

REVELTM-S

Expandable Stand-Alone ACDF Spacer



Our mission is to deliver cutting-edge technology, research, and innovative solutions to promote healing in patients with musculoskeletal disorders.

Life moves us 

The Surgical Technique shown is for illustrative purposes only. The technique(s) actually employed in each case always depends on the medical judgment of the surgeon exercised before and during surgery as to the best mode of treatment for each patient. Additionally, as instruments may occasionally be updated, the instruments depicted in this Surgical Technique may not be exactly the same as the instruments currently available. Please consult with your sales representative or contact Globus directly for more information.

SURGICAL TECHNIQUE GUIDE

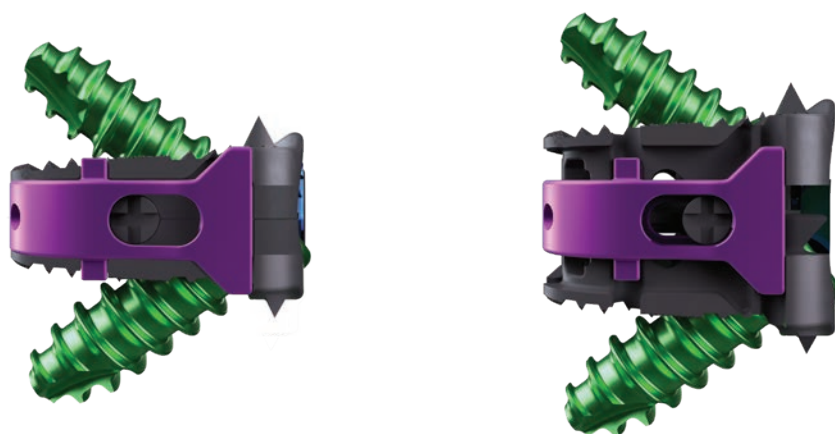
REVEL™-S

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REVEL™-S

Expandable Stand-Alone ACDF Spacer

REVEL™-S is an all-titanium, expandable stand-alone ACDF spacer designed to restore segmental height and cervical lordosis while reducing impaction forces and providing controlled, continuous expansion.



REVEL™-S is designed for:

Controlled Expansion

REVEL™-S continuously expands up to 3mm to help maximize indirect decompression and allows for up to 12° of lordosis.

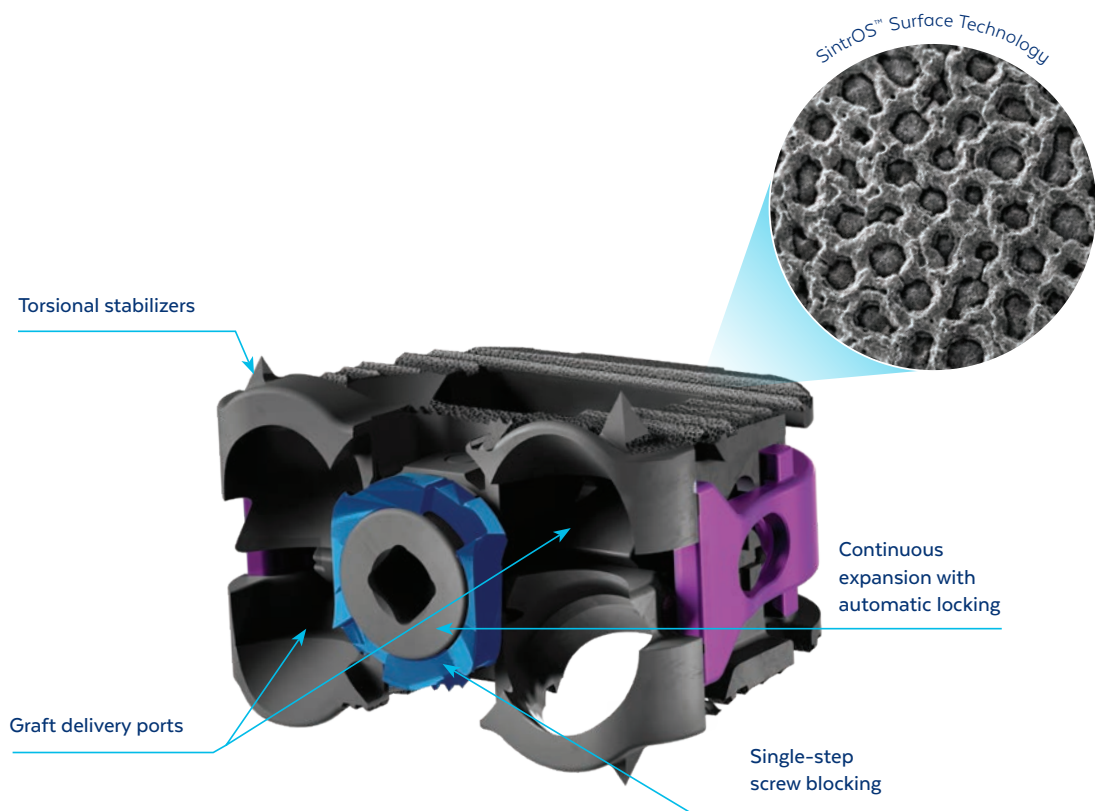
Minimized Impaction

Inserted at a contracted height to ease insertion and reduce impaction, to help preserve endplate integrity.

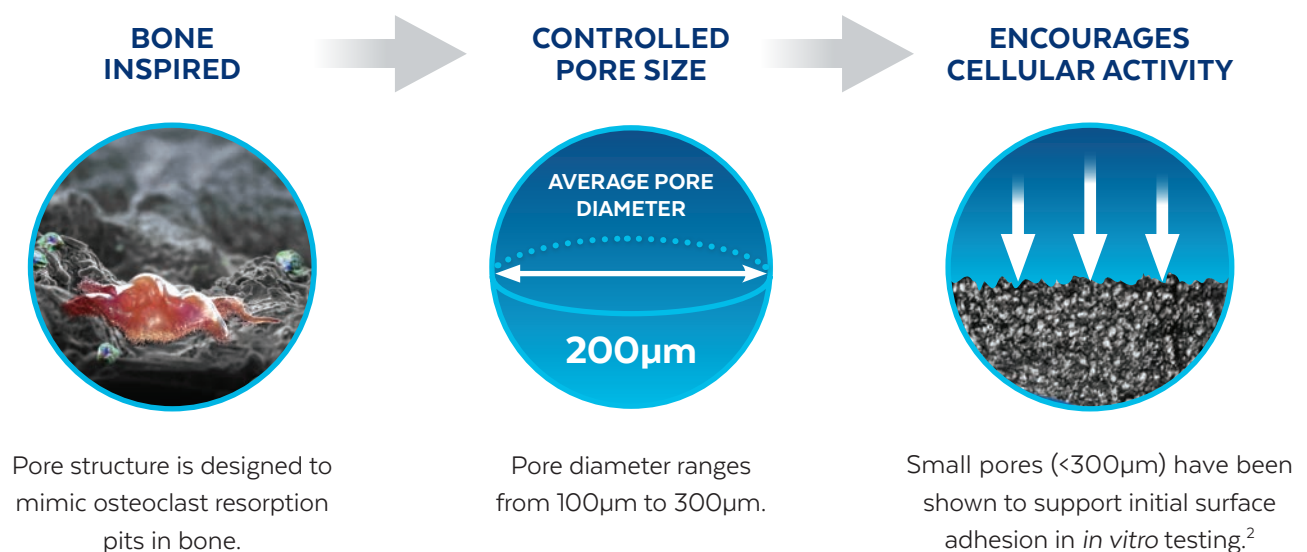
Maximized Fusion Potential

Endplates are treated with SintrOS™ laser etched surface technology designed to encourage cellular activity at the bone interface* coupled with post-expansion delivery of bone graft.

**Cell study data on file*



SintrOS™ titanium laser-etched surface technology features a biomimetic texture designed to encourage cellular activity at the bone interface.¹



1. Cell study data on file

2. Torres-Sanchez et al. *Material Science and Engineering*. 2017 Mar; 219-228.

IMPLANT OVERVIEW

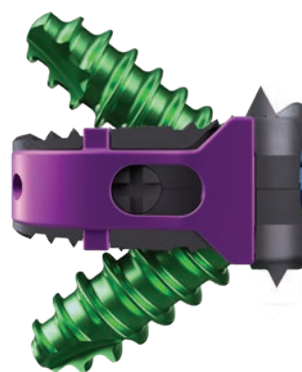
Spacer Options

- All-titanium spacer
- Three axial footprints: 12x14, 14x16, 15x18mm
- Height ranges from 5-10mm
 - 5-8mm, 6-9mm, 7-10mm
- Sagittal profiles: 0°, 7°, 12°
- SintrOS™ Surface Technology
 - 5-8mm; available with roughened texture



Features

- Minimized need for trialing due to expansion capabilities
- Implant inserted at a contracted height
- Controlled continuous expansion up to 3mm
- Automatic expansion locking
- Streamlined instrumentation
- Integrated fixation
- SintrOS™ Surface Technology



12x14mm



14x16mm

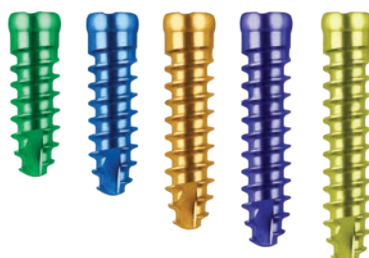


15x18mm

Screw Options

- Fixed and variable angle screws ($\pm 4^\circ$)
- Five screw lengths: 12, 14, 16, 18, 20mm
- Two screw diameters: 3.6mm, 4.2mm
- Self-drilling and self-tapping

12mm 14mm 16mm 18mm 20mm



Variable
Angle Screw



Fixed
Angle Screw

INSTRUMENT OVERVIEW

DISTRACTION INSTRUMENTS

The Universal ACDF Instrument Set, 9147.9001 is required.







Distractor Locking Nuts 665.606



Distractor Pin Driver 665.608

Distractor Pins

Height	Part No.	
12mm	665.612	
14mm	665.614	
16mm	665.616	
18mm	665.618	

REVEL™ MODULAR TRIALS



Module Handle Inner Shaft Assembly 6147.9002



Trial Holder, Modular Trial/Rasp Heads - Outer Sleeve 6147.9001



12x14mm		
Height	0°	7°
5mm	6131.0005	6131.0105
6mm	6131.0006	6131.0106
7mm	6131.0007	6131.0107
8mm	6131.0008	6131.0108
9mm	6131.0009	6131.0109
10mm	6131.0010	6131.0110

14x16mm		
Height	0°	7°
5mm	6131.1005	-
6mm	6131.1006	6131.1106
7mm	6131.1007	6131.1107
8mm	6131.1008	6131.1108
9mm	6131.1009	6131.1109
10mm	6131.1010	6131.1110

15x18mm		
Height	0°	7°
5mm	6131.2005	-
6mm	6131.2006	6131.2106
7mm	6131.2007	6131.2107
8mm	6131.2008	6131.2108
9mm	6131.2009	6131.2109
10mm	6131.2010	6131.2110

IMPLANT INSERTION INSTRUMENTS



Thumb Wheel 6131.6001.02



Outer Sleeve 6131.6001.03



Inner Shaft 6131.6001.01



Midline Holder 6131.6001 (Assembled)



Size	Part No.
5-8mm	6131.6105
6-9mm	6131.6106
7-10mm	6131.6107

Midline Tips



Expansion Driver, Torque-Limiting, 1Nm 6131.6002



Blocking Positioner, 6131.6102



Torque-Limiting, Quick-Connect Handle, 0.3Nm 697.312

BONE PACKING INSTRUMENTS



Bone Packing Pusher, 6131.6005



Bone Packing Funnel, 6131.6004



Bone Packing Funnel Tip, 6131.6006



Assembled Bone Funnel and Bone Funnel Tip

STRAIGHT INSTRUMENTS



Quick-Connect Handle, Swivel 636.450



Awl, Straight with Self-Centering Sleeve 684.403



Tap Straight, 684.004



Awl with Retractable Sleeve 684.006



Drills, Straight with Self-Centering Sleeve

Lengths	Part No.
12mm	684.422
14mm	684.424
16mm	684.426
18mm	684.428
20mm	684.430



Screwdriver, 2.5mm Hex, Self-Retaining, with Cap 684.305

ANGLED INSTRUMENTS



Awl, Bent with Self-Centering Sleeve 684.404



Angled Driver (Sleeve) Body 684.415



Backing Nut 684.416



Counter-Torque 684.421



Angled Driver Shaft 684.417



Angled Driver Assembly

Angled Drill, 14mm with Self-Centering Sleeve 684.434

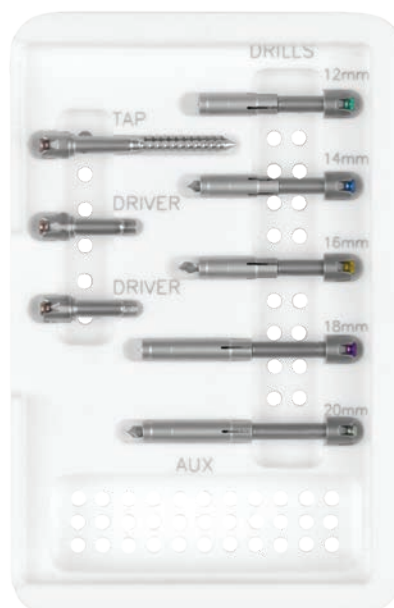
Angled Driver Body 684.415

Backing Nut 684.416

Angled Driver Shaft 684.417

Angled Tap, Driver, and Drills

Instrument	Part No.
Angled Tap	684.419
Angled Driver	684.418
Angled Driver	684.418
Angled Drill, 12mm	684.432
Angled Drill, 14mm	684.434
Angled Drill, 16mm	684.436
Angled Drill, 18mm	684.438
Angled Drill, 20mm	684.440



