HumanTech
Medical Devices

# HERO®

## CERVICAL PLATE SYSTEM

The HERO® anterior cervical plate system serves to stabilise the cervical spine following a ventral fusion.

Thanks to its intelligent set of instruments, HERO® is a highly efficient cervical plate system and therefore represents a widely-accepted product range for cervical indications.

The HERO® anterior cervical plate system is suitable for use with dynamic or rigid screws and a combination of both screw types (hybrid).

The expansion screws offer a additional, secure hold for monocortical fixation even in the event of weakened bone substance.

HERO® polysegmental plates have multiposition holes, which provide the surgeon with additional length variation options for multisegmental treatment.

The set of instruments is extremely clear and ergonomic.
Many unique features are integrated in order to suit the widest possible range of surgical conditions.

HERO® enables the surgeon to have increased precision with fast, secure implantation and offers the following outstanding product-specific benefits:

### anatomical
- Expandable bone screws
- Angle-variable bone screws
- Preformed plates
- Extra-thin, tapered plate design
- Flush finish for plate and screw upper edge

### transparent
- Drilling gauge with several hole options
- Colour-coded screws
- Self-tapping screws
- “Pick and Place” handling of the screws

### stable
- Secure anterior support construction
- Secure screw anchoring in the plate
- Extra large instrument holders

### flexible
- Monosegmental plates
- Polysegmental plates
- Extra long screws (up to 22mm)
- Large range of screws
- Large range of plates
- Multiposition holes in polysegmental plates
- Angle variability of up to 30° from caudal to cranial

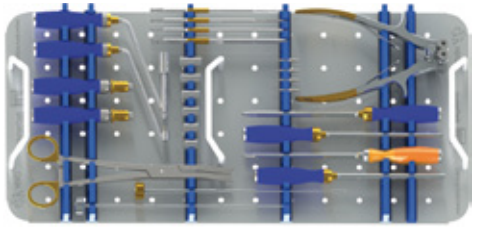
### universal
- Expandable bone screws for revisions
- Expandable bone screws for weakened bone substance
- Unique plate/screw fastening mechanism


# HERO®

Cervical Plate System

## Produkt-Specific Advantages

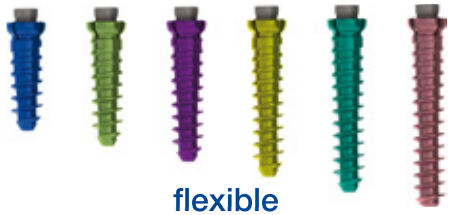
anatomical



transparent

universal

stable



flexible

1. flexible
2. anatomical
3. universal
4. stable
5. transparent

## HERO® Material

The latest knowledge is used to manufacture titanium implant materials with tailor-made surface properties.
We exclusively use titanium Ti 6Al-4V ELI (in accordance with DIN Ti3.7165).

## HERO® Standard Screws (fig. 1)

The male thread of the screw is constructed as a self-tapping bone thread.
The plane side of the screw head, which features several slots, serves as the instrument holder.

The locking screw that has the same male thread can be screwed into the lower section of the metric female/right hand thread, fixing the screw head in the plate hole.

The unscrewing instrument can be screwed into the upper section of the metric female/left hand thread, which is larger than the thread in the lower section, in the event of screw removal (fig. 2).

Fig. 1

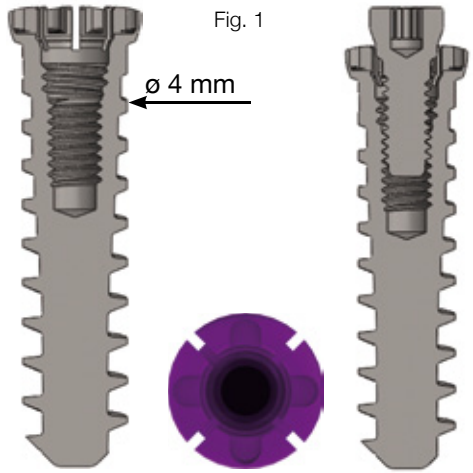
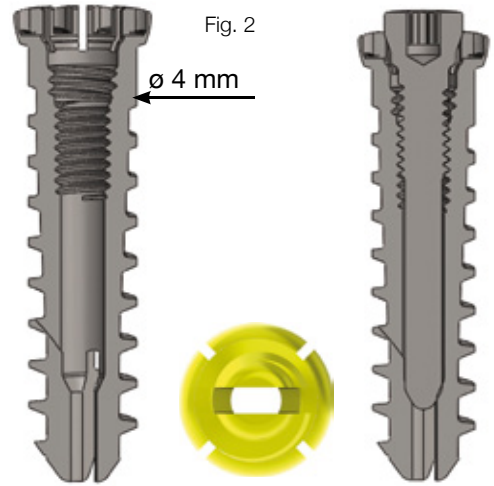



Fig. 2




## HERO® Expansion Screws (fig. 2)

By screwing in the locking screw, the screw head is splayed and triggers the stabilisation mechanism (dynamic or angle-stable), both with standard screws and expansion screws.

In the case of the expansion screw, the slotted screw shaft is also splayed and ensures a secure fit if there are poor bone conditions or in cases of revisions.

## HERO® Single Screws (fig. 3)

Single screws have a self-tapping and self-drilling thread and no locking screws. The tap should be used with the drill guide for optimum functioning of the screws and for centring the single screw passage. The single screws are implanted using the single screwdriver.

Fig. 3

## HERO® Screw/Plate Closure Mechanism

Angle-variable screws provide an angle of up to 22.5° from caudal to cranial, while retaining the sagittal alignment of the screws. This flexibility enables easier positioning of the screws without affecting the stability of the construct.

The HERO® plates have a thickness of 2mm, a width of 17.3mm, a tapering of 12,8mm and are pre-bent lordotically.

Polysegmental plates also have variably usable long holes in addition to corner holes (fig. 7). Therefore they are centric strengthened to 18,8 mm. These multiposition holes each consist of 3 individual holes which are 3mm apart in order to offer the surgeon additional length variation options for multi-segmental treatment.

There are 20 lengths available in total (from 23mm to 97mm).

