

CARING FOR LIFE



Monoloc Locking Compression Plate System

Surgical Technique



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Introduction

Osteosynthesis inter-fixation is a combination therapy based on anatomical reduction, stable fixation, maintenance of the blood supply, and early functional mobilisation. Plate and screw osteosynthesis has been an established procedure for a long time and is clinically recognized.

The locking compression plate system is based on the wealth of experience with standard plates and screws and the internal fixator. In the case of metaphyseal fractures and osteoporotic bone, the clinical results have been improved by the use of angular stable systems, or internal fixators, and the maintenance of blood supply and stability are significantly improved. It enables the use of the standard plate technique, the internal fixator approach, and the specific combination of both methods. An indication can therefore be treated with the technique that achieves the best results without having to make compromises.

Monoloc System offers a wide variety of locking compression plates, a correspondingly large variety of indications are covered. The fragments are fixed in their reduced position without regarding to the plate model. Angular stable support of fragments offers optimum fixation irrespective of bone density, reduces the risk of primary and secondary loss of reduction. A limited contact design reduces plate-to-bone contact and helps to preserve the periosteal blood supply, creates an environment for bone healing. Monoloc locking compression system has favorable hold in osteoporotic bone and in multiple fragment fractures, supplies stable bridging of comminuted fractures. Minimally invasive surgery is easy to perform. An indication can therefore be treated with the technique that achieves the best results without having to make compromises.



1

Reduce the fracture and preliminarily fix it

Reduce the fracture under the image intensifier, as needed, provide fixation with Kirschner wire or reducing forceps.



2

Position the plate

Position the plate on the bone. Before setting the first locking screw, make sure that the plate is provisionally fixed well since it could otherwise rotate when locking the screw and damage soft tissue.



3

Set drill guide

Carefully screw the drill guide into the desired hole until it is gripped completely by the thread. The drill guide ensures that the locking screw is correctly locked in the plate.

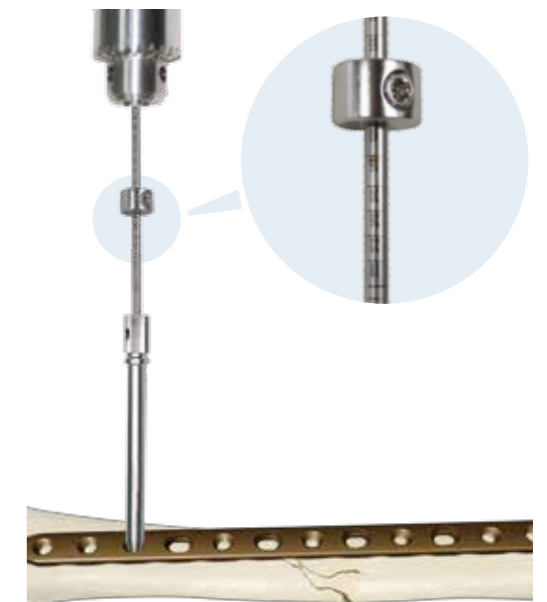
Note: in the case of metaphyseal plates, the threaded hole is usually not perpendicular to the plate surface due to the anatomy.



4

Predrill screw hole

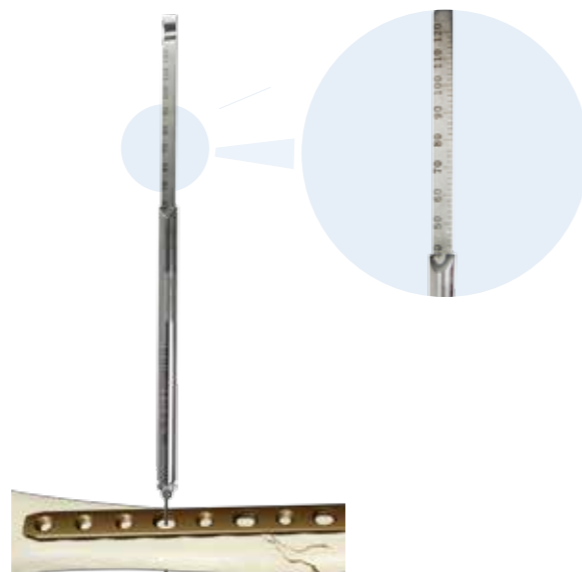
Carefully drill the screw hole using an appropriate drill. Shove the stop ring down to the drill sleeve to control depth. Remove the drill sleeve.



