VA-LCP Condylar Plate 4.5/5.0

Part of the Synthes Variable Angle Periarticular Plating System

Surgical Technique

AO 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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VA-LCP Condylar Plate 4.5/5.0

System

The VA-LCP Condylar Plate 4.5/5.0 is part of the VA-LCP Periarticular Plating System which merges Variable Angle Locking Screw Technology with conventional plating techniques.

■ Note:

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

Implant Overview

- Choice of plate lengths (6–22 holes) ❶
- Contoured shaft to mimic the anterior bow of the femur, contoured plate head to match the distal femur and anatomic screw hole pattern ❷
- Plate with Variable Angle (VA) locking holes in the plate head and Variable Angle combi-holes (VA-LCP) in the plate shaft ❸
- Choice of plate material (Stainless Steel or Titanium Alloy)
- Plate compatibility with VA Locking, Locking and Cortex Screws
- Plate compatibility with periprosthetic implant options: VA periprosthetic locking screws with blunt tip and VA Positioning Pins for cable system in cruciform fit in VA Locking hole. Compatibility with Locking Attachment Plate ❹

■ Note:

The central hole in the head of the plate is a fixed angle locking hole and accepts VA locking screws 5.0 mm. ❺

Variable Angle Locking and OPTILINK™ Screw technology

Variable Angle Screw Technology

- VA technology with angulation possibilities of up to 15° in each direction around the central axis of the plate hole 6
- Choice of screw types and lengths depending on fracture types and surgeon preference: periprosthetic, solid or cannulated VA Locking Screws 7
- All solid VA Locking Screws are equipped with a Stardrive recess; cannulated VA Locking Screws offer a 4.0 mm Hex recess.

OPTILINK™ Screw Technology

- OPTILINK™ is the brand name for a Stainless Steel VA Locking Screw which has undergone a heat treatment and hardening process.
- To differentiate the screw from “normal” Stainless Steel Locking Screws, a golden color coating has been added on top of the screw.
- OPTILINK™ technology is available for VA Locking Screws in Stainless Steel or TAN VA Condylar Plates.

Instrument options

- Various instrument options for fixed and variable angle predrilling in the plate head
- Aiming Arm instrumentation for minimally-invasive targeted predrilling and screw insertion in the plate shaft
- One Universal Aiming Arm for both left and right side
- Insertion Handle with Guiding Block for targeted predrilling and screw insertion in the plate head. The use of guiding block instruments is recommended in porotic bone where screws may not necessarily follow the predrilled path

The AO Principles of Fracture Management

Mission

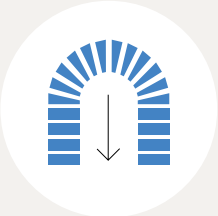
The AO's mission is promoting excellence in patient care and outcomes in trauma and musculoskeletal disorders.

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.

Intended Use, Indications and Contraindications

Intended Use, Indications and Contraindications can be found in the corresponding system Instructions for Use.

Preparation

1. Preparation

Sets	
01.231.030	VA-LCP Condylar Plate 4.5/5.0, Stainless Steel, in Vario Case
or	
01.231.031	A-LCP Condylar Plate 4.5/5.0, Titanium Alloy (TAN), in Vario Case
01.231.032	Instruments for VA-LCP Condylar Plate 4.5/5.0, in Vario Case
01.231.033	VA Periarticular Aiming Arm Instruments for VA-LCP Condylar Plate 4.5/5.0, in Vario Case

Optional sets
LCP Large Fragment Instruments and Standard Instruments
Periarticular Instrument Set
Reduction Instruments

Complete preoperative radiographic assessment and prepare the preoperative plan. Position the patient supine on a radiolucent operating table. Viewing the distal femur under fluoroscopy in both the lateral and AP view is necessary.

▲ Precaution:

Plate bending is not recommended as this may weaken the plate and the plate-screw interface and can compromise the targeting function of an aiming arm, if in use. However, there may be cases in which plate bending is clinically necessary. In such cases, the plate should only be bent to fit proximal femur anatomy and only bend the plate incrementally and between screw holes using the plate bending press (329.300), and never bend back-and-forth. Insert at least one screw distal to the bend.

2. Attach insertion handle

Instruments	
03.231.005	Locking Bolt for Aiming Arm Instruments, for VA-LCP Condylar Plate 4.5/5.0
03.231.006	Locking Nut for Aiming Arm Instruments, for VA-LCP Condylar Plate 4.5/5.0
03.231.020	Insertion Handle for Universal Aiming Arm for VA-LCP Condylar Plate 4.5/5.0
321.160	Combination Wrench ∅ 11 mm
Alternative instrument (1st generation design)	
03.231.001	Insertion Handle for Aiming Arm for VA-LCP Condylar Plate 4.5/5.0
Optional instruments	
03.231.021	Insertion Handle with Guiding Block for Universal Aiming Arm, left
03.231.022	Insertion Handle with Guiding Block for Universal Aiming Arm, right

■ Note:

In certain cases (e.g. distal fracture treated with a short plate) it may be advantageous to do the surgery without using an aiming arm. Then, for inserting VA locking screws in the plate shaft the same surgical technique as described in the chapter “Insert screws in remaining head holes” (section “Screw Insertion in Plate Head”) applies. Cortex screws can be inserted in the shaft of the plate without using the aiming arm by applying the technique described in the LCP Locking Compression Plate surgical technique (section Standard Plate Technique).

Choose the appropriate insertion handle: either the standard insertion handle or the insertion handle with guiding block can be used.

The insertion handle with guiding block has a left and a right side design and helps to insert the screw in a guided way (additionally to the guided predrilling). The use of guiding block instruments is recommended in porotic bone where screws may not necessarily follow the pre-drilled path. Thread the nut onto the locking bolt. (1)

Position the insertion handle so that the spherical pins on the underside align with the dimples around the first combi-hole of the appropriate VA-LCP Condylar Plate 4.5/5.0. (2)

Insert the locking bolt with nut into the through hole of the insertion handle. Thread the tip into the threaded portion of the combi-hole until it is firmly finger-tight. Tighten the locking nut.

▲ Precaution:

It is important to place the plate on a flat surface when positioning the insertion handle and locking bolt to ensure the locking bolt is perpendicular to the plate and not cross-threaded into the combi-hole.

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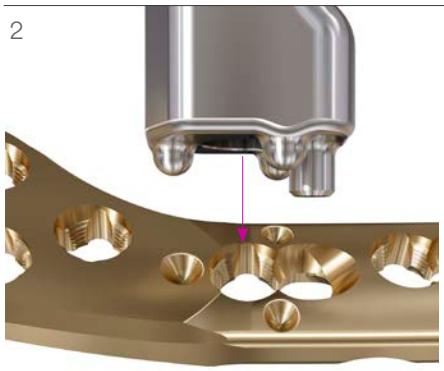


3. Secure aiming arm to plate

Instruments	
03.231.023	Connecting Bolt for Universal Aiming Arm
03.231.024	Universal Aiming Arm for VA-LCP Condylar Plates 4.5/5.0
03.231.007	Guide Sleeve for Aiming Arm Instruments, for VA-LCP Condylar Plate 4.5/5.0
324.215	Wire Guide 5.0, percutaneous, for Guide Wire ∅ 2.5 mm
321.160	Combination Wrench ∅ 11 mm
Alternative instrument (1st generation design)	
03.231.003	Aiming Arm for VA-LCP Condylar Plate 4.5/5.0, left
or 03.231.004	Aiming Arm for VA-LCP Condylar Plate 4.5/5.0, right

Attach the aiming arm in the appropriate orientation (left/right) to the insertion handle (1). Secure the connection bolt to the insertion handle.

Insert a guide sleeve into the hole in the aiming arm that corresponds with the most proximal combi-hole in the plate. Orient the arrow on the guide sleeve in the direction of the “LOCKING SCREW” arrow on the aiming arm. (2)

Insert the wire guide through the guide sleeve and thread it into the plate. Tighten the wire guide to the plate to achieve a stable construct between the aiming arm and the plate. (3)

Using the combination wrench, tighten the nut on the locking bolt to compress the insertion handle to the plate and secure the connection bolt to the insertion handle. Ensure that the insertion handle is securely attached to the plate before inserting the plate. (4)

4. Remove aiming arm

Remove the wire guide, guide sleeve and aiming arm to prepare for initial plate insertion.

