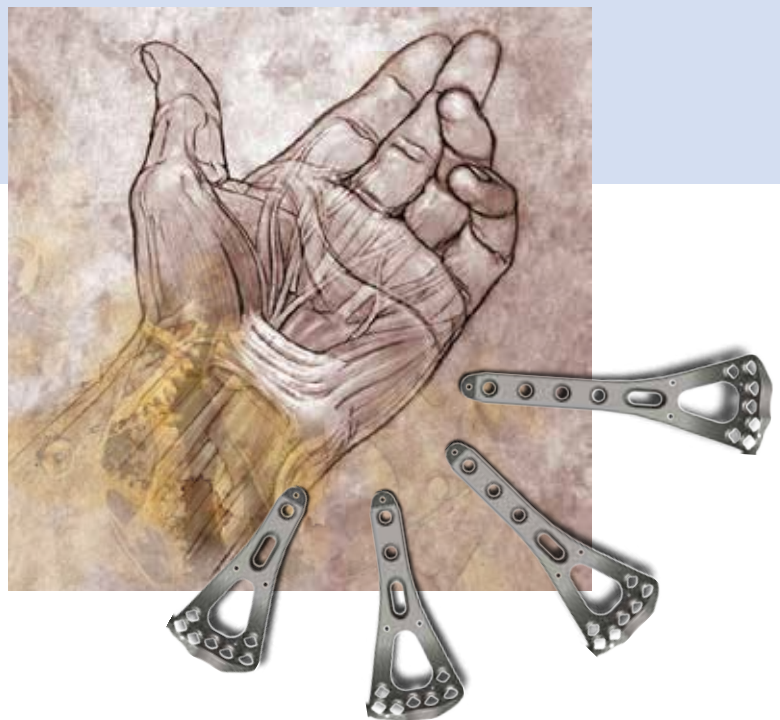


 **ORLOSI**  
RADIUS POLYLOCK DISTAL RADIUS

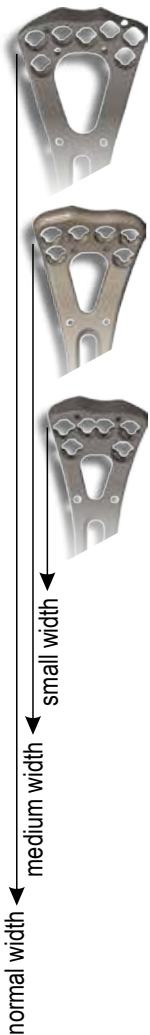


**P V D R**  
**POLYAXIAL VOLAR DISTAL RADIUS PLATE**

**RADIUS POLYLOCK DISTAL RADIUS  
PLATE SYSTEM**

**VOLAR POLYAXIAL SOLUTION WITHOUT COMPROMISE**

## IMPLANTS FOR POLYAXIAL LOCKING VOLAR DISTAL RADIUS PLATE SYSTEM



### System of implants:

The polyaxial locking volar distal radius plate provides a versatile fixing option for the treatment of wrist fractures. The plates' design warrants anatomical fitting.

Our portfolio includes two plate forms; the first is a generally well-established form with a design to cover the most common fracture zone of the distal radius. It is distributed in three sizes: normal, medium, and small to optimize the treatment of more gracile and smaller wrists. The other type can be used for fractures extending to the styloid process of the radius.

The plates are fastened by specific screws that have threaded heads to lock within the plate. Therefore, the bone and the plate establish an "internal fixator" type connection. As polyaxial directions can be selected, the alignment of the screw head ensures the fixation of the bone fragments. The screw direction perpendicular to the plane of the plate may be established by pre-drilling through a polyaxial drill-sleeve, if necessary. Spatial alteration of  $\pm 15$  degrees as compared to the perpendicular plane is allowed. Always make sure to avoid the joint during both pre-drilling and screw insertion.

Conventional cortical screws of appropriate size may also be used in the threaded plate holes designed for locking head screws, therefore the conventional plate-bone connection and the "internal fixator" effect may be combined. In order to provide even power-transmission, the screwdrivers have star bit keyhole connections. The firmness of fixation of the screws is provided by a torque limited screwdriver which prevents the screws from being tightened too much.



