

Surgical technique

balanSys BICONDYLAR

Bone oriented
leggera instruments

For healthcare professional use only. The illustrated image does not represent a connection between the use of the medical device described, nor its performance.

Preservation in motion



*Building on our heritage
Moving technology forward
Step by step with our clinical partners
Towards a goal of preserving mobility*



Preservation in motion

As a Swiss company, Mathys is committed to this guiding principle and pursues a product portfolio with the goal of further developing traditional philosophies with respect to materials or design in order to address existing clinical challenges. This is reflected in our imagery: traditional Swiss activities in conjunction with continuously evolving sporting equipment.

Table of contents

| | |
|---|------------|
| Introduction | 4 |
| 1. Indications and contraindications | 5 |
| 2. Options | 6 |
| 2.1 Implant options | 6 |
| 2.2 Instrument options | 6 |
| 3. Aim of the intervention and surgical approach | 7 |
| 4. Patient preparation | 7 |
| 5. Preoperative planning | 8 |
| 6. Surgical technique | 10 |
| 6.1 Overview of the surgical technique | 10 |
| 6.2 Tibial resection | 13 |
| 6.3 Femur resection | 20 |
| 6.4 Femoral preparation and trial reduction | 35 |
| 6.5 Implantation definitive implants | 44 |
| 6.6 Rotating Platform – Femur and Inlay | 49 |
| 7. Appendix | 51 |
| 7.1 PS – Preparation and implantation | 51 |
| 7.2 Intramedullary Tibia Alignment | 63 |
| 7.3 Optional 2° recut | 70 |
| 7.4 Preparation 3-Peg Patella | 72 |
| 7.5 Pins and screws | 76 |
| 8. Implants | 77 |
| 8.1 Combination charts | 77 |
| 8.2 Item numbers of the balanSys implants | 78 |
| 8.3 Double pouch and triple pouch sterile packaging | 90 |
| 9. Instruments | 91 |
| 9.1 Measuring templates | 114 |
| 10. Symbols and abbreviations | 115 |

Remark

Please make yourself familiar with the handling of the instruments, the product-related surgical technique and the warnings, the safety notes as well as the recommendations of the instruction leaflet before using an implant manufactured by Mathys Ltd Bettlach. Make use of the Mathys user training and proceed according to the recommended surgical technique.

Introduction

The objective of total knee arthroplasty is re-establishment of the normal lower-extremity axis, restoration of normal knee function, and reduction of pain.

Mathys balanSys BICONDYLAR implants and instruments are designed to meet the surgeons' demands on prostheses with respect to kinematics, ligament balancing, stability and long-term survival.¹ Since 1997, the balanSys BICONDYLAR system has proven its clinical worth.²

With the Swiss-made knee system balanSys, Mathys Ltd Bettlach offers a wide range of components that match the patient's anatomical conditions and the functional requirements of the knee joint.

It consists of a cemented or non-cemented femoral component, a cemented symmetrical tibial tray, and a tibial inlay. A cemented patellar component is optional. For femoral and tibial metal components, a TiNbN-coated option is available.

¹ Superior long-term survival for fixed bearing compared with mobile bearing in ligament-balanced total knee arthroplasty. Heesterbeek, P.J.C., van Houten, A.H., Klenk, J.S. et al. Knee Surg Sports Traumatol Arthrosc, online 07 April 2017

² Data on file at Mathys Ltd Bettlach.

1. Indications and contraindications

Indications

- Painful and/or disabling joint disease of the knee resulting from osteoarthritis, avascular necrosis, inflammatory arthritis or post-traumatic arthritis
- Revision of previous knee replacement

Contraindications

- Local or general infection
- Any soft tissue, ligament, nerve or vessel insufficiency which may create an unacceptable risk of prosthesis instability, prosthesis fixation failure and/or complications in post-operative care
- Compromised bone stock due to bone loss or bone defects and/or insufficient bone substance, which cannot provide adequate support and/or fixation for the prosthesis
- Hypersensitivity to materials used
- Skeletal immaturity
- Genu recurvatum
- Insufficiency of the extensor mechanism
- Progressive neoplastic disease

For further information, please refer to the instructions for use or ask your Mathys representative.

2. Options

2.1 Implant options

Based on the surgeon's preference and the patient's requirements, the surgeon has the choice between a variety of balanSys BICONDYLAR implant options for mobile- and fixed-bearing knee replacements, with or without preservation of the posterior cruciate ligament (PCL).

Mobile bearing: Rotating Platform (RP)

Fixed bearing: Cruciate Retaining (CR), Ultra Congruent (UC), and Posterior Stabilized (PS).

The CR femoral components are to be used with a CR inlay when the PCL is intact, or with either RP or UC inlays when the PCL is sacrificed or deficient and removed. In addition, PS femoral components are to be used with the PS inlays when the PCL is sacrificed or deficient and removed. Tibial inlays are available in standard UHMWPE or in vitamys, the vitamin E stabilized PE.

The intuitive leggera instruments are made for reproducible accurate results.

Preparation of the femur follows tibial resection, using the spacer block or soft-tissue balancing technique. The rotation of the femoral component is determined using the posterior condyles, Whiteside's line, or the epicondyles. With the aim of balancing the extension and flexion gap, the A-P position of the femoral component is measured from the posterior condyles (posterior-referenced).

For sizing and compatibility refer to the chart in chapter 8.1 (page 77).

2.2 Instrument options

With balanSys leggera instruments all balanSys BICONDYLAR implants can be implanted, the surgeon can choose to align the tibia extra-medullarily or intramedullarily and has different options to position the femur. In addition to this bone-oriented technique, Mathys provides also the soft tissue balancing combination technique for balanSys BICONDYLAR implants.

leggera instruments are compatible with 1.27 mm (0,05 inch) saw blades. For saw blades distributed by Mathys refer to the brochure 336.030.032 «Sterile Sawblades».

3. Aim of the intervention and surgical approach

- Intraoperative correction of axial deviations in the frontal plane of the leg along the mechanical axis, where the joint line should be orthogonal to this axis
- Reconstruction of the physiological axis ratios
- Prosthesis-related kinematics:
 - physiological joint line
 - sufficient medial and lateral stability in extension and flexion
 - correctly centred and balanced patellofemoral joint
 - free movement: from maximal extension to maximal possible flexion

The choice of approach is dependent on the axial malposition (varus/valgus).

4. Patient preparation

The surgery is carried out on patients under general or spinal anaesthesia, while an adequate muscle relaxation is being required.

Postoperative pain is reduced without the use of a tourniquet. If it is necessary to apply a tourniquet, it should be placed on the proximal thigh and inflated with the knee in hyperflexion. That will keep the maximal portion of the quadriceps below the level of the tourniquet.

Place the patient in supine position.

Flex the knee into a 90° position.

Use a supporting roll on the table and a lateral support to facilitate extension and flexion of the leg.

5. Preoperative planning

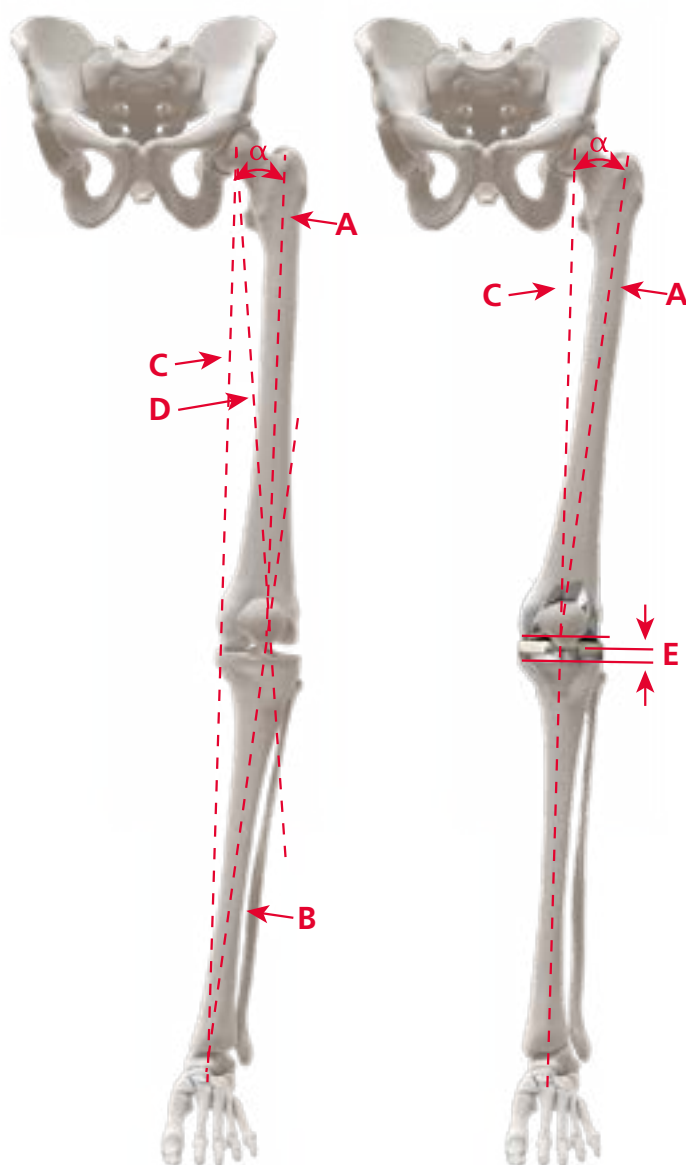
The preoperative planning comprises the indication, evaluation, and preparation that are important for the success of the surgery.

Preoperative radiographies are essential for surgical planning. Radiographies of the knee in two views are recommended: A single-leg stance radiography in the anterior-posterior (A-P) plane, and a lateral radiography of the knee joint in 90° flexion or in extension. In addition, a long-leg radiography with loading of both legs is needed. It is useful to have a «skyline» or «sunrise» view of the patella in 40° flexion as well.

Radiographies are needed to identify and quantify deformities and bone defects as well as osteophytes. Using planning templates, the size of the femoral and tibial prosthesis can be initially determined. Long-leg radiographies help to detect deviations of the axis and deformities in the diaphyseal area of the femur and the tibia. Long-leg radiographies help also to determine whether intramedullary alignment can be performed. Furthermore, the mechanical and anatomical axes of the leg can be plotted, and the femoral angle can be determined (see graphic on page 9). This angle varies depending on morphology. The femoral angle must be known for the definition of the femoral distal cut. This is transferred to the bone resection by the leggera Angle Guide.

The entry point for the tibial and femoral extra- or intramedullary alignment guide is determined by extending the line of the anatomical axes of the tibia and the femur. Usually, the entry point is located slightly medially to the eminentia intercondylaris or to the apex of the intercondylar notch, respectively.

On the long-leg radiography, the extent of tibial resection can be determined as well. In this way, the required magnitude of the medial and lateral bone resection can be assessed. This is especially important in case of extensive bone defects, in order to avoid excessively resection.



Examination of the A-P long-leg radiography in the following manner:

1. Draw the anatomical axis of the femur (**A**) on the radiography. If the femur is excessively curved, a line representing the intramedullary alignment should be drawn instead of the line **A**.
2. Draw a line from the center of the femoral head to the center of the knee: Mechanical axis **D**.
3. The angle between the anatomical axis and the mechanical axis (femoral valgus angle α) is specific for each patient and determines the degrees to be set on the Angle Guide (see figure 25).
4. Draw the axis of the tibia (**B**), and determine the tibial resection plane (**E**) perpendicular to **B**. Take care to prevent too extensive resection in the case of tibial defects.
5. Preoperative determination of component size and resection depth using the radiography templates in the A-P and lateral planes.
6. After the resection, the mechanical axis of the leg (**C**) should coincide with lines **D** and **B**.

- A Anatomical axis of the femur
- B Axis of the tibia
- C Mechanical axis of the leg
- D Mechanical axis of the femur
- E Resection depth of the tibia (mm)
- α Femoral valgus angle

6. Surgical technique

6.1 Overview of the surgical technique

1. Tibial resection



Application of the Tibial Reference System parallel to the anterior tibial cortex and alignment. Adjustment of the posterior slope. Determination of the joint line and fixation of the Tibial Reference System.

> Page 13



Adjustment of the resection depth.
Tibial osteotomy.
Determination of the tibial plateau size.

Remark

Place retractors to protect ligaments during tibial resection.

> Page 16

2. Femoral resection



Opening of the intramedullary canal and insertion of the Intramedullary Rod. Fixation of the Distal Femoral Cutting Block.
Distal Osteotomy

> Page 20



Verification of extension gap.
Control of the mechanical axis.

> Page 25



Insertion of the Femoral Sizing/Rotation Guide. Determination of femur size and rotation. Drilling of two holes for the 4in1 Cutting Block. Optional: Adjustment of the A-P position.

> Page 27



Insertion of the 4in1 Cutting Block. Control of the planned resection depth. Optional: Adjustment of the A-P position. Anterior and posterior femoral osteotomies with the chamfer cuts.














> Page 31



Verification of the flexion gap.

> Page 34

3. Preparation and implantation balanSys CR, UC and RP

| | | | | |
|---|---|---|--|--|
|  |  |  |  | <p>Preparation of trochlea groove. Insertion of Tibial Template and Trial PE Inlay. Insertion of Trial Femur. Trial reduction of the knee joint.</p> <p>> Page 35</p> |
| |  |  |  | <p>Preparation of the femoral anchor pins. Preparation of the tibial medullary space. Preparation of the fins.</p> <p>> Page 38</p> |
| |  |  | <p>Insertion of balanSys Tibial Plateau. Impaction of balanSys Tibial Plateau.</p> <p>> Page 44</p> | |
|  |  |  |  | <p>Insertion of the balanSys Inlay. Insertion of the balanSys Femur. Impacting of balanSys Femur. Curing of the bone cement.</p> <p>> Page 46</p> |

4. Preparation and implantation balanSys PS

| | | | | |
|--|--|--|--|---|
| | | | | <p>Preparation of femoral box. Insertion of Trial Femur. Insertion of Tibial Template and Trial PE Inlay. Trial reduction of the knee joint.</p> <p>> Page 51</p> |
| | | | | <p>Preparation of the tibial medullary space. Preparation of the fins.</p> <p>> Page 55</p> |
| | | | | <p>Insertion of balanSys Tibial Plateau. Impacting of balanSys Tibial Plateau.</p> <p>> Page 58</p> |
| | | | | <p>Insertion of the balanSys Femur. Impacting of balanSys Femur. Insertion of the balanSys Inlay. Curing of the bone cement.</p> <p>> Page 60</p> |

Before each surgery, instruments should be checked for damage or deformation. Use only undamaged instruments. Do not use trial components with marks or scratches.

