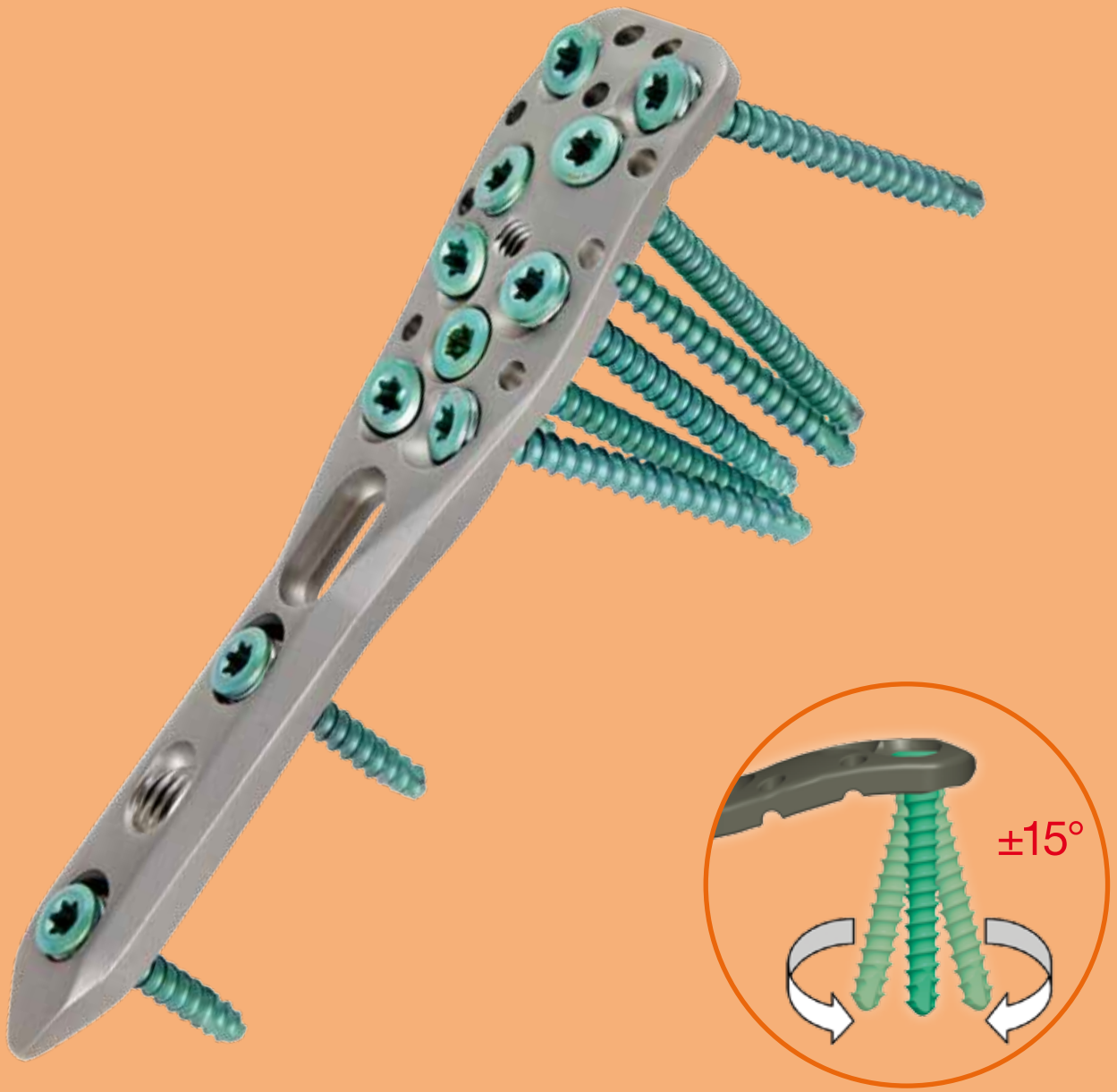
Vortex

Proximal humerus plate



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References

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The following surgical description contains general outlines for humerus plate fixation with the Vortex Proximal Humeral plate system. 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.

