OrthoLine™ Small Animal Fracture Straight and Cuttable Plate

Surgical Technique

Arthrex®
Vet Systems

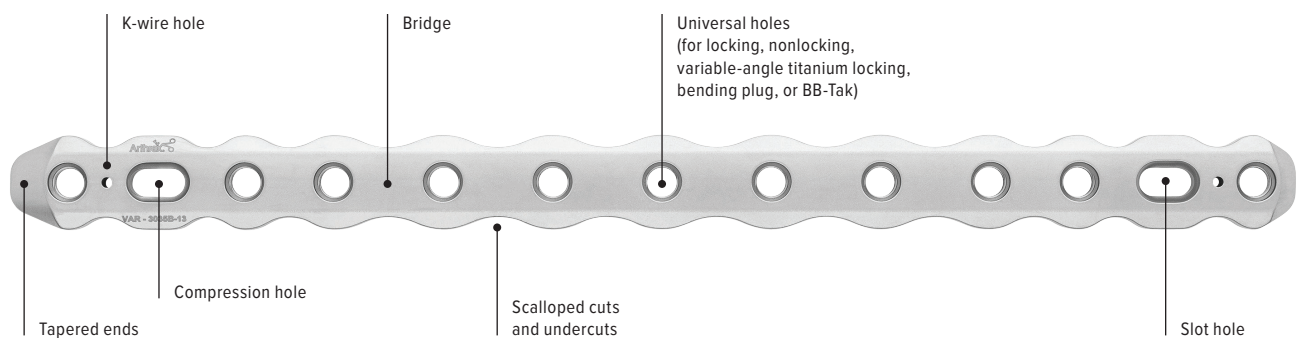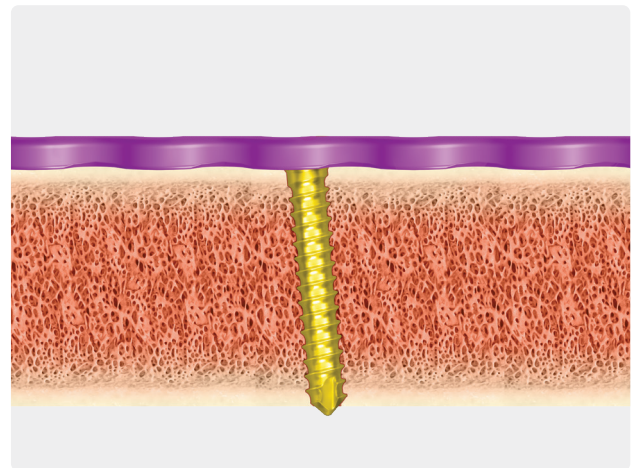# OrthoLine™ Small Animal Fracture Straight Plate

A considerable upgrade from a standard straight-plate and T-plate design, the 99-plate OrthoLine plating system enables fracture repair for a variety of canine and feline patients. Unique hole-to-hole spacing, along with an oblong compression hole and an oblong slide hole, allows for the most optimal plate location for the fracture.

Development, research, and surgeon feedback converge to create an innovative plating system in a comprehensive range of sizes and lengths designed specifically for veterinary patients of all weight ranges. The OrthoLine plating system affords surgeons options ranging from 1.6 mm to broad 3.5 mm/4.0 mm plates to perform fracture repairs on a variety of small animal patients.

Product Highlight

Experience the versatility and design surgeons have asked for with the OrthoLine straight plates. Features of the plate design include proximal and distal high screw density, central low screw density with a strong bridging design, slide and compression holes, and tapered ends for minimally invasive implantation. Locking screw holes accommodate variable-angle titanium locking, cortical, or locking screws, as well as additional features, such as undercuts, scalloped edges, and K-wire holes.
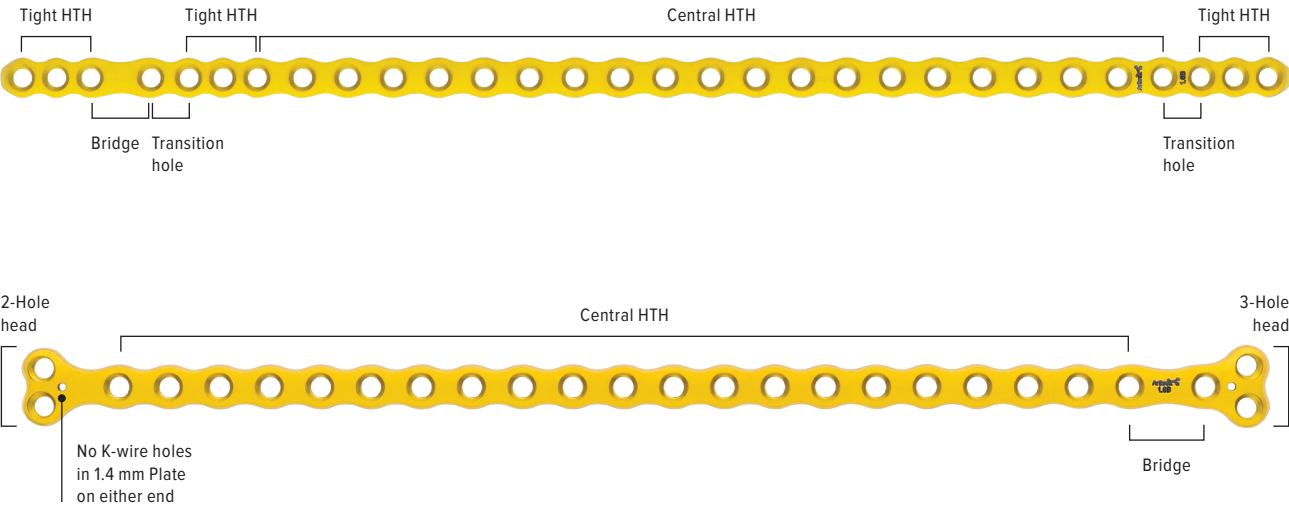
The straight plates are available in a variety of lengths and sizes ranging from 1.6 mm to broad 3.5 mm. The variable-angle titanium locking screws range from 1.6 mm to 3.0 mm. For a complete list, please see the final pages of this guide.

K-wire hole

Bridge

Universal holes
(for locking, nonlocking, variable-angle titanium locking, bending plug, or BB-Tak)

Tapered ends

Compression hole

Scalloped cuts and undercuts

Slot hole

OrthoLine™ Small Animal Fracture Cuttable Plate

The cuttable straight plates are designed to offer multiple options and applications for veterinary orthopedic surgery. Each plate features three tight hole-to-hole (HTH) spacings on either end, followed by a bridge on one side and a transition hole. Additionally, there is another set of three tight hole-to-hole spacings on the side of the bridge. The central hole spacing is larger, allowing for in-plane bending of approximately 7°-8° before deformation of the screw hole occurs. This design provides flexibility and precision in various surgical scenarios.

