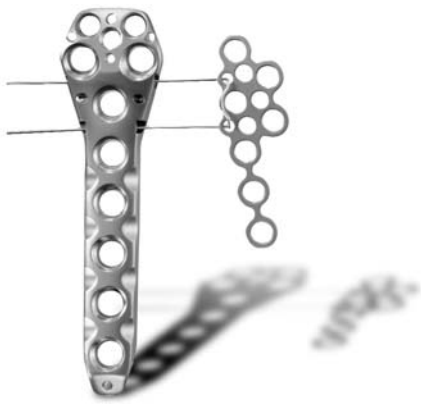
NCB® Proximal Humerus Plating System

Surgical Technique



The right locking option for tough fractures

zimmer
Confidence in your hands®

NCB Plating System – Proximal Humerus Surgical Technique

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Fracture Classifications

Indications for Open Technique (Deltoid Pectoral Incision)

- Neer classification: 2-, 3-, 4-part displaced fractures (anatomical neck, surgical neck, tuberculum majus, tuberculum minus and head splitting).
- AO classification: type 11 A, extracapsular, 2 fragments; type 11 B, partially intracapsular, 3 fragments; type 11 C, – intracapsular.

Zimmer MIS Technique (Anterior/Lateral Deltoid Split Incision)

- Neer classification: 2-part displaced fractures.
- AO classification: type 11 A, extracapsular, 2 fragments.

Preoperative Planning and Patient Positioning

Preoperative Planning

An X-ray of the injured shoulder on the anteroposterior plane is essential for preoperative planning. In addition, a “Y” view, that is to say perpendicular to the anteroposterior view, of the scapula is also required.

A CT scan can also provide information concerning the tuberosities. The use of the X-ray template is recommended for preoperative planning.

Positioning of the Patient

The patient is placed on the operating table in the beachchair position (Fig. 1).

After the patient is in the correct position, the C-arm must be adjusted so as to achieve the widest possible view of the proximal humerus.

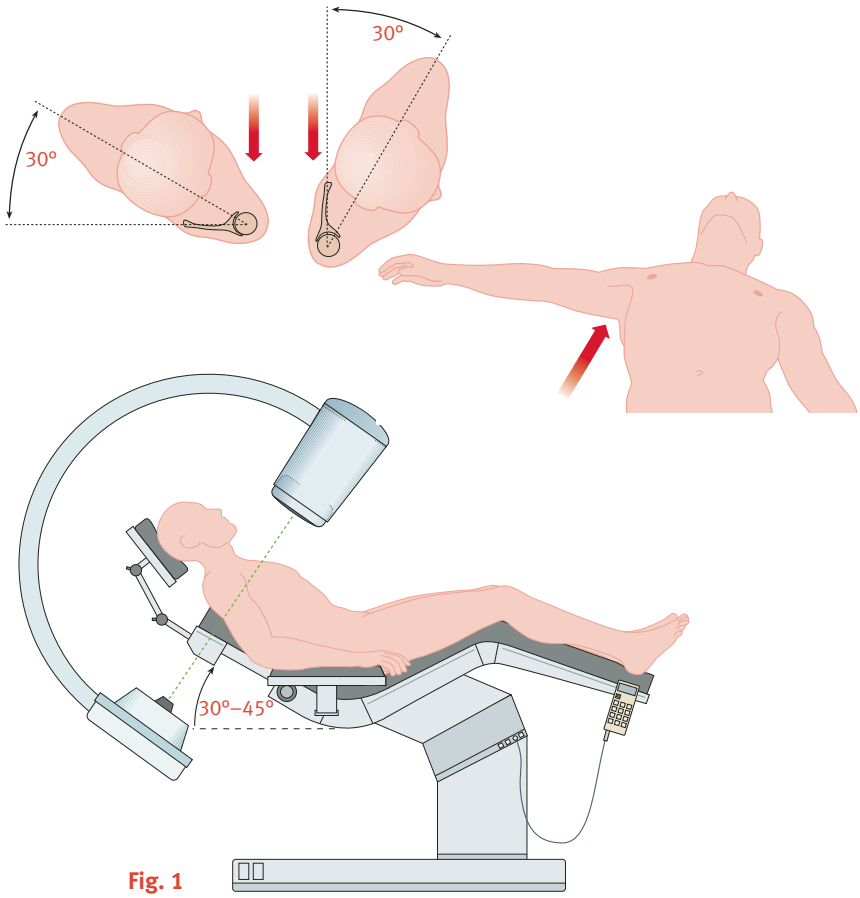


Fig. 1

Open Technique (Deltoid Pectoral Incision)

Deltoid Pectoral Incision

For the open technique deltoid pectoral incision is recommended (Fig. 2).

Important: Care must be taken to avoid damaging the N. axillaris and to keep the blood supply of the bone fragments intact.

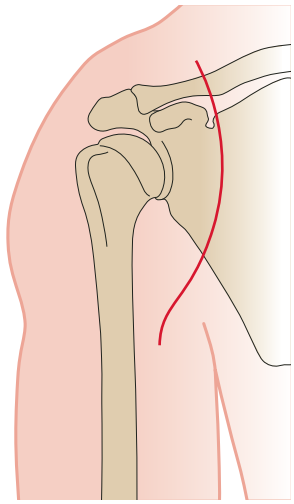


Fig. 2 Deltoid pectoral incision

Reduce the Fracture

Reduce the fracture and confirm the reduction under image intensification.

The humeral head and tuberosity fragments may be manipulated and temporarily fixed with suture and/or 2mm Kirschner wires. K-wires should be placed where they will not interfere with plate application (Fig. 3).

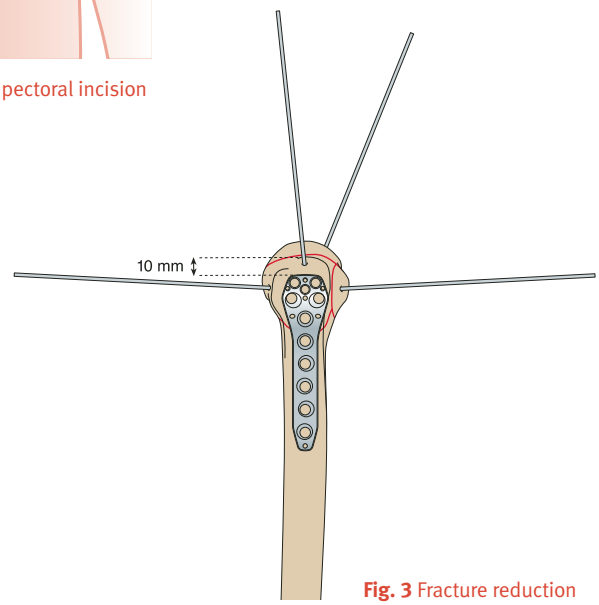


Fig. 3 Fracture reduction

Insert Plate

The plate can be temporarily fixed to the bone with a distal and a proximal 2mm K-wire through the small holes in the plate.

Positioning from A-P view

The plate should be placed approx. 10mm distal to the rotator cuff attachment on the upper edge of the greater tuberosity to avoid postoperative subacrominal impingement (Fig. 4).

Positioning from lateral view

The plate should be centered against the lateral aspect of the greater tuberosity (Fig. 5).

Note: The plate should not be bent since this might disrupt the function of the locking mechanism.

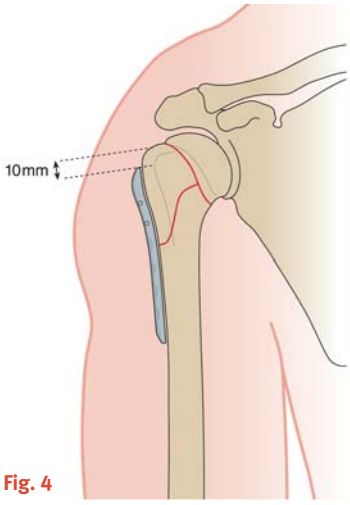


Fig. 4 Plate alignment 10mm distally from the edge of greater tuberosity and centered against the lateral aspect.

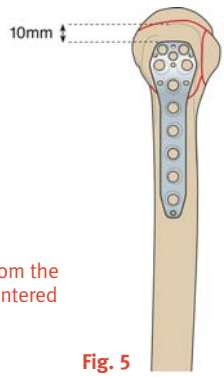


Fig. 5

Bone Spacer (optional)

You may insert bone spacer into the locking holes to avoid periosteum impairment (Fig. 6). Three lengths from 1 to 3mm are available.

Bone Spacer

Color	Bone space
red	1mm
blue	2mm
green	3mm

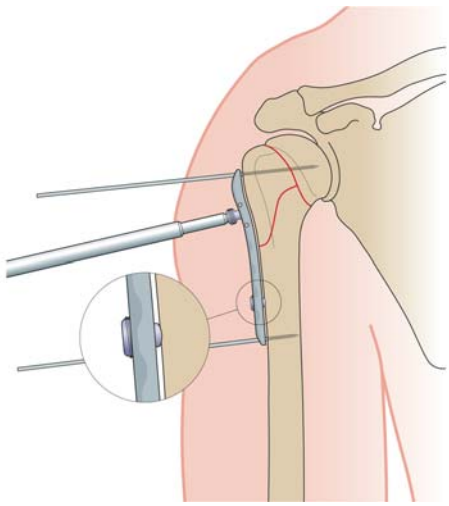


Fig. 6 Bone spacer 2mm (blue) proximally and distally

NCB Screw Insertion

1. Screw Angulation

Up to 30° screw angulation is possible for all plate holes (Fig. 7).

