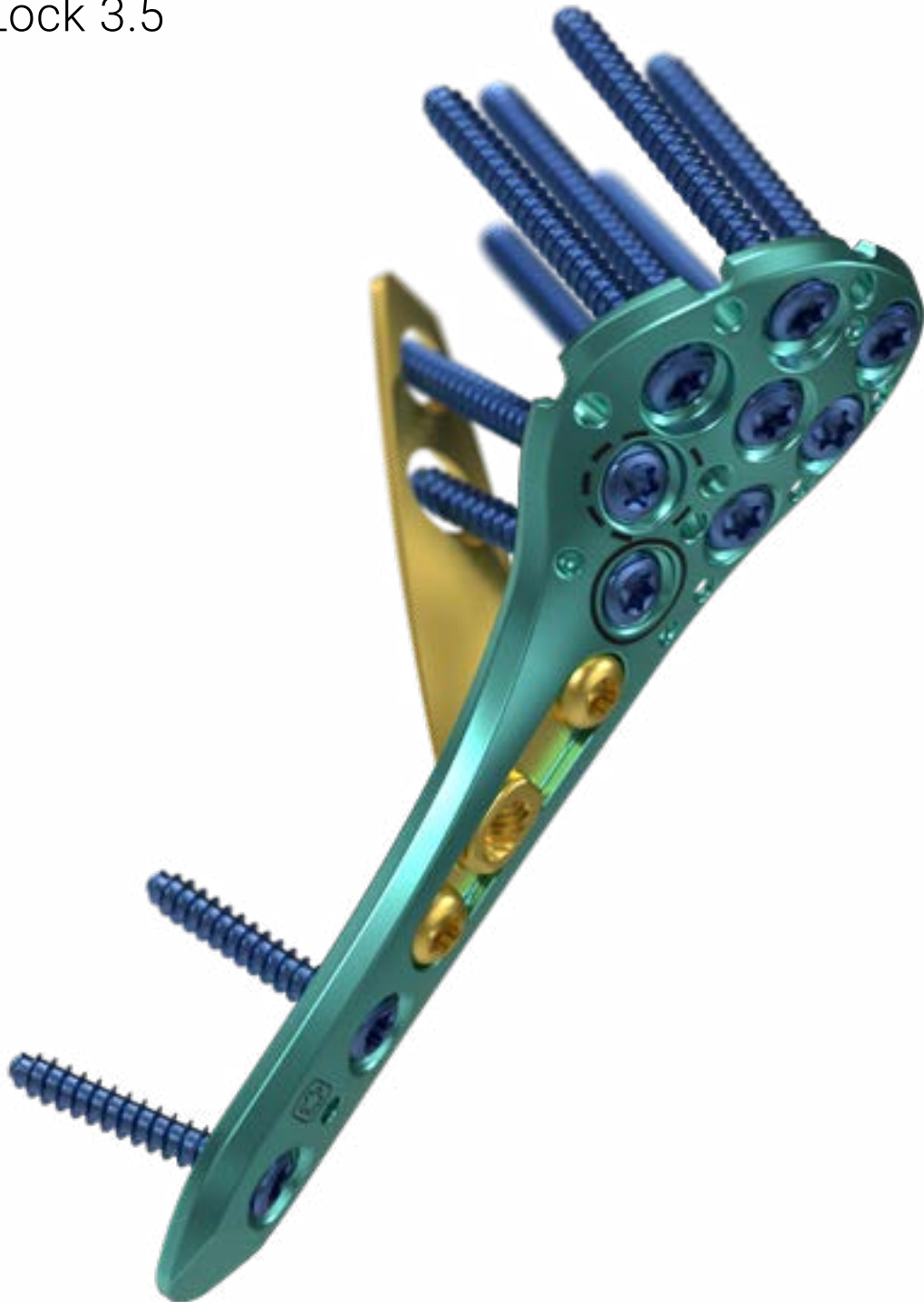


SURGICAL TECHNIQUE

Proximal Humerus System

PentaLock 3.5



APTUS Shoulder

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For further information regarding the APTUS product line, visit www.medartis.com

Introduction

Product Materials

Plates, Screws

Ti6Al4V (ASTM F136)

Spiral blades

cpTi (ASTM F67)

K-Wires

Stainless steel (ISO 5832-1)

Instruments

Stainless steel, aluminum, aluminum alloy, cpTi (ASTM F67), Nitinol, PA, PEEK, POM, PP, PPSU, PTFE, silicone

Containers

Stainless steel, aluminum alloy, PEEK, PP, PPSU, silicone

Indications

APTUS Shoulder

Fractures and osteotomies of the bones of the shoulder

- Proximal humerus plates
 - fractures, osteotomies and non-unions of the proximal humerus
- Proximal humerus XL plates
 - fractures, osteotomies and non-unions of the proximal humerus and fractures extending to the humeral shaft

Contraindications

- Preexisting or suspected infection at or near the implantation site
- Known allergies and/or hypersensitivity to implant materials
- Inferior or insufficient bone quality to securely anchor the implant
- Patients who are incapacitated and/or uncooperative during the treatment phase
- Growth plates are not to be blocked with plates and screws

Color Coding

System Size	Color Code
3.5 mm / HD15	Dark blue

Plates, Screws and Spiral Blades

Special implant plates, screws and spiral blades have their own color:

Implant plates turquoise	PentaLock plates
Implant spiral blades gold	Spiral blades
Implant screws for blade fixation gold	Screws for blade fixation

Implant screws dark blue PentaLock screws



Implant screws dark blue with ring marking on the screw head Cortical screws



Symbols



HexaDrive



PentaLock (locking technology)



