment or by the person responsible for determining its specifications. It shall be the responsibility of the customer to determine the suitability of the product for specific equipment and to ensure the safety and performance of that equipment.
- This product has not been designed and manufactured for use with equipment that directly controls or affects human life\* or equipment that controls or critically affects the maintenance of public facilities relating to human safety;\*\* it should therefore not be used for such purposes.
  - \*\*"Equipment that directly controls or affects human life" refers to the following:
    - Life support devices, operating room equipment and other medical equipment.
    - Automobile exhaust machines, smoke control systems or other equipment. used for toxic fumes.
    - Equipment whose installation is required by the Fire Defense Law, Building Standard Law or other laws and regulations.
  - Equipment conforming to the above.
- \*\*\*"Equipment that controls or critically affects the maintenance of public facilities relating to human safety" refers to the following:
  - Aircraft, railway, road, maritime and other traffic control equipment
  - Equipment for use in nuclear power plants, etc.
  - Equipment conforming to the above.

## Limitation of Liability

- Rex Industries will not be held liable for damage arising from fire, earthquake, the actions of third parties, or other accidents, actions on the part of the user (either intentional or unintentional), improper use, or use under other erroneous conditions.
- Rex Industries will not be held liable for incidental damage (loss of profits or interruptions to business operations) arising from the use of this product or the failure of the product to operate properly.
- Rex Industries will not be held liable for damage arising from any use other than that outlined in this Operation Manual.
- Rex Industries will not be held liable for damage arising from malfunction, etc. resulting from the combination of this product with other equipment connected to it.
- Rex Industries will not be held liable for damage arising from repairs or modifications performed by the user.
- In all cases, Rex Industries' burden of cost relating to the product shall be no more than the purchase price of the individual product.

# Names of Parts, Standard Accessories

## Names of Parts

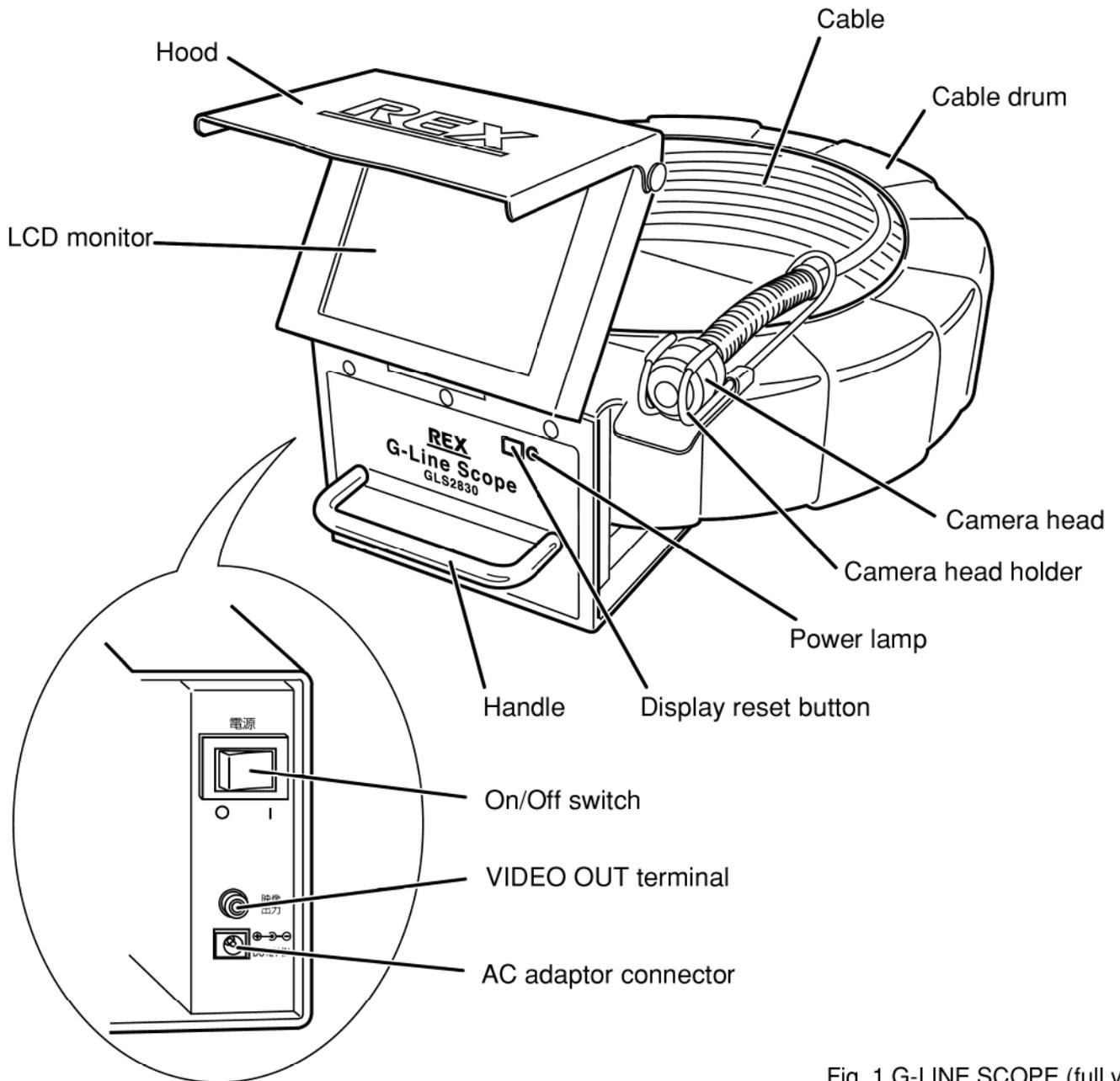


Fig. 1 G-LINE SCOPE (full view)

