



# Surgical Technique

2.5 | 3.5 | 4.0 | 4.7 | 5.5 | 7.5mm Headless Cannulated Screw System

## about us

Auxein Medical is an integrated, research based, orthopaedic Implants & instruments manufacturing company, producing a wide range of quality, affordable generic implants, trusted by healthcare professionals and patients across geographies. It is the Company's constant endeavor to provide a wide basket of generic and our innovator products that exceed the highest expectations of customers in term of quality and safety. The company has world-class manufacturing unit established in india and serves customers in over 75 countries worldwide.

## **Guidelines**

This publication sets forth detailed recommended procedures for using Auxein Medical devices and instruments.

It offers guidance that needs to be heeded. However, with any such technical guide, each surgeon must consider the unique needs of each patient and make appropriate adjustments when and as required.

A workshop training under DAIS Academy by Auxein will provide assistance prior to first surgery. It is vital to know that all non-sterile devices must be cleaned and sterilized before use.

Moreover, multi-component instruments must be disassembled for cleaning. The surgeon must discuss all relevant risks, including the finite lifetime of the device, with the patient, when necessary.

**Please NOTE** that all the bone screws referenced in this document here are not approved for screw attachment or fixation in the areas not mentioned in this publication.

#### Warning:

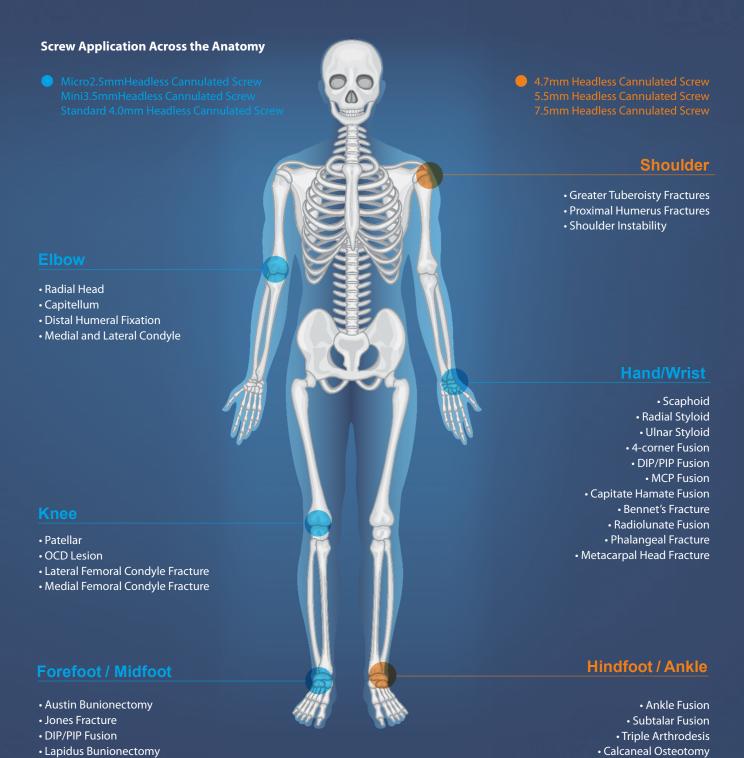
This description is not sufficient for immediate application of the instrumentation. Instruction by a surgeon experienced in handling this instrumentation is highly recommended.





### **Indications for Use:**

Auxein Screw System is intended as a fixation device for small bones, bone fragments, and osteotomies. It is not intended for interference or soft tissue fixation.



Calcaneal Fracture

• Malleolar Fracture

• Talar Navicular Fusion

Calcaneal Cuboid Fusion

• MTP Fusion

• TMT Fusion

Chevron Osteotomy

SCARF Osteotomy

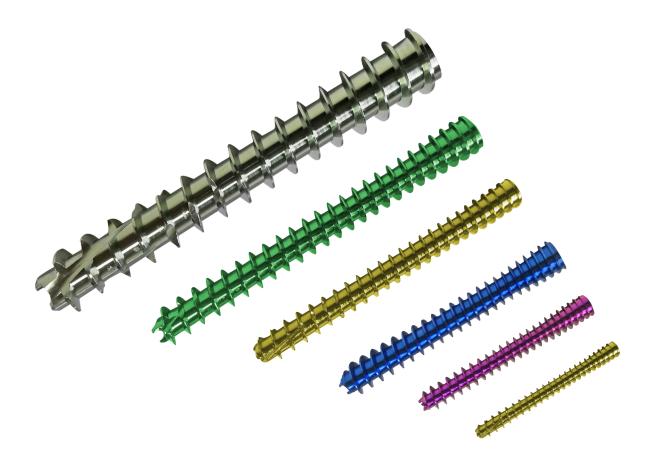
Weil OsteotomyHammertoe FusionAkin Osteotomy



Auxein's Headless cannulated screws are specialized orthopedic implants designed for surgical procedures such as treating fractures, particularly in bones that require compression and stability.