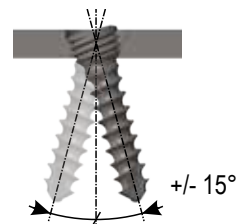
Extension for the radial styloid process



Screw driver profile for star bit



Locking head screw in angular stable position



The polyaxial ability of locking head screw driving

## IMPLANTS FOR POLYAXIAL LOCKING VOLAR DISTAL RADIUS PLATE SYSTEM

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**System of implants:**

Material: titanium alloy

Polyaxial volar locking distal radius plate, normal, left

Cat. No. from LS-LS-332931-02072 to LS-LS-332931-14012 (titanium alloy)

Polyaxial volar locking distal radius plate, normal, right

Cat. No. from LS-LS-332921-05072 to LS-LS-332921-14012 (titanium alloy)

Polyaxial volar locking distal radius plate, medium, left

Cat. No. from LS-LS-332951-04862 to LS-LS-332951-07565 (titanium alloy)

Polyaxial volar locking distal radius plate, medium, right

Cat. No. from LS-LS-332941-04862 to LS-LS-332941-07565 (titanium alloy)

Polyaxial volar locking distal radius plate, small, left

Cat. No. from LS-LS-332971-04562 to LS-LS-332971-07265 (titanium alloy)

Polyaxial volar locking distal radius plate, small, right

Cat. No. from LS-LS-332961-04562 to LS-LS-332961-07265 (titanium alloy)

Polyaxial volar locking distal radius plate, (processus styloideus radii), left

Cat. No. from LS-LS-333021-05792 to LS-LS-333021-08495 (titanium alloy)

Polyaxial volar locking distal radius plate, (processus styloideus radii), right

Cat. No. from LS-LS-333011-05792 to LS-LS-333011-08495 (titanium alloy)

Locking head cortical screw, self tapping, star bit, 2.4 mm

Cat. No. from LS-32003-24008 to LS-32003-24030 (titanium alloy)

Cortical screw (AO), self tapping, star bit, 2.4 × 0.6 mm

Cat. No. from LS-31003-24006 to LS-31003-24050 (titanium alloy)

Cortical screw (AO), self tapping, star bit, 2.7 × 1.0 mm

Cat. No. from LS-31003-27006 to LS-31003-27044 (titanium alloy)

## IMPLANTS FOR POLYAXIAL LOCKING VOLAR DISTAL RADIUS PLATE SYSTEM

### Polyaxial locking distal radius plate, normal, left, right

Thickness: 2.0 mm (head 3.0 mm)

Width: 25.0 mm

Locking head screw: cortical 2.4 mm, star bit

Cortical screw (AO): 2.7 mm

| Left, cat. no. |       |                 |
|----------------|-------|-----------------|
| L (mm)         | Holes | titanium alloy  |
| 50             | 7+2   | LS-332931-05072 |
| 59             | 7+3   | LS-332931-05973 |
| 68             | 7+4   | LS-332931-06874 |
| 77             | 7+5   | LS-332931-07775 |
| 104            | 7+8   | LS-332931-10408 |
| 122            | 7+10  | LS-332931-12210 |
| 140            | 7+12  | LS-332931-14012 |

| Right, cat. no. |       |                 |
|-----------------|-------|-----------------|
| L (mm)          | Holes | titanium alloy  |
| 50              | 7+2   | LS-332921-05072 |
| 59              | 7+3   | LS-332921-05973 |
| 68              | 7+4   | LS-332921-06874 |
| 77              | 7+5   | LS-332921-07775 |
| 104             | 7+8   | LS-332921-10408 |
| 122             | 7+10  | LS-332921-12210 |
| 140             | 7+12  | LS-332921-14012 |



### Polyaxial locking distal radius plate, medium, left, right

Thickness: 2.0 mm (head 3.0 mm)

Width: 22.0 mm

Locking head screw: cortical 2.4 mm, star bit

Cortical screw (AO): 2.7 mm

| Left, cat. no. |       |                 |
|----------------|-------|-----------------|
| L (mm)         | Holes | titanium alloy  |
| 48             | 6+2   | LS-332951-04862 |
| 57             | 6+3   | LS-332951-05763 |
| 66             | 6+4   | LS-332951-06664 |
| 75             | 6+5   | LS-332951-07565 |

| Right, cat. no. |       |                 |
|-----------------|-------|-----------------|
| L (mm)          | Holes | titanium alloy  |
| 48              | 6+2   | LS-332941-04862 |
| 57              | 6+3   | LS-332941-05763 |
| 66              | 6+4   | LS-332941-06664 |
| 75              | 6+5   | LS-332941-07565 |