The cuttable T-plates are designed to be placed in a juxta-articular fashion and cut to size. The design includes a 3-hole T on one side and a 2-hole T on the opposite side, following a bridge design with uniform hole-to-hole spacing throughout centrally. The central hole spacing allows in-plane bending up to 7°-8°. This design ensures adaptability and precise placement in complex orthopedic procedures.
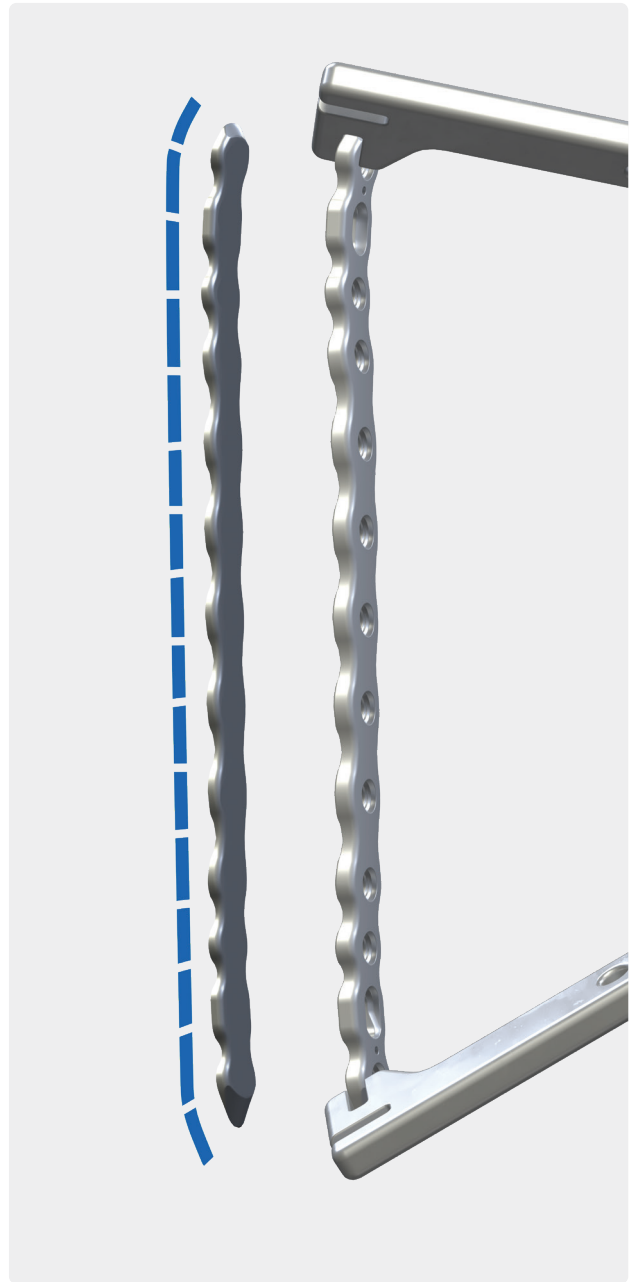
Tight HTH   Tight HTH   Central HTH   Tight HTH

Bridge   Transition hole   Transition hole

2-Hole head   Central HTH   3-Hole head

No K-wire holes in 1.4 mm Plate on either end   Bridge

Surgical Technique

01

Reduce the fracture using standard fracture reduction techniques and equipment.

02

To contour the plate, place the appropriate cannulated, threaded, bending plug inserts into the locking screw holes where the plate will be contoured using the appropriate screwdriver. Contour the plate as necessary using bending irons or another form of plate benders, replicating the anatomy.