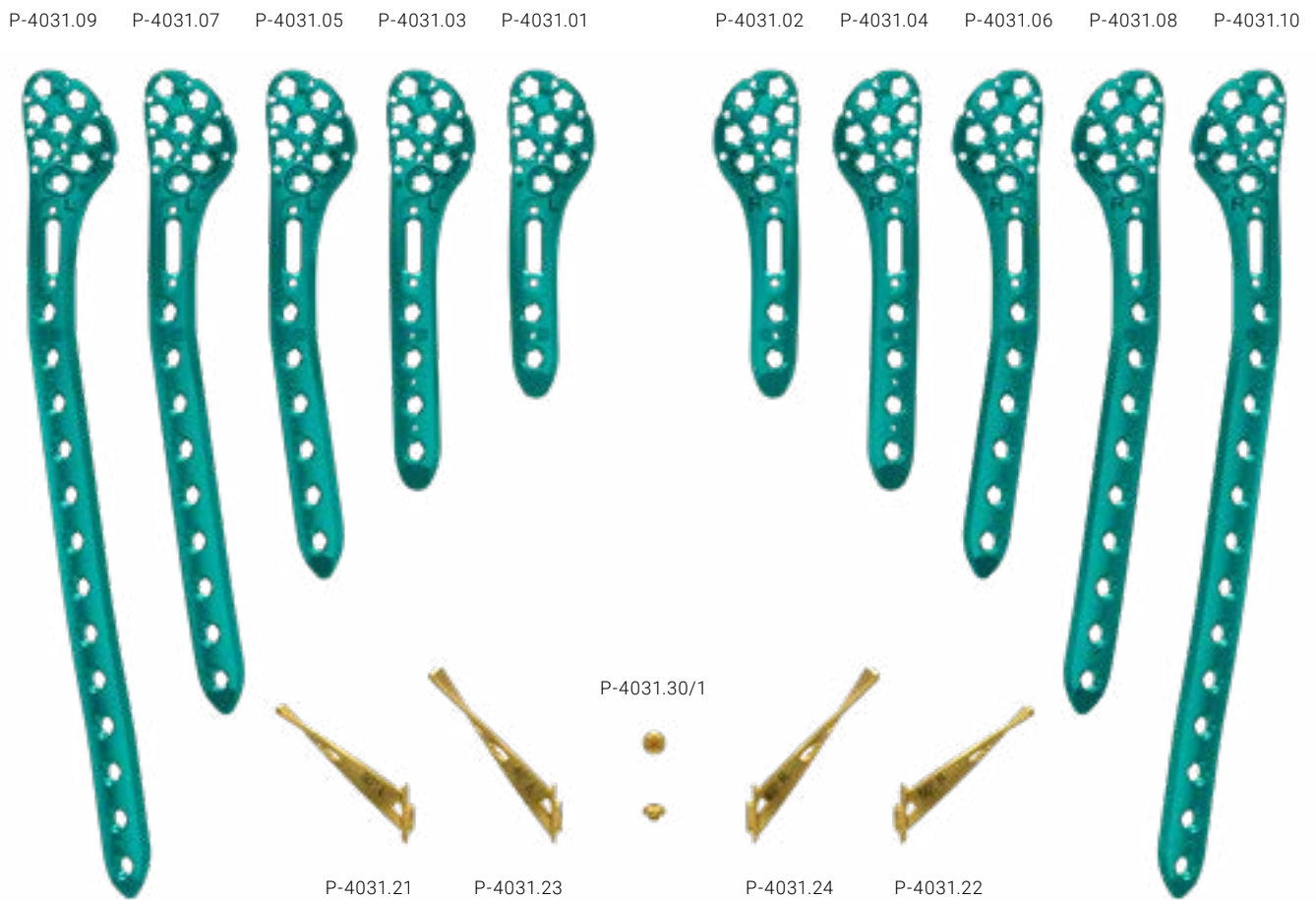
System Overview

The plates of the APTUS Proximal Humerus System (P-4031.01–10) are available in five lengths and in a left and a right version.

The spiral blades are optional and are available in 40° (P-4031.23–24) and 50° angles (P-4031.21–22), in both left and right configurations.

Both options are compatible with all five plate lengths.

The spiral blade is fixed to the plate with two set screws (P-4031.30/1).



Treatment Concept

When addressing a fracture pattern that requires additional medial support of the proximal humerus, the plate can optionally be combined with the spiral blade 40° or the spiral blade 50°. These spiral blades provide additional support to the plate-screw-construct in the medial bone tissue¹. In addition, the XL plate types enable the management of fracture patterns that extend to the humeral shaft.



The above-mentioned information is a recommendation only. The operating surgeon is solely responsible for the choice of the suitable implant for the specific case.

Screw distribution without spiral blade, view from top:



¹ Beirer M, Crönlein M, Venjakob AJ, Saier T, Schmitt-Sody M, Huber-Wagner S, Biberthaler P, Kirchhoff C: Additional calcar support using a blade device reduces secondary varus displacement following reconstruction of the proximal humerus: a prospective study. Eur J Med Res 2015; 20: 82

Instrument Application

General Instrument Application

Sizing Templates

Sizing templates facilitate the intraoperative selection of the appropriate implant. The article numbers of the sizing templates correspond as follows:

- P-4031.04TP (with suffix TP) is for sizing the plates P-4031.01-04
- P-4031.10TP (with suffix TP) is for sizing the plates P-4031.05-10

