

Healthcare

CAE Blue Phantom User Guide

BPH660-AP Gen II Central Line Ultrasound Training Model, automated pump

BPH660-HP Gen II Central Line Ultrasound Training Model, hand pump

BPH665-C-AP Gen II Central Line Ultrasound Training Model, transparent,
automated pump

BPH665-C-HP Gen II Central Line Ultrasound Training Model, transparent,
hand pump

BPHNB670-AP Gen II Central Line and Regional Anesthesia Ultrasound
Training Model, automated pump

BPHNB670-HP Gen II Central Line and Regional Anesthesia Ultrasound
Training Model, hand pump



CAE

Disclaimer

This product is a simulation device designed for training and demonstration purposes only.

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Cautions and Warnings

Read this user guide, including all cautions and warnings, before you use your CAE Blue Phantom™ ultrasound training model. Use this product only as described in this guide. If you use the product incorrectly, it may be unsafe and will void your warranty. Keep this information for future reference.

This model has electrical components. The *Electrical Safety* section of this user guide has cautions and warnings that are important for your safety.

General Precautions

- Make sure the training model is set up on a stable, sturdy work surface such as a bed, stretcher, or table that will not collapse and cause injury to users.
- Heavier training models should be placed on a patient bed or stretcher rated to support such weight.
- Place the model on smooth surfaces only. Rough or uneven surfaces can leave impressions on the skin and damage the model.
- Do only the procedures supported by each product as described in this guide.
- Use only needles to access fluids.
- Do not use or store other sharp objects such as scissors, scalpels, or box-cutters with the training model.
- Do not pull on the training model skin. This can cause the skin to tear.
- Do not mark directly on the training model as this will permanently damage it.
- Do not insert any objects or tools into the model except for the equipment, accessories, or medical supplies intended for use with this model.
- Do not use chemical solvents on the models.
- Clean the training model with water and a light soap solution only. Do not immerse the model or use large amounts of liquid to wash it.

Latex-Free

- All CAE Blue Phantom training models, products, and accessories are manufactured only of materials that do not contain latex.

Needles and Catheters

- Use only new, sharp, unbent 18–21 gauge needles or 7F catheters. Smaller needles (higher than 22 gauge) can bend during use and damage the model.
- The self-healing feature of CAE Blue Phantom simulated tissue applies only to needle sticks from 18–21 gauge needles. Healing is not guaranteed if needles larger than 18 gauge, scalpels, or other sharp implements are used to cut into or pierce the model.
- Replace needles after ten uses. Dull needles can damage the model.
- Use extreme caution when using needles during training to avoid injury.

Electrical Safety

(Applies to BPH660-AP, BPH665-C-AP, BPHNB670-AP only)

- When you unpack your training model, inspect the product and make sure all electronic access ports are sealed shut. If any ports are open or accessible, report this immediately to CAE Blue Phantom Customer Support.
- To reduce the risk of electric shock, do not remove the access panel or port cover of models containing electronic components or an automated pumping system. Refer all service questions to CAE Blue Phantom Customer Support.
- Do not remove tags or labels with product and safety information from any equipment. Keep them with the equipment for reference.
- Connect this product only to a properly-grounded electrical outlet.
- Use only the included power cords. Do not substitute any other cords.
- The included power cord has either a polarized 2-wire AC (alternating current) plug (which has one blade wider than the other), or a 3-wire grounding plug, (which has a third pin for grounding).
- The 2-wire polarized plug will fit into the power outlet only one way. This is a safety feature. If you cannot insert the plug fully into the outlet, flip the plug.
If the plug still does not fit, contact your electrician to replace the outlet. Do not attempt to defeat the safety features of the polarized plug.
- The 3-wire grounding plug will fit into a 3-hole grounding outlet. This is a safety feature.
If you cannot insert the plug into the outlet, contact your electrician to replace the outlet. Do not attempt to defeat the grounding and safety features of the plug.
- Arrange power cords so they do not cause someone to trip over them. Do not walk on them or put items on or against them.
- Unplug all equipment when not in use.
- Unplug all equipment before cleaning.
- Do not insert objects of any kind into electrical equipment as they may touch dangerous voltage points or cause a short-circuit that could result in fire or electric shock.
- Do not use the training model outdoors or near any source of water or moisture.
- Do not allow large amounts of fluid to flow on or into electronic parts.
- Do not spill liquid into the equipment.
- Do not apply gel or liquid substances to the product unless instructed by the use or cleaning procedures in this guide.
- Do not plug in the electronic pumping system in any area with a potentially explosive atmosphere. Sparks created by the electrical connection could create an explosion or fire and cause serious injury or death
- Do not drop, disassemble, open, crush, bend, deform, puncture, shred, microwave, incinerate, paint, or insert foreign objects into the equipment.
- Do not use models with the automated pump system in rain, or near sinks or other wet areas. Do

