



Evolution[®]

REVISION KNEE SYSTEM

Surgical Technique



INDICATIONS AND WARNINGS EVOLUTION REVISION KNEE SYSTEM

Indications

Intended Use Total Knee Systems

MicroPort Total Knee Systems are indicated for use in knee arthroplasty in skeletally mature patients with the following conditions:

- 1) noninflammatory degenerative joint disease including osteoarthritis, traumatic arthritis, or avascular necrosis;
- 2) inflammatory degenerative joint disease including rheumatoid arthritis;
- 3) correction of functional deformity;
- 4) revision procedures where other treatments or devices have failed; and treatment of fractures that are unmanageable using other techniques.

Non-porous MicroPort total knee replacement implants are for cemented use only.

Important

Proper surgical procedures and techniques are the responsibility of the medical professional. The following guidelines are furnished for information purposes only. Each surgeon must evaluate the appropriateness of the procedures based on his or her personal medical training, experience, and patient condition. Prior to use of the system, the surgeon should refer to the product package insert for additional warnings, precautions, indications, contraindications and adverse effects. Instructions for Use package inserts are also available by contacting the manufacturer. Contact information can be found on the back of this surgical technique and the package insert is available on the website listed.

(European Union Only) EVOLUTION® Stemmed CS femoral components are only intended for use in revision knee arthroplasty.

Package inserts can be found under: Prescribing Information on ortho.microport.com/ifus.

Please contact your local MicroPort Orthopedics representative for product availability.

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Introduction

The Evolution® Revision Knee System is built on a 20-year, clinically established heritage of patient satisfaction and survivorship.¹ The system maintains the published kinematic benefits of a medial-pivot design, while also offering surgeons intra-operative flexibility to meet patient needs.¹

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Reference:

1. Based on a retrospective study of Advance® Medial-Pivot. Macheras GA et al A long term clinical outcome of the Medial Pivot Knee Arthroplasty System. Knee. 2017 Mar;24(2):447-453

Design overview

INTELLIGENT DESIGN

EVOLUTION® Canal Filling Stem Extension

- Contain splines and flutes to provide immediate fixation and torsional resistance
- Flexible coronal slot provides dynamic structure to address long-term endosteal bone changes
- Diameters of 10-24mm in 1mm increments
- Lengths of 100 and 150mm

EVOLUTION® Tib Offset Adapter w/ Screws

- 360° of offset rotation for optimal bone coverage
- 4 and 8mm offset
- 25mm length
- Femoral offset has a boss at the top of the taper to prevent mating with the tibia

EVOLUTION® Revision Stem Adapter w/ Screws

- Extend total length of the stem for additional fixation
- 25 and 50mm lengths
- 17mm diameter

EVOLUTION® Revision Femoral CCK and Stemmed CS Femoral Implant

- Trunnion height is 35mm
- Stem housing at 5° valgus

EVOLUTION® Revision Distal Augment and EVOLUTION® Revision Posterior Augment

- Available in 4, 8, 12mm thicknesses
- Attach with single threaded screw

EVOLUTION® CCK Insert

- One-up and one-down size interchangeability

- +/-4° of internal-external rotation and +/-2° of varus-valgus constraint
- Allows up to 125° range-of-motion
- Pass-through locking screw provides additional fixation and stability

CS Tibial Insert

- Asymmetric to position mating femur more posterior
- One-up and one-down size interchangeability
- Soft tissue friendly patellar tendon relief
- 15° of permissible femoral rotation
- For use with Evolution Primary CS or Stemmed CS femur

EVOLUTION® Revision Tibial Base w/ Plugs

- Asymmetric for improved bone coverage
- 0° posterior slope
- Enhanced locking mechanism angled in direction of the incision

EVOLUTION® Tibial Block Augment w/ Screw & Handle

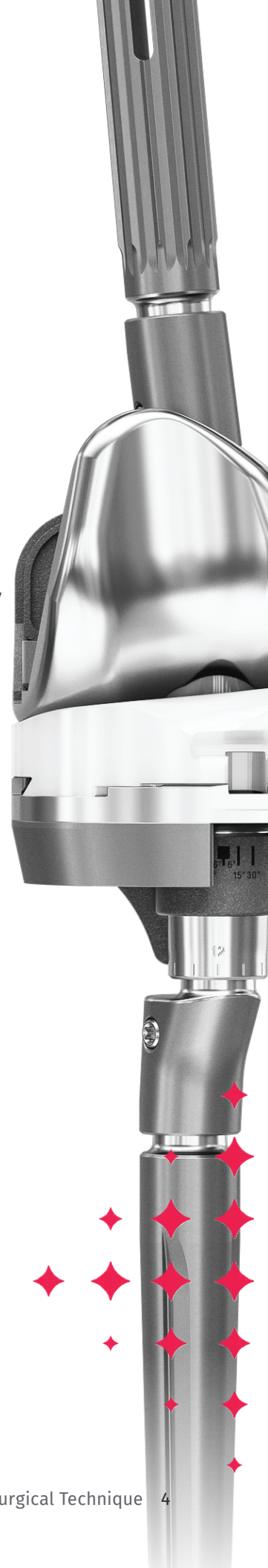
- 5, 10 and 15mm thick, medial and lateral options
- 10 and 15mm augments taper to match the natural tibial geometry

EVOLUTION® Revision Pressfit Keel Modular

- Three sizes to optimize rotational stability
- +/- 30° rotation without augments
- +/- 6° rotation with augments

EVOLUTION® Cemented Stem Extension

- 17mm diameter in lengths of 25 and 50mm
- 10, 12, 14, 16, and 18mm diameters in a length of 75mm



Preoperative planning

Pre-operative assessment of the appropriate size and position of the components is determined based on x-ray images and pre-operative evaluation.



Both print and digital x-ray templates are available. Please contact your local sales representative for more information.

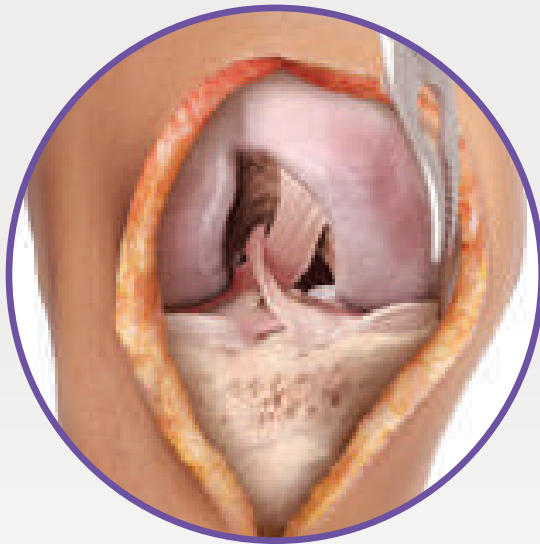
CAUTION: Preoperative templating is intended for estimation purposes only. Final component size and position should be determined intraoperatively. Accurate pre-operative templating requires good quality standardized radiographs of the appropriate anatomy.

Ordering information

Implant and instrument ordering information, including part numbers, can be found in the Evolution Revision Ordering Guide (014013).

Exposure

- Incision and exposure should be performed using the surgeon's preferred technique, or a previous incision can be used.
- When removing the components to be revised, take care to preserve as much remaining bone to reduce the risk of fracture.
- Once the components have been removed, clear all residual cement and thoroughly wash the joint.



Tibial preparation

NOTE: The Evolution® Revision Knee System uses intramedullary tibial resection guides. The tibial slope is set at 0° to accommodate the complexity of the tibial components.

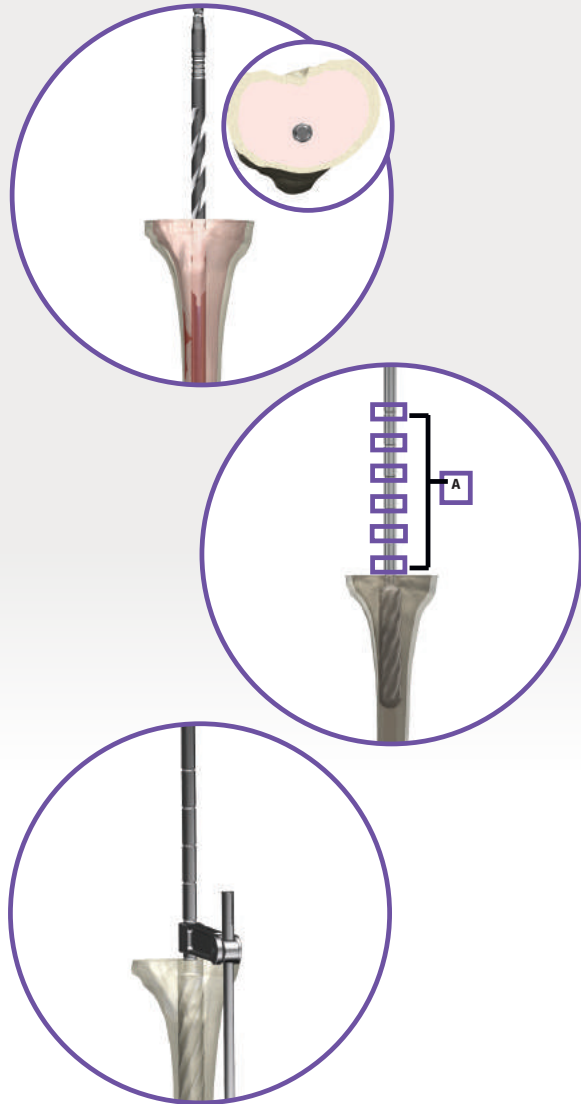
NOTE: The Evolution® Revision Tibia can be used in conjunction with primary femoral components for specific patient needs.

Tibial reaming

- Using the 9.5mm starter drill, initiate an opening in the proximal tibia just posterior to the original attachment point of the anterior cruciate ligament (ACL).
- Starting with an appropriate size reamer, ream the tibial intramedullary canal until cortical stability is achieved using sequentially larger diameter reamers.
- Leave the fixed reamer in the canal and record the depth and diameter.
- Slide the extramedullary check guide and alignment rod over the fixed reamer to assess varus/valgus alignment.

NOTE: Reamers are available in 0.5mm increments from 10mm to 24mm. Reamers include markings from 100 to 225mm in 25mm increments that correspond to the overall construct length.

Overall tibial construct length



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P/N E2431XXX



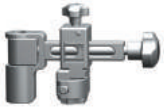
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P/N E5101001

Stem length

	Offset/Extension Adapter Length		
	None	25mm	50mm
25mm	50mm	75mm	100mm
50mm	75mm	100mm	125mm
75mm	100mm	125mm	150mm
100mm	125mm	150mm	175mm
150mm	175mm	200mm	225mm



P/N E2230002



P/N E223000L/R OR
P/N E223001L/R



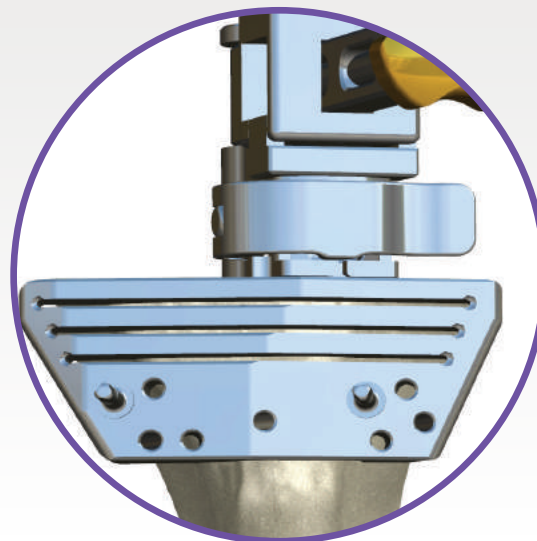
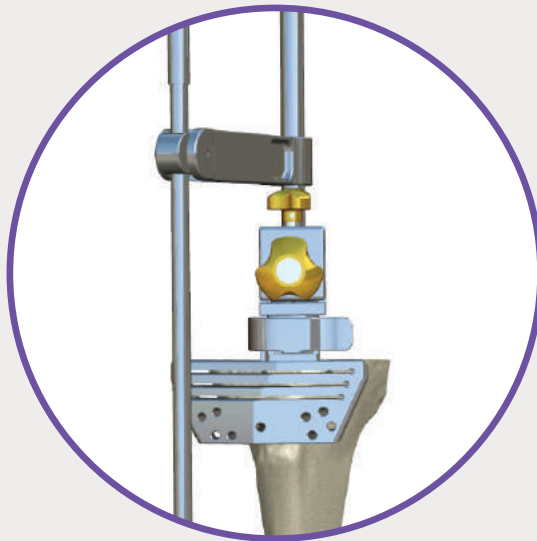
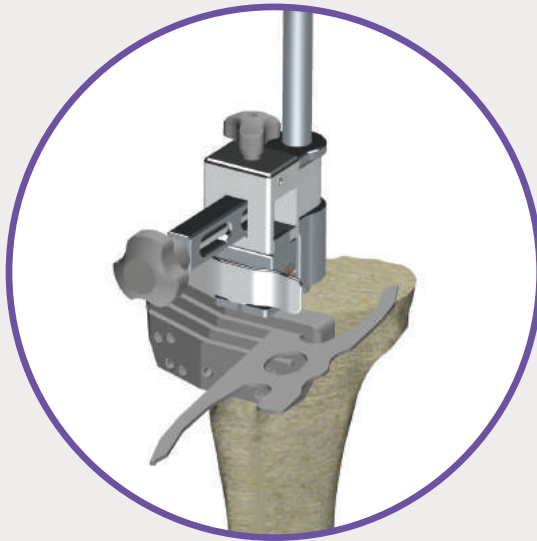
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P/N E5101002



Intramedullary (IM) tibial resection

NOTE: All resection guides are designed for use with a 1.27mm (.05") thick saw blade.

