Surgical technique

# 4-MOTION®

Total knee replacement system

ARTIQO


4-motion®

# 4-motion® TOTAL KNEE SYSTEM

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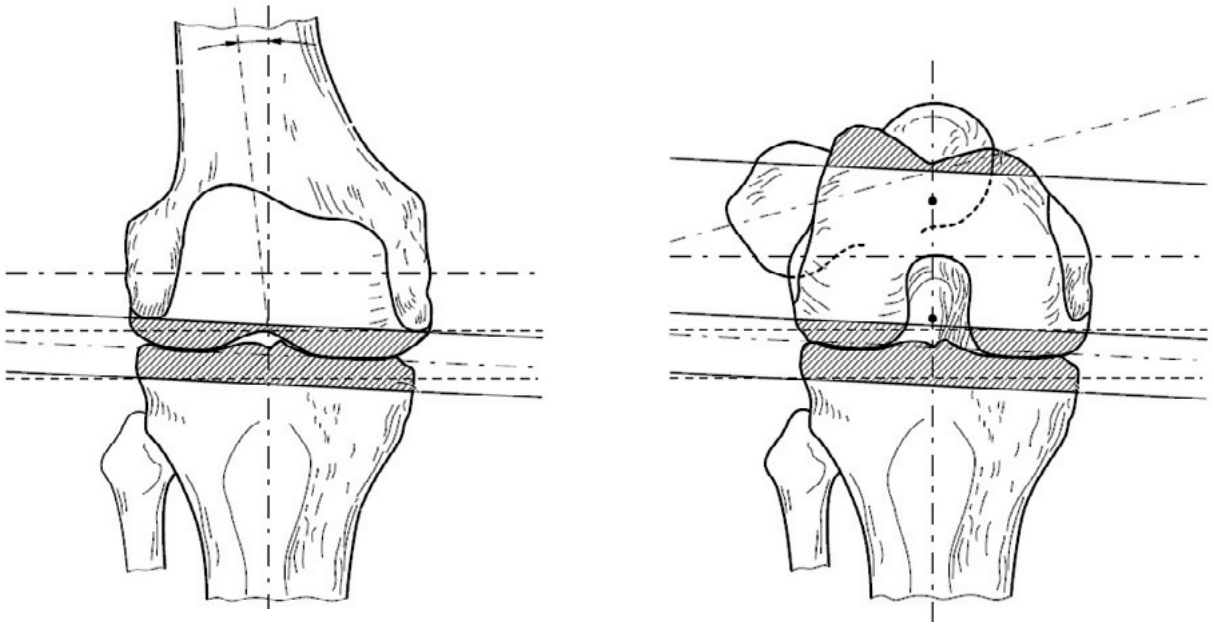
4-motion®
6R
REF 4631-R006
SN GDF771

# 4-motion®

## KNEE ENDOPROSTHESIS



With the development of the 4-motion® knee endoprosthesis, we are consistently pursuing the reconstruction of the anatomical planes of movement in the knee joint. This reconstruction offers numerous advantages in the context of prosthesis implantation. The femoral offset can be reconstructed since the operation-related external rotation of the femoral component is no longer necessary. In addition, the anatomical position significantly reduces the need for ligament releases.

# Design-Merkmale

## Femoral component

- Anatomical joint line
- Reconstruction of the dorsal offset
- Q angle of 9°
- Widened patella inlet
- Different dorsal condyle length
- 10 sizes in 3 mm a-p steps
- 2 different m-l dimensions for the relevant sizes


## Tibial component PSA

- Asymmetric base plate
- Central keel with semicircular shield
- Reconstruction of the patient-specific anatomical alignment in the range of 87° to 90° (MPTA) possible
- Suitable for allergy-sensitive patients (titanium alloy)

# Indications and contraindications

## Indications

- Patients with advanced degeneration of the knee joint resulting from degenerative and post-traumatic arthritis (PTA) or rheumatoid arthritis (RA)
- Avascular necrosis of the femoral condyle
- Moderate varus, valgus, or flexion deformity

## Contraindications

- Acute or chronic infections, local or systemic
- Severe muscular, neural, or vascular diseases putting the affected extremity at risk
- Absent bone substance or inadequate bone quality posing a risk to the stable fit of the prosthesis
- Severe osteoporosis or osteomalacia
- Hypersensitivity to the materials employed
- Loss of the ligaments
- Any concomitant disease capable of putting the function of the implant at risk
- Revision with pronounced bony defects

## Precautions / restrictions

- Major malpositions in combination with instabilities
- BMI >30
- Loss of posterior cruciate ligament
- High level of physical activity (e.g., competitive sports, strenuous physical work)
- Diabetes

# Customised instrument concept

## “Image to instrument” procedure

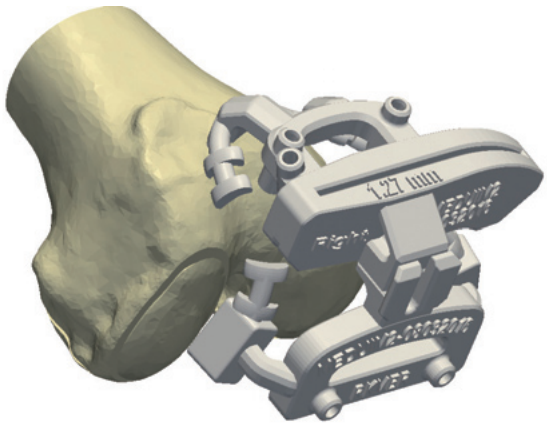
This innovative procedure allows for customized endoprosthetic knee replacement and begins with a CT scan of the patient, which is uploaded to a secure, web-based planning platform operated by **(https://artiqo.medivation-planning.com)**.

On the basis of these DICOM data, an interactive, three-dimensional CAD model of the patient’s pathologically altered knee is generated, and a detailed, preoperative proposal sent to the surgeon for review and approval. The important aspect here is that the surgeon always has the final decision regarding the procedure. Depending on the anatomical requirements, the user can adjust the axial and rotational alignment parameters as required. Once the design has been finalised, patient-specific cutting blocks are generated. These enable the surgeon to implement the highly precise, three-dimensional planning during the operation.

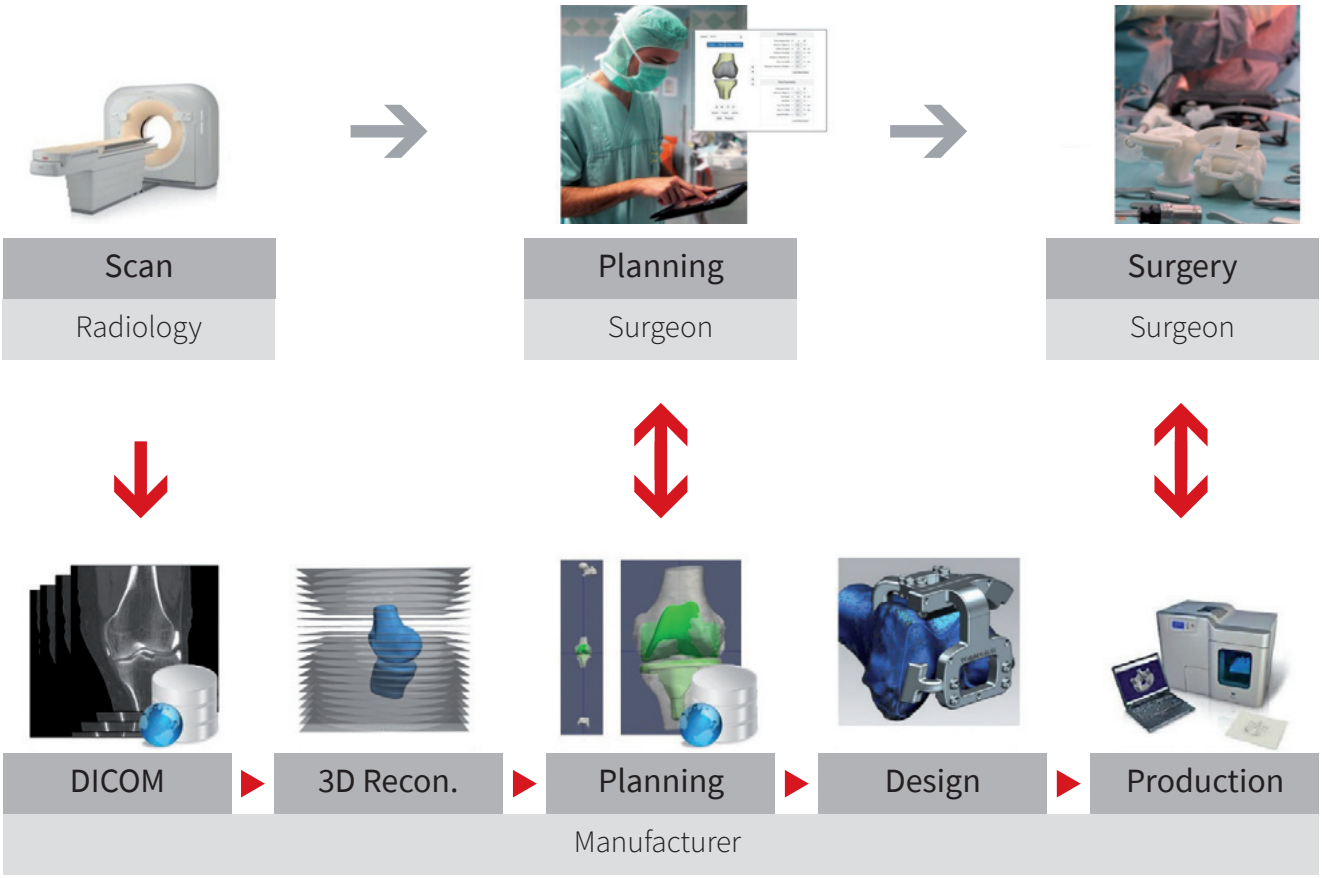
This “image to instrument” concept combines various functions and offers many advantages for both surgeons and patients alike:

- 3D reconstruction of the knee to be operated on
- Interactive 3D web planning
- Precise positioning of the implant
- No need to open the medullary canal
- Fewer surgical steps and shorter operation time
- Reduction of time required and costs for cleaning, assembly, and sterilisation

The instruments manufactured on this basis are precisely adapted to the individual surface contour and anatomy of the respective knee joint.

