maxx health

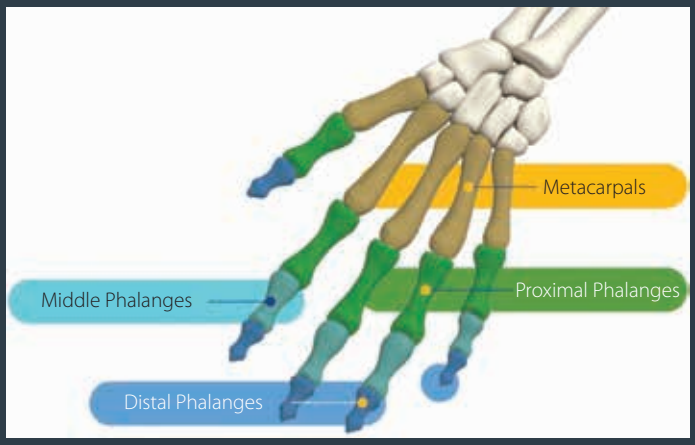
summa ortho

HAND SYSTEM

Surgical Guide

Contents

Indication



The SUMMA Hand System is intended for use in internal fixation of the bones of hand and wrist.

Examples of these procedures may include but are not limited to replantation, lag screw techniques, joint fusions, corrective osteotomies, and the treatment of fractures.

- Screw Size: 1.5mm, 1.8 mm, 2.0mm and 2.3mm
- Plate Thickness: 0.6mm, 1.0mm, 1.3mm
- Comprehensive plates and screws to treat full range of hand fractures Biocompatible titanium materials
- Color coded implants and instruments for quick identification

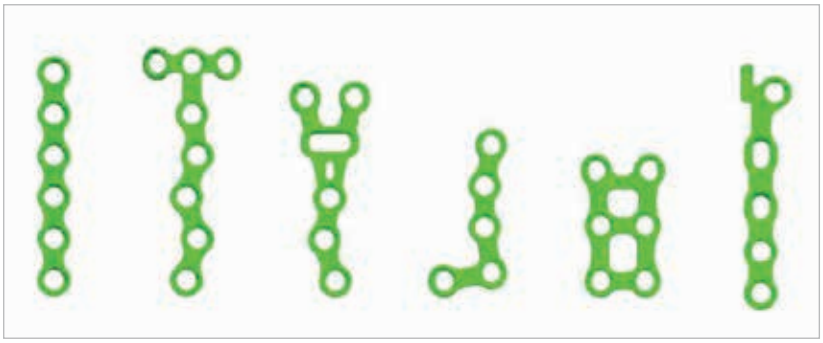
SUMMA Hand Plating System: H1 Locking System Specifications

PLATE			*SCREW*						
Thickness	*Color*	*Material*	*Outer Diameter*	*Length*	*Type*	*Emergency*	*Screwdriver to Screw Interface*	*Color*	*Material*
0.6	Green	Pure Titanium	Ø1.5	6~20	Locking Screw Cortical Screw	Ø1.8 Cortical Screw Length - 6,10	Cross head	Silver	Titanium Alloy

SUMMA Hand Plating System: H2 Locking System Specifications

PLATE			*SCREW*						
Thickness	*Color*	*Material*	*Outer Diameter*	*Length*	*Type*	*Emergency*	*Screwdriver to Screw Interface*	*Color*	*Material*
1	Blue	Pure Titanium	Ø2.0	6~20	Locking Screw	Ø2.3 Cortical Screw Length - 6,10	Hexa head	Silver	Titanium Alloy
1.3	Silver				Cortical Screw				