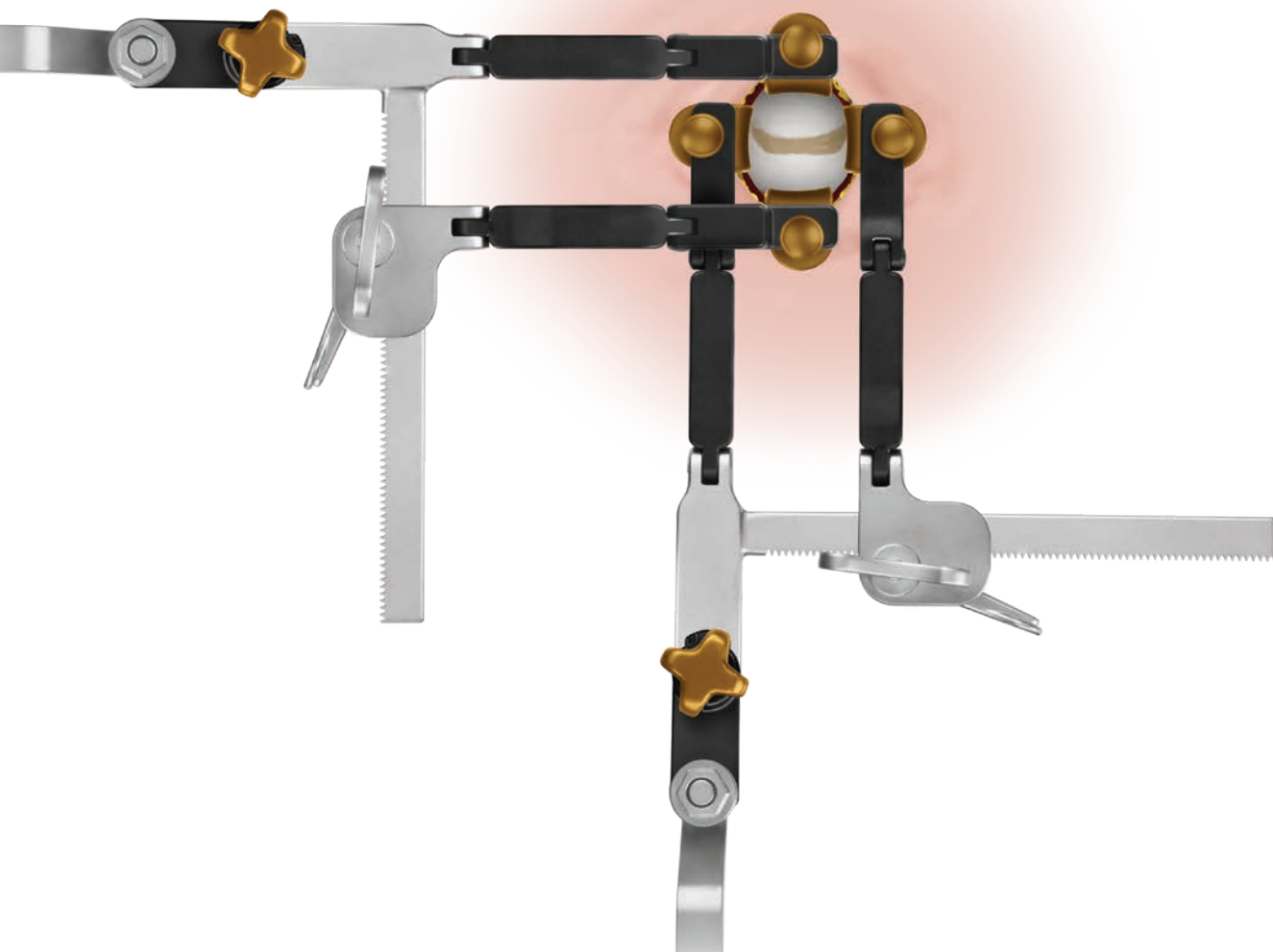
SURGICAL TECHNIQUE

REVEL™-S

Refer to the package insert at the back of this guide for information regarding intended use/indications, device description, contraindications, precautions, warnings, and potential risks associated with this system.

STEP 1 SURGICAL APPROACH

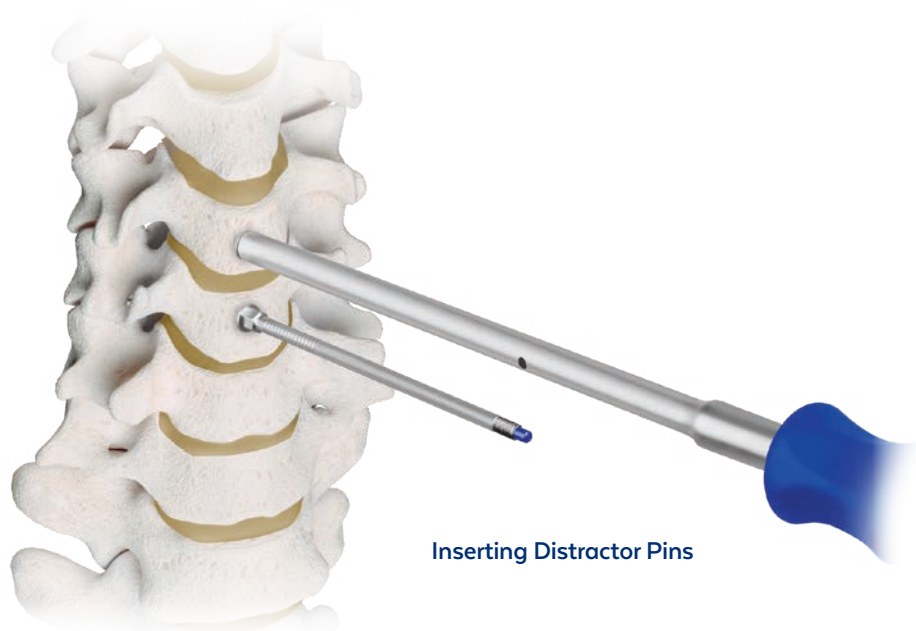
An anterior cervical approach is used to implant REVEL™-S. The patient is placed under anesthesia and positioned supine with support of the posterior cervical spine to maintain cervical lordosis. The operative area is carefully cleaned and an incision is made at the appropriate fusion level. Traditional cervical retractors may be used.



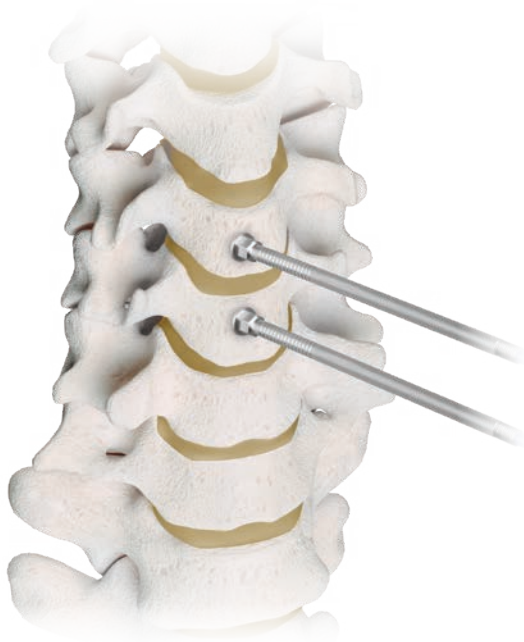
STEP 2 DISTRACTION

Distraction may be accomplished using the **Distractor** available in this system or other standard methods.

To use the Distractor, determine placement of the distractor pins within the vertebral bodies. Select the appropriate pin length and place the **Distractor Pins** into adjacent vertebral bodies using the **Distractor Pin Driver**. Care should be taken when placing pins to avoid interference with any subsequently placed screws or supplemental fixation.



Inserting Distractor Pins



Distractor Pins inserted

Place the Distractor, right or left as desired, over pins until seated. Once seated, secure the Distractor in place by attaching the **Distractor Locking Nuts** and rotating clockwise until secured. Rotate the ratchet handle to distract to the desired amount, being careful not to over-distract the segment. Distraction may be used throughout the technique to provide visualization and access to the disc and osseous structures.

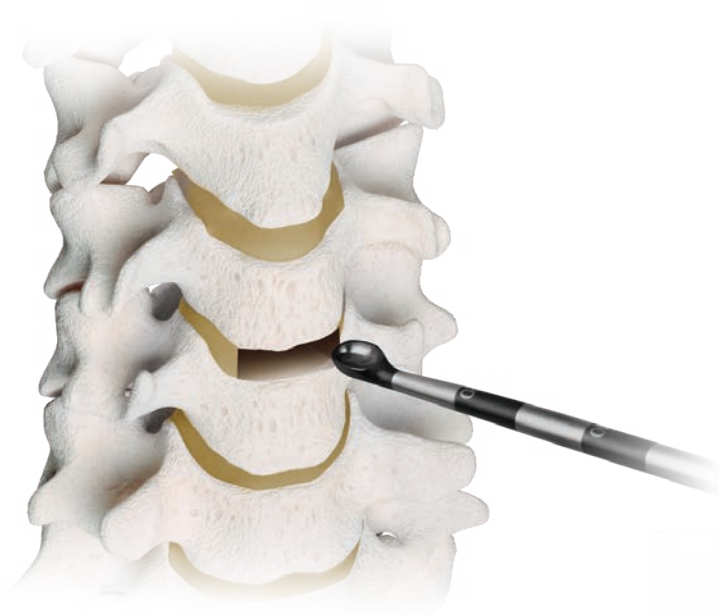


Distracting disc space
using Distractor

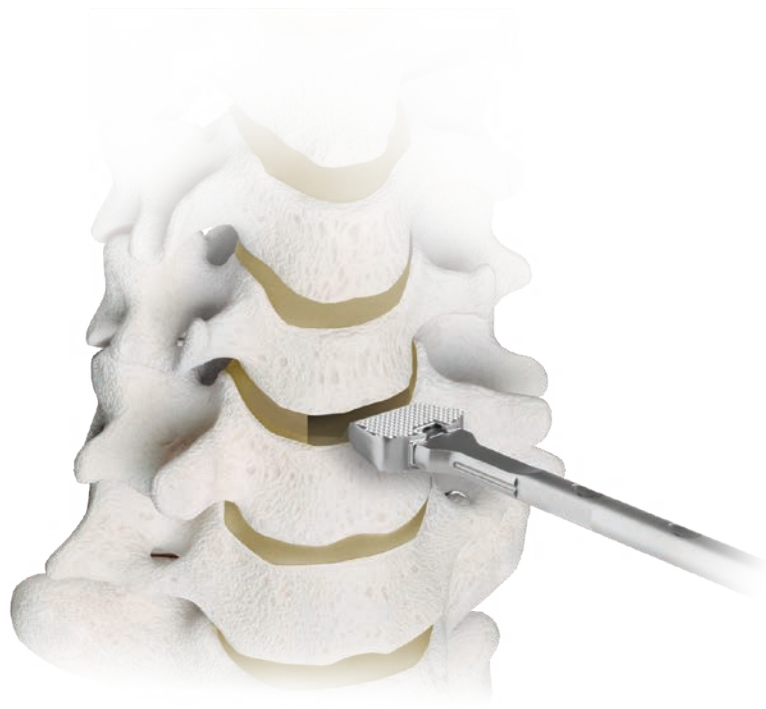
STEP**3****DISCECTOMY/ENDPLATE PREPARATION**

Expose the disc space. Leaving the lateral annulus intact, remove the intervertebral disc and the osteophytes, using rongeurs, curettes, rasps and other instruments as needed. Remove the superficial layers of the cartilaginous endplates to expose bleeding bone; trial spacer rasps may be used for this purpose. The lateral walls of the annulus should be preserved to provide peripheral support for the implant and bone graft material. Distraction pins may be removed before insertion of the implant but are optional if needed to maintain distraction of the disc space.

Note: Excessive endplate preparation may weaken the vertebral endplates and may result in subsidence.



Endplate preparation using Box Curette



Endplate preparation using Trial Rasp

STEP

4

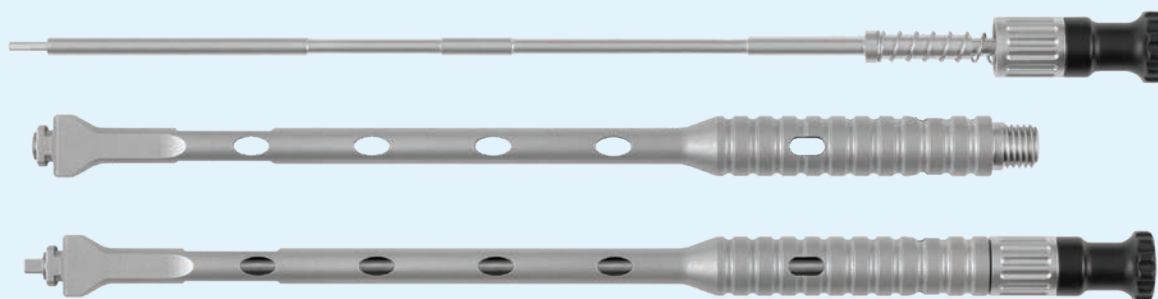
SPACER SIZING

Determine the most suitable spacer profile for the desired segment. Refer to the section titled “Using the Modular Trial System” for detailed instructions on use of the modular trials. Insert the smallest **Modular Trial Head** into the disc space first, moving to larger trials as needed. Determine which trial best fits the prepared disc space. A secure fit is desirable in order to maintain disc height and stabilize the segment. Confirm using fluoroscopy and tactile feedback. After the size has been determined, proceed to implant insertion.

