



BIO-RSA™
surgical **technique**
BONY INCREASED OFFSET - REVERSED SHOULDER ARTHROPLASTY

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CONCEPT

● 1. BONY INCREASED OFFSET RSA (BIO-RSA) CONCEPT

The BIO-RSA is a biologic lateralization of glenoid component.

Benefits of the BIO-RSA:

- Keep the center of rotation into the scapula (no glenoid loosening)
- No scapular Notching
- Better mobility in rotation
- Better stability
- Better shoulder contour
- Easier glenoid preparation



Bony Lateralization

SURGICAL TECHNIQUE

● 1. PRE-OPERATIVE PLANNING

Pre-operative planning is performed using x-ray templates of known magnification on the frontal and sagittal views.

Appropriate implant size and positioning are then determined.

The use of a CT scan or MRI is recommended to determine the orientation of the glenoid and the quality of its bone stock.

X-ray templates allow the surgeon to assess:

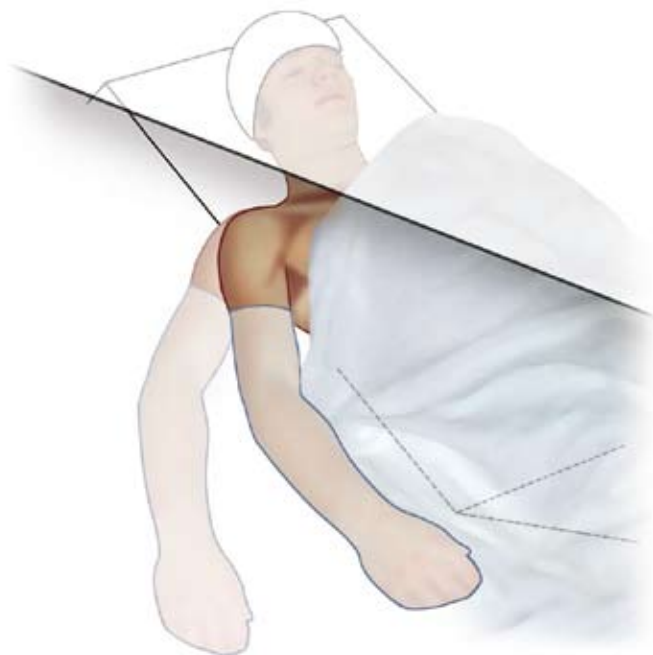
- The size and the optimal length of the gleno-humeral implants.
- The diameter of the metaphysis, the insert, and the glenoid sphere.

The final decision should be taken preoperatively.

● 2. PATIENT POSITIONING

Beach chair position with the shoulder positioned sufficiently lateral to allow full arm extension.

The patient is vertically inclined depending on the chosen surgical approach.