H1 Locking Plate System



Plate

Thin locking Plate

• 0.6mm thickness locking plate

New locking mechanism

• Offers better locking condition

• Offers variable angle locking technology

Pre contoured plate design

• Less bending / OR time

Less Soft tissue irritation

• Chamfered plate holes

• Rounded edges

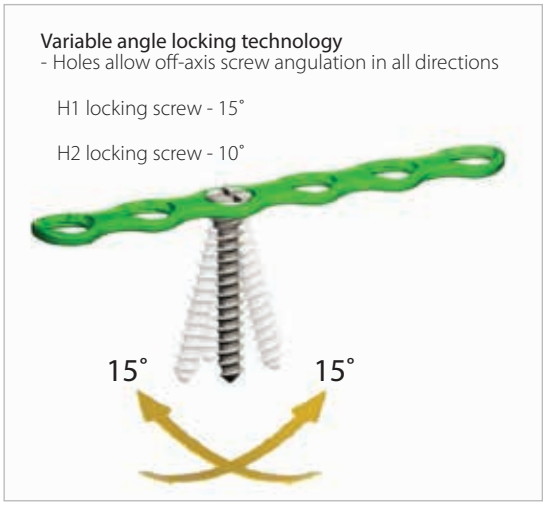
Offset plate holes

• Increased rotational stability

• Avoid collisions between screws

Rounded bending

• Every H1 plate is pre-contoured to improve anatomic fit



Screw

Self-retaining screwdriver shaft

• No necessity of holding sleeves

Low profile Screw Head

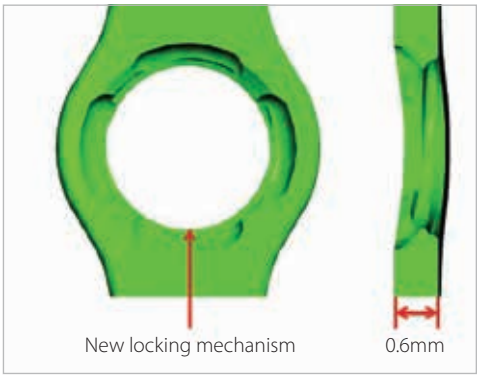
Blunt screw tip

Locking and non-locking screw options

• Holes accept both locking and non-locking (Cortical) screws

Variable locking technology

• Holes allow 15° off-axis screw angulation in all directions

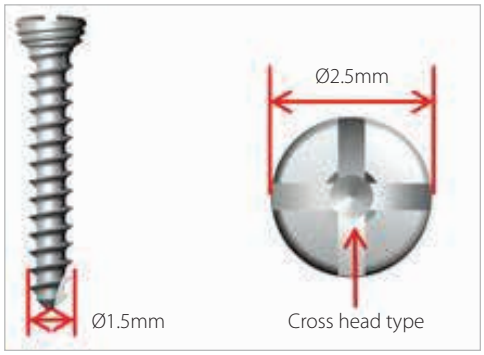


Instrument

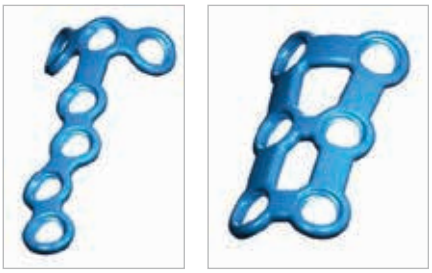
Combined plate bender/cutter

• Plate bender/cutter combines the functions of plate bending and cutting

• Plate bender is designed to minimize the deformation of plate holes



H2 Locking Plate System



Plate

Pre contoured plate design

• Less bending / OR time

Less Soft tissue irritation

• Chamfered plate holes

• Rounded edges

Offset plate holes

• Increased rotational stability

• Avoid collisions between screws

Rounded bending

• Every H2 plate is pre-contoured to improve anatomic fit

Screw

Self-retaining screwdriver shaft

• No necessity of holding sleeves

Low profile Screw Head

Blunt screw tip

Locking and non-locking screw options

• Holes accept both locking and non-locking (Cortical) screws

Variable locking technology

• Holes allow 10° off-axis screw angulation in all directions

Instrument

Combined plate bender/cutter

• Plate bender/cutter combines the functions of plate bending and cutting

• Plate bender is designed to minimize the deformation of plate holes

Surgical Technique

Surgical Technique – Straight plate systems (Locking)

Reduction

Indirect reduction by traction

If the fracture is not significantly displaced, reduction can be obtained by traction and flexion of the PIP joint exerted by the surgeon.

Confirm reduction using image intensification.

Often, these fractures are stable after reduction, in which case, non-operative treatment is indicated.

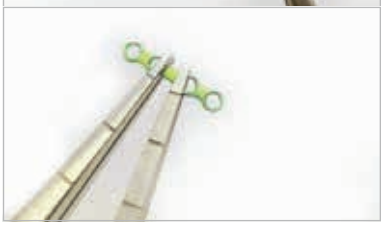
Direct reduction

Direct reduction is necessary when the fracture cannot be reduced by traction and flexion, or is unstable.