## Standard Accessories

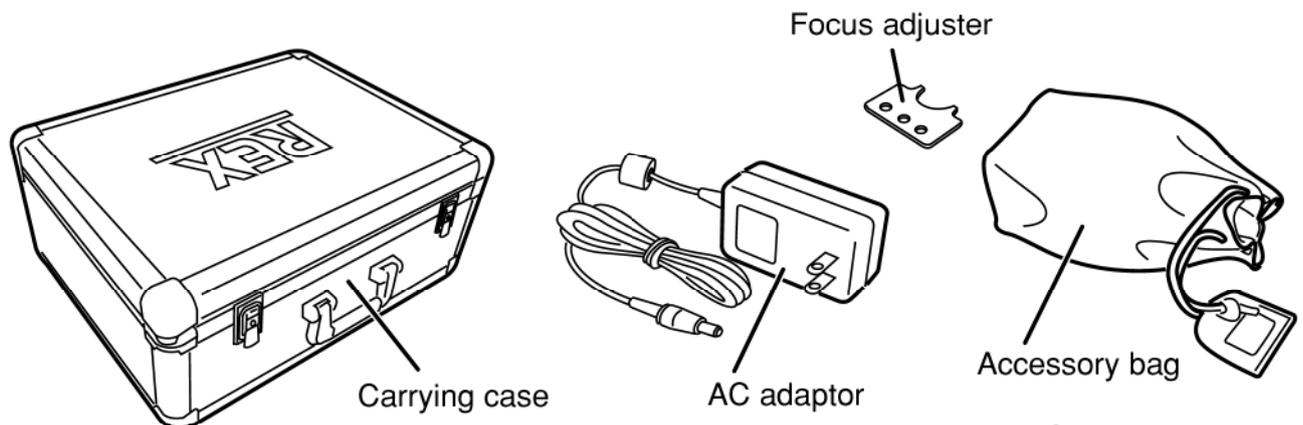


Fig. 2 Standard accessories

## Standard specifications (GLS2830)

Item	Specifications
<ul style="list-style-type: none"> <li>● Applications</li> </ul>	<ul style="list-style-type: none"> <li>● Inspection of various types of pipes</li> <li>● Structural inspections</li> <li>● Inspection of air conditioning ducts and air intake/discharge tubes</li> </ul>
<ul style="list-style-type: none"> <li>● Camerahead <ul style="list-style-type: none"> <li>Applicable pipe diameter</li> <li>Pipe bend pass-through</li> <li>External dimensions</li> <li>Water resistance</li> <li>Lights</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● <math>\phi</math> 30 ~ <math>\phi</math> 110</li> <li>● Can pass through 90° elbow joints in two locations ( <math>\phi</math> 40 pipe)</li> <li>● <math>\phi</math> 28×37 m m</li> <li>● Water resistant to IP68, 10 meters (camera only)</li> <li>● 12 white LEDs</li> </ul>
<ul style="list-style-type: none"> <li>● Camera cable <ul style="list-style-type: none"> <li>Cable diameter and length</li> <li>Sheath</li> <li>Flexible body</li> <li>Minimum radius of curvature</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● <math>\phi</math> 6.6×30 m</li> <li>● Polyester (blue-green)</li> <li>● <math>\phi</math> 2.5 FRP (fiber-reinforced plastic)</li> <li>● R100 (at room temperature)</li> </ul>
<ul style="list-style-type: none"> <li>● Lens <ul style="list-style-type: none"> <li>Lens</li> <li>Angle of view</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● F 2.8 f = 2 mm (focusing range: 10 mm ~∞)</li> <li>● Approximately 160° (opposite angles)</li> </ul>
<ul style="list-style-type: none"> <li>● Cable drum <ul style="list-style-type: none"> <li>Connectors, terminals</li> <li>External dimensions</li> <li>Weight</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● DC + 12 V IN / VIDEO OUT</li> <li>● <math>\phi</math> 350</li> <li>● Approximately 5 kg (including camera cable and head)</li> </ul>
<ul style="list-style-type: none"> <li>● LCD monitor</li> </ul>	<ul style="list-style-type: none"> <li>● 5.5" TFT color LCD monitor</li> </ul>
<ul style="list-style-type: none"> <li>● During AC adaptor use <ul style="list-style-type: none"> <li>Input voltage range</li> <li>Power consumption</li> <li>Insulation resistance</li> <li>Withstand voltage</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● AC 100 V - 240V ±10% (50 / 60 Hz)</li> <li>● Maximum 20 VA</li> <li>● 100 MΩ</li> <li>● 1000 V/1 minute</li> </ul>
<ul style="list-style-type: none"> <li>● Camera machine <ul style="list-style-type: none"> <li>TV system</li> <li>Image pickup device</li> <li>VIDEO OUT</li> <li>Minimum subject illumination</li> <li>S/N ratio</li> <li>White balance</li> <li>AGC</li> <li>ELC</li> <li>Distance display</li> <li>Display location</li> <li>Distance detection method</li> <li>Functions</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● NTSC compatible</li> <li>● 250,000 pixels 1/4" interline CCD</li> <li>● VBS: 1.0 V (p-p) 75 Ω</li> <li>● 21 x (F2.8 / 5000 K)</li> <li>● 40 dB min.</li> <li>● Fixed at AUTO</li> <li>● Fixed at ON, 0 ~ + 24 dB</li> <li>● 1/60 ~ 1 / 1/100,000 s</li> <li>● -99.9 M ~ +99.9 M (displayable numeric value)</li> <li>● Displayed in white, in 0.1 m increments, in upper right hand corner of screen</li> <li>● Number of revolutions of cable drum</li> <li>● Distance display counter value can be reset (to 0 m)</li> <li>● Distance display can be turned ON or OFF</li> </ul>
<ul style="list-style-type: none"> <li>● General <ul style="list-style-type: none"> <li>Power input</li> <li>Current consumption</li> <li>Emissions</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● DC 12 V ±10%</li> <li>● Approximately 0.65 A (DC 12 V))</li> <li>● Compatible with VCCI Class A, CISPR22 Class A</li> </ul>
<ul style="list-style-type: none"> <li>● Operating environment <ul style="list-style-type: none"> <li>Performance guaranteed at</li> <li>Operation guaranteed at</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Temperature 0°C - + 40°C (32°F - 104°F) (no dew))</li> <li>● Humidity 10 - 90% RH</li> <li>● Temperature -10°C - + 45°C (50°F - 113°F) (no dew)</li> <li>● Humidity 10 - 90% RH</li> </ul>