These screws are designed with a hollow core or cannulation, allowing them to be inserted over a Kirschner wire during surgery.

Note-: The surgical steps defined ahead are for Calcaneal Osteotomy Technique using 7.5mm headless cannulated screws.





## **VOLAR SCAPHOID TECHNIQUE**

#### **Surgical approach**

The procedure can be carried out using the volar traction approach or using a conventional volar type approach with the arm supine on a hand table. The volar traction approach facilitates reduction of a displaced fracture and permits arthroscopy to ensure accuracy of the reduction. Fluoroscopy is used throughout.



levering on the trapezium this maneuver brings the distal pole of the scaphoid more radial and thus ultimately facilitates screw insertion. The entry point should be approximately 1/3 the way across the scaphoid from the tuberosity in the A/P plane and central in the lateral plane.



#### **Fracture Reduction.**

#### instruments:

7-096-02 Wire Guide, Ø0.8mm x Length 108mm 7-096-01 Kirschner Wire, Ø0.8mm x Length 147mm

Pass the guide wire across the fracture, continually checking the direction on the image intensifier and correcting as necessary, aiming for the radial aspect of the proximal pole. It is extremely important not to bend the guide wire and any adjustments in direction should be made

A second de-rotation wire can then be inserted in those cases where it is felt that there is a possibility of rotational instability of the fracture.

Advance the guide wire to stop just short of the articular surface and the wire should not breach it at this stage. The position, alignment and length are checked once more. Make a simple stab incision at the entry point of the wire, and deepen this down to the distal pole of the scaphoid using a small hemostat and blunt dissection. This is a relatively safe zone with minimal risk to the adjacent neuro-vascular structures.

When using the volar approach, the correct screw size is 2-4 mm shorter than the measured length so as to ensure that the proximal tip of the screw is fully buried below the cartilage and the cortical surface.

## Optional Instrument for K wire Fixation:-

#### instruments:

7-096-22 Out Sleeve 7-096-25 Inner Sleeve

7-096-01 Kirschner Wire, Ø0.8mm x Length 147mm

**7-096-20** Plunger is use to extract the outer and inner sleeve without manipulating the position of the K wire. The plunger is plugged at the outer end of the K wire and the sleeves are pulled backfrom bone.

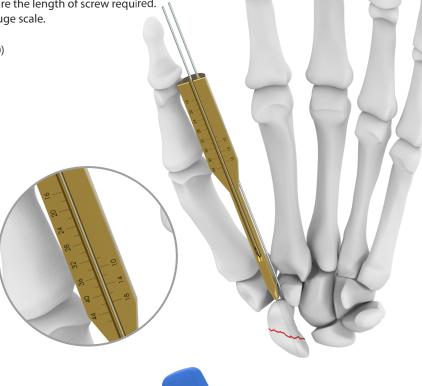






Pass the depth gauge over the inserted K wire to measure the length of screw required. Carefully check the drill marking matching with the gauge scale.

**7-096-24** Depth Gauge for Headless Screw (2.5|3.5|4.0)



#### Reaming

#### instruments:

7-096-03 Reamer Ø2.5mm

7-096-19 Ratchet Handle with Quick Coupling

Pass the entry reamer over the inserted K wire to break the cortex and make entry for drill.

Either power tool or hand reaming can be perform.

Stop reaming 1-2 mm short of the articular surface.

The long drill is recommended to mitigate the effects of varying bone density and distraction upon screw insertion.





#### **Drilling**

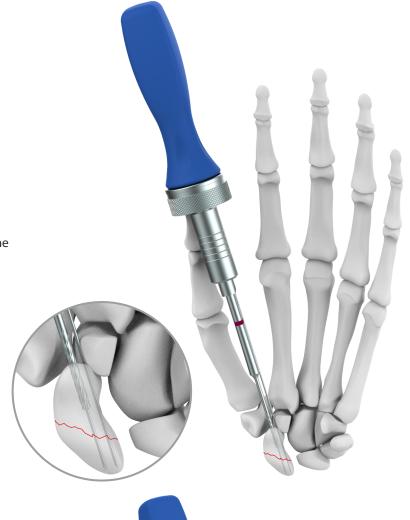
#### instruments:

7-096-04 Drill Bit Ø2.0mm x Length 89mm 7-096-19 Ratchet Handle with Quick Coupling

Once the opening has been created pass the drill bit over the K wire to drill the bone.

Make sure the drill marking is visible while performing the procedure to make sure required depth is drilled.

**Note:**- Operations like drilling and reaming for 2.7 mm Headless Screws are open approach while for 3.5 and 4.0 mm screw use the outer sleeve to perform drilling and reaming.



#### Screw Insertation

#### instruments:

7-096-17 Cannulated Screwdriver, Hex 2.5mm 7-096-19 Ratchet Handle with Quick Coupling

Use the cannulated screw driver to pick and insert the screw into the drilled canal

The ratchet handle locked in the desired clockwise direction and the screw is inserted

The self-tapping screw is then advanced over the guide wire and the wire removed. Compression can then be confirmed radiographically on the image intensifier.