When indirect reduction is not possible, this is usually due to interposition of parts of the extensor apparatus.

Use two pointed reduction forceps for direct reduction.

Plate Positioning

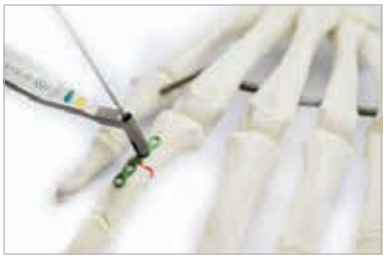


Select an appropriate plate for fractures/osteotomy site. If necessary, contour the plate to fit bone anatomically.

Position the plate over fracture or osteotomy site. If necessary, fix provisionally with K-wires.

Instruments	
Code	*Description*
111-024	Bender
114-009	Forceps

Drilling



Select appropriate drill guide.

Place the drill guide in the hole of the plate nearest fracture or osteotomy site. Drill a pilot hole in desired angle of screw trajectory.

Instruments	
Code	*Description*
112-15-702, 112-15-701-L	H1 locking drill bit
111-046	H1 locking drill guide
111-124 (Fixed), 111-125 (Variable angle)	H1 locking drill sleeve
112-20-701, 112-20-701-L	H2 locking drill bit
111-047	H2 locking drill guide
111-078 (Fixed), 111-079 (Variable angle)	H2 locking drill sleeve

Depth Measurement

Measure the depth of pilot hole with corresponding depth gauge to determine desired screw length.

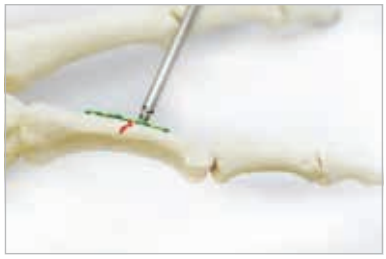
Instruments	
Code	*Description*
111-027	H1 locking Depth gauge
111-028	H2 locking Depth gauge

Select desired screw diameter and length. Verify screw length with gauge on block.

Instruments	
Code	*Description*
111-010	Hand body
113-NF-101	H1 locking Driver (Cross head)
113-HF-103	H2 locking Driver (Hexa head)

Fixation

Insert screw in the plate hole.



Insert additional screws in the remaining holes that require fixation.

Complete fixation

Complete the fixation with the insertion of a neutral fourth screw, after the fashion of the first two screws.

Appendix: Surgical Guide - Y-plate systems (Locking)

Reduction

Direct reduction

Direct reduction is necessary when the fracture cannot be reduced by traction and flexion, or is unstable because of surrounding soft-tissue lesions.

When indirect reduction is not possible, this is usually due to interposition of parts of the extensor apparatus.

Use two pointed reduction forceps for direct reduction.

Plate Positioning

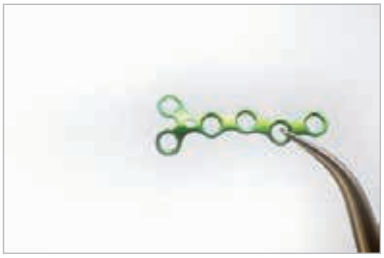
Bending and contouring the plate

The dorsal surface of the proximal phalanx is slightly convex. If the straight Y-plate is not adequately contoured to follow this convexity, tightening of the distal screw will open the fracture on its palmar aspect.

To overcome this, the plate is slightly over contoured so that when the distal load screw is tightened, compression is generated evenly over the whole fracture surface.

Instruments	
Code	*Description*
111-024	Bender
114-009	Forceps

Plate application



The plate is placed dorsally on the phalanx, as proximally as possible, without interfering with the joint.

Ensure that the plate is centered on the diaphysis in the coronal plane.

Drilling

Using a drill guide, carefully drill a first hole for a screw through the transverse part of the plate with a drill bit.

Repeat for the second hole in the transverse part.

Pitfall: Be sure not to injure the flexor tendons and digital artery and nerve.