5

Determine screw length

Read the drilled depth directly from the laser mark on the drill bit, alternatively determine the screw length with the depth gauge.



6

Insert locking screw

Before setting the first locking screw, anatomical reconstruction must have occurred and, where necessary, fixed with lag screws. After setting the locking screws, additional reduction can no longer occur without removing the locking screws. The locking screws can either be inserted with a power tool without locking or manually.

a

Insertion with a power tool

Insert the screwdriver shaft into the power tool, then pick up the locking screw and insert it into the plate hole. To insert the screw, start the power tool slowly, increase the speed and then stop it before the screw is fully tightened. Uncouple the power tool, and manually tighten the screw with the torque limiter screwdriver. After one click, the optimum torque is reached.



Note: Do not lock the screws at full speed to reduce the risk of stripping the head. This can make it difficult to remove the implant. For long screws and thick cortical bone, ensure sufficient cooling during insertion.

b

Manual insertion

Pick up the locking screw and insert it into the plate hole. To insert the locking screw manually, screw the torque limiter screwdriver in the locking screw, and lock it in the plate. After one click, the optimum torque is reached.



7

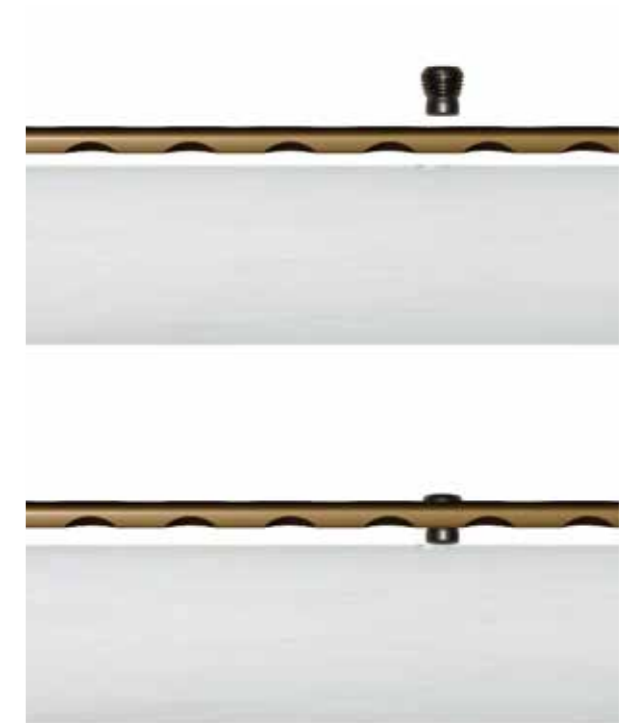
Remove the Implant

To remove the plate, first remove the tissue and bone from all screw heads and drives. Insert a screwdriver that is in good condition in the screw recess and unlock all screws manually.



Set locking spacers

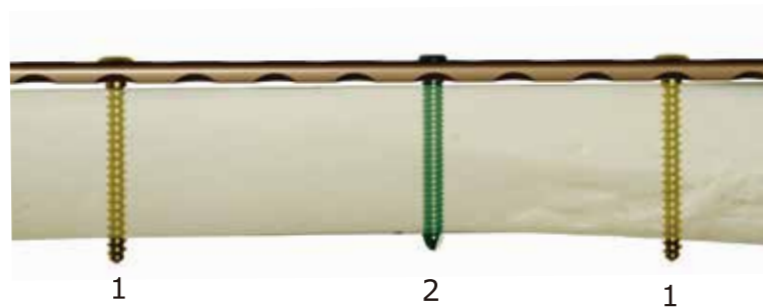
If necessary, screw an LCP spacer in the plate before positioning the plate. The spacer ensures that a distance of 2mm will be maintained between the plate and the bone when the screws are later inserted. The spacer can be removed after setting the locking screws.



