GLIDESCOPE®


# GLIDESCOPE SYSTEM
# AVL SINGLE-USE
## Operations & Maintenance Manual

VERATHON®

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# AVL SINGLE-USE
## Operations & Maintenance Manual

Effective: August 27, 2018

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

For customers with GlideScope systems using the GlideScope Video Monitor (version 0570-0338).

# CONTACT INFORMATION

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


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Information in this manual may change at any time without notice. For the most up-to-date information, see the documentation available at verathon.com/product-documentation.

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# IMPORTANT INFORMATION

## PRODUCT INFORMATION

The GlideScope® AVL Single-Use video laryngoscope system is designed for "1st Pass Success." It provides a consistently clear view of a patient's airway, enabling quick intubations. The AVL design is based on the GlideScope GVL®, which is clinically proven to achieve a Cormack-Lehane Grade I or II view 99 percent of the time.

## STATEMENT OF INTENDED USE

The GlideScope AVL system is 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 AVL system is to provide a clear view of the vocal cords.

## STATEMENT OF PRESCRIPTION

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

This system 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 GlideScope users:

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

# PRECAUTIONS & WARNINGS

*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.

**PRECAUTIONS**

**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 on page 69.

To maintain electromagnetic interference (EMI) within certified limits, the GlideScope system must be used with the cables, components, and accessories specified or supplied by Verathon®. For additional information, see the System Parts & Accessories and Product 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.

The GlideScope system should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, the system should be observed to verify normal operation in the configuration in which it will be used.

This device can radiate radio frequency energy and is very 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 could be damaged by ultrasonic and automated washing equipment. Do not use an ultrasonic device or automated washing equipment 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**

Bleach may be used on the video batons, but pay special attention to stainless steel components, as bleach can corrode stainless steel.

**CAUTION**

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

**CAUTION**

**Risk of permanent equipment damage.** This product is sensitive to heat, which will cause 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 will cause permanent device damage and void the warranty. For a list of approved cleaning procedures and products, see the Cleaning & Disinfecting chapter.

## WARNINGS

**WARNING**

Several areas of the Stat that contact the patient can exceed 41°C (106°F) as part of normal operation:

- The first area is the light-emitting area surrounding the camera. When used as indicated, continuous contact with this area is unlikely because, if tissue were to contact this area, the view would be lost and devices would need to be adjusted to regain the airway view.
- The second area is the area surrounding the camera, out of view of the camera. Continuous contact with this area is unlikely because the product is typically not held stationary for an extended period of time exceeding 1 minute.

If continuous contact is maintained for longer than 1 minute, it is possible to cause thermal damage such as a burn to the mucosal tissue.

**WARNING**

If the GlideScope Direct is powered on for an extended period of time, it is possible for the surface temperature to exceed 41°C (106°F) at the tip of the blade, where the lighting and camera are located.

**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 video monitor screen. Failure to do so may result in injury, such as to the tonsils or soft palate.

**WARNING**

Before every use, ensure the instrument is operating correctly and has no sign of damage. Do not use this product if the device appears damaged. 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/support.

**WARNING**

GlideScope systems are delivered nonsterile and require cleaning or disinfection prior to initial use.

**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**

Ensure that you follow the manufacturer's instructions for handling and disposing of the cleaning, disinfection, or sterilization solutions provided in this manual.

**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/support.

**WARNING**

This product may only be cleaned, disinfected, or sterilized by using the approved low-temperature processes provided in this manual. Cleaning, disinfection, and sterilization methods listed are recommended by Verathon based on efficacy or compatibility with component materials.

**WARNING**

Cleaning is critical to ensuring a component is ready for disinfection or sterilization. Failure to properly clean the device could 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**

Do not place the video baton in the cradle if any of the components are contaminated.

**WARNING**

In order to maintain electrical safety, use only the provided, medical-approved power supply.

**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 will void the warranty. Contact Verathon Customer Care for all servicing needs.

**WARNING**

No modification of this equipment is allowed.

**WARNING**

The external monitor must be safety-approved medical equipment.

**WARNING**

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

**WARNING**

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

**WARNING**

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

**WARNING**

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

# PRODUCT DESCRIPTION

The GlideScope AVL system is an ideal tool for physicians and other healthcare professionals who need to effectively manage routine to difficult airways. It is useful for the intubation of normal airways, anterior airways, neonatal patients, obese patients, and patients with limited neck extension. Additionally, it is useful for teaching purposes, verification of endotracheal tube (ETT) placement, nasal intubation, and ETT exchange. The AVL is easy to learn, use, and teach. It is ideal for acute care settings and emergency environments. It also integrates into standard ED, OR, ICU, and NICU applications.

The system combines a high-resolution, full-color digital camera with an integrated LED light source and Reveal™ anti-fog feature. The AVL video batons and GlideScope Direct blade connect directly to a full-color, digital video monitor for real-time viewing.

The system is recommended for use with an endotracheal tube stylet, particularly the GlideRite® Rigid Stylet, which complements the blade angle. For more information about the stylet, see the *GlideRite Rigid Stylet Operations and Maintenance Manual*.

## GLIDESCOPE VIDEO MONITOR

The monitor can record video and photos directly to a USB flash drive for archiving and further review. The monitor has a DVI video output through an HDMI connector. It is recommended that you use the HDMI-to-DVI cable provided by Verathon® to connect to an external monitor that is approved for medical use. You can operate the monitor by connecting it to the medical-grade power supply provided by Verathon or by using the internal, rechargeable lithium-ion battery.

Verathon occasionally makes software updates available for the GlideScope video monitor. 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.

*Figure 1. GlideScope Video Monitor*

## SINGLE-USE SYSTEM

The AVL single-use system can be used with a choice of three video batons and multiple GVL® Stats. Single-use GVL Stats are offered in a comprehensive range of sizes, allowing clinicians to meet the particular requirements of patients ranging in size from preterm infants to large adults.

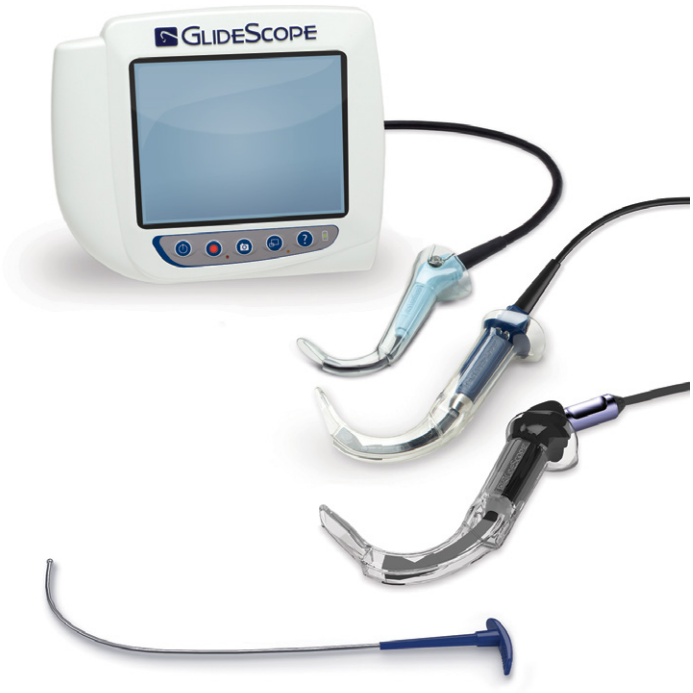
The system may include the following components:

- GlideScope Video Monitor
- AVL Video Baton 1-2 (for neonatal patients and small children)
    - GVL 0 Stat, for patients less than 1.5 kg (3.3 lbs)*
    - GVL 1 Stat, for patients between 1.5–3.8 kg (3.3–8.4 lbs)*
    - GVL 2 Stat, for patients between 1.8–10 kg (4–22 lbs)*
    - GVL 2.5 Stat, for patients between 10–28 kg (22–61.7 lbs)*
- AVL Video Baton 3-4 (for use on children and adults)
    - GVL 3 Stat, for patients between 10 kg–adult (22 lbs–adult)*
    - GVL 4 Stat, for patients between 40 kg–large adult (88.2 lbs–large adult)*
- Video Baton 2.0 Large (3-4, for use on children and adults)
    - GVL 3 Stat, for patients between 10 kg–adult (22 lbs–adult)*
    - GVL 4 Stat, for patients between 40 kg–large adult (88.2 lbs–large adult)*
- GlideRite® Rigid Stylet (recommended for use with the AVL Video Baton 3-4 or Video Baton 2.0 Large)

** Weight ranges are approximate; a medical professional must evaluate on a patient-by-patient basis.*

*Note: Video Batons 2.0 require system software version 3.9 or later. For more information, refer to* *System Software on page 56.*

*Figure 2. GlideScope AVL Single-Use System*



## GLIDESCOPE DIRECT INTUBATION TRAINER

The GlideScope Direct intubation trainer is designed to work with the GlideScope Video Monitor. The GlideScope Direct resembles a traditional Macintosh direct laryngoscope with the addition of a video camera near the end of the blade, permitting both direct laryngoscopy and a video display of the airway. This provides the user with a laryngeal view, permits mentoring by an instructor, and combined with the system monitor allows the image to be captured for documentation, quality control, and teaching.

The GlideScope Direct intubation trainer does not provide the same benefits of GlideScope video laryngoscopes in settings when a line-of-sight cannot be achieved. Typically, these occur in patients with difficult (Cormack-Lehane grade 3 or 4) airways. It will, however, facilitate the instruction of direct laryngoscopy. Should the GlideScope Direct fail to provide an adequate laryngeal view, the airway manager can easily convert to a single-use video baton and GVL® Stat for an optimal view.

*Figure 3. GlideScope Direct Intubation Trainer*

## SYSTEM PARTS & ACCESSORIES

The system consists of the following components.

*Table 1. System Components*

<table>
<tr><th colspan="3">PARTS & ACCESSORIES</th></tr>
<tr><td colspan="3">Required Components</td></tr>
<tr><td colspan="2">GlideScope Video Monitor<br>  </td><td>Video batons (for Single-Use system only)<br>  </td></tr>
<tr><td colspan="3">GVL® Stat sizes 0, 1, 2.5, 3, and 4 (for Single-Use system only)<br>  </td></tr>
<tr><td>Smart Cable<br>(for Video Baton 2.0)<br>Note: Cable shortened for illustration purposes.<br>  </td><td>Video monitor 12 V DC power adapter<br>  </td><td>Power cable<br>  </td></tr>
</table>

## PARTS & ACCESSORIES

### Optional Components

Premium cart

Mobile stand

Universal accessory basket

*Note: For use with AVL portable stand*

Media storage USB flash drive


Cradle for video baton

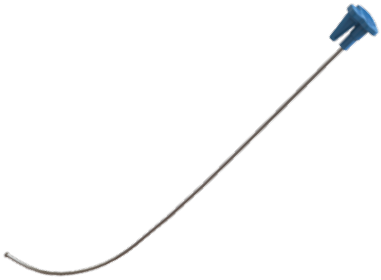
GlideScope Direct


IV pole mounting kit

HDMI-to-DVI cable

GlideRite® DLT Stylet

*Note: For ET tubes 6.0 mm or larger*



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*

# LANGUAGE SETTINGS

The GlideScope 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, visit verathon.com/support.

# VIDEO LARYNGOSCOPE COMPONENTS

*Figure 4. Single-Use Video Laryngoscope Components*

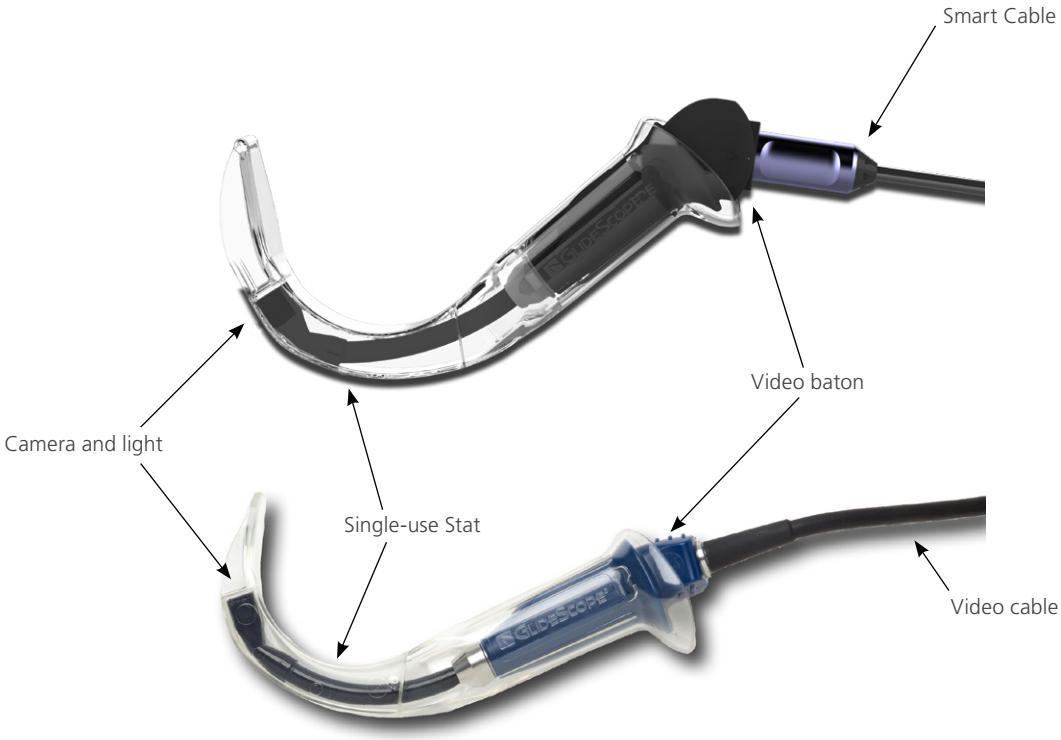
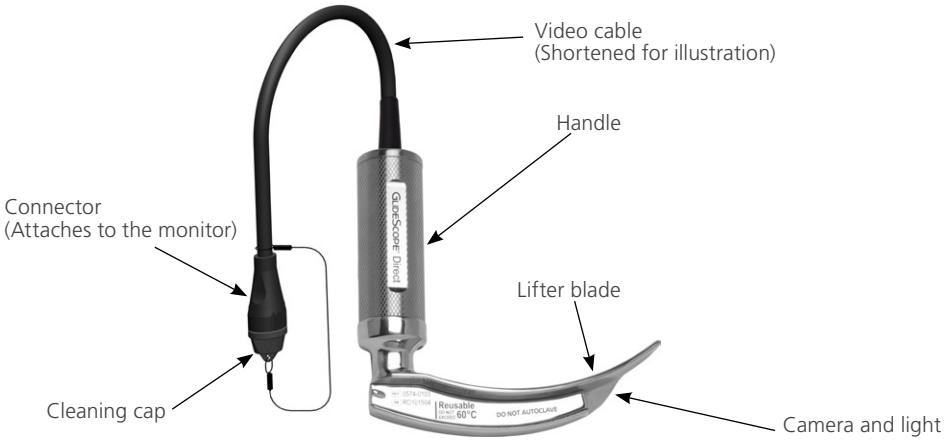



