GLIDESCOPE
TITANIUM REUSABLE & SPECTRUM SINGLE-USE

Operations & Maintenance Manual

VERATHON®

GLIDESCOPE TITANIUM REUSABLE & SPECTRUM SINGLE-USE

Operations & Maintenance Manual

Effective: 13 February 2025

Caution: Federal (United States) law restricts this device to sale by or on the order of a physician.

CONTACT INFORMATION

To obtain additional information regarding your GlideScope system, please contact Verathon Customer Care or visit verathon.com/service-and-support.

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PRODUCT INFORMATION

GlideScope Titanium Reusable and Spectrum Single-Use video laryngoscopes combine innovative blade options, angles, and construction in order to enable rapid intubations for more patients in more settings. The systems are designed with low profile blades, and the slimmer design allows for more working space in the airway and accommodates smaller mouth openings.

PRODUCT DESCRIPTION

The GlideScope Titanium Reusable and Spectrum Single-Use video laryngoscopes are designed to deliver clear airway views and enable rapid intubation. Low-profile designs and innovative construction make these blades streamlined and lightweight, offering improved maneuverability and working space for routine and difficult airways. With more video laryngoscope options, including Mac-style and Miller-style, clinicians can choose their preferred airway tool for a wide range of patients and clinical settings. Both the GlideScope Titanium Reusable and Spectrum Single-Use systems feature a high-resolution, full-color digital camera and monitor for real-time viewing and recording.

GlideScope Titanium and Spectrum video laryngoscopes are designed to work with the GlideScope Video Monitor version 0570-0338.

STATEMENT OF INTENDED USE

The GlideScope Titanium Reusable and Spectrum Single-Use systems are intended for use by qualified professionals to obtain a clear, unobstructed view of the airway and vocal cords for medical procedures.

ESSENTIAL PERFORMANCE

Essential performance is the system performance necessary to achieve freedom from unacceptable risk. The essential performance of the GlideScope Titanium Reusable and Spectrum Single-Use systems is to provide a clear view of the vocal cords.

ENVIRONMENTS OF INTENDED USE

The GlideScope Titanium Reusable and Spectrum Single-Use systems are intended to be used in professional healthcare environments such as hospitals.

STATEMENT OF PRESCRIPTION

Caution: Federal (United States) law restricts this device to sale by or on the order of a physician.

GlideScope Titanium and Spectrum video laryngoscopes should be used only by individuals who have been trained and authorized by a physician or used by healthcare providers who have been trained and authorized by the institution providing patient care.

NOTICE TO ALL USERS

Verathon recommends that all users read this manual before using the system. Failure to do so may result in injury to the patient, may compromise the performance of the system, and may void the system warranty. Verathon recommends that new users:

- Obtain instruction from a qualified individual
- Practice using the video laryngoscope on a mannequin before clinical use
- Acquire clinical training experience on patients without airway abnormalities

WARNINGS & CAUTIONS

Warnings indicate that injury, death, or other serious adverse reactions may result from use or misuse of the device. *Cautions* indicate that use or misuse of the device may cause a problem, such as a malfunction, failure, or damage to the product. Throughout the manual, pay attention to sections labeled *Important*, as these contain reminders or summaries of the following cautions as they apply to a specific component or use situation. Please heed the following warnings and cautions.

WARNINGS: USE

WARNING

Before every use, ensure that the instrument is operating correctly and has no sign of damage. Do not use this product if the device appears damaged. Refer servicing to qualified personnel.

Always ensure that alternative airway management methods and equipment are readily available.

Report any suspected defects to Verathon Customer Care. For contact information, visit verathon.com/service-and-support.

WARNING

Portable radio frequency communications equipment (including peripherals such as antenna cables and external antennas) may not be used within 30 cm (12 inches) of any part of the system, including cables that Verathon specifies or provides for use with the system. If this distance is not maintained, performance of the system may be degraded and image display may be compromised.

WARNING

When you are guiding the endotracheal tube to the distal tip of the video laryngoscope, ensure that you are looking in the patient's mouth, not at the screen. Failure to do so may result in injury, such as to the tonsils or soft palate.

WARNING

Use only a passive-type USB flash drive. Do not use USB drives powered by another external source.

WARNINGS: REPROCESSING

WARNING

Because the product may be contaminated with human blood or body fluids capable of transmitting pathogens, all cleaning facilities must be in compliance with (U.S.) OSHA Standard 29 CFR 1910.1030 "Bloodborne Pathogens" or an equivalent standard.

WARNING

This product may only be cleaned, disinfected, or sterilized by using the approved processes provided in the GlideScope and GlideRite Products Reprocessing Manual (part number 0900-5032). Cleaning, disinfection, and sterilization methods listed are recommended by Verathon based on efficacy or compatibility with component materials.

WARNING

Reusable video laryngoscopes and video cables are delivered nonsterile and require cleaning and disinfection prior to initial use.

WARNING

Cleaning is critical to ensuring a component is ready for disinfection or sterilization. Failure to properly clean the device may result in a contaminated instrument after completing the disinfection or sterilization procedure.

When cleaning, ensure all foreign matter is removed from the surface of the device. This allows the active ingredients of the chosen disinfection method to reach all the surfaces.

WARNING

Availability of cleaning, disinfection, and sterilization products varies by country, and Verathon is unable to test products in every market. For more information, please contact Verathon Customer Care. For contact information, visit verathon.com/service-and-support.

WARNING

For information on the handling and disposing of recommended reprocessing solutions, please refer to the solution manufacturer's instructions.

WARNING

Do not reuse, reprocess, or resterilize single-use components. Reuse, reprocessing, or resterilization may create a risk of contamination of the device.

WARNING

The reusable Titanium video laryngoscope is considered a semi-critical device intended to contact the airway. It must be thoroughly cleaned and undergo high-level disinfection after each use.

WARNINGS: PRODUCT SAFETY

WARNING

The external monitor must be safety-approved medical equipment.

WARNING

To reduce the risk of electrical shock, use only the accessories and peripherals recommended by Verathon.

WARNING

Electric shock hazard. Do not attempt to open the system components. This may cause serious injury to the operator or damage to the instrument and voids the warranty. Contact Verathon Customer Care for all servicing needs.

WARNING

Electric shock hazard. Do not immerse the power adapter in water. When cleaning the power adapter, use a cloth dampened with isopropyl alcohol on the outside of the enclosure.

WARNING

Do not use the power adapter in the presence of flammable anesthetics.

WARNING

This instrument and related devices may contain mineral oils, batteries, and other environmentally hazardous materials. When the instrument or accessories have reached the end of their useful service life, see the section Device Disposal. Dispose of used, single-use components as infectious waste.

WARNING

To maintain electrical safety, use only the provided power supply. Connect the power cord and power adapter to a properly grounded plug, and ensure that the disconnect is easily accessible. Use only the accessories and peripherals recommended by Verathon.

WARNING

Use of accessories and cables other than those specified or provided by Verathon may cause this system to experience electromagnetic malfunctions, including increased emissions or decreased immunity. This may cause improper operation, procedure delays, or both.

WARNING

No modification of this equipment is allowed.

CAUTIONS

CAUTION

Medical electrical equipment requires special precautions regarding electromagnetic compatibility (EMC) and must be installed and operated according to the instructions in this manual. For more information, see the Electromagnetic Compatibility section.

Avoid using the GlideScope system adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, observe the system to verify normal operation in the configuration in which it will be used.

This device can radiate radio frequency energy and is highly unlikely to cause harmful interference with other devices in the vicinity. There is no guarantee that interference will not occur in a particular installation. Evidence of interference may include degradation of performance in this device or other devices when operated simultaneously. If this occurs, try to correct the interference by using the following measures:

- Turn devices on and off in the vicinity to determine the source of interference
- Reorient or relocate this device or other devices
- Increase the separation between devices
- Connect the device to an outlet on a circuit different than the other device(s)
- Eliminate or reduce EMI with technical solutions (such as shielding)
- Purchase medical devices that comply with IEC 60601-1-2 EMC standards

Be aware that portable and mobile radio frequency communications equipment (cellular phones, etc.) may affect medical electrical equipment; take appropriate precautions during operation.

CAUTION

The system contains electronics that may be damaged by ultrasonic and automated washing equipment. Do not use an ultrasonic device or automated washing equipment, other than Verathon-approved systems, to clean this product.

CAUTION

When cleaning video laryngoscopes, do not use metal brushes, abrasive brushes, scrub pads, or rigid tools. They will scratch the surface of the unit or the window protecting the camera and light, which may permanently damage the device.

CAUTION

Risk of permanent equipment damage. This product is sensitive to heat, which causes damage to the electronics. Do not expose the system to temperatures above 60°C (140°F), and do not use autoclaves or pasteurizers. Use of such methods to clean, disinfect, or sterilize the system causes permanent device damage and voids the warranty. For a list of approved cleaning procedures and products, see the Cleaning & Disinfecting chapter.

CAUTION

Ensure that you do not use any abrasive brushes, pads, or tools when cleaning the video monitor screen. The screen can be scratched, permanently damaging the device.

CAUTION

Do not use a knife or other sharp instrument to open packaging containing single-use video laryngoscopes, and do not use such components if their packaging is damaged.

CAUTION

European Union only: If any serious incident occurs during use of this product, you must immediately notify Verathon (or its authorized representative), the Competent Authority of the Member State where the incident occurred, or both.

INTRODUCTION

TITANIUM REUSABLE & SPECTRUM SINGLE-USE SYSTEMS

The system is available in the following configurations:

- GlideScope Titanium Reusable System
- GlideScope Spectrum Single-Use System

Both configurations feature the same video monitor, the cables and adapters to power the device, and any optional system components that may facilitate intubations or provide convenience to the user. The primary differences between the systems are the video laryngoscopes and the connecting cable.

You may use either the single-use or reusable system configurations, or your facility may elect to provide both configurations. This manual details both single-use and reusable system information and notes where the systems differ. In this document, unless otherwise noted, the term *video cable* describes both the Spectrum Smart Cable for the single-use system and the video cable for the reusable system.

Figure 1. Titanium Reusable System

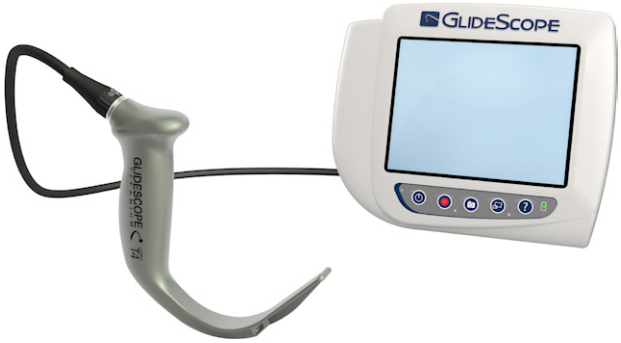


Figure 2. Spectrum Single-Use System

SPECTRUM SINGLE-USE SYSTEM

The single-use system features durable, plastic video laryngoscopes that must be disposed of after one use. It also features the GlideScope Titanium Spectrum Smart Cable—a reusable video cable that connects the video laryngoscope to the video monitor and contains the electronics that process the video data captured by the camera. Single-use video laryngoscopes are identified by an *S* in the blade name, such as *LoPro S4*.

IMPORTANT

Single-use video laryngoscopes in S3 and S4 sizes may also be available in white. These are not part of the Spectrum Single-Use system. For more information about the white video laryngoscopes, see the *GlideScope Titanium Single-Use Operations and Maintenance Manual* at verathon.com/service-and-support.

TITANIUM REUSABLE SYSTEM

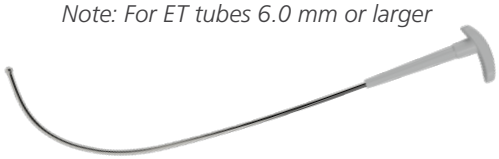
The reusable system features a titanium video laryngoscope that must be cleaned and high-level disinfected between uses. The video laryngoscope is connected to the video monitor via a reusable video cable. Unlike the single-use system, the reusable system video electronics are located within the laryngoscope. Due to their titanium construction, reusable video laryngoscopes contain a *T* in the blade name, such as *LoPro T4*.