- With the fixed reamer in place, assemble the IM alignment guide and appropriate tibial resection guide and attach the construct to the fixed reamer.
- Adjust the alignment guide to the desired resection level with the aid of the saw blade or the "angel wing" dual reference gauge, then secure the alignment guide to the reamer by turning the anterior lock knob.
- Once secure, pin the resection guide to the proximal tibia through the holes marked "STD." A divergent pin can also be placed for additional stability.
- Complete the proximal tibial resection, ensuring the tibial plateau is flat after resection. The clean up resection is completed off uncaptured top of the resection block.

NOTE: The proximal tibial resection can be made with or without the intramedullary guide and reamer in place. To keep only the fixed reamer in place, use the anterior lock knob to release the intramedullary guide from the reamer. To remove the whole construct, release the lever on the alignment guide, connect a T-handle to the fixed reamer, and pull up.

- Alignment can be checked again with the external alignment guide and alignment rod.

NOTE: Lubrication of the crosshead connection cam hinge is particularly important to maintenance of the mechanism. Regular lubrication with surgical-grade lubricant intended for heat sterilized medical instruments per MicroPort Orthopedics cleaning instructions should be part of the routine instrument maintenance.

Tibial augmentation

- If tibial augmentation is needed, the tibial resection guide provides resection slots in 5mm increments from the top of the guide to make a 5, 10 or 15mm augment cut on the medial and/or lateral side.

NOTE: There is a marking on the resection guide that denotes the center of the guide for reference.

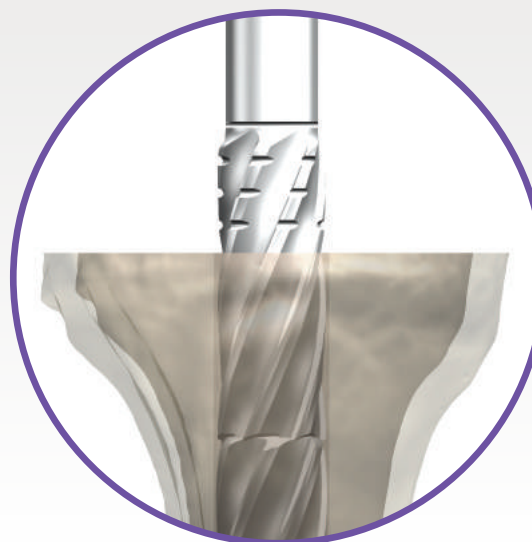
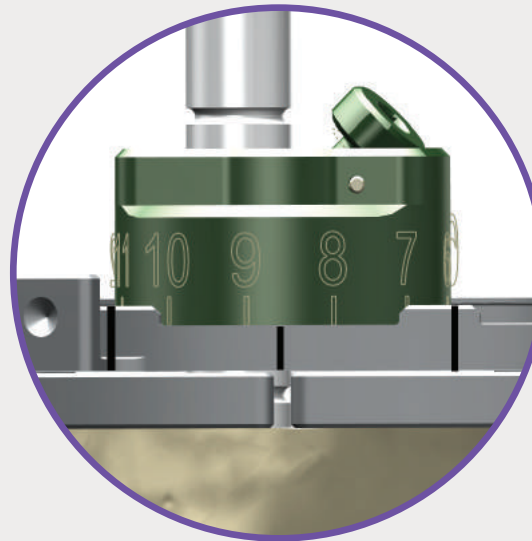
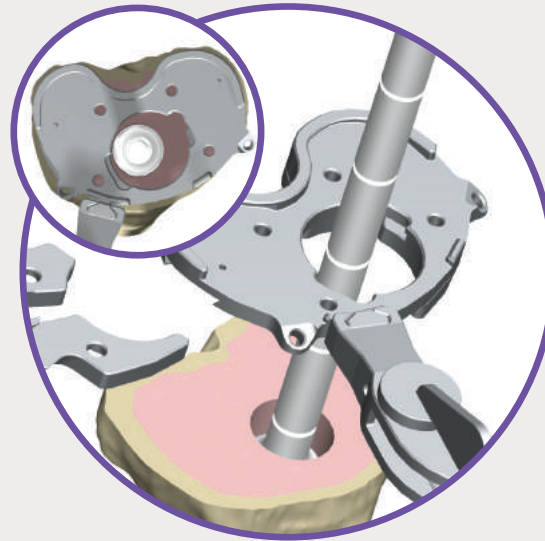
Tibial sizing

- If the fixed reamer was removed for the tibial resection, re-insert the reamer into the IM canal to the correct depth.
- If augment resections were made, place the appropriate augment trials on the tibial surface to ensure proper reamer depth.
- Select the trial tibial base that provides optimal proximal tibial bone coverage. Assemble the selected trial tibial base with the appropriate size and thickness augment trial(s) and attach the construct to the trial tibial base handle.
- Place the trial tibial assembly on the proximal tibia.

Offset preparation

- Attach the appropriate offset bushing to the trial tibial base and adjust the assembly for optimal bone coverage.
- The alignment rod can be used with trial tibial base handle to assess varus/valgus alignment.
- Once desired coverage has been achieved, tighten the offset bushing using a 3.5mm driver, mark the location of the trial tibial base using electrocautery and record the amount of offset and rotation.
- If offset is required, remove the trial tibial base assembly.
- Align the offset reamer to the fixed reamer and ream to the solid line. If the proximal surface has been prepared for augments on both the medial and lateral compartments, ream to the appropriate depth grooves (5, 10, or 15mm) for the specific compartment.

NOTE: The highest dashed line corresponds with the 5mm augments, the middle line corresponds with the 10mm augments, and the lowest line corresponds with the 15mm augments.



P/N E2331XXL/R



P/N E2330001



P/N E253XXXX



P/N E2030001, E2030002,
E2030003



P/N E2431003



P/N E2030004



P/N E2431001 OR
E2431002



P/N E2332XXL/R
OR
P/N E2333XXL/R



P/N E223001X



P/N E2230425, E2230825



P/N E273XXXX OR
E2831XXX



P/N E253XXXX



P/N E5001005



P/N E2030007



Trunnion preparation

- Remove the fixed reamer from the IM canal and the offset bushing from the trial tibial assembly.
- Reposition the trial tibial assembly onto the tibial surface using the previously-made markings and pin to the tibia.
- Attach the trunnion bushing and rotate clockwise to lock into position.
- Ream for the modular keel and tibial trunnion using the trunnion reamer.

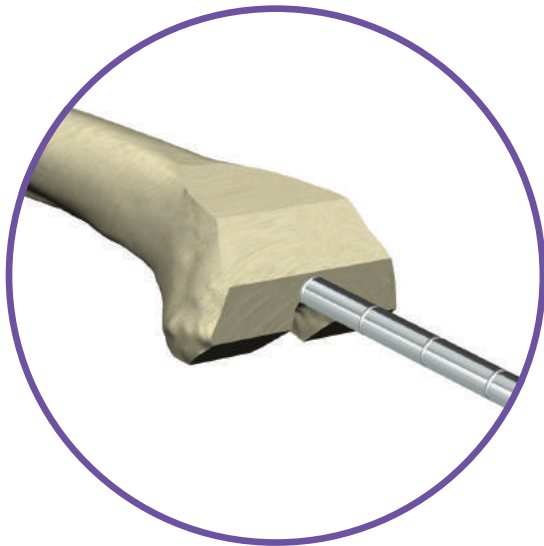
NOTE: If using a 25mm cemented stem or a 25mm stem extension, the long trunnion reamer must be used.

NOTE: If a reamer larger than 21mm has been used, the use of the trunnion reamer is optional.

Keel preparation Broaching (base referencing)

- Assemble the broach construct with the appropriate monolithic tibial base trial, modular keel broach, offset or extension adapter broach, stem extension trials, and augment trials, if applicable.
- Ensure the offset adapter broach is assembled at the orientation determined during tibial sizing.
- Secure the broaching construct with the lock screw using a 3.5mm driver.
- Impact the broaching construct using the trial base impactor until the construct is flush with the resected tibial surface.

NOTE: The EVOLUTION® Revision Pressfit Keel Modular can be positioned according to surgeon preference; however, keel rotation is limited with use of an augment trial. Marks denoting keel rotation are provided on the monolithic tibial base trial.

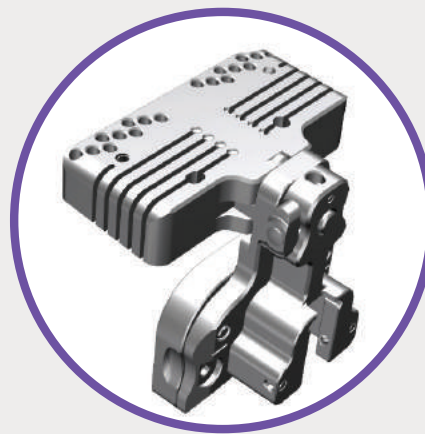
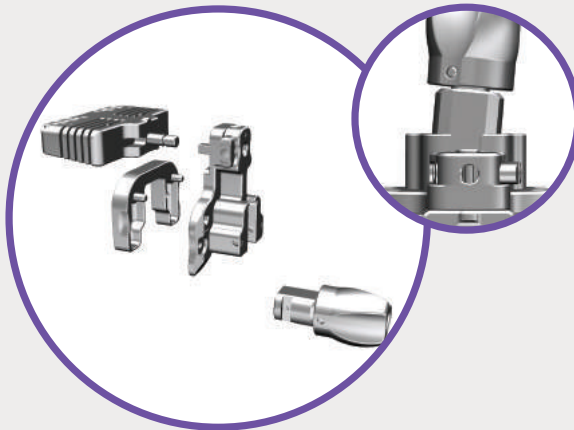


Femoral preparation

- Remove the trial tibial assembly with the slap hammer by attaching the trial base impactor into the slots on the monolithic base trial.
- Initiate an opening in the femoral canal using the 9.5mm starter drill. In the proper position, the starter drill should pass easily into the femoral canal.
- Starting with an appropriate size reamer, ream the femoral canal until cortical stability is achieved using sequentially larger diameter reamers.
- Leave the fixed reamer in the canal and record the depth and diameter.

NOTE: Reamers are available in 0.5mm increments from 10mm to 24mm. Reamers include depth markings designated “F” that represent the overall construct length and are 10mm greater than the previous markings.

Stem length	Overall femoral construct length		
	OFFSET/EXTENSION ADAPTER LENGTH		
	None	25mm	50mm
25mm	60mm	85mm	110mm
50mm	85mm	110mm	135mm
75mm	110mm	135mm	160mm
100mm	135mm	160mm	185mm
150mm	185mm	210mm	235mm



Distal femoral instrument assembly

- Assemble the distal femoral resection guide onto the distal femoral alignment guide and lock together by sliding the locking button from left to right. Once locked, a lock icon will be visible.
- Set the valgus bushing to 5° to match the valgus orientation of the femoral component stem.
- Attach the valgus bushing to the alignment guide ensuring that side marked “Left” is facing up for a left knee and vice versa.
- Affix the distal skim spacer to the alignment guide. This spacer will provide a “clean-up” resection of 0.5mm along the most prominent condylar surface.
- Slide the assembled construct over the IM reamer and secure the valgus bushing to the IM reamer by tightening the knob.



