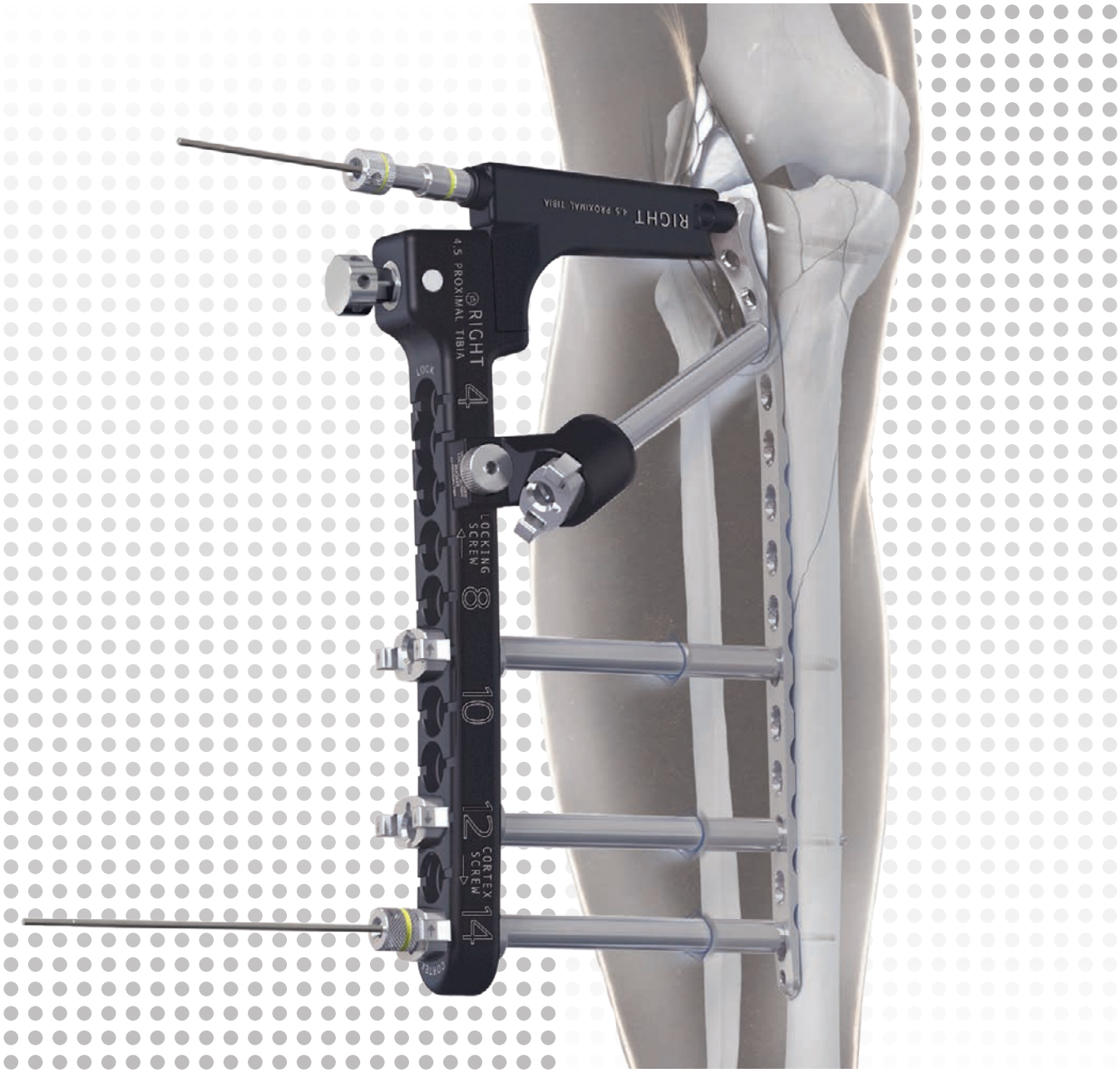
# LCP Proximal Tibial Plate 4.5/5.0

## with Periarticular Aiming Arm Instruments

## Surgical Technique




approved by AO Technical Commission

DePuy Synthes
THE ORTHOPAEDICS COMPANY OF Johnson & Johnson

Image intensifier control

This description alone does not provide sufficient background for direct use of DePuy Synthes products. Instruction by a surgeon experienced in handling these products is highly recommended.

**Processing, Reprocessing, Care and Maintenance**
For general guidelines, function control and dismantling of multi-part instruments, as well as processing guidelines for implants, please contact your local sales representative or refer to:
http://emea.depuysynthes.com/hcp/reprocessing-care-maintenance
For general information about reprocessing, care and maintenance of DePuy Synthes reusable devices, instrument trays and cases, as well as processing of DePuy Synthes non-sterile implants, please consult the Important Information leaflet (SE_023827) or refer to:
http://emea.depuysynthes.com/hcp/reprocessing-care-maintenance

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# LCP Proximal Tibial Plate 4.5/5.0

The DePuy Synthes LCP Proximal Tibial Plate 4.5/5.0 is part of the LCP Periarticular Plating System, which merges locking screw technology with conventional plating techniques.

The Locking Compression Plate (LCP) has combi-holes in the plate shaft that combine a dynamic compression unit (DCU) hole with a locking screw hole.

# Periarticular Aiming Arm Instruments

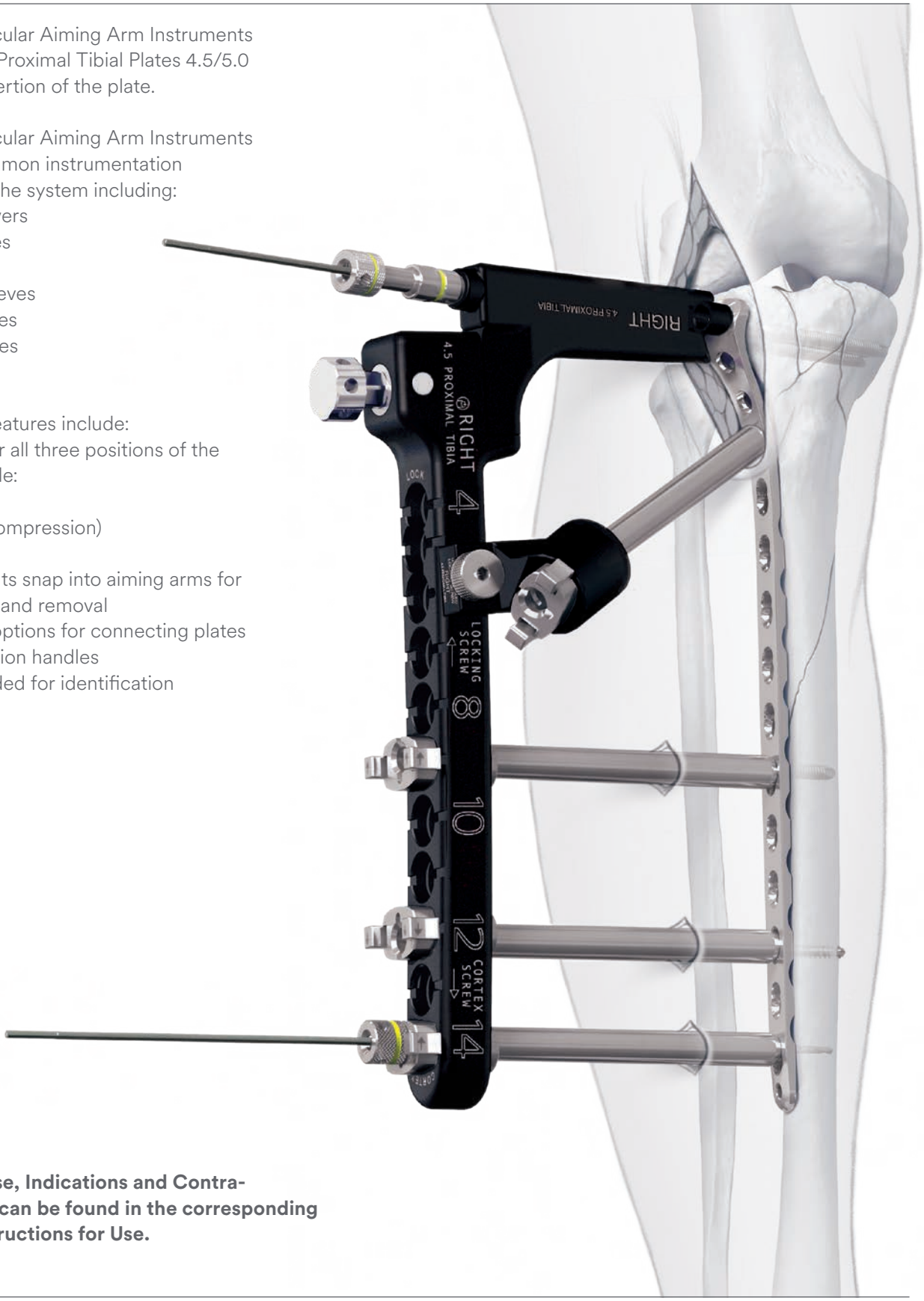
The Periarticular Aiming Arm Instruments for the LCP Proximal Tibial Plates 4.5/5.0 facilitate insertion of the plate.

