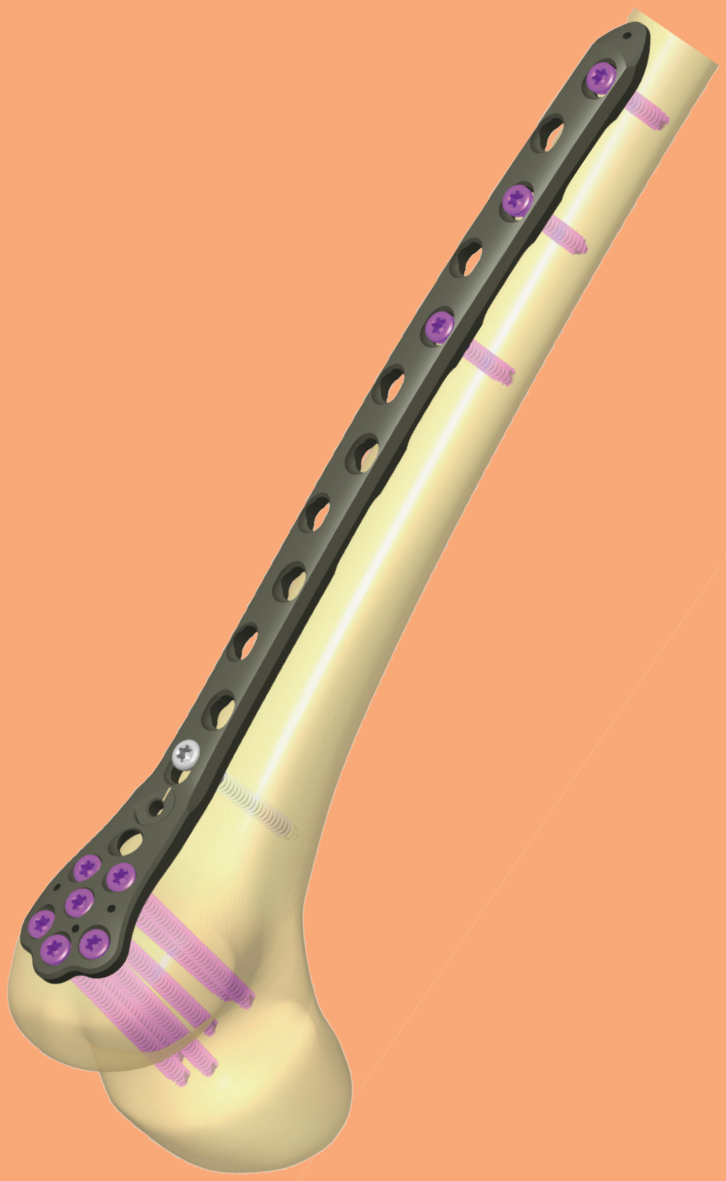
TRAUMATOLOGY

# Vortex

# Vortex Distal Femur



Sanatmetal®

# Content

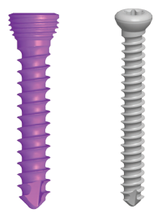
The following surgical description contains general outlines for Vortex Distal Femur plating. However, the operating surgeon shall adapt the content to the patient, fracture type and all other relevant factors that may have influence on the outcome of the surgery.

Therefore, Sanatmetal Ltd. strongly recommends participation on workshops and trainings prior to the initial operation.

Vortex plates, serving to heal peri- and intraarticular fractures, have a new family member, VDF (Vortex Distal Femur) which goes to the distal part of the femur bone offering the same usual high end features that we got used to from Vortex plates. The comfort and security of polyaxial locking is further enhanced by a minimally invasive radiolucent targeting arm for the tail. To reach stabile-enough locking the system uses dia 5,1 mm polyaxial and cortical screws. They represent the outstanding features of Vortex screws together with excellent mechanical properties.