P/N E5001002



P/N E2431XXX



P/N E1200117



P/N E1101001



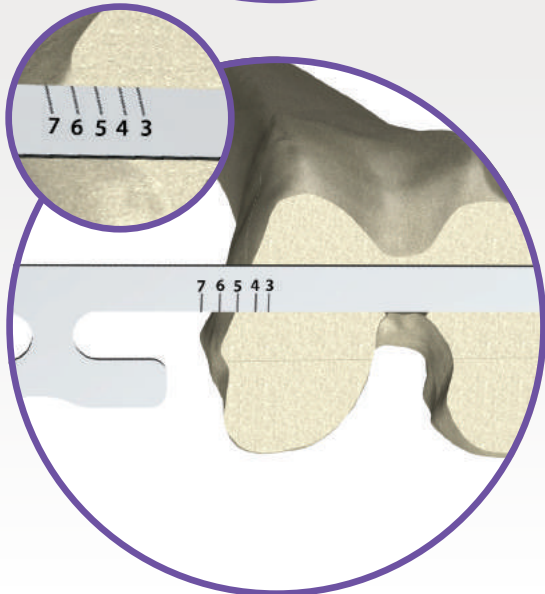
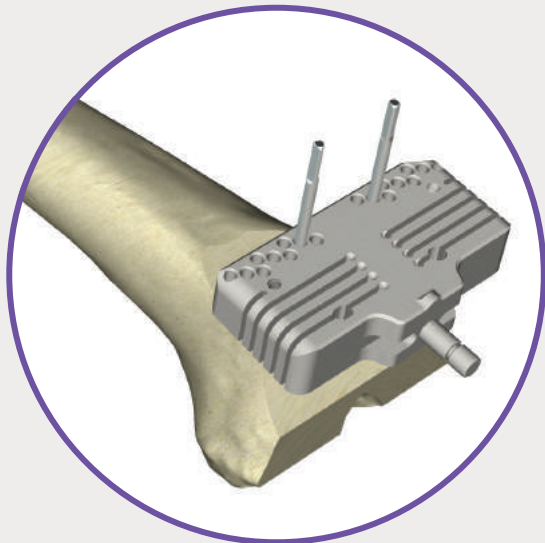
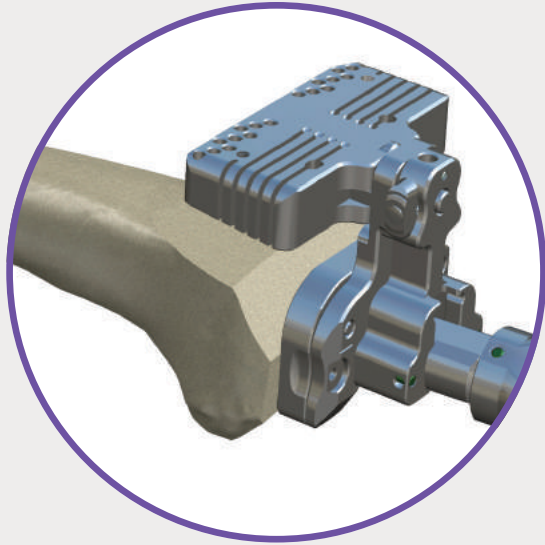
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P/N E6300005



P/N E1101006



P/N E5001011



Distal femoral “clean-up” resection

- Pin the resection guide with two headless pins through the most proximal holes marked “0mm.” A third pin can be inserted through one of the divergent holes for additional stability. Ensure the pins are fully seated to avoid impeding the saw blade.
- Disengage the resection guide by sliding the locking knob to the left and remove the rest of the construct, including the reamer, by pulling distally.
- Resect the distal femur through the standard resection slot starting with the most prominent condyle.
- 4, 8, or 12mm distal augment resections can also be made at this point.
- Remove the resection guide, but consider leaving the pins in place to allow for a re-cut if required.

NOTE: All resection guides are designed for use with a 1.27mm (.05”) thick saw blade.

NOTE: To avoid trapping the reamer, use the outermost pin holes.

Femoral sizing

- Femoral implant sizing may be approximated by one of the following methods:
 1. Use the dual reference gauge to approximate the femoral size. Alignment of the gauge along the epicondylar axis is critical to fully measure the M/L width. The gauge has laser markings on both sides to template both the A/P and M/L dimensions of the fixed component.
 2. Assessment of the explanted femoral component.
 3. Use of trial femoral components.
 4. Pre-operative radiographic evaluation of both knees.
 5. Reference of tibial base sizing.

4-in-1 resection guide

- Re-insert the fixed reamer into the canal and select the appropriately sized 4-in-1 resection guide.
- If distal augment resections were made, attach the appropriate size and thickness distal augment trial(s) in the proper orientation to the back of the resection guide using the laser markings.
- Set the dovetail into the recess in the 4-in-1 resection guide.
- Press down slightly and slide the augment into place.
- The resection guide has an modular posterior capture attachment.
 - The posterior capture is required if starting from a previously unresected femur or primary procedure.

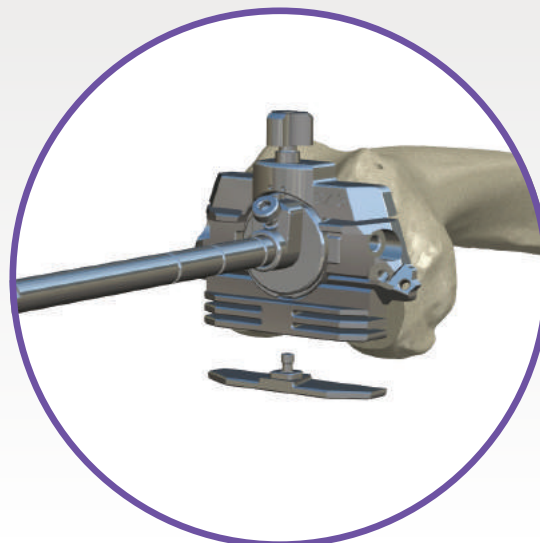
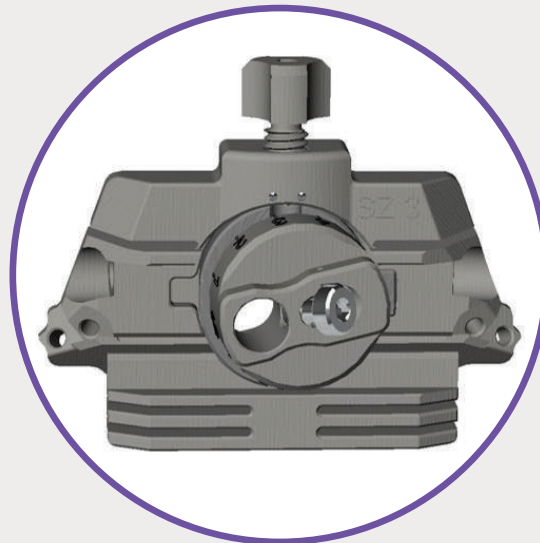
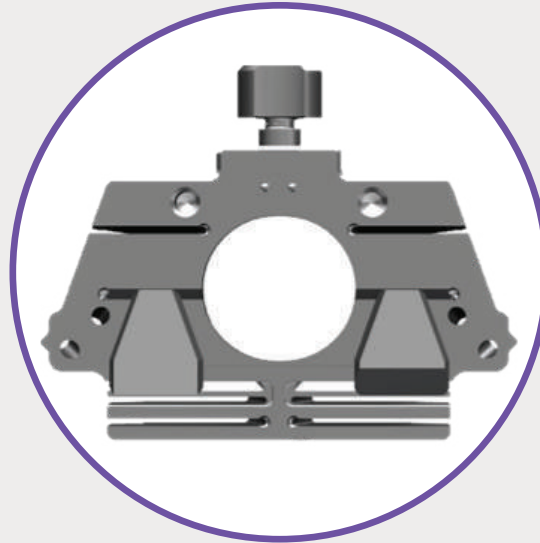
NOTE: Ensure the posterior capture is securely tightened down prior to assembling onto the fixed reamer.

- Attach the valgus bushing to the resection guide according to the side of the operative leg (left or right). Tighten the top screw halfway to hold the bushing in place.
- Set the 0mm offset bushing into the valgus bushing and tighten the locking knob on the resection guide. Slide the whole construct over the fixed reamer.
- The width of the posterior cut section of the resection guide corresponds to the width of the EVOLUTION® Revision Femoral CCK component and can be used as a final check of femoral size.

NOTE: Optional stability handles can be ordered by SKU, P/N K001009.

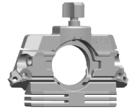
Offset determination

- If no offset is required, skip this step and proceed to “Femoral Resections & Posterior Augmentation.”
- If femoral offset is required, slide the construct off the end of the fixed reamer, loosen the knob on the resection guide, and exchange the 0mm offset bushing with the



P/N E1204503 - E1204508

OR



P/N E1204513 - E1204538



P/N E1200311



P/N E1200310



P/N E2030001 - E2030003
OR E2030021 - E2030023



P/N E5001XXX



P/N E50017XX



P/N E50031XX



P/N E50041XX

4mm offset bushing.

- While holding the offset bushing in place on the resection guide, slide the construct over the fixed reamer allowing the bushing to rotate until the desired position of the resection guide is achieved.
- Repeat if necessary with the 8mm offset bushing.
- Tighten the knob on the resection guide and the lock screw on the offset bushing with a 3.5mm driver.
- Record the magnitude and position of the offset bushing

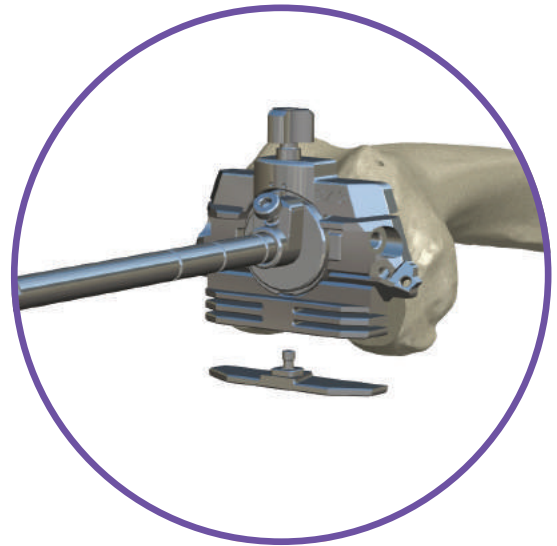
Femoral resections and posterior augmentation

- Mark the A/P axis (Whiteside’s Line) and/or the transepicondylar axis on the resected distal femur.
- Adjust the degree of external rotation until the resection guide is parallel to the transepicondylar axis and perpendicular to the A/P axis.
- Use the dual reference gauge to confirm the location of the anterior resection and degree of rotation.
- Pin the resection guide into place using 1/8” (3.2mm) diameter headed pins.
- The flexion space can be checked by placing the flexion spacer block below the resection guide with the posterior capture removed. If tibial augmentation has been prepared for, assemble the appropriate spacer shims to the underside of the flexion/extension spacer block before inserting into the joint space.

NOTE: The resection guide will need to be removed to allow the removal of the fixed reamer if using an 8mm offset, or a 4mm offset and a fixed reamer larger than 18mm.

- Perform the resections in the following recommended order: anterior, posterior, and posterior chamfer, and anterior chamfer.
- If necessary, resect for 4 or 8mm posterior augments at this time. 12mm posterior augment resections must be performed through the cut-through femoral trial.

NOTE: The top knob on the resection guide may spin freely during resections.



Trunnion reaming

NOTE: It is recommended to ream for the trunnion through the cut-through femoral trial in order to facilitate easier placement of the cut-through trial in the proper position. If using the translating stem, you must skip step and ream for the cut through femoral trial.

- If removed, re-assemble the valgus bushing guide to the proper side.
- Assemble the 4-in-1 trunnion reamer bushing by sliding into place and tightening the top screw on the 4-in-1 guide completely.
- Ream with the long trunnion reamer until a full stop.

NOTE: The trunnion reamer is part of the EVOLUTION® Revision Tibia Kit P/N E400KIT1.

Cut-through femoral trial assembly

- Assemble the cut-through valgus bushing with the cut-through femoral trial. Align the captured screws in the valgus bushing to the screw holes on the cut through femoral trial.
- Tighten the two screws on the valgus bushing with a 3.5mm driver.
- Place the previously determined offset bushing into the valgus bushing and align the pre-determined clock marking to the medial marking. Secure into place by tightening the locking knob on the valgus bushing with a 3.5mm driver.
- Slide any previously-determined distal augment trials into place.
- Re-insert the fixed reamer and slide the construct over the reamer.
- If the cut-through femoral trial is appropriately positioned, tighten the locking screw on the offset bushing using a 3.5mm driver and pin the cut-through femoral trial through the anterior pin holes using threaded, headed pins available in MicroPort's pin pack.