6. Surgical technique

6.2 Tibial resection

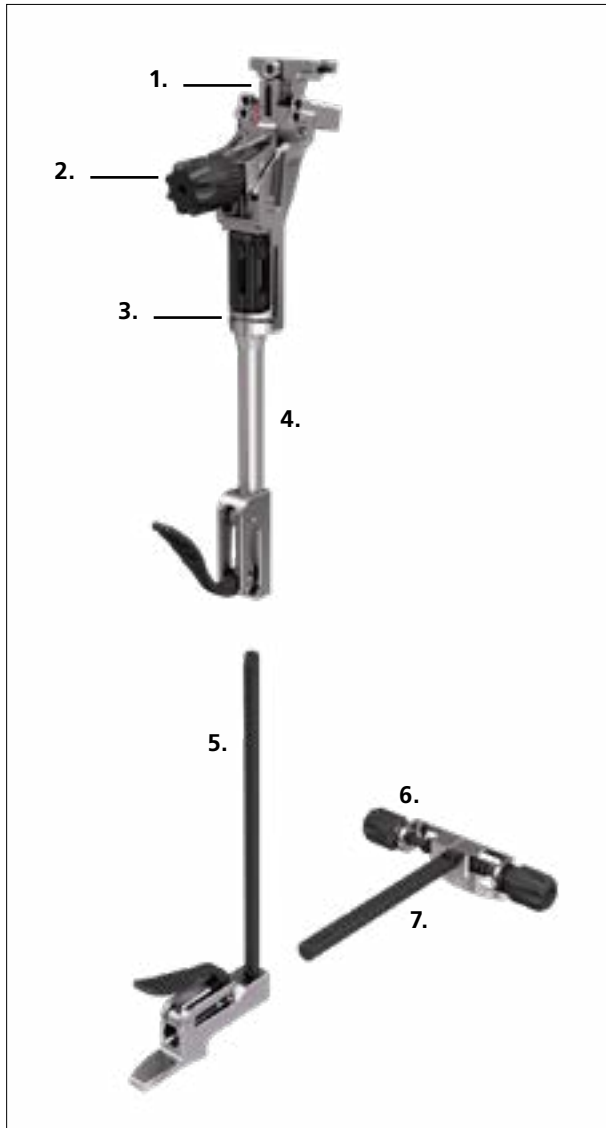


Fig. 1

6.2.1 Assembly of the Extramedullary Tibial Alignment Reference System (TRS)

Overview Extramedullary Tibial Alignment Reference System (TRS)

1. Scale resection level
2. Adjustment tibial slope
3. Adjustment resection level
4. TRS Proximal
5. TRS Distal
6. Adjustment tibia axis
7. TRS Ankle Holder

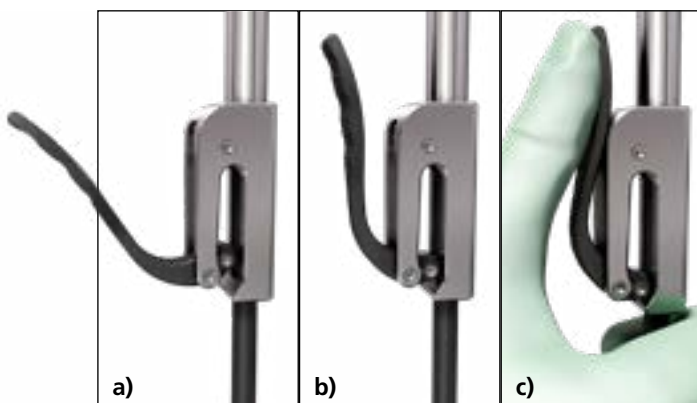


Fig. 2

The locking mechanism has three positions:

- a) Open: To mount/dismount instruments
- b) Fixed: Stable/Working position
- c) Slide: For non-incremental positioning

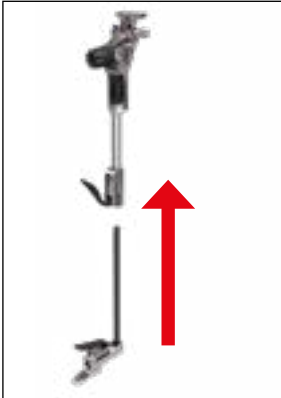


Fig. 3 Attach the TRS Distal



Fig. 4 Attach the TRS Ankle Holder



Fig. 5

Assemble the TRS Cutting Guide to the TRS Proximal with the balanSys Screwdriver. The TRS Cutting Guide can be shifted to the left and to the right, according to the side of surgery and the approach.



Fig. 6

Set the scale of the resection level to 0 mm by turning the axial wheel **1**.

Optional

The Eminentia Shackle can be mounted to fixate the TRS on the eminentia intercondylaris. For assembly refer to appendix 7.2 – intramedullary alignment.

Remark

To have a good overview, first the ACL and – in case of deficiency or due to planning – the PCL should be completely removed. In addition, all osteophytes in the notch must be removed.

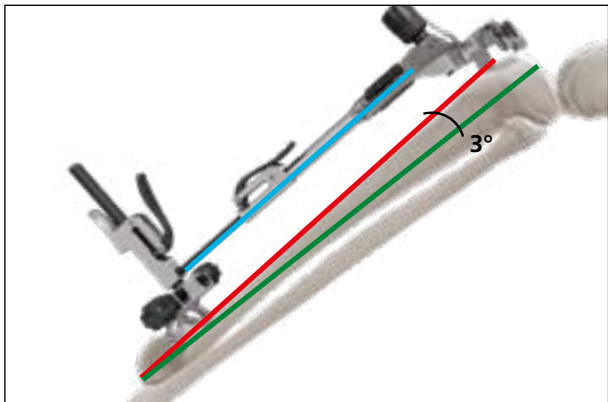


Fig. 7



Fig. 8



Fig. 9

6.2.2 Tibial resection

The axis of the TRS is placed parallel to the anterior tibial cortex. This can be approximated by running two fingers between the Tibia Reference System and the anterior face of the tibia.

Remark

The TRS incorporates the 3° angle between the medullary cavity (green line) and the anterior tibial cortex (red line). With the TRS being parallel to the anterior cortex (blue line), the degree of posterior slope of the resection will be as indicated on the dial.

Align the TRS distally with the second metatarsophalangeal bone, and fix it with the TRS Rubber Band. The center of the proximal TRS must be placed over the junction between the medial and central third of the tibial tubercle, and the distal TRS aligns in the medial third of the ankle to reproduce tibial rotation.

The scale of the resection level must indicate a value of 0mm.

Using the gliding mechanism ②, set the lengths of the TRS so that the cutting slot is approximately at the height of the tibial plateau.

Stabilize the TRS with a central 3.2 mm pin. Pre-drill with the 3.2 mm drill and insert a pin through the vertical slot of the TRS Proximal to increase stability. The vertical position should be in the lower part of the slot.

Optional, the Intramedullary Shackle can be used for additional stability. Refer to appendix 7.2 – intramedullary alignment.



Fig. 10 Varus/Valgus adjustment

Use the varus/valgus Adjustment Mechanism to align the TRS parallel to the long axis of the tibia. The distal TRS must align in the medial third of the ankle (medial and lateral malleolus). The long marking represents the neutral position.



Fig. 11 Posterior slope

Use the slope adjustment dial **3** to set the posterior slope according to the anatomy. The reference plate must be parallel to the best-preserved tibial joint surface.

Remark

The authors recommend a posterior slope up to 7° for a PCL retaining implant and up to 5° for a PCL substituting implant.



Fig. 12

Determine the original joint line at the level of the best-preserved tibial joint surface. To that end, use the reference plate as a reference, or attach the Tibial Stylus through the cutting slot of the TRS Cutting Guide. The tip of the Tibial Stylus must touch the best-preserved tibial joint surface. Use the gliding mechanism **2** to move the cutting guide distally or proximally.

Fixate the TRS proximally with at least two straight pins and one oblique pin. Predrill the holes with the 3.2 mm drill.



Fig. 13

There are two options to fixate the TRS.

1. Proximal holes (chamfered)
2. Distal holes

Generally, the proximal holes should be used for fixation, because the tibial bone widens proximally. The cutting guide can then be distalized by up to 10 mm.

For a planned resection of more than 10 mm, the distal holes should be used. After placement of the pins, the TRS with cutting guide can then be re-positioned to the proximal holes. This procedure will allow resection of 10–15 mm. Note that one must add 5 mm to the readable scale.



Fig. 14



Drill and pins may pass only through the anterior cortical bone and must not perforate the posterior cortical bone, in order to avoid injuries to dorsal vessels and nerves. It is recommended to drill just past the anterior dense bone and drive in the pin with a mallet until it touches the posterior cortex.



If the PCL is preserved, the stability must be taken into account. Especially in case of larger resections.



Fig. 15

Set the resection height by moving the TRS Cutting Guide 6–8 mm distad by turning the axial wheel ❶. The minimum resection height depends on the quality of cartilage in the area, where the joint line was determined (Fig. 14).

Check the adjusted osteotomy level with the reference plate, before resection.



Fig. 16

With a 1.27 mm saw blade, resect the tibia through the cutting slot.

Remark

Place bone retractors to protect the ligaments during tibial resection.

Remark

To reduce heat and the risk of osteonecrosis, it is recommended to cool the saw blades during sawing.



Fig. 17

Remove the instruments. At least one straight pin should be kept in place for the option of a later additional resection.



Fig. 18

Determine the tibial prosthesis size with the Tibial Template. Take the rotational alignment into account, to restore the flexion plane of the knee.

The rotation of the Tibial Template is typically centered on the junction between the medial and central third of the tibial tubercle.

Provide maximum coverage of the osteotomy surface without overhang of the Tibial Template.

Remark

If a Rotation Platform (RP) implant is being planned, the rotational alignment of the tibial implant must be considered. The Rotation Platform allows a rotational variability of not more than approximately 5° deviation.



Fig. 19



Fig. 20

Use the Alignment Rod to check the axis of the cutting plane.

6.3 Femur resection



Fig. 21

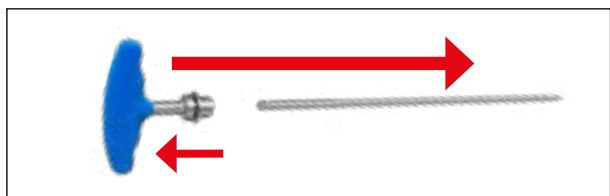


Fig. 22



Fig. 23



Fig. 24

Distal femoral resection

Remove all osteophytes.

Open the medullary canal with the balanSys drill bit 8.5/11 mm.

The entry point is determined by analyzing the long-leg radiograph. In general, it will be 3–5 mm medially to the apex of the intercondylar notch and 7–10 mm anterior to the origin of the Posterior Cruciate Ligament (PCL).

Insert the drill fully down to the end of the thread. The step feature of the drill increases the diameter of the hole by 1.5 mm to allow depressurization of the canal when the Intramedullary Rod is inserted.

Connect the Handle to the Intramedullary Rod.

Remark

Pull the locking ring for connecting and disconnecting the handle.

Insert the Intramedullary Rod slowly and fully into the femur in order to ensure the most accurate replication of the anatomical axis.

The Intramedullary Rod should not have any contact to the cortical bone at the entry point, to avoid misguiding. If it has, remove the Intramedullary Rod and widen the entry hole with the drill.

Remove the Handle.

Remark

If the entry hole is out of the anatomical axis, the Intramedullary Rod will be misguided. This may cause malangulation of the femoral component. In order to avoid that, the Intramedullary Rod must not touch the cortical bone when it is fully engaged. If it does, remove the Intramedullary Rod and widen the entry hole with the drill.

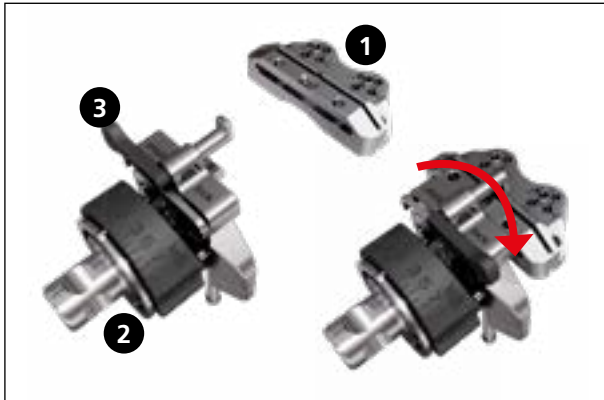


Fig. 25

Engage the Distal Cutting Guide with the Angle Guide.

To that end, mount the Distal Cutting Guide **1** onto the open connector of the Angle Guide **2** with the lever **3** in open position. Then flip the lever over to «lock», securing the Distal Cutting Guide.

The secured Distal Cutting Guide still can slide to the left and to the right.

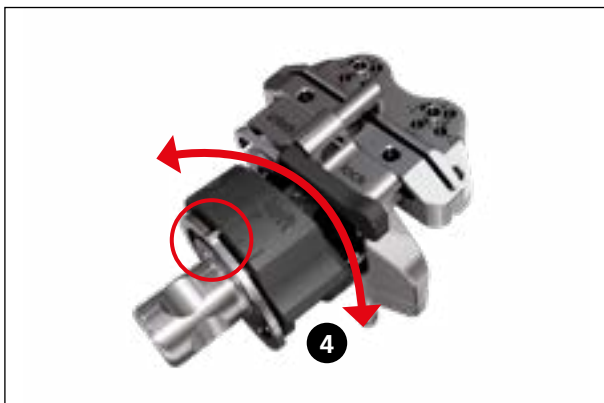


Fig. 26

According to the pre-operative planning, set the desired valgus angle (0 degrees to 9 degrees) on the Angle Guide.

Rotate the dial **4** clockwise or counter-clockwise to the appropriate setting at the setting mark (top). Upon rotation, the dial has palpable stops and markings at each 1° location.

The marking «left» indicates the left knee, the marking «right» indicates the right knee.



Fig. 27

Slide the Angle Guide with the Distal Cutting Guide over the Intramedullary Rod toward the femur until the Angle Guide touches at least one distal condyle.



Fig. 28



Fig. 29

Since the distal cut is performed at an angle of 83° in relation to the intramedullary rod, the Angle Guide must be aligned parallel to the epicondylar axis.



Fig. 30

The Distal Cutting Guide touches normally only one anterior condyle. It can be shifted mediolaterad, based on the anatomical conditions.

Pre-drill through the two raised holes of the Distal Cutting Guide. Secure the Distal Cutting Guide to the femur with two headless pins through the raised holes.



Do not shift the Distal Cutting Guide more than 5 mm from the middle, in order to avoid hitting the Intramedullary Rod with the drill. Otherwise, carefully pre-drill the cortical bone only and fully engage the pin after removal of the Intramedullary Rod.



Fig. 31

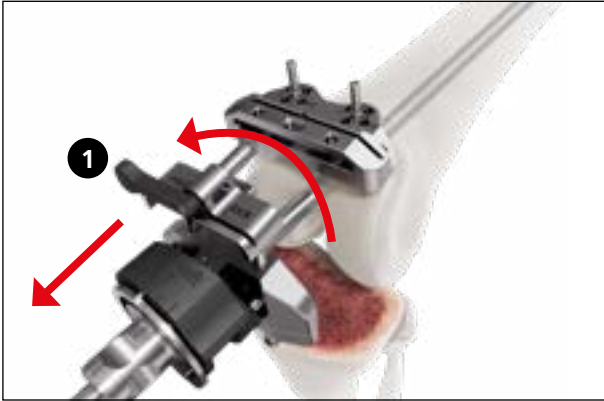


Fig. 32

Disconnect the Angle Guide from the Distal Cutting Guide (flip the lever **1** to «unlock») and remove the Angle Guide and the Intramedullary Rod.