For bending the tip/nose of the plate, use the "fork" end of the bending irons. Once the contouring is complete, the bending plugs can be removed or used in conjunction with K-wires.
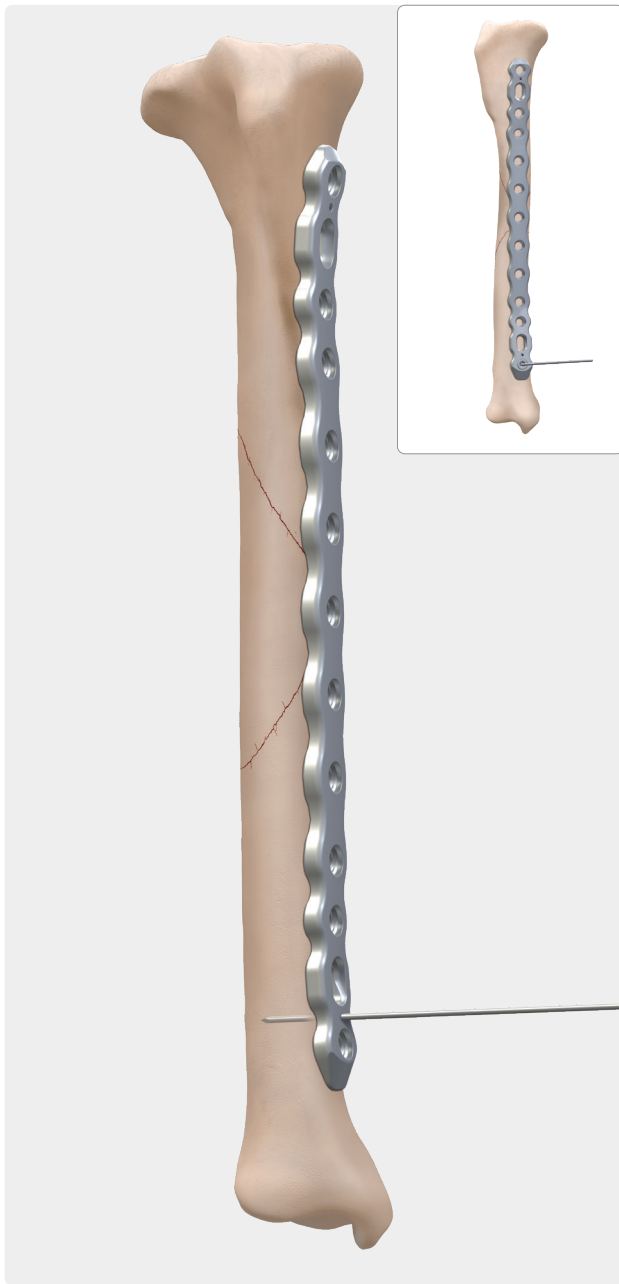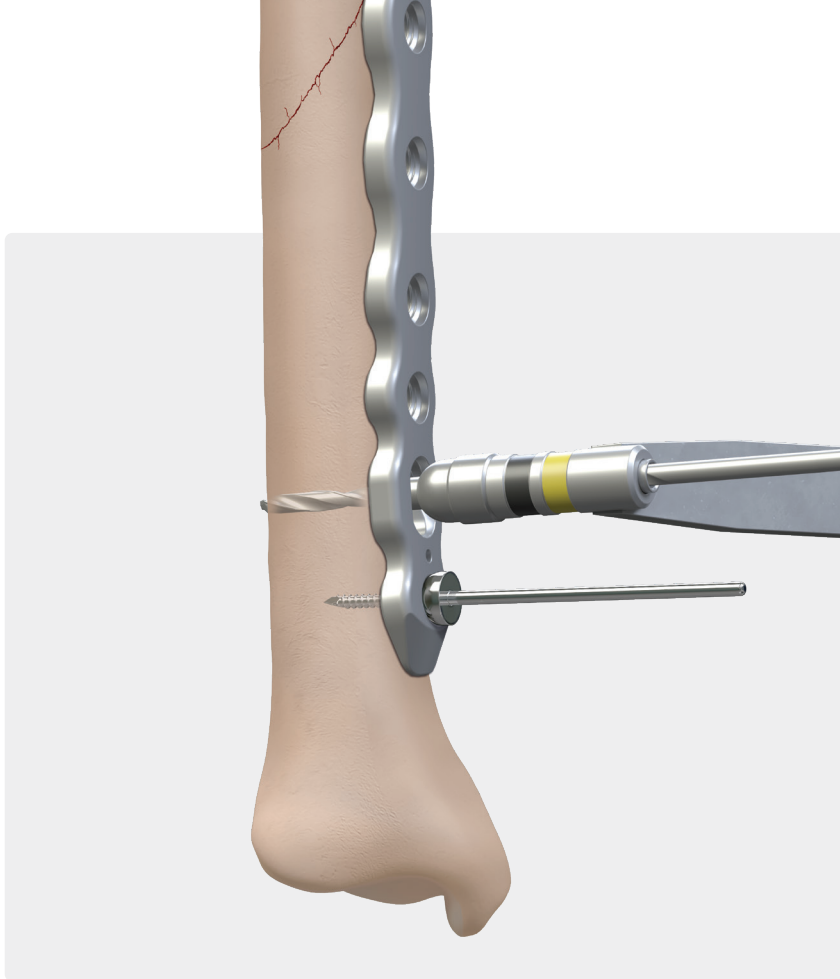
03a
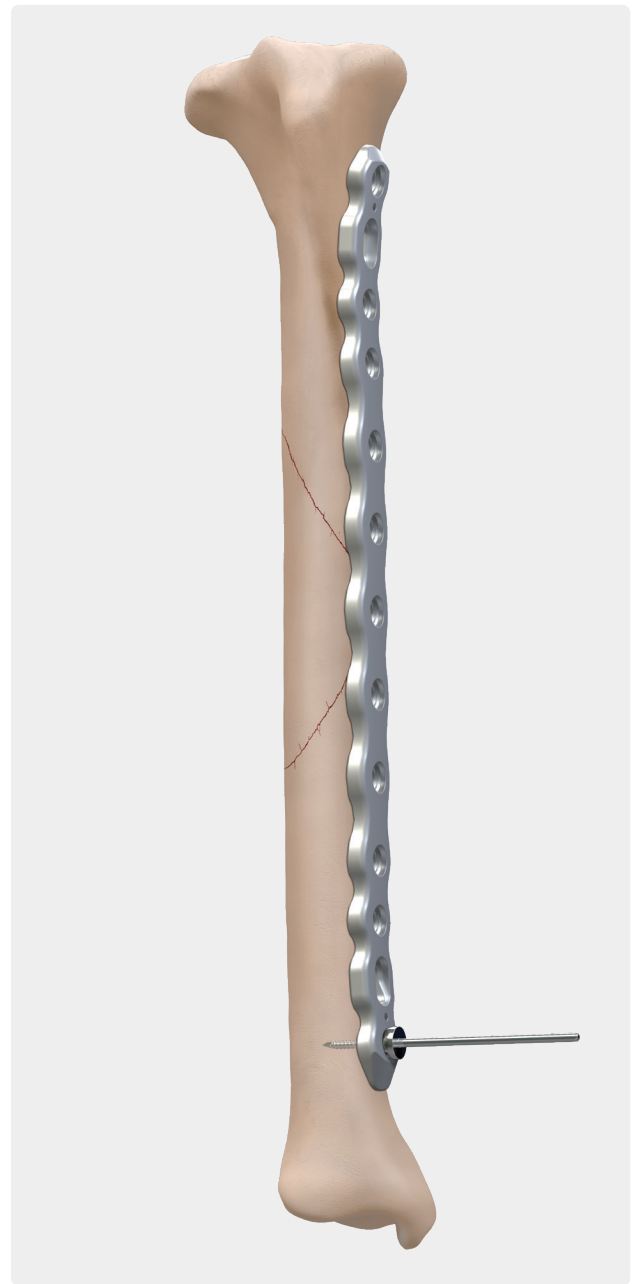
03b

The plate may be temporarily affixed to the bone using multiple methods. For temporary fixation, K-wire holes and K-wires, in conjunction with bending plugs, can be used as well as threaded or nonthreaded BB-Tak in the center of a universal screw hole.