Instruments	
Code	*Description*
112-15-702, 112-15-701-L	H1 locking drill bit
111-046	H1 locking drill guide
111-124 (Fixed), 111-125 (Variable angle)	H1 locking drill sleeve
112-20-701, 112-20-701-L	H2 locking drill bit
111-047	H2 locking drill guide
111-078 (Fixed), 111-079 (Variable angle)	H2 locking drill sleeve

Depth Measurement

Measuring

Use a depth gauge to determine screw length.

Instruments	
Code	*Description*
111-027	H1 locking Depth gauge
111-028	H2 locking Depth gauge

Fixation

Screw insertion (proximal)

Insert the first screw. Ensure that it engages the far cortex but does not protrude into the fibro-osseous flexor digital channel, where the flexor tendons run. The digital nerve and artery are also at risk of injury.

Insert a second screw into the opposite end of the transverse plate section after the same fashion, alternately tightening both screws.

Pitfall: bad plate adaptation

Check for perfect adaptation of the plate to the diaphysis and metaphysis. If it is not perfectly adapted, take out the screws and re-contour the plate to avoid fracture displacement, or malrotation.

Pitfall: Interfering screws

Conflict of the screws tips in the transverse part of the plate and joint penetration must be avoided.

Instruments	
Code	*Description*
111-010	Hand body
113-NF-101	H1 locking Driver (Cross head)
113-HF-103	H2 locking Driver (Hexa head)

Distal Screw insertion

Insert the distal screw eccentrically and tighten it, thereby compressing the fracture.

Prepare and insert another, more proximal diaphyseal screw in a neutral position.

Complete fixation

Complete the fixation with the insertion of all screws.

Appendix: Surgical Technique – Condylar plate systems

Reduction

Indirect reduction by traction

Reduction can be achieved by traction and flexion exerted by the surgeon, or by two pointed reduction forceps.

Confirm reduction under image intensification.

Often, these fractures are stable after reduction. In such cases, non-operative treatment is indicated.

Direct reduction

Direct reduction is necessary when the fracture cannot be reduced by traction and flexion, or is unstable.

When indirect reduction is not possible, this is usually due to interposition of parts of the extensor apparatus.

Use a pointed reduction forceps for direct reduction.

Plate Positioning

It is advised to use magnifying loupes for this step.

Plan the blade position as dorsal as possible to avoid injuring the collateral ligament.

Make sure that the plate is perfectly aligned with the long axis of the proximal phalanx in the lateral view.

Instrument	
Code	*Description*
114-009	Forceps

As the condylar plate has notches (like a reconstruction plate), it can also be curved on the flat to fit the curve of the phalanx.

Note

It is worth investing time in the precise contouring of the plate to the phalanx. Any imperfection in contouring will result in fracture displacement when the diaphyseal screws are tightened.

Instruments	
Code	*Description*
111-024	Bender

Drilling

To determine the position of the first drill hole for the blade, it can be helpful to turn the plate over and use it as a template.

Instruments	
Code	*Description*
112-15-702, 112-15-701-L	H1 locking drill bit
111-046	H1 locking drill guide
111-124 (Fixed), 111-125 (Variable angle)	H1 locking drill sleeve
112-20-701, 112-20-701-L	H2 locking drill bit
111-047	H2 locking drill guide
111-078 (Fixed), 111-079 (Variable angle)	H2 locking drill sleeve

Trim the plate

Adapt the plate length to fit the length of the proximal phalanx. Avoid sharp edges which may injure the tendons. There should be at least 3 plate holes distal to the fracture available for fixation in the diaphysis. At least two screws need to be inserted into the diaphysis.

Cut the blade transversely

If you cut the blade on the flat, it will compress and widen very slightly as it is cut. This makes its maximum width larger than 1.5mm and not fit in the 1.5mm hole that you have drilled.

Therefore, cut the blade on the edge to the correct length.

The resultant tip should be arrow-shaped.

Avoid dangerous edge

When cutting the plate, be very careful not to create a sharp dorsal edge that will endanger the extensor apparatus. Correct cutting will produce the sharp edge on the bone side of the plate.

Drilling

Drill a transverse hole through the condylar metaphysis of the proximal phalanx, adjacent to the subchondral bone.

The drill hole needs to be sufficiently dorsal to leave enough space for the plate hole adjacent to the blade.

Depth Measurement

Prepare the blade

Measure the length of the drill hole.

Cut the blade to the determined length, so that it just fills the drill hole.