The Periarticular Aiming Arm Instruments provide common instrumentation throughout the system including:

- Screwdrivers
- Drill guides
- Drill bits
- Guide sleeves
- Drill sleeves
- Wire guides
- Trocars

Additional features include:

- Aiming for all three positions of the combi-hole:
  - Locking
  - Load (compression)
  - Neutral
- Instruments snap into aiming arms for assembly and removal
- Multiple options for connecting plates and insertion handles
- Color-coded for identification




**Intended Use, Indications and Contra-indications can be found in the corresponding system Instructions for Use.**

# The AO Principles of Fracture Management

## Mission

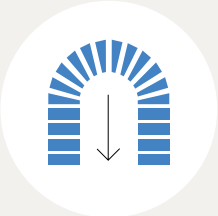
The AO's mission is promoting excellence in patient care and outcomes in trauma and musculoskeletal disorders.

### AO Principles[1,2]

**1.**

Fracture reduction and fixation to restore anatomical relationships.

**2.**



Fracture fixation providing absolute or relative stability, as required by the "personality" of the fracture, the patient, and the injury.

**3.**

Preservation of the blood supply to soft-tissues and bone by gentle reduction techniques and careful handling.

**4.**

Early and safe mobilization and rehabilitation of the injured part and the patient as a whole.

[1] Müller ME, Allgöwer M, Schneider R, Willenegger H. Manual of Internal Fixation. 3rd ed. Berlin, Heidelberg New York: Springer 1991.
[2] Buckley RE, Moran CG, Apivatthakakul T. AO Principles of Fracture Management: 3rd ed. Vol. 1: Principles, Vol. 2: Specific fractures. Thieme; 2017.

# Surgical Technique

## 1. Preoperative planning

| Sets | |
|---|---|
| 01.120.424 | LCP Proximal Tibial Plates 4.5/5.0 in Modular Tray |
| 01.120.035 | Periarticular Aiming Arm Instruments for LCP Proximal Tibial Plate 4.5/5.0 |
| 01.120.021 | Periarticular Instruments |
| | LCP Large Fragment Instruments and Standard Instruments |
| | Large Fragment Screws including Cannulated Locking and Conical Screws |

Complete a preoperative radiographic assessment and prepare the preoperative plan. Position the patient supine on a radiolucent table. Viewing the proximal tibia under image intensifier control in both the lateral and AP views is necessary.

**Note:**

For information on fixation principles using conventional and locked plating techniques,please refer to the DePuy Synthes Locking Compression Plate (LCP) surgical technique.

## 2. Attach insertion handle

| Instruments | |
|---|---|
| 03.120.002 | Insertion Handle for Aiming Arm, for LCP Proximal Tibial Plate 4.5/5.0, right |
| 03.120.005 | Insertion Handle for Aiming Arm for LCP Proximal Tibial Plate 4.5/5.0, left |
| 03.120.020 | Wire Guide ∅ 2.5, for Lock. Screws ∅ 5.0, for Cannulated Locking Screws ∅ 5.0 mm and for Cann. Conical Screws ∅ 5.0 mm |
| 03.120.021 | Nut for No. 03.120.020 |
| 03.120.027 | Locking Bolt, for Nos. 03.120.002 and 03.120.005, length 151 mm |

Thread a nut (flats first) completely onto the locking bolt.

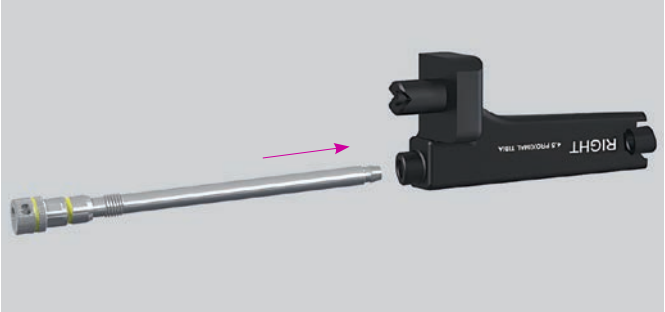
Insert the locking bolt assembly through the central hole of the insertion handle and finger-tighten its threads into the central locking hole in the plate head. Finger-tighten the nut against the handle.

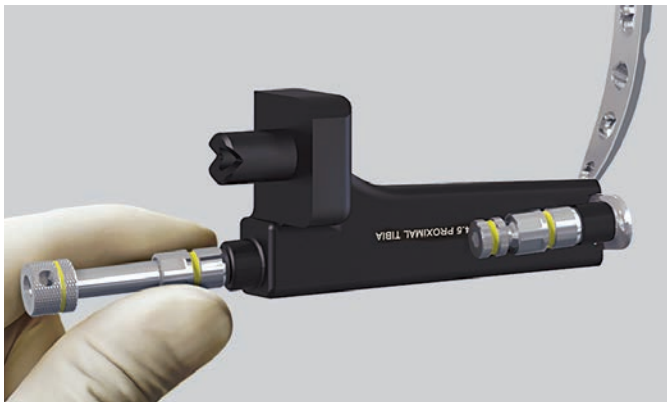
Thread a nut onto a wire guide for screws ∅ 5.0 until its flats stop flush against the head of the post.

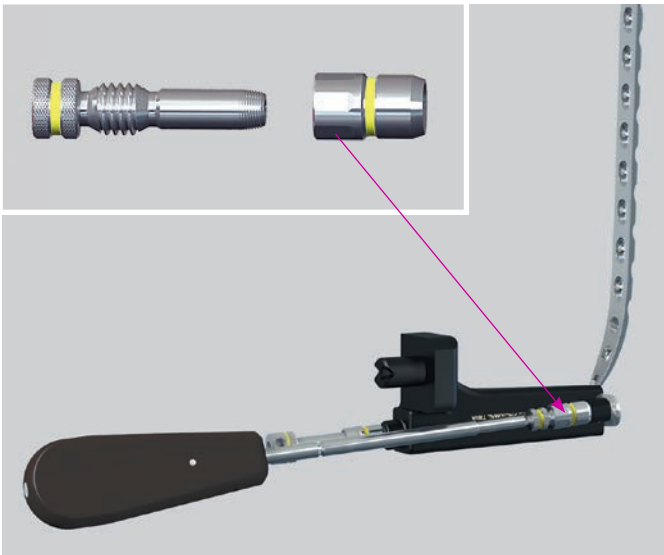
Insert an assembled wire guide with nut through both the anterior and posterior insertion handle holes and thread them into the corresponding locking holes in the proximal plate head. Finger-tighten each wire guide into the plate.

| Optional instruments | |
|---|---|
| 313.930 | Screwdriver, hexagonal |
| 314.050 | Screwdriver, hexagonal, cannulated |

A hexagonal screwdriver can be used to facilitate insertion and removal of wire guides.



Turn each of the nuts down their wire guide and finger-tighten to firmly clamp the insertion handle to the plate.

**■ Note:**

At the surgeon's discretion (e.g. proximal fracture treated with a short plate) it may be decided to do the surgery without using the aiming arm and the corresponding instruments. Then, screws can be inserted by applying the technique described in the Locking Compression Plate (LCP) surgical technique.

## 3. Make incision

### Lateral S incision

A lateral S incision is recommended when a simple articular (AO classification 41-C1) or extra-articular fracture (AO classification 42- or 41-A) is present.

### Anterolateral incision

In the presence of a complex intra-articular fracture (AO classification 41-C2 or C3), perform an anterolateral approach. Perform arthrotomy to expose the joint for reduction. Extend the incision for adequate exposure of the joint for reduction and anatomic fixation.

## 4. Reduce articular surface

| Instrument | |
|---|---|
| 394.350 | Large Distractor, complete |

Reduce the fracture fragments and confirm reduction under image intensifier control. Fragments may be reduced using independent Kirschner wires; however, Kirschner wire holes are also provided in the plate for reduction, plate position, or fixation.

The locking screws do not provide interfragmentary or plate-to-bone compression; therefore, any desired compression must be achieved with traditional lag screws. The angular fragments must be reduced and compression must be obtained before applying the LCP Proximal Tibial Plate 4.5/5.0 with locking screws. Alternatively cannulated conical screws ∅ 5.0 mm can be used through the head of the plate to compress the plate to the bone.

**Notes:**

- Before reduction, application of an external fixator or large distractor may facilitate reduction of the joint.
- To verify that lag screws will not interfere with plate placement, hold the plate laterally to the bone.

## 5. Insert plate

Using the insertion handle assembly, insert the plate submuscularly proximal-to-distal, starting at the tibial plateau. Slide the plate distally until the plate head is oriented properly on the tibial plateau.

**▲ Precautions:**

- Instruments and screws may have sharp edges or moving joints that may pinch or tear user's glove or skin.
- Handle devices with care and dispose worn bone cutting instruments in an approved sharps container.

## 6. Determine plate position

| Instrument | |
|---|---|
| 338.002 | Guide Wire ∅ 2.5 mm, with drill tip, length 300 mm, Cobalt-Chrome Alloy |
| or | |
| 03.120.026 | Guide Wire ∅ 2.5 mm, with drill tip, length 300 mm, Cobalt-Chrome Alloy |

Using anatomic landmarks and image intensifier control, position the plate on the intact or reconstructed plateau without attempting to reduce the distal portion of the fracture. Use the handle and/or the wire guides to help position the plate on the bone.