Fig. 33

Check the planned distal resection plane with the reference plate.



Fig. 34

Depending on the quality of the cartilage in the area where the Angle Guide is seated, additional adjustments may be made by repositioning of the Distal Cutting Guide.

Therefore, remove the Distal Cutting Guide from the Pins and place it onto the sets of holes marked «-2», «-4» and «+2», «+4».



Fig. 35

The markings on the Distal Cutting Guide indicate the amount of bone resection each cut will yield, relative to the initial distal resection setting in millimeters.

If necessary for additional stability, now insert headless pins through the oblique pinholes.

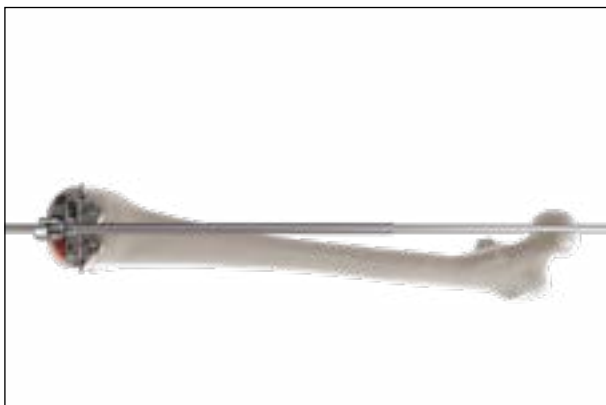


Fig. 36

Check the angle of the planned resection plane with the Alignment Rod.



Fig. 37



Fig. 38

With a 1.27 mm saw blade, execute the distal femoral osteotomy.

Remove the oblique pins and the Distal Cutting Guide.

Depending on the surgeon's preference, the Pins may be removed or left in place to allow for a recut if required.

Remark

Place bone retractors to protect the ligaments during resection of the distal femur.

Remove all tibial and femoral osteophytes and marginal bones.



Fig. 39

Extension gap assessment

Connect the black Spacer Block Femur with the appropriate blue Spacer Block Tibia.

The Spacer Block Femur corresponds to the thickness of the femoral implant, distal and posterior (9 mm).

The Spacer Block Tibia corresponds to the thickness of the Tibial Plateau plus the indicated inlay thickness.



Fig. 40

The system includes Spacer Blocks Tibia for 8/9 mm, 10.5/11.5 mm, and 13/15.5 mm.

For inlay thicknesses 18 mm and 20.5 mm, the Spacer Shift Plate +5 must be connected to the balanSys Spacer Block Tibia 13/15.5.

Remark

The inlay thicknesses 9 mm and 11.5 mm are available in vitamys only.



Fig. 41

Verify the extension gap by inserting the Spacer Block Femur with the appropriate Spacer Block Tibia. The extension gap should be M-L balanced with the leg in full extension. If the extension gap is not balanced, adjust the angle of either the tibial or the femoral cut, or perform appropriate soft-tissue releases to achieve balance.

Remark

Remaining dorsal osteophytes can impede extension or pretend ligament stability.



Fig. 42

Connect the Alignment Rod Short with the Alignment Rod Long.

Check the mechanical axis and the medial and lateral stability, as well as the extension ability. If conditions are too tight, a re-osteotomy can be performed at the distal femur or the proximal tibia.

Remove the Spacer Block and the Pins.

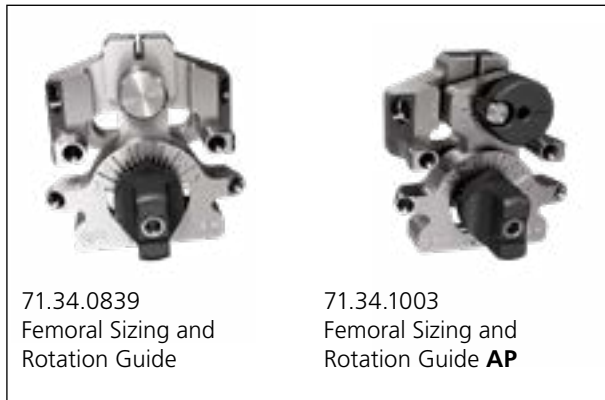


Fig. 43

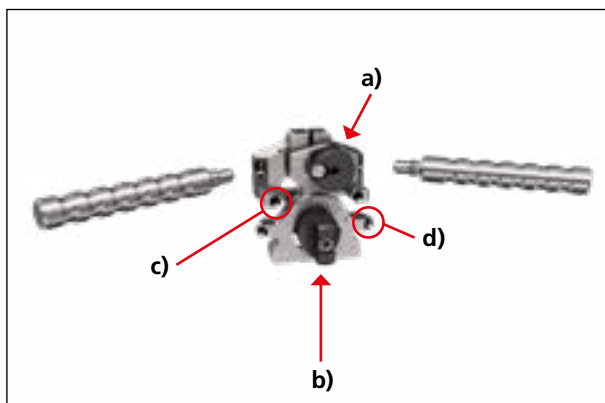


Fig. 44

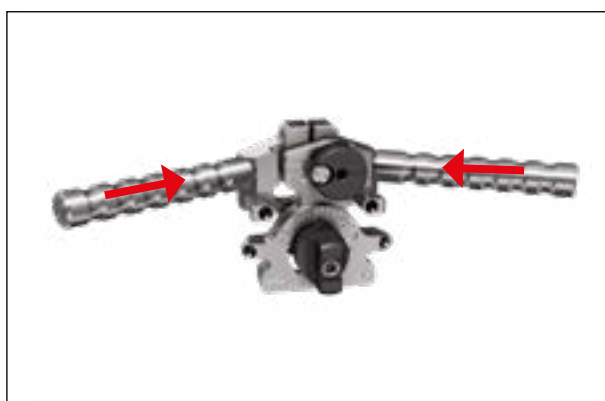


Fig. 45

Femoral rotation and sizing

To determine the size and rotation of the femoral component, two guide instruments are available.

Both have the same functionality for determination of the size of the femoral component and of the rotation of the femoral component.

In addition, the Femoral Sizing and Rotation Guide AP (right) gives the opportunity to shift the femoral component by max. 2 mm in anterior or posterior direction, if the femur size determined is between two sizes.

In the following the Femoral Sizing and Rotation Guide AP is shown; the steps are similar for both versions.

Remark

A-P shifting can also be performed in the next step with the 4in1 Cutting Guides, if the anterior cut can be verified through the anterior cutting slot.

Overview Femoral Sizing and Rotation Guides

Rotation adjustment: 1 click = 1°

A-P-shift: 1 click = 0.5 mm

- a) A-P-shift (71.34.1003 only)
- b) Rotation adjustment
- c) Drill holes for 4in1 Cutting Block
- d) Fixation holes

If desired, connect the handles to the Femoral Sizing and Rotation Guide.

On the balanSys Femoral Sizing/Rot. Guide AP (71.34.1003) the A-P-shift Knob must be in position «0».

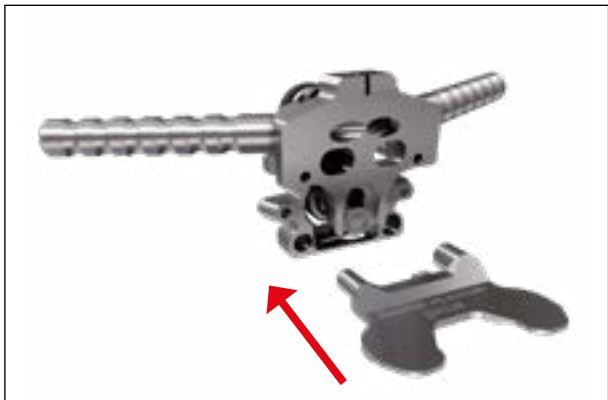


Fig. 46

Connect the proper Femur Rotation Bearing to the Femoral Sizing and Rotation Guide. 2 Femur Rotation Bearing sizes are available (small & large), to be used depending of the distance of the condyles.

Place the Femoral Sizing and Rotation Guide against the resected surface of the distal femur with the Femur Rotation Bearings contacting the most prominent point of the posterior condyles.

Existing osteophytes at the posterior condyles must be removed before.

If desired, secure the Instrument with a pin through the fixation hole in the lower section.



Fig. 47

The rotation of the femoral component can be adjusted from 0° to 7°. To that end, turn the rotation adjustment knob clockwise or counter-clockwise to the appropriate degrees. The knob has palpable stops and markings for each degree of rotation.

The marking «left» represents external femoral rotation on a left knee, the marking «right» represents external femoral rotation on a right knee.

Remark

Keep in mind that medio-lateral differences in the thickness of the cartilage at the posterior condyles, e.g. excessive loss of cartilage, will influence the rotation of the instrument and thus the femoral rotation (approximately 1° per 1 mm loss of cartilage).



Fig. 48

The rotation should be fine-tuned by aligning the handles with the epicondylar axis and/or using the cutout on the top of the Guide and a reference plate to align with Whiteside's line.

After adjustment of the rotation alignment, the Guide should be fixed in its lower section with at least one Pin.



Fig. 49

The femur size is determined using the Femur Stylus, which is inserted into the Femoral Sizing and Rotation Guide anteriorly.

Place the tip of the Femur Stylus on the elevation of the femoral metaphysis.



Fig. 50

Read the femur size on the vertical scale of the Femur Stylus.

Each character corresponds to the line below the character. The line indicates the exact size of the femoral components, when it is even with the top edge of the Femoral Sizing and Rotation Guide.

In the example shown the femur would be size «C».



Fig. 51

Adjust the size at the femoral stylus to the size read on the vertical scale. Check the tower scale again. Both scales must match.

The tip of the Femur Stylus points to the end of the femoral component.

Remark

The positioning of the femoral component is posterior-referenced, which allows good control of the flexion gap. If the Femur Stylus is between two sizes, consider upsizing to avoid notching. Also consider anterior shifting of the femoral component using the A-P shifting features of Femoral Sizing and Rotation Guide AP or the 4in1 Cutting Guides (see figure 57).

Optional



Fig. 52

A-P adjustment (shifting) of the femoral component (Femoral Sizing / Rot. Guide AP only)

If the tower scale is between two sizes, the A-P position can be varied by turning the A-P-Shift knob with the Screwdriver.

The adjustment can be made up to 2 mm in anterior and 2 mm in posterior direction in steps of 0.5 mm each. Turning the knob clockwise will shift the femoral component in anterior direction. Turning the knob counter-clockwise will shift the femoral component in posterior direction.

This step must be performed before the holes for the 4in1 Cutting Block are pre-drilled. After the pre-drilling of the holes, the A-P shift can only be performed with the 4in1 Cutting Block.

Remark

The positioning of the femoral component is posterior-referenced, which allows good control of the flexion gap. Anterior shifting will loosen the flexion gap. Posterior shifting will tighten the flexion gap.



Fig. 53

Pre-drill the two holes for the 4in1 Cutting Block.

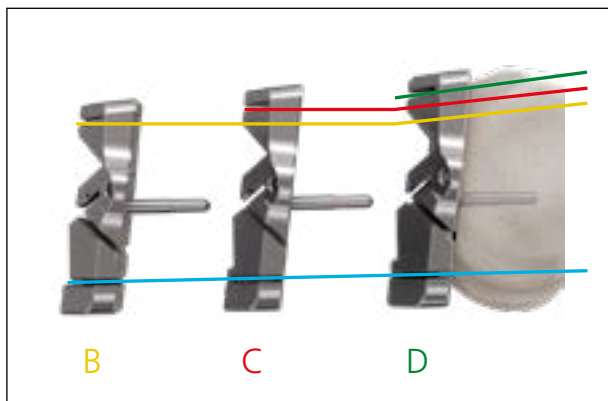


Fig. 54

Femoral 4in1 resection

The difference in AP dimension of the balanSys Femur components is approximately 3 mm per size (with the exception of the difference from size E to size F, which is 4 mm).

The distance between the posterior cut and the pin fixation is the same throughout the entire range of the 4in1 Cutting Guide, thus leaving the flexion gap constant through all sizes.



Fig. 55

Place the selected 4in1 Cutting Block in the two pre-drilled holes using the Pin Pliers, until it abuts flat on the distal osteotomy surface. If needed, you can use a mallet on the Pin Pliers.



The Instrument must be seated fully at the distal cut.



Fig. 56

The flexion space can be checked by using a Spacer Block Tibia placed below the 4in1 Cutting Block. Use the same thickness as for the extension gap balancing, but the Spacer Block Tibia only.

Check the anterior and posterior cuts with the reference plate.

Remark

Overhanging of the anterior shield may have a negative impact to the patella function. Notching of the anterior cortex of the femur can induce fractures. Both must be avoided.

Optional



Fig. 57

A-P adjustment (shifting) of the femoral component with the 4in1 cutting block

The 4in1 Cutting Block can be shifted 1.5 mm in anterior and 1.5 mm in posterior direction.

Pre-drill the corresponding drill holes medially and laterally through the 4in1 Cutting Block.

Use the anterior drill holes for 1.5mm of shifting in anterior direction.

Use the posterior drill holes for 1.5 mm of shifting in posterior direction.



Fig. 58

Using the Pin Pliers, re-position the Cutting Block into the newly pre-drilled holes until it abuts flatly on the distal osteotomy surface. If needed, you can use a mallet on the Pin Pliers.

Check the flexion gap and the cuts again.



The Instrument must be seated fully at the distal cut.

Remark

The positioning of the femoral component is posterior-referenced, which allows good control of the flexion gap. Shifting in anterior direction will loosen the flexion gap. Shifting in posterior direction will tighten the flexion gap.



Fig. 59

Secure the Cutting Block with two pins medially and laterally. With a 1.27 mm saw blade, execute the osteotomies through the cutting slots in the following order:

1. Anterior osteotomy
2. Posterior osteotomy
3. Chamfer cuts

Remove the pins and the 4in1 Cutting Block with the Pliers.



Place Retractors to protect soft tissues at the medial and lateral collateral ligaments and the popliteal tendon.



Fig. 60

Remark

The posterior osteotomies should be performed with the knee at 90° flexion, as this avoids touching the tibial surface with the saw blade and it moves the posterior soft tissues away from the posterior condyles.

Remark

The posterior cutting slots are open medially and laterally to accommodate complete saw cuts. To reduce the risk of inadvertent saw blade kick out, direct the saw slightly toward the midline before starting the sawing.



Fig. 61



Fig. 62



Fig. 63

Removal of all marginal bones and osteophytes, particularly in the region of the posterior condyles.



Fig. 64

Verification of the flexion gap

Insertion of the Spacer Block (Femur & Tibia) into the flexion gap with the Spacer Block Tibia, previously defined in extension (see figure 41).
Evaluation of ligament stability, both medially and laterally.