## 1.1 | The implant

- Polyaxial angle stabilized system in step - free ±15 deg angulation of insertion
- Optimal, pre-determined screw directions in the holes
- Maximum 3 times of correction possibility when misidentifying the correct screw direction
- Thinned head, the implant does not interfere with the soft tissues
- Rounded edges to protect nearby soft tissues
- Oval hole for plate positioning
- Ability to perform minimally invasive surgery
- Self tapping but blunt ended screws to avoid tissue irritation



- Anodized Titanium raw material
- Torx recess screws

## 1.2 | The instruments

- Capable of drilling in preset and ±15 deg directions step – free
- Easy to assemble targeting head for choosing either selected or planned direction fixation in the pre-determined directions.
- Radio translucent targeting arm for the tail holes
- Instruments and implants in one tray
- Optimized instruments
- Color coded torque limiting screwdriver

## 1.3 | Indications

Distal femoral fractures
Periprosthetic fractures





## 2.1 | Vortex Distal Femur plate

| Holes on tail | Side |
|---|---|
| **6H** | **right/left** |
| **8H** | **right/left** |
| **10H** | **right/left** |
| **12H** | **right/left** |
| **14H** | **right/left** |
| **16H** | **right/left** |

Raw material
**anodized Titanium**

Color
**grey**

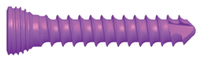
## 2.2 | Vortex screw Ø5,1 mm

Length (mm)
**12 - 18**

Raw material
**anodized Titanium**

Color
**purple**

## 2.3 | Vortex screw Ø5,1 mm



Length (mm)
**24 - 80**

Raw material
**anodized Titanium**

Color
**purple**

## 2.4 | Cortical screw - TX Ø5,1 mm

Length (mm)
**24 - 55**

Raw material
**anodized Titanium**

Color
**grey**

## 2.5 | Cancellous screw - A Ø6,5 mm

Length (mm)
**65 - 80**

Raw material
**anodized Titanium**

Color
**grey**

## 2.6 | Cancellous screw - B Ø6,5 mm

Length (mm)
**65 - 80**

Raw material
**anodized Titanium**

Color
**grey**

# 3 | Surgical description

## 3.1 | Patient positioning

In supine position on straight, translucent table with the possibility of bi-lateral x-ray control.

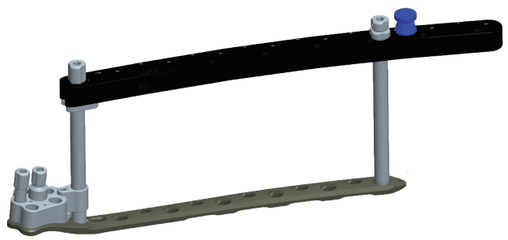
## 3.2 | Plate selection

During preoperative planning select the most appropriate plate for the fracture and the anatomy of the patient. Consider that a little longer plate is more acceptable than a too short one.

## 3.3 | Assembly of plate and targeting arm

The system enables selected- and planned direction locking on the head of the plate. See point 3.11.1 for the planned direction head targeting.

Place the targeting arm on the plate while paying attention to the small peg entering into its hole on the plate. Mount the carbon arm and fix the system to the plate as per the image.



Check accuracy with soft tissue protector, drill sleeve and the dia 4 mm drillbit.

In case we do not use the longest plate put the indicator plug into the arm to represent the position of the last hole.

## 3.4 | Approach

Concerning the approach and the incision, the number of screws applied and the optimal steps of the surgery this present description does not make a stance. The above shall be acquired from surgical textbooks, videos and workshops.



## 3.5 | Modellation of the plate

For optimal fitting we can modellate the plate if needed. Use table bending device for that purpose.

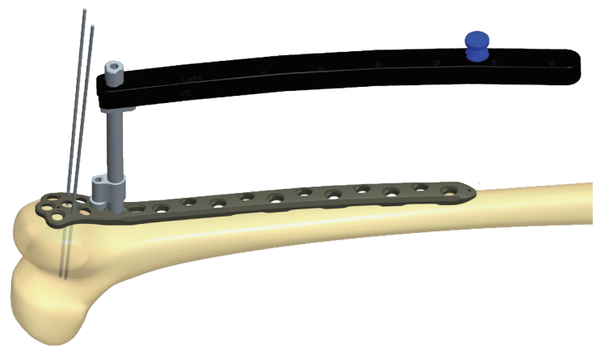
Attention!