Insert a guide wire ∅ 2.5 mm through a wire guide for screws ∅ 5.0. Readjust the plate position if necessary. Place a second guide wire through the other wire guide to prevent rotation of the plate, and secure provisional fixation of the plate to the tibial plateau.

Place a third guide wire through the locking bolt and central hole in the plate head.

Advance each guide wire until it reaches either the medial wall of the tibial plateau, or the desired screw tip location when placing convergent screws.

**■ Note:**

Additional Kirschner wires ∅ 2.0 mm may be placed in the proximal Kirschner wire holes to hold the plate in position.

**▲ Precaution:**

Kirschner wires are single-use items, do not re-use.

## 7. Secure aiming arm to handle and plate

| Instruments | |
|---|---|
| 03.120.001 | Aiming Arm, for LCP Proximal Tibial Plate 4.5/5.0, right |
| 03.120.004 | Aiming Arm, for LCP Proximal Tibial Plate 4.5/5.0, left |
| 03.120.014 | Guide Sleeve for Periarticular Aiming Arm Instruments |
| 03.120.015 | Trocar with Handle for No. 03.120.014 |
| 03.120.022 | Handle for Percutaneous Drill Guide ∅ 4.3 mm, with thread |
| 324.215 | Wire Guide 5.0, percutaneous, for Guide Wire Ø 2.5 mm |


Attach the appropriate aiming arm by tightening its connecting bolt firmly into the insertion handle.

Locate the hole in the aiming arm that corresponds with the most distal combi-hole in the plate. The aiming arm is numbered to facilitate locating the most distal hole in the plate.

Make a small skin incision at this location.


| Optional instrument | |
|---|---|
| 03.120.016 | Scalpel Handle for Periarticular Aiming Arm Instruments |

Attach a blade to the scalpel holding end of the handle.

The scalpel handle will pass through the aiming arm holes and assist in performing a minimally invasive incision. (The scalpel handle, with a #10 blade, will only travel through the aiming arm as far as the top edge of the plate.)

Remove the scalpel from the aiming arm.

**■ Note:**

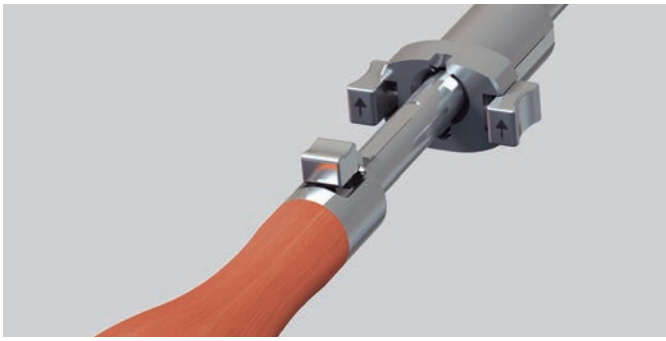
Remove the scalpel blade before storage in the case.

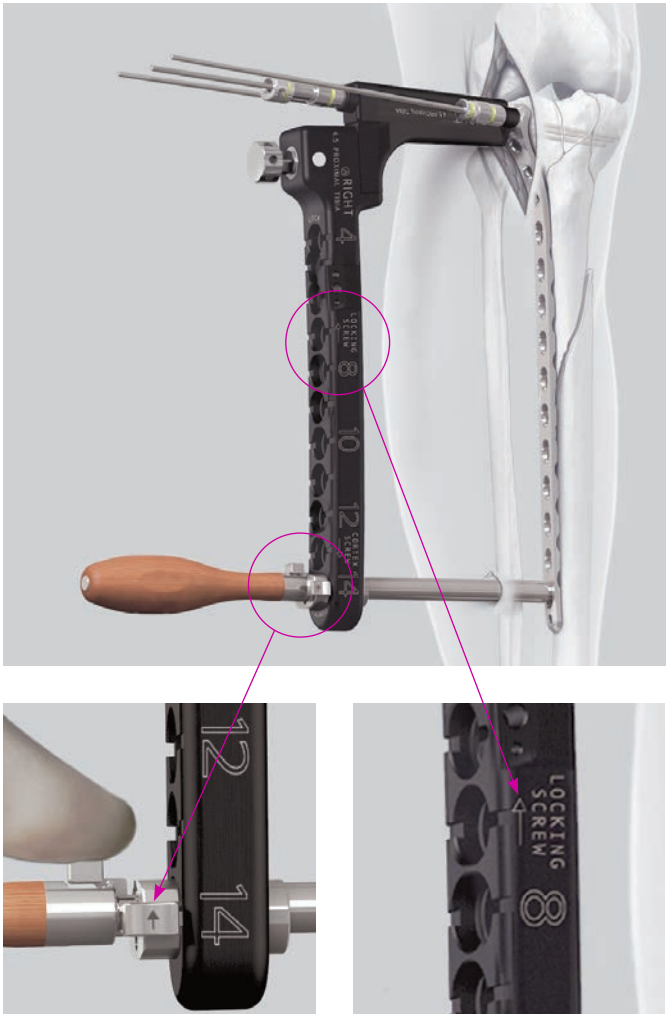
Insert the trocar with handle into a guide sleeve for peri-articular aiming arm instruments and align the self-retaining features until the trocar snaps into place within the guide sleeve.

Orient the arrow on the guide sleeve in the direction of the “LOCKING SCREW” arrow on the aiming arm, and then use the assembled trocar and guide sleeve to push down to the plate through the incision.

Push the assembly completely down, aligning the self-retaining features, until it snaps into the aiming arm.

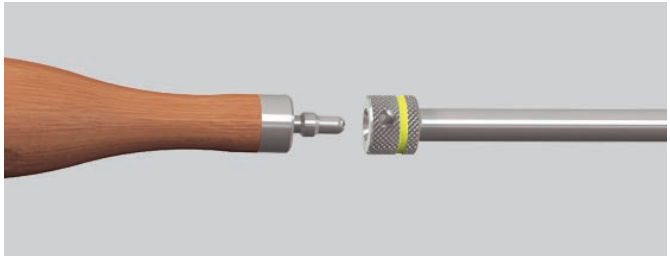
Remove the trocar with handle by gently depressing its release mechanism and slowly pulling it away from the guide sleeve.





Thread the handle for percutaneous drill guide into a percutaneous wire guide 5.0.

Insert the handle and wire guide assembly through the guide sleeve, and securely thread it into the plate. Turn the handle counterclockwise to disengage and remove it from the wire guide.



**■ Note:**

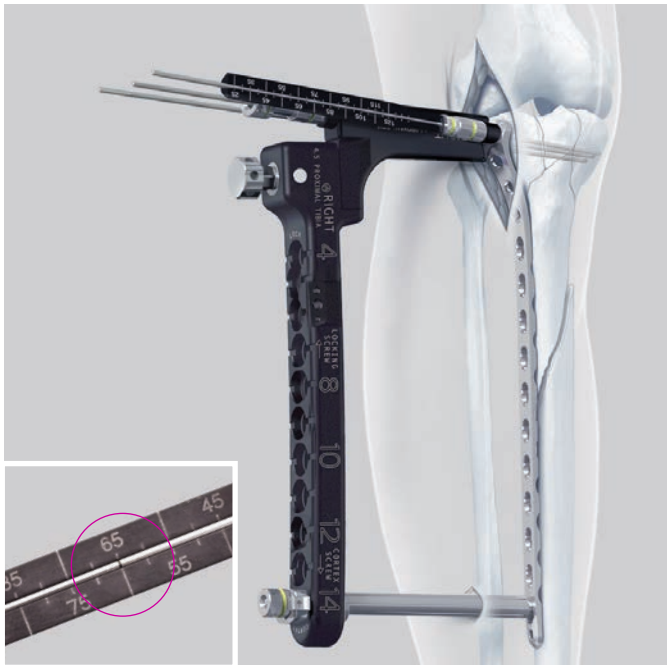
Be sure to securely tighten the wire guide to the plate to achieve a stable construct between the aiming arm and the plate.


| **Alternative instrument** | |
|---|---|
| 324.203 | Drill Guide ∅ 4.3 mm, percutaneous, with thread |

Alternatively, a percutaneous drill guide can be used in the most distal hole.

## 8. Insert proximal screws ∅ 5.0 mm in plate head

| Instruments | |
|---|---|
| 314.119 | Screwdriver Shaft Stardrive 4.5/5.0, T25, self-holding, for AO/ASIF Quick Coupling |
| 314.560 | Screwdriver Shaft, hexagonal, large, ∅ 3.5 mm, length 165 mm, for Quick Coupling |
| 310.634 | Drill Bit ∅ 4.3 mm, cannulated, length 200 mm, with Quick Coupling |
| 314.050 | Screwdriver, hexagonal, cannulated, for Cannulated Screws ∅ 6.5 and 7.3 mm |
| 314.230 | Screwdriver Shaft, hexagonal, cannulated |
| 319.701 | Measuring Device for Cannulated Locking Screws and Cannulated Conical Screws ∅ 5.0 and 7.3 mm |
| 511.774 | Torque Limiter, 4 Nm, for AO/ASIF Quick Coupling for Reamers |





**■ Note:**

Before proceeding, confirm plate head placement.