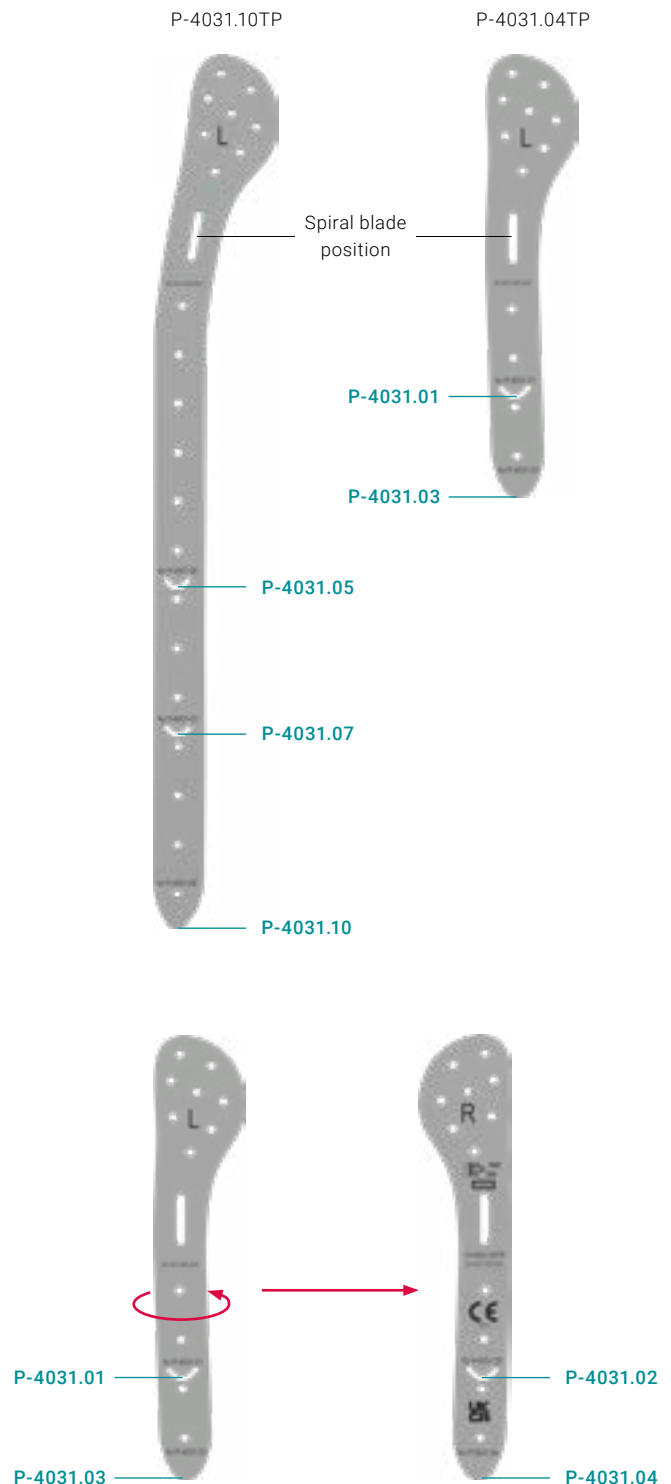
The length markings on the templates correspond to the lengths of the respective implants, with odd numbers indicating left plates and even numbers indicating right plates (see image turquoise font).

The sizing templates feature small holes that indicate the center position of the screw holes on the respective implants. In addition, a slit represents the oblong hole in the implants, which is used for cortical screws or the spiral blade.

Make sure to respect the "right" and "left" symbol by applying the templates accordingly. Use appropriate K-wires/olive K-wires to temporarily fix the sizing template to the bone, if necessary.

Notice

Do not implant sizing templates.
Do not bend or cut sizing templates.



Drilling

Color-coded twist drills are available for every APTUS system size. All twist drills are color-coded with a ring system.

System Size	Color Code
3.5 / HD15	Dark Blue

There are two different types of twist drills for every system size:

- The core hole drill is characterized by one dark blue ring.
- The optional gliding hole drill for lag screw technique is characterized by two dark blue rings.

Options for drill guides configuration:

Application of the drill guides:

P-2032.01 **Multidirectional** drill guide: has two ends, a multidirectional cone and a multidirectional spherical tip:

- When using the cone end, press firmly to ensure the drill guide tip keys into the shape of the PentaLock screw hole in a fixed (nominal) angle. The cone will provide a secure window of 15° angulation.
- When using the spherical tip end, gently press the instrument into the PentaLock hole. The lip portion of the spherical tip end engages with the cloverleaf section of the hole, providing tactile feedback of the angulations. Continue applying light pressure while holding the drill guide at the desired angle. The spherical tip end of the drill guide allows freedom to choose direction providing haptic feedback when the angle deviates by 15° from the nominal hole direction. To ensure a precise 15° angulation, use the cone end of the multidirectional drill guide.



P-3033.10 Core hole drill
Ø 2.6 mm = one colored ring



P-3033.21 (optional) Lag screw drill
Ø 3.6 mm = two colored rings



P-2032.01 Drill Guide
Multidirectional, Ø 2.6 mm

P-2032.03 **Unidirectional**, self-holding drill guide:
is a threaded drill guide engaging in a fixed (nominal)
direction of the PentaLock screw hole and is applied by
threading the guide in the hole until haptic resistance can be
felt (after approx. 360° rotation).



P-2032.03 Drill Guide
Unidirectional, Self-Holding Ø 2.6 mm

P-2032.02 Drill Guide for **the lag screw** gliding hole:
for application details, see chapter “Lag Screw Technique”.



P-2032.02 Drill Guide
for Lag Screws, Ø 3.6 mm

The drill guides P-2032.01 and P-2032.03 with one dark blue
marking can be used for all screw holes and for the insertion
of independent screws (e.g. fragment fixation with screws
alone). Note that the unidirectional drill guide P-2032.03 does
not work in the oblong hole.

Warning

The twist drills must always be guided by drill guides
(P2032.01–03). This prevents damage to the screw hole,
reduces the risk of drill breakage and protects the
surrounding tissue from direct contact with the drill.

Warning

For PentaLock plates ensure that the screw holes are
predrilled with a pivoting angle of no more than $\pm 15^\circ$.
A predrilled pivoting angle of $> 15^\circ$ no longer allows the
PentaLock screws to correctly lock in the plate.

Assigning the Screw Length

The depth gauge (P-2033.01) is used to assign the ideal screw length for use in monocortical or bicortical screw fixation of PentaLock screws and cortical screws.

Retract the slider of the depth gauge.

The depth gauge caliper has a hooked tip that is either inserted to the bottom of the hole or is used to catch the far cortex of the bone. When using the depth gauge, the caliper stays static, only the slider is adjusted.

To assign the screw length, place the end of the slider onto the implant plate or directly onto the bone.

