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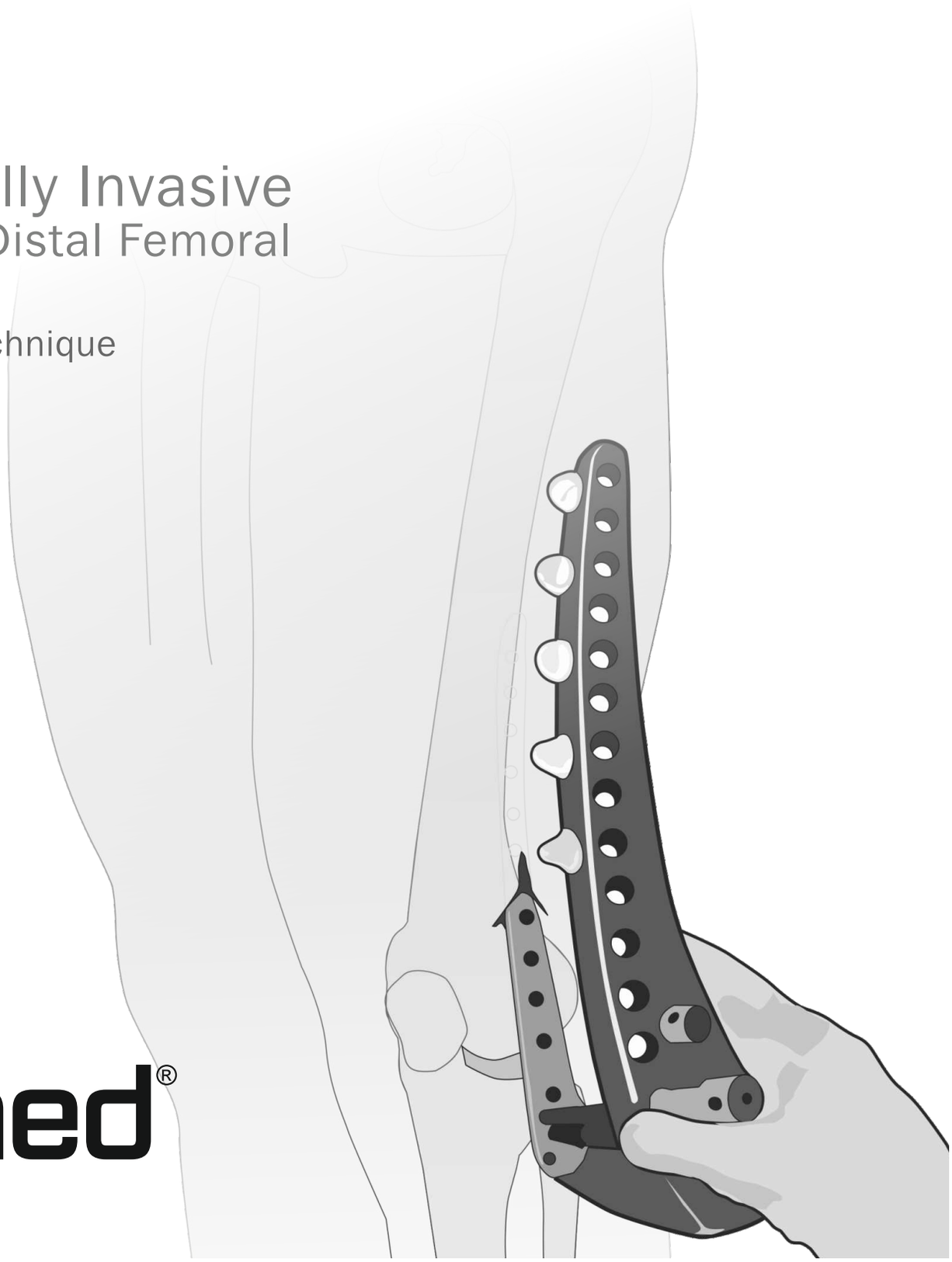
Minimally Invasive
Locking Distal Femoral Plate
Surgical Technique



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Minimally Invasive
Locking Distal Femoral Plate

CONTENS

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ISO 9001:
ISO 13485: CE 1984

1.1. Minimally Invasive Locking Distal Femoral Plate

1.1.1 Specification

İt is used with guide system. Unlike the ordinary technique of open reduction it is applied by sending a screw to the plate through the guide with a small incision . It is indicated for supracondylar fractures, intra-articular and extra-articular condylar fractures, malunion and nonunion of the distal femur, and periprosthetic fractures. Used with Ø5mm locking screw. The plate is available in 12, 16, 20 hole right and left sizes. Plate is produced from Ti6Al4V material.

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Locking Screws
Self Drilling 5.0 mm

REF. NO	LENGTH (mm)
2192-5018	18
2192-5020	20
2192-5025	25
2192-5030	30
2192-5035	35
2192-5040	40
2192-5045	45
2192-5050	50
2192-5055	55
2192-5060	60
2192-5065	65
2192-5070	70
2192-5075	75
2192-5080	80
2192-5085	85
2192-5090	90
2192-5095	95
2192-5100	100
2192-5105	105
2192-5110	110
2192-5115	115

Minimally Invasive
Locking Distal Femoral Plate

REF. NO	HOLES
1802-1012	12-R
1802-1016	16-R
1802-1020	20-R
1802-2012	12-L
1802-2016	16-L
1802-2020	20-L

2.1. Instaling the guide system

The guide system is required both during the placement of the plate and the application of fixed angle lock screws.

The main part and the radiolucent part are combined *(Fig.4)*.


Fig.4

Fig.5

Connecting screw is passed through holes *(Fig.5)*.

