

# Surgical Technique

*2.4mm Wise-Lock Distal Radius System*

# about us

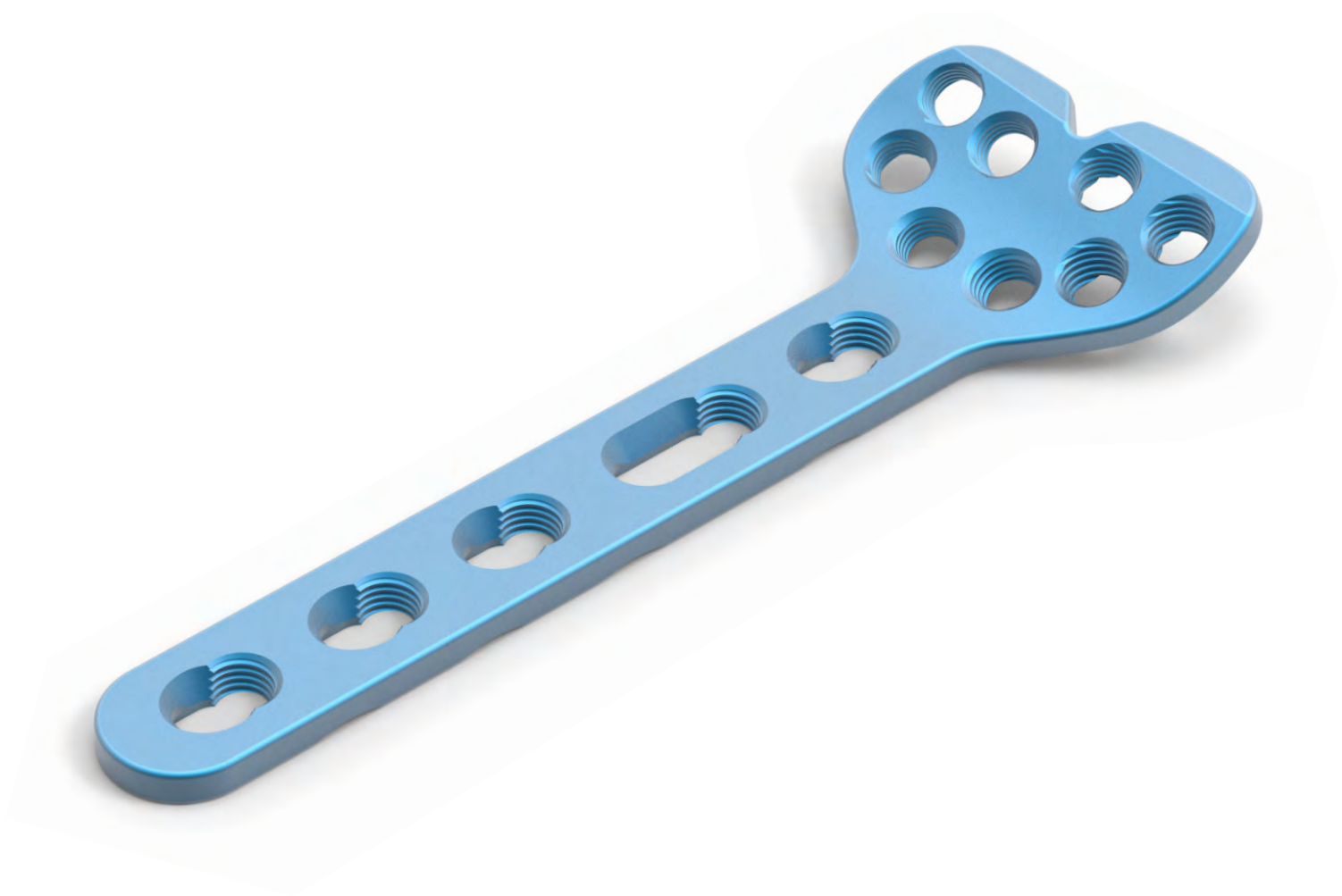
Auxein Medical is an integrated, research based, orthopaedic Implants & instruments manufacturing company, producing a wide range of quality, affordable generic implants, trusted by healthcare professionals and patients across geographies. It is the Company's constant endeavor to provide a wide basket 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.

