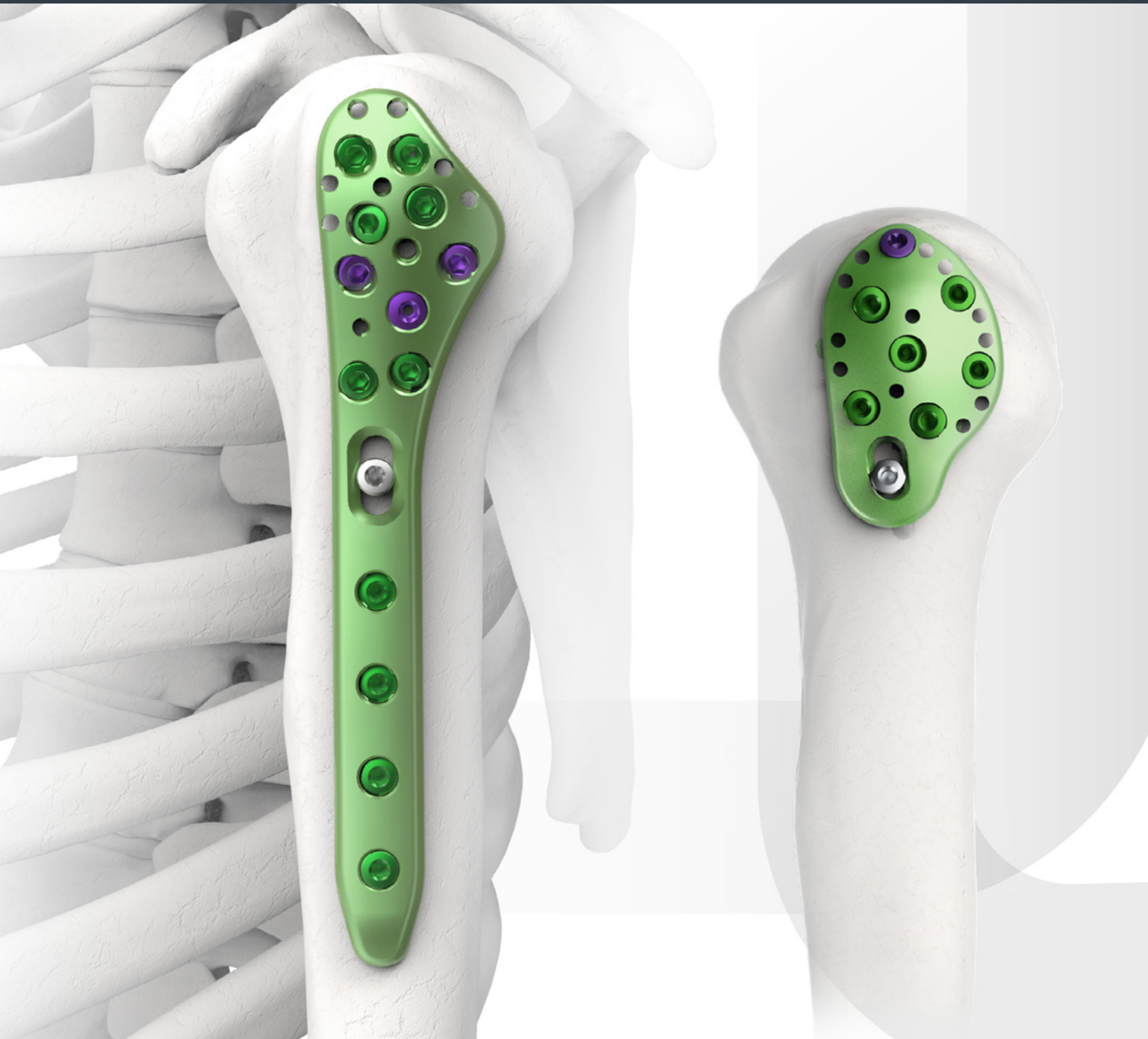


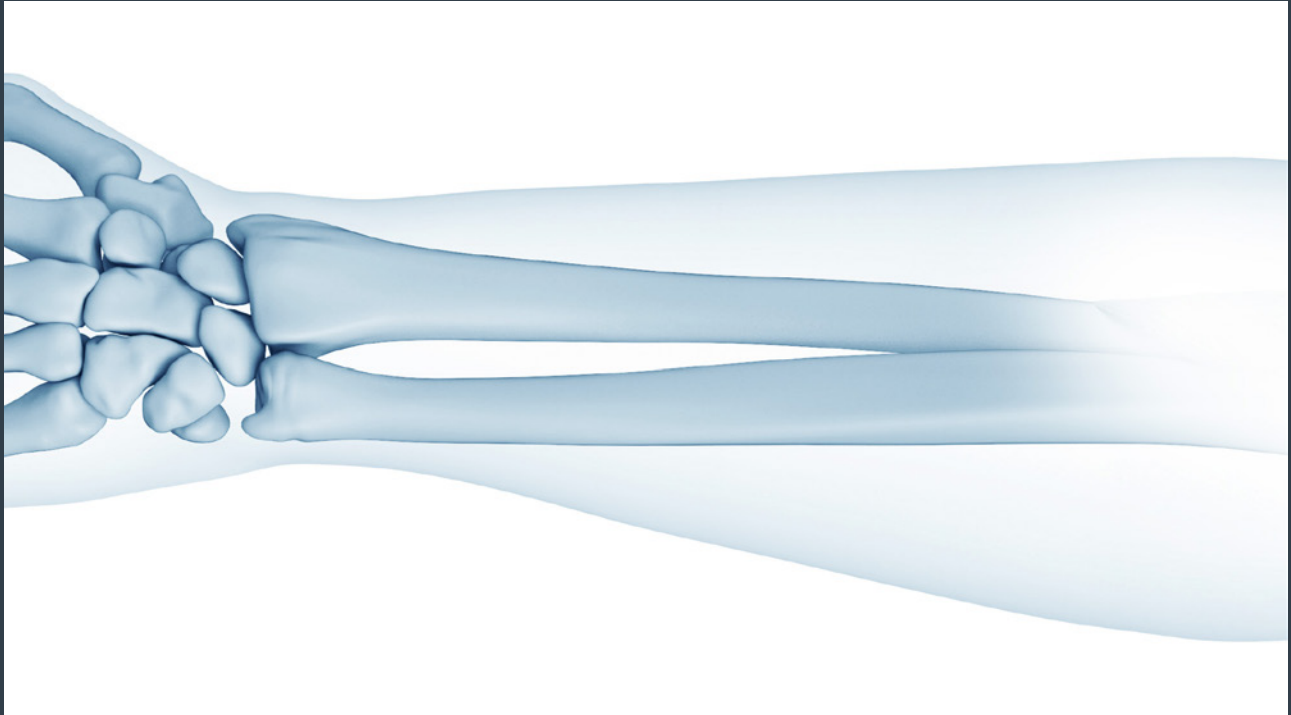
*summa*  
ortho **HUMERUS SYSTEM**

3.5 / 4.0 Proximal Humerus and Greater Tuberosity Plate



# Contents

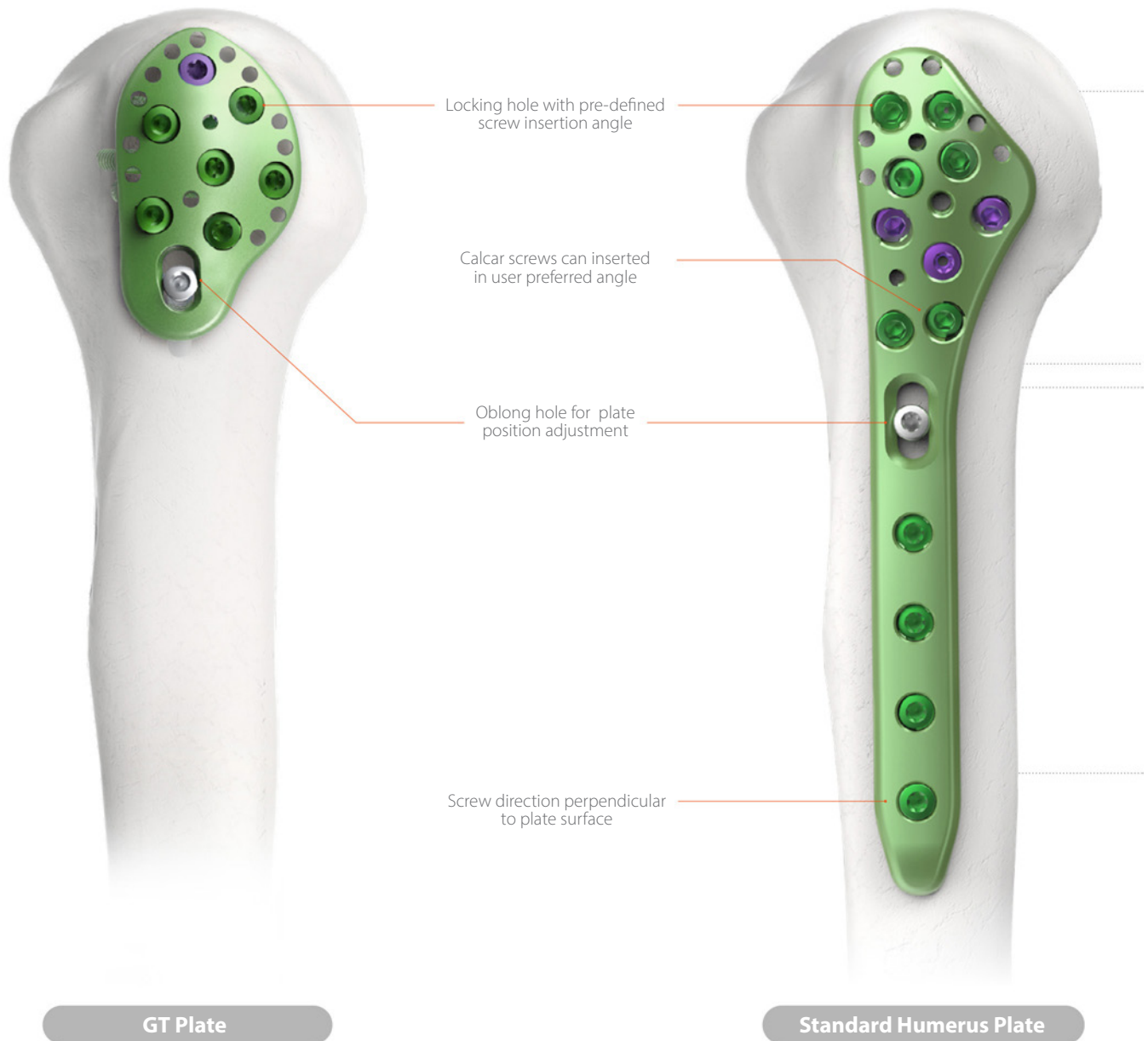
3	Indication
4	Overview
9	Surgical Technique
10	- Proximal Humeral Plate
14	- Greater Tuberosity Humeral Fracture Plate
	Ordering Information
18	- Plates
21	- Screws