SYSTEM PARTS & ACCESSORIES

Table 1. Required System Components

REQUIRED PARTS & ACCESSORIES		
GlideScope Video Monitor 	Video cable (for reusable system) *Note: Cable shortened for illustration purposes.* 	Spectrum Smart Cable (for single-use system) *Note: Cable shortened for illustration purposes.* 
One or more of the following video laryngoscopes:		
Spectrum Single-Use Sizes		
LoPro S1 	LoPro S2 	LoPro S2.5 
LoPro S3 	LoPro S4 	
Miller S0 	Miller S1 	DirectView MAC S3 
DirectView MAC S4 		
Reusable Sizes		
LoPro T2 	LoPro T3 	LoPro T4 
MAC T3 	MAC T4 	
Accessories		
Video monitor 12V DC power adapter 	Power cable 	In-service USB flash drive *Note: Contains instructions for use.* 

Table 2. Optional System Components

OPTIONAL PARTS & ACCESSORIES			
Premium cart 	Mobile stand 	Media storage USB flash drive 	Universal accessory basket *Note: For use with mobile stand* 
		HDMI-to-DVI cable 	IV pole mounting kit 
GlideRite Rigid Stylet *Note: For ET tubes 6.0 mm or larger* 		GlideRite Single-Use Stylet (Small) *Note: For ET tubes 3.0–4.0 mm* 	
GlideRite Single-Use Stylet (Medium) *Note: For ET tubes 4.5–5.5 mm* 		GlideRite Single-Use Stylet (Large) *Note: For ET tubes 6.0 mm or larger* 	

The monitor is also compatible with GlideScope AVL system components. For more information, contact Verathon Customer Care or see the *GlideScope AVL Single-Use Operations and Maintenance Manual*.

Note: The monitor is not compatible with Spectrum QC video laryngoscopes or the Video Baton QC Large.

LANGUAGE SETTINGS

The video monitor software is available in a variety of languages. To change the language used on your system, you must install a new software version via a USB flash drive. For more information, contact Verathon Customer Care or your local representative. For contact information, see verathon.com/service-and-support.

VIDEO LARYNGOSCOPE COMPONENTS

The main components of the system are the LoPro, Miller, or Mac video laryngoscopes in either single-use or reusable configurations. The single-use video laryngoscopes are available in a disposable format with blades that feature the signature GlideScope LoPro curve, or in Miller and Mac styles which incorporate the look and feel of traditional Miller and Macintosh blades. The reusable video laryngoscopes combine the performance of LoPro or Miller-style blades with the strength of titanium.

Figure 3. Video Laryngoscope Components

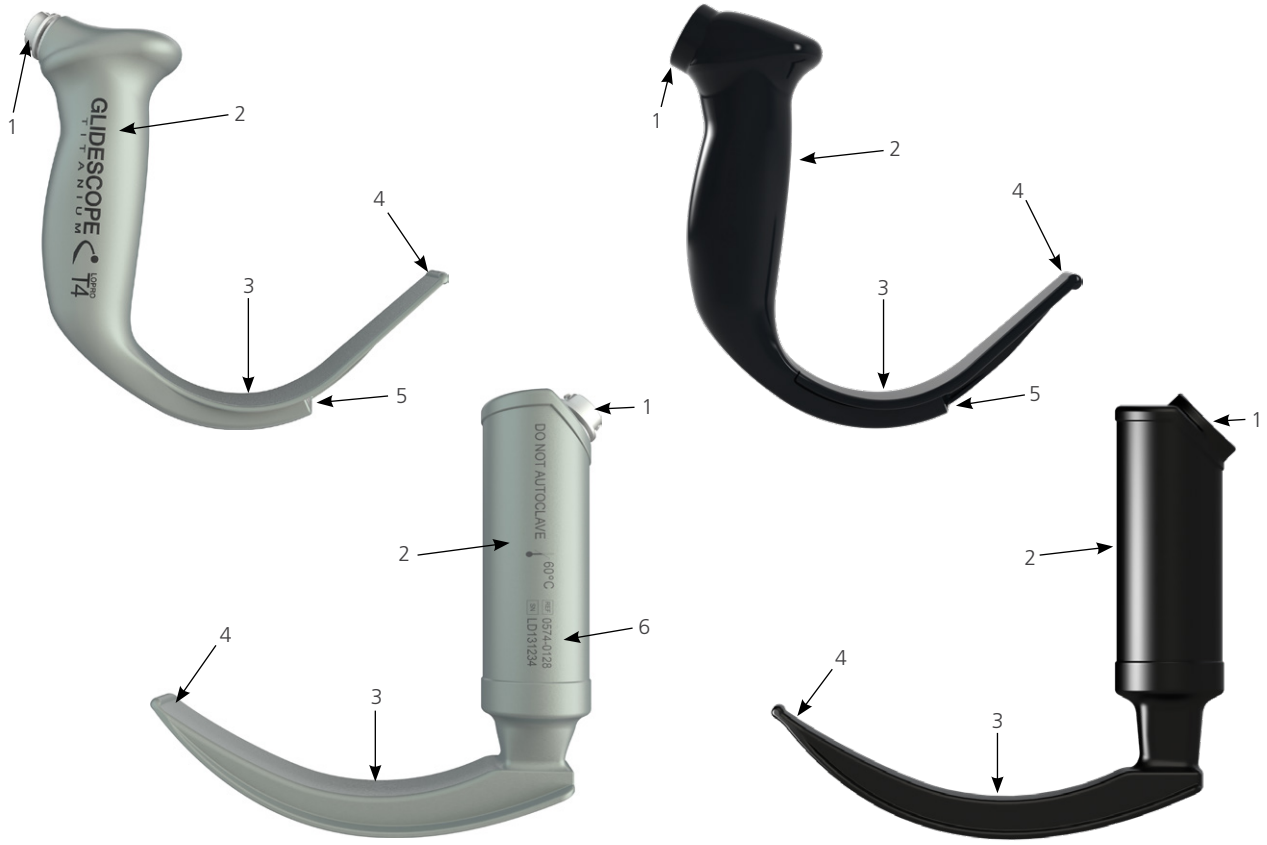


Table 3. Video Laryngoscope Components

FIGURE KEY	COMPONENT	NOTES
1	Connector	—
2	Handle	—
3	Blade	The low-profile, thinner blade design allows for more working room in the airway and mouth
4	Distal tip/lifter	—
5	Camera and light	High-resolution, full-color camera with integrated LED light source
6	Product number and serial number	On the left side of the handle of reusable video laryngoscopes. (Not available on single-use video laryngoscopes.)

VIDEO MONITOR BUTTONS, ICONS, & CONNECTIONS

One of the main components of the system is the digital, full-color monitor. The front of the monitor includes the screen and the buttons you use to operate the system.

The back panel of the monitor includes the sockets and ports for connecting the power cord, the video cable, an HDMI-to-DVI cable for external video display, and a USB flash drive. When a socket or port is not in use, it is recommended that the rubber cap is inserted into the opening. This protects the exposed connectors from dust and other contamination. The back of the video monitor also features a mounting plate fitting that allows you to attach the monitor to a mobile stand or IV pole.

Figure 4. GlideScope Video Monitor Keypad

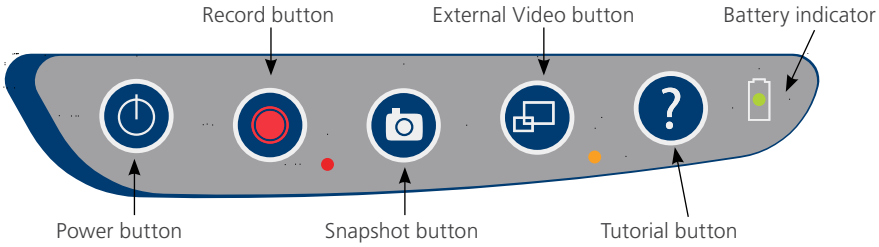


Table 4. Keypad Buttons

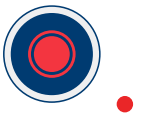
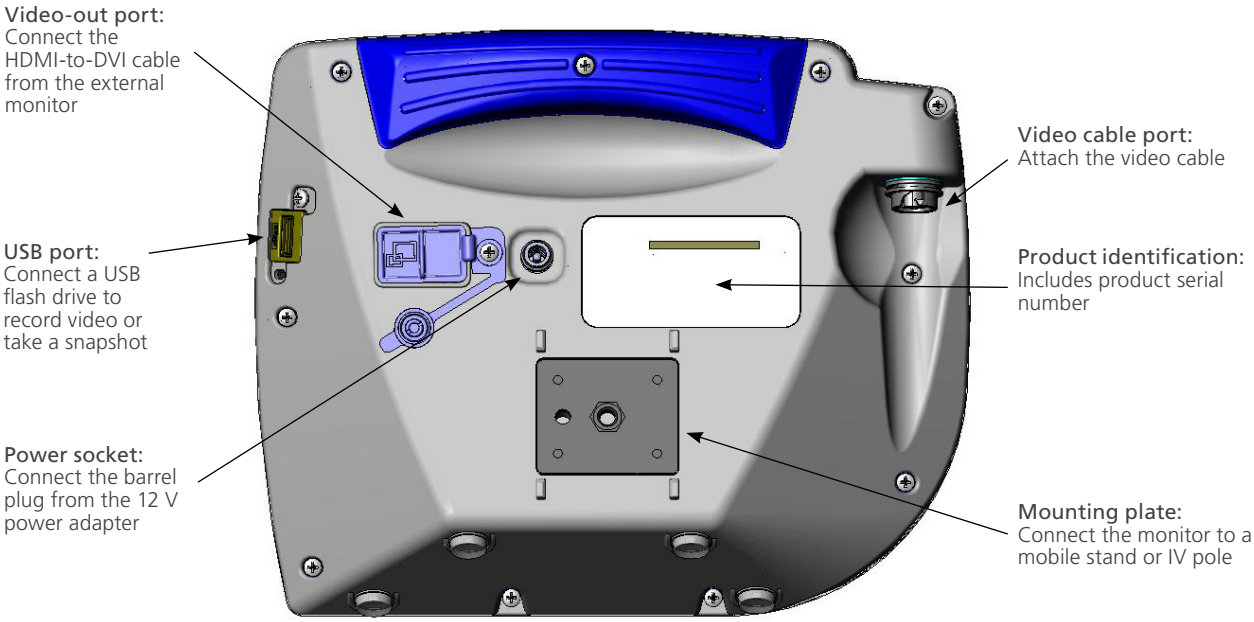
BUTTON	FUNCTION
	**Power:** Press and release to turn on the monitor. Press and hold to turn it off. *Note: If the monitor freezes at any time during use, press and hold the Power button for 10 seconds to reset the system.*
	**Record:** Press to start and stop recording directly to a USB flash drive that has been inserted in the USB port. When you are recording, the red LED indicator to the right of the button will be lit, and the Recording icon will be shown on the screen. *Note: To record video, a USB flash drive must be inserted into the monitor USB port.*
	**Snapshot:** Press this button to save a snapshot of the live display to the USB flash drive. You may take a snapshot while video recording or independent of recording. *Note: To take a snapshot, a USB flash drive must be inserted into the monitor USB port.*
	**External Video:** Press to display video on an external monitor. The yellow LED to the right of the button will light up to indicate that the feature has been activated. Press the button again to deactivate the external video. *Note: An HDMI-to-DVI cable is required in order to display video on an external monitor.*
	**Tutorial:** If a USB flash drive is not inserted into the monitor, press and hold to access the video tutorial. If a USB flash drive is inserted into the monitor, press and hold to access the Playback menu. *Note: The Playback menu is only accessible if the GlideScope Video Monitor is operating software version 3.4 or higher and if a USB flash drive is inserted in the monitor.*
	**Battery Indicator:** LED is: **Green:** Unit fully charged **Red:** Unit charging **Flashing Red:** Indicates a problem with the battery. Charge for 6 hours, and if still flashing, contact Verathon Customer Care.