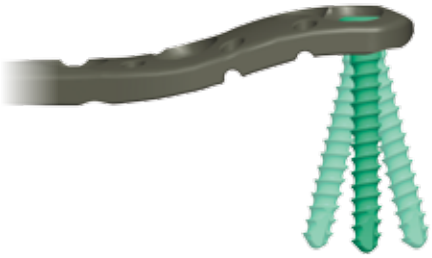
Content

1 | Introduction

The **VPH** (Vortex Proximal Humeral) plate system is the upgraded version of the angle stabilized humeral head plate. It ensures all the Vortex advantages besides the even wider fixation range compared to other products. The problem-free healing is guaranteed by the modern and multifunctional targeting system, the resized plate adapted for polyaxial technique and the standardized polyaxial screws.

1.1 | The implant

- Polyaxial angle stabilized system in step - free ±15 deg angulation of insertion



- Maximum 3 times of correction possibility when misidentifying the correct screw direction
- Optimal, pre-determined screw directions in the holes
- Thinned head, the implant does not interfere with the soft tissues
- Rounded edges to protect nearby soft tissues
- Ability to perform minimally invasive surgery
- Oval hole for plate positioning
- Self tapping but blunt ended screws to avoid tissue irritation
- Anodized Titanium raw material
- Torx headed screws

1.2 | Instrumnets

- Capable of drilling in preset and ±15 deg directions step – free
- Easy to assemble targeting head for choosing either polyaxial or monoaxial fixation in the pre-determined directions.

1.3 | Indications

- Dislocated fractures of the proximal humerus
- Pseudoarthrosis on proxima humerus
- Osteotomy on proximal humerus

2.1 | Vortex Proximal Humerus plate

Holes on the tail	Length (mm)
3H	**84**
4H	**96**
6H	**120**
8H	**144**
10H	**168**
12H	**192**

Raw material

Anodised Titanium

2.2 | Vortex screw Ø3,5 mm

Length (mm)

10 - 50

Raw material

Anodised Titanium

Colour

Green

2.3 | Corticalis screw - TX Ø3,5 mm

Length (mm)

10 - 50

Raw material

Anodised Titanium

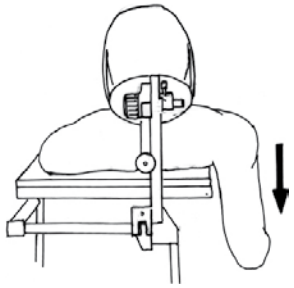
Colour

Grey

3 | Surgical description

3.1 | Patient positioning

In beach chair position in such a way the multiple directional images can be made of the fracture area with the image intensifier.



3.2 | Incision

In case of minimally invasive operation vertical transdeltoid approach paying attention to nervus radialis or typical frontal approach near to sulcus deltoideo pectoralis.

3.3 | Temporary fixation

Identify the fragments and fix them temporarily with 2 mm Kirschner wires. Use image intensifier to confirm correct position of the fragments.

3.4 | Selecting the plate

Select the most appropriate plate for the given fracture.

3.5 | Targeting options in VPH system

The surgeon can select between two methods.

Monoaxial fixation
The holes on the plate head can be drilled and locked in the pre-determined directions. The aiming is facilitated by a targeting jig which can be easily put on the plate.

Polyaxial fixation
You can fix the holes of the plate on the head by polyaxial method. The conical side of the double sleeve has to be used without the targeting jig.

3.6 | Assembly of the targeting jig and the plate

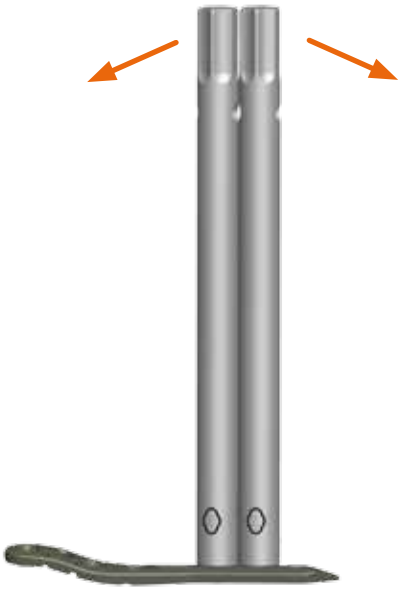
The positioning of the plate is enhanced by the targeting jig, therefore, we recommend its usage in all cases. The jig shall be fixed with a screw on the plate. The screw shall be tightened by the screwdriver.

3.7 | Modellation of the plate

For optimal fit we can modellate the plate- in case it is needed. There are two bending irons for this purpose. For the round holes of the head use the device with round marking, while for the oval holes of the shaft use the ones with keyhole marking. Drive the bending tools fully in the respective holes and always use two neighbouring holes. Perform bending.