24	- Instruments
27	Set Configuration



The **SUMMA Humerus System** is intended for fractures, fracture dislocations, osteotomies, and nonunions of the proximal humerus, particularly in osteopenic bone.

## SUMMA Humerus System

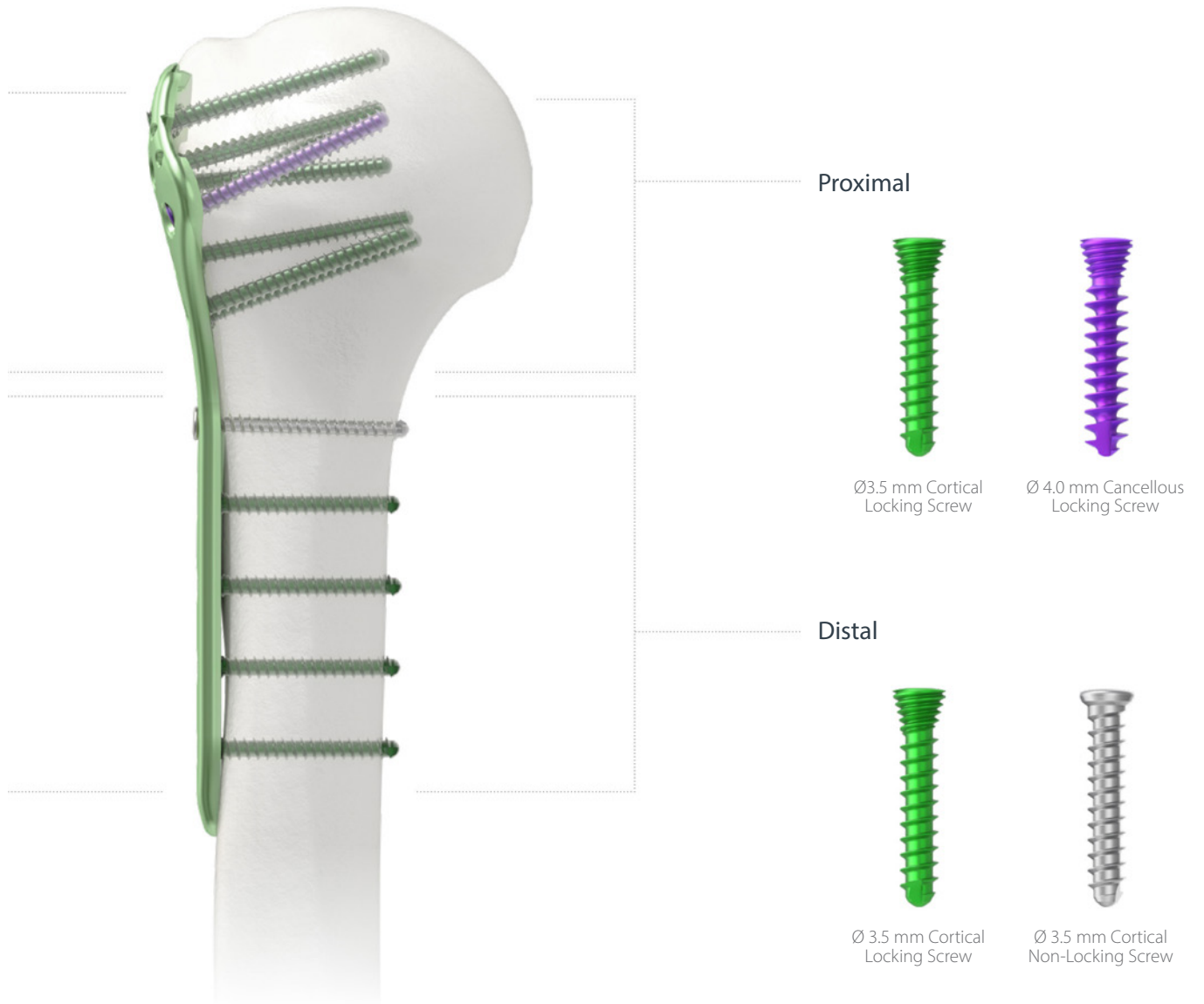
The SUMMA Humerus System is indicated for fractures, fracture dislocations, osteotomies and nonunions of the proximal humerus.