Table 5. On-Screen Icons

ICON	FUNCTION
	**Battery Status:** The remaining battery power is indicated by the Battery Status icon and the percentage above the icon. If the icon is red, the battery should be charged as soon as possible. (See Charge the Monitor Battery.) While the battery is being charged, a lightning bolt will be displayed alongside the Battery Status icon.
	**Progress Confirmation:** While the user is pressing a button, the operation is loading. If the button is released before the loading process is completed, the operation is canceled.
	**Power-Down Countdown:** The unit is about to turn off. If this is due to the Auto Power Off feature that saves battery life, pressing any button stops the power-down sequence. *Note: The Auto Power Off feature can be adjusted or disabled on the User Settings screen. For more info, see* Configure User Settings *on* page 23.
	**USB Flash Drive:** A USB flash drive is detected. While recording, a number next to the icon indicates approximately what percentage of the USB flash drive has been used. When the USB flash drive is full, recording stops.
	**Incompatible USB Drive:** The USB flash drive that is plugged into the monitor is not suitable for recording videos. (This normally occurs when using an older, inexpensive USB flash drive that is not capable of the speed necessary to save video in real time.)
	**USB Flash Drive Not Found:** A USB drive needs to be inserted into the USB port.
	**Attach Video Cable:** The video baton or video laryngoscope is not attached to the monitor.
	**Recording:** The system is recording video to the USB flash drive. *Note: Do not remove the USB flash drive while recording is in progress, or the recording will be lost.*
	**Saving Snapshot:** The system is saving a snapshot to the USB flash drive. *Note: Do not remove the USB flash drive while saving a snapshot, or the snapshot will be lost.*
	**Saving File:** The system is saving a recorded file to the USB flash drive. *Note: Do not remove the USB flash drive while this icon is displayed, or the recording will be lost.*
	**External Monitor:** The HDMI-to-DVI connection for external video is enabled. Video may now be displayed on an external monitor.

ICON	FUNCTION
	**Hourglass:** Please wait while the system prepares for the next action.
	**Audio Recording is Active:** Audio is being recorded on the video. *Note: The default for audio recording is OFF, so audio recording on the video occurs only if the default has been changed to ON in user settings.*
	**Back Arrow:** Exit to previous screen.
	**Up Arrow:** Select previous file for playback.
	**Down Arrow:** Select next file for playback.
	**Play:** Play the selected file or continue playing a paused video file.
	**Pause:** Pause the video playback.
	**Snapshot:** On the Playback menu, this icon indicates that a file is a snapshot.
	**Video:** On the Playback menu, this icon indicates that a file is a video.

Figure 5. GlideScope Video Monitor Back Panel



SETTING UP

Please read the Warnings & Cautions section before performing the following tasks.

Before you can use the system for the first time, you must inspect the components, set up the system, and perform a functional test as recommended by Verathon. Complete the following procedures:

1. Perform Initial Inspection—Inspect the system for any obvious physical damage that may have occurred during shipment.
2. Mount the System (Optional)—Set up the GlideScope Video Monitor on a mobile stand or IV pole.
3. Charge the Monitor Battery—Note that you can use the system while the battery is charging.

   Note: The monitor will operate without charging the battery by using the GlideScope Video Monitor 12V DC power adapter that shipped with the unit.
4. Attach the Video Cable & Video Laryngoscope—Connect the video cable or Smart Cable to the monitor, and then connect the video laryngoscope to the video cable or Smart Cable.
5. Connect to an External Monitor (Optional)—Connect the monitor to an external display source, such as a larger monitor screen, by using the HDMI-to-DVI cable.
6. Configure User Settings—Enter data customized to your clinic, and configure settings such as the date and time.
7. Perform a Functional Check—Before you use the device for the first time, perform a functional check to ensure that the system is working properly.

PROCEDURE 1. PERFORM INITIAL INSPECTION

When you receive the system, Verathon recommends that an operator familiar with the instrument perform a full visual inspection of the system for any obvious physical damage that may have occurred during shipment.

Note: Due to the hand-polishing method used to create the titanium exterior of the reusable video laryngoscopes, slight variations or irregularities may occur in the finish. These variations do not affect the cleaning process or system efficacy.

1. Verify that you have received the appropriate components for your system by referring to the packing list included with the system.
2. Inspect the components for damage.
3. If any of the components are missing or damaged, notify the carrier and Verathon Customer Care or your local representative. For contact information, visit verathon.com/service-and-support.

PROCEDURE 2. MOUNT THE SYSTEM (OPTIONAL)

If you choose to mount the system, you may use either of the following configurations:

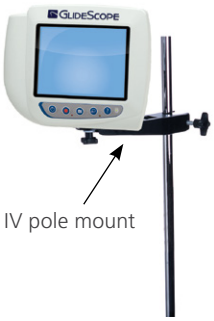
- Mount it on a premium cart or mobile stand (Figure 6 or Figure 7). These solutions make it easy for you to move the system from one location to another.
- Mount it on an IV pole (Figure 8).

This procedure includes instructions for assembling the mobile stand, mounting the system on either the mobile stand or an IV pole, and adjusting the monitor angle.

Figure 6. Premium Cart

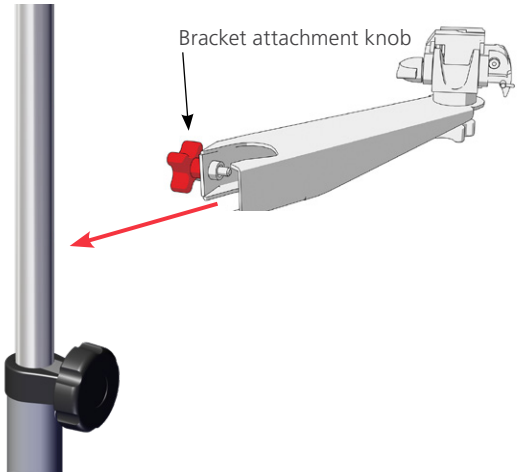
Figure 7. Mobile Stand

Figure 8. IV Pole Mount

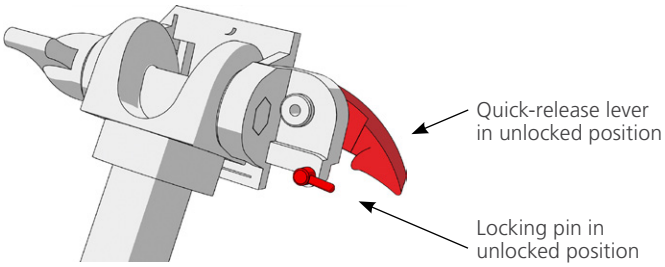


ATTACH THE MONITOR TO THE MOBILE STAND OR IV POLE

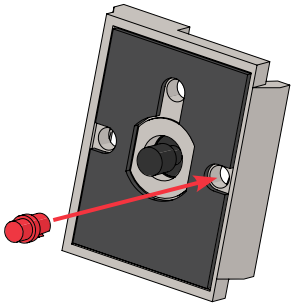
1. If you are using the GlideScope premium cart or mobile stand, assemble it according to the instructions included with the component.
2. If you are using an IV pole mount, place the mounting bracket on the IV pole, and then tighten the bracket attachment knob until the IV pole mount is secure.



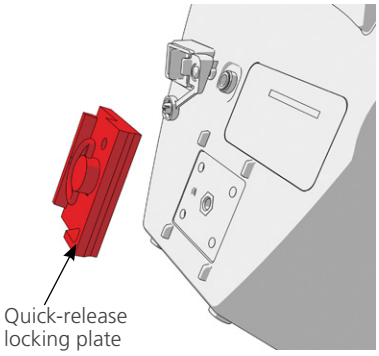
3. On the mobile stand mount or the IV pole mount, ensure that the locking pin and quick-release lever are in the unlocked (horizontal) position.

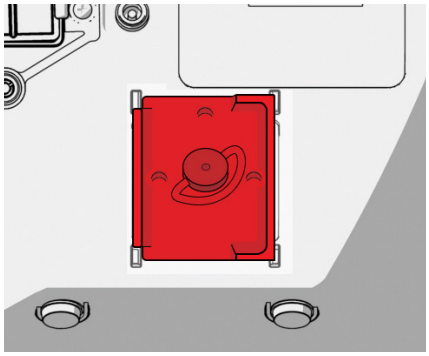


4. While holding the quick-release locking plate with the head of the mounting screw facing away from you and the larger of the two flanges to your left, Insert a positioning pin into the right-hand hole on the locking plate as shown in the following image.



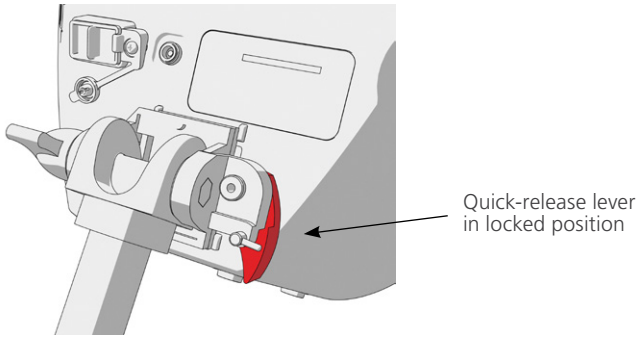
5. Using the orientation shown in the following images, screw the quick-release locking plate to the back panel of the monitor.



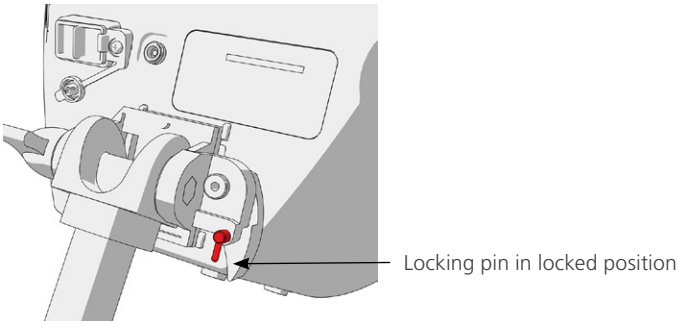


6. Seat the locking plate of the monitor on the quick-release mount. When properly situated, the monitor sits securely on the mount, and the quick-release lever automatically snaps into the locked (down) position.

7. Ensure that the quick-release lever is fully in the locked (down) position. This locks the monitor into place.



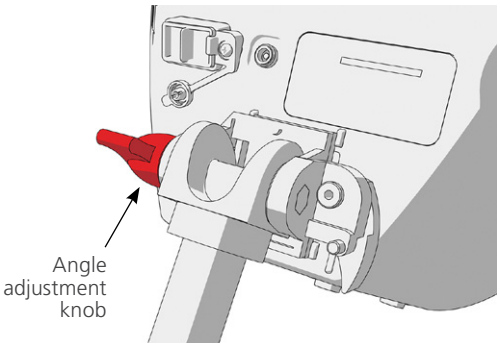
8. Adjust the locking pin to the locked (down) position. This secures the quick release lever in the locked position.



ADJUST THE MONITOR ANGLE

Before you start using the video monitor, adjust the angle of the monitor for optimal viewing. The ideal angle minimizes glare and maximizes visibility.

1. Turn the angle adjustment knob counterclockwise.



2. Tilt the monitor to the desired angle.
3. Turn the angle adjustment knob clockwise. This secures the monitor at the desired angle.

PROCEDURE 3. CHARGE THE MONITOR BATTERY

Please read the Warnings & Cautions section before performing the following task.

The GlideScope Video Monitor includes an internal lithium-ion battery. Verathon recommends that you charge the battery fully prior to first use.

Under normal operating conditions, a fully charged battery lasts approximately 90 minutes or longer before it needs to be recharged. For optimal battery life, ensure that the battery is fully charged before you try to use the monitor in battery mode. You should charge the battery at temperatures between 0–35°C (32–95°F).

The percentage above the Battery Status icon indicates the remaining battery charge.

Figure 9. Battery Status Icons

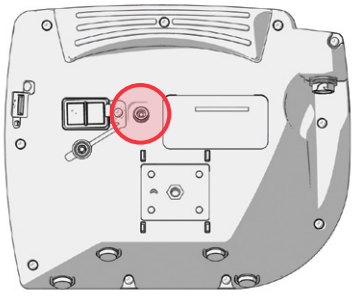
19% battery life or less remaining. Battery must be charged.

20% to 50% battery life remaining.

51% to 82% battery life remaining.

Battery is 83% to fully charged. The lightning bolt indicates that the battery is charging.

1. Connect the video monitor 12 V DC power adapter to the power cable.
2. On the back panel of the monitor, remove the power socket cap, and then connect the 12 V DC power adapter to the power socket.



3. Plug the power supply into a hospital-grade power outlet.
4. Allow the battery to charge. Fully charging the battery may take up to 6 hours.