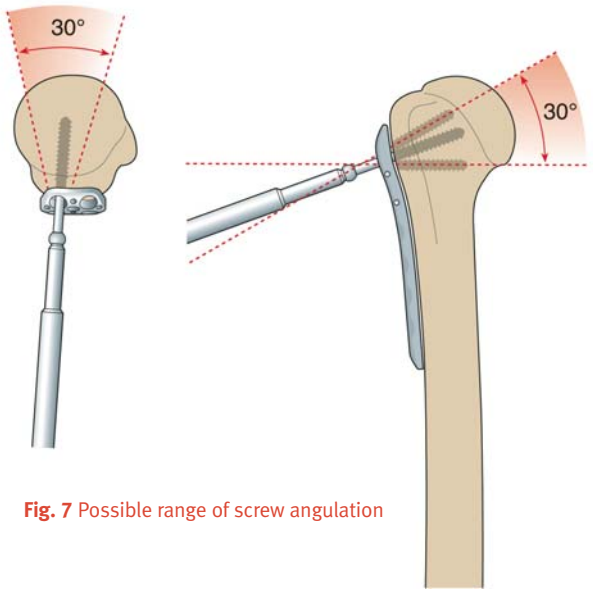


Fig. 7 Possible range of screw angulation

2. Screw and Drill Dimensions

NCB Self-Tapping Screw and drill dimensions

Screw Type	**Screw Type**
Cortical	Cancellous
∅ 4.0mm	∅ 4.5mm
L 20-50mm	L 30-50mm
	

Drill

∅ 3.3mm

3. Insert Screws

The placement of the initial *NCB* Screw depends on the fracture type and the reduction achieved.

For screw insertion use the *NCB* Drill Guide ∅ 3.3mm and the drill bit ∅ 3.3mm (Fig. 8). The Drill Guide allows polyaxial screw placement. A stop is felt at 30° (Fig. 9).

a) Proximal screw setting

When drilling the proximal screw holes, the use of an image intensifier is recommended. Stop approximately 5mm before the subchondral bone.

The screw length is measured with the *NCB* Depth Gauge or with the calibration on the drill bit shaft (Fig. 10). The appropriate screw length is chosen from the screw rack. Insert the Self-Tapping Screw with the *NCB* Torque Screwdriver (Fig. 11). The screw can be used to apply compression if needed. For osteoporotic bone use ∅ 4.5mm *NCB* Cancellous Screws. Repeat procedure to place all proximal bone screws.

Note: Bone screws should be hand tightened only.

Important: When determing the proximal screw length, the probability of bone resorption and screw, compression at the fracture site must be taken into account. Care should be taken to ensure that the screw tip is within an adequate distance away from the subchondral zone.

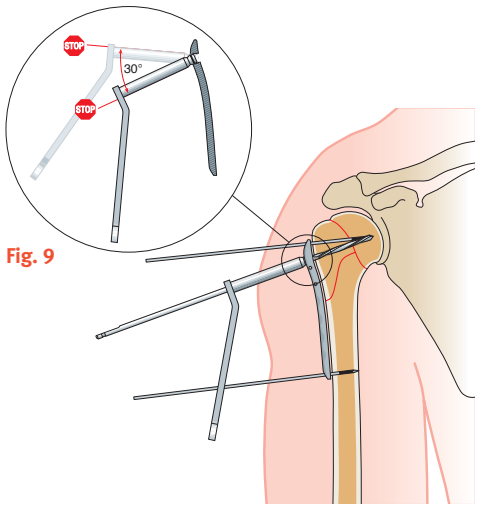


Fig. 9

Fig. 8 Exact screw setting with the drill guide and drill

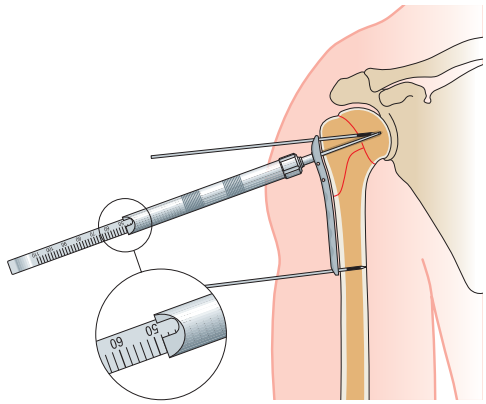


Fig. 10 Measuring screw length with the depth gauge

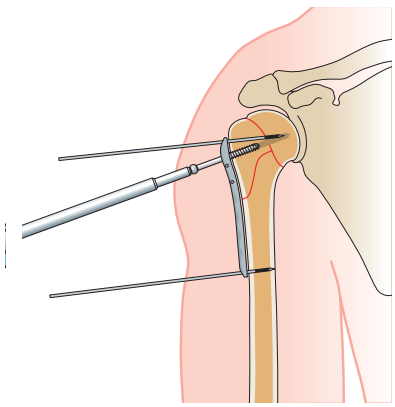


Fig. 11 Insert the Self-Tapping Screw

b) Distal screw insertion
Use the same screw procedure for distal screws as proximally. For optimal fixation, bicortical insertion is recommended (Fig. 12). Place at least 3 screws at the distal end.

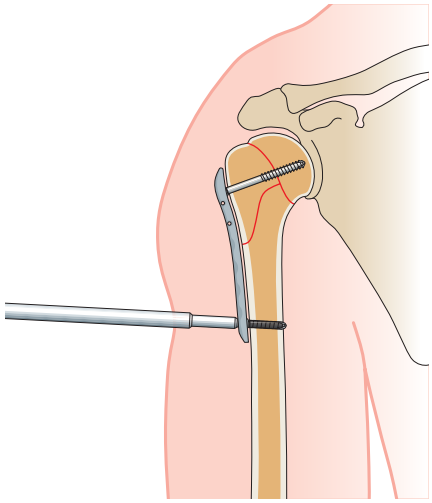


Fig. 12 Insert the distal Self-Tapping Screws

4. Add Locking Screw Cap

To achieve angular stability, set *NCB* Locking Screw Caps at all screws with the Torque Screwdriver until the wrench declutches (clicking sound) (Fig. 13). This applies for all *NCB* Locking Screw Caps (Fig. 14).

Note: Bone spacers can be removed and replaced with *NCB* Screws.

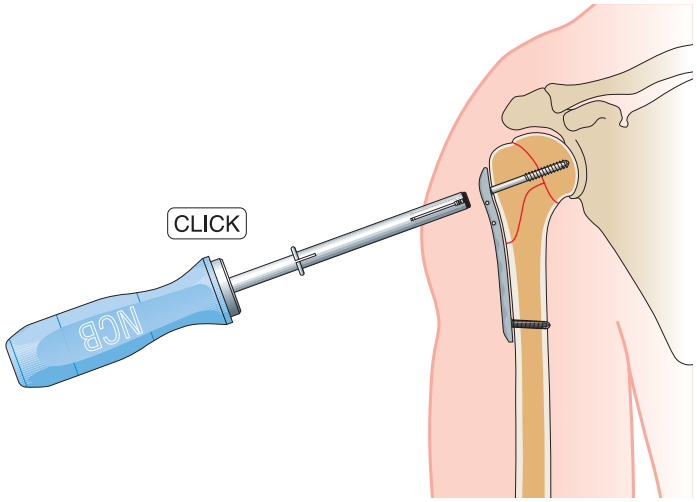


Fig. 13 Locking Screw Cap insertion, tighten until wrench declutches (click sound).

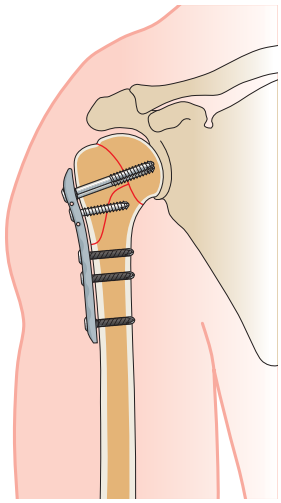


Fig. 14

Alternative Step: Fracture Reduction

1. Insert the plate before fracture reduction (Fig. 15).
2. Place first the distal screw closest to the fracture line (Fig. 16).
3. Tighten the screw and use the plate for fracture reduction (Fig. 17).
4. Place a K-wire at the proximal end of the plate and use the plate-K-wire construct to further reduce the fracture.
5. Finish the osteosynthesis with further screws as described in paragraph "*NCB* Screw Insertion".

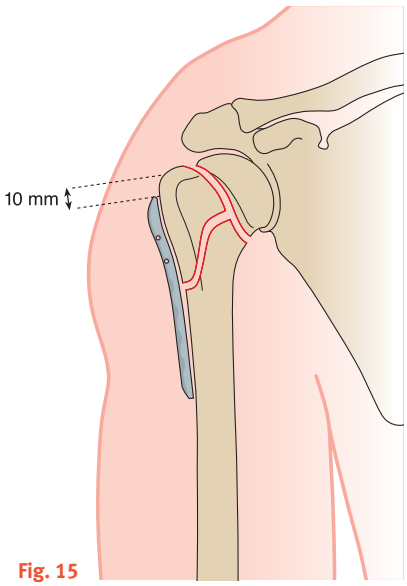


Fig. 15

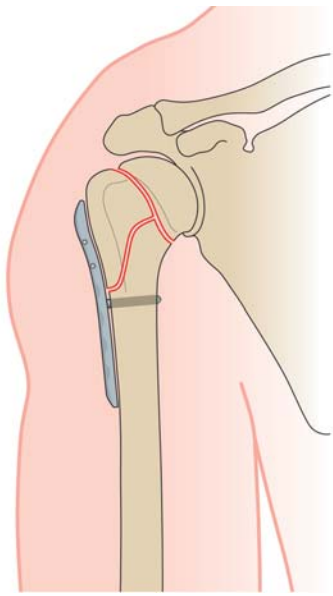


Fig. 16

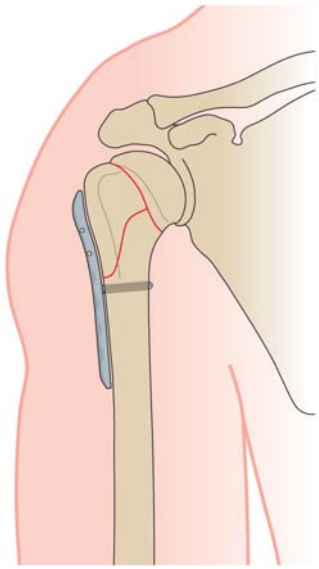


Fig. 17

Proximal ∅ 3.5mm Cortical Screw Placement (optional)

Additionally it is possible to set standard ∅ 3.5mm self-tapping cortical screws in the two top proximal plate holes.

