Expert ModAD – Modular Aiming Device

Surgical Technique

Nail tip locking of tibia, femur and humerus

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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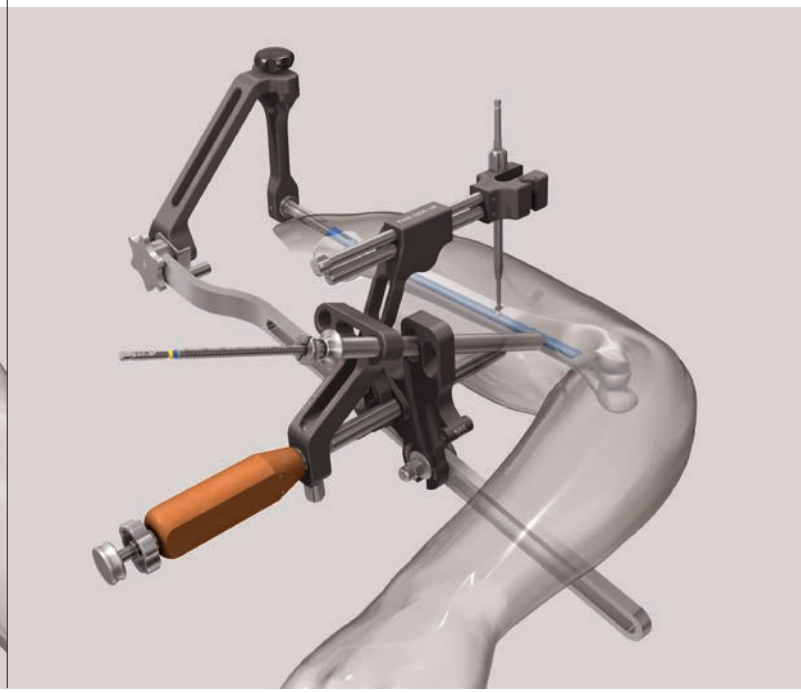
Expert ModAD – Modular Aiming Device

Nail-tip locking of tibia, femur and humerus

Expert LFN

Expert HN

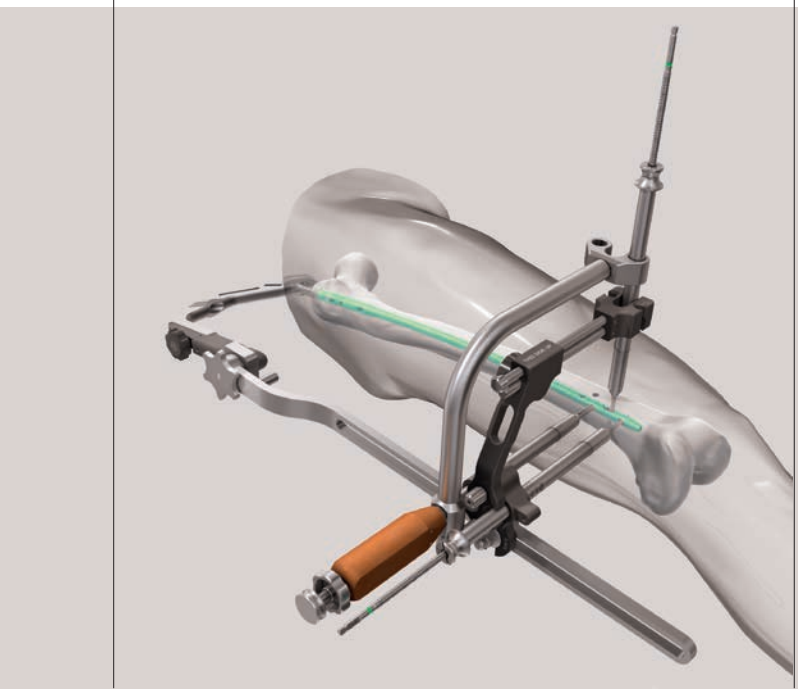


The Expert Modular Aiming Device (Expert ModAD) is a mechanical aiming support for the distal interlocking of long Expert Nails.

Compatible with DePuy Synthes Expert Tibial Nails, Expert Lateral Femoral Nails, Expert Retrograde/ Antegrade Femoral Nails, and Expert Humeral Nails

The Expert ModAD can be used for long DePuy Synthes Expert Nails.

Expert R/AFN Antegrade



Expert R/AFN Retrograde

Principles of Function

After nail insertion, the position of the locking holes can be determined by establishing contact of a precalibrated spacer tip with the nail surface. Drilling and screw insertion can then be performed as in proximal locking, using sleeve systems through the aiming arm.

Expert TN

The AO Principles of Fracture Management

Mission

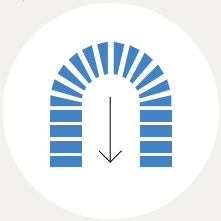
The AO's mission is promoting excellence in patient care and outcomes in trauma and musculoskeletal disorders.

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, M Allgöwer, R Schneider, H Willenegger. 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.

Preoperative Calibration

1. Pre-calibrate the L-/T-spacers

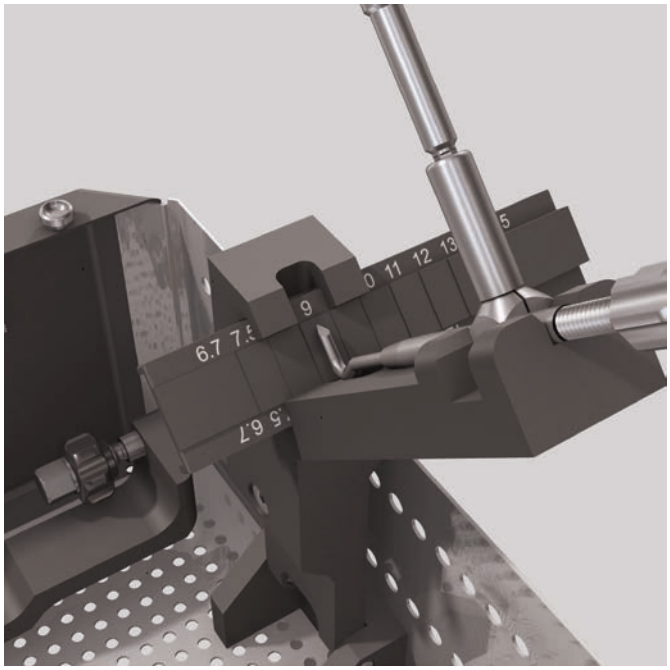
Instruments

Required instruments (nail-specific):		**Femur**	**Tibia**	**Humerus**
312.952	Calibration Block for L-Spacer, for ModAD,			
	for Vario Case No. 685.174	×	×	×
68.010.304	Sliding Carriage for Expert Femoral and			
	Humeral Nails, for Calibration Block No. 312.952	×		×
68.010.305	Sliding Carriage for Expert Tibial Nails,			
	for Calibration Block No. 312.952		×	
314.260	Screwdriver, hexagonal, large, ∅ 3.5 mm, with Groove, length 300 mm	×	×	×