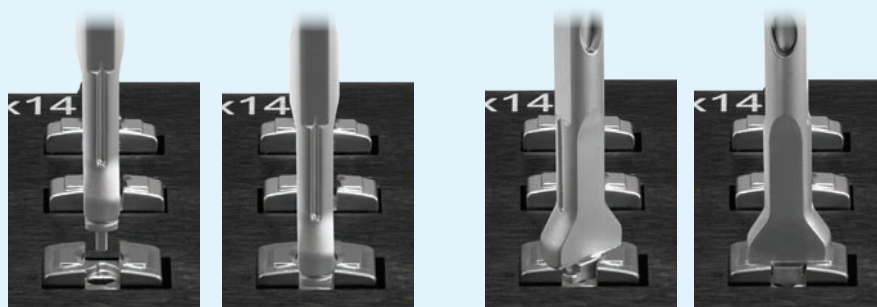


Trialing for spacer size

USING THE MODULAR TRIAL SYSTEM



The Trial Holder is provided in two parts (inner shaft and outer sleeve). To assemble, thread the inner shaft and outer sleeve together by turning the silver thumb wheel clockwise. To load a Modular Trial or Rasp Head on the Trial Holder, insert the tip of the holder into the notch in the appropriate trial or rasp head and rotate clockwise 90°, as shown below.



Trial Holder inserted into Modular Trial

Trial Holder rotated 90° to fully load

Loading Modular Trial Onto Trial Holder

Confirm that the trial or rasp head is fully engaged with the holder and that the black knob is in the lock position.



To remove the trial or rasp head from the holder, pull the black knob on the distal end of the holder and rotate counterclockwise to the “UNLOCK” position.



To reconnect or connect to a different trial or rasp head, insert the tip of the trial holder into a new head, and rotate clockwise 90°. Rotate the black knob clockwise until it is back in the “LOCK” position.

ASSEMBLING THE MIDLINE HOLDER

To assemble the **Midline Holder**, slide the **Thumb Wheel** into the **Outer Sleeve** as shown below.



Slide the **Inner Shaft** through the Thumb Wheel and the Outer Sleeve assembly while rotating the Thumb Wheel counterclockwise until the Inner Shaft cannot be advanced any farther. The midline implant holder is ready to accept the **Midline Tip**.



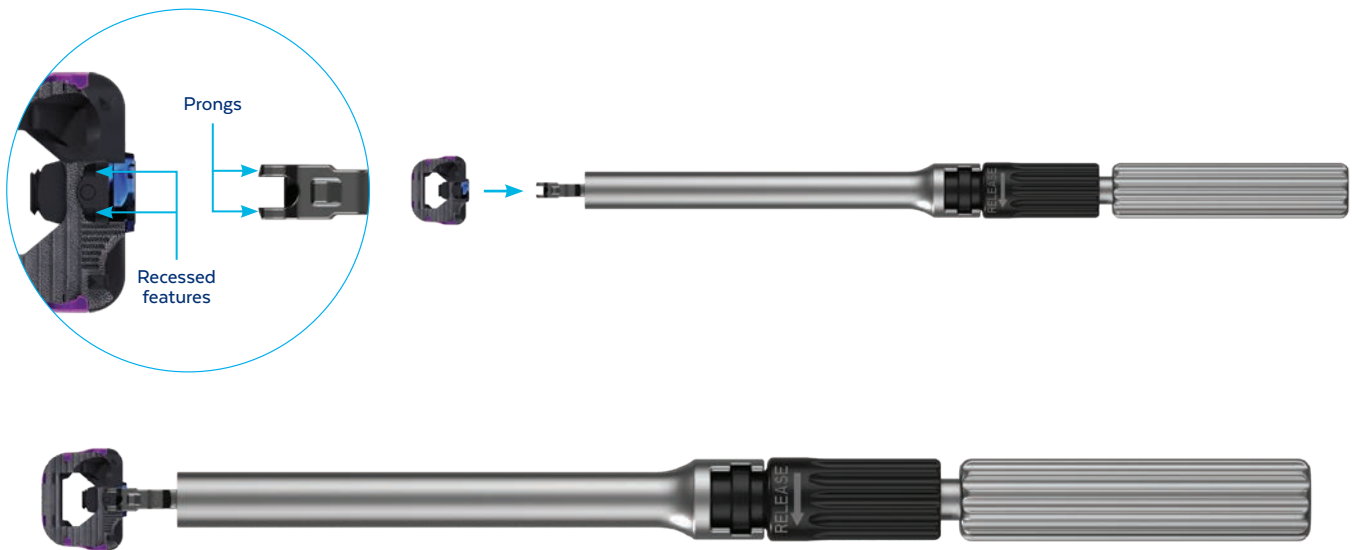
Thread the midline tip clockwise into the distal portion of the midline holder until it cannot be advanced any farther.



IMPLANT INSERTION (CONT'D)

Select an appropriately sized implant and pack with autograft bone and/or allogenic bone graft composed of cortical, cancellous, and/or corticocancellous bone. The Midline Holder is used to insert the implant into the intervertebral space.

In order to attach the implant to the tip of the Midline Holder, insert the prongs of the midline tip into the recess features on the selected implant. Rotate the thumb wheel clockwise until the Outer Sleeve stops and the implant is secured onto the Midline Holder.



Implant loaded onto Midline Holder

Insert the implant into the disc space. The implant should be flush or slightly recessed. Confirm placement using fluoroscopy.

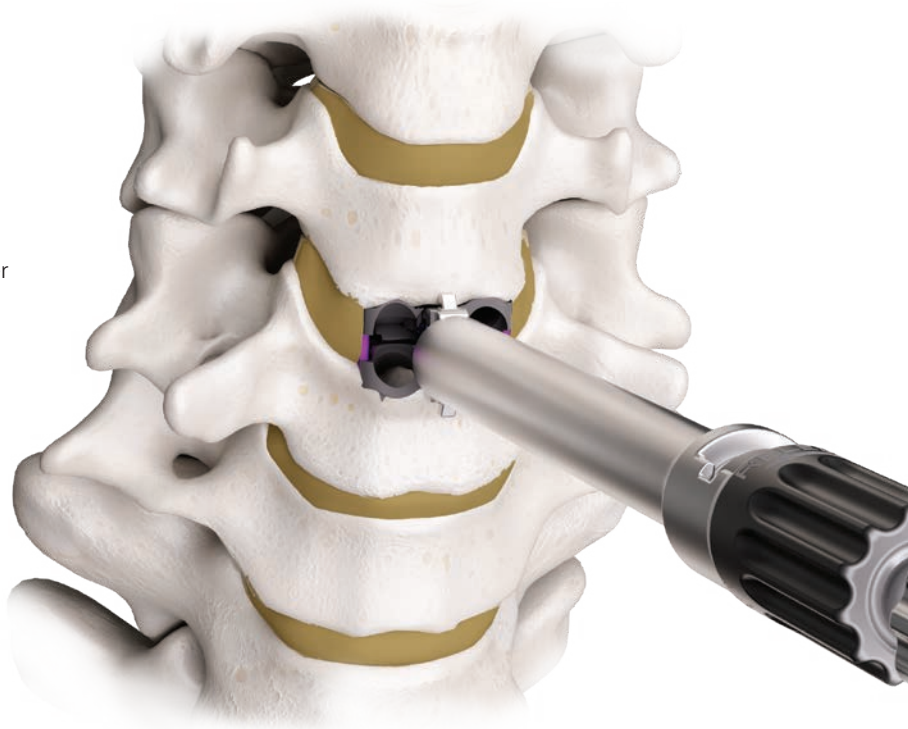


Implant insertion

STEP 6 EXPANSION

Insert the **Expansion Driver, Torque-Limiting, 1Nm** into the shaft of the Midline Holder. Ensure the square tip of the driver is seated in the actuator screw and rotate clockwise until the desired height is achieved. Use fluoroscopy and tactile feedback to confirm proper placement and expansion.

1 rotation = 0.4mm



Implant expansion

ASSEMBLING THE BONE PACKING FUNNEL

Thread the **Bone Packing Funnel Tip** clockwise to the distal end of the **Bone Packing Funnel**.



STEP**7****EXPANSION GRAFT DELIVERY**

Once expansion is complete, remove the holder by rotating counterclockwise on the thumb wheel. Additional autograft bone and/or allogenic bone graft composed of cortical, cancellous, and/or corticocancellous bone may be inserted through the fixation holes using the Bone Packing Funnel and Pusher if needed.



STEP 8 SCREW PREPARATION

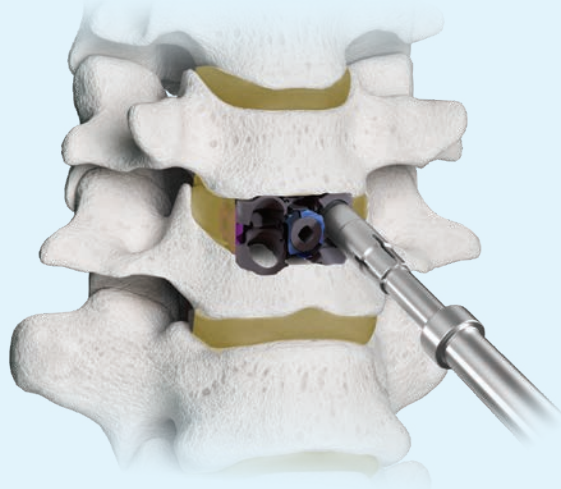
Universal ACDF Set (9147.9001) is required.

⚙️ USING SELF-CENTERING INSTRUMENTS

Self-centering awls (bent and straight) and drills are available for screw trajectories up to 35° cephalad/caudal.

Insert the spacer into the disc space.

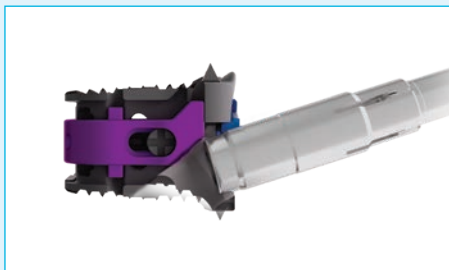
After the spacer is inserted into the disc space, use an **Awl with Self-Centering Sleeve** to break the cortex. A **Self-Centering Drill and Tap** may be used to further prepare the screw hole. Depending on the angle and position, a straight or angled instrument may be used.



Awl insertion

Aligning the Self-Centering Sleeve

The **Self-Centering Sleeve** helps to ensure proper screw trajectory without the use of a drill guide. The sleeve must be properly engaged with the screw hole on the implant before advancing a screw hole preparation instrument. Proceed to screw insertion prior to preparing the remaining screw hole.



INCORRECT



CORRECT

ASSEMBLING THE ANGLED INSTRUMENTS

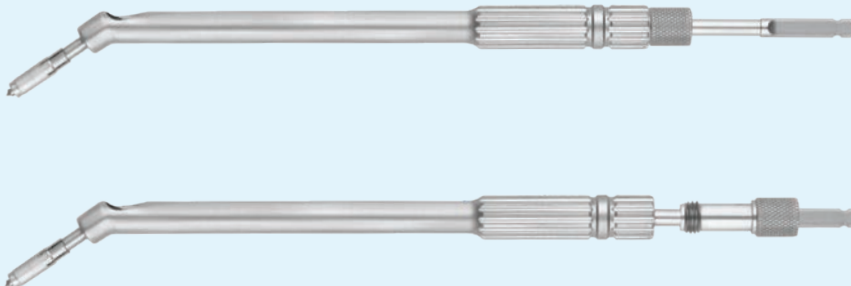
1. Select the appropriate Angled Driver, Angled Drill, or Angled Tap for assembly with the **Angled Driver Body** and **Angled Driver Shaft**.
2. Hold the Angled Driver Body pointed downward with the cutout facing upward. Insert the selected tip into the cutout on the distal end of the driver body.



3. Insert the Angled Driver Shaft into the driver body until the gears on the shaft mesh with the gears on the selected tip.



4. Place the **Backing Nut** over the shaft. Rotate the threads clockwise until the nut sits flush with the driver body.



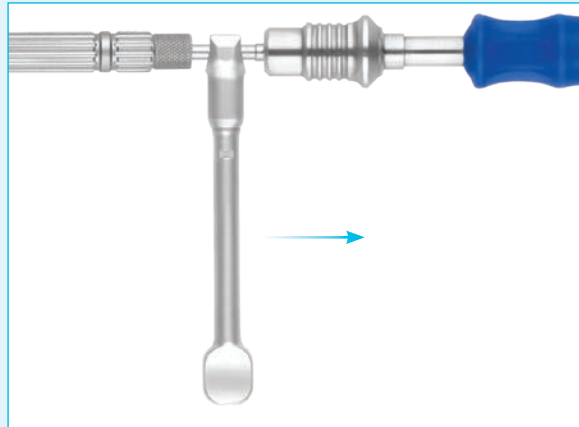
5. Attach a **Quick-Connect Handle, Swivel**. The driver is now ready for use.



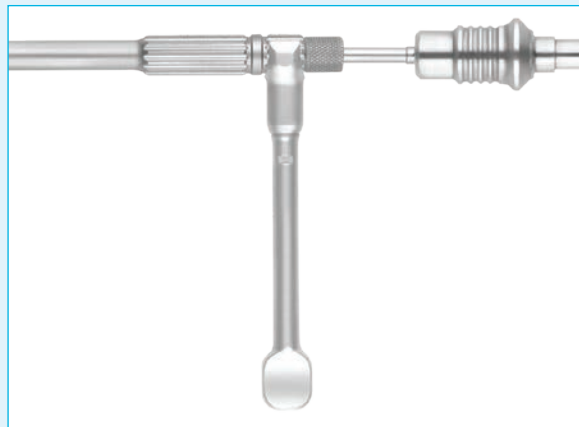
ASSEMBLING THE ANGLED INSTRUMENTS (CONT'D)

6. For additional control, a **Counter-Torque** handle may be attached to the Angled Instruments.

Starting from the top, slide the Counter-Torque from the smooth portion of the Angled Driver Body to the knurled portion until fully seated.