*Figure 5. GlideScope Direct Intubation Trainer*



# BUTTONS, ICONS, & CONNECTIONS

The main component 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 6. GlideScope Video Monitor Keypad*

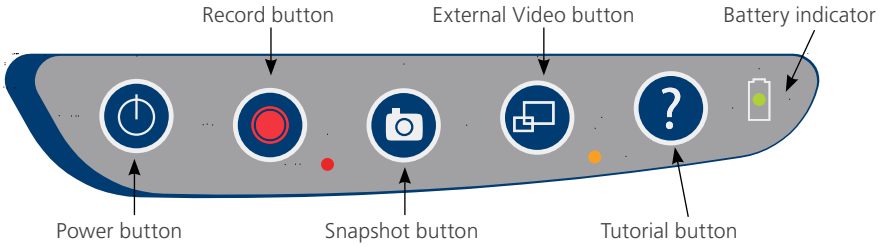



*Table 2. Keypad Buttons*

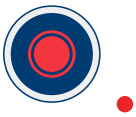
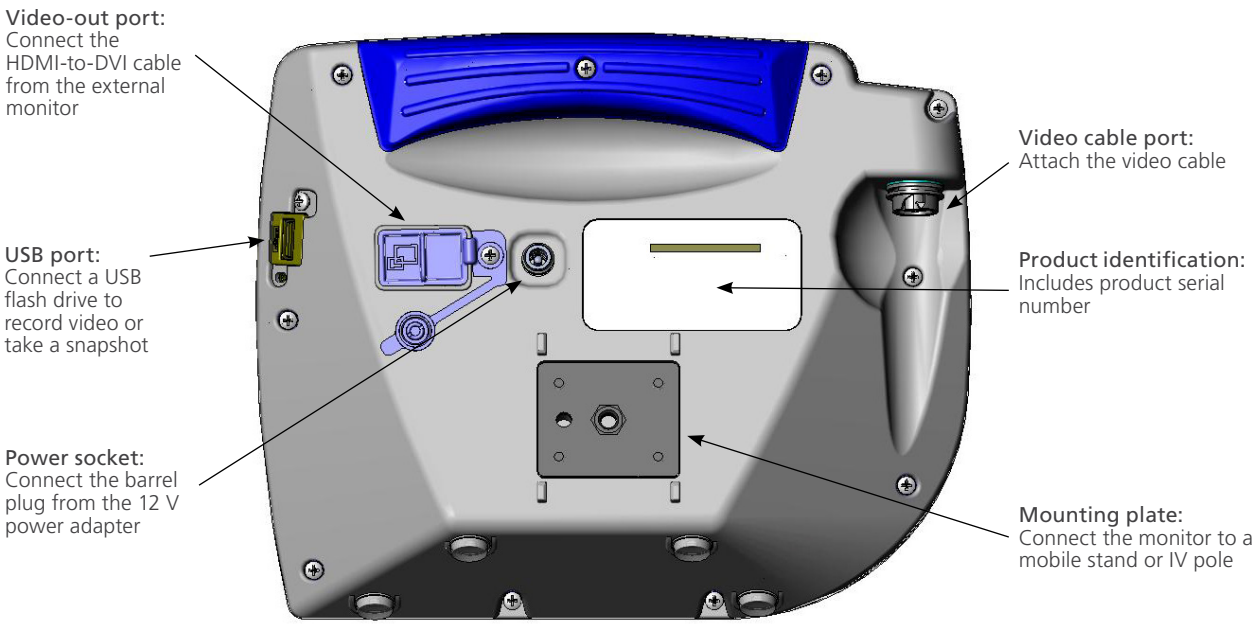
| BUTTON | FUNCTION |
|---|---|
|  | **Power:** Press and release to turn on the monitor. Press and hold to turn it off.<br>*Note: If the monitor freezes at any time during use, press and hold the Power button for 10 seconds to reset the system.* |
|  | **Record:** Press to start and stop recording directly 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.<br>*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.<br>*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.<br>*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.<br>*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:<br>**Green:** Unit fully charged<br>**Red:** Unit charging<br>**Flashing Red:** Indicates a problem with the battery. Charge for 6 hours, and if still flashing, contact Verathon® Customer Care. |

*Table 3. 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.<br>*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 25. |
|  | **USB Flash Drive:** A USB flash drive is detected.<br>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.<br>*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 USB flash drive.<br>*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.<br>*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.<br>*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 7. GlideScope Video Monitor Back Panel*



# SETTING UP

**WARNING**

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

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 GlideScope Video Monitor (Optional)—Set up the GlideScope Video Monitor on a mobile stand or IV pole.
3. Charge the Monitor Battery—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 12 V DC Power Adapter that shipped with the unit.*
4. Connect the Video Cable or Smart Cable to the Monitor—Attach the cable that connects the video baton or laryngoscope to the monitor and transmits the video data.
5. Connect the Smart Cable to the Video Baton (Video Baton 2.0 Only)—Attach the Smart Cable to a GlideScope Video Baton 2.0.
6. 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.
7. Configure User Settings—Enter data customized to your clinic, and configure settings such as the date and time.
8. 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.

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/support.

## PROCEDURE 2. MOUNT THE GLIDESCOPE VIDEO MONITOR (OPTIONAL)

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

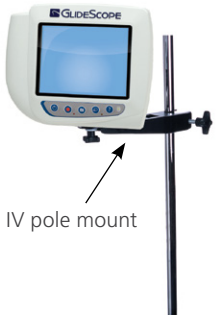
- Mount it on a premium cart or mobile stand (Figure 8 or Figure 9). These solutions make it easy for you to move the system from one location to another.
- Mount it on an IV pole (Figure 10).

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 8. Premium Cart*

*Figure 9. Mobile Stand*

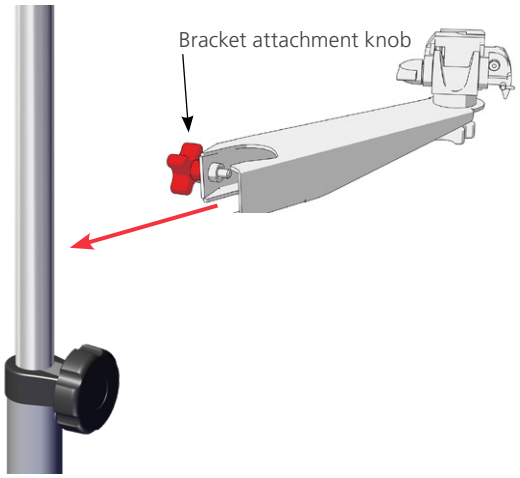
*Figure 10. IV Pole Mount*



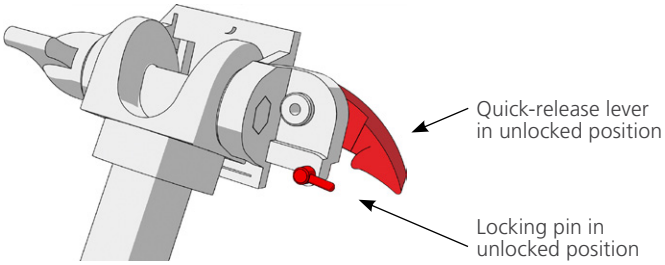
## ATTACH THE MONITOR TO THE MOBILE STAND OR IV POLE

1. If you are using the GlideScope premium cart or AVL portable stand, assemble it according to the instructions included with the component.

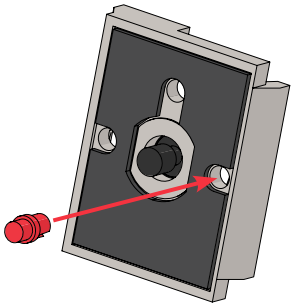
2. If you are using an IV pole mount, place the mounting bracket on the IV pole, and then tighten the bracket attachment knob until the IV pole mount is secure.



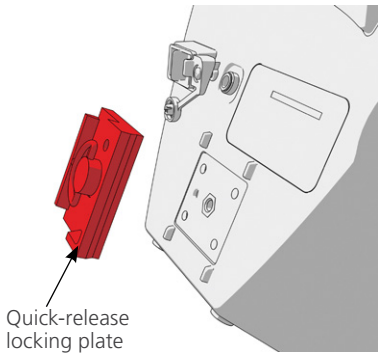

3. On the mobile stand mount or the IV pole mount, ensure that the locking pin and quick-release lever are in the unlocked (horizontal) position.

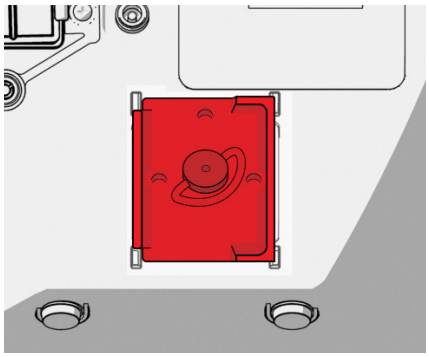



4. While holding the quick-release locking plate with the head of the mounting screw facing away from you and the larger of the two flanges to your left, Insert a positioning pin into the right-hand hole on the locking plate as shown in the following image.



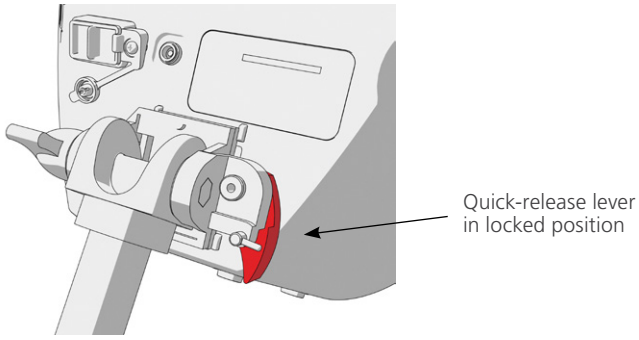
5. Using the orientation shown in the following images, screw the quick-release locking plate to the back panel of the monitor.



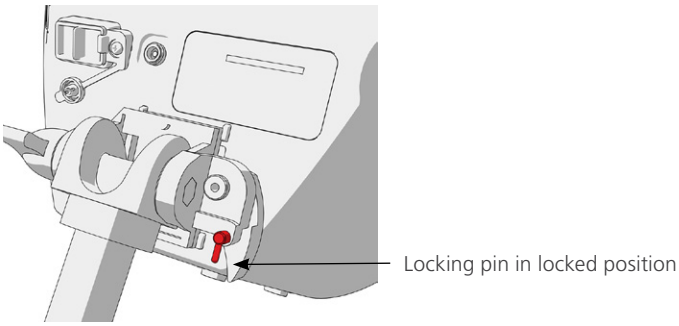



6. Seat the locking plate of the monitor on the quick-release mount. When properly situated, the monitor sits securely on the mount, and the quick-release lever automatically snaps into the locked (down) position.

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



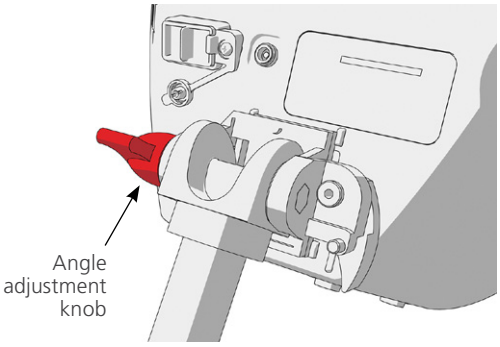

8. Adjust the locking pin to the locked (down) position. This secures the quick release lever in the locked position.



### 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.

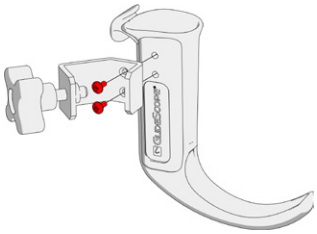



2. Tilt the monitor to the desired angle.
3. Turn the angle adjustment knob clockwise. This secures the monitor at the desired angle.
4. To attach a video baton cradle, see the procedure Attach the Video Baton Cradle (Optional).