L-/T-spacers:		**Femur**	**Tibia**	**Humerus**
356.209	L-Spacer, large, adjustable, length 157.5 mm, for ModAD	×		
356.208	L-Spacer, medium, adjustable, length 157.5 mm, for ModAD	×	×	
356.207	L-Spacer, small, adjustable, length 157.5 mm, for ModAD		×	×
356.206	T-Spacer, adjustable, length 157.5 mm, for ModAD			×

Click the calibration block for L- and T-spacer to the sidewall of the Vario Case. Align the corresponding sliding carriage to the appropriate nail diameter.

Place the L-/T-spacer into the calibration block so that the hook contacts the appropriate nail diameter. Press firmly down on the quick coupling of the L-/T-spacer so that the L-/T-spacer hook is pressed firmly against the sliding carriage. Tighten the fixation sleeve with the 3.5 mm hexagonal screwdriver.



■ Note:

To ensure an accurate calibration, it is important to press down firmly on the L-spacer prior to tightening the fixation.

Repeat for the other L-/T-spacer(s).

■ Note:

Pre-calibration of the L-/T-spacers must always be followed by the verification of the calibration of the L/T-spacers with spacer arm directly on the nail (step 4).

2. Attach nail-insertion-handle jig to mounting block

Instruments	
68.010.303	Holding Block for Vario Case Nos. 68.010.201 and 68.010.301
03.010.301	Aiming Beam for Locking, for Expert ModAD
321.160	Combination Wrench ∅ 11.0 mm

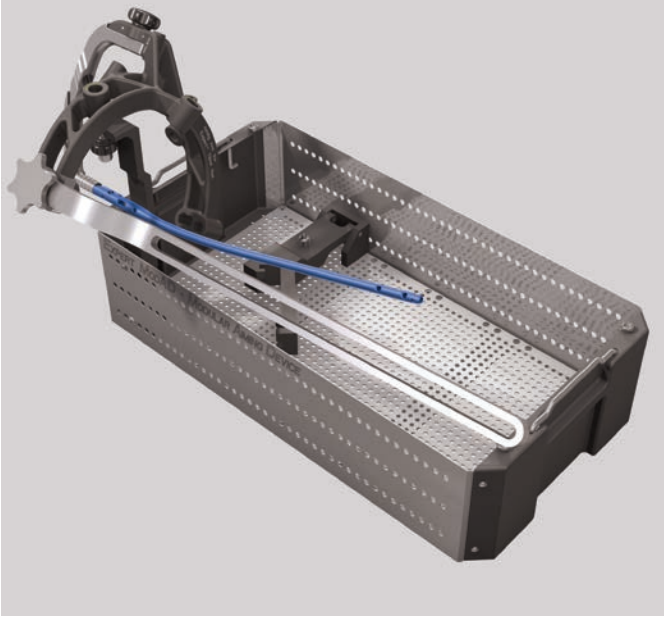
For Expert Tibial Nail

03.010.045	Insertion Handle, for Expert Tibial and Femoral Nails
03.010.011	Insertion Handle for Expert Tibial Nail, radiolucent, long
03.010.013	Insertion Handle for Expert Tibial Nail, radiolucent, short
03.010.018	Aiming Arm for Expert Tibial Nail
03.010.010	Aiming Arm for Expert Tibial Nail, radiolucent

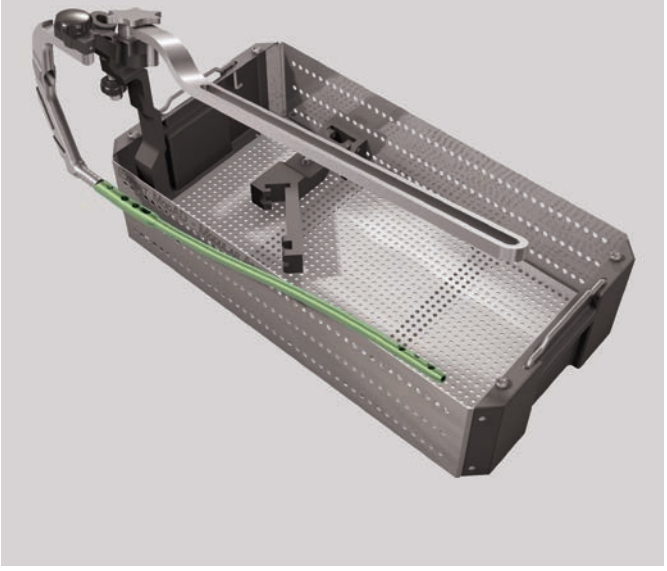
For Expert LFN

03.010.045	Insertion Handle, for Expert Tibial and Femoral Nails
03.010.046	Insertion Handle, long, for Expert Femoral Nails
03.010.302	Adapter for Expert Lateral Femoral Nail, for Nos. 03.010.045 and 03.010.046

Expert TN



Expert LFN



For Expert R/AFN

03.010.045	Insertion Handle, for Expert Tibial and Femoral Nails
03.010.046	Insertion Handle, long, for Expert Femoral Nails
03.010.049	Aiming Arm for Expert R/AFN, antegrade, for Standard Locking
03.010.050	Aiming Arm for Expert R/AFN, retrograde, for Standard Locking

For Expert HN

03.010.054	Insertion Handle for Expert Humeral Nail
03.010.312	Adapter for Expert Humeral Nail

Click the Expert ModAD holding block to the sidewall of the Vario Case.