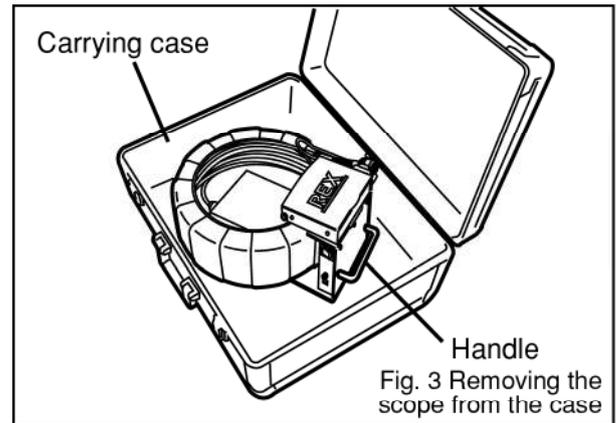
Table 1 Standard specifications

# Preparation

## ■ Transport and installation

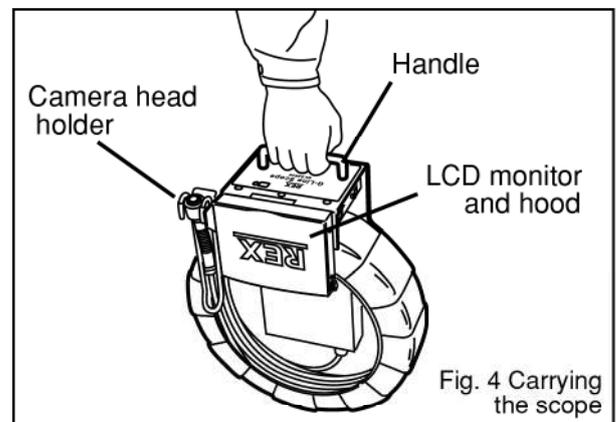
### 1. Removing the G-LINE SCOPE from the carrying case (Fig. 3)

- Open the carrying case, grasp the handle, then lift the machine out of the case.



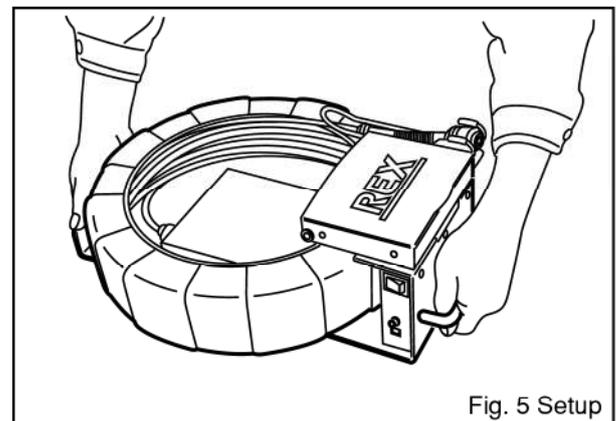
### 2. Transport (Fig. 4)

- When transporting the machine, place the camera head in the camera head holder and fold down the LCD monitor and hood. Then carry the machine by the handle.



### 3. Setup (Fig. 5)

- To set up the machine, take hold of the machine with both hands and set it down carefully with the rubber feet on the bottom.



#### ⚠ WARNING

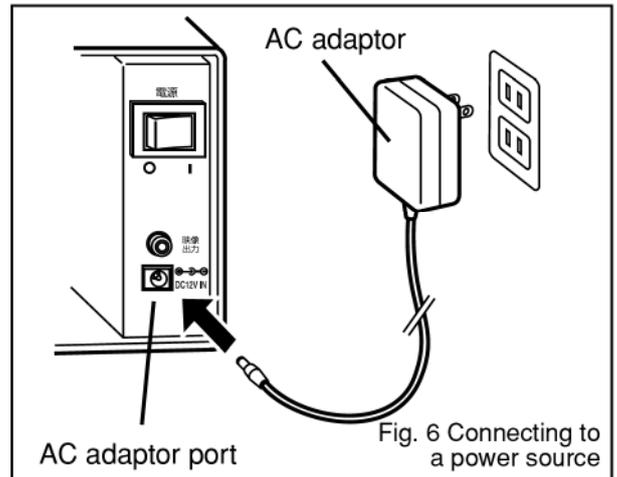
- Be careful not to drop the machine during transport. This may result in injury or damage to the machine.
- During transport, always carry the machine by the handle. Holding it by the LCD monitor or cable drum may damage the machine. Moreover, the moving parts may suddenly move unexpectedly, resulting in injury or causing you to drop and damage the machine.
- Set the machine on a stable level surface. If it is placed on an inclined surface, it may topple while you are operating it, resulting in personal injury or damage to the machine.
- The cable drum is neither waterproof, dustproof nor dirtproof. Do not set up the equipment in wet, dusty or dirty locations, as this may result in electric shock or short-circuiting.

## ■ Connecting to a power source (Fig. 6)

Use the AC adaptor to connect the machine to a power source

1. Connect the AC adaptor to the G-LINE SCOPE.
2. Make sure the power switch is set to 0 (OFF).
3. Connect the AC adaptor to an electrical outlet (AC 100 - 240V).

 For use exclusively with ordinary household power AC 100 V - 240V

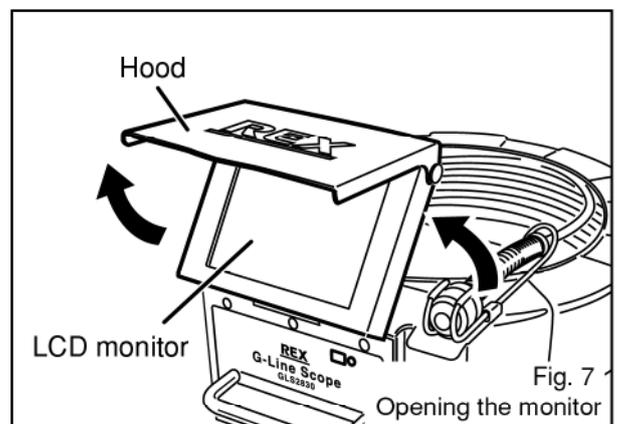


## ■ Procedure for operation

When preparations are complete, you can get the machine itself ready.

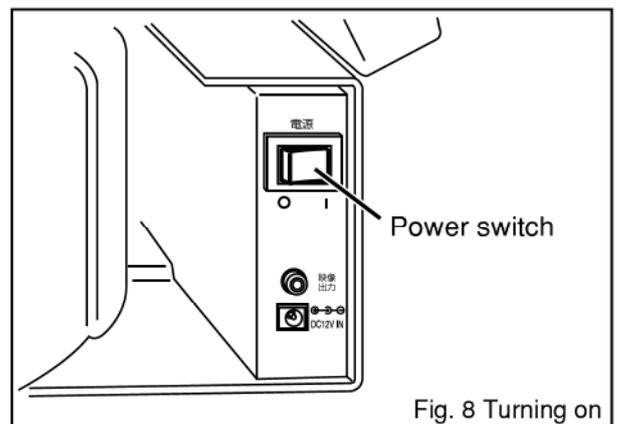
### 1. Open the LCD monitor. (Fig. 7)

- Open the hood and position the hood and LCD monitor so the screen is easy to see.