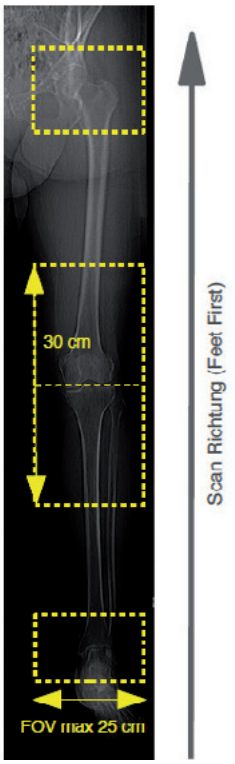


# Workflow and process

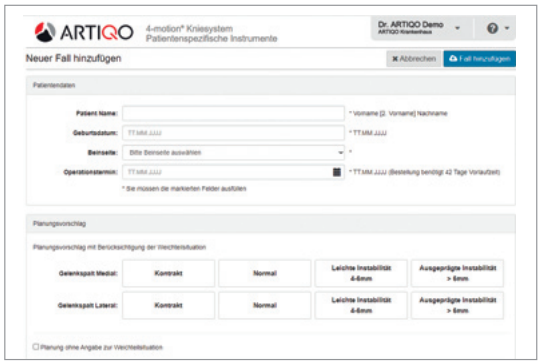


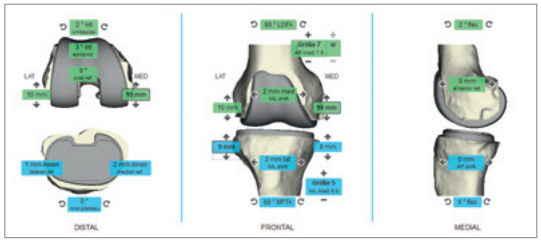

MEDivation is pleased to be the contact partner for the commissioned radiology centres and provides them with the technical information for the generation of the patient's image data, so that the scans can always be performed in accordance with the required protocol and that at the first attempt.

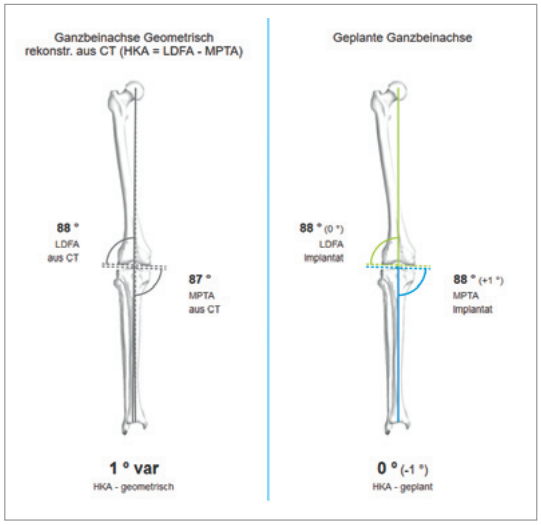
In principle, CT scans are planned in three subareas (hip, knee, and ankle joint). For better orientation and increased precision, a whole leg radiograph can also be included in the planning. Once the data are available, MEDivation prepares the segmentation and planning proposal. On the basis of the images, the resection planes and the positioning of the components are precisely aligned with the mechanical leg axes and the clearly identified landmarks. Osteophytes are taken into consideration during the design of the cutting blocks, as they are an important part of the current patient anatomy and essential for the precise fit of the instrument to the bone. A lead time of approx. seven weeks should be planned for the entire cycle.



# Preoperative planning


## 4-motion® online planning tool

The preoperative planning begins with the input of the patient data, specification of the desired time and date of the surgery and sending of the CT data to MEDivation's web-based planning platform (https://artiqo.medivation-planning.com).

**NOTE:**

A surgeon-specific procedure such as the femur-first or ligament-supported tibia-first technique can be predefined directly in the customer profile.

The automated planning utilises a planning algorithm which takes the data regarding the leg axis (varus, neutral or valgus), pathology (tibia and / or femur) and degree of instability into consideration during positioning of the implants.

- Reconstruction of the joint line between 87° and 90° depending on the anatomy
- For varus deformities and neutral leg axes, the preoperative alignment (LDFA) of the femur is reconstructed
- For valgus deformities, the preoperative alignment (MPTA) of the tibia is reconstructed
- 4° slope
- Neutral flexion position of the femur in the sagittal plane
- Rotational orientation of the component on the posterior femoral condyle
- Determination of the size and a-p position through primary orientation to the ventral cortex of the femur

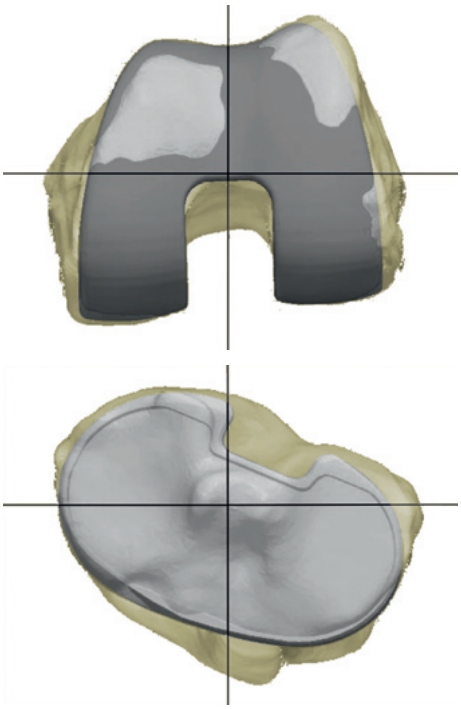
**NOTE:**

Depending on the anatomical requirements, the surgeon can check and individually adjust the axial and rotational orientation parameters in the planning proposal. Further details on the workflow can be found in MEDivation's "Webplanning" user manual.

Finally, a summary of the implantation parameters and geometries of the patient-specific cutting blocks is prepared for approval.

# Preoperative planning

Frontal plane



Horizontal plane

## Recommendations for the positioning of the implants and determination of the

**Femoral component**
The femoral component must sit flush against the cortex without protruding over the bone beneath. In case of doubt, the mediolaterally smaller implant is selected.

In the frontal plane, the components are aligned in the anatomical joint line. Alignment in the range LDFA 87° +/– 3° (depending on the anatomy and defect situation) is recommended.

Protrusion of the patellar sliding surface in the ventral direction must always be avoided in order to minimise retropatellar contact forces and achieve good flexion.

The rotation is aligned parallel to the posterior femoral condyles as standard.

**Tibial component**
The tibial component must sit flush against the cortex without protruding over the bone beneath.

In the frontal plane, the components are aligned in the anatomical joint line. Alignment in the following range (depending on the anatomy, tibial implant type and defect situation) is recommended:

- Tibia PSA: MPTA 87° to 90°

Special attention should be paid to the correct rotational position of the tibial component. Alignment over the attachment point of the posterior cruciate ligament to the medial third of the tibial tuberosity is recommended.

# Implantation

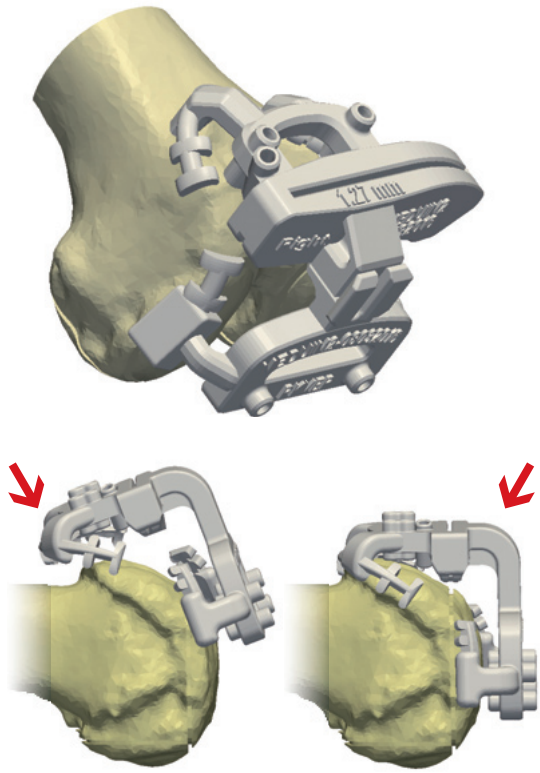
## Introduction and preparation

The surgical steps described below are based on the femur-first technique, which is the standard option on the planning platform for the **implantation of the 4-motion® knee endoprosthesis**.

The 4-motion® knee endoprosthesis can optionally also be implanted using a tibia-first or ligament-supported tibia-first technique depending on the preferred surgical procedure. **Detailed information can be found in the "Ligament-balancing technique" section**. Instruments for the ligament-guided surgical technique are not included in the instrument tray as standard. If required, the customer profile on the planning platform also offers the option of individually predefining the operator-specific procedure or specifying the surgical technique or requirement when placing the order.