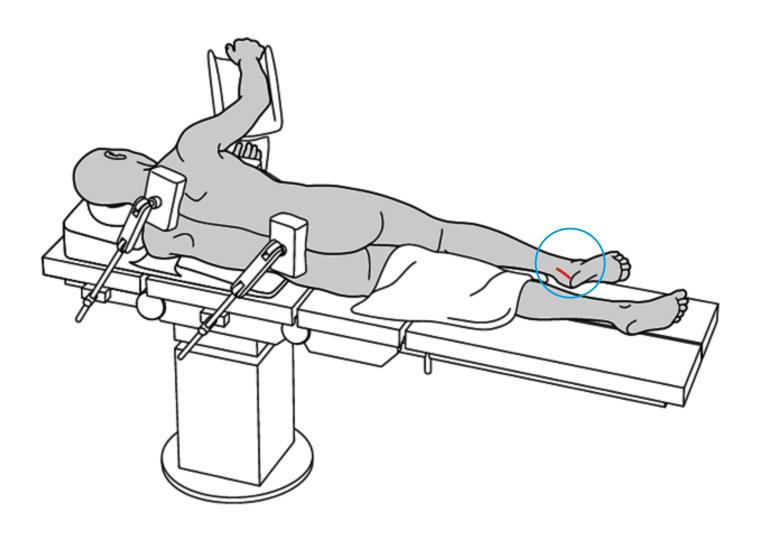
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## **Osteotomy Surgical Approach**

#### **Approach and Exposure:**

Make an incision posterior to the peroneal tendons, perpendicular to the calcaneus. Use cephalad and caudal mini Hohmann retractors to protect the neurovascular structures and plantar fascia. Take caution to preserve the peroneal tendons and sural nerve.



#### **Create Osteotomy:**

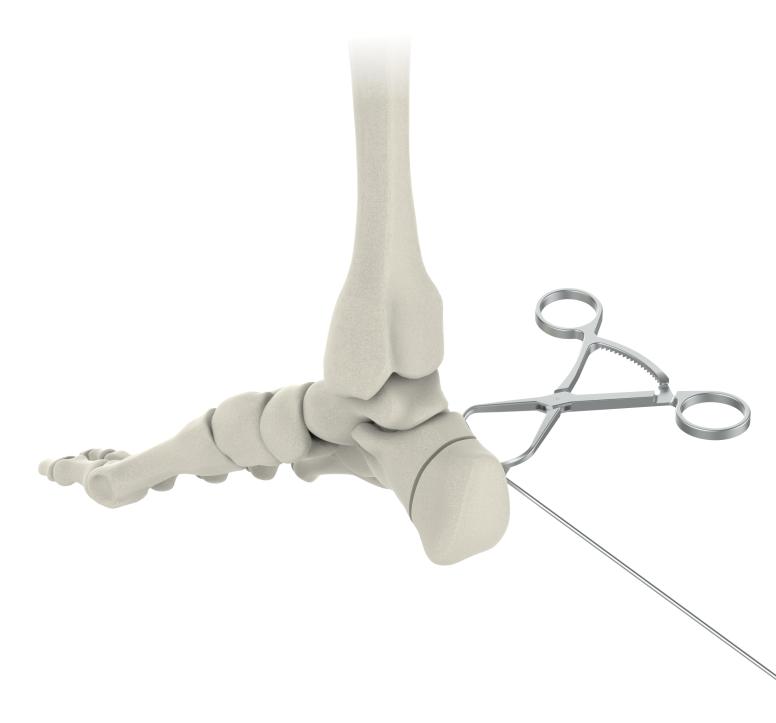
Use an Osteodrive Power Tool to make a perpendicular osteotomy cut on the calcaneus. Avoid using the saw to complete the cut through the medial cortex to prevent damage to the medial neurovascular structures.



#### **Fracture Reduction and K wire Fixation:**

Use the (7-096-23) Reduction Forcep with Point for Headless Screw to reduce the fracture and hold the osteotomy in place. Pass the K wire through the other tip of reduction forcep. Hold the calcaneal body laterally.