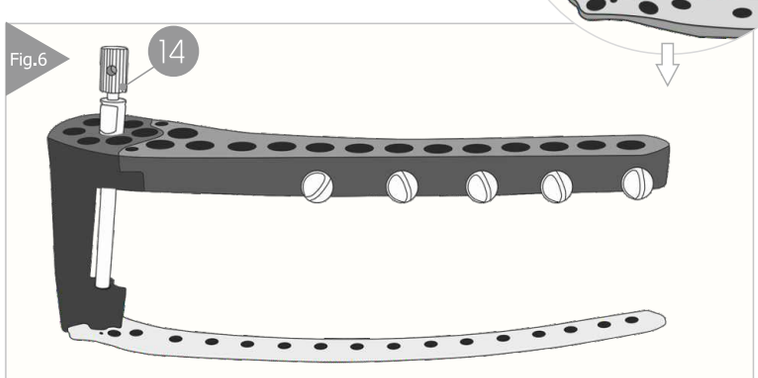


Fig.6

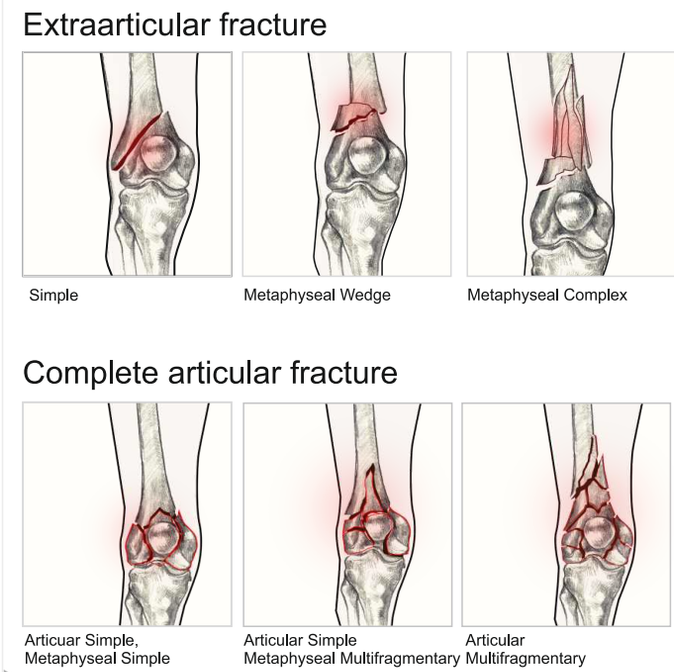
The system is fixed by tightening the connection screw and stabilization screw. *(Fig.6)*.

2.2. Fractures

2.2.1. Fractures of Distal Femur

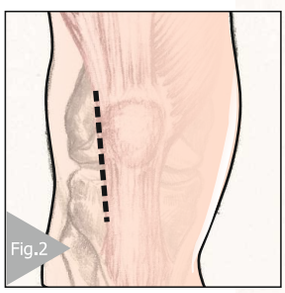
Most distal femur fractures are the result of a varus, valgus, or rotational force and a severe axial load.
In young adults, its occur typically the result of high-energy trauma such as motor vehicle collision or fall from a height
In the elderly, its occur may result from a minor slip or fall onto a flexed knee.

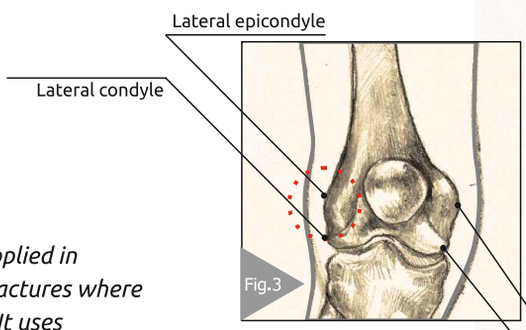
Various classifications have been developed to describe fractures. These classifications make it easy to choose the appropriate treatment. Some examples for the Minimally Invasive Distal Femoral Plate *(Fig.1)*.

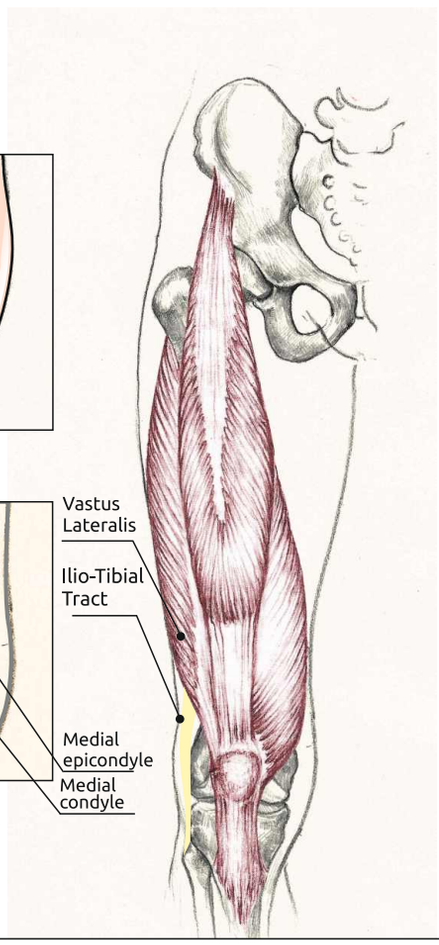


2.2.2.Incision

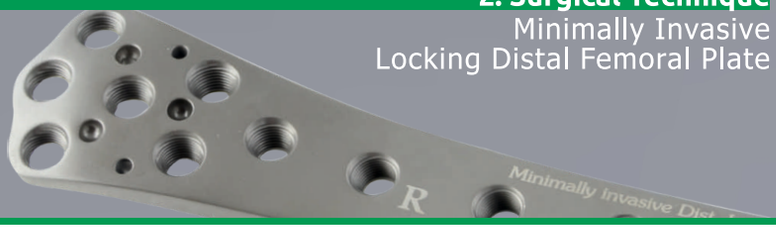
The patient prepares for surgery in the supine position. In extraarticular fracture, the incision is made approximately 4 cm from the knee joint to the lateral condyle of the femur towards the proximal. The lateral iliotibial band fibers are separated, *(Fig.2)*. It is reached through a straight incision in the lateral condyle of the femur *(Fig.13)*. A plate will be applied through this incision.







A lateral parapatellar incision can be applied in patients with intra-articular complex fractures where the fracture line extends into the joint. It uses temporary K-wires, lag screws and cannulated screws to achieve anatomical reduction of intra-articular fractures and articular surface.