Mount the nail with corresponding insertion handle and aiming arm or adapter on the holding block.

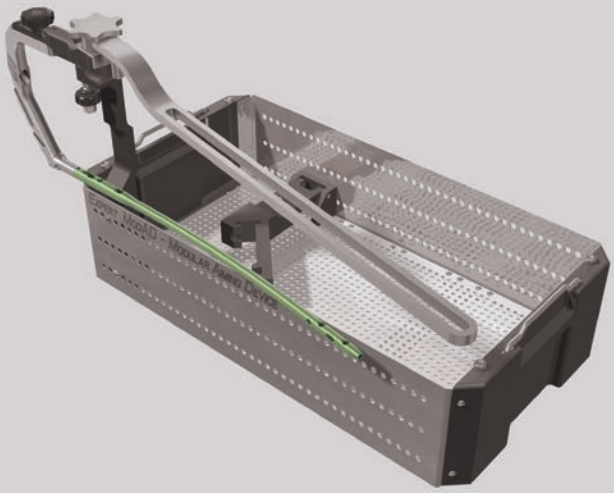
Secure the nail-insertion handle jig to the holding block by tightening the black nut on the holding block with the combination wrench.

Attach the aiming beam to the aiming arm hole that is closest to the nail tip. Tighten the large star-shaped nut by hand.

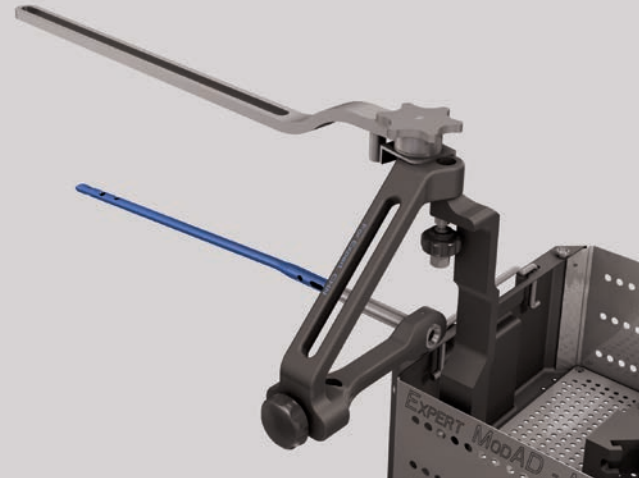
■ Note:

Make sure you mount everything for the correct limb (right or left).

Expert R/AFN



Expert HN



3A.

Expert TN:

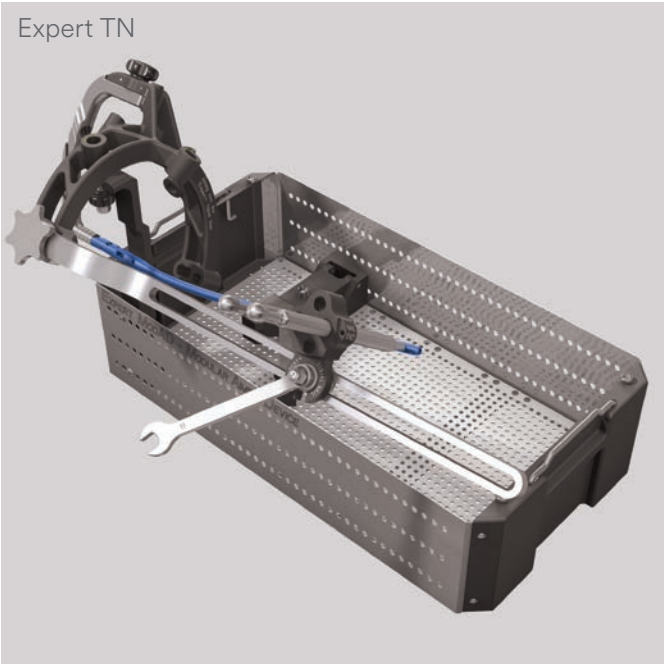
Expert LFN:

Expert R/AFN 300 – 480 mm:

Calibrate the position of the aiming block

Instruments	
03.010.204	Calibration Pin ∅ 12.0 mm
03.010.303	Aiming Block for distal ML-Locking, for Expert LFN, for No. 03.010.301
03.010.304	Aiming Block for distal ML-Locking, for Expert TN, for No. 03.010.301
03.010.305	Aiming Block for proximal and distal ML-Locking, for Expert R/AFN, for No. 03.010.301
321.160	Combination Wrench ∅ 11.0 mm

Expert TN



Attach the corresponding aiming block to the aiming beam and turn the nut slightly by hand so that the block is still able to slide and rotate. The aiming block needs to be placed with the holes anterior to the aiming beam and the sign “Nail Tip” pointing to the tip of the nail.

Slide both calibration pins through the aiming block. Align the aiming block until both pins fall into the locking holes of the nail. Tighten the nut with the combination wrench ∅ 11 mm.

Remove the calibration pins.

■ Note:

Repeat calibration if the calibration pins can’t easily be removed from the locking holes.

▲ Important:

If the sign “Nail Tip” is not pointing to the tip of the nail, the ML locking holes will be missed.

3B.

Expert RFN 220 – 280 mm:
Calibrate the position of the aiming block

Instruments	
03.010.305	Aiming Block for proximal and distal ML-Locking, for Expert Retrograde/Antegrade Femoral Nail, for No. 03.010.301
03.010.308	Spacer Arm, for Expert ModAD, for Nos. 03.010.303 to 03.010.306
356.209	L-Spacer, large, adjustable, length 157.5 mm, for ModAD
356.208	L-Spacer, medium, adjustable, length 157.5 mm, for ModAD
03.010.313	Handle for Expander Spacer, for Expert ModAD
03.010.310	Aiming Arm for AP Locking, for Expert Retrograde Femoral Nail, for No. 03.010.313
03.010.320–24	Expander Spacer for Expert R/AFN ∅ 9.0 mm–15.0 mm, for No. 03.010.313
356.625	Connecting Screw for Expander Spacer, for No. 356.621
314.260	Screwdriver, hexagonal, large, ∅ 3.5 mm, with Groove, length 300 mm
356.626	Expander Wire for Expander Spacer, for No. 356.621
03.010.204	Calibration Pin ∅ 12.0 mm

Attach the aiming block to the aiming beam and turn the nut slightly by hand so that the block is still able to slide and rotate. The aiming block needs to be placed with the holes anterior to the aiming beam and the sign “Nail Tip” pointing to the tip of the nail.