SURGICAL TECHNIQUE

● 3. HUMERAL EXPOSURE

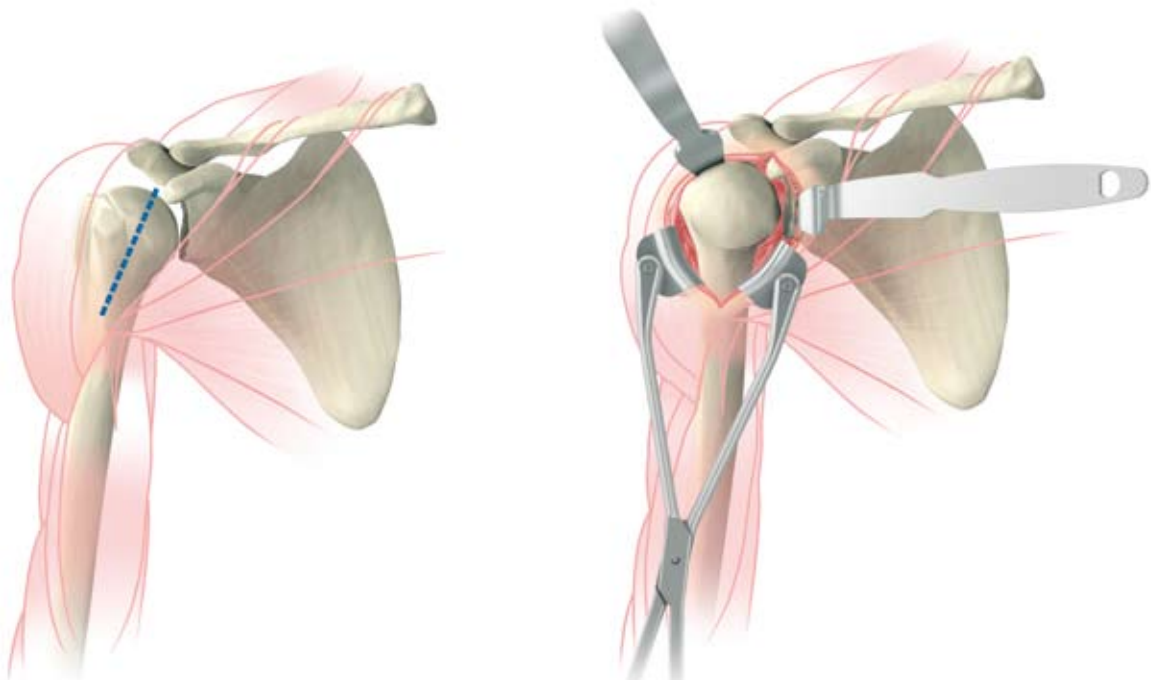
Delto-Pectoral Approach

An incision is made from the tip of the coracoid along the delto-pectoral groove, slightly lateral to the axillary fold. The pectoralis major is identified. The deltoid and cephalic veins are retracted laterally to open the delto-pectoral groove.

The coracoid process is identified. A Hohmann retractor is positioned behind the coracoid. Care should be taken to preserve the origin and insertion of the deltoid.

The clavi-pectoral fascia is incised at the external border of the coraco-brachialis. The axillary nerve is then identified before opening the subscapularis. As the arm is externally rotated, a conservative anterior and inferior capsule release from the humerus to the glenoid may be performed.

With adequate releases, the humeral head is then dislocated into the delto-pectoral interval by abduction of the arm and progressive external rotation and extension. In cases of severe restriction of external rotation (0° or less), it is recommended to release more of the upper pectoralis insertion.



SURGICAL TECHNIQUE

4. HUMERAL PREPARATION

4.1 Pin Positioning

Note: The specific pin guide is placed first prior to use standard Aequalis Reversed cutting guide !

Place the pin guide onto the humeral head with the handle inline with the humeral shaft (Fig. 1). To define the prosthetic retroversion, a retroversion rod is positioned into one of the appropriate holes along the axis which allows for retroversion between 0° and 25° („R“ for right arm and „L“ for left arm).

The pin guide is turned until the retroversion rod is aligned with the patient's forearm or the desired location.

The pin guide will create 155° of inclination and establish the desired retroversion.

Once the humeral head pin guide is properly placed, a 2.5 mm alignment pin is placed through the top of the humeral head pin guide (Fig. 2). Once the alignment pin is placed the humeral pin guide is then removed (Fig. 3). A final check should be performed to ensure the pin is properly placed. Additionally, it is important that the alignment pin remains straight throughout the surgical procedure. If bent or damaged the alignment pin should be replaced.



Fig. 1



Fig. 2



Fig. 3

SURGICAL TECHNIQUE

4.2 Graft Reaming

The BIO-RSA graft reamer is assembled to power and then passed over the alignment pin. (Fig. 4)
Note that the BIO-RSA graft reamer will harvest only a 29 mm bone graft and reaming should stop once good quality bone is encountered.

Additionally, it is ideal to ream until a flat surface is created and free from articular cartilage. (Fig. 5)
In instances of hard Bone, the 29 mm cannulated flat glenoid reamer may be used prior to the graft reamer to remove the articular cartilage and hard bone. The bone graft is then completed using the BIO-RSA Graft Reamer.

The reamer is removed leaving the alignment pin in place. (Fig. 6)



Fig. 4



Fig. 5



Fig. 6

SURGICAL TECHNIQUE

4.3 Graft Drilling

Once the reaming is complete, the 8.3 mm cannulated drill bit is advanced over the alignment pin to create the hole for the bone graft (Fig. 7).