1

2

3

4

Plate Insertion and Aiming Arm Attachment

1. Make incision

Lateral Incision (1)

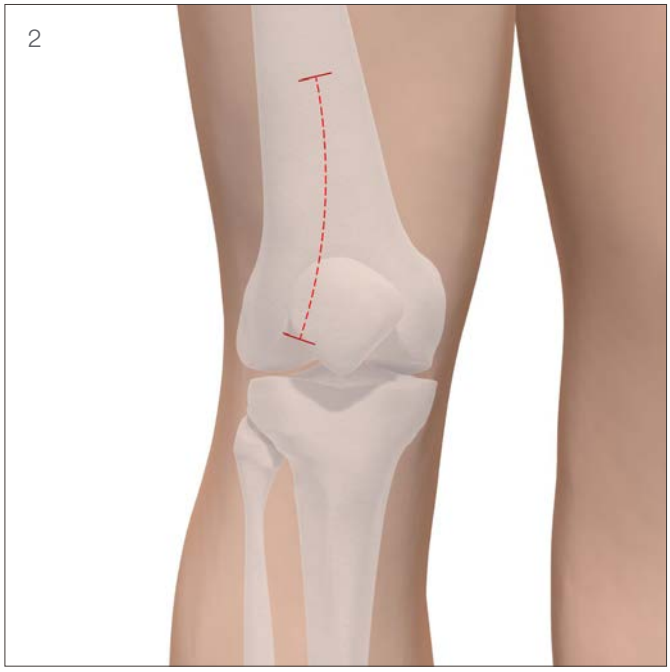
A lateral incision is recommended for a simple articular (AO Classification 33-C1) or extra-articular fracture (AO Classification 32- or 33-A). The incision begins at Gerdy's tubercle.

▲ Precaution:

The incision can be extended if necessary to improve visualization of the articular surface or lateral metaphysis and diaphysis. It may not always be appropriate to use limited incisions and closed reduction techniques.

Lateral parapatellar incision (2)

In the presence of a complex intra-articular fracture (AO classifications 33-C2 or C3), perform a lateral parapatellar approach. Perform an arthrotomy to expose the joint for reduction. Translate the patella and extensor mechanism as necessary with eversion of the patella if required. Ensure adequate exposure of the joint for an anatomic reduction.



2. Reduce articular surface

Reduce and temporarily secure the articular fragments with pointed reduction forceps and/or Kirschner wires. If a Hoffa plane fracture is present, the posterior condylar fragments are typically reduced and provisionally stabilized with Kirschner wires inserted from anterior to posterior. These fragments require interfragmentary compression with independent screws.

Secure the condyles with appropriately placed screws. The VA-LCP Condylar Plate 4.5/5.0 may be held laterally on the condyle to select an area where the screw(s) will not interfere with the footprint of the plate. Placing screws around the periphery of the condyle, choosing screws with smaller heads (e.g. screws ∅ 3.5mm), and sinking screws so that they are nearly flush with the lateral condylar cortical edge will ease subsequent plate insertion and improve fit. (1)

For fixation of a posterior articular fragment (Hoffa fracture), place cortex screws ∅ 3.5 mm or cancellous bone screws ∅ 4.0 mm from anterior to posterior and countersink the screw heads so they lie below the level of articular cartilage. An appropriate headless compression screw may also be used.

1

3. Insert plate and determine plate position

Using the insertion handle assembly, insert the plate sub-muscularly distal to proximal. Slide the plate proximally until the plate head is oriented properly on the lateral condyle. (1)

■ Note:

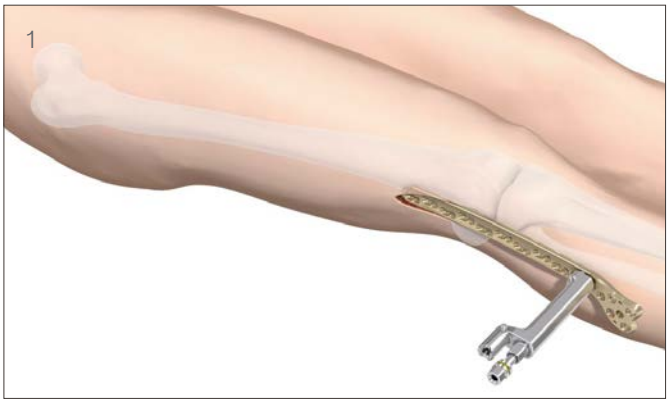
The aiming arm can be attached either before or after insertion of the plate. In larger patients, it is advantageous to attach the aiming arm after plate insertion as it could impinge upon the lateral soft tissues during insertion.

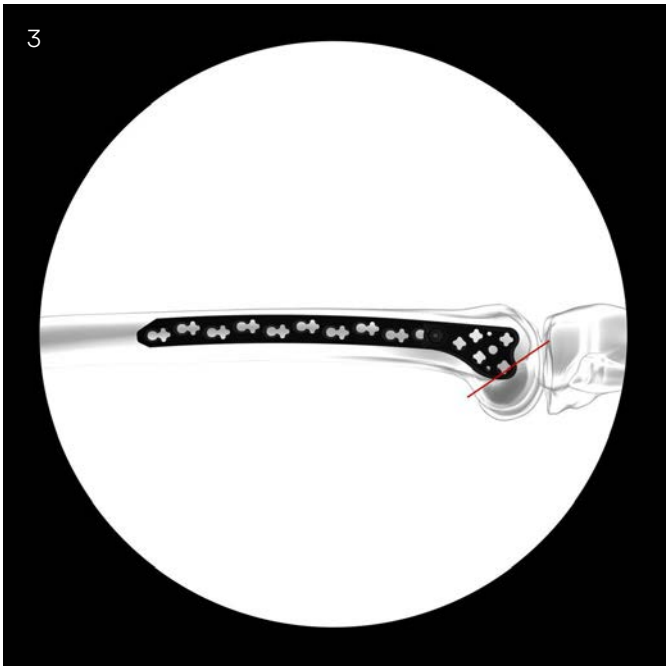
Because the shaft of the femur is frequently out of alignment with the distal fragment, proper plate placement can be determined by orienting the distal shape to that of the condyle. Orient the plate so that the shape mimics the condyle anteriorly and posteriorly (2).

Position the plate parallel to the anterior portion of the lateral femoral condyle which is typically internally rotated approximately 10 to 15 degrees with respect to the vertical plane. Proximity to the anterior cortex at the metaphysis and proximity to the anterior articular margin distally are critical elements for alignment. The plate was designed such that the anterior edge of the implant parallels the anterior cortical margin at the metaphyseal level. Similarly, the posterior edge of the implant is curved to mimic the posterior anatomic curvature extending from the epiphyseal to the metaphyseal region.

Use clinical examination and radiographic imaging to confirm that the plate is properly oriented on the condyle under a lateral image (3).

Secure the plate position by using either reduction forceps or by inserting at least one guide wire through the Kirschner wire holes in the plate head before inserting the first screw in the distal segment.

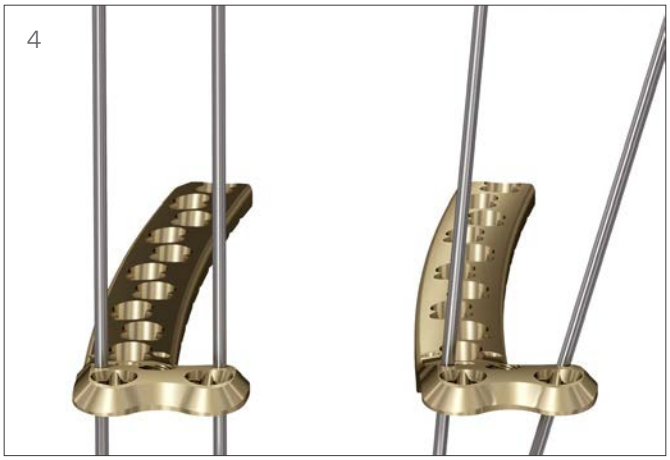




Visualization of wire hole direction change

■ Note:

The wire hole trajectory in the plate head has been changed to lower the possibility of interference with other instruments. Image 4 illustrates the old and new wire hole trajectory in the plate head.



Old New

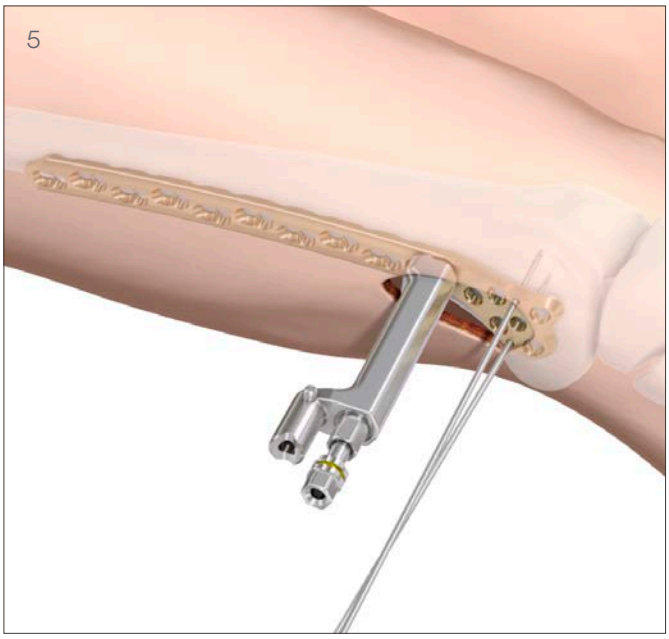
Visualization of wire insertion depth

■ Note:

The recommended insertion depth of the wires in the plate head is 20 mm. Image 5 illustrates the recommended insertion length and the new wire hole trajectory in the plate head.