### Material

Unalloyed Titanium, ASTM F67

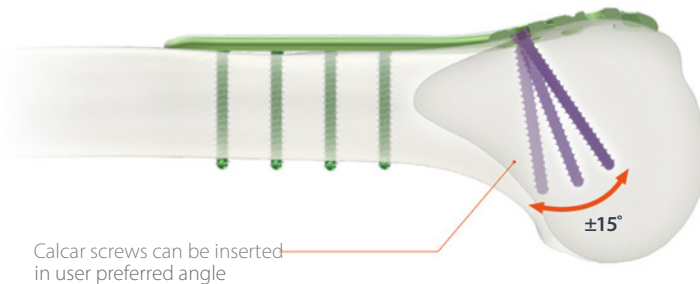
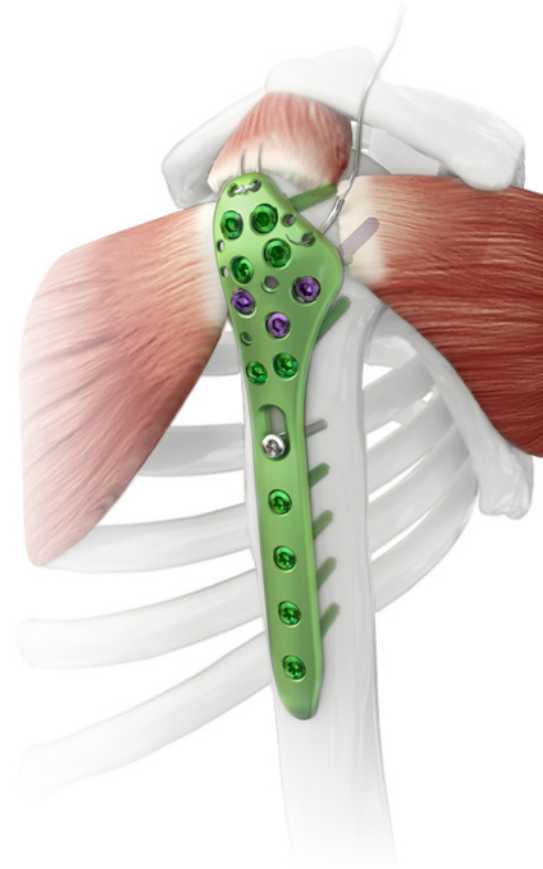
Ti-6Al-4V ELI Alloy, ASTM F136



## Proximal Humerus Plate

### General Features

- Anatomically Pre-contoured
- Variable Locking up to  $\pm 15^\circ$
- Left & Right Plate Variation for anatomical fitting
- Suture Holes & Grooves for Additional Suturing
- Plate Thickness 3.0mm & 4.0mm
- $\varnothing 3.5$  Cortical Locking Screw,  $\varnothing 3.5$  Cortical Non-locking Screw,  $\varnothing 4.0$  Cancellous Locking Screw



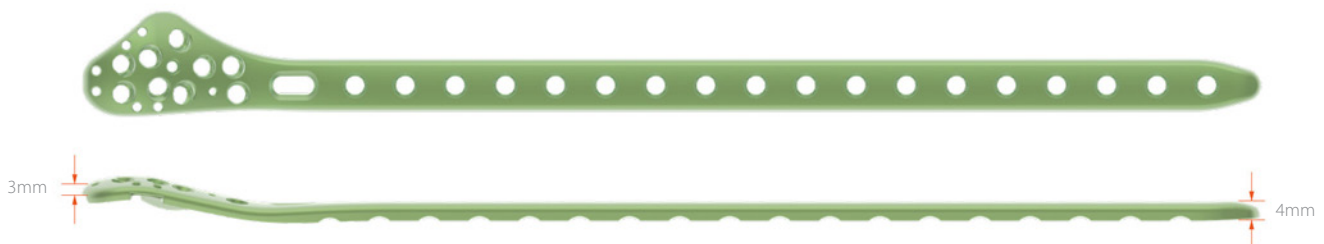
Calcar screws can be inserted in user preferred angle



Special designed grooves enable suturing after the complete screw insertion

### Special Feature for Long Type Plates (Optional, Thickness: 4mm)

- Limited Contact Design for Better Blood Supply
- Extra Long Plates available (3~19 Holes)
- Improved Plate Strength with Variable Plate Thickness