After bending the plate the targeting devices on the head and the tail cannot be used!

## 3.6 | Insertion of the plate

The plate can be introduced minimally invasively. Guide the plate mounted on the targeting arm on the bone surface towards the proximal. Optimal position shall be checked with image intensifier.

The plate can be fixed with Kirschner wires at this step but the fine tuning of the position with the oval holes is only possible after the wires are removed.



## 3.7 | Positioning with the oval hole

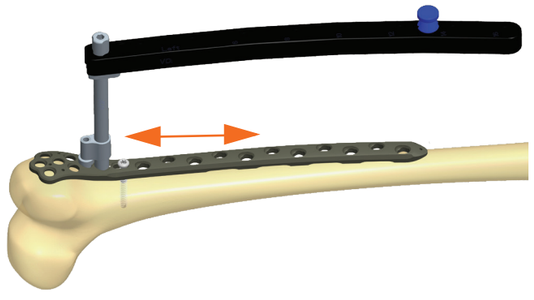
Lock the plate in the oval hole with a grey cortical screw.

Pre drilling takes place through the straight side of the Ø4 mm double drill sleeve. After setting the optimal angle perform drilling with the Ø4 mm drillbit.

Measure the necessary screw length.

Remove the Ø4 mm double drill sleeve. Hook the gauge to the other side of the hole while moving the reader on the bone surface. Read length at the red mark.

The plate is fixed to the bone with a Ø5,1 mm cortical screw in the oval hole. The screw is not fully tightened until the fine tuning of the position is done. Afterwards it is to be locked firmly.



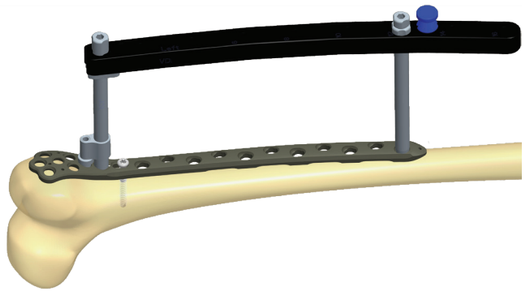
## 3.8 | Closing the frame

Perform incision at the most proximal hole of the plate used. Push the Ø8 mm soft tissue protector into the hole and turn the drill sleeve into the hole of the plate. This way the plate and the carbon arm are aligned. The plate can be fixed - either at the most proximal hole or through the small hole on the tip of the plate - with Kirschner wires to the bone.

Attention!

This step is absolutely necessary for the perfect targeting.

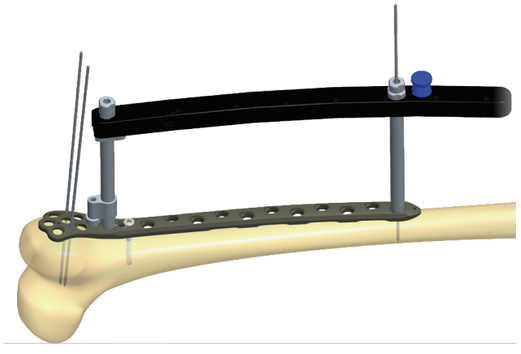
In case sleeves cannot be turned by the hand, use the T25 screwdriver!





## 3.9 | Temporary fixation of the plate

Fix the plate to the bone with Kirschner wires through the corresponding holes on the head or at the tip of the plate. In the latter the wires can be led from the sides of the carbon arm.



## 3.10 | Fixation of the head

There are 6 locking options on the head. In each hole planned- and selected direction locking is also possible.