Example A

If a plate is first fixed with standard screws

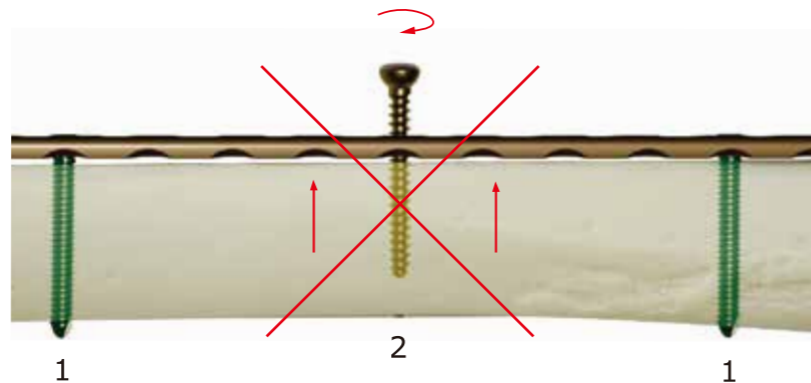
- (1) locking screws can be introduced later
- (2) to fix the fragments at a stable angle.



Example B

If a plate is first fixed to a fragment with locking screws

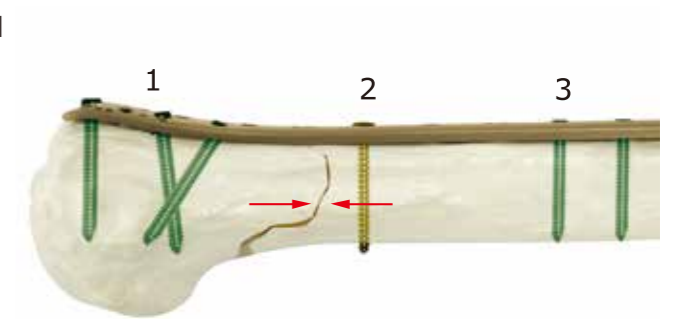
- (1) it is not recommendable to later insert lag screws or compression screws in the same fragment
- (2) in this case, the locking screws must be removed first.



Example C

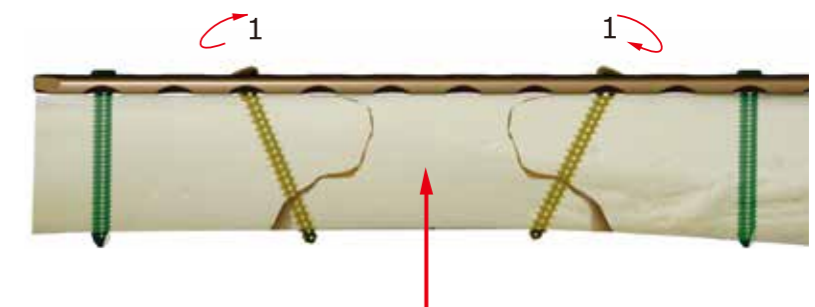
If the metaphyseal fragment is fixed with locking screws

- (1) the fracture can be dynamically compressed with standard screws
- (2) to increase the stability of fixation, insert additional locking screws into the diaphyseal fragment.



Example D

In the case of a diaphyseal fracture, standard screws can be alternately inserted as lag screws after the locking screws have been inserted (1) to draw the opposing fragments to the plate.





a

Select the neutral position

Press the universal guide against the bone in the dynamic compression hole of the LCP.
The inner sleeve retracts. The rounded end of the outer sleeve slides along the hole angle into neutral position. This enables neutral predrilling.