2.3. Placement

2.3.1 Plate Placement

At least 4 holes should be enough to pass proximal to the fracture. After the plate system is prepared, the plate is advanced through the potential space between the lateral vastus muscle and the periosteum. *(Fig.5)*.

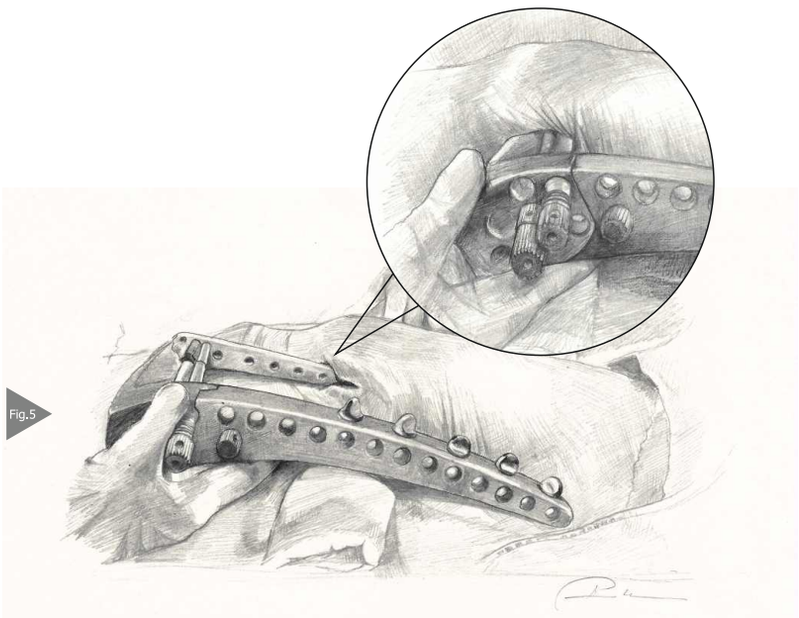


Fig.5

The plate should be positioned in line with the lateral femoral condyle. The plate should be placed at an angle of 10 ° in accordance with the slope of the condyle.
Femur length and rotation should be evaluated before locking the distal plate *(Fig.5)*.

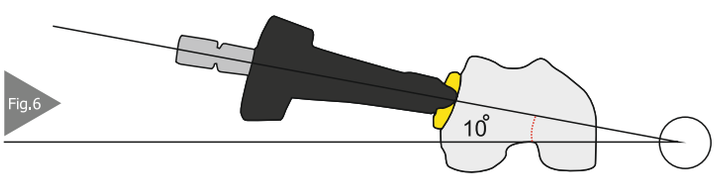


Fig.6

2.3.2. Kirschner wire

First, the distal and proximal of the plate are applied to the femur with 2 Kirschner wires under fluoroscopy control. (Fig.7

This way, plate and radiolucent device is temporarily fixed. After that start to drill for the distally screw

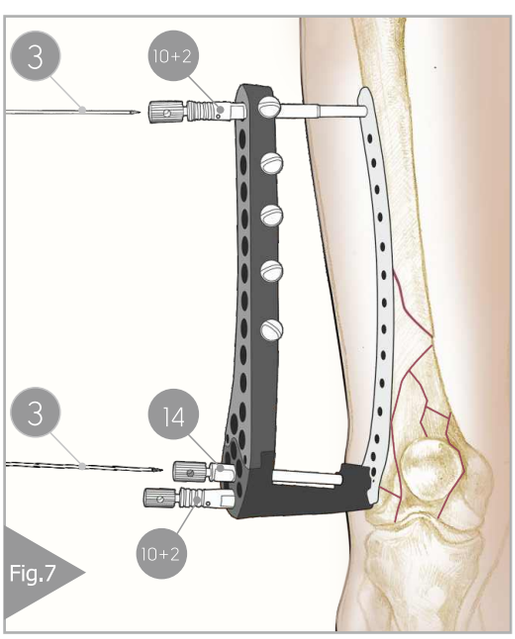


Fig.7

2.3. Placement

2.3.3.
Distal Locking Screw

At the first, *(guide Ø7.3)* is used. Attach the *(drill sleeve Ø4.2)* through inside from guide.*(Fig.8)*.

(Ø4.1 drill bit) is used for drilling.*(Fig.8)*.

Remove *(Ø4.2 drill Sleeve)* to use depth guide and screwdriver.

Use *(Depth Guide)* to determine screw lenght.*(Fig.9)*.