▲ Precaution:

In case a deeper insertion is required, the use of fluoroscopy is recommended to avoid collision.



Optional technique to determine plate position

Instrument	
324.215	Wire Guide 5.0, percutaneous, for Guide Wire ∅ 2.5 mm

When using the plate as a reduction tool, proper plate placement with respect to the distal segment must be ensured prior to proceeding.

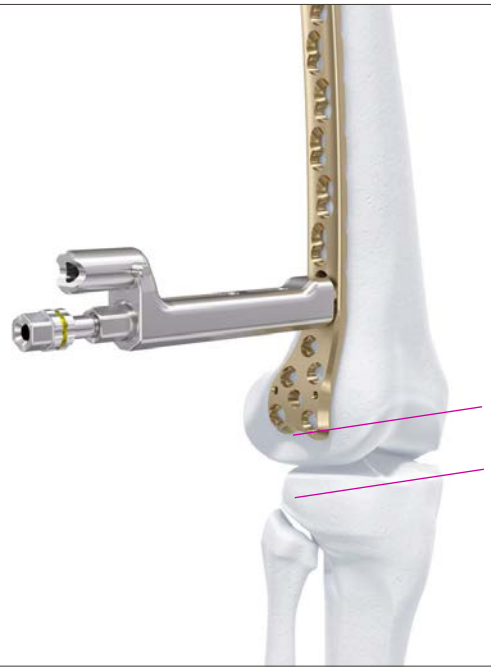
Place a guide wire across the femoral condyles at the level of the knee to indicate the joint axis. Place a second guide wire across the patellofemoral joint on the trochlear surface (6, 7).

Secure the plate position by using either reduction forceps or by inserting at least one guide wire before inserting the first screw into the distal segment. Wires can also be inserted through one of the plate head holes by using a wire guide threaded at zero degrees in relation to the plate.

■ Note:

Before proceeding, confirm plate head placement.

6



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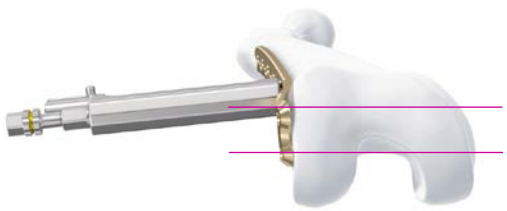


4. Secure aiming arm to plate distally and make incision

Instruments	
03.231.023	Connecting Bolt for Universal Aiming Arm
03.231.024	Universal Aiming Arm for VA-LCP Condylar Plates 4.5/5.0
321.160	Combination Wrench ∅ 11 mm

Reattach the aiming arm which has been chosen in an earlier step to the insertion handle. Make sure to use the correct side. (1)

Finger-tighten the connection bolt to secure the aiming arm to the insertion handle. Using the combination wrench, tighten the nut on the locking bolt to compress the insertion handle to the plate. The insertion handle should be securely attached to the plate. (2)

Locate the hole in the aiming arm that corresponds with the most proximal combi-hole in the plate. The aiming arm is numbered to facilitate locating the most proximal hole in the plate. Make a skin incision at this location. The incision should be in line with the direction of future trocar and sleeve insertion.

■ Note:

The recommended insertion depth of the wires in the plate head is 20 mm. The images illustrate the recommended insertion depth and the new wire hole trajectory in the plate head.

▲ Precaution:

In case a deeper insertion is required, the use of fluoroscopy is recommended to avoid collision.

Alternative instrument for making incision

Instrument	
03.120.016	Scalpel Handle for Periarticular Aiming Arm Instruments

Attach a No. 1,1 mm blade to the scalpel handle. The scalpel handle will pass through the aiming arm holes and assist in performing a minimally invasive and accurate incision. (3)

The scalpel handle is designed such that the blade is offset with respect to the handle. It should be inserted, backed out, rotated 180 degrees, and reinserted through the aiming arm. The goal is to create an incision through the skin, IT band, and vastus lateralis fascia that is larger than the cannula that is to be inserted. An adequate incision must be made in order to prevent soft tissue impingement when inserting the sleeve.

Remove the scalpel from the aiming arm.

▲ Precaution:

Always remove the scalpel blade before storage in the case.

■ Note:

For clear visualization, soft tissue is not shown in the following steps.

5. Insert trocar

Instruments	
03.120.015	Trocar with Handle for No. 03.120.014
03.231.007	Guide Sleeve for Aiming Arm Instruments, for VA-LCP Condylar Plate 4.5/5.0

Insert the trocar with handle into a guide sleeve (1). Align the self-retaining features until the trocar snaps into place within the guide sleeve.

1

Orient the arrow on the guide sleeve in the direction of the “LOCKING SCREW” arrow on the aiming arm (2), and then use the assembled trocar and guide sleeve to push down to the plate through the incision (3).

Push the assembly completely down, aligning the self-retaining features, until it snaps completely into the aiming arm. Take care not to place excessive pressure on the guide sleeve as deflection can occur between the guide sleeve and the plate in the face of excessive pressure. The potential for this is increased with longer plates inserted through small incisions in larger patients.

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

6. Secure aiming arm to plate proximally

Instruments	
03.120.022	Handle for Nos. 324.203 and 324.215
324.215	Wire Guide 5.0, percutaneous, for Guide Wire ∅ 2.5 mm
03.120.026	Guide Wire ∅ 2.5 mm, with drill tip, length 300 mm, Cobalt-Chrome Alloy (CoCrWNi)
or 338.002	Guide Wire ∅ 2.5 mm, with drill tip, length 300 mm, Cobalt-Chrome Alloy

To ensure precise targeting using the aiming arm, it is important to secure the aiming arm to the plate proximally by inserting a guide wire ∅ 2.5 mm.

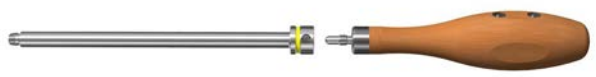
Thread the handle into the wire guide (1). Insert the handle and wire guide assembly through the guide sleeve, and securely thread it into the most proximal plate hole (2). Turn the handle counterclockwise to disengage and remove it from the guide sleeve.

■ Note:

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

Insert a guide wire ∅ 2.5 mm into the bone through the percutaneous wire guide only after confirming adequate reduction of limb length and rotational alignment (3). Small changes in coronal and sagittal plane alignment will still be possible after this step.

1



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If necessary, to assist in aligning the aiming arm with the plate, the trocar with handle and guide sleeve can be inserted into the most distal hole of the proximal fragment (4). The trocar assembly may assist in securing the wire guide into the most proximal hole in the plate so that a guide wire can be inserted to secure the aiming arm to the plate.

Alternative instruments for proximal fixation

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

Using the drill bit ∅ 4.3 mm, drill through the threaded drill guide ∅ 4.3 mm to the far cortex, leaving the drill bit in place to stabilize the proximal portion of the plate on the bone.

4

7. Use pull reduction device (optional)

Instruments	
03.231.007	Guide Sleeve for Aiming Arm Instruments, for VA-LCP Condylar Plate 4.5/5.0
324.203	Drill Guide ∅ 4.3 mm, percutaneous, with thread
03.120.023	Pull Reduction Device for Percutaneous Drill Guide ∅ 4.3 mm, with Nut
321.160	Combination Wrench ∅ 11 mm

Additional correction can be completed before placement of screws in both main fracture fragments. The pull reduction device (1) is placed through the guide sleeve and plate holes to pull or push bone fragments relative to the plate. This instrument can be used for:

- Minor varus/valgus adjustment (approximately 2°–4°)
- Coronal plane translational adjustments
- Stabilization of plate-bone orientation during insertion of the first screws
- Alignment of segmental fractures
- Predrilling dense or thick cortical bone before placing a VA locking screw ∅ 5 mm

■ Note:

The pull reduction device may be used for minor corrections. It must be used with a threaded drill guide ∅ 4.3 mm and a guide sleeve.

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

When the pull reduction device has been attached to a power tool (quick coupling), insert it through a drill guide ∅ 4.3 mm that has been threaded into the plate.

With the nut in its highest position possible, begin power insertion of the pull reduction device. Stop insertion before the tip of the pull reduction device reaches the far cortex. (2)

1

2

▲ Precaution:

Attempting to advance beyond this point may damage the thread in the bone.