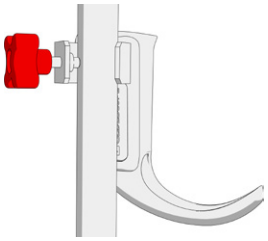
## PROCEDURE 3. ATTACH THE VIDEO BATON CRADLE (OPTIONAL)

You may elect to attach a video baton cradle to the mobile stand or IV pole mount.

1. Screw the center pole clamp to the video baton cradle.



2. Attach the center pole clamp and video baton cradle to the pole, and then turn the adjustment knob clockwise to tighten.



## PROCEDURE 4. CHARGE THE MONITOR BATTERY

**WARNING**

In order to maintain electrical safety, use only the provided, medical-approved power supply.

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 11. Battery Status Icons*

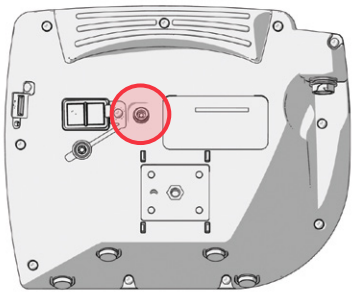

19% battery life or less remaining. Battery must be charged.


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.



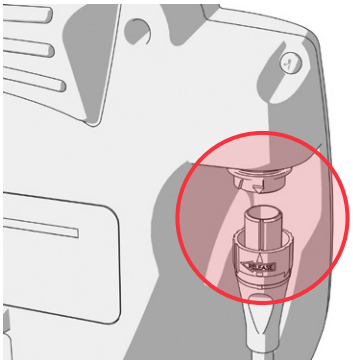
3. Plug the power supply into a hospital-grade power outlet.
4. Allow the battery to charge. Fully charging the battery may take up to 6 hours.

## PROCEDURE 5. CONNECT THE VIDEO CABLE OR SMART CABLE TO THE MONITOR

This procedure connects the video cable or Smart Cable to the monitor, which displays the image transmitted from the camera.

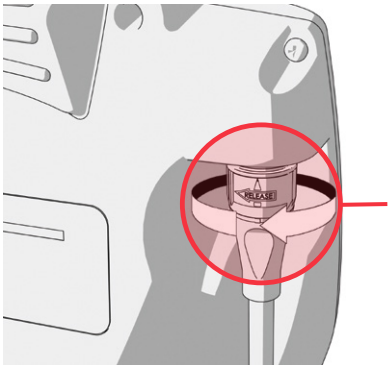
Ensure that the video monitor is turned off prior to connecting or disconnecting the video cable or Smart Cable.

1. Align the arrow on the video cable or Smart Cable and the arrow on the video cable port.



2. Insert the cable into the port. You will hear a click when the cable is successfully connected.

   *Note: When disconnecting the cable from the monitor, rotate the connector ring in the direction of the arrow.*

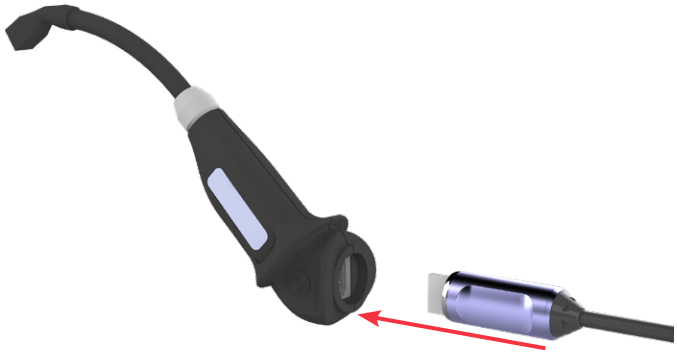


## PROCEDURE 6. CONNECT THE SMART CABLE TO THE VIDEO BATON (VIDEO BATON 2.0 ONLY)

If you want to use GlideScope Video Batons 2.0 with the GlideScope Video Monitor, you can use a Smart Cable to connect them.

*Note: Video Batons 2.0 require system software version 3.9 or later. For more information, refer to System Software on page 56.*

1. After connecting the Smart Cable to the monitor as described in the section Connect the Video Cable or Smart Cable to the Monitor on page 22, grasp the other end of the Smart Cable in one hand.
2. Holding the video baton in the other hand, align the HDMI connectors on the Smart Cable and the baton with one another.
3. Insert the HDMI connector on the Smart Cable into the connector on the video baton.



4. Press the Smart Cable securely into place within the recess on the video baton.

## PROCEDURE 7. CONNECT TO AN EXTERNAL MONITOR (OPTIONAL)

**WARNING**

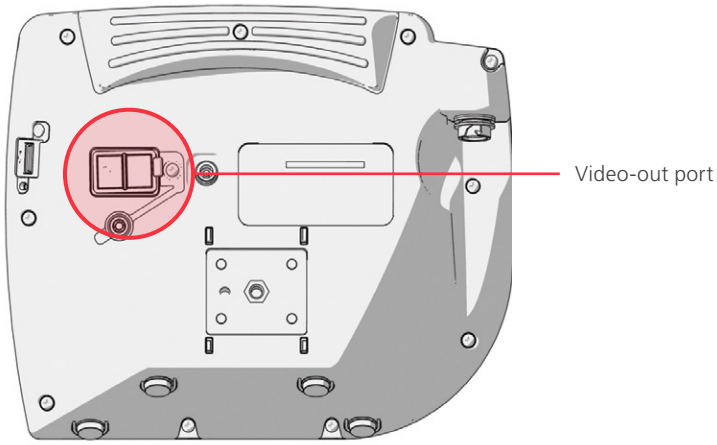
The external monitor must be safety-approved medical equipment.

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 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 8. 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 13, 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 56.

*Figure 12. User Settings Screen Page 1*

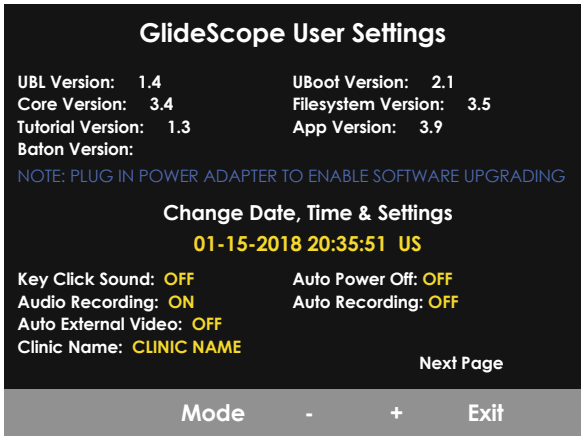



*Figure 13. User Settings Screen Page 2*

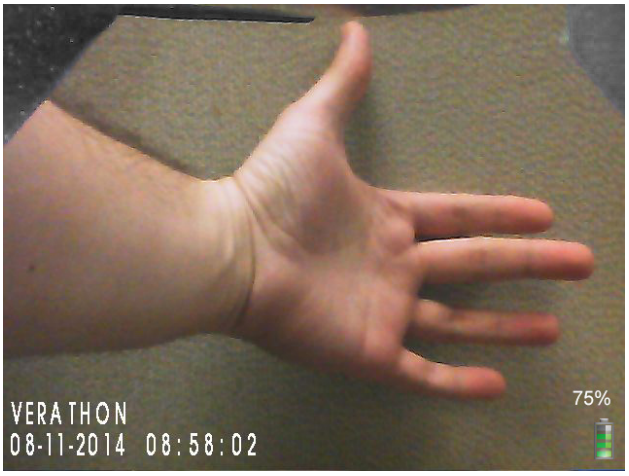

1. If a USB flash drive is inserted into the monitor, remove it.
2. Press the **Power** button. The monitor turns on.
3. Press and hold the **Tutorial** button, and while continuing to hold it, press the **Snapshot** button. The User Settings screen appears on the monitor. The configurable user settings 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 Setting screen closes.

## PROCEDURE 9. 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/support.

### REQUIRED CHECKS

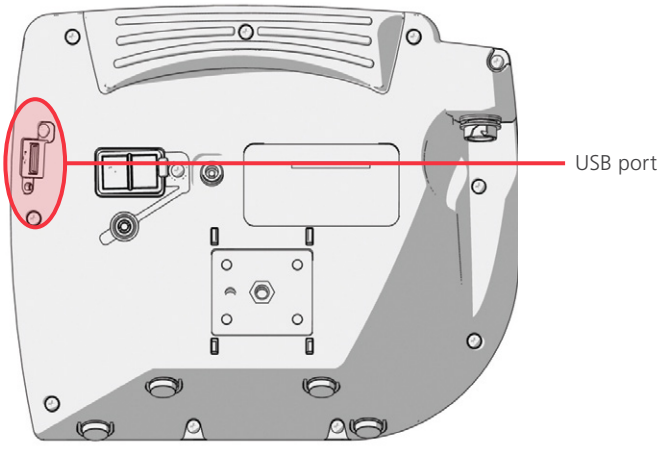
1. Fully charge the monitor battery (this takes approximately 6 hours).
2. Attach the video cable to the monitor.
3. Press the **Power** button. The monitor turns on.
4. Look at the monitor screen, and verify that the image displayed is being received from the video baton or GlideScope Direct blade.




*Note: There may be a slight blade intrusion in the upper-left and upper-right corners 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.

**WARNING**

GlideScope systems are delivered nonsterile and require cleaning or disinfection prior to initial use.

**WARNING**

Before every use, ensure the instrument is operating correctly and has no sign of damage. Do not use this product if the device appears damaged. 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/support.

AVL video laryngoscopes are equipped with the Reveal™ anti-fog feature, which reduces camera fogging during the intubation procedure. To fully optimize the feature, 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. Full optimization of the anti-fog feature is not necessary in order to use the device; if desired, you may begin the intubation procedure immediately.

*Note: If the video laryngoscope is stored in cold conditions, additional warming time may be required for optimal performance of the anti-fog feature.*

Using the system consists of the following procedures:

- Procedure 1: Connect the Video Cable to the Monitor
- Procedure 2: Insert the Video Baton into the Stat (Single-Use Only)
- Procedure 3: Prepare the GlideScope System
- Procedure 4: Intubate Using a Video Baton and Stat
- Procedure 5: Intubate Using the GlideScope Direct
- Procedure 6: Use the Record & Snapshot Features (Optional)
- Procedure 7: Use the Playback Feature (Optional)

## PROCEDURE 1. CONNECT THE VIDEO CABLE TO THE MONITOR

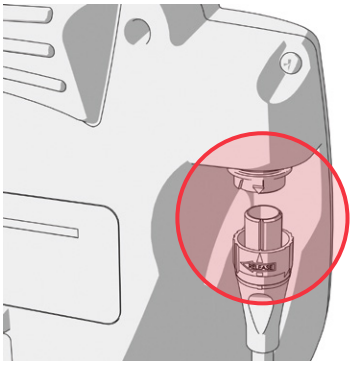
Ensure that the video monitor is turned off prior to connecting or disconnecting the video cable.

*Table 4. Video Laryngoscope Sizes*

| SIZES | | |
|---|---|---|
| Stat | Video Baton | Recommended Patient Weight/Size |
| GVL® 0 Stat | Video baton 1-2 | Patients less than 1.5 kg (3.3 lbs)* |
| GVL 1 Stat | Video baton 1-2 | Patients between 1.5–3.8 kg (3.3–8.4 lbs)* |
| GVL 2 Stat | Video baton 1-2 | Patients between 1.8–10 kg (4–22 lbs)* |
| GVL 2.5 Stat | Video baton 1-2 | Patients between 10–28 kg (22–61.7 lbs)* |
| GVL 3 Stat | Video baton 3-4 | Patients between 10 kg–adult (22 lbs–adult)* |
| GVL 4 Stat | Video baton 3-4 | Patients between 40 kg–large adult (88 lbs–large adult)* |

** Weight ranges are approximate; a medical professional must evaluate on a patient-by-patient basis.*

1. Ensure the video laryngoscope and other system components have been properly cleaned and disinfected. For more information, see the Cleaning & Disinfecting chapter.
2. Using the information in Table 4, in combination with a clinical assessment of the patient and the experience and judgment of the clinician, select the single-use video baton/Stat combination that is appropriate for the patient.
3. Align the arrow on the video cable and the arrow on the video cable port.



4. Insert the video cable into the port. You will hear a click when the cable is successfully connected.

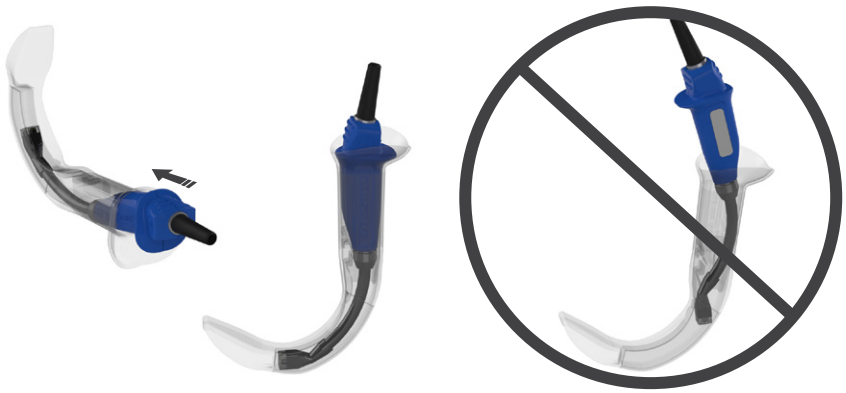
   *Note: When disconnecting the video cable from the monitor, rotate the connector ring in the direction of the arrow.*

## PROCEDURE 2. INSERT THE VIDEO BATON INTO THE STAT (SINGLE-USE ONLY)

1. Open the GVL® Stat pouch, but do not remove the Stat from the packaging.
2. Ensure that the logo on the side of the baton and the logo on the side of the Stat are aligned.
3. Slide the video baton into the GVL Stat until it clicks into place. Do not remove the Stat from the pouch until you are ready to begin the intubation. This ensures that the Stat remains as clean as possible.