The drill is advanced until the step of the drill contacts the surface of the prepared bone. (Fig. 8)

Once drilling is complete the alignment pin can be removed. (Fig. 9)

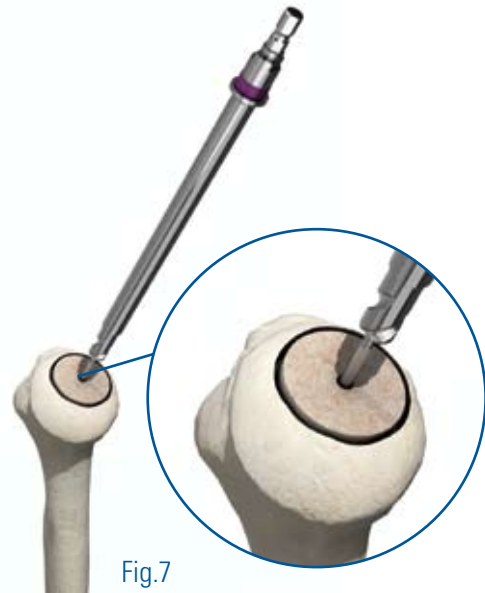


Fig. 7

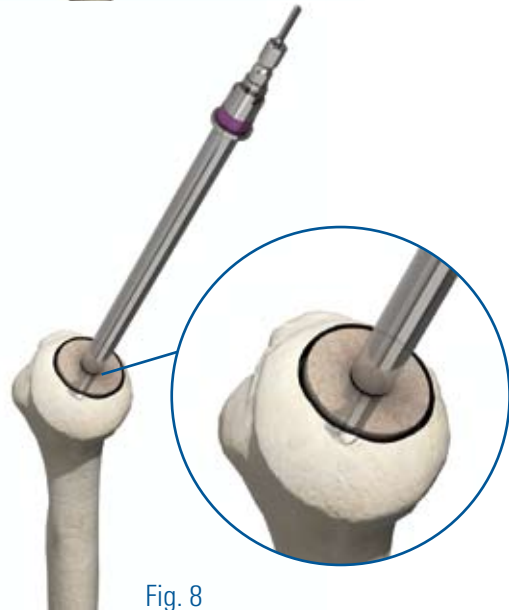


Fig. 8



Fig. 9

SURGICAL TECHNIQUE

4.4 Cutting The Graft

Once the alignment pin is removed the appropriate humeral cutting guide is selected based on the size of the humerus. BIO-RSA cutting guides are available in both Large or Extra Large (Fig. 10).

Note: that there are two cut slots available (7 mm and 10 mm) for producing the bone graft. Equal lateral offset is created when a 10 mm graft is used with the 36 mm sphere, and a 7 mm graft is used with the 42 mm sphere. (Fig. 11)

It is important to ensure the humeral cutting guide covers the entire humerus while minimizing the gap between the cut guide and bone. To position the cut guide, align the bottom of the cut guide with the edge of the graft created by the graft reamer. (Fig. 12a)

If the cut guide does not fit easily, the central hole may be enlarged using the 8.3mm drill bit.

The graft is resected using an oscillating saw through the chosen cut slots 7 or 10 mm. (Fig. 12b)

The slot is designed to accommodate a 0.8mm thick blade. In order to perform a complete cut the length of the blade should be at least 75 mm.

Caution should be taken to ensure the proper window is selected prior to making the cut. Failure to select the correct size may impact the ability to reduce the prosthesis.

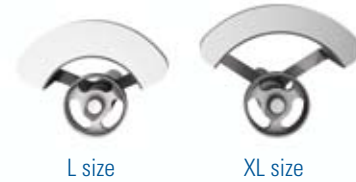


Fig. 10

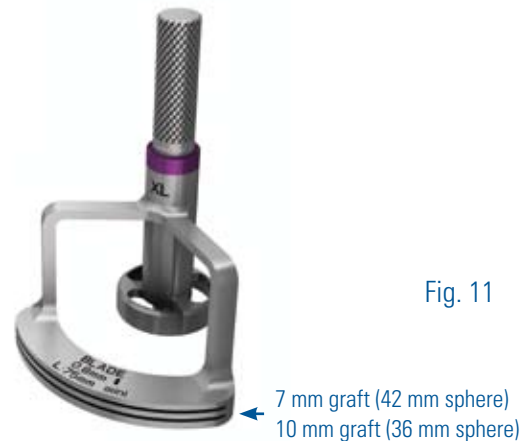


Fig. 11



Fig. 12a



Fig. 12b

SURGICAL TECHNIQUE

4.5 Graft Extraction

The bone graft may be contained within the humeral cutting guide upon removal. The bone graft remover is then used to safely remove the bone graft from the cutting guide (Fig. 13). Be sure to note the difference in thickness of one of the extensions used to remove the graft. This extension must be oriented toward the cut slots in order to advance.

Once removed the graft should be inspected to ensure the bone quality is adequate for use with the BIO-RSA technique. The BIO-RSA technique should never be used with poor quality bone, as it may compromise bone healing. A standard Reversed technique should be used in patients with poor bone quality.