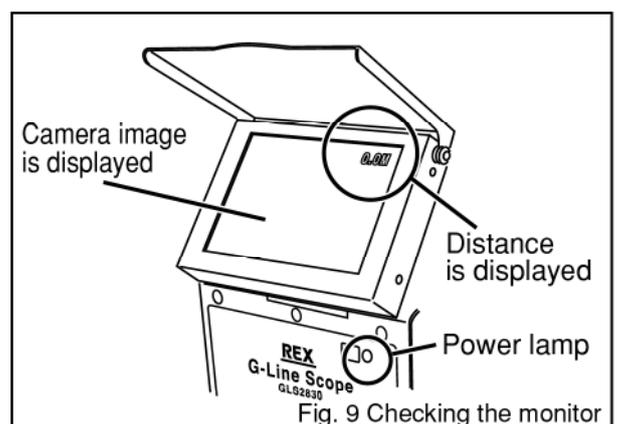
### 2. Set the power switch to | (ON). (Fig. 8)

- Set the power switch to the ON position.



### 3. Check the LCD monitor to make sure the machine has started up properly. (Fig. 9)

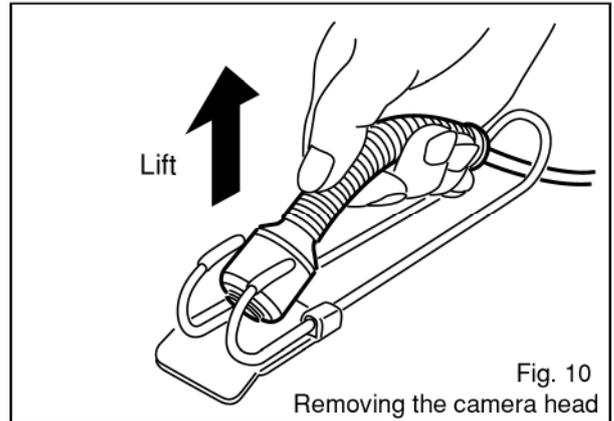
- Make sure the power lamp is lit.
- Look on the LCD monitor to make sure the camera image is displayed.
- Check the upper right-hand corner of the LCD monitor screen to make sure the distance is displayed.



# Preparation

## 4. Extending the camera head (Fig. 10)

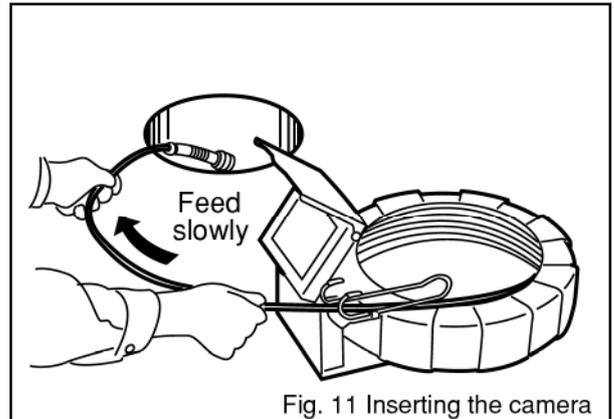
Lift the camera head to remove it from the camera head holder, as shown in Fig. 10.



## 5. Insert the camera into the pipe to be inspected (Fig. 11)

- Slowly pull out the camera and at the same time insert the camera head into the pipe to be inspected.

※Note: Do not pull the cable out either too quickly or with too much force, as this may damage the machine.

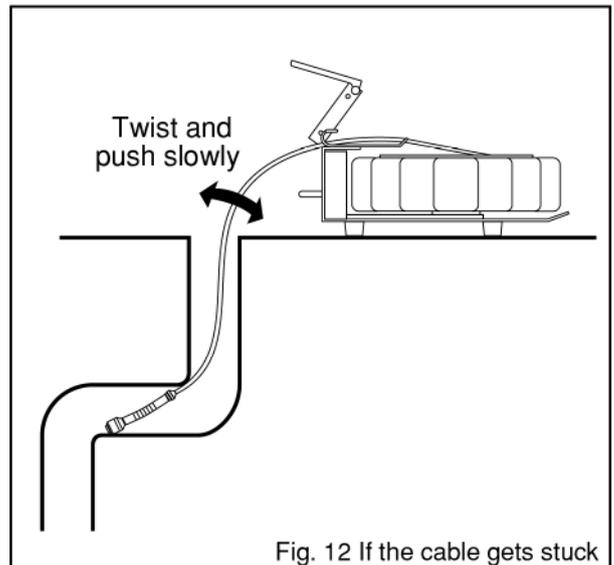


## ●Feeding the cable past pipe bends (Fig. 12)

- When feeding the cable past pipe bends (elbow joints, etc.), if the camera head gets stuck, do not pull or push it with excessive force. Instead, twist the cable and push slowly to pass it through the bend.

Note: Use of excessive force may damage the cable joints etc.

No: Use of excessive force may damage the cable joints etc.



## 6. Condition inside the pipe (Fig. 13)

- While viewing the image on the monitor, feed the camera head forward to check the pipe interior.
- The image will change in accordance with the orientation of the camera head. (If the camera is upside-down, the image will also be upside-down.)

Note: To record or store images, see "Recording and storing images" on Page 12.

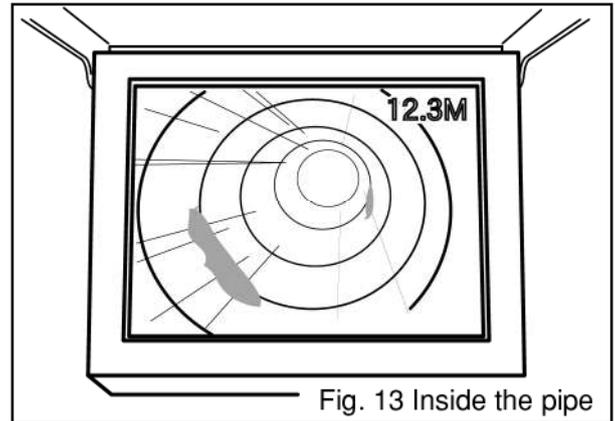
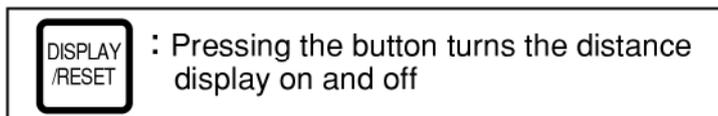


Fig. 13 Inside the pipe

## ■ Displaying the length of the cable extension

- **Turning the distance display on and off** (Fig. 14)



- Pressing the DISPLAY/RESET button located below the monitor turns the distance display alternately on and off.
- When the power is first turned on, the distance is always displayed.