not spill any food or liquid on the electrical components. An automated pump system damaged by liquids is not serviceable.

- Do not leave the electronic controller unattended when it is plugged in. A malfunction can cause a fire, or electrical shock or burn injuries.
- If electronic components get wet, unplug all cables and let the equipment dry completely before turning it on. Do not dry electronics with a heat source, like an oven or hair dryer.
- It is important to use the model and automated pump system only within a temperature range of 0° to 35°C (32° to 95°F). Avoid any big changes in temperature or humidity, as this can cause condensation to form on or in the automated pump system.

Fluids System

- Use only CAE Blue Phantom fluids. Other fluids can affect the imaging quality and promote fungal or bacterial growth, and may void your warranty. Use fluids only as directed.
- Do not substitute any other fluid unless indicated by this guide.
- Do not modify the fluid reservoirs or any assembly components.
- Protect your eyes, skin, and clothing against accidental fluid exposure. Refer to the Material Safety Data Sheet (MSDS) for guidance.
 - May irritate eyes or skin; flush well with water.
 - May contain pigments that stain clothing; wash immediately with cold soapy water.
- Fluid is not intended for human consumption. If accidental ingestion occurs, drink a glass of water and consult a physician.

Service and Repair

- The CAE Blue Phantom training models are not user-serviceable. Only a trained technician may open or disassemble the product and any electronic components.
- Unauthorized use or handling of the model may void the warranty.
- If you have a problem with your product, contact CAE Customer Support.

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Introduction

This user guide describes the features, use, and care of the following training models:

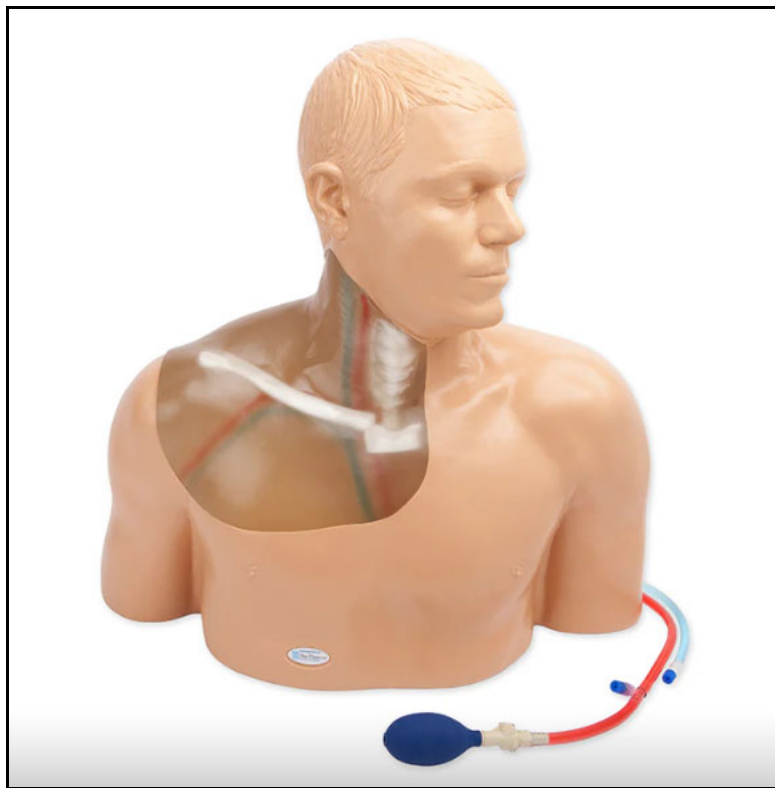
- CAE Blue Phantom Gen II Central Line Ultrasound Training Model, automated pump (BPH660-AP)
- CAE Blue Phantom Gen II Central Line Ultrasound Training Model, hand pump (BPH660-HP)
- CAE Blue Phantom Gen II Central Line Ultrasound Training Model, transparent, automated pump (BPH665-C-AP)
- CAE Blue Phantom Gen II Central Line Ultrasound Training Model, transparent insert, hand pump (BPH665-C-HP)
- CAE Blue Phantom Gen II Central Line and Regional Anesthesia Ultrasound Training Model, automated pump (BPHNB670-AP)
- CAE Blue Phantom Gen II Central Line and Regional Anesthesia Ultrasound Training Model, hand pump (BPHNB670-HP)

The training models are intended as platforms for the practice of central venous access procedures and brachial plexus nerve block (optional).

NOTE: It is not possible to convert a hand pump model to an automated pump model. Replacement inserts are specific to the base model pump type.



Ultrasound Training Model, opaque insert



Ultrasound Training Model, transparent insert

Anatomy

CAE Blue Phantom training models are constructed using our patented Simulex™ ultrasound tissue which has imaging characteristics that mimic human tissue. The models contain skeletal components so the user will encounter the same imaging landmarks as in a human patient. Some models have an access panel at the back.

▲ SAFETY NOTICE

Do not open the access panel unless directed to do so by CAE Customer Support or as described in this guide.

This training model has two tubes exiting from the model. They are used to fill the simulated blood vessels within the model. The tubes have a female Luer lock connector that is designed to work with syringes that have a male Luer lock connector.

Models are delivered with minimal fluid. Users must infuse additional fluid to prepare the model for use. More information can be found in the *Using the Training Model* section of this guide.

The model has either a hand bulb or an automated pump to simulate arterial pulsation. Pulsation is not palpable, but is visible on ultrasound to help distinguish between artery and vein.

The model has the vascular and cardiac anatomy and landmarks of the right upper thorax and neck:

- Carotid artery
- Subclavian artery
- Axillary artery
- Internal jugular vein
- Brachiocephalic vein
- Subclavian vein
- Axillary vein
- Trachea
- Suprasternal notch
- Manubrium
- Clavicle
- Superior Vena Cava
- Right atrium of the heart
- Right ventricle of the heart
- Brachial Plexus (Regional Anesthesia option only)

You can fully thread guidewires and catheters without resistance through multiple points of access: internal jugular (IJ), subclavian, infraclavicular, and supraclavicular.

The Regional Anesthesia option allows for for interscaline, infraclavicular, and supraclavicular nerve block training.

Equipment Overview

The following items are included with your shipment:

- Ultrasound training model
- Red ultrasound refill fluid
- Blue ultrasound refill fluid
- Low voltage transformer (automated pump models only)

The following additional items are required for training but not included with shipment:

- Ultrasound system with appropriate transducer
- Ultrasound gel
- Vascular access and regional nerve block equipment per local protocol

CAE Blue Phantom training models are compatible with any diagnostic ultrasound system. General frequency ranges for diagnostic ultrasound imaging are 2-20MHz.