   *Note: Ensure that you do not insert the video baton backwards.*

Correct Incorrect



4. When you remove the GVL Stat from the packaging, visually inspect the Stat to ensure that all exterior surfaces are free of unintended rough areas, sharp edges, protrusions, or cracks.

## PROCEDURE 3. PREPARE THE GLIDESCOPE SYSTEM

1. Press the **Power** button. The video monitor turns on.

   *Note: If the monitor locks up or becomes unresponsive for any reason, press and hold the Power button for 10 seconds to reboot the system.*
2. Ensure that the battery is sufficiently charged. If necessary, connect the monitor directly to power.
3. On the monitor screen, verify that the image displayed is from the video laryngoscope camera. On the monitor, a small portion of the GVL Stat may be visible on the top or upper-left and right corners.
4. 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.*
5. If desired to provide additional anti-fog benefits, you may apply Dexide™ Fred™ Lite to the camera window on the Stat.* Use the solution according to the manufacturer's instructions.

* Compatibility has been demonstrated for up to one hour of continuous exposure on video batons and Stats.

## PROCEDURE 4. INTUBATE USING A VIDEO BATON AND STAT

If you are using a GlideScope Direct intubation trainer, skip to the next procedure, Intubate Using the GlideScope Direct.

**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 video monitor screen. Failure to do so may result in injury, such as to the tonsils or soft palate.

**WARNING**

Several areas of the Stat that contact the patient can exceed 41°C (106°F) as part of normal operation:

- The first area is the light-emitting area surrounding the camera. When used as indicated, continuous contact with this area is unlikely because, if tissue were to contact this area, the view would be lost and devices would need to be adjusted to regain the airway view.
- The second area is the area surrounding the camera, out of view of the camera. Continuous contact with this area is unlikely because the product is typically not held stationary for an extended period of time exceeding 1 minute.

If continuous contact is maintained for longer than 1 minute, it is possible to cause thermal damage such as a burn to the mucosal tissue.

To perform an intubation, 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® Rigid Stylet, remove it by pulling toward the patient's feet.

## PROCEDURE 5. INTUBATE USING THE GLIDESCOPE DIRECT

**WARNING**

If the GlideScope Direct is powered on for an extended period of time, it is possible for the surface temperature to exceed 41°C (106°F) at the tip of the blade, where the lighting and camera are located.

**WARNING**

Before every use, ensure the instrument is operating correctly and has no sign of damage. Do not use this product if the device appears damaged. 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/support.

The following techniques are recommended for use of the GlideScope Direct intubation trainer. Ensure that the GlideScope Direct has been properly cleaned and high-level disinfected prior to use.

### *OPTION 1. RIGHT-SIDED APPROACH*

This option details the use of a right-sided approach to the mouth, pharynx, and glottis.

1. The patient is optimally positioned with either extension of the neck or a "classic sniffing position."
2. The mouth is opened, and efforts are made to minimize contact with the lips and teeth. The GlideScope Direct is introduced along the right side of the tongue, which is displaced leftward.
3. The GlideScope Direct is advanced along the tongue base until the epiglottis is seen. The GlideScope Direct tip is placed in the vallecula, lifting the epiglottis by tension on the hyoepiglottic ligament.
4. A direct line-of-sight to the glottis may be achieved by elevation of the epiglottis. The operator can view this directly, and the instructor can observe the progress on the video monitor.
5. The use of a stylet is optional. The operator attempts to introduce the endotracheal tube through the vocal cords.

### *OPTION 2. MIDLINE APPROACH*

This option details the use of a midline approach to the mouth, pharynx, and glottis.

1. The patient is optimally positioned with either extension of the neck or a "classic sniffing position."
2. Using the GlideScope Direct, the operator then enters the midline of the mouth, attempting to see directly to the epiglottis (guide to the glottis) and then the GlideScope Direct tip is placed in the vallecula, lifting the epiglottis by tension on the hyoepiglottic ligament.
3. The operator now attempts to gain a line-of-sight of the glottis, and the instructor observes the progress on the video monitor.
4. Where necessary, the operator may also observe the video view.

## PROCEDURE 6. USE THE RECORD & SNAPSHOT FEATURES (OPTIONAL)

**WARNING**

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

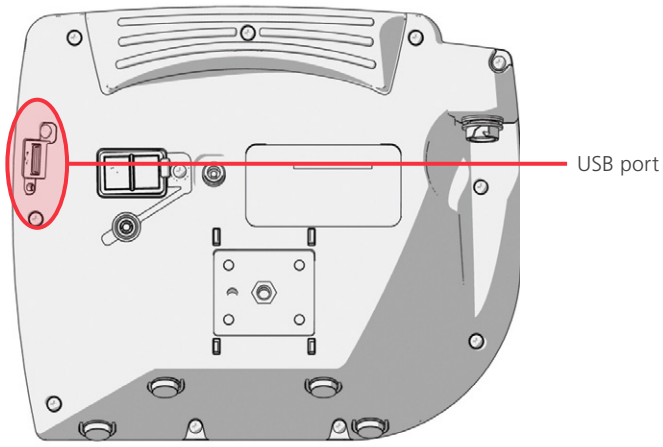
The system is equipped with video and audio recording features and the ability to save a snapshot of the live display on the monitor. The video monitor saves this data to a USB flash drive, and you can view the recordings or snapshots on a computer or on the video monitor. For more information about viewing these files on a monitor, see Use the Playback Feature (Optional) on page 34.

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)*

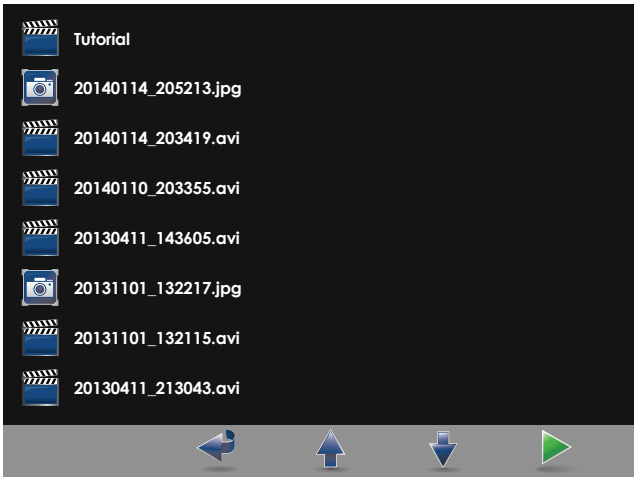
## PROCEDURE 7. USE THE PLAYBACK FEATURE (OPTIONAL)

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 56.

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.

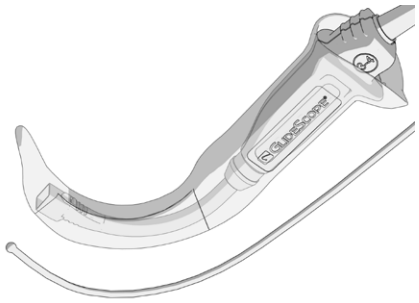
*Figure 14. Playback Menu*



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.

# TIPS FOR USING THE GLIDESCOPE AVL SYSTEM

- The GlideScope video laryngoscope is designed to be inserted down the midline of the tongue to the epiglottis.
- Intubations using the GlideScope video laryngoscope only require approximately 0.5–1.5 kg (1–3.5 lbs) of lifting force.
- The use of an endotracheal tube stylet is recommended. The GlideRite® Rigid Stylet has been designed to complement the angle of the GlideScope video laryngoscope to facilitate intubation. For more information about the stylet, see the *GlideRite Rigid Stylet Operations and Maintenance Manual*.



# TIPS FOR WORKING WITH ENDOTRACHEAL TUBES

- Insert the ETT behind or immediately adjacent to the GlideScope video laryngoscope.
- Do not insert the stylet into the larynx during intubation.
- Carefully introduce the distal end of the ETT between the vocal folds.
- When introducing the video laryngoscope or the endotracheal tube, look directly into the mouth to avoid damaging the endotracheal tube cuff, the patient's teeth, or soft tissues such as the soft palate or tonsils.
- Avoid excessive lifting or pushing of the glottis. Maximum laryngeal exposure may not facilitate intubation; reducing the elevation applied to the laryngoscope may make inserting the ETT easier.

# CLEANING & DISINFECTING

## GENERAL INFORMATION

**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**

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/support.

**WARNING**

This product may only be cleaned, disinfected, or sterilized by using the approved low-temperature processes provided in this manual. Cleaning, disinfection, and sterilization methods listed are recommended by Verathon based on efficacy or compatibility with component materials.

**WARNING**

Ensure that you follow the manufacturer's instructions for handling and disposing of the cleaning and disinfection solutions provided in this manual.

**WARNING**

Cleaning is critical to ensuring a component is ready for disinfection or sterilization. Failure to properly clean the device could 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**

Do not place the video baton in the cradle if any of the components are contaminated.

**WARNING**

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

Cleaning and disinfecting the system is an important part of using and maintaining it. Prior to each use, ensure that all system components have been cleaned, disinfected, or sterilized according to the guidance provided in Table 5. You should also examine the system periodically to make sure it is operating correctly. For more information, see the Maintenance & Safety chapter on page 56.

This chapter is divided into the following sections:

- General Information—Contains an overview of system information and provides the cleaning and disinfection procedures that are common to the system
- Video Batons—Contains the cleaning and disinfection procedures for the AVL video baton
- Direct Intubation Trainer—Contains the cleaning and disinfection procedure for the GlideScope Direct intubation trainer

Prior to cleaning or disinfecting, ensure the protective cap is properly fitted on the video cable connector. The arrow on the connector plug should match to the dot on the protective cap.

Correct fitting

Incorrect fitting

**IMPORTANT**

Do not let any contaminant(s) dry on the device. Bodily contaminants tend to become securely attached to solid surfaces when dried, making removal more difficult.

When using any of the disinfectants listed in this manual, read and comply with product use instructions in all applications.

*Note: It is understood that all items in the following table will be used as intended, and the level of disinfection or sterilization required may vary according to local regulations.*

*Table 5. System Risk Classification*

| DEVICE | PACKAGED | USE | SPAULDING'S/CDC CLASSIFICATION | DISINFECTION LEVEL | | STERILIZE |
|---|---|---|---|---|---|---|
| | | | | Low | High | |
| Smart Cable | Nonsterile | Reusable | Noncritical | X‖ | | |
| Monitor* | Nonsterile | Reusable | Noncritical | | | |
| Cradle* | Nonsterile | Reusable | Noncritical | | | |
| Cart* | Nonsterile | Reusable | Noncritical | | | |
| GVL® Stat† | Sterile | Single-Use | Semi-critical | | | |
| Video baton‡ | Nonsterile | Reusable | Noncritical | X‖ | | |
| GlideScope Direct | Nonsterile | Reusable | Semi-critical | | X | |
| GlideRite® Rigid Stylet§ | Nonsterile | Reusable | Semi-critical | | X | |

* *Clean the video monitor, cradle, and cart when they are visibly soiled and on a regular basis, as per a schedule established by the medical care facility or provider.*

† *Single-use Stats may not be cleaned, disinfected, or sterilized. Dispose of single-use Stats after use.*

‡ *The video baton is a nonsterile, reusable device, which is protected from contact with mucous membranes and non-intact skin by the Stat (sterile, single-use) when used as intended. Low-level disinfection is recommended for the video baton after every patient use. High-level disinfection is required for the video baton when it is visibly soiled.*

§ *For instructions on cleaning and disinfection, see the GlideRite Rigid Stylet Operations and Maintenance Manual.*

‖ *The low-level disinfection solutions in this manual are not available in all geographic regions. If they are not available in your region, such as the United States, use a high-level disinfection method only.*

X *Checked boxes show minimum disinfection level requirement.*

■ *Shaded areas indicate that the disinfection/sterilization level is not required or not compatible with the device materials.*

☐ *Unshaded areas show permissible levels of disinfection or sterilization based on compatibility with the device materials.*

## COMPATIBILITY

Table 6 shows the disinfectant and cleaning products that have demonstrated compatibility with system materials but have not been tested for biological efficacy. Solutions included in the cleaning, disinfection, and sterilization procedures have demonstrated both compatibility and biological efficacy.

Results with compatible solutions may vary based on exposure periods and device handling. Ensure that you adhere to an inspection schedule as described in Periodic Inspections on page 56.

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

*Table 6. Compatible Pre-Cleaners, Cleaning Solutions, and Disinfectants*

| PRODUCT | CYCLES PER COMPONENT | | |
|---|---|---|---|
| | AVL Video Baton | Video Baton 2.0 | Smart Cable |
| Ecolab® MetalClean | | | 1500 |
| Ecolab® Enzymatic Detergent | 1000 | 2000 | 1500 |
| Ecolab® OptiPro™ Gel Instrument Pre-Cleaner | | | 1500 |
| schülke® thermosept® ER cleaner | | | 1500 |
| Anios® Anioxyde® 1000 high level disinfectant and cold sterilant | | | 1500 |
| neodisher® MediClean forte | | | 1500 |
| Anios® Aniosyme® XL3 enzymatic detergent | | | 1500 |
| STERIS® PRE-Klenz™ Instrument Transport Gel | 1000 | 2000 | 1500 |
| Certol® ProEZ Foam™ | | | 500 |
| Getinge® Renuzyme Foam Spray | | | 250 |

After reviewing Table 5 and Table 6, complete the following procedures to clean, disinfect, or sterilize the system components:

- Clean the GlideScope Video Monitor
- Clean the Power Adapter
- Clean the Cradle
- Clean the GlideScope Premium Cart
- Remove the Stat
- Clean & Disinfect the Video Baton
- Inspect the Video Baton
- Clean the Smart Cable
- Disinfect the Smart Cable
- Sterilize the Smart Cable (Optional)
- Clean & Disinfect the GlideScope Direct

## PROCEDURE 1. CLEAN THE GLIDESCOPE VIDEO MONITOR

**IMPORTANT**

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

Clean the video monitor when it is visibly soiled and on a regular basis, as per a schedule established by the medical care facility or provider.