The plate holes have the same spherical shape as the screw heads (fig. 6). The sphere centre is in the upper part of the plate.

This makes the hole diameter larger on the upper side of the plate than on the underside, which prevents the screw from passing through the plate.

If the screw meets the upper edge of the plate hole when screwing in the ball head (fig. 5), the screw head bends inwards and the screw can be screwed into the plate hole.

The locking screws are inserted using the locking screw inserter. This limits the tapering of the screw head inwards while also expanding the screw head outwards.

This expansion of the slotted screw head fixes it into the spherical shape of the plate holes.

Both the plane sided instrument holder and the torx are really large dimensioned. So they are stable and long-lasting.

HERO®

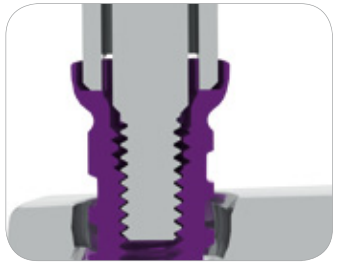


Fig. 4

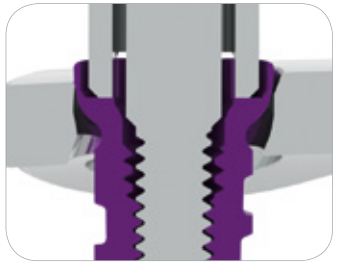


Fig. 5

Fig. 6

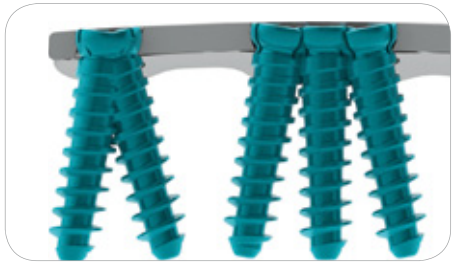
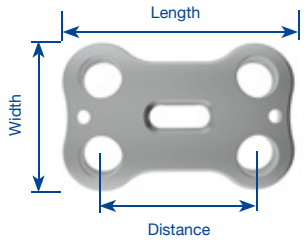


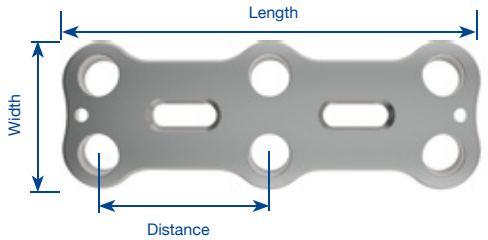
Fig. 7

## 1 Level



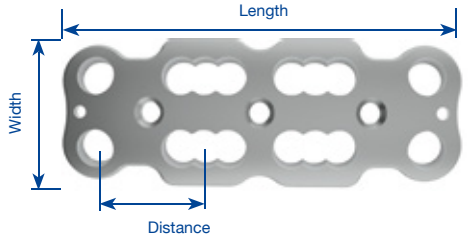

| Art.No. | Name | Length | Width | Distance |
|---|---|---|---|---|
| 1101040123 | One Level Cervical Plate 23 mm | 23 mm | 17,3 mm | 14 mm |
| 1501040125 | One Level Cervical Plate 25 mm | 25 mm | 17,3 mm | 16 mm |
| 1501040127 | One Level Cervical Plate 27 mm | 27 mm | 17,3 mm | 18 mm |
| 1501040129 | One Level Cervical Plate 29 mm | 29 mm | 17,3 mm | 20 mm |
| 1501040131 | One Level Cervical Plate 31 mm | 31 mm | 17,3 mm | 22 mm |

## 2 Levels



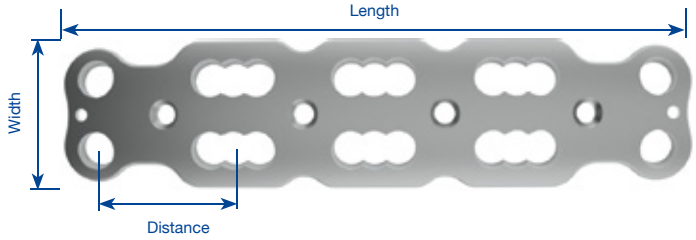

| Art.No. | Name | Length | Width | Distance |
|---|---|---|---|---|
| 1101050137 | Two Levels Cervical Plate 37 mm | 37 mm | 17,3 mm | 14 mm |
| 1101050141 | Two Levels Cervical Plate 41 mm | 41 mm | 17,3 mm | 16 mm |
| 1101050145 | Two Levels Cervical Plate 45 mm | 45 mm | 17,3 mm | 18 mm |
| 1101050149 | Two Levels Cervical Plate 49 mm | 49 mm | 17,3 mm | 20 mm |
| 1101050153 | Two Levels Cervical Plate 53 mm | 53 mm | 17,3 mm | 22 mm |

## 3 Levels



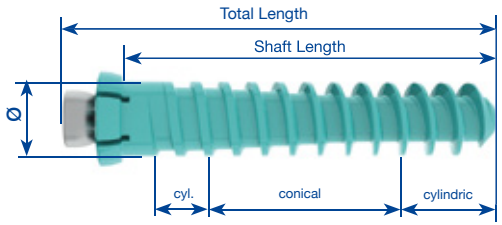

| Art.No. | Name | Length | Width | Distance |
|---|---|---|---|---|
| 1101060151 | Three Levels Cervical Plate 51 mm | 51 mm | 18,8 mm | 14 mm |
| 1101060157 | Three Levels Cervical Plate 57 mm | 57 mm | 18,8 mm | 16 mm |
| 1101060163 | Three Levels Cervical Plate 63 mm | 63 mm | 18,8 mm | 18 mm |
| 1101060169 | Three Levels Cervical Plate 69 mm | 69 mm | 18,8 mm | 20 mm |
| 1101060175 | Three Levels Cervical Plate 75 mm | 75 mm | 18,8 mm | 22 mm |