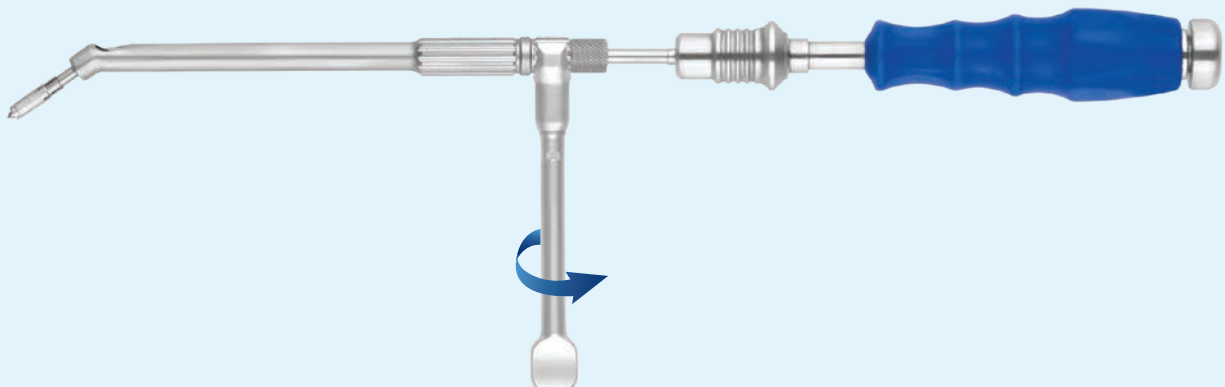


Attaching Counter-Torque



Counter-Torque in final position

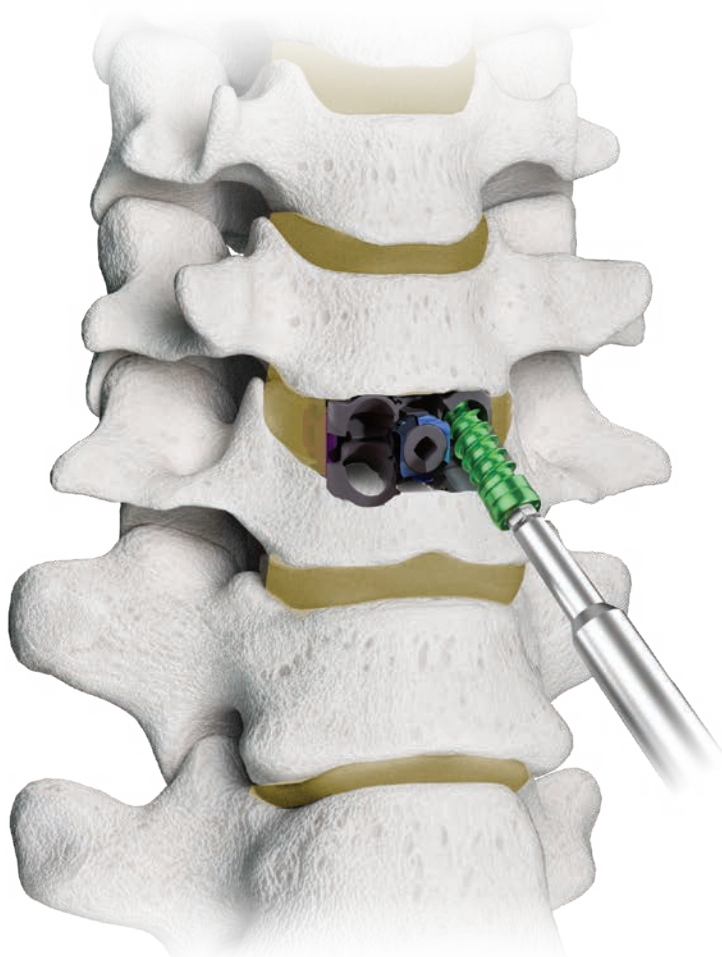
7. Rotate the Counter-Torque clockwise to final tighten.



STEP**9****SCREW INSERTION**

Depending on the angle and position of the spacer, a **Straight** or **Angled Driver** may be used. If drilling is preferred, determine the desired drill depth and select the appropriate fixed length drill. Insert the drill into the screw hole and drill to the stop.

Select the appropriate length screw, load onto the driver, and insert the screw. Repeat for the second screw.



Screw insertion

STEP 10 SCREW BLOCKING

ASSEMBLING THE BLOCKING POSITIONER

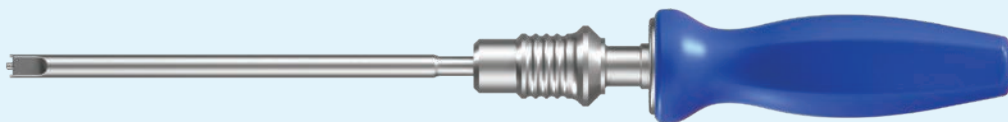
Attach the Blocking Positioner to the Torque-Limiting, Quick-Connect Handle. The Blocking Positioner is now ready to use.



Blocking Positioner



Torque-Limiting, Quick-Connect Handle, 0.3Nm 697.312



Blocking Positioner assembled with Torque-Limiting, Quick-Connect Handle, 0.3Nm

Once the screws are fully seated, use the **0.3Nm Torque-Limiting, Blocking Positioner** to secure the **Blocking Ring**.

Note: Hyperlordotic ($\geq 20^\circ$) devices must be used with supplemental fixation, in addition to the two bone screws.



Initial position
Blocking Ring unblocked



Final position
Blocking Ring blocked

FINAL CONSTRUCT



Anterior view

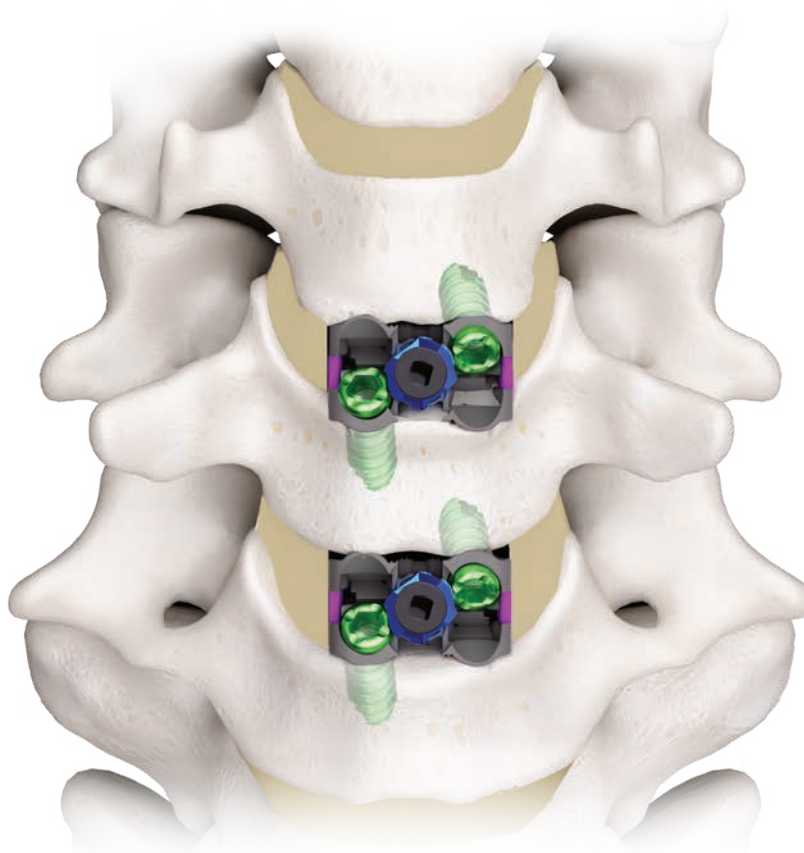


Axial view

OPTIONAL TECHNIQUE: 2-LEVEL INSERTION

To implant a second spacer at an adjacent level, repeat steps 2-10.

Final Two-Level Construct



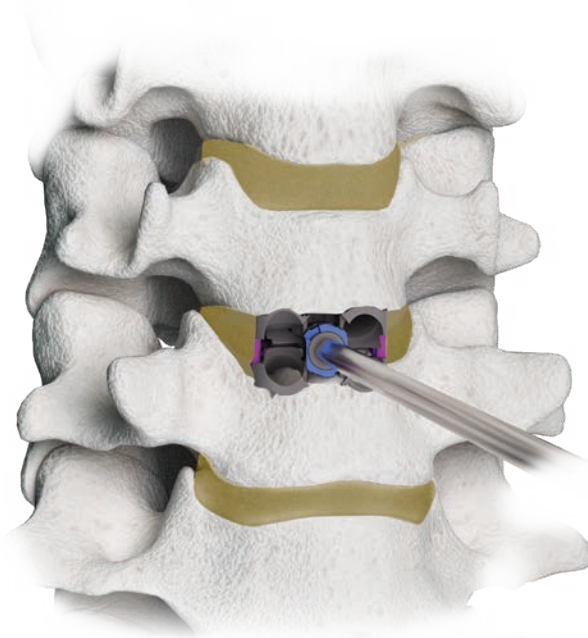
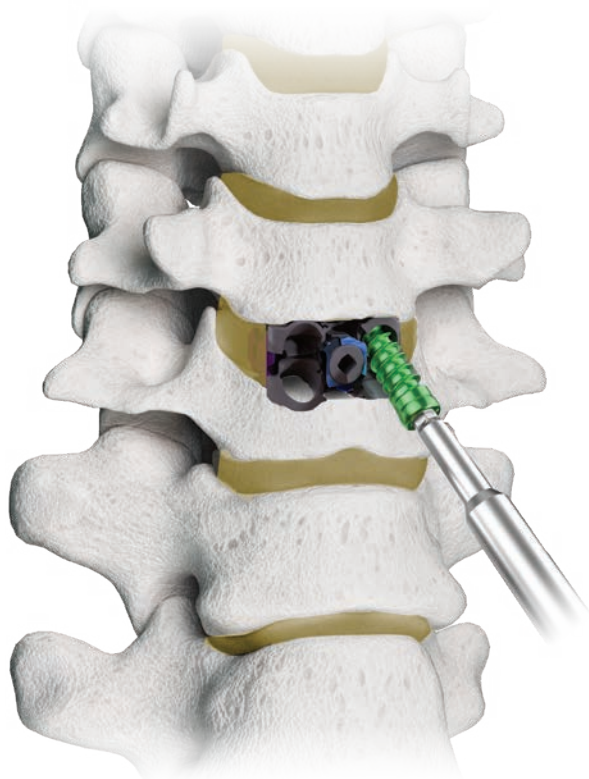
Coronal/AP view

OPTIONAL: IMPLANT OR SCREW REMOVAL

For screw removal, rotate the blocking ring 90° counterclockwise. Remove the screws using a screwdriver.



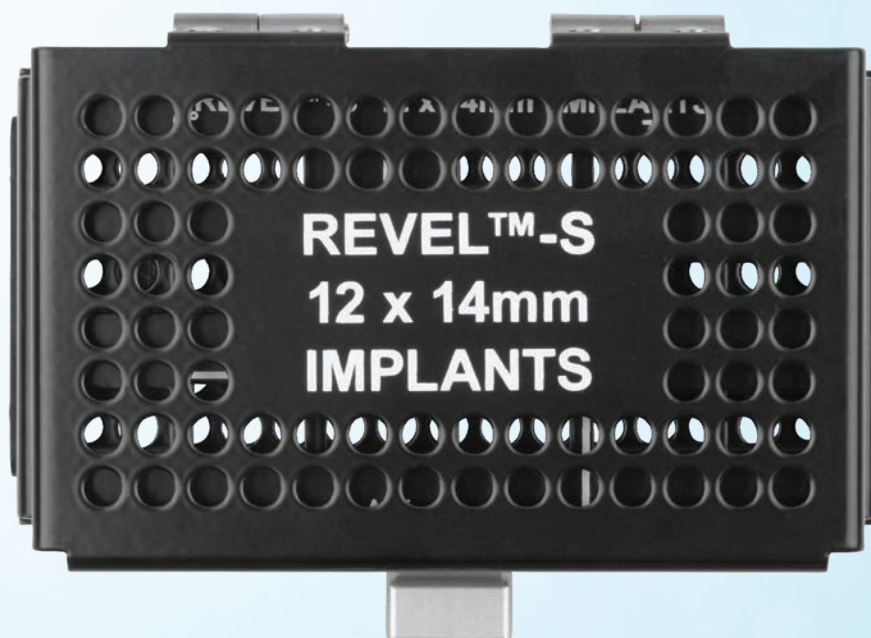
Initial position
Blocking set screw unlocked



For implant removal, insert the Expansion Driver, Torque-Limiting, 1Nm, and rotate the actuator screw counterclockwise until the implant is fully collapsed. The implant may be removed using the Midline Holder with Midline Tip, forceps, or other manual surgical instruments. In the event of a fracture, follow removal steps, including a partial corpectomy if necessary.