Mount the spacer arm onto the aiming block.

Place sequentially the calibrated L-spacers/T-spacer into that hole of the spacer arm which is farther away from the nail tip. Make sure the foot of the L-spacer is perpendicular to the nail.

Tighten the upper nut of the L-spacer by hand onto the spacer arm hole. Slide the carriage of the spacer arm until the mid-length of the L-spacer foot is in line with the nail. Tighten the large black screw of the spacer arm.

Mount the corresponding expander spacer with the connecting screw to the handle for expander spacer. Attach the aiming arm for AP locking and tighten the screw with the screwdriver 3.5 mm.

Insert the expander spacer through the aiming block and insert the expander into the LM locking hole of the nail. Secure with the expander wire.

Slide one calibration pin through that hole of the aiming arm, which is closer to the nail tip and then through the slot of the spacer arm. Align the aiming block until the pin falls into the dynamic AP locking hole of the nail. Ensure that the L-spacer contacts the nail. Tighten the nut with the combination wrench ∅ 11 mm.

Remove the calibration pin and L-spacer. Remove expander wire and expander spacer assembly. Remove the assembled aiming device from the aiming arm by opening the star-shaped nut and lay it aside. Do not loosen any other parts or calibration will be lost!

■ Note:

Repeat calibration, if the calibration pin or expander spacer cannot be easily removed from the locking holes.

Go to: Insert Nail.

3C.

Expert HN:

Calibrate the position of the aiming block

Instruments	
03.010.306	Aiming Block for distal and proximal Locking, for Expert Humeral Nail, for No. 03.010.301
03.010.204	Calibration Pin ∅ 12.0 mm
03.010.313	Handle for Expander Spacer, for Expert ModAD
03.010.340	Aiming Arm for oblique Locking, for Expert Humeral Nail, for No. 03.010.313
03.010.331	Expander Spacer for Expert Humeral Nail ∅ 7.0 mm, for No. 03.010.313
03.010.332	Expander Spacer for Expert Humeral Nail ∅ 9.0 mm, for No. 03.010.313
03.010.333	Expander Spacer for Expert Humeral Nail ∅ 11.0 mm, for No. 03.010.313
356.625	Connecting Screw for Expander Spacer, for No. 356.621
314.260	Screwdriver, hexagonal, large, ∅ 3.5 mm, with Groove, length 300 mm
356.626	Expander Wire for Expander Spacer, for No. 356.621

Attach the aiming block to the aiming beam and turn the nut slightly by hand so that the block is still able to slide and rotate. The aiming block needs to be placed with the holes anterior to the aiming beam and the sign “Nail Tip” pointing to the tip of the nail.

Mount the corresponding expander spacer with the connecting screw to the handle for expander spacer. Attach the aiming arm for oblique locking and tighten the screw with the screwdriver 3.5 mm.

Insert the expander spacer through the aiming block and insert the expander into that locking hole of the nail which is farthest away from the nail tip. Secure with the expander wire.

Slide one calibration pin through the aiming arm and through the slot of the aiming block. Align the aiming block until the pin falls into the oblique locking hole of the nail. Tighten the nut with the combination wrench ∅ 11 mm.

Remove the calibration pin.

■ Note:

Repeat calibration, if the calibration pins cannot be easily removed from the locking holes.

4. Verify calibration of the L-/T-spacer

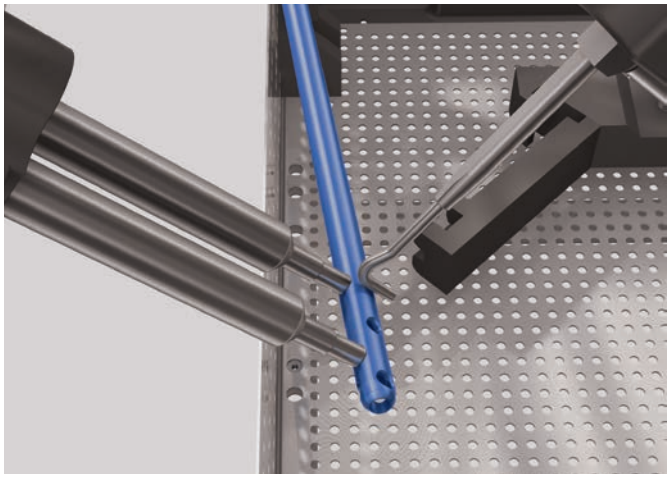
Instruments	
03.010.308	Spacer Arm, for Expert ModAD, for Nos. 03.010.303 to 03.010.306
311.431	Handle with Quick Coupling
356.209	L-Spacer, large, adjustable, length 157.5 mm, for ModAD
356.208	L-Spacer, medium, adjustable, length 157.5 mm, for ModAD
356.207	L-Spacer, small, adjustable, length 157.5 mm, for ModAD
356.206	T-Spacer, adjustable, length 157.5 mm, for ModAD

Mount the spacer arm onto the aiming block.

Place sequentially the calibrated L-spacers into that hole of the spacer arm which is farther away from the nail tip. Make sure the foot of the L-spacer is perpendicular to the nail.

Tighten the upper nut of the L-spacer by hand onto the spacer arm hole. Slide the carriage of the spacer arm until the mid-length of the L-spacer foot is in line with the nail. Tighten the large black screw of the spacer arm.

Ensure that the L-Spacer contacts the nail. Ensure that the calibration pins go through the holes freely when calibrated.



■ Note:

For humerus, only 1 calibration pin can be used.

Remove calibration pins and L- or T-spacers.

Once calibration of the first L-spacer has been verified, repeat step 4 for all other calibrated L-spacers/T-spacer.

Humerus: Remove the expander wire and the expander spacer assembly.

Remove the assembled aiming device from the aiming arm or insertion handle by opening the star-shaped nut and lay it aside. Do not loosen any other parts or calibration will be lost.

Nail Insertion

1. Insert Nail

Insert the nail into the specific bone using standard technique.