Remark

It is recommended to re-check the extension gap as well. The removal of the posterior osteophytes may have an influence on stability.

6.4 Femoral preparation and trial reduction

Depending if a CR or PS femoral component is planned, the final preparation of the femur is different. In the following the surgical steps for the CR femoral component are shown. For preparation and implantation of the PS femoral component follow the surgical steps in Appendix 7.1 – PS – Preparation and implantation.



Fig. 65

Femoral preparation

The Trochlea Reamer Guide is placed onto the femur, with the entry for the reamer on the anterior side, and fixated with at least two Pins diagonally.

Remark

The authors recommend placing the Trochlea Reamer Guide slightly laterally for optimized patella tracking. The bone resection allows correction of the M-L position of the femoral component by up to 1.5 mm. Avoid overhang of the final component.



Fig. 66

Connect the Trochlea Reamer to a power drill.

The trochlea is chamfered by pushing the Trochlea Reamer to the stop. Do not start reaming before the central guide pin is engaged.

Remove all the instruments.

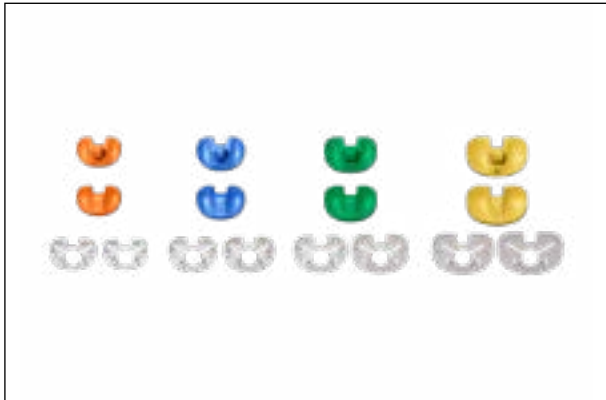


Fig. 67



Fig. 68



Fig. 69

Trial reduction

There are 4 sizes of Trial Inlays available. Use the Trial Inlay that fits the appropriate Tibial Template. The Tibial Templates and Trial Inlays are marked with the following symbols:



Combine only Tibial Template and Trial Inlays with the same symbols.

Place the selected Tibial Template and Trial Inlay with the Holder Tibial Template onto the resected tibia.

It must be ensured that the selected Tibial Template provides the desired tibial coverage and takes the selected femur size into account.

Remark

The femur sizes that are compatible with the selected Tibia sizes are marked on the Tibial Templates.

Remark

If desired, the Tibial Template can be fixated with two short Pins with Head before the Trial Inlay is inserted.

Insert the selected Trial Femur with the Femur Holder.

To mount the Trial Femur onto the Femur Holder, rotate the handle counter-clockwise. Open the clamps and attach the Trial Femur in the direction indicated on the instrument. Secure the Trial Femur by rotating the handle clockwise until it is tight.



Use the Femoral Impactor to drive the trial femur into the final position. Application of excessive force to the Femur Holder can cause damage to the instrument.



Fig. 70

Drive the Trial Femur in with the Femoral Impactor and a mallet until it is completely seated on the bone.

Avoid flexion position of the Femur Component.



Fig. 71

Repositioning of the extension apparatus.

With all provisional components in place, the knee is tested at 0° - 30° - 60° - 90° at least for:

- range of motion
- stability
- PCL stability
- kinematics and mobility
- mechanical axis
- tibial overhang
- implant rotation
- patella tracking



Fig. 72

To remember the correct position of the tibial component, mark the position of the Tibial Template anterior with the electrocautery knife on the tibia. The Tibial Template can be fixed with short headed pins.

Remark

If the patella is to be replaced, it is recommended to perform the patellar osteotomy and positioning the patellar trial component before the function of the knee is tested.



Fig. 73

Drill the two holes for the femoral anchor pins with the 6 mm Drill Bit.

Remark

Scratches on trial femurs can lead to damage of the trial inlays and must be replaced.



Fig. 74

Removal of the Trial Inlay and Trial Femur.

The Trial Inlay can be lifted with the handle end of the Holder Tibial Template. For the Trial Femur use the Femur Extractor.



Fig. 75

Final preparation tibia

The Tibial Template is fixed with two headed Pins.

Ensure that your markings on the tibial head match those on the Tibial Template.



Fig. 76

Position of the Chisel Centering Guide.

Seat the holdings into the oval holes in the Tibial Template.



Fig. 77

For positioning of the Chisel Centering Guide, the locking mechanism at the anterior side must be in the vertical open position (↑).



Fig. 78

To fix the Chisel Centering Guide on the Tibial Template turn the knob into the horizontal closed position (0).



Fig. 79

Introduce the Attachment Milling Guide into the Tibial Centering Guide.



Fig. 80

Connect the Reamer to a power drill.

Insert the Reamer Drill into the Attachment Milling Guide before starting drilling. Drill out the tibial medullary space.

The depth must correspond to the appropriate length of the anchorage stem of the predetermined balanSys PS Tibial Plateau. The size markings on the Reamer must level the top edge of the Attachment Milling Guide.



Fig. 81

Remove Reamer and Attachment Milling Guide.



Fig. 82

Mount the Fin Chisel to the Handle for Tibia Chisel.

There are two sizes of the Fin Chisel. The smaller one can be used for tibia sizes 59 to 70 and the larger one for all tibia sizes.

Insert the Fin Chisel assembly into the Chisel Centering Guide.

Take care to protect the collateral ligaments and the poplitea.

Impact the Fin Chisel until the instrument depth stops rest on the Tibial Template. The depths of the fins are defined by the size of the Tibial Template.



Fig. 83

! *To prevent fracture on the tibia, hammer down the Fin Chisel with care. If the bone is medially or laterally sclerotic, it may be helpful to prepare the fin slot initially with an oscillating saw or high-speed burr.*

Remove all remaining instruments.

Optional



Fig. 84

Test rotating platform (RP)

For testing the Rotation Platform implant, connect the Pin Pliers to the RP Trial Tibial Plateau.

Insert the RP Trial Tibial Plateau into the prepared tibial plateau until it is fully seated.



Fig. 85

Insert the determined RP PE Trial Inlay.

It must be ensured that the selected RP PE Trial Inlay takes the selected femur size into account.

Insert the determined Trial Femur with the Femur Holder.

To mount the Trial Femur onto the Femur Holder, rotate the handle counter-clockwise. Open the clamps and attach the Trial Femur in the direction indicated on the instrument. Secure the Trial Femur by rotating the handle clockwise until it is tight.



Fig. 86

Remark

Scratches on trial femurs can lead to damage of the trial inlays. Damaged trial instruments must be replaced.



Use the Femoral Impactor to drive the trial femur into the final position. Application of excessive force to the Femur Holder can cause damage to the instrument.



Fig. 87

Drive the Trial Femur in with the Femoral Impactor and a mallet until it is completely seated on the bone.

Avoid flexion position of the Femur Component.



Fig. 88

Repositioning of the extension apparatus.

With all provisional components in place, the knee is tested at 0° - 30° - 60° - 90° at least for:

- range of motion
- stability
- PCL stability
- kinematics and mobility
- mechanical axis
- tibial overhang
- implant rotation
- patella tracking

If not performed in the step «Trial Reduction» (figure 73), drill the two holes for the femoral anchor pins with the 6 mm Drill Bit.

Removal of the Trial Femur and Trial Inlay.

6.5 Implantation definitive implants



Fig. 89

In sclerotic bone, short drill holes can be used to improve cement interdigitation.

Clean the osteotomy surfaces thoroughly (e.g. by means of pulse lavage).



Fig. 90

Always put on fresh gloves before unpacking the final implants and starting the cement preparation. Use clean and dry gloves for cementing.



Fig. 91

Tibia

After the implants have been selected, one last check is recommended to ensure that the femoral, tibial, and PE inlay components match.

Attach the Positioner Tibia Plateau to the selected Tibial Plateau.

For fixed Tibial Plateau hook the instrument posteriorly under the rim; then it is fixed by turning the anterior knob clockwise, while the instrument sits flat on the Tibial Plateau surface.

Positioner Tibial Plateau RP

For RP Tibial Plateau turn the anterior knob counter-clockwise up to the stop. Attach the Positioner Tibial Plateau RP to the selected Tibial Plateau. It is fixed by turning the anterior knob clockwise, while the instrument sits flat on the Tibial Plateau surface.



Fig. 92



Fig. 93

Mix the bone cement. Apply a thick layer of cement to the bone or the implant.

The cement should be in the early dough phase when applied. Follow the instructions for the specific bone cement.

For secure fixation of the Tibial Plateau in the bone, it is necessary that the tibial backside be fully cemented in the dough phase of the cement. The stem and fins may be cemented or not.

Failure to fully cement and pressurize the Tibial Plateau may lead to early loosening of the prosthesis. Furthermore, cementing in advanced stages of polymerization can lead to early loosening of the prosthesis.

Remark

Excessive cement extrusion should be avoided, especially in the posterior part of the tibia. Cement that is extruded posteriorly is difficult to remove.

Impact the Tibial Plateau with a mallet and the Tibial Impactor until the Tibial Plateau is fully seated on the resected bone. Then pressurize the Tibial Plateau with the Tibial Impactor until the cement cured.

Use a Curette to remove all extruded bone cement. Take care to inspect the posterior aspect for cement residues.

Remark

Avoid movement of the components while the cement is curing.



Fig. 94

The Femur Impactor

- Driving in the Femur Component
- Extra push for seating the anterior shield
- Insertion of the Inlay



Fig. 95

Femur and Inlay CR and UC

Insert the final CR or UC Inlay of determined size and thickness.

The Inlay is first hooked under the posterior rim and then engaged at the anterior rim.



Fig. 96



Fig. 97



Fig. 98

Mount the Femur onto the Femur Holder. Rotate the handle counter-clockwise, open the clamps, and attach the Femur in the direction indicated on the instrument. Secure the Femur by rotating the handle clockwise until it is tight.

Insert the selected CR Femur Component (cemented or uncemented) with the Femur Holder. The knee must be in 90° flexion to avoid impingement with the Inlay. When using a cemented Femur, apply a thick layer of cement to the implant.

Remark

The friction on the ventral side is greater than dorsally, particularly when using an uncemented implant. Push the holder ventrad to avoid flexion position of the femoral component. Optionally, the Femoral Impactor can be placed at the notch to correct the femoral component.

Drive in the femoral component until it protrudes no more than 1–2 mm, then remove the Femur Holder. Use the Femoral Impactor and a mallet to drive in the Femur Component until it is completely seated on the bone. Place the instrument in a slightly posterior position to avoid flexion position of the femoral component.

Use a curette to remove all extruded bone cement. Take care to inspect the notch and the posterior aspect for cement residues.



Use only the Femoral Impactor to drive the trial femur into the final position. Application of excessive force to the Femur Holder can damage the instrument.



Fig. 99

Optional

If desired, Trial Inlays can be used on the final Tibial Plateau to double-check function and stability of the knee with the planned inlay thickness.

The Trial inlays match two tibia sizes each. Use the Adapter Trial Inlay for the respectively larger tibia sizes to achieve a stable situation.



Fig. 100

The leg should be in extension during hardening of the bone cement.



Avoid hyperextension during the curing of the bone cement. Hyperextension leads to high pressure anteriorly, which may result in tilting of the tibial implant.

6.6 Rotating Platform – Femur and Inlay



Fig. 101

For insertion of the Rotating Platform inlay (RP), insert the balanSys Bolt for the RP Tibial Plateau into the hole in the Tibial Plateau.

Remark

Ensure that there are no foreign bodies in the receiving hole of the Tibial Plateau.

Remark

The bolt is packed with the Tibial Plateau.



Fig. 102

Insertion of the balanSys RP PE Inlay above the balanSys Bolt for the RP Tibial Plateau.

Mount the Femur onto the Femur Holder. Rotate the handle counter-clockwise, open the clamps, and attach the Femur in the direction indicated on the instrument. Secure the Femur by rotating the handle clockwise until it is tight.

Insert the selected CR Femur Component (cemented or uncemented) with the Femur Holder. The knee must be in 90° flexion to avoid impingement with the inlay. When using a cemented Femur, apply a thick layer of cement to the implant.

Remark

The friction on the ventral side is greater than dorsally, particularly when using an uncemented implant. Push the holder ventrad to avoid flexion position of the femoral component. Optionally, the Femoral Impactor can be placed at the notch to correct the femoral component.



Fig. 103



Fig. 104

Drive in the femoral component until it protrudes no more than 1–2 mm, then remove the Femur Holder. Use the Femoral Impactor and a mallet to drive in the Femur Component until it is completely seated on the bone. Place the instrument in a slightly posterior position to avoid flexion position of the femoral component.



Fig. 105

Use a curette to remove all extruded bone cement. Take care to inspect the notch and the posterior aspect for cement residues.



Use only the Femoral Impactor to drive the trial femur into the final position. Application of excessive force to the Femur Holder can damage the instrument.



Fig. 106

The leg should be in extension during the curing of the bone cement.



Avoid hyperextension during the curing of the bone cement. Hyperextension leads to high pressure anteriorly, which may result in tilting of the tibial implant.

7. Appendix

7.1 PS – Preparation and implantation



Fig. 107



Fig. 108



Fig. 109

Femoral preparation

A Femur Box Cutting Guide of appropriate size is placed onto the femur. It must rest flush onto the resected surfaces of the posterior and distal femur.

The Cutting Guide must be secured to the femur with four Pins diagonally. The posterior Pins must be introduced first.

The sizing guides medially and laterally show the widest M-L dimension of the marked femur size.

Remark

The authors recommend placing the Femur Box Cutting Guide slightly laterally for optimized patella tracking. Avoid overhang of the final component.

A reciprocating saw should be used and guided along the walls of the open box to cut the medial and lateral sides and the base of the intercondylar notch.

Use pins in the two anterior pinholes as stops for the saw.

Using a saw, also the base of the intercondylar notch should be cut out. Then the block is mobilized with the balanSys chisel A–F or XS–S, respectively.



Fig. 110

After the cutting, the Femur Box Cutting Guide and the Pins are removed in the following order:

1. Pins
2. Cutting guide
3. Resected bone block



Fig. 111

Trial reduction

Insert the selected Trial Femur with the Femur Holder.

To mount the Trial Femur onto the Femur Holder, rotate the handle counter-clockwise. Open the clamps and attach the Trial Femur in the direction indicated on the instrument. Secure the Trial Femur by rotating the handle clockwise until it is tight.



Use the Femoral Impactor to drive the trial femur into the final position. Application of excessive force to the Femur Holder can cause damage to the instrument.



Fig. 112

Drive in the Trial Femur with the Femoral Impactor and a mallet until it is completely seated on the bone.

Avoid flexion position of the Femur Component.