04

When applying the plate, start by drilling a hole using the universal drill guide, then measure and place a cortical screw in the slide hole of the contoured plate. The screw is brought into contact with the plate, and small adjustments are made prior to tightening the screw to the plate.
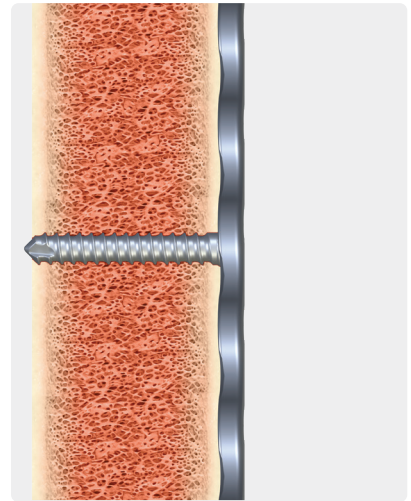
> **Note:** Note: K-wires and BB-Tak must be removed for proper application and use of the slide hole.
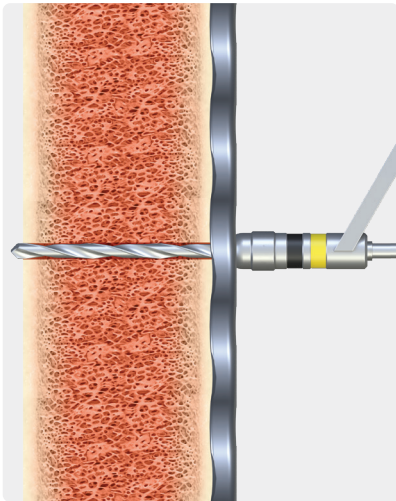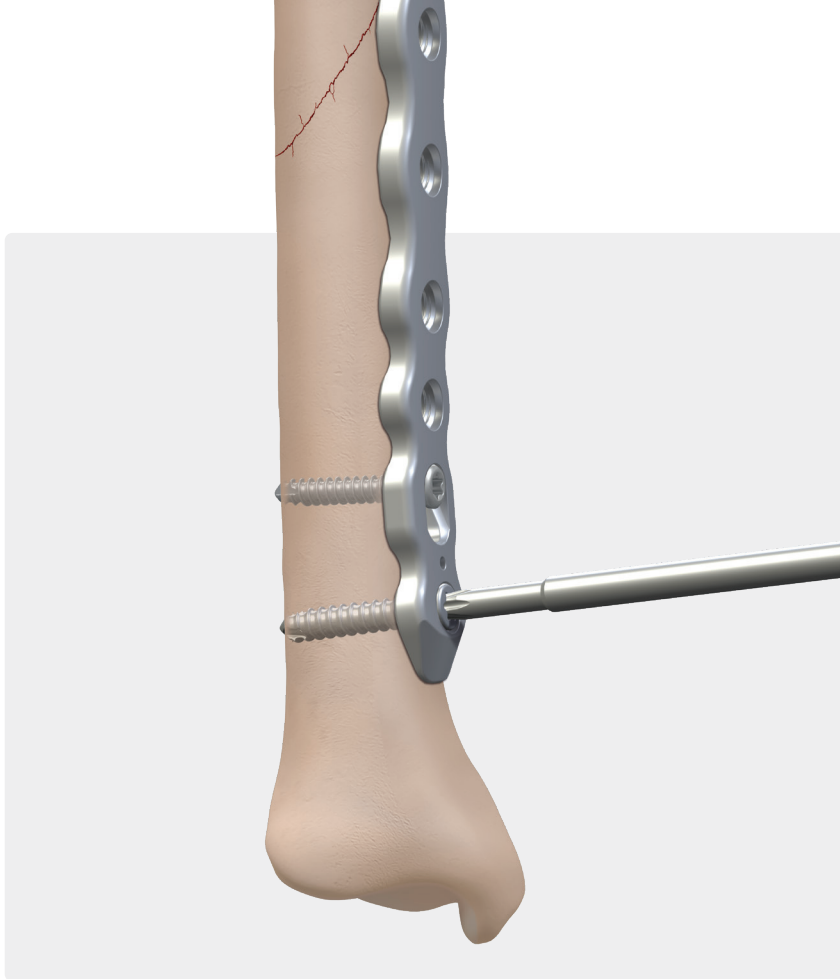

Drill Side Cross Section
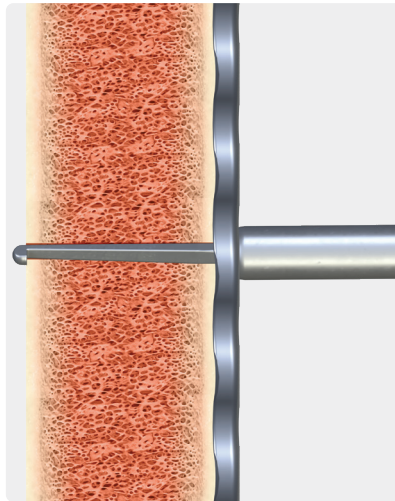
Depth Gauge Measurement Side Cross Section

Locking Screw Placement Cross Section

05

Place a locking screw next to the slide hole by drilling, measuring, placing the screw, and locking the screw in place. Screws may be placed under power, but the final turns should be done manually with the manual screwdriver.

The variable angle guide can also be used for titanium implants sizes 3.0 mm and below for use with the variable angle locking screws. If care is not taken, a screw placed using a variable angle method can converge with another screw.
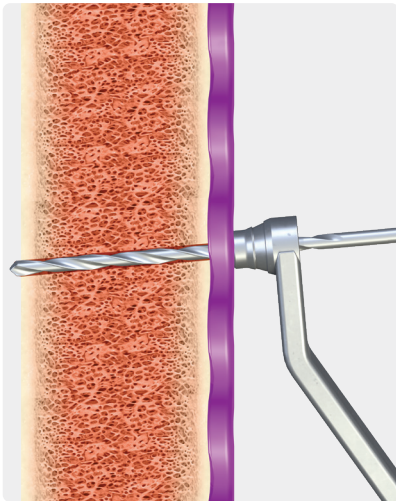
Drilling Side Cross Section