See technique guide for respective Nail System:
- Expert Tibial Nail
- Expert Lateral Femoral Nail
- Expert R/AFN
- Expert Humeral Nailing System

Re-attach the calibrated Expert ModAD aiming construct to the aiming arm. Tighten the star shaped screw of the guide bar by hand.

■ Note:

The tip of the aiming block has a hole indicating the nail tip of the corresponding nail. Use a 3.2 mm guide wire to indicate the nail tip.

▲ Caution:

Do not hammer on the Expert ModAD. This can cause loss of calibration.

1. Drill opening for L-/T-spacer

Instruments	
03.010.334	Drill Sleeve 8.0/6.0, for No. 03.010.063
03.010.335	Trocar ∅ 6.0 mm, for No. 03.010.334
03.010.336	Drill Bit ∅ 6.0 mm, length 250 mm, 2-flute, for No. 03.010.334
03.010.337	Drill Bit ∅ 6.0 mm, flat tip, length 250 mm, 2-flute, for No. 03.010.334

Align the locking holes of the aiming block roughly with bone shaft axis. Loosen the large black screw on the spacer arm to readjust the carriage until centered over the bone. Tighten black screw. Insert the drill sleeve 8.0/6.0 with the trocar 6.0 mm through that guiding hole in the carriage which is farther away from the nail tip. Make stab incision and insert sleeve assembly to the bone.

Remove the trocar. Drill the first cortex with the 6.0 mm drill bit down to the nail.

Humerus and Tibia: Additionally drill with the 6.0 mm flat-tipped drill bit to ensure that the cortex is completely opened.

Remove drill bit and drill sleeve.

■ Note:

If the guiding hole/carriage is not centered over the bone, it might later be impossible to place the L- or T-spacer correctly over the nail.

2. Clean opening for L-/T-spacer with L-/T-curettes

Instruments	
311.431	Handle with Quick Coupling

Required instruments (nail-specific):		**Femur**	**Tibia**	**Humerus**
356.618	L-Curette for Anterior Nail Contact Opening, small		×	×
356.619	L-Curette for Anterior Nail Contact Opening, medium	×	×	
356.620	L-Curette for Anterior Nail Contact Opening, large	×		
356.226	T-Curette for Anterior Nail Contact Opening, for ModAD			×

Tilt the aiming beam assembly upward. If this is not possible, remove the entire Expert ModAD aiming construct by loosening the star-shaped screw.

Mount the handle with quick coupling onto the chosen curette and insert it into the opening.

With rotating movements remove cancellous bone from the opening, in order to achieve a clean contact with the surface of the nail.

3.

Insert L-/T-spacer into opening to re-establish nail contact

Instruments	
311.431	Handle with Quick Coupling
356.209	L-Spacer, large, adjustable, length 157.5 mm, for ModAD
356.208	L-Spacer, medium, adjustable, length 157.5 mm, for ModAD
356.207	L-Spacer, small, adjustable, length 157.5 mm, for ModAD
356.206	T-Spacer, adjustable, length 157.5 mm, for ModAD

Choose the size of the L- or T-spacer depending on the canal space and mount the handle with quick coupling.

Insert the L- or T-spacer into the nail contact opening and place its foot on the anterior radius/edge of the nail. If the L- or T-spacer is correctly placed, the notches at the foot of the spacer will make a soft metallic clattering sound when gently moved across the nail to confirm nail-spacer contact.

L-spacer not correctly placed:

L-spacer correctly placed:

■ Note:

If there is no contact between the L-spacer foot and the nail, try turning the foot 180°. If contact with the nail still cannot be established, use a larger L-spacer.
Verify that the L-spacer is not through the interlocking hole of the nail by turning the L-spacer 180°.

Reattach the Expert ModAD aiming construct (if removed before) and connect to the L- or T-spacer using the open guide hole in the carriage which is farther away from the nail tip. Tighten the clamping nut firmly by hand.

Remove handle from L- or T-spacer.

4.

Femur & Tibia:

Drill the hole for standard ML/LM locking

Humerus:

Drill the hole for standard AP locking

Instruments	
03.010.060	Drill Bit ∅ 3.2 mm, calibrated, length 340 mm, 3-flute, for Quick Coupling, for No. 03.010.064
03.010.061	Drill Bit ∅ 4.2 mm, calibrated, length 340 mm, 3-flute, for Quick Coupling, for No. 03.010.065
03.010.062	Drill Bit ∅ 5.0 mm, calibrated, length 340 mm, 3-flute, for Quick Coupling
03.010.063	Protection Sleeve 12.0/8.0, length 188 mm
03.010.064	Drill Sleeve 8.0/3.2, for No. 03.010.063
03.010.065	Drill Sleeve 8.0/4.2, for No. 03.010.063
03.010.066	Drill Sleeve 8.0/5.0, for No. 03.010.063
03.010.069	Trocar ∅ 3.2 mm, for No. 03.010.064
03.010.070	Trocar ∅ 4.2 mm, for No. 03.010.065
03.010.071	Trocar ∅ 5.0 mm, for No. 03.010.066

Use the drill system corresponding to the chosen nailing system.

Insert a trocar/drill sleeve/protection sleeve assembly through each hole of the aiming block. Make stab incision and advance sleeve assemblies to the bone. Remove the trocars.

Drill through both cortices of the locking hole which is closer to the nail tip and leave the drill bit in the bone. This will stabilize the ModAD construct. Drill the second hole, drilling through both cortices.

Remove the drill sleeve and drill bit from the second hole.

■ Note:

Always push on handle to ensure good contact between L-/T-spacers and nail.