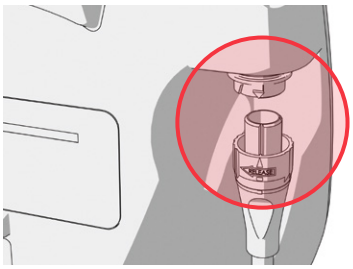
PROCEDURE 4. ATTACH THE VIDEO CABLE & VIDEO LARYNGOSCOPE

The video cable attaches the video laryngoscope to the GlideScope Video Monitor, supplying power to the video laryngoscope and transmitting video data from the camera to the monitor. This procedure provides options for single-use and reusable systems—complete the option appropriate for your configuration.

The monitor is also compatible with GlideScope AVL system components. For more information, contact Verathon Customer Care or see the *GlideScope AVL Single-Use Operations and Maintenance Manual*.

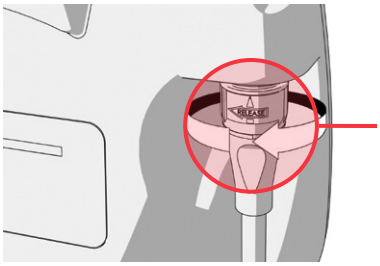
OPTION 1. REUSABLE SYSTEM

1. Ensure that the video monitor is turned off.
2. Align the arrow on the video cable and the arrow on the video cable port.



3. Insert the video cable connector into the port. You will hear a click when the cable is successfully connected.
4. Align the arrow on the video cable with the dot on the video laryngoscope, and then insert the video cable into the port. You will hear a click when the cable is successfully connected.

5. To disconnect the video cable from the monitor or video laryngoscope, rotate the connector ring in the direction of the release arrow, and then remove the connector from the port.



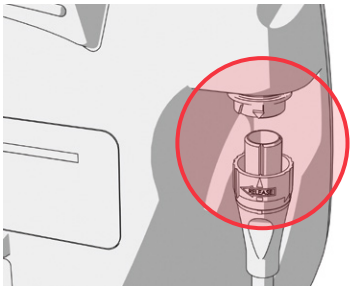
OPTION 2. SPECTRUM SINGLE-USE SYSTEM

IMPORTANT

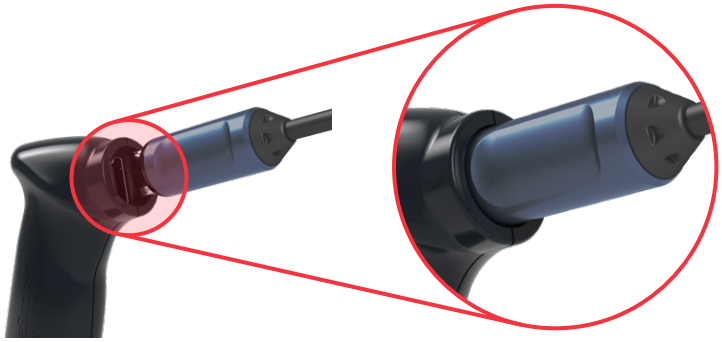
Spectrum Miller video laryngoscopes are not compatible with the original GlideScope Titanium Smart Cable (part number 0800-0522). You must use a Spectrum Smart Cable (part number 0800-0543) to connect these video laryngoscopes to a GlideScope Video Monitor. Spectrum Smart Cables can be identified by the blue color of their video laryngoscope connectors.

It is recommended that you leave the single-use video laryngoscope in its packaging while you connect it, and that you do not remove it from the package until you are ready to perform an intubation procedure. This helps ensure that the blade remains as clean as possible until you are ready to use it.

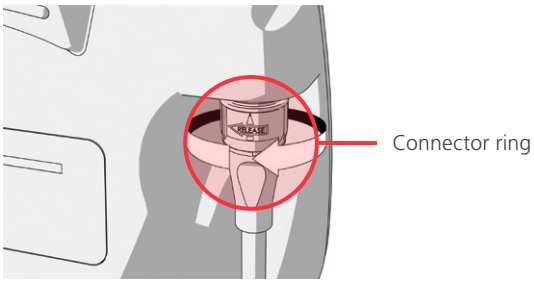
1. Ensure that the video monitor is turned off.
2. Align the arrow on the Smart Cable and the arrow on the video cable port.



3. Insert the Smart Cable connector into the port. You will hear a click when the cable is successfully connected.
4. Align the arrow on the Smart Cable with the dot on the video laryngoscope's cable port, and then insert the connector fully into the port.



5. To disconnect the Smart Cable from the monitor, rotate the connector ring in the direction of the release arrow, and then remove the connector from the port.



6. To disconnect a video laryngoscope from the Smart Cable, hold the cable connector in one hand and the video laryngoscope handle in the other, and then pull. The video laryngoscopes disconnects from the cable.

PROCEDURE 5. CONNECT TO AN EXTERNAL MONITOR (OPTIONAL)

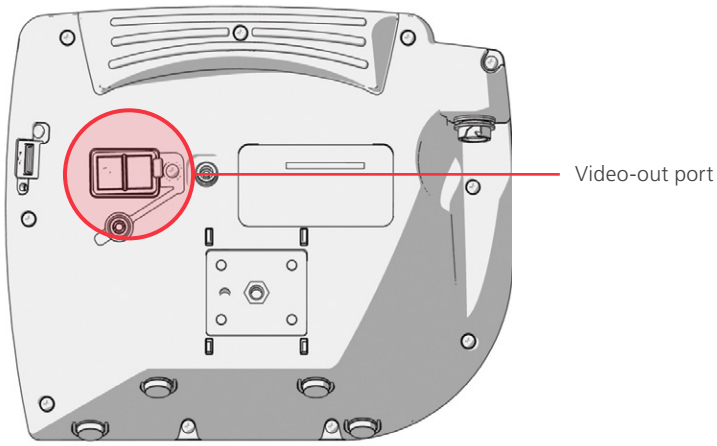
Please read the Warnings & Cautions section before performing the following task.

By using an HDMI-to-DVI cable, you can connect the GlideScope Video Monitor to an external monitor that is approved for medical use. For more information, please contact your Verathon Customer Care representative.

Note: Image quality on the external monitor may vary according to the resolution of the external monitor.

Note: To maintain electromagnetic interference (EMI) within certified limits, the system must be used with the cables, components, and accessories specified or supplied by Verathon. For additional information, see the System Parts & Accessories and Component Specifications sections. The use of accessories or cables other than those specified or supplied may result in increased emissions or decreased immunity of the system.

1. Ensure that the video monitor is turned off.
2. On the back of the monitor, remove the HDMI cap from the video-out port.
3. Connect the HDMI end of the cable to the video-out port.



4. Connect the other end of the cable to the DVI port on an external monitor that is approved for medical use.
5. Press the **Power** button. The monitor turns on.
6. Press the **External Video** button. The indicator LED to the right of the button illuminates when the connection is successful, and the video displays on the external monitor.
7. To stop sending video to an external monitor, press the **External Video** button again.
8. Prior to disconnecting the HDMI-to-DVI cable, ensure the video monitor is turned off.

PROCEDURE 6. CONFIGURE USER SETTINGS

You may configure the following settings directly on the unit:

- Date and Time
- Date and Time Format
- Key Click Sound
- Auto Power Off
- Audio Recording
- Auto Recording
- Auto External Video
- Clinic Name

The second page of user settings, as seen in Figure 11, is only available if your GlideScope Video Monitor is running software version 3.4 or higher. This page of user settings displays system use information, and it does not contain any configurable settings. If you would like to update the software, see System Software on page 35.

Figure 10. User Settings Screen Page 1

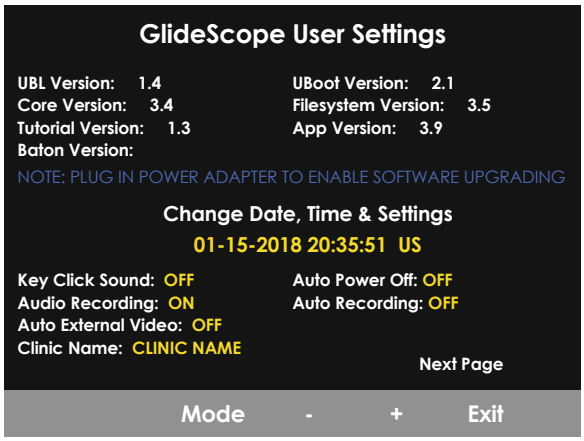
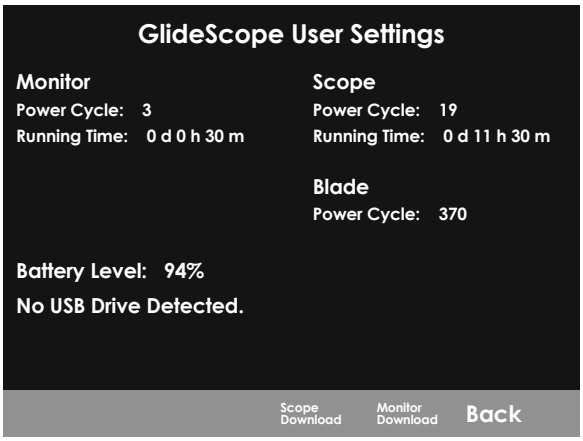


Figure 11. User Settings Screen Page 2



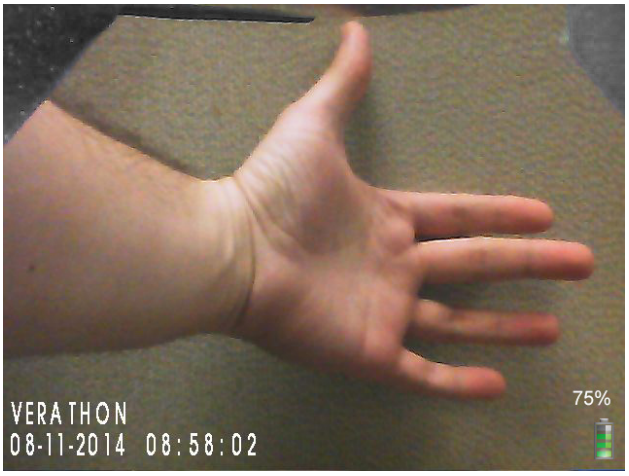
1. If a USB flash drive is inserted into the monitor, remove it.
2. Press the **Power** button. The monitor turns on.
3. Press and hold the **Tutorial** button, and while continuing to hold it, press the **Snapshot** button. The User Settings screen appears on the monitor. The configurable user settings are displayed in yellow, and the selected setting is highlighted in red.
4. Customize your user settings by using the following buttons:
   - Press the **Record** button to select the parameter you want to set.
   - Press the **Snapshot** button to decrease the parameter value.
   - Press the **External Video** button to increase the parameter value.
   - When inputting the Clinic Name, the **Tutorial** button moves the selection to the next letter. Press the **Record** button twice to return the selection back to the Date/Time setting.
   - To view the second page of user settings, press the **Record** button until **Next Page** is highlighted in red, and then press the **Tutorial** button. To exit the second page of user settings, press the **Tutorial** button again.
5. When you are finished customizing the settings, press the **Record** button until the option **Exit** is available in the gray bar, and then press the **Tutorial** button. This saves the parameters, and the User Settings screen closes.

PROCEDURE 7. PERFORM A FUNCTIONAL CHECK

Before you use the device for the first time, perform the following functional check to ensure that the system is working properly. Please contact your local Verathon representative or Verathon Customer Care if your system does not function as described below. For contact information, visit verathon.com/service-and-support.

REQUIRED CHECKS

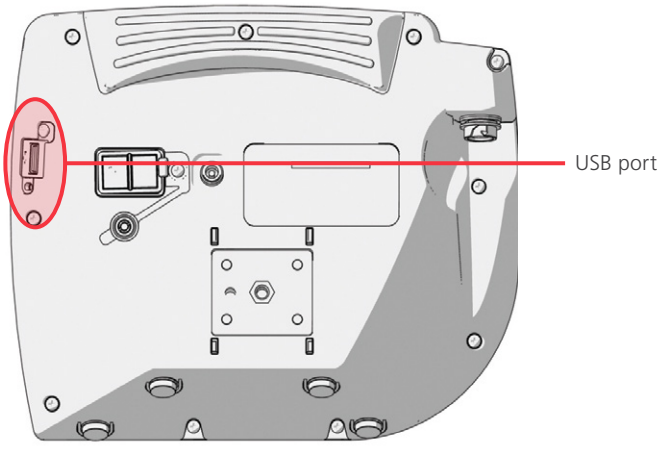
1. Fully charge the monitor battery (this takes approximately 6 hours).
2. Connect a video cable to a video laryngoscope, and then connect it to the monitor.
3. Press the **Power** button. The monitor turns on.
4. Look at the monitor screen and verify that the image displayed is being received from the camera.