**NOTE:**

The patient-specific cutting blocks are custom-made devices produced to fit the patient's anatomy based on the operating surgeon's preoperative planning. The user must ensure that the correct cutting blocks for the patient undergoing surgery are used. The patient code (initials, date of birth, side) is printed on the packaging and on all instruments. The cutting blocks are designed for a 1.27 mm saw blade and pins with a diameter of 3.2 mm as standard and may only be used with the specified implant system. Use of other instruments can result in damage to the cutting blocks and undesirable outcomes.

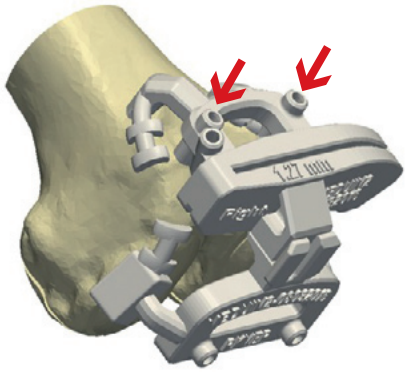


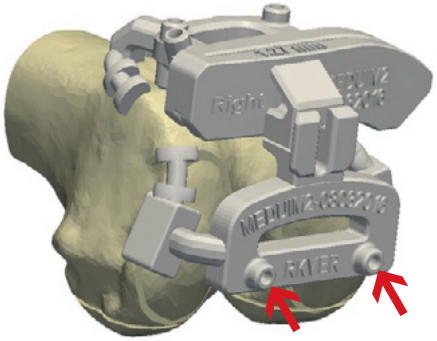
## Distal femoral resection

The patient-specific femoral cutting block is positioned stably on the bone at the correct contact sites as per the planning diagram. The edge of the articular surface with the osteophytes must be clear. Soft tissue and cartilage at the contact points should be removed in order to be able to position the cutting block precisely.

**NOTE:**

Special attention must be given to ensuring that all cartilage is removed from the contact area for the cutting block. It is recommended to position the cutting block temporarily, mark the contact area and then remove the cartilage with a curette. Osteophytes should not be removed unless their presence would prevent the correct positioning of the block. Sterilizable plastic phantoms of the femur can be optionally ordered for trial positioning, enabling identification of the correct position.



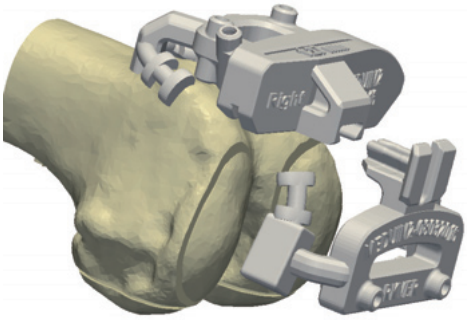


## Implantation

The femoral cutting block is fixed in position from the ventral direction with drill pins. The subsequent fixation holes for the 4in1 cutting block are then predrilled at least 30 mm deep via the distal guide holes using a 3.2 mm drill bit.

**NOTE:**

Make sure the cutting block does not slip and is not displaced during the fixation. Verify the correct positioning again once the pins are in place.

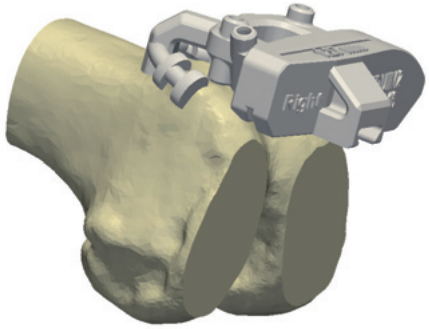


The distal part of the cutting block must be removed before the bone is cut.

**NOTE:**

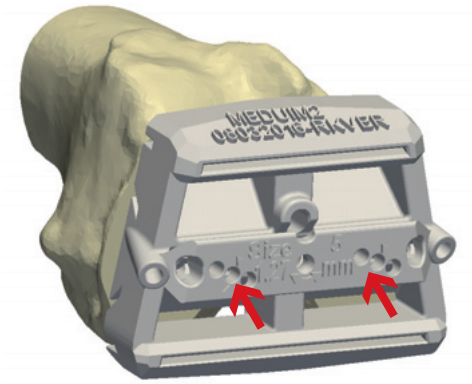
Ensure that the distal drilling holes for the 4in1 cutting block have been drilled before removal.

The distal cut can then be performed directly through the cutting block.



**NOTE:**

If necessary, a correction cutting block can be used for parallel recutting or a varus / valgus correction of 2° performed.



## Femoral AP and chamfer resection

Position the 4in1 cutting block on the inserted 3.2 mm pins. When doing so, ensure that the cutting block sits level and flush against the already resected distal surface. The final fixation is performed with 3.2 mm oblique pins.

**NOTE:**

To avoid errors when positioning the pins, it is recommended to insert the pins into the predrilled holes with the cutting block level in place.

Ensure that the planned size of cutting block is used. (Cutting blocks in the next sizes up and down can also be optionally ordered).

Check the cut planes with the cortical palp and make the anterior and posterior bone cuts. The distal pins must be removed for the chamfer cuts.

**NOTE:**

If required, the cutting block can be moved +/– 2 mm in the anterior/posterior direction. For precise bone cuts, ensure that the saw blade is inserted smoothly through the saw slot with no lever action.

## Final femoral preparation

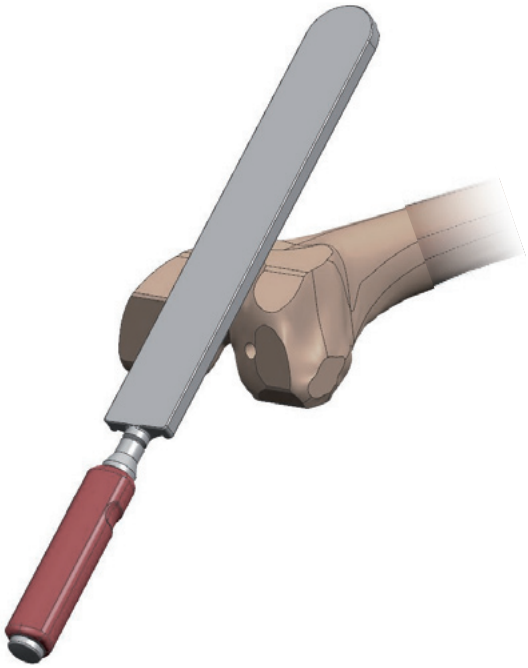
The correct femoral trial component is positioned on the femur, using the femoral impactor if necessary.

**NOTE:**

The femoral component must sit flush against the cortex without protruding over the bone beneath.
The general recommendation is to align the femoral component in a lateral direction.

The final positioning in the m/l direction is determined based on the patellar tracking.

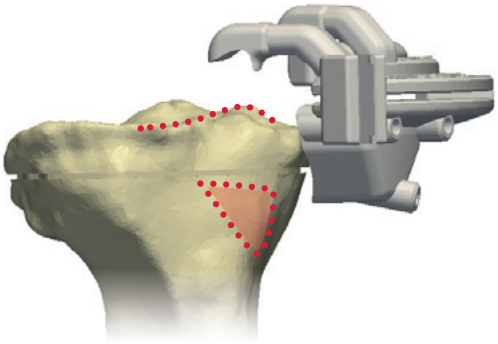
The definitive m/l position of the femoral component is fixed via the drilling of the plug holes. The central axis for the trochleaplasty is then marked with a pen or electrocautery.



Finally, the trochleaplasty is performed in a V shape using the rasp. First, the side of the rasp with the narrow ridge is placed on the marked line and the ridge rasped as far as it will go. The rasp is then turned over and the full toothed surface of the broad side applied along the pre-rasped surface.

**NOTE:**

Ensure that the trochea rasp is guided in the plane of the ventral chamfer.

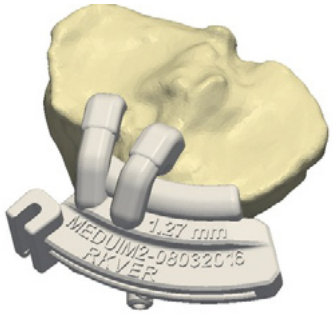


## Tibial resection

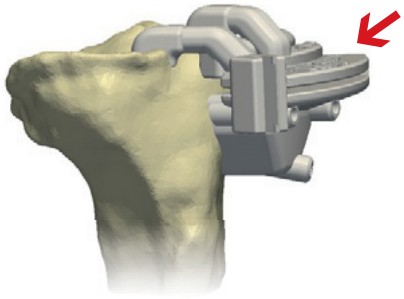
The patient-specific tibial cutting block is positioned stably on the bone at the correct contact sites as per the planning diagram.

**NOTE:**

Special attention must be given to ensuring that all cartilage is removed from the contact area for the cutting block. It is recommended to position the cutting block temporarily, mark the contact area and then remove the cartilage with a curette. Sterilizable plastic phantoms of the tibia can be optionally ordered for trial positioning.



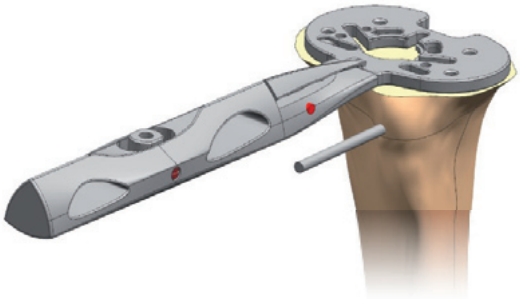

The tibial cutting block is fixed in position with 2 parallel drill pins and an oblique pin. The cut plane is then checked with the cortical palp, the longitudinal axis verified with the alignment rod and the tibial cut performed. Ensure that the posterior cruciate ligament is preserved.



**NOTE:**

The tibial resection is performed with a 1.27 mm saw blade as standard. For a precise bone cut, ensure that the saw blade is inserted smoothly through the saw slot with no lever action.