### Polyaxial locking distal radius plate, small, left, right

Thickness: 2.0 mm (head 3.0 mm)

Width: 19.5 mm

Locking head screw: cortical 2.4 mm, star bit

Cortical screw (AO): 2.7 mm

| Left, cat. no. |       |                 |
|----------------|-------|-----------------|
| L (mm)         | Holes | titanium alloy  |
| 45             | 6+2   | LS-332971-04562 |
| 54             | 6+3   | LS-332971-05463 |
| 63             | 6+4   | LS-332971-06364 |
| 72             | 6+5   | LS-332971-07265 |

| Right, cat. no. |       |                 |
|-----------------|-------|-----------------|
| L (mm)          | Holes | titanium alloy  |
| 45              | 6+2   | LS-332961-04562 |
| 54              | 6+3   | LS-332961-05463 |
| 63              | 6+4   | LS-332961-06364 |
| 72              | 6+5   | LS-332961-07265 |



## IMPLANTS FOR POLYAXIAL LOCKING VOLAR DISTAL RADIUS PLATE SYSTEM

### Polyaxial locking distal radius plate (processus styloideus radii), left, right

Thickness: 2.0 mm

Width: 24.5 mm

Locking head screw: cortical 2.4 mm, star bit

Cortical screw (AO): 2.7 mm



| Left, cat. no. |       |                 |
|----------------|-------|-----------------|
| L (mm)         | Holes | titanium alloy  |
| 57             | 9+2   | LS-333021-05792 |
| 66             | 9+3   | LS-333021-06693 |
| 75             | 9+4   | LS-333021-07594 |
| 84             | 9+5   | LS-333021-08495 |

| Right, cat. no. |       |                 |
|-----------------|-------|-----------------|
| L (mm)          | Holes | titanium alloy  |
| 57              | 9+2   | LS-333011-05792 |
| 66              | 9+3   | LS-333011-06693 |
| 75              | 9+4   | LS-333011-07594 |
| 84              | 9+5   | LS-333011-08495 |

### Locking head cortical screw, self tapping, 2.4 mm, star bit, (for polyaxial locking distal radius plate)

Thread diameter: 2,4 mm

Core diameter: 1,6 mm

Head diameter: 3,5 mm

Pitch: 1,0 mm

Spiral drill: cat. no. INS-99010-15070

cat. no. INS-99020-15080

Screwdriver (star bit T8): cat. no. INS-99153-08105



| L (mm) | titanium alloy |
|--------|----------------|
| 8      | LS-32003-24008 |
| 10     | LS-32003-24010 |
| 12     | LS-32003-24012 |
| 14     | LS-32003-24014 |
| 16     | LS-32003-24016 |
| 18     | LS-32003-24018 |

| L (mm) | titanium alloy |
|--------|----------------|
| 20     | LS-32003-24020 |
| 22     | LS-32003-24022 |
| 24     | LS-32003-24024 |
| 26     | LS-32003-24026 |
| 28     | LS-32003-24028 |
| 30     | LS-32003-24030 |

### Cortical screw, self tapping, 2.4 × 0.6 mm, star bit,

Thread diameter: 2.4 mm

Core diameter: 1.7 mm

Head diameter: 4.0 mm

Pitch: 0.6 mm

Screwdriver (star bit T8): cat. no. INS-99153-08105



| L (mm) | titanium alloy |
|--------|----------------|
| 6      | LS-31003-24006 |
| 8      | LS-31003-24008 |
| 10     | LS-31003-24010 |
| 12     | LS-31003-24012 |
| 14     | LS-31003-24014 |
| 16     | LS-31003-24016 |
| 18     | LS-31003-24018 |

| L (mm) | titanium alloy |
|--------|----------------|
| 20     | LS-31003-24020 |
| 22     | LS-31003-24022 |
| 24     | LS-31003-24024 |
| 26     | LS-31003-24026 |
| 28     | LS-31003-24028 |
| 30     | LS-31003-24030 |
| 32     | LS-31003-24032 |

| L (mm) | titanium alloy |
|--------|----------------|
| 34     | LS-31003-24034 |
| 36     | LS-31003-24036 |
| 38     | LS-31003-24038 |
| 40     | LS-31003-24040 |
| 45     | LS-31003-24045 |
| 50     | LS-31003-24050 |