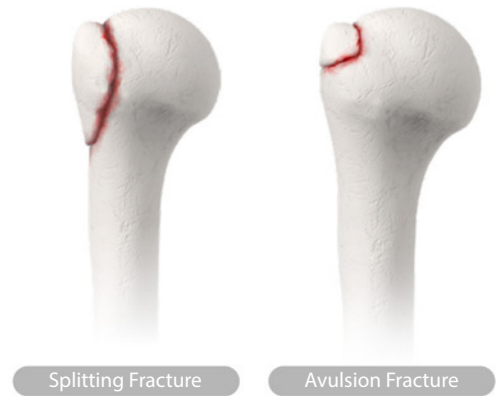




# Great Tuberosity Humeral Fracture Plate

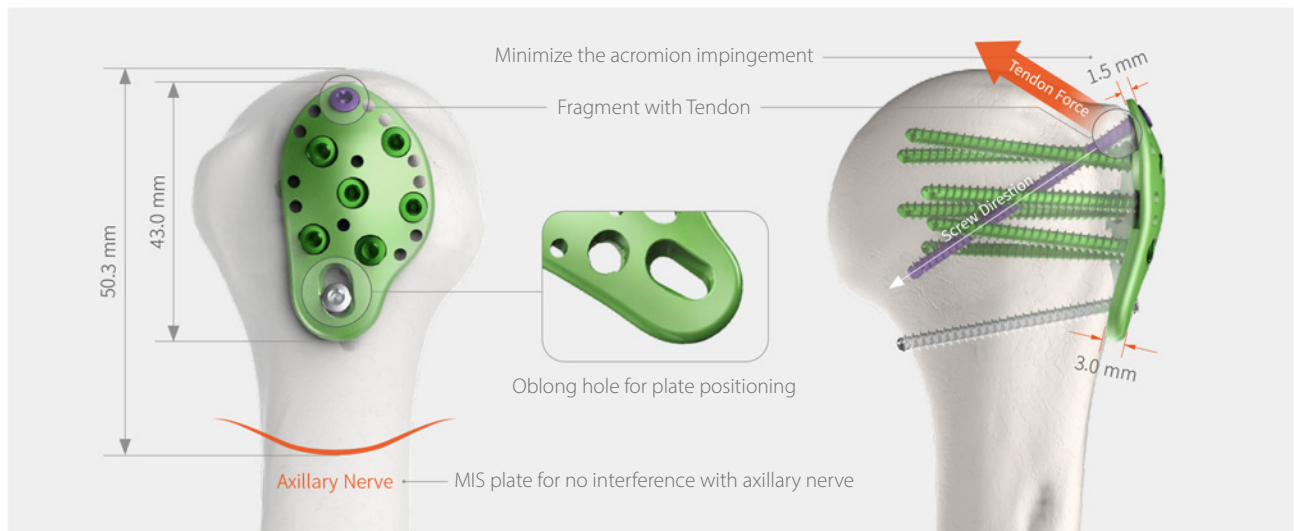
## Features

- Easy to restore the normal GT anatomy with stable fixation
- Provide to lessen deltoid damage using deltoid splitting approach
- Permits early range-of-motion exercises and preserves the integrity of the rotator cuff.
- More suture holes available
- Anatomically contoured tuberosity plating

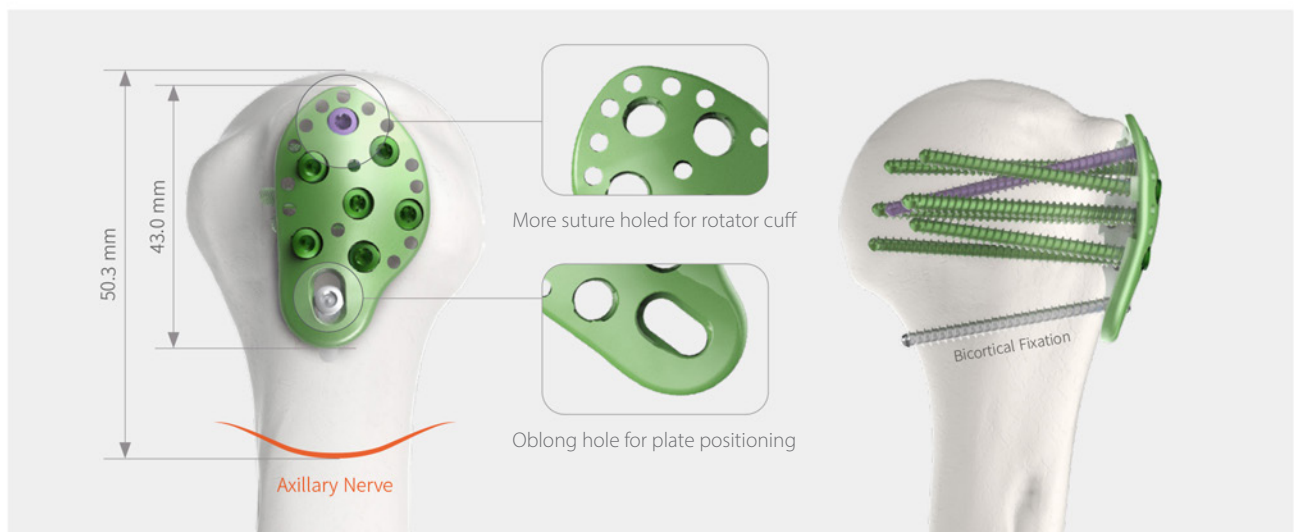


## Types of Plates

- Plate for Splitting Type



- Plate for Avulsion Type



## SUMMA Humerus System

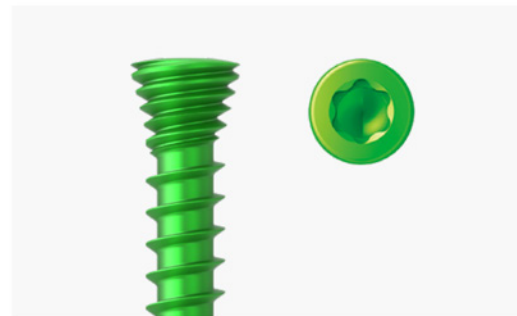
### Variable Locking Interface with Locking Screw

- Poly-axial Screw Insertion
- Angle range:  $\pm 15^\circ$
- Plate-Screw Locking Interface

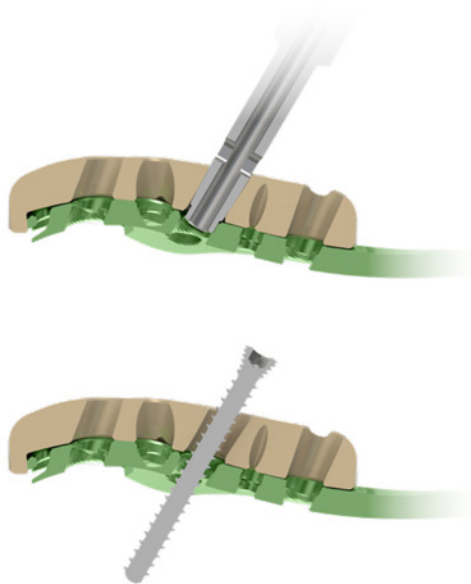


### STARIX Screw with T10

- Prevent Cam-out
- Allow Higher Torque Application
- Self-Retaining function
- Locking & Non-Locking Variations available



### Drill Guide Block for Optimal Screw Insertion



Drill guide block ensures optimal screw insertion angles



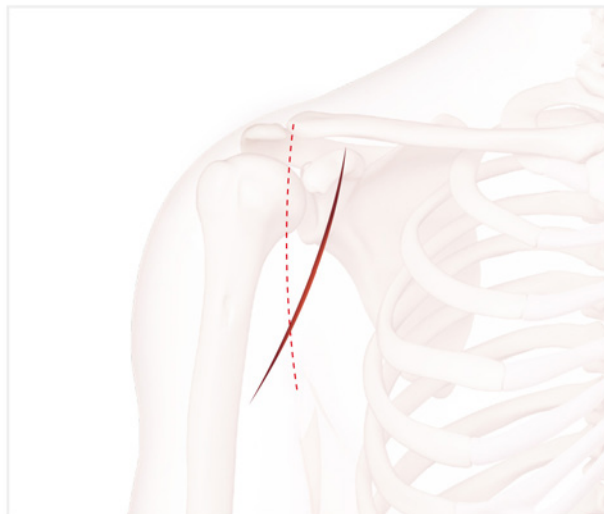




## Proximal Humerus Plate

### 1. Approach

The deltopectoral approach can be used for almost any proximal humeral fracture.