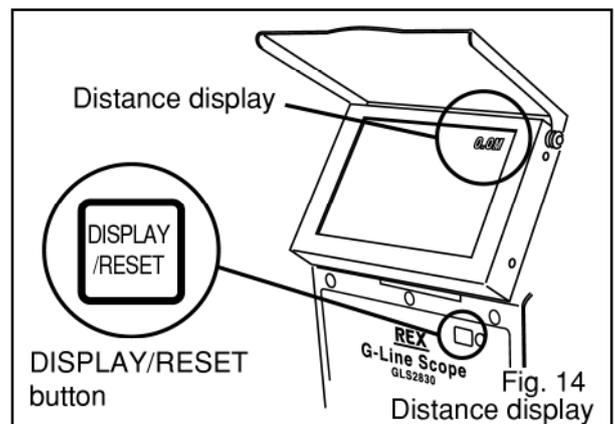
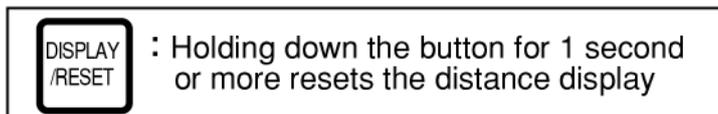


Fig. 14 Distance display

- **Resetting the distance display** (Fig. 15)



- Holding down the DISPLAY/RESET button for 1 second or more resets the distance display (to "00.0 M").
- If, in the process of extending the cable, you want to measure the distance from one reference point to another, you can reset the distance display at the reference point to make it easy to measure the distance from that point to the other.

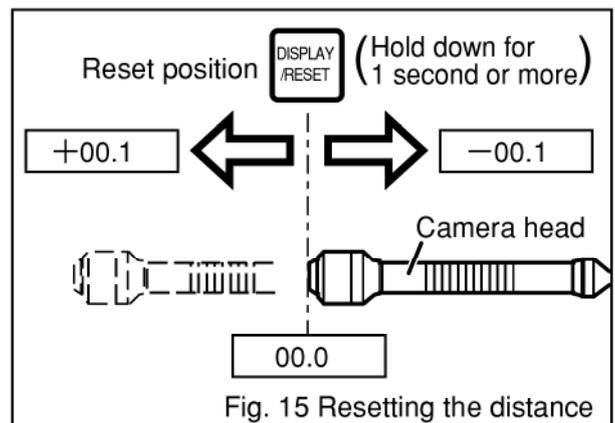


Fig. 15 Resetting the distance

- **Precautions regarding distance display** (Fig. 16)

- Do not move the machine during inspection. Moving the machine during inspection may cause the distance display to be incorrect.

Note: Distance is measured by the number of rotations of the cable drum. For this reason, moving the machine while measuring the distance will change the distance display value, even though the position of the camera may not have changed.

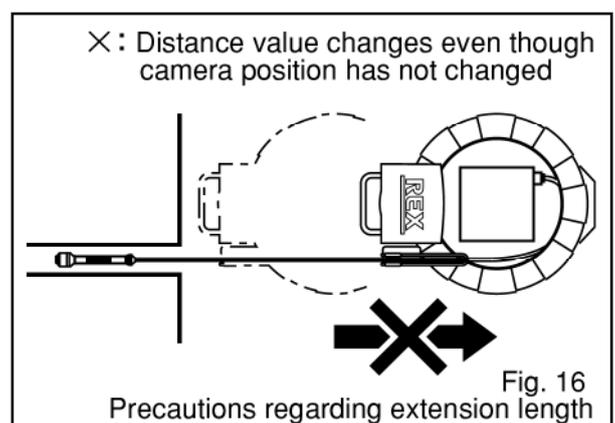
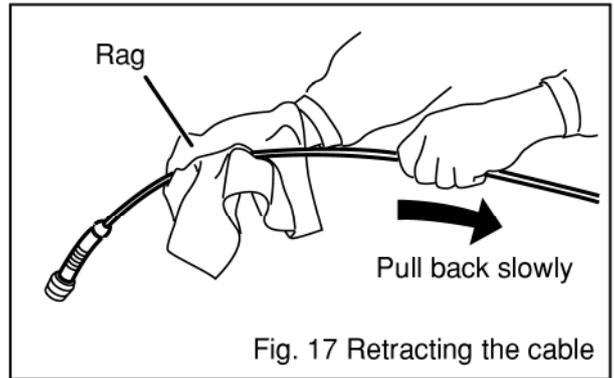


Fig. 16 Precautions regarding extension length

# Preparation

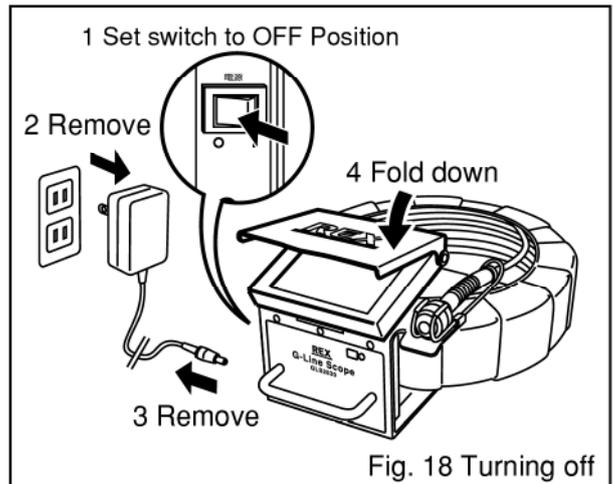
## 7. Retracting the cable (Fig. 17)

1. Retract the cable slowly back into the cable drum.  
Note: When retracting the cable, use a rag to wipe away any moisture from the cable.
2. Place the camera head in the camera head holder.