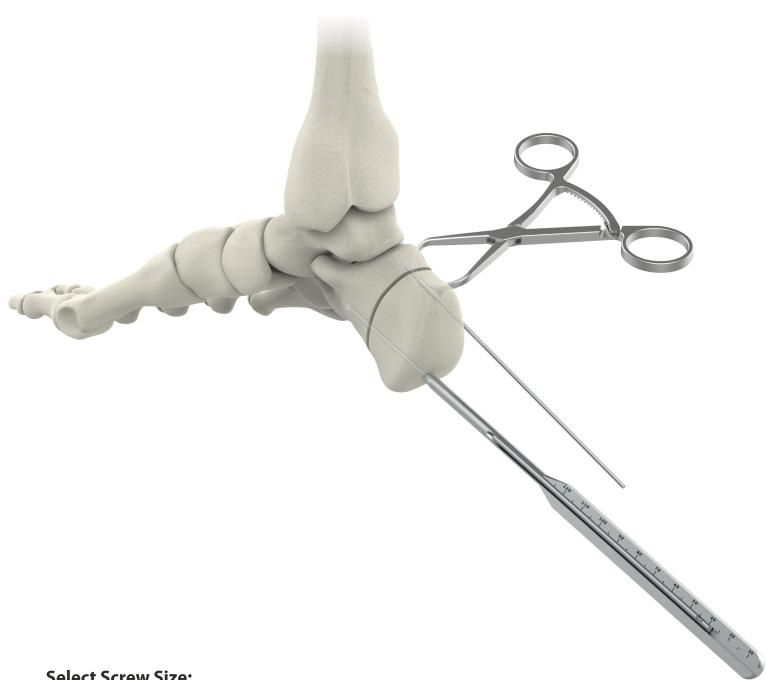
Confirm the placement of the guide pins using fluoroscopy. Note: The Guide for K Wire 2.4mm (7-097-11) can be helpful for guide wire placement.





#### **Measure Depth:**

Use the Auxein Depth Gauge (7-097-17) to measure the depth from the exposed portion of the Kirschner Wire 02.4mm x Length 240mm (7-097-16).



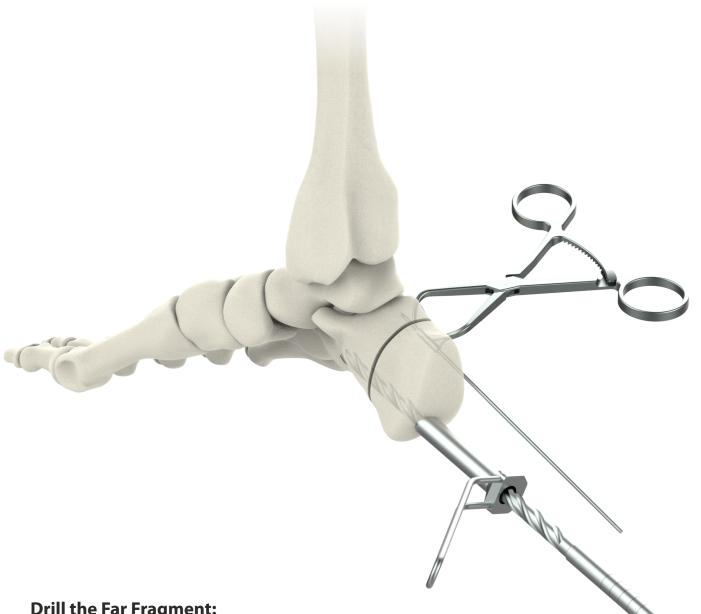
#### **Select Screw Size:**

To account for countersinking and compression, it is common to select a screw one size shorter (5.5mm) than the measured depth. Advance the Kirschner Wire 02.4mm x Length 240mm (7-097-16) approximately 5.5mm to maintain distal pin fixation before drilling. Warning: Take care not to compromise joint surfaces when advancing the guide wire.



#### **Drill the Near Cortex:**

Place the 6.5 mm Sleeve (7-097-24) over the Kirschner Wire 02.4mm x Length 240mm (7-097-16) and open the near cortex using the Cannulated Drill Bit 6.5mm, 100-120mm (7-097-14).