1. Turn off the video monitor, and then unplug the device.
2. Using one of the following solutions, wipe the exterior of the video monitor:
   - 70% isopropyl alcohol (IPA)
   - Metrex® CaviWipes™
   - AHP® Oxivir®
   - PDI® SaniCloth® AF3 Germicidal Wipes

## PROCEDURE 2. CLEAN THE POWER ADAPTER

Clean the power adapter when it is visibly soiled and on a regular basis, as per a schedule established by the medical care facility or provider. When cleaning the power adapter, use a cloth dampened with isopropyl alcohol on the outside of the enclosure. Do not immerse the power adapter in water.

## PROCEDURE 3. CLEAN THE CRADLE

Clean the cradle when it is visibly soiled and on a regular basis, as per a schedule established by the medical care facility or provider.

1. Wipe the cradle with a standard hospital-grade, surface-cleaning product.

## PROCEDURE 4. CLEAN THE GLIDESCOPE PREMIUM CART

Clean the cart when it is visibly soiled and on a regular basis, as per a schedule established by the medical care facility or provider.

*Table 7. Cleaning Methods for the GlideScope Premium Cart**

| PRIMARY ACTIVE INGREDIENT† | BRAND NAME | CONCENTRATION |
|---|---|---|
| Sodium hypochlorite | Clorox® Bleach | 0.16% (1600 ppm) |
| Hydrogen peroxide | Virox® Technologies Accel® TB Wipes | 0.5% |
| | Diversey® Oxivir® TB Wipes | |
| Isopropyl alcohol | — | 70% |
| Quaternary ammonium compound (alcohol-based) | PDI® Super Sani-Cloth® Germicidal Disposable Wipes | 0.5% |
| | Metrex® CaviWipes™ | 0.28% |

* *All solutions have been tested for 100 compatibility cycles. Exceeding the recommended number of cycles may affect the potential life of the product.*

† *See solution manufacturer's label for additional active and inactive ingredients.*

1. If you are using bleach, prepare the solution to the concentration indicated in Table 7.

   *Note: If you are using a product containing 5% bleach, dilute 120 mL (4 ounces) of bleach in 3.8 L (1 gallon) of water.*

2. Using one of the solutions in Table 7, expose the cart to the cleaning solution according to the solution manufacturer's instructions.

# VIDEO BATONS

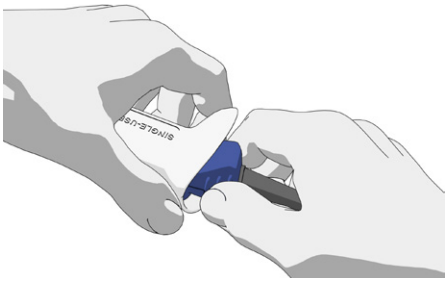
For more information about the risk classification of AVL system components, see Table 5 on page 38.

## PROCEDURE 5. REMOVE THE STAT

The GVL® Stat is a sterile, single-use device. After each use, it is a biohazard, and it should be removed from the video baton and disposed of in a manner consistent with local protocols.

1. Hold the Stat in one hand.
2. To reduce the force required to remove the video baton from the Stat, use your thumb and finger to gently press the collar of the Stat.

3. With the other hand, grasp the handle of the video baton and pull firmly.



## PROCEDURE 6. CLEAN & DISINFECT THE VIDEO BATON

When used as intended, the video baton is a nonsterile, reusable device, which is protected from contact with mucous membranes and non-intact skin by the Stat (sterile, single-use). Low-level disinfection is recommended for the video baton after every patient use. High-level disinfection is required for the video baton when it is visibly soiled.

**IMPORTANT**

Do not use metal or abrasive brushes, scrub pads, or rigid tools to clean the video baton. The window that protects the camera and light can be scratched, permanently damaging the device.

This component is heat-sensitive, and exposing it to temperatures in excess of 60°C (140°F) will cause damage to the electronics.

Bleach may be used on the video baton, but pay special attention to the stainless steel on the component, as bleach can corrode stainless steel.

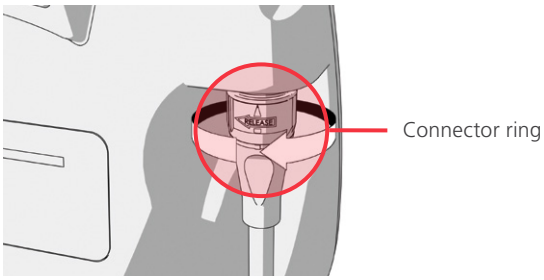
*Table 8. Cleaning & Disinfection Methods for the GlideScope Video Baton*

| PRODUCT | DISINFECTION LEVEL | CONDITIONS |
|---|---|---|
| Enzymatic debridement agent/detergent | Cleaner | As per chemical manufacturer's instructions |
| STERIS® Prolystica 2x Concentrate Enzymatic Presoak and Cleaner | Cleaner | Up to 2000 cycles as per the following instructions:<br>**Exposure:** Prepare solution in warm water at ⅛ to ½ fl. oz. per gallon (1–4 mL/L). Soak component for at least 3 minutes. Before removing from solution, brush all surfaces using a soft-bristled brush, paying special attention to hard-to-reach areas. Use a cotton swab for the camera window to avoid damaging the window.<br>**Rinse:** Rinse for 3 minutes under warm running water. If component is soaked for longer than 3 minutes, increase rinse time in proportion to soak time. |
| Bleach (500 ppm) | Low | As per chemical manufacturer's instructions |

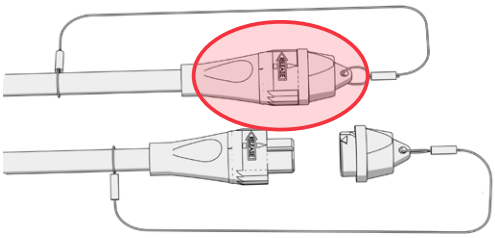
| PRODUCT | DISINFECTION LEVEL | CONDITIONS |
|---|---|---|
| Isopropyl alcohol solution (70%) | Low | As per chemical manufacturer's instructions |
| Oxivir® Tb Wipes | Low | Up to 1100 cycles as per chemical manufacturer's instructions |
| Sani-Cloth® Bleach Wipes | Low | Up to 750 cycles as per chemical manufacturer's instructions |
| SaniCloth® AF3 Germicidal Wipes | Cleaner | Up to 2000 cycles as per chemical manufacturer's instructions |
| | Low | Exposure: Using fresh wipe(s), wet all surfaces and allow to remain wet for 3 minutes.<br>Rinse: Not applicable. Allow the component to thoroughly air dry. |
| ASP® CIDEXPLUS® 28 Day Solution | High | As per chemical manufacturer's instructions |
| ASP® CIDEX® OPA | High | As per chemical manufacturer's instructions |
| Metrex® MetriCide® Plus 30 | High | As per chemical manufacturer's instructions |
| Medivators® Rapicide® | High | 100 cycles in a Medivators Advantage® Plus automated endoscope reprocessor (AER) disinfection routine meeting the following requirements:<br>• Concentration of disinfectant – 750-950 parts per million<br>• Temperature – 28°C–32°C (82.4°F – 89.6°F)<br>• Exposure time – 5 minutes<br>• AER configuration – Hookup 2-8-002HAN rev A<br>• AER parameter set – 1-35-101 C DISF |
| Sultan® Healthcare Sporox® II | High | As per chemical manufacturer's instructions |
| STERIS® S40™ or S20™ | Sterilization | Standard cycles in the following processors:<br>STERIS® SYSTEM 1® (outside U.S.)<br>SYSTEM 1E® (in U.S.)<br>SYSTEM 1 EXPRESS (outside U.S.)<br>SYSTEM 1 PLUS (outside U.S.) |
| STERIS® V-PRO® low temperature sterilization systems | Sterilization | Up to 200 cycles as per manufacturer's instructions |
| ASP® Hydrogen Peroxide Gas Plasma | Sterilization | STERRAD® 100S (in U.S.),<br>STERRAD® 100S short cycle (outside U.S.),<br>STERRAD® NX standard cycle, or<br>STERRAD® 100NX standard cycle |

### PREPARE THE VIDEO BATON FOR CLEANING

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




3. If you are cleaning a Video Baton 2.0, skip to the section Clean the Video Baton.
4. Place the protective cleaning cap over the connector. Ensure that the mark on the cap is aligned with the arrow on the cable.



### CLEAN THE VIDEO BATON

5. Wash the video baton manually using a hospital-grade equipment detergent or an enzymatic debridement agent/detergent. For more information, see Table 8.

**IMPORTANT**

**Be sure to remove all foreign material, such as soil and organic material, from the surface of the component.**

6. Rinse the video baton in clean, running water.

   The video baton can now be disinfected.

### DISINFECT OR STERILIZE THE VIDEO BATON

7. Ensure the equipment is clean according to the previous steps.
8. Ensure the protective caps on the connectors are secure.
9. Prepare and condition the disinfection solution according to the solution manufacturer's instructions and the conditions stated in Table 8.

10. Disinfect the video baton according to the conditions stated in Table 8. The exposure process and times vary depending on the solution and the component.

**IMPORTANT**

**If you are using pre-moistened wipes,** wipe down the component as often as needed to keep it visibly wet throughout the specified exposure time. You may use multiple wipes if necessary.

11. If applicable, rinse the video baton according to the solution manufacturer's instructions.
12. Dry the video baton as appropriate for the disinfectant you are using.

| *If you are using …* | *Then …* |
|---|---|
| A liquid disinfectant | Use a sterile cloth, hospital-grade clean air, or a low-temperature dryer to dry the component. |
| Pre-moistened wipes | Allow the component to air dry completely. |

13. Inspect the video baton according to the instructions in the following procedure, and then store the disinfected video baton in a clean environment.

## PROCEDURE 7. INSPECT THE VIDEO BATON

**WARNING**

Before every use, ensure the instrument is operating correctly and has no sign of damage. Do not use this product if the device appears damaged. 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/support.

1. Visually inspect the video baton for signs of damage. Perform a routine inspection of the video baton before and after every use to ensure that all endoscopic components are free of unintended rough surfaces, sharp edges, protrusions, or cracks.

## PROCEDURE 8. CLEAN THE SMART CABLE

**WARNING**

Cleaning is critical to ensuring a component is ready for disinfection or sterilization. Failure to properly clean the device could 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.

Use this procedure in order to clean the Smart Cable. It is critical to remove all traces of contamination from the component prior to completing disinfection or sterilization procedures. The Smart Cable is IPX7 compliant and may be completely immersed in cleaning and disinfecting solutions. The use of protective caps is not required during reprocessing.

To significantly reduce the amount of effort needed to clean the system, do not let contaminant(s) dry on any system component. Bodily contaminants tend to become securely attached to solid surfaces when dried, making removal more difficult.

Verathon has validated the products in this procedure for both chemical compatibility and biological efficacy when cleaning the indicated component(s) as instructed in the Conditions column.

*Table 9. Cleaning Methods for Smart Cables*

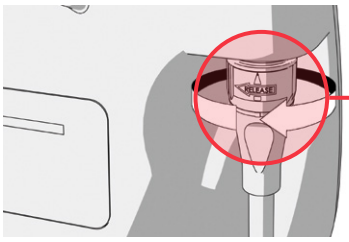
| PRODUCT | LEVEL | CYCLES* | CONDITIONS |
|---|---|---|---|
| STERIS® Prolystica® 2X Concentrate§ | Cleaner | 1500 | **Exposure:** Prepare solution in warm water at ⅛ to ½ fl. oz. per gallon (1–4 mL/L). Soak component for at least 3 minutes. Before removing from solution, brush all surfaces using a soft-bristled brush, paying special attention to hard-to-reach areas. Use a cotton swab for the camera window to avoid damaging the window.<br>**Rinse:** Rinse for 3 minutes under warm running water. If component is soaked for longer than 3 minutes, increase rinse time in proportion to soak time. |
| Metrex® CaviCide® | Cleaner | 1500 | **Water temperature:** 33–40°C (91–104°F)<br>**Exposure:** Spray all surfaces until drenched. Allow to remain wet for 10 minutes. Brush all surfaces. Rinse under running water for 5 minutes. Spray all surfaces until drenched. Allow to remain wet for 10 minutes.<br>**Rinse:** Rinse under running water for 5 minutes. Fully immerse in water and agitate for 3 minutes. Before removing from water, brush the cable with a soft-bristled brush. Remove from water and flush the connectors with running water and a syringe. Fully immerse in **fresh** water and agitate for 3 minutes. Rinse under running water for 2 minutes. |