## 3.11 | Planned direction locking

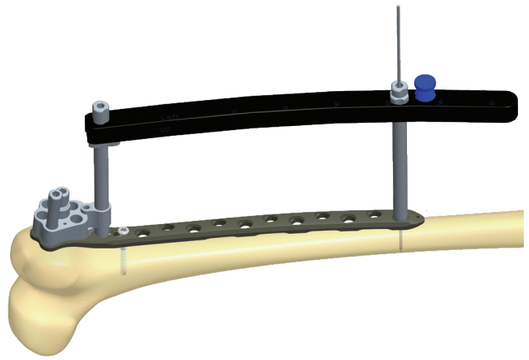
In this case the screws can be inserted in the anatomically optimal direction. The screw-plate connection will be angle stabilized ensuring loosening-free locking.

### 3.11.1 | Assembly of the head block

Fix the removable head as per the image.

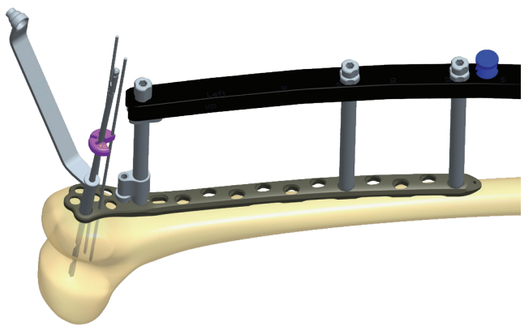
The mounted targeting arm for the tail ensures the targeting head against rotation. The targeting head and the plate are connected with a short sleeve in the center hole.

You can use the double drill sleeve's straight side for monoaxial locking as well. This technique is to be detailed further on.



### 3.11.2 | Planned direction drilling - head

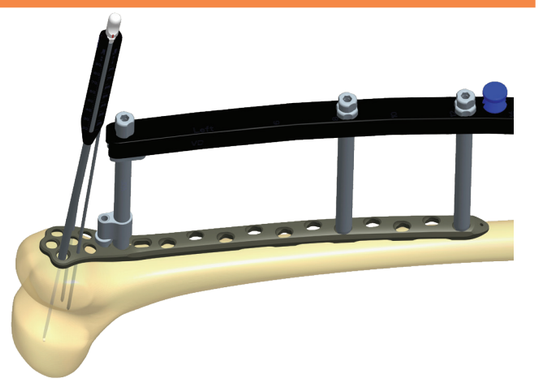
Drill through the sleeve for the Ø5,1 mm screw while using image intensifier control. The spiral dill to be used is Ø4 mm in diameter.



### 3.11.3 | Depth gauging – head

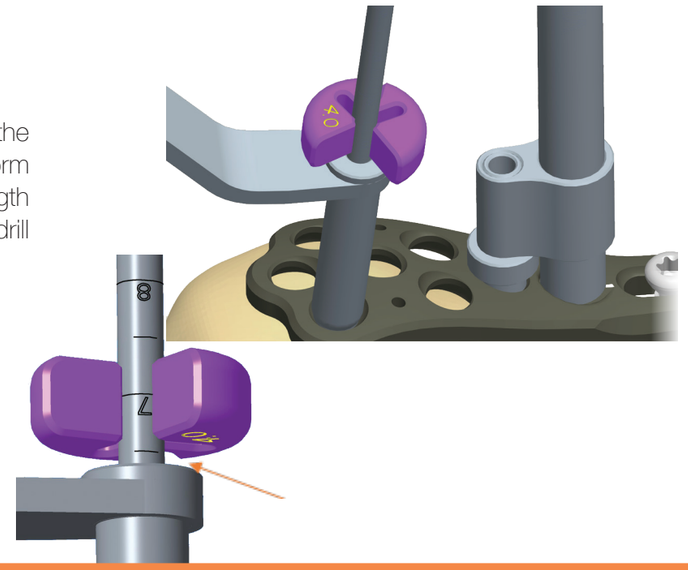
Depth gauging can take place in two ways.

As per the first, previously already detailed, use a hooked gauge. Hook it into the other wall of the hole, push the moving part on the bone surface and read length.