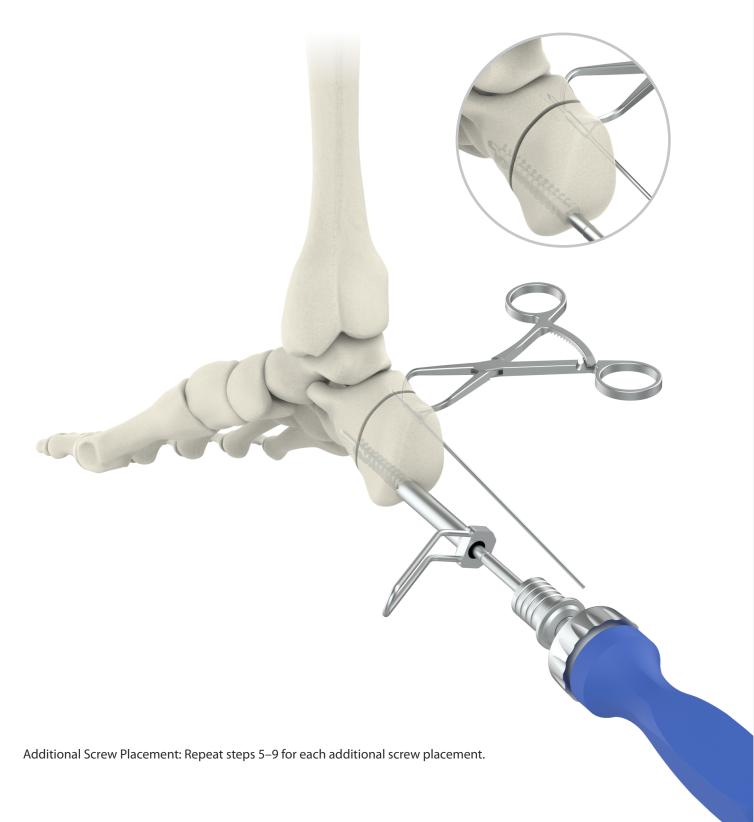
#### **Drill the Far Fragment:**

With the 4.7mm Sleeve (7-097-22) in place, drill into the far fragment using the Cannulated Drill Bit 6.5mm, 100-120mm (7-097-14). Refer to the markings on the drill to ensure the desired depth. Note: The long drill is recommended to account for varying bone density and distraction during screw insertion. Caution: Advance the Cannulated Drill Bit 6.5mm, 100-120mm (7-097-14) slowly and with continuous irrigation to minimize heat build-up. Clean the drill periodically during the procedure for optimal performance.



#### **Screw Insertion:**

Insert the appropriate size 7.5mm Headless Cannulated Screw (13-026-XXXX) using the Cannulated Screwdriver, Hex 4.0mm (7-097-09). If resistance is encountered during insertion or if distraction occurs, stop, remove the screw, re-drill with the Cannulated Drill Bit 6.5mm, 100-120mm (7-097-14), and then re-insert the screw. Confirm the placement and length of the screw under fluoroscopy, ensuring that both the leading and trailing threads are within the bone. Finally, remove the guide wires.





#### **Multiple Screw Fixation**

Repeat the trailing steps to fix multiple screws in fragment depending on fracture.



2-5-3-5-4-0
Headless Screw
System



#### **Micro, 2.5mm Headless Cannulated Screw**

Length (mm)	Titanium
8	13-021-08TI
9	13-021-09TI
10	13-021-10TI
11	13-021-11TI
12	13-021-12TI
13	13-021-13TI
14	13-021-14TI
16	13-021-16TI
18	13-021-18TI
20	13-021-20TI
22	13-021-22TI
24	13-021-24TI
26	13-021-26TI
28	13-021-28TI
30	13-021-30TI



#### Mini, 3.5mm Headless Cannulated Screw

Length (mm)	Titanium
16	13-022-16TI
18	13-022-18TI
20	13-022-20TI
22	13-022-22TI
24	13-022-24TI
26	13-022-26TI
28	13-022-28TI
30	13-022-30TI



#### **Standard, 4.0mm Headless Cannulated Screw**

Length (mm)	Titanium
16	13-023-16TI
18	13-023-18TI
20	13-023-20TI
22	13-023-22TI
24	13-023-24TI
26	13-023-26TI
28	13-023-28TI
30	13-023-30TI
32	13-023-32TI
34	13-023-34TI







#### Micro, 2.5mm Headless Screw implant case



Length (mm)	Titanium	Unit
8	13-021-08TI	2
9	13-021-09TI	2
10	13-021-10TI	2
11	13-021-11TI	2
12	13-021-12TI	2
13	13-021-13TI	2
14	13-021-14TI	2
16	13-021-16TI	2
18	13-021-18TI	2
20	13-021-20TI	2
22	13-021-22TI	2
24	13-021-24TI	2
26	13-021-26TI	2
28	13-021-28TI	2
30	13-021-30TI	2

Mini, 3.5mm Headless Screw implant case



Length (mm)	Titanium	Unit
16	13-022-16TI	2
18	13-022-18TI	2
20	13-022-20TI	2
22	13-022-22TI	2
24	13-022-24TI	2
26	13-022-26TI	2
28	13-022-28TI	2
30	13-022-30TI	2

#### Standard, 4.0mm Headless Screw implant case



Length (mm)	Titanium	Unit
16	13-023-16TI	2
18	13-023-18TI	2
20	13-023-20TI	2
22	13-023-22TI	2
24	13-023-24TI	2
26	13-023-26TI	2
28	13-023-28TI	2
30	13-023-30TI	2
32	13-023-32TI	2
34	13-023-34TI	2