Attention

The bent plate cannot be targeted with the head targeting device!



3.8 | Positioning of the plate

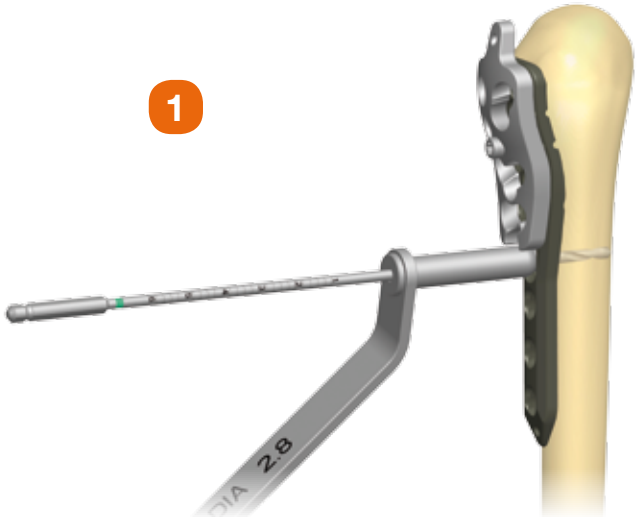
The optimal position of the plate is 8 mm from the upper edge of the tuberculum maius. Put a 2 mm Kirschner wire into the guide hole of the jig and position the plate in such a way that the wire shall lay on the proximal joint surface.

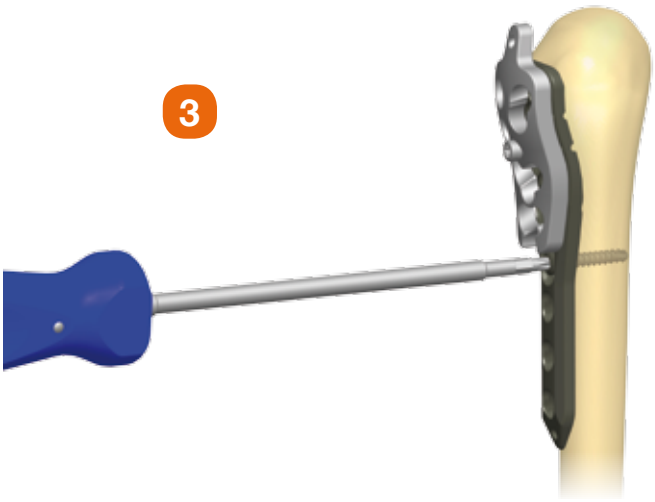
3.9 | Fixation in the oval hole

After approximate positioning remove the Kirschner wire and use the straight side of the double drill sleeve to drill a 2.8 mm hole into the middle of the oval hole. (1)

Measure screw length. Remove the 2.8 mm drill sleeve and push the hook of the gauge through the hole while pushing its moving part to the bone surface. Select screw accordingly. (2)

Fix the screw in such a way that the fine positioning of the plate is possible. In the final position tighten the cortical screw. (3)





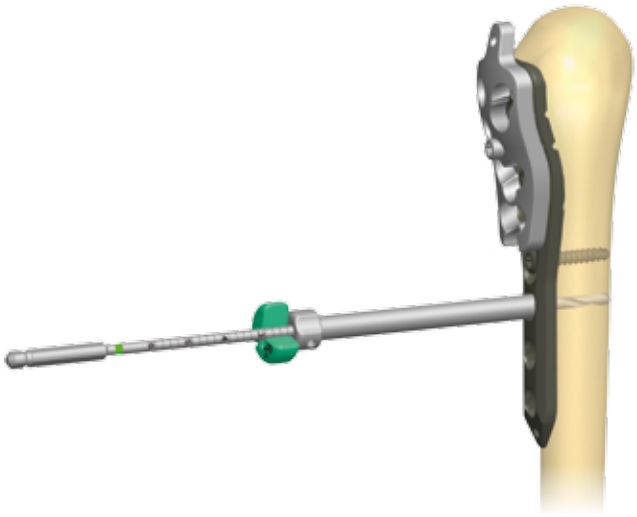
3.10 | Distal locking I.