## IMPLANTS FOR POLYAXIAL LOCKING VOLAR DISTAL RADIUS PLATE SYSTEM

### Cortical screw, self tapping, 2.7 × 1.0 mm, star bit

Thread diameter: 2.7 mm

Core diameter: 1.9 mm

Head diameter: 5.0 mm

Pitch: 1.0 mm

Screwdriver (star bit T10): cat. no. INS-99153-10120



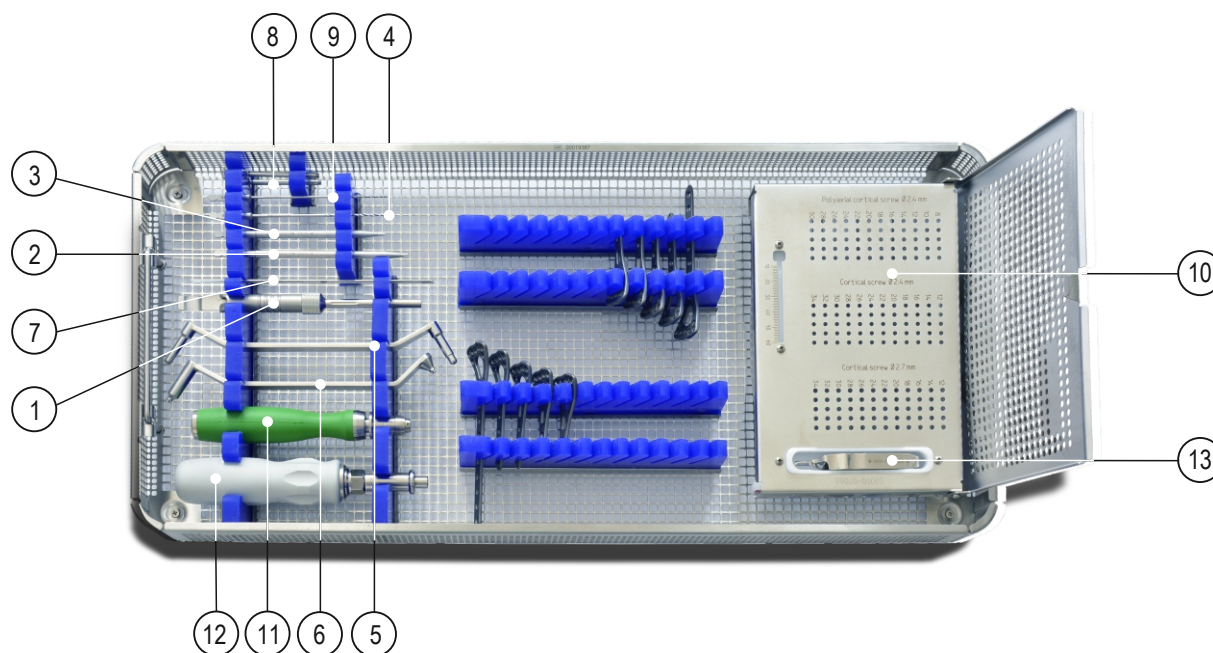
| L (mm) | titanium alloy |
|--------|----------------|
| 6      | LS-31003-27006 |
| 8      | LS-31003-27008 |
| 10     | LS-31003-27010 |
| 12     | LS-31003-27012 |
| 14     | LS-31003-27014 |
| 16     | LS-31003-27016 |
| 18     | LS-31003-27018 |
| 20     | LS-31003-27020 |
| 22     | LS-31003-27022 |
| 24     | LS-31003-27024 |
| 26     | LS-31003-27026 |
| 28     | LS-31003-27028 |
| 30     | LS-31003-27030 |
| 32     | LS-31003-27032 |
| 34     | LS-31003-27034 |
| 36     | LS-31003-27036 |
| 38     | LS-31003-27038 |
| 40     | LS-31003-27040 |
| 42     | LS-31003-27042 |
| 44     | LS-31003-27044 |

## SURGICAL SET FOR POLYAXIAL LOCKING VOLAR DISTAL RADIUS PLATE SYSTEM

### Surgical set

Tray for polyaxial volar distal radius plate with instruments:

Cat. No.: SET-932900-00000 ( Empty tray with instrument holder, Cat.No. : TRAY-932900-10000)



| POS. | CAT. NO.           | DESCRIPTION   | PCS |
|------|--------------------|---|-----|
| 1.   | INS-99000 - 00020  | Depth gauge (up to 40 mm)   | 1   |
| 2.   | INS-99153 - 10120  | Screw driver (for 2.7 mm cortical screw, quick coupling, T10 star bit, 120mm) | 1   |
| 3.   | INS-99153 - 08105  | Screw driver (for 2.4 mm screws, quick coupling, T8 star bit, 105 mm)         | 2   |
| 4.   | INS-99020 - 20110  | Spiral drill (quick copuling, 2.0 × 110 mm)                                   | 1   |
| 5.   | INS-932011-24270   | Double drill sleeve (2.7 mm and 2.4 mm cortical screw)                        | 1   |
| 6.   | INS-932011-02400   | Double drill sleeve (2.4 mm, polyaxial or angular stable)                     | 1   |
| 7.   | INS-15000 - 12150  | Kirschner wire  | 4   |
| 8.   | INS-93200 - 35217  | Drill sleeve (threaded, for angular stable holes)                             | 2   |
| 9.   | INS-99020 - 16110  | Spiral drill (quick coupling, 1.6 × 110 mm)                                   | 1   |
| 10.  | TRAY-93290 - 00300 | Screw box page 9  | 1   |
| 11.  | INS-99000 - 00012  | Handle for screw driver (quick coupling)                                      | 1   |
| 12.  | INS-99000 - 00100  | Torque limited screw driver (0.75 Nm)   | 1   |
| 13.  | INS-99000 - 00005  | Forceps   | 1   |

## SURGICAL INSTRUMENTS FOR POLYAXIAL VOLAR DISTAL RADIUS PLATE SYSTEM



| POS. | CAT.NO.           | DESCRIPTION               | PCS |
|------|-------------------|---------------------------|-----|
| 1.   | INS-99000 - 00020 | Depth gauge (up to 40 mm) | 1   |



| POS. | CAT.NO.           | DESCRIPTION                                       | PCS |
|------|-------------------|---|-----|
| 2.   | INS-99153 - 10120 | Screw driver (quick coupling) T10 star bit, 120mm | 1   |



| POS. | CAT.NO.           | DESCRIPTION  | PCS |
|------|-------------------|--|-----|
| 3.   | INS-99153 - 08105 | Screw driver (quick coupling) T8 star bit, 105 mm) | 2   |



| POS. | CAT.NO.           | DESCRIPTION                                | PCS |
|------|-------------------|--|-----|
| 4.   | INS-99020 - 20110 | Spiral drill (quick copuling) 2.0 × 110 mm | 1   |



| POS. | CAT.NO.          | DESCRIPTION  | PCS |
|------|------------------|--|-----|
| 5.   | INS-932011-24270 | Double drill sleeve for 2.7 mm and 2.4 mm cortical screw | 1   |



| POS. | CAT.NO.          | DESCRIPTION   | PCS |
|------|------------------|---|-----|
| 6.   | INS-932011-02400 | Double drill sleeve 2.4 mm, polyaxial or angular stable | 1   |



| POS. | CAT.NO.           | DESCRIPTION    | PCS |
|------|-------------------|----------------|-----|
| 7.   | INS-15000 - 12150 | Kirschner wire | 4   |



## SURGICAL INSTRUMENTS FOR POLYAXIAL VOLAR DISTAL RADIUS PLATE SYSTEM



| POS. | CAT.NO.           | DESCRIPTION   | PCS |
|------|-------------------|---|-----|
| 8.   | INS-93200 - 35217 | Drill sleeve for 1.6 mm spiral drill threaded, for angular stable holes | 2   |



| POS. | CAT.NO.           | DESCRIPTION                                | PCS |
|------|-------------------|--|-----|
| 9.   | INS-99020 - 16110 | Spiral drill (quick coupling) 1.6 × 110 mm | 1   |



| POS. | CAT.NO.            | DESCRIPTION  | PCS |
|------|--------------------|--|-----|
| 10.  | TRAY-93290 - 00300 | Screw box for 2.4 mm and 2.7 mm polyaxial, cortical star bit screws, (empty) | 1   |



| POS. | CAT.NO.           | DESCRIPTION                              | PCS |
|------|-------------------|--|-----|
| 11.  | INS-99000 - 00012 | Handle for screw driver (quick coupling) | 1   |