Fig.8

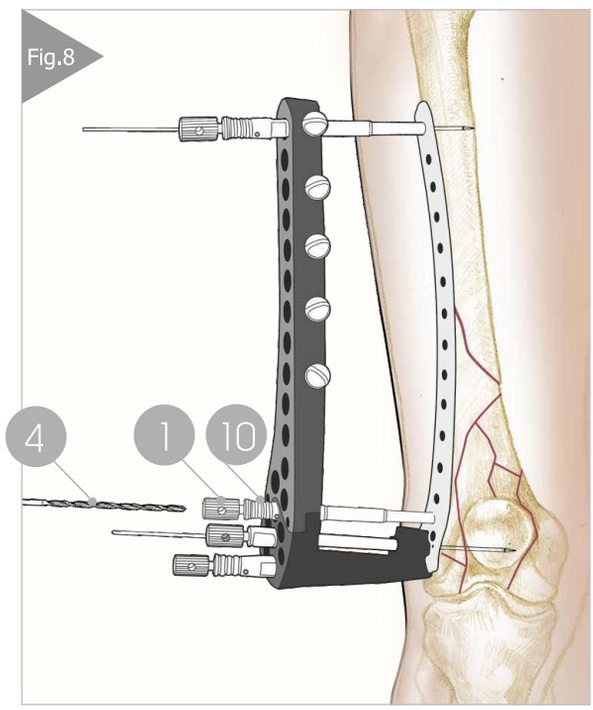
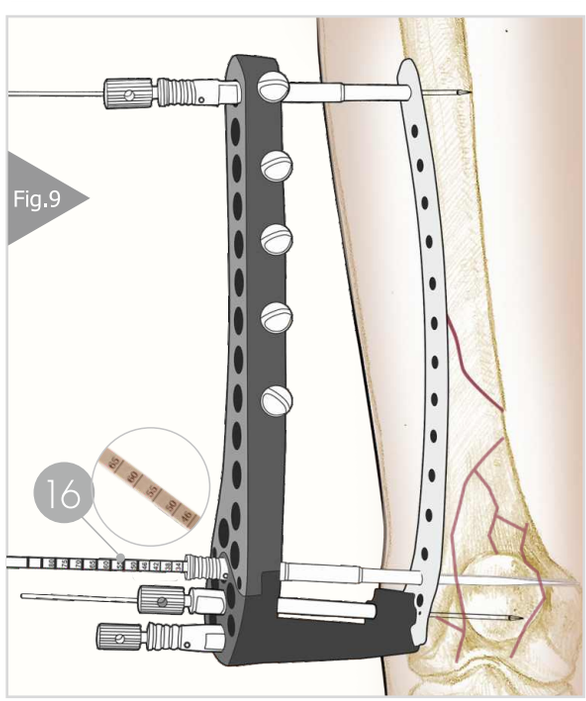
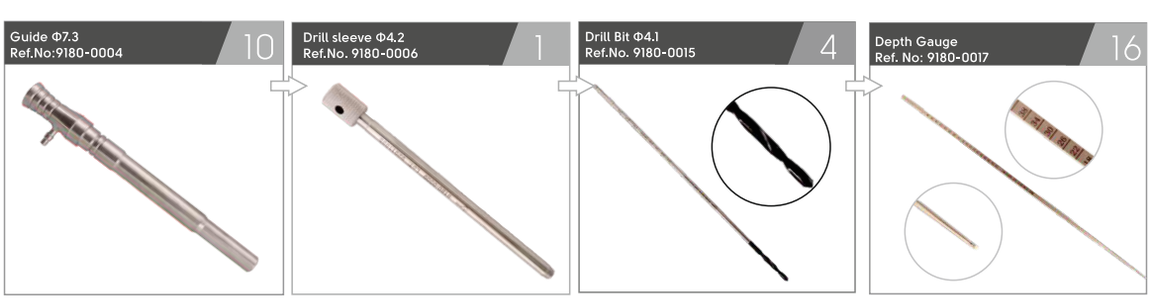
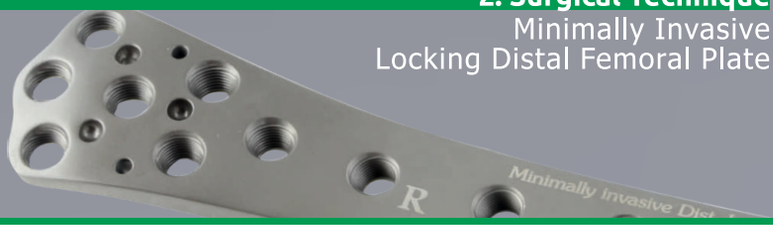


Fig.9



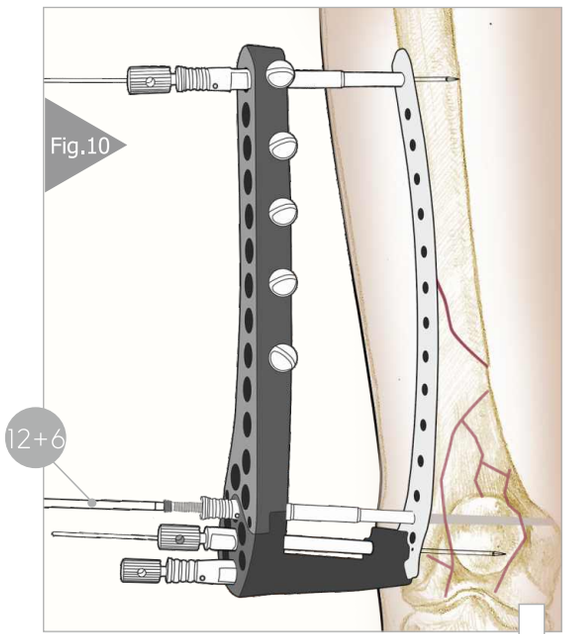


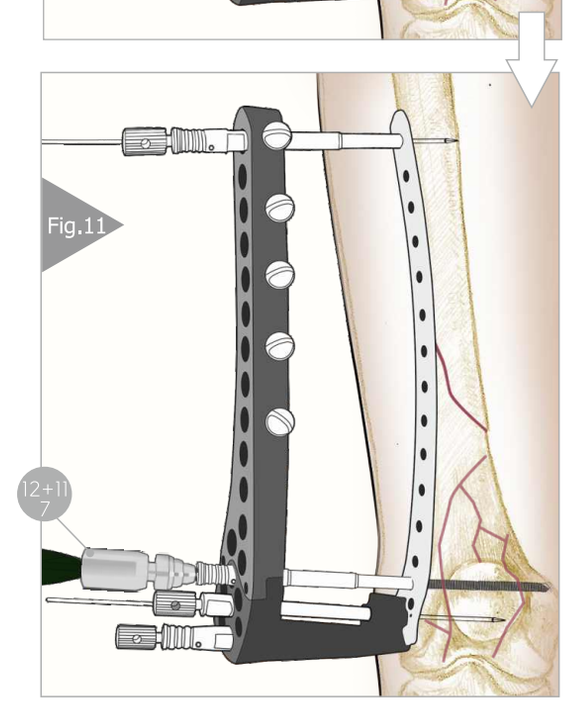


2.3. Placement

2.3.3.
Distal Locking Screw

Combine *(Handle)* with *(Screw driver Ø3.5)*.
Send the screw which is determined of the lenght. *(Fig.10)*
Don't forget torque *(Fig.11)*.





2.3. Placement

2.2.4.
Approximation tool

Alignment is controlled with fluoroscopy and the adaptation of the plate in the lateral plane is checked. Plate approximation to femoral shaft is achieved with the help of the *(Approximation tool)* *(Fig.12)*.