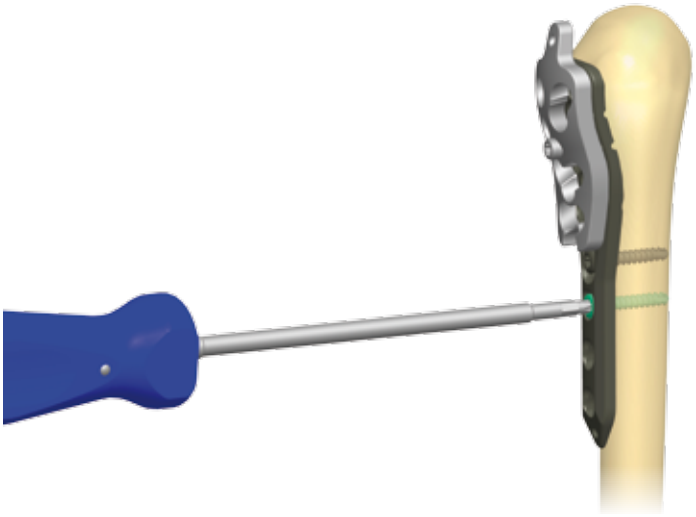
After positioning place a 3.5 mm polyaxial screw into the fix distal bone. The rest of the fragments shall be built onto this.

Using the soft tissue protector and the drill sleeve the monoaxial drilling can be made.

To measure length place the green drill stop on the 2.8 mm drillbit prior to drilling just above the spiral part. After drilling the required screw length can be read on the side of the stop which hit the sleeve.

Drive the screw in with the T15 screwdriver.





3.11 | Proximal locking

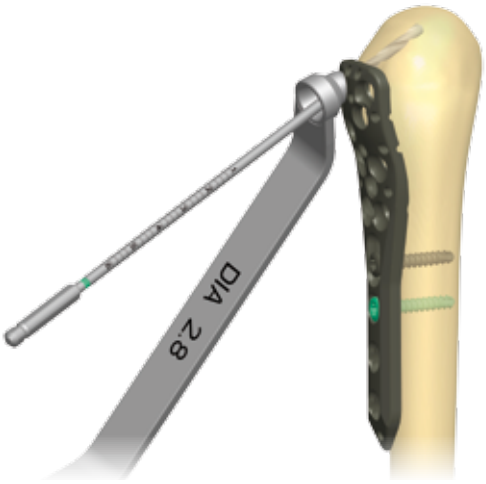
3-4 proximal screws ensure motion-stable fixation. The number of screws to be used depends on the number and positions of the fragments.

There are holes for Kirschner wires and for tendon and bone stitching.

3.11.1 | Polyaxial technique

Remove the targeting jig used for positioning.

Use the conical side of the 2.8 mm double drill sleeve and the 2.8 mm drillbit. The tip of the sleeve fits into the hole and the axis of the conical sleeve is in the optimal direction. This ensures the ± 15 degree deviation from the optimal direction.



Drill with the 2.8 mm drillbit up to 5 mms from the subchondral zone. Use image intensifier control.

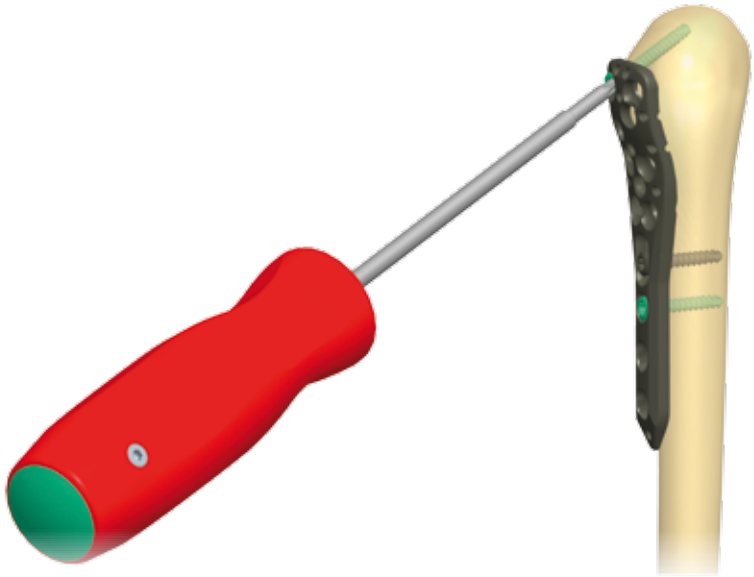
If you wish to use monoaxial locking together with the polyaxial then use the straight side of the double sleeve.