If no AP or oblique locking is performed, proceed to step 1 (Insert locking screws)

Expert HN

Expert TN & R/AFN: Locking AP
Expert LFN & HN: Locking Oblique

1. Opening for interlocking nail hole contact

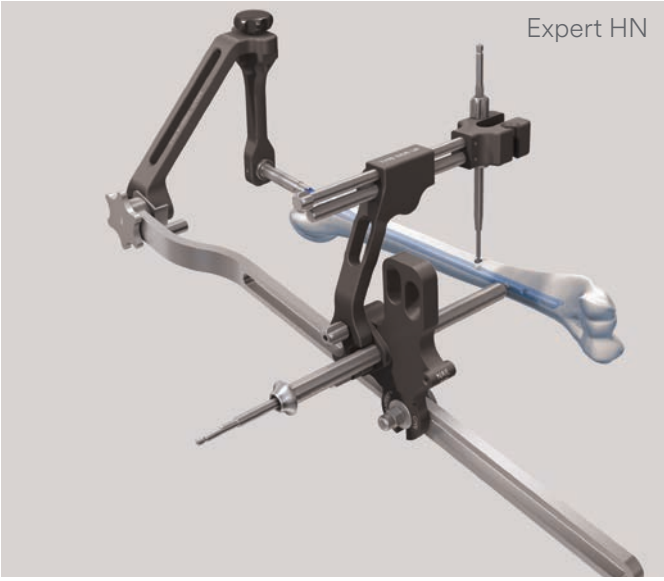
Instruments	
03.010.334	Drill Sleeve 8.0/6.0 for No. 03.010.063
03.010.336	Drill Bit ∅ 6.0 mm, length 250 mm, 2-flute, for No. 03.010.334

Insert the 6.0 mm drill sleeve into the protection sleeve 12.0/8.0. Drill the near cortex with the 6.0 mm drill bit down to the nail. Stop immediately when the nail is hit with the drill bit.

Remove the 6.0 mm drill bit.

■ Note:

The diameter of the 6.0 mm drill bit does not pass through the nail locking hole: only drill the first cortex.



2. Cleaning of the nail contact opening

Instrument	
311.431	Handle with Quick-Coupling

4.0 mm (blue) and 5.0 mm (green) locking screws:

03.010.338	Curette for Medial Nail Contact Opening ∅ 6.0/3.2 mm, for No. 03.010.334

6.0 mm (aqua) locking screws:

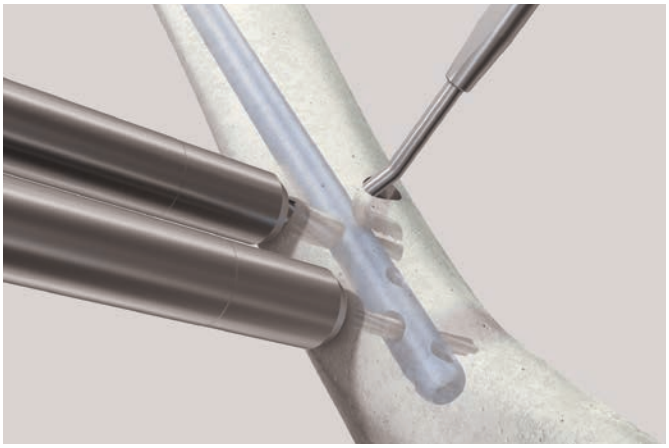
03.010.339	Curette for Medial Nail Contact Opening ∅ 7.0/5.0 mm, for No. 03.010.063

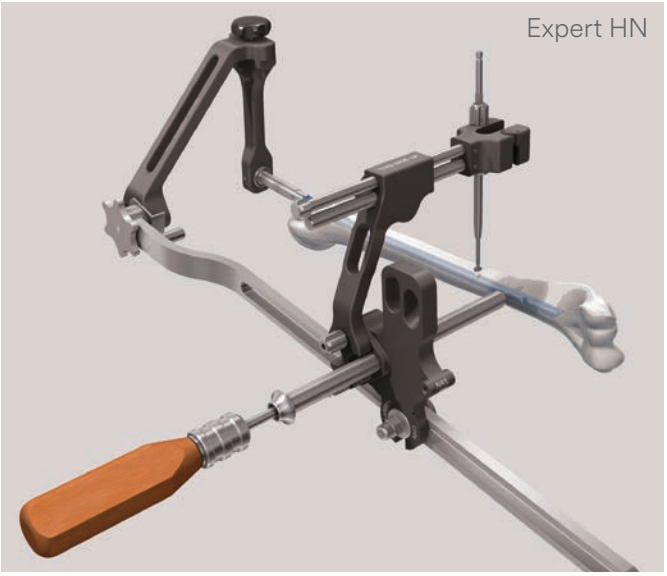
Remove drill sleeve.

Attach the corresponding dual-diameter curette to the handle.

Clean the medial nail contact opening and the locking hole in the nail manually with the curette. Remove curette and sleeve assembly.

Humerus: *proceed to step 4, Nail contact with the expander spacer section*





3. Assemble aiming arm for AP/oblique locking

Instruments	
03.010.313	Handle for Expander Spacer, for Expert ModAD
356.625	Connecting Screw for Expander Spacer, for 356.621
03.010.309	Aiming Arm for AP Locking, for Expert Tibial Nail, for No. 03.010.313
03.010.310	Aiming Arm for AP Locking, for Expert Retrograde Femoral Nail, for No. 03.010.313
03.010.311	Aiming Arm for oblique Locking, for Expert LFN, for No. 03.010.313
314.260	Screwdriver, hexagonal, large, ∅ 3.5 mm, with Groove, length 300 mm
03.010.314-319	Expander Spacer for Expert Tibial Nail ∅ 8.0 mm–13.0 mm, for No 03.010.313
03.010.320-324	Expander Spacer for Expert R/AFN
	∅ 9.0 mm–15.0 mm, for No 03.010.313
03.010.325-330	Expander Spacer for Expert LFN ∅ 9.0 mm–16.0 mm, for No 03.010.313

Assemble the correct expander spacer (depending on the used nail system and nail size) with the connecting screw to the handle for expander spacer.

Attach the corresponding aiming arm and tighten the screw with the screwdriver 3.5 mm.

Expert TN, R/AFN

Expert LFN

4. Nail contact with the expander spacer

Instrument	
356.626	Expander Wire for Expander Spacer, for 356.621

Insert the expander spacer through the aiming block into that locking hole of the nail, which is farther away from the nail tip.

Fully insert the expander wire into the handle for expander spacer.

▲ Important:

Ensure that the expander spacer is fully inserted and verify that the expander spacer construct can not be pulled out from the interlocking hole (stress test).

5.