### 2. Fracture Reduction and Preliminary fixation

Fractures in proximal humerus represent various fracture types. Reduction can be performed by suturing or pure traction depending on the type of fracture. After fracture reduction, hold the reduction manually or with a pointed reduction forceps. Temporarily secure it with 2 K-wires.

**Note:** Ensure that K-wires do not interfere with correct plate placement.

#### Required Set



SUMMA Humerus System Kit  
112-172

### 3. Plate positioning and initial fixation

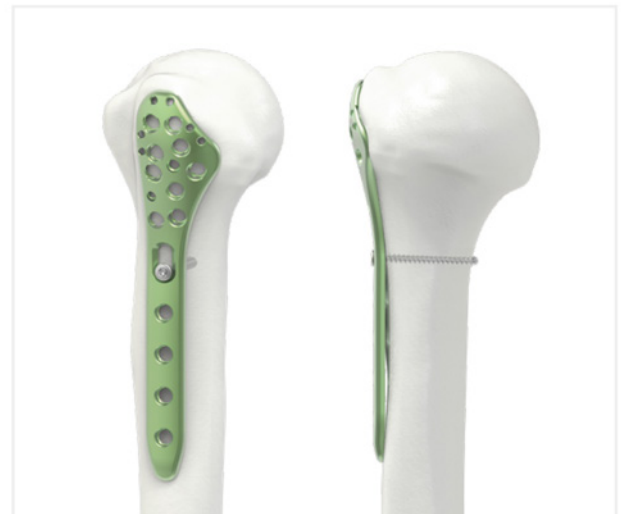
Place the plate in correct placement.

1. Align properly along the axis of the humeral shaft
2. More slightly posterior to the bicipital groove (2~4mm)

Place the drill guide (111-212) on the oblong hole in plate shaft for drilling.

Using a  $\varnothing 2.7$  drill bit (112-35-704), drill a hole with bi-cortical.

Attach the plate to the humeral shaft with a 3.5 mm cortical screw in the oblong hole.



**Note:** If necessary, assemble the drill sleeve handle(111-157) with a variable drill sleeve(111-172) for better visibility during operation.

#### Required Instruments



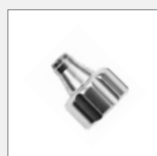
Drill Bit  
112-35-704



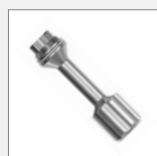
Drill Guide  
111-212



Depth Gauge  
111-181



Drill Sleeve  
111-172



Drill Sleeve Handle  
111-157

## Proximal Humerus Plate

### 4. Fixation

Attach the plate to the proximal humerus head & shaft with plate locking holes.

Several types of screw can be used in plate locking holes.

- Ø3.5 Locking Screw (35L-SO-LXX-TA)
- Ø3.5 Cortical Non-Locking Screw (35-SO-LXX-T)
- Ø4.0 Locking Cancellous Screw (40L-SA-XXX-TA)

The procedures can be used in the following methods.

Choose an appropriate drill sleeve between unidirectional sleeve (111-173) and variable angle sleeve (111-172) to drill holes. Do not drill through the subchondral bone and into the shoulder joint.

Measure hole depth and choose an appropriate screw to insert into the plate locking holes.

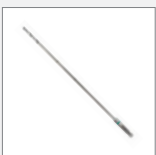


### Optional

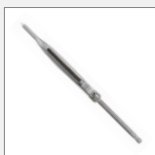
Use a drill guide block(111-175-L,R).

It makes the fastening and positioning of sleeve more convenient. Do not use the variable angle drill sleeve with drill guide block together.

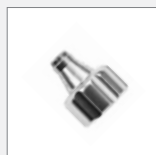
### Required Instruments



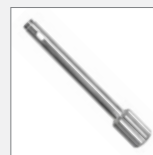
Drill Bit  
112-35-704



Depth Gauge  
111-181



Drill Sleeve  
111-172



Drill Sleeve  
111-173



Drill Sleeve Handle  
111-157



Drill Guide Block  
111-175-L



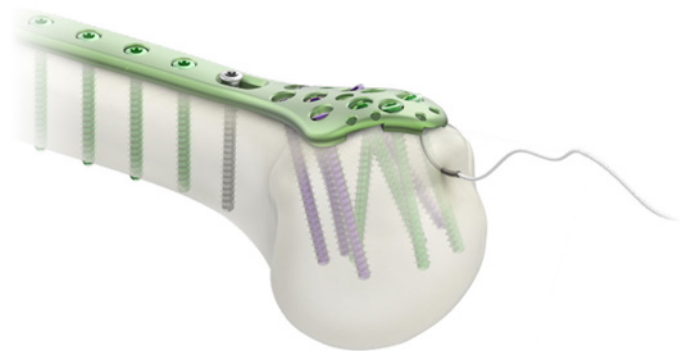
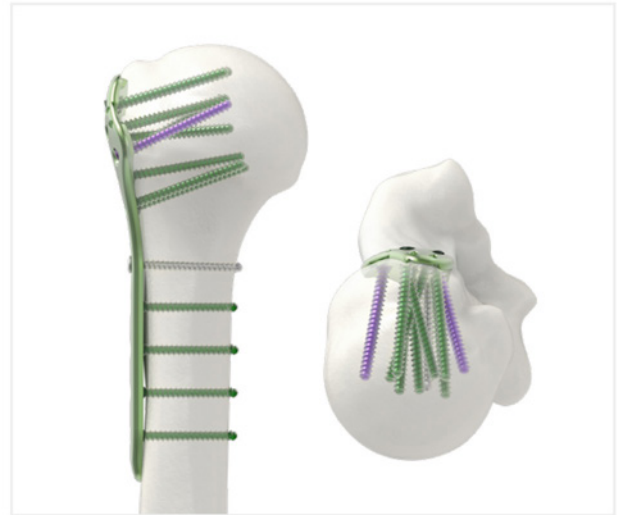
Drill Guide Block  
111-175-R

## 5. Suturing and Final check

Sutures placed through the insertions of each rotator cuff tendon increase stability.

Pass the sutures through the corresponding holes in the plate and tie them together.

Using image intensification, check carefully for correct reduction and fixation at various arm positions. Ensure that screw tips are not intraarticular.



## 6. Closure and Implant Removal

### Close Incision

Use the appropriate method for surgical closure of the incision.

### Implant Removal

To remove locking screws, first unlock all screws from the plate; then remove the screws completely from the bone.