Before make drill for device. The use *(of the device)* that comes with the set is shown in the picture to provide the necessary getting closer. *(Fig.12-13)*.

Fig.12

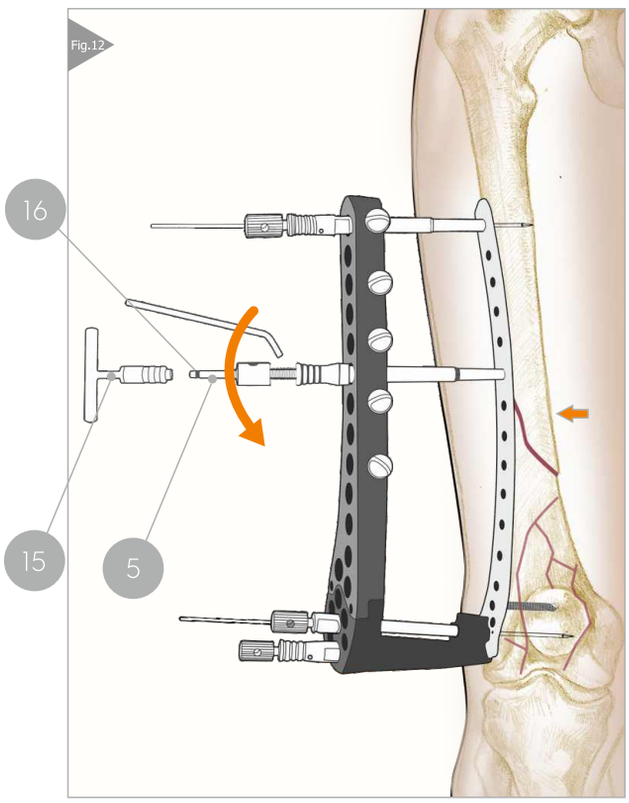
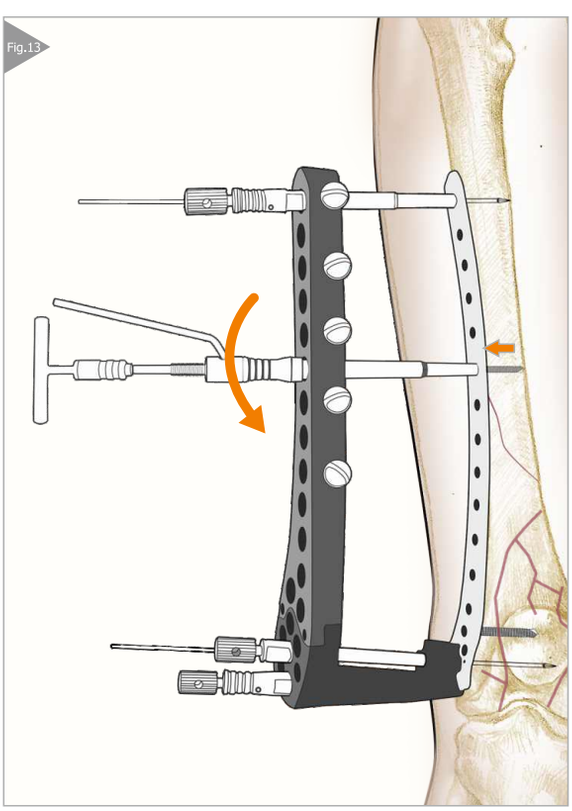
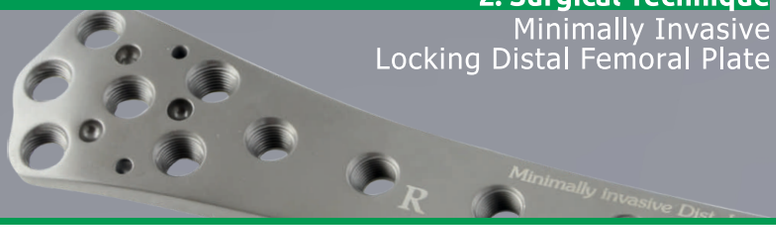