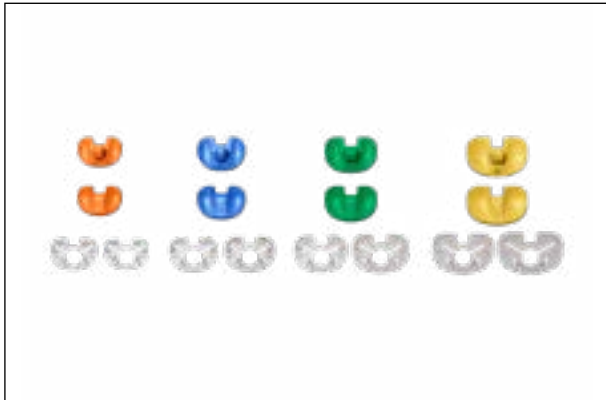


Fig. 113

There are 4 sizes of Trial Inlays available. Use the Trial Inlay that fits the appropriate Tibial Template. The Tibial Templates and Trial Inlays are marked with the following symbols:



Combine only Tibial Template and Trial Inlays with the same symbols.



Fig. 114

Once the femur is impacted, the tibia must be subluxated anteriorly with a Bone Retractor to position the Tibial Template and the PS Trial Inlay.

Insert the selected Tibial Template and the PS Trial Inlay with the Holder Tibial Template onto the resected tibia.

It must be ensured that the selected template provides the desired tibial coverage and takes the selected femur size into account.

Remark

The femur sizes that are compatible with the chosen Tibia are marked on the Tibial Templates.

Remark

If desired, the Tibial Template can be fixated with two short Pins with Head before the Trial Inlay is inserted.



Fig. 115



Fig. 116



Fig. 117

Repositioning of the extension apparatus.

With all provisional components in place, the knee is tested at 0° -30° -60° -90° at least for:

- range of motion
- stability
- kinematics and mobility
- mechanical axis
- tibial overhang
- implant rotation
- patella tracking

To remember the correct position of the tibial component mark the position of the Tibial Template anterior with the electro-surgical knife on the tibia. The Tibial Template can be fixed with short headed pins.

Remark

If the patella is to be replaced, it is recommended to perform the patellar osteotomy and positioning the patellar trial component before the function of the knee is tested.

Removal of the Trial Inlay and Trial Femur.

The Trial Inlay can be lifted with the handle end of the Holder Tibial Template. For the Trial Femur use the Femur Extractor 71.34.0788.

Remark

Scratches on trial femurs can lead to damage of the trial inlays and must be replaced.



Fig. 118

Final preparation tibia

The Tibial Template is fixed with two headed Pins.

Ensure that your markings on the tibial head match those on the Tibial Template.



Fig. 119

Position of the Chisel Centering Guide.

Seat the holdings into the oval holes in the Tibial Template.



Fig. 120

For positioning of the Chisel Centering Guide, the locking mechanism at the anterior side must be in the vertical open position (↑).

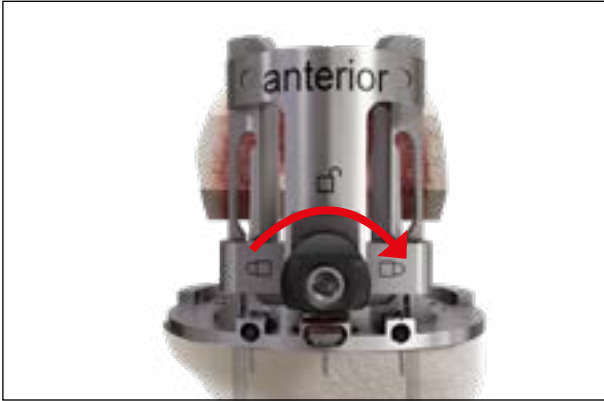


Fig. 121

To fix the Chisel Centering Guide on the Tibial Template turn the knob into the horizontal closed position (0).



Fig. 122

Introduce the Attachment Milling Guide into the Tibial Centering Guide.



Fig. 123

Connect the Reamer to a power drill.

Insert the Reamer Drill into the Attachment Milling Guide before starting drilling. Drill out the tibial medullary space.

The depth must correspond to the appropriate length of the anchorage stem of the predetermined balanSys PS Tibial Plateau. The size markings on the Reamer must level the top edge of the Attachment Milling Guide.



Fig. 124

Remove Reamer and Attachment Milling Guide.



Fig. 125

Mount the Fin Chisel to the Handle for Tibia Chisel.

There are two sizes of the Fin Chisel. The smaller one can be used for tibia sizes 59 to 70 and the larger one for all tibia sizes.

Insert the Fin Chisel assembly into the Chisel Centering Guide.

Take care to protect the collateral ligaments and the poplitea.

Impact the Fin Chisel until the instrument depth stops rest on the Tibial Template. The depths of the fins are defined by the size of the Tibial Template.



Fig. 126

! *To prevent fracture on the tibia, hammer down the Fin Chisel with care. If the bone is medially or laterally sclerotic, it may be helpful to prepare the fin slot initially with an oscillating saw or high-speed burr.*

Remove all remaining instruments.



Fig. 127

In sclerotic bone, short drill holes can be used to improve cement interdigitation.

Clean the osteotomy surfaces thoroughly (e.g. by means of pulse lavage).



Fig. 128

Always put on fresh gloves before unpacking the final implants and starting the cement preparation. Use clean and dry gloves for cementing.



Fig. 129

Tibia

After the implants have been selected, one last check is recommended to ensure that the femoral, tibial, and PE inlay components match.

Attach the Positioner Tibia Plateau to the selected Tibial Plateau.

For fixed Tibial Plateau hook the instrument posteriorly under the rim; then it is fixed by turning the anterior knob clockwise, while the instrument sits flat on the Tibial Plateau surface.



Fig. 130

Mix the bone cement. Apply a thick layer of cement to the bone or the implant.

The cement should be in the early dough phase when applied. Follow the instructions for the specific bone cement.

For secure fixation of the Tibial Plateau in the bone, it is necessary that the tibial backside be fully cemented in the dough phase of the cement. The stem and fins may be cemented or not.

Failure to fully cement and pressurize the Tibial Plateau may lead to early loosening of the prosthesis. Furthermore, cementing in advanced stages of polymerization can lead to early loosening of the prosthesis.

Remark

Excessive cement extrusion should be avoided, especially in the posterior part of the tibia. Cement that is extruded posteriorly is difficult to remove.



Fig. 131

Impact the Tibial Plateau with a mallet and the Tibial Impactor until the Tibial Plateau is fully seated on the resected bone. Then pressurize the Tibial Plateau with the Tibial Impactor until the cement cured.

Use a Curette to remove all extruded bone cement. Take care to inspect the posterior aspect for cement residues.

Remark

Avoid movement of the components while the cement is curing.



Fig. 132

The Femur Impactor

- Driving in the Femur Component
- Extra push for seating the anterior shield
- Insertion of the Inlay



Fig. 133

Femoral implant and inlay

Mount the Femur onto the Femur Holder. Rotate the handle counter-clockwise, open the clamps, and attach the Femur in the direction indicated on the instrument. Secure the Femur by rotating the handle clockwise until it is tight.

Insert the selected PS Femur Component (cemented or uncemented) using the Femur Holder. The knee must be in 90° flexion to avoid impingement with the tibia. If using a cemented Femur, apply a thick layer of cement to the implant.

Remark

The friction on the ventral side is greater than dorsally. Push the holder ventrad to avoid flexion position of the femoral component. Optionally, the Femoral Impactor can be placed at the notch to correct the femoral component.



Fig. 134

Drive in the femoral component until it protrudes no more than 1–2 mm, then remove the Femur Holder. Use the Femoral Impactor and a mallet to drive in the Femur Component until it is completely seated on the bone. Place the instrument in a slightly posterior position to avoid flexion position of the femoral component.

Use a curette to remove all extruded bone cement. Take care to inspect the notch and the posterior aspect for cement residues.



Fig. 135



Use only the Femoral Impactor to drive the trial femur into the final position. Application of excessive force to the Femur Holder can damage the instrument.



Fig. 136

Insert the final PS Inlay of the determined size and thickness.

The Inlay is first hooked in under the posterior rim and then engaged at the anterior rim.



Fig. 137

Optional

If desired, Trial Inlays can be used on the final Tibial Plateau to double-check function and stability of the knee with the planned inlay thickness.

The Trial inlays match for two tibia sizes each. Use the Adapter Trial Inlay for the respective larger tibia sizes to achieve stable situation.



Fig. 138

The leg should be in extension during the curing of the bone cement.



Avoid hyperextension during the curing of the bone cement. Hyperextension leads to high pressure anteriorly, which may result in tilting of the tibial implant.

7. Appendix

7.2 Intramedullary Tibia Alignment

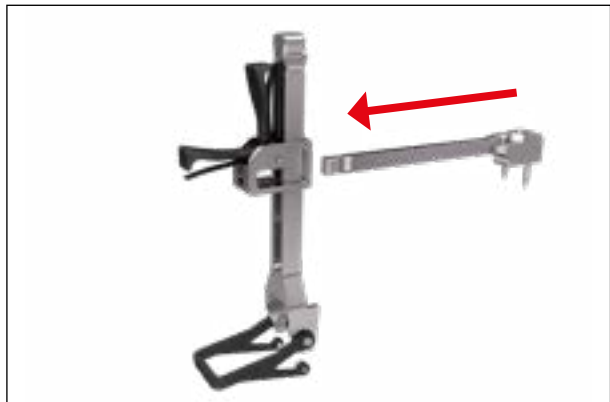


Fig. 139

Connect the Eminentia Shackle (optional Eminentia Shackle rotating) with the Intramedullary Shackle. Position instruments at «start position».



Fig. 140

Assemble the TRS Cutting Guide to the TRS Proximal with the balanSys Screwdriver. The TRS Cutting Guide can be shifted to the left and to the right, according to the side of surgery and the approach.

Place the Intramedullary Shackle onto the TRS Proximal. Push the locking mechanism to fix the two parts together.

Open the medullary canal with the balanSys drill bit 8.5/11 mm.

The entry point is determined by analyzing the long-leg radiography. In general, it is medial to the eminentia intercondylaris.

Insert the drill fully down to the end of the thread. The step feature of the drill increases the diameter of the hole by 1.5 mm to allow depressurization of the canal when the Intramedullary Rod is inserted.

Remark

If the entry hole is out of the anatomical axis, the Intramedullary Rod will be misguided. This may cause malangulation of the tibial component.



Fig. 141

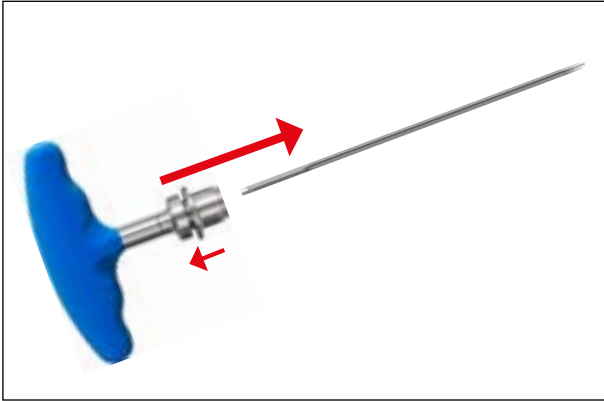


Fig. 142

Connect the Handle to the Intramedullary Rod.

Remark

Pull the locking ring for connecting and disconnecting the handle.



Fig. 143

Insert the Intramedullary Rod slowly and fully into the tibia to ensure the most accurate replication of the anatomical axis.

Remove the Handle.

The Intramedullary Rod should not have any contact to the cortical bone at the entry point to avoid misguiding. If it has, remove the Intramedullary Rod and widen the entry hole with the drill.

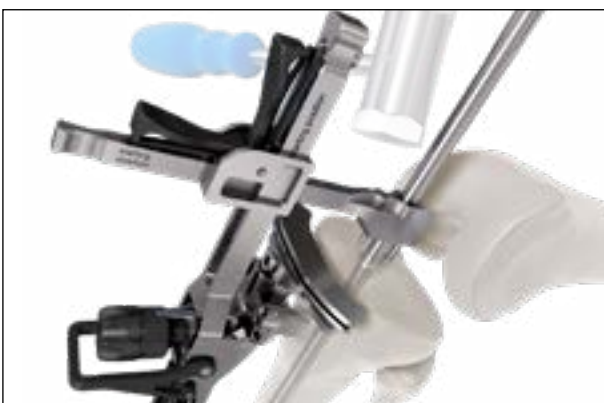


Fig. 144

Slide the pre-mounted equipment onto the Intramedullary Rod.

Distal alignment of the TRS to the second metatarsophalangeal bone, proximally to the transition of the medial to the middle third of the tibial tuberosity.

Impaction of the Intramedullary Shackle.

Remark

The zero-position of the TRS Cutting Guide is 90° to the Intramedullary Rod.



Fig. 145a

The scale of the resection level must show «0».

With the gliding mechanism, set the lengths of the TRS so that the cutting slot is approximately at the level of the Tibial Plateau.

For proximal-distal adjustment press the lower lever and for anterior-posterior adjustment the upper lever.

Optional

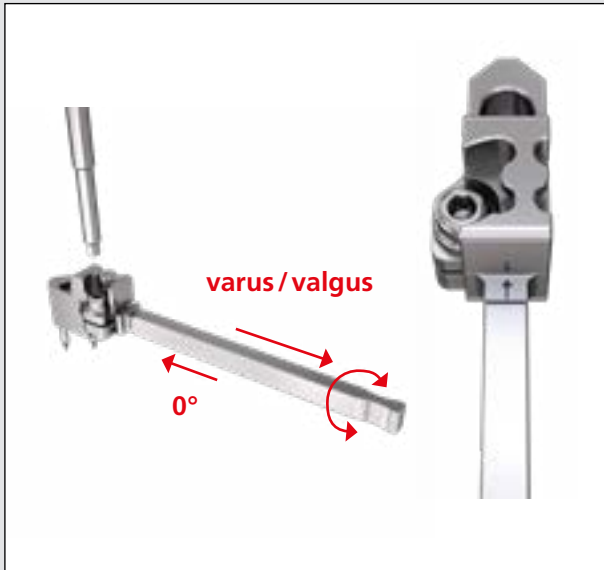


Fig. 145b

balanSys TRS Eminentia Shackle rotating

The TRS Eminentia Shackle rotating can be used for varus/valgus adjustment with intramedullary alignment.

The angle of the TRS Eminentia Shackle rotating can be adjusted according to the anatomy and fixed with the balanSys Screwdriver.

If no angle is to be set (0°), the TRS Eminentia Shackle rotating must be arrested and the markings on the top side in line.



Fig. 146

Posterior slope

Use the slope adjustment dial to set the posterior slope according to the anatomy (reference plate parallel to the best-preserved tibial joint surface).

Remark

The authors recommend a posterior slope of 7° for a PCL-retaining implant and up to 5° for a PCL substituting implant.



Fig. 147

Determine the original joint line at the level of the best-preserved tibial joint surface. To that end, attach the Tibial Stylus through the cutting slot of the TRS Cutting Guide and use the gliding mechanism to move the cutting guide distad or proximad. The Tibial Stylus must touch the best-preserved tibial joint surface.