1. Drill Screw Holes

Use the standard Double Drill Guide for screws ∅ 2.5/3.5/4.0mm and the drill bit ∅ 2.5mm, with quick coupling to drill the screw hole (Fig. 18).

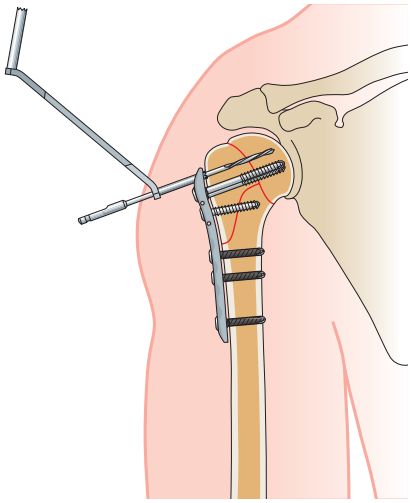


Fig. 18 Drill with drill bit ∅ 2.5mm

2. Measure Screw Length

Measure the appropriate screw length with the standard Depth Gauge, small for screws ∅ 2.7/3.5/4.0mm (Fig. 19).

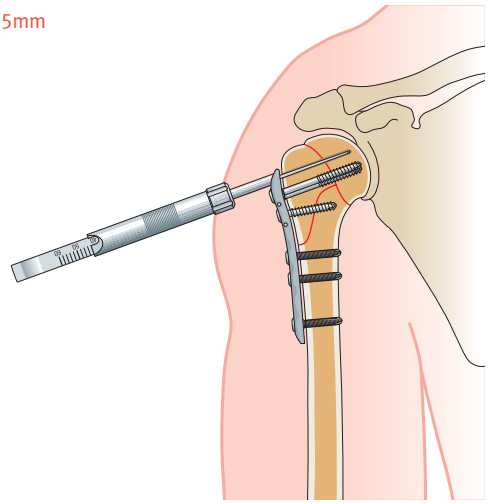


Fig. 19 Measure the appropriate screw length

3. Set the ∅ 3.5mm Screws

Insert the ∅ 3.5mm Self-Tapping cortical Screw with the Hexagonal Screwdriver small, hex 2.5mm (Fig. 20).

Important: When determining the proximal screw length, the probability of bone resorption and compression at the fracture site must be taken into account. Care should be taken to ensure that the screw tip is within an adequate distance away from the subchondral zone.

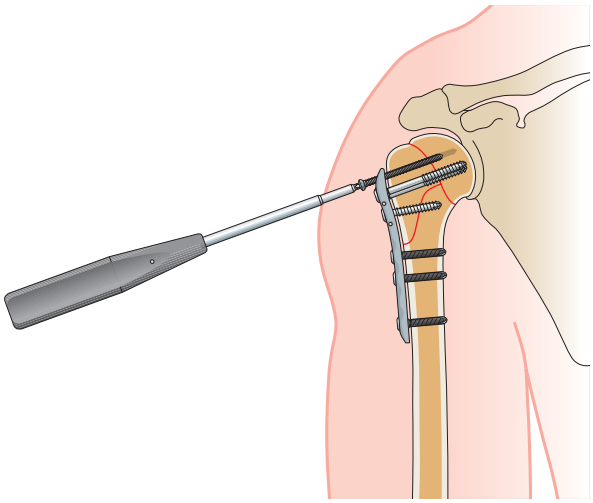


Fig. 20 ∅ 3.5mm Self-Tapping Cortical Screw setting

Tuberculum Minus Plate (optional)

1. Apply Tuberculum Minus Plate

For tuberculum minus fractures it is possible to apply a small bendable tuberculum minus plate with 7 screw holes. The plate is fixed to the bone using ∅ 3.5mm standard Self-Tapping Cortical Screws. The plate can be assembled to the *NCB* Humerus Plate with a prebent U-shaped cerclage wire ∅ 0.8mm through two holes at the side of the *NCB* Plate (Fig. 21).

The same plate can be used for the left and right humerus.

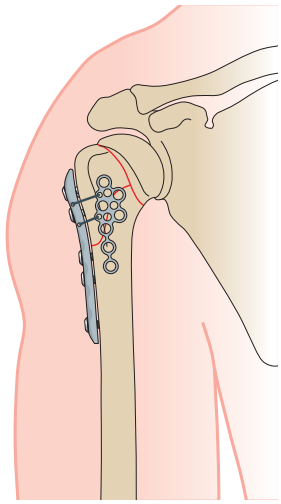


Fig. 21 Apply tuberculum minus plate to the bone

2. Drill Screw Holes

Use the standard Double Drill Guide for screws ∅ 2.5/3.5/4.0mm and the drill bit ∅ 2.5mm, with quick coupling to drill the holes (Fig. 22).

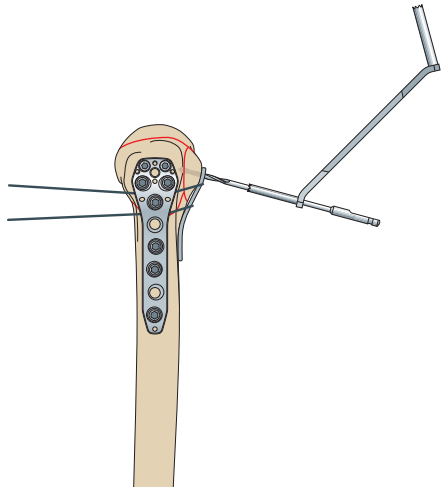


Fig. 22 Drilling with a standard Double-Drill Guide

3. Measure Screw Length and Insert Screws

Measure the appropriate screw length with the standard Depth Gauge, small for screws ∅ 2.7/3.5/4.0mm.

Insert the ∅ 3.5mm Self-Tapping Cortical Screw with the Hexagonal Screwdriver small, hex 2.5mm (Fig. 23).

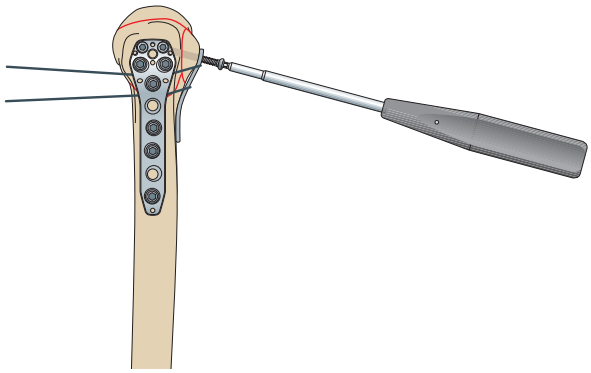


Fig. 23 Tuberculum minus plate screw-setting

4. Twist the Wire

Twist the cerclage wire with the Wire-Bending Forceps and apply some tension to the tuberculum minus plate (Fig. 24).

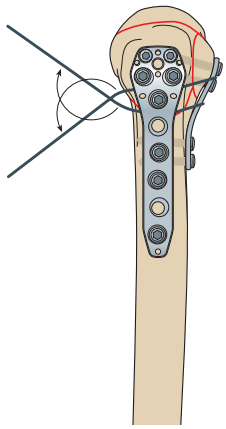


Fig. 24 Standard cerclage wire technique is used

5. Cut the Wire

Cut off the remaining twisted cerclage wire with the Wire Cutter and bend it along the side of the *NCB* Plate (Fig. 25).

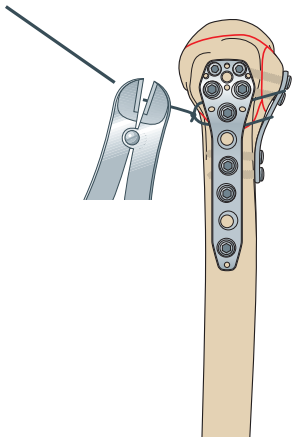
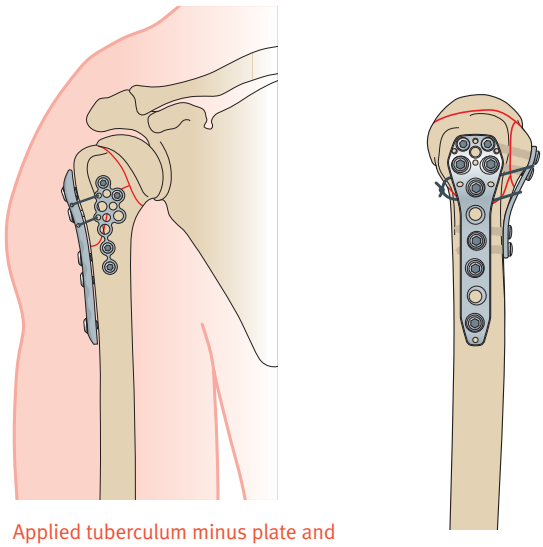


Fig. 25 Cut off the remaining twisted cerclage wire



Applied tuberculum minus plate and final construct

Blind Screw Inserts and Sutures (optional)

NCB Blind Screw Insert

To prevent bone ingrowth into empty screw holes it is possible to use *NCB* Blind Screw Inserts (Fig. 26).