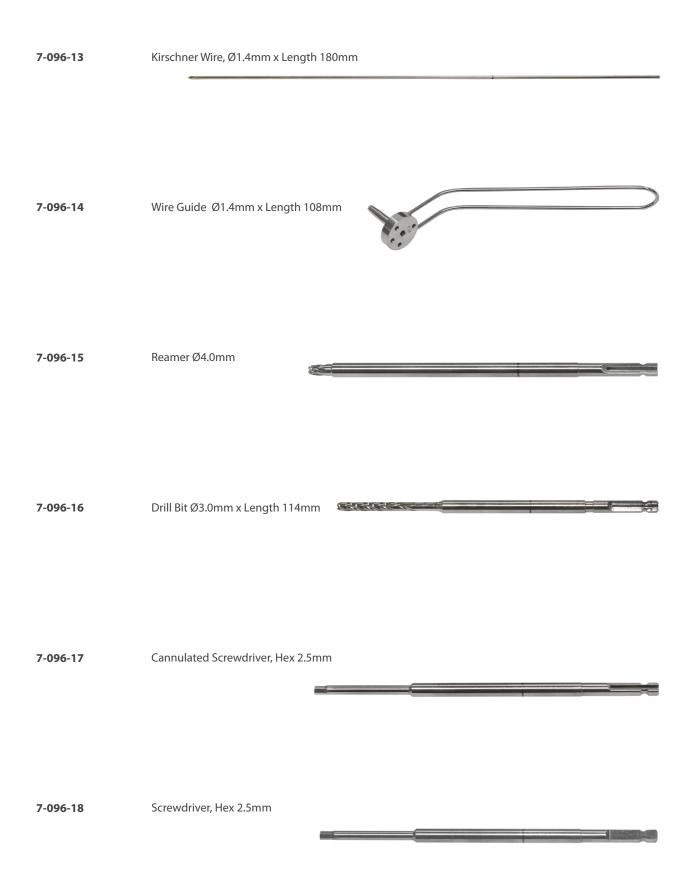


7-096-01	Kirschner Wire, Ø0.8mm x Length 147mm	n
7-096-02	Wire Guide, Ø0.8mm x Length 108mm	
7-096-03	Reamer Ø2.5mm	
7-096-04	Drill Bit Ø2.0mm x Length 89mm	
7-096-05	Cannulated Screwdriver, Hex 1.5mm	SW1.5
7-096-06	Screwdriver, Hex 1.5mm	



7-096-07	Kirschner Wire, Ø1.1mm x Length 153mm
7-096-08	Wire Guide, Ø1.1mm x Length 108mm
7-096-09	Reamer Ø3.5mm
7-096-10	Drill Bit Ø2.5mm Length 114mm
7-096-11	Cannulated Screw Driver, Hex 2.0mm
7-096-12	Screw Driver, Hex 2.0mm







Ratchet Handle with Quick Coupling 7-096-19 7-096-20 Plunger 7-096-21 Forcep Out Sleeve 7-096-22 7-096-23 Reduction Forcep with Point Depth Gauge for Headless Screw (2.5|3.5|4.0) 7-096-24



**7-096-25** Inner Sleeve



**7-096-26** 2.5mm Headless Cannulated Screw caddy



**7-096-27** 3.5mm Headless Cannulated Screw caddy



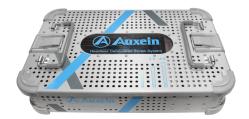
**7-096-28** 4.0mm Headless Cannulated Screw caddy



**7-096-29** Instrument Trays for 2.5, 3.5 & 4.0mm Headless Cannulated Screw Instrument Set



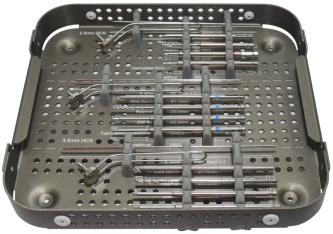
**7-096-30** Container for 2.5, 3.5 & 4.0mm Headless Cannulated Screw Instrument Set

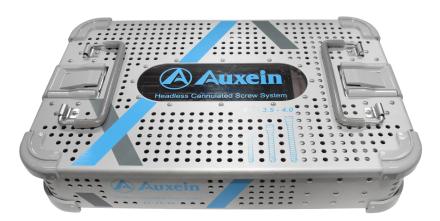




**7-096** 2.5, 3.5 & 4.0mm Headless Cannulated Screw Instrument Set











#### **7-096** 2.5, 3.5 & 4.0mm Headless Cannulated Screw Instrument Set

Code	Set Consisting of	Units
7-096-01	Kirschner Wire, Ø0.8mm x Length 147mm	2
7-096-02	Wire Guide, Ø0.8mm x Length 108mm	1
7-096-03	Reamer Ø2.5mm	1
7-096-04	Drill Bit, Ø2.0mm x Length 89mm	1
7-096-05	Cannulated Screwdriver, Hex 1.5mm	1
7-096-06	Screwdriver, Hex 1.5mm	1
7-096-07	Kirschner Wire, Ø1.1mm x Length 153mm	2
7-096-08	Wire Guide, Ø1.1mm x Length 108mm	1
7-096-09	Reamer Ø3.5mm	1
7-096-10	Drill Bit, Ø2.5mm x Length 114mm	1
7-096-11	Cannulated Screwdriver, Hex 2.0mm for Headless Screw	1
7-096-12	Screwdriver, Hex 2.0mm for Headless Screw	1
7-096-13	Kirschner Wire, Ø1.4mm x Length 180mm	2
7-096-14	Wire Guide, Ø1.4mm x Length 108mm	1
7-096-15	Reamer Ø4.0mm	1
7-096-16	Drill Bit, Ø3.0mm x Length 114mm	1
7-096-17	Cannulated Screwdriver, Hex 2.5mm for Headless Screw	1
7-096-18	Screwdriver, Hex 2.5mm	1
7-096-19	Ratchet Handle with Quick Coupling for Headless Screw	1
7-096-20	Plunger for Headless Screw	1
7-096-21	Forcep for Headless Screw	1
7-096-22	Out Sleeve for Headless Screw	1
7-096-23	Reduction Forcep with Point for Headless Screw	1
7-096-24	Depth Gauge for Headless Screw (2.5 3.5 4.0)	1
7-096-25	Inner Sleeve for Headless Screw	1
7-096-26	2.5mm Headless Cannulated Screw Caddy	1
7-096-27	3.5mm Headless Cannulated Screw Caddy	1
7-096-28	4.0mm Headless Cannulated Screw Caddy	1
7-096-29	Instrument Trays for 2.5, 3.5 & 4.0mm Headless Cannulated Screw Instrument Set	2
7-096-30	Container for 2.5, 3.5 & 4.0mm Headless Cannulated Screw Instrument Set	1