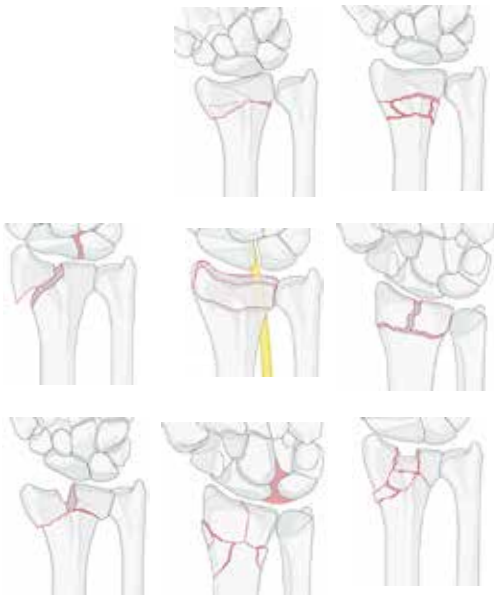


| POS. | CAT.NO.           | DESCRIPTION                         | PCS |
|------|-------------------|-------------------------------------|-----|
| 12.  | INS-99000 - 00100 | Torque limited screw driver 0.75 Nm | 1   |



| POS. | CAT.NO.           | DESCRIPTION | PCS |
|------|-------------------|-------------|-----|
| 13.  | INS-99000 - 00005 | Forceps     | 1   |

## SURGICAL TECHNIQUE FOR POLYAXIAL VOLAR DISTAL RADIUS PLATES



### APPLICATION

The plate can be used to reliably fix AO 23A-2-3, 23B1-3, and 23C1-3 type distal radius fractures.

### SELECTING THE IMPLANT

The plates are designed as right and left side plates. Based on the horizontal size of the distal part (large, medium, and small plate) an appropriate plate can be selected for any case while taking the bone's anatomical properties into consideration.

Seven or six polyaxial screws can be driven into the part of the plate near the joint. Two to 12 screws can be inserted into the diaphysis through the large plate and 2 to 5 screws through the medium and small plate.

In cases where the nature of the styloid process fracture of the radius requires more reliable fixation, there is a special plate developed specifically for such fractures.

The implant's design allows its use solely on the volar surface of the radius.

### 1. POSITIONING THE PATIENT

The surgery is performed on a supine patient, using an arm table, and in a supinated forearm position. Tourniquet is applied.

### 2. APPROACH

Make a longitudinal incision along the radial edge of the flexor carpi radialis tendon (FCR). The length of the incision is determined by the size of the plate to be used.

Expose the pronator quadratus while sparing the radial artery. Detach the muscle radially from the bone to expose the fracture.

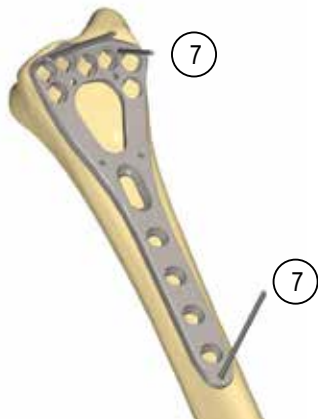
### 3. REDUCTION

Remove any entrapped tissue from the fracture gap. Apply longitudinal traction to restore the length of the radius.

Depending on the fracture type, volar or dorsal tilt and the correction of the lateral dislocation is necessary.

Visually control the reduction and the resulting position may be temporarily fixed by a percutaneous Kirschner wire drilled in obliquely through the radial styloid process.

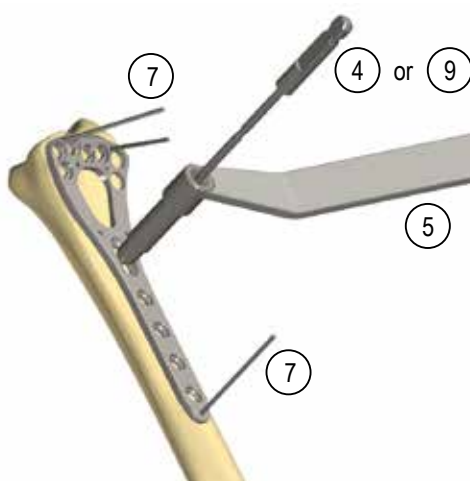
## SURGICAL TECHNIQUE FOR POLYAXIAL VOLAR DISTAL RADIUS PLATES



### 4. PLATE APPLICATION

Apply the selected implant upon the volar surface of the bone and use Kirschner wires (7) through the designated holes to fix it to the bone.