## Our Achievements



## INTRODUCTION

The **AUXEIN MEDICAL'S** 2.4 mm Radius System (Wise-Lock) consists of variety of Bone plates & fixed angle Bone Screws. This system is a single use implantable device for long term duration (intended for continuous use for more than 30 days) contacting radius bone and its surrounding tissues.



**INDICATIONS:**

The Distal Radius Implants are intended for:

- Displaced extra-articular and intra-articular distal radius fractures and corrective osteotomies of the distal radius.
- Dorsally displaced fractures
- Extra-articular fractures with metaphyseal defect (AO classification 23-A3)
- Open joint reconstruction (AO classification 23-C1, C2, C3)
- Combination of distal radius with carpal and metacarpal Fractures
- Corrective osteotomies

**CONTRAINDICATIONS:**

Contraindications include but are not limited to:

- Infection, local to operative site
- Signs of local inflammation
- Morbid Obesity
- Severely comminuted fractures in which bone fractures are too small or numerous to fix or maintain a reduced position
- Metal sensitivity or intolerance
- Alcohol or drug addict
- Symptomatic Arthritis



## GENERAL TECHNIQUE

### Plate Selection And Contouring:

Plate selection is done according to the fracture pattern and contouring is done according to post reduction anatomy of distal radius. Fine bending of locking plates of Juxta-articular or extra-articular plates may be achieved using plate holder or threaded Drill guide.

### Precaution:

Care should be taken to avoid over-bending because the bending pin may become dislodged from the plate hole and damage the plate's threads

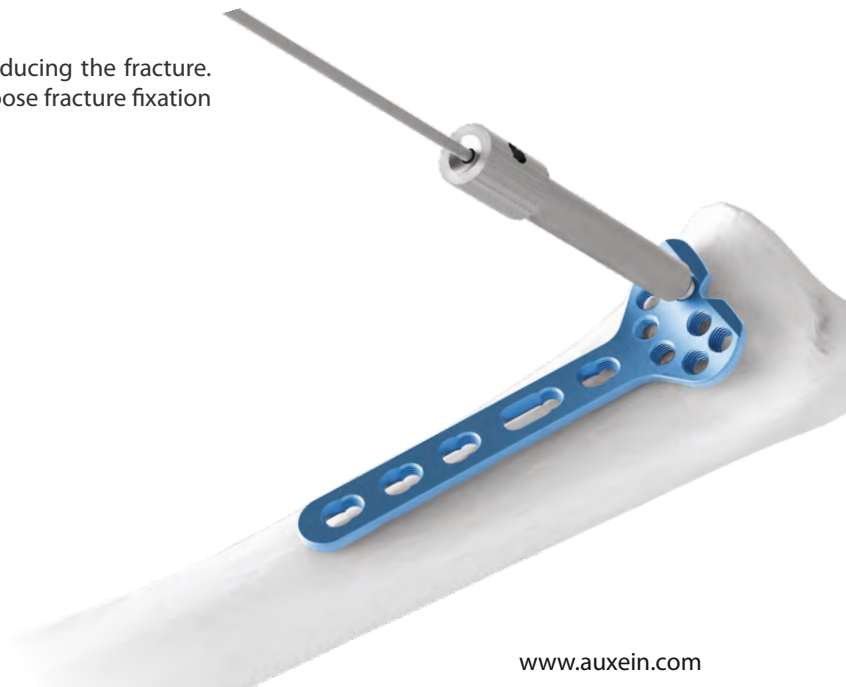


### Temporary Fixation:

Fracture reduction is done with traction and reduced because of ligamentotaxis. Plate is placed over fracture site (Dorsal/Volar) and temporary fixed with k-wire. K-wire can be placed through threaded drill guide

### Precaution:

care should be taken while inserting the k-wire and reducing the fracture. choose the appropriate diameter of k-wire. carefully choose fracture fixation approach dorsal or volar.



### Cortical Screw Insertion:

Standard cortical screws should be used first for fixation in the shaft. Locking screw in the head of plate gives an advantage to support articular surface and prevent loss of reduction by forming a fixed angle construct.