Introduction

Optional accessories or consumables for your model are available to purchase on the CAE website:

- BRS180-RED Red ultrasound refill fluid
- BRS181-BLUE Blue ultrasound refill fluid
- BPH663 Gen II Central Line replacement insert, opaque
- BPH667-C Gen II Central Line replacement insert, transparent
- BPHNB673 Gen II Central Line and Regional Anesthesia replacement insert

Using the Training Model

This section has information and instructions about the setup and use of the training model and any specific training procedures.

Setup

Follow the guidelines below to unpack and set up your CAE Blue Phantom training model.

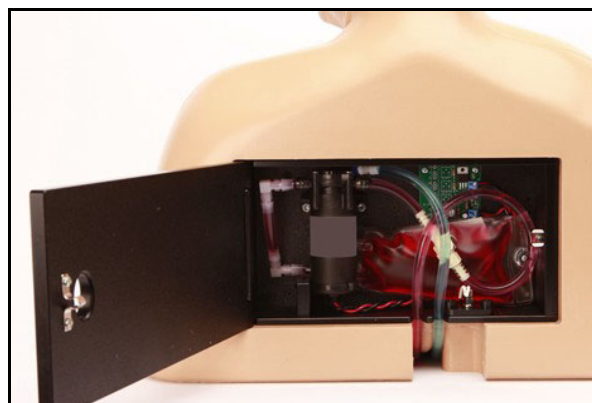
1. Open the shipping carton:
 - Use extreme caution with sharp tools, such as a box cutter, to avoid damage to the training model.
2. Unpack the equipment:
 - Remove the training model from its shipping container. For heavier models, use proper lifting techniques to prevent bodily injury.
 - Review the equipment, accessories, and supplies to make sure all necessary pieces are present. See the *Equipment Overview* section of this guide for a list of items included with this model.
3. Set up for training:
 - Put the model on a stable patient bed, stretcher, or table.
 - Prepare your ultrasound system and equipment.
 - Gather any procedural equipment and supplies.

Fluid Setup

The training model is shipped with minimal fluid in any vessels or fluid spaces. During periods of non-use, fluid may also evaporate from inside the model. Before first use, you must add fluid and remove any air.

For -AP models only: Disconnect the automated pump tube before you continue. Follow these steps:

1. Unplug the pump from the power source.
2. Open the back panel of the model.



Using the Training Model

3. Locate the red-fluid-filled arterial tube and press the silver quick-disconnect button.
4. Lay the model back down flat on a stable surface.

For all models: To fill fluid, use one of these methods:

Method A: Syringe Fill (also to remove air)

1. Stand the model upright.
2. Remove the cap of the fill tube.
3. Fill a syringe half-full and connect it to the tube.
4. Hold the tube up and tap it to move any air bubbles upwards.
5. Aspirate the air before filling for optimal imaging.
6. Inject 10 ml of fluid.
7. Remove 5 ml of fluid along with any air.
8. Repeat steps 4 through 7 until all the air is removed.
9. Remove the syringe and replace the cap.

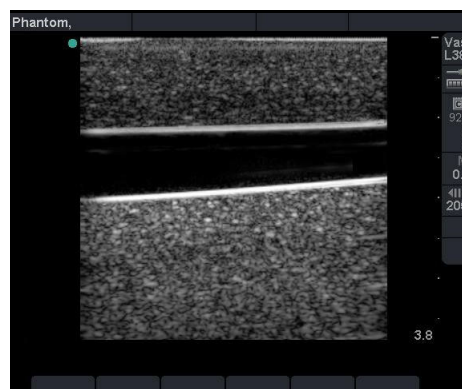
Method B: Quick-Fill port for high volume use

1. Connect an IV bag containing CAE Blue Phantom fluid to the fill tube.
2. Hang the IV bag no more than 12 inches (30 cm) above the training model to avoid overfilling.