Locking Screw Placement Cross Section
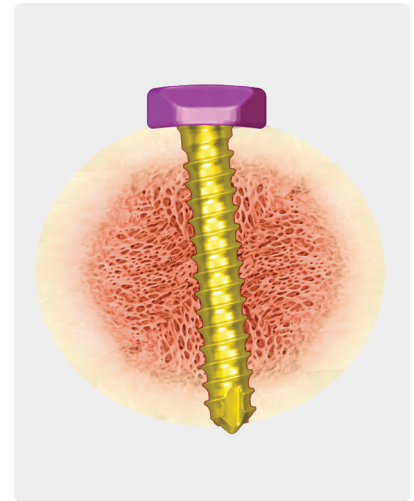
Top, Cross-Section Detail
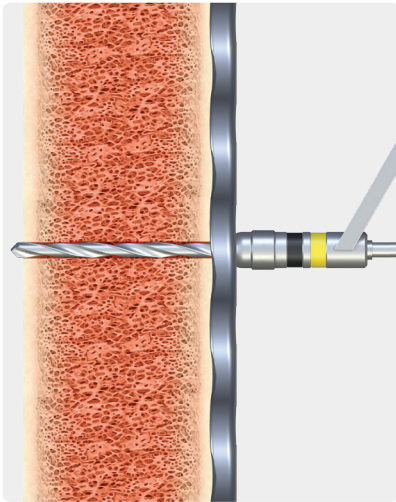
Drill Side Cross Section
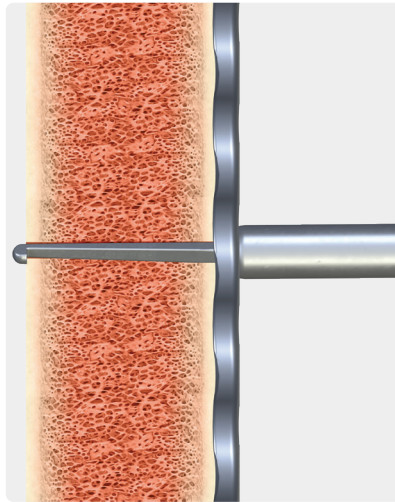
Depth Gauge Measurement Side Cross Section
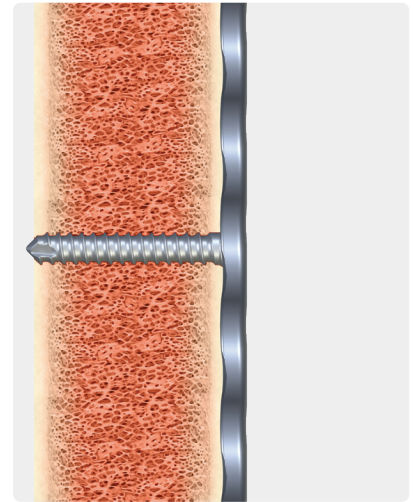
Locking Screw Placement Cross Section
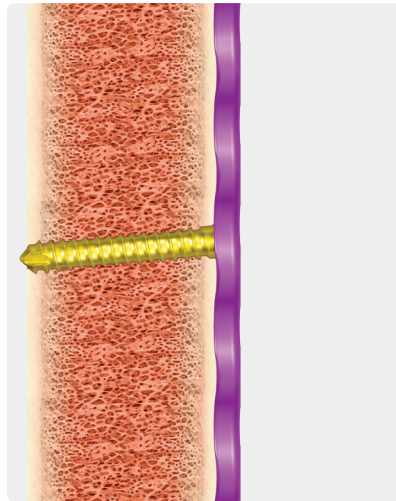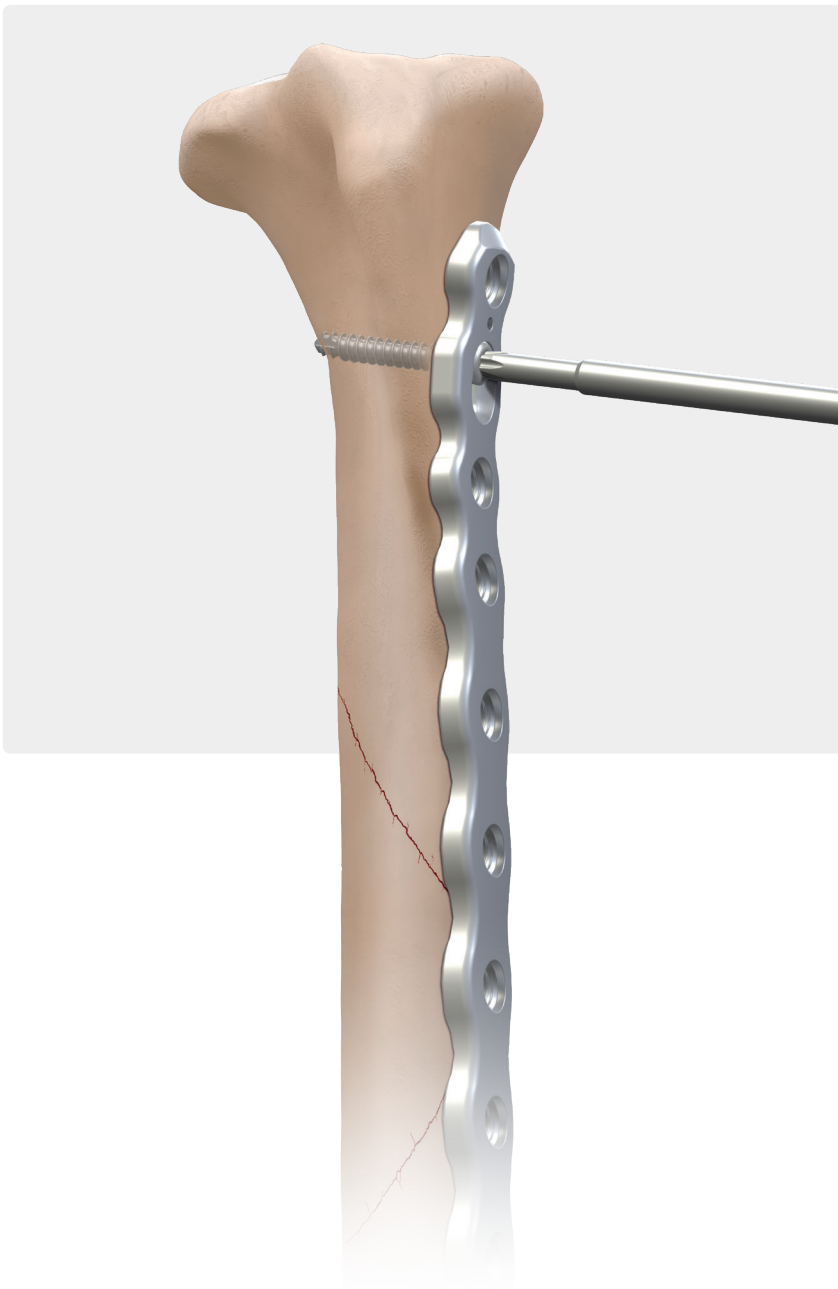

06

If compression is desired, place a cortical screw in the compression slot. Place the universal drill guide farthest away from the fracture within the compression hole of the plate, then drill, measure, and insert the screw. Placing the guide farther from the fracture will result in greater compression. To ensure compression is obtained, a fixed point on the distal end will need to be in place.
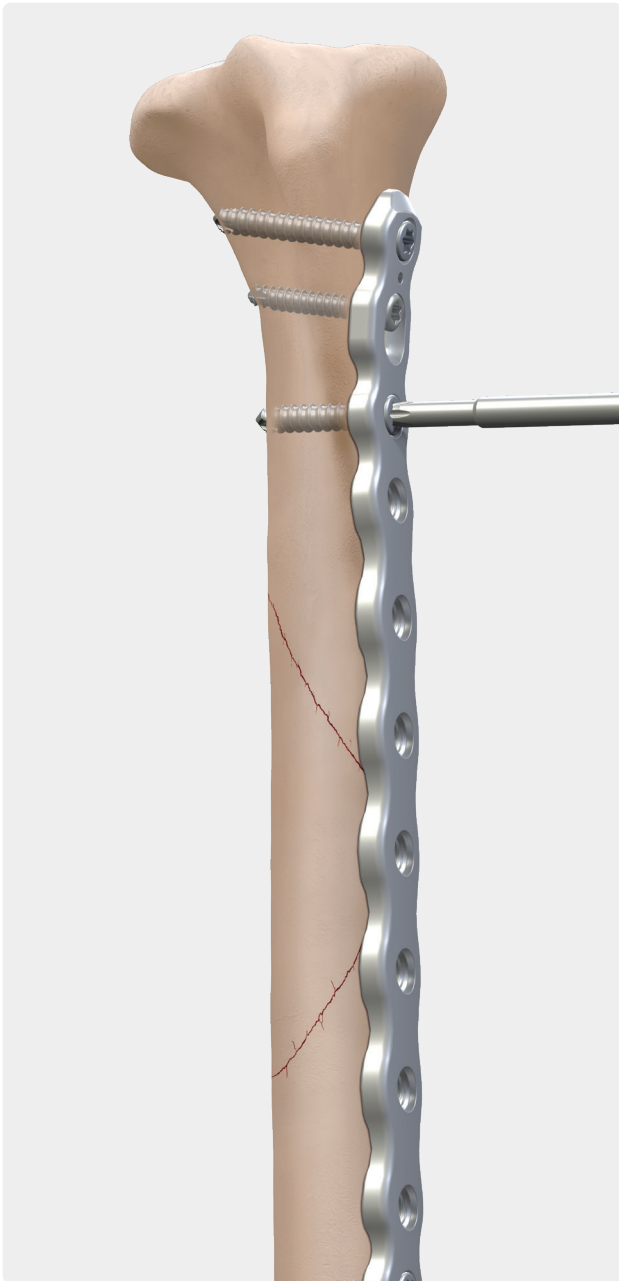
07