## 8. Finishing up (Fig. 18)

1. Set the power switch to 0 (OFF).
2. Remove the AC adaptor from the outlet and unplug it from the machine.  
(Store the AC adaptor in the accessory bag.)
3. Wipe away any dirt or moisture from the machine.
4. Fold down the LCD monitor and hood.



## 9. Storage

- Store the machine in a cool, dark place not exposed to direct sunlight.

### ⚠ WARNING

- Store out of the reach of children.

## ■ Problems focusing the camera (Figs. 19 & 20)

Use the focus adjustment tool to adjust the camera focus.

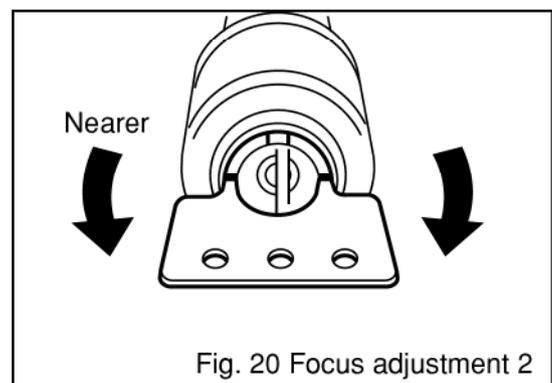
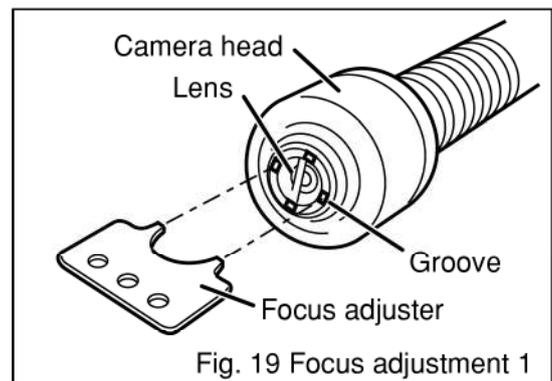
- Before shipment from the factory, the machine is adjusted so an object 25 mm from the lens will be in focus. To focus on objects nearer or further away, insert the focus adjuster into the groove around the lens and turn the lens, as shown in the figure at right.

(Counter-clockwise: nearer Clockwise: farther away)

To change the focus from objects nearer to objects further away, or vice versa, turn the adjuster so the lens makes about one complete revolution.

Note: When adjusting the focus, if the lens is turned too far in a counter-clockwise direction, the lens may come loose from the camera head. If this happens, dust and dirt will get on the lens and the O-ring (provided for watertight sealing). As a result, the next time the lens is attached to the camera head, dust will appear on the image and the watertightness of the machine may be adversely affected. To ensure that this does not happen, be careful not to turn the lens too far in the counter-clockwise direction.

Note: If the lens is adjusted, it may not be possible to see tiny sections of the image in the corners of the screen. This is normal.



## ■ Recording and storing images

The G-LINE SCOPE is equipped with a VIDEO OUT terminal. This can be used to connect other equipment for a variety of applications including recording images. (Fig. 21)

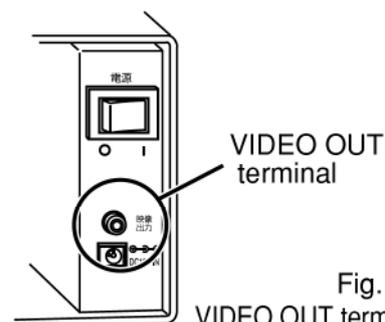


Fig. 21  
VIDEO OUT terminal

### 1. Displaying images on an external monitor (Fig. 22)

1. Connect a commercial video cable to the VIDEO OUT terminal on the scope
2. Connect the other end of the cable to the VIDEO IN terminal on the external monitor.
3. Conduct the required settings on the external monitor (for example, switching to external input, etc.).

Necessary items: : Video cable  
External monitor (with VIDEO IN terminal)

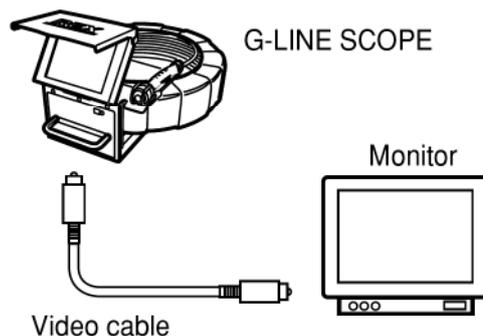


Fig. 22 Connection example 1

### 2. Recording images (on a video camera) (Fig. 23)

1. Connect a commercial video cable to the VIDEO OUT terminal on the G-LINE SCOPE.
2. Connect the other end of the cable to the VIDEO IN terminal on the video camera, etc.
3. Use video camera, etc. to record the image from the scope.

Items required : Video cable  
Video camera

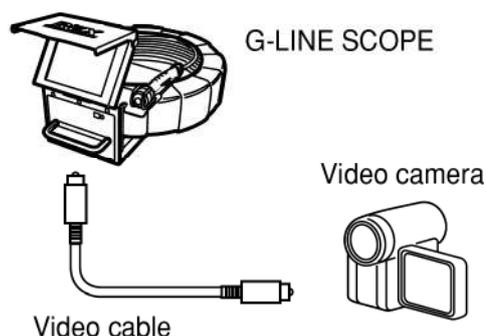


Fig. 23 Connection example 2

### 3. Creating still images from the recorded video image (on a PC) (Fig. 24)

1. Connect a commercial video cable to the VIDEO OUT terminal on the G-LINE SCOPE.
2. Connect the other end of the cable to a commercial USB video capture machine or the VIDEO IN terminal on a video camera.
3. In the case of a video capture machine, connect the video capture machine to a PC.
4. Operate the PC or video camera to record the image.
5. Create a still image from the image recorded on the PC.