NOTE: A clear sign of overfill is the appearance of small dimples of simulated blood on the surface of the model at the sites of previous cannulations. To correct overfill, see the *Troubleshooting* section.

3. As users withdraw fluid, it is refilled continuously from the IV bag.

An optimally-filled umbilical cord can be identified using ultrasound by the presence of a black echo-free lumen.



Normal Fluid Level - Good Imaging

A low fluid environment is identified by the inability to see the cord during normal ultrasound imaging. This is due to the presence of air, which reflects all sound energy.



Low Fluid Level - Poor Imaging

Training

This section provides information about using your model for training and practice.

Ultrasound Scanning

Note: CAE Blue Phantom products do not teach ultrasound procedures or techniques. Refer to your institution or training program for more information.

To scan with your training model and conduct a simulated ultrasound-guided procedure:

1. Place the model in the appropriate position for scanning.
2. Place ultrasound gel on the transducer or on the training model in an adequate quantity so that the transducer slides effortlessly on the model. Add more gel as needed.
3. Adjust the ultrasound system controls per your training protocol and the manufacturer's instructions. Optimize the image with the ultrasound controls as needed.

Ultrasound-guided Procedures

Your CAE Blue Phantom training model is a realistic platform for central vascular access procedural training and brachial plexus nerve block (optional). Use your normal protocol and equipment, and follow the policies and guidelines of your institution.

⚠ CAUTION

Do not use antiseptics, such as iodine, on the model. This can cause permanent damage to the products.

Using the Training Model

During use of this training model, users may withdraw fluid to confirm needle placement after the vessel has been accessed. Any fluid withdrawn must be refilled because it is important to maintain the fluid level within the vessels.

Refill the fluid using one of the filling methods described in the *Fluid Setup* section of this guide. A third way is for users to refill fluid by simply re-injecting it:

- During use, the user immediately injects any withdrawn fluid back into the model at the access site.
- Take care not to inject any air into the model when using this method.

NOTE: This method cannot be used with full catheter placements.

Using the Hand Bulb

Applies to -HP models only

This model is equipped with a hand bulb. You can create a pulse in the arteries by lightly squeezing the hand bulb. The pulse is not physically palpable, but is visible via ultrasound.

The veins do not pulsate, and are collapsible with light pressure from the transducer.

⚠ CAUTION

Excess pressure on the hand bulb may cause a fistula between arteries and veins.

Care and Maintenance

With proper care, your training model will remain in optimal condition and ready for use.

Storage and Transport

Follow these guidelines to properly store or transport your model:

- Storage temperature degree range: 45 to 85 °F (7 to 29 °C)
- Store the model as is, or in a CAE Blue Phantom storage case (if available for your model).
- Do not store in contact with other models or hard objects as the pressure can damage the Simulex tissue. Do not stack multiple training models on top of each other.
- Ensure any tubes are not pinched or compressed under the model. This will damage the tubes and void the warranty.
- When models with inserts are stored standing up for long periods of time, gravity may cause the insert to deform slightly. Remove the insert and let it sit for a few days to regain its shape.
- Store the model with some fluid in any vessels and fluid spaces. If these become dry, it will damage the model and cause poor ultrasound imaging.
- If fluid was infused into the model during training, remove excess fluid after each training session. If you store the model with too much fluid inside, it can cause damage.
- Transport the model securely so it does not fall.
- Do not carry by the tubes or use them as handles as this will damage the model.

Cleaning

To maintain the product skin for the lifespan of the product, clean the exterior of the model after each use. Follow these steps:

1. Mix one cup of tap water with ¼ teaspoon of mild liquid soap (such as dish soap).
2. Gently clean the model's exterior with the soap mixture and a soft, non-abrasive sponge or cloth.
3. Rinse lightly with clean water.
4. Dab or pat with a clean, soft, lint-free cloth to dry the product after cleaning. Do not wipe or rub the skin, which can damage it.
5. After the model has dried completely, lightly coat the external surface of the model with baby powder and dust off any excess.