Note: There may be a slight blade intrusion in the upper-left corner of the monitor, and a thin line may appear along the top. These blade edges are captured in the view because of the wide-angle camera lens used in the video laryngoscope. This image acts as a frame of reference during the intubation process and ensures that the orientation of the image is correct in the monitor.

RECOMMENDED CHECKS

5. On the back of the monitor, remove the USB port cap, and then insert a USB flash drive into the port.



6. Ensure that the USB flash drive is detected by checking if the **USB Flash Drive** icon on the bottom of the screen is displayed.

7. Press the **Record** button  . Recording starts.
8. To stop recording, press the **Record** button  again.
9. Wait until the **Saving File** icon  has disappeared from the screen, and then remove the USB flash drive from the monitor.
10. On a computer, verify that the recorded video (.avi) file can be played.

    Note:

    If you are viewing the recorded file on a Windows operating system (OS), use an application such as Windows Media Player.

    If you are viewing the recorded video file on Mac OS, use an application such as one of the following:

    - *MPlayerX (free in the App Store)*
    - VLC (free at http://www.videolan.org/vlc/index.html)

    If you are viewing the recorded video file on iOS, use an application such as one of the following:

    - *VLC for iOS (free in the App Store)*
    - *8player lite (free in the App Store)*
    - *Media Player—PlayerXtreme HD (free in the App Store)*

USING THE DEVICE

Prior to using the device, set up the device according to the instructions in the previous chapter, and verify the setup by completing the procedure Perform a Functional Check.

Please read the Warnings & Cautions section before performing the following tasks.

Titanium video laryngoscopes are equipped with the Reveal anti-fog feature, which reduces camera fogging during the intubation procedure. For the maximum level of fog reduction, you must allow the video laryngoscope to warm up for 30–120 seconds prior to use, depending on the ambient temperature and humidity of the clinical environment. Complete fog reduction is not necessary to use the device; if necessary, you may begin the intubation procedure immediately.

Using the Titanium system consists of the following:

- Prepare the GlideScope System
- Intubate the Patient
- Use the Record & Snapshot Features (Optional)
- Use the Playback Feature (Optional)

PROCEDURE 1. PREPARE THE GLIDESCOPE SYSTEM

IMPORTANT

Ensure that each component has been properly cleaned, disinfected, or sterilized according to the guidance provided in the *GlideScope and GlideRite Products Reprocessing Manual* (part number 0900-5032), which is available at verathon.com/service-and-support.

In this procedure, you select and attach the appropriate video laryngoscope for the patient, turn the system on, and verify that the system is functioning properly.

1. Based on a clinical assessment of the patient and the experience and judgment of the clinician, select the GlideScope video laryngoscope that is appropriate for the patient.
2. Inspect the system, the power adapter, the video laryngoscope, and all cables to make sure they are not damaged.
3. Attach the video cable and video laryngoscope to the monitor, according to the instructions in Attach the Video Cable & Video Laryngoscope on page 19.
4. Press the **Power** button. The video monitor turns on.

   Note: If the GlideScope Video Monitor locks up, becomes unresponsive for any reason, or does not show an image from the blade, press and hold the Power button for 10 seconds to reboot the system.
5. Ensure that the battery is sufficiently charged. If necessary, connect the monitor directly to power.
6. On the monitor screen, verify that the image displayed is from the video laryngoscope camera. A small portion of the blade may be visible on the upper-left corner or top of the monitor screen.
7. If you are using a Titanium video laryngoscope and if needed, allow the GlideScope Reveal anti-fog feature to warm up for 30–120 seconds.

   Note: The time required for the anti-fog feature to be fully optimized varies according to the ambient temperature and humidity where the equipment is being stored or used. If the video laryngoscope is stored in cold conditions, additional warming time may be required for optimal performance of the anti-fog feature.
8. If desired to provide additional anti-fog benefits, you may apply Dexide Fred or Dexide Fred Lite to the camera window on the blade.* Use the solution according to the manufacturer's instructions.

* Compatibility has been demonstrated for up to 100 cycles on reusable video laryngoscopes.

PROCEDURE 2. INTUBATE THE PATIENT

Please read the Warnings & Cautions section before performing the following tasks.

To perform an intubation using GlideScope hyperangulated blades, Verathon recommends using the technique outlined in this procedure. Prior to beginning this procedure, verify that the monitor is receiving an accurate image from the video laryngoscope.

1. Stabilize the patient's head.
2. Look in the mouth, insert the blade midline, and then advance the tip into the vallecula.
3. Look at the screen, and then lift the epiglottis for a view of the larynx.
4. Look in the mouth, and then introduce an endotracheal tube alongside the blade.
5. Look at the screen, and then complete the intubation.
6. If using a GlideRite stylet, remove it by pulling toward the patient's feet.

PROCEDURE 3. USE THE RECORD & SNAPSHOT FEATURES (OPTIONAL)

Please read the Warnings & Cautions section before performing the following task.

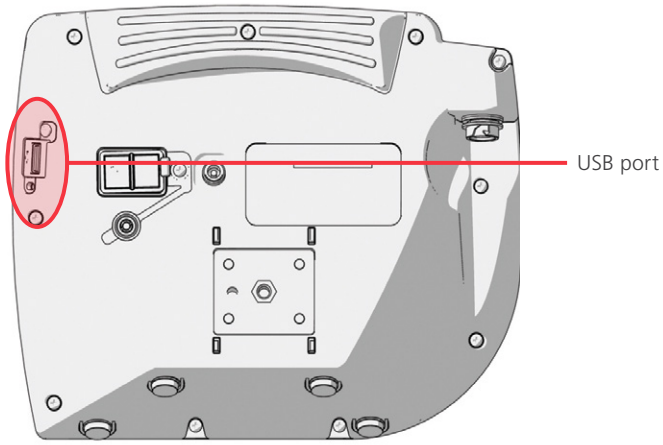
The system is equipped with video and audio recording features and the ability to save a snapshot of the live display on the monitor. The video monitor saves this data to a USB flash drive, and you can view the recordings or snapshots on a computer or on the video monitor. For more information about viewing these files on a monitor, see Use the Playback Feature (Optional) on page 31.

By default, audio recording is disabled on the system. If you would like the system to record audio in addition to video, complete the procedure Configure User Settings in order to enter the User Setting display, and then change the **Audio Recording** setting to **On**.

While recording, a number next to the icon indicates approximately what percentage of the USB flash drive has been used. When the USB flash drive is full, recording stops.

1. On the back of the monitor, remove the USB port cap, and then insert a USB flash drive into the port.

   Note: If you do not insert a USB flash drive, the video recording, audio recording, and snapshot features will not be available.



2. Ensure that the USB flash drive is detected by checking if the **USB Flash Drive** icon on the bottom of the screen is displayed.
3. If you are recording the intubation, press the **Record** button . Video recording starts and is saved to the USB flash drive.

   If audio recording is enabled in the User Settings display, the **Audio Recording is Active** icon will appear on the screen, and audio will be recorded with the video.
4. When you are finished recording, press the **Record** button again, and then wait for the **Saving File** icon to disappear.

   Note: If you remove the USB flash drive before the Saving File icon disappears, the recording will be lost.
5. If at any point you would like to save a photo of the live display to the USB flash drive, press the **Snapshot** button , and then wait for the **Saving Snapshot** icon to disappear.

   Note: If you remove the USB flash drive before the Saving Snapshot icon disappears, the photo will be lost.

6. If you would like to review the recorded files on the video monitor, complete the following procedure, Use the Playback Feature (Optional).

   If you would like to review the recorded files on a computer, insert the USB flash drive into the PC, and then view the .avi or .jpg files.

   Note:

   If you are viewing the recorded file on a Windows operating system (OS), use an application such as Windows Media Player.

   If you are viewing the recorded video file on Mac OS, use an application such as one of the following:

   - *MPlayerX (free in the App Store)*
   - VLC (free at http://www.videolan.org/vlc/index.html)

   If you are viewing the recorded video file on iOS, use an application such as one of the following:

   - *VLC for iOS (free in the App Store)*
   - *8player lite (free in the App Store)*
   - *Media Player—PlayerXtreme HD (free in the App Store)*

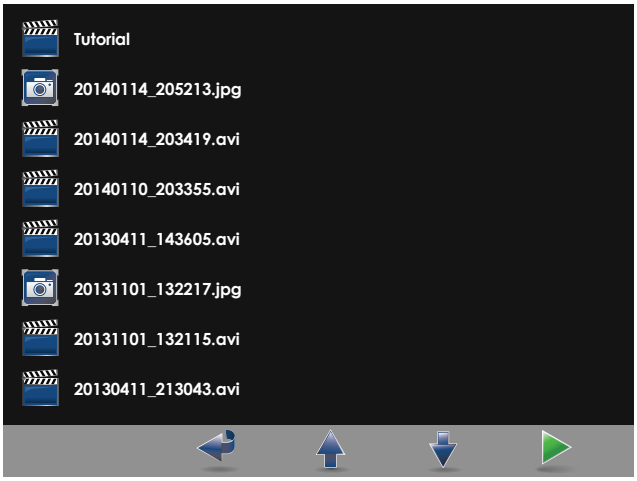
PROCEDURE 4. USE THE PLAYBACK FEATURE (OPTIONAL)

Recorded videos and snapshots on a USB flash drive can be viewed on the GlideScope Video Monitor.

This feature is only available if your GlideScope Video Monitor is running software version 3.4 or higher. For more information about upgrading the software, see System Software on page 35.

1. On the back of the monitor, remove the USB port cap, and then insert a USB flash drive into the port.
2. Ensure that the USB flash drive is detected by checking if the **USB Flash Drive** icon on the bottom of the screen is displayed.
3. Press and hold the **Tutorial** button 3 seconds or longer. The playback menu is displayed.

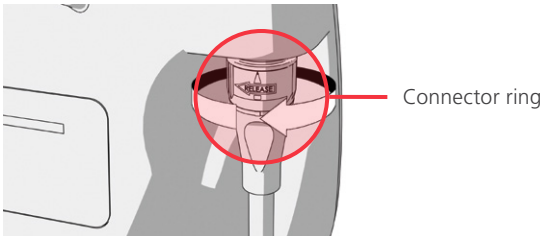
Figure 12. Playback Menu



4. Navigate the menu as follows:
   - Press the **Snapshot** button to move up the list of playback files.
   - Press the **External Video** button to move down the list of playback files.
5. When you have selected the item that you want to play, press the **Tutorial** button. Playback starts.
6. When the file is being played back and is displayed on the screen, press the **Snapshot** button to playback the next file above the one currently displayed. Press the **External Video** button to play the next file below the one currently displayed.
7. If the file being played back is a video, pause and resume playback by pressing the **Tutorial** button.
8. Press the **Record** button to return to the playback menu.
9. Press the **Record** button again to close the playback menu.

PROCEDURE 5. PREPARE A COMPONENT FOR CLEANING

1. Make sure the video monitor has been turned off.
2. Detach the cable from the monitor by turning the connector ring in the direction of the release arrow.



3. Detach the cable from the video laryngoscope.

   If you are cleaning a reusable system, rotate the connector ring on the video cable in the direction of the release arrow and pull the components apart gently.

   If you are cleaning a single-use system, holding the Smart Cable connector in one hand and the video laryngoscope handle in the other. Pull the components apart gently, and then dispose of the single-use video laryngoscope.

4. Optionally, to prevent contaminants from drying onto the surface of the device, apply a pre-cleaner to the component. Bodily contaminants tend to become securely attached to solid surfaces when dried, making removal more difficult.

REPROCESSING

Some of the components in this manual may require cleaning, low-level disinfection, high-level disinfection, or sterilization between uses or under specific circumstances. For information about the cleaning, disinfection, and sterilization requirements for these components, refer to the *GlideScope and GlideRite Products Reprocessing Manual* (part number 0900-5032), which is available at verathon.com/service-and-support/glidescope-reprocessing-products.

