

GE Healthcare

Invenia™ ABUS

Scan Station Positioning Guide



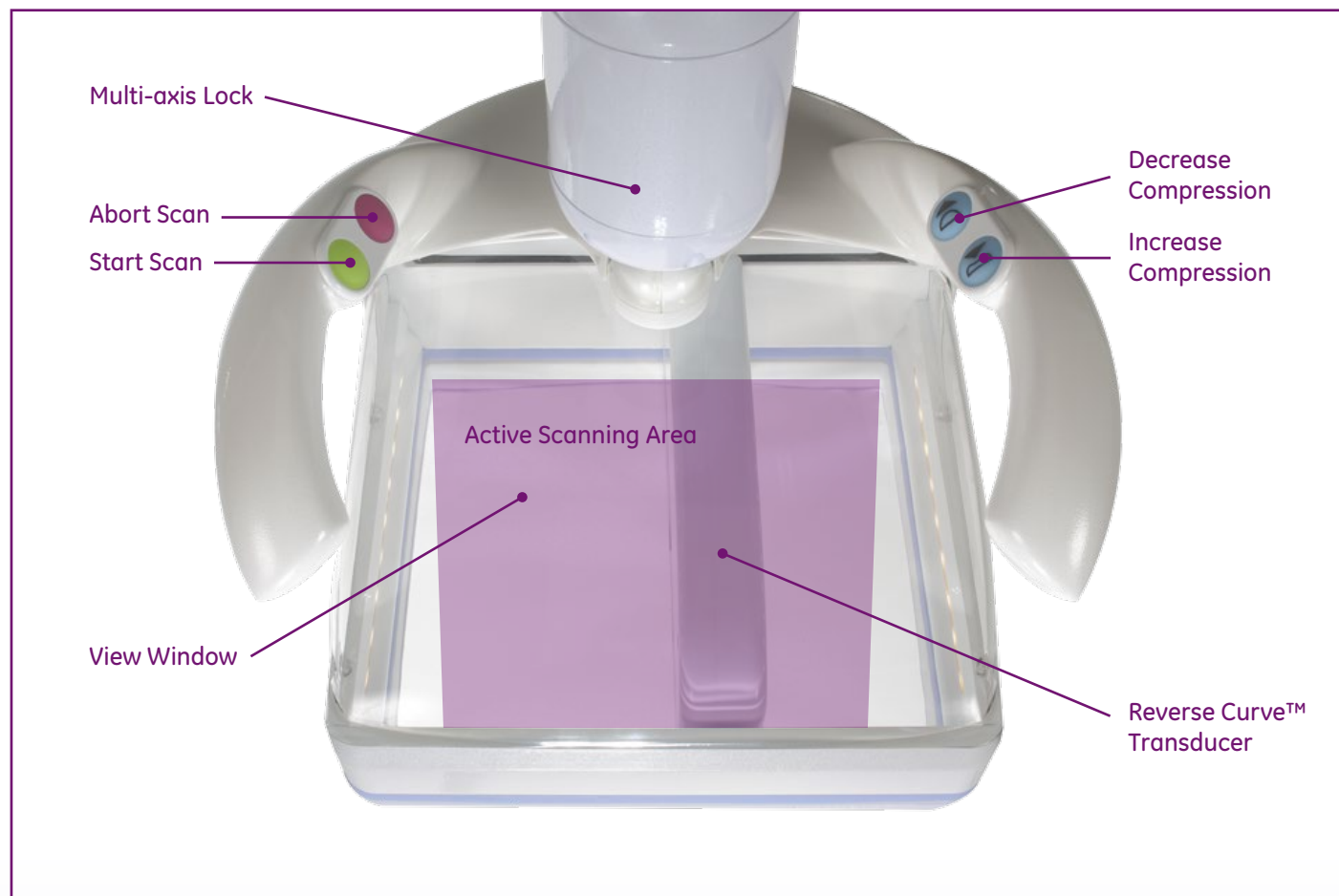
About this Guide

This guide is for sonographers, technologists and other trained clinical care providers using the Invenia ABUS Scan Station. It describes techniques and procedures for obtaining optimal image quality during each breast exam.