| PRODUCT | LEVEL | CYCLES* | CONDITIONS |
|---|---|---|---|
| Metrex® EmPower™ | Cleaner | 1500 | **Water temperature:** 19–29°C (66–84°F)<br>**Exposure:** Prepare solution at 1 ounce/gallon (7.8 mL/L). Soak component for 3 minutes. Before removing from solution, brush all surfaces and pay special attention to hard-to-reach areas.<br>**Rinse:** Rinse for 3 minutes under running water. |
| Tristel™ Trio Wipes System (outside U.S.) | Cleaner | 1500 | **Pre-clean:** Use 2 or more pre-clean towelettes to remove all visible contamination from the component.<br>Continue to the entry "Tristel™ Trio Wipes System" in Table 10 on page 50. |
| Pro-Line Solutions EcoZyme® | Cleaner | 1500 | **Water temperature:** 19–29°C (66–84°F)<br>**Exposure:** Prepare solution at 1 ounce/gallon (7.8 mL/L) in 30–40°C (86–104°F) water. Soak component for 5 minutes. Before removing from solution, brush all surfaces and pay special attention to hard-to-reach areas. Using a syringe, flush the connectors.<br>**Rinse:** Rinse for 5 minutes under running water. Using a syringe, flush the connectors. |
| Metrex® CaviWipes™ | Cleaner | 1500 | **Water temperature:** N/A<br>**Exposure:** Use towelette(s) to remove all visible contamination from the component. Using fresh towelette(s), wet all surfaces and allow to remain wet for 3 minutes.<br>**Rinse:** N/A. Allow the component to thoroughly air dry. |
| Metrex® CaviWipes1™ | Cleaner | 1500 | Use 3 or more towelettes to remove all visible contamination from the component.<br>Continue to the entry "Metrex® CaviWipes1™" in Table 10 on page 50. |
| Wip'Anios Premium (outside U.S.) | Cleaner | 1500 | **Water temperature:** N/A<br>**Exposure:** Use towelette(s) to remove all visible contamination from the component. Using fresh towelette(s), wet all surfaces and allow to remain wet for 5 minutes.<br>**Rinse:** N/A. Allow the component to thoroughly air dry. |
| Clinell® Universal Sanitizing Wipes (outside U.S.) | Cleaner | 1500 | **Water temperature:** N/A<br>**Exposure:** Use towelette(s) to remove all visible contamination from the component. Using fresh towelette(s), wet all surfaces and allow to remain wet for 5 minutes.<br>**Rinse:** N/A. Allow the component to thoroughly air dry. |

| PRODUCT | LEVEL | CYCLES* | CONDITIONS |
|---|---|---|---|
| Sani-Cloth® Active Wipes | Cleaner | 1500 | **Water temperature:** N/A<br>**Exposure:** Use towelette(s) to remove all visible contamination from the component. Using fresh towelette(s), wet all surfaces and allow to remain wet for 5 minutes.<br>**Rinse:** N/A. Allow the component to thoroughly air dry. |
| Sani-Cloth® AF3 Germicidal Wipes | Cleaner | 1500 | **Exposure:** Using fresh wipe(s), wet all surfaces and allow to remain wet for 3 minutes.<br>**Rinse:** Not applicable. Allow the component to thoroughly air dry. |
| Ecolab® OptiPro™ Multi Enzymatic Low-Foam Detergent | Cleaner | 1500 | **Exposure:** Prepare working solution at a concentration of 7.0–15.6 mL per L, or 0.5–2 U.S. fluid ounces per U.S. gallon.‡ Soak components for 2–5 minutes. After soaking, brush all surfaces with a soft-bristled brush in order to remove any visible contamination. |

* *Value indicates number of compatibility cycles tested on the component. Exceeding the recommended number of cycles may affect the potential life of the product.*

1. Ensure the video monitor has been turned off.
2. Detach the Smart Cable from the monitor by turning the connector ring in the direction of the release arrow.




3. Detach the Smart Cable from the video baton by holding the Smart Cable connector in one hand and the base of the baton in the other, and then pulling.
4. If you are using a wipe method to clean the component, skip to Step 10.
5. If you are using a pre-cleaning solution, apply it to the component as specified in Table 10.
6. Using the water temperature specified in Table 10, rinse the component in clean tap water and scrub with a soft-bristled brush until all visible contamination has been removed.
7. Examine the connectors on both ends of the Smart Cable for contamination.

8. If there is any visible sign of contamination in the connectors, use a long, soft-bristled brush or cotton swab to remove it.
9. Prepare one of the approved cleaning solutions in Table 10 according to the solution manufacturer's instructions.
10. Expose the components to the cleaning solution according to the instructions in Table 9. The exposure process and times vary depending on the solution and the component.

    *Note:*

    - *If you are using Metrex® CaviCide®, spray additional solution as needed in order to ensure that the component remains visibly wet for the duration of the exposure period.*
    - *If you are using a wipe method, rewipe the component as needed in order to ensure that it remains visibly wet for the duration of the exposure period. You may use multiple wipes as necessary.*
11. If applicable for the cleaning solution, rinse the components according to the instructions in Table 9. The rinsing process and times vary depending on the solution and the component.

**WARNING**

To reduce the risk of cytotoxic residual when cleaning with Metrex® CaviCide®, thoroughly rinse the component as instructed in this manual.

12. Visually inspect the component for contamination. If there is any sign of contamination, restart the procedure.
13. Using hospital-grade clean air, which is free from oils and residuals found in common compressed air, blow out the connectors. This dries the connectors and removes any remaining residuals.
14. Using a clean, lint-free cloth, hospital-grade clean air, or a low-temperature dryer, dry the component.

    *Note: If you are using a wipe method, allow the component to thoroughly air dry.*
15. Examine the component for any signs of damage. Reusable titanium blades should not have any signs of damage other than minor surface scratches or discoloration of the metal as the result of use. If damage is present, do not use the component, and contact Verathon® Customer Care.

The component should now be clean and free of contamination. Handle the product carefully to avoid recontamination.

*Note: Before each use, Smart Cables must be low-level disinfected.*

## PROCEDURE 9. DISINFECT THE SMART CABLE

Before each use, Smart Cables must be low-level disinfected. Use the following instructions to disinfect the Smart Cable. In this procedure, the term *pure water* refers to water that is suitable for disinfection according to local regulations and your medical facility.

When high-level disinfecting a Smart Cable, you may use a Medivators® CER Optima 1 & 2 AER, DSD-201 AER, or SSD-102 AER system, provided you do the following:

- Use an approved high-level disinfectant from Table 10.
- Use a disinfectant that is compatible with the Medivators® system. For more information about chemical compatibility, contact Medivators.®
- Use the conditions provided in Table 10, such as temperature, exposure, and concentration.
- Do not expose the component to temperatures exceeding 60°C (140°F) on any cycle.

Verathon has validated the products in this procedure for both chemical compatibility and biological efficacy when disinfecting Smart Cables as instructed in the Conditions column.

*Table 10. Disinfection Methods for Smart Cables*

| PRODUCT | DISINFECTION LEVEL | CYCLES* | CONDITIONS |
|---|---|---|---|
| Sani-Cloth® Bleach Germicidal Disposable Wipes | Low | 1500 | **Exposure:** Using a Sani-Cloth® Bleach Wipe, wipe the product in order to remove any heavy soil, and then using a new wipe, thoroughly wet all surfaces of the product. Allow all surfaces to remain visibly wet for a minimum of 4 minutes. Use additional wipes as needed to ensure the surfaces stay wet.<br>**Rinse:** N/A. Allow the component to thoroughly air dry. |
| Clinell® Universal Sanitizing Wipes (outside U.S.) | Low | 1500 | **Conditioning:** N/A<br>**Water temperature:** N/A<br>**Exposure:** Using fresh towelette(s), wet all surfaces and allow to remain wet for 6 minutes.<br>**Rinse:** N/A. Allow the component to thoroughly air dry. |
| Clorox® Bleach Germicidal Wipes | Low | 1500 | **Conditioning:** N/A<br>**Water temperature:** N/A<br>**Exposure:** Using fresh towelette(s), wet all surfaces and allow to remain wet for 3 minutes.<br>**Rinse:** N/A. Allow the component to thoroughly air dry. |
| Metrex® CaviWipes1™ | Low | 1500 | **Conditioning:** N/A<br>**Water temperature:** N/A<br>**Exposure:** Using fresh towelette(s), wet all surfaces and allow to remain wet for 1 minute.<br>**Rinse:** N/A. Allow the component to thoroughly air dry. |

| PRODUCT | DISINFECTION LEVEL | CYCLES* | CONDITIONS |
|---|---|---|---|
| STERIS® S40™ or S20™ | High | 750 | Standard cycles in the following processors:<br>STERIS® SYSTEM 1® (outside U.S.)<br>SYSTEM 1E® (in U.S.)<br>SYSTEM 1 EXPRESS (outside U.S.)<br>SYSTEM 1 PLUS (outside U.S.) |
| Tristel™ Trio Wipes System (outside U.S.) | High | 1500 | Clean according to the entry "Tristel™ Trio Wipes System" in Table 9 on page 46.<br>**Sporocidal:** Apply two pumps of the activator foam to a sporocidal towelette and manipulate towelette for 15 seconds. Wet all surfaces of the component and allow to remain wet for 30 seconds.<br>**Rinse:** Use a rinse towelette to wipe all surfaces. |
| STERIS® Revital-Ox™ Resert® XL HLD†<br>Revital-Ox™ Resert® HLD/ Chemosterilant†<br>Resert® XL HLD† | High | 1500 | **Conditioning:** 20°C (68°F) or higher<br>**Water Temperature:** 20°C (68°F) or higher<br>**Exposure:** Soak for 8 minutes, ensuring that all air bubbles are removed from the surface of the component.<br>**Rinse:** (1) 1-minute immersion with agitation in pure water. Ensure the connector is properly rinsed. |
| ASP® Cidex® OPA | High | 1500 | **Conditioning:** 20°C (68°F) or higher<br>**Water Temperature:** 20°C (68°F) or higher<br>**Exposure:** Soak for 10 minutes, ensuring that all air bubbles are removed from the surface of the cable.<br>**Rinse:** (3) 1-minute immersions with agitation in pure water. |
| Metrex® MetriCide® OPA Plus | High | 1500 | **Conditioning:** 20°C (68°F) or higher<br>**Water Temperature:** 20°C (68°F) or higher<br>**Exposure:** Soak for 10 minutes, ensuring that all air bubbles are removed from the surface of the cable.<br>**Rinse:** (3) 1-minute immersions with agitation in pure water. |
| Medivators® Rapicide® OPA/28 | High | 1500 | **Conditioning:** 20°C (68°F) or higher<br>**Water Temperature:** 20°C (68°F) or higher<br>**Exposure:** Soak for 10 minutes, ensuring that all air bubbles are removed from the surface of the blade.<br>**Rinse:** (3) 1-minute immersions with agitation in pure water |
| Anios/Farmec® OPASTER | High | 1500 | **Water Temperature:** 20°C (68°F)<br>**Exposure:** Soak the component for 30 minutes in OPASTER solution, ensuring that all air bubbles are removed from the surface. Use the solution at full strength.<br>**Rinse:** (3) 1-minute immersions with agitation in pure water. Ensure that any exposed connectors are properly rinsed. |

| PRODUCT | DISINFECTION LEVEL | CYCLES* | CONDITIONS |
|---|---|---|---|
| Medivators® Rapicide® PA 30°C | High | 100 | **Concentration:** 850 ± 100 parts per million<br>**Conditioning:** 28–32°C (82–90°F)<br>**Exposure:** 5 minutes in a Medivators® Advantage Plus AER reprocessing system with the following configuration:<br>• Hookup: 2-8-002HAN Rev. B<br>• Parameter: 1-24-010 C DISF |

* *Value indicates number of compatibility cycles tested on the component. Exceeding the recommended number of cycles may affect the potential life of the product.*

† *This chemical may cause discoloration of metal components, but the discoloration does not affect system efficacy or functionality.*

‡ *The minimum concentration shown in metric units is higher than the minimum concentration shown in U.S. units. This is consistent with the manufacturer's current instructions.*

1. Ensure the Smart Cable has been properly cleaned, according to the procedure Clean the Smart Cable.
2. Prepare and condition the disinfection solution according to the solution manufacturer's instructions and the conditions stated in Table 10.
3. Disinfect the component according to the conditions stated in Table 10. The exposure process and times vary depending on the solution.

**IMPORTANT**

**If you are using pre-moistened wipes,** wipe down the component as often as needed to keep it visibly wet throughout the specified exposure time. You may use multiple wipes if necessary.

4. Rinse the component according to the conditions stated in Table 10. The rinsing process and times vary depending on the solution.
5. Dry the component as appropriate for the disinfectant you are using.

| *If you are using …* | *Then …* |
|---|---|
| A liquid disinfectant | Use a sterile cloth, hospital-grade clean air, or a low-temperature dryer to dry the component. |
| Pre-moistened wipes | Allow the component to air dry completely. |

6. Examine the component for any signs of damage. If damage is present, do not use the component, and contact Verathon® Customer Care.
7. Store the component in a clean environment.

## PROCEDURE 10. STERILIZE THE SMART CABLE (OPTIONAL)

Smart Cables are considered to be noncritical devices Therefore, sterilization of the Smart Cable is optional. Your medical care facility or provider may require sterilization of this component prior to use.

Verathon has validated the products in this procedure for both chemical compatibility and biological efficacy when sterilizing Smart Cables as instructed in the Conditions column.

**IMPORTANT**

This component is heat-sensitive, and exposing it to temperatures in excess of 60°C (140°F) will cause damage to the electronics.