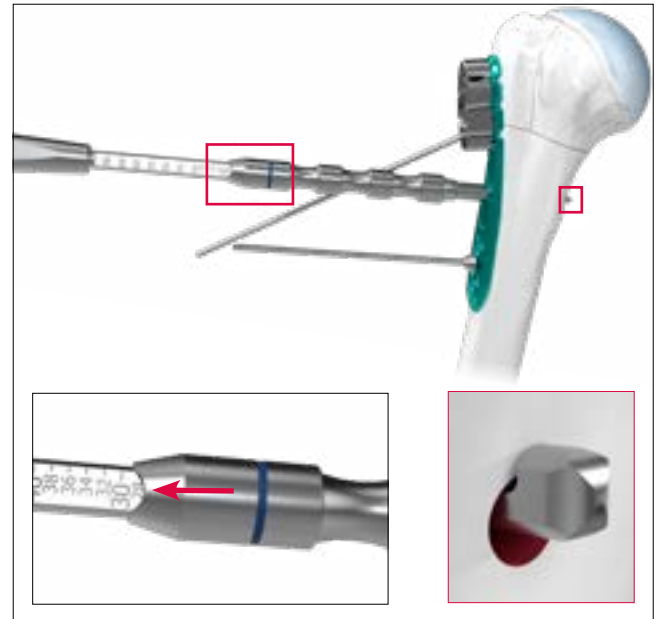
When using the lag screw technique, place the end of the slider directly onto the bone (e.g. for fracture fixation with lag screws).

The ideal screw length for the assigned drill hole can be read on the scale of the depth gauge.

The required screw length may also be determined at the scale on the drill (P-3033.10). The length is read at the end of either the drill guide (P-2032.01) or the self-holding drill guide (P-2032.03).



P-2033.01
Depth Gauge, HD15



Screw Pick-Up

Both screwdriver blades (P-2031.02, P-2031.03) feature the HexaDrive self-holding system.



P-2031.02
Screwdriver Blade, Short, HD15, AO



P-2031.03
3.5/4.0 Screwdriver Blade, Long, HD15, AO



P-2031.01
Sleeve for P-2031.03



A-2074
Handle with Quick Connector, AO

To pick up the screws from the implant container, insert the appropriately color-coded screwdriver blade perpendicularly into the screw head of the desired screw and pick up the screw with axial pressure.

Notice

The screw will not hold without axial pressure.

Caution

Vertically extract the screw from the compartment. Picking up the screw repeatedly may lead to permanent deformation of the self-retaining area of the HexaDrive inside the screw head. Therefore, the screw may no longer be able to be picked up correctly. In this case, a new screw has to be used.

Notice

Check the screw length and diameter at the scale of the measuring module. The screw length is determined at the end of the screw head.



Surgical Techniques

General Surgical Techniques

Lag Screw Technique

Warning

Incorrect application of the lag screw technique may result in postoperative loss of reduction.

1. Drilling the gliding hole

Drill the gliding hole using the twist drill marked with two dark blue rings (P-3033.21, Ø 3.6 mm) in combination with the drill guide (P-2032.02, labeled with "LAG"). Drill perpendicular to the fracture line.

Do not drill further than the fracture line.



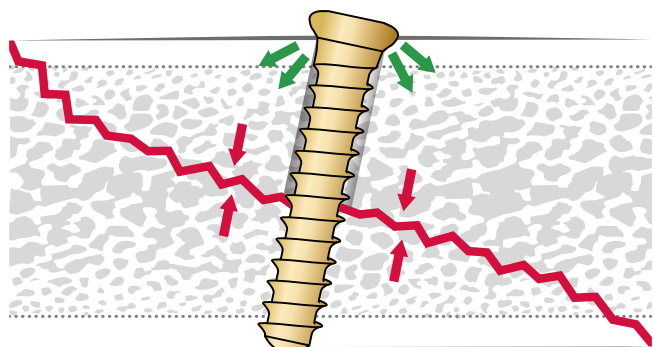
2. Drilling the core hole

Insert the drill guide (P-2032.01) into the drilled gliding hole and use the twist drill for core holes with one dark blue ring (P-3033.10, Ø 2.6 mm) to drill the core hole.



3. Compressing the fracture

Compress the fracture with the corresponding cortical screw.



Specific Surgical Techniques

Fixing the Plate without Drill Guide Block

For inserting the spiral blade please follow the surgical technique with the guide block.

1. Positioning the plate

After reducing the fracture, the humeral plate (P-4031.01–10) can be fixed temporarily with 2.0 mm K-wires (A-5040.61, A-5042.61) or olive K-wires (P-5004.62/1, P-5004.65/1) in the desired position.

The course of the sulcus intertubercularis (bicipital groove) may be used as orientation for positioning the anterior plate edge. The plate has an anatomical fit and comes to rest approx. 5–10 mm distally from the top of the greater tubercle.

Caution

Placing the plate too proximally increases the risk of a subacromial impingement. If the plate is placed too distally, the optimal screw positioning in the humeral head may be more difficult.

Use intraoperative X-ray control to verify the correct plate position.



2. Initial fixation of the plate

Insert a cortical screw (P-5031.xx) into the center of the oblong hole. For that, drill a core hole through the oblong hole using the drill guide P-2032.01 and the twist drill \varnothing 2.6 mm (P-3033.10, one colored ring).

Assign the screw length with the depth gauge (P-2033.01).

Pick up a cortical screw of the determined length with the help of the screwdriver blade (P-2031.02, P-2031.03) attached to the handle (A-2074) and insert it into the corresponding hole.



If the plate needs further repositioning: remove all relevant K-wires, slightly loosen the cortical screw in the oblong hole, readjust the position of the plate and retighten the cortical screw.

3. Fixing the plate

Fill the remaining screw holes with cortical screws (P-5031.xx) or preferably with PentaLock screws (P-5032.xx) wherever indicated by the fracture pattern and remove the remaining K-wires. All screw holes with the exception of the oblong hole accept both cortical as well as PentaLock screws.

For locking firmly hand tighten the screw.

Choice of screw type: choosing locking screws generally provides greater stability to the construct, especially in cases of comminuted fractures or poor bone quality. Choosing non-locking screws (cortical screws) permits to pull fragments toward the plate.

Choice of drill guide: by using the drill guide P-2032.01 the multidirectionality of the locked ($\pm 15^\circ$) and unlocked screws allows to individually address each fragment.

Warning

When inserting the screws without using the drill guide block, care must be taken that the drilling channels do not cross.

If the free choice of the screw angle in the proximal area is not necessary, either the unidirectional drill guide P-2032.03 or the drill guide block (P-2032.11 left, P-2032.12 right) can be used. For instructions on how to use the drill guide block refer to the chapter "Plate Fixation with Drill Guide Block".



4. Attaching soft tissue

Soft tissue or bone fragments may be secured to the plate using sutures passed through the dedicated suture holes in the plate.