PERIODIC INSPECTIONS

In addition to the user performing routine inspections before and after every use, periodic inspections should be performed to ensure safe and effective operation. It is recommended that an operator familiar with the instrument perform a full visual inspection of all components at least every three months. The inspector should check the system for the following:

- External damage to the equipment
- Damage to the power supply or adapter
- Damage to the connectors or cable insulation

Report any suspected defects to Verathon Customer Care or your local representative. For contact information, visit verathon.com/service-and-support.

ELUTION COMPATIBILITY

For use with GlideScope Titanium reusable video laryngoscopes, Verathon has completed testing of compatibility with a 1% sodium dodecyl sulphate (SDS) solution with pH 11.0.

The SDS solution is commonly utilized in Europe as an eluting solution to collect residual protein samples from medical tools or devices that are cleaned after contacting patient tissue. The protein sample solution is then examined as a verification of the hospital cleaning process.

The testing concluded that 1% SDS solution with pH 11.0 is chemically compatible with the titanium video laryngoscopes and gives no adverse results when performing repeated 30-minute soaking for 100 cycles.

GLIDESCOPE VIDEO MONITOR BATTERY

Under normal operating conditions, the monitor battery will last 2–3 years, or approximately 500 charge and discharge cycles. For more information about the battery, see Battery Specifications.

The battery is not user-replaceable. In case of battery malfunction, do not attempt to replace the monitor battery. Any attempts to replace the battery by unauthorized service technicians may cause serious harm to the user and will void the warranty. Please contact your Verathon Customer Care representative for more information on battery replacement.

SYSTEM SOFTWARE

Verathon may release software upgrades for the GlideScope Video Monitor. Software upgrades are supplied directly by Verathon or an authorized representative, and installation instructions are provided with the upgrade.

This manual documents the most current version of the GlideScope Video Monitor software. If your monitor does not function as described in this manual, or to determine if your software should be updated, contact Verathon Customer Care.

Do not perform any software upgrades from third-party vendors or attempt to modify the existing software. Doing so may damage the monitor and void the warranty.

For information about software language options, see Language Settings on page 9.

DEVICE REPAIR

Please read the Warnings & Cautions section.

The GlideScope Titanium system components are not user-serviceable. Verathon does not make available any type of circuit diagrams, component parts lists, descriptions, or other information that would be required for repairing the device and related accessories. All service must be performed by a qualified technician.

If you have any questions, contact your local Verathon representative or Verathon Customer Care.

DEVICE DISPOSAL

The system and related accessories may contain batteries and other environmentally hazardous materials. When the instrument has reached the end of its useful service life, it must be disposed of in accordance with WEEE requirements. Coordinate disposal through your Verathon Service Center, or alternatively, follow your local protocols for hazardous waste disposal.

LIMITED WARRANTY

ORIGINAL TOTAL CUSTOMER CARE WARRANTY

This Limited Warranty ("Warranty") is provided by Verathon Inc. ("Verathon") to its customer, distributor, original equipment manufacturer, end-user, or other purchaser ("Buyer") on the terms and conditions stated herein, for the GlideScope product ("Product"). The terms of this Warranty are subject to the standard Terms and Conditions of Sale or any other separate negotiated agreement between the parties.

SCOPE OF COVERAGE: This Warranty covers service and repair of all malfunctions (mechanical, electrical, and other defects) associated with the Product purchased by Buyer from Verathon, including coverage for accidental drops or mishandling of Product (subject to Buyer's payment of a deductible charge for Product replacement), for a period of one (1) year (unless otherwise noted under "COVERED COMPONENTS" below) from Product shipment date ("Term"), and applies only to the original Buyer. Replacement parts will be new, rebuilt or non-original manufacturer's parts that perform to the factory specifications of the Product at Verathon's sole option.

Verathon will perform repair and replacement services ("Service") only on Products purchased from an authorized dealer. If the Product or component is purchased from an unauthorized dealer, or if the original factory serial number has been removed, defaced or altered, this Warranty is void.

If a Product purchased by Buyer requires Service, Verathon will, at its discretion, either repair or replace the Product and may provide a loaner unit, at Buyer's request. If Buyer requests a loaner unit, Buyer shall send the defective Product to Verathon (cleaned and disinfected as appropriate) immediately upon receiving the loaner unit from Verathon. Buyer shall return the loaner unit within two (2) business days of receipt of the repaired Product. All exchanged parts become property of Verathon.

EXCLUSIONS: This Warranty excludes problems caused by the Buyer's acts (or failure to act), the acts of others, or events beyond Verathon's reasonable control including:

- Accident, theft, misuse, abuse, extraordinary wear and tear, or neglect.
- Misapplication, improper use, or other failure to follow Verathon's product instructions and safety precautions contained in the Operations and Maintenance Manual. This warranty does not apply if there is evidence of the equipment being exposed to temperatures in excess of 60°C (140°F).
- Use of the system in conjunction with hardware, software, components, services, accessories, attachments, interfaces, or consumables, other than those supplied or specified by Verathon.
- Products that have been repaired or maintained by anyone other than a Verathon authorized service provider.
- Modification, disassembly, rewiring, re-engineering, recalibration, and/or reprogramming of Products other than as specifically authorized by Verathon in writing.

COVERED COMPONENTS: Warranty coverage applies to the following components:

- GlideScope Video Monitor
- GlideScope Smart Cable
- Video cable
- GlideScope Titanium video laryngoscope

Additional reusable components purchased either singularly or as a part of a system, including GlideScope Workstations and the GlideScope Video Cable, are limited to a one-year factory warranty unless stated otherwise. Consumable items are not covered under this warranty.

EXTENDED WARRANTIES: Buyer may purchase a Premium Total Customer Care warranty that extends this Limited Warranty. For more information, contact Verathon's Customer Care Department or your local representative.

LIMITED REMEDY: This Warranty gives Buyer specific legal rights which may vary based on local law. When, under applicable law, implied warranties are not allowed to be excluded in their entirety, such warranties will be limited to the duration of the applicable written warranty and, for European Customers, any terms herein limiting Verathon's liability shall not apply insofar as they conflict with mandatory statutory provisions of the Product Liability Act.

TO THE FULL EXTENT ALLOWED BY LAW, THE FOREGOING LIMITED WARRANTIES AND REMEDIES ARE EXCLUSIVE AND EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, REPRESENTATIONS, TERMS, OR CONDITIONS, WRITTEN OR ORAL, EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE, INCLUDING BUT NOT LIMITED TO ANY WARRANTIES, TERMS OR CONDITIONS OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SATISFACTORY QUALITY, CORRESPONDENCE WITH DESCRIPTION, AND NON-INFRINGEMENT, ALL OF WHICH ARE HEREBY EXPRESSLY DISCLAIMED.

TRANSFER OF SERVICE: This Warranty extends only to Buyer, and may not be transferred to third parties by operation of law or otherwise.

COMPONENT SPECIFICATIONS

Table 6. GlideScope Video Monitor (0570-0338)

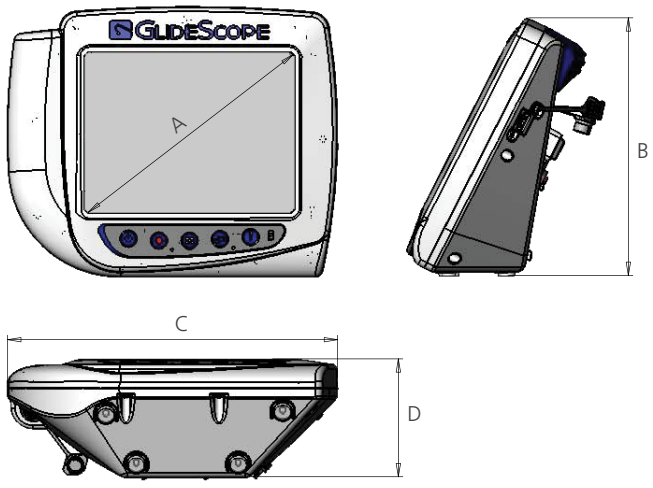
GENERAL SPECIFICATIONS		
Classification:	Electrical Class II, Applied Part BF	
Line voltage:	Range: 100–240 VAC, 50 and 60 Hz. Connect to a medical-grade power supply (If the provided power cord has a third prong, it is used as a functional ground).	
DC power supply:	12 V DC, 3.33 A max	
Ingress protection:	IP54	
OPERATING & STORAGE SPECIFICATIONS		
	Operating Conditions	Shipping & Storage Conditions
Temperature:	10–40°C (50–104°F)	-20–45°C (-4–113°F)
Relative humidity:	10–95%	10–95%
Atmospheric pressure:	700–1060 hPa	440-1060 hPa
COMPONENT SPECIFICATIONS		
Screen type and resolution	TFT Color VGA 640 × 480 px	
Screen size (diagonal; A)	16.3 cm (6.4 in)	
Height (B)	174 mm	
Width (C)	223 mm	
Depth (D)	80 mm	
Weight	1.0 kg	

Table 7. Video Cable (0600-0616; Reusable System)

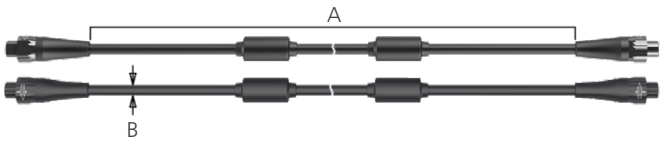
GENERAL SPECIFICATIONS		
Ingress protection:	IPX8	
OPERATING & STORAGE SPECIFICATIONS		
	Operating Conditions	Shipping & Storage Conditions
Temperature:	10–40°C (50–104°F)	-20–45°C (-4–113°F)
Relative humidity:	10–95%	10–95%
Atmospheric pressure:	700–1060 hPa	440-1060 hPa
COMPONENT SPECIFICATIONS		
Length (A)	2190 ± 55 mm	
Diameter (B)	5.4 mm	

Table 8. Spectrum Smart Cable (0800-0543; Single-Use System)

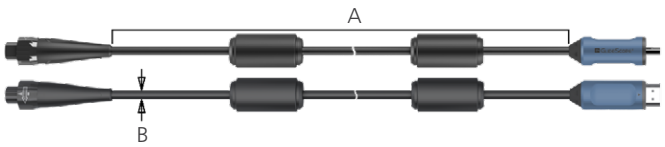
GENERAL SPECIFICATIONS		
Ingress protection:	IPX7	
OPERATING & STORAGE SPECIFICATIONS		
	Operating Conditions	Shipping & Storage Conditions
Temperature:	10–40°C (50–104°F)	-20–45°C (-4–113°F)
Relative humidity:	10–95%	10–95%
Atmospheric pressure:	700–1060 hPa	440-1060 hPa
COMPONENT SPECIFICATIONS		
Length (A)	1417 ± 25 mm	
Diameter (B)	6.8 mm	

Table 9. Premium Cart (0800-0537)

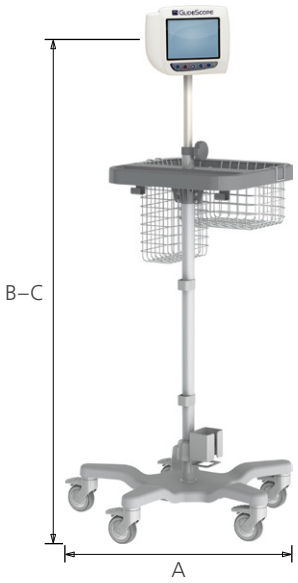
OPERATING & STORAGE SPECIFICATIONS		
	Operating Conditions	Shipping & Storage Conditions
Temperature:	10–40°C (50–104°F)	-20–45°C (-4–113°F)
Relative humidity:	10–95%	10–95%
Atmospheric pressure:	700–1060 hPa	440-1060 hPa
COMPONENT SPECIFICATIONS		
Wheelbase diameter (A)	53.3 cm	
Minimum height (B)	101.6 cm	
Maximum height (C)	132.1 cm	
Weight	8.0–8.4 kg	

Table 10. Mobile Stand (0800-0410)

OPERATING & STORAGE SPECIFICATIONS		
	Operating Conditions	Shipping & Storage Conditions
Temperature:	10–40°C (50–104°F)	-20–45°C (-4–113°F)
Relative humidity:	10–95%	10–95%
Atmospheric pressure:	700–1060 hPa	440-1060 hPa
COMPONENT SPECIFICATIONS		
Wheelbase diameter (A)	61 cm	
Minimum height (B)	76 cm	
Maximum height (C)	122 cm	