Scanner Assembly

The active scan area is clearly visible through the view window on the scanner assembly. The transducer width represents the actual area of the breast being scanned.

The transducer and disposable membrane are the only parts of the scanner assembly that come in contact with the patient.



- The disposable membrane is intended for one time use and is changed for each patient.
- Always check to make sure a membrane has been replaced on the scanner assembly.
- If the membrane is torn or damaged in any way, do not use.
- The transducer and membrane are the only parts of the scanner assembly that come into contact with the patient.



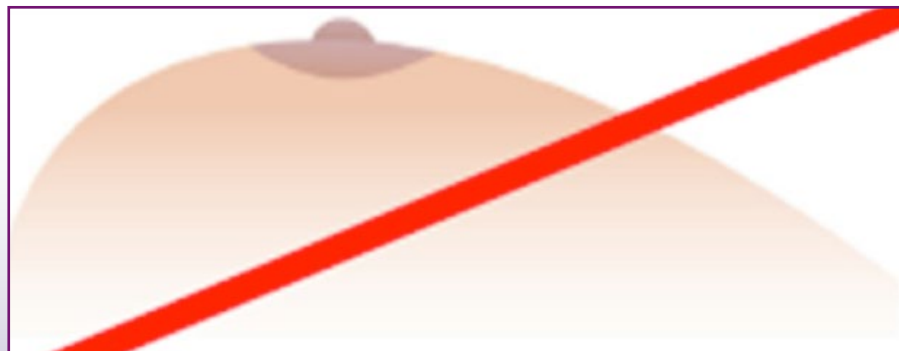
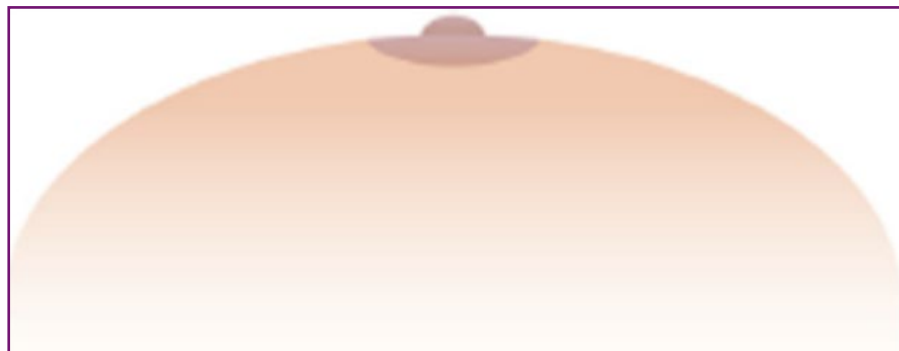
- Lay the patient supine and elevate the head if needed to create a breast mound.
- Turn patients head away from the side being scanned.
- Place the patients arm above their head. If the patient has difficulty raising their arm, it may be placed at a 90-degree angle.



An angled wedge sponge is used to position the patient, so the breast tissue is equally distributed on the chest wall and the nipple is pointing up. Use of a pillow is optional.

The breast should appear:

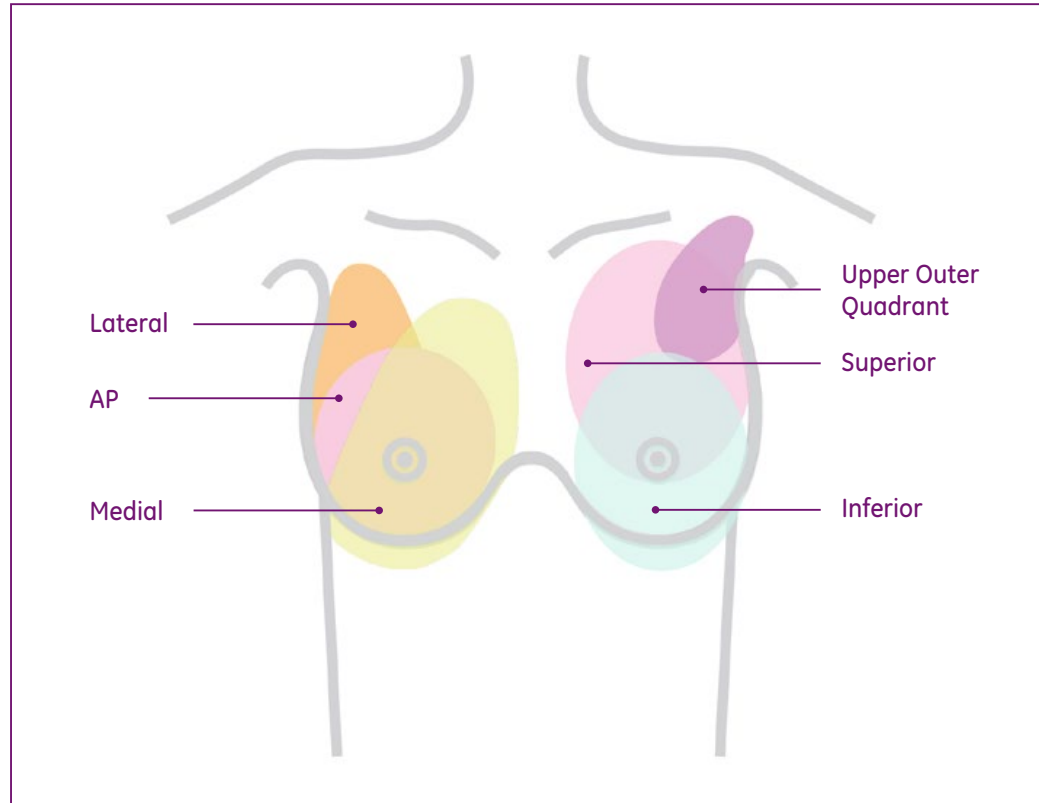
- Equally sloped in all directions
- Without asymmetric mounding or tilting
- With the nipple pointing up to the ceiling



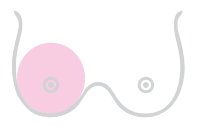


- Ultrasound coupling lotion is applied to the breast in a thick, even layer creating a “white” appearance on the skin.
- Apply lotion liberally to the entire surface of the breast, making sure there are no air bubbles trapped around the nipple.
- Lotion should be applied to the areola and nipple in a circular motion for 3-4 rotations using the three middle fingers to reduce the potential of air bubbles and associated nipple shadowing. Avoid using a spoon or tongue depressor.
- Lotion is re-applied before each view to maintain coupling.

Note: Ultrasound coupling lotion reduces the incidence of air bubbles, which commonly cause artifact in conventional ultrasound gel. Therefore, gel is not recommended.








Standard Views

View Type	Description	Transducer Positioning
AP 	Central tissue: includes nipple. Nipple is centered. Lotion is applied to the entire breast surface.	Center the scanner assembly on the breast using the nipple-positioning arrow as a guide. Transducer placement is at the inferior edge of the nipple. Bring the Scanner Assembly straight down on the breast flattening the tissue equally on all sides.
Lateral 	Lateral tissue: includes nipple and superior tissue to include axillary tail. Nipple is in the inferior-medial corner. Lotion is applied from nipple to lateral breast surface, to include axilla	Scanner assembly placement is shifted towards the axilla and laterally. Bring the scanner assembly straight down on the breast flattening the tissue equally on all sides. Tilt superior, then laterally making contact with the lateral edge of the breast. Apply pressure snugging the transducer into the lateral edge. Transducer should be angled to follow the contour of the body. If breast shape and body habitus do not allow good superior compression, the scanner assembly can be placed at the lateral edge and rolled down onto the breast without displacing the tissue medially. For larger breasts, if the nipple is outside the field of view, a second lateral view should be done to include the nipple.
Medial 	Medial tissue; includes nipple and inferior tissue including inframmary fold. Nipple is superior and medial to the nipple-positioning arrow. Lotion is applied from nipple to sternum extending below the inframmary fold.	Move to the opposite side of the patient turning the scanner assembly around. Position scanner assembly so it extends 4-5 cm (1½-2 in.) below the inframmary fold. Bring scanner assembly straight down then tilt medially aligning the bottom edge of assembly with the sternum. Nipple should be superior to the transducer and slightly above the nipple-positioning arrow. Apply even pressure flattening the tissue equally then apply pressure snugging the transducer into the medial edge. Transducer should be angled to follow the contour of the body.