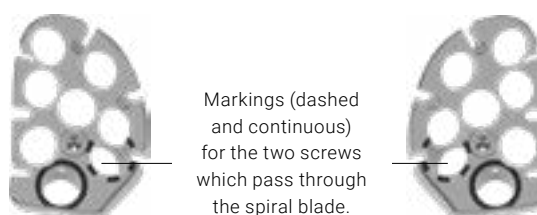


Fixing the Plate with Drill Guide Block

The drill guide blocks (P-2032.11 for left plates and P-2032.12 for right plates) serve to rapidly and accurately position the proximal screws and act as a target guide for the screws which cross the spiral blade. There is no danger of drill channels crossing during the drilling process.

The drill guide blocks are adapted to the proximal plate area. They are marked with L and R for the left and the right side respectively. The screw holes for the two screws passing through the spiral blade are both marked with a black ring and a dashed ring on the drill guide block. If a spiral blade is used, the spiral blade must be placed before inserting these two screws.

In addition, the dashed ring has a secondary function: it indicates the hole where the guide pin should be placed (see section 4 in this chapter).



Markings (dashed and continuous) for the two screws which pass through the spiral blade.

1. Fixing the drill guide block

Place the drill guide block (P-2032.11 left, P-2032.12 right) on the humeral plate (P-4031.01–10) so that the three positioning aids (see inset image) on its underside noticeably engage with the plate surface. Use the screwdriver (screwdriver blade P-2031.02 or .03 with handle A-2074) to finger-tighten the screw integrated in the drill guide block until there is no play between the plate and the drill guide block.



Notice

If the drill guide block is mounted onto the plate when the plate is already positioned on the bone, ensure that no soft tissue is trapped between the plate and the drill guide block and that the drill guide block is correctly aligned.

2. Positioning the plate

After reducing the fracture, the plate can be temporarily fixed in the desired position using 2.0 mm K-wires (A-5040.61, A-5042.61) for the shaft portion or olive K-wires (P-5004.62/1, P-5004.65/1). The course of the sulcus intertubercularis (bicipital groove) may be used as orientation for positioning the anterior plate edge. The plate has an anatomical fit and comes to rest approx. 5–10 mm distally from the top of the greater tubercle.

Caution

Placing the plate too proximally increases the risk of a subacromial impingement. If the plate is placed too distally, the optimal screw positioning in the humeral head may be more difficult.



Use intraoperative X-ray control to verify the correct plate position.

3. Initial plate fixation

Drill a core hole through the centre of the oblong hole using the drill guide P-2032.01 and the twist drill \varnothing 2.6 mm (P-3033.10, one colored ring).

Assign the screw length with the depth gauge (P-2033.01).

Pick up a cortical screw (P-5031.xx) of the determined length with the help of the screwdriver blade (P-2031.02, P-2031.03) as well as the handle (A-2074) and insert it into the oblong hole to approximate the plate to the humerus.



4. Using the guide pin

To recheck the plate height before screw insertion the guide pin (P-3030.01) can be inserted through screw hole marked with a dashed circle, as shown in the image. The guide pin is used together with the multidirectional drill guide (P-2032.01).

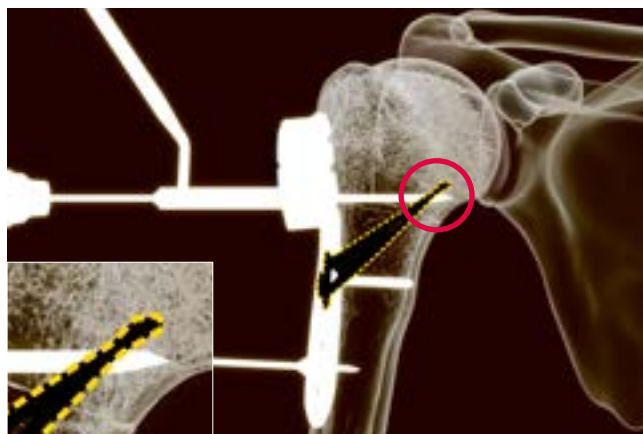
Caution

Ensure guide pin insertion is performed under X-ray guidance to prevent damaging the soft tissue structures medial to the second cortex or articular structures.



In an AP X-ray view (perpendicular to the axis of the guide pin) the tip of the guide pin will show where the tip of an inserted 50° angled blade will be located (see image).

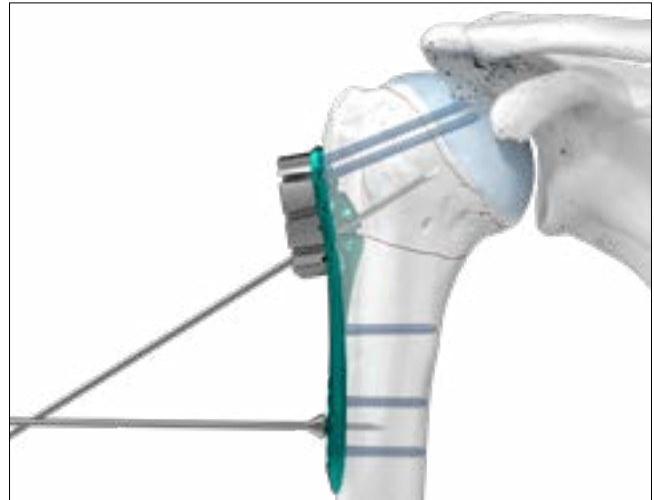
If the plate needs further repositioning: remove all relevant K-wires, slightly loosen the cortical screw in the oblong hole, readjust the position of the plate and retighten the cortical screw.



5. Fixing the plate

Fix the plate with at least two PentaLock screws (P-5032.xx) distally and at least two proximally. All screw holes with the exception of the oblong hole accept both cortical and PentaLock screws.

The multidirectional drill guide (P-2032.01, using the spherical tip only and not the cone end) and the depth gauge (P-2033.01) are designed to work together with the drill guide block: they enable drilling, measuring and screw insertion through the holes of the attached drill guide block.



Caution

When using the optional spiral blade, do not insert screws into the holes marked with a dashed or solid black ring on the drill guide block. The screws in these screw holes pass through the spiral blade and must only be inserted after the spiral blade has been placed.