Use the gauge as per the image, without the sleeve.

Attention

After drilling through the conical side of the double drill sleeve the length gauging with the scaled drillbit is not possible.

After gauging drive the screw in with the T15/1.5 Nm torque screwdriver. Repeat the above steps in case of all hole that we wish to use.



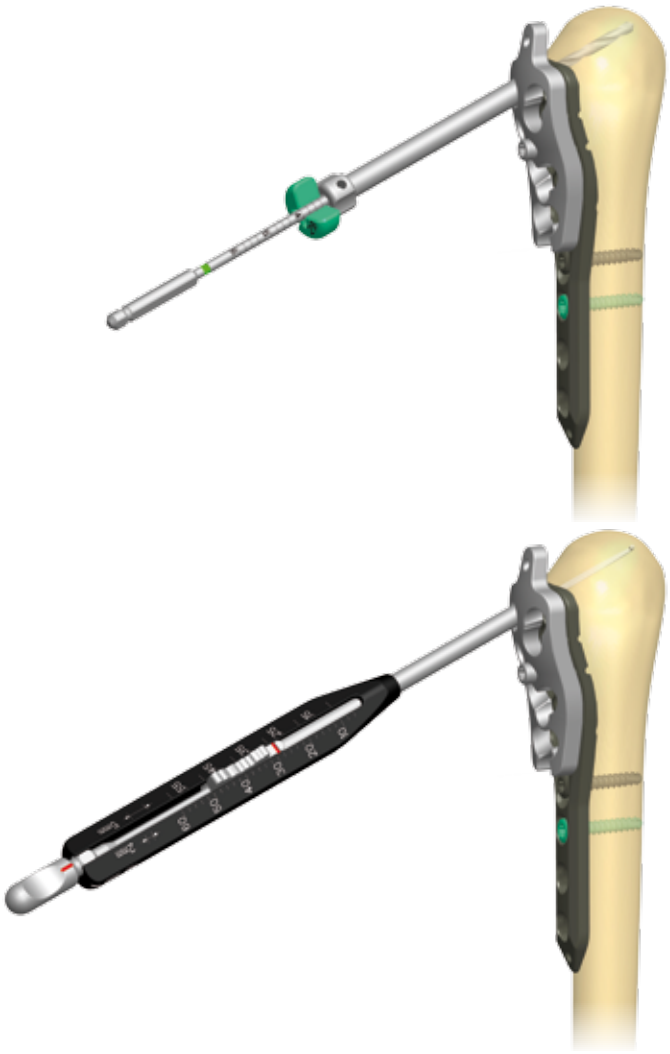
3.11.2 | Monoaxial technique

Put the soft tissue protector and the 2.8 mm drill sleeve into the appropriate hole and drill under image intensifier control up to 5 mm from the subchondral zone.
Mind that the most distal drilling shall be at least 5 mm above the medial arch of the surgical neck.

Confirm the correct direction of the drilling and measure screw length. Use the hooked gauge or the drill with the stop as described previously. In case of blind holes subtract 2 mm from the read value.

After gauging drive the screw in with the T15/1.5 Nm torque screwdriver.

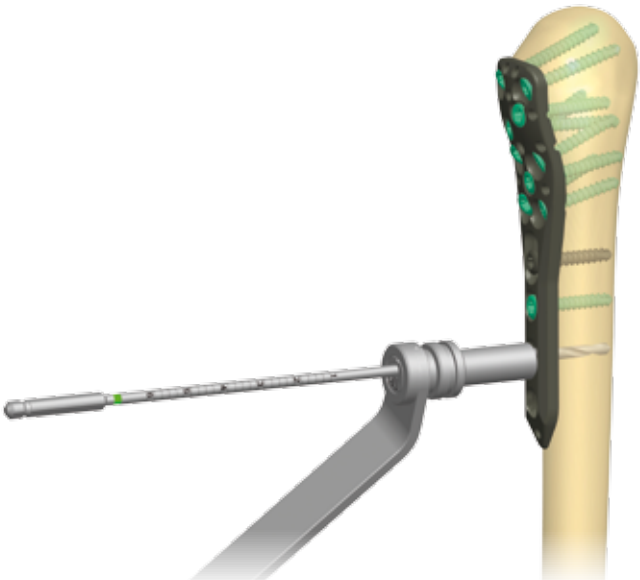
Repeat the above steps in case of all hole that we wish to use.