Use clinical examination and image intensifier control to confirm that:

- Screw trajectories in the proximal locking holes are parallel to the joint in the transverse plane, and the plate is oriented properly on the plateau;
- Screw and plate placement are consistent with the preoperative plan; and
- Alignment of the plate to the shaft of the tibia is correct in both the AP and lateral views. Placement of the plate at this point will determine the final flexion/extension reduction.

Use the measuring device for cannulated locking screws to measure for screw lengths of the anterior and posterior head screws. Screw length is indicated by the etched line on the guide wire.

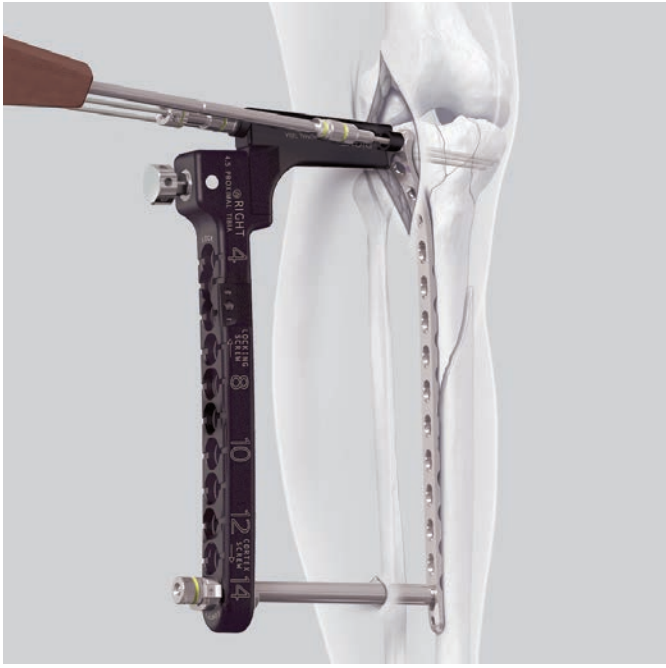
**■ Notes:**

- For an accurate screw length measurement, the measuring device must contact the end of the wire guide for screws ∅ 5.0. This will place the tip of the screw at the tip of the guide wire.
- If the plate shifts during screw insertion, the guide wires must be removed and reinserted for the screws to lock to the plate properly.
- The self-drilling, self-tapping flutes of the cannulated conical screws ∅ 5.0 mm make predrilling and pretapping unnecessary in most cases. In dense bone, the lateral cortex can be predrilled using the cannulated drill bit ∅ 4.3 mm, for screws ∅ 5.0 mm.

Remove the anterior and posterior wire guide assemblies and insert the appropriate length screw over the guide wire and into the bone, using the cannulated hexagonal screwdriver. Locking screws may be inserted using power equipment. However, final tightening should be done by hand.

### ■ Notes:

- To compress the plate to the lateral tibial plateau, it is necessary to use a conical screw before inserting any locking screws. Conical screws should be replaced with locking screws after reduction is complete.
- It is recommended to keep the central locking bolt connected and not place a screw centrally at this time. One of the connecting points anterior, posterior or central in the plate head must remain in place to ensure that the aiming arm alignment is maintained.
- If the 4 Nm torque limiting attachment is unavailable, do not tighten the screws to the plate under power. Perform final tightening by hand.
- If a combination of cortex and locking screws is used, a cortex screw should be inserted first to pull the plate to the bone.
- If locking screws have been used to fix the plate to a fragment, subsequent insertion of a cortex screw in the same fragment without loosening and retightening the locking screw is not recommended.




## 9. Secure aiming arm and plate to diaphysis

| Instrument | |
|---|---|
| 338.002 | Guide Wire ∅ 2.5 mm, with drill tip, length 300 mm, Cobalt-Chrome Alloy |
| or | |
| 03.120.026 | Guide Wire ∅ 2.5 mm, with drill tip, length 300 mm, Cobalt-Chrome Alloy |

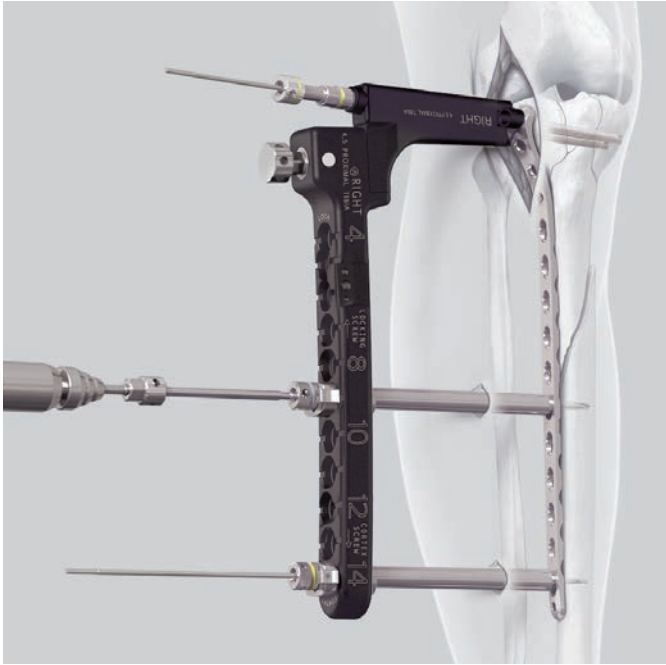
A guide wire with drill tip ∅ 2.5 mm can be used to secure the plate's location if a percutaneous wire guide has been threaded into the distal plate hole.

| Alternative instrument | |
|---|---|
| 324.213 | Drill Bit ∅ 4.3 mm, percutaneous, calibrated, length 300/200 mm, for Quick Coupling |

Alternatively, a percutaneous drill bit, drilled through a distally placed percutaneous drill guide to the far cortex, can be used to stabilize the distal portion of the plate on the bone.

## 10. Use of pull reduction device (optional)

| Instruments | |
|---|---|
| 03.120.014 | Guide Sleeve for Periarticular Aiming Arm Instruments |
| 03.120.023 | Pull Reduction Device for Percutaneous Drill Guide ∅ 4.3 mm, with Nut |
| 321.160 | Combination Wrench ∅ 11.0 mm |
| 324.203 | Drill Guide ∅ 4.3 mm, percutaneous, with thread |




Additional correction can be completed prior to placement of screws in both main fracture fragments. The pull reduction device with quick coupling is placed through the guide and plate holes to pull or push bone fragments in relation to the plate. This instrument can be used for:

- Repositioning of bone fragments
- Predrilling dense or thick cortical bone before placing a locking screw ∅ 5.0 mm

**■ Note:**

The pull reduction device must be used with a percutaneous drill guide ∅ 4.3 mm and a guide sleeve.

Thread the nut for pull reduction device over the drill tip of the pull reduction device.

Thread a percutaneous drill guide ∅ 4.3 mm into the plate. Attach the pull reduction device to a power tool (quick coupling). Insert it through the percutaneous drill guide.

With the nut in its highest position possible, begin power insertion of the pull reduction device. Stop insertion before the end of the threaded portion meets the plate surface.

**■ Note:**

Attempting to advance beyond this point may cause threads to strip in bone.

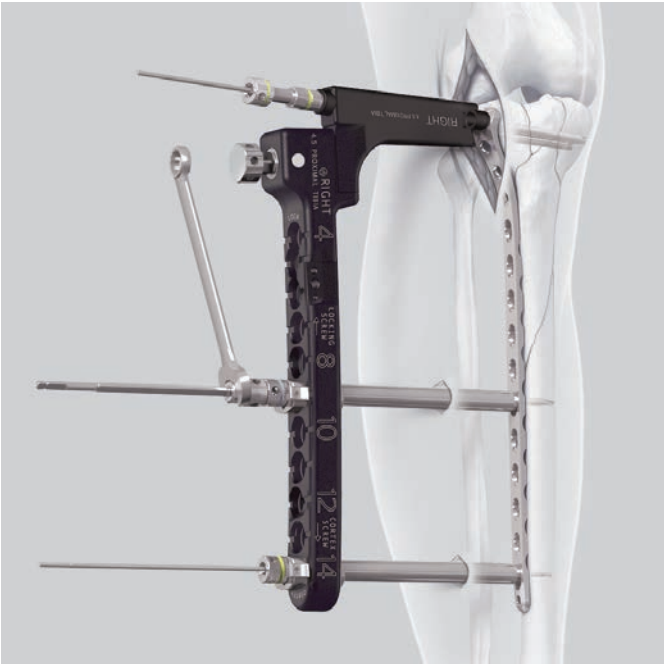
Remove the power tool and begin tightening the nut toward the drill guide, while monitoring progress under image intensifier control. The combination wrench can facilitate tightening.

Stop when the desired reduction is achieved.

The pull reduction device is 4.3 mm in diameter and calibrated for screw length measurement, to allow later placement of a locking screw ∅ 5.0 mm in the same hole.

| **Optional instrument** | |
|---|---|
| 03.120.025 | Stopper for Periarticular Aiming Arm Instruments |

Mark each screw location in the aiming arm using a stopper for reference as screw insertion proceeds.