4.6 Metaphyseal Diaphyseal Preparation

Note: Refer to the standard Reversed or Reversed II surgical technique for humeral (metaphyseal/diaphyseal) reaming.



Smaller prong oriented in the direction of the cut guide

Fig. 13

5. GLENOID PREPARATION

5.1 Assembling Of The Baseplate

Note: Use only a 29 mm long post baseplate with the graft

The glenoid baseplate is attached to the baseplate impactor through its central hole using a screw in the impactor central shaft. (Fig 14a)

Care should be taken to ensure that the two pegs on the impactor seat properly into their respective holes on the implant baseplate. (Fig. 14b)

Note: There is no baseplate trial

5.2 Graft Preparation

Note: It is importante to use the long post baseplate for BIO-RSA technique. The pure cancellous bone graft harvested from the humerus is then inserted onto the long post baseplate until it reaches the posterior surface of the baseplate (Fig. 15). In case of an asymmetrical bone graft, a mark may be drawn with a sterile pencil to orient. The graft is inserted onto the baseplate in a direction that best accomodates the surface of the glenoid.

Note: During the glenoid preparation. The surgeon may consider keeping the baseplate with the bone graft on the back table in a wet sponge. (Fig. 16)



Fig. 14a



Fig. 14b

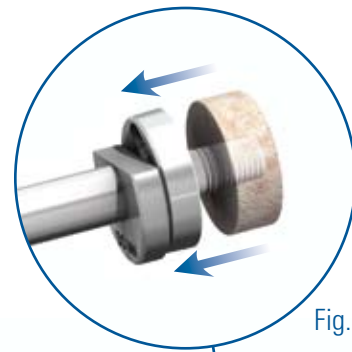


Fig. 15

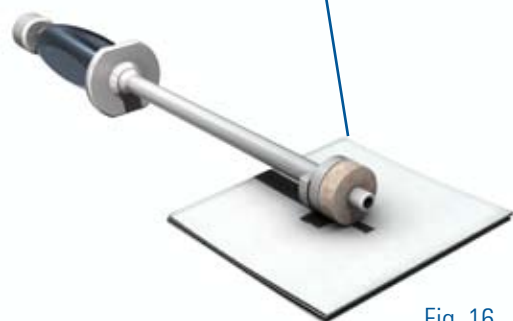


Fig. 16

SURGICAL TECHNIQUE

5.3 Glenoid Pin Alignment

The glenoid is prepared using the same drilling and reaming technique as a Reversed procedure.

When using a cannulated approach, a 0° or 10° tilt can be applied using the glenoid pin guide. (Fig. 17a)

To create more compression on the graft a 10° inferior tilted is preferred to increase bone graft integration. (Fig. 17b)

These guides are left and right specific.

Note: The 36 mm and 42 mm peripheral glenoid reamers are no longer necessary.

5.4 Glenoid Reaming

To obtain proper seating and secure fixation of the glenoid baseplate, it's important to prepare a flat surface on the glenoid.

A circular cannulated reamer, to the same diameter as the prepared BIO-RSA graft, is available, that will prepare the glenoid bone.

Note: The peripheral glenoid ream step (36 mm or 42 mm) is not required for the BIO-RSA technique.

Connect the 29 mm reamer to power, slide the assembly onto the guide pin and ream. (Fig. 18)

It is recommended to start the reamer before contacting the glenoid surface and ream until the glenoid surface is flat. (Fig. 19)

If insertion of reamer is difficult, remove or reposition retractors for greater exposure.

A T-handle is available if manual reaming is preferred.

It is desirable to preserve as much bone as possible to support proper primary fixation.

It is believed that the glenoid surface must be cancellous and/or bleeding to optimize the chances of bone healing.

If the guide pin is damaged or bent, use a new guide pin.



Fig. 17a



Fig. 17b

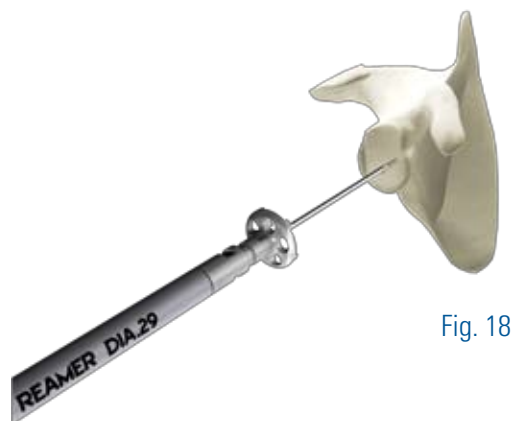


Fig. 18



Fig. 19

SURGICAL TECHNIQUE

5.5 Glenoid Central Hole Drilling

The glenoid central hole is enlarged using the 7.5 mm cannulated drill bit to enable a press-fit when impacting the final glenoid base plate (the baseplate central post is 8 mm diameter).