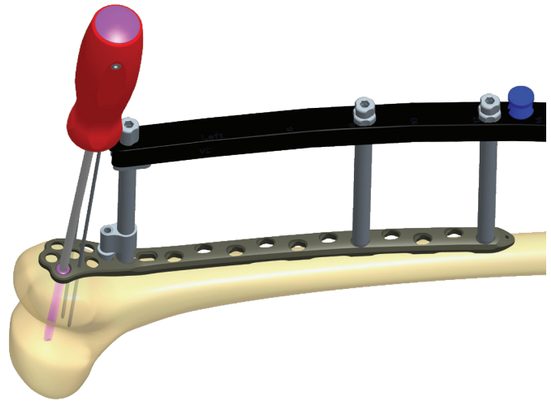
The other method uses the purple drill stop over the Ø4 mm drillbit just above the spiral part. Perform drilling through the sleeve. The necessary length can be read on the scale of the drillbit at the drill stop's side facing the sleeve.




### 3.11.4 | Screw insertion – head

Drive the selected Ø5,1 mm screw with the T25/3,5 Nm torque screwdriver. Using torque screwdriver reduces chances of cold welding during the healing period.

Repeat the above steps in case of all necessary screws. This way they are inserted in the anatomically optimal direction.



### 3.11.5 | Drilling – tail

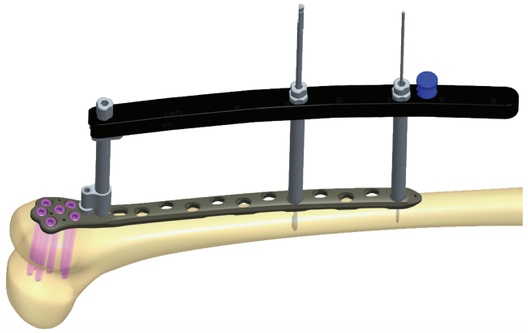
VDF system uses radio translucent arm for minimally invasive targeting of the tail.

Attention!

The targeting arm can be used only with intact, non-modellated plate. Otherwise drilling accuracy greatly reduces and plate and/or targeting arm damages might occur.

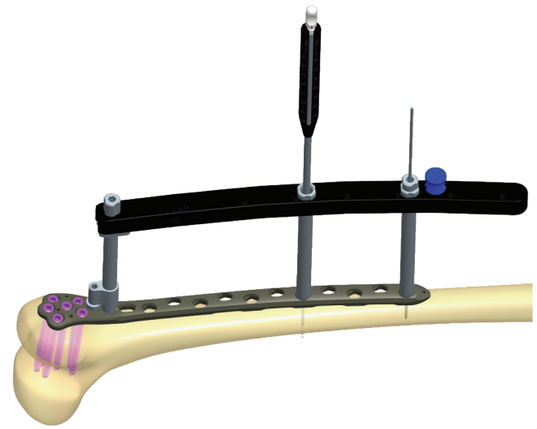
On the tail the traditional planned direction locking is suggested.

Push and drive the soft tissue protector and the drill sleeve into the hole's thread you wish to use. Perform drilling with the Ø4 mm drillbit. Remove the Ø4 mm drill sleeve.



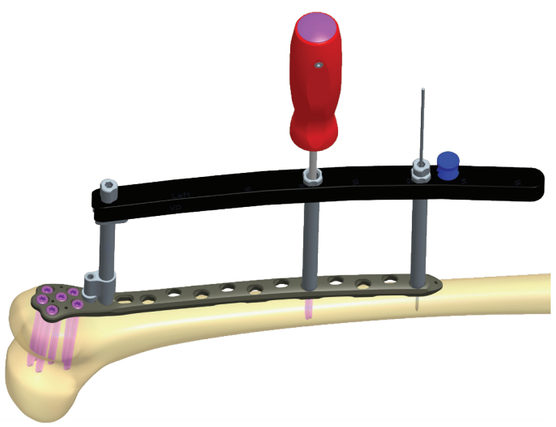
### 3.11.6 | Depth gauging – tail

To determine screw length either use depth gauge or the drill stop.



### 3.11.7 | Screw insertion – tail

Turn in the selected screw with the T25/3,5 Nm screwdriver.