## 11. Insert cortex screws ∅ 4.5 mm

| Instruments | |
|---|---|
| 03.400.102 | Screwdriver Shaft 3.5, hexagonal, Stardrive T25 |
| and | |
| 03.400.112 | Handle for Screwdriver Shaft 3.5, hexagonal, Stardrive T25 |
| 314.119 | Screwdriver Shaft Stardrive 4.5 / 5.0, T25, self-holding, for AO/ASIF Quick Coupling |
| or | |
| 314.560 | Screwdriver Shaft, hexagonal, large, ∅ 3.5 mm, length 165 mm, for Quick Coupling |
| 03.120.014 | Guide Sleeve for Periarticular Aiming Arm Instruments |
| 03.120.015 | Trocar with Handle for No. 03.120.014 |
| 03.120.017 | Drill Sleeve ∅ 3.2 mm, for neutral position, for Periarticular Aiming Arm Instruments |
| 03.120.018 | Drill Sleeve ∅ 3.2 mm, for load position, for Periarticular Aiming Arm Instruments |
| 03.120.025 | Stopper for Periarticular Aiming Arm Instruments |
| 324.212 | Drill Bit ∅ 3.2 mm, percutaneous, calibrated, length 300/200 mm, for Quick Coupling |

Choose an aiming arm hole through which to make an appropriate incision. Create an incision.

As described on Section 7 (Secure aiming arm to handle and plate), assemble a trocar with handle and guide sleeve.

Orient the arrow on the guide sleeve in the direction of the “CORTEX SCREW” arrow on the aiming arm, and then use the assembled trocar and guide sleeve to stab down to the plate through the chosen aiming arm hole and corresponding incision.

Push the assembly completely down until it snaps into the self-retaining feature of the aiming arm.

Remove the trocar with handle by depressing its release mechanism and pulling it away from the guide sleeve.

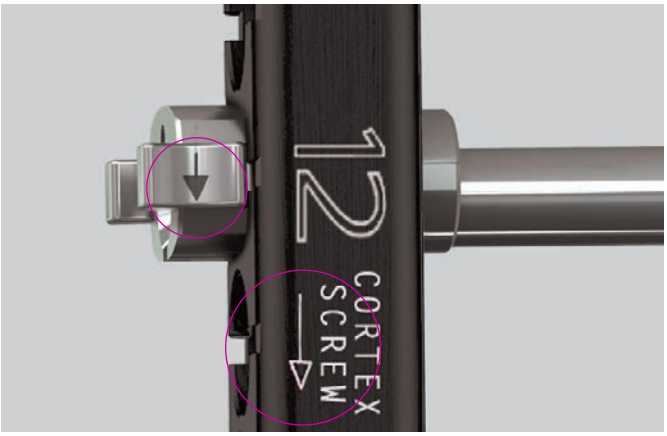
Choose an appropriate drill sleeve, neutral or load, and insert it into the guide sleeve while aligning the self-retaining features until it snaps into place.

**■ Note:**

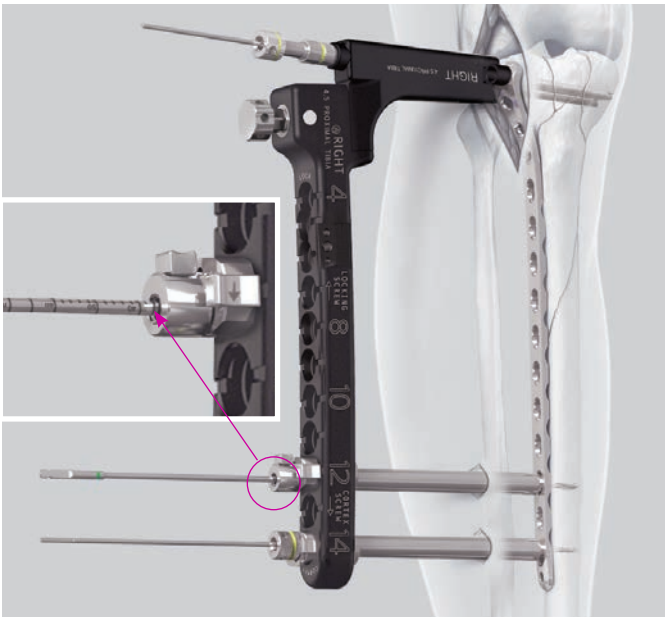
When using the “drill sleeve ∅ 3.2 mm for load position“, orient the sleeve’s directional arrow in the direction of the “CORTEX SCREW” arrow on the aiming arm.

Use the percutaneous drill bit ∅ 3.2 mm to drill and determine screw length from the drill bit calibration aligned with the top of the drill sleeve.

Remove the drill bit.







**Alternative instrument**

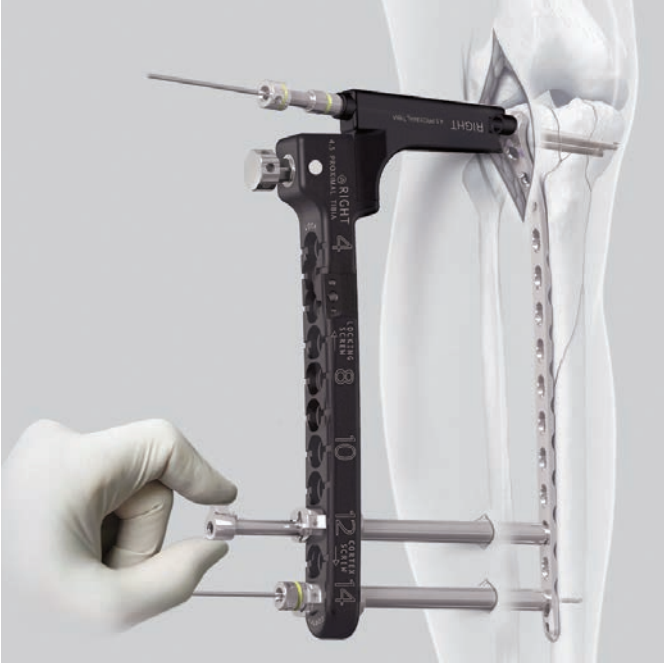
| | |
|---|---|
| 324.208 | Direct Measuring Device, percutaneous |

Place the percutaneous direct measuring device over the drill bit and against the end of the drill sleeve. Determine screw length from the end of the drill bit.

Remove the drill bit.

Remove the drill sleeve by gently depressing its release mechanism and slowly pulling it away from the guide sleeve.

Insert a screw using the screwdriver shaft with handle.

Remove a guide sleeve from the aiming arm by gently pinching its release mechanisms together and slowly pulling it away from the aiming arm.

| **Optional instrument** | |
|---|---|
| 03.120.025 | Stopper for Periarticular Aiming Arm Instruments |

Mark each screw location in the aiming arm using a stopper for reference as screw insertion proceeds.

Repeat this process to insert as many cortex screws ∅ 4.5 mm as necessary into the plate shaft.

**■ Note:**

All of the cortex screws ∅ 4.5 mm must be inserted before insertion of locking screws.



## 12. Insert locking screws ∅ 5.0 mm

| Instruments | |
|---|---|
| 03.400.102 | Screwdriver Shaft 3.5, hexagonal, Stardrive T25 |
| and | |
| 03.400.112 | Handle for Screwdriver Shaft 3.5, hexagonal, Stardrive T25 |
| 314.119 | Screwdriver Shaft Stardrive 4.5/5.0, T25, self-holding, for AO/ASIF Quick Coupling |
| or | |
| 314.560 | Screwdriver Shaft, hexagonal, large, ∅ 3.5 mm, length 165 mm, for Quick Coupling |
| 03.120.014 | Guide Sleeve for Periarticular Aiming Arm Instruments |
| 03.120.015 | Trocar with Handle for No. 03.120.014 |
| 03.120.022 | Handle for Percutaneous Drill Guide ∅ 4.3 mm, with thread |
| 03.120.025 | Stopper for Periarticular Aiming Arm Instruments |
| 324.203 | Drill Guide ∅ 4.3 mm, percutaneous, with thread |
| 324.213 | Drill Bit ∅ 4.3 mm, percutaneous, calibrated, length 300/200 mm, for Quick Coupling |
| 511.774 | Torque Limiter, 4 Nm, for AO/ASIF Quick Coupling for Reamers |

Choose an aiming arm hole through which to make an appropriate incision. Create an incision.

As described on Section 7 (Secure aiming arm to handle and plate), assemble a trocar with handle and guide sleeve.

Orient the arrow on the guide sleeve in the direction of the “LOCKING SCREW” arrow on the aiming arm, and then use the assembled trocar and guide sleeve to stab down to the plate through the chosen aiming arm hole and incision.

Push the assembly completely down until it snaps into the self-retaining feature of the aiming arm. Remove the trocar by depressing its release mechanism and pulling it away from the guide sleeve.

Thread the handle for percutaneous drill guide into the percutaneous drill guide Ø 4.3 mm.

