

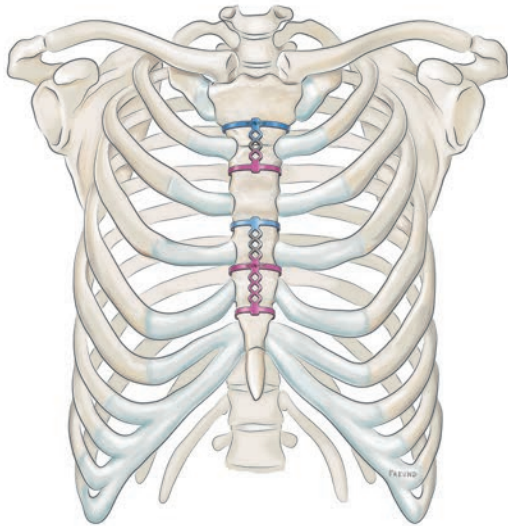
## STRATOS



STRASBOURG  
THORAX  
OSTEOSYNTHESE

## Sternal Closure





## Sternal closure with STRATOS sternal clip

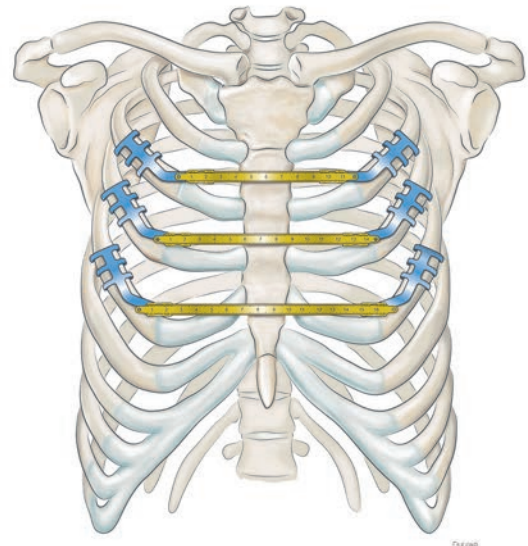
Partial or total sternotomy is used to gain a surgical approach for operations on organs of the mediastinum. Examples of operations include openheart surgery, coronary artery vein grafts and heart transplants. Total sternotomy means a longitudinal incision from the manubrium to the xiphoid.

Following longitudinal-axis sternotomy the „sternal halves“ are subjected to accurate reduction and fixed in proper alignment with one another.

For this purpose the sternal clip is designed for load-bearing, functionally efficient stabilisation of the sternum. Its use enables rapid mobilisation of the patient without restricting thoracic motion.

Clinical evidence was confirmed for the following indications:

- Surgical stabilisation for sternal osteotomy
- Chronic pain conditions in connection with incomplete ossification following sternal osteotomy

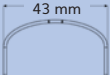


## Sternal closure with STRATOS implant bridge

Primary stabilisation following sternotomy or following very off-centre sternotomy is achieved by affixing implant bridges. In this procedure the osteotomised sternum is pressed close together and stabilised by closure of the implant bridges.

Distance stabilisation is also achieved by affixing implant bridges. In this procedure the osteotomised sternum is not joined together but a gap is left between the two sides in order to support wound healing. The rib clips can be affixed far to the side of the osteotomy on the intact ribs, thus bridging the critical region and ensuring the required stability.

# IMPLANTS

| S                                                                                                                                                |  | M                                                                                                                                           |                                                                   | L                                                                                                                                             |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <br><b>015-01010</b><br>Titanium Sternum<br>Single-clip S       |                                                                                   | <br><b>015-01020</b><br>Titanium Sternum<br>Single-clip M  |                                                                                                                                                    | <br><b>015-01030</b><br>Titanium Sternum<br>Single-clip L  |                                                                                     |
| <br><b>015-01110</b><br>Titanium Sternum<br>Double-clip S       |                                                                                   | <br><b>015-01120</b><br>Titanium Sternum<br>Double-clip M  |                                                                                                                                                    | <br><b>015-01130</b><br>Titanium Sternum<br>Double-clip L  |                                                                                     |
| <br><b>015-01310</b><br>Titanium Sternum<br>Triple-clip S      |                                                                                   | <br><b>015-01320</b><br>Titanium Sternum<br>Triple-clip M |                                                                                                                                                    | <br><b>015-01330</b><br>Titanium Sternum<br>Triple-clip L |                                                                                     |
| <br><b>015-01210</b><br>Titanium Sternum<br>Double-clip S/M   |                                                                                   |                                                                                                                                             | <br><b>015-01220</b><br>Titanium Sternum<br>Double-clip M/L   |                                                                                                                                               |                                                                                     |
| <br><b>015-01410</b><br>Titanium Sternum<br>Triple-clip S/S/M |                                                                                   |                                                                                                                                             | <br><b>015-01420</b><br>Titanium Sternum<br>Triple-clip M/M/L |                                                                                                                                               |                                                                                     |