Table 11. IV Pole Mount (0810-0200)

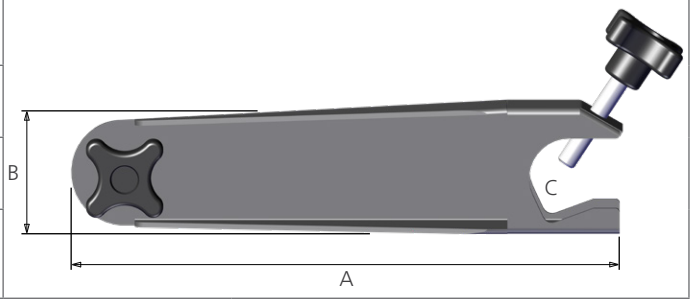
OPERATING & STORAGE SPECIFICATIONS		
	Operating Conditions	Shipping & Storage Conditions
Temperature:	10–40°C (50–104°F)	-20–45°C (-4–113°F)
Relative humidity:	10–95%	10–95%
Atmospheric pressure:	700–1060 hPa	440-1060 hPa
COMPONENT SPECIFICATIONS		
Arm length (A)	27 cm	
Width (B)	6.3 cm	
Pole width range (C)	6.4–33 mm	
Weight	0.9 kg	

Table 12. LoPro T2 (0574-0196; Reusable System)

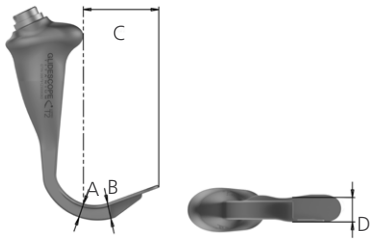
GENERAL SPECIFICATIONS		
Ingress protection:	IPX8	
Expected product life:	3 years or 3000 cycles	
OPERATING & STORAGE SPECIFICATIONS		
	Operating Conditions	Shipping & Storage Conditions
Temperature:	10–35°C (50–95°F)	-20–45°C (-4–113°F)
Relative humidity:	10–95%	10–95%
Atmospheric pressure:	700–1060 hPa	440-1060 hPa
COMPONENT SPECIFICATIONS		
Height at handle (A)	8.5 mm	
Height at camera (B)	9.5 mm	
Blade tip to handle (C)	44.0 mm	
Width at camera (D)	13.9 mm	

Table 13. LoPro T3 (0574-0126; Reusable System)

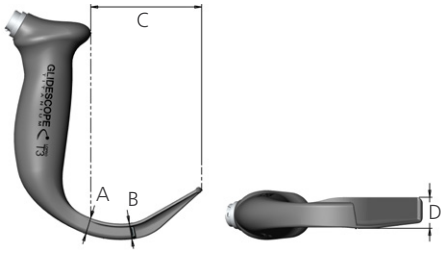
GENERAL SPECIFICATIONS		
Ingress protection:	IPX8	
Expected product life:	3 years or 3000 cycles	
OPERATING & STORAGE SPECIFICATIONS		
	Operating Conditions	Shipping & Storage Conditions
Temperature:	10–35°C (50–95°F)	-20–45°C (-4–113°F)
Relative humidity:	10–95%	10–95%
Atmospheric pressure:	700–1060 hPa	440-1060 hPa
COMPONENT SPECIFICATIONS		
Height at handle (A)	10.8 mm	
Height at camera (B)	10.5 mm	
Blade tip to handle (C)	72 mm	
Width at camera (D)	20 mm	

Table 14. LoPro T4 (0574-0127; Reusable System)

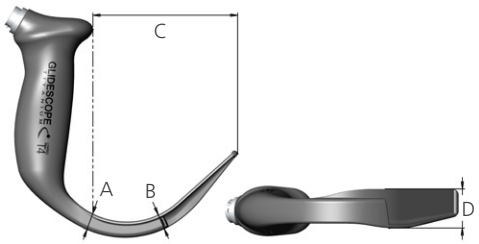
GENERAL SPECIFICATIONS		
Ingress protection:	IPX8	
Expected product life:	3 years or 3000 cycles	
OPERATING & STORAGE SPECIFICATIONS		
	Operating Conditions	Shipping & Storage Conditions
Temperature:	10–35°C (50–95°F)	-20–45°C (-4–113°F)
Relative humidity:	10–95%	10–95%
Atmospheric pressure:	700–1060 hPa	440-1060 hPa
COMPONENT SPECIFICATIONS		
Height at handle (A)	11.0 mm	
Height at camera (B)	10.0 mm	
Blade tip to handle (C)	91 mm	
Width at camera (D)	25 mm	

Table 15. MAC T3 (0574-0128; Reusable System)

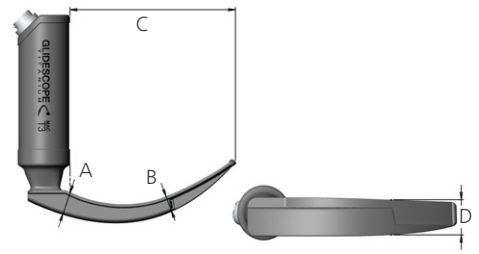
GENERAL SPECIFICATIONS		
Ingress protection:	IPX8	
Expected product life:	3 years or 3000 cycles	
OPERATING & STORAGE SPECIFICATIONS		
	Operating Conditions	Shipping & Storage Conditions
Temperature:	10–35°C (50–95°F)	-20–45°C (-4–113°F)
Relative humidity:	10–95%	10–95%
Atmospheric pressure:	700–1060 hPa	440-1060 hPa
COMPONENT SPECIFICATIONS		
Height at handle (A)	14.5 mm	
Height at camera (B)	9.6 mm	
Blade tip to handle (C)	107 mm	
Width at camera (D)	22 mm	

Table 16. MAC T4 (0574-0129; Reusable System)

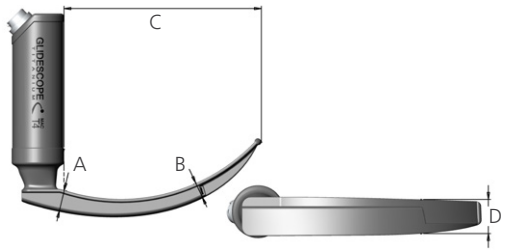
GENERAL SPECIFICATIONS		
Ingress protection:	IPX8	
Expected product life:	3 years or 3000 cycles	
OPERATING & STORAGE SPECIFICATIONS		
	Operating Conditions	Shipping & Storage Conditions
Temperature:	10–35°C (50–95°F)	-20–45°C (-4–113°F)
Relative humidity:	10–95%	10–95%
Atmospheric pressure:	700–1060 hPa	440-1060 hPa
COMPONENT SPECIFICATIONS		
Height at handle (A)	13.4 mm	
Height at camera (B)	9.6 mm	
Blade tip to handle (C)	128 mm	
Width at camera (D)	22 mm	

Table 17. Spectrum Miller S0 (Sterile, 0574-0202; Non-Sterile, 0574-0216; Single-Use System)

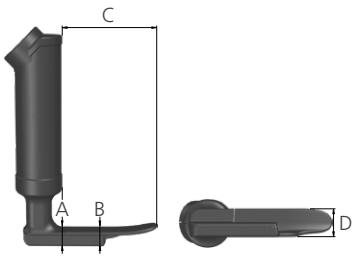
GENERAL SPECIFICATIONS			
Ingress protection:	IPX4		
Expected product life:	Refer to the date indicated by the ⌛ symbol on the package label.		
OPERATING, SHIPPING, & STORAGE SPECIFICATIONS			
	Operating Conditions	Shipping Conditions	Storage Conditions
Temperature:	10–40°C (50–104°F)	-20–45°C (-4–113°F)	18–28°C (64–82°F)
Relative humidity:	10–95%	10–95%	40–60%
Atmospheric pressure:	700–1060 hPa	440-1060 hPa	1013 hPa
COMPONENT SPECIFICATIONS			
Height at handle (A)	12.1 mm		
Height at camera (B)	12.2 mm		
Blade tip to handle (C)	55.5 mm		
Width at camera (D)	15.3 mm		

Table 18. Spectrum Miller S1 (Sterile, 0574-0203; Non-Sterile, 0574-0217; Single-Use System)

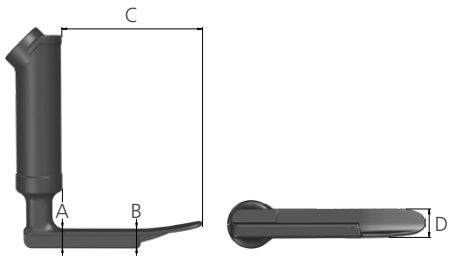
GENERAL SPECIFICATIONS			
Ingress protection:	IPX4		
Expected product life:	Refer to the date indicated by the ⧖ symbol on the package label.		
OPERATING, SHIPPING, & STORAGE SPECIFICATIONS			
	Operating Conditions	Shipping Conditions	Storage Conditions
Temperature:	10–40°C (50–104°F)	-20–45°C (-4–113°F)	18–28°C (64–82°F)
Relative humidity:	10–95%	10–95%	40–60%
Atmospheric pressure:	700–1060 hPa	440-1060 hPa	1013 hPa
COMPONENT SPECIFICATIONS			
Height at handle (A)	12.1 mm		
Height at camera (B)	12.2 mm		
Blade tip to handle (C)	81.5 mm		
Width at camera (D)	15.3 mm		

Table 19. Spectrum LoPro S1 (Sterile, 0574-0165; Non-Sterile, 0574-0218; Single-Use System)

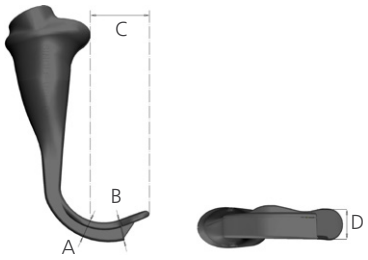
GENERAL SPECIFICATIONS			
Ingress protection:	IPX4		
Expected product life:	Refer to the date indicated by the ⧖ symbol on the package label.		
OPERATING, SHIPPING, & STORAGE SPECIFICATIONS			
	Operating Conditions	Shipping Conditions	Storage Conditions
Temperature:	10–40°C (50–104°F)	-20–45°C (-4–113°F)	18–28°C (64–82°F)
Relative humidity:	10–95%	10–95%	40–60%
Atmospheric pressure:	700–1060 hPa	440-1060 hPa	1013 hPa
COMPONENT SPECIFICATIONS			
Height at handle (A)	8.7 mm		
Height at camera (B)	9.6 mm		
Blade tip to handle (C)	29 mm		
Width at camera (D)	12.2 mm		

Table 20. Spectrum LoPro S2 (Sterile, 0574-0166; Non-Sterile, 0574-0219; Single-Use System)

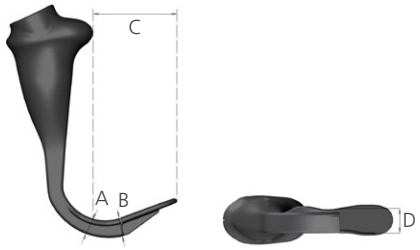
GENERAL SPECIFICATIONS			
Ingress protection:	IPX4		
Expected product life:	Refer to the date indicated by the ⧖ symbol on the package label.		
OPERATING, SHIPPING, & STORAGE SPECIFICATIONS			
	Operating Conditions	Shipping Conditions	Storage Conditions
Temperature:	10–40°C (50–104°F)	-20–45°C (-4–113°F)	18–28°C (64–82°F)
Relative humidity:	10–95%	10–95%	40–60%
Atmospheric pressure:	700–1060 hPa	440-1060 hPa	1013 hPa
COMPONENT SPECIFICATIONS			
Height at handle (A)	8.7 mm		
Height at camera (B)	9.6 mm		
Blade tip to handle (C)	44 mm		
Width at camera (D)	13.0 mm		

Table 21. Spectrum LoPro S2.5 (Sterile, 0574-0201; Non-Sterile, 0574-0220; Single-Use System)