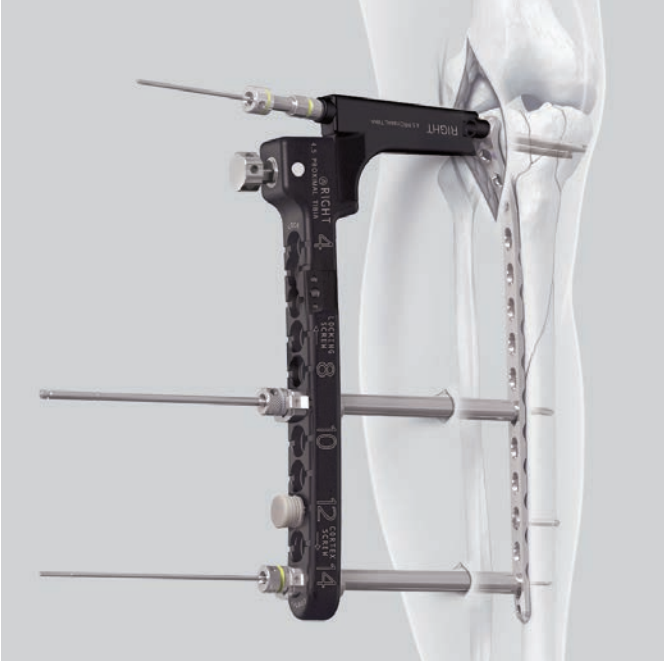
Insert the handle and percutaneous drill guide assembly through the guide sleeve, and thread it into the plate. Turn the handle counterclockwise to disengage and remove it from the drill guide.

Drill using the appropriate percutaneous drill bit. Determine screw length from the drill bit calibration aligned with the top of the drill guide.

| **Alternative instrument** | |
|---|---|
| 324.208 | Direct Measuring Device, percutaneous |

Place the percutaneous direct measuring device over the drill bit and against the end of the drill guide. Determine screw length from the end of the drill bit.

Remove the drill bit.

Remove the drill guide.

**■ Notes:**

- Use the tip of the handle for percutaneous drill guide as a pin wrench to loosen the drill guides from the plate.
- The hexagonal pin wrench ∅ 4.0 mm may also be used.

Insert a screw using the screwdriver shaft with handle or screwdriver shaft.

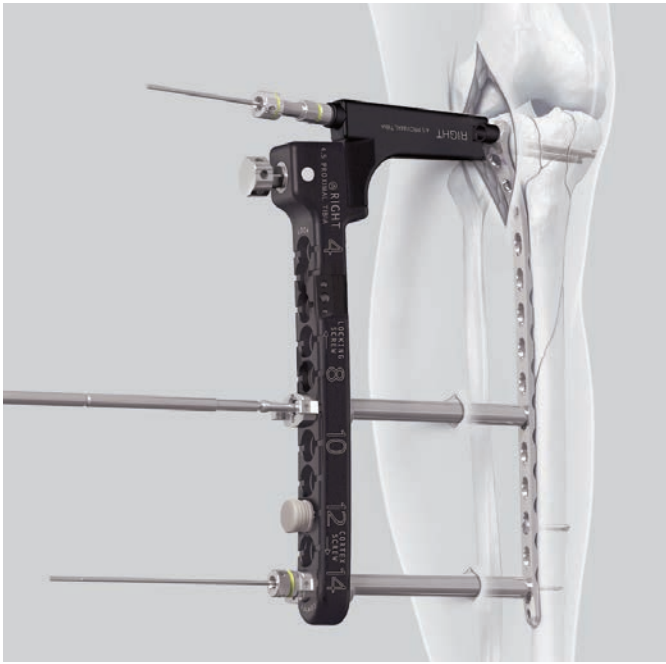
**Option**

Mark each screw location in the guide, using a stopper for reference as screw insertion proceeds.

Repeat this process to insert as many locking screws ∅ 5.0 mm into the plate shaft as necessary.

**■ Note:**

The measuring device must contact the end of the wire guide for an accurate measurement.

## 13. Insert angled cannulated locking screw ∅ 5.0 mm

| Instruments | |
|---|---|
| 03.120.003 | Angled Aiming Guide for No. 03.120.001, right |
| 03.120.006 | Angled Aiming Guide for No. 03.120.004, left |
| 03.120.014 | Guide Sleeve for Periarticular Aiming Arm Instruments |
| 03.120.015 | Trocar with Handle for No. 03.120.014 |
| 03.120.022 | Handle for Percutaneous Drill Guide ∅ 4.3 mm, with thread |
| 03.120.026 | Guide Wire ∅ 2.5 mm, with drill tip, length 300 mm, Cobalt-Chrome Alloy (CoCrMo) |
| or<br>338.002 | Guide Wire ∅ 2.5 mm, with drill tip, length 300 mm, Cobalt-Chrome Alloy |
| 314.050 | Screwdriver, hexagonal, cannulated, for Cannulated Screws ∅ 6.5 and 7.3 mm |
| 314.230 | Screwdriver Shaft, hexagonal, cannulated |
| 324.208 | Direct Measuring Device, percutaneous |
| 324.215 | Wire Guide 5.0, percutaneous, for Guide Wire ∅ 2.5 mm |
| 511.774 | Torque Limiter, 4 Nm, for AO/ASIF Quick Coupling for Reamers |

**■ Note:**

If the angled aiming guide for the oblique plate hole will be used, do not place a screw in the plate shaft hole where the drill bit or guide wire is located during initial aiming arm connection, until after the angled screw is placed. This will ensure the aiming arm is fixed relative to its connection at the plate's central head hole.

Attach an appropriate angled aiming guide to the aiming arm by aligning the connecting pins and finger-tightening its connecting bolt into its mating hole on the aiming arm.

As necessary, make a small skin incision to correspond with the screw's insertion site.

As described on Section 7 (Secure aiming arm to handle and plate), assemble a trocar with handle to a guide sleeve. Push the assembly completely down through the angled aiming guide, aligning the self-retaining features, until it snaps into place.

Remove the trocar by depressing its release mechanism and pulling it away from the guide sleeve.

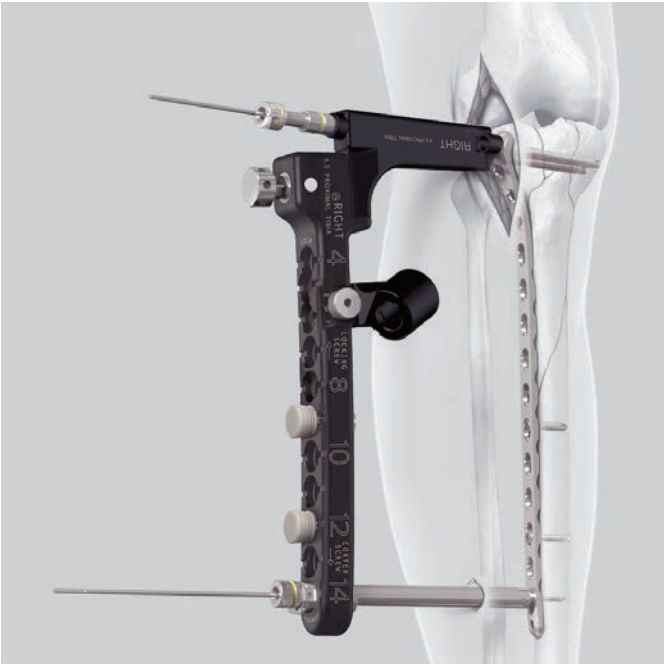
Thread the handle for percutaneous drill guide into the percutaneous wire guide.

Insert the handle and percutaneous wire guide assembly through the guide sleeve in the aiming guide, and thread it into the plate. Turn the handle counterclockwise to disengage and remove it from the wire guide.

Drill, using the guide wire with drill tip ∅ 2.5 mm. Determine screw length using the percutaneous direct measuring device and read the measurement at the end of the guide wire.

**■ Note:**

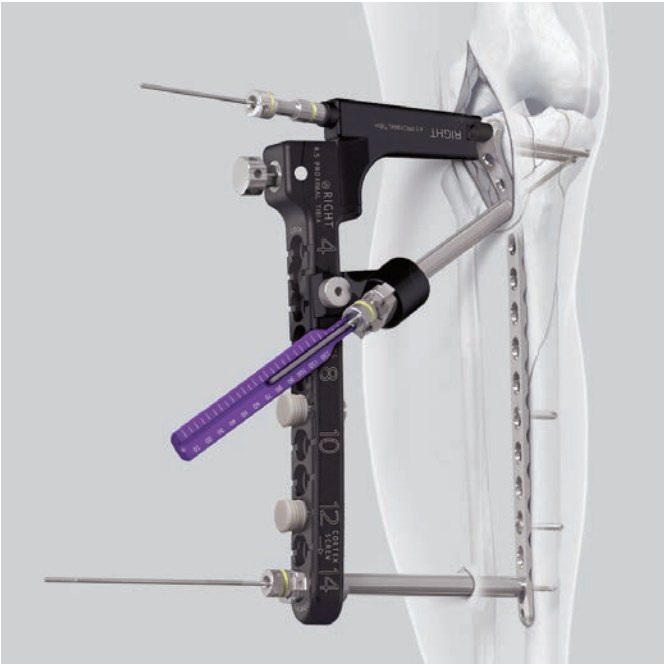
The measuring device must contact the end of the wire guide for an accurate measurement.




## Screw length considerations

Angled locking hole: The oblique locking screw in the plate shaft converges with the central locking screw in the plate head for pullout strength and fixation. If the oblique locking screw exceeds 65 mm in length, it should contact the proximal locking screw.

Remove the wire guide and use the cannulated hexagonal screwdriver to insert the appropriate length screw through the guide sleeve, over the guide wire, into the angled hole of the plate.




**■ Note:**

Use the oblique locking position to buttress a medial fragment.