**Precaution:** Choose appropriate length of cortical screw. Excessive tightening is avoided.

**Drill bit insertion:** The flange on T handle is pushed away from the handle and the appropriate drill bit is inserted according to requirement. The flange is finally released to lock the drill bit in T handle.

**Precaution:** Choose the appropriate diameter of drill bit. Care should be taken while drilling to avoid excessive drilling.



### Predrill Screw Hole:

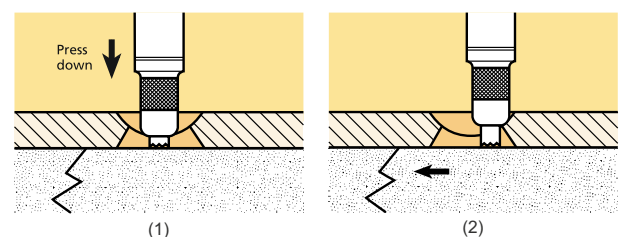
According to required screw, use appropriate Double drill guide 1.8/2.4 or 2.0/2.7 mm to predrill the hole for insertion of cortical screw. For 2.4mm cortical screw, 1.8mm drill bit is used for threaded hole while a 2.4mm drill bit is used for the gliding hole. Similarly for 2.7mm cortical screw, 2.0mm drill bit is used for threaded hole while a 2.7mm drill bit is used for the gliding hole.

**Precaution:** Selection of correct drill bit should be carefully chosen for the gliding hole.

The hole can be drilled at neutral or compression position according to requirement of the reduction as described below:

**1. Predrilling in neutral position:** The upper part of the inner sleeve of drill guide is depressed and is positioned in plate hole remote from the fracture as indicated by 1 in adjoining figure.

**2. Predrilling in compression position:** The upper part of the inner sleeve of drill guide is not depressed and is positioned in plate hole remote from the fracture as indicated by 2 in adjoining figure.



If required, the tap for both 2.4 and 2.7mm screws are available. These quick coupling taps can be inserted into the T handle and used to create screw thread pattern in the bone.



#### **Determining Screw length:**

For 2.4mm Screws, use Depth Gauge (5001-2.4) in the predrill hole to determine the screw length. Similarly for 2.7mm Screw, use Depth Gauge (5001-2.7) in the predrill hole to determine the screw length. Double drill guide is removed before inserting the depth gauge to measure the screw length.

**Precaution:** Care should be taken to choose appropriate length using depth gauge. Selection of excessive or too short screw length can create complications in bone healing as excessive length can lead to soft tissue irritation or damage.



#### **Screw Insertion:**

Depending on the screw head type, the Hexagonal head Screwdriver or the Star Head Screwdriver is used to pick and insert the cortical screw of appropriate determined length into the predrill hole.

**Precaution:** Care should be taken while screw insertion. Avoid excessive tightening as it can lead to screw breakage and recess deformation. And also improper tightening can lead to loosening of implant and irritation or soft tissue damage.



## WISE-LOCK SCREW INSERTION:

### Predrill Screw Hole:

For 2.4mm Wise-Lock screw, Threaded Drill guide 2.4 is used. The Threaded Drill guide is aligned with the trajectory of the threaded plate hole and the guide is approximately given a quarter counter-clockwise turn until the thread engages. Finally the guide is advanced clockwise until firmly seated. Drill bit of 1.8mm is inserted into the threaded drill guide to drill the hole for screw insertion.

**Precaution:** Selection of correct drill bit should be carefully chosen.

### Determining Screw Length:

As mentioned earlier, the appropriate Depth Gauge is used according to the diameter of the screw to measure the required screw length. The threaded drill guide is first removed before inserting the Depth Gauge to measure the desirable screw length.

**Precaution:** Care should be taken to choose appropriate length using depth gauge. Selection of excessive or too short screw length can create complications in bone healing.