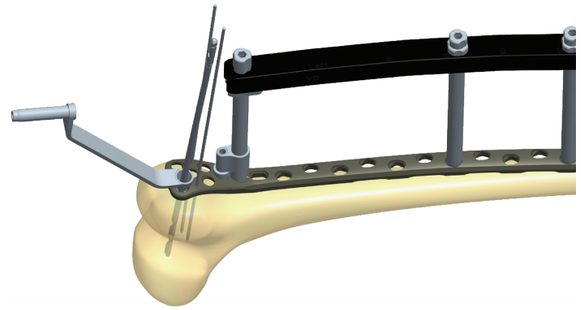
### 3.12 | Selected direction locking

In case of selected direction locking we have the freedom of ±15 degrees from the anatomically optimal direction. Use the system without the removable head to have the possibility of the six selected direction locking on the head.

### 3.12.1 | Selected direction drilling – head

Place the conical end of the Ø4 mm double drill sleeve into the hole. It fits exactly into the hole and its symmetry axis is in the anatomically optimal direction (the same direction in which monoaxial locking takes place). Thus it is ensured that the ±15 degree direction is always from the anatomically optimal direction.

Perform drilling in the desired direction with the Ø4 mm drillbit.

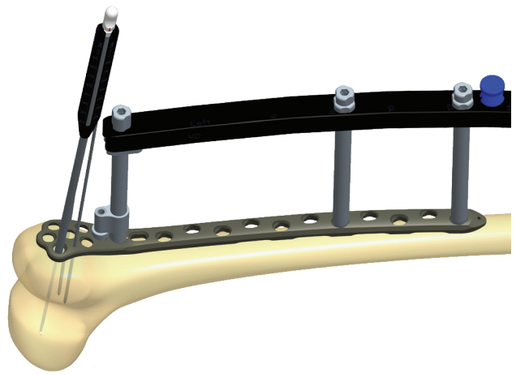


### 3.12.2 | Length gauging – head

Use the depth gauge without the sleeve.

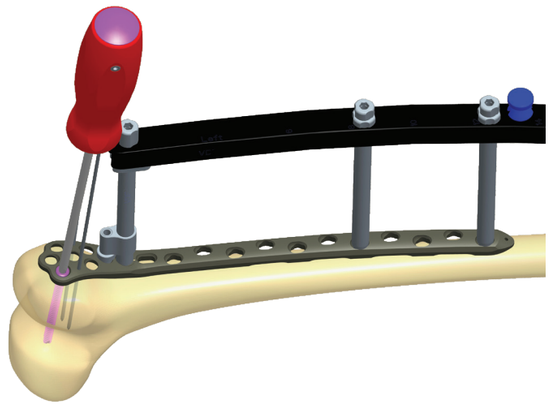
Attention!

The drillstop method cannot be used when drilling through the conical end of the double drill sleeve.



## 3.12.3 | Screw insertion – head

Drive in the selected screw with the T25/3,5 Nm torque limiting screwdriver.



## 3.12.4 | Drilling – tail

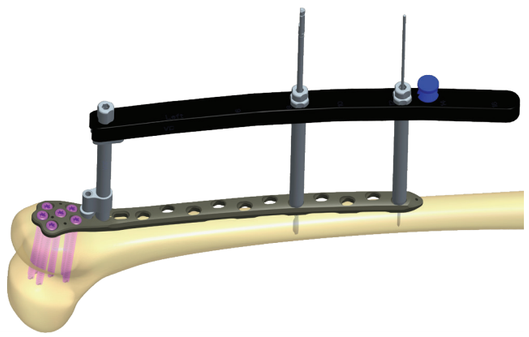
VDF system uses radio translucent arm for minimally invasive targeting of the tail.

Attention!

The targeting arm can be used only with intact, non-modellated plate. Otherwise drilling accuracy greatly reduces and plate and/or targeting arm damages might occur.