Two 7.5 mm cannulated drill bits are available according to the length of the Glenoid Baseplate central post:

- A 15 mm drill bit
- A 25 mm drill bit

The Ø 7.5 mm long post drill bit (25 mm long) should be used when preparing the glenoid for use with a 7 mm graft to ensure the baseplate will fully seat against the glenoid during impaction. The Ø 7.5 mm short post drill bit (15 mm long) is adequate when preparing the glenoid for use with a 10 mm graft. When using a cannulated approach with the 29 mm reamer

Select the appropriate drill bit and connect it to power. Slide the assembly onto the guide pin and drill the central hole until the stop contacts the bone. (Fig. 20a-b)

Remove the drill bit.

Remove the guide pin using power. (Fig. 21)

Note: Once the glenoid surface has been prepared, small drill holes should be made at the periphery of the glenoid face to obtain a bleeding surface.

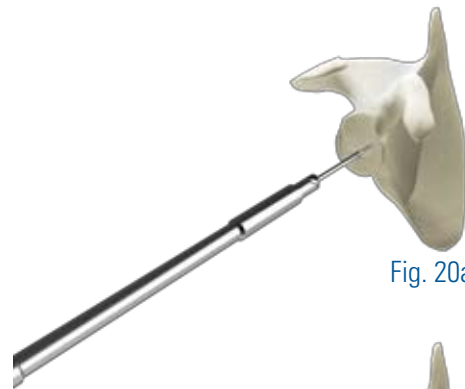


Fig. 20a



Fig. 20b



Fig. 21

SURGICAL TECHNIQUE

6. GLENOID BONE GRAFT & BASEPLATE FIXATION

The baseplate and bone graft construct is impacted into the central drill hole (Fig. 23a). Upon impaction, it is important to verify that the baseplate is fully seated against the glenoid. Additionally, the distal portion of the baseplate post must be within native glenoid bone. (Fig. 23b)

The remainder of the Reversed procedure is completed as outlined in the surgical guidelines.

Note: Consideration should be given to the orientation of the screws in order to avoid protrusion through the outside wall of the graft.



Fig. 23a



Fig. 23b

7. GLENOID SPHERE IMPLANTATION, REDUCTION AND CLOSURE

The rest of the procedure is exactly the same as the standard Reversed procedure. (Fig. 24a-b)

Note: A centred standard sphere should be chosen when using the BIO RSA.



Fig. 24a



Fig. 24b

INSTRUMENTATION

● BIO-RSA INSTRUMENTATION

YKAD100 - BIO-RSA Set

#	Description	Reference	Quantity
1	Humeral Pin Guide	MWB360	1
2	BIO-RSA Graft Reamer	MWB361	1
3	8.3 mm Cannulated Drill Bit	MWB362	1
4	Large BIO-RSA Cutting Guide	MWB363	1
5	Extra Large (XL) BIO-RSA Cutting Guide	MWB364	1
6	BIO-RSA Bone Graft Remover	MWB366	1