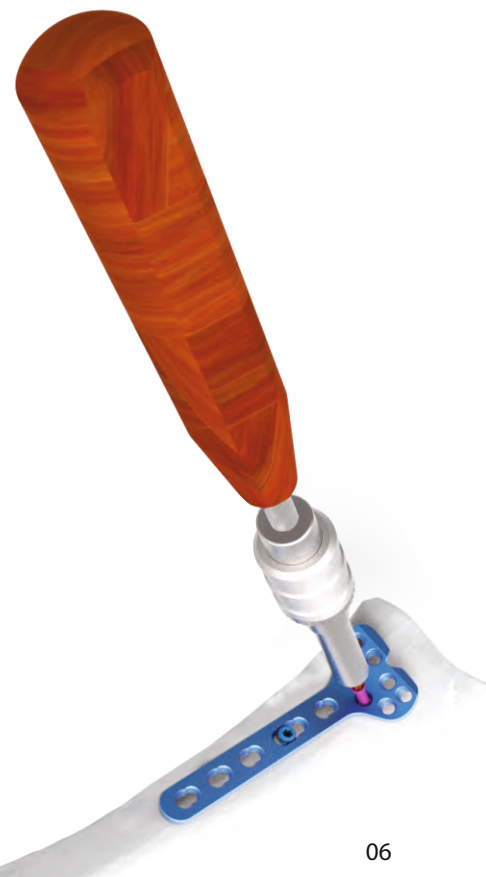


### Screw Insertion:

Depending on the screw head type, the Hexagonal head Screwdriver or the Star Head Screwdriver is used to pick and insert the wise lock screw of appropriate determined length into the predrill hole.

For picking and inserting screw, the holding sleeve flange is pulled towards the screwdriver handle and the screw is attached to the screwdriver. Now, the flange is release to lock the screw head into the screwdriver.

**Precaution:** Care should be taken while screw insertion. Avoid excessive tightening or loosening. Choose appropriate size torque limiter. For example 0.8Nm torque limiter for insertion of 2.4mm Wise-Lock screw, self-tapping (Star Head).





## SURGICAL APPROACH

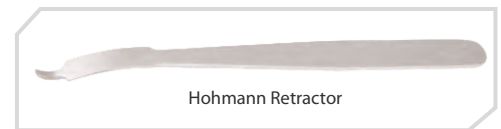
### Volar Plating Surgical Technique:

Primary is plate selection that depends upon fracture pattern and patient anatomy. Various Volar Plating options are available.

1. **Patient Positioning:** Patient is placed in supine position on an operating table. Forearm is rested on hand table in supinated position so that palm faces upwards
2. **Incision:** Begin the incision longitudinal just lateral to FCR (Flexor Carpi radialis) tendon. Superficial dissection is done between FCR tendon and radial artery that exposes pronator quadratus muscle. Detach pronator quadratus muscle from lateral aspect of distal radius towards ulna so that distal radius fracture is exposed. Leave the volar wrist capsule to avoid devascularisation and stability of volar wrist ligaments. After initial incision, the **Hohmann Retractor** is used to pull soft tissue away from the operative field and expose the bony tissues being operated on.
3. **Plate fixation:** The above mentioned General technique is used for plate fixation on the bone.



Volar Approach



Hohmann Retractor

### Dorsal Plating Surgical Technique:

Primary is plate selection that depends upon fracture pattern and patient anatomy. Various dorsal plating options are available.

1. **Patient Positioning:** Patient is placed in supine position on an operating table. Forearm is rested on hand table in supinated position so that the palm faces downwards.
2. **Incision:** Make a longitudinal incision 6-9 cm in length crossing wrist joint from the base of second metacarpal over listers tubercle. Open the extensor retinaculum over third compartment. Dissect the EPL (extensor pollicis longus) tendon and retract it. In deep dissection second and fourth dorsal compartment are elevated subperiosteally to preserve integrity of compartment. Continue to dissect towards radial border of DRUJ and on radial side. Dissect toward the brachioradialis tendon to place dorsoradial plate.
3. **Plate Fixation:** The above mentioned General technique is used for plate fixation on the bone.