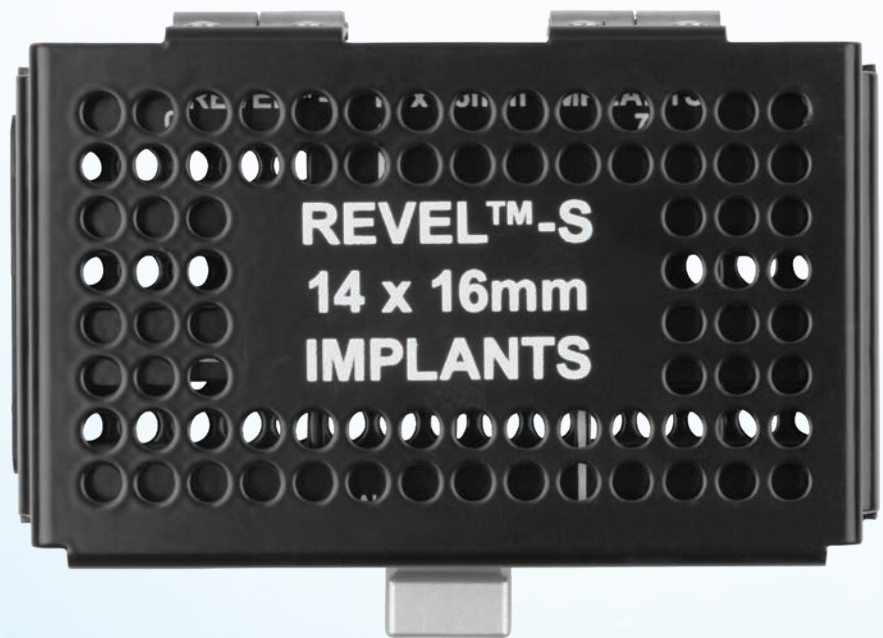
REVEL™-S 12x14mm IMPLANT SET 9131.9102

Part No.	Description	Qty
1131.0005	REVEL™-S, 12x14mm, 0°, 5-8mm	2
1131.0006	REVEL™-S, 12x14mm, 0°, 6-9mm	2
1131.0007	REVEL™-S, 12x14mm, 0°, 7-10mm	1
1131.0105	REVEL™-S, 12x14mm, 7°, 5-8mm	3
1131.0106	REVEL™-S, 12x14mm, 7°, 6-9mm	3
1131.0107	REVEL™-S, 12x14mm, 7°, 7-10mm	2
9131.0102	REVEL™-S 12x14mm Implant Module	



REVEL™-S 14x16mm IMPLANT SET 9131.9103

Part No.	Description	Qty
1131.1005	REVEL™-S, 14x16mm, 0°, 5-8mm	2
1131.1006	REVEL™-S, 14x16mm, 0°, 6-9mm	2
1131.1007	REVEL™-S, 14x16mm, 0°, 7-10mm	1
1131.1106	REVEL™-S, 14x16mm, 7°, 6-9mm	3
1131.1107	REVEL™-S, 14x16mm, 7°, 7-10mm	2
9131.0103	REVEL™-S 14x16mm Implant Module	



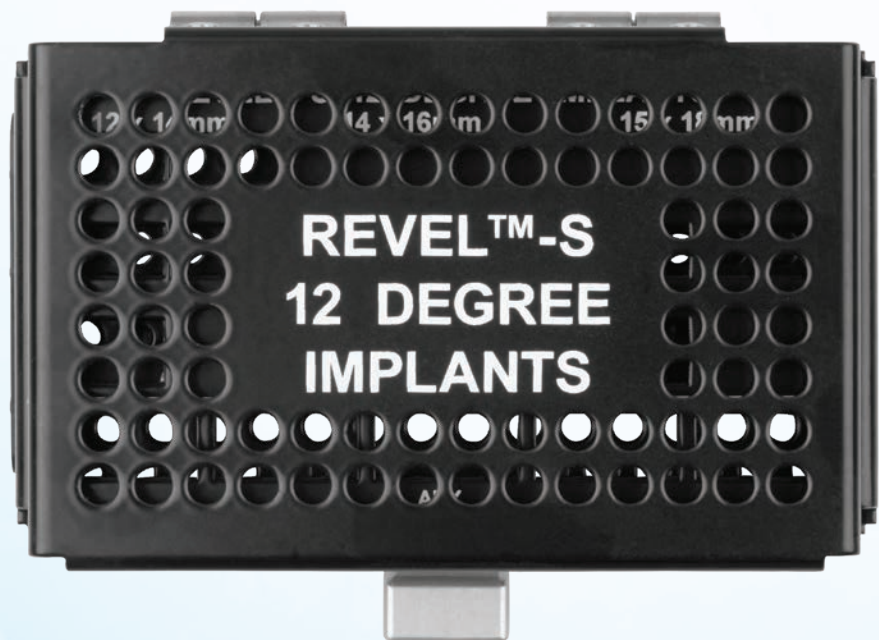
REVEL™-S 15x18mm IMPLANT SET 9131.9104

Part No.	Description	Qty
1131.2005	REVEL™-S, 15x18mm, 0°, 5-8mm	2
1131.2006	REVEL™-S, 15x18mm, 0°, 6-9mm	2
1131.2007	REVEL™-S, 15x18mm, 0°, 7-10mm	1
1131.2106	REVEL™-S, 15x18mm, 7°, 6-9mm	3
1131.2107	REVEL™-S, 15x18mm, 7°, 7-10mm	2
9131.0104	REVEL™-S 15x18mm Implant Module	



REVEL™-S 12° IMPLANT SET 9131.9108

Part No.	Description	Qty
1131.0206	REVEL™-S, 12x14mm, 12°, 6-9mm	2
1131.0207	REVEL™-S, 12x14mm, 12°, 7-10mm	2
1131.1207	REVEL™-S, 14x16mm, 12°, 7-10mm	2
1131.2207	REVEL™-S, 15x18mm, 12°, 7-10mm	2
9131.0108	REVEL™-S 12° Implant Module	



TRIAL MODULES

12x14 Trial Module 9131.9001

Part No.	Description	Qty
6131.0005	Modular Trial, 12x14mm, 0°, 5mm	1
6131.0006	Modular Trial, 12x14mm, 0°, 6mm	1
6131.0007	Modular Trial, 12x14mm, 0°, 7mm	1
6131.0009	Modular Trial, 12x14mm, 0°, 9mm	1
6131.0010	Modular Trial, 12x14mm, 0°, 10mm	1
6131.0105	Modular Trial, 12x14mm, 7°, 5mm	1
6131.0106	Modular Trial, 12x14mm, 7°, 6mm	1
6131.0107	Modular Trial, 12x14mm, 7°, 7mm	1
6131.0109	Modular Trial, 12x14mm, 7°, 9mm	1
6131.0110	Modular Trial, 12x14mm, 7°, 10mm	1
9131.0001	REVEL™ 12x14mm Trial Module	

14x16 Trial Module 9131.9002

Part No.	Description	Qty
6131.1005	Modular Trial, 14x16mm, 0°, 5mm	1
6131.1006	Modular Trial, 14x16mm, 0°, 6mm	1
6131.1007	Modular Trial, 14x16mm, 0°, 7mm	1
6131.1009	Modular Trial, 14x16mm, 0°, 9mm	1
6131.1010	Modular Trial, 14x16mm, 0°, 10mm	1
6131.1106	Modular Trial, 14x16mm, 7°, 6mm	1
6131.1107	Modular Trial, 14x16mm, 7°, 7mm	1
6131.1109	Modular Trial, 14x16mm, 7°, 9mm	1
6131.1110	Modular Trial, 14x16mm, 7°, 10mm	1
9131.0002	REVEL™ 14x16 Trial Module	

15x18 Trial Module 9131.9003

Part No.	Description	Qty
6131.2005	Modular Trial, 15x18mm, 0°, 5mm	1
6131.2006	Modular Trial, 15x18mm, 0°, 6mm	1
6131.2007	Modular Trial, 15x18mm, 0°, 7mm	1
6131.2009	Modular Trial, 15x18mm, 0°, 9mm	1
6131.2010	Modular Trial, 15x18mm, 0°, 10mm	1
6131.2106	Modular Trial, 15x18mm, 7°, 6mm	1
6131.2107	Modular Trial, 15x18mm, 7°, 7mm	1
6131.2109	Modular Trial, 15x18mm, 7°, 9mm	1
6131.2110	Modular Trial, 15x18mm, 7°, 10mm	1
9131.0003	REVEL™ 15x18mm Trial Module	

12° Trial Module 9131.9008

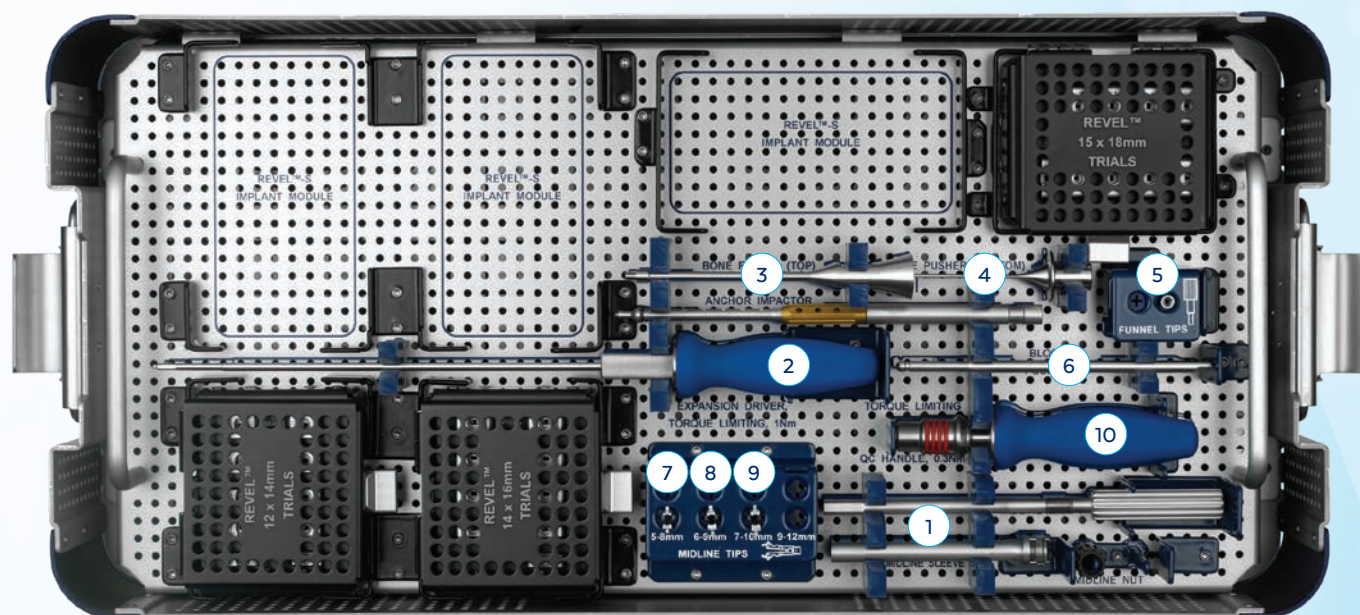
Part No.	Description	Qty
6131.0206	Modular Trial, 12x14mm, 12°, 6mm	1
6131.0207	Modular Trial, 12x14mm, 12°, 7mm	1
6131.0209	Modular Trial, 12x14mm, 12°, 9mm	1
6131.0210	Modular Trial, 12x14mm, 12°, 10mm	1
6131.1207	Modular Trial, 14x16mm, 12°, 7mm	1
6131.1209	Modular Trial, 14x16mm, 12°, 9mm	1
6131.1210	Modular Trial, 14x16mm, 12°, 10mm	1
6131.2207	Modular Trial, 15x18mm, 12°, 7mm	1
6131.2209	Modular Trial, 15x18mm, 12°, 9mm	1
6131.2210	Modular Trial, 15x18mm, 12°, 10mm	1
9131.0008	REVEL™ 12° Trial Module	

REVEL™-S

INSTRUMENT SET 9131.9101

	Part No.	Description	Qty
1	6131.6001	Midline Holder	2
2	6131.6002	Expansion Driver, Torque-Limiting, 1Nm	1
3	6131.6004	Bone Packing Funnel - 2mm	1
4	6131.6005	Bone Packing Pusher - 2mm	1
5	6131.6006	Bone Packing Funnel Tip - 2mm	2
6	6131.6102	Blocking Positioner, Torque-Limiting, 0.15Nm	1
7	6131.6105	Midline Tip, 5-8mm	2
8	6131.6106	Midline Tip, 6-9mm	2
9	6131.6107	Midline Tip, 7-10mm	2
10	697.3120	Torque-Limiting Quick-Connect Handle, 0.3Nm	1
	9131.0101	REVEL™-S Graphic Case	