Remove the power tool and begin tightening the nut toward the drill guide, while monitoring progress under radiographic imaging. (3)

Stop when the desired reduction is achieved. If the plate is properly positioned distally parallel to the anterior half of the lateral femoral condyle, it will be slightly internally rotated with respect to the shaft proximally. This has the potential to create minor sagittal plane changes when using this technique for coronal plane alignment.

The pull reduction device is 4.3 mm in diameter and calibrated for screw length measurement to allow later placement of a VA locking screw ∅ 5 mm in the same hole.

■ Note:

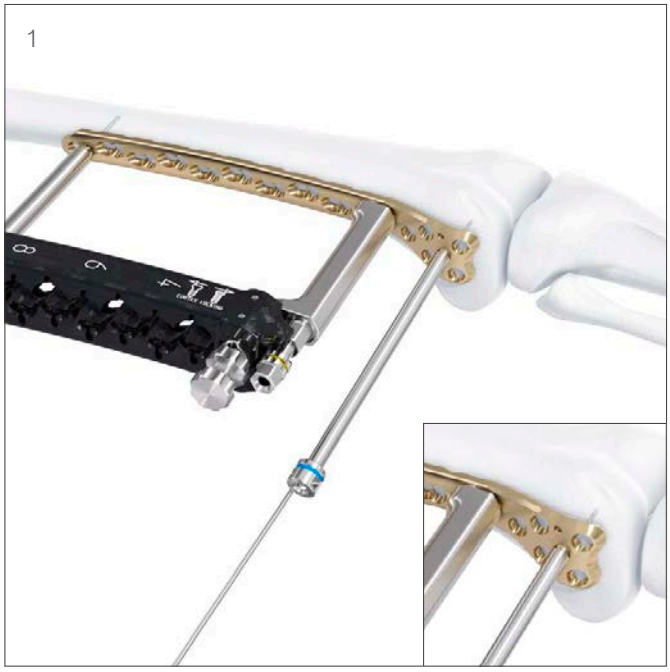
A combination wrench may be used to facilitate tightening and loosening of the nut.

3

Option A. Insert solid VA locking screw ∅ 5.0 mm

1. Insert screw in central head hole

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
314.119	Screwdriver Shaft Stardrive 4.5/5.0, T25, self-holding, for AO/ASIF Quick Coupling
03.231.013	T-Handle with Torque Limiting Function, 6 Nm
03.231.015	Screwdriver Shaft Stardrive, T25, length 180 mm, for Hexagonal Coupling 6.0 mm



The central plate head hole is a fixed-angle hole which accepts VA locking screws ∅ 5.0 mm, however only in a non-angled position. Although screws may be inserted in any order, it is usually advantageous to start with the central screw. (1)

■ Note:

If required, lag screw reduction of a fragment must be accomplished before inserting locking screws into the fragment. Lag screw reduction can be accomplished using a cortex screw ∅ 4.5 mm in the central hole of the plate head. Alternatively, a cannulated conical screw ∅ 5.0 mm or for interfragmentary compression a screw nut ∅ 5.0 mm with a cannulated conical screw ∅ 5.0 mm can be used. Conical and cortex screws may be replaced with locking screws after reduction is complete.

▲ Precaution:

Verify that the wire for preliminary fixation is not colliding with a drill bit or screw during insertion.

Insert a threaded drill guide ∅ 4.3 mm into the central head hole of the plate. Insert the drill bit ∅ 4.3 mm through the drill guide, parallel to the joint axis and perpendicular to the anterior half of the lateral femoral condyle.

Advance the drill bit until it reaches the medial wall of the femoral condyle. Read the measurement from the calibrated drill bit ∅ 4.3 mm. (2)

Remove the drill bit and drill guide.

Insert the appropriate length variable angle locking screw. The VA locking screw ∅ 5.0 mm may be inserted using power equipment and the screwdriver shaft Stardrive SD25.

▲ WARNING:

If the torque limiter is unavailable, do not tighten the screws to the plate under power.

■ Note:

Confirm screw position and length prior to final tightening with the T-handle with torque limiting function 6 Nm. Final tightening must be done by hand using the screwdriver shaft Stardrive SD25 for hexagonal coupling 6.0 mm, together with the T-handle with torque limiting function 6 Nm. (3)

Alternative instruments for drilling central hole

323.042	LCP Drill Sleeve 5.0, for Drill Bits ∅ 4.3 mm
310.430	LCP Drill Bit ∅ 4.3 mm with Stop, length 221 mm, 2-flute, for Quick Coupling
319.100	Depth Gauge for Screws ∅ 4.5 to 6.5 mm, measuring range up to 110 mm

As an alternative to the percutaneous drill guide and drill bit ∅ 4.3 mm, the LCP drill sleeve and LCP drill bit from the LCP Large Fragment Instrument Set can be used (4). Read the measurement from the calibrated drill bit ∅ 4.3 mm.

Alternatively, the depth gauge can be used for screw length measuring after removal of the LCP Drill Sleeve 5.0.

▲ Precaution:

Due to the difference in the placement of the head of a locking screw compared to a cortex screw, care should be taken when determining screw length with the depth gauge.

2. Insert screws in remaining head holes

Instruments	
03.122.040	VA Double Drill Sleeve ∅ 4.3 mm
324.213	Drill Bit ∅ 4.3 mm, percutaneous, calibrated, length 300/200 mm, for Quick Coupling
319.100	Depth Gauge for Screws ∅ 4.5 to 6.5 mm, measuring range up to 110 mm
314.119	Screwdriver Shaft Stardrive 4.5/5.0, T25, self-holding, for AO/ASIF Quick Coupling
03.231.013	T-Handle with Torque Limiting Function, 6 Nm
03.231.015	Screwdriver Shaft Stardrive, T25, length 180 mm, for Hexagonal Coupling 6.0 mm
Alternative instrument for drilling	
310.430	LCP Drill Bit ∅ 4.3 mm with Stop, length 221 mm, 2-flute, for Quick Coupling

As an alternative to the percutaneous drill bit ∅ 4.3 mm, the LCP drill bit from the LCP Large Fragment Instrument Set can be used.

For predrilling the holes for the solid VA locking screw ∅ 5.0 mm that surround the central hole in the plate head, the VA double drill sleeve ∅ 4.3 mm can be used together with the drill bit ∅ 4.3 mm. (1)

The VA double drill sleeve allows either off-axis drilling (funnel end) or fixed-angle drilling (straight end).

For off-axis drilling, insert the drill bit through the cone-shaped end of the drill sleeve at the desired angle (1). The drill sleeve inserts coaxially into the variable angle locking hole and the tip keys into the cloverleaf design of the hole.

■ Note:

Placing screws at their nominal angle provides adequate connection strength between plate and screw. Choose off-axis angles based on clinical need.

Remove the drill bit and drill sleeve and use the depth gauge to measure for screw length. (2)

▲ Precaution:

Due to the difference in the placement of the head of a locking screw compared to a cortex screw, care should be taken when determining screw length with the depth gauge.

For fixed-angle drilling, insert the drill bit through the straight end of the drill sleeve. (3)

Remove the drill bit and drill sleeve and use the depth gauge to measure the screw length.

■ Note:

When drilling, the tip of the VA drill sleeve should remain fully seated in the hole.

▲ Precaution:

Take into consideration that the most posterior distal screw may be positioned distal to Blumensaat's line, requiring a unicondylar screw.

Alternative instruments for off-axis drilling

Instruments	
03.231.008	VA Drill Guide ∅ 4.3 mm, long
395.911	Handle for Drill Sleeve

As an alternative to the VA double drill sleeve, the VA drill guide ∅ 4.3 mm with spherical head can be used for off-axis drilling with the percutaneous drill bit ∅ 4.3 mm. Thread the VA drill guide with spherical head into the handle for drill sleeve and insert.

For off-axis drilling, the spherical tip of the VA drill guide should be gently pressed into the variable angle hole to ensure the lip of the VA drill guide stops on the edge of the variable angle hole to prevent drilling beyond 15 degrees. Insert the drill bit ∅ 4.3 mm through the VA drill guide at the desired angle. (4)

Drill and determine screw length from the drill bit calibration aligned with the top of the VA drill guide. Remove the drill bit and drill guide. (4)

Insert the appropriate length variable angle locking screw. The VA locking screw ∅ 5.0 mm may be inserted using power equipment and the screwdriver shaft Stardrive SD25.

■ Note:

Confirm screw position and length prior to final tightening with the T-handle with torque limiting function 6 Nm. Final tightening must be done by hand using the screwdriver shaft Stardrive SD25 for hexagonal coupling 6.0 mm, together with the T-handle with torque limiting function 6 Nm. (5)

3. Use guiding block instruments

Instruments	
03.231.025	Guide Sleeve, for Guiding Block for VA-LCP Condylar Plate 4.5/5.0
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
314.119	Screwdriver Shaft Stardrive 4.5/5.0, T25, self-holding, for AO/ASIF Quick Coupling
03.231.013	T-Handle with Torque Limiting Function, 6 Nm
03.231.015	Screwdriver Shaft Stardrive, T25, length 180 mm, for Hexagonal Coupling 6.0 mm

When the insertion handle with guiding block (short "guiding block") has been chosen and assembled, follow the steps below (the assembly is described in chapter "Preparation", section 2, Attach insertion handle). (1)

Insert the guide sleeve into the guiding block. Its spring mechanism holds it in place.