# 4.7mm-5.5mm-7.5mm Headless Screw System





#### **4.7mm Headless Cannulated Screw**

Length (mm)	Titanium
20	13-024-20TI
22	13-024-22TI
24	13-024-24TI
26	13-024-26TI
28	13-024-28TI
30	13-024-30TI
35	13-024-35TI
40	13-024-40TI
45	13-024-45TI
50	13-024-50TI



#### **5.5mm Headless Cannulated Screw**

Length (mm)	Titanium
25	13-025-25TI
30	13-025-30TI
35	13-025-35TI
40	13-025-40TI
45	13-025-45TI
50	13-025-50TI
55	13-025-55TI
60	13-025-60TI



#### 7.5mm Headless Cannulated Screw

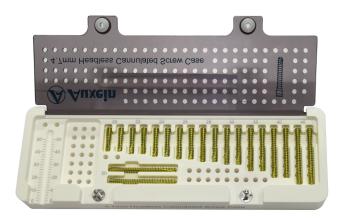
Length (mm)	Titanium
40	13-026-40TI
45	13-026-45TI
50	13-026-50TI
55	13-026-55TI
60	13-026-60TI
65	13-026-65TI
70	13-026-70TI
75	13-026-75TI
80	13-026-80TI
85	13-026-85TI
90	13-026-90TI
95	13-026-95TI
100	13-026-100TI
105	13-026-105TI
110	13-026-110TI
115	13-026-115TI
120	13-026-120TI







#### **4.7mm Headless Screw Implant Case**



Length (mm)	Titanium	Unit
20	13-024-20TI	2
22	13-024-22TI	2
24	13-024-24TI	2
26	13-024-26TI	2
28	13-024-28TI	2
30	13-024-30TI	2
35	13-024-35TI	2
40	13-024-40TI	2
45	13-024-45TI	2
50	13-024-50TI	2

#### **5.5mm Headless Screw Implant Case**



Length (mm)	Titanium	Unit
25	13-025-25TI	2
30	13-025-30TI	2
35	13-025-35TI	2
40	13-025-40TI	2
45	13-025-45TI	2
50	13-025-50TI	2
55	13-025-55TI	2
60	13-025-60TI	2

#### 7.5mm Headless Screw Implant Case



Length (mm)	Titanium	Unit
40	13-026-40TI	2
45	13-026-45TI	2
50	13-026-50TI	2
55	13-026-55TI	2
60	13-026-60TI	2
65	13-026-65TI	2
70	13-026-70TI	2
75	13-026-75TI	2
80	13-026-80TI	2
85	13-026-85TI	2
90	13-026-90TI	2
95	13-026-95TI	2
100	13-026-100TI	2
105	13-026-105TI	2
110	13-026-110TI	2
115	13-026-115TI	2
120	13-026-120TI	2



7-097-01	Cannulated Drill Bit Ø4.5mmx Length 160mm
	PARTICIPATION IN ID ID ID ID
7-097-02	Cannulated Drill Bit, Long Ø4.5mm x Length 200mm
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	distribution in the last is a last
7-097-03	K Wire Ø1.6mm x Length 240mm
	-
	:
7-097-04	Guide for K Wire Ø1.6mm
7-097-05	Cannulated Screwdriver, Hex 3.0mm
	E8/30 - CO
7-097-06	Screwdriver, Hex 3.0mm
. 377 30	
	- Sw5.0



7-097-07	Cannulated Drill Bit Ø5.2mm x Length 165mm	
7-097-08	Cannulated Drill Bit, Long Ø5.2mm x Length 200mm	
7-097-09	Cannulated Screwdriver, Hex 4.0mm	
7-097-10	Screwdriver, Hex 4.0mm	
	OW4-0	
7-097-11	Guide for K Wire Ø2.4mm	
7-097-12	Cannulated Drill Bit Ø6.5mm, 40-65mm	



7-097-13	Cannulated Drill Bit Ø6.5mm, 70-95mm
7-097-14	Cannulated Drill Bit Ø6.5mm, 100-120mm
7-097-15	Threaded Guide Pin Ø2.4mm x Length 240mm
7-097-16	K Wire Ø2.4mm x Length 240mm
7-097-17	Depth Gauge
7-097-18	Hook