## 4 Levels



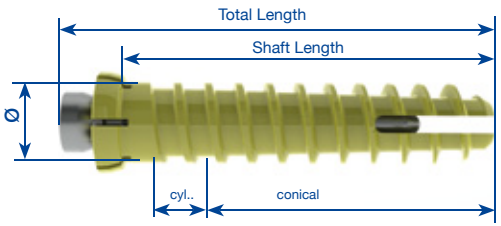

| Art.No. | Name | Length | Width | Distance |
|---|---|---|---|---|
| 1101070165 | Four Levels Cervical Plate 65 mm | 65 mm | 18,8 mm | 14 mm |
| 1101070173 | Four Levels Cervical Plate 73 mm | 73 mm | 18,8 mm | 16 mm |
| 1101070181 | Four Levels Cervical Plate 81 mm | 81 mm | 18,8 mm | 18 mm |
| 1101070189 | Four Levels Cervical Plate 89 mm | 89 mm | 18,8 mm | 20 mm |
| 1101070197 | Four Levels Cervical Plate 97 mm | 97 mm | 18,8 mm | 22 mm |

## Standard



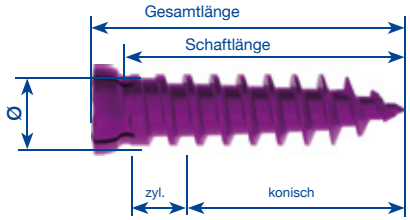

| Art.No. | Name | Shaft Length | Total Length | ø |
|---|---|---|---|---|
| 1101080212 | Standard Screw 12 mm | 12 mm | 13,5 mm | 4 mm |
| 1101080214 | Standard Screw 14 mm | 14 mm | 15,5 mm | 4 mm |
| 1101080216 | Standard Screw 16 mm | 16 mm | 17,5 mm | 4 mm |
| 1101080218 | Standard Screw 18 mm | 18 mm | 19,5 mm | 4 mm |
| 1101080220 | Standard Screw 20 mm | 20 mm | 21,5 mm | 4 mm |
| 1101080222 | Standard Screw 22 mm | 22 mm | 23,5 mm | 4 mm |

## Expansion




| Art.No. | Name | Shaft Length | Total Length | ø |
|---|---|---|---|---|
| 1101090212 | Expansion Screw 12 mm | 12 mm | 13,5 mm | 4 mm |
| 1101090214 | Expansion Screw 14 mm | 14 mm | 15,5 mm | 4 mm |
| 1101090216 | Expansion Screw 16 mm | 16 mm | 17,5 mm | 4 mm |
| 1101090218 | Expansion Screw 18 mm | 18 mm | 19,5 mm | 4 mm |

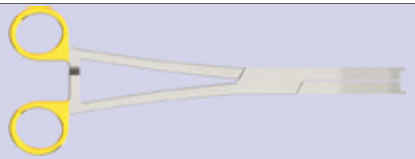
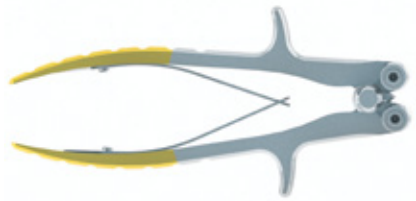
## Single

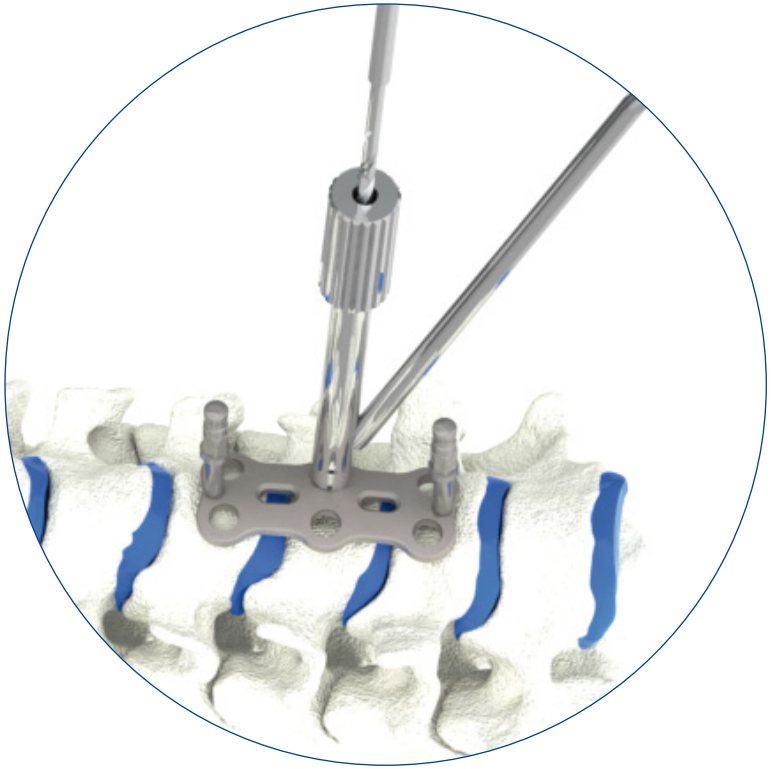


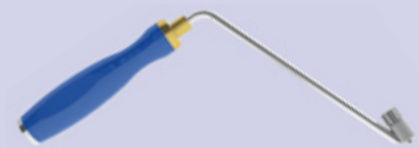

| Art.No. | Name | Shaft Length | Total Length | ø |
|---|---|---|---|---|
| 1101200212 | Single Screw 12mm | 12 mm | 13,5 mm | 4 mm |
| 1101200214 | Single Screw 14mm | 14 mm | 15,5 mm | 4 mm |
| 1101200216 | Single Screw 16mm | 16 mm | 17,5 mm | 4 mm |
| 1101200218 | Single Screw 18mm | 18 mm | 19,5 mm | 4 mm |