If the spiral blade is not being used, all holes may be filled at the surgeon's preference.

Caution

Always use the sleeve (P-2031.01) to insert the screws into the drill guide block.

The sleeve on the screwdriver blade (P-2031.03) ensures that the screws are guided precisely and follow the predrilled core hole even in case of osteoporotic bone.

Insert the sleeve completely into the drill guide block. Use the long screwdriver blade to insert the screws through the sleeve.

For locking firmly hand-tighten the screw.



Optional Spiral Blade Insertion with Drill Guide Block

In case the optional spiral blade is used, follow the previously described surgical steps using the drill guide block until step 4 and continue with the following sections.



P-2032.05 K-wire Guide Ø 2.0 mm

1. Determining the angle of the spiral blade

Remove the K-wires and the cortical screw in the oblong hole. Insert the K-wire guide (P-2032.05) either with the 40° or 50° side into the oblong hole by first hooking the nose on the K-wire guide under the distal part of the oblong hole and then inserting the entire K-wire guide into the oblong hole.

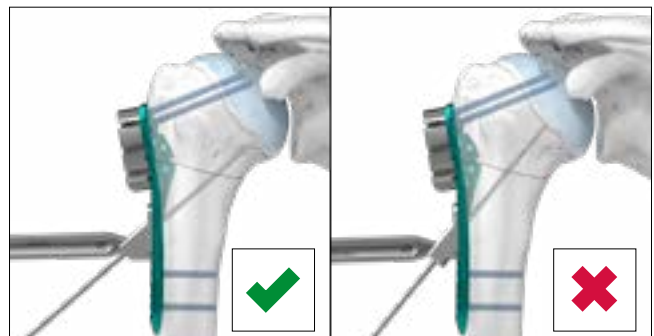


Notice

Any instrument that is placed into the oblong hole must completely snap into place and rest flush in the oblong hole. Ensure that no soft tissue is trapped under the instrument. Incomplete insertion of the instrument may result in incorrect guidance of the spiral blade's direction.



Place a 2.0 mm K-wire through the K-wire guide (P-2032.05). This K-wire indicates the future position of the spiral blade. The tip of the K-wire should lie close to the inferomedial cortex of the humeral head. Verify this position with an AP X-ray.



If the position is not optimal, remove the K-wire and repeat the step with the other end of the K-wire guide for the alternative spiral blade angle.



P-2032.04
Drill guide for cortex opening for spiral blade, Ø 2.6 mm

2. Opening of the cortex

The cortex in the oblong hole has to be opened in order to enable the insertion of the spiral blade.

Remove the K-wire and the K-wire guide from the oblong hole, then insert the drill guide for cortex opening (P-2032.04) into the oblong hole.

Notice

Any instrument that is placed into the oblong hole must completely snap into place and rest flush in the oblong hole. Ensure that no soft tissue is trapped under the instrument. Incomplete insertion of the instrument may result in incorrect guidance of the spiral blade's direction.



Drill two/three short holes through the holes of both sides of the drill guide using the 2.6 mm twist drill (P-3033.10, one dark blue ring). Only pass the first cortex. Repeat this procedure with the other end of the drill guide. Remove the drill guide for cortex opening.



The five overlapping holes enable to cut a spiral channel into the bone in order to insert the spiral blade.



A-2001.01 A-2001.02
Left and right guide for spiral cutters for 50° spiral blade



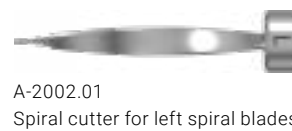
A-2001.03 A-2001.04
Left and right guide for spiral cutters for 40° spiral blade

3. Cutting the spiral channel

As the spiral blade has a blunt end, a spiral channel must be pre-cut into the bone, using the spiral cutter for blade (A-2002.01 for left plates, A-2002.02 for right plates). Insert the guide for the spiral cutter for the chosen blade angle (A-2001.01/03 for left plates or A-2001.02/04 for right plates) into the oblong hole. Finger-tighten the integrated screw using the screwdriver blade (P-2031.02, P-2031.03) and the handle (A-2074).

Notice

Any instrument that is placed into the oblong hole must completely snap into place and rest flush in the oblong hole. Ensure that no soft tissue is trapped under the instrument. Incomplete insertion of the instrument may result in incorrect guidance of the spiral blade's direction.



A-2002.01
Spiral cutter for left spiral blades



A-2002.02
Spiral cutter for right spiral blades



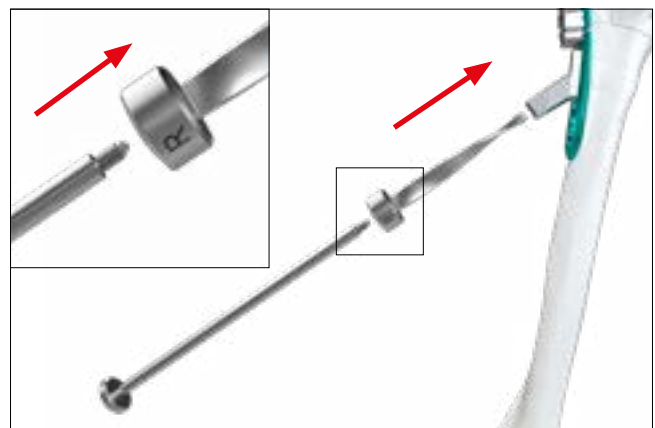
A-2003
Handle for spiral blade cutters and spiral blades



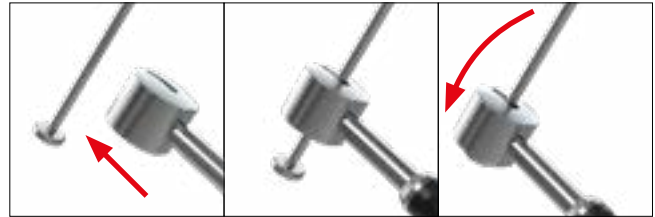
A-2004
Mallet, slotted

Place the spiral cutter for blade into the guide fixed to the plate, and under X-ray guidance, insert it manually or carefully tap it in with the mallet (A-2004) up to the stop.