Locking screws may be inserted using power equipment. However, final tightening should be done by hand.

**■ Note:**

If the 4 Nm torque limiting attachment is unavailable, do not tighten the screws to the plate under power. Perform final tightening by hand.

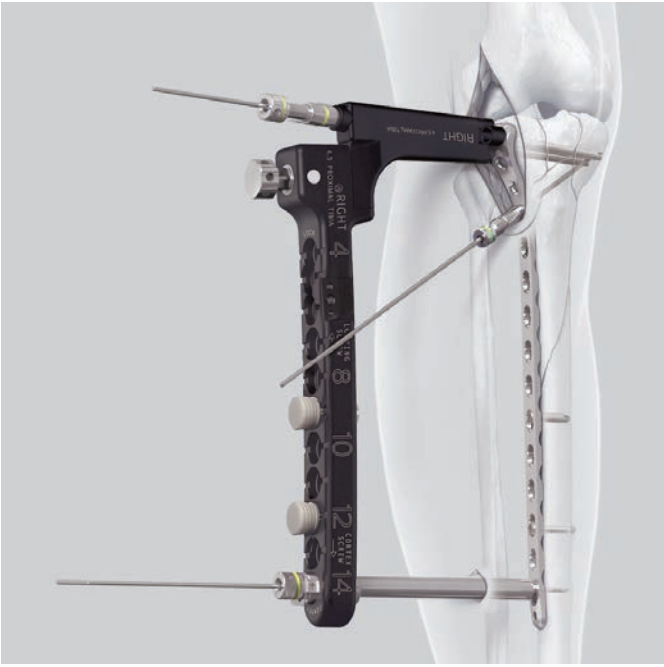
If desired, the most distal plate hole can now be filled with an appropriate screw as previously described.

Remove the guide wire.

**Alternative instruments**

| | |
|---|---|
| 03.120.020 | Wire Guide ∅ 2.5, for Lock. Screws ∅ 5.0, for Cannulated Locking Screws ∅ 5.0 mm and for Cann. Conical Screws ∅ 5.0 mm |
| 319.701 | Measuring Device for Cannulated Locking Screws and Cannulated Conical Screws ∅ 5.0 and 7.3 mm |
| 324.174 | Wire Guide 5.0, for Guide Wire ∅ 2.5 mm |

Alternatively, a wire guide for screws ∅ 5.0 or the wire guide 324.174 from the periarticular instrument set can be threaded directly into the plate's angled hole if the incision and plate exposure permit. Use the cannulated screw measuring device to measure for screw length.



## 14. Remove aiming guide, arm and insertion handle

Remove the guide sleeve from the angled aiming guide by gently pinching its release mechanisms together and pulling it away from the guide. To remove angled aiming guide, turn its connecting bolt counterclockwise; a screwdriver can be used to aid in its removal.

Remove any remaining guide sleeves from the aiming arm.

Remove the aiming arm from the insertion handle.

## 15. Insert central cannulated locking screw ∅ 5.0 mm in plate head

| Instruments | |
|---|---|
| 314.050 | Screwdriver, hexagonal, cannulated, for Cannulated Screws ∅ 6.5 and 7.3 mm |
| 314.230 | Screwdriver Shaft, hexagonal, cannulated |
| 321.160 | Combination Wrench ∅ 11.0 mm |
| 324.208 | Direct Measuring Device, percutaneous |

Use the percutaneous direct measuring device to measure for screw length by placing it over the guide wire extending from the locking bolt.

Remove the locking bolt from the insertion handle by loosening its nut. Unthread the locking bolt from the plate and slide it and the insertion handle off the plate, over the central hole's guide wire.

Insert the appropriate length cannulated conical screw ∅ 5.0 mm.

Remove the guide wire.

| Alternative instrument | |
|---|---|
| 324.215 | Wire Guide 5.0, percutaneous, for Guide Wire ∅ 2.5 mm |

If the locking bolt has already been removed, a percutaneous wire guide can be placed over the remaining guide wire and threaded into the plate. Use the percutaneous direct measuring device to measure for the central screw's length.

## Implant Removal

Unlock all screws from the plate, then remove the screws completely from the bone. This prevents simultaneous rotation of the plate when unlocking the last locking screw. For details regarding implant removal refer to the surgical technique "Screw Extraction Set".

# Plates

## LCP Proximal Tibial Plates 4.5/5.0

| Stainless steel | Pure Titanium (TiCP) | Holes | Length (mm) | |
|---|---|---|---|---|
| 240.036 | 440.036 | 4 | 82 | right |
| 240.038 | 440.038 | 6 | 118 | right |
| 240.040 | 440.040 | 8 | 154 | right |
| 240.042 | 440.042 | 10 | 190 | right |
| 240.044 | 440.044 | 12 | 226 | right |
| 240.046 | 440.046 | 14 | 262 | right |
| 240.037 | 440.037 | 4 | 82 | left |
| 240.039 | 440.039 | 6 | 118 | left |
| 240.041 | 440.041 | 8 | 154 | left |
| 240.043 | 440.043 | 10 | 190 | left |
| 240.045 | 440.045 | 12 | 226 | left |
| 240.047 | 240.047 | 14 | 262 | left |

All plates are available sterile packed. For sterile implants add suffix "S" to article number.

# Screws Used with the LCP Proximal Tibial Plate 4.5/5.0

## Locking Screw ∅ 5.0 mm

- Threaded conical head
- Fully threaded shaft
- Self-tapping tip

## Cannulated Locking Screw ∅ 5.0 mm

- Threaded conical head
- Fully threaded shaft
- Self-drilling, self-tapping tip

## Cannulated Conical Screw ∅ 5.0 mm

Compresses the plate to the lateral femoral condyle

- Smooth conical head
- Partially threaded shaft
- Self-drilling, self-tapping tip

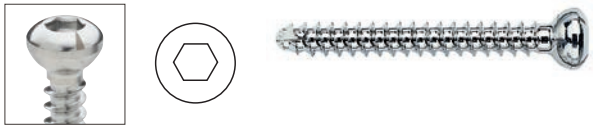
## Screw Nut ∅ 5.0 mm

- Self-cutting, serrated tip
- Inserted from the medial aspect of the proximal tibia
- Internal threads mate with the 5.0 mm cannulated conical screws

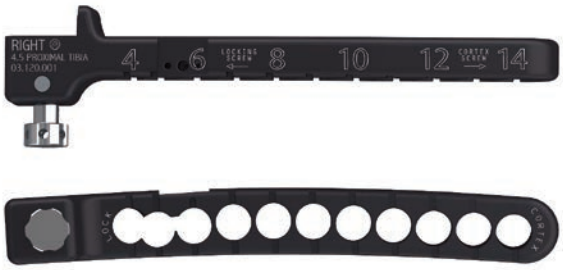
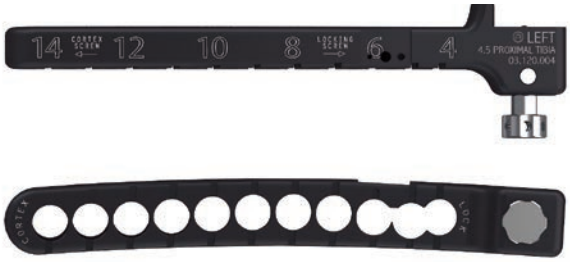
## Cortex Screw ∅ 4.5 mm

Compresses the plate to the bone

- May be used in the DCU portion of the combi-holes in the plate shaft



# Periarticular Aiming Arm Instruments

| | | |
|---|---|---|
| 03.120.001 | Aiming Arm, for LCP Proximal Tibial Plate 4.5 / 5.0, right |   |
| 03.120.002 | Insertion Handle for Aiming Arm for LCP Proximal Tibial Plate 4.5 / 5.0, right |   |
| 03.120.003 | Angled Aiming Guide for No. 03.120.001, right |  |
| 03.120.004 | Aiming Arm, for LCP Proximal Tibial Plate 4.5 / 5.0, left |   |
| 03.120.005 | Insertion Handle for Aiming Arm for LCP Proximal Tibial Plate 4.5 / 5.0, left |   |
| 03.120.006 | Angled Aiming Guide for No. 03.120.004, left |  |

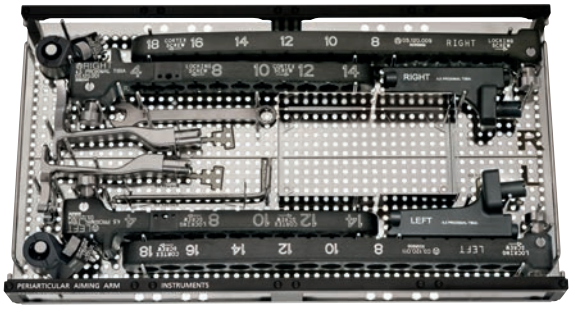
| | | |
|---|---|---|
| 03.120.007 | Connecting Bolt for Nos. 03.120.003 and 03.120.006 |  |
| 03.120.014 | Guide Sleeve for Periarticular Aiming Arm Instruments |  |
| 03.120.015 | Trocar with Handle for No. 03.120.014 |  |
| 03.120.016 | Scalpel Handle for Periarticular Aiming Arm Instruments |  |
| 03.120.017 | Drill Sleeve ∅ 3.2 mm, for neutral position, for Periarticular Aiming Arm Instruments |  |
| 03.120.018 | Drill Sleeve ∅ 3.2 mm, for load position, for Periarticular Aiming Arm Instruments |  |
| 03.120.020 | Wire Guide ∅ 2.5, for Lock. Screws ∅ 5.0, for Cannulated Locking Screws ∅ 5.0 mm and for Cann. Conical Screws ∅ 5.0 mm |  |