## Benefit

- Secure, functionally stable closure of the sternum
- Axial and horizontal displacements of the sternum halves are prevented
- Rapid mobilisation of the patient without any motion restrictions
- Closure with at least 5 clip segments, e.g. 1 titanium sternum triple clip and 1 titanium sternum double clip

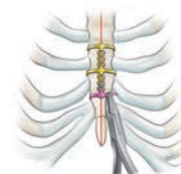
## INSTRUMENTS

### 010-00025

#### Flat-nosed bending pliers for rib clips and connecting bars, 13.5 cm

Pliers for horizontal bending and axial torquing of the rib clips. In this procedure the pliers are used in pairs.

Removal of the implants can be performed with these pliers because the jaws are flattened on one side. The flattened jaw is slipped under the implant to be removed and then the segment is lifted and bent open carefully.

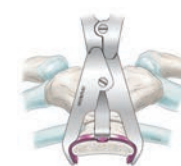
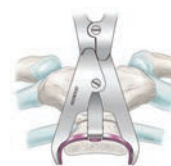


### 010-01510

#### Sternum clip Preforming Pliers

Pliers for placing and preshaping the titanium sternal clip on the sternum. The pliers is placed vertically on the titanium sternal clip to be closed and then the pliers is closed completely.

In this procedure the hold-down device presses on the titanium sternal clip and keeps it in position whilst the lateral claws shape and fix the titanium sternal clip segments around the sternum.



### 010-01520

#### Sternum clip Final Forming Pliers

Pliers for final shaping of the titanium sternal clip on the sternum.

The final shaping pliers is used to shape the titanium sternal clip on the sternum finally, also retrosternally.

The pliers is placed with the shortened claw of the jaws on the segment of the clip and attached. The segment is shaped around the sternum with the lengthened claw of the jaws. This procedure is repeated for each segment level on the left and right until all the clip segments have been adapted.

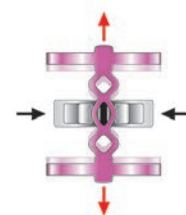


### 010-01530

#### Sternum clip Bar Elongation Pliers

Pliers for lengthening the distance between the segments of the titanium sternal clip.

The pliers is placed on the rhombus-shaped interconnecting bar. The jaws are designed in such a way that they grip round the rhombus tip. By closing the pliers the rhombus is compressed so the distance between the clip segments is lengthened. A stop prevents the material from being overstretched. The procedure can be performed on all the rhombi, lengthening the distance between the two segments by up to 5 mm.

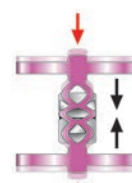


### 010-01540

#### Sternum clip Bar Shortening Pliers

Pliers for shortening the distance between the segments of the titanium sternal clip.

The pliers is placed on the rhombus-shaped interconnecting bar. The jaws are designed in such a way that they grip round the rhombus tip. By closing the pliers the rhombus is pressed apart so the distance between the clip segments is shortened. A stop prevents the material from being overstretched. The procedure can be performed on all the rhombi, shortening the distance between the two segments by up to 5 mm.



## INSTRUMENTS

### 010-01560

#### Sternum Implant Sizer

Instrument for determining and selecting the implant size.

The jaws of this instrument are introduced to the previously exposed intercostal spaces in order to establish the particular width of the sternum. The clip size to be used is determined on the basis of a scale: S / M / L / XL.



### 010-01580

#### Sternum Repositioning Forceps

Pliers for temporary fixation of the sternum.

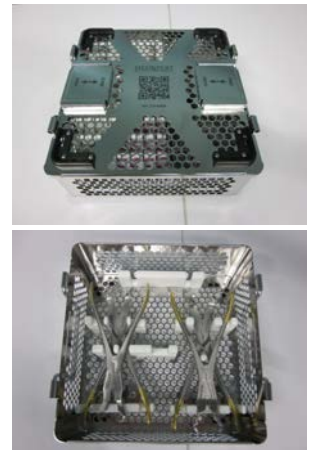
For temporary fixation and positioning of the sternum for affixing the titanium sternal clip.