If necessary, a correction cutting block can be used for parallel recutting or a varus / valgus correction of 2° performed.

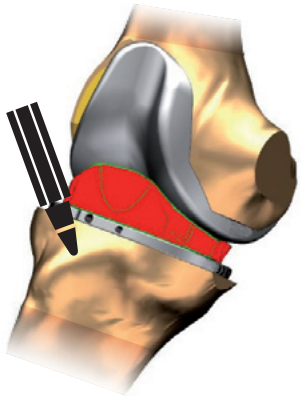


## Tibial preparation

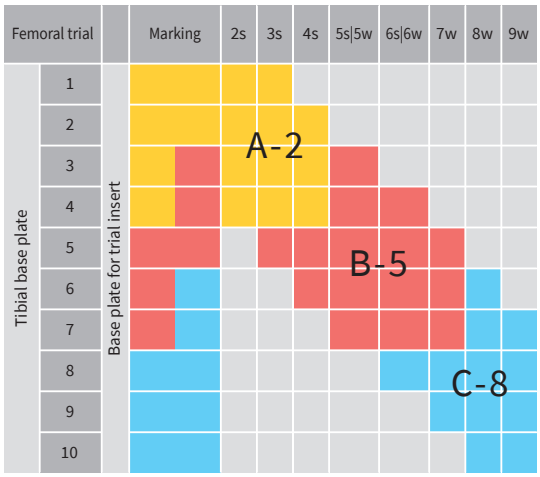
The planned size is checked again in situ using the tibial base plate. Complete cortical coverage without protrusion of the components is the aim. Note that the plate can be used side-specifically from both sides for a right and a left knee.

**NOTE:**

The tibial size must not be more than two sizes different (larger or smaller) from that of the femur. The corresponding base plate must be used depending on the planning and selected implant type.



pecial attention should be paid to the correct rotational position. This is done using the femoral trial, tibial base plate, and trial insert. When the knee joint is actively flexed and extended, the implant finds its individually desired position. This rotational position is marked on the transition from the front edge of the tibia to the tibial base plate with an electrocautery or similar, so that it can be found again later.




**NOTE:**

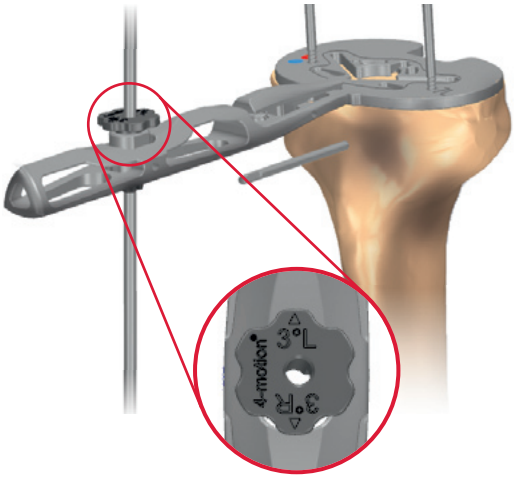
Alternatively, the rotational alignment can also be performed anatomically over the attachment point of the posterior cruciate ligament to the medial third of the tibial tuberosity.

**NOTE:**

In principle, there are three trial insert sizes (A, B and C) available in four heights (6, 8, 10, 12). The compatibility of the insert groups with the femur sizes is shown in the table.
In addition, the femoral and tibial base plates are marked with the colour code of the corresponding insert group.

### Information on the insert range

The 4-motion® product range offers the following CR insert:
**CR insert VEX** for increased femoral range of motion (deep flexion and rotation) Detailed information on the insert versions can be found in the description on page 27. If required, the availability of both insert versions must be checked prior to the implantation.

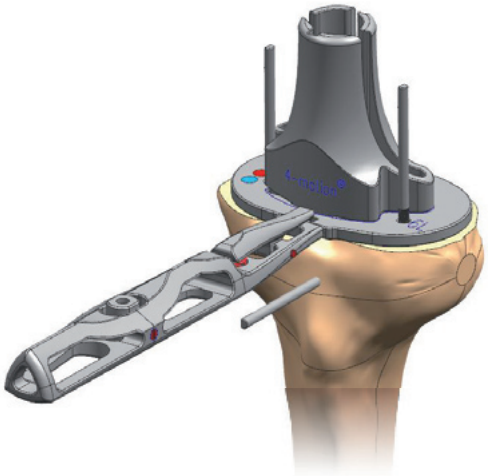



## Tibial preparation

Finally, the defined rotational position is checked with the alignment rod and the tibial base plate fixed in place with two pins.

**NOTE:**

The corresponding angle socket (0°–3°) based on the planned MPTA angle on the tibia (90°–87°) is inserted into the handle. When doing so, it is important to ensure that the angle socket is employed for the correct side (left and right) and that the arrowhead points towards the head of the tibia when correctly aligned.



The preparation for the tibial keel begins with the application of the drill and keel tower.

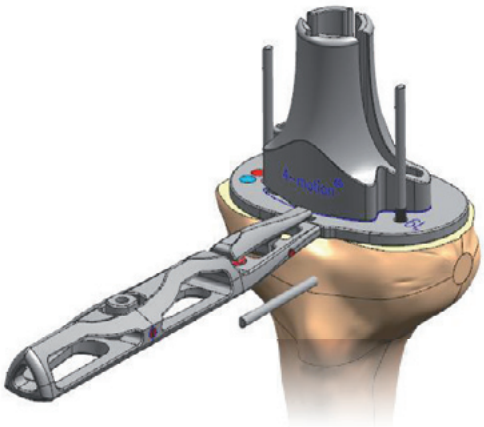
**NOTE:**

The corresponding keel tower (Tibia PSA) must be used depending on the planning and selected implant type.

The tibial keel is then reamed with the stepped drill.

**NOTE:**

There is one drill available for all sizes, which is equipped with an AO quick coupling as standard. The corresponding drill must be used depending on the planning and selected implant.



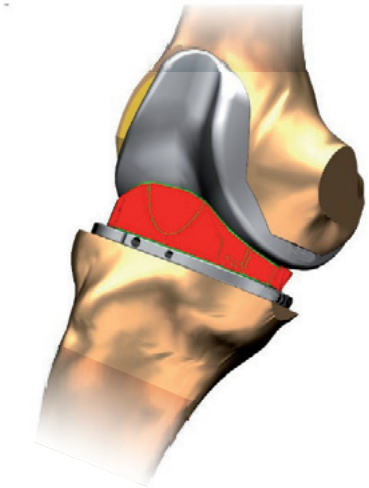
The drill is inserted as far as it will go.

## Tibial preparation

The corresponding keel punch is selected based on the size of the tibial implant and connected with the prime handle. The keel punch is impacted as far as it will go.

**NOTE:**

The keel punch is available in three sizes:
size 1–3, size 4–6 and size 7–10



## Trial repositioning

Final trial repositioning with checking of the ligamentary stability and patellar tracking is recommended.

# Ligament-balancing technique

## Description of the function of the 4-motion® ligament balancer

**1. ASSEMBLY**

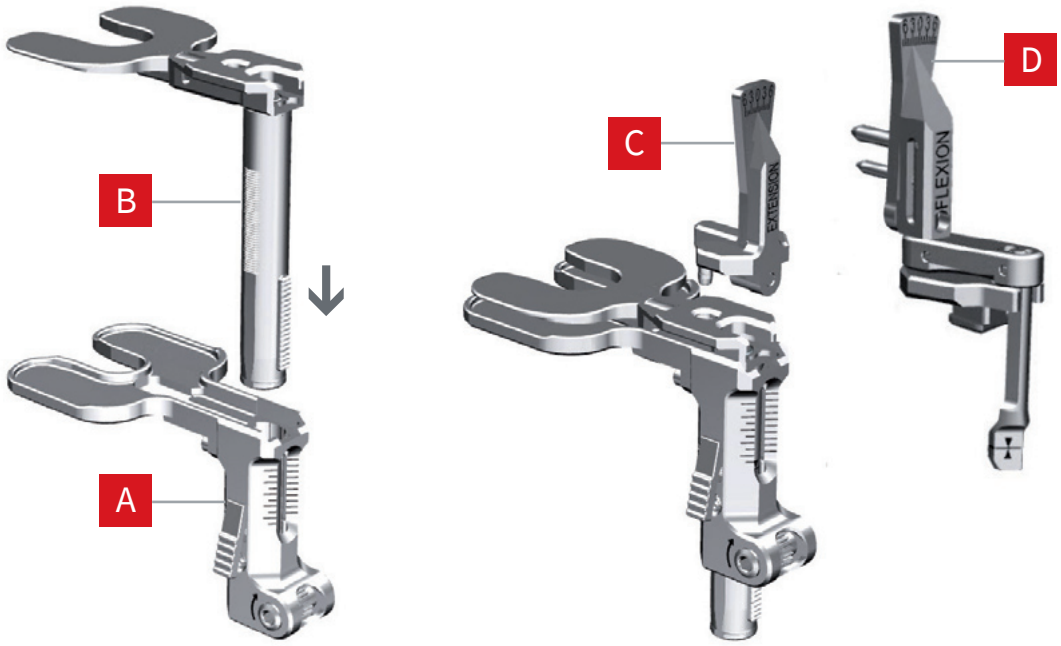
The ligament balancer is a four-part instrument comprising:

A Balancer body

B Balancer spacer

C Extension attachment

D Flexion attachment



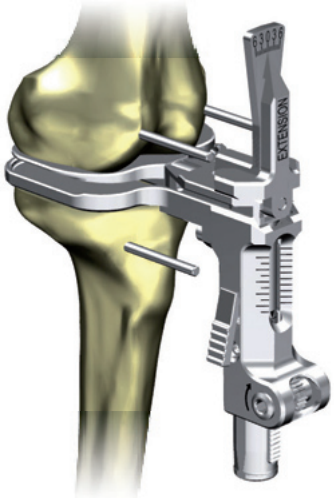

The first step of assembly of the ligament balancer is insertion of the balancer spacer into the balancer body. The extension or flexion attachment can be selected and connected depending on the intended use (verification of the extension or flexion gap).