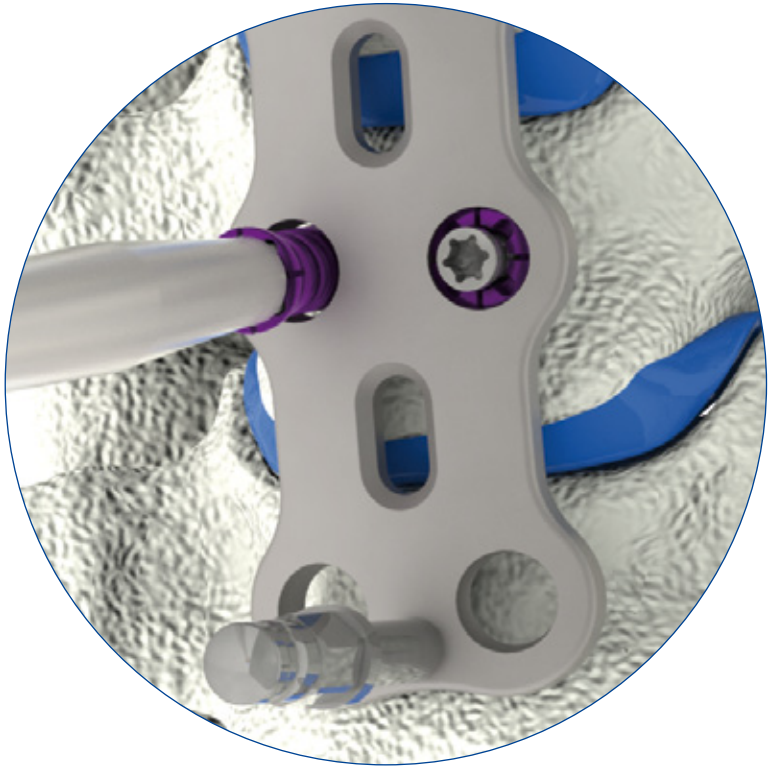
## Colour Code

| 12mm | 14mm | 16mm | 18mm | 20mm | 22mm |
|---|---|---|---|---|---|

| Art.No. | Description | Image |
|---|---|---|
| 1101010000 | Screw Driver |  |
| 1101010001 | Locking Screw Driver |  |
| 1101010002 | Tap 4 mm |  |
| 1101010003 | Drill 2,5 mm |  |
| 1101010004 | Drill Guide |  |
| 1101010005 | Plate Holder |  |
| 1101010006 | Plate Bender |  |



| Art.Nr. | Bezeichnung | Abbildung |
|---|---|---|
| 1501010011 | Pin Driver |  |
| 1101010010 | Fixation Pin |  |
| 1101010011 | Standard AO Handle |  |
| 1101010012 | Plate Positioner |  |
| 1101010013 | Single Screw Driver |  |
| 1101010014 | Screw Inserter Shaft |  |
| 1101010016 | Locking Screw Inserter 4P |  |
| 1101010017 | Screw Extraction Handle 6P |  |



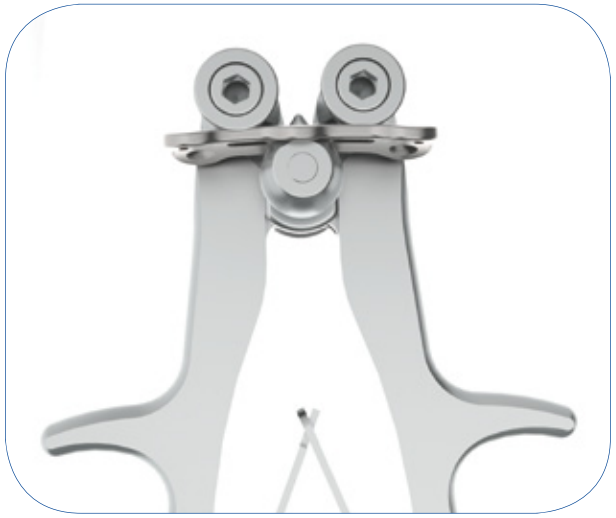


fig. 1

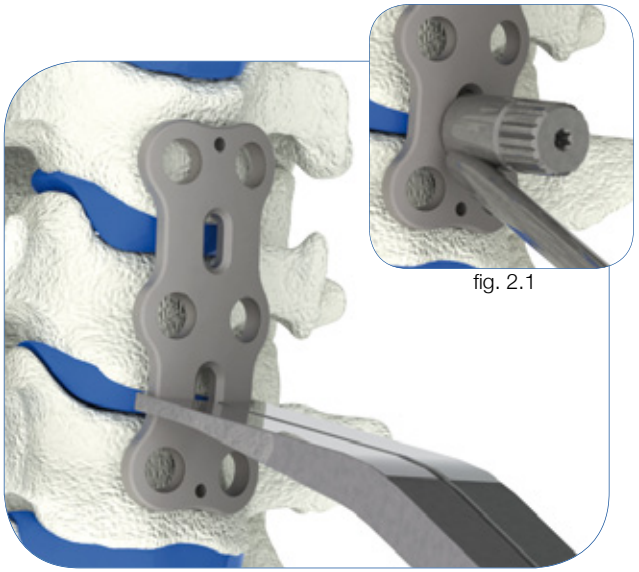


fig. 2



fig. 2.1

fig. 3.1



fig. 3

## Adjusting the plate (optional)

Although they are already pre-bent for most anatomical applications, the plates can also be adapted lordotically or kyphotically to suit the patient's anatomical features.

**Note:**
Bends near the screw holes can impair the screw fit and reduce biomechanical stability. Plates only are allowed to bent in 1 direction.

## Positioning the plate

The plates can be held and positioned using the plate holder (fig. 2) or the plate positioner (fig. 2.1). The central long hole fittings in the plate contain a thread into which the plate positioner can be screwed.
You can also use the plate holder for free-hand screw positioning or other positioning manoeuvres.

## Temporary fixation with fixation pins

The fixation pins are inserted into the pin driver (fig. 3.1) and screwed into the vertebral body through the cranial or caudal ends of the plate.

**Note:**
The fixation pins should not be screwed in too tightly (fig. 3) in order that they can be removed easily following instrumentation.