REVEL™-S INSTRUMENT SET 9131.9101

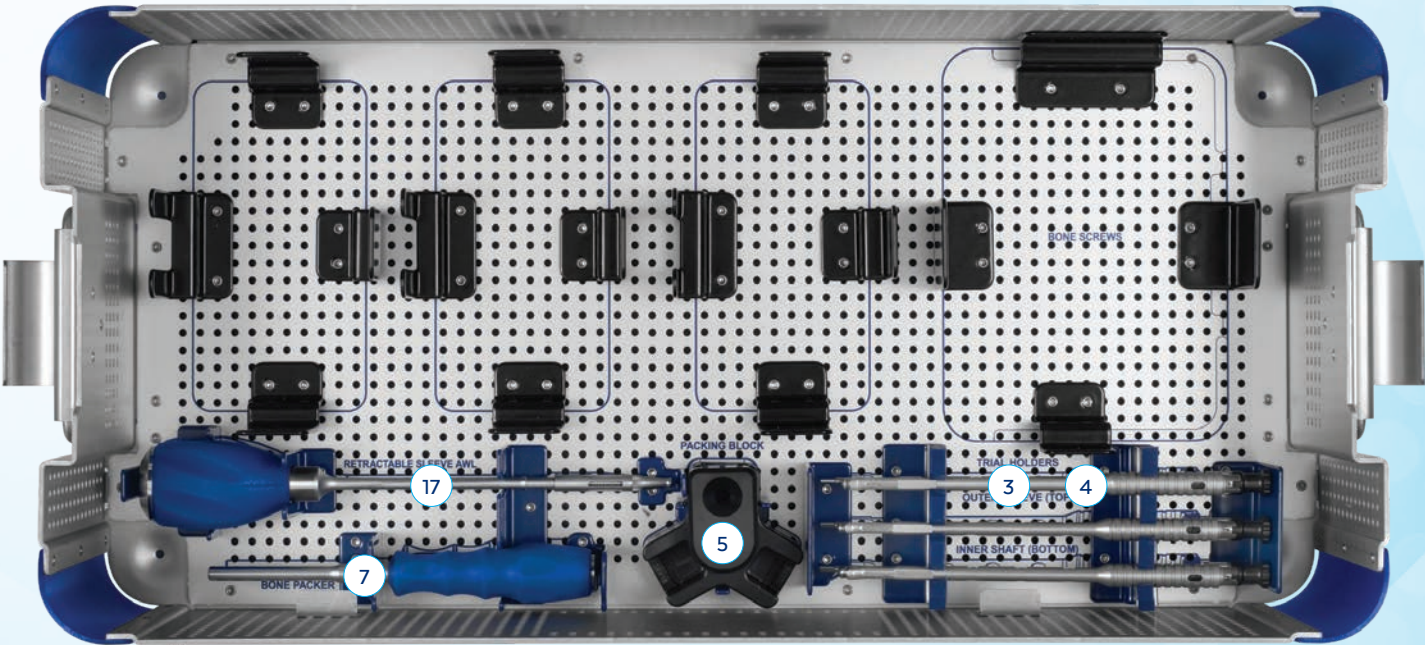
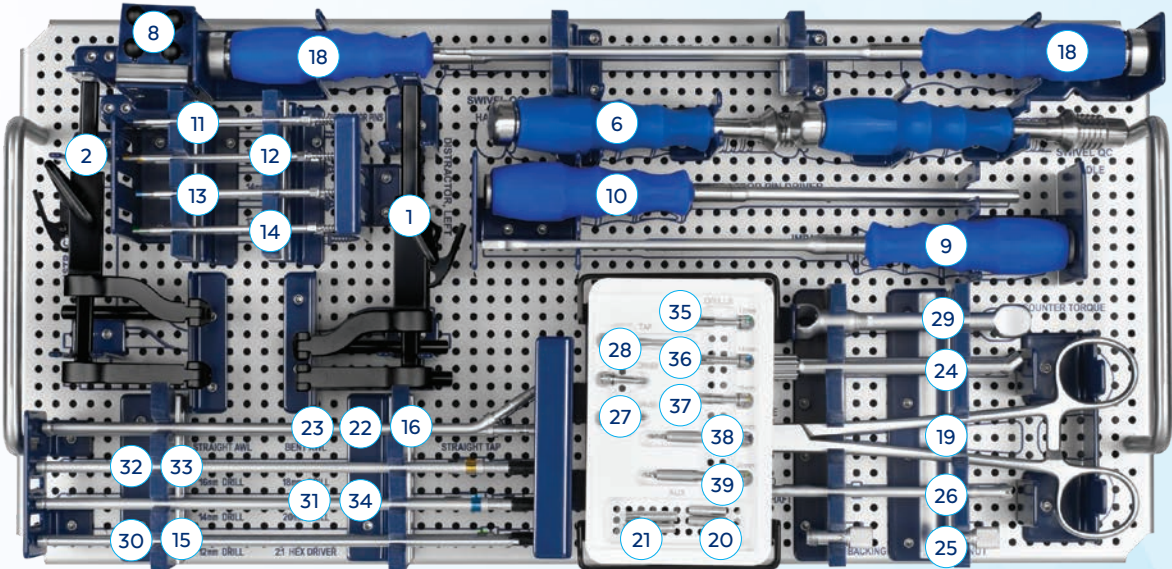


UNIVERSAL ACDF

INSTRUMENT SET 9147.9001

Part No.	Description	Qty	Part No.	Description	Qty
1	601.020 Distractor, Left	1	30	684.422 Straight Drill with Self-Centering Sleeve, 12mm	1
2	601.021 Distractor, Right	1	31	684.424 Straight Drill with Self-Centering Sleeve, 14mm	1
3	6147.9001 Trial Holder, Modular Trial/Rasp Heads - Outer Sleeve	3		684.425 Angled Driver Tip, Short	
4	6147.9002 Trial Holder, Modular Trial/Rasp Heads - Inner Shaft Assembly	3	32	684.426 Straight Drill with Self-Centering Sleeve, 16mm	1
5	6147.9003 Packing Block	1	33	684.428 Straight Drill with Self-Centering Sleeve, 18mm	1
6	636.450 Quick-Connect Handle, Swivel	2	34	684.430 Straight Drill with Self-Centering Sleeve, 20mm	1
7	665.504 Bone Packer	1	35	684.432 Angled Drill Tip with Self-Centering Sleeve, 12mm	1
8	665.606 Distractor Locking Nuts	4	36	684.434 Angled Drill Tip with Self-Centering Sleeve, 14mm	1
9	665.607 Impactor	1	37	684.436 Angled Drill Tip with Self-Centering Sleeve, 16mm	1
10	665.608 Distractor Pin Driver	1	38	684.438 Angled Drill Tip with Self-Centering Sleeve, 18mm	1
	665.610 Distractor Pin, 10mm		39	684.440 Angled Drill Tip with Self-Centering Sleeve, 20mm	1
11	665.612 Distractor Pin, 12mm	2		9147.0001 Universal ACDF Instrument Graphic Case	
12	665.614 Distractor Pin, 14mm	2		984.004 COALITION® Module, Angled Instruments	
13	665.616 Distractor Pin, 16mm	2			
14	665.618 Distractor Pin, 18mm	2			
15	671.313 VIP® Screwdriver, 2.1mm Hex, QC	1			
16	684.004 Tap, Straight	1			
17	684.006 Awl with Retractable Sleeve	1			
18	684.305 Screwdriver, 2.5mm Hex, Self-Retaining, with Cap	2			
19	684.309 Drill Sleeve Adjuster	1			
20	684.401 Self-Centering Sleeve - Short	2			
21	684.402 Self-Centering Sleeve - Long	2			
22	684.403 Awl with Self-Centering Sleeve, Straight	1			
23	684.404 Awl with Self-Centering Sleeve, Bent	1			
	684.405 Sleeved Driver				
24	684.415 Angled Sleeve	2			
25	684.416 Angled Sleeve with Backing Nut	2			
26	684.417 Angled Driving Shaft	2			
27	684.418 Hex Driver Assembly	2			
28	684.419 Angled Tap Tip	1			
29	684.421 Counter-Torque, Angled Instrument	2			

UNIVERSAL ACDF INSTRUMENT SET 9147.9001



UNIVERSAL ACDF SCREW SET 9147.9008

4.2mm Variable, Self-Tapping Qty

184.012	4.2mm Bone Screw, Variable, Self-Tapping, 12mm	6
184.014	4.2mm Bone Screw, Variable, Self-Tapping, 14mm	6
184.016	4.2mm Bone Screw, Variable, Self-Tapping, 16mm	6
184.018	4.2mm Bone Screw, Variable, Self-Tapping, 18mm	4
184.020	4.2mm Bone Screw, Variable, Self-Tapping, 20mm	4

4.2mm Fixed, Self-Tapping Qty

184.032	4.2mm Bone Screw, Fixed, Self-Tapping, 12mm	6
184.034	4.2mm Bone Screw, Fixed, Self-Tapping, 14mm	6
184.036	4.2mm Bone Screw, Fixed, Self-Tapping, 16mm	6
184.038	4.2mm Bone Screw, Fixed, Self-Tapping, 18mm	4
184.040	4.2mm Bone Screw, Fixed, Self-Tapping, 20mm	4

4.2mm Variable, Self-Drilling Qty

184.052	4.2mm Bone Screw, Variable, Self-Drilling, 12mm	6
184.054	4.2mm Bone Screw, Variable, Self-Drilling, 14mm	6
184.056	4.2mm Bone Screw, Variable, Self-Drilling, 16mm	6
184.058	4.2mm Bone Screw, Variable, Self-Drilling, 18mm	4
184.060	4.2mm Bone Screw, Variable, Self-Drilling, 20mm	4

4.2mm Fixed, Self-Drilling Qty

184.072	4.2mm Bone Screw, Fixed, Self-Drilling, 12mm	6
184.074	4.2mm Bone Screw, Fixed, Self-Drilling, 14mm	6
184.076	4.2mm Bone Screw, Fixed, Self-Drilling, 16mm	6
184.078	4.2mm Bone Screw, Fixed, Self-Drilling, 18mm	4
184.080	4.2mm Bone Screw, Fixed, Self-Drilling, 20mm	4

3.6mm Variable, Self-Tapping Qty

184.112	3.6mm Bone Screw, Variable, Self-Tapping, 12mm	6
184.114	3.6mm Bone Screw, Variable, Self-Tapping, 14mm	6
184.116	3.6mm Bone Screw, Variable, Self-Tapping, 16mm	6
184.118	3.6mm Bone Screw, Variable, Self-Tapping, 18mm	4
184.120	3.6mm Bone Screw, Variable, Self-Tapping, 20mm	4

3.6mm Fixed, Self-Tapping Qty

184.132	3.6mm Bone Screw, Fixed, Self-Tapping, 12mm	6
184.134	3.6mm Bone Screw, Fixed, Self-Tapping, 14mm	6
184.136	3.6mm Bone Screw, Fixed, Self-Tapping, 16mm	6
184.138	3.6mm Bone Screw, Fixed, Self-Tapping, 18mm	4
184.140	3.6mm Bone Screw, Fixed, Self-Tapping, 20mm	4

3.6mm Variable, Self-Drilling Qty

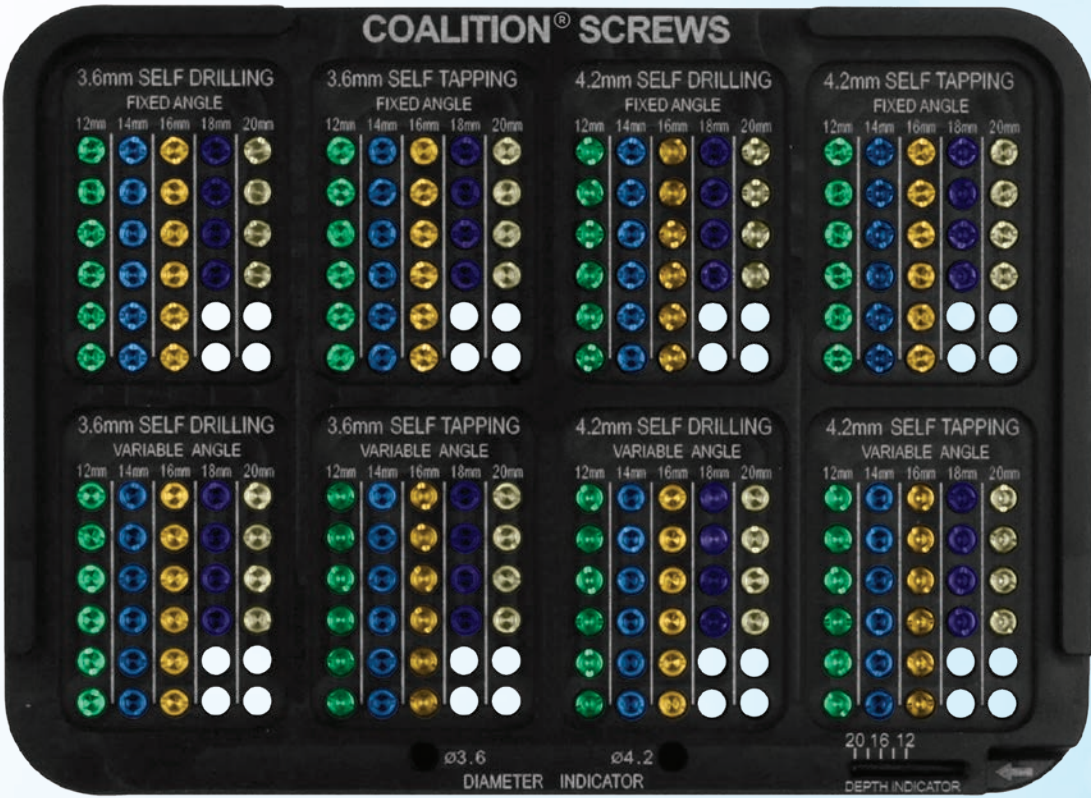
184.152	3.6mm Bone Screw, Variable, Self-Drilling, 12mm	6
184.154	3.6mm Bone Screw, Variable, Self-Drilling, 14mm	6
184.156	3.6mm Bone Screw, Variable, Self-Drilling, 16mm	6
184.158	3.6mm Bone Screw, Variable, Self-Drilling, 18mm	4
184.160	3.6mm Bone Screw, Variable, Self-Drilling, 20mm	4

3.6mm Fixed, Self-Drilling Qty

184.172	3.6mm Bone Screw, Fixed, Self-Drilling, 12mm	6
184.174	3.6mm Bone Screw, Fixed, Self-Drilling, 14mm	6
184.176	3.6mm Bone Screw, Fixed, Self-Drilling, 16mm	6
184.178	3.6mm Bone Screw, Fixed, Self-Drilling, 18mm	4
184.180	3.6mm Bone Screw, Fixed, Self-Drilling, 20mm	4