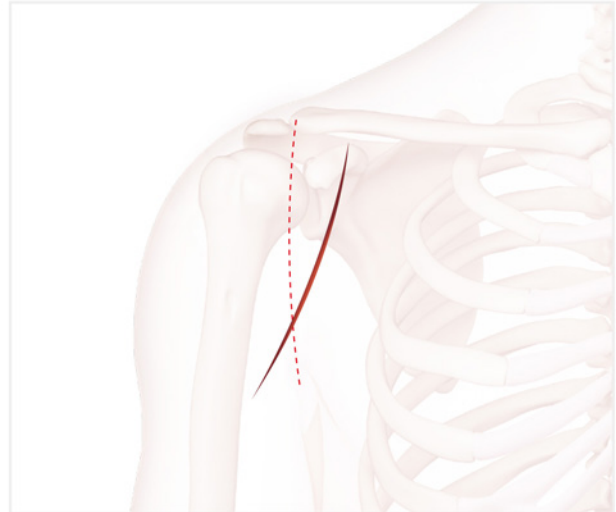
The last screw removed should be a non-locking screw on the shaft.

This is to make sure the plate does not spin when locking screws are removed.

## Greater Tuberosity Humeral Fracture Plate

### 1. Approach

The deltopectoral approach can be used for almost any proximal humeral fracture.



### 2. Fracture Reduction and Preliminary fixation

Use a small elevator, ball-spiked pusher or hook to reduce the fractured greater tuberosity and pushed it into its bed.

**Note:** Ensure that K-wires do not interfere with correct plate placement.

#### Required Set



SUMMA Humerus System Kit  
112-172



### 3. Guide pin fixation

After reduction is achieved, use the guide pins to fix the plate and the bone fragment.



### 4. Screw Insertion

Insert a non-locking screws bi-cortically for initial fixation of the plate.



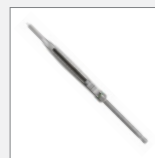
#### Required Instruments



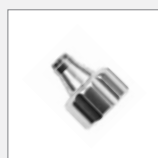
Drill Bit  
112-35-704



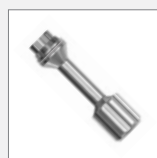
Drill Guide  
111-212



Depth Gauge  
111-181



Drill Sleeve  
111-172



Drill Sleeve Handle  
111-157

## Greater Tuberosity Humeral Fracture Plate

### 4. Screw Insertion (with Drill Sleeve)

Use a Drill Sleeve (111-173) for pre-defined angle of the screw.

It is highly recommended to use the Drill Sleeve to achieve the optimized angle of the screw insertion to resist against the rotator cuff tendon pulling.



### 5. Osteosynthesis

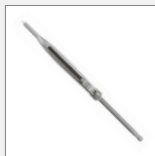
Once osteosynthesis is completed remove all Guide Pins and insert the rest of screws.



#### Required Instruments



Drill Bit  
112-35-704



Depth Gauge  
111-181



Drill Sleeve  
111-172



Drill Sleeve Handle  
111-157



Drill Sleeve  
111-173

## 5. Suturing and Final check

Sutures placed through the insertions of each rotator cuff tendon increase stability.

Pass the sutures through the corresponding holes in the plate and tie them together.

Using image intensification, check carefully for correct reduction and fixation at various arm positions. Ensure that screw tips are not intraarticular.



## 6. Closure and Implant Removal

### Close Incision

Use the appropriate method for surgical closure of the incision.

### Implant Removal

To remove locking screws, first unlock all screws from the plate; then remove the screws completely from the bone.

The last screw removed should be a non-locking screw on the shaft.

This is to make sure the plate does not spin when locking screws are removed.

## SUMMA Humerus System Plates

### Proximal Humerus Plates



35-PLHU-003-L



35-PLHU-004-L



35-PLHU-005-L

\* Illustrated scale 1:1

Code	Length	Width	Thickness	Color	Holes
35-PLHU-003-L	90 mm	24.5 mm	3.0 mm	Green	3
35-PLHU-004-L	102 mm	24.5 mm	3.0 mm	Green	4
35-PLHU-005-L	114 mm	24.5 mm	3.0 mm	Green	5



35-PLHU-003-L



35-PLHU-004-L



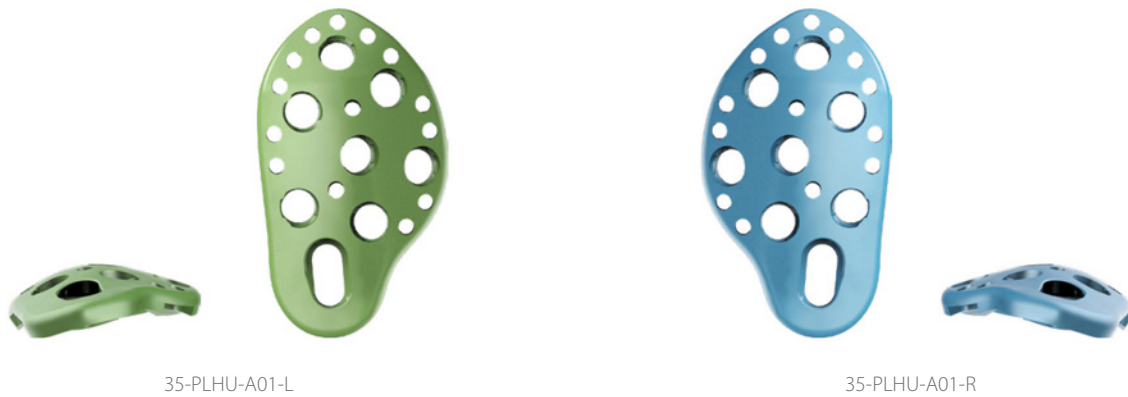
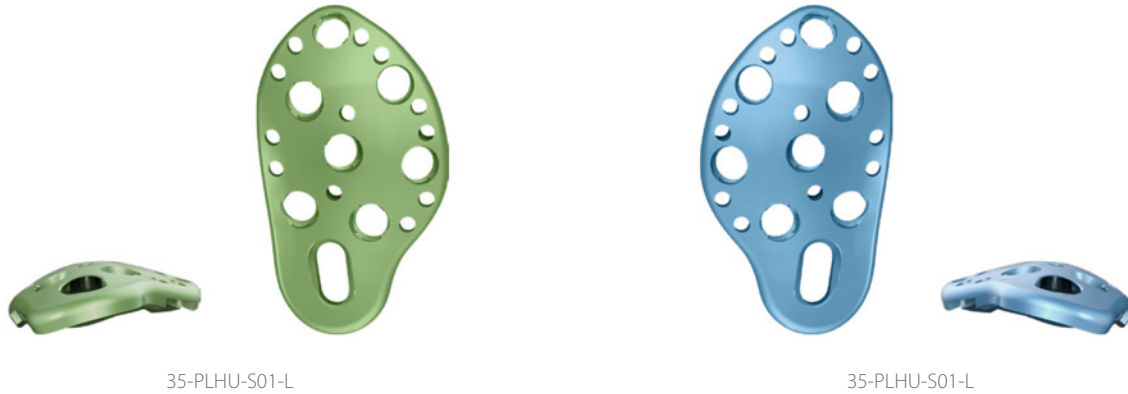
35-PLHU-005-L

\* Illustrated scale 1:1

Code	Length	Width	Thickness	Color	Holes
35-PLHU-003-R	90 mm	24.5 mm	3.0 mm	Blue	3
35-PLHU-004-R	102 mm	24.5 mm	3.0 mm	Blue	4
35-PLHU-005-R	114 mm	24.5 mm	3.0 mm	Blue	5