Note: Hand tighten only.

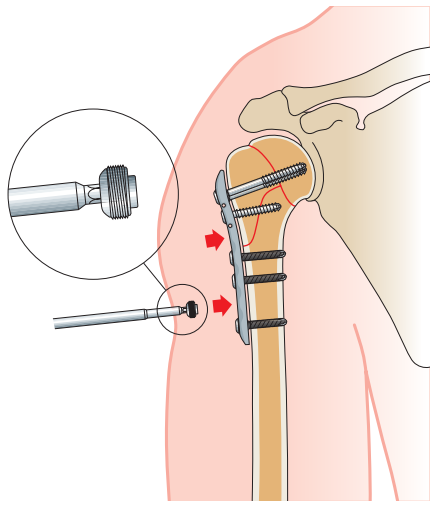


Fig. 26 *NCB* Blind Screw Inserts

Sutures

Oblique holes ∅ 2mm can be used for sutures and reattachment of the rotator cuff (Fig. 27).

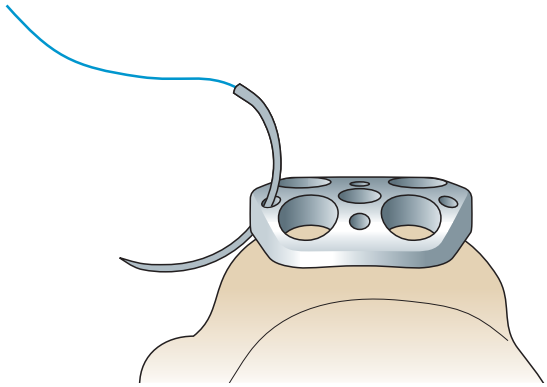


Fig. 27 Oblique holes 2mm for sutures proximally

Zimmer MIS Technique (Anterior/Lateral Deltoid Split Incision)

High Anterior/Lateral Deltoid Split Incision

A high anterior/lateral deltoid split incision is recommended (Fig. 28).

Important: Care must be taken to avoid damaging the axillary nerve and to keep the blood supply of the bone fragments intact.

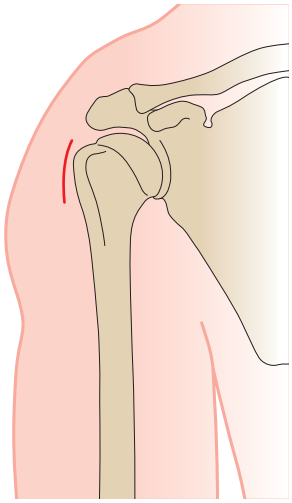


Fig. 28

1. Reduce the Fracture

Reduce the fracture and check correct reduction under image intensification.

The humeral head and tuberosity fragments may be manipulated and temporary fixed with 2mm Kirschner wires. K-wires should be placed where they will not interfere with the plate application.

Targeting Device

Plate Hole Numbering System

To target the correct plate holes there is a numbering system on the targeting module (Figs 29 & 30).

Fig. 29

Targeting for screw holes with the numbers:
1–2–4–5–6–7–8

Turn for the number:
3 (Fig. 31)

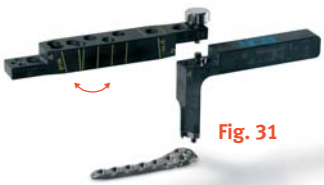


Fig. 31

Note: The plate should not be bent since this might disrupt the function of the locking mechanism.

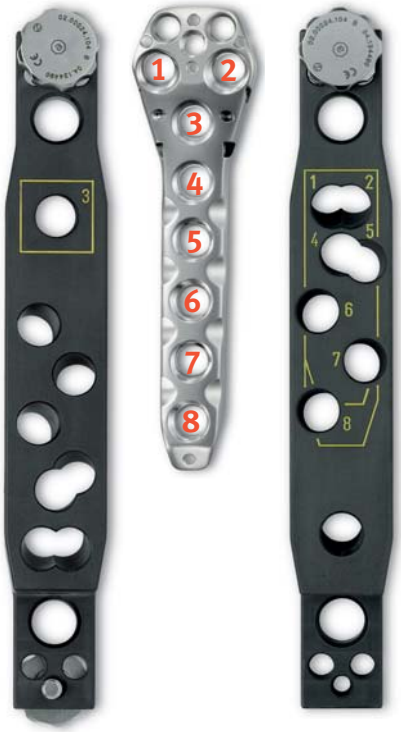


Fig. 30 *NCB* screw hole numbering system

Insert the Plate

1. Assemble the MIS radiolucent targeting device

Assemble the radiolucent handle to the proximal end of the plate. Use a 3.5mm hexagonal screwdriver to tighten moderatly the fixation screw.

2. Inserting Plate

Insert the plate through the high anterior/lateral deltoid split incision subcutaneously along the proximal humerus (Fig. 32).

Note: Aim to get bone contact immediately. Insert the plate underneath the subdeltoid bursa. **Care must be taken to avoid damaging the axillary nerve and the vascularization of the fragments.**

3. Position Plate to Bone

Positioning from A-P view

The plate should be placed approx. 10 mm distal to the rotator cuff attachment on the upper edge of the greater tuberosity to avoid postoperative subacrominal impingement (Fig. 33).

Positioning from lateral view

The plate should be centered against the lateral aspect of the greater tuberosity (Fig. 34).

4. Assemble the Targeting Module

Attach the targeting module to the handle with the hole numbering 1–2–4–5–6–7–8 on the lateral side (Fig. 35). Fit the yellow arrowhead markings together for proper assembly (Fig. 36).

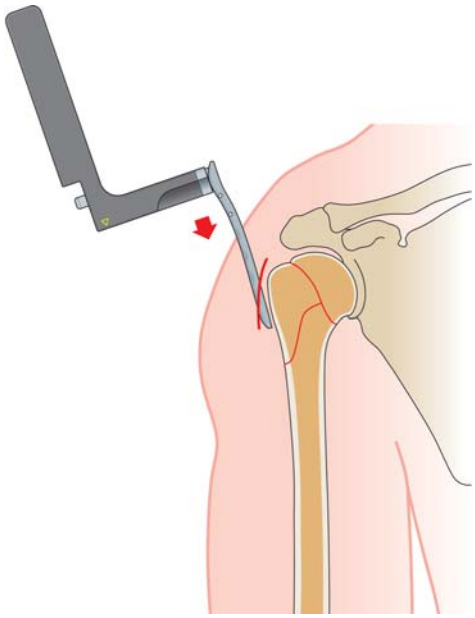
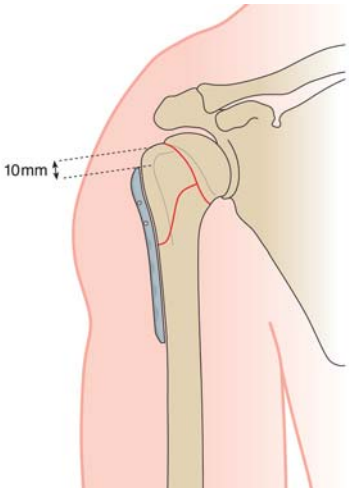


Fig. 32 Insert the plate



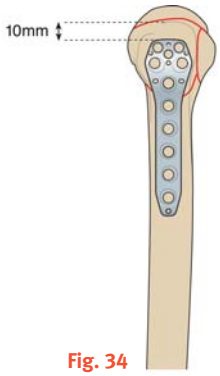


Fig. 34

Fig. 33 Plate alignment 10mm distal of edge greater tuberosity and center against the lateral aspect

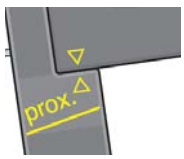


Fig. 36 Yellow arrowhead markings

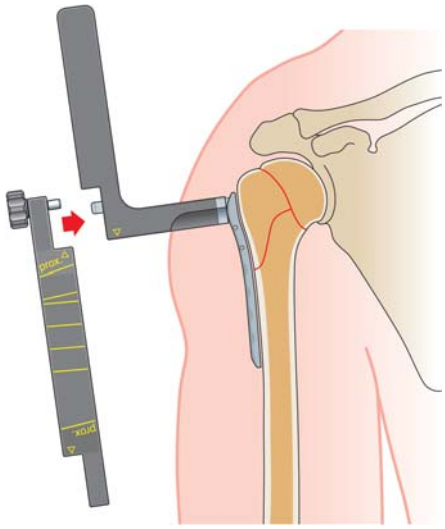


Fig. 35 Assemble the targeting modul

NCB Cannulated Screw Insertion

1. General Remarks

The placement of the initial *NCB* Screw depends on the fracture type and the reduction achieved. It is recommended to start with the distal screw ∅ 4.5mm.

Two cannulated screw types are offered with the *NCB* Plating System. Cancellous *NCB* Screws preferably for the epi- and metaphysis as well as *NCB* Cortical Screws which are ideal for placement in the diaphysis. Both screw types are self-drilling and self-tapping. The screws can be precisely placed over K-wires. A tissue protection sleeve assembly is used for guidance. A cannulated drill bit can be used to predrill strong cortical bone.