*Table 11. Sterilization Methods for Smart Cables*

| PRODUCT | DISINFECTION LEVEL | CYCLES* | CONDITIONS |
|---|---|---|---|
| STERIS® S40™ or S20™ | High/ Sterilization | 750 | Standard cycles in the following processors:<br>STERIS® SYSTEM 1® (outside U.S.)<br>SYSTEM 1E® (in U.S.)<br>SYSTEM 1 EXPRESS (outside U.S.)<br>SYSTEM 1 PLUS (outside U.S.) |
| STERIS® Vaprox® HC | Sterilization | 100 | Non-lumen cycle in any STERIS® Amsco® V-PRO® low-temperature sterilization system. |
| ASP® Hydrogen Peroxide Gas Plasma | Sterilization | 100 | Use one of the following processors:<br>STERRAD® 100S (in U.S.)<br>STERRAD® 100S short cycle (outside U.S.)<br>STERRAD® NX standard cycle<br>STERRAD® 100NX standard cycle |

* *Value indicates number of compatibility cycles tested on the component. Exceeding the recommended number of cycles may affect the potential life of the product.*

1. Ensure that the component has been properly cleaned according to the procedure Clean the Smart Cable.
2. Package the component according to the instructions provided by the manufacturer of the sterilization system (Example: trays, pouches, or wraps).
3. Sterilize the component according to the manufacturer's instructions or according to the conditions stated in Table 11.
4. Examine the component for any signs of damage. Reusable titanium blades should not have any signs of damage other than minor surface scratches or discoloration of the metal as the result of use. If damage is present, do not use the component, and contact Verathon® Customer Care.
5. Store the component in a clean environment that is appropriate for sterile equipment.

# DIRECT INTUBATION TRAINER

The GlideScope Direct intubation trainer requires high-level disinfection prior to use. For more information about the risk classification of AVL system components, see Table 5 on page 38.

**IMPORTANT**

Do not use metal or abrasive brushes, scrub pads, or rigid tools to clean the blade. The window that protects the camera and light can be scratched, permanently damaging the device.

This component is heat-sensitive, and exposing it to temperatures in excess of 60°C (140°F) will cause damage to the electronics.

## PROCEDURE 11. CLEAN & DISINFECT THE GLIDESCOPE DIRECT

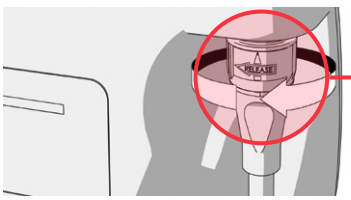
*Table 12. Cleaning & Disinfection Methods for the GlideScope Direct*

| PRODUCT | DISINFECTION LEVEL | CONDITIONS |
|---|---|---|
| Enzymatic debridement agent/detergent | Cleaner | As per chemical manufacturer's instructions |
| ASP® Cidex® OPA * | High | As per chemical manufacturer's instructions |
| Metrex® MetriCide® Plus 30 * | High | As per chemical manufacturer's instructions |
| Sultan® Healthcare Sporox® II * | High | As per chemical manufacturer's instructions |
| STERIS® S40™ or S20™ * | Sterilization | Standard cycles in the following processors:<br>STERIS® SYSTEM 1® (outside U.S.)<br>SYSTEM 1E® (in U.S.)<br>SYSTEM 1 EXPRESS (outside U.S.)<br>SYSTEM 1 PLUS (outside U.S.) |
| ASP® Hydrogen Peroxide Gas Plasma † | Sterilization | STERRAD® 100S (in U.S.),<br>STERRAD® 100S short cycle (outside U.S.),<br>STERRAD® NX standard cycle, or<br>STERRAD® 100NX standard cycle |

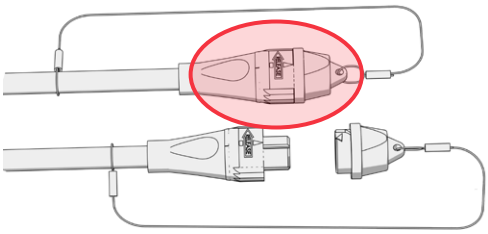
* *Tested for 500 compatibility cycles.*
† *Tested for 100 compatibility cycles.*

### CLEAN THE GLIDESCOPE DIRECT

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



3. Place the protective cleaning cap over the connector. Ensure that the mark on the cap is aligned with the arrow on the cable.



4. Wash the GlideScope Direct manually using a hospital-grade equipment detergent or an enzymatic debridement agent/detergent. For more information, see Table 12.

**IMPORTANT**

**Be sure to remove all foreign material, such as soil and organic material, from the surface of the component.**

5. Rinse the GlideScope Direct in clean, running water.

   The blade can now be disinfected.

### DISINFECT OR STERILIZE THE GLIDESCOPE DIRECT

1. Ensure the equipment is clean according to the previous steps.
2. Ensure the protective caps on the connectors are secure.
3. Prepare and condition the disinfection solution according to the solution manufacturer's instructions and the conditions stated in Table 12.
4. Disinfect the GlideScope Direct according to the conditions stated in Table 12. The exposure process and times vary depending on the solution and the component.
5. If applicable, rinse the blade according to the solution manufacturer's instructions.
6. Dry the blade by using a sterile cloth, hospital-grade clean air, or a low-temperature dryer.
7. Store the disinfected blade in a clean environment.

### INSPECT THE GLIDESCOPE DIRECT

1. Examine the blade and integrated cable for any signs of damage. The metal blade should not have any signs of damage other than minor surface scratches as the result of use. If damage is present, do not use the component, and contact Verathon® Customer Care.

# MAINTENANCE & SAFETY

## 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/support.

## GLIDESCOPE VIDEO MONITOR BATTERY

Under normal operating conditions, the monitor battery will last 2–3 years; or approximately 500 charge/discharge cycles. For more information about the battery, see the Component Specifications section on page 61.

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.

# DEVICE REPAIR

The 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.

**WARNING**

No modification of this equipment is allowed.

**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 will void the warranty. Contact Verathon Customer Care for all servicing needs.

# DEVICE DISPOSAL

Disposal of this device in accordance with WEEE requirements can be coordinated through your Verathon Service Center.

# WARRANTY

## ORIGINAL FIRST YEAR TOTAL CUSTOMER CARE WARRANTY

Verathon® warrants the system against defects in material and workmanship. The limited warranty applies for one (1) year from the date of shipment from Verathon and applies only to the original purchaser of the system. The terms of this warranty are subject to the *Terms and Conditions of Sale* or any other contractual document between the parties.

Verathon's policy is to honor product warranties and to perform services only on products purchased from an authorized Verathon dealer. If you purchase a Verathon product or system components from an unauthorized dealer or if the original factory serial number has been removed, defaced or altered, your Verathon warranty will be void. Purchasing Verathon products from unauthorized entities could result in receipt of product that is counterfeit, stolen, used, defective, or not intended for use in your region.

If a customer's system requires service or repair, Verathon will, at its discretion, either repair or replace the customer's unit and provide a loaner unit. The customer agrees to send the defective unit to Verathon (cleaned and disinfected as appropriate) upon receipt of the loaner unit, and the customer agrees to return the loaner unit within two (2) business days of receipt of the repaired unit. All exchanged parts become property of Verathon.

Each product manufactured by Verathon is warranted to be free from defects in material and workmanship under normal use and services. Verathon's warranty does not cover defects or problems caused by the buyer's acts (or failure to act), the acts of others, or events beyond Verathon's reasonable control. The buyer shall be solely responsible, for any problem, failure, malfunction, defect, claim, damage, liability, or safety issue arising out of the following:

- 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. The system shall be used in accordance with the instructions contained in this 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 is prohibited and will void all warranties.

This warranty provides coverage if the instrument is rendered inoperable as a result of an accidental drop or mishandling after payment by the buyer of the current deductible as determined by Verathon. The deductible charge will be applied on each warranty request and may be applied an unlimited number of times per instrument.

**WHAT IS COVERED?**

Warranty coverage applies to the following system components:

- GlideScope Video Monitor
- GlideScope AVL Video Baton (single-use system only)
- GlideScope Video Baton 2.0 (single-use system only)
- GlideScope Smart Cable (single-use system only)
- Direct Intubation Trainer

Additional reusable components purchased either singularly or as a part of a system are warranted separately. Consumable items are not covered under this warranty.

## PREMIUM CUSTOMER CARE WARRANTY

You may purchase a Premium Customer Care℠ warranty that extends the limited warranty. For more information, contact Verathon® Customer Care or your local representative.

## DISCLAIMER OF ADDITIONAL WARRANTIES

There are no understandings, agreements, representations of warranties expressed or implied (including warranties of merchantability or fitness for a particular purpose) other than those set forth in this chapter and the *Terms and Conditions of Sale*. The contents of this manual do not constitute a warranty.

Some states disallow certain limitations on applied warranties. The purchaser should consult state law if there is a question regarding this disclaimer. The information, descriptions, recommendations, and safety notations in this manual are based upon Verathon experience and judgment. The contents of this manual should not be considered to be all-inclusive or to cover all contingencies.

# PRODUCT SPECIFICATIONS

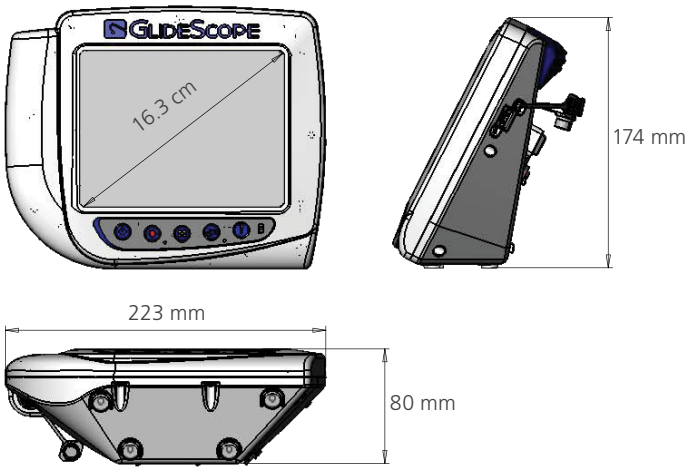
## SYSTEM SPECIFICATIONS

*Table 13. AVL System Specification*

| 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, 2.5 A max | |
| Fuse: | Internal 2.5 A Hold / 5 A Trip, 15 V max | |
| Ingress protection against water: | Video monitor | IP54 |
| | Video baton | IPX8 |
| Expected product life: | Video baton 1-2 | 2 years or 1000 cycles |
| | Video baton 3-4 | 2 years or 1000 cycles |
| | Video Baton 2.0 Large (3-4) | 2 years or 2000 cycles |
| | Single-use Stat | 1 use or 3-year shelf life |
| **OPERATING AND STORAGE SPECIFICATIONS** | | |
| **Operating Specifications** | | |
| Temperature: | 10 to 40°C (50 to 104°F) | |
| Relative humidity: | 0 to 95% | |
| Atmospheric pressure: | 700–1060 hPa | |
| **Shipping and Storage Conditions** | | |
| Temperature: | -20 to 45°C (-4 to 113°F) | |
| Relative humidity: | 0 to 95% | |
| Atmospheric pressure: | 440–1060 hPa | |

# COMPONENT SPECIFICATIONS

*Table 14. System Component Specifications*

| GLIDESCOPE VIDEO MONITOR | |
|---|---|
| TFT Color, VGA 640 x 480 px<br>Monitor: 16.3 cm (6.4 in)<br>Height: 174 mm<br>Width: 223 mm<br>Depth: 80 mm<br>Weight: 1.0 kg |  |
| **IV POLE MOUNT** | |
| Weight: 0.9 kg<br>Arm length: 27 cm<br>Width: 6.2 cm<br>Pole width range: 6.4–33 mm |  |
| **PREMIUM CART** | |
| Wheelbase: 53.3 cm<br>Min. height: 101.6 cm<br>Max. height: 132.1 cm<br>Weight: 8.0–8.4 kg |  |

## MOBILE STAND

Wheelbase diameter: 61 cm

Min. height: 76 cm

Max. height: 122 cm

## AVL VIDEO BATON 1-2

Length of flexible portion of baton: 66 mm

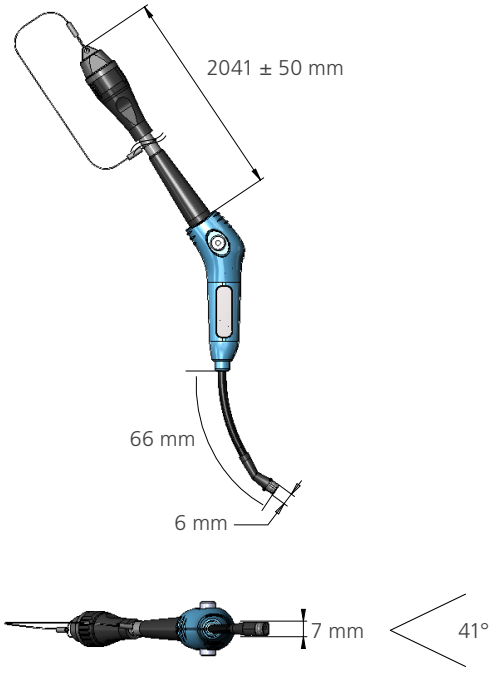
Height at camera: 6 mm

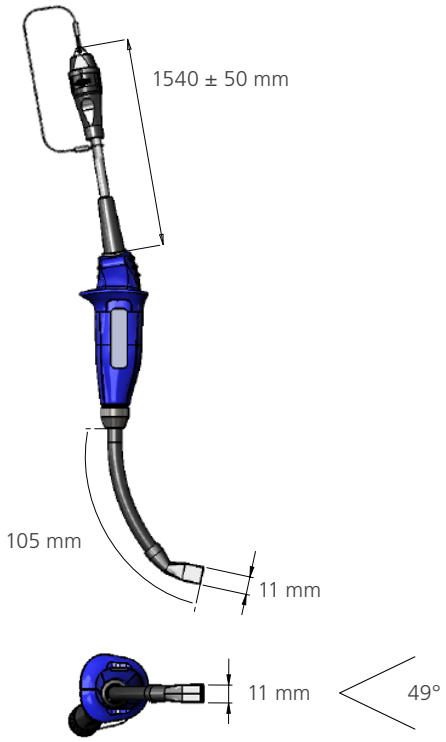
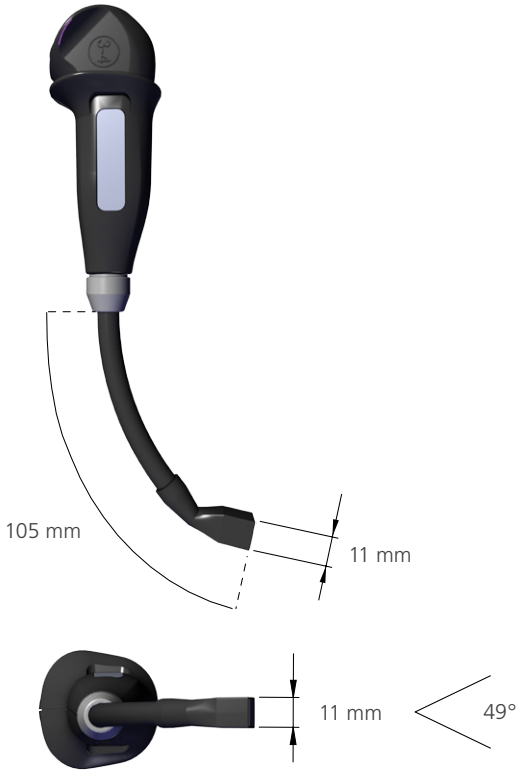
Width at camera: 7 mm