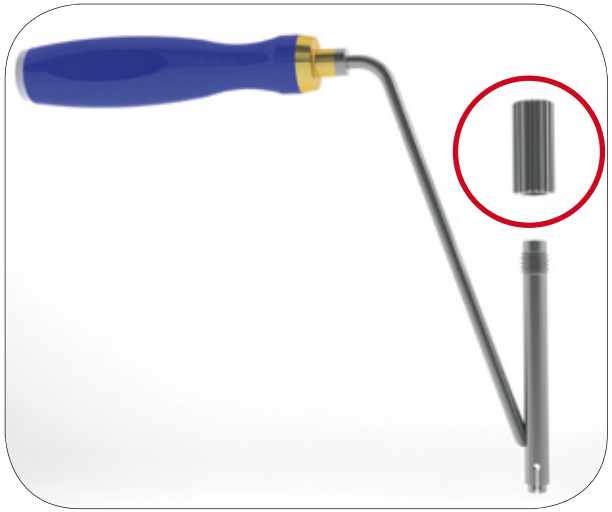


fig. 4

## Preparing the depth stop

There are drill hole templates available for the different screw lengths in order to prevent the screws from being screwed in too deeply.
The depth stop collar is screwed onto the drill guide according to the desired screw length (fig. 4).

fig. 5

## Accommodating the screw channel

Both the drill and the optional screw tap (not pictured) can be used with the straight standard handle (fig. 5)

**Note:**
The drill manoeuvre should always be carried out with the aid of the drill guide and while monitoring the procedure using imaging.

fig. 6

## Standaed and Expansion Screws

Both standard screws (fig. 6 left) and expansion screws (fig. 6 right) have a self-tapping bone thread and consist of 2 parts (screw + locking screw). The plane side of the screw head, which is slotted several times, serves as the instrument holder.
By screwing in the locking screw, the screw head is splayed and triggers the stabilisation mechanism (dynamic or angle-stable). In the case of the expansion screw, the screw shaft is also splayed and ensures a secure fit if there are poor bone conditions or in cases of revisions.

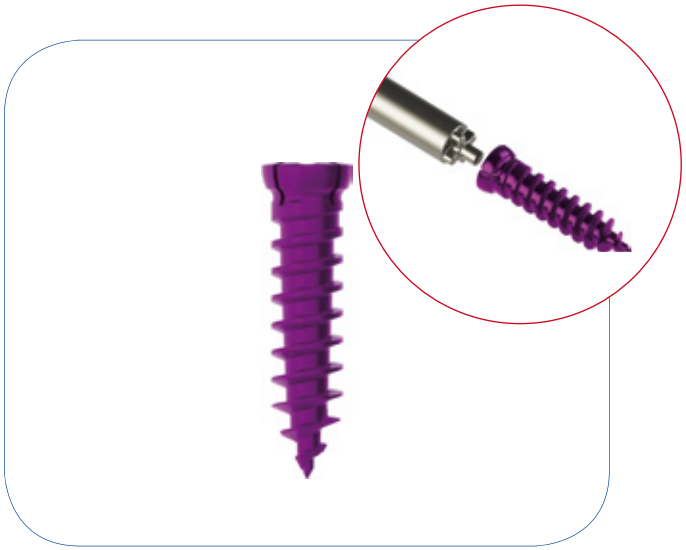


Fig. 7

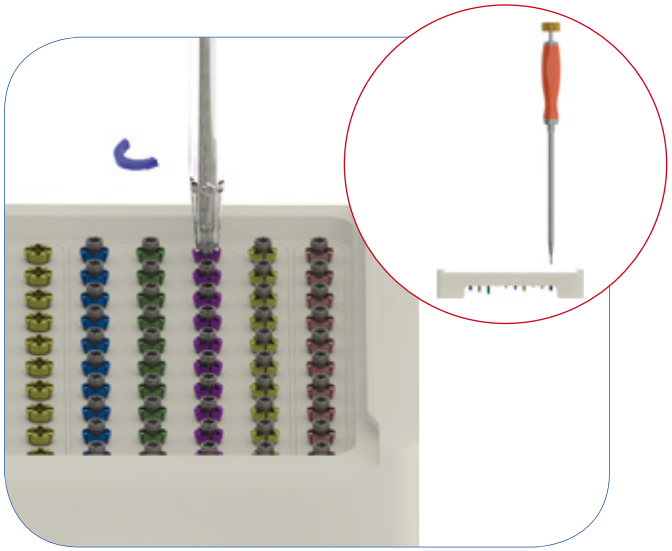


Fig. 8

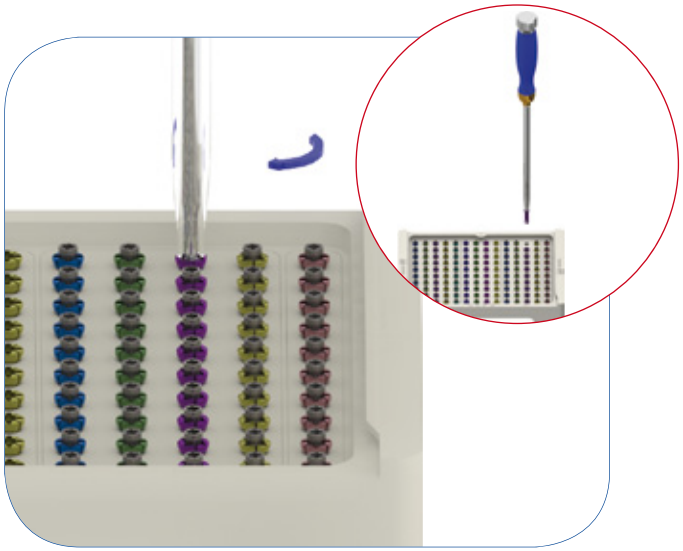


Fig. 9

## Single screws

The single screws have a self-drilling thread and no locking screws. The tap should be used with the drill guide for optimum functioning of the screws and for centring the single screw passage. The single screws are implanted using the single screwdriver. The screw heads and plate holes have been aligned in such a way that the screw head itself locks into the plate.
For standard and expansion screws, an additional safety mechanism is triggered by the locking screw to minimise the risk of screw loosening (fig. 7).

## Removing the locking screws

The locking screw of the screw to be implanted is removed from the bone screw with the locking screw inserter by turning the locking screwdriver anti-clockwise. The locking screw can be held and positioned using the locking screw inserter until it has been inserted back into the bone screw (fig. 8).