## SUMMA Humerus System Plates

### Greater Tuberosity Humeral Fracture Plates - Splitting & Avulsion Type



\* Illustrated scale 1:1

Code	Type	Length	Width	Thickness	Color	Holes
35-PLHU-S01-L	Splitting	42.3 mm	24.7 mm	3.0 mm	Green	8
35-PLHU-S01-R	Avulsion	42.3 mm	24.7 mm	3.0 mm	Green	8
35-PLHU-A01-L	Splitting	42.3 mm	24.7 mm	3.0 mm	Blue	8
35-PLHU-A01-R	Avulsion	42.3 mm	24.7 mm	3.0 mm	Blue	8



## SUMMA Humerus System Screws

### Ø 3.5 Cortical Locking Screws (STARIX)



Code	Length	Color	Set Quantity
35L-SO-L20-TA	20 mm	Green	5
35L-SO-L22-TA	22 mm	Green	5
35L-SO-L24-TA	24 mm	Green	5
35L-SO-L26-TA	26 mm	Green	5
35L-SO-L28-TA	28 mm	Green	5
35L-SO-L30-TA	30 mm	Green	10
35L-SO-L32-TA	32 mm	Green	10
35L-SO-L34-TA	34 mm	Green	10
35L-SO-L36-TA	36 mm	Green	10
35L-SO-L38-TA	38 mm	Green	10
35L-SO-L40-TA	40 mm	Green	10
35L-SO-L42-TA	42 mm	Green	5
35L-SO-L44-TA	44 mm	Green	5
35L-SO-L46-TA	46 mm	Green	5
35L-SO-L48-TA	48 mm	Green	5
35L-SO-L50-TA	50 mm	Green	5
35L-SO-L52-TA	52 mm	Green	5
35L-SO-L56-TA	56 mm	Green	5
35L-SO-L60-TA	60 mm	Green	5

### Ø 3.5 Cortical Non-Locking Screws (STARIX)



Code	Length	Color	Set Quantity
35-SO-L20-T	20 mm	Silver	5
35-SO-L22-T	22 mm	Silver	5
35-SO-L24-T	24 mm	Silver	5
35-SO-L26-T	26 mm	Silver	5
35-SO-L28-T	28 mm	Silver	5
35-SO-L30-T	30 mm	Silver	5
35-SO-L32-T	32 mm	Silver	5
35-SO-L34-T	34 mm	Silver	5
35-SO-L36-T	36 mm	Silver	5
35-SO-L38-T	38 mm	Silver	5
35-SO-L40-T	40 mm	Silver	5

## SUMMA Humerus System Screws

### Ø 4.0 mm Cancellous Locking Screws (STARIX)



<i>Code</i>	<i>Length</i>	<i>Color</i>	<i>Set Quantity</i>
40L-SA-020-TA	20 mm	Purple	5
40L-SA-022-TA	22 mm	Purple	5
40L-SA-024-TA	24 mm	Purple	5
40L-SA-026-TA	26 mm	Purple	5
40L-SA-028-TA	28 mm	Purple	5
40L-SA-030-TA	30 mm	Purple	10
40L-SA-032-TA	32 mm	Purple	10
40L-SA-034-TA	34 mm	Purple	10
40L-SA-036-TA	36 mm	Purple	10
40L-SA-038-TA	38 mm	Purple	10
40L-SA-040-TA	40 mm	Purple	10
40L-SA-042-TA	42 mm	Purple	5
40L-SA-044-TA	44 mm	Purple	5
40L-SA-046-TA	46 mm	Purple	5
40L-SA-048-TA	48 mm	Purple	5
40L-SA-050-TA	50 mm	Purple	5
40L-SA-052-TA	52 mm	Purple	5
40L-SA-056-TA	56 mm	Purple	5
40L-SA-060-TA	60 mm	Purple	5



## Instruments

### Drill Bits



Code	Description	Set Quantity
112-35-704	Drill Bits for Ø 3.5 mm, Ø 4.0 mm Screws, AO Type	2

### Drill Guide



Code	Description	Set Quantity
111-212	Drill Guide for Ø 3.5 mm, Ø 4.0 mm Screws, Fixed Angle	1

### Drill Guide Block



111-175-L



111-175-R

Code	Description	Set Quantity
111-175-L	Drill Guide Block, Left	1
111-175-R	Drill Guide Block, Right	1

### Drill Sleeve & Drill Sleeve Handle



111-173



111-172



111-157

Code	Description	Set Quantity
111-173	Drill Guide Block, Left	2
111-172	Drill Guide Block, Right	1
111-157	Drill Sleeve Handle	1

Driver



Code	Description	Set Quantity
113-HF-616	Driver for STARIX T10	2

Grasping Forceps



Code	Description	Set Quantity
114-009	Grasping Forceps	1

Screwdriver Handle



Code	Description	Set Quantity
111-063	Screwdriver Handle	2

Screwdriver Handle



Code	Description	Set Quantity
111-181	Depth Gauge for Ø 3.5 mm, Ø 4.0 mm Screws	1

## SUMMA Humerus System Instruments

### Guide Pin Dispenser & Guide Pin



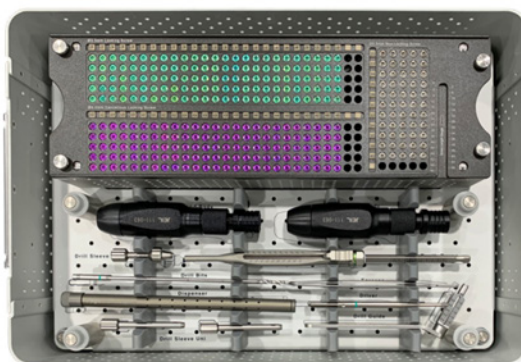
111-068-3



111-096

Code	Description	Set Quantity
111-068-3	Guide Pin Ø 1.6 mm	10
111-096	Guide Pin Dispenser	1

### Kit



Code	Description	Set Quantity
112-172	SUMMA Humerus System Kit	1



## Set Configuration

Humerus Plates			
No	Code	Description	Set Quantity
1	35-PLHU-003-L	Proximal Humeral, Left, 3T, 3H, Green, Length 90mm	2
2	35-PLHU-004-L	Proximal Humeral, Left, 3T, 4H, Green, Length 102mm	2
3	35-PLHU-005-L	Proximal Humeral, Left, 3T, 5H, Green, Length 114mm	2
4	35-PLHU-003-R	Proximal Humeral, Right, 3T, 3H, Blue, Length 90mm	2
5	35-PLHU-004-R	Proximal Humeral, Right, 3T, 4H, Blue, Length 102mm	2
6	35-PLHU-005-R	Proximal Humeral, Right, 3T, 5H, Blue, Length 114mm	4
7	35-PLHU-S01-L	GT, Splitting, Left, 3T, 8H, Green, Length 42.3mm	4
8	35-PLHU-A01-L	GT, Avulsion, Left, 3T, 8H, Green, Length 42.3mm	4
9	35-PLHU-S01-R	GT, Splitting, Right, 3T, 8H, Blue, Length 42.3mm	4
10	35-PLHU-A01-R	GT, Avulsion, Right, 3T, 8H, Blue, Length 42.3mm	4