For easier manipulation, the handle for spiral blade (A-2003) can be screwed onto the spiral cutter.

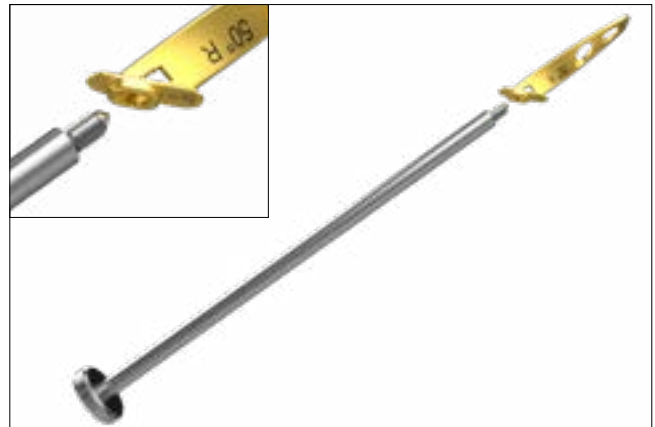


Remove the spiral cutter using the handle for spiral blade (A-2003) and the slotted mallet (A-2004). Remove the guide for spiral cutter.

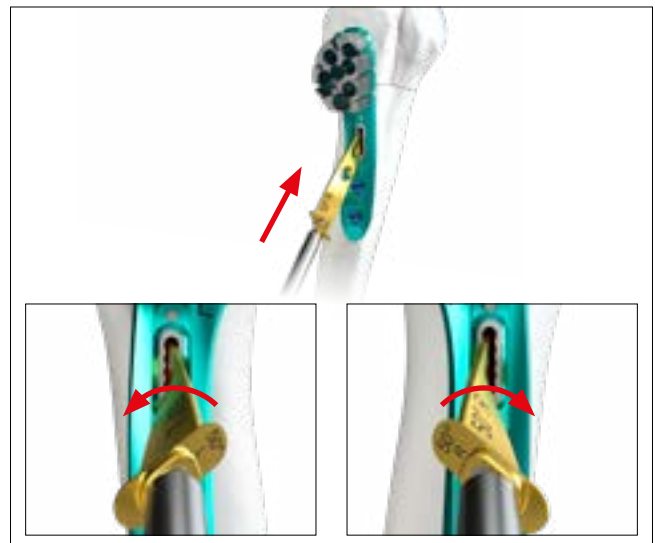


4. Inserting the spiral blade

Select the appropriate spiral blade (P-4031.21/23 for left plates or P-4031.22/24 for right plates) from the container module and screw it onto the handle (A-2003) until fully secured. Ensure that the blade direction aligns with the handle.



The spiral blade can be inserted manually into the pre-cut channel by applying slight pressure. Ensure to insert it in the approximate angle of the blade (40° or 50°) to prevent malpositioning. During the insertion, the spiral blade rotates clockwise for right plates and counter-clockwise for left plates. If necessary, carefully tap it in with the mallet (A-2004).



Warning

The spiral blade must sit flush with the oblong hole.

Remove the handle.



Fix the spiral blade to the plate with two screws for spiral blade (P-4031.30/1). Start with the distal screw.

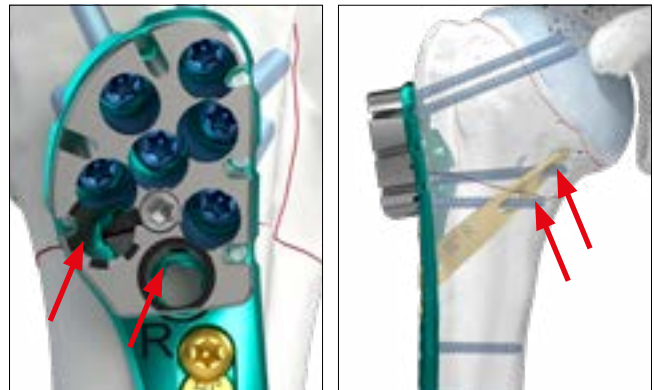
Warning

The two screws for fixation of the spiral blade can only be inserted if the spiral blade sits flush with the oblong hole.

Alternating the tightening of the screws is recommended, since fully tightening one screw may cause slight tilting of the blade, complicating the insertion of the second screw.



The plate-spiral blade construct is additionally stabilized with two PentaLock screws that pass through the two recesses in the spiral blade. The corresponding screw holes are indicated with two rings (solid and dashed) on the drill guide block.



Drill, assign the screw length and insert a PentaLock screw (P-5032.xx) in each of the two marked screw holes using the screwdriver blade (P-2031.03) and the sleeve (P-2031.01).

Caution

The two screws that pass through the spiral blade must always be inserted with the drill guide block in place.

While misdirection of these screws with the guide block in place is unlikely, it is recommended to use X-ray imaging during or after screw placement to avoid articular penetration of the humeral head and to ensure that the screw passed through the blade, especially in osteoporotic bone or in case of traumatic bone loss.



For these two screws and depending on the chosen angle of the spiral blade, select the minimal screw length as shown in the image.



with spiral blade 50°

Proximal screw: at least 36 mm
(P-5032.36/1)
Distal screw: at least 26 mm
(P-5032.26/1)



with spiral blade 40°

Proximal screw: at least 28 mm
(P-5032.28/1)
Distal screw: at least 22 mm
(P-5032.22/1)

5. Filling the remaining screw holes

Fill the remaining screw holes preferably with PentaLock screws (P-5032.xx) or cortical screws (P-5031.xx) wherever indicated by the fracture pattern. All remaining screw holes accept both cortical and PentaLock screws.

For locking firmly handtighten the screw.

Choice of screw type: choosing locking screws generally provides greater stability to the construct, especially in cases of comminuted fractures or poor bone quality. Choosing non-locking screws (cortical screws) permits to pull fragments toward the plate.



6. Attaching soft tissue

Soft tissue or bone fragments may be secured to the plate using sutures passed through the dedicated suture holes in the plate. Remove the drill guide block.

Alternatively, the drill guide block can be removed prior to soft tissue attachment.