## Preparing the screws

Both standard and expansion screws can be implanted using the screwdriver.
The screw is secured by simply turning the pull rod clockwise using the screwdriver; this creates a stable connection between the screw and the screwdriver.
Note:
The screwdriver can be mounted more easily if the screw is screwed in with the pull rod first, That way, standard and expansion screws can be extracted from the screw box and implanted easily (fig. 9).

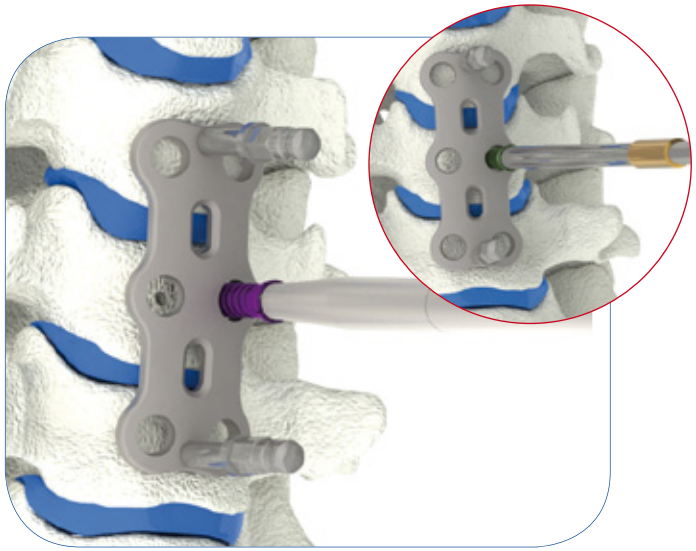


Fig. 10

## Inserting the bone screws

In the case of bisegmental instrumentation, it is recommended that the bone screws are first inserted into the middle level.
When using 3- or 4-segment plates, you can choose between 3 hole positions through which the screws can be screwed in. An angle-stable or angle-variable fixation is also possible here.
Standard or expansion screws are screwed in using the screwdriver until you can feel it is locked in the plate hole (Fig. 10).

The single screws are inserted using the single screwdriver (fig. 10a).

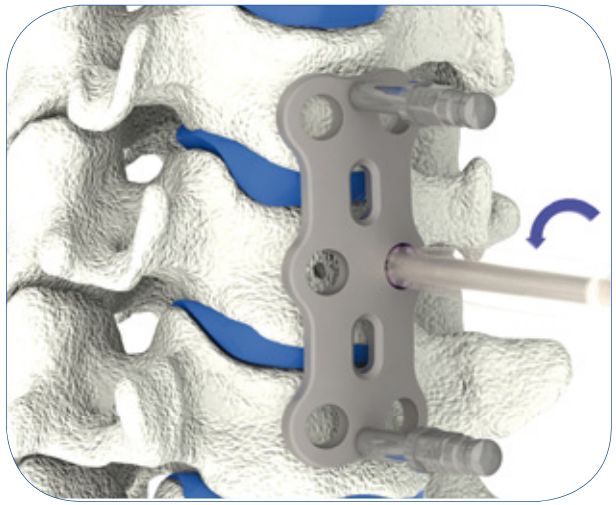


Fig. 11

## Loosening of the pull rod

After the bone screw has been implanted, the pull rod should be loosened from the screw by turning it anti-clockwise and removed from the screwdriver.
The screwdriver should not yet be removed, as it acts as a rotational brake arm when inserting the locking screw.

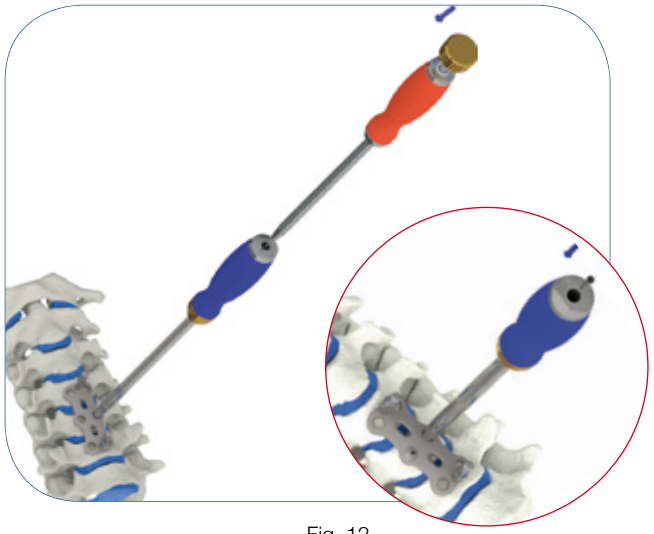


Fig. 12

## Fitting the locking screws

The locking screw that was previously removed from the bone screw (standard or expansion), is inserted with the locking screw inserter or manually through the screwdriver opening.
When using expansion screws, the screw shaft is splayed simultaneously and provides a secure anchoring if there is poor bone quality and/or for additional retention in cases of revisions.

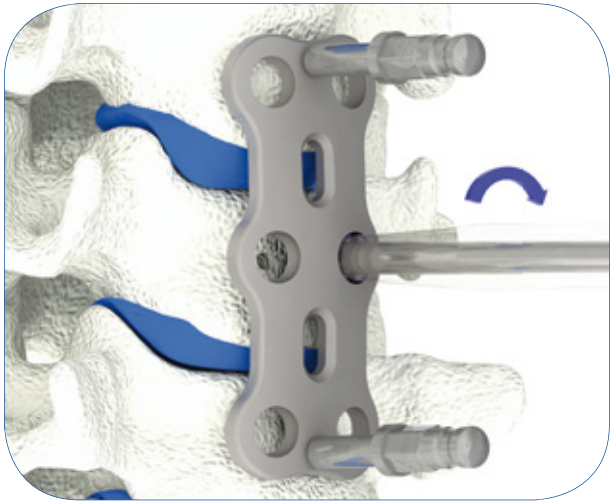


Fig. 13

## accommodating the bone screws

In the case of bisegmental instrumentation, it is recommended that the bone screws are first inserted into the middle level.
When using 3- or 4-segment plates, you can choose between 3 hole positions through which the screws can be screwed in. An angle-stable or angle-variable fixation is also possible here.
Standard or expansion screws are screwed in using the screwdriver until you can feel it is locked in the plate hole (fig. 7).