9147.0008 Screw Module, Universal ACDF

UNIVERSAL ACDF SCREW SET 9147.9008

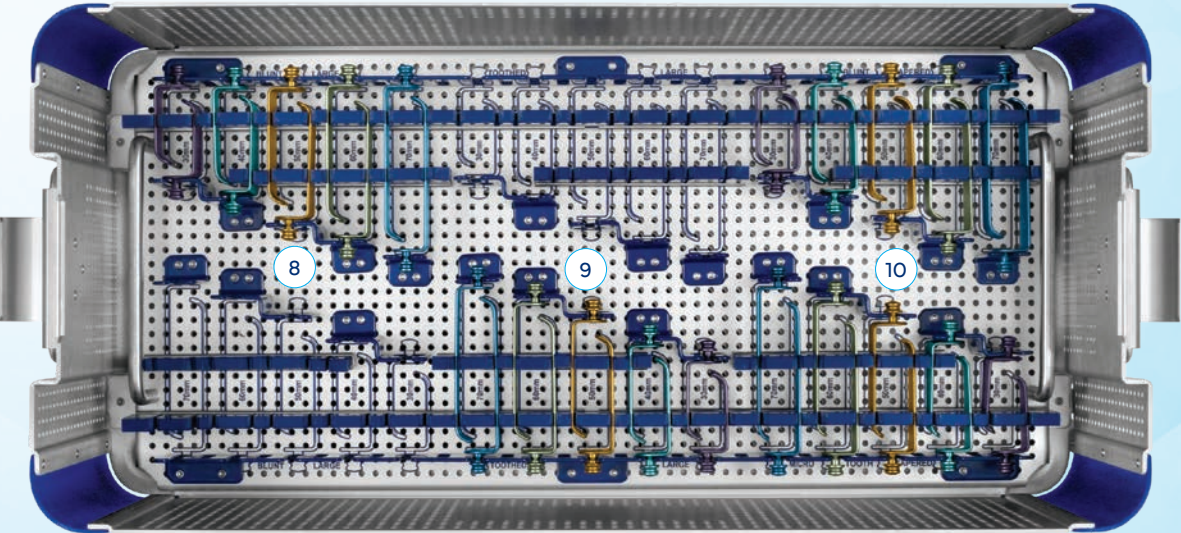
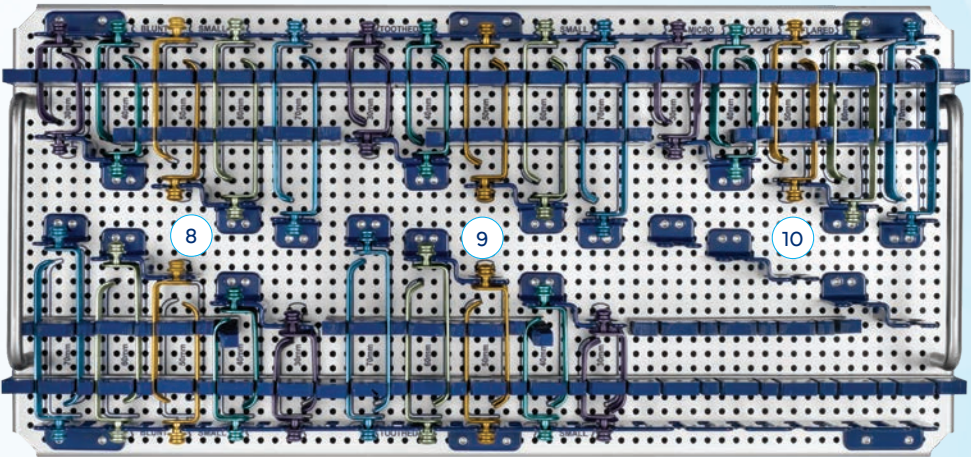
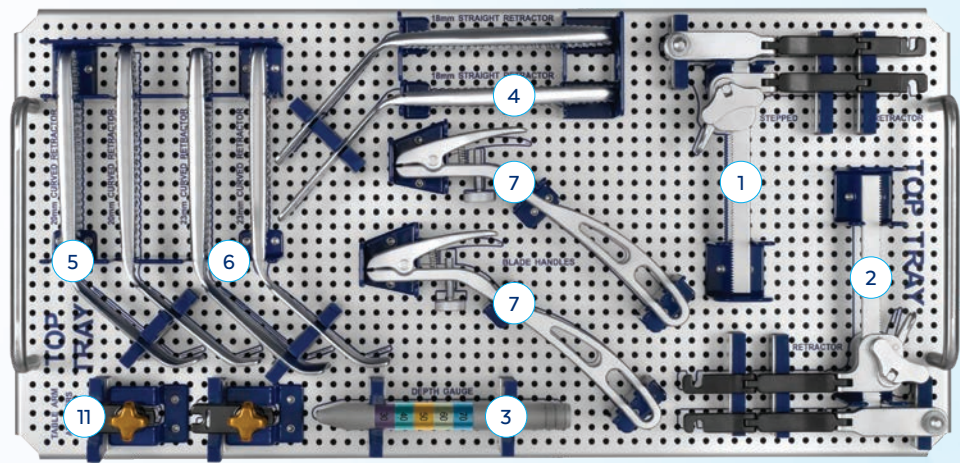


MARS™ ACDF

RETRACTOR SET 9138.9001

	Part No.	Description	Qty		Toothed Blades (Cont'd)		Qty
1	6138.0103	Retractor Frame, Offset	1		6138.1231	30mm Blade, Toothed - Large	2
2	6138.0101	Retractor Frame, Left	1		6138.1241	40mm Blade, Toothed - Large	2
3	6138.0203	Depth Gauge	1		6138.1251	50mm Blade, Toothed - Large	2
4	6138.0218	Handheld Retractor, Straight - 18mm	2		6138.1261	60mm Blade, Toothed - Large	2
5	6138.0220	Handheld Retractor, Curved - 20mm	2		6138.1271	70mm Blade, Toothed - Large	2
6	6138.0223	Handheld Retractor, Curved - 23mm	2				
7	6138.0230	Blade Handle, Interchangeable	2				
8	Blunted Blades		Qty	10	Micro Tooth Blades		Qty
	6138.1030	30mm Blade, Blunt - Small	4		6138.1330	30mm Blade, Micro Tooth - Tapered	2
	6138.1040	40mm Blade, Blunt - Small	4		6138.1340	40mm Blade, Micro Tooth - Tapered	2
	6138.1050	50mm Blade, Blunt - Small	4		6138.1350	50mm Blade, Micro Tooth - Tapered	2
	6138.1060	60mm Blade, Blunt - Small	4		6138.1360	60mm Blade, Micro Tooth - Tapered	2
	6138.1070	70mm Blade, Blunt - Small	4		6138.1370	70mm Blade, Micro Tooth - Tapered	2
	6138.1031	30mm Blade, Blunt - Large	2		6138.1430	30mm Blade, Micro Tooth - Flared	2
	6138.1041	40mm Blade, Blunt - Large	2		6138.1440	40mm Blade, Micro Tooth - Flared	2
	6138.1051	50mm Blade, Blunt - Large	2		6138.1450	50mm Blade, Micro Tooth - Flared	2
	6138.1061	60mm Blade, Blunt - Large	2		6138.1460	60mm Blade, Micro Tooth - Flared	2
	6138.1071	70mm Blade, Blunt - Large	2		6138.1470	70mm Blade, Micro Tooth - Flared	2
	6138.1130	30mm Blade, Blunt - Tapered	2	11	6133.0790	Table Arm Adaptor	2
	6138.1140	40mm Blade, Blunt - Tapered	2				
	6138.1150	50mm Blade, Blunt - Tapered	2		9138.0001	ACDF Graphic Case	
	6138.1160	60mm Blade, Blunt - Tapered	2				
	6138.1170	70mm Blade, Blunt - Tapered	2				
9	Toothed Blades		Qty				
	6138.1230	30mm Blade, Toothed - Small	4				
	6138.1240	40mm Blade, Toothed - Small	4				
	6138.1250	50mm Blade, Toothed - Small	4				
	6138.1260	60mm Blade, Toothed - Small	4				
	6138.1270	70mm Blade, Toothed - Small	4				

MARS™ ACDF
RETRACTOR SET 9138.9001



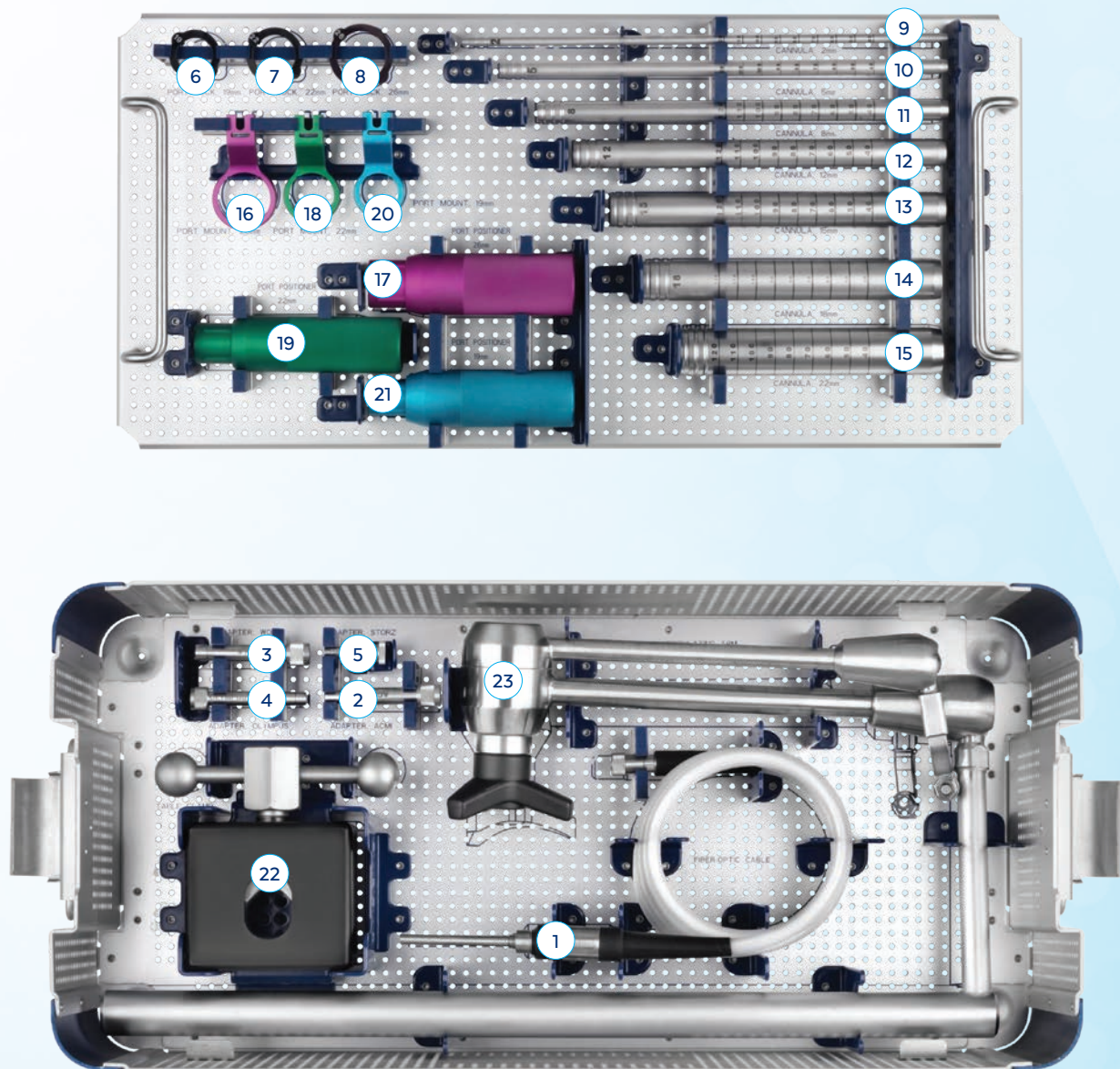
MARS™

INSTRUMENT II SET 932.902

	Part No.	Description	Qty
1	632.300	Fiber-Optic Cord	1
2	632.305	Adapter, ACMI	1
3	632.306	Adapter, Wolf	1
4	632.307	Adapter, Olympus	1
5	632.308	Adapter, Storz	1
6	632.310S	Light Cable	1
7	632.390	Port Lock, 19mm	1
8	632.391	Port Lock, 22mm	1
9	632.392	Port Lock, 26mm	1
10	632.401	2mm Cannula	1
11	632.402	5mm Cannula	1
12	632.403	8mm Cannula	1
13	632.404	12mm Cannula	1
14	632.405	15mm Cannula	1
15	632.406	18mm Cannula	1
16	632.407	22mm Cannula	1
17	632.408	26mm Port Mount	1
18	632.409	26mm Port Positioner	1
19	632.410	22mm Port Mount	1
20	632.411	22mm Port Positioner	1
21	632.412	19mm Port Mount	1
22	632.413	19mm Port Positioner	1
23	632.500	Table Clamp	1
24	632.750	Articulating Arm Assembly	1
	932.002	MARS™ Instrument II Graphic Case	

MARS™

INSTRUMENT II SET 932.902



IMPORTANT INFORMATION ON ON REVEL™ SPACERS

DESCRIPTION

REVEL™ Spacers are expandable, anterior cervical interbody fusion devices used to provide structural stability in skeletally mature individuals following discectomy. The devices are available in various height ranges and footprints to fit the anatomical needs of a wide variety of patients. Protrusions on the superior and inferior surfaces of each device grip the endplates of the adjacent vertebrae to resist expulsion.