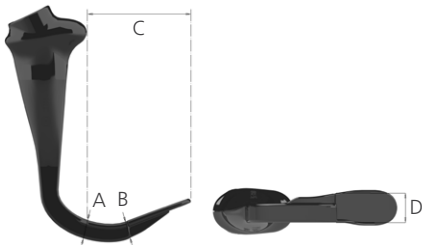
GENERAL SPECIFICATIONS			
Ingress protection:	IPX4		
Expected product life:	Refer to the date indicated by the ⧖ symbol on the package label.		
OPERATING, SHIPPING, & STORAGE SPECIFICATIONS			
	Operating Conditions	Shipping Conditions	Storage Conditions
Temperature:	10–40°C (50–104°F)	-20–45°C (-4–113°F)	18–28°C (64–82°F)
Relative humidity:	10–95%	10–95%	40–60%
Atmospheric pressure:	700–1060 hPa	440-1060 hPa	1013 hPa
COMPONENT SPECIFICATIONS			
Height at handle (A)	10.3 mm		
Height at camera (B)	9.6 mm		
Blade tip to handle (C)	57 mm		
Width at camera (D)	16 mm		

Table 22. Spectrum LoPro S3 (Sterile, 0574-0194; Non-Sterile, 0574-0221; Single-Use System)

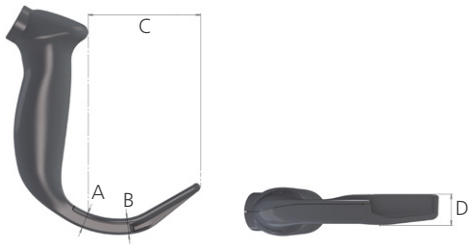
GENERAL SPECIFICATIONS			
Ingress protection:	IPX4		
Expected product life:	Refer to the date indicated by the ⧖ symbol on the package label.		
OPERATING, SHIPPING, & STORAGE SPECIFICATIONS			
	Operating Conditions	Shipping Conditions	Storage Conditions
Temperature:	10–40°C (50–104°F)	-20–45°C (-4–113°F)	18–28°C (64–82°F)
Relative humidity:	10–95%	10–95%	40–60%
Atmospheric pressure:	700–1060 hPa	440-1060 hPa	1013 hPa
COMPONENT SPECIFICATIONS			
Height at handle (A)	11.0 mm		
Height at camera (B)	11.0 mm		
Blade tip to handle (C)	74 mm		
Width at camera (D)	20 mm		

Table 23. Spectrum LoPro S4 (Sterile, 0574-0195; Non-Sterile, 0574-0222; Single-Use System)

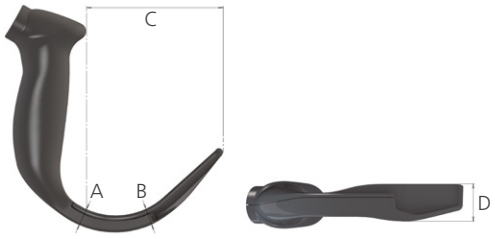
GENERAL SPECIFICATIONS			
Ingress protection:	IPX4		
Expected product life:	Refer to the date indicated by the ⧖ symbol on the package label.		
OPERATING, SHIPPING, & STORAGE SPECIFICATIONS			
	Operating Conditions	Shipping Conditions	Storage Conditions
Temperature:	10–40°C (50–104°F)	-20–45°C (-4–113°F)	18–28°C (64–82°F)
Relative humidity:	10–95%	10–95%	40–60%
Atmospheric pressure:	700–1060 hPa	440-1060 hPa	1013 hPa
COMPONENT SPECIFICATIONS			
Height at handle (A)	12.0 mm		
Height at camera (B)	11.3 mm		
Blade tip to handle (C)	91 mm		
Width at camera (D)	25 mm		

Table 24. Spectrum DirectView MAC S3 (Sterile, 0574-0187; Non-Sterile, 0574-0223; Single-Use System)

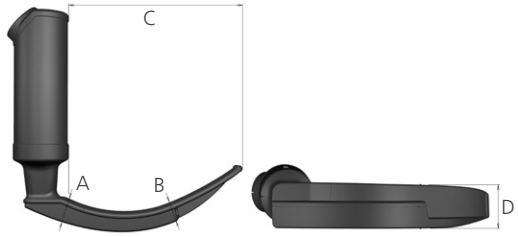
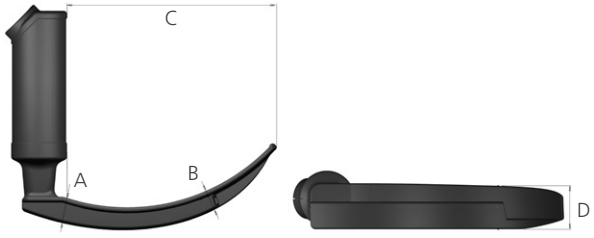
GENERAL SPECIFICATIONS			
Ingress protection:	IPX4		
Expected product life:	Refer to the date indicated by the ⌛ symbol on the package label.		
OPERATING, SHIPPING, & STORAGE SPECIFICATIONS			
	Operating Conditions	Shipping Conditions	Storage Conditions
Temperature:	10–40°C (50–104°F)	-20–45°C (-4–113°F)	18–28°C (64–82°F)
Relative humidity:	10–95%	10–95%	40–60%
Atmospheric pressure:	700–1060 hPa	440-1060 hPa	1013 hPa
COMPONENT SPECIFICATIONS			
Height at handle (A)	14.6 mm		
Height at camera (B)	11.7 mm		
Blade tip to handle (C)	107.5 mm		
Width at camera (D)	26.6 mm		

Table 25. Spectrum DirectView MAC S4 (Sterile, 0574-0188; Non-Sterile, 0574-0224; Single-Use System)

GENERAL SPECIFICATIONS			
Ingress protection:	IPX4		
Expected product life:	Refer to the date indicated by the ⌛ symbol on the package label.		
OPERATING, SHIPPING, & STORAGE SPECIFICATIONS			
	Operating Conditions	Shipping Conditions	Storage Conditions
Temperature:	10–40°C (50–104°F)	-20–45°C (-4–113°F)	18–28°C (64–82°F)
Relative humidity:	10–95%	10–95%	40–60%
Atmospheric pressure:	700–1060 hPa	440-1060 hPa	1013 hPa
COMPONENT SPECIFICATIONS			
Height at handle (A)	14.3 mm		
Height at camera (B)	11.4 mm		
Blade tip to handle (C)	128 mm		
Width at camera (D)	26.4 mm		

BATTERY SPECIFICATIONS

Table 26. Battery Specifications

CONDITION	DESCRIPTION
Battery type	Lithium-ion
Battery life	Under normal operating conditions, a fully charged battery lasts approximately 90 minutes
Charging time	Charging time off line will take no more than 6 hours from an empty battery to a full charge
Rated capacity	2150 mAh
Nominal voltage	7.2 V
Max charging voltage	8.4 V
Nominal weight	90 g (0.2 lbs)
Width	23 mm (0.9 in)
Length	391 mm (5.4 in)
Thickness	23 mm (0.9 in)

ELECTROMAGNETIC COMPATIBILITY

The system is designed to be in compliance with IEC 60601-1-2, which contains electromagnetic compatibility (EMC) requirements for medical electrical equipment. The limits for emissions and immunity specified in this standard are designed to provide reasonable protection against harmful interference in a typical medical installation.

The system complies with the applicable essential performance requirements specified in IEC 60601-1 and IEC 60601-2-18. Results of immunity testing show that the essential performance of the system is not affected under the test conditions described in the following tables. For more information about the essential performance of the system, see Essential Performance on page 1.

ELECTROMAGNETIC EMISSIONS

Table 27. Guidance and Manufacturer's Declaration—Electromagnetic Emissions

The system is intended for use in the electromagnetic environment specified below. The customer or the user of the system should ensure that it is used in such an environment.

EMISSIONS TEST	COMPLIANCE	ELECTROMAGNETIC ENVIRONMENT – GUIDANCE
RF emissions CISPR 11	Group 1	The system uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class A	The system is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	In compliance	

ELECTROMAGNETIC IMMUNITY

Table 28. Guidance and Manufacturer's Declaration—Electromagnetic Immunity

The system is intended for use in the electromagnetic environment specified below. The customer or the user of the system should ensure that it is used in such an environment.

IMMUNITY TESTS	IEC 60601 TEST LEVEL	COMPLIANCE LEVEL	ELECTROMAGNETIC ENVIRONMENT – GUIDANCE
Electrostatic discharge (ESD) IEC 61000-4-2	± 8 kV contact ± 15 kV air	In compliance	Floors should be wood, concrete, or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/ burst IEC 61000-4-4	± 2 kV for power supply lines 100 kHz repetition frequency	In compliance	Mains power quality should be that of a typical hospital environment.
Surge IEC 61000-4-5	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	In compliance	Mains power quality should be that of a typical hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	0% U_T; 0.5 Cycle At 0˚, 45˚, 90˚, 135˚, 180˚, 225˚, 270˚, and 315˚ 0% U_T; 1 cycle and 70% U_T; 25/30 cycles Single Phase: at 0˚	In compliance	Mains power quality should be that of a typical hospital environment. If the user of the system requires continued operation during power mains interruptions, it is recommended that the system be powered from an uninterruptible power supply or a battery.
Rated power frequency magnetic fields IEC 61000-4-8	30 A/m Frequency 50/60 Hz	In compliance	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical hospital environment.
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz 6 Vrms in ISM bands 150 kHz to 80 MHz 80% AM at 1 kHz	In compliance	Portable and mobile RF communications equipment should be used no closer to any part of the system, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance d (m)** $d=1.2\sqrt{P}$

Table 28. Guidance and Manufacturer's Declaration—Electromagnetic Immunity

The system is intended for use in the electromagnetic environment specified below. The customer or the user of the system should ensure that it is used in such an environment.

IMMUNITY TESTS	IEC 60601 TEST LEVEL	COMPLIANCE LEVEL	ELECTROMAGNETIC ENVIRONMENT – GUIDANCE
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.7 GHz 80% AM at 1 kHz	In compliance	Interference may occur in the vicinity of equipment marked with the following symbol: 

Note: U_T is the AC mains voltage prior to application of the test level.

These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

ACCESSORY CONFORMANCE TO STANDARDS

To maintain electromagnetic interference (EMI) within certified limits, the system must be used with the cables, components, and accessories specified or supplied by Verathon. For additional information, see the System Parts & Accessories and Component Specifications sections. The use of accessories or cables other than those specified or supplied may result in increased emissions or decreased immunity of the system.

Table 29. EMC Standards for Accessories

ACCESSORY	MAX LENGTH
AC power cord	4.5 m (15.0 ft)
DC medical power adapter	2.5 m (8.2 ft)
HDMI-to-DVI cable	4.6 m (15.1 ft)
Video cable	2.2 m (7.2 ft)
Smart Cable	1.6 m (5.2 ft)

GLOSSARY

The following table provides definitions for specialized terms used in this manual or on the product itself. For a full list of caution, warning, and informational symbols used on this and other Verathon products, please refer to the *Verathon Symbol Glossary* at verathon.com/service-and-support/symbols.

TERM	DEFINITION
A	Ampere
AC	Alternating current
AER	Automated endoscope reprocessor
C	Celsius
CFR	Code of Federal Regulations (U.S.)
CISPR	International Special Committee on Radio Interference
cm	Centimeter
CSA	Canadian Standards Association
DL	Direct laryngoscopy
EMI	Electromagnetic interference
ESD	Electrostatic discharge
Essential performance	The system performance necessary to achieve freedom from unacceptable risk
F	Fahrenheit
g	Gram
GHz	Gigahertz
HDMI	High-definition multimedia interface
hPa	Hectopascal
Hz	Hertz
IEC	International Electrotechnical Commission
in	Inch
IPA	Isopropyl alcohol
ISM	Industrial, scientific, and medical
kHz	Kilohertz
kV	Kilovolt
L	Liter
lbs	Pounds
m	Meter
mAh	Milliampere-hour
MDD	Medical Device Directive
MHz	Megahertz
mL	Milliliter
mm	Millimeter
MSDS	Material Safety Data Sheet

TERM	DEFINITION
OSHA	Occupational Safety and Health Administration (federal agency in U.S.)
psia	Pounds per square inch absolute
Pure water	Water that is suitable for high-level disinfection according to local regulations and your medical facility
RF	Radio frequency
RH	Relative humidity
RoHS	Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment
SDS	Sodium dodecyl sulphate
V	Volt
Vrms	Voltage root mean squared
W	Watt
WEEE	Waste electrical and electronic equipment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