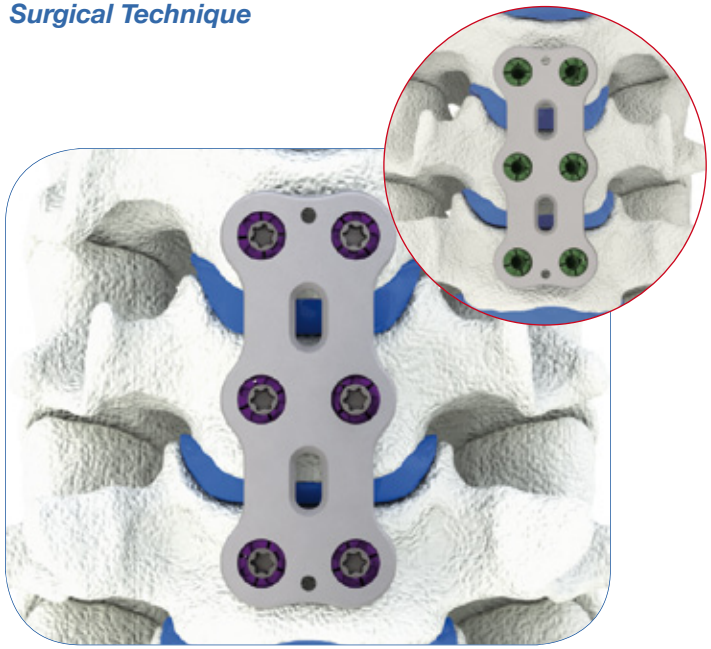


Fig. 14

## final construction

With its unique screw system, HERO® offers the opportunity to perform both angle-stable and dynamic surgery with one screw design.
In addition, the instrument holders on the implant are of sufficient size to enhance the stability and simplicity of handling.

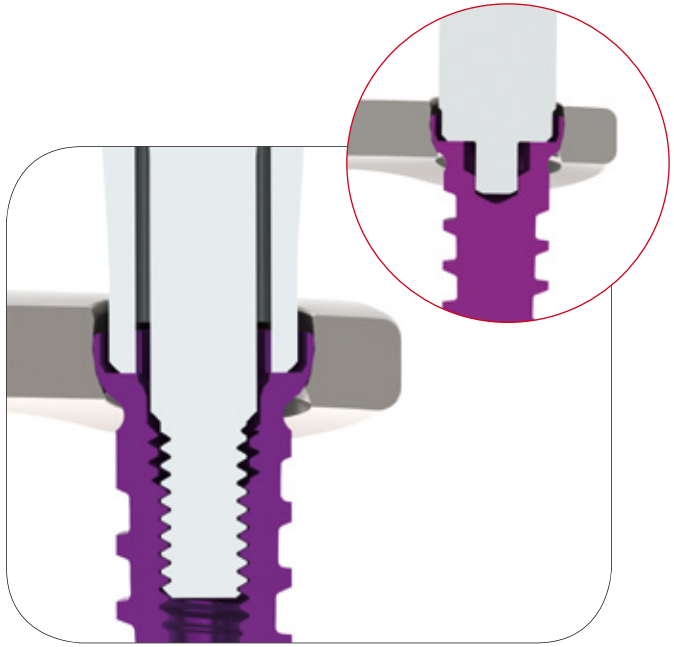


Fig. 15

## screw removal

If, contrary to expectations, it becomes necessary to remove the screws, the locking screw should first be loosened before removing the implants. The standard or expansion screws can subsequently be removed by turning both the screwdriver/pull rod anti-clockwise (fig. 15). For deeply embedded screws, it is recommended to first loosen the implant using the single screwdriver (for 6P screws, with the 6P screw extraction handle) and then to remove it using the above-mentioned screwdriver/pull rod combination.
The single screws can be removed using the single screwdriver (fig. 15a).