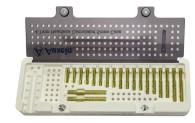
7-097-19	Reduction Forcep with Point	
7-097-20	Easy Out 3.0mm	
7-097-21	Easy Out 4.0mm	
7-097-22	4.7mm Sleeve	
7-097-23	5.5mm Sleeve	
7-097-31	6.5mm Sleeve	
7-097-24	Ratchet Handle with Quick Coupling	



**7-097-25** T-Handle with Quick Coupling



**7-097-26** 4.7mm Headless Cannulated Screw caddy



**7-097-27** 5.5mm Headless Cannulated Screw caddy



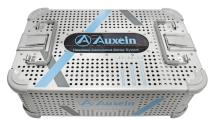
**7-097-28** 7.5mm Headless Cannulated Screw caddy



**7-097-29** Instrument Trays for 4.7, 5.5 & 7.5mm Headless Cannulated Screw Instrument Set

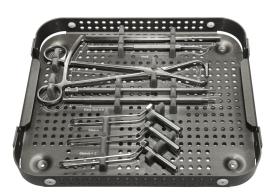


**7-097-30** Container for 4.7, 5.5 & 7.5mm Headless Cannulated Screw Instrument Set



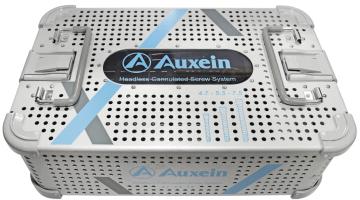


**7-097** 4.7, 5.5 & 7.5mm Headless Cannulated Screw Instrument Set













#### **7-097** 4.7, 5.5 & 7.5mm Headless Cannulated Screw Instrument Set

Code	Set Consisting of	Units
7-097-01	Cannulated Drill Bit, Ø4.5mm x Length 160mm	2
7-097-02	Cannulated Drill Bit, Long, Ø4.5mm x Length 200mm	2
7-097-03	Kirschner Wire, Ø1.6mm x Length 240mm	4
7-097-04	Guide for Kirschner Wire Ø1.6mm	1
7-097-05	Cannulated Screwdriver, Hex 3.0mm	2
7-097-06	Screwdriver, Hex 3.0mm	2
7-097-07	Cannulated Drill Bit, Ø5.2mm x Length 165mm	2
7-097-08	Cannulated Drill Bit, Long, Ø5.2mm x Length 200mm	2
7-097-09	Cannulated Screwdriver, Hex 4.0mm	1
7-097-10	Screwdriver, Hex 4.0mm	1
7-097-11	Guide for Kirschner Wire Ø2.4mm	1
7-097-12	Cannulated Drill Bit, Ø6.5mm, 40-65mm	2
7-097-13	Cannulated Drill Bit, Ø6.5mm, 70-95mm	2
7-097-14	Cannulated Drill Bit Ø6.5mm, 100-120mm	2
7-097-15	Threaded Guide Pin Ø2.4mm x Thread Length 8mm x Length 240mm	4
7-097-16	Kirschner Wire, Ø2.4mm x Length 240mm	4
7-097-17	Depth Gauge for Headless Screw (4.7 5.5 7.5)	1
7-097-18	Hook for Headless Screw	1
7-097-19	Reduction Forcep with Point	1
7-097-20	Easy Out 3.0mm	1
7-097-21	Easy Out 4.0mm	1
7-097-22	4.7mm Sleeve	1
7-097-23	5.5mm Sleeve	2
7-097-31	6.5mm Sleeve	1
7-097-24	Ratchet Handle with Quick Coupling	1
7-097-25	T-Handle with Quick Coupling for Headless Screw	1
7-097-26	4.7mm Headless Cannulated Screw Caddy	1
7-097-27	5.5mm Headless Cannulated Screw Caddy	1
7-097-28	7.5mm Headless Cannulated Screw Caddy	1
7-097-29	Instrument Trays for 4.7, 5.5 & 7.5mm Headless Cannulated Screw Instrument Set	3
7-097-30	Container for 4.7, 5.5 & 7.5mm Headless Cannulated Screw Instrument Set	1



#### USA

Auxein Inc. 1500 Nw 89th Court, Suite 205, Doral, Florida 33172 Tel: +1 305 395 6062 E Fax: +1 305 395 6262 Email: USoffice@auxein.com

#### **MEXICO**

Auxein México, S.A. de C.V.
Tepic 139 int 801, Colonia Roma Sur,
Alcaldía Cuauhtémoc, CDMX,
México, C.P. 06760
Tel: +521 55 7261 0318
Email: info@auxein.mx

#### INDIA

Auxein Medical Pvt. Ltd.
Plot No. 168-169-170, Phase-4,
Kundli Industrial Area,
HSIIDC, Sector-57, Sonepat - 131028, Haryana
Tel: +91 99106 43638 | Fax: +91 86077 70197
Email: info@auxein.com