Affix the TRS proximally with at least two straight and one oblique pin. Predrill the holes with the 3.2 mm drill.

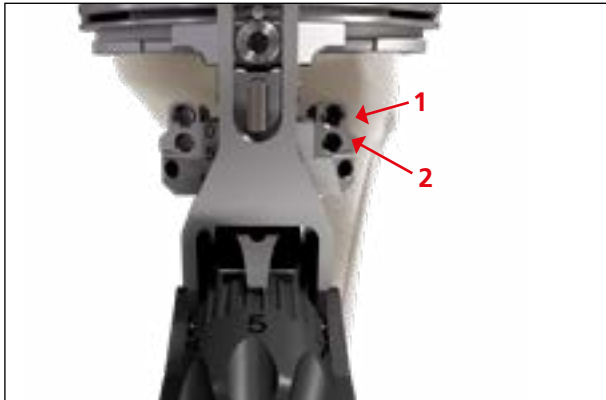


Fig. 148

There are two options to fixate the TRS.

1. Proximal holes (chamfered)
2. Distal holes

Generally, the proximal holes should be used for fixation, because the tibial bone widens proximally. The cutting guide can then be distalized by up to 10 mm.

For a planned resection of more than 10 mm, the distal holes should be used. After placement of the pins, the TRS with cutting guide can then be re-positioned to the proximal holes. This procedure will allow resection of 10–15 mm. Note that one must add 5 mm to the readable scale.



Fig. 149



Drill and pins may pass only through the anterior cortical bone and must not perforate the posterior cortical bone, in order to avoid injuries to dorsal vessels and nerves. It is recommended to drill just past the anterior dense bone and drive in the pin with a mallet until it touches the posterior cortex.



The stability of the PCL must be taken into account, especially in case of larger resections.



Fig. 150

After fixation of the TRS Distal unlock intramedullary shackle from TRS and remove the Intramedullary Rod and the Intramedullary Shackle.

Be careful not to interfere with the fixation pins.

Set the resection height by moving the TRS Cutting Guide 6–8 mm distally by turning the axial wheel. The minimum resection height depends on the quality of cartilage in the area, where the joint line was determined.

Check the adjusted osteotomy level with the reference plate, before resection.



Fig. 151

Using a 1.27 mm saw blade, resect the tibia through the cutting slot.

Remove the instruments. At least one straight pin should be kept in place for the option of a later additional resection.

Remark

Place bone retractors to protect the ligaments during tibial resection.

Remark

To reduce heat and the risk of osteonecrosis, it is recommended to cool the saw blades during sawing.



Fig. 152



Fig. 153

Determine the tibial prosthesis size with the Tibial Template. Take the rotational alignment into account, to restore the flexion plane of the knee.

The rotation of the Tibial Template is typically centered on the junction between the medial and central third of the tibial tubercle.

Provide maximum coverage of the osteotomy surface without overhang of the Tibial Template.



Fig. 154

Remark

Furthermore, if a Rotation Platform (RP) implant is being planned, the rotational alignment of the tibial implant must be considered. The Rotation Platform allows a rotational variability of not more than approximately 5° deviation.



Fig. 155

Use the Alignment Rod to check the axis of the cutting plane.

7. Appendix

7.3 Optional 2° recut



Fig. 156

If the performed tibial or femoral resection needs to be corrected, an optional 2° recut can be done.



Fig. 157 Tibia

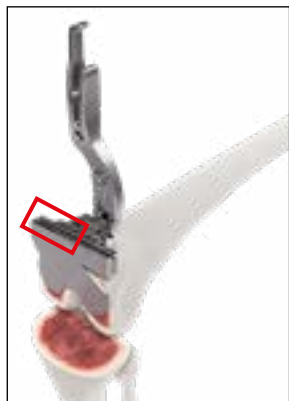


Fig. 158 Femur

Insert the Paddle into the Corrective Cutting Guide. Then attach the Holder Tibial Template to the Corrective Cutting Guide and position the Paddle onto the resected tibia or femur, respectively.

To correct from a valgus situation, the paddle slot (marked in the picture) must be on the lateral side (side of larger bone resection).

To correct from a varus situation, the paddle slot (marked in the picture) must be on the medial side (side of larger bone resection).



Fig. 159 Tibia

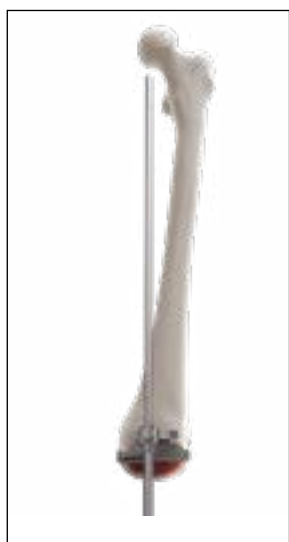


Fig. 160 Femur

Use the Alignment Rod to check the axis of the planned corrective cutting plane.



Fig. 161 Tibia



Fig. 162 Femur

Remove the Holder Tibial Template and fixate the Corrective Cutting Guide in the determined position with at least two straight and one oblique pin. Predrill the holes with the 3.2 mm drill.



Fig. 163 Tibia



Fig. 164 Femur

Before performing the resection through the cutting slot, move the Paddle as far as possible to the side of the larger bone resection to avoid impingement with the saw blade.

With a 1.27 mm saw blade, resect the tibia or femur through the cutting slot, respectively.

Remove the instruments and all pins.

7. Appendix

7.4 Preparation 3-Peg Patella



Fig. 165

Evert the Patella.

Perform circumferential denervation of the synovial edge of the patella using electrocautery. Remove peripheral osteophytes to restore the patella to its normal shape and size. Be careful not to damage the tendon insertions.



Fig. 166

Determine the patella size using the caliper or the Patella Sizing Guide.



Fig. 167

Measure the thickness of the patella with the caliper.

After resection, a minimum of 12 mm bone must remain to allow sufficient bone stock. See the table below for the thickness = resection height for the balanSys 3-Peg FLAT patella.

| Dia | 3-Peg FLAT | 3-Peg |
|-----|------------|--------|
| 26 | 8mm | – |
| 28 | 8mm | 10.2mm |
| 31 | 8mm | 11.4mm |
| 34 | 9mm | 12.3mm |
| 37 | 9mm | 13.0mm |



Fig. 168

Grip the patella centrally with the Patella Forceps. Adjust the resection height with the height topper to the selected patellar size setting.

It is important to avoid tilting of the patella implant. Double-check the planned resection with the reference plate.

Remark

*Ensure that you are using the Patella Resection Pliers Flat for the 3-Peg Patella FLAT (marked with sizes **26**–**37**) and the Patella Resection Pliers Standard for the 3-Peg Patella (marked with sizes **28**–**37**), respectively.*



Fig. 169

Perform the patellar osteotomy through the saw guide on the lateral side of the Patella Forceps.



Fig. 170

Attach the balanSys Patella Drill Guide to the Patella Universal Pliers.



Fig. 171

Place the Drill Guide in order to determine the final positioning of the patella implant with regard to the predetermined gliding path of the femoral shield.

Fixate the Drill Guide to the Patella toughly by turning the knurled nut clockwise.

Drill the three patella peg holes with the 5.5 mm Drill Bit.

Remove the Drill Guide.

Remark

Slightly medializing of the patella implant can support patella tracking.

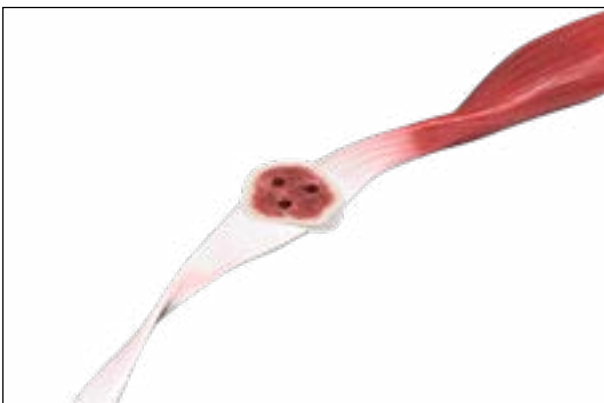


Fig. 172

Retro-patellar surface prepared for implantation.

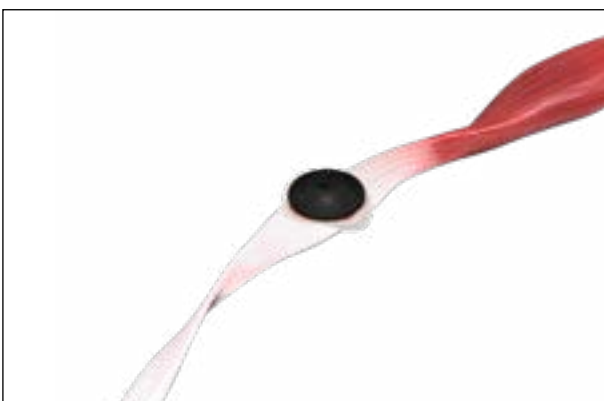


Fig. 173

Insert the Trial Patella of predetermined size (FLAT or standard).

Chamfer the medial and lateral edges of the rear surface of the patella.

Check the resulting patella thickness with the caliper and the gliding movement in the femoro-patellar joint with respect to centering and impingement.



Fig. 174

Attach the balanSys Patella Cementing Aid to the Patella Universal Pliers.

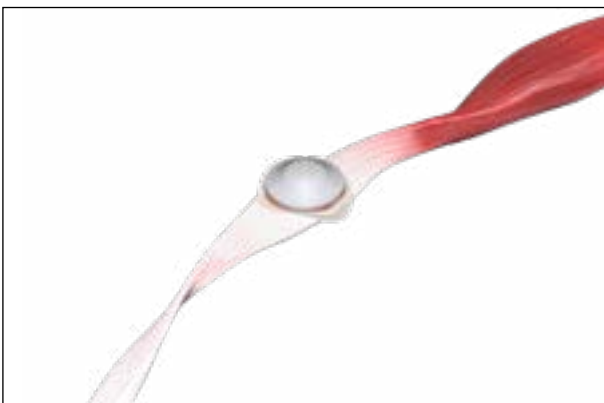


Fig. 175

Thoroughly clean the osteotomy surface.

Apply a layer of cement to the bone or the patella component.

Insert the balanSys 3-Peg Patella cemented.



Fig. 176

Place the Patella Cementing Aid and fixate the Cementing Aid toughly by turning the knurled nut clockwise.

Use a curette to remove all extruded bone cement.

After hardening of the cement remove the Patella Cementing Aid.

After reposing the joint capsule, make a final functional test and check the centered running of the patella.

7. Appendix

7.5 Pins and screws



| Item no. | Description |
|------------|---------------------|
| 71.02.3054 | balanSys pin 3.2/80 |



| Item no. | Description |
|------------|-------------------------------|
| 71.34.1047 | balanSys Pin with Head 3.2/30 |



| Item no. | Description |
|----------|------------------|
| 315.310 | AO Drill bit 3.2 |



| Item no. | Description |
|------------|-----------------------|
| 71.34.0647 | Drill Pin 3.2/89/2.25 |



| Item no. | Description |
|------------|--|
| 71.34.0787 | Quick Coupling Square 2.25 (Adapter for Drill Pin) |





| Item no. | Description |
|------------|---------------------|
| 71.34.0798 | balanSys Pin Pliers |


8. Implants

8.1 Combination charts



balanSys Fixed Bearing CR and UC

| <div></div> <div>Tibia/Inlay</div> | <div>Femur<div></div></div> | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | XS | S | A | B | C | D | E | F |
| | ✓ | ✓ | | | | | | |
| | ✓ | ✓ | ✓ | | | | | |
| | | ✓ | ✓ | ✓ | | | | |
| | | | ✓ | ✓ | | | | |
| | | | ✓ | ✓ | ✓ | | | |
| | | | | ✓ | ✓ | ✓ | | |
| | | | | | ✓ | ✓ | ✓ | ✓ |
| | | | | | | ✓ | ✓ | ✓ |

balanSys PS

| | | Femur | | | | | | | |
|--|-------|-------|---|---|---|---|---|---|---|
| | | XS | S | A | B | C | D | E | F |
|  Tibia/Inlay | 59/40 | ✓ | ✓ | | | | | | |
| | 62/42 | ✓ | ✓ | ✓ | | | | | |
| | 64/45 | | ✓ | ✓ | ✓ | | | | |
| | 67/46 | | | ✓ | ✓ | | | | |
| | 70/48 | | | ✓ | ✓ | ✓ | | | |
| | 75/51 | | | | ✓ | ✓ | ✓ | | |
| | 80/53 | | | | | ✓ | ✓ | ✓ | ✓ |
| | 85/55 | | | | | | ✓ | ✓ | ✓ |

balanSys Mobile Bearing RP

| | | | | | | | | | |
|---|-------|--|---|---|---|---|---|---|---|
|  <i>Tibia</i> | |  <i>Femur/Inlay</i> | | | | | | | |
| | | XS | S | A | B | C | D | E | F |
| | 59/40 | ✓ | ✓ | | | | | | |
| | 62/42 | ✓ | ✓ | ✓ | | | | | |
| | 64/45 | | ✓ | ✓ | ✓ | | | | |
| | 67/46 | | | ✓ | ✓ | | | | |
| | 70/48 | | | ✓ | ✓ | ✓ | | | |
| | 75/51 | | | | ✓ | ✓ | ✓ | | |
| | 80/53 | | | | | ✓ | ✓ | ✓ | ✓ |
| | 85/55 | | | | | | ✓ | ✓ | ✓ |

8. Implants

8.2 Item numbers of the balanSys implants

balanSys Femur Components for CR/UC/RP

balanSys Femur, cemented



| Item no. | Mediolat. | Size |
|------------|-----------|----------|
| 72.15.3401 | 56mm | XS left |
| 72.15.3701 | 58mm | S left |
| 72.15.4001 | 60mm | A left |
| 72.15.4301 | 64mm | B left |
| 72.15.4601 | 68mm | C left |
| 72.15.4901 | 72mm | D left |
| 72.15.5201 | 76mm | E left |
| 72.15.5501 | 80mm | F left |
| 72.15.3402 | 56mm | XS right |
| 72.15.3702 | 58mm | S right |
| 72.15.4002 | 60mm | A right |
| 72.15.4302 | 64mm | B right |
| 72.15.4602 | 68mm | C right |
| 72.15.4902 | 72mm | D right |
| 72.15.5202 | 76mm | E right |
| 72.15.5502 | 80mm | F right |