Expert TN and R/AFN (retrograde): AP locking
Expert LFN and HN: oblique locking

Instruments	
03.010.060	Drill Bit ∅ 3.2 mm, calibrated, length 340 mm, 3-flute, for Quick Coupling, for No. 03.010.064
03.010.061	Drill Bit ∅ 4.2 mm, calibrated, length 340 mm, 3-flute, for Quick Coupling, for No. 03.010.065
03.010.063	Protection Sleeve 12.0/8.0, length 188 mm
03.010.064	Drill Sleeve 8.0/3.2, for No. 03.010.063
03.010.065	Drill Sleeve 8.0/4.2, for No. 03.010.063
03.010.069	Trocar ∅ 3.2 mm, for No. 03.010.064
03.010.070	Trocar ∅ 4.2 mm, for No. 03.010.065
03.010.072	Depth Gauge for Locking Screws, measuring range up to 110 mm, for No. 03.010.063
03.010.107	Screwdriver Stardrive, T25, length 330 mm

Use the drill system from the corresponding nailing system.

Align the respective aiming arm by inserting the protection sleeve/drill sleeve/trocar assembly through that hole of the aiming arm, which is closer to the nail tip and then through the respective slot of the spacer arm or aiming block.
Make stab incision and advance the sleeve assembly to the bone. Remove trocar.

Drill, measure length and insert screw using standard technique for proximal locking (i.e. guided with aiming arm and sleeves).

Notes:

- Measure screw length with a depth gauge as the use of calibrated drill bits is difficult without image intensification.
- It is not possible to lock the static AP hole on the Expert R/AFN with Expert ModAD. Only the dynamic AP hole is possible.

Remove protection sleeve.

For oblique locking of Expert TN, go to step 1

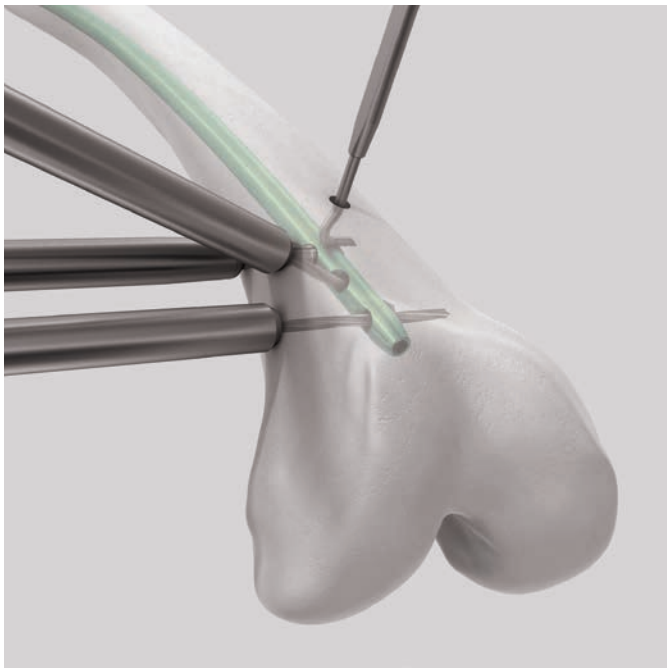
Remove the expander wire.

Remove the aiming arm for AP locking.

For insertion of ML or LM screws, go to step 1

Expert TN & R/AFN: Locking AP
Expert LFN & HN: Locking Oblique

Expert LFN



Expert R/AFN

Expert HN

Expert TN: Locking Oblique

1. Oblique interlocking of Expert Tibial Nail

Instruments	
03.010.307	Aiming Arm for oblique Locking, for Expert Tibial Nail, for No. 03.010.309
03.010.060	Drill Bit ∅ 3.2 mm, calibrated, length 340 mm, 3-flute, for Quick Coupling, for No. 03.010.064
03.010.061	Drill Bit ∅ 4.2 mm, calibrated, length 340 mm, 3-flute, for Quick Coupling, for No. 03.010.065
03.010.063	Protection Sleeve 12.0/8.0, length 188 mm
03.010.064	Drill Sleeve 8.0/3.2, for No. 03.010.063
03.010.065	Drill Sleeve 8.0/4.2, for No. 03.010.063
03.010.069	Trocar ∅ 3.2 mm, for No. 03.010.064
03.010.070	Trocar ∅ 4.2 mm, for No. 03.010.065
03.010.072	Depth Gauge for Locking Screws, measuring range up to 110 mm, for No. 03.010.063

Use the drill system corresponding to the chosen nail diameter.

Align the aiming arm for AP locking by inserting the aiming arm for oblique locking through the aiming arm and the slot of the spacer arm.

Insert the protection sleeve/drill sleeve/trocar assembly through the respective hole in the aiming block for oblique locking. Make stab incision and insert sleeve assembly to the bone.

Drill, measure length and insert screw using standard technique for proximal locking (i.e. guided with aiming arm and sleeves, see technique guide Expert Tibia Nail).

Expert TN

Expert TN

■ Note:

Measure screw length with a depth gauge as the use of calibrated drill bits is difficult without image intensification.

▲ Important:

The aiming arm for oblique locking must be completely inserted into the aiming arm for AP locking.

- Remove the sleeve assembly.
- Remove the aiming arm for oblique locking.
- Remove the expander wire.
- Remove the aiming arm for AP locking.

Locking of the Remaining Holes

1. Insert locking screws

Instrument	
03.010.072	Depth Gauge for Locking Screws, measuring range up to 110 mm, for No. 03.010.063
03.010.107	Screwdriver Stardrive, T25, length 330 mm

Measure length and insert screw into the hole previously used for AP aiming arm using standard technique for proximal locking.

■ Note:

Measure screw length with a depth gauge as the use of calibrated drill bits is difficult without image intensification.

Expert TN, R/AFN, LFN: Remove the drill bit and drill sleeve from the last hole and insert the final locking screw through the protection sleeve.

Remove Expert ModAD and continue with standard nailing technique.