3.12 | Distalis locking II.

Fix the rest of the tail holes as per indicated in Distal locking I.
When locking the holes on the tail there is a compression possibility. Use the double drill sleeve. One side of the sleeve is marked with 1,0, which is the compression side, while the other is the neutral one. Put the sleeve into the chosen hole with the respective end (i.e: compression vs neutral) while paying attention to the marked arrow. It should point into the direction of the fracture. Perform drilling and length gauging.

Attention
Only the hooked gauge can be used with this method!



4 | Implant list

4.1 | Vortex Proximal Humerus plate

Holes (F+SZ)	Length (mm)	Anodised Titanium
9 + 3	84	280303003
9 + 4	96	280303004
9 + 6	120	280303006
9 + 8	144	280303008
9 + 10	168	280303010
9 + 12	192	280303012

4.2 | Vortex screw Ø3,5 mm

Length (mm)	Anodised Titanium
10	260835510
12	260835512
14	260835514
16	260835516
18	260835518
20	260835520
22	260835522
24	260835524
26	260835526
28	260835528
30	260835530
32	260835532
34	260835534
36	260835536
38	260835538
40	260835540
42	260835542
44	260835544
46	260835546
48	260835548
50	260835550

4.3 | Cortical screw - TX Ø3,5 mm

Length (mm)	Anodised Titanium
10	267535010
12	267535012
14	267535014
16	267535016
18	267535018
20	267535020
22	267535022
24	267535024
26	267535026
28	267535028
30	267535030
32	267535032
34	267535034
35	267535035
36	267535036
38	267535038
40	267535040
42	267535042
44	267535044
46	267535046
48	267535048
50	267535050

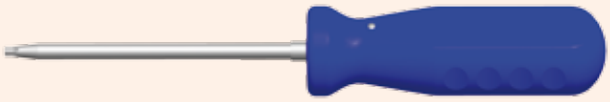
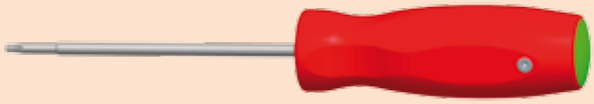
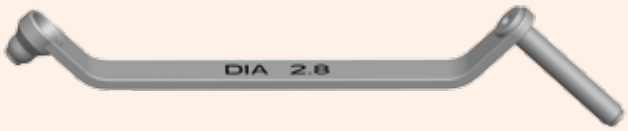
5.1 | Filled-up tray

Surgical instruments

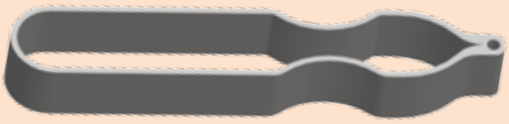
Description	Size	Quantity	Cat.no.
Target device - VPH plate		1	240300903
Screwdriver	T15	1	210720015
Torque screwdriver	T15/1.5 Nm	1	210510044
Double drill sleeve	2.8 mm	1	280122903
Double drill sleeve - V	small	1	275212902
Length gauge	2.7-3.5 mm	1	280114905
Plate bender	6 mm	2	280122907
Plate bender	6 mm	2	280122914
Spiral drill with quick-connecting end	2.8x165 mm	2	240300904
Screw forceps		1	939999002
Drill stop	2.8 mm	2	210510227
Kirschner wire	2x150 mm	2	937520150
Tray (empty) VPH		1	233800021
Filled-up tray - VPH		**1**	**233800020**

5 | Instrument list

5.2 | Instruments

Targeting device - VPH plate	 240300903
Screwdriver (T15)	 210720015
Torque screwdriver (T15/1.5 Nm)	 210510044
Double drill sleeve (2.8 mm)	 280122903
Double drill sleeve - V (small)	 275212902
Length gauge (2.7-3.5 mm)	 280114905
Plate bender (6 mm)	 280122907

5.2 | Instruments

Plate bender - V (6 mm)	 280122914
Spiral drill with quick-connecting end (2,8x165 mm)	 240300904
Screw forceps	 939999002
Drill stop (2.8 mm)	 210510227
Kirschner wire (2x150 mm)	937520150

Product family

TRAUMATOLOGY

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

ORTOPAEDICS

DENTAL

SPINE

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