### 001-20001

#### Sterilizing Container Trauma, empty

Container made of stainless steel (material 1.4301) for the transport and sterilization of products, implants and instruments. For reprocessing, cleaning and disinfection of the products they must be removed from the container and introduced to the process on suitable perforated trays. The containers can be cleaned in any automatic reprocessing program.

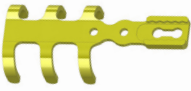


**All bending procedures must be carried out slowly. Repeated bending of the implants must be avoided at all costs in order to prevent structural changes in the implant material.**

## IMPORTANT NOTE

Before using for the first time, it is absolutely essential to read our „Application Manual“ and our Instructions for Use. We always recommend intensive product training and briefing by MedXpert or an authorised specialist dealer prior to the first intervention using products of this system.

## IMPLANTS

| STANDARD                                                                                                                                              | <br>19 mm                                                           | XL                                                                                                                                               | <br>27,5 mm                                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <br><b>012-02225</b><br>Titanium rib clip,<br>right, 22.5°, Standard | <br><b>012-01225</b><br>Titanium rib clip,<br>left, 22.5°, Standard | <br><b>012-04225</b><br>Titanium rib clip,<br>right, 22.5°, XL | <br><b>012-03225</b><br>Titanium rib clip,<br>left, 22.5°, XL |
| <br><b>012-02450</b><br>Titanium rib clip,<br>right, 45°, Standard   | <br><b>012-01450</b><br>Titanium rib clip,<br>left, 45°, Standard   | <br><b>012-04450</b><br>Titanium rib clip,<br>right, 45°, XL   | <br><b>012-03450</b><br>Titanium rib clip,<br>left, 45°, XL   |
| <br><b>014-01000</b><br>Titanium rib clip,<br>straight, Standard   |                                                                                                                                                      | <br><b>014-01001</b><br>Titanium rib clip,<br>straight, XL   |                                                                                                                                                  |



## CONNECTING BARS AND CONNECTORS

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### 014-10190

Titanium connecting bar, completely serrated, 190 mm

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### 014-10230

Titanium connecting bar, completely serrated, 230 mm

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### Application

- We always recommend three implant bridges for one sternal closure
- an implant bridge comprises of two titanium rib clips and one titanium connecting bar
- the titanium rib clips are selected according to the anatomical situation and placed on the left and right side on the ribs
- after precise positioning and alignment of the titanium rib clips the titanium connecting bar is shortened to the particular length and introduced to the connectors of the titanium rib clips
- the titanium rib clips are fixed in place on the rib
- the titanium connecting bar is crimped onto the connectors of the titanium rib clips

### Benefit and outcome

- primary management and distance-ensuring management possible
- secure connection by crimping the connectors of the titanium rib clips to the titanium connecting bar
- immediate functionally stable fixation
- the patient is mobile directly after the intervention

### Material

The Titanium rib clips and Titanium connecting bars are made of grade 2 pure titanium.

The material designation of the material is 3.7035 / ASTM B 265 Gr. 2 / ASTM F 67, in accordance with DIN EN ISO 5832-2.

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## INSTRUMENTS

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The MedXpert instrument set has been specially developed for the use of the MedXpert implants and is matched to the products. MedXpert implants may only be used with the instruments specified by MedXpert.

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### 010-00010

#### **Implant cutting pliers with exchangeable jaw inserts, 22cm**

Pliers for cutting the Titanium connecting bars.

After deciding on the individual length the Titanium connecting bars are shortened using the implant cutting pliers. „Completely serrated“ Titanium connecting bars can be shortened without any limitations.

„Partially serrated“ Titanium connecting bars may only be shortened on the left and right to such an extent that at least one serrated length of 15 mm remains on both sides, in order to enable secure crimping to the connectors of the titanium rib clips.

The rubber jaw inserts collect disconnected Titanium connecting bar segments.



### 010-00020

#### **Three-point bending pliers for rib clips, 18 cm**

Pliers for longitudinal-axis adjustment of the angle of the Titanium rib clip.

The two pins on the jaws of the pliers are inserted in the two drillholes of the Titanium rib clip. Longitudinal axis-alignment of the Titanium rib clip is altered by closing the pliers. Subsequent shaping is possible even if the Titanium rib clip has already been fixed in place on the rib.