Fig.13

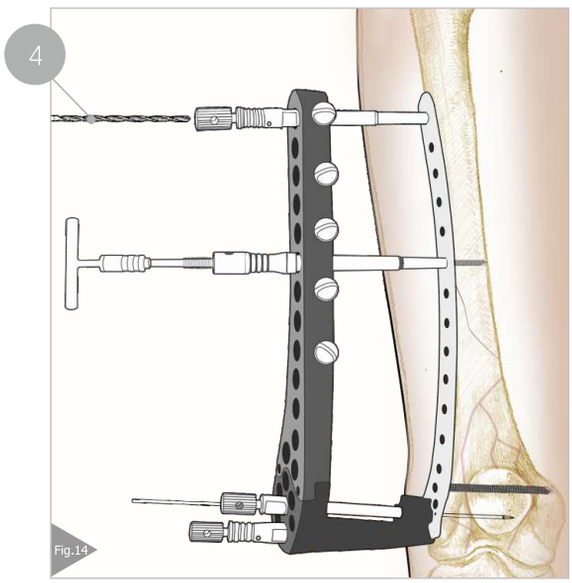


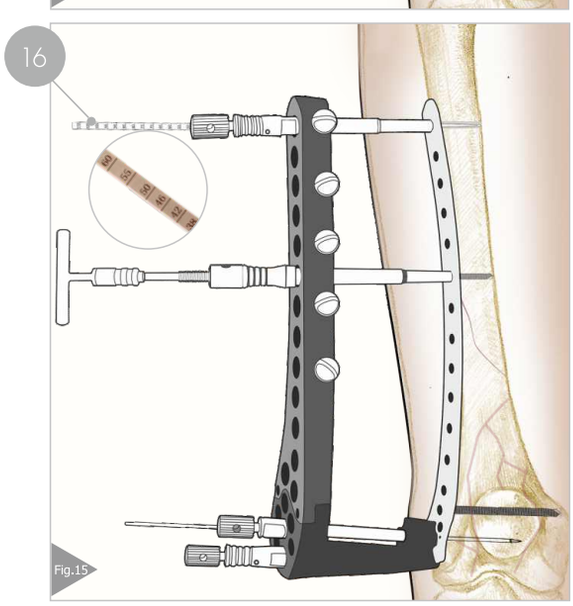


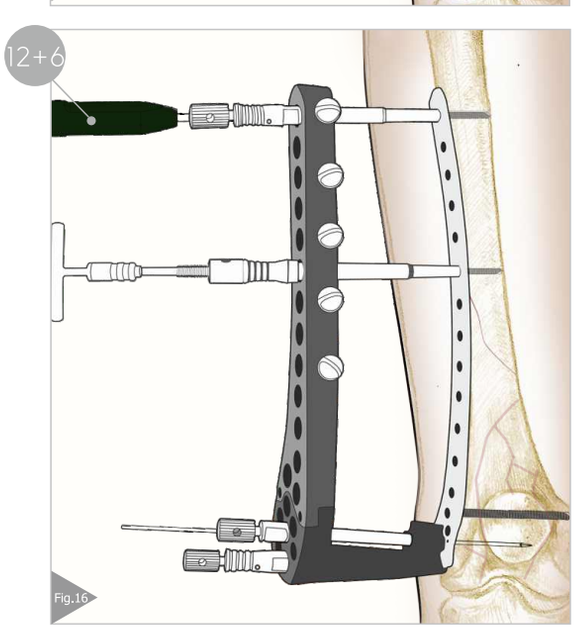
2.3. Placement

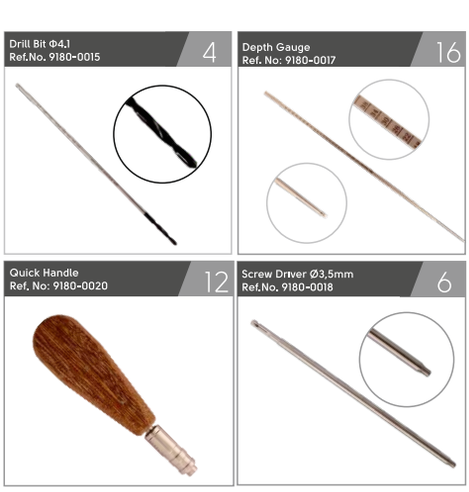
2.3.5.
Proximal Screw

The proximal screw is inserted without removing the device. *(Fig14-16).*
Remove *(Kirschner wire)* and *(Ø2.2 drill guide).* attach *(Ø4.2 drill guide)* instead.
Drill with *(Ø4.1 drill bit)(Fig14)*
Remove drill guide,
Use depth guide to determine screw lenght*(Fig15)*. Send the Ø 5.0 screw with *(Ø3.5 screwdriver) (Fig.16)*









2.3. Placement

2.3.6
Insert screw instead bone approximation tool

Now on Plate and device is stabilized proximally and distally. *(plate to bone approximation tool)* is on removable position in this way *(Fig17)*. Send the screw instead *with using (Ø3.5 Screw Driver)*

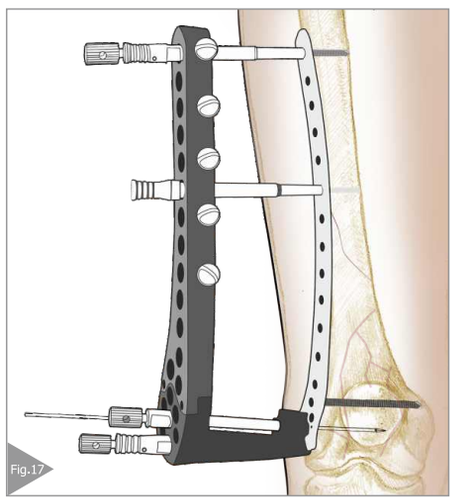


Fig.17

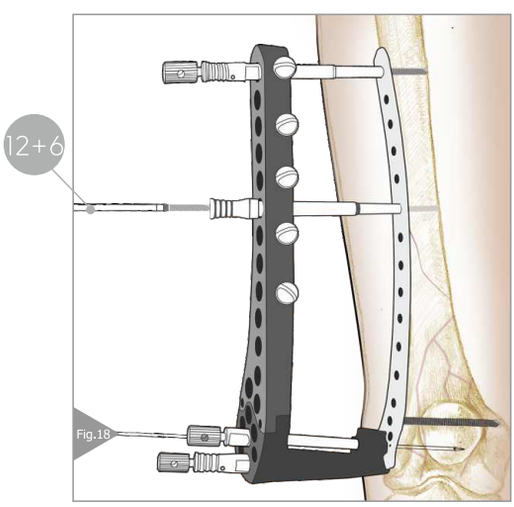
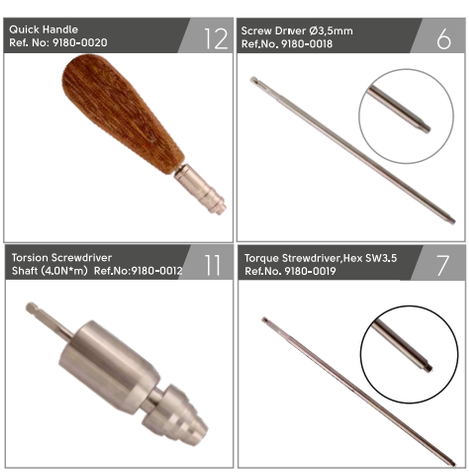


Fig.18

Note:Note: After every screw sending process don't forget torquing



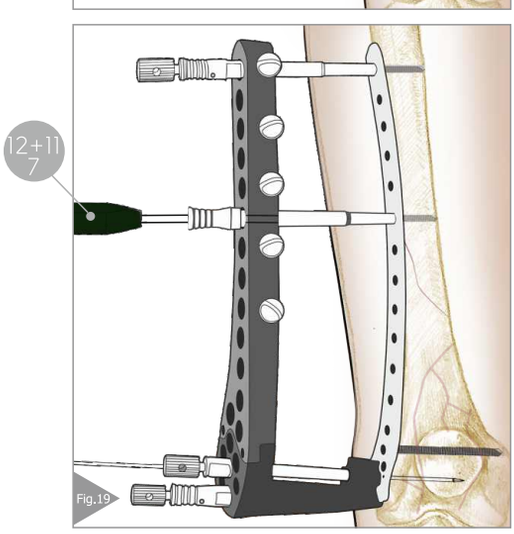


Fig.19

2.2.7
Finishing

A stable osteosynthesis is achieved by applying sufficient number of screws from the plate proximal and distal.*(Fig.20).*