Video cable length: 2041 ± 50 mm

Field of view: 41°

Direction of view: 0°



| AVL VIDEO BATON 3-4 | |
|---|---|
| Length of flexible portion of baton: 105 mm<br>Height at camera: 11 mm<br>Width at camera: 11 mm<br>Video cable length: 1540 ± 50 mm<br>Field of view: 49°<br>Direction of view: 0° |  |
| **GLIDESCOPE VIDEO BATON 2.0 LARGE (3-4)** | |
| Length of flexible portion of baton: 105 mm<br>Height at camera: 11 mm<br>Width at camera: 11 mm<br>Field of view: 49°<br>Direction of view: 0° |  |

## GVL® 0 STAT

Blade tip to handle: 36.2 mm

Height at camera: 8.6 mm

Width at camera: 11.0 mm

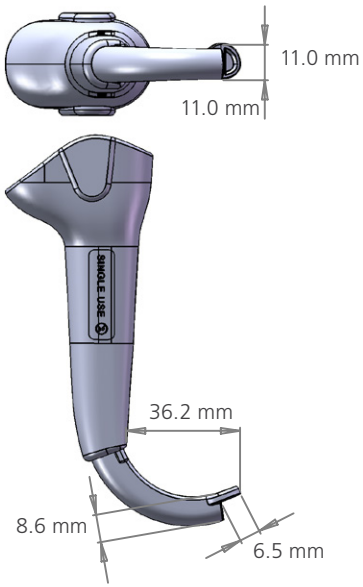
Blade length in front of camera: 6.5 mm

Max blade width in front of camera: 11.0 mm

Direction of View (DOV): 0°

Insertion portion (IP) Length: 42 mm

Insertion portion (IP) Width: 15 mm




## GVL 1 STAT

Blade tip to handle: 43.5 mm

Height at camera: 8.6 mm

Width at camera: 10.1 mm

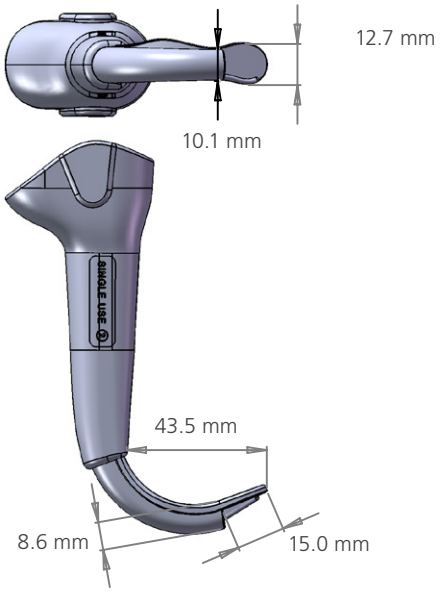
Blade length in front of camera: 15.0 mm

Max blade width in front of camera: 12.7 mm

Direction of View (DOV): 0°

Insertion portion (IP) Length: 50 mm

Insertion portion (IP) Width: 15 mm



## GVL® 2 STAT

Blade tip to handle: 55.7 mm

Height at camera: 8.6 mm

Width at camera: 11.2 mm

Blade length in front of camera: 28.0 mm

Max blade width in front of camera: 16.0 mm

Direction of View (DOV): 0°

Insertion portion (IP) Length: 62 mm

Insertion portion (IP) Width: 18 mm


## GVL 2.5 STAT

Blade tip to handle: 63.4 mm

Height at camera: 9.1 mm

Width at camera: 12.7 mm

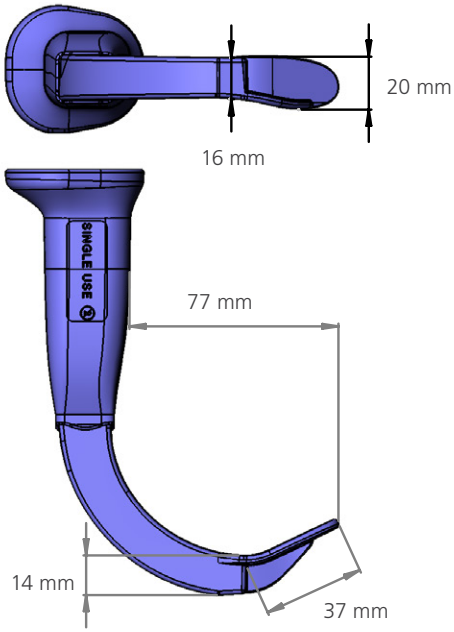
Blade length in front of camera: 37.0 mm

Max blade width in front of camera: 19.7 mm

Direction of View (DOV): +2°

Insertion portion (IP) Length: 74 mm

Insertion portion (IP) Width: 22 mm

| GVL® 3 STAT | |
|---|---|
| Blade tip to handle: 77 mm<br>Height at camera: 14 mm<br>Width at camera: 16 mm<br>Blade length in front of camera: 37 mm<br>Max blade width in front of camera: 20 mm<br>Direction of View (DOV): 0°<br>Insertion portion (IP) Length: 89 mm<br>Insertion portion (IP) Width: 25 mm<br>  |  |

## GVL 4 STAT

Blade tip to handle: 92 mm

Height at camera: 14 mm

Width at camera: 20 mm

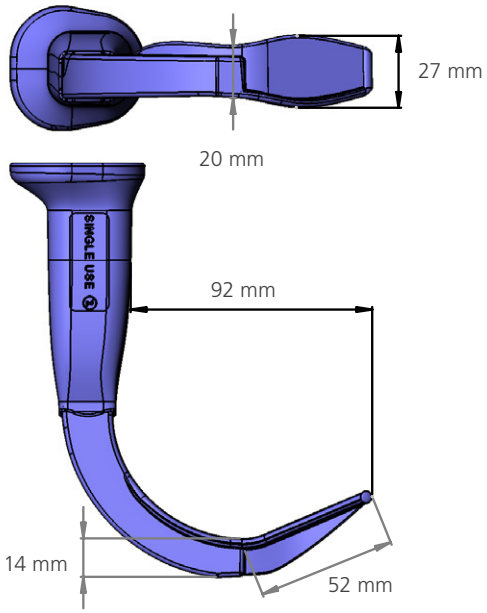
Blade length in front of camera: 52 mm

Max blade width in front of camera: 27 mm

Direction of View (DOV): 0°

Insertion portion (IP) Length: 105

Insertion portion (IP) Width: 30




## GLIDESCOPE DIRECT INTUBATION TRAINER

Cable length: 1942 ± 100 mm

Height at camera: 15 mm

Width at camera: 23 mm

Blade tip to handle: 119 mm

Max blade width in front of camera: 23 mm

# BATTERY SPECIFICATIONS

*Table 15. 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 (3.17 oz) |
| 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 60601-1-2:2007, 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 16. 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<br>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<br>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<br>IEC 61000-3-2 | Class A | |
| Voltage fluctuations/ flicker emissions<br>IEC 61000-3-3 | Complies | |

## ELECTROMAGNETIC IMMUNITY

*Table 17. 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)<br>IEC 61000-4-2 | ± 6 kV contact<br>± 8 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<br>IEC 61000-4-4 | ± 2 kV for power supply lines<br>± 1 kV for input/output lines | In compliance | Mains power quality should be that of a typical commercial or hospital environment. |

*Table 17. 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 |
|---|---|---|---|
| Surge<br>IEC 61000-4-5 | ± 1 kV line(s) to line(s)<br>± 2 kV line(s) to earth | In compliance | Mains power quality should be that of a typical commercial or hospital environment. |
| Voltage dips, short interruptions and voltage variations on power supply input lines<br>IEC 61000-4-11 | <5% $U_T$ (>95% dip in $U_T$) for 0.5 cycle<br>40% $U_T$ (60% dip in $U_T$) for 5 cycles<br>70% $U_T$ (30% dip in $U_T$) for 25 cycles<br><5% $U_T$ (>95% dip in $U_T$) for 5 s | In compliance | Mains power quality should be that of a typical commercial or 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. |
| Power frequency (50/60 Hz) magnetic field<br>IEC 61000-4-8 | 3 A/m | In compliance | Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment. |
| Conducted RF<br>IEC 61000-4-6 | 3 Vrms<br>150 kHz to 80 MHz | 3 V | 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.<br>**Recommended separation distance d (m)**<br>$d=1.2\sqrt{P}$ |

*Table 17. 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<br>IEC 61000-4-3 | 3 V/m<br>80 MHz to 2.5 GHz | 3 V/m | $d$=1.2 $\sqrt{P}$ 80 MHz to 800 MHz<br>$d$=2.3 $\sqrt{P}$ 800 MHz to 2.5 GHz<br>where $P$ is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and $d$ is the recommended separation distance in meters (m).<br>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,[a] should be less than the compliance level in each frequency range.[b]<br>Interference may occur in the vicinity of equipment marked with the following symbol:<br>  |

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

*At 80 MHz and 800 MHz, the higher frequency range applies.*

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

a. Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the system is used exceeds the applicable RF compliance level above, the system should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the system.

b. Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

## RECOMMENDED SEPARATION DISTANCES

*Table 18. Recommended Separation Distances between Portable and Mobile RF Communications Equipment and the System*

The system is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the system can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the system as recommended below, according to the maximum output power of the communications equipment.

| RATED MAXIMUM OUTPUT POWER OF TRANSMITTER (W) | SEPARATION DISTANCE ACCORDING TO FREQUENCY OF TRANSMITTER (m) | | |
|---|---|---|---|
| | 150 kHz to 80 MHz $d=1.2\sqrt{P}$ | 80 MHz to 800 MHz $d=1.2\sqrt{P}$ | 800 MHz to 2.5 GHz $d=2.3\sqrt{P}$ |
| 0.01 | 0.12 | 0.12 | 0.23 |
| 0.1 | 0.38 | 0.38 | 0.73 |
| 1 | 1.2 | 1.2 | 2.3 |
| 10 | 3.8 | 3.8 | 7.3 |
| 100 | 12 | 12 | 23 |

For transmitters rated at a maximum output power not listed above, the recommended separation distance *d* in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where *P* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

*Note: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.*

*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 19. EMC Standards for Accessories*

| ACCESSORY | LENGTH |
|---|---|
| AC power cord | 4.5 m (15 ft) |
| DC medical power adapter | — |
| HDMI-to-DVI cable | 6 m (20 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/symbols.

| TERM | DEFINITION |
|---|---|
| A | Ampere |
| AC | Alternating current |
| C | Celsius |
| CFR | Code of Federal Regulations (U.S.) |
| CISPR | International Special Committee on Radio Interference |
| cm | Centimeter |
| DC | Direct current |
| DL | Direct laryngoscopy |
| ED | Emergency Department |
| EMI | Electromagnetic interference |
| ESD | Electrostatic discharge |
| Essential performance | The system performance necessary to achieve freedom from unacceptable risk |
| ETT | Endotracheal tube |
| F | Fahrenheit |
| g | Gram |
| GHz | Gigahertz |
| HDMI | High-definition multimedia interface |
| hPa | Hectopascal |
| Hz | Hertz |
| ICU | Intensive Care Unit |
| IEC | International Electrotechnical Commission |
| in | Inch |
| IPA | Isopropyl alcohol |
| ISM | Industrial, scientific, and medical |
| kHz | Kilohertz |
| kV | Kilovolt |
| lbs | Pounds |
| m | Meter |
| mAh | Milliampere-hour |
| MHz | Megahertz |
| mm | Millimeter |
| NICU | Neonatal Intensive Care Unit |
| OR | Operating Room |

| TERM | DEFINITION |
|---|---|
| OSHA | Occupational Safety and Health Administration (federal agency in U.S.) |
| oz | Ounce |
| ppm | Parts per million |
| Pure water | Water that is suitable for high-level disinfection according to local regulations and your medical facility |
| RF | Radio frequency |
| RH | Relative humidity |
| V | Volt |
| Vrms | Voltage root mean squared |
| W | Watt |
| WEEE | Waste electrical and electronic equipment |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