Additional Views

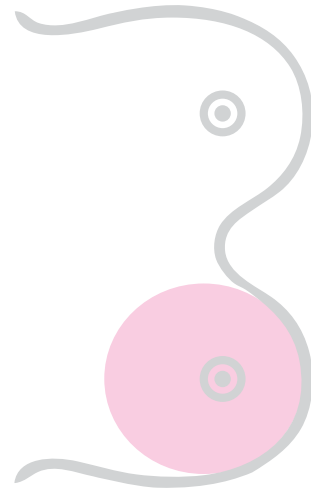
View Type	Description	Transducer Positioning
Superior 	Superior tissue: used when the AP view does not cover superior tissue. Nipple will appear in the center at the inferior edge. Lotion is applied from the clavicle to the nipple.	Shift the scanner assembly towards the patient's head so that the superior edge of the assembly is just below the clavicle. Center the scanner assembly on the breast using the nipple-positioning arrow as a guide. Bring the scanner assembly straight down flattening the tissue equally on all sides. The nipple will appear in the center at the inferior edge of the active scan area.
Inferior 	Inferior tissue: nipple will appear in the center at the superior edge of the active scan area. Lotion is applied from the nipple to 5 cm (2 in.) below inframammary fold.	Center the scanner assembly on the breast using the nipple-positioning arrow as a guide. Shift the scanner assembly inferior so it extends 4-5 cm (1½-2 in.) below the inframammary fold. Bring the scanner assembly straight down flattening the tissue equally on all sides, then apply superior pressure flattening out the inframammary fold. The nipple will appear in the center at the superior edge of the active scan area.
Upper Outer Quadrant 	Superior and lateral tissue; includes axillary tail. The nipple may not appear in the active scan area or will be at the lower inner edge. Lotion is applied to the upper outer quadrant of the breast extending into the axilla.	A rolled towel can be placed behind the scapula to flatten out the armpit. Place the scanner assembly superior and lateral to the breast extending up into the axilla. Bring the scanner assembly straight down into the axilla following the contour of the body. The nipple may not appear in the active scan area or will be at the lower inner edge.

Depending on the indication, an Invenia ABUS exam may be Bilateral or Unilateral. A standard screening exam is Bilateral and is typically composed of three standard views: AP (Anterior-Posterior), LAT (Lateral), and MED (Medial). Depending on breast size, additional views such as SUP (Superior), INF (Inferior) and UOQ (Upper Outer Quadrant) may be required to accommodate all breast tissue.

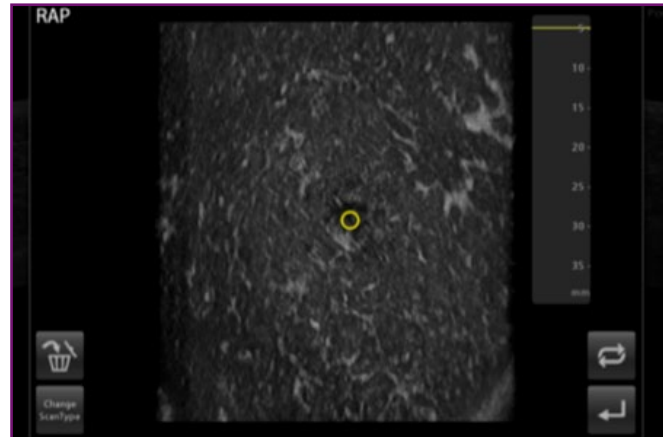


AP View

- This view includes the central tissue and nipple.
- Lotion is applied to the entire breast surface.
- Center the scanner assembly on the breast using the nipple-positioning arrow as a guide. Transducer placement is at the inferior edge of the nipple. Bring the scanner assembly straight down on the breast flattening the tissue equally on all sides.