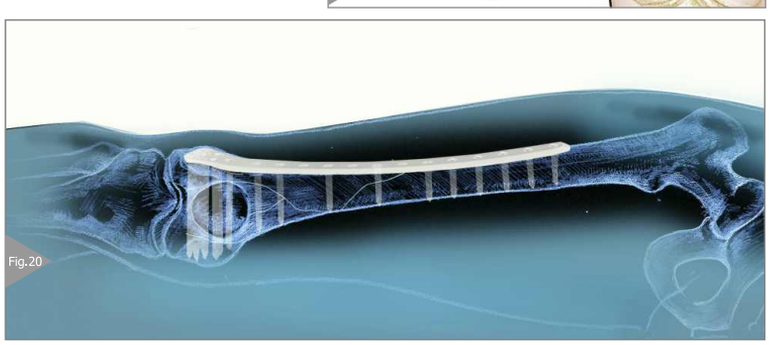
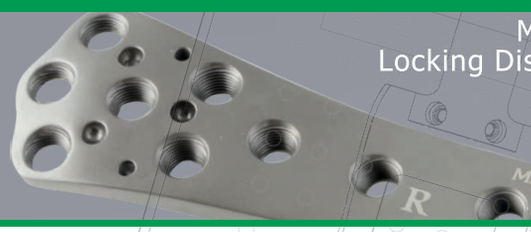
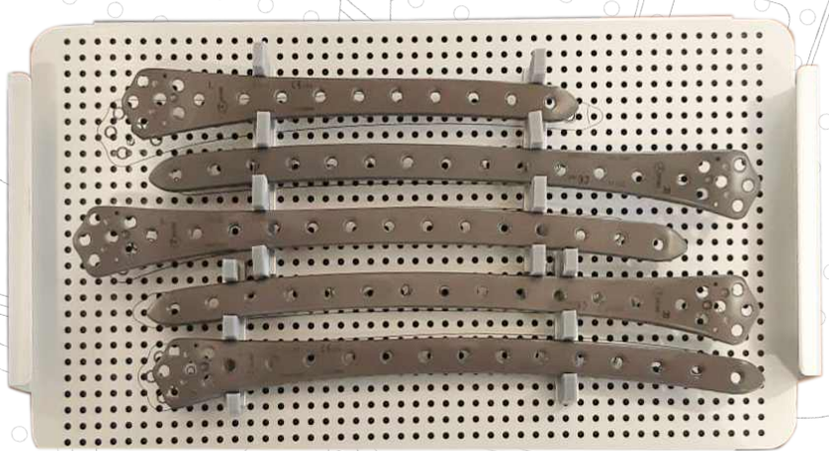


Fig.20

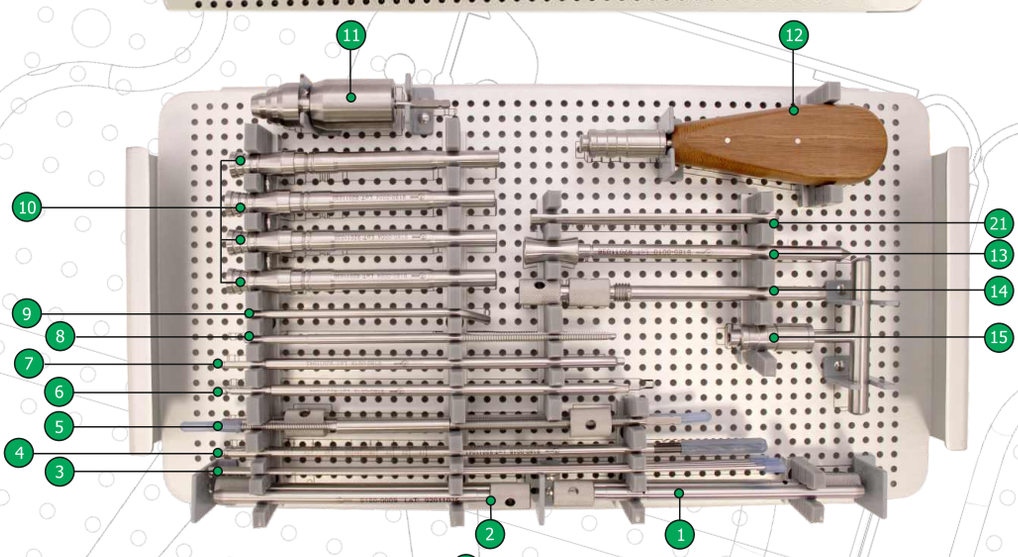


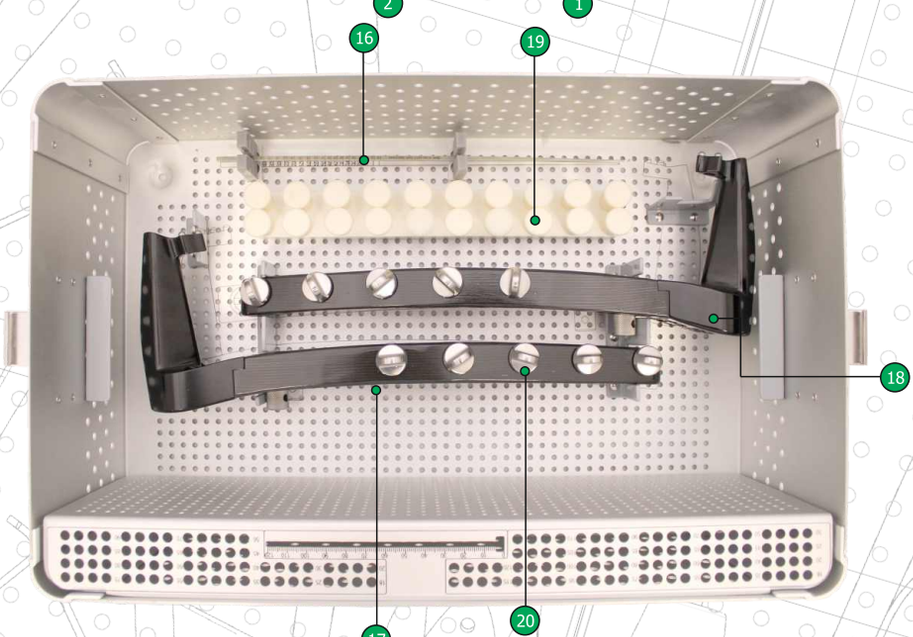
3.1.
Minimally Invasive Locking Distal Femoral Plate Instrument Set