Dorsal Approach

#### 2.4mm Wise-Lock Distal Radius Volar Plate, Extra-Articular, (5 Head Holes)

	Left Direction	Right Direction
Holes	Titanium	Titanium
3	TI-M12.03	TI-M13.03
5	TI-M12.05	TI-M13.05



#### 2.4mm Wise-Lock Distal Radius Volar Plate, Extra-Articular, (4 Head Holes)

	Left Direction	Right Direction
Holes	Titanium	Titanium
3	TI-M14.03	TI-M15.03
5	TI-M14.05	TI-M15.05



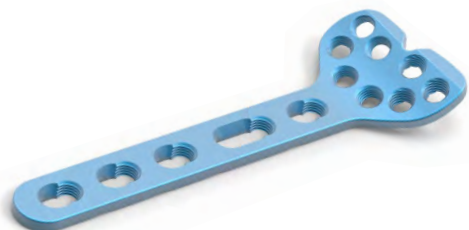
#### 2.4mm Wise-Lock Volar Buttress Plate, (5 Head Holes)

	Left Direction	Right Direction
Holes	Titanium	Titanium
3	TI-M11.03L	TI-M11.03R



#### 2.4mm Wise-Lock Volar Column Distal Radius Plate, (8 Head Holes)

	Left Direction	Right Direction
Holes	Titanium	Titanium
3	TI-759.103L	TI-759.103R
4	TI-759.104L	TI-759.104R
5	TI-759.105L	TI-759.105R



#### 2.4mm Wise-Lock Volar Column Distal Radius Plate (9 Head Holes)

	Left Direction	Right Direction
Holes	Titanium	Titanium
3	TI-759.203L	TI-759.203R
4	TI-759.204L	TI-759.204R
5	TI-759.205L	TI-759.205R



### 2.4mm Wise-Lock "L" Distal Radius Dorsal Plate, Oblique

	Left Direction	Right Direction
Holes	Titanium	Titanium
3	TI-M06.03	TI-M07.03
4	TI-M06.04	TI-M07.04



### 2.4mm Wise-Lock Distal Radius Volar Plate, Extra-Long, (4 Head Holes)

	Head with 4 Holes
Holes	Titanium
8	TI-M16.08
10	TI-M16.10
12	TI-M16.12



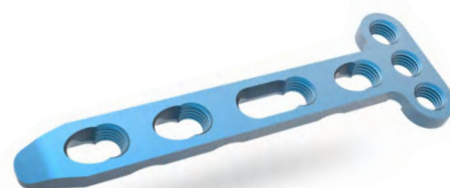
### Wise-Lock "T" Wrist Volar Plate

	Left Direction	Right Direction
Holes	Titanium	Titanium
3	6137/06	6136/06
4	6137/01	6136/01



### 2.4mm Wise-Lock "T" Distal Radius Dorsal Plate, (3 Head Holes)

Holes	Titanium
3	TI-M08.03
4	TI-M08.04



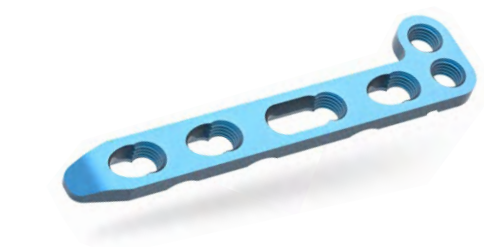
### 2.4mm Wise-Lock Distal Radius Dorsal Plate, Straight

Holes	Titanium
5	TI-M01.05
6	TI-M01.06



### 2.4mm Wise-Lock "L" Distal Radius Dorsal Plate, (2 Head Holes)

	Left Direction	Right Direction
Holes	Titanium	Titanium
3	TI-M02.03	TI-M03.03
4	TI-M02.04	TI-M03.04



### 2.4mm Wise-Lock "L" Distal Radius Dorsal Plate, (3 Head Holes)

	Left Direction	Right Direction
Holes	Titanium	Titanium
3	TI-M04.03	TI-M05.03
4	TI-M04.04	TI-M05.04



### 2.4mm Wise-Lock Distal Radius Volar Plate, (5 Head Holes)

	Left Direction	Right Direction
Holes	Titanium	Titanium
3	TI-M09.03	TI-M10.03
5	TI-M09.05	TI-M10.05



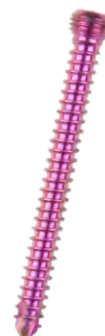
### 2.5mm Volar Screws, Self Tapping, Partial Thread

Length (mm)	Titanium
10	6152/11
12	6152/01
14	6152/02
16	6152/03
18	6152/04
20	6152/05
22	6152/06
24	6152/07
26	6152/08
28	6152/09
30	6152/10