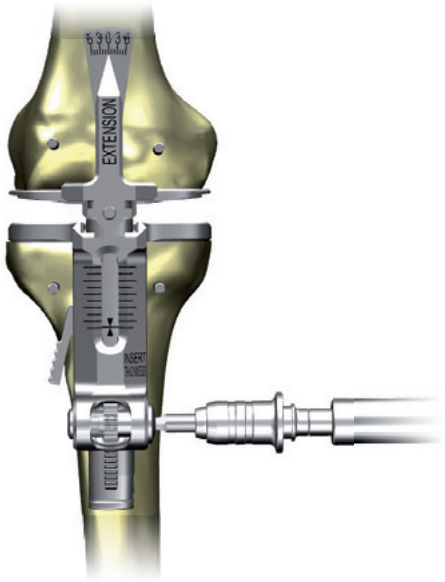
**2. GENERAL FUNCTIONING**

For proper functioning of knee joints, the gap should be as parallel and similarly sized in both extension and flexion. A variety of techniques can be employed to achieve this. In contrast to conventional techniques (e.g., the measured resection technique), the patient-specific soft-tissue tension and alignment are taken into consideration in ligament-guided techniques.

The 4-motion® ligament balancer can be used intraoperatively to verify the extension gap in relation to the parallelism and height of the resections and to balance the flexion gap based on the tibial resection with ligament guidance.

The aim is to find an improved alignment and soft-tissue balance of the 4-motion® anatomical knee prosthesis utilising the ligament-balancing technique and the defined workflow.


# Ligament-guided surgical technique

**NOTE:**

The prerequisite for use of the ligament balancer in extension is the (temporary or final) resection on the distal femur and the resection on the tibia as well as the removal of all osteophytes.

The ligament balancer is assembled as shown under Point 1 “Assembly” and the extension module attached.

The ligament balancer is inserted into the joint gap with the leg axis in a neutral “not hyperextended” position. When doing so, ensure that the ligament balancer is completely closed and not spread.

Then use the hexagon socket on the side to tighten the ligament balancer in the direction of the arrow using the torque wrench provided (2 Nm).

**NOTE:**

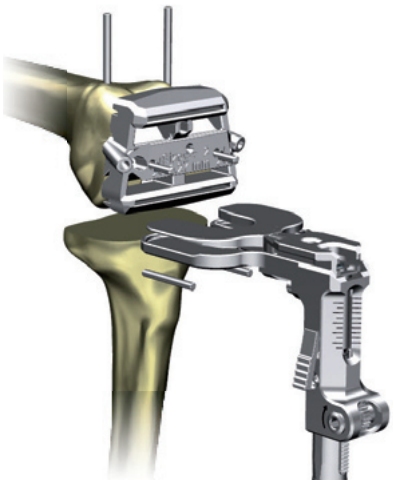
The applied torque is used to limit the clamping force and for comparison of the extension and flexion gap.

The two indicators can be utilised for estimation of the parallelism and the height of the joint gap.

**NOTE:**

Angle differences can be resolved via a correction cut on the femur or ligament releases.

The minimum height required for the implantation of the knee prosthesis with the lowest PE height (6 mm) is 18 mm.



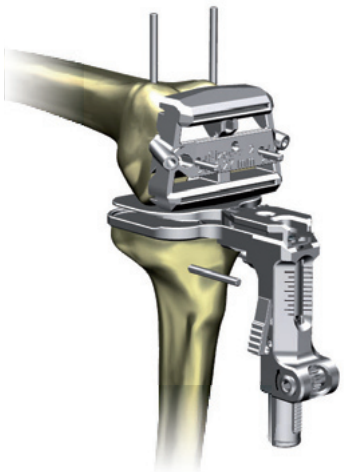
# Ligament-guided surgical technique

**Verification of the flexion gap:**

**NOTE:**

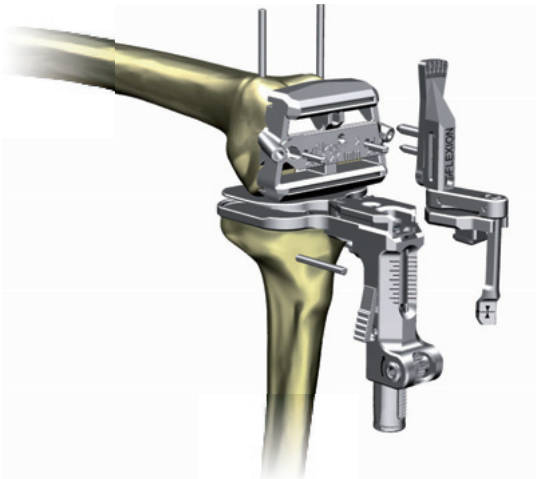
For the use of the ligament balancer in flexion, the 4in1 cutting block is first pushed onto the pins already positioned using the PSI femur cutting block.

The ligament balancer is inserted into the joint gap at approx. 90° flexion before resection of the anterior and posterior femoral cut. When doing so, ensure that the ligament balancer is completely closed and not spread.



**NOTE:**

The thickness of the ligament balancer / the distance to the surface when closed is 10 mm and thus corresponds to the minimum height required for implantation of the tibial component with the lowest PE height (6 mm).



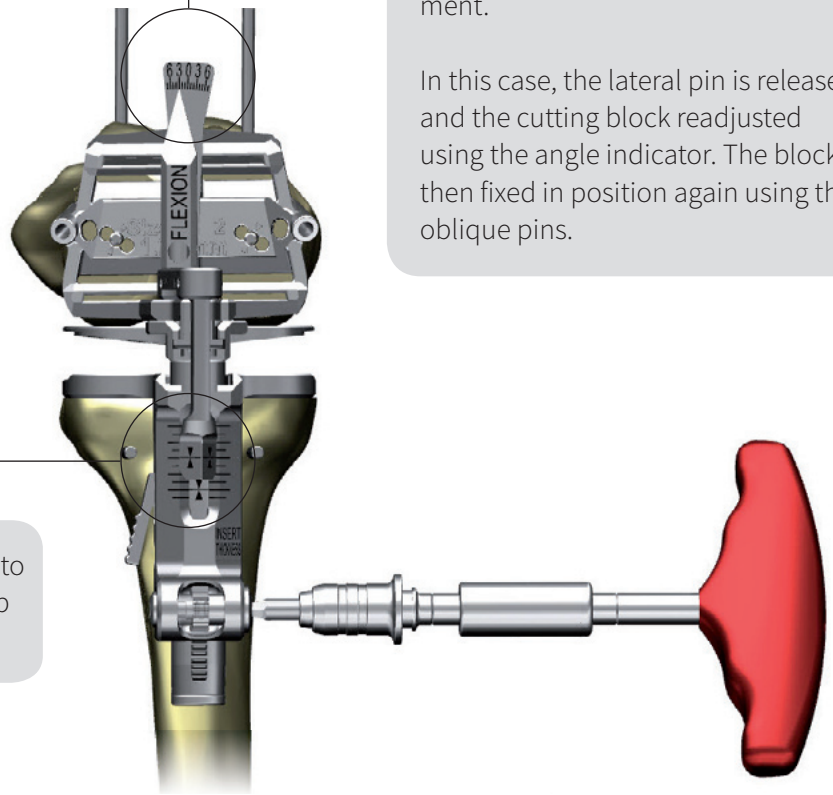
The flexion attachment is inserted into the ligament balancer and connected to the 4in1 cutting block using the two locking pins. Ensure that the pins are connected to the cutting block over at least half the pin length. If necessary, the ligament balancer must be inserted further into the flexion gap or the flexion angle of the knee joint (approx. 90°) checked and corrected.

# Ligament-guided surgical technique

Then, as in extension, the ligament balancer is tightened in the direction of the arrow using the hexagon socket on the side and the torque wrench provided.

The angle indicator can be used to compare the soft tissue-guided rotation of the femur with the bony alignment of the 4in1 cutting block. If a difference is determined, the position of the cutting block can be adjusted to the soft tissue-guided femur alignment.

In this case, the lateral pin is released and the cutting block readjusted using the angle indicator. The block is then fixed in position again using the oblique pins.




The second indicator can be used to estimate the height of the joint gap or the required insert height.

**NOTE:**

The locking mechanism is released (unclamping) using the button on the side of the balancer body.

**Once the 4in1 cutting block has been positioned, the remaining steps are performed as described in the standard surgical technique above.**

# Implantation of the final implants

In principle, the 4-motion® knee system can be implanted with or without the use of cement. It is important to note that the respectively correct implants are selected for the respective technique and then the compatibility checked again.

## Cemented anchoring of the tibial and femoral components:

When cementing components, the recommendation is to use two portions of cement.

The procedure usually begins with implantation of the tibial component via anterior subluxation of the tibia. The first portion of bone cement is mixed in accordance with the respective manufacturer's instructions. A layer of cement is applied to the underside of the tibial component, around the keel and to the resected tibial surface. The tibial component is inserted into the tibia by hand and impacted using the tibial impactor. Excess cement is removed thoroughly. The definitive tibial PE insert is inserted into the tibial component and fixed in place via the ventral catch using the tibial impactor. PE inserts which have already been fixed in place and removed from the tibial component again must not be reused.