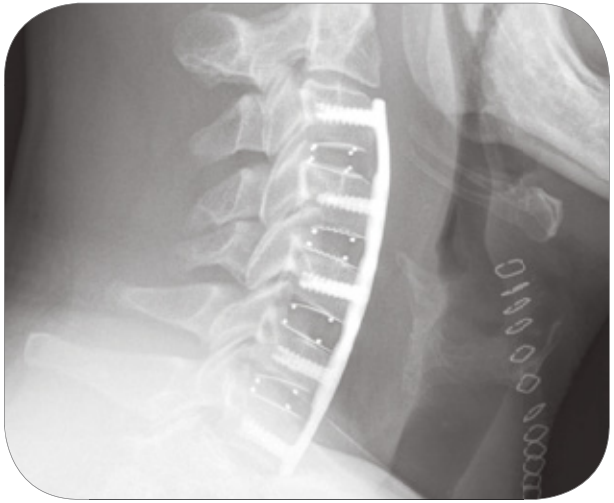


Fig. 16

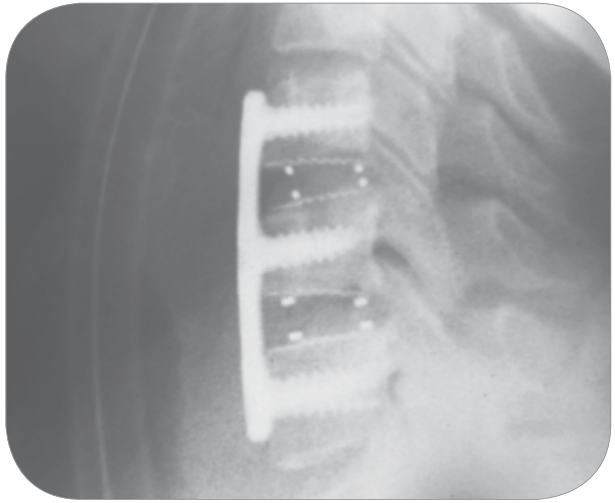


Fig. 18

final construction/X-rays

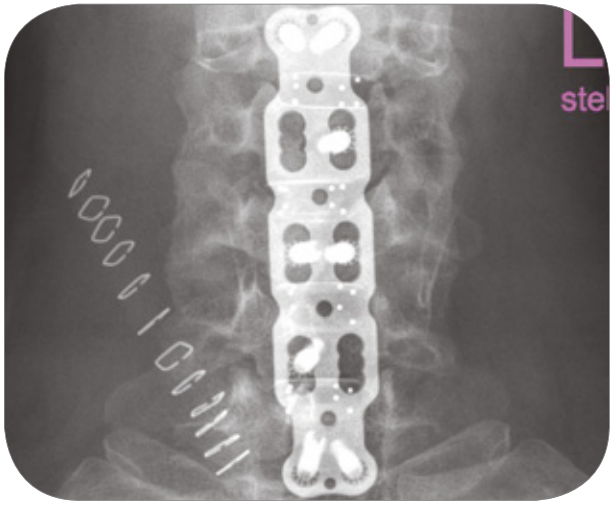


Fig. 17



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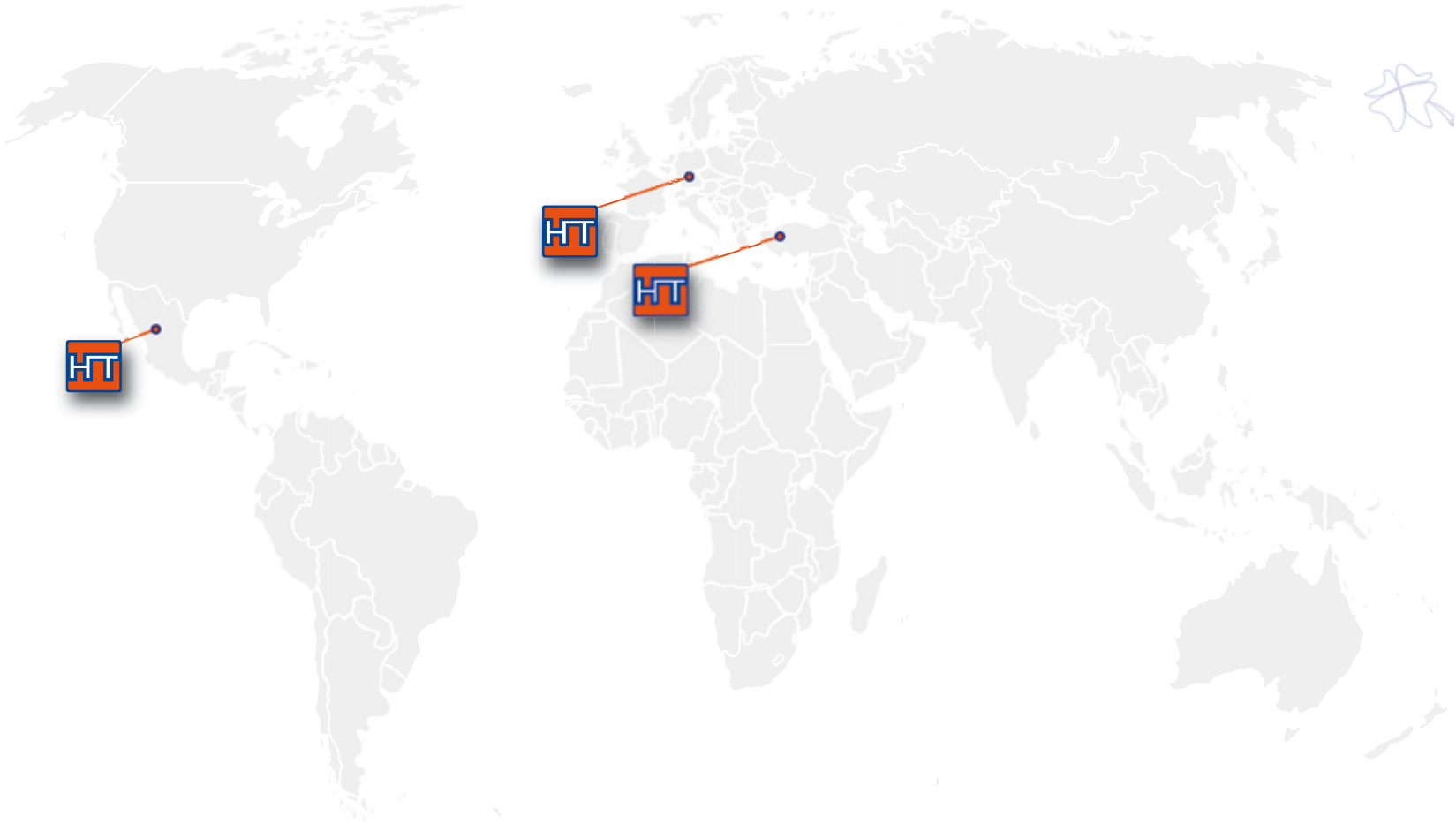
Cervical Plate System



HumanTech
Medical Devices

## Manufacturer and Sales Europe

HumanTech Germany GmbH

Gewerbestr. 5
D-71144 Steinenbronn

Germany

Phone: +49 (0) 7157/5246-71
Fax: +49 (0) 7157/5246-33
info@humantech-solutions.de
www.humantech-solutions.de

## Sales Middle East

HumanTech Med. Sag. Tic. Ltd.

Ikitelli OSB Tümsan 2. Kısım
C-Blok No: 47
TR-34306 Basaksehir Istanbul

Turkey

Phone: +90 (0) 212/485 6675
Fax: +90 (0) 212/485 6674
info@humantech.com.tr
www.humantech-solutions.de

## Sales Latin America

HumanTech Mexico, S. DE R.L. DE C.V.

Rio Mixcoac No. 212-3
Acacias del Valle
Del. Benito Juárez
C.P. 03240 Mexico, D.F.
Mexico

Phone: +52 (0) 55/5534 5645
Fax: +52 (0) 55/5534 4929
info@humantech-solutions.mx
www.humantech-solutions.de

## Other Countries

HumanTech Germany GmbH

Gewerbestr. 5
D-71144 Steinenbronn

Germany

Phone: +49 (0) 7157/5246-71
Fax: +49 (0) 7157/5246-33
info@humantech-solutions.de
www.humantech-solutions.de

CE 0297

Made in Germany

Edition 1/2013 - subject to change