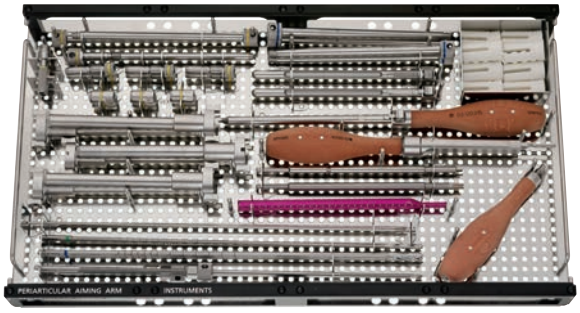
| | | |
|---|---|---|
| 03.120.021 | Nut for No. 03.120.020 |  |
| 03.120.022 | Handle for Percutaneous Drill Guide ∅ 4.3 mm, with thread |  |
| 03.120.023 | Pull Reduction Device for Percutaneous Drill Guide Ø 4.3 mm, with Nut |  |
| 03.120.024 | Nut for No. 03.120.023 |  |
| 03.120.025 | Stopper for Periarticular Aiming Arm Instruments |  |
| 03.120.026 | Guide Wire ∅ 2.5 mm, with drill tip, length 300 mm, Cobalt-Chrome Alloy (CoCroMo) |  |
| 03.120.027 | Locking Bolt, for Nos. 03.120.002 and 03.120.005 length 151 mm |  |
| 03.120.029 | Hexagonal Pin Wrench ∅ 4.0 mm with ball tip |  |
| 03.120.030 | Connecting Bolt for Aiming Arm for Periarticular Aiming Arm Instruments |  |

| | | |
|---|---|---|
| 314.119 | Screwdriver Shaft Stardrive 4.5/5.0, T25, self-holding, for AO/ASIF Quick Coupling |  |
| 314.560 | Screwdriver Shaft, hexagonal, large, ∅ 3.5 mm, length 165 mm, for Quick Coupling |  |
| 321.160 | Combination Wrench ∅ 11.0 mm |  |
| 324.203 | Drill Guide ∅ 4.3 mm, percutaneous, with thread |  |
| 324.208 | Direct Measuring Device, percutaneous |  |
| 324.212 | Drill Bit ∅ 3.2 mm, percutaneous, calibrated, length 300/200 mm, for Quick Coupling |  |
| 324.213 | Drill Bit ∅ 4.3 mm, percutaneous, calibrated, length 300/200 mm, for Quick Coupling |  |
| 324.215 | Wire Guide 5.0, percutaneous, for Guide Wire ∅ 2.5 mm |  |
| 338.002 | Guide Wire ∅ 2.5 mm, with drill tip, length 300 mm, Cobalt-Chrome Alloy |  |

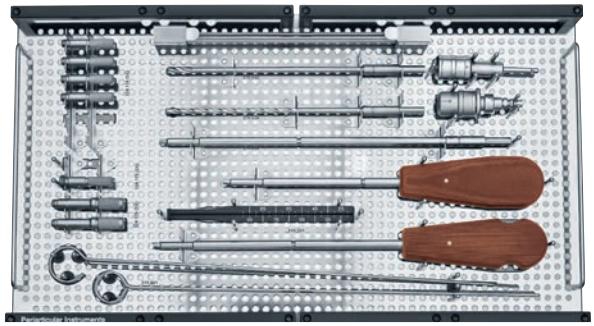
# Sets

| | |
|---|---|
| **01.120.035** | **Periarticular Aiming Arm Instruments for LCP Condylar Plate 4.5/5.0 and LCP Proximal Tibial Plate 4.5/5.0, in Vario Case** |
| 68.120.035 | Vario Case for Periarticular Aiming Arm Instruments, size 1/1, without Contents |
| 68.120.036 | Modular Tray 1, for Periarticular Aiming Arm Instruments, size 1/1, without Contents, Vario Case System |
| 68.120.037 | Modular Tray 2, for Periarticular Aiming Arm Instruments, size 1/1, without Contents, Vario Case System |

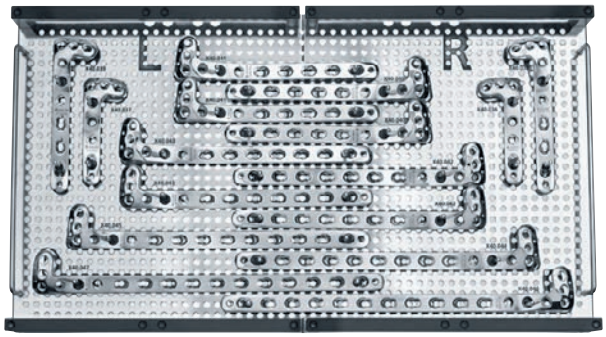




| | |
|---|---|
| **01.120.021** | **Periarticular Instruments in Vario Case** |
| 68.120.445 | Modular Tray for Periarticular Instruments, size 1/1, without Contents, Vario Case System |
| 68.120.447 | Vario Case for Periarticular Instruments, size 1/1, without Contents |



| | |
|---|---|
| **01.120.424** | **LCP Proximal Tibial Plates 4.5/5.0 (Pure Titanium) in Modular Tray, Vario Case System** |
| 68.120.420 | Modular Tray for LCP Proximal Tibial Plates 4.5 / 5.0, size 1/1, without Contents, Vario Case System |



## Modular Large Fragment Screw Rack

| | |
|---|---|
| 68.122.050 | Modular Insert, for Modular Screw Rack, for Screws ∅ 5.0 mm, size 1/3, without Contents, Vario Case System |
| 68.122.051 | Modular Insert, for Modular Screw Rack, for Screws ∅ 4.5 mm, size 1/3, without Contents, Vario Case System |
| 68.122.052 | Modular Insert, for Modular Screw Rack, for Screws ∅ 6.5 mm, size 1/3, without Contents, Vario Case System |
| 68.122.053 | Modular Insert, for Modular Screw Rack, for Screws ∅ 7.3 mm, size 1/3, without Contents, Vario Case System |
| 68.122.054 | Modular Screw Rack, with Drawer, Measuring Block and Lid, length 200 mm, height 115 mm, size 1/2, without Contents, Vario Case System |
| 68.122.056 | Auxiliary Modular Insert, for Modular Screw Rack, size 1/3, without Contents, Vario Case System |
| 68.000.128 | Auxiliary Module, size 1/3, height 14 mm, for Screw Rack, size 1/2 |
| 68.000.129 | Auxiliary Module, size 1/3, height 28 mm, for Screw Rack, size 1/2 |

## Additionally required

| | |
|---|---|
| LCP Large Fragment Instrument Set | |
| Recommended | |
| **01.120.457** | **LCP Large Fragment Instruments and Standard Instruments in Vario Case** |
| 68.120.457 | LCP Large Fragment Instruments and Standard Instruments, in Vario Case |
| constisting of | |
| 68.120.455 | Modular Tray for LCP Large Fragment Instruments, size 1/1, without Contents, Vario Case System |
| and | |
| 68.120.456 | Modular Tray for Large Fragment Standard Instruments, size 1/1, without Contents, Vario Case System |

# MRI Information

**Torque, Displacement and Image Artifacts according to ASTM F 2213-06, ASTM F 2052-14 and ASTM F2119-07**

Non-clinical testing of worst case scenario in a 3 T MRI system did not reveal any relevant torque or displacement of the construct for an experimentally measured local spatial gradient of the magnetic field of 3.69 T/m. The largest image artifact extended approximately 169 mm from the construct when scanned using the Gradient Echo (GE). Testing was conducted on a 3 T MRI system.

**Radio-Frequency-(RF-)induced heating according to ASTM F2182-11a**

Non-clinical electromagnetic and thermal testing of worst case scenario lead to peak temperature rise of 9.5 °C with an average temperature rise of 6.6 °C (1.5 T) and a peak temperature rise of 5.9 °C (3 T) under MRI Conditions using RF Coils (whole body averaged specific absorption rate [SAR] of 2 W/kg for 6 minutes [1.5 T] and for 15 minutes [3 T]).

**▲ Precautions:**

The above mentioned test relies on non-clinical testing. The actual temperature rise in the patient will depend on a variety of factors beyond the SAR and time of RF application. Thus, it is recommended to pay particular attention to the following points:

- It is recommended to thoroughly monitor patients undergoing MR scanning for perceived temperature and/or pain sensations.
- Patients with impaired thermoregulation or temperature sensation should be excluded from MR scanning procedures.
- Generally, it is recommended to use a MR system with low field strength in the presence of conductive implants. The employed specific absorption rate (SAR) should be reduced as far as possible.
- Using the ventilation system may further contribute to reduce temperature increase in the body.

Not all products are currently available in all markets.
This publication is not intended for distribution in the USA.
Intended use, Indications and Contraindications can be found in the corresponding system Instructions for Use.
All Surgical Techniques are available as PDF files at www.depuysynthes.com/ifu

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