Drill and place the additional locking screws desired, ideally 6 cortices on each side of the fracture.
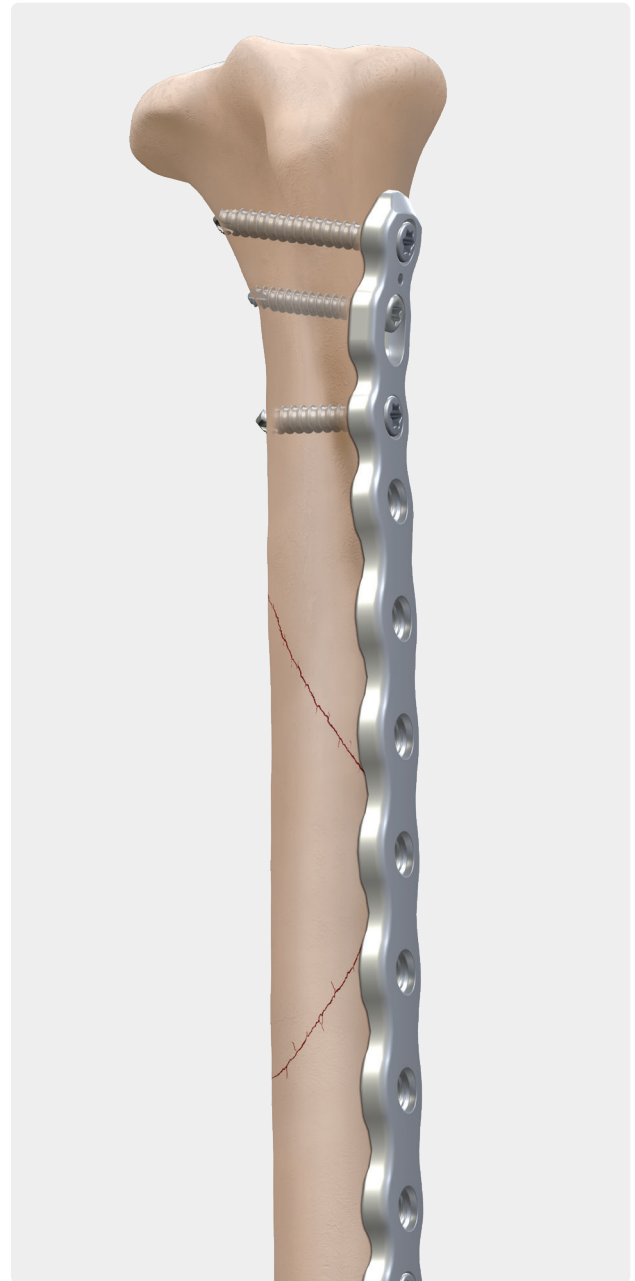
08

Final fixation.

Ordering Information

Implants

1.6 mm Straight Plates	
Straight plate, Ti, 1.6 mm, 5 hole	VAR-3116-05
Straight plate, Ti, 1.6 mm, 6 hole	VAR-3116-06
Straight plate, Ti, 1.6 mm, 7 hole	VAR-3116-07
Straight plate broad, Ti, 1.6 mm, 5-hole	VAR-3116B-05
Straight plate broad, Ti, 1.6 mm, 6-hole	VAR-3116B-06
Straight plate broad, Ti, 1.6 mm, 7-hole	VAR-3116B-07
Straight plate broad, Ti, 1.6 mm, 8-hole	VAR-3116B-08
Straight plate broad, Ti, 1.6 mm, 9-hole	VAR-3116B-09
Straight plate broad, Ti, 1.6 mm, 10-hole	VAR-3116B-10

2.0 mm Straight Plates	
Straight plate, Ti, 2.0 mm, 6-hole	VAR-3120-06
Straight plate, Ti, 2.0 mm, 7-hole	VAR-3120-07
Straight plate, Ti, 2.0 mm, 8-hole	VAR-3120-08
Straight plate, Ti, 2.0 mm, 9-hole	VAR-3120-09
Straight plate, Ti, 2.0 mm, 10-hole	VAR-3120-10
Straight plate, Ti, 2.0 mm, 11-hole	VAR-3120-11
Straight plate, Ti, 2.0 mm, 12-hole	VAR-3120-12
Straight plate, Ti, 2.0 mm, 13-hole	VAR-3120-13
Straight plate, Ti, 2.0 mm, 14-hole	VAR-3120-14
Straight plate, Ti, 2.0 mm, 15-hole	VAR-3120-15

2.4 mm Straight Plates	
Straight plate, Ti, 2.4 mm, 6-hole	VAR-3124-06
Straight plate, Ti, 2.4 mm, 7-hole	VAR-3124-07
Straight plate, Ti, 2.4 mm, 8 hole	VAR-3124-08
Straight plate, Ti, 2.4 mm, 9 hole	VAR-3124-09
Straight plate, Ti, 2.4 mm, 10-hole	VAR-3124-10
Straight plate, Ti, 2.4 mm, 11-hole	VAR-3124-11
Straight plate, Ti, 2.4 mm, 12-hole	VAR-3124-12
Straight plate, Ti, 2.4 mm, 13-hole	VAR-3124-13
Straight plate, Ti, 2.4 mm, 14-hole	VAR-3124-14
Straight plate, Ti, 2.4 mm, 15-hole	VAR-3124-15

3.0 mm Straight Plates	
Straight plate, Ti, 3.0 mm, 6-hole	VAR-3130-06
Straight plate, Ti, 3.0 mm, 7-hole	VAR-3130-07
Straight plate, Ti, 3.0 mm, 8-hole	VAR-3130-08
Straight plate, Ti, 3.0 mm, 9-hole	VAR-3130-09
Straight plate, Ti, 3.0 mm, 10-hole	VAR-3130-10
Straight plate, Ti, 3.0 mm, 11-hole	VAR-3130-11
Straight plate, Ti, 3.0 mm, 12-hole	VAR-3130-12
Straight plate, Ti, 3.0 mm, 13-hole	VAR-3130-13
Straight plate, Ti, 3.0 mm, 14-hole	VAR-3130-14
Straight plate, Ti, 3.0 mm, 15-hole	VAR-3130-15
Straight plate, Ti, 3.0 mm, 16-hole	VAR-3130-16
Straight plate, Ti, 3.0 mm, 17-hole	VAR-3130-17
Straight plate, Ti, 3.0 mm, 18-hole	VAR-3130-18
Straight plate, Ti, 3.0 mm, 19-hole	VAR-3130-19
Straight plate, Ti, 3.0 mm, 20-hole	VAR-3130-20
Straight plate, Ti, 3.0 mm, 21-hole	VAR-3130-21
Straight plate, Ti, 3.0 mm, 22-hole	VAR-3130-22