For the implantation of the femoral component, the knee is flexed in an approx. 90° position and a collateral ligament retractor placed both laterally and medially. Cement is applied to the underside of the implant and the resected femoral surfaces. The femoral component is applied to the femur. When doing so, ensure that the plugs align with the holes and no soft tissues are trapped beneath the implant. The final fixation of the femoral component is performed with the femoral impactor. Scratches on the surfaces of the components must be avoided. The retractors are removed again. The medial and lateral sides are checked to ensure that the femoral component has been impacted completely. Excess cement is removed thoroughly.

## Non-cemented anchoring of the tibial and femoral components:

The non-cemented procedure also begins with the tibial component. The tibia is subluxated and the tibial component inserted manually into the tibia. The final fixation is performed with the tibial impactor. The definitive tibial PE insert is inserted into the tibial component and fixed in place via the ventral catch using the tibial impactor. PE inserts which have already been fixed in place and removed from the tibial component again must not be reused.

For the implantation of the femoral component, the knee is flexed in an approx. 90° position and a collateral ligament retractor placed both laterally and medially. The femoral component is applied to the femur. When doing so, ensure that the plugs align with the holes and no soft tissues are trapped beneath the implant. The final fixation of the femoral component is performed with the femoral impactor. Scratches on the surfaces of the components must be avoided.

## Implantation of the patellar component:

The underside of the patellar component is covered with cement and the three plug holes in the patella filled with cement. With the leg extended, the patellar component is inserted by hand and pressed in using the patellar forceps. Excess cement is removed. The patellar forceps are left in place until the cement has set fully.

**NOTE:**

Preparation of the patella (underside replacement) is performed optionally. The 4-motion® knee endoprosthesis can optionally be used with or without an artificial patella replacement. The patellar instruments are not part of this surgical technique and can be requested if required.

## Compatibility overview

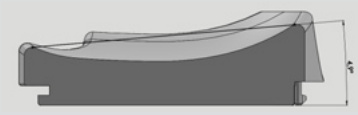
| | | Femur first | Insert | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|  Dia. 26<br>Dia. 28<br>Dia. 32<br>Dia. 35 | Patella | 2 | | | | | | | | | | |
| | | 3 | | | | | | | | | | |
| | | 4 | | | | | | | | | | |
| | | 5 | | | | | | | | | | |
| | | 6 | | | | | | | | | | |
| | | 7 | | | | | | | | | | |
| | | 8 | | | | | | | | | | |
| | | 9 | | | | | | | | | | |
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | | | Tibia | | | | | | | | | |

# Insert versions for the 4-motion® knee endoprosthesis

The 4-motion® product range contains two CR insert versions. Both insert versions have a concave shape from anterior to posterior, which has the priority of limiting the translational movement of the femur in the anterior direction and can partially compensate for the stabilizing function of the missing anterior cruciate ligament.

The CR insert made of standard polyethylene has a raised anterior and posterior lip (compared to the PE insert VEX). This insert version can be utilised to achieve increased a-p stability for patients with lax joint conditions.

Compared to the PE insert Standard, the VEX insert has been designed for patients with good joint stability and high demands on mobility. In particular, the lower dorsal lip enables an extended range of motion for deep flexion. In addition, the smaller concavity provides increased freedom of rotation of the femur.

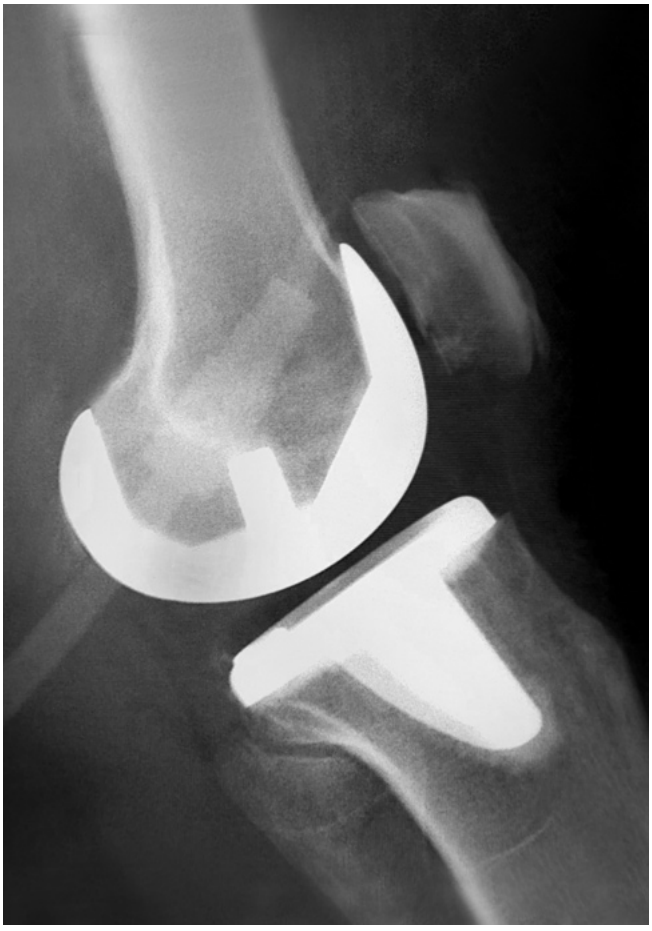
| | CR insert Standard with raised anterior and posterior lip | CR insert VEX |
|---|---|---|
| Material | UHMWPE in accordance with ISO 5834-2 | Highly crosslinked UHMWPE with vitamin E |
| Unconstrained insert type | CR insert for increased femoral a-p stability “Deep Dish” | CR insert for increased femoral range of movement (deep flexion and rotation) |
| Rotational freedom of the femur in extension* | 6° | 12° |
| Rotational freedom of the femur in flexion* | 12° | 20° |
| Posterior slope of the PE inserts incl. 4° slope | 8,9° | 8,5° |
| |  |  |

*Calculation for femur size 6 and insert size 4

# Postoperative treatment / Sterilisation

## Postoperative treatment

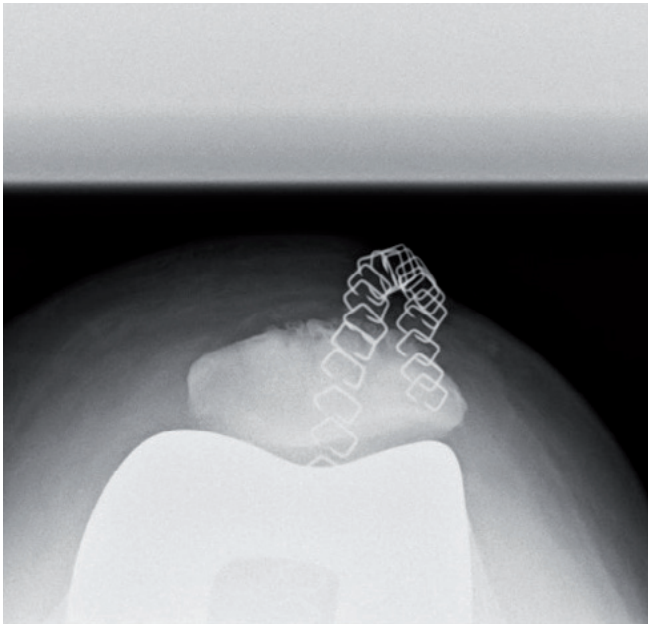
The postoperative treatment depends on the result of the surgery. In principle, mobilisation can be begun early. Questions such as partial or full weight-bearing, crutches, three- or four-point gait, etc., are recommended by the surgeon or hospital.
The bone quality and patient's condition must always been taken into consideration here. Physiotherapy during the stay in hospital is recommended.



## Sterilisation

**Implants**
All implants described in the surgical technique are supplied sterile by the manufacturer. Resterilisation is not permitted.

**Instruments**
The system elements and instruments are not delivered sterile. They must be cleaned, disinfected and sterilized in a validated procedure before being used. Cleaning instructions contained validated instructions for the reprocessing of a medical device can be provided. The reprocessor is responsible for ensuring that the reprocessing actually performed with the equipment, materials and personnel available in the reprocessing facility achieves the desired results. Validation and routine monitoring of the process are normally required for this. Instrument manufacturers and distributors assume no liability for the sterilisation of devices by the purchaser.



# Implants

## 4-motion® femoral components

| Size left | Size right | A-P | M-L slim | M-L wide |
|---|---|---|---|---|
| 2s-L | 2s-R | 53 | 58 | – |
| 3s-L | 3s-R | 56 | 60 | – |
| 4s-L | 4s-R | 59 | 62 | – |
| 5s-L | 5s-R | 62 | 64 | – |
| 6s-L | 6s-R | 65 | 66 | – |
| 5w-L | 5w-R | 62 | – | 68 |
| 6w-L | 6w-R | 65 | – | 71 |
| 7w-L | 7w-R | 68 | – | 74 |
| 8w-L | 8w-R | 71 | – | 77 |
| 9w-L | 9w-R | 74 | – | 80 |

## 4-motion® tibial components PSA (3° tibial keel optionally available)

| Size left | Size right | M-L | A-P medial | A-P lateral |
|---|---|---|---|---|
| 1-L | 1-R | 63 | 42 | 40 |
| 2-L | 2-R | 66 | 44 | 42 |
| 3-L | 3-R | 69 | 46 | 44 |
| 4-L | 4-R | 72 | 48 | 46 |
| 5-L | 5-R | 75 | 50 | 48 |
| 6-L | 6-R | 78 | 52 | 50 |
| 7-L | 7-R | 81 | 54 | 52 |
| 8-L | 8-R | 84 | 56 | 54 |
| 9-L | 9-R | 87 | 58 | 56 |
| 10-L | 10-R | 90 | 60 | 58 |

# Implants

## 4-motion® femoral components cemented

| Side | Size | Art.-no |
|---|---|---|
| Right | 2s-R* | 4801-RS02 |
| Right | 3s-R | 4801-RS03 |
| Right | 4s-R | 4801-RS04 |
| Right | 5s-R | 4801-RS05 |
| Right | 6s-R | 4801-RS06 |
| Right | 5w-R | 4801-RW05 |
| Right | 6w-R | 4801-RW06 |
| Right | 7w-R | 4801-RW07 |
| Right | 8w-R* | 4801-RW08 |
| Right | 9w-R* | 4801-RW09 |

| | | |
|---|---|---|
| Left | 2s-L* | 4801-LS02 |
| Left | 3s-L | 4801-LS03 |
| Left | 4s-L | 4801-LS04 |
| Left | 5s-L | 4801-LS05 |
| Left | 6s-L | 4801-LS06 |
| Left | 5w-L | 4801-LW05 |
| Left | 6w-L | 4801-LW06 |
| Left | 7w-L | 4801-LW07 |
| Left | 8w-L* | 4801-LW08 |
| Left | 9w-L* | 4801-LW09 |

* Special size only on request / optionally available

**Implant material:**
CoCrMo casting alloy according to ISO 5832-4
Surface: Sliding surfaces polished

**NOTE:**

On request, the femoral components are also available in an allergy-inhibiting “Sensitive” version with a titanium-niobium nitride (TiNbN) coating for allergy sufferers.