Insert the drill guide into the guide sleeve and thread it into the plate. (2)

Then follow the steps for pre-drilling as described in section 1 of this chapter (Insert screw in central head hole). (3)

For screw insertion through the guide sleeve remove the drill guide from the plate hole and insert the screw through the guide sleeve according to the steps for screw insertion described in section 1 of this chapter (Insert screw in central head hole). (4)

For predrilling and screw insertion in the remaining head holes the same surgical steps as described in section 2 (Insert screws in remaining head holes) and earlier in this section for guide block usage apply. (5)

■ Note:

The central protection sleeve has to be removed in order to assemble the two most posterior protection sleeves.

Optional instrument: use long VA Drill Guide within guiding block	
03.231.008	VA Drill Guide ∅ 4.3 mm, long
395.911	Handle for Drill Sleeve

It is possible to use the long VA Drill Guide with handle to predrill screws in a slight angle while having the insertion handle with guiding block attached. A maximum angulation of 4 degrees can be achieved. (6)

▲ Precautions:

- When having predrilled screws in an angled position, a guide sleeve for fixed angle insertion must not be used.
- To avoid collisions, insert all fixed angle screws over the guiding block first; in a second step insert screws in variable angle position.

Alternatively, screws can be predrilled and inserted in variable angle position as last step of the surgery after having removed the insertion handle with guiding block.

Option B. Insert cannulated VA locking screw ∅ 5.0 mm

1. Insert screw in central head hole

Instruments	
324.174	Wire Guide 5.0, for Guide Wire ∅ 2.5 mm
310.243	Guide Wire ∅ 2.5 mm, with drill tip, length 200 mm, Stainless Steel
319.701	Measuring Device for Cannulated Locking Screws and Cannulated Conical Screws ∅ 5.0 and 7.3 mm
314.230	Screwdriver Shaft, hexagonal, cannulated
338.490	Quick Coupling for Small Air Drill
03.231.013	T-Handle with Torque Limiting Function, 6 Nm
03.231.016	Screwdriver Shaft, hexagonal ∅ 4.0 mm, cannulated, length 180 mm, for Hexagonal Coupling ∅ 6.0 mm

■ Note:

All articles of the above list except the last two can be found in the Periarticular Instrument Set.

▲ Precaution:

Verify that the wire for preliminary fixation is not colliding with a guide wire or screw during insertion.

Insert a guide wire ∅ 2.5 mm through the preassembled wire guide, parallel to the joint axis and perpendicular to the anterior half of the lateral femoral condyle. (1)

Advance the guide wire through the wire guide until it reaches the medial wall of the femoral condyle. (2)

Measure for screw length using the measuring device for cannulated locking screws. For proper screw length measurement the measuring device must contact the end of the wire guide. This will place the tip of the screw at the tip of the guide wire. (3)

Remove the wire guide and insert the appropriate length VA cannulated locking screw ∅ 5.0 mm over the guide wire and into the bone (4). Remove the guide wire. The VA cannulated locking screw ∅ 5.0 mm may be inserted using power equipment, the cannulated hexagonal screwdriver shaft and quick coupling.

■ Notes:

- Confirm screw position and length prior to final tightening with the 6 Nm T-handle with torque limiting function. Final tightening must be done by hand using the cannulated hexagonal screwdriver shaft for hexagonal coupling 6.0 mm, together with the T-handle with torque limiting function 6 Nm. (5)
- The self-drilling, self-tapping flutes of the VA cannulated locking screw ∅ 5.0 mm make predrilling and pre-tapping unnecessary in most cases. In dense bone, the lateral cortex can be predrilled, if necessary.

2. Insert screws in remaining head holes

Instruments	
03.231.019	VA Wire Guide ∅ 2.5 mm, long
395.911	Handle for Drill Sleeve
03.120.026 or 338.002	Guide Wire ∅ 2.5 mm, with drill tip, length 300 mm, Cobalt-Chrome Alloy (CoCrWNi) Guide Wire ∅ 2.5 mm, with drill tip, length 300 mm, Cobalt-Chrome Alloy
03.231.017	Direct Measuring Device for VA Screws ∅ 5.0 mm, cannulated, for VA-LCP Condylar Plate 4.5/5.0
314.230	Screwdriver Shaft, hexagonal, cannulated
03.231.013	T-Handle with Torque Limiting Function, 6 Nm
03.231.016	Screwdriver Shaft, hexagonal ∅ 4.0 mm, cannulated, length 180 mm, for Hexagonal Coupling ∅ 6.0 mm

■ Note:

The guide wire and cannulated screwdriver shaft can be found in the Periarticular Instrument Set.

For insertion of VA cannulated locking screws ∅ 5.0 mm into the variable angle locking holes surrounding the central hole in the plate head, use the VA wire guide ∅ 2.5 mm with spherical head for off-axis drilling of the guide wire ∅ 2.5 mm.

Insert and thread the VA wire guide into the drill sleeve handle until tight.

For off-axis drilling, press the spherical tip of the VA wire guide gently into the variable angle hole to ensure the lip of the wire guide stops on the edge of the variable angle hole to prevent drilling beyond 15 degrees (1). Insert the guide wire through the VA wire guide at the desired angle. (2)

If fixed-angle insertion of a screw is essential, use a threaded wire guide to align the guide wire ∅ 2.5 mm to a normal trajectory.

Remove the wire guide and measure for screw length using the direct measuring device for VA cannulated screws ∅ 5.0 mm. For proper screw length measurement, place the direct measuring device firmly into the plate hole. This will place the tip of the screw at the tip of the guide wire. (3)

▲ Precaution:

Take into consideration that the most posterior distal screw may be positioned distal to Blumensaat's line, requiring a unicondylar screw.

Insert the appropriate length VA cannulated locking screw over the guide wire and into the bone (4). Remove the guide wire.

The VA cannulated locking screw ∅ 5.0 mm may be inserted using power equipment together with the cannulated hexagonal screwdriver shaft and quick coupling.

■ Note:

Confirm screw position and length prior to final tightening with the T-handle with torque limiting function 6 Nm. Final tightening must be done by hand using the cannulated hexagonal screwdriver shaft for hexagonal coupling 6.0 mm together with the T-handle with torque limiting function 6 Nm. (5)

3. Use guiding block instruments

Instruments	
03.231.025	Guide Sleeve, for Guiding Block for VA-LCP Condylar Plate 4.5/5.0
324.215	Wire Guide 5.0, percutaneous, for Guide Wire ∅ 2.5 mm
03.120.026	Guide Wire ∅ 2.5 mm, with drill tip, length 300 mm, Cobalt-Chrome Alloy (CoCrWNi)
or 338.002	Guide Wire ∅ 2.5 mm, with drill tip, length 300 mm, Cobalt-Chrome Alloy
324.208	Direct Measuring Device, percutaneous
314.230	Screwdriver Shaft, hexagonal, cannulated
03.231.013	T-Handle with Torque Limiting Function, 6 Nm
03.231.016	Screwdriver Shaft, hexagonal ∅ 4.0 mm, cannulated, length 180 mm, for Hexagonal Coupling ∅ 6.0 mm

When using guiding block instruments for cannulated VA Locking Screws the same technique as described earlier for guiding block usage (chapter Screw Insertion in Plate Head, section Use guiding block instruments) and for cannulated screw technique (chapter Option B. Insert cannulated VA locking screw ∅ 5.0 mm, section Insert screw in central head hole) applies.

Screw Insertion in Plate Shaft

1. Insert cortex screws ∅ 4.5 mm

Instruments	
03.120.015	Trocar with Handle for No. 03.120.014
03.231.007	Guide Sleeve for Aiming Arm Instruments, for VA-LCP Condylar Plate 4.5/5.0
03.120.017	Drill Sleeve ∅ 3.2 mm, for neutral position, for Periarticular Aiming Arm Instruments
324.212	Drill Bit ∅ 3.2 mm, percutaneous, calibrated, length 300/200 mm, for Quick Coupling
03.010.516	Handle, large, with Quick Coupling
314.560	Screwdriver Shaft, hexagonal, large, ∅ 3.5 mm, length 165 mm, for Quick Coupling

Choose an aiming arm hole and make an appropriate incision through it. Optionally, the scalpel handle can be used.