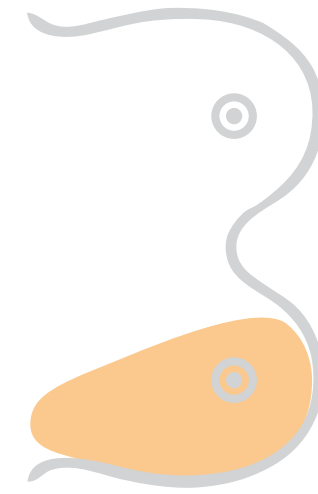
AP Acquisition



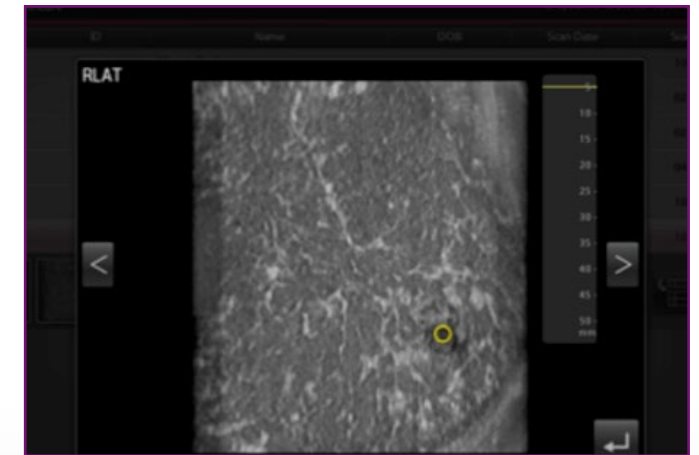
AP Coronal Reconstruction

Lateral View

- This view includes lateral and superior tissue including the axillary tail. The nipple is in the inferior-medial corner of the scanner assembly.
- Lotion is applied from the nipple to the lateral breast surface including the axilla.
- Scanner assembly placement is shifted towards the axilla and laterally. Bring the scanner assembly straight down on the breast flattening the tissue equally on all sides, tilt superior, then laterally making contact with the lateral edge of the breast. Apply pressure snugging the transducer into the lateral edge. The transducer should be angled to follow the contour of the body.
- If breast shape and body habitus do not allow good superior compression, the scanner assembly can be placed at the lateral edge and rolled down onto the breast without displacing the tissue medially.
- For larger breasts, if the nipple is outside the field of view, a second lateral view should be done to include the nipple.



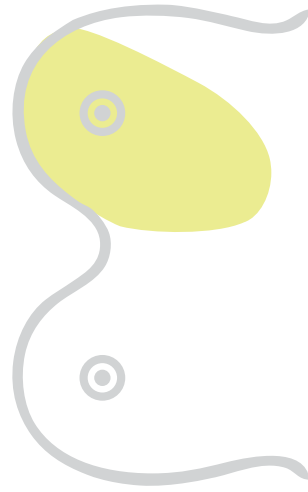
Lateral Acquisition



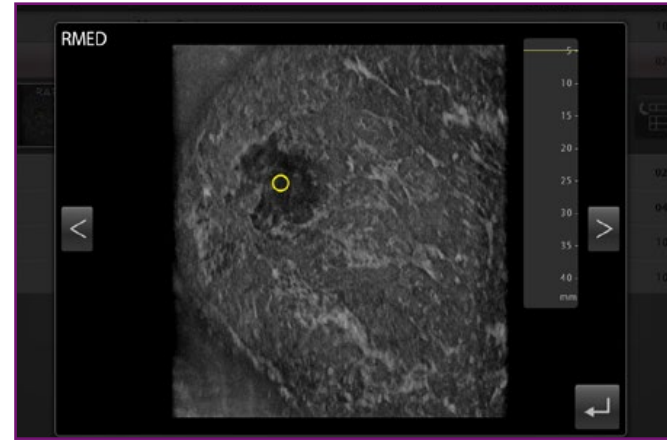
Lateral Coronal Reconstruction

Medial View

- This view includes medial tissue, the nipple and inferior tissue including inframmary fold (IMF). Move to the opposite side of the patient turning the scanner assembly around.
- Lotion is applied from the nipple to the sternum extending below the IMF.
- Position scanner assembly so it extends 4-5 cm (1½- 2 in.) below the IMF. Bring scanner assembly straight down then tilt medially aligning the bottom edge of scanner with the sternum. Nipple should be superior to the transducer and slightly above the nipple-positioning arrow. Apply even pressure flattening the tissue equally then apply pressure snugging the transducer into the medial edge. Transducer should be angled to follow the contour of the body.