b

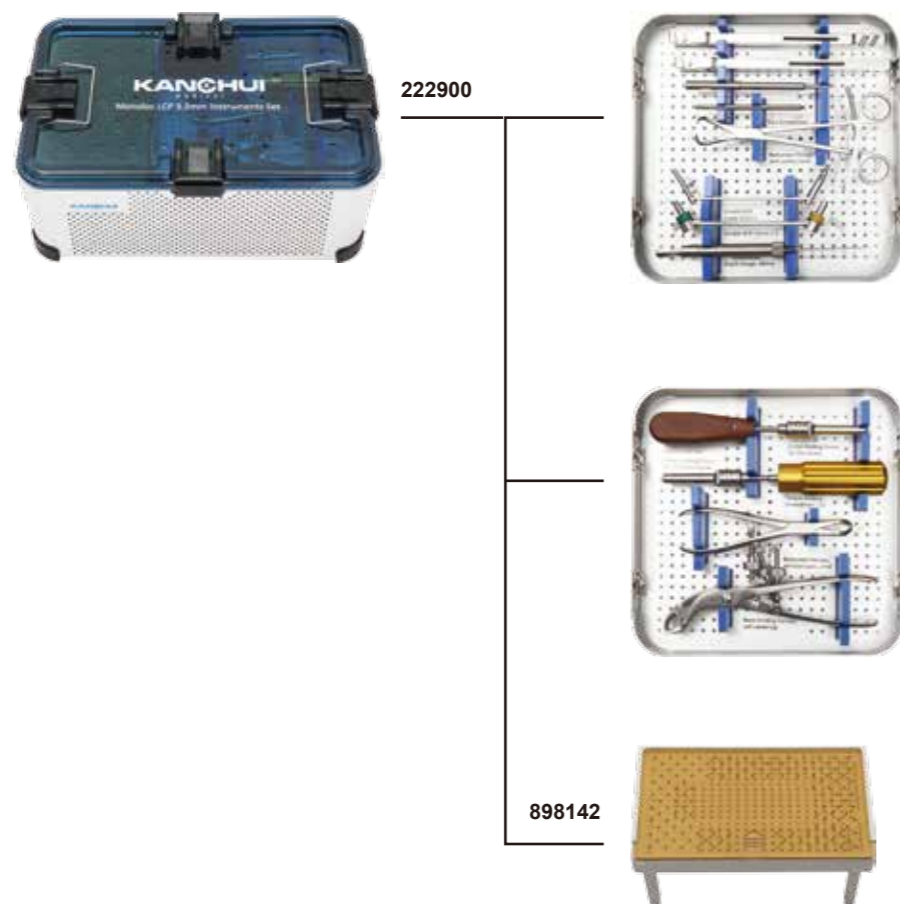
Select eccentric position (dynamic compression)

Place the universal drill guide on the edge of the dynamic compression hole of the LCP without exerting any pressure. The inner sleeve remains in its original state. The dynamic compression is generated by setting and tightening the cortex screw.





Monoloc LCP 3.5mm Instruments Set



Code	Product Description	Qty
222900	MonoLoc LCP 3.5mm System Instruments Set	
898142	3.5mm LCP Screw Case -PPSU	1
898347	MonoLoc LCP 3.5mm System Instruments Set(Empty)-PPSU	1
221100	Drill Guide 2.6	3
221111	Drill Bit with Stop, Φ 2.6mm	1
222110	Drill Bit with straight shank, Φ 2.6mm	2
221120	Guide Sleeve for K-Wire, Φ 1.2mm	1
221151	Torque-limiting Screwdriver, T15	1
221140	Screw Holding Sleeve for StarDrive Screw	1
221160	Screwdriver, self-retaining	1
221180	Allen Key	1
10736220	Kirschner Wire, Φ 1.2mm	3
221170	Extraction Screw, Φ 3.5mm	1
221190	Drill Bit for Screw Head Removal	1
201150	Trephine	1
010030	Drill Bit, Φ 3.5mm	1
010010	Drill Bit, Φ 2.5mm	1
221200	Torx Screwdriver, with Quick Coupling	1
201120	Double Drill Guide 3.5/2.5	1
201130	Double Drill Sleeve 2.5	1
201200	Depth Gauge, 60mm	1
020020	Tap, Φ 4.0mm	1
020010	Tap, Φ 3.5mm	1
030100	T-handle with Quick Coupling	1
201250	Screw Holding Sleeve for Hex Screw	1
201140	Hex Screwdriver	1
201170	Bone Holding Forceps, self-centering	2
201180	Reduction Forceps, serrated jaws, small	1
201190	Reduction Forceps with Points, small	1
201160	Bending Irons	2

Please contact your sales representative for final product list.

Monoloc LCP 3.5mm Instruments

- Drill Guide 2.6

Allows centric and orthogonal drilling with the 4.1mm drill bit and protects soft tissues. Ensures that the locking screw is correctly locked in the plate.



- Drill bit with stop, Φ 2.6mm

Shove the stop ring down to the drill sleeve to limit the depth



- Torque-limiting Screwdriver, T15

Torque limiter, 1.5Nm. Ensures an optimal tightening moment and prevents overtightening of the locking head-screw



- Screwdriver, self-retaining

Screwdriver, self-retaining, For extraction screw only



- Extraction Screw, Φ 3.5mm

Extraction screw, conical, for screws 3.5mm. If the screws cannot be removed with the screwdriver, set the extraction screw with the left-hand thread in the screw head using the T-handle with Quick Coupling, and remove the locking screw counter-clockwise.



- Drill Bit for Screw Head Removal

The drill bit for metal is used to remove the screw head from the shaft when the conical extraction screw can not be anchored in the screw head. The drill bit for metal is only suitable for single use. It can not be reused.