3.5 mm Straight Plates	
Straight plate, SS, 3.5 mm, 6-hole	VAR-3035-06
Straight plate, SS, 3.5 mm, 7-hole	VAR-3035-07
Straight plate, SS, 3.5 mm, 8-hole	VAR-3035-08
Straight plate, SS, 3.5 mm, 9-hole	VAR-3035-09
Straight plate, SS, 3.5 mm, 10-hole	VAR-3035-10
Straight plate, SS, 3.5 mm, 11-hole	VAR-3035-11
Straight plate, SS, 3.5 mm, 12-hole	VAR-3035-12
Straight plate, SS, 3.5 mm, 13-hole	VAR-3035-13
Straight plate, SS, 3.5 mm, 14-hole	VAR-3035-14
Straight plate, SS, 3.5 mm, 15-hole	VAR-3035-15
Straight plate, SS, 3.5 mm, 16-hole	VAR-3035-16
Straight plate, SS, 3.5 mm, 17-hole	VAR-3035-17
Straight plate, SS, 3.5 mm, 18-hole	VAR-3035-18
Straight plate, SS, 3.5 mm, 19-hole	VAR-3035-19
Straight plate, SS, 3.5 mm, 20-hole	VAR-3035-20
Straight plate broad, SS, 3.5 mm, 8-hole	VAR-3035B-08
Straight plate broad, SS, 3.5 mm, 9-hole	VAR-3035B-09
Straight plate broad, SS, 3.5 mm, 10-hole	VAR-3035B-10
Straight plate broad, SS, 3.5 mm, 11-hole	VAR-3035B-11
Straight plate broad, SS, 3.5 mm, 12-hole	VAR-3035B-12
Straight plate broad, SS, 3.5 mm, 13-hole	VAR-3035B-13
Straight plate broad, SS, 3.5 mm, 14-hole	VAR-3035B-14
Straight plate broad, SS, 3.5 mm, 15-hole	VAR-3035B-15
Straight plate broad, SS, 3.5 mm, 16-hole	VAR-3035B-16
Straight plate broad, SS, 3.5 mm, 17-hole	VAR-3035B-17
Straight plate broad, SS, 3.5 mm, 18-hole	VAR-3035B-18
Straight plate broad, SS, 3.5 mm, 19-hole	VAR-3035B-19
Straight plate broad, SS, 3.5 mm, 20-hole	VAR-3035B-20

Cuttable Straight Plate

1.6 mm Cuttable Straight Plate	
Cuttable straight plate, Ti, 1.6 mm, 30-hole	VAR-3116C-30
Cuttable straight plate, broad, Ti, 1.6 mm, 30-hole	VAR-3116BC-30

2.0 mm Cuttable Straight Plate	
Cuttable straight plate, Ti, 2.0 mm, 36-hole	VAR-3120C-36

2.4 mm Cuttable Straight Plate	
Cuttable straight plate, Ti, 2.4 mm, 29-hole	VAR-3124C-29

T-Plates

1.6 mm T-Plate

T-plate, Ti, 1.6 mm, 2-hole/3-hole	VAR-3116T-2-3
T-plate broad, Ti, 1.6 mm, 2-hole/3-hole	VAR-3116BT-2-3
T-plate broad, Ti, 1.6 mm, 3-hole/4-hole	VAR-3116BT-3-4

2.0 mm T-Plate

T-plate, Ti, 2.0 mm, 2-hole/4-hole	VAR-3120T-2-4
T-plate, Ti, 2.0 mm, 2-hole/6-hole	VAR-3120T-2-6
T-plate, Ti, 2.0 mm, 3-hole/4-hole	VAR-3120T-3-4
T-plate, Ti, 2.0 mm, 3-hole/6-hole	VAR-3120T-3-6

2.4 mm T-Plate

T-plate, Ti, 2.4 mm, 2-hole/4-hole	VAR-3124T-2-4
T-plate, Ti, 2.4 mm, 2-hole/6-hole	VAR-3124T-2-6
T-plate, Ti, 2.4 mm, 3-hole/4-hole	VAR-3124T-3-4
T-plate, Ti, 2.4 mm, 3-hole/6-hole	VAR-3124T-3-6

3.0 mm T-Plate

T-plate, Ti, 3.0 mm, 2-hole/4-hole	VAR-3130T-2-4
T-plate, Ti, 3.0 mm, 2-hole/6-hole	VAR-3130T-2-6
T-plate, Ti, 3.0 mm, 2-hole/8-hole	VAR-3130T-2-8
T-plate, Ti, 3.0 mm, 3-hole/4-hole	VAR-3130T-3-4
T-plate, Ti, 3.0 mm, 3-hole/6-hole	VAR-3130T-3-6
T-plate, Ti, 3.0 mm, 3-hole/8-hole	VAR-3130T-3-8
T-plate, Ti, 3.0 mm, 3-hole/13-hole	VAR-3130T-3-13

3.5 mm T-Plate

T-plate, SS, 3.5 mm, 2-hole/4-hole	VAR-3035T-2-4
T-plate, SS, 3.5 mm, 2-hole/6-hole	VAR-3035T-2-6
T-plate, SS, 3.5 mm, 2-hole/8-hole	VAR-3035T-2-8
T-plate, SS, 3.5 mm, 3-hole/4-hole	VAR-3035T-3-4
T-plate, SS, 3.5 mm, 3-hole/6-hole	VAR-3035T-3-6
T-plate, SS, 3.5 mm, 3-hole/8-hole	VAR-3035T-3-8
T-plate, SS, 3.5 mm, 3-hole/12-hole	VAR-3035T-3-12

Cuttable T-Plates

1.6 mm Cuttable T-Plate

Cuttable T-plate, Ti, 1.6 mm, 21-hole	VAR-3116CT-21
Cuttable T-plate, broad, Ti, 1.6 mm, 21-hole	VAR-3116BCT-21

2.0 mm Cuttable T-Plate

Cuttable T-plate, Ti, 2.0 mm, 30-hole	VAR-3120CT-30

2.4 mm Cuttable T-Plate

Cuttable T-plate, Ti, 2.4 mm, 23-hole	VAR-3124CT-23

Screws

1.6 mm Low-Profile Cortical, Variable Angle

Low-profile cortical screw, 1.6 mm × 6 mm–20 mm Sizes: 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 24 mm	VAR-8916-05 to -24
Low-profile variable-angle screw, 1.6 mm × 6 mm–20 mm Sizes: 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 24 mm	VAR-8916V-05 to -24

2.0 mm Low-Profile Cortical, Variable Angle, Locking

Low-profile cortical screw, 2.0 mm × 6 mm–30 mm Sizes: 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40 mm	VAR-8920-06 to -40
Low-profile variable-angle screw, 2.0 mm × 6 mm–30 mm Sizes: 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40 mm	VAR-8920V-06 to -40
Low-profile locking screw, 2.0 mm × 6 mm–30 mm Sizes: 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40 mm	VAR-8920L-06 to -40