Note: Use the cannulated screws only after inserting ∅ 1.6mm, L 190mm K-wires.

MIS Technique
NCB Self-Drilling Screw and Drill Dimensions

Screw Type	**Screw Type**
Cortical	Cancellous
∅ 4.0mm	∅ 4.5mm
L 20-50mm	L 30-50mm
	

Drill

∅ 3.3mm

K-wire

∅ 1.6mm

L 190mm

2. Temporary Plate Fixation

The plate can be temporary fixed to the bone with ∅ 1.6mm K-wire through the proximal cannulated fixation screw of the targeting device (Fig. 37).

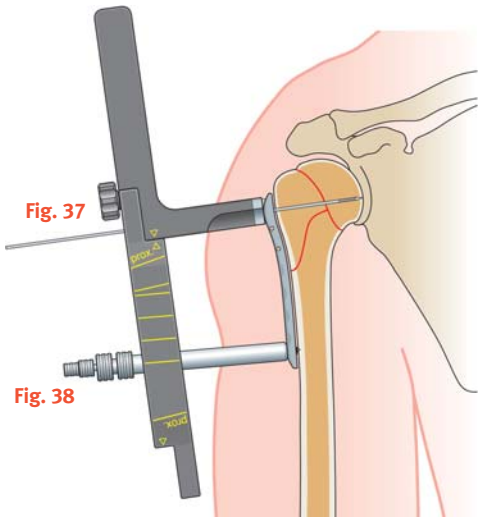


Fig. 37

3. Insert Tocar Sleeves

Insert the *NCB* tissue protection sleeve assembly ∅ 1.6 to 10mm through a skin incision (Fig. 38).

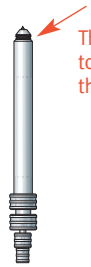


Fig. 38

4. Insert ∅ 1.6mm Guide Wire L = 190mm

Insert ∅ 1.6mm guide wire with a length of 190mm and confirm the correct position with an image intensifier (Fig. 39).

Note: The distal center can be found with ∅ 1.6mm K-wire by finding the anterior and posterior bone cortex and putting the K-wire in the middle of these two reference points (Fig. 40).

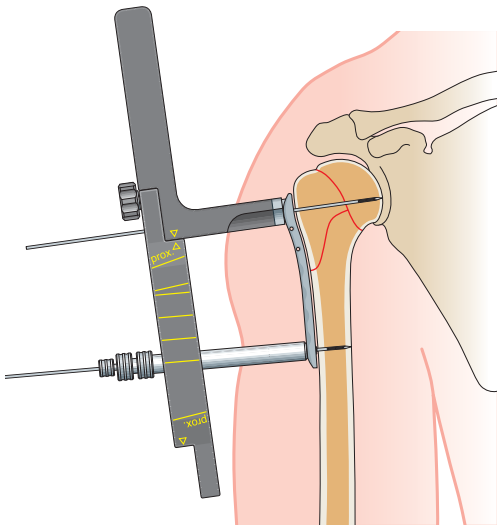


Fig. 39 Insert ∅ 1.6mm guide wire

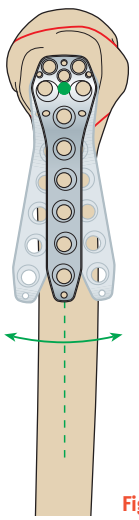


Fig. 40 Find the distal center

5. Drilling and Measuring the Screw Length

Determine the screw length from the measurement with the *NCB* depth gauge along the ∅ 1.6mm guide wire (L = 190mm only) (Fig. 41).

Note: With this procedure the distance from the plate to the tip of the K-wire is measured.

For hard cortical bone it is possible to use the ∅ 3.3mm cannulated drill bit (only for the lateral cortex, to make sure that the K-wire does not fall out). If the drill bit is used without a K-wire, the screw length can be determined from the calibration on the drill bit shaft (Fig. 42).

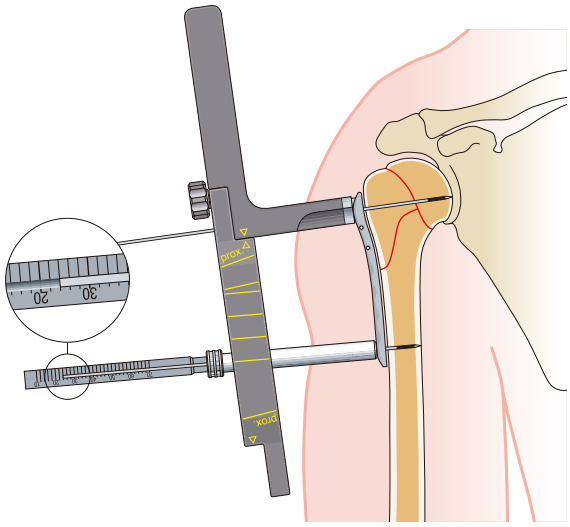


Fig. 41 Determine the screw length with the Depth Gauge

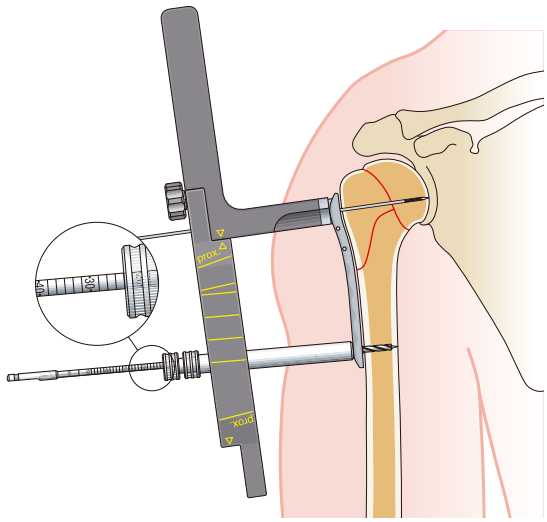


Fig. 42 Determine the screw length with the scaling on the drill bit shaft

6. Distal Cannulated Screw Insertion

Use the 3.5mm cannulated hexagonal screw driver to insert the cannulated self-drilling screw over the 1.6mm guide wire (Fig. 43).

The *NCB* screws should be tightened moderately to the bone.

Note: For adequate stable fixation, bi cortical screw insertion is recommended.

Note: Care should be taken to avoid the branch of the axillary nerve in the diaphyseal area of the plate.

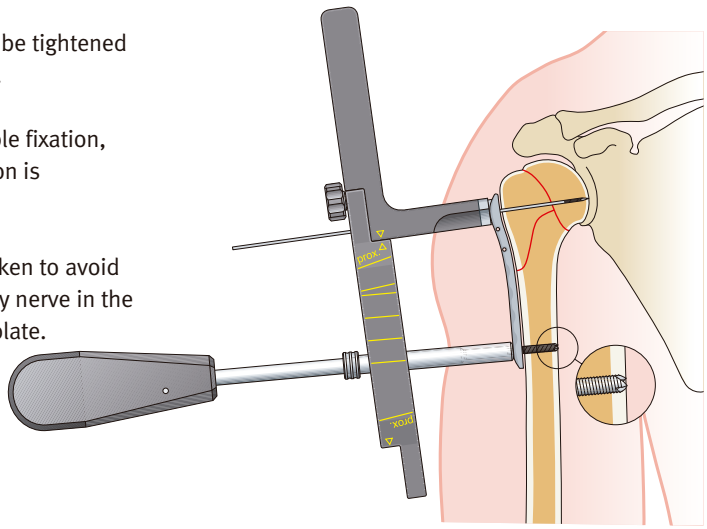


Fig. 43 Insert the Cannulated Self-Drilling Screw

7. Add Locking Screw

Insert the Locking Screw Caps with the 3.5mm cannulated Hexagonal Screw Driver over the ∅ 1.6mm guide wire (Fig. 44).

Tighten the locking screw moderately.

Note: Make sure there is no blood in the screwdriver cannulation since this may push the K-wire forward.

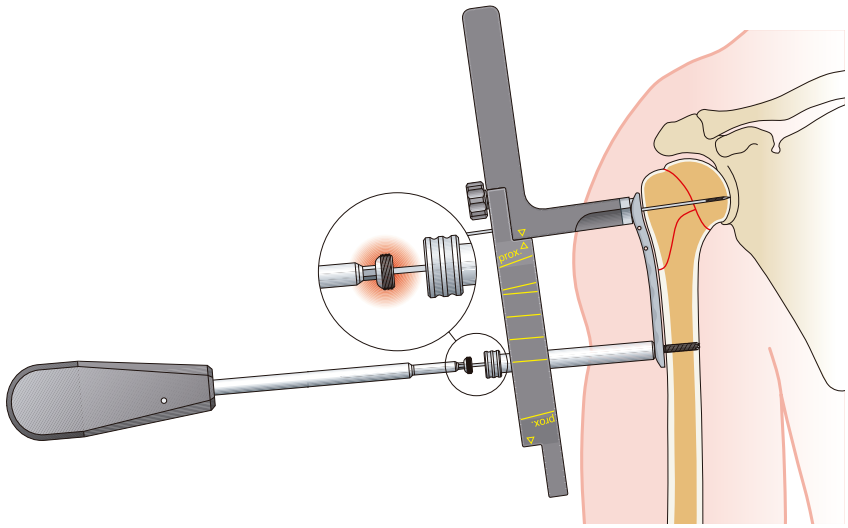


Fig. 44 Insert the Locking Screws

8. Achieve Final Angular Stability

To achieve the final angular stability remove the guide wire and tighten the Locking Screw Caps with the Torque Screwdriver until the wrench declutches (clicking sound) (Fig. 45).