# Implants

## PSA tibial components cemented

| Side | Size | Art.-no. |
|---|---|---|
| Right | 1* | 4631-R001 |
| Right | 2 | 4631-R002 |
| Right | 3 | 4631-R003 |
| Right | 4 | 4631-R004 |
| Right | 5 | 4631-R005 |
| Right | 6 | 4631-R006 |
| Right | 7 | 4631-R007 |
| Right | 8 | 4631-R008 |
| Right | 9 | 4631-R009 |
| Right | 10* | 4631-R010 |
| Left | 1* | 4631-L001 |
| Left | 2 | 4631-L002 |
| Left | 3 | 4631-L003 |
| Left | 4 | 4631-L004 |
| Left | 5 | 4631-L005 |
| Left | 6 | 4631-L006 |
| Left | 7 | 4631-L007 |
| Left | 8 | 4631-L008 |
| Left | 9 | 4631-L009 |
| Left | 10* | 4631-L010 |

* Special size only on request / optionally available

**Implant material of PSA tibial component:**
Wrought Ti6Al4V alloy in accordance with ISO 5832-3

## 3° tibial components cemented (optional)

| Side | Size | Art.-no. |
|---|---|---|
| Right | 1* | 4601-R001 |
| Right | 2 | 4601-R002 |
| Right | 3 | 4601-R003 |
| Right | 4 | 4601-R004 |
| Right | 5 | 4601-R005 |
| Right | 6 | 4601-R006 |
| Right | 7 | 4601-R007 |
| Right | 8 | 4601-R008 |
| Right | 9 | 4601-R009 |
| Right | 10* | 4601-R010 |
| Left | 1* | 4601-L001 |
| Left | 2 | 4601-L002 |
| Left | 3 | 4601-L003 |
| Left | 4 | 4601-L004 |
| Left | 5 | 4601-L005 |
| Left | 6 | 4601-L006 |
| Left | 7 | 4601-L007 |
| Left | 8 | 4601-L008 |
| Left | 9 | 4601-L009 |
| Left | 10* | 4601-L010 |

* Special size only on request / optionally available

**Implant material of 3° tibial component:**
CoCrMo casting alloy in accordance with ISO 5832-4

# Implants

## PSA tibial components non-cemented

| Side | Size | Art.-no. |
|---|---|---|
| Right | 1* | 3631-R001 |
| Right | 2* | 3631-R002 |
| Right | 3* | 3631-R003 |
| Right | 4* | 3631-R004 |
| Right | 5* | 3631-R005 |
| Right | 6* | 3631-R006 |
| Right | 7* | 3631-R007 |
| Right | 8* | 3631-R008 |
| Right | 9* | 3631-R009 |
| Right | 10* | 3631-R010 |

| | | |
|---|---|---|
| Left | 1* | 3631-L001 |
| Left | 2* | 3631-L002 |
| Left | 3* | 3631-L003 |
| Left | 4* | 3631-L004 |
| Left | 5* | 3631-L005 |
| Left | 6* | 3631-L006 |
| Left | 7* | 3631-L007 |
| Left | 8* | 3631-L008 |
| Left | 9* | 3631-L009 |
| Left | 10* | 3631-L010 |

* Special size only on request / optionally available

**Implant material of PSA tibial component:**
Wrought Ti6Al4V alloy in accordance with ISO 5832-3, TPS

# Implants

## 4-motion® insert VEX, highly crosslinked UHMWPE with vitamin E

| Art.-no. | Size | Height |
|---|---|---|
| 7411-0106 | Size 1 | 6 mm |
| 7411-0107* | Size 1 | 7 mm |
| 7411-0108 | Size 1 | 8 mm |
| 7411-0109* | Size 1 | 9 mm |
| 7401-0110 | Size 1 | 10 mm |
| 7411-0111* | Size 1 | 11 mm |
| 7411-0112* | Size 1 | 12 mm |
| 7411-0115* | Size 1 | 15 mm |
| 7411-0206 | Size 2 | 6 mm |
| 7411-0207* | Size 2 | 7 mm |
| 7411-0208 | Size 2 | 8 mm |
| 7411-0206* | Size 2 | 9 mm |
| 7411-0210 | Size 2 | 10 mm |
| 7411-0211* | Size 2 | 11 mm |
| 7411-0212* | Size 2 | 12 mm |
| 7411-0215* | Size 2 | 15 mm |
| 7411-0306 | Size 3 | 6 mm |
| 7411-0307* | Size 3 | 7 mm |
| 7411-0308 | Size 3 | 8 mm |
| 7411-0309* | Size 3 | 9 mm |
| 7411-0310 | Size 3 | 10 mm |
| 7411-0311* | Size 3 | 11 mm |
| 7411-0312* | Size 3 | 12 mm |
| 7411-0315* | Size 3 | 15 mm |

| Art.-no. | Size | Height |
|---|---|---|
| 7411-0406 | Size 4 | 6 mm |
| 7411-0407* | Size 4 | 7 mm |
| 7411-0408 | Size 4 | 8 mm |
| 7411-0409* | Size 4 | 9 mm |
| 7401-0410 | Size 4 | 10 mm |
| 7411-0411* | Size 4 | 11 mm |
| 7411-0412* | Size 4 | 12 mm |
| 7411-0415* | Size 4 | 15 mm |
| 7411-0506 | Size 5 | 6 mm |
| 7411-0507* | Size 5 | 7 mm |
| 7411-0508 | Size 5 | 8 mm |
| 7411-0506* | Size 5 | 9 mm |
| 7411-0510 | Size 5 | 10 mm |
| 7411-0511* | Size 5 | 11 mm |
| 7411-0512* | Size 5 | 12 mm |
| 7411-0515* | Size 5 | 15 mm |
| 7411-0606 | Size 6 | 6 mm |
| 7411-0607* | Size 6 | 7 mm |
| 7411-0608 | Size 6 | 8 mm |
| 7411-0609* | Size 6 | 9 mm |
| 7411-0610 | Size 6 | 10 mm |
| 7411-0611* | Size 6 | 11 mm |
| 7411-0612* | Size 6 | 12 mm |
| 7411-0615* | Size 6 | 15 mm |

* Special size only on request / optionally available

**Implant material:**
Highly crosslinked UHMWPE with vitamin E in accordance with ISO 5834-2

# Implants

## 4-motion® insert VEX, highly crosslinked UHMWPE with vitamin E

| Art.-no. | Size | Height |
|---|---|---|
| 7411-0706 | Size 7 | 6 mm |
| 7411-0707* | Size 7 | 7 mm |
| 7411-0708 | Size 7 | 8 mm |
| 7411-0709* | Size 7 | 9 mm |
| 7401-0710 | Size 7 | 10 mm |
| 7411-0711* | Size 7 | 11 mm |
| 7411-0712* | Size 7 | 12 mm |
| 7411-0715* | Size 7 | 15 mm |
| 7411-0806 | Size 8 | 6 mm |
| 7411-0807* | Size 8 | 7 mm |
| 7411-0808 | Size 8 | 8 mm |
| 7411-0806* | Size 8 | 9 mm |
| 7411-0810 | Size 8 | 10 mm |
| 7411-0811* | Size 8 | 11 mm |
| 7411-0812* | Size 8 | 12 mm |
| 7411-0815* | Size 8 | 15 mm |
| 7411-0906 | Size 9 | 6 mm |
| 7411-0907* | Size 9 | 7 mm |
| 7411-0908 | Size 9 | 8 mm |
| 7411-0909* | Size 9 | 9 mm |
| 7411-0910 | Size 9 | 10 mm |
| 7411-0911* | Size 9 | 11 mm |
| 7411-0912* | Size 9 | 12 mm |
| 7411-0915* | Size 9 | 15 mm |

| Art.-no. | Size | Height |
|---|---|---|
| 7411-1006 | Size 10 | 6 mm |
| 7411-1007* | Size 10 | 7 mm |
| 7411-1008 | Size 10 | 8 mm |
| 7411-1009* | Size 10 | 9 mm |
| 7401-1010 | Size 10 | 10 mm |
| 7411-1011* | Size 10 | 11 mm |
| 7411-1012* | Size 10 | 12 mm |
| 7411-1015* | Size 10 | 15 mm |