REVEL™ Spacers are manufactured from titanium alloy, as specified in ASTM F136, F1295, and F1472. The screws and anchors for use with the REVEL™-S Spacer are manufactured from titanium alloy, as specified in ASTM F136 and F1295.

INDICATIONS

REVEL™ Spacers (REVEL™ and REVEL™-S) are interbody fusion devices intended for use in skeletally mature patients with degenerative disc disease (DDD) of the cervical spine (C2-T1) for one or two contiguous levels, depending on the system. DDD is defined as discogenic pain with degeneration of the disc confirmed by history and radiographic studies. These patients should be skeletally mature and have had at least six (6) weeks of non-operative treatment. Hyperlordotic implants ($\geq 20^\circ$) must be used with supplemental fixation in addition to the two screws or anchors. These devices are to be filled with autograft bone and/or allogenic bone graft composed of cortical, cancellous, and/or corticocancellous bone.

The REVEL™ Spacer is an interbody fusion device intended to be used with supplemental fixation, such as anterior cervical plates or posterior cervical screw fixation, for one or two levels of the cervical spine.

The REVEL™-S Spacer is an integrated interbody fusion device intended to be used with two titanium alloy screws and/or anchors which accompany the implant. When used with two screws, the REVEL™-S Spacer is a stand-alone interbody fusion device intended for use at one or two levels of the cervical spine. When used with any anchors, the REVEL™-S Spacer is intended for use at one level of the cervical spine with additional supplemental fixation such as posterior cervical screw fixation.

WARNINGS

One of the potential risks identified with this system is death. Other potential risks which may require additional surgery, include:

- device component fracture,
- loss of fixation,
- non-union,
- fracture of the vertebrae,
- neurological injury, and
- vascular or visceral injury.

Certain degenerative diseases or underlying physiological conditions such as diabetes, rheumatoid arthritis, or osteoporosis may alter the healing process, thereby increasing the risk of implant breakage or spinal fracture.

Components of this system should not be used with components of any other system or manufacturer.

The components of this system are manufactured from titanium alloy. Dissimilar metals in contact with each other can accelerate the corrosion process due to galvanic corrosion effects. Mixing of implant components with different materials is not recommended, for metallurgical, mechanical, and functional reasons.

Patients with previous spinal surgery at the level(s) to be treated may have different clinical outcomes compared to those without previous surgery.

These warnings do not include all adverse effects which could occur with surgery in general, but are important considerations particular to orthopedic implants. General surgical risks should be explained to the patient prior to surgery.

Use this device as supplied and in accordance with the handling and use information provided below.

PRECAUTIONS

The implantation of intervertebral fusion devices should be performed only by experienced spinal surgeons with specific training in the use of this system because this is a technically demanding procedure presenting a risk of serious injury to the patient. Preoperative planning and patient anatomy should be considered when selecting implant size.

Surgical implants must never be reused. An explanted implant must never be reimplanted. Even though the device appears undamaged, it may have small defects and internal stress patterns which could lead to breakage.

Adequately instruct the patient. Mental or physical impairment which compromises or prevents a patient's ability to comply with necessary limitations or precautions may place that patient at a particular risk during postoperative rehabilitation.

For optimal implant performance, the surgeon should consider the levels of implantation, patient weight, patient activity level, other patient conditions, etc. which may impact the performance of the system.

MRI SAFETY INFORMATION



The REVEL™ Spacers are MR Conditional. A patient with this device can be safely scanned in an MR system meeting the following conditions:

- Static magnetic field of 1.5 Tesla and 3.0 Tesla only
- Maximum spatial field gradient of 3,000 gauss/cm (30 T/m) or less
- Maximum MR system reported, whole body averaged specific absorption rate (SAR) of 1 W/kg

Under the scan conditions defined above, the REVEL™ Spacers are expected to produce a maximum temperature rise of less than or equal to 3.9°C after 15 minutes of continuous scanning.

The image artifact caused by the device is not expected to extend beyond 35mm from the device when imaged with a gradient echo pulse sequence and a 3.0 Tesla MRI system.

CONTRAINDICATIONS

Use of these implants is contraindicated in patients with the following conditions:

1. Active systemic infection, infection or inflammation localized to the site of the proposed implantation, or when the patient has demonstrated allergy or foreign body sensitivity to any of the implant materials.
2. Signs of local inflammation.
3. Prior fusion at the level(s) to be treated.
4. Severe osteoporosis, which may prevent adequate fixation.
5. Conditions that may place excessive stresses on bone and implants, such as severe obesity or degenerative diseases, are relative contraindications. The decision whether to use these devices in such conditions must be made by the physician taking into account the risks versus the benefits to the patient.
6. Patients whose activity, mental capacity, mental illness, alcoholism, drug abuse, occupation, or lifestyle may interfere with their ability to follow postoperative restrictions and who may place undue stresses on the implant during bony healing and may be at a higher risk of implant failure.
7. Any patient not willing to cooperate with postoperative instruction.
8. Any condition not described in the indications for use.
9. Fever or leukocytosis.
10. Pregnancy.
11. Any other condition which would preclude the potential benefit of spinal implant surgery, such as the presence of tumors or congenital abnormalities, fracture local to the operating site, elevation of sedimentation rate unexplained by other diseases, elevation of the white blood count (WBC), or a marked left shift in the WBC differential count.
12. Any case not needing a fusion.
13. Patients with a known hereditary or acquired bone friability or calcification problem should not be considered for this type of surgery.
14. These devices must not be used for pediatric cases or where the patient still has general skeletal growth.
15. Any case where the implant components selected for use would be too large or too small to achieve a successful result.
16. Any case that requires the mixing of metals from two different components or systems.
17. Any patient having inadequate tissue coverage at the operative site or inadequate bone stock or quality.
18. Any patient in which implant utilization would interfere with anatomical structures or expected physiological performance.

COMPLICATIONS AND POSSIBLE ADVERSE EVENTS

Prior to surgery, patients should be made aware of the following possible adverse effects in addition to the potential need for additional surgery to correct these effects:

- Loosening, bending or breakage of components
- Displacement/migration of device components
- Tissue sensitivity to implant material
- Potential for skin breakdown and/or wound complications
- Non-union or delayed union or mal-union
- Infection
- Nerve damage, including loss of neurological function (sensory and/or motor), paralysis, dysesthesia, hyperesthesia, paresthesia, radiculopathy, reflex deficit, cauda equina syndrome
- Dural tears, cerebral spinal fluid leakage
- Fracture of vertebrae
- Foreign body reaction (allergic) to components or debris
- Vascular or visceral injury
- Change in spinal curvature, loss of correction, height and/or reduction

IMPORTANT INFORMATION ON ON REVEL™ SPACERS

- Urinary retention or loss of bladder control or other types of disorders of the urogenital system
- Ileus, gastritis, bowel obstruction or other types of gastrointestinal system compromise
- Reproductive system compromise including impotence, sterility, loss of consortium and sexual dysfunction
- Pain or discomfort
- Bursitis
- Decrease in bone density due to stress shielding
- Loss of bone or fracture of bone above or below the level of surgery
- Bone graft donor site pain, fracture, and/or delayed wound healing
- Restriction of activities
- Lack of effective treatment of symptoms for which surgery was intended
- Need for additional surgical intervention
- Death

PACKAGING

Implants may be supplied pre-packaged and sterile, using gamma irradiation. The integrity of the sterile packaging should be checked to ensure that sterility of the contents is not compromised. Packaging should be carefully checked for completeness and all components should be carefully checked to ensure that there is no damage prior to use. Damaged packages or products should not be used, and should be returned to Globus Medical. During surgery, after the correct size has been determined, remove the products from the packaging using aseptic technique.

The instrument sets are provided nonsterile and are steam sterilized prior to use, as described in the STERILIZATION section below. Following use or exposure to soil, instruments must be cleaned, as described in the CLEANING section below.

HANDLING AND USE

All instruments and implants should be treated with care. Improper use or handling may lead to damage and/or possible malfunction. Products should be checked to ensure that they are in working order prior to surgery. All products should be inspected prior to use to ensure that there is no unacceptable deterioration such as corrosion, discoloration, pitting, cracked seals, etc. Non-working or damaged instruments should not be used, and should be returned to Globus Medical.

Implants are single use devices and should not be cleaned. Re-cleaning of single use implants might lead to mechanical failure and/or material degradation. Discard any implants that may have been accidentally contaminated.

CLEANING

Instruments should be cleaned separately from instrument trays and cases. Lids should be removed from cases for the cleaning process, if applicable. All instruments that can be disassembled must be disassembled for cleaning. All handles must be detached. Instruments may be reassembled following sterilization. The instruments should be cleaned using neutral cleaners before sterilization and introduction into a sterile surgical field or (if applicable) return of the product to Globus Medical.

Cleaning and disinfecting of instruments can be performed with aldehyde-free solvents at higher temperatures. Cleaning and decontamination must include the use of neutral cleaners followed by a deionized water rinse. Note: certain cleaning solutions such as those containing formalin, glutaraldehyde, bleach and/or other alkaline cleaners may damage some devices, particularly instruments; these solutions should not be used.

The following cleaning methods should be observed when cleaning instruments after use or exposure to soil, and prior to sterilization:

1. Immediately following use, ensure that the instruments are wiped down to remove all visible soil and kept from drying by submerging or covering with a wet towel.
2. Disassemble all instruments that can be disassembled.
3. Rinse the instruments under running tap water to remove all visible soil. Flush the lumens a minimum of 3 times, until the lumens flush clean.
4. Prepare Enzol® (or a similar enzymatic detergent) per manufacturer's recommendations.
5. Immerse the instruments in the detergent and allow them to soak for a minimum of 2 minutes.
6. Use a soft bristled brush to thoroughly clean the instruments. Use a pipe cleaner for any lumens. Pay close attention to hard to reach areas.
7. Using a sterile syringe, draw up the enzymatic detergent solution. Flush any lumens and hard to reach areas until no soil is seen exiting the area.
8. Remove the instruments from the detergent and rinse them in running warm tap water.
9. Prepare Enzol® (or a similar enzymatic detergent) per manufacturer's recommendations in an ultrasonic cleaner.
10. Completely immerse the instruments in the ultrasonic cleaner and ensure detergent is in lumens by flushing the lumens. Sonicate for a minimum of 3 minutes.

11. Remove the instruments from the detergent and rinse them in running deionized water or reverse osmosis water for a minimum of 2 minutes.
12. Dry instruments using a clean soft cloth and filtered pressurized air.
13. Visually inspect each instrument for visible soil. If visible soil is present, then repeat cleaning process starting with Step 3.

CONTACT INFORMATION

Globus Medical may be contacted at 1-866-GLOBUS1 (456-2871). A surgical technique manual may be obtained by contacting Globus Medical.

STERILIZATION

These implants may be supplied sterile or nonsterile. Instruments are provided nonsterile.

Sterile implants are sterilized by gamma radiation, validated to ensure a Sterility Assurance Level (SAL) of 10^{-6} . Sterile products are packaged in a heat-sealed double pouch or container/pouch. The expiration date is provided on the package label. These products are considered sterile unless the packaging has been opened or damaged. Sterile implants that become nonsterile or have expired packaging are considered nonsterile and may be sterilized according to instructions for nonsterile implants and instruments below. Sterile implants meet pyrogen limit specifications.

Nonsterile implants and instruments have been validated to ensure an SAL of 10^{-6} . The use of an FDA-cleared wrap is recommended, per the Association for the Advancement of Medical Instrumentation (AAMI) ST79, *Comprehensive Guide to Steam Sterilization and Sterility Assurance in Health Care Facilities*. It is the end user's responsibility to use only sterilizers and accessories (such as sterilization wraps, sterilization pouches, chemical indicators, biological indicators, and sterilization cassettes) that have been cleared by the FDA for the selected sterilization cycle specifications (time and temperature).

When using a rigid sterilization container, the following must be taken into consideration for proper sterilization of Globus devices and loaded graphic cases:










- Recommended sterilization parameters are listed in the table below.
- Only FDA-cleared rigid sterilization containers for use with pre-vacuum steam sterilization may be used.
- When selecting a rigid sterilization container, it must have a minimum filter area of 176 in² total, or a minimum of four (4) 7.5in diameter filters.
- No more than one (1) loaded graphic case or its contents can be placed directly into a rigid sterilization container.
- Stand-alone modules/racks or single devices must be placed, without stacking, in a container basket to ensure optimal ventilation.
- The rigid sterilization container manufacturer's instructions for use are to be followed; if questions arise, contact the manufacturer of the specific container for guidance.
- Refer to AAMI ST79 for additional information concerning the use of rigid sterilization containers.

For implants and instruments provided NONSTERILE, sterilization is recommended (wrapped or containerized) as follows:

Method	Cycle Type	Temperature	Exposure Time	Drying Time
Steam	Pre-vacuum	132°C (270°F)	4 Minutes	30 Minutes

These parameters are validated to sterilize only this device. If other products are added to the sterilizer, the recommended parameters are not valid and new cycle parameters must be established by the user. The sterilizer must be properly installed, maintained, and calibrated. Ongoing testing must be performed to confirm inactivation of all forms of viable microorganisms.

CAUTION: Federal (USA) Law Restricts this Device to Sale by or on the order of a Physician.

SYMBOL TRANSLATION			
	CATALOGUE NUMBER		STERILIZED BY IRRADIATION
	LOT NUMBER		AUTHORISED REPRESENTATIVE IN THE EUROPEAN COMMUNITY
	CAUTION		MANUFACTURER
	SINGLE USE ONLY		USE BY (YYYY-MM-DD)
	QUANTITY		

DI192A Rev B



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system instructions for use (IFU) for description, indications, contraindications, warnings,
precautions and other important information at globusmedical.com/eIFU.

GMTGD238
12.24 Rev B