Note: The guide wire must be removed as the Torque-Limiting Screwdriver is not cannulated.

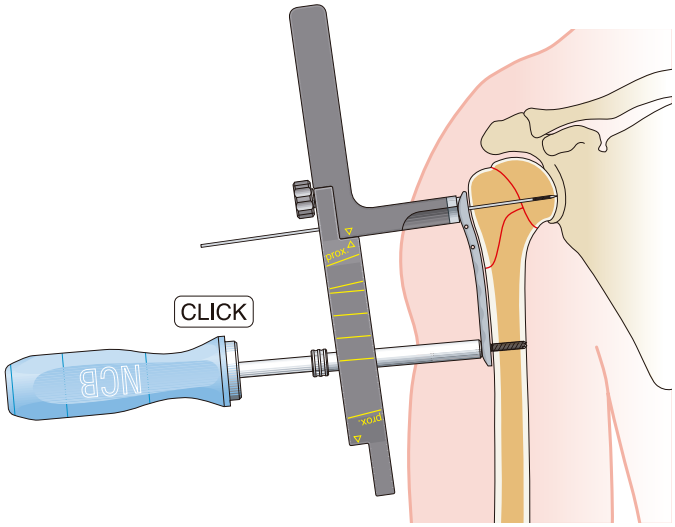


Fig. 45 Tighten the Locking Screws with the Torque-Limiting Wrench

9. Proximal Screw Insertion

Insert ∅ 1.6mm guide wire with a length of 190mm close to the subchondral bone and confirm the correct position under image intensification (Fig. 46).

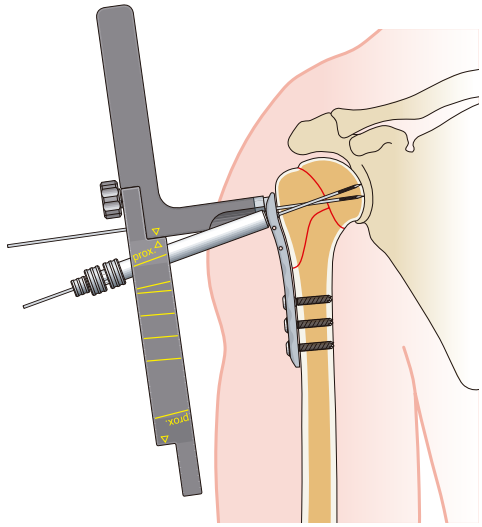


Fig. 46 Insert the guide wire

10. Drilling and Measuring the Screw Length

Measure the length with the *NCB* Depth Gauge along the ∅ 1.6mm guide wire (L = 190mm only) (Fig. 47).

Note: With this procedure the distance from the plate to the tip of the K-wire is measured. Determine the screw length by subtracting a sufficient distance to make sure that the screw is in an adequate distance from the joint.

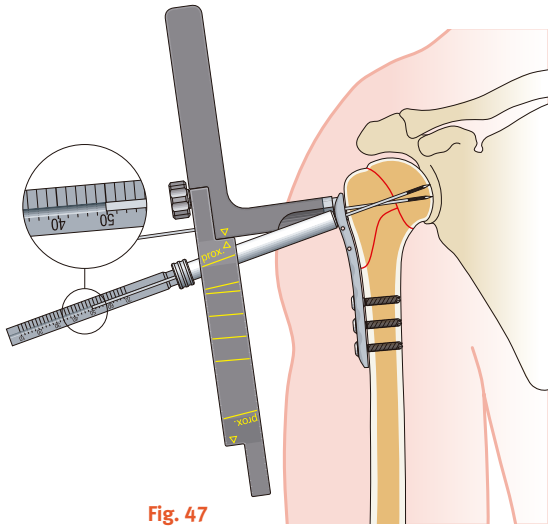


Fig. 47

11. Cannulated Screw Insertion

Use the 3.5mm Cannulated Hexagonal Screw Driver to insert the Cannulated Self-Drilling Cancellous Screw over the 1.6mm guide wire (Fig. 48).

Apply compression for reduction of the fracture. The *NCB* Screws should only be tightened moderately to the bone.

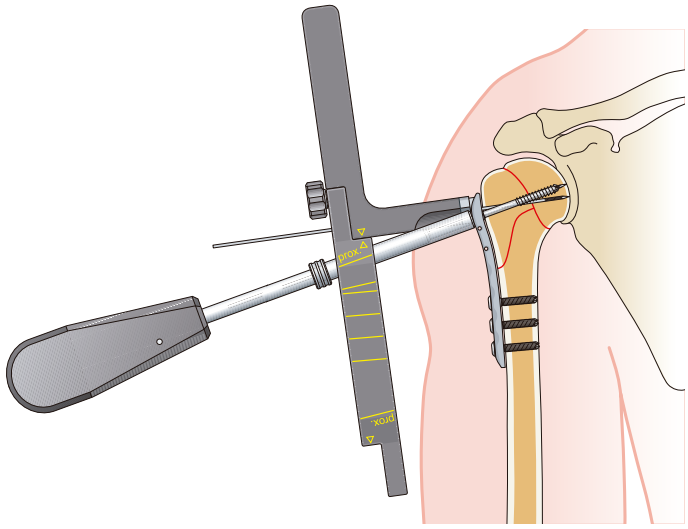


Fig. 48 Insert the Cannulated Self-Drilling Cancellous Screw

12. Add Locking Screw

Insert the Locking Screw Caps with the Cannulated Hexagonal Screwdriver hex 3.5mm over the ∅ 1.6mm guide wire.

Tighten the Locking Screw moderately.

13. Achieve Final Angular Stability

To achieve the final angular stability remove the guide wire and tighten the Locking Screw Caps with the Torque-Limiting Screwdriver until the wrench declutches (clicking sound) (Fig. 49).

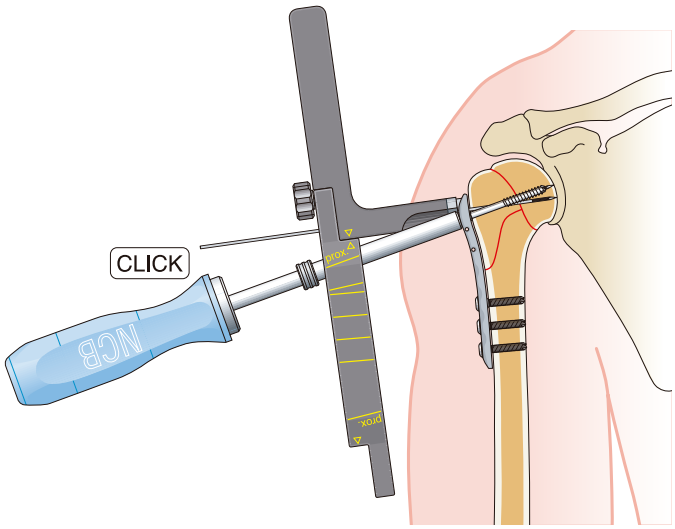


Fig. 49 Tighten the Locking Screws with the Torque Screwdriver

14. Last Proximal Screw Setting (No. 3)

To insert the last proximal screw turn the targeting module and use the hole numbering 3 and the yellow frame on top. Fit the two yellow arrowhead markings (Fig. 50). Then follow the same screw-setting procedure as described in step 9-13 (Fig. 51).

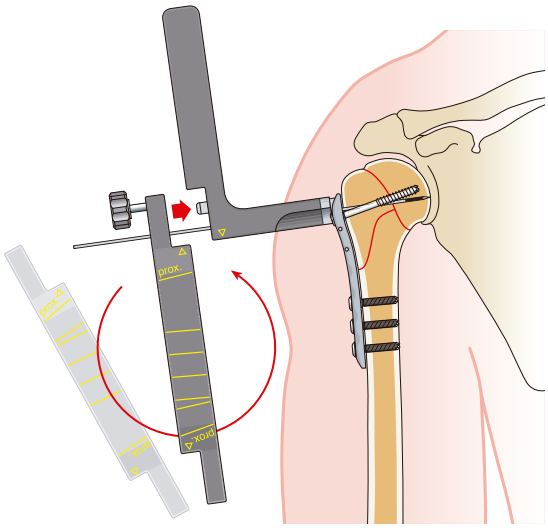


Fig. 50 Turn the Targeting Module and use the yellow top marking with hole no. 3

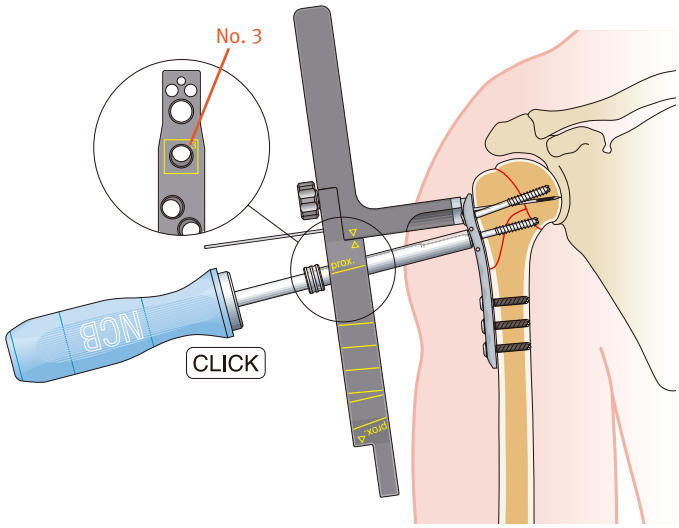
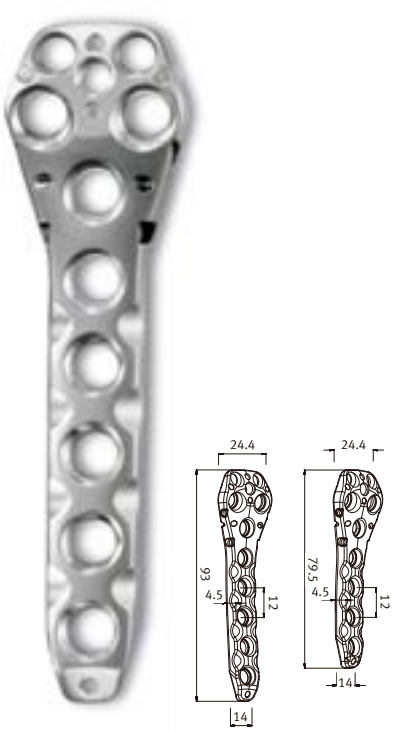