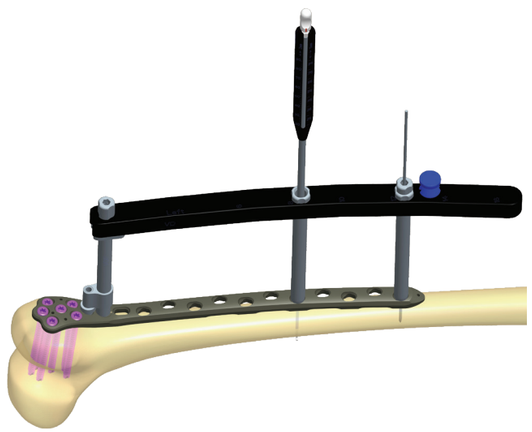
On the tail the traditional monoaxial locking is suggested.

Push and drive the soft tissue protector and the drill sleeve into the hole's thread you wish to use. Perform drilling with the Ø4 mm drillbit. Remove the Ø4 mm drill sleeve.



## 3.12.5 | Length gauging – tail

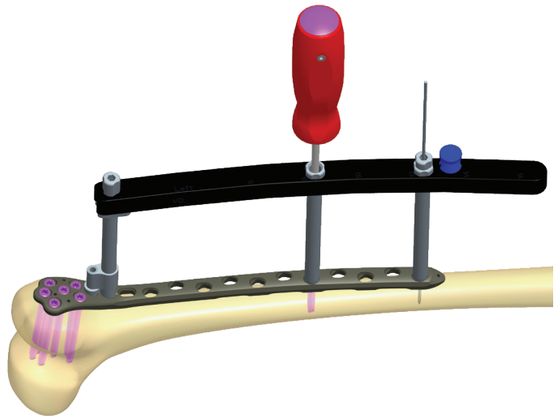
To determine screw length either use depth gauge or the drill stop.





## 3.12.6 | Screw insertion – tail

Turn in the selected screw with the T25/3,5 Nm screwdriver.



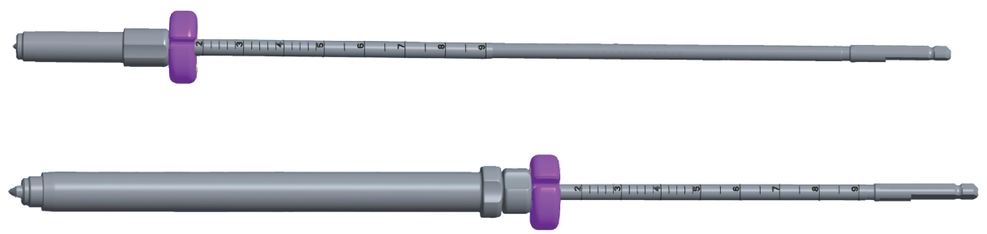
## Compression locking

For implanting compression screws drill through the compression side of the double drill sleeve V with the 4 mm drillbit. The arrow on the sleeve shall point to the direction of the fracture. Take general guidelines of compression locking into account. Length gauging is followed by screw insertion with the T25 screwdriver.

For the optimal compression use TX cortical screws.

## Gauging tip

When using the drill stop gauging the 4x250 mm bit is calibrated to the short sleeves while the 4x260 mm bit is for the long sleeves. Due to scale positions no false reading is possible.

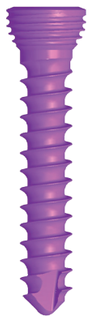


## 4.1 | Vortex Distal Femur plate

Anodized Titanium

| Cat no | Size |
|---|---|
| 280251506 | 6H/left |
| 280251508 | 8H/left |
| 280251510 | 10H/left |
| 280251512 | 12H/left |
| 280251514 | 14H/left |
| 280251516 | 16H/left |
| 280251606 | 6H/right |
| 280251608 | 8H/right |
| 280251610 | 10H/right |
| 280251612 | 12H/right |
| 280251614 | 14H/right |
| 280251616 | 16H/right |