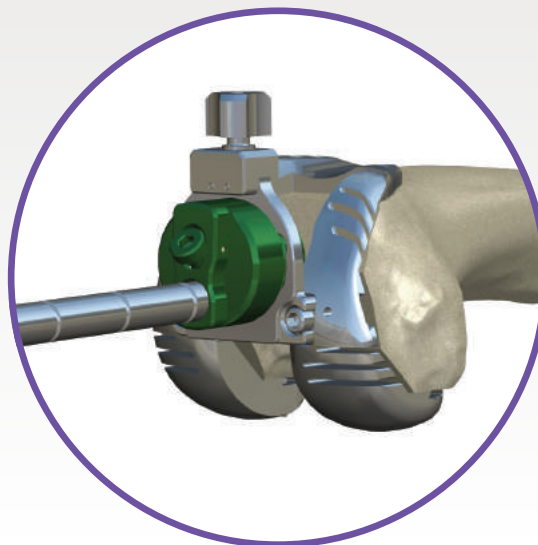
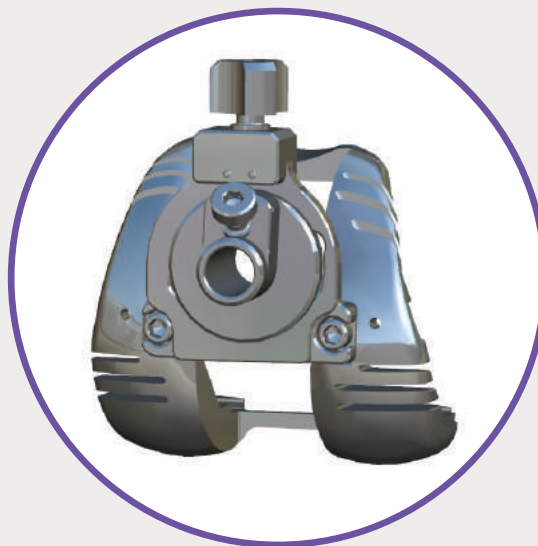
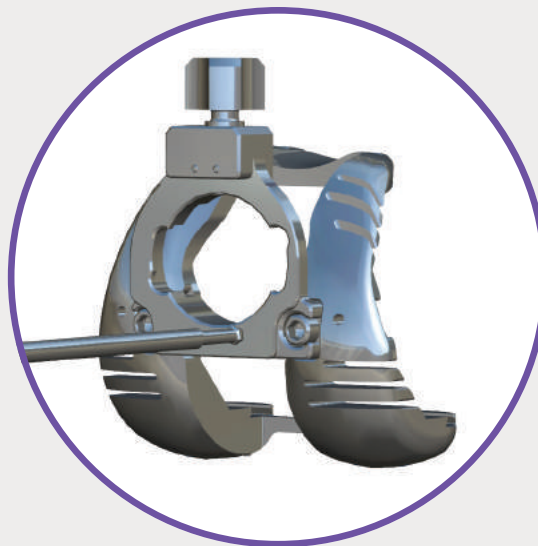
NOTE: The offset bushings are part of the EVOLUTION® Revision Tibia Kit (E2030001 - E2030003 available in E400KIT1).

Offset determination

- If no offset is required or has been previously determined with the 4-in-1 guide, skip this step and proceed to "Secondary Flexion/Extension Gap Analysis".
- If femoral offset is required, slide the construct off the end of the fixed reamer, loosen the knob on the valgus bushing, and exchange the 0mm offset bushing with the 4mm offset bushing.
- Slide the construct over the fixed reamer onto the distal femur allowing the bushing to rotate until the desired position of the cut-through femoral trial is achieved.

NOTE: The offset bushing may need to be held down into the valgus bushing until the rotation is set. Optional over reamer impactor can be used to impact femoral trial assembly over the reamer. P/N E6001008/E6001009

- Repeat if necessary with the 8mm offset bushing.



P/N E630346L, E630078L,
E630346R, OR E630078R



P/N E2030001 - E2030003
OR
E2030021 - E2030023



P/N E63043RL/
RR-E63048RL/RR
OR
E63143RL/RR-E63148RL/RR



P/N E310XXXR/L



P/N E2030007



P/N E6001001



P/N E5002001



P/N E5002002

- Tighten the knob on the valgus bushing using a 3.5mm driver
- Tighten the lock screw on the offset bushing with a 3.5mm driver to prevent movement of the cut-through femoral trial construct.
- Pin the cut-through femoral trial through the anterior pin holes using threaded, headed pins available in MicroPort's pin pack.
- Record the magnitude and position of the offset bushing at the mark on the medial side (e.g. 4mm offset at 11 o'clock).

NOTE: If the cut-through femoral trial fits tightly in the A/P plane, it may be necessary to make clean-up resections and set the offset using the 4-in-1 resection guide. See Chapter 4 for the proper surgical technique.

Flexion/extension gap analysis

- Place the previously-assembled trial tibial construct onto the tibia.
- Select the appropriate size cut-through

- femoral trial and place onto the femur.
- Select the appropriate CS trial insert size and thickness. Insert the trial insert onto the trial tibial base by first engaging the posterior edge of the insert and then snapping the anterior portion into place.
- With the trial insert in place, flex and extend the knee, evaluating component positions, flexion and extension gaps, and whether any augments will be needed.
- Once trialing is complete, remove all trial components.
- Remove the monolithic base trial with the slaphammer by attaching the trial base impactor into the available slots.
- Remove the cut-through femoral trial with the slaphammer by attaching the femoral impactor into the dovetail slots.

NOTE: The translating stem adapter is available to help fine tune the distal placement of the femoral implant.

Trialing matrix

	Loose in extension	Tight in extension	Stable in extension
Loose in flexion	<ul style="list-style-type: none"> • Increase poly bearing thickness • Add/increase tibial augments • Augment distal femur and upsize femur with posterior augments • Augment distal femur and offset femur posteriorly 	<ul style="list-style-type: none"> • Resect distal femur and use thicker poly bearing • Resect distal femur and upsize upsize femur with posterior augments • Resect distal femur and offset femur posteriorly 	<ul style="list-style-type: none"> • Upsize femur with posterior augments • Offset femur posteriorly
Tight in flexion	<ul style="list-style-type: none"> • Downsize femur and add distal augments • Offset femur anteriorly to be flush with anterior cortex and add distal augments 	<ul style="list-style-type: none"> • Decrease tibial poly thickness • Resect more proximal tibia 	<ul style="list-style-type: none"> • Downsize femur • Offset femur anteriorly to be flush with anterior cortex
Stable in flexion	Augment distal femur	Resect more distal femur	No adjustments necessary

NOTE: The following chart shows the largest reamer diameter is that the user can remove through the 4-in-1, the cut thru trial, and the tibia baseplate when using an offset.

Largest Reamer to Be Used without Removing Cut Thru Trial		
	Offset	
Size	4mm	8mm
1	19mm	11mm
2	19mm	11mm
3	19mm	11mm
4	19mm	11mm
5	19mm	11mm
6	19mm	11mm
7	19mm	11mm
8	19mm	11mm

Largest Reamer to Be Used without Removing 4-in-1		
	Offset	
Size	4mm	8mm
1	19mm	11mm
2	19mm	11mm
3	19mm	11mm
4	19mm	11mm
5	19mm	11mm
6	19mm	11mm
7	19mm	11mm
8	19mm	11mm

Largest Reamer to Be Used without Removing Tibia Trial		
	Offset	
Size	4mm	8mm
1	17.5mm	>10mm
2	17.5mm	>10mm
3	17.5mm	>10mm
4	17.5mm	>10mm
5	17.5mm	>10mm
6	17.5mm	>10mm
7	17.5mm	>10mm
8	17.5mm	>10mm

Offset preparation

- If no offset is required, skip this step.
- If an offset is being used, re-insert the fixed reamer.
- Slide the cannulated reamer over the fixed reamer and ream to the depth of the dotted line.
- Remove the fixed reamer.

NOTE: If the fixed reamer is greater than 17.5mm, this step can be skipped.

NOTE: The offset reamer is part of the EVOLUTION® Revision Tibia Kit (E400KIT1).

Trunnion preparation

NOTE: Skip this step if previously completed.

- Assemble the cut-through valgus bushing guide to the cut-through femoral trial using a 3.5mm driver.
- Lock the trunnion reamer bushing into the valgus bushing by turning clockwise.
- Use a 3.5mm driver to tighten the locking knob on the valgus bushing.
- If pins were removed during trialing, re-insert the pins.
- Ream for the trunnion using the long trunnion reamer until it comes to a stop.
- Remove the valgus bushing and trunnion reamer bushing.

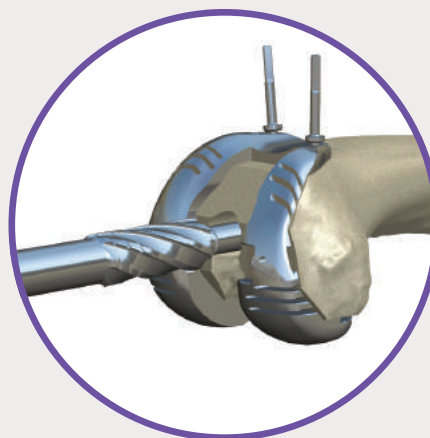
NOTE: The trunnion reamer and trunnion bushing is part of the EVOLUTION® Revision Tibia Kit (E400KIT1).

Femoral augment resections

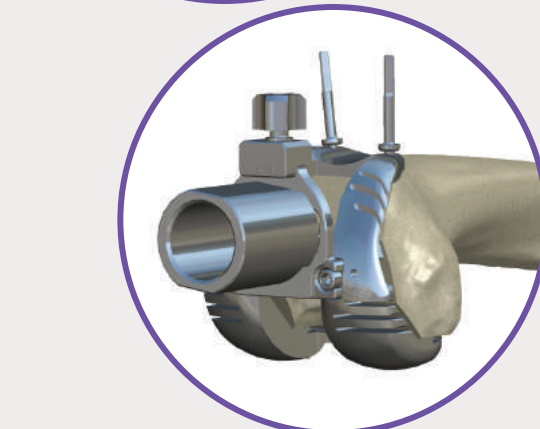
- The cut-through femoral trial contains 4, 8, and 12mm distal and posterior augment cut slots.
- If necessary, make the appropriate distal and posterior augment resections.
- Assemble distal and posterior augment trials into place.

NOTE: It is critical to remove any bone fragments after resection as they may impede augment trial placement. If this occurs, remove the cut-through femoral trial construct, remove the fragments, and replace the components.

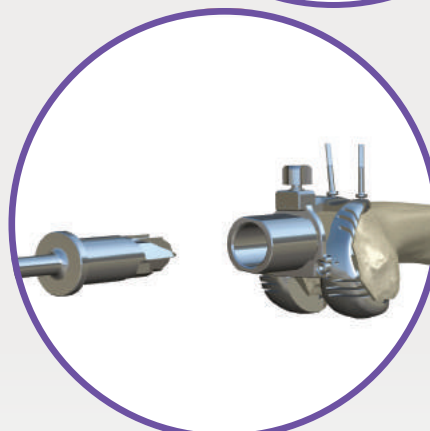
NOTE: All augment trials are grouped by size; however, distal augment trials are also side- and medial-/lateral-specific.



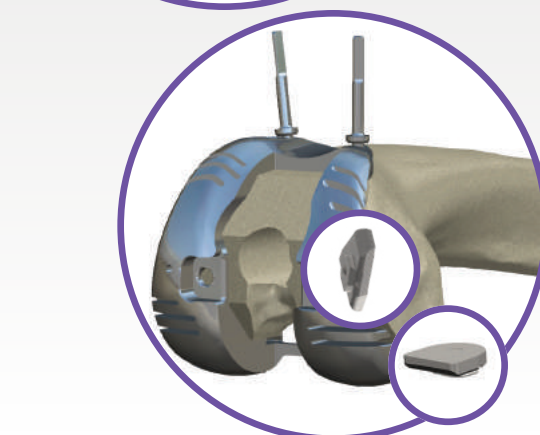
P/N E2431002



P/N E2030004



P/N E1604345, E1608345,
E1612345, E1604678,
E1608678, E1612678



P/N E1704351, E1708351,
E1712351, E1704681,
E1708681, E1712681



P/N E273XX10, E273XX15, OR E283XX75



P/N E2230X25 OR E22300XX



P/N E6001007



P/N E1205403-E1205408



P/N E120543L-E120548L OR E120543R-E120548R

Trochlear groove preparation for stemmed CS

- Assemble the stemmed CS sulcus burr guide onto the cut-through femoral trial by aligning the captured screws to the screw holes on the cut-through femoral trial.
- Tighten the screws on the sulcus burr guide using a 3.5mm hex driver.
- Resect for the sulcus using the sulcus burr.
- If desired, slide the stem adapter into the resected intercondylar space to ensure that enough bone has been cleared for the sulcus.