Material: CoCrMo

balanSys Femur, uncemented



| Item no. | Mediolat. | Size |
|---------------|-----------|----------|
| 73.15.3401TPS | 56mm | XS left |
| 73.15.3701TPS | 58mm | S left |
| 73.15.4001TPS | 60mm | A left |
| 73.15.4301TPS | 64mm | B left |
| 73.15.4601TPS | 68mm | C left |
| 73.15.4901TPS | 72mm | D left |
| 73.15.5201TPS | 76mm | E left |
| 73.15.5501TPS | 80mm | F left |
| 73.15.3402TPS | 56mm | XS right |
| 73.15.3702TPS | 58mm | S right |
| 73.15.4002TPS | 60mm | A right |
| 73.15.4302TPS | 64mm | B right |
| 73.15.4602TPS | 68mm | C right |
| 73.15.4902TPS | 72mm | D right |
| 73.15.5202TPS | 76mm | E right |
| 73.15.5502TPS | 80mm | F right |

Material: CoCrMo, TiCP coated

balanSys Fixed Bearing Components

balanSys CR PE Inlay



| Item no. | Mediolat. | Size |
|------------|-----------|--------|
| 74.30.5908 | 59mm | 8.0mm |
| 74.30.5910 | 59mm | 10.5mm |
| 74.30.5913 | 59mm | 13.0mm |
| 74.30.5915 | 59mm | 15.5mm |
| 74.30.6208 | 62mm | 8.0mm |
| 74.30.6210 | 62mm | 10.5mm |
| 74.30.6213 | 62mm | 13.0mm |
| 74.30.6215 | 62mm | 15.5mm |
| 74.30.6408 | 64mm | 8.0mm |
| 74.30.6410 | 64mm | 10.5mm |
| 74.30.6413 | 64mm | 13.0mm |
| 74.30.6415 | 64mm | 15.5mm |
| 74.30.6708 | 67mm | 8.0mm |
| 74.30.6710 | 67mm | 10.5mm |
| 74.30.6713 | 67mm | 13.0mm |
| 74.30.6715 | 67mm | 15.5mm |

| Item no. | Mediolat. | Size |
|------------|-----------|--------|
| 74.30.7008 | 70mm | 8.0mm |
| 74.30.7010 | 70mm | 10.5mm |
| 74.30.7013 | 70mm | 13.0mm |
| 74.30.7015 | 70mm | 15.5mm |
| 74.30.7508 | 75mm | 8.0mm |
| 74.30.7510 | 75mm | 10.5mm |
| 74.30.7513 | 75mm | 13.0mm |
| 74.30.7515 | 75mm | 15.5mm |
| 72.34.0170 | 80mm | 8.0mm |
| 72.34.0171 | 80mm | 10.5mm |
| 72.34.0172 | 80mm | 13.0mm |
| 72.34.0173 | 80mm | 15.5mm |
| 72.34.0174 | 85mm | 8.0mm |
| 72.34.0175 | 85mm | 10.5mm |
| 72.34.0176 | 85mm | 13.0mm |
| 72.34.0177 | 85mm | 15.5mm |

Material: UHMWPE



vitamys®

balanSys CR vitamys Inlay

| Item no. | Mediolat. | Size |
|------------|-----------|--------|
| 72.34.1000 | 59mm | 8.0mm |
| 72.34.1001 | 59mm | 9.0mm |
| 72.34.1002 | 59mm | 10.5mm |
| 72.34.1003 | 59mm | 11.5mm |
| 72.34.1004 | 59mm | 13.0mm |
| 72.34.1005 | 59mm | 15.5mm |
| 72.34.1010 | 62mm | 8.0mm |
| 72.34.1011 | 62mm | 9.0mm |
| 72.34.1012 | 62mm | 10.5mm |
| 72.34.1013 | 62mm | 11.5mm |
| 72.34.1014 | 62mm | 13.0mm |
| 72.34.1015 | 62mm | 15.5mm |
| 72.34.1020 | 64mm | 8.0mm |
| 72.34.1021 | 64mm | 9.0mm |
| 72.34.1022 | 64mm | 10.5mm |
| 72.34.1023 | 64mm | 11.5mm |
| 72.34.1024 | 64mm | 13.0mm |
| 72.34.1025 | 64mm | 15.5mm |
| 72.34.1030 | 67mm | 8.0mm |
| 72.34.1031 | 67mm | 9.0mm |
| 72.34.1032 | 67mm | 10.5mm |
| 72.34.1033 | 67mm | 11.5mm |
| 72.34.1034 | 67mm | 13.0mm |
| 72.34.1035 | 67mm | 15.5mm |

| Item no. | Mediolat. | Size |
|------------|-----------|--------|
| 72.34.1040 | 70mm | 8.0mm |
| 72.34.1041 | 70mm | 9.0mm |
| 72.34.1042 | 70mm | 10.5mm |
| 72.34.1043 | 70mm | 11.5mm |
| 72.34.1044 | 70mm | 13.0mm |
| 72.34.1045 | 70mm | 15.5mm |
| 72.34.1050 | 75mm | 8.0mm |
| 72.34.1051 | 75mm | 9.0mm |
| 72.34.1052 | 75mm | 10.5mm |
| 72.34.1053 | 75mm | 11.5mm |
| 72.34.1054 | 75mm | 13.0mm |
| 72.34.1055 | 75mm | 15.5mm |
| 72.34.1060 | 80mm | 8.0mm |
| 72.34.1061 | 80mm | 9.0mm |
| 72.34.1062 | 80mm | 10.5mm |
| 72.34.1063 | 80mm | 11.5mm |
| 72.34.1064 | 80mm | 13.0mm |
| 72.34.1065 | 80mm | 15.5mm |
| 72.34.1070 | 85mm | 8.0mm |
| 72.34.1071 | 85mm | 9.0mm |
| 72.34.1072 | 85mm | 10.5mm |
| 72.34.1073 | 85mm | 11.5mm |
| 72.34.1074 | 85mm | 13.0mm |
| 72.34.1075 | 85mm | 15.5mm |

Material: VEPE



balanSys UC PE Inlay

| Item no. | Mediolat. | Size |
|------------|-----------|--------|
| 77.30.5908 | 59mm | 8.0mm |
| 77.30.5910 | 59mm | 10.5mm |
| 77.30.5913 | 59mm | 13.0mm |
| 77.30.5915 | 59mm | 15.5mm |
| 77.30.5918 | 59mm | 18.0mm |
| 77.30.6208 | 62mm | 8.0mm |
| 77.30.6210 | 62mm | 10.5mm |
| 77.30.6213 | 62mm | 13.0mm |
| 77.30.6215 | 62mm | 15.5mm |
| 77.30.6218 | 62mm | 18.0mm |
| 77.30.6408 | 64mm | 8.0mm |
| 77.30.6410 | 64mm | 10.5mm |
| 77.30.6413 | 64mm | 13.0mm |
| 77.30.6415 | 64mm | 15.5mm |
| 77.30.6418 | 64mm | 18.0mm |
| 77.30.6708 | 67mm | 8.0mm |
| 77.30.6710 | 67mm | 10.5mm |
| 77.30.6713 | 67mm | 13.0mm |
| 77.30.6715 | 67mm | 15.5mm |
| 77.30.6718 | 67mm | 18.0mm |

Material: UHMWPE

| Item no. | Mediolat. | Size |
|------------|-----------|--------|
| 77.30.7008 | 70mm | 8.0mm |
| 77.30.7010 | 70mm | 10.5mm |
| 77.30.7013 | 70mm | 13.0mm |
| 77.30.7015 | 70mm | 15.5mm |
| 77.30.7018 | 70mm | 18.0mm |
| 77.30.7508 | 75mm | 8.0mm |
| 77.30.7510 | 75mm | 10.5mm |
| 77.30.7513 | 75mm | 13.0mm |
| 77.30.7515 | 75mm | 15.5mm |
| 77.30.7518 | 75mm | 18.0mm |
| 72.34.0182 | 80mm | 8.0mm |
| 72.34.0183 | 80mm | 10.5mm |
| 72.34.0184 | 80mm | 13.0mm |
| 72.34.0185 | 80mm | 15.5mm |
| 72.34.0186 | 80mm | 18.0mm |
| 72.34.0188 | 85mm | 8.0mm |
| 72.34.0189 | 85mm | 10.5mm |
| 72.34.0190 | 85mm | 13.0mm |
| 72.34.0191 | 85mm | 15.5mm |
| 72.34.0192 | 85mm | 18.0mm |



vitamys®

balanSys UC vitamys Inlay

| Item no. | Mediolat. | Size |
|------------|-----------|--------|
| 72.34.1100 | 59mm | 8.0mm |
| 72.34.1101 | 59mm | 9.0mm |
| 72.34.1102 | 59mm | 10.5mm |
| 72.34.1103 | 59mm | 11.5mm |
| 72.34.1104 | 59mm | 13.0mm |
| 72.34.1105 | 59mm | 15.5mm |
| 72.34.1106 | 59mm | 18.0mm |
| 72.34.1110 | 62mm | 8.0mm |
| 72.34.1111 | 62mm | 9.0mm |
| 72.34.1112 | 62mm | 10.5mm |
| 72.34.1113 | 62mm | 11.5mm |
| 72.34.1114 | 62mm | 13.0mm |
| 72.34.1115 | 62mm | 15.5mm |
| 72.34.1116 | 62mm | 18.0mm |
| 72.34.1120 | 64mm | 8.0mm |
| 72.34.1121 | 64mm | 9.0mm |
| 72.34.1122 | 64mm | 10.5mm |
| 72.34.1123 | 64mm | 11.5mm |
| 72.34.1124 | 64mm | 13.0mm |
| 72.34.1125 | 64mm | 15.5mm |
| 72.34.1126 | 64mm | 18.0mm |
| 72.34.1130 | 67mm | 8.0mm |
| 72.34.1131 | 67mm | 9.0mm |
| 72.34.1132 | 67mm | 10.5mm |
| 72.34.1133 | 67mm | 11.5mm |
| 72.34.1134 | 67mm | 13.0mm |
| 72.34.1135 | 67mm | 15.5mm |
| 72.34.1136 | 67mm | 18.0mm |

Material: VEPE

| Item no. | Mediolat. | Size |
|------------|-----------|--------|
| 72.34.1140 | 70mm | 8.0mm |
| 72.34.1141 | 70mm | 9.0mm |
| 72.34.1142 | 70mm | 10.5mm |
| 72.34.1143 | 70mm | 11.5mm |
| 72.34.1144 | 70mm | 13.0mm |
| 72.34.1145 | 70mm | 15.5mm |
| 72.34.1146 | 70mm | 18.0mm |
| 72.34.1150 | 75mm | 8.0mm |
| 72.34.1151 | 75mm | 9.0mm |
| 72.34.1152 | 75mm | 10.5mm |
| 72.34.1153 | 75mm | 11.5mm |
| 72.34.1154 | 75mm | 13.0mm |
| 72.34.1155 | 75mm | 15.5mm |
| 72.34.1156 | 75mm | 18.0mm |
| 72.34.1160 | 80mm | 8.0mm |
| 72.34.1161 | 80mm | 9.0mm |
| 72.34.1162 | 80mm | 10.5mm |
| 72.34.1163 | 80mm | 11.5mm |
| 72.34.1164 | 80mm | 13.0mm |
| 72.34.1165 | 80mm | 15.5mm |
| 72.34.1166 | 80mm | 18.0mm |
| 72.34.1170 | 85mm | 8.0mm |
| 72.34.1171 | 85mm | 9.0mm |
| 72.34.1172 | 85mm | 10.5mm |
| 72.34.1173 | 85mm | 11.5mm |
| 72.34.1174 | 85mm | 13.0mm |
| 72.34.1175 | 85mm | 15.5mm |
| 72.34.1176 | 85mm | 18.0mm |



balanSys PS Tibial Plateau, cemented

| Item no. | Mediolateral |
|------------|--------------|
| 79.15.0400 | 59mm |
| 79.15.0401 | 62mm |
| 79.15.0056 | 64mm |
| 79.15.0402 | 67mm |
| 79.15.0057 | 70mm |
| 79.15.0058 | 75mm |
| 79.15.0059 | 80mm |
| 79.15.0060 | 85mm |

Material: CoCrMo

balanSys Mobile Bearing RP Components

balanSys RP PE Inlay



| Item no. | Femur | Size | Item no. | Femur | Size |
|------------|-------|---------|------------|-------|---------|
| 72.34.0200 | XS | 8.0 mm | 78.30.7008 | C | 8.0 mm |
| 72.34.0201 | XS | 10.5 mm | 78.30.7010 | C | 10.5 mm |
| 72.34.0202 | XS | 13.0 mm | 78.30.7013 | C | 13.0 mm |
| 72.34.0203 | XS | 15.5 mm | 78.30.7015 | C | 15.5 mm |
| 72.34.0206 | S | 8.0 mm | 78.30.7408 | D | 8.0 mm |
| 72.34.0207 | S | 10.5 mm | 78.30.7410 | D | 10.5 mm |
| 72.34.0208 | S | 13.0 mm | 78.30.7413 | D | 13.0 mm |
| 72.34.0209 | S | 15.5 mm | 78.30.7415 | D | 15.5 mm |
| 78.30.6208 | A | 8.0 mm | 78.30.7808 | E | 8.0 mm |
| 78.30.6210 | A | 10.5 mm | 78.30.7810 | E | 10.5 mm |
| 78.30.6213 | A | 13.0 mm | 78.30.7813 | E | 13.0 mm |
| 78.30.6215 | A | 15.5 mm | 78.30.7815 | E | 15.5 mm |
| 78.30.6608 | B | 8.0 mm | 72.34.0242 | F | 8.0 mm |
| 78.30.6610 | B | 10.5 mm | 72.34.0243 | F | 10.5 mm |
| 78.30.6613 | B | 13.0 mm | 72.34.0244 | F | 13.0 mm |
| 78.30.6615 | B | 15.5 mm | 72.34.0245 | F | 15.5 mm |

Material: UHMWPE, FeCrNiMoMn (Contrast balls, optional)



balanSys RP vitamys Inlay

| Item no. | Femur | Size |
|------------|-------|---------|
| 72.34.1200 | XS | 8.0 mm |
| 72.34.1201 | XS | 9.0 mm |
| 72.34.1202 | XS | 10.5 mm |
| 72.34.1203 | XS | 11.5 mm |
| 72.34.1204 | XS | 13.0 mm |
| 72.34.1205 | XS | 15.5 mm |
| 72.34.1210 | S | 8.0 mm |
| 72.34.1211 | S | 9.0 mm |
| 72.34.1212 | S | 10.5 mm |
| 72.34.1213 | S | 11.5 mm |
| 72.34.1214 | S | 13.0 mm |
| 72.34.1215 | S | 15.5 mm |
| 72.34.1220 | A | 8.0 mm |
| 72.34.1221 | A | 9.0 mm |
| 72.34.1222 | A | 10.5 mm |
| 72.34.1223 | A | 11.5 mm |
| 72.34.1224 | A | 13.0 mm |
| 72.34.1225 | A | 15.5 mm |
| 72.34.1230 | B | 8.0 mm |
| 72.34.1231 | B | 9.0 mm |
| 72.34.1232 | B | 10.5 mm |
| 72.34.1233 | B | 11.5 mm |
| 72.34.1234 | B | 13.0 mm |
| 72.34.1235 | B | 15.5 mm |