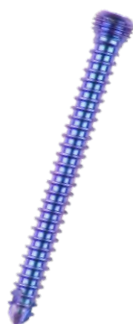
### 2.4mm Wise-Lock Screws, Self Tapping

Length (mm)	Titanium
6	TI-M17.06
8	TI-M17.08
10	TI-M17.10
12	TI-M17.12
14	TI-M17.14
16	TI-M17.16
18	TI-M17.18
20	TI-M17.20
22	TI-M17.22
24	TI-M17.24
26	TI-M17.26
28	TI-M17.28
30	TI-M17.30



### 2.5mm Volar Screws, Self Tapping, Full Thread

Length (mm)	Titanium
10	6151/10
12	6151/01
14	6151/02
16	6151/03
18	6151/04
20	6151/05
22	6151/06
24	6151/07
26	6151/08
28	6151/09
30	6151/11



### 2.4mm Cortical Screws, Self Tapping

Length (mm)	Titanium
6	TI-M18.06
8	TI-M18.08
10	TI-M18.10
12	TI-M18.12
14	TI-M18.14
16	TI-M18.16
18	TI-M18.18
20	TI-M18.20
22	TI-M18.22
24	TI-M18.24
26	TI-M18.26
28	TI-M18.28
30	TI-M18.30



### 2.0mm Peg Screws

Length (mm)	Titanium
10	6153/09
12	6153/10
14	6153/11
16	6153/01
18	6153/02
20	6153/03
22	6153/04
24	6153/05
26	6153/06
28	6153/07
30	6153/08



### 2.7mm Cortical Screws, Self Tapping

Length (mm)	Titanium
10	TI-103.210
12	TI-103.212
14	TI-103.214
16	TI-103.216
18	TI-103.218
20	TI-103.220
22	TI-103.222
24	TI-103.224
26	TI-103.226
28	TI-103.228
30	TI-103.230



## 2.4mm Wise-Lock Distal Radius Plate Set (Dorsal & Volar)

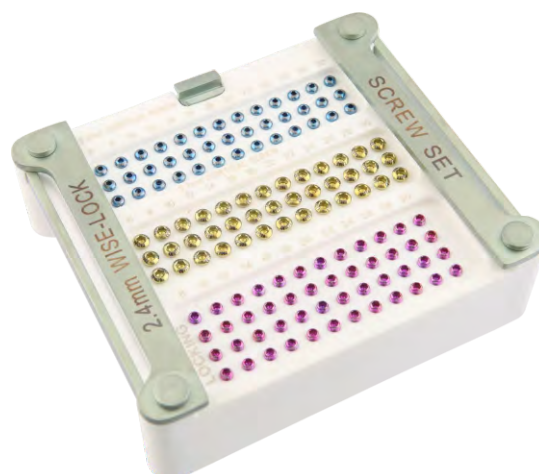


Dorsal



Volar

## 2.4mm Distal Radius Screw Set



## Instruments



### Double Drill Guide

Codes	Dia (mm)
3767-2.4	2.4/1.8
3767-2.7	2.7/2.0



### Drill Bit - Quick Coupling End

Codes	Dia (mm)	Length (mm)
2100-1.8-110	1.8	110
2100-2.4-100	2.4	100
2100-2.0-100	2.0	100
2100-2.7-100	2.7	100