Monoloc LCP 3.5mm Instruments

- Double Drill Guide 3.5/2.5

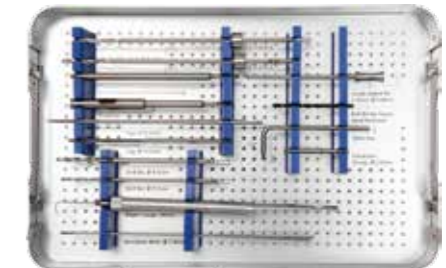
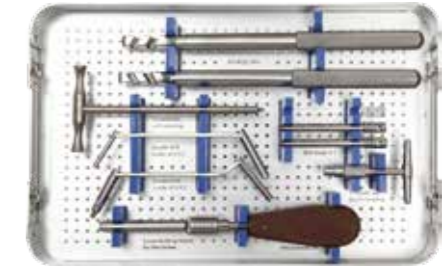
Permits centric and eccentric pre-drilling for 3.5mm cortex screws using a 2.5mm drill bit, and as a tissue protection for taps.



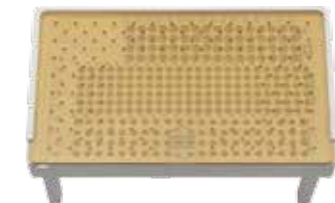
Monoloc LCP 5.0mm Instruments Set



227900



898146



Code	Product Description	Qty
227900	MonoLoc LCP 5.0mm System Instruments Set	
898146	5.0mm LCP Screw Case -PPSU	1
898348	MonoLoc LCP 5.0mm System Instruments Set(Empty)-PPSU	1
226100	Drill Guide 4.1	3
226110	Drill Bit with Stop, Φ 4.1mm	1
227110	Drill Bit with straight shank, Φ 4.1mm	2
226120	Guide Sleeve for K-Wire, Φ 2.0mm	1
226151	Torque-limiting Screwdriver, T25	1
226140	Screw Holding Sleeve for StarDrive Screw	1
226160	Screwdriver, self-retaining	1
226200	Torx Screwdriver, with Quick Coupling	1
226170	Extraction Screw, Φ 5.0mm	1
221180	Allen Key	1
226190	Drill Bit for Screw Head Removal	1
10737230	Kirschner Wire, Φ 2.0mm	3
206110	Double Drill Guide 6.5/3.2	1
206120	Double Drill Guide 4.5/3.2	1
206240	Trephine	1
010040	Drill Bit, Φ 4.5mm	1
010020	Drill Bit, Φ 3.2mm	1
206170	Depth Gauge, 90mm	1
030100	T-handle with Quick Coupling	1
020040	Tap, Φ 6.5mm	1
020030	Tap, Φ 4.5mm	1
206280	Hex Screwdriver	1
206300	Screw Holding Sleeve for Hex Screw	1
206150	Reduction Forceps, serrated jaws, large	1
206160	Reduction Forceps with Points, large	1
206290	Bone Holding Forceps, self-centering	2
206320	Bending Irons, left	1
206340	Bending Irons, right	1



Monoloc LCP 5.0mm Instruments

- Drill Guide 4.1

Allows centric and orthogonal drilling with the 4.1mm drill bit and protects soft tissues. Ensures that the locking screw is correctly locked in the plate.



- Drill Bit with Stop, Φ 4.1mm

Shove the stop ring down to the drill sleeve to limit the depth



- Torque-limiting Screwdriver, T25

Torque limiter, 4.0Nm. Ensures an optimal tightening moment and prevents overtightening of the locking head screw



Monoloc LCP 5.0mm Instruments

- Screwdriver, self-retaining

Screwdriver, self-retaining, for screw removal only



- Extraction Screw, Φ 5.0mm

Extraction screw, conical, for screws 4.5/5.0mm. If the screws cannot be removed with the screwdriver, set the extraction screw with the left-hand thread in the screw head using the T-handle with Quick Coupling, and remove the locking screw counter-clockwise.



- Drill Bit for Screw Head Removal

The drill bit for metal is used to remove the screw head from the Shaft when the conical extraction screw cannot be anchored in the screw head. The drill bit for metal is only suitable for single use. It cannot be reused.



- Double Drill Guide 4.5/3.2

Permits centric and eccentric pre-drilling for 4.5mm cortex screws using a 3.2mm drill bit, and as a tissue protection for taps.