Pitfall: Protrusion of the blade

Avoid protrusion of the blade through the opposite cortex, as it may result in friction during movement and eventual ligament injury.

Due to the fact that the phalanx is wider on the palmar side that on the dorsal side, an AP or PA x-ray view may suggest that the blade is fully contained within the bone, whereas in transverse section, it actually protrudes.

Instruments	
Code	*Description*
111-027	H1 locking Depth gauge
111-028	H2 locking Depth gauge

Fixation

Introduce the blade into the drill hole.

Gently push with the thumb until the plate is fully seated.

Align the plate with the diaphysis

Before inserting distal screw adjacent to the blade, ensure that the plate is in line with the phalangeal diaphysis in the lateral view by rotating it around the long axis of the blade.

Insert the distal screw

The distal screw is then inserted in a neutral position.

The screw should just engage the far cortex.

Note

Be careful to avoid screw protrusion, as ligament injury may result from friction during movement.

Instruments	
Code	*Description*
111-010	Hand body
113-NF-101	H1 locking Driver (Cross head)
113-HF-103	H2 locking Driver (Hexa head)

Drill eccentric proximal hole

Use drill bit to prepare the first diaphyseal screw hole at the proximal end of the plate.

This hole must be eccentrically drilled to produce axial compression.

Pitfall: loss of reduction

While tightening this second screw, a maladapted plate may cause rotational displacement and result in loss of reduction.

Be sure to check the reduction using image intensification after this step.

Insert remaining screws

Insert the remaining diaphyseal screws in neutral positions.

Completed osteosynthesis

The x-ray shows a completed osteosynthesis of the condylar metaphysis with a condylar plate.