Required items : Video cable  
USB video capture machine  
PC (with USB port)

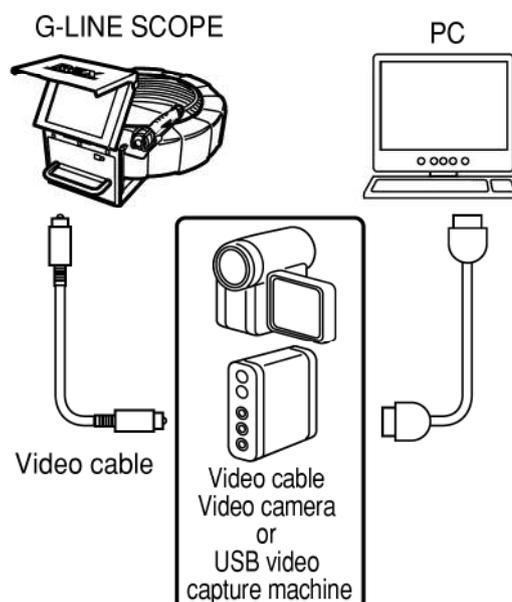
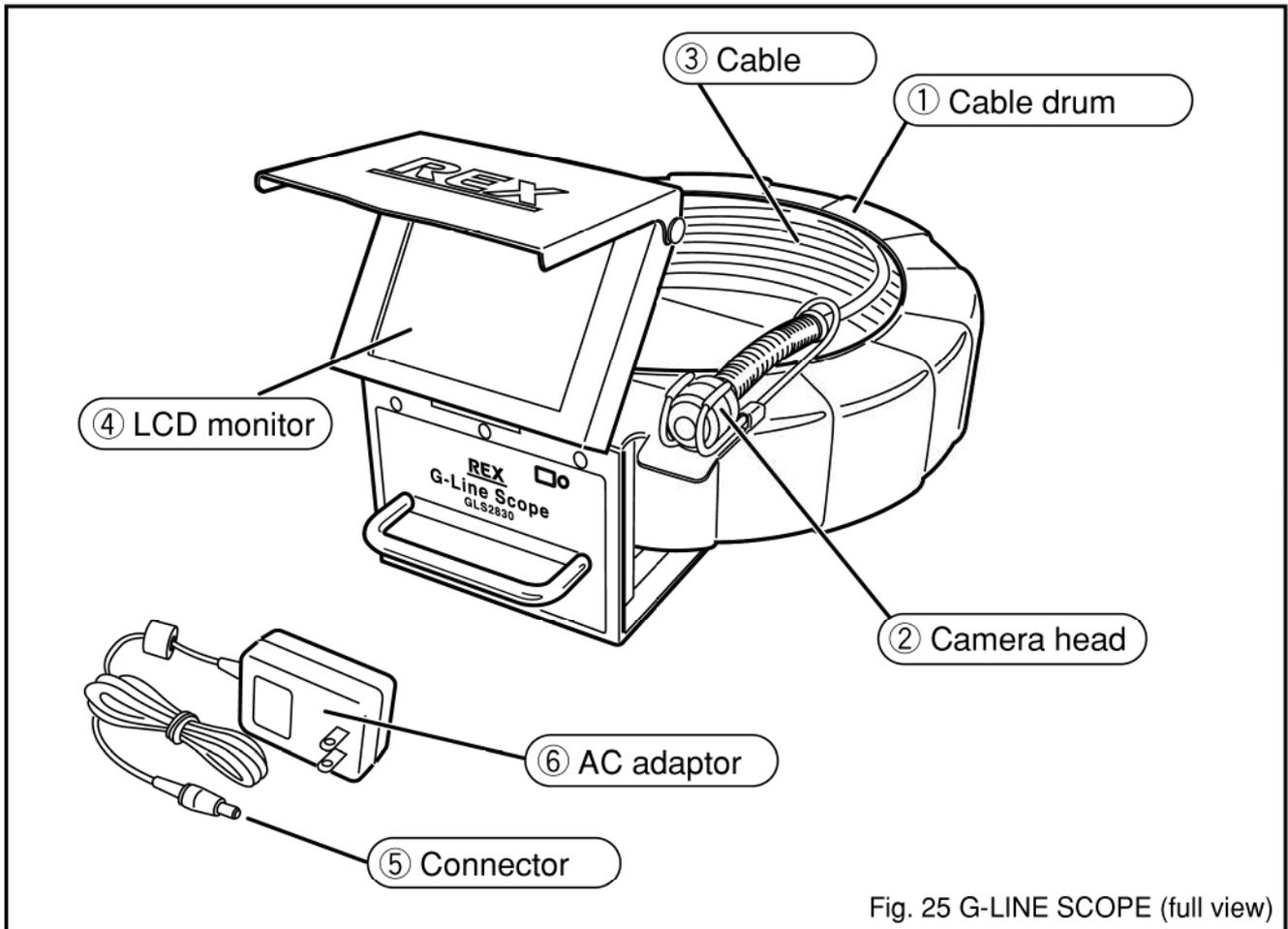


Fig. 24 Connection example 3

# Daily inspections and maintenance

## ⚠ WARNING

- Before conducting inspections and maintenance, make sure that the POWER switch is set to the OFF position and remove the plug from the outlet. Conducting inspections and maintenance with the machine connected to a power source may result in electric shock or other accident or injury.
- If you discover anything out of the ordinary during inspections or maintenance, check for the problem in the table on Page 15 and follow the instructions. Continued use without correcting the problem may result in heat, smoke or flame, leading to accident or injury.



## ■ General inspection and cleaning

- General inspection and cleaning
- Check each part for major damage, cracks etc.
- Check to make sure moving parts move properly.
- Using a soft cloth, wipe away dirt from the machine. If the machine is very dirty, moisten the soft cloth with water, wring it thoroughly, and then wipe the dirt from the machine.
- After use, clean the machine and then replace it in its carrying case for storage.

Note: Do not use paint thinner or other organic solvents for cleaning, as these may damage the machine.

## ⚠ WARNING

- If drops of water get inside the machine when you are wiping dirt from the machine, leave it in a warm room to dry out. Do not use the machine until it has dried, as this may result in electric shock or other accident or damage. The inside of the LCD monitor in particular contains high voltage points, so be particularly careful to prevent water from getting inside the monitor.

# Daily inspections and maintenance

## ■ Inspecting and cleaning individual parts

### ① Cable drum

- Check to make sure the cable drum moves smoothly and the cable can be retracted and extended properly. If it does not move smoothly, remove any foreign matter or the like that may be clogging the moving parts.

### ② Camera head

- Check to make sure there are no splits, cracks or other major damage to the lens and cover.
- Make sure there is no moisture inside.
- Make sure there is no dirt sticking to the lens.

### ③ Cable

- Make sure the cable is not torn and has not suffered any major damage.