As described above in step 5 (page 17), 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. (1)

Use the assembled trocar and guide sleeve to staB down to the plate through the aiming arm hole and incision. Push the assembly completely down until it snaps into the selfretaining feature of the aiming arm. (2)

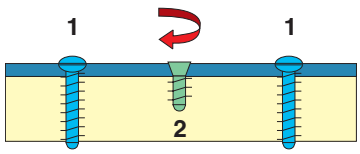
■ Note:

If a combination of cortex (1) and locking screws (2) is used, a cortex screw should be inserted first to pull the plate to the bone.

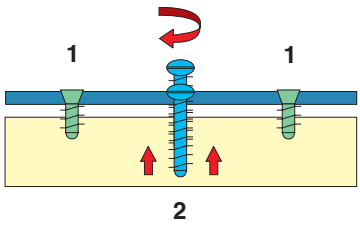
If locking screws (1) have been used to fix the plate to a fragment, subsequent insertion of a standard screw (2) in the same fragment without loosening and retightening the locking screws is not recommended.

1

2



Correct



Incorrect

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

Insert the drill sleeve ∅ 3.2 mm for neutral position into the guide sleeve, while aligning the self-retaining features, until it snaps into place. (3)

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 guide. (4)

Alternative instrument for measuring

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. (5)

Remove the drill bit and drill sleeve. Assemble screwdriver shaft and handle and insert the cortex screw using a power tool. Use the screwdriver shaft with handle to fully tighten the screw.

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

Optional instrument	
Instrument	
03.231.002	Stopper for Aiming Arm, for VA-LCP Condylar Plate 4.5/5.0

Mark each screw location in the aiming arm using a stopper for reference as screw insertion proceeds. (7)

▲ Precaution:

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

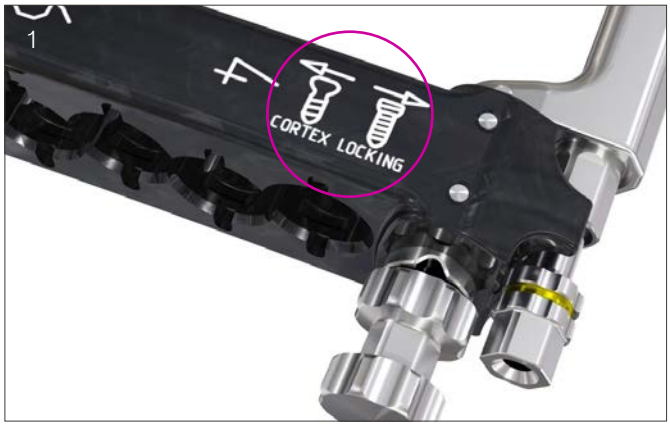
Option A. Insert solid VA locking screws ∅ 5.0 mm

1. Insert fixed-angle VA locking screws ∅ 5.0 mm

Instruments	
03.120.015	Trocar with Handle for No. 03.120.014
03.231.007	Guide Sleeve for Aiming Arm Instruments, for VA-LCP Condylar Plate 4.5/5.0
03.120.022	Handle for Nos. 324.203 and 324.215
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
03.120.029	Hexagonal Pin Wrench ∅ 4.0 mm with ball tip
314.119	Screwdriver Shaft Stardrive 4.5/5.0, T25, self-holding, for AO/ASIF Quick Coupling
03.231.013	T-Handle with Torque Limiting Function, 6 Nm
03.231.015	Screwdriver Shaft Stardrive, T25, length 180 mm, for Hexagonal Coupling 6.0 mm

Choose an aiming arm hole through which to make an incision. Create an incision. Optionally, the scalpel handle can be used.

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 (1), and then use the assembled trocar and guide sleeve to staB down to the plate through the chosen aiming arm hole with corresponding incision. Push the assembly completely down until it snaps into the self-retaining feature of the aiming arm (2).



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

Thread the handle into the percutaneous drill guide ∅ 4.3 mm. Insert the drill guide 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 percutaneous drill bit ∅ 4.3 mm (3). Determine screw length from the drill bit calibration aligned with the top of the drill guide (4).

Alternative instrument for measuring

Instrument	
324.208	Direct Measuring Device, percutaneous

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

Remove the drill bit and drill guide.

■ Note:

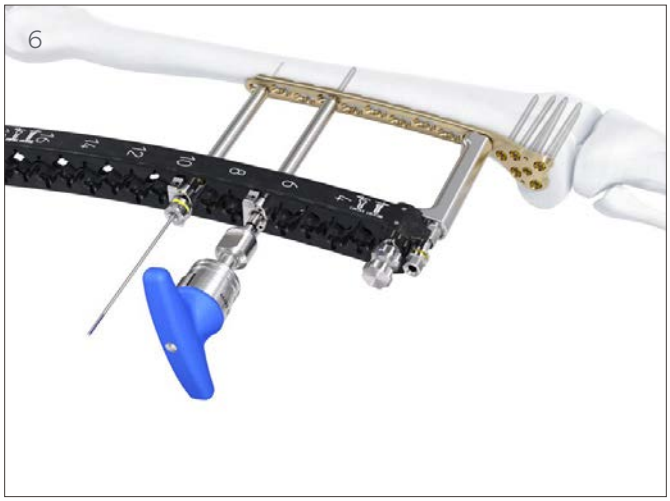
Use the tip of the handle as a pin wrench to loosen the percutaneous drill guides from the plate. Alternatively, the pin wrench can be used.

Insert the appropriate length variable angle locking screw. The VA locking screw ∅ 5.0 mm may be inserted using power equipment and the screwdriver shaft Stardrive SD25. (5)

■ Note:

Confirm screw position and length prior to final tightening with the T-handle with torque limiting function 6 Nm. Final tightening must be done by hand using the screwdriver shaft Stardrive SD25 for hexagonal coupling 6.0 mm, gether with the T-handle with torque limiting function 6 Nm. (6)

Insert as many VA locking screw ∅ 5.0 mm as necessary into the plate shaft. Mark each screw location in the aiming arm using a stopper for reference as screw insertion proceeds.



2. Insert variable angle VA locking screws ∅ 5.0 mm

Instruments	
03.231.010	Protection Sleeve for VA Drill Guide ∅ 4.3 mm, long
03.231.008	VA Drill Guide ∅ 4.3 mm, long
03.231.009	Trocar for VA Drill Guide ∅ 4.3 mm, long
324.213	Drill Bit ∅ 4.3 mm, percutaneous, calibrated, length 300/200 mm, for Quick Coupling
03.010.516	Handle, large, with Quick Coupling
03.231.013	T-Handle with Torque Limiting Function, 6 Nm
03.231.015	Screwdriver Shaft Stardrive, T25, length 180 mm, for Hexagonal Coupling 6.0 mm

Choose an aiming arm hole and make an incision through it.

For off-axis insertion of the VA locking screw ∅ 5.0 mm, insert the VA drill guide ∅ 4.3 mm with spherical head into the protection sleeve. Insert the trocar into the VA drill guide ∅ 4.3 mm. Insert the trocar/drill guide/protection sleeve assembly into the plate through the previously created incision. (1)

Depending on the desired angle, the trocar/drill guide/protection sleeve assembly can be placed through the aiming arm hole, or it can be placed outside of the aiming arm.

The spherical tip of the VA drill guide should be gently pressed into the variable angle hole to ensure the lip of the drill guide stops on the edge of the variable angle hole to prevent drilling beyond 15°.

Remove the trocar from the assembly. (2)

Optional instruments for protection sleeve fixation

Instruments	
03.120.026	Guide Wire ∅ 2.5 mm, with drill tip, length 300 mm, Cobalt-Chrome Alloy (CoCrWNi)
or	
338.002	Guide Wire ∅ 2.5 mm, with drill tip, length 300 mm, Cobalt-Chrome Alloy

Find the desired angle and insert a guide wire ∅ 2.5 mm into one of the wire holes around the central hole of the protection sleeve (3). The variable angle drill guide and protection sleeve assembly is now provisionally fixed at the desired angle. Depending on the guide wire location, the wire may need to be cut to allow room for drilling.

▲ Precaution:

If the guide wire is inserted into one of the two outside holes, there is no need to cut the wire before drilling. If the guide wire is inserted into one of the immediate holes around the drill guide then the wire must be cut to allow room for the drill bit.