Minimally Invasive
Locking Distal Femoral Plate

REF. NO	HOLES
1802-1012	12-R
1802-1016	16-R
1802-1020	20-R
1802-2012	12-L
1802-2016	16-L
1802-2020	20-L





4.1. DEVICE CLEANING CONDITIONS

Do not use metal brushes or rubbing pads during Decontamination of the tools should be performed immediately after the surgical procedure is completed. Contaminated tools must not be allowed to dry before reprocessing.

Excessive blood or debris must be removed in order to prevent the drying on the surface. All users must be qualified staff with documented evidence of training and competence. Training should include the current guidelines, standards and hospital policies. Even if they are made of high-grade stainless steel, the surgical tools must be thoroughly dried in order to prevent rust formation. Prior to sterilization, all the tools should be examined for the cleanliness of the lumens of the joints of the surfaces. manual cleaning process. Use cleaning agents with low-foam surfactant to be able to see the tools in the cleaning solution. Rinse the cleaning materials easily from the tool in order to prevent residue formation.

Mineral oil or silicon lubricants should not be used on Zimed tools. Neutral pH enzymatic and cleaning materials are recommended for cleaning the reusable instruments. It is very important to neutralize and rinse the alkaline cleaning materials thoroughly from the tools. Anodized aluminum should not contact with certain cleaning or disinfectant solutions. Avoid strong alkaline cleaners and disinfectants and solutions containing iodine, chlorine or certain metal salts.

4.1.1. Manual Cleaning/Disinfection:

Prepare the enzymatic and cleaning materials at the dilution rates and temperatures as recommended by the manufacturer. New solutions should be prepared when the existing solutions are heavily contaminated. Place the tools in the enzymatic solution so that they are completely immersed. Operate all the movable parts so that the detergent contacts with all the surfaces.

Keep in the fluid for minimum 20 min. Use a nylon, soft-bristled brush to gently rub the tools until all visible debris is cleaned. Pay particular attention to the accessible areas and use a suitable bottle brush. In order to remove the dirt in the open springs, coils or flexible parts, wash the recesses with plenty of cleaning solution. Rub the surface with a scrubbing brush to remove all the visible dirt from the surface and the recesses. To ensure that all the recesses are cleaned, turn the component while rubbing. Remove the tools and rinse them for minimum 3 min. under running water. Pay particular attention to the cannulas and use a syringe to pass the fluid through the hard-to-reach areas. Place all the tools that are completely immersed in water, in an ultrasonic unit containing teh cleaning solution. Operate all the movable parts so that the detergent contacts with all the surfaces. Expose the tools to sonification process for minimum 10 min..

Remove the tools and rinse with deionized water for at least 3 minutes or unless all the blood or dirt traces are eliminated in the rinsing water. Examine the tools under normal light to verify that visible dirt is removed. If visible dirt is present, repeat the above mentioned sonification procedure and the rinsing steps. Remove the excessive moisture on the tool with a clean, absorbent, lint-free cloth.

4.1.2. Combination Manual / Automated Cleaning and Disinfection:

Prepare the enzymatic and cleaning materials at the dilution rates and temperatures as recommended by the manufacturer. New solutions should be prepared when the existing solutions are heavily contaminated. Place the tools in the enzymatic solution so that they are completely immersed. Operate all the movable parts so that the detergent contacts with all the surfaces. Keep in the fluid for minimum 10 min. Use a nylon, soft-bristled brush to gently rub the tools until all visible debris is cleaned. Pay particular attention to the accessible areas and use a suitable bottle brush. A sonicator will help to clean the instruments thoroughly. The use of a syringe or a water fountain will facilitate passing of the liquid from the low-spaced areas and difficult-to-access areas. Remove the tools from the enzyme solution and rinse them for minimum 1 min. under deionized water. Place the tools in a suitable washer / disinfector basket and perform a standard washer / disinfector cycle. Specific minimum parameters are essential for a complete cleaning and disinfection. These parameters are given in a below mentioned table.

4.1.3. Combination Manual / Automated Cleaning and Disinfection:

Automated washing / drying systems are not recommended as the only cleaning method for surgical tools. An automated system can be used as a follow-up operation after manual cleaning. To ensure an effective cleaning, tools must be thoroughly examined before sterilization. For detailed information on Washing and Disinfection see

Specific minimum parameters used for a complete cleaning and disinfection:

	Definition
1	Pre-washing for 2 minutes with cold tap water
2	enzyme sprey for 20 seconds with hot tap water
3	Immersion in enzyme after 1 minute
4	rinsing for 15 seconds with cold tap water (Should be repeated twice)
5	Washing with detergent for 2 minutes with hot tap water
6	rinsing for 15 seconds with hot tap water
7	Rinsing with 10 seconds with optional lubricated purified water
8	Drying for 7 minutes with hot air

Note: Follow the isntruction of the washer/disinfector manufacturer

● *Zimed Medical, as the manufacturer of this device, and their surgical consultants do not recommend this or any othersurgical technique for use on a specific patient. The surgeon who performs any implant procedure isresponsible for determining and utilizing the appropriatetechniques for implanting the device in each individual patient. Zimed and their surgical consultants are notresponsible for selection of the appropriate surgicaltechnique to be utilized for an individual patient.*

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