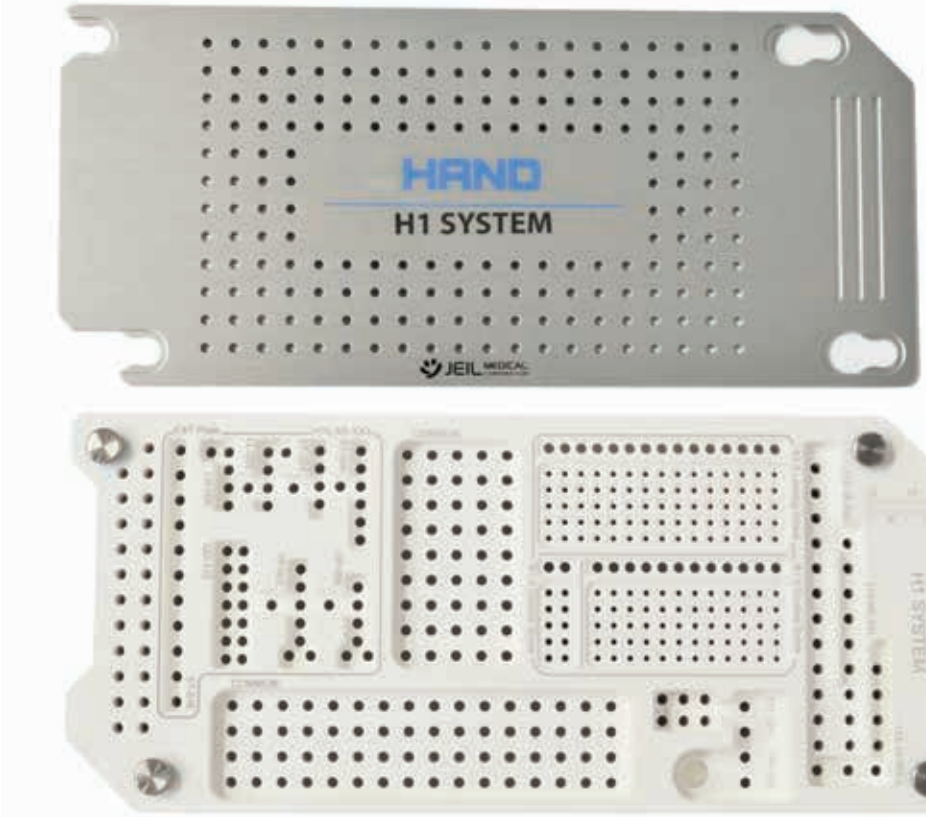
Ordering Information

112-104 (Set code)					
No	ITEMS		Description	Code	Quantity
1	Screw (H1L)	Ø1.5 Locking Screw	Locking Screw (6mm)	15L-HF-006	5
2			Locking Screw (7mm)	15L-HF-007	5
3			Locking Screw (8mm)	15L-HF-008	5
4			Locking Screw (9mm)	15L-HF-009	5
5			Locking Screw (10mm)	15L-HF-010	5
6			Locking Screw (11mm)	15L-HF-011	5
7			Locking Screw (12mm)	15L-HF-012	5
8			Locking Screw (13mm)	15L-HF-013	5
9			Locking Screw (14mm)	15L-HF-014	5
10			Locking Screw (16mm)	15L-HF-016	5
11			Locking Screw (18mm)	15L-HF-018	5
12			Locking Screw (20mm)	15L-HF-020	5
13		Φ1.5 Cortical Screw	Cortical Screw (6mm)	15-HC-006	5
14			Cortical Screw (7mm)	15-HC-007	5
15			Cortical Screw (8mm)	15-HC-008	5
16			Cortical Screw (9mm)	15-HC-009	5
17			Cortical Screw (10mm)	15-HC-010	5
18			Cortical Screw (11mm)	15-HC-011	5
19			Cortical Screw (12mm)	15-HC-012	5
20			Cortical Screw (13mm)	15-HC-013	5
21			Cortical Screw (14mm)	15-HC-014	5
22			Cortical Screw (16mm)	15-HC-016	5
23			Cortical Screw (18mm)	15-HC-018	5
24			Cortical Screw (20mm)	15-HC-020	5
25		Φ1.8 Cortical Screw	Cortical Screw (6mm)	18-HC-006	5
26			Cortical Screw (10mm)	18-HC-010	5
27	Screw (H2L)	Φ2.0 Locking Screw	Locking Screw (6mm)	20L-HF-006	5
28			Locking Screw (7mm)	20L-HF-007	5
29			Locking Screw (8mm)	20L-HF-008	5
30			Locking Screw (9mm)	20L-HF-009	5
31			Locking Screw (10mm)	20L-HF-010	5
32			Locking Screw (11mm)	20L-HF-011	5
33			Locking Screw (12mm)	20L-HF-012	5
34			Locking Screw (13mm)	20L-HF-013	5
35			Locking Screw (14mm)	20L-HF-014	5
36			Locking Screw (16mm)	20L-HF-016	5
37			Locking Screw (18mm)	20L-HF-018	5
38			Locking Screw (20mm)	20L-HF-020	5
39		Φ2.0 Cortical Screw	Cortical Screw (6mm)	20-HF-006	5
40			Cortical Screw (7mm)	20-HF-007	5
41			Cortical Screw (8mm)	20-HF-008	5
42			Cortical Screw (9mm)	20-HF-009	5
43			Cortical Screw (10mm)	20-HF-010	5
44			Cortical Screw (11mm)	20-HF-011	5
45			Cortical Screw (12mm)	20-HF-012	5
46			Cortical Screw (13mm)	20-HF-013	5
47			Cortical Screw (14mm)	20-HF-014	5
48			Cortical Screw (16mm)	20-HF-016	5
49			Cortical Screw (18mm)	20-HF-018	5
50			Cortical Screw (20mm)	20-HF-020	5
51	Screw (H2L)	Φ2.3 Cortical Screw	Cortical Screw (6mm)	23-FC-006	5
52			Cortical Screw (10mm)	23-FC-010	5

112-104 (Set code)				
No	ITEMS	Description	Code	Quantity
53	Plate (H1L)	0.6t Locking Plate	H1L-ST-006	3
54			H1L-ST-016	3
55			H1L-ST-104	3
56			H1L-QD-112	3
57			H1L-TP-007	3
58			H1L-YP-006	3
59			H1L-LL-005	3
60			H1L-LR-005	3
61	Plate (H2L)	1.0t Locking Plate	H2L-ST-004	3
62			H2L-ST-006	3
63			H2L-ST-016	3
64			H2L-QD-006	3
65			H2L-TP-007	3
66			H2L-YP-006	3
67			H2L-YP-007	3
68			H2L-LL-006	3
69			H2L-LR-006	3
70		1.3t Locking Plate	H2L-ST-104-13	3
71			H2L-ST-105-13	3
72			H2L-ST-106-13	3
73			H2L-ST-208-13	3
74			H2L-TP-006-13	3
75			H2L-TP-010-13	3
76			H2L-LL-006-13	3
77			H2L-LR-006-13	3
78			H2L-LL-010-13	3
79			H2L-LR-010-13	3