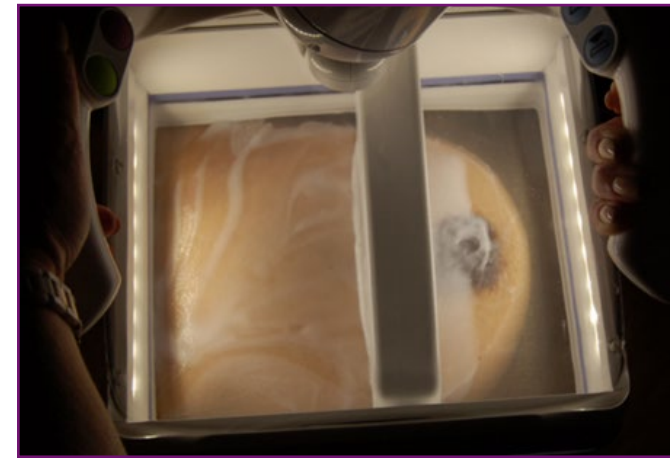
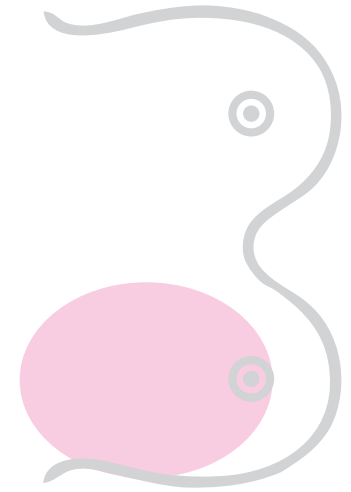
Medial Acquisition



Medial Coronal Reconstruction

Superior View

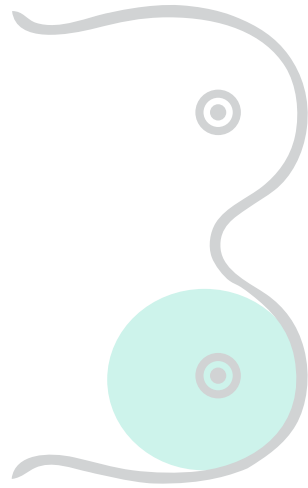
- This view is used when the AP view does not cover superior tissue. The nipple will appear in the center at the inferior edge.
- Lotion is applied from the clavicle to the nipple. Shift the scanner assembly towards the patient's head so that the superior edge of the assembly is just below the clavicle.
- Center the scanner assembly on the breast using the nipple-positioning arrow as a guide. Bring the scanner assembly straight down flattening the tissue equally on all sides. The nipple will appear in the center at the inferior edge of the active scan area.



Superior Acquisition

Inferior View

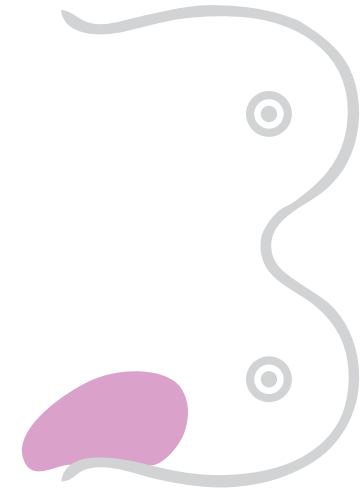
- This view is used when the AP view does not cover the inferior tissue. The nipple will appear in the center at the superior edge of the active scan area.
- Lotion is applied from the nipple to 5 cm (2 in.) below the inframammary fold (IMF).
- Center the scanner assembly on the breast using the nipple-positioning arrow as a guide. Shift the scanner assembly 4-5 cm (1½-2 in.) below the IMF. Bring the scanner assembly straight down flattening the tissue equally on all sides, then apply superior pressure flattening out the IMF. The nipple will appear in the center at the superior edge of the active scan area.



Inferior Acquisition

Upper Outer Quadrant View

- This view includes superior and lateral tissue and also the axillary tail. The nipple may not appear in the active scan area or will be at the lower inner edge. A rolled towel can be placed behind the scapula to flatten out the armpit.
- Lotion is applied to the upper outer quadrant of the breast extending into the axilla.
- Place the scanner assembly superior and lateral to the breast extending up into the axilla. Bring the scanner assembly straight down in the axilla following the contour of the body. The nipple may not appear in the active scan area or will be at the lower inner edge.