Replacing the Tissue Insert

To replace the insert, you will need:

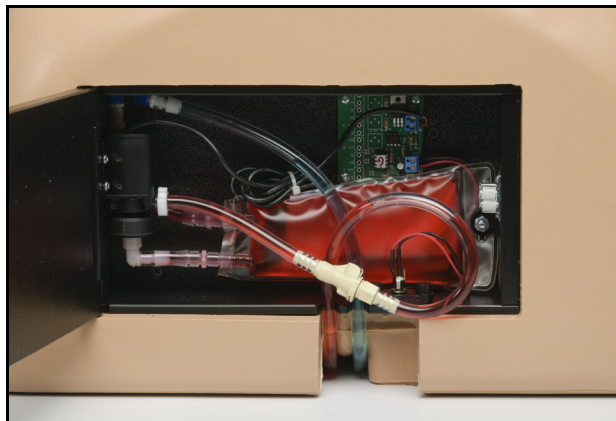
- Replacement insert
- 1:4 soap and distilled water mixture
- Clean, lint-free cloth

Follow these steps:

1. Position your training model in the upright position.
2. Disconnect the insert tube from the hand bulb or automated pump using the silver quick disconnect button.



Quick-Disconnect - Hand Bulb



Quick-Disconnect - Automated Pump

3. Lubricate the opening(s) around the tube(s) with the soap and distilled water mixture. Apply enough lubrication so the tube slides out easily. Do not inject the soap and distilled water mixture directly into the tubing.

4. Gently lift up and pull the insert and tube(s) out completely.

⚠ CAUTION

The attachment point of the tube to the Simulex tissue is delicate. Do not apply stress to the connection or it can tear. Do not pull hard on tubes or use them to carry the insert.

5. Place the tube(s) of the new insert into the correct openings.
6. Guide the tube(s) through the openings until the tissue insert fits into the space.
7. Adjust the insert as needed so it aligns with the surface of the model.
8. Dry with the clean, lint free cloth as needed.

Troubleshooting

This section provides information to identify and fix problems that may occur with the product.

Fluid Overfill

You can overfill fluid spaces and vessels if you inject too much fluid. Overfill does not usually result in permanent damage, but you should correct it as soon as possible.

Withdraw excess fluid to alleviate overfill, or, with the Quick Fill method, make sure the IV bag is not hanging any higher than 12 inches (30 cm) above the training model.

Removing Air

Fluid can evaporate from the model during shipment or during extended periods of non-use. Air may also enter through accidental injection during fluid filling or training use. This may cause the Simulex tissue to stick together in some areas, preventing fluid from circulating. Remove any air from the model for optimal performance.

To remove air:

1. Fill a syringe with fluid and connect it to the tube.
2. Infuse fluid, and tilt the model up at least 6-10" so any air rises to the top.
3. Let the model sit for at least one hour to allow any air to rise.
4. Use the syringe to slowly pull the fluid out of the model.
5. Watch for air bubbles and let them rise to the top (back) of the syringe.
6. Slowly push fluid back in without pushing the air in.
7. Repeat steps 4-6 three to four times.

8. Empty the syringe into a container and use it to remove any additional fluid, then disconnect it.

NOTE: When all the fluid is removed, the syringe will be under vacuum. Do not put excessive force on the syringe or the tissue may rupture.

9. If there is still air, fill any fluid spaces or vessels with fluid and let the model sit overnight, then repeat the procedure.

Help and Technical Assistance

For assistance, contact CAE Customer Support. Contact information for all regions is available on the back cover of this guide and on the CAE Healthcare website.



Healthcare

For more information about CAE products, contact your regional sales manager or the CAE distributor in your country, or visit caehealthcare.com.

Tel +1941-377-5562 or 866-233-6384

For customer support, please contact CAE.

Customer Support Headquarters - United States

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