Insert the percutaneous drill bit ∅ 4.3 mm through the VA drill guide and drill to the desired depth. (4)

Determine screw length from the drill bit calibration at the top of the drill guide. (4)

Remove the drill bit and the drill guide and insert the appropriate VA locking screw ∅ 5.0 mm through the protection sleeve. (5)

■ Notes:

- For initial insertion of VA locking screws ∅ 5.0 mm it is recommended to use the Stardrive screwdriver shaft with handle.
- Confirm screw position and length prior to final tightening with the T-handle with torque limiting function 6 Nm. Final tightening must be done by hand using the SD25 Stardrive screwdriver shaft for hexagonal coupling 6.0 mm and the T-Handle with torque limiting function 6 Nm. (6)

Option B: Insert cannulated VA locking screws ∅ 5.0 mm

1. Insert variable angle VA locking screws ∅ 5.0 mm

Instruments	
03.231.010	Protection Sleeve for VA Drill Guide ∅ 4.3 mm, long
03.231.019	VA Wire Guide ∅ 2.5 mm, long
03.120.026	Guide Wire ∅ 2.5 mm, with drill tip, length 300 mm, Cobalt-Chrome Alloy (CoCrWNi)
or 338.002	Guide Wire ∅ 2.5 mm, with drill tip, length 300 mm, Cobalt-Chrome Alloy
324.208	Direct Measuring Device, percutaneous
314.230	Screwdriver Shaft, hexagonal, cannulated
03.231.013	T-Handle with Torque Limiting Function, 6 Nm
03.231.016	Screwdriver Shaft, hexagonal ∅ 4.0 mm, cannulated, length 180 mm, for Hexagonal Coupling ∅ 6.0 mm

Choose an aiming arm hole and make an incision through it.

For off-axis insertion of VA cannulated locking screws ∅ 5.0 mm, insert the VA wire guide ∅ 2.5 mm with spherical head into the protection sleeve. (1)

Depending on the desired angle, the wire guide/protection sleeve assembly can be placed through the aiming arm hole or outside of the aiming arm.

The spherical tip of the variable angle wire guide should be gently pressed into the variable angle hole to ensure the lip of the wire guide stops on the edge of the hole to prevent drilling beyond 15°. (1)

Insert the guide wire ∅ 2.5 mm through the wire guide at the desired angle. (2)

Measure for screw length using the direct measuring device. Place the direct measuring device over the guide wire and against the end of the wire guide. Determine screw length from the end of the wire. (3)

Remove the wire guide and protection sleeve.

Insert the appropriate length VA cannulated locking screw ∅ 5.0 mm over the guide wire and into the bone (4). Remove the guide wire.

The VA cannulated locking screw ∅ 5.0 mm may be inserted using power equipment together with the cannulated hexagonal screwdriver shaft and quick coupling.

■ Note:

Confirm screw position and length prior to final tightening with the T-handle with torque limiting function 6 Nm. Final tightening must be done by hand using the cannulated hexagonal screwdriver shaft for hexagonal coupling 6.0 mm together with the T-handle with torque limiting function 6 Nm. (5)

Optional instrument for drilling

Instrument	
310.634	Drill Bit ∅ 4.3 mm, cannulated, length 200 mm, with Quick Coupling

The self-drilling, self-tapping flutes of the VA cannulated locking screws ∅ 5.0 mm make predrilling and pretapping unnecessary in most cases. In dense bone, the lateral cortex can be predrilled, if necessary.

Instrument and Implant Removal

Instrument Removal

321.160	Combination Wrench ∅ 11.0 mm

Remove all guide sleeves. Turn the connecting bolt on the aiming arm counterclockwise to loosen and remove the aiming arm from the insertion handle. Use the combination wrench to loosen the nut on the locking bolt for the insertion handle and remove the locking bolt. (1)

If desired, insert an appropriate screw into the first combi-hole in the plate shaft.

▲ Precaution:

This hole is often located immediately adjacent to or in the fracture zone. Because of this, it has the potential to maximize stress concentration in the implant and adversely affect strain in the fracture gap. With most fracture patterns in this region, it is preferable to leave this hole unfilled.

Implant Removal

For screw removal (both VA Locking Screws in Stainless Steel and with OPTILINK™ technology), follow the instructions in the Screw Extraction surgical technique (DSEM/TRM/0614/0104). In the event of a damaged VA Locking Screw with OPTILINK™ technology recess or broken screw, the following table provides guidance on instrument selection:

	Solid VA Locking Screw ∅ 5.0 mm, OPTILINK™ Technology	**Cannulated VA Locking Screw ∅ 5.0 mm, OPTILINK™ Technology**
Drill Bit	Carbide Drill Bit (309.004S)	HSS Drill Bit (309.506S)
Extraction	Conical Extraction Screw (309.530)	N/A
Shaft Removal	Hollow Reamer (309.450) and Extraction bolt (309.490)	Hollow Reamer (309.450) and Extraction bolt (309.490)

VA-LCP Condylar Plates 4.5/5.0

Stainless steel	Titanium alloy	Holes	Length (mm)	Side
02.124.406	04.124.406	6	159 mm	right
02.124.407	04.124.407	6	159 mm	left
02.124.408	04.124.408	8	195 mm	right
02.124.409	04.124.409	8	195 mm	left
02.124.410	04.124.410	10	230 mm	right
02.124.411	04.124.411	10	230 mm	left
02.124.412	04.124.412	12	266 mm	right
02.124.413	04.124.413	12	266 mm	left
02.124.414	04.124.414	14	301 mm	right
02.124.415	04.124.415	14	301 mm	left
02.124.416	04.124.416	16	336 mm	right
02.124.417	04.124.417	16	336 mm	left
02.124.418	04.124.418	18	370 mm	right
02.124.419	04.124.419	18	370 mm	left

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

Additionally available (only sterile packed):

Stainless steel	Titanium alloy	Holes	Length (mm)	Side
02.124.420S	04.124.420S	20	405 mm	right
02.124.421S	04.124.421S	20	405 mm	left
02.124.422S	04.124.422S	22	439 mm	right
02.124.423S	04.124.423S	22	439 mm	left

Screws

VA locking screw ∅ 5.0 mm

- Threaded rounded head
- Self-tapping tip
- Stainless Steel or Stainless Steel with OPTILINK™ technology (02.231.214 – 02.231.300, 42.231.214 – 42.231.300)

VA periprosthetic locking screw ∅ 5.0 mm

- Threaded rounded head
- Self-tapping flutes
- Stainless Steel or Stainless Steel with OPTILINK™ technology (02.231.008 – 02.231.020, 42.231.008 – 42.231.020)

VA cannulated locking screw ∅ 5.0 mm

- Threaded rounded head
- Self-drilling tip
- Stainless Steel or Stainless Steel with OPTILINK™ technology (02.231.620 – 02.231.700, 42.231.620 – 42.231.700)

Positioning Pin for VA 5.0

- Recommended pin solution for cable applications in VA 5.0 plates with cruciform design to fit in the locking portion of the VA 5.0 hole
- Hole in the pin oriented to the side of the plate allows for cable fixation
- Pean forceps or a needle holder may help to hold the pin when placing it in the plate hole
- Make sure to mount the positioning pin on the cable before passing it. For further information on cable system usage consult the Cable System surgical technique.

02.231.022	Positioning Pin for VA 5.0, cruciform, Stainless Steel	
04.231.022	Positioning Pin for VA 5.0, cruciform, Pure Titanium	

The following existing screws are compatible with the VA-LCP Condylar Plate 4.5/5.0:

Locking screw ∅ 5.0 mm
Periprosthetic locking screw ∅ 5.0 mm
Cannulated locking screw ∅ 5.0 mm
Cannulated conical screw ∅ 5.0 mm*
Cortex screw ∅ 4.5 mm

* The cannulated conical screw ∅ 5.0 mm can only be used in the fixed-angle central plate head hole and cannot be used in the variable angle locking holes.

Notes:

- All locking screws ∅ 5.0 mm must be inserted in nominal angle and tightened with 4.0 Nm.
- It is recommended to use the available guiding tools to assist insertion in nominal angle.

Locking screw ∅ 5.0 mm

- Threaded conical head
- Fully threaded shaft
- Self-tapping tip
- Stainless steel and titanium

Cortex screw ∅ 4.5 mm

- Self-tapping tip
- Stainless steel or titanium

The VA-LCP Condylar System is compatible with
- the cable system
- the Locking Attachment Plate

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

VA Instruments and Aiming Arm Instruments

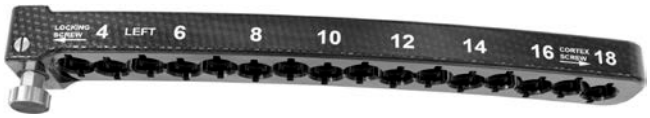
03.231.020	Insertion Handle for Universal Aiming Arm for VA-LCP Condylar Plate 4.5/5.0	
03.231.023	Connecting Bolt for Universal Aiming Arm	
03.231.024	Universal Aiming Arm for VA-LCP Condylar Plates 4.5/5.0	
03.231.002	Stopper for Aiming Arm, for VA-LCP Condylar Plate 4.5/5.0	
03.231.005	Locking Bolt for Aiming Arm Instruments, for VA-LCP Condylar Plate 4.5/5.0	
03.231.006	Locking Nut for Aiming Arm Instruments, for VA-LCP Condylar Plate 4.5/5.0	
03.231.007	Guide Sleeve for Aiming Arm Instruments, for VA-LCP Condylar Plate 4.5/5.0	
03.231.008	VA Drill Guide ∅ 4.3 mm, long	

03.231.009	Trocar for VA Drill Guide ∅ 4.3 mm, long	
03.231.010	Protection Sleeve for VA Drill Guide ∅ 4.3 mm, long	
03.231.013	T-Handle with Torque Limiting Function, 6 Nm*	
03.231.015	Screwdriver Shaft Stardrive, T25, length 180 mm, for Hexagonal Coupling 6.0 mm	
03.231.016	Screwdriver Shaft, hexagonal ∅ 4.0 mm, cannulated, length 180 mm, for Hexagonal Coupling ∅ 6.0 mm	
03.231.017	Direct Measuring Device for VA Screws ∅ 5.0 mm, cannulated, for VA-LCP Condylar Plate 4.5/5.0	
03.231.018	Handle with Torque Limiting Function, 6 Nm*	
03.231.019	VA Wire Guide ∅ 2.5 mm, long	

* Recalibration of the Torque Limiting Handles (03.231.013 and 03.231.018). DePuySynthes recommends 6 months servicing and inspection by the original manufacturer. The Torque Limiting Handle has to be sent to your DePuySynthes repair center annually for calibration. The user accepts the responsibility for this annual calibration.