CS femoral trial assembly

- Remove the pins, and remove the cut-through femoral trial construct from the femur.
- Disassemble the stemmed CS sulcus burr guide by loosening the screws with a 3.5mm driver
- If an offset or stem extension adapter is required, thread the appropriate trial stem into the bottom of the appropriate offset or stem extension broach.
- Insert this construct into the trunnion on the stem adapter and tighten the captured pass through screw with a 3.5mm hex driver.
- If using an offset broach, align the previously determined rotation to the laser marking on the medial side of the stem adapter BEFORE tightening the screw.
- If only a stem is required, insert the appropriate trial stem into the trunnion of the box and stem adapter and tighten the captured pass-through screw with a 3.5mm driver.
- Align the captured screws on the stem adapter with the screw holes on the cut-through femoral trial and tighten the construct using a 3.5mm driver.
- If distal and posterior augments are needed, select the appropriate size trials and slide onto the cut-through femoral trial from the side.
- Complete trial reduction with appropriate CS trial insert

Optional Transition to a CCK

- If additional constraint is desired pin the cut through femoral trial into place using the anterior pin holes
- Completely loosen the two screws on the stem adapter
- Use the slap hammer if necessary to remove the stem adapter construct
- Continue with box resection procedure on the following page.

Intercondylar bone preparation for CCK

- Assemble the box cut guide into the cut-through femoral trial by aligning the captured screws on the box cut guide to the screw holes on the cut-through femoral trial.
- Tighten the screws on the box cut guide using a 3.5mm driver.
- Resect for the box using a narrow oscillating saw or reciprocating saw.

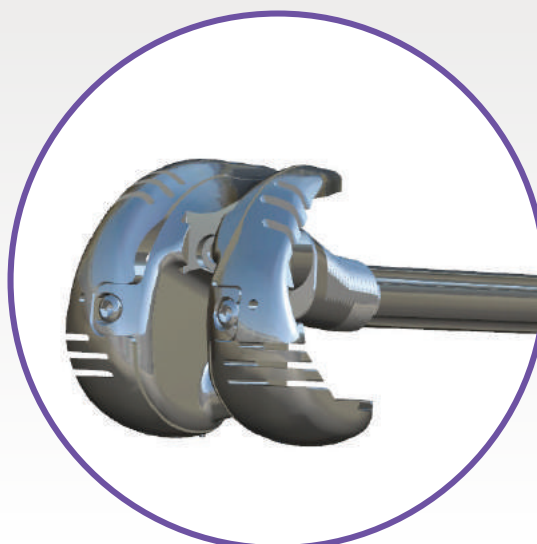
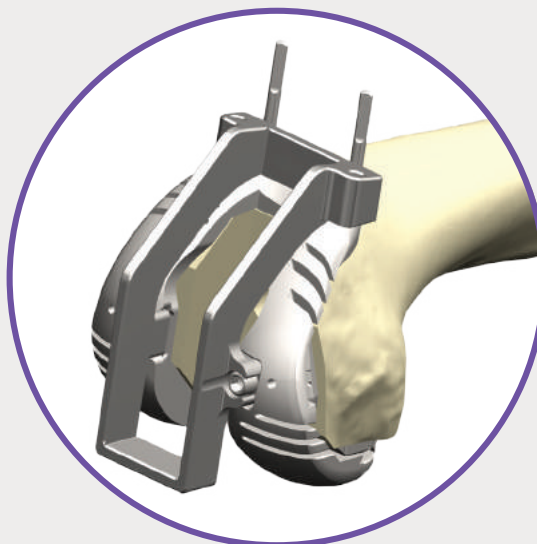
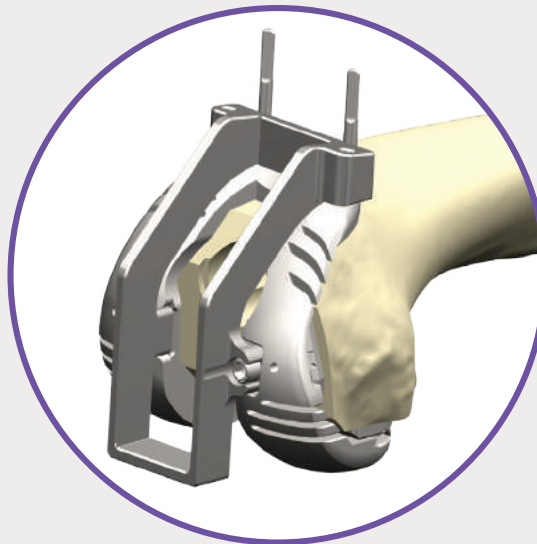
NOTE: There are two additional pin holes on the anterior portion of the box cut guide, which will allow the attachment of the dual fulcrum if a captured resection is desired. The dual fulcrum attachment can be ordered by SKU, P/N K0014027.

Note: Intercondylar box can be prepared with distal resection guides and reference jigs (E1204523-8 & E1204533-8) with Optimized 4-in-1 Resection Guides (E1204513-E1204518)

- If desired, slide the box stem adapter into the resected intercondylar space to ensure that enough bone has been cleared for the box.

CCK femoral trial assembly

- Remove the pins, cut-through femoral trial, and box cut guide by loosening the screws with a 3.5mm driver.
- If an offset or stem extension adapter is required, thread the appropriate trial stem into the bottom of the appropriate offset or stem extension broach.
- Insert this construct into the trunnion on the box and stem adapter and tighten the captured pass through screw with a 3.5mm hex driver.
- If using an offset broach, align the previously determined rotation to the laser marking on the medial side of the box and stem adapter BEFORE tightening the screw.
- If only a stem is required, insert the appropriate trial stem into the trunnion of the box and stem adapter and tighten the captured pass-through screw with a 3.5mm driver.
- Align the captured screws on the box stem adapter with the screw holes on the cut-through femoral trial and tighten the construct using a 3.5mm driver.
- If distal and posterior augments are needed, select the appropriate size trials and slide onto the cut-through femoral trial from the side.



P/N E1205303 - E1205308



P/N E120533L - E120538L OR
E120533R - E120538R



P/N E273XX10, E273XX15, OR
E283XX75



P/N E2230X25 OR E22300XX



P/N E6001001



P/N E1005101



P/N E310XXXR/L



P/N E350XXXL/R

OR



P/N E351XXXL/R



P/N E3510000

		Femur						
		3	4	5	6	7	8	
Tibial base	3	3	3	3+				
	4	4	4	4	4+			
	5			5	5	5+		
	6				6	6	6+	
	6+					6		
	7						7	7+
	8						8	8
	8+						8	8

		Femur						
		3	4	5	6	7	8	
Tibial base	3	3	3	3				
	4	4	4	4	4			
	5			5	5	5		
	6				6	6	6+	
	6+					6		
	7						7	7
	8						8	8
	8+						8	8

NOTE: The following compatibility chart is for use with the revision tibia and a primary femur, and not for full revision.

		FEMUR							
		1	2	3	4	5	6	7	8
TIBIAL BASE	1	1	1	1+					
	2	2	2	2	2+				
	2+			2					
	3				3	3+			
	4				4	4	4+		
	5					5	5	5+	
	6						6	6	6+
	6+							6	
	7								7
8								8	8
8+									8

Final flexion/extension gap analysis

- Impact the previously-assembled trial tibial construct onto the tibia using the trial base impactor.
- Impact the final trial femoral construct onto the femur using the femoral impactor.
- Select the appropriate size and thickness trial insert. Insert the trial insert onto the trial tibial base by first engaging the posterior edge of the insert and then snapping the anterior portion into place.

NOTE: If distal augment trials are present, it is necessary to use the finishing impactor rather than the femoral impactor.

- Once the trial components are in place, reduce the patella and perform the preferred balancing tests to ensure stability in flexion while still allowing full extension.
- Remove the monolithic base trial with the slaphammer by attaching the trial base impactor into the available slots.
- Verify the rotational position of the keel and offset adapter on the monolithic base trial assembly with the offset and rotation recordings.
- Remove the trial femoral construct with the slaphammer by attaching the femoral impactor into the dovetail slots on the stem adapter.

Size interchangeability

- The Evolution® Revision System allows for 1-up, 1-down interchangeability between the femur and tibia for all styles.
- Refer to the sizing chart at the right for size interchangeability, and see the implant dimension charts in Chapter 5 for a more detailed look at the options available for use.
- Be aware of the size 6+ tibial bases; these are required for the articular surface groupings built into the system.

Femoral implant assembly

- Select the correct size EVOLUTION® Revision Femoral CCK or stemmed CS femoral component, revision tibial base implant, and CCK or CS insert as well as the appropriate stem, augments, and offset adapter/stem extension (if required).
- Follow one of the four methods below based on the selected components.

NOTE: The femoral implants are packaged with a polyethylene plug. Place the plug in the trunnion if no stem extension is being used on the femur to prevent cement from entering the trunnion.

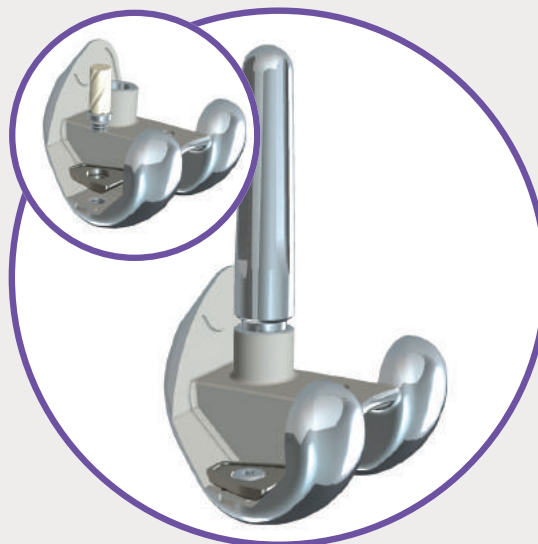
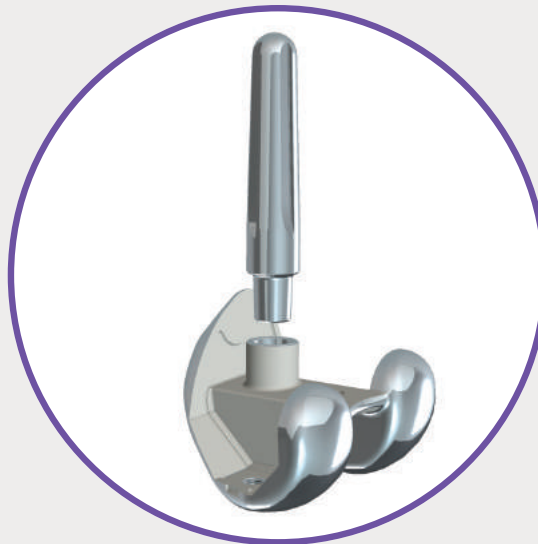
NOTE: When using a canal filling stem it is recommended to assemble the slot of the stem running in the medial-lateral direction or in a way that the slot is able to be viewed on medial-lateral x-ray.

Stem only

- Place the femoral component on a sterile, rigid surface.
- Assemble the stem into the trunnion and impact with three firm mallet blows directly to the stem.

Augment(s) and Stem

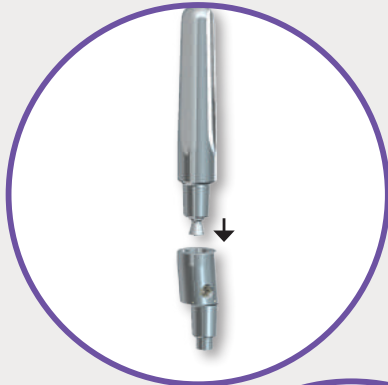
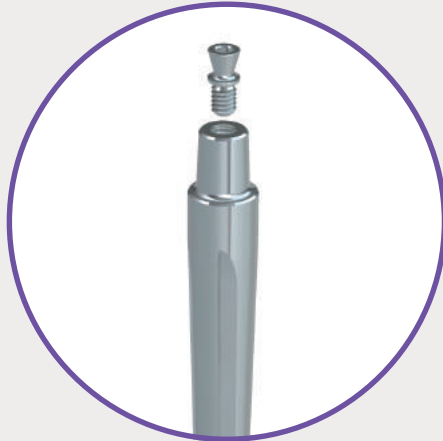
- Assemble the augment(s) to the femoral component.
- Using the screw packaged with the augment, secure the augment to the femoral implant.
- Following removal of the plastic starter handle, final tightening is completed with a 3.5mm driver.
- Place the construct on a sterile, rigid surface. Assemble with the stem into the trunnion and impact with three firm mallet blows directly to the stem.



P/N EFCCN3RL-EFCCN8RL
OR EFCCN3RR-EFCCN8RR



P/N EFSRN3RL-EFSRN8RL
OR EFSRN3RR-EFSRN8RR



Offset/extension adapter and stem

- Screw the secondary locking screw, packaged with the offset/extension adapter, into the top of the stem and tighten with a 3.5mm driver.
- Place all components on a sterile, rigid surface.