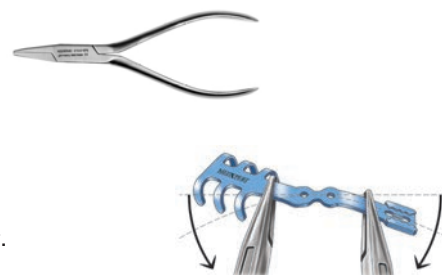


### 010-00025

#### **Flat-nosed bending pliers for rib clips and connecting bars, 13.5 cm**

Pliers for horizontal bending and axial torquing of the rib clips. In this procedure the pliers are used in pairs.

Removal of the implants can be performed with these pliers because the jaws are flattened on one side. The flattened jaw is slipped under the implant to be removed and then the segment is lifted and bent open carefully.





## INSTRUMENTS

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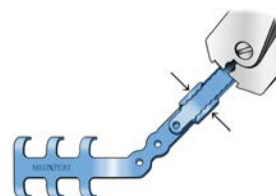
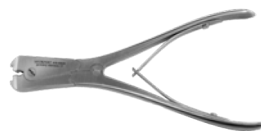
### 010-00030

#### Implant crimping pliers, 18 cm

Pliers for final closure (crimping) of the connection between Titanium rib clip and Titanium connecting bar.

The jaw of the pliers is placed on the connector at an angle of 90° and closed. In this procedure the connector is crimped to the connecting bar and the connection is made irreversible. The pliers is provided with a stop that prevents the connection from being over-pressed.

The pressing action must be repeated in at least three work steps (on the left, in the middle and on the right) over the entire length of the connector.



### 010-00032

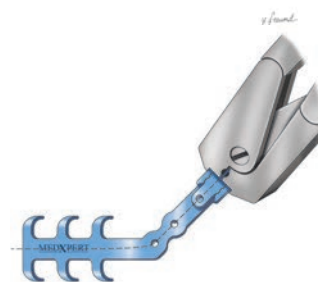
#### Implant crimping pliers, angled 100°, 20.5 cm

Pliers for final closure (crimping) of the connection between Titanium rib clip and Titanium connecting bar.

The jaw of this pliers is provided with 100° angulation in order to be able to connect the rib clips to the connecting bars even at virtually inaccessible sites.

The jaw of this pliers is placed on the connector at an angle of 90° and closed. In this procedure the connector is crimped to the connecting bar and the connection is made irreversible. The pliers is provided with a stop that prevents the connection from being over-pressed.

The pressing action must be repeated in at least three work steps (on the left, in the middle and on the right) over the entire length of the connector.



### 010-00037

#### Rib clip fixation pliers for Standard rib clips, angled 100°, 20.5 cm

### 010-00047

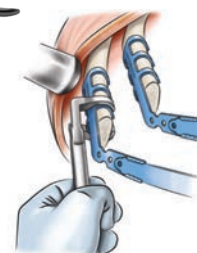
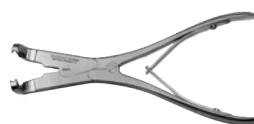
#### Rib clip fixation pliers for XL rib clips, angled 100°, 20.5 cm

Pliers for affixing the titanium rib clip to the rib.

The jaw of this pliers is provided with 100° angulation in order to be able to close the rib clips even at virtually inaccessible sites.

The jaw of the pliers is placed on the rib clip to be closed and then they are closed completely. After that, the segments are shaped flush onto the rib with a rotation of approx. 45° in each case.

The pliers are available for standard and XL titanium rib clips.



### 010-00050

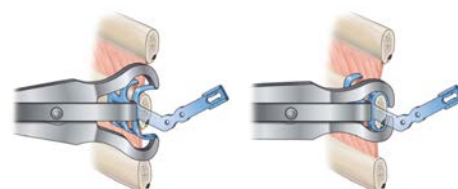
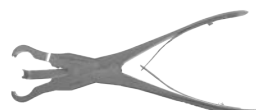
#### Rib clip fixation pliers, Universal

Pliers for affixing the titanium rib clip to the rib

The pliers is placed vertically on the titanium rib clip to be closed and then closed completely.

In this procedure the hold-down device presses on the titanium rib clip and keeps it in position whilst the lateral jaws shape and fix the titanium rib clip segments around the rib.

With this instrument it is possible to affix not only standard titanium rib clips but also XL ones.



## INSTRUMENTARIUM

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### 010-00005

**Sterilizing container (Polyphenylsulfone)**

### 010-00007

**Sterilizing Container (Polyphenylsulfone), half-size**

Container made of PPSU (polyphenylsulfone) for the transportation and sterilization of products, implants and instruments.

For reprocessing, cleaning and disinfection of the products they must be removed from the container and introduced to the process on suitable perforated trays.

The containers can be cleaned in any automatic reprocessing program.



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