112-104 (Set code)					
No	ITEMS		Description	Code	Quantity
80	Instrument (H1L)	Drill	AO Type	112-15-702	2
81			AO Type	112-15-701-L	1
82		Driver	Cross head	113-NF-101	2
83		Drill guide		111-046	1
84		Depth gauge		111-027	1
85		Drill sleeve	Fixed angle	111-124	1
86			Variable angle	111-125	1
87	Instrument (H2L)	Drill	AO Type	112-20-701	2
88			AO Type	112-20-701-L	1
89		Driver	Hexa head	113-HF-103	2
90		Drill guide		111-047	1
91		Depth gauge		111-028	1
92		Drill sleeve	Fixed angle	111-078	1
93			Variable angle	111-079	1
94	Instrument	Hand body		111-010	2
95		Bender		111-024	2
96		Forceps		114-009	1
97	Tray	Tray		112-104	1


HAND
H1 SYSTEM
JEIL MEDICAL
HAND
H2 SYSTEM
JEIL MEDICAL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H1 SYSTEM
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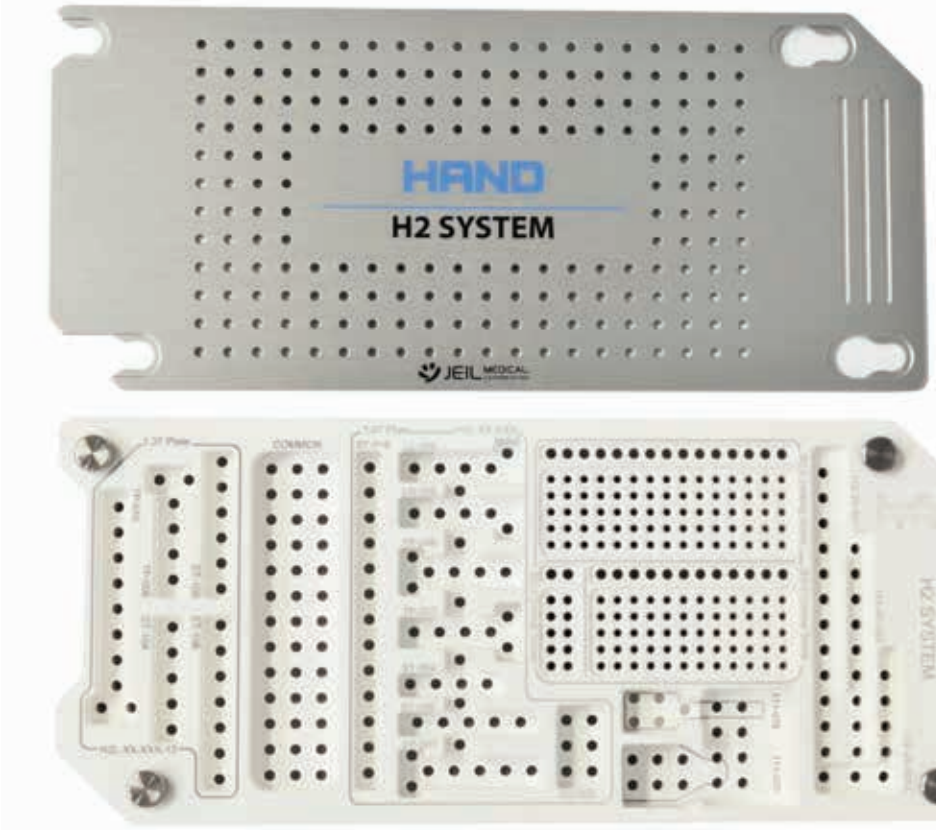
HAND
H2 SYSTEM
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MAXX HEALTH INC.

11 Woodside Avenue, Berwyn, PA 19312 USA

SALES **T** 484.321.8560 **F** 484.991.2080 **E** info@maxxhealthinc.com

www.maxxhealthinc.com