Upper Outer Quadrant Acquisition

- Minimum bed height should be 30" to achieve proper compression. The compression range indicator arrows on the articulating arm notify the user when the arm is at its lowest point and compression cannot be applied.
- Avoid wedging the breast tissue, which causes the ultrasound beam to penetrate the tissue at an angle, which may result in shadowing, artifact and false positives.
- Begin by establishing optimal manual contact and compression of the breast, then activate compression assist while gradually releasing manual compression.
- There are 3 levels of compression that can be applied one level at a time using the increase button on the right handle of the scanner assembly. The arm locks as pressure is added.
- Manual compression is recommended for women who are not able to tolerate any levels of compression, such as women with fibrocystic breast tissue, islands of dense breast tissue or women with moderate to large size cysts/masses.
- Compression level 2 is recommended for most breast tissue. Once the scan has begun, if the transducer slides or lifts, abort the scan and decrease to a lower level of compression.
- Compression applied to the breast should be sufficient to flatten out the tissue, but not uncomfortable for the patient. Confirm patient comfort at each level.
- Pressure can be released one level at a time using the decrease compression button on the right handle or red abort button on the left handle for quick release.
- The breast should be compressed firmly, flattening the tissue equally on all sides.
- The transducer can be tilted medial or lateral to optimize contact.
- Review the image on the touchscreen to make sure there is contact all across the transducer and that the tissue is level.

- Press the green start scan button on the left handle to begin the scan. The multi-axis lock engages when the button is pressed.
- The transducer will move to the inferior edge and scan across the breast from the inferior to the superior edge in 30 seconds.
- When the transducer reaches the superior edge the compression will automatically release and the transducer is then lifted off the breast.
- If the transducer moves from the superior to inferior edge, press the red abort button to stop the scan. Then correct the orientation icon on lower right corner of the touchscreen and repeat the scan.
- The scanner assembly should not slide, roll, or lift during scanning.
- Ultrasound coupling lotion is reapplied to the breast before each view.
- The patient is re-positioned with the angled wedge sponge for each side scanned.
- Remind the patient they can breathe normally but should refrain from talking or moving during the scan to avoid motion artifacts.



Good contact across the transducer



Poor contact across the transducer

Scanning Tips

- Minimum bed height should be 30" to achieve proper compression. The compression range indicator arrows on the articulating arm notify the user when the arm is at its lowest point and compression cannot be applied.
- Always check to make sure a membrane has been replaced on the scanner assembly.
- Select proper depth to avoid tissue exclusion. Depth can be evaluated by visualizing the chest wall at the time of initial transducer placement. If the chest wall is not visualized a deeper depth should be selected.
- Keep the nipple inside the active scan area whenever possible.
- The active scan area should have as much skin contact as possible.
- Breast tissue should be kept level without tilting or mounding.
- Avoid wedging the breast tissue, which causes the ultrasound beam to penetrate the tissue at an angle which may result in shadowing, artifact and false positives.
- Begin by establishing optimal manual contact and compression of the breast, then activate compression assist while gradually releasing manual compression.
- Compression level 2 is recommended for most breast tissue. Once the scan has begun, if the transducer slides or lifts, abort the scan and decrease to a lower level of compression.
- Manual compression is recommended for women who are not able to tolerate any levels of compression, such as women with fibrocystic breast tissue, islands of dense breast tissue or women with moderate to large size cysts/masses.
- If the breasts are large and tissue extends more than 15 cm from the nipple, it will be necessary to obtain views that do not include the nipple in order to ensure coverage of all the tissue. Additional views include: SUP, INF and UOQ or a second LAT.
- When the breasts are large, the operator obtains a view that includes as much tissue as possible with the nipple visible and then obtains a second volume of the same view farther in the direction that the breast tissue extends away from the nipple.
- The transducer should not slide, roll or lift during scanning.
- Remind the patient they can breathe normally but should refrain from talking or moving during the scan to avoid motion artifacts.

For a complete summary of Invenia ABUS Scan Station operation and positioning information, please refer to the Invenia ABUS Scan Station Basic User Manual (DOC. No. 4700-0014-00).

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