Ø 3.5 mm Cortical Locking Screws			
No	Code	Description	Set Quantity
1	35L-SO-L20-TA	Ø 3.5 mm Cortical Locking Screw, Length 20 mm	5
2	35L-SO-L22-TA	Ø 3.5 mm Cortical Locking Screw, Length 22 mm	5
3	35L-SO-L24-TA	Ø 3.5 mm Cortical Locking Screw, Length 24 mm	5
4	35L-SO-L26-TA	Ø 3.5 mm Cortical Locking Screw, Length 26 mm	5
5	35L-SO-L28-TA	Ø 3.5 mm Cortical Locking Screw, Length 28 mm	5
6	35L-SO-L30-TA	Ø 3.5 mm Cortical Locking Screw, Length 30 mm	10
7	35L-SO-L32-TA	Ø 3.5 mm Cortical Locking Screw, Length 32 mm	10
8	35L-SO-L34-TA	Ø 3.5 mm Cortical Locking Screw, Length 34 mm	10
9	35L-SO-L36-TA	Ø 3.5 mm Cortical Locking Screw, Length 36 mm	10
10	35L-SO-L38-TA	Ø 3.5 mm Cortical Locking Screw, Length 38 mm	10
11	35L-SO-L40-TA	Ø 3.5 mm Cortical Locking Screw, Length 40 mm	10
12	35L-SO-L42-TA	Ø 3.5 mm Cortical Locking Screw, Length 42 mm	5
13	35L-SO-L44-TA	Ø 3.5 mm Cortical Locking Screw, Length 44 mm	5
14	35L-SO-L46-TA	Ø 3.5 mm Cortical Locking Screw, Length 46 mm	5
15	35L-SO-L48-TA	Ø 3.5 mm Cortical Locking Screw, Length 48 mm	5
16	35L-SO-L50-TA	Ø 3.5 mm Cortical Locking Screw, Length 50 mm	5
17	35L-SO-L52-TA	Ø 3.5 mm Cortical Locking Screw, Length 52 mm	5
18	35L-SO-L54-TA	Ø 3.5 mm Cortical Locking Screw, Length 54 mm	5
19	35L-SO-L60-TA	Ø 3.5 mm Cortical Locking Screw, Length 60 mm	5

Ø 3.5 mm Cortical Non-Locking Screws			
No	Code	Description	Set Quantity
1	35-SO-L20-T	Ø 3.5 mm Cortical Non-Locking Screw, Length 20 mm	5
2	35-SO-L22-T	Ø 3.5 mm Cortical Non-Locking Screw, Length 22 mm	5
3	35-SO-L24-T	Ø 3.5 mm Cortical Non-Locking Screw, Length 24 mm	5
4	35-SO-L26-T	Ø 3.5 mm Cortical Non-Locking Screw, Length 26 mm	5
5	35-SO-L28-T	Ø 3.5 mm Cortical Non-Locking Screw, Length 28 mm	5
6	35-SO-L30-T	Ø 3.5 mm Cortical Non-Locking Screw, Length 30 mm	5
7	35-SO-L32-T	Ø 3.5 mm Cortical Non-Locking Screw, Length 32 mm	5
8	35-SO-L34-T	Ø 3.5 mm Cortical Non-Locking Screw, Length 34 mm	5
9	35-SO-L36-T	Ø 3.5 mm Cortical Non-Locking Screw, Length 36 mm	5
10	35-SO-L38-T	Ø 3.5 mm Cortical Non-Locking Screw, Length 38 mm	5
11	35-SO-L40-T	Ø 3.5 mm Cortical Non-Locking Screw, Length 40 mm	5

Ø 4.0 mm Cancellous Locking Screws			
No	Code	Description	Set Quantity
1	40L-SA-020-TA	Ø 4.0 mm Cancellous Locking Screw, Length 20 mm	5
2	40L-SA-022-TA	Ø 4.0 mm Cancellous Locking Screw, Length 22 mm	4
3	40L-SA-024-TA	Ø 4.0 mm Cancellous Locking Screw, Length 24 mm	4
4	40L-SA-026-TA	Ø 4.0 mm Cancellous Locking Screw, Length 26 mm	4
5	40L-SA-028-TA	Ø 4.0 mm Cancellous Locking Screw, Length 28 mm	4
6	40L-SA-030-TA	Ø 4.0 mm Cancellous Locking Screw, Length 30 mm	4
7	40L-SA-032-TA	Ø 4.0 mm Cancellous Locking Screw, Length 32 mm	4
8	40L-SA-034-TA	Ø 4.0 mm Cancellous Locking Screw, Length 34 mm	4
9	40L-SA-036-TA	Ø 4.0 mm Cancellous Locking Screw, Length 36 mm	4
10	40L-SA-038-TA	Ø 4.0 mm Cancellous Locking Screw, Length 38 mm	4
11	40L-SA-040-TA	Ø 4.0 mm Cancellous Locking Screw, Length 40 mm	4
12	40L-SA-042-TA	Ø 4.0 mm Cancellous Locking Screw, Length 42 mm	4
13	40L-SA-044-TA	Ø 4.0 mm Cancellous Locking Screw, Length 44 mm	4
14	40L-SA-046-TA	Ø 4.0 mm Cancellous Locking Screw, Length 46 mm	4
15	40L-SA-048-TA	Ø 4.0 mm Cancellous Locking Screw, Length 48 mm	4
16	40L-SA-050-TA	Ø 4.0 mm Cancellous Locking Screw, Length 50 mm	4
17	40L-SA-056-TA	Ø 4.0 mm Cancellous Locking Screw, Length 56 mm	4
18	40L-SA-060-TA	Ø 4.0 mm Cancellous Locking Screw, Length 60 mm	4

Instruments			
No	Code	Description	Set Quantity
1	112-35-704	Drill Bits for Ø 3.5mm, Ø 4.0 mm Screws, AO Type	2
2	113-HF-616	Driver for STARIX T10	2
3	111-173	Drill Sleeve for Ø 3.5mm, Ø 4.0 mm Screws, Fixed Angle	2
4	111-172	Drill Sleeve for Ø 3.5mm, Ø 4.0 mm Screws, Variable Angle	1
5	111-175-R	Drill Guide Block, Right	1
6	111-175-L	Drill Guide Block, Left	1
7	114-009	Drill Guide Block, Right	1
8	111-212	Drill Guide for Ø 3.5mm, Ø 4.0 mm Screws, Fixed Angle	1
9	111-063	Screwdriver Handle	2
10	111-181	Depth Gauge for Ø 3.5mm, Ø 4.0 mm Screws	1
11	111-068-3	Guide Pin Ø1.6mm	10
12	111-096	Guide Pin Dispenser	1
13	112-172	SUMMA Humerus System Kit	1

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