2.4 mm Low-Profile Cortical, Variable Angle, Locking

Low-profile cortical screw, 2.4 mm × 8 mm–30 mm Sizes: 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40 mm	VAR-8924-06 to -40
Low-profile variable-angle screw, 2.4 mm × 8 mm–30 mm Sizes: 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40 mm	VAR-8924V-06 to -40
Low-profile locking screw, 2.4 mm × 8 mm–30 mm Sizes: 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40 mm	VAR-8924L-06 to -40

3.0 mm Low-Profile Cortical, Variable Angle, Locking

Low-profile cortical screw, 3.0 mm × 8 mm–40 mm Sizes: 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 55 mm	VAR-8930-08 to -55
Low-profile variable-angle screw, 3.0 mm × 8 mm–40 mm Sizes: 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 55 mm	VAR-8930V-08 to -55
Low-profile locking screw, 3.0 mm × 8 mm–40 mm Sizes: 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 55 mm	VAR-8930L-08 to -55

3.5 mm Low-Profile Cortical, Locking

Low-profile cortical screw, 3.5 mm × 8 mm–65 mm Sizes: 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 65 mm	VAR-8835-08 to -65
Low-profile locking screw, 3.5 mm × 10 mm–60 mm Sizes: 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60 mm	VAR-8835L-10 to -60

4.0 mm Low-Profile Cortical, Locking

Low-profile locking screw, 4.0 mm × 18 mm–65 mm Sizes: 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 65 mm	VAR-8840L-18 to -65

Equipment Part List

Disposable/Limited Reusable	
Drill bit, solid, AO, 1.1 mm	VAR-4016D
Drill bit, solid, AO, 1.5 mm	VAR-4020D
Drill bit, solid, AO, 1.8 mm	VAR-4024D
Drill bit, solid, AO, 2.3 mm	VAR-4030D
Drill bit, solid, short, AO, 2.5 mm	VAR-8943-30
Drill bit, solid, AO, 2.8 mm	VAR-4035D
Drill bit, solid, AO, 3.5 mm	VAR-4040D
Drill bit, solid, short, AO, 1.1 mm	VAR-4016SD
Drill bit, solid, short, AO, 1.5 mm	VAR-4020SD
Drill bit, solid, short, AO, 1.8 mm	VAR-4024SD
Drill bit, solid, short, AO, 2.3 mm	VAR-4030SD
Guidewire w/ trocar, 0.86 mm × 80 mm (6 pcs)	VAR-8929K
Guidewire w/ trocar, 1.1 mm × 150 mm (6 pcs)	VAR-8933K
Guidewire w/ trocar, 1.3 mm × 150 mm (6 pcs)	VAR-8937K
Instruments	
Depth measuring device, 1.6 mm/2.0 mm/2.4 mm	VAR-2024DD
Depth measuring device, 2.7 mm/3.0 mm/3.5 mm/4.0 mm	VAR-8943-15
T6 driver, 1.6 mm/2.0 mm (AO)	VAR-4020-01
T8 driver, 2.4 mm (AO)	VAR-4024-01
T10 driver, 3.0 mm (AO)	VAR-8944DH
T15 driver, 3.5 mm (AO)	VAR-8941DH
T6 Screwdriver, 1.6 mm/2.0 mm	VAR-4020-02
T8 Screwdriver, 2.4 mm	VAR-4024-02
T10 Screwdriver, 3.0 mm	VAR-8943-08
T15 Screwdriver, 3.5 mm	VAR-8943-10
Screw holding forceps	VAR-8941F
Drill/depth guide, locking, 1.6 mm	VAR-4016DG
Drill/depth guide, locking, 2.0 mm	VAR-4020DG
Drill/depth guide, locking, 2.4 mm	VAR-4024DG
Drill/depth guide, locking, 3.0 mm	VAR-4030DG
Drill/depth guide, locking, 3.5 mm	VAR-4035DG
Drill/depth guide, locking, 4.0 mm	VAR-4040DG
Drill guide, 1.1 mm	VAR-4016TDG
Tap/drill guide, 2.0 mm/1.5 mm	VAR-4020TDG
Tap/drill guide, 2.4 mm/1.8 mm	VAR-4024TDG
Tap/drill guide, 3.0 mm/2.3 mm	VAR-4030TDG
Drill guide, 3.5 mm/2.5 mm	VAR-8943-14
BB-Tak, small, threaded, 1.6 mm/2.0 mm/2.4 mm	VAR-8933TBB

BB-Tak, small, 1.6 mm/2.0 mm/2.4 mm	VAR-8933BB
BB-Tak, large, threaded, 3.0 mm/3.5 mm	VAR-8941TBB
BB-Tak, large, 3.0 mm/3.5 mm	VAR-8941BB
Drill guide, variable, 1.6 mm	VAR-4016VDG
Drill guide, variable, 2.0 mm	VAR-4020VDG
Drill guide, variable, 2.4 mm	VAR-4024VDG
Drill guide, variable, 3.0 mm	VAR-4030VDG
Bone tap, 2.0 mm	VAR-4020T
Bone tap, 2.4 mm	VAR-4024T
Bone tap, 3.0 mm	VAR-4030T
Bending plug, cannulated, 1.6/ 2.0 mm	VAR-4020-04
Bending plug, cannulated, 2.4 mm	VAR-4024-04
Bending plug, cannulated, 3.0 mm	VAR-4030-04
Bending plug, cannulated, 3.5 mm	VAR-4035-04
Bending iron, small, 1.6 mm/2.0 mm	VAR-4000-07
Bending iron, medium, 2.4 mm/3.0 mm	VAR-4000-08
Bending iron, large 3.5 mm/broad 3.5 mm	VAR-4000-09
Freer Elevator	VAR-4000-10
Hohmann retractor, double ended, 6 mm/10 mm	VAR-4000-11
Ikuta clamp	VAR-4000-12
Lobster clamp, mini	VAR-4000-13
Lobster clamp, mini, radiolucent	VAR-4000-14
Periosteal Elevator, 6 mm curved blade	VAR-4000-15
Pliers, needlenose	VAR-4000-16
Pointed reduction forceps	VAR-4000-17
Reduction forceps, guidewire	VAR-4000-18
Sharp hook	VAR-4000-19
Termite forceps	VAR-4000-20
Toothed reduction forceps, Kocher	VAR-4000-21
Cases and Caddies	
General instrument case	VAR-4000GC
General instrument tray insert	VAR-4000GC-01
Bending plug caddy	VAR-4000BPC
Screw caddy, 1.6 mm	VAR-3016SC-01
Screw caddy, 2.0 mm	VAR-3020SC-01
Screw caddy, 2.4 mm	VAR-3024SC-01
Screw caddy, 3.0 mm	VAR-3030SC-01
Screw caddy, 3.5 mm/4.0 mm	VAR-4035SC-02

Arthrex manufacturer, authorized representative, and importer information (Arthrex eIFUs)

US patent information

arthrexvetsystems.com