NOTE: It may be necessary to slightly back out the side set screws before implant assembly.

- Insert the male taper of the stem into the female taper of the offset

NOTE: If using a canal filling stem align the clothes pin slot with the predetermined offset clock mark.

- Impact the stem into the offset with three firm mallet blows directly to the stem.
- Tighten down the side set screws with the hexalobe driver
- Insert the offset and stem construct into the femur and align the correct clock marking on the offset to the medial mark on the femoral trunnion. Impact with three firm mallet blows directly to the stem.

NOTE: Some positions of the offset that are not available with certain sizes.

Femurs	8mm Offset Clockings Available
1	1, 2, 3, 4, 5, 6, and 12
2	1, 2, 3, 4, 5, 6, and 12
3	1, 2, 3, 4, 5, 6, and 12
4	1, 2, 3, 4, 5, 6, 7, 11 and 12
5	All
6	All
7	All
8	All

Augment(s), offset/extension adapter, and stem

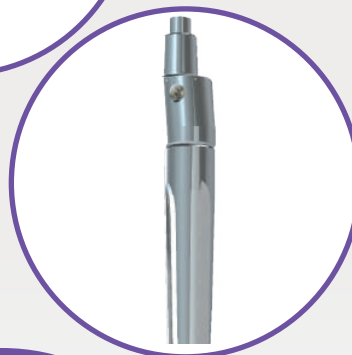
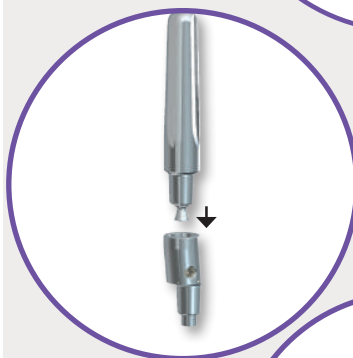
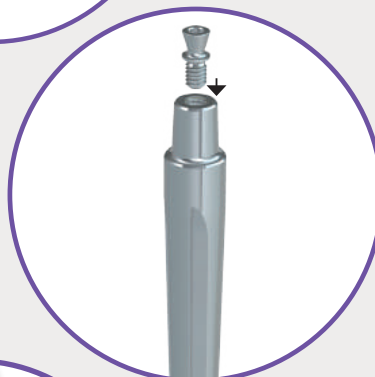
- Assemble the augment(s) to the femoral component.
- Using the screw packaged with the augment, secure the augment to the femoral implant.
- Following removal of the plastic starter handle, final tightening is completed with a 3.5mm driver.
- Screw the secondary locking screw, packaged with the offset/extension adapter, into the top of the stem and tighten with a 3.5mm driver.

NOTE: It may be necessary to slightly back out the side set screws before implant assembly.

- Insert the male taper of the stem into the female taper of the offset

NOTE: If using a canal filling stem align the clothes pin slot with the predetermined offset clock mark.

- Impact the stem into the offset with three firm mallet blows directly to the stem.
- Tighten down the side set screws with the hexalobe driver
- Insert the offset and stem construct into the femur and align the correct clock marking on the offset to the medial mark on the femoral trunnion.
- Impact with three firm mallet blows directly to the stem.



P/N ESPXXXX



P/N ESCXXXX



P/N EFDANXXX



P/N EFPANXXX



P/N ESRF0425 OR ESRF0825



P/N ESRK0025 OR ESRK0050



P/N ETRKNXXL/R



P/N E2030010



P/N E2030013



P/N ETRKMKXX



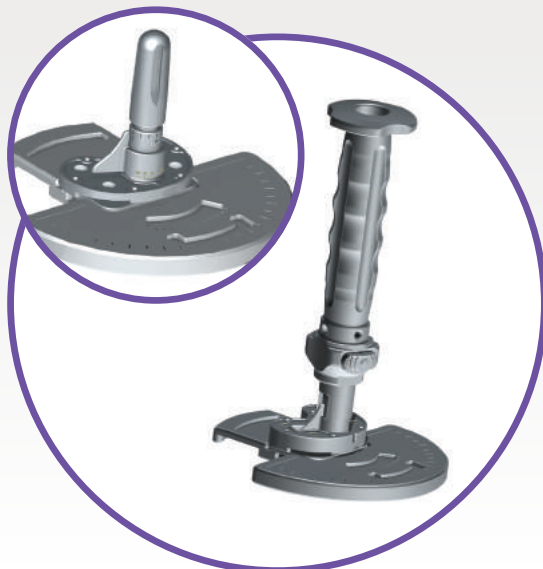
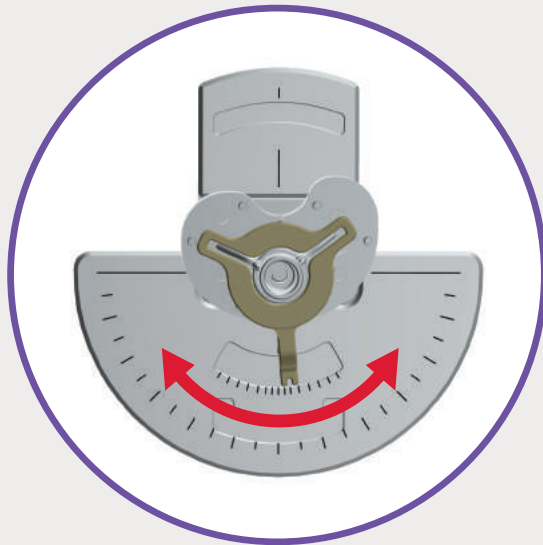
P/N E2030015



P/N ESCXXXXX



P/N E2030009



Tibial implant assembly

Follow one of the four assembly methods dictated by the previous preparations.

NOTE: The tibial implants are packaged with a polyethylene plug. Place the plug in the trunnion if no stem extension is being used on the tibia to prevent cement from entering the trunnion

NOTE: When using a canal filling stem it is recommended to assemble the slot of the stem running in the anterior-posterior direction or in a way that the slot is able to be viewed on an anterior-posterior x-ray.

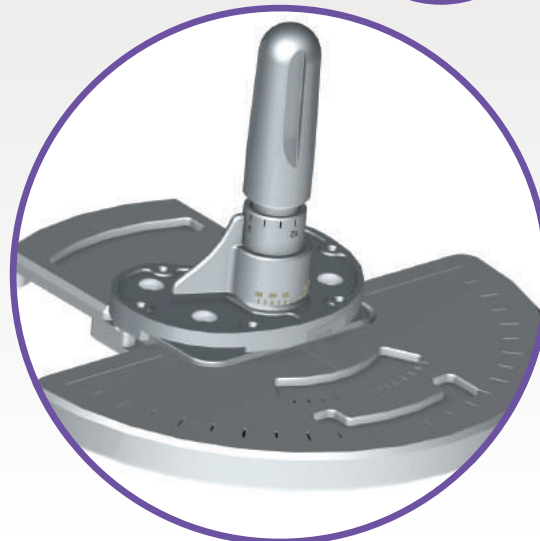
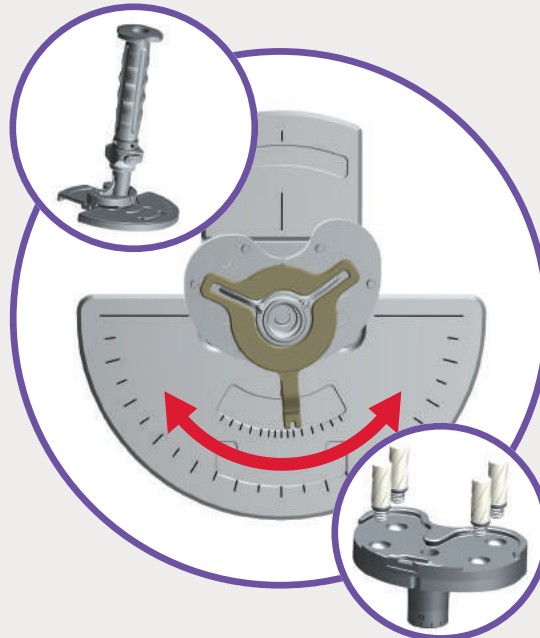
Stem only

- Place the appropriate tibial base implant onto the impactation platform and impactation platform insert.
- Align the modular keel implant using the keel alignment guide.
- Impact the modular keel implant with three firm blows using the keel impactor.
- The thread extension can be connected to the keel impactor for alignment to the tibial base implant during impactation, if preferred.
- Place the appropriate stem into the trunnion of the implant and impact with three firm mallet blows.

Augment(s) and stem

- Place the assembled tibial base onto the impaction platform and impaction platform insert.
- Align the modular keel implant according to the trial assembly using the keel alignment guide.
- Impact the modular keel implant with three firm blows using the keel impactor.
- The thread extension can be connected to the keel impactor for alignment to the tibial base implant during impactions, if preferred.
- Remove the construct from the impaction platform and assemble the appropriate tibial augments.
- Tibial augments are attached by aligning the three centering pegs on the tibial augment with the three centering pegs on the tibial base with the three corresponding depressions on the tibial base.
- Utilizing the packaged screws, secure the augments to the tibial base. Plastic starter handles are provided with each augment screw and should be removed once the screw is tightened.
- Continue to tighten with a 3.5mm driver. Replace the construct onto the impaction platform.
- Place the appropriate stem into the trunnion of the implant and impact with three firm mallet blows.

NOTE: The rotation of the modular keel implant is limited if an augment implant is present.



P/N ETRKNXXL/R



P/N E2030010



P/N E2030013



P/N ETRKMKXX



P/N ETHXXXXX



P/N E2030015



P/N E2030009



P/N ESCXXXXX



P/N ETRKNXXL/R



P/N E2030010



P/N E2030013



P/N ETRKMKXX



P/N E2030015



P/N E2030009



P/N ESRK0X25



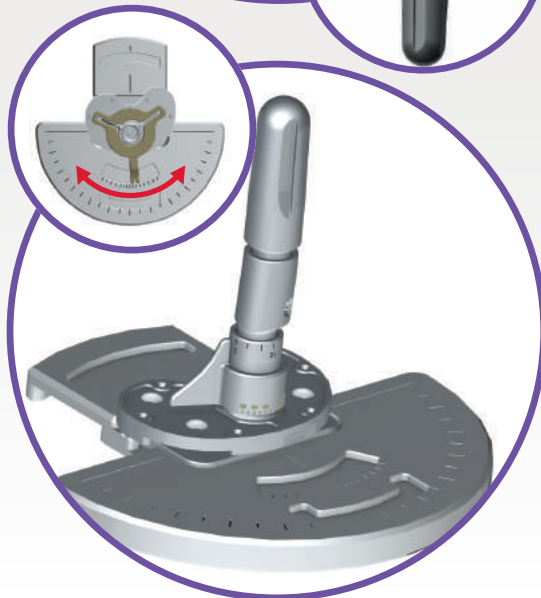
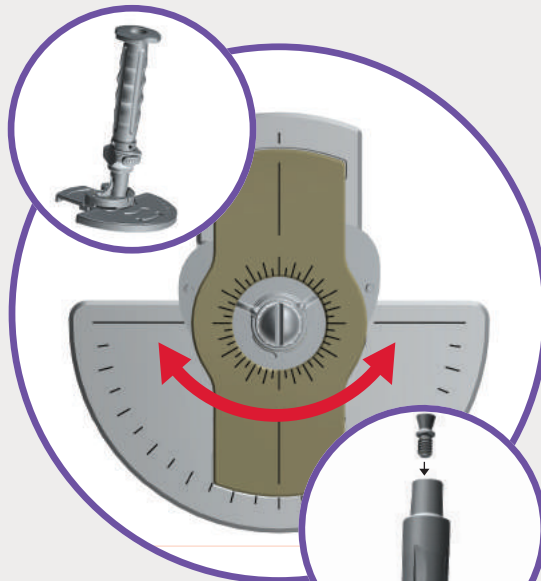
P/N E2030014



P/N ESCXXXXX



P/N E2030014



Offset/extension adapter and stem

- Place the appropriate tibial base implant onto the impaction platform and impaction platform insert.
- Align the modular keel implant according to the trial assembly using the keel alignment guide.
- Impact the modular keel implant with three firm blows using the keel impactor.
- The thread extension can be connected to the keel impactor for alignment to the tibial base implant during impaction, if preferred.
- Screw the secondary locking screw that was packaged with the adapter into the top of the appropriate stem extension and tighten with a 3.5mm driver.