The plate may be modeled by pliers, if necessary. Use multidirectional fluoroscopy to control the reduction and plate position.

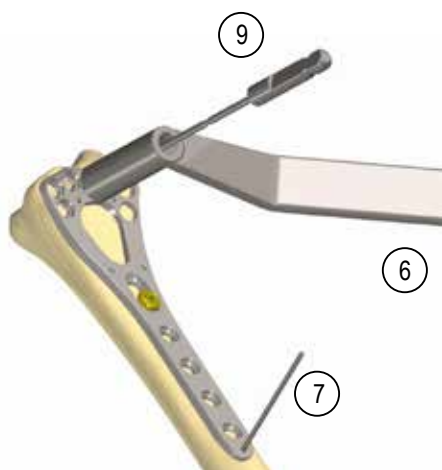


### 5. PLATE FIXATION

If the plate is in a correct position and fits all along the bone, insert the first screw into the oval hole between the head and shaft part.

Place the drill sleeve (5) with the 2.7 mm or 2.4 mm mark to the center of the oval hole, use a 2.0 mm (4) or 1.6 mm (9) drill bit to prepare the drill-hole, assess the length, and drive in the 2.4 mm or 2.7 mm self-tapping cortical screw. Depending on the screw size, T8 (3) or T10 (2) screwdrivers may be used with a quick coupling handle. (11).

The Kirschner wire (7) can now be removed. Depending on the screw size, T8 (3) or T10 (2) screwdrivers may be used with a quick coupling handle.



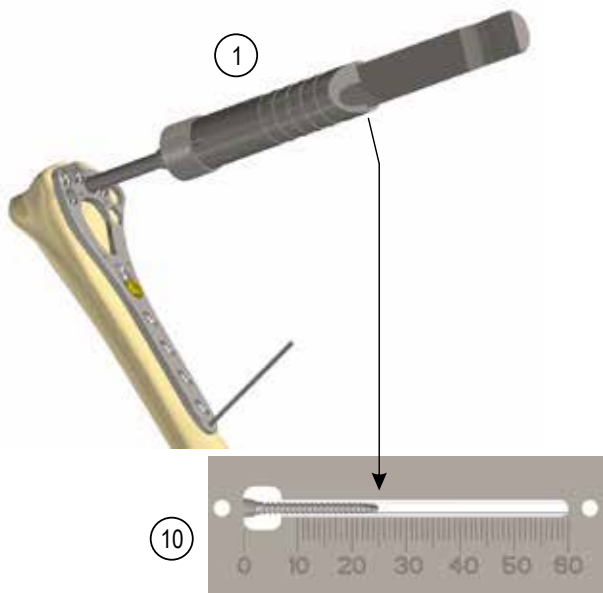
### 6. INSERTING THE DISTAL SCREWS

Use the torque limited screwdriver (12) to drive in the screws.

#### A. ANGULAR STABLE OPTION:

If the distal part is not fragmented, then locking screws shall be used. To this end, insert the "angular stable" end of the 2.4 mm drill sleeve (6) into one of the distal, clovershaped holes of the plate, and use the 1.6 mm drill (6) to drill the bone.

## SURGICAL TECHNIQUE FOR POLYAXIAL VOLAR DISTAL RADIUS PLATES



It is recommended to use fluoroscopy to check the drill position.

Following length measurement (1). Measure the drill hole depth to assess screw length. The value read from the depth gauge scale directly provides the length of the screw needed for fixation. Screw length means the size of the shaft and the screw head combined which is in accordance with the catalogue data.

The size scale integrated in the screw box (10) may be used to verify the length of the selected screw.

Drive in the appropriate length of the 2.4 mm diameter locking screw.

Use a T8 star bit screwdriver (3) and a torque limited screwdriver (12) to drive in the screw.

Follow the same procedure to insert the other distal screws as well.



### B. POLYAXIAL OPTION:

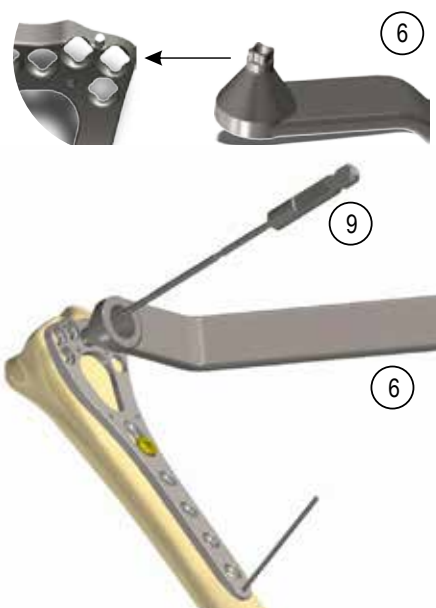
Polyaxial screw insertion can be used to reliably fix AO B and C type, intraarticular, comminuted fractures.