Instruments

Vario Cases

68.010.301	Vario Case for Expert ModAD, without Lid, without Contents
68.010.302	Vario Case for Expert ModAD, for AP and oblique Locking, without Lid, without Contents

Standard Instruments

03.010.301	Aiming Beam for Locking, for Expert ModAD	
03.010.308	Spacer Arm, for Expert ModAD, for Nos. 03.010.303 to 03.010.306	
03.010.334	Drill Sleeve 8.0/6.0, for No. 03.010.063	
03.010.335	Trocar ∅ 6.0 mm, for No. 03.010.334	
03.010.336	Drill Bit ∅ 6.0 mm, length 250 mm, 2-flute, for No. 03.010.334	
03.010.063	Protection Sleeve 12.0/8.0, length 188 mm	
321.160	Combination Wrench ∅ 11.0 mm	
03.010.204	Calibration Pin ∅ 12.0 mm	
311.431	Handle with Quick Coupling	
314.260	Screwdriver, hexagonal, large, ∅ 3.5 mm, with Groove, length 300 mm	

Optional Instruments

03.010.302	Adapter for Expert LFN, for 03.010.045 and 03.010.046	
03.010.303	Aiming Block for distal ML-Locking, for Expert Lateral Femoral Nail, for No. 03.010.301	
03.010.304	Aiming Block for distal ML-Locking, for Expert Tibial Nail, for No. 03.010.301	
03.010.305	Aiming Block for proximal and distal ML-Locking, for Expert Retro- grade/Antegrade Femoral Nail, for No. 03.010.301	
03.010.306	Aiming Block for distal and proximal Locking, for Expert Humeral Nail, for No. 03.010.301	

03.010.307	Aiming Arm for oblique Locking, for Expert Tibial Nail, for No. 03.010.309	
03.010.309	Aiming Arm for AP Locking, for Expert Tibial Nail, for No. 03.010.313	
03.010.310	Aiming Arm for AP Locking, for Expert Retrograde Femoral Nail, for No. 03.010.313	
03.010.311	Aiming Arm for oblique Locking, for Expert LFN, for No. 03.010.313	
03.010.312	Adapter for Expert Humeral Nail, for No. 03.010.054	
03.010.340	Aiming Arm for oblique Locking, for Expert Humeral Nail, for No. 03.010.313	

03.010.064	Drill Sleeve 8.0/3.2 for No. 03.010.063	
03.010.065	Drill Sleeve 8.0/4.2, for No. 03.010.063	
03.010.066	Drill Sleeve 8.0/5.0, for No. 03.010.063	
03.010.069	Trocar ∅ 3.2 mm, for No. 03.010.064	
03.010.070	Trocar ∅ 4.2 mm, for No. 03.010.065	
03.010.071	Trocar ∅ 5.0 mm, for No. 03.010.066	
03.010.060	Drill Bit ∅ 3.2 mm, calibrated, length 340 mm, 3-flute, for Quick Coupling, for No. 03.010.064	
03.010.061	Drill Bit ∅ 4.2 mm, calibrated, length 340 mm, 3-flute, for Quick Coupling, for No. 03.010.065	
03.010.062	Drill Bit ∅ 5.0 mm, calibrated, length 340 mm, 3-flute, for Quick Coupling	
03.010.337	Drill Bit ∅ 6.0 mm, flat tip, length 250 mm, 2-flute, for No. 03.010.334	
03.010.338	Curette for Medial Nail Contact Opening ∅ 6.0/3.2 mm, for No. 03.010.334	
03.010.339	Curette for Medial Nail Contact Opening ∅ 7.0/5.0 mm, for No. 03.010.063	
356.226	T-Curette for Anterior Nail Contact Opening, for ModAD	

356.618	L-Curette for Anterior Nail Contact Opening, small	
356.619	L-Curette for Anterior Nail Contact Opening, medium	
356.620	L-Curette for Anterior Nail Contact Opening, large	
356.206	T-Spacer, adjustable, length 157.5 mm, for ModAD	
356.207	L-Spacer, small, adjustable, length 157.5 mm, for ModAD	
356.208	L-Spacer, medium, adjustable, length 157.5 mm, for ModAD	
356.209	L-Spacer, large, adjustable, length 157.5 mm, for ModAD	
03.010.313	Handle for Expander Spacer, for Expert ModAD	
356.625	Connecting Screw for Expander Spacer, for No. 356.621	
356.626	Expander Wire for Expander Spacer, for No. 356.621	

03.010.314	Expander Spacer for Expert Tibial Nail ∅ 8 mm, for No 03.010.313	
03.010.315	Expander Spacer for Expert Tibial Nail ∅ 9 mm, for No 03.010.313	
03.010.316	Expander Spacer for Expert Tibial Nail ∅ 10 mm, for No 03.010.313	
03.010.317	Expander Spacer for Expert Tibial Nail ∅ 11 mm, for No 03.010.313	
03.010.318	Expander Spacer for Expert Tibial Nail ∅ 12 mm, for No 03.010.313	
03.010.319	Expander Spacer for Expert Tibial Nail ∅ 13 mm, for No 03.010.313	
03.010.320	Expander Spacer for Expert R/AFN ∅ 9 mm, for No 03.010.313	
03.010.321	Expander Spacer for Expert R/AFN ∅ 10 mm, for No 03.010.313	
03.010.322	Expander Spacer for Expert R/AFN ∅ 11.0, 12.0 and 13.0 mm, for No. 03.010.313	
03.010.323	Expander Spacer for Expert R/AFN ∅ 14 mm, for No 03.010.313	
03.010.324	Expander Spacer for Expert R/AFN ∅ 15 mm, for No 03.010.313	
03.010.325	Expander Spacer for Expert LFN ∅ 9 mm, for No 03.010.313	
03.010.326	Expander Spacer for Expert LFN ∅ 10 mm, for No 03.010.313	
03.010.327	Expander Spacer for Expert LFN ∅ 11.0, 12.0 and 13.0 mm, for No. 03.010.313	

03.010.328	Expander Spacer for Expert LFN ∅ 14 mm, for No 03.010.313	
03.010.329	Expander Spacer for Expert LFN ∅ 15 mm, for No 03.010.313	
03.010.330	Expander Spacer for Expert LFN ∅ 16 mm, for No 03.010.313	
03.010.331	Expander Spacer for Expert Humeral Nail ∅ 7.0 mm, for No. 03.010.313	
03.010.332	Expander Spacer for Expert Humeral Nail ∅ 9.0 mm, for No. 03.010.313	
03.010.333	Expander Spacer for Expert Humeral Nail ∅ 11.0 mm, for No. 03.010.313	

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