Humeral Pin Guide



Graft Reamer



Cannulated Drill



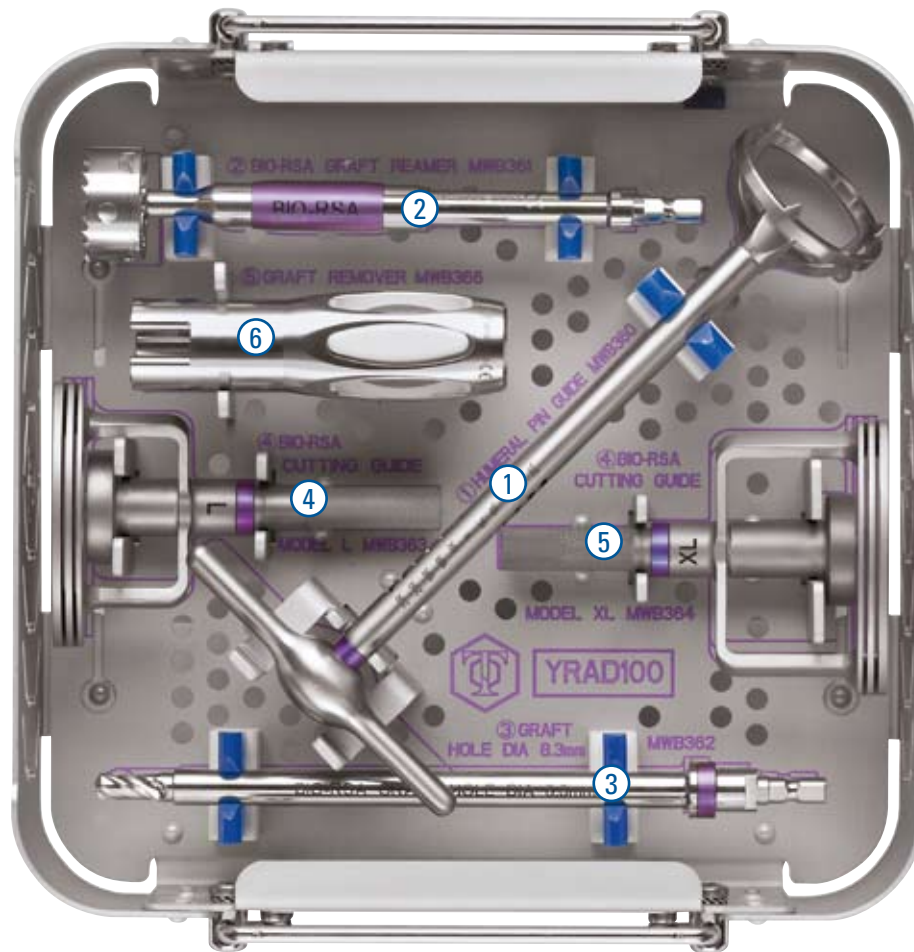
Cutting Guide



Graft Remover

INSTRUMENTATION

YKAD100 - BIO-RSA Instrument Set



Ref. YKAD100

Note: All BIO-RSA instruments are color coded purple for identification.

ADDENDUM TO AEQUALIS®-REVERSED TECHNIQUE BIO-RSA

GLENOID IMPLANTS

● Glenoid Implants 29 mm

29 mm Glenoid Baseplate

Description	Reference
Ø 29 mm Glenoid Baseplate with Long Post	DWD068



Glenoid Sphere for 29 mm Glenoid Baseplate

Description	Reference
Centered Glenoid Sphere Ø 36 mm for Ø 29 mm Baseplate	DWD190 or DWB 935
Centered Glenoid Sphere Ø 42 mm for Ø 29 mm Baseplate	DWD193 or DWB 936



● Screw Caddy

Description	Reference
Screw Caddy	MGB 389

● Glenoid Baseplate Screws

Ø 4.5 mm Compression Screw		
Size	Reference Non Sterile	Reference Sterile
L 18 mm	VDV218	VDV118
L 20 mm	VDV220	VDV120
L 23 mm	VDV223	VDV123
L 26 mm	VDV226	VDV126
L 29 mm	VDV229	-
L 32 mm	VDV232	VDV132
L 35 mm	VDV235	-
L 38 mm	VDV238	-
L 41 mm	VDV241	-
L 45 mm	VDV245	VDV145
L 50 mm	VDV250	-



Ø 4.5 mm Multidirectional Locking Screw		
Size	Reference Non Sterile	Reference Sterile
L 20 mm	DWD020	DWD120
L 23 mm	DWD023	-
L 26 mm	DWD026	DWD126
L 29 mm	DWD029	-
L 32 mm	DWD032	DWD132
L 35 mm	DWD035	-
L 38 mm	DWD038	DWD138
L 41 mm	DWD041	-
L 44 mm	DWD044	DWD144
L 47 mm	DWD047	DWD047
L 50 mm	-	DWD150



● Sterile Instruments Single Use

Description	Reference
Ø 3 mm Drill Bit	DWD055
Ø 2.5 mm Alignment Pin L 200 mm	DWD063
Ø 2.5 mm Alignment Pin L 150 mm	DWD065
Multidirectional Drilling Guide Ø 25 mm	DWD051
Multidirectional Drilling Guide Ø 29 mm	DWD052
Pilot Tip	DWD164
Ø 3.5 mm Hexagonal Tip	DWD167
Retroversion Rod	DWD163



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