03.122.040	VA Double Drill Sleeve ∅ 4.3 mm	
395.911	Handle for Drill Sleeve	
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	
03.120.022	Handle for Nos. 324.203 and 324.215	
03.120.023	Pull Reduction Device for Percutaneous Drill Guide ∅ 4.3 mm, with Nut	
03.120.024	Nut for No. 03.120.023	
03.120.026	Guide Wire ∅ 2.5 mm, with drill tip, length 300 mm, Cobalt-Chrome Alloy (CoCrWNi)	

03.120.029	Hexagonal Pin Wrench ∅ 4.0 mm with ball tip	
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	
03.010.516	Handle, large, with Quick Coupling	
Optional: guiding block instruments		
03.231.021	Insertion Handle with Guiding Block for Universal Aiming Arm, left	
03.231.022	Insertion Handle with Guiding Block for Universal Aiming Arm, right	
03.231.025	Guide Sleeve, for Guiding Block for VA-LCP Condylar Plate 4.5/5.0	
Alternative instrument (1st generation design)		
03.231.003	Aiming Arm for VA-LCP Condylar Plate 4.5/5.0, left	
03.231.004	Aiming Arm for VA-LCP Condylar Plate 4.5/5.0, right	
03.231.001	Insertion Handle for Aiming Arm for VA-LCP Condylar Plate 4.5/5.0	

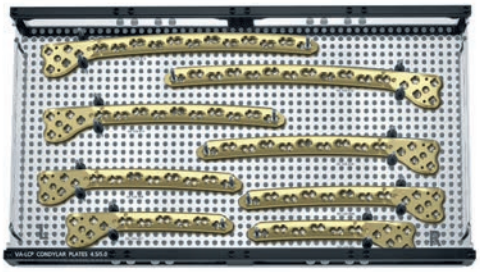
■ Note:

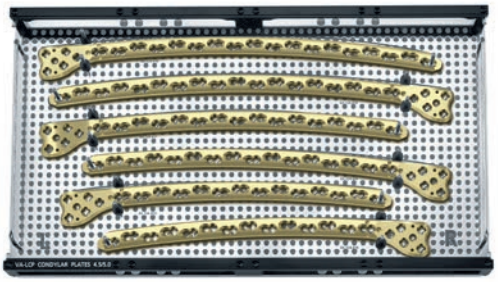
The insertion handle 03.231.001 may only be used in combination with aiming arms 03.231.003 or 03.231.004. These aiming arms are also compatible with the insertion handles 03.231.020–03.231.022.

Sets

Plates

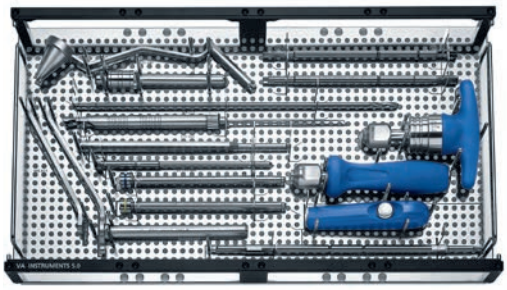
01.231.030	VA-LCP Condylar Plate 4.5/5.0, Stainless Steel, in Vario Case
or	
01.231.031	VA-LCP Condylar Plate 4.5/5.0, Titanium Alloy (TAN), in Vario Case
68.231.001	Vario Case for VA-LCP Condylar Plate 4.5/5.0, size ½, without Contents
68.231.002	Modular Tray 1 for VA-LCP Condylar Plate 4.5/5.0, size ½, without Contents, Vario Case System
68.231.003	Modular Tray 2 for VA-LCP Condylar Plate 4.5/5.0, size ½, without Contents, Vario Case System





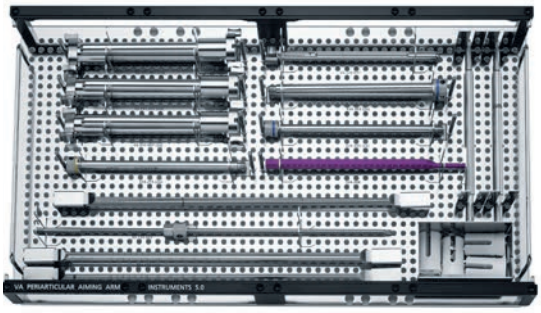
VA Instruments

01.231.032	Instruments for VA-LCP Condylar Plate 4.5/5.0, in Vario Case
68.231.007	Modular Tray for VA Instruments, for VA-LCP Condylar Plate 4.5/5.0, size ½, without Contents, Vario Case System

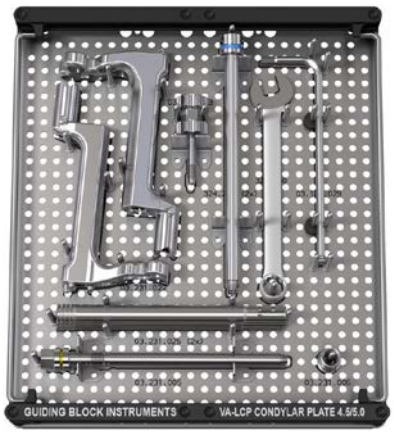


VA Aiming Arm Instruments

01.231.033	VA Periarticular Aiming Arm Instruments for VA-LCP Condylar Plate 4.5/5.0, in Vario Case
68.231.004	Vario Case for VA Periarticular Aiming Arm Instruments, size 1/1, without Contents
68.231.005	Modular Tray 1 for VA Periarticular Aiming Arm Instruments, size 1/1, without Contents, Vario Case System
68.231.006	Modular Tray 2 for VA Periarticular Aiming Arm Instruments, size 1/1, without Contents, Vario Case System



68.231.009	Modular Tray for Guiding Block for VA-LCP Condylar Plate 4.5/5.0, size 1/2, without Contents, Vario Case System



Screws

68.122.054	Modular Screw Rack, with Drawer, Measuring Block and Lid, length 200 mm, height 115 mm, size ½, without Contents, Vario Case System
68.122.050	Modular Insert, for Modular Screw Rack, for Screws ∅ 5.0 mm, size ⅓, without Contents, Vario Case System

Other optional modules

68.122.051	Modular Insert, for Modular Screw Rack, for Screws ∅ 4.5 mm, size ⅓, without Contents, Vario Case System
68.122.052	Modular Insert, for Modular Screw Rack, for Screws ∅ 6.5 mm, size ⅓, without Contents, Vario Case System
68.122.056	Auxiliary Modular Insert, for Modular Screw Rack, size ⅓, without Contents, Vario Case System
68.000.128	Auxiliary Module, size ⅓, height 14 mm, for Screw Rack, size ½
68.000.129	Auxiliary Module, size ⅓, height 28 mm, for Screw Rack, size ½

MRI Information

Torque, Displacement and Image Artifacts according to ASTM F 2213-06, ASTM F 2052-14 and ASTM F 2119-07

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 135 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 F 2182-11a

Non-clinical electromagnetic and thermal testing of worst case scenario lead to peak temperature rise of 9.20 °C (1.5 T) with an average temperature rise of 6.39 °C (1.5 T) and a peak temperature rise of 7.43 °C (3 T) with an average temperature rise of 5.38 °C (3.0 T) under MRI Conditions using RF Coils (whole body averaged specific absorption rate [SAR] of 2 W/kg for 15 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

DePuy Synthes
THE ORTHOPAEDICS COMPANY OF Johnson & Johnson

Synthes GmbH
Eimattstrasse 3
4436 Oberdorf
Switzerland
Tel: +41 61 965 61 11

www.depuysynthes.com

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