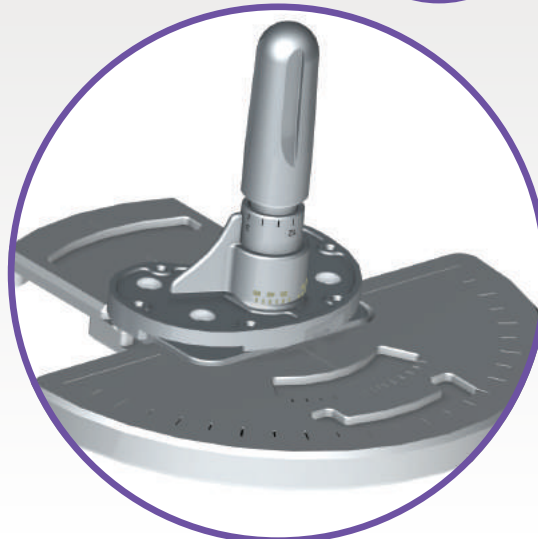
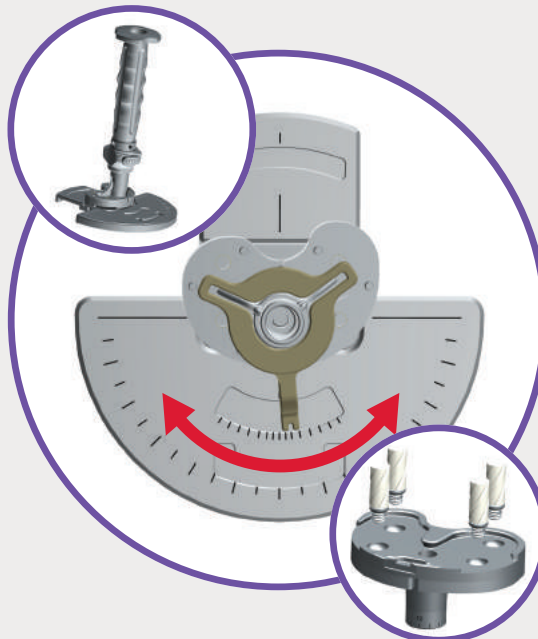
NOTE: It may be necessary to back out the side set screws slightly prior to impaction.

- Place the offset/extension adapter implant onto tibial base. If using an offset, use the offset alignment guide to position the offset adapter implant in the proper orientation as previously determined by the broach construct.
- Place the appropriate stem assembled with the secondary locking screw into the adapter and impact with **three firm mallet blows**.
- Tighten down the side screws with the hexalobe driver.

Augment(s), offset/extension adapter, and stem

- Place the assembled tibial base onto the impaction platform and impaction platform insert.
- Align the modular keel implant according to the trial assembly using the keel alignment guide.
- Impact the modular keel implant with three firm blows using the keel impactor.
- The thread extension can be connected to the keel impactor for alignment to the tibial base implant during impaction, if preferred.
- Remove the construct from the impaction platform and assemble the appropriate tibial augments.
- Tibial augments are attached by aligning the three centering pegs on the tibial augment with the three corresponding depressions on the tibial base.
- Utilizing the packaged screws, secure the augments to the tibial base. Plastic starter handles are provided with each augment screw and should be removed once the screw is tightened. Replace the construct onto the impaction platform.
- Screw the secondary locking screw that was packaged with the adapter into the top of the appropriate stem extension and tighten with a 3.5mm driver.
- Place the stem or offset/extension adapter implant onto the tibial base. If using an offset, use the offset alignment guide to position the offset adapter implant in the proper orientation as previously determined by the broach construct.
- Place the appropriate stem assembled with the secondary locking screw into the adapter and impact with three firm mallet blows.
- Tighten the side set screws with the hexalobular driver.

NOTE: The rotation of the modular keel implant is limited if an augment implant is present.



P/N ETRKXXL/R



P/N E2030010



P/N E2030013



P/N ETRKMXX



P/N ETHXXXXX



P/N E2030015



P/N E2030009



P/N ESRK0X25



P/N E2030014



P/N ESCXXXXX



P/N E2030014



P/N E2001021



P/N E2005101



P/N E3005101



CS insert seating

- Insert the pass through screw at the proximal end of the tibial base implant and tighten with a 3.5 hex driver.
- Ensure the posterior and peripheral captures of the tibial base implant are clear of soft tissue and bone. The tips of the dual reference gauge are contoured to fit in the lock detail to help clear debris. A final assessment of joint stability can be confirmed using the CS trial insert.
- Once the cement has cured, select the appropriate CS insert and push the insert as posteriorly as possible with hand pressure, paying special attention to engage the medial and lateral dovetails.
- Place the impactor tip in the anterior slot of the tibial insert at a 45° angle relative to the tibial base. While maintaining this angle, apply several firm mallet blows directing the insert posteriorly.
- After the anterior edge of the insert has been pushed past the anterior capture of the tibial base, it will automatically drop behind the anterior capture and the insert

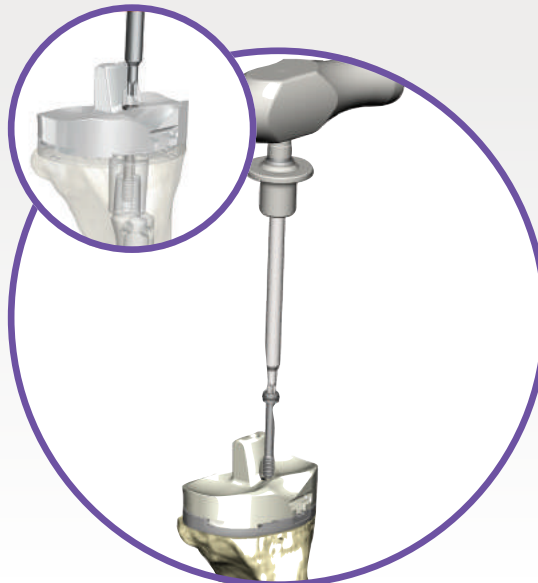
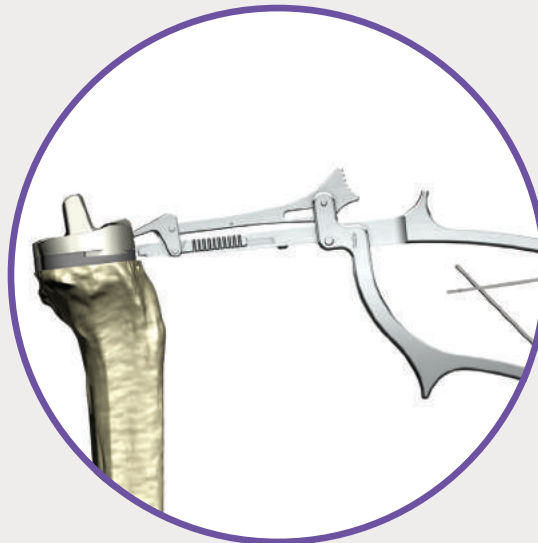
NOTE: The pass through locking screw is packaged by itself.

EVOLUTION® CCK insert seating

- Ensure the posterior and peripheral captures of the tibial base implant are clear of soft tissue and bone. The tips of the dual reference gauge are contoured to fit in the lock detail to help clear debris. A final assessment of joint stability can be confirmed using the CCK trial insert.
- Once the cement has cured, select the appropriate CCK insert and push the insert as posteriorly as possible with hand pressure, paying special attention to engage the medial and lateral dovetails.
- Place the impactor tip in the anterior slot of the tibial insert at a 45° angle relative to the tibial base. While maintaining this angle, apply several firm mallet blows directing the insert posteriorly.
- After the anterior edge of the insert has been pushed past the anterior capture of the tibial base, it will automatically drop behind the anterior capture and the insert face will be flush against the surface of the tibial base.
- Once the insert is in place, thread the pass-through locking screw into the insert.
- Hold the base plate with the counter torque tool by placing the lower jaw in the anterior cavity of the base plate. Then, slide the locking shim forward by pressing forward and down on the thumb toggle.
- To ensure the base plate is held securely, squeeze the handle until the upper jaw slides forward and engages with the insert.
- Use the secondary lock torque wrench to completely thread the locking screw until the screw audibly clicks into place.

NOTE: The pass through locking screw is packaged with the insert.

NOTE: Please reference the Evolution® Revision Knee Ordering Guide(s) for relevant list of part numbers applicable to this technique.



P/N E2001021



P/N E2005101



P/N E3005101



P/N E6001004



P/N E6001006



P/N E6001003



P/N E1030001



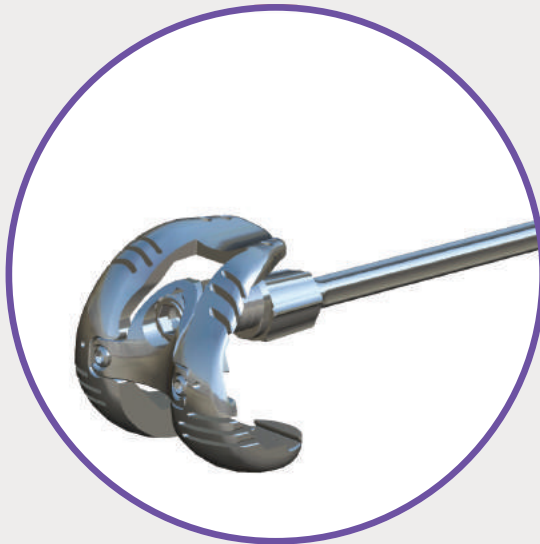
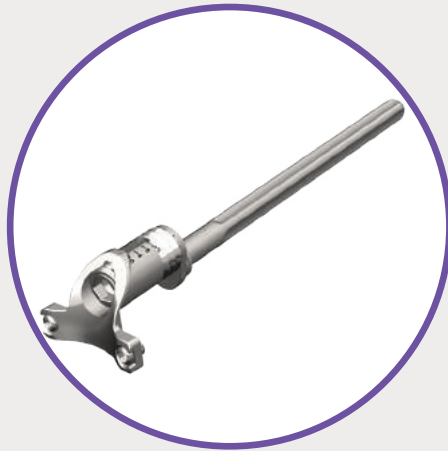
P/N E1030002 OR E1030003



P/N E631346L/R OR E631078L/R



P/N E6001002



Fixed reamer diameter (mm)	Splined cone (mm)	Secondary reamer diameter (mm)
10-15	16	15.5
15.5-17	18	17.5
17.5-19	20	19.5
19.5-21	22	21.5
21.5-23	24	23.5
23.5-24	24	N/A

Addendum

Translating stem adapter technique

NOTE: This step is optional.

NOTE: Use the 3.5mm ball nose hex driver for translating stem assembly.

- Assemble the appropriate translating trial stem or translating offset trial stem with the translating stem adapter.
- If using an offset stem, ensure the offset is set to the previously determined rotation using the laser marking on the medial side of the translating stem adapter.
- Secure the construct by tightening the captured locking screw in the center of the translating stem adapter with the 3.5mm ball nose hex driver.

Splined cone selection and preparation

- Splined cones must be used for fixation of the translating stem construct and require additional preparation of the distal femoral canal.
- Use the chart at the right to determine the proper sized splined cone and secondary reamer based on the diameter of the fixed reamer.
- Using the appropriate secondary reamer, ream approximately one inch into the distal femoral canal.
- Remove the cut-through femoral trial and assemble together with the translating stem construct.
- Align the captured screws on the translating stem adapter construct with the screw holes on the cut-through femoral trial.
- Tighten the two screws on the translating stem adapter with the 3.5mm driver to lock it into place.
- Assemble the appropriate splined cone onto the translating trial stem or translating offset trial stem by sliding it up the stem towards the cut-through femoral trial until snapped into place.

Distal translation

- Ensure the translating stem is set at 0mm. If the stem needs to be collapsed back to 0mm, use the translating hex driver. Turning in a counter clockwise direction will collapse the stem and turning clockwise will extend the stem.
- Using the femoral impactor, impact the construct onto the distal femur letting the stem guide you into alignment with the femoral canal. Ensure the splined cone is fixed securely in the canal.

NOTE: Trials will be assembled in-situ further in the procedure.

- Translate the stem distally to adjust the extension gap. Ensure both sides of the femur are extended equally. If the cut-through femoral trial translates asymmetrically, switch the splined cone to the next larger size for more secure fixation.

NOTE: It is necessary to repeat the secondary reaming step if increasing the size of the splined cone.

- Assess the flexion and extension gaps using the appropriate CS trial insert. Once the desired extension gap and rotation is achieved, pin the cut-through femoral trial through the anterior pin holes.
- Resect for both distal and posterior augments if needed.
- Assemble the trial augments in-situ. These should be done prior to removing the stem for stability.
- Loosen the translating stem adapter from the cut-through femoral trial using a 3.5mm driver and remove the translating stem adapter. Use the slap hammer if needed. Leave the cut-through femoral trial pinned into place.
- If the splined cone remains in the bone, use the threaded splined cone extractor to remove the splined cone.