## 4-motion® patella cemented

| Art.-no. | Type | Dia. |
|---|---|---|
| 4101-0826 | DOM | 26 |
| 4101-0829 | DOM | 29 |
| 4101-0832 | DOM | 32 |
| 4101-0835 | DOM | 35 |

* Special size only on request / optionally available

**Implant material:**
UHMWPE in accordance with ISO 5834-2

# Implants

## 4-motion® PE insert (optionally available)

| Art.-no. | Size | Height |
|---|---|---|
| 7401-0106 | Size 1 | 6 mm |
| 7401-0108 | Size 1 | 8 mm |
| 7401-0110 | Size 1 | 10 mm |
| 7401-0112 | Size 1 | 12 mm |
| 7401-0115* | Size 1 | 15 mm |
| 7401-0206 | Size 2 | 6 mm |
| 7401-0208 | Size 2 | 8 mm |
| 7401-0210 | Size 2 | 10 mm |
| 7401-0212 | Size 2 | 12 mm |
| 7401-0215* | Size 2 | 15 mm |
| 7401-0306 | Size 3 | 6 mm |
| 7401-0308 | Size 3 | 8 mm |
| 7401-0310 | Size 3 | 10 mm |
| 7401-0312 | Size 3 | 12 mm |
| 7401-0315* | Size 3 | 15 mm |
| 7401-0406 | Size 4 | 6 mm |
| 7401-0408 | Size 4 | 8 mm |
| 7401-0410 | Size 4 | 10 mm |
| 7401-0412 | Size 4 | 12 mm |
| 7401-0415* | Size 4 | 15 mm |
| 7401-0506 | Size 5 | 6 mm |
| 7401-0508 | Size 5 | 8 mm |
| 7401-0510 | Size 5 | 10 mm |
| 7401-0512 | Size 5 | 12 mm |
| 7401-0515* | Size 5 | 15 mm |

| Art.-no. | Size | Height |
|---|---|---|
| 7401-0606 | Size 6 | 6mm |
| 7401-0608 | Size 6 | 8mm |
| 7401-0610 | Size 6 | 10mm |
| 7401-0612 | Size 6 | 12mm |
| 7401-0615* | Size 6 | 15mm |
| 7401-0706 | Size 7 | 6mm |
| 7401-0708 | Size 7 | 8mm |
| 7401-0710 | Size 7 | 10mm |
| 7401-0712 | Size 7 | 12mm |
| 7401-0715* | Size 7 | 15mm |
| 7401-0806 | Size 8 | 6mm |
| 7401-0808 | Size 8 | 8mm |
| 7401-0810 | Size 8 | 10mm |
| 7401-0812 | Size 8 | 12mm |
| 7401-0815* | Size 8 | 15mm |
| 7401-0906 | Size 9 | 6mm |
| 7401-0908 | Size 9 | 8mm |
| 7401-0910 | Size 9 | 10mm |
| 7401-0912 | Size 9 | 12mm |
| 7401-0915* | Size 9 | 15mm |
| 7401-1006 | Size 10 | 6mm |
| 7401-1008 | Size 10 | 8mm |
| 7401-1010 | Size 10 | 10mm |
| 7401-1012 | Size 10 | 12mm |
| 7401-1015* | Size 10 | 15mm |

* Special size only on request / optionally available

**Implant material:**
UHMWPE in accordance with ISO 5834-2

# Instruments

## 4-motion® – General instrument set

| No. | Name | Art. no. |
|---|---|---|
| 1 | Instrument Tray | 9210000 |
| 2 | Drillpin Adaptor 3.2 | 9210101 |
| 3 | Drillpin 3.2, M3 | 9210201 |
| 4 | Drillpin 3.2 with head | 9210202 |
| 5 | Pin Extractor | 9210300 |
| 6 | Cortical Palp 1.27 mm | 9210401 |
| 7 | Femoral Drill 6.4 | 9210501 |
| 8* | Femoral Trial 2s L | 9210701 |
| 9 | Femoral Trial 3s L | 9210702 |
| 10 | Femoral Trial 4s L | 9210703 |
| 11 | Femoral Trial 5s L | 9210704 |
| 12 | Femoral Trial 6s L | 9210705 |
| 13 | Femoral Trial 5w L | 9210706 |
| 14 | Femoral Trial 6w L | 9210707 |
| 15 | Femoral Trial 7w L | 9210708 |
| 16* | Femoral Trial 8w L | 9210709 |
| 17* | Femoral Trial 9w L | 9210710 |
| 18* | Femoral Trial 2s R | 9210801 |
| 19 | Femoral Trial 3s R | 9210802 |
| 20 | Femoral Trial 4s R | 9210803 |
| 21 | Femoral Trial 5s R | 9210804 |
| 22 | Femoral Trial 6s R | 9210805 |
| 23 | Femoral Trial 5w R | 9210806 |
| 24 | Femoral Trial 6w R | 9210807 |
| 25 | Femoral Trial 7w R | 9210808 |
| 26* | Femoral Trial 8w R | 9210809 |
| 27* | Femoral Trial 9w R | 9210810 |

| No. | Name | Art. no. |
|---|---|---|
| 28 | Trial Insert A h=6 | 9211106 |
| 29 | Trial Insert A h=8 | 9211108 |
| 30 | Trial Insert A h=10 | 9211110 |
| 31 | Trial Insert A h=12 | 9211112 |
| 32 | Trial Insert B h=6 | 9211206 |
| 33 | Trial Insert B h=8 | 9211208 |
| 34 | Trial Insert B h=10 | 9211210 |
| 35 | Trial Insert B h=12 | 9211212 |
| 36 | Trial Insert C h=6 | 9211306 |
| 37 | Trial Insert C h=8 | 9211308 |
| 38 | Trial Insert C h=10 | 9211310 |
| 39 | Trial Insert C h=12 | 9211312 |
| 40 | Trochlea Rasp | 9211410 |
| 41 | Prime Handle | 9211500 |
| 42 | Attachment for Femoral / Tibial | 9211501 |
| 43 | Attachment for Insert Impactor | 9211502 |
| 44 | Attachment for Femoral Extractor | 9211503 |
| 45 | Alignment Handle | 9211510 |
| 46 | Alignment Rod | 9211511 |
| 47 | Alignment Rod Extension | 9211512 |

**NOTE:**

The 4-motion® instrument set is split into two parts containing customised, patient-specific and system-specific, general instruments respectively.

For successful implantation of the system, the preoperative planning must be performed via the web-based platform operated by MEDivation and the patient-specific, single-use instruments ordered.

* Optional instrument

# Instruments

## 4-motion® – General instrument set

| No. | Name | Art. no. |
|---|---|---|
| 63* | Ligament Balancer | 9211600 |
| 64* | Torque Wrench for LB | 9211601 |
| 65* | AO Adaptor for Torque Wrench | 9211602 |
| 66* | Femoral Correction Block | 9211700 |
| 68* | Adjustable Tibia Correction Bl. left | 9211702 |
| 69* | Adjustable Tibia Correction Bl. right | 9211703 |
| 70* | Angle Socket 0° | 9211520 |

| No. | Name | Art. no. |
|---|---|---|
| 71* | Angle Socket 1° | 9211521 |
| 72* | Angle Socket 2° | 9211522 |
| 73* | Angle Socket 3° | 9211523 |
| 74* | Distal Adjustable Femur Correction Bl. | 9211704 |
| 75* | External Tibial Alignment Guide | 9211001 |

## 4-motion® – Tibia PSA

| No. | Name | Art. no. |
|---|---|---|
| 48a | Drill and Keel Tower PSA | 9211411 |
| 49a | Keel Punch PSA 1–3 | 9211412 |
| 50a | Keel Punch PSA 4–6 | 9211413 |
| 51a | Keel Punch PSA 7–10 | 9211414 |
| 52a | Tibial Drill PSA | 9210503 |
| 53a* | Tibial Base Plate PSA 1 | 9210911 |
| 54a | Tibial Base Plate PSA 2 | 9210912 |
| 55a | Tibial Base Plate PSA 3 | 9210913 |
| 56a | Tibial Base Plate PSA 4 | 9210914 |
| 57a | Tibial Base Plate PSA 5 | 9210915 |
| 58a | Tibial Base Plate PSA 6 | 9210916 |
| 59a | Tibial Base Plate PSA 7 | 9210917 |
| 60a | Tibial Base Plate PSA 8 | 9210918 |
| 61a | Tibial Base Plate PSA 9 | 9210919 |
| 62a* | Tibial Base Plate PSA 10 | 9210920 |

## 4-motion® – Tibia 3° (optionally available)

| No. | Name | Art. no. |
|---|---|---|
| 48 | Drill and Keel Tower | 9211400 |
| 49 | Keel Punch 1-3 | 9211401 |
| 50 | Keel Punch 4-6 | 9211402 |
| 51 | Keel Punch 7-10 | 9211403 |
| 52 | Tibial Drill | 9210502 |
| 53* | Tibial Base Plate 1 | 9210901 |
| 54 | Tibial Base Plate 2 | 9210902 |
| 55 | Tibial Base Plate 3 | 9210903 |
| 56 | Tibial Base Plate 4 | 9210904 |
| 57 | Tibial Base Plate 5 | 9210905 |
| 58 | Tibial Base Plate 6 | 9210906 |
| 59 | Tibial Base Plate 7 | 9210907 |
| 60 | Tibial Base Plate 8 | 9210908 |
| 61 | Tibial Base Plate 9 | 9210909 |
| 62* | Tibial Base Plate 10 | 9210910 |

* Optional instrument

**Information:**

Further information on the auxiliary instruments and their use is available from your customer representative, your distributor or directly from the manufacturer.

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You can find the digital version of the surgical technique at https://artiqo.de/download/st-4-motion/ or directly using this QR code.

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