Explantation

1. Removing the screws passing through the spiral blade

If a spiral blade was used, it is important to first remove the two screws passing through the recesses in the spiral blade. Use the screwdriver blade (P-2031.02, P-2031.03) together with the handle (A-2074). The two screws are both marked with a ring around the screw hole.

Caution

When removing the screws, ensure that any bone ingrowth in the screw head has been removed, that the screwdriver/screw head connection is aligned in axial direction, and that a sufficient axial force is used between screwdriver blade and screw.



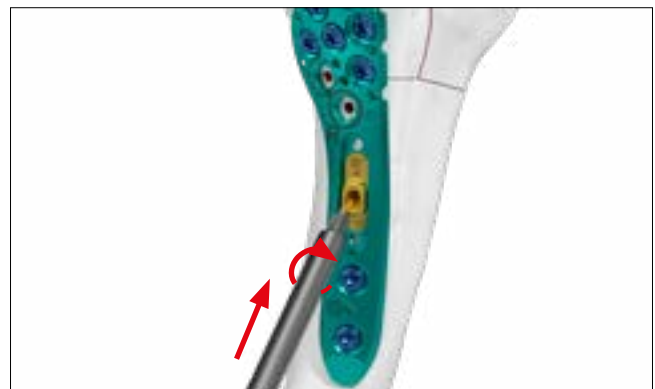
2. Removing the screws fixating the spiral blade

Afterwards remove the two screws (P-4031.30/1) securing the spiral blade to the plate.

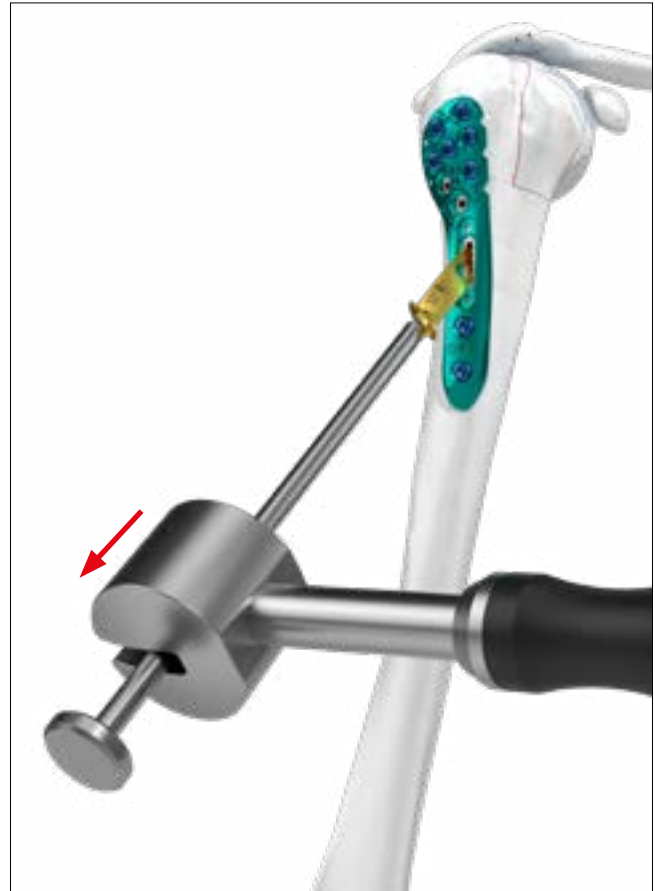


3. Removing the spiral blade

Insert the handle for spiral blade (A-2003) into the spiral blade.



Extract the spiral blade. If necessary, carefully tap the metallic disc on the rear part of the handle (A-2003) with the slotted mallet (A-2004), directing the force away from the bone.



4. Removing the remaining screws

Unlock all remaining screws. Now remove the unlocked screws in random order. In case the plate sticks to the bone, use a periosteal elevator to carefully lift and detach it from the bone.

Appendix

Implants, Instruments and Containers

Plates	P-5031.45/1	Twist Drills	P-6013.11
P-4031.01	P-5031.50/1	P-3033.10	P-6013.12
P-4031.02	P-5031.55/1	P-3033.21	P-6013.13
P-4031.03	P-5031.60/1		
P-4031.04	P-5032.16/1	Instruments	
P-4031.05	P-5032.18/1	A-2001.01	
P-4031.06	P-5032.20/1	A-2001.02	
P-4031.07	P-5032.22/1	A-2001.03	
P-4031.08	P-5032.24/1	A-2001.04	
P-4031.09	P-5032.26/1	A-2001.05	
P-4031.10	P-5032.28/1	A-2002.01	
	P-5032.30/1	A-2002.02	
Templates	P-5032.32/1	A-2003	
P-4031.04TP	P-5032.34/1	A-2004	
P-4031.10TP	P-5032.36/1	A-2074	
	P-5032.38/1	P-2031.01	
Spiral Blades	P-5032.40/1	P-2031.02	
P-4031.21	P-5032.42/1	P-2031.03	
P-4031.22	P-5032.44/1	P-2032.01	
P-4031.23	P-5032.46/1	P-2032.02	
P-4031.24	P-5032.48/1	P-2032.03	
	P-5032.50/1	P-2032.04	
Screw for	P-5032.55/1	P-2032.11	
Spiral Blades	P-5032.60/1	P-2032.12	
P-4031.30/1		P-2032.13	
	K-Wires	P-2033.01	
Screws	A-5040.61	P-3030.01	
P-5031.16/1	A-5040.61/1		
P-5031.18/1	A-5040.61/2S	Containers	
P-5031.20/1	A-5042.61	A-6501.05	
P-5031.22/1	A-5042.61/1	A-6501.07	
P-5031.24/1	A-5042.61/2S	A-6501.10	
P-5031.26/1		P-6002.01	
P-5031.28/1	Olive K-Wires	P-6011.01	
P-5031.30/1	P-5004.62/1	P-6011.02	
P-5031.32/1	P-5004.65/1	P-6012.01	
P-5031.34/1		P-6012.02	
P-5031.36/1	K-Wire Guide	P-6012.05	
P-5031.38/1	P-2032.05	P-6012.11	
P-5031.40/1		P-6012.13	

R_SHOULDER-01020001_v1 / 2026-03, Medartis AG, Switzerland. All technical data subject to alteration.

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