Fig. 51 Position of the Targeting Module to place screw no. 3

Implant Removal

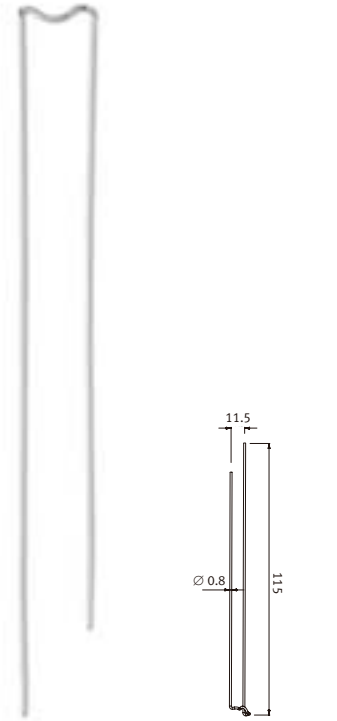
To remove the *NCB*-PH Humerus Plate, remove all ∅ 8mm Locking Screw Caps from the plate first, then loosen all bone screws. This prevents simultaneous rotation of the plate when removing the last bone screw. Remove all bone screws completely from the bone.

NCB-PH – Implants



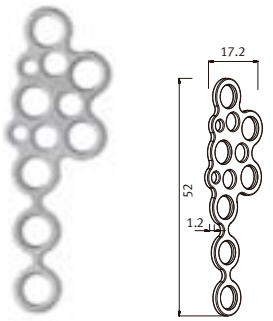
NCB-PH Plate
Protasul®-64 Metal Alloy

Holes	Quantity*	Length	REF
4	2	79.5mm	02.03262.004
5	2	93mm	02.03262.005



NCB Cerclage Wire for T. minus plate
Stainless Steel-316L

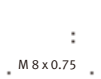
L mm	Ø mm	Quantity*	REF
115	0.8	2	02.01362.108



NCB T. minus plate, 7 holes
Protasul-Ti Metal Alloy

Holes	Quantity*	Length	REF
7	2	52mm	02.03262.101

NCB Locking Screw Cap
Protasul-64 Metal Alloy

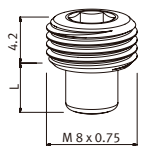


Ø mm	⬡ mm	Quantity*	REF
8	3.5	20	02.03150.300

NCB Blind screw insert
Protasul-64 Metal Alloy

Quantity*	REF
2	02.03150.310

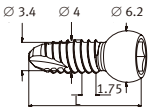
NCB Spacer
(red, green, blue)
Protasul-64 Metal Alloy



L mm	⬡ mm	Quantity*	REF
1	3.5	2	02.03150.311
2	3.5	2	02.03150.312
3	3.5	2	02.03150.313

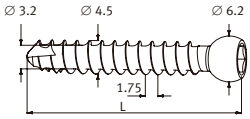
*Indicates the quantity in the standard graphic case.

NCB Screw, self-tapping
Protasul-64 Metal Alloy



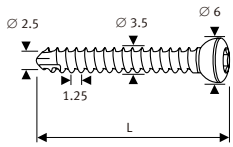
L mm	∅ mm	⬡ mm	Quantity*	REF
20	4	3.5	4	02.03155.020
22	4	3.5	4	02.03155.022
24	4	3.5	4	02.03155.024
26	4	3.5	4	02.03155.026
28	4	3.5	4	02.03155.028
30	4	3.5	4	02.03155.030
32	4	3.5	4	02.03155.032
34	4	3.5	4	02.03155.034
36	4	3.5	4	02.03155.036
38	4	3.5	4	02.03155.038
40	4	3.5	4	02.03155.040
42	4	3.5	4	02.03155.042
44	4	3.5	4	02.03155.044
46	4	3.5	4	02.03155.046
48	4	3.5	4	02.03155.048
50	4	3.5	4	02.03155.050

NCB Cancellous Screw, self-tapping
thread 32mm
Protasul-64 Metal Alloy



L mm	∅ mm	⬡ mm	Quantity*	REF
30	4.5	3.5	4	02.03156.030
32	4.5	3.5	4	02.03156.032
34	4.5	3.5	4	02.03156.034
36	4.5	3.5	4	02.03156.036
38	4.5	3.5	4	02.03156.038
40	4.5	3.5	4	02.03156.040
42	4.5	3.5	4	02.03156.042
44	4.5	3.5	4	02.03156.044
46	4.5	3.5	4	02.03156.046
48	4.5	3.5	4	02.03156.048
50	4.5	3.5	4	02.03156.050

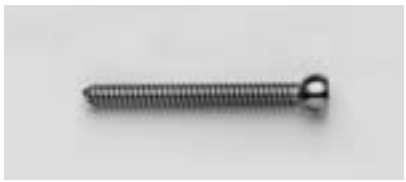
Cortical Screw, self-tapping
Protasul-100 Metal Alloy



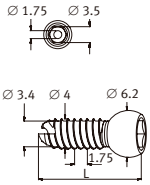
L mm	∅ mm	⬡ mm	Quantity*	REF
20	3.5	3.5	4	02.3131.020
22	3.5	3.5	4	02.3131.022
24	3.5	3.5	4	02.3131.024
26	3.5	3.5	4	02.3131.026
28	3.5	3.5	4	02.3131.028
30	3.5	3.5	4	02.3131.030
32	3.5	3.5	4	02.3131.032
34	3.5	3.5	4	02.3131.034
36	3.5	3.5	4	02.3131.036
38	3.5	3.5	4	02.3131.038
40	3.5	3.5	4	02.3131.040

*Indicates the quantity in the standard graphic case.

Implants for MIS Surgical Technique

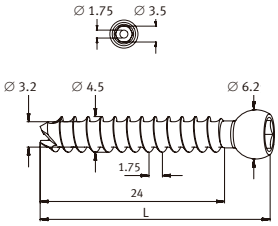


NCB Cannulated Screw
self-drill
Protasul-64 Metal Alloy



L mm	∅ mm	Quantity**	REF
20	4	4	02.03157.020
22	4	4	02.03157.022
24	4	4	02.03157.024
26	4	4	02.03157.026
28	4	4	02.03157.028
30	4	4	02.03157.030
32	4	4	02.03157.032
34	4	4	02.03157.034
36	4	4	02.03157.036
38	4	4	02.03157.038
40	4	4	02.03157.040
42	4	4	02.03157.042
44	4	4	02.03157.044
46	4	4	02.03157.046
48	4	4	02.03157.048
50	4	4	02.03157.050

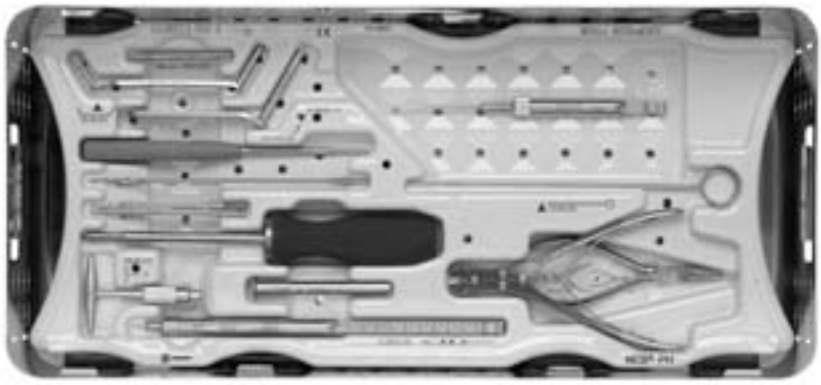
NCB Cannulated Cancellous Screw
Self-Drill, thread 24mm *Protasul*-64
Metal Alloy



L mm	∅ mm	Quantity**	REF
30	4.5	4	02.03158.030
32	4.5	4	02.03158.032
34	4.5	4	02.03158.034
36	4.5	4	02.03158.036
38	4.5	4	02.03158.038
40	4.5	4	02.03158.040
42	4.5	4	02.03158.042
44	4.5	4	02.03158.044
46	4.5	4	02.03158.046
48	4.5	4	02.03158.048
50	4.5	4	02.03158.050

** Indicates the quantity in the *MIS* graphic case module.

NCB Plating System – Sterilization Cases



NCB-PH Standard Sterilization Case
for open technique (with content)

Unit	REF
1	**02.00024.700**

NCB-PH Standard Sterilization Case
for open technique, includes
REF 02.00024.701 to 706
(no content)

Unit	REF
1	02.00024.710

NCB-PH Sterilization Case
module implants

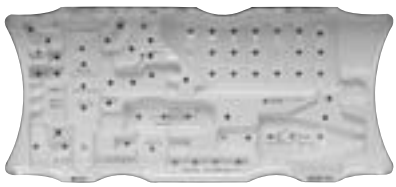
Quantity*	REF
1	02.00024.704

NCB-PH Sterilization Case Module
screw rack standard

Quantity*	REF
1	02.00024.705

NCB-PH Sterilization Case Lid

Quantity*	REF
1	02.00024.701



NCB-PH Sterilization Case
module instruments

Quantity*	REF
1	02.00024.703

NCB-PH Sterilization Case Module**
cavity

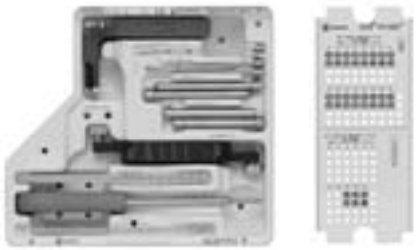
Quantity*	REF
1	02.00024.706

NCB-PH Sterilization Case Base (inox)

Quantity*	REF
1	02.00024.702

*Indicates the quantity in the standard sterilization case. **Optional case if ordered without *MIS* instruments.