In order to perform that, place the “polyaxial” end of the 2.4 mm drill sleeve (6) accurately into one of the distal holes of the plate. Remaining within the directions provided by the funnel-shaped drill sleeve, make the drill-hole using a 1.6 mm drill bit (9) to the direction set depending on the fragment position.

Use fluoroscopy to control the direction. If the drill enters a fracture gap or joint, modify the direction.

Following length measurement (1), drive in the 2.4 diameter locking head screw. This way each fragment can be fixed with a screw. The connection of the plate and the screws will be adequately stable with both convergent and divergent screws.

The two methods of screw insertion may be combined if necessary.



## SURGICAL TECHNIQUE FOR POLYAXIAL VOLAR DISTAL RADIUS PLATES

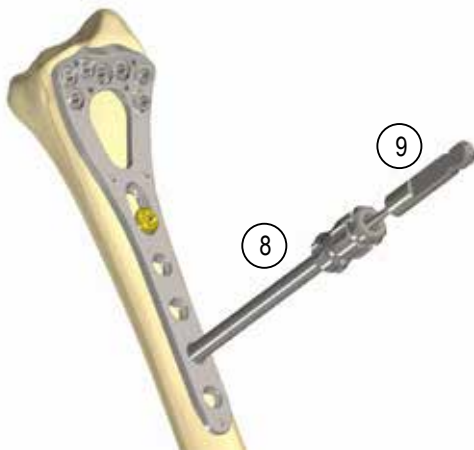


### 7. SUBSEQUENT LENGTH CORRECTION

Following the insertion of the required amount of angular stable or polyaxial screws the length may be corrected if necessary.

For this loosen the screw inserted into the oval hole a little bit and use a proper tool (such as a bone hook) to pull the plate towards distal or let it slip to proximal direction.

When the correct position is reached drive in the screw again and fasten it.



### 8. INSERTING THE PROXIMAL SCREWS

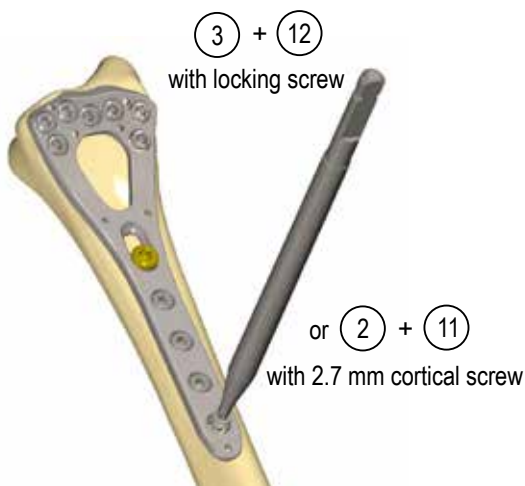
For the round holes on the shaft of the plate you may use 2.7 mm thick cortical screws and 2.4 mm thick locking screws.

A 2.7 mm drill sleeve (5) and a 2.0 mm thick drill bit (4) is necessary for the cortical screws.

For the angular stable screws, screw the designated threaded sleeve (8) into the plate and use a 1.6 mm thick drill bit (9). Use a torque limited screwdriver (12) to fix the 2.4 mm locking head screws.

If the angular stable screws hold in both corticals, usually less screws suffice, and they can be used unicortically as well.

Check the plate position and the congruence of the articular surface with fluoroscopy from AP, lateral and oblique views before wound closure. Pay special attention to the extra-articular position of the distal screws.



### 9. WOUND CLOSURE

Close the surgical wound layer-by-layer over a drain.

## SURGICAL TECHNIQUE FOR POLYAXIAL VOLAR DISTAL RADIUS PLATES

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### 10. PLATE REMOVAL

Use the original surgical scar line to expose the implant. First loosen the locked and polyaxial screws one-by-one to release the connection of the screws and the plate. Then remove the screws completely. In order to prevent the plate from turning, leave the cortical screw inserted into the oval hole to be the last.

## NOTES

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