### ● When the cable drum, cable and camera head are dirty

- Moisture and dirt will stick to the camera head and camera cable during inspections. When the interior of the cable drum becomes very dirty or wet, extend the camera cable all the way out of the drum and wipe the interior of the drum clean. Then retract the camera cable back into the cable drum, wiping the dirt from the cable as you do so.

### ④ LCD monitor

- To ensure that the images displayed on the LCD monitor are clear, use a soft cloth to wipe away dirt and the like from the screen. Be sure to use a soft cloth; using a rough cloth may scratch the acrylic panel of the LCD monitor and make images difficult to see. If it is difficult to wipe away the dirt, moisten the cloth with a neutral cleaning agent or the like diluted with water (do not use paint thinner or organic solvents), then wipe only the area that is difficult to clean.
- Always fold down the hood when the LCD monitor is not in use.

### ⑤ Terminals

- Dirt stuck on the terminals may prevent proper contact, which may lead to unforeseen accidents. If there is dirt or moisture on the terminals, immediately wipe it away with a dry cloth.

### ⑥ AC adaptor

- Check to make sure that there are no breaks in the cord, etc. or other damage.

### ● Checks performed with the power ON

- When the above inspections have been completed, plug in the AC adaptor and set the POWER switch to the | (ON) position and then check the following points. If you discover anything out of the ordinary, consult the table on Page 15 and order repairs as necessary.
  - Camera head : Make sure all 12 LEDs light up
  - LCD monitor : Make sure there are no color or contrast problems
  - Distance display : Make sure there is no abnormal error with respect to the extension distance

# Troubleshooting

## ⚠ WARNING

- If none of the items or instructions in the table below apply, do not attempt to disassemble and repair the machine yourself.
- If none of the items or instructions in the table below apply, or if the instruction is to "order repairs," contact the dealer where you purchased the machine or contact a REX office.
- Having the machine repaired by a person without the necessary knowledge or technical training to carry out proper repairs may prevent adequate performance and may lead to accident or injury. If a problem arises with the product, check the items in the table below and then contact your dealer or REX.

Problem	Possible cause	Remedy
Image is too dark	Camera is too far away from subject	Move the camera closer to the subject
	LED is burned out (unlit)	Arrange a service
	External device is improperly adjusted (if a monitor etc. is connected)	Adjust external device
Image is not visible	Switch is not set to ON position	Set the switch to the   (ON) position
	Power is not on (AC adaptor is not connected)	Connect the AC adaptor and set the switch to the   (ON) position
	External device is improperly adjusted (when a monitor, etc. is connected)	Check external device settings
POWER lamp is not lit	Switch is not set to ON position	Set the switch to the   (ON) position
	Power is not on (AC adaptor is not connected)	Connect the AC adaptor and set the switch to the   (ON) position
Image is out of focus	Camera is not focused properly	Adjust the focus (see Page 11)
Distance display does not appear	Distance display is turned off	Press the DISPLAY/RESET button once to turn on the distance display
Moving parts do not move smoothly	Foreign matter is caught in the moving parts	Remove foreign matter
Cable cannot be extended	Foreign matter is caught in the cable drum, etc.	Remove foreign matter
Cable cannot be retracted	Foreign matter is caught in the cable drum, etc.	Remove foreign matter
Image cannot be stored	External device is improperly adjusted	Check external device settings

Table 2 Troubleshooting

Special instruments have been used in the manufacture and adjustment of this product. In the event that the product fails to function properly, do not attempt to repair it yourself; order repairs from your nearest REX office or distributor. Problems that arise within the warranty period will be repaired at no charge. However, the LED cover and camera cable suffer considerable wear during use, and these repairs shall be treated as a replacement of consumable items. Therefore, please be advised that there will be a charge for such repairs even if the problem arises within the warranty period. To purchase replacement parts or for inquiries regarding servicing, please contact REX.

## ⚠ CAUTION

- Rex Industries will not be held responsible for injury or damage to the equipment occurring as a result of repairs that have been conducted by any party other than authorized Rex repair personnel.
- Repairs will not be conducted for equipment that has been contaminated by toxic substances, radiation etc.

Warranty period for parts	Parts for this product will be provided for a period of seven (7) years after manufacture of the product ceases, or five (5) years in the case of electronic components.
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# Options

The following options are available for the G-LINE SCOPE. Choose the option that best suits your application or purpose of use.

## Battery options

### ● DC battery (model no. 424954)

- Battery especially designed for use of the G-LINE SCOPE in places with no power supply.

Please do not dispose of used DC batteries in normal garbage; return them to a REX office for proper disposal

### ● Special DC battery adaptor (model no. 440364)

- Adaptor for connecting the G-LINE SCOPE to a DC battery

### ● DC battery recharger model no. (424956 for 100-120V,) 424960 for 220-240V.)

- Special recharger for use with DC batteries

## Other

### ● $\phi$ 100 mm skid (model no. 440366)

- Maintains the position of the camera in the center of the pipe during the inspection of  $\phi$  100 mm pipes

- For details, please contact your dealer or the nearest REX office.

## **⚠ Guarantee and Exemption from Liability**

1. Should the machine happen to break down for no apparent reason, despite normal and correct use, repairs and service parts shall be provided free of charge as outlined below.

Repairs shall be provided free of charge for a period of one year from date of purchase.

Dates, procedures and methods for providing repairs and service parts shall be decided in consultation with the customer.

After the one-year guarantee period, all repairs and service parts will be charged.

Repairs may be charged even within the guarantee period under the following circumstances:

- if the machine has not been used according to the instructions in the Operation Manual
- if it has been used for anything other than its intended purpose
- if it has not been repaired according to the Operation Manual or if it has been remodeled
- if consumables need replacing
- if the machine has been handled in an inappropriate way.

2. REX will accept no responsibility under the following circumstances:

- if a malfunction or accident occurs as a result of fire, abnormal fluctuations in voltage, damage from flood, earthquakes, lightning or other natural disasters, war, conflict, riot, terrorism or pollution, etc.
- when the machine has not been operated according to the Operation Manual
- when the machine has been used incorrectly, repaired or remodelled inappropriately
- when a malfunction or accident results from using the machine, or leaving it lying around and/or if it is exposed to the elements
- when a malfunction or accident results from using the machine either while or after connecting it to a joint.

3. Any costs incurred by the manufacturer shall not exceed the purchase price of the machine.

# **REX**

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