NCB Plating System – Sterilization Case Modules for MIS Surgical Technique



NCB-PH Sterilization Case Module *MIS* Instruments and Screw Rack (with content)

Quantity**	**REF**
–	**02.00024.750**

NCB-PH Sterilization Case Module *MIS* Instruments

Quantity**	REF
1	02.00024.707

NCB-PH Sterilization Case Module *MIS* Screw Rack

Quantity**	REF
1	02.00024.708

** Indicates the quantity in the *MIS* Sterilization Case Module.

NCB Plating System – Instruments (Standard)

NCB Depth Gauge,
for *NCB* Screws ∅ 5.0, 4.5 and 4.0mm

L mm	Quantity*	REF
110	1	02.00024.005

NCB Locking Screw holder for
Hexagonal Drivers 3.5mm

L mm	Quantity*	REF
95	1	02.00024.121

Wire Bending Forceps

L mm	Quantity*	REF
140	1	100.11.155

NCB Torque-Limiting Screwdriver

L mm	⬡ mm	Quantity*	REF
245	3.5	1	02.00024.022

Reduction Forceps with serrated jaws,
with ratchet

L mm	Quantity*	REF
140	–	100.01.110

Double Drill Guides ∅ 2.5 / 3.5 / 4.0mm

Quantity*	REF
1	100.40.035

NCB Drill Guide for
NCB Screws ∅ 4.0 and 4.5mm

∅ mm	Quantity*	REF
3.3	1	02.00024.111

Bone-Holding Forceps Verbrugge,
with thread lock

L mm	Quantity*	REF
190	–	100.01.320

Screw Forceps self-holding

Quantity*	REF
1	100.90.005

NCB Drill Bit, with quick coupling

L mm	∅ mm	Quantity*	REF
195	3.3	1	02.00024.118

Wire Cutter, with double articulation,
for wire max. ∅ 1.7mm

L mm	Quantity*	REF
165	1	100.11.115

Depth Gauge small,
for screws ∅ 2.7, 3.5 and 4.0mm

L mm	Quantity*	REF
60	1	100.90.020

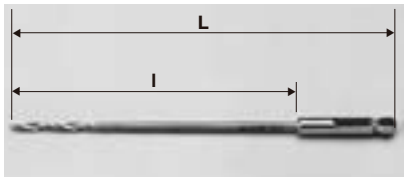
*Indicates the quantity in the standard sterilization case.

T-handle, with quick coupling

Quantity*	REF
–	100.90.210

Hexagonal Screwdriver small

L mm	⬡ mm	Quantity*	REF
245	2.5	1	109.01.020



Drill Bit with quick coupling

L mm	l mm	∅ mm	Quantity*	REF
110	84	2.5	2	103.25.110

Kirschner Wire, with threaded tip

L mm	∅ mm	Quantity*	REF
150	2.0	10	299.20.150

Tap for quick coupling

L mm	l mm	∅ mm	Quantity*	REF
110	50	3.5	–	106.35.110

Countersink, for quick coupling
∅ 3.5 and 4.0mm

Quantity*	REF
–	108.01.035

*Indicates the quantity in the standard sterilization case.

NCB Plating System – Instruments for MIS Surgical Technique

NCB-PH Targeting Device radiolucent, includes 02.00024.101 to 104

unit	REF
1	02.00024.100

NCB-PH Handle for Targeting Device

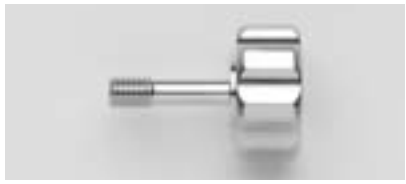
Quantity**	REF
1	02.00024.101

NCB-PH Targeting Module for Targeting Device

Quantity**	REF
1	02.00024.102

NCB-PH Connection Screw for Targeting Device

Quantity**	REF
1	02.00024.103



NCB-PH Fixation Screw for Targeting Device

Quantity**	REF
2	02.00024.104

NCB-PH Drill Guide assembly, includes 02.00024.113 to 116

unit	REF
1	02.00024.112

NCB-PH Tissue Protection Sleeve

∅	Quantity**	REF
10/8.0	2	02.00024.113
3/3.3	2	02.00024.114
3.3/1.6	2	02.00024.115
1.6	2	02.00024.116

NCB Cannulated Drill Bit with quick coupling

L mm	∅ mm	Quantity**	REF
195	3.3	2	02.00024.117

NCB-PH Guide Wire with threaded tip

L mm	∅ mm	Quantity**	REF
190	1.6	10	02.01362.116

NCB-PH Measuring Device for cannulated screws

Quantity**	REF
1	02.00024.119

NCB-PH Hexagonal Screwdriver cannulated short hex

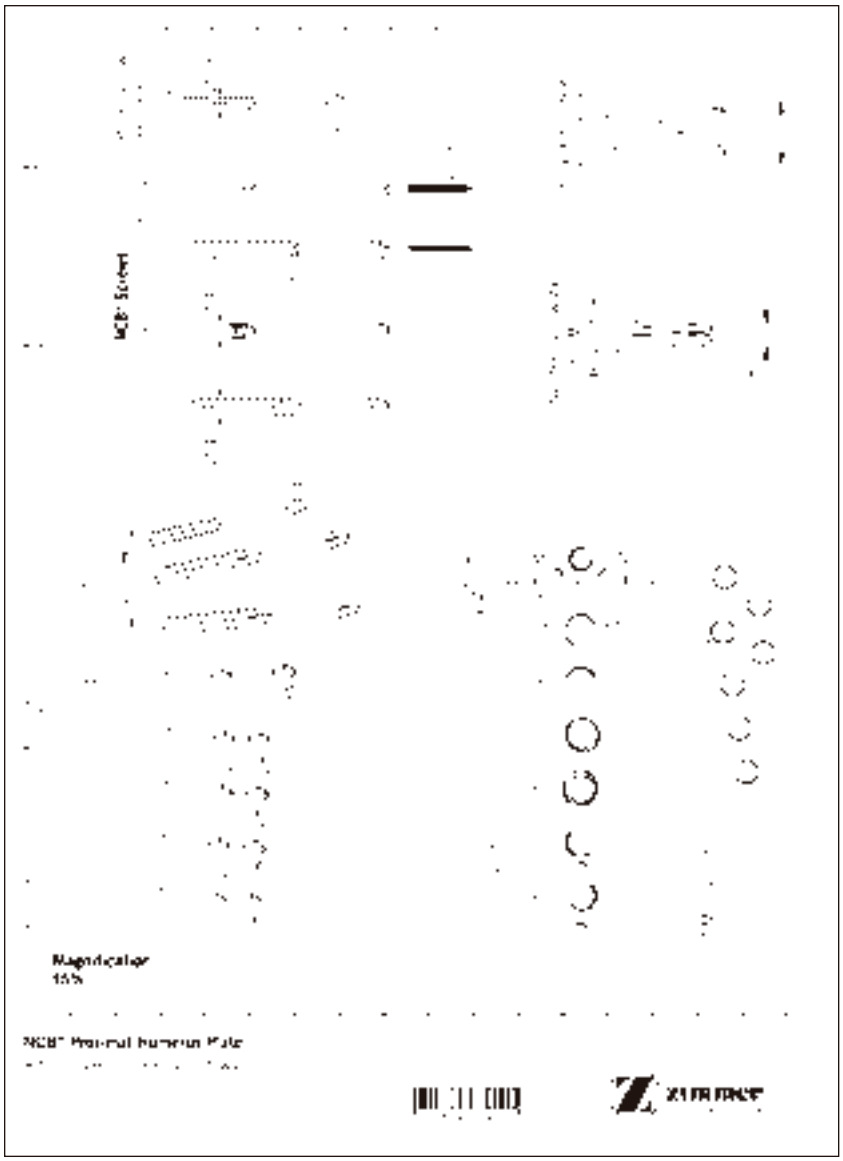
L mm	⬡ mm	Quantity**	REF
245	3.5	1	02.00024.120

Cleaning Wire

L mm	∅ mm	Quantity**	REF
230	1.6	1	110.06.200

** Indicates the quantity in the *MIS* sterilization case module.

Planning Template



X-ray template REF 06.01238.000

Please refer to package insert for complete product information, including contraindications, warnings, precautions, and adverse effects.

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