## 4.2 | Vortex screw Ø5,1 mm



Anodized Titanium

| Cat. no | Size (mm) |
|---|---|
| 260851024 | 24 |
| 260851026 | 26 |
| 260851028 | 28 |
| 260851030 | 30 |
| 260851032 | 32 |
| 260851034 | 34 |
| 260851036 | 36 |
| 260851038 | 38 |
| 260851040 | 40 |
| 260851042 | 42 |
| 260851044 | 44 |
| 260851046 | 46 |
| 260851048 | 48 |
| 260851050 | 50 |
| 260851055 | 55 |
| 260851060 | 60 |
| 260851065 | 65 |
| 260851070 | 70 |
| 260851075 | 75 |
| 260851080 | 80 |

## 4.3 | Vortex screw - blunt Ø5,1 mm

Anodized Titanium

| Cat. no | Size (mm) |
|---|---|
| 260851012 | 12 |
| 260851014 | 14 |
| 260851016 | 16 |
| 260851018 | 18 |

## 4.4 | Cancellous screw - A Ø6,5 mm

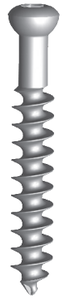
Anodized Titanium

| Cat no | Size (mm) |
|---|---|
| 914265065 | 65 |
| 914265070 | 70 |
| 914265075 | 75 |
| 914265080 | 80 |

## 4.5 | Cancellous screw - B Ø6,5 mm

Anodized Titanium

| Cat no | Size (mm) |
|---|---|
| 914365065 | 65 |
| 914365070 | 70 |
| 914365075 | 75 |
| 914365080 | 80 |



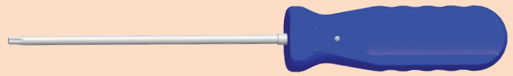
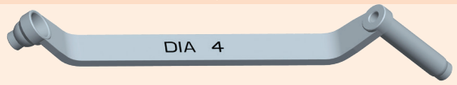
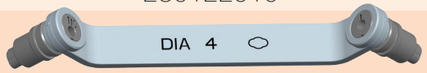
## 4.6 | Cortical screw - TX Ø5,1 mm

Anodized Titanium

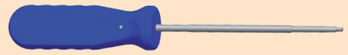
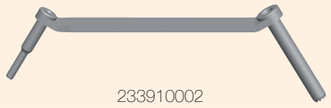
| Cat. no | Size (mm) |
|---|---|
| 267551024 | 24 |
| 267551026 | 26 |
| 267551028 | 28 |
| 267551030 | 30 |
| 267551032 | 32 |
| 267551034 | 34 |
| 267551036 | 36 |
| 267551038 | 38 |
| 267551040 | 40 |
| 267551045 | 45 |
| 267551050 | 50 |
| 267551055 | 55 |

Instrument list | 5

## 5.1 | Instruments

| | | |
|---|---|---|
| Screwdriver (T25) | 1 pc |  210720025 |
| Torque screwdriver (T25/3,5 Nm) | 1 pc |   210510046 |
| Spiral drill (4x250 mm; 4x260 mm) | 1-1 pc |  280251903; 280122915 |
| Double drill sleeve - PAS (4 mm) | 1 pc |   280122910 |
| Double drill sleeve - V (Large) | 1 pc |   275214902 |
| Kirschner wire (2x230 mm) | 5 pcs |  937520230 |
| Screw forceps | 1 pc |  939999002 |
| Drill stop (4 mm) | 2 pcs |   210510240 |
| Depth gauge (10-90 mm) | 1 pc |  280122912 |
| Target device - VDF | 1 pc |  280251902 |
| Filled up (VDF) | | 233800024 |

Optional

| | |
|---|---|
| Power torque screwdriver (T25/3,5 Nm) (for purple screw) |   210510048 |
| Spiral drill with quick connecting end (3,2x195 mm) |  939532195 |
| Screwdriver (3,5 mm |  210700035 |
| Double drill sleeve (6,5/3,2 mm) |  233910002 |

# Product Family

## TRAUMATOLOGY

1.1. Intramedullary nails
1.2. Plates
1.3. Screws
1.4. Fixateur
1.5. Other

## ORTHOPAEDICS

## DENTAL

## SPINE

# Contact

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Fax: +36 36 512 932