1328.024

**2.4mm Screw Driver  
with Fiber Handle "Star drive"**



3406.02

**Hexagonal Screw Driver with  
Holding Sleeve, 2.0mm Tip**



### Depth Gauge

Codes	Description
5001-2.4	2.0 and 2.4mm Screws

### Threaded Drill Guide 2.4 for Drill Bit Ø 1.8mm



TDG-1.8

### Threaded Drill Guide 2.7 for Drill Bit Ø 2.0mm



TDG-2.7



### Tap

Codes	Dia (mm)
2104-010	2.4mm Screws
2104-01	2.7mm Screws



TQS-2.0

**Torque Screw Driver-  
2.0mm, 0.8Nm**



### Depth Gauge

Codes	Description
5001-2.7	2.7mm Screws





2107.000      **Reduction Forcep  
with Points**



5001-032      **Hohmann Retractor,  
Small 6mm**



2701.215      **Plate Holder**



2108.000      **Reduction Forcep,  
Serrated Jaw**



2149-1003      **Periosteal Elevator  
with Fibre Handle**



2107.00B      **Reduction Forcep,  
Bend Tip**



2139.000      **Sharp Hook**

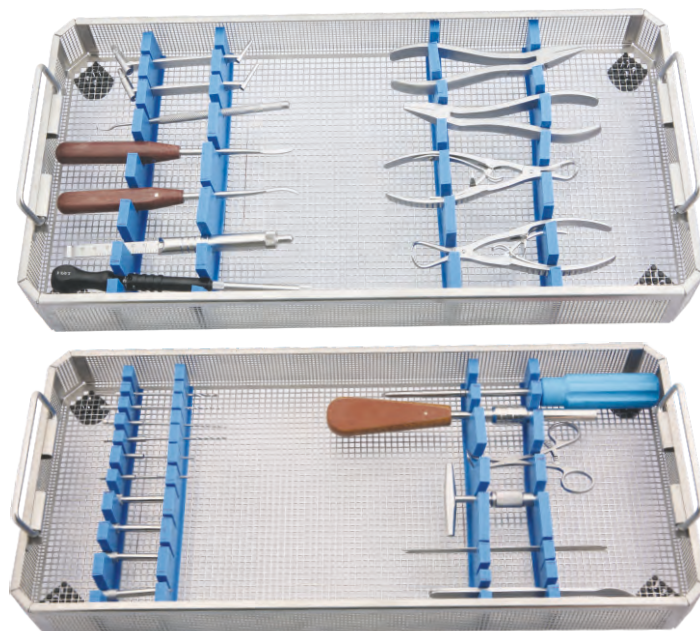


3402.000      **T-Handle Quick Coupling**



451-1.8-150      **Kirschner Wire Trocar Tip at Both End Ø1.8mm x 150mm**



**2300.000**
**2.4mm Wise-Lock Distal Radius Instrument Set**


Codes	Set consisting of:	Units
2100-1.8-110	Drill Bit Ø 1.8mm x 110mm, Quick Coupling	2
2100-2.4-100	Drill Bit Ø 2.4mm x 100mm, Quick Coupling	2
2100-2.0-100	Drill Bit Ø 2.0mm x 100mm, Quick Coupling	2
2100-2.7-100	Drill Bit Ø 2.7mm x 100mm, Quick Coupling	2
2104-010	Tap for Ø 2.4mm Screws, Quick Coupling	1
2104-01	Tap for Ø 2.4mm Screws, Quick Coupling	1
3767-2.4	Double Drill Guide 2.4/1.8	1
3767-2.7	Double Drill Guide 2.7/2.0	1
TDG-1.8	Threaded Drill Guide 2.4, for Drill Bit Ø1.8mm	2
TDG-2.7	Threaded Drill Guide 2.7, for Drill Bit Ø2.0mm	2
3402.000	T Handle with Quick Coupling	1
3406.02	Hexagonal Screw Driver with Holding Sleeve, 2.0mm Tip	1
1328.024	2.4mm Screw Driver with Fiber Handle "Star drive"	1
TQS-2.0	Torque Screw Driver - 2.0mm Tip, 0.8Nm	1
5001-2.4	Depth Gauge, for 2.0mm and 2.4mm Screws	1
5001-2.7	Depth Gauge, for 2.7mm Screws	1
2139.000	Sharp Hook	1
2107.000	Reduction Forcep with Points	1
2108.000	Reduction Forcep, Serrated Jaw	1
2149-1003	Reduction Forcep, Bend Tip	1
2107.00B	Plate Holder	2
2701.215	Periosteal Elevator, 3mm	1
5001-032	Hohmann Retractor, Small 6mm	1
451-1.8-150	Kirschner Wire Ø1.8mm x 150mm	5
A10.042	Container for 2.4mm Wise-Lock Distal Radius Instrument Set	1





#### **USA**

Auxein Inc.  
1500 Nw 89th Court, Suite 107-108  
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, Sonapat - 131028, Haryana  
Tel: +91 99106 43638 | Fax: +91 86077 70197  
Email: info@auxein.com