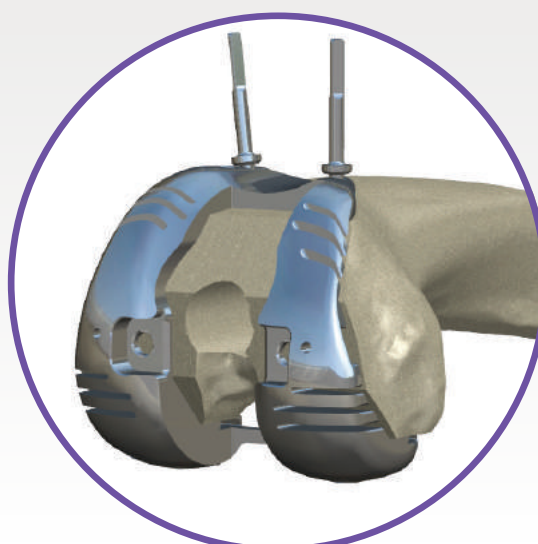
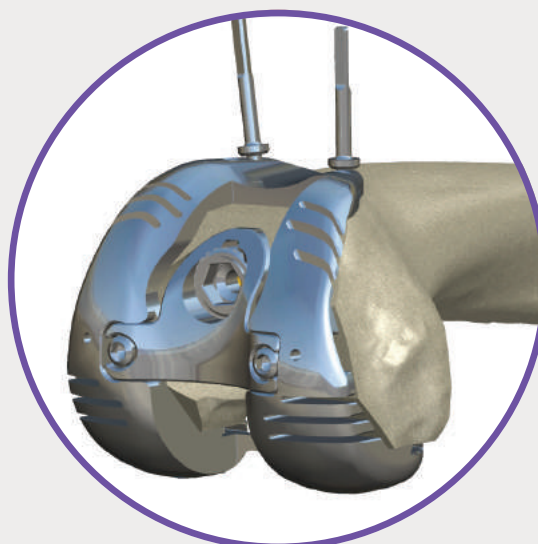
NOTE: The translating stem adapter can extend to a maximum 12mm. This is equivalent to the largest distal augment in the system.



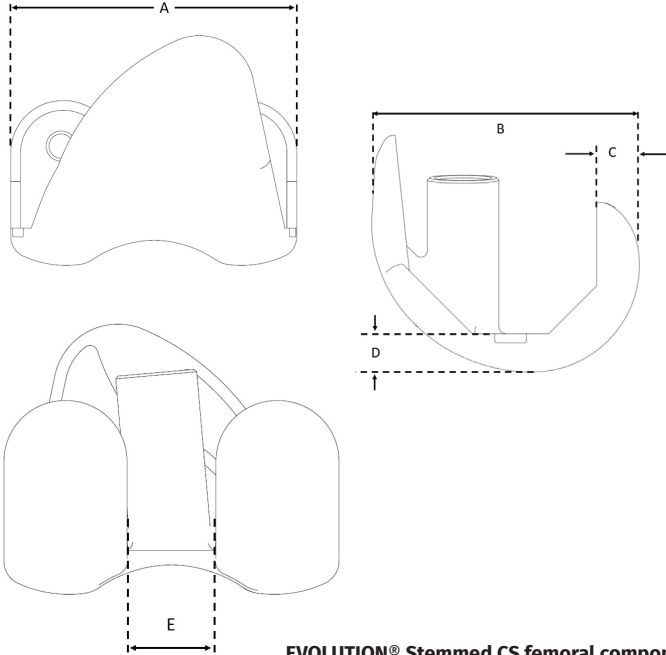
P/N E6001000



P/N E1030000



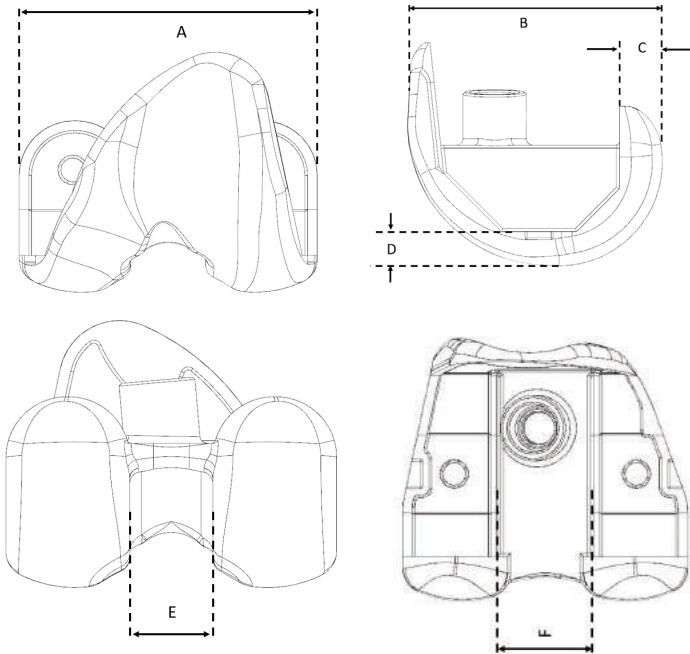
Implant dimensions



EVOLUTION® Stemmed CS femoral component

Size	A	B	C	D	E
3	64	57	10	9	18
4	66	60	10	9	18
5	69	64	11	9	18
6	73	68	11	9	18
7	77	72	11	9	20
8	80	76	11	9	20

Dimensions are in mm

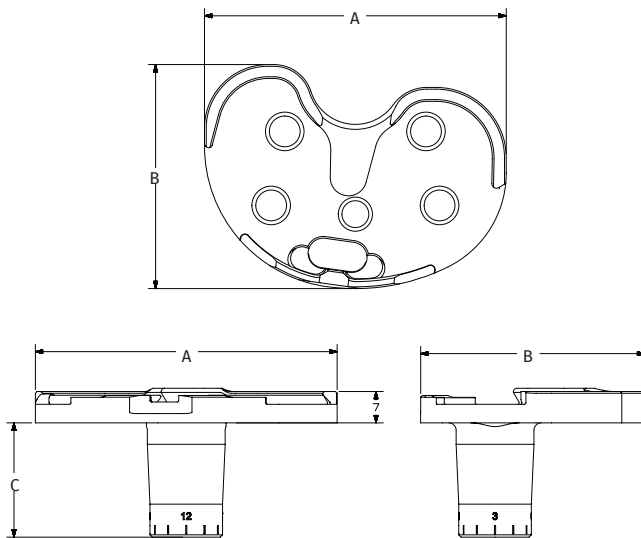


EVOLUTION® Revision Femoral CCK

Size	A	B	C	D	E	F
3	64	57	10	9	18	22
4	66	60	10	9	18	22
5	69	64	11	9	18	22
6	73	68	11	9	18	22
7	77	72	11	9	20	25
8	80	76	11	9	20	25

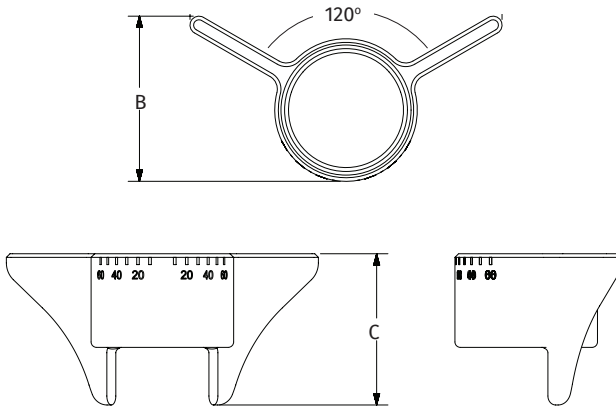
Dimensions are in mm

EVOLUTION® Revision Tibial Base w/ Plugs



Size	A	B	C
1	54	40	25
2	58	43	25
2+	62	46	25
3	62	46	25
4	66	49	25
5	70	52	25
6	74	55	25
6+	78	58	25
7	78	58	25
8	82	61	25
8+	86	64	25

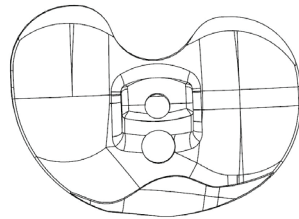
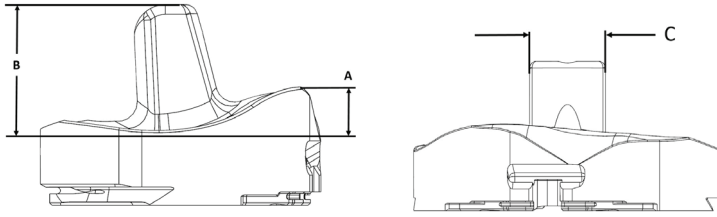
Dimensions are in mm



EVOLUTION® Revision Pressfit Keel Modular

Size	B	C
Small	21	17
Medium	23	21
Large	23	23

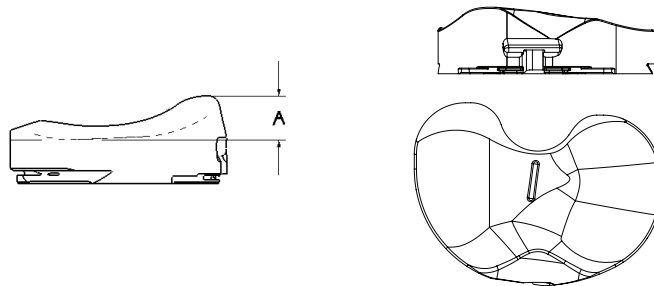
Dimensions are in mm



EVOLUTION® CCK insert
available thicknesses
10, 12, 14, 17, 20, 22, 24mm

Size	A	B	C
3	9	23	17
4	10	23	17
5	10	24	17
6	10	25	17
6+	10	26	20
7	10	26	20
8	10	27	20

Dimensions are in mm



eMP™ CS insert
available thicknesses
10, 12, 14, 17, 20, 24mm

CS	A
1	11
1+	11
2	11
2+	11
3	11
3+	11
4	11
4+	11
5	11
5+	11
6	11
6+	11
7	11
7+	11
8	12

Dimensions are in mm

Cementless information

		Canal filling stem diameter														
		10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Reamer diameter	10	0.5														
	10.5	0.25														
	11		0.5													
	11.5		0.25													
	12			0.5												
	12.5			0.25												
	13				0.5											
	13.5				0.25											
	14					0.5										
	14.5					0.25										
	15						0.5									
	15.5						0.25									
	16							0.5								
	16.5							0.25								
	17								0.5							
	17.5								0.25							
	18									0.5						
	18.5									0.25						
	19										0.5					
	19.5										0.25					
	20											0.5				
	20.5											0.25				
	21												0.5			
	21.5												0.25			
22													0.5			
22.5													0.25			
23														0.5		
23.5															0.25	
24																0.5

Cement mantle information

		Cemented stem diameter											
		10	12	14	16	17	18						
Reamer diameter	10	Cement mantle per side											
	10.5							.25					
	11							.5					
	11.5							.75					
	12							1					
	12.5							1.25	.25				
	13							1.50	.5				
	13.5							1.75	.75				
	14							2	1				
	14.5							2.25	1.25	.25			
	15							2.50	1.50	.5			
	15.5							2.75	1.75	.75			
	16							3	2	1			
	16.5							3.25	2.25	1.25	.25		
	17							3.50	2.50	1.50	.5		
	17.5							3.75	2.75	1.75	.75	.25	
	18							4	3	2	1	.5	
	18.5							4.25	3.25	2.25	1.25	.75	.25
	19							4.50	3.50	2.50	1.50	1	.5
	19.5							4.75	3.75	2.75	1.75	1.25	.75
	20							5	4	3	2	1.50	1
	20.5							5.25	4.25	3.25	2.25	1.75	1.25
	21							5.50	4.50	3.50	2.50	2	1.50
	21.5							5.75	4.75	3.75	2.75	2.25	1.75
22	6	5	4	3	2.50	2							
22.5	6.25	5.25	4.25	3.25	2.75	2.25							
23	6.50	5.50	4.50	3.50	3	2.50							
23.5	6.75	5.75	4.75	3.75	3.25	2.75							
24	7	6	5	4	3.50	3							

Explant Information

IMPORTANT NOTE: *If the removal of the implant is required due to revision or failure of the device, the surgeon should contact the manufacturer using the contact information located on the back cover of this surgical technique to receive instructions for returning the explanted device to the manufacturer for investigation.*

Insert replacement

A narrow osteotome may be inserted into the anterior region of the insert to facilitate removal. A hemostat may be used to remove the insert once it is no longer locked to the tibial base. Care must be taken not to scratch or mar any component that is not intended to be removed.

Femur, tibia, and patella components

To remove the components, small osteotomes, power saws, or other surgical instruments may be used to disrupt the bone-cement interface and bone ingrowth into porous coating. Once the components have been removed, rongeurs or small osteotomes as well as other surgical instruments may be used to remove the remaining cement.



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