Material: VEPE

| Item no. | Femur | Size |
|------------|-------|---------|
| 72.34.1240 | C | 8.0 mm |
| 72.34.1241 | C | 9.0 mm |
| 72.34.1242 | C | 10.5 mm |
| 72.34.1243 | C | 11.5 mm |
| 72.34.1244 | C | 13.0 mm |
| 72.34.1245 | C | 15.5 mm |
| 72.34.1250 | D | 8.0 mm |
| 72.34.1251 | D | 9.0 mm |
| 72.34.1252 | D | 10.5 mm |
| 72.34.1253 | D | 11.5 mm |
| 72.34.1254 | D | 13.0 mm |
| 72.34.1255 | D | 15.5 mm |
| 72.34.1260 | E | 8.0 mm |
| 72.34.1261 | E | 9.0 mm |
| 72.34.1262 | E | 10.5 mm |
| 72.34.1263 | E | 11.5 mm |
| 72.34.1264 | E | 13.0 mm |
| 72.34.1265 | E | 15.5 mm |
| 72.34.1270 | F | 8.0 mm |
| 72.34.1271 | F | 9.0 mm |
| 72.34.1272 | F | 10.5 mm |
| 72.34.1273 | F | 11.5 mm |
| 72.34.1274 | F | 13.0 mm |
| 72.34.1275 | F | 15.5 mm |



balanSys RP Tibial Plateau, cemented

| Item no. | Mediolateral |
|------------|--------------|
| 72.34.0059 | 59 mm |
| 72.34.0060 | 62 mm |
| 72.34.0061 | 64 mm |
| 72.34.0062 | 67 mm |
| 72.34.0063 | 70 mm |
| 72.34.0064 | 75 mm |
| 72.34.0065 | 80 mm |
| 72.34.0066 | 85 mm |

Material: CoCrMo

balanSys PS Components

balanSys PS Femur, cemented



| Item no. | Mediolat. | Size |
|------------|-----------|----------|
| 79.15.0999 | 56mm | XS right |
| 79.15.1000 | 58mm | S right |
| 79.15.0001 | 60mm | A right |
| 79.15.0002 | 64mm | B right |
| 79.15.0003 | 68mm | C right |
| 79.15.0004 | 72mm | D right |
| 79.15.0005 | 76mm | E right |
| 79.15.1006 | 80mm | F right |
| 79.15.1009 | 56mm | XS left |
| 79.15.1010 | 58mm | S left |
| 79.15.0011 | 60mm | A left |
| 79.15.0012 | 64mm | B left |
| 79.15.0013 | 68mm | C left |
| 79.15.0014 | 72mm | D left |
| 79.15.0015 | 76mm | E left |
| 79.15.1016 | 80mm | F left |

Material: CoCrMo



balanSys PS PE Inlay

| Item no. | Mediolat. | Size |
|------------|-----------|--------|
| 79.30.9986 | 59mm | 8.0mm |
| 79.30.9987 | 59mm | 10.5mm |
| 79.30.9988 | 59mm | 13.0mm |
| 79.30.9989 | 59mm | 15.5mm |
| 79.30.9990 | 59mm | 18.0mm |
| 79.30.9991 | 59mm | 20.5mm |
| 79.30.9993 | 62mm | 8.0mm |
| 79.30.9994 | 62mm | 10.5mm |
| 79.30.9995 | 62mm | 13.0mm |
| 79.30.9996 | 62mm | 15.5mm |
| 79.30.9997 | 62mm | 18.0mm |
| 79.30.9998 | 62mm | 20.5mm |
| 79.30.0200 | 64mm | 8.0mm |
| 79.30.0201 | 64mm | 10.5mm |
| 79.30.0202 | 64mm | 13.0mm |
| 79.30.0203 | 64mm | 15.5mm |
| 79.30.0204 | 64mm | 18.0mm |
| 79.30.0205 | 64mm | 20.5mm |
| 79.30.0210 | 67mm | 8.0mm |
| 79.30.0211 | 67mm | 10.5mm |
| 79.30.0212 | 67mm | 13.0mm |
| 79.30.0213 | 67mm | 15.5mm |
| 79.30.0214 | 67mm | 18.0mm |
| 79.30.0215 | 67mm | 20.5mm |

Material: UHMWPE

| Item no. | Mediolat. | Size |
|------------|-----------|--------|
| 79.30.0010 | 70mm | 8.0mm |
| 79.30.0011 | 70mm | 10.5mm |
| 79.30.0012 | 70mm | 13.0mm |
| 79.30.0013 | 70mm | 15.5mm |
| 79.30.0014 | 70mm | 18.0mm |
| 79.30.0015 | 70mm | 20.5mm |
| 79.30.0020 | 75mm | 8.0mm |
| 79.30.0021 | 75mm | 10.5mm |
| 79.30.0022 | 75mm | 13.0mm |
| 79.30.0023 | 75mm | 15.5mm |
| 79.30.0024 | 75mm | 18.0mm |
| 79.30.0025 | 75mm | 20.5mm |
| 72.34.0255 | 80mm | 8.0mm |
| 72.34.0256 | 80mm | 10.5mm |
| 72.34.0257 | 80mm | 13.0mm |
| 72.34.0258 | 80mm | 15.5mm |
| 72.34.0259 | 80mm | 18.0mm |
| 72.34.0260 | 80mm | 20.5mm |
| 72.34.0262 | 85mm | 8.0mm |
| 72.34.0263 | 85mm | 10.5mm |
| 72.34.0264 | 85mm | 13.0mm |
| 72.34.0265 | 85mm | 15.5mm |
| 72.34.0266 | 85mm | 18.0mm |
| 72.34.0267 | 85mm | 20.5mm |



balanSys PS vitamys Inlay

| Item no. | Mediolat. | Size |
|-------------|-----------|--------|
| 72.34.1300 | 59mm | 8.0mm |
| 72.34.1301 | 59mm | 9.0mm |
| 72.34.1302 | 59mm | 10.5mm |
| 72.34.1303 | 59mm | 11.5mm |
| 72.34.1304 | 59mm | 13.0mm |
| 72.34.1305 | 59mm | 15.5mm |
| 72.34.1306 | 59mm | 18.0mm |
| 72.34.1307* | 59mm | 20.5mm |
| 72.34.1310 | 62mm | 8.0mm |
| 72.34.1311 | 62mm | 9.0mm |
| 72.34.1312 | 62mm | 10.5mm |
| 72.34.1313 | 62mm | 11.5mm |
| 72.34.1314 | 62mm | 13.0mm |
| 72.34.1315 | 62mm | 15.5mm |
| 72.34.1316 | 62mm | 18.0mm |
| 72.34.1317* | 62mm | 20.5mm |
| 72.34.1320 | 64mm | 8.0mm |
| 72.34.1321 | 64mm | 9.0mm |
| 72.34.1322 | 64mm | 10.5mm |
| 72.34.1323 | 64mm | 11.5mm |
| 72.34.1324 | 64mm | 13.0mm |
| 72.34.1325 | 64mm | 15.5mm |
| 72.34.1326 | 64mm | 18.0mm |
| 72.34.1327* | 64mm | 20.5mm |
| 72.34.1330 | 67mm | 8.0mm |
| 72.34.1331 | 67mm | 9.0mm |
| 72.34.1332 | 67mm | 10.5mm |
| 72.34.1333 | 67mm | 11.5mm |
| 72.34.1334 | 67mm | 13.0mm |
| 72.34.1335 | 67mm | 15.5mm |
| 72.34.1336 | 67mm | 18.0mm |
| 72.34.1337* | 67mm | 20.5mm |

Material: VEPE

*on request

| Item no. | Mediolat. | Size |
|-------------|-----------|--------|
| 72.34.1340 | 70mm | 8.0mm |
| 72.34.1341 | 70mm | 9.0mm |
| 72.34.1342 | 70mm | 10.5mm |
| 72.34.1343 | 70mm | 11.5mm |
| 72.34.1344 | 70mm | 13.0mm |
| 72.34.1345 | 70mm | 15.5mm |
| 72.34.1346 | 70mm | 18.0mm |
| 72.34.1347* | 70mm | 20.5mm |
| 72.34.1350 | 75mm | 8.0mm |
| 72.34.1351 | 75mm | 9.0mm |
| 72.34.1352 | 75mm | 10.5mm |
| 72.34.1353 | 75mm | 11.5mm |
| 72.34.1354 | 75mm | 13.0mm |
| 72.34.1355 | 75mm | 15.5mm |
| 72.34.1356 | 75mm | 18.0mm |
| 72.34.1357* | 75mm | 20.5mm |
| 72.34.1360 | 80mm | 8.0mm |
| 72.34.1361 | 80mm | 9.0mm |
| 72.34.1362 | 80mm | 10.5mm |
| 72.34.1363 | 80mm | 11.5mm |
| 72.34.1364 | 80mm | 13.0mm |
| 72.34.1365 | 80mm | 15.5mm |
| 72.34.1366 | 80mm | 18.0mm |
| 72.34.1367* | 80mm | 20.5mm |
| 72.34.1370 | 85mm | 8.0mm |
| 72.34.1371 | 85mm | 9.0mm |
| 72.34.1372 | 85mm | 10.5mm |
| 72.34.1373 | 85mm | 11.5mm |
| 72.34.1374 | 85mm | 13.0mm |
| 72.34.1375 | 85mm | 15.5mm |
| 72.34.1376 | 85mm | 18.0mm |
| 72.34.1377* | 85mm | 20.5mm |

balanSys TiNbN Components

balanSys Femur TiNbN, cemented



| Item no. | Mediolat. | Size |
|------------|-----------|---------|
| 72.23.3401 | 56 mm | XS left |
| 72.23.3701 | 58 mm | S left |
| 72.23.4001 | 60 mm | A left |
| 72.23.4301 | 64 mm | B left |
| 72.23.4601 | 68 mm | C left |
| 72.23.4901 | 72 mm | D left |
| 72.23.5201 | 76 mm | E left |
| 72.23.5501 | 80 mm | F left |

Material: CoCrMo, TiNbN coating

| Item no. | Mediolat. | Size |
|------------|-----------|----------|
| 72.23.3402 | 56 mm | XS right |
| 72.23.3702 | 58 mm | S right |
| 72.23.4002 | 60 mm | A right |
| 72.23.4302 | 64 mm | B right |
| 72.23.4602 | 68 mm | C right |
| 72.23.4902 | 72 mm | D right |
| 72.23.5202 | 76 mm | E right |
| 72.23.5502 | 80 mm | F right |

balanSys PS Tibial Plateau TiNbN Fix, cemented



| Item no. | Mediolateral |
|------------|--------------|
| 79.23.0400 | 59 mm |
| 79.23.0401 | 62 mm |
| 79.23.0056 | 64 mm |
| 79.23.0402 | 67 mm |

Material: CoCrMo, TiNbN coating

| Item no. | Mediolateral |
|------------|--------------|
| 79.23.0057 | 70 mm |
| 79.23.0058 | 75 mm |
| 79.23.0059 | 80 mm |
| 79.23.0060 | 85 mm |

balanSys PS Femur TiNbN, cemented



| Item no. | Mediolat. | Size |
|------------|-----------|---------|
| 79.23.1009 | 56 mm | XS left |
| 79.23.1010 | 58 mm | S left |
| 79.23.0011 | 60 mm | A left |
| 79.23.0012 | 64 mm | B left |
| 79.23.0013 | 68 mm | C left |
| 79.23.0014 | 72 mm | D left |
| 79.23.0015 | 76 mm | E left |
| 79.23.1016 | 80 mm | F left |

Material: CoCrMo, TiNbN coating

| Item no. | Mediolat. | Size |
|------------|-----------|----------|
| 79.23.0999 | 56 mm | XS right |
| 79.23.1000 | 58 mm | S right |
| 79.23.0001 | 60 mm | A right |
| 79.23.0002 | 64 mm | B right |
| 79.23.0003 | 68 mm | C right |
| 79.23.0004 | 72 mm | D right |
| 79.23.0005 | 76 mm | E right |
| 79.23.1006 | 80 mm | F right |

balanSys 3-Peg Patella FLAT Components



| Item no. | Diameter Ø |
|------------|------------|
| 72.34.0049 | 26 mm |
| 72.34.0050 | 28 mm |
| 72.34.0051 | 31 mm |
| 72.34.0052 | 34 mm |
| 72.34.0053 | 37 mm |

Material: UHMWPE, FeCrNiMoMn (Contrast balls)

balanSys 3-Peg Patella Components



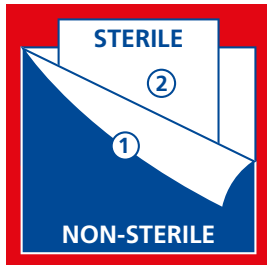
| Item no. | Diameter Ø |
|------------|------------|
| 72.30.0128 | 28 mm |
| 72.30.0131 | 31 mm |
| 72.30.0134 | 34 mm |
| 72.30.0137 | 37 mm |

Material: UHMWPE, FeCrNiMoMn (Contrast balls)

Not all products are available in all countries.

8. Implants

8.3 Double pouch and triple pouch sterile packaging



Instruction for double pouch / double blister packaging:

This packaging consists of a double sterile barrier system.

- 1) The outer sterile barrier (1st layer) must be opened by non-sterile operating room (OR) personnel.
- 2) The inner sterile barrier must be presented to sterile OR personnel using an aseptic technique.
- 3) The inner sterile barrier (2nd layer) must be taken out by sterile OR personnel.
- 4) The inner sterile barrier (2nd layer) must be opened by sterile OR personnel, and the implant can be taken out.



Instruction for the triple pouch packaging:

This packaging consists of a double sterile barrier system packaged into non-sterile protective pouch.

- 1) The non-sterile protective pouch (1st layer) must be opened by non-sterile operating room (OR) personnel.
- 2) The outer sterile barrier (2nd layer) must be taken out of the protective pouch by non-sterile OR personnel.
- 3) The outer sterile barrier (2nd layer) must be opened by non-sterile OR personnel and the inner sterile barrier must be presented to sterile OR personnel using an aseptic technique.
- 4) The inner sterile barrier (3rd layer) must be taken out by sterile OR personnel.
- 5) The inner sterile barrier (3rd layer) must be opened by sterile OR personnel, and the implant can be taken out.

9. Instruments

Basic instruments

| | |
|-------------------------------|----|
| leggera Basic Set 71.34.9193A | 92 |
| leggera Tibia Set 71.34.9194A | 96 |

Surgical technique

| | |
|---|----|
| leggera Femur Set Bone Oriented 71.34.9195A | 99 |
|---|----|

Trial instruments

| | |
|--|-----|
| leggera Trial Set CR/UC 71.34.9196A | 101 |
| leggera Trial Set PS 71.34.9197A | 103 |
| leggera Trial Set CR/UC Add. Sizes 71.34.9198A | 106 |
| leggera Trial Set PS Add. Sizes 71.34.9199A | 107 |
| balanSys Trial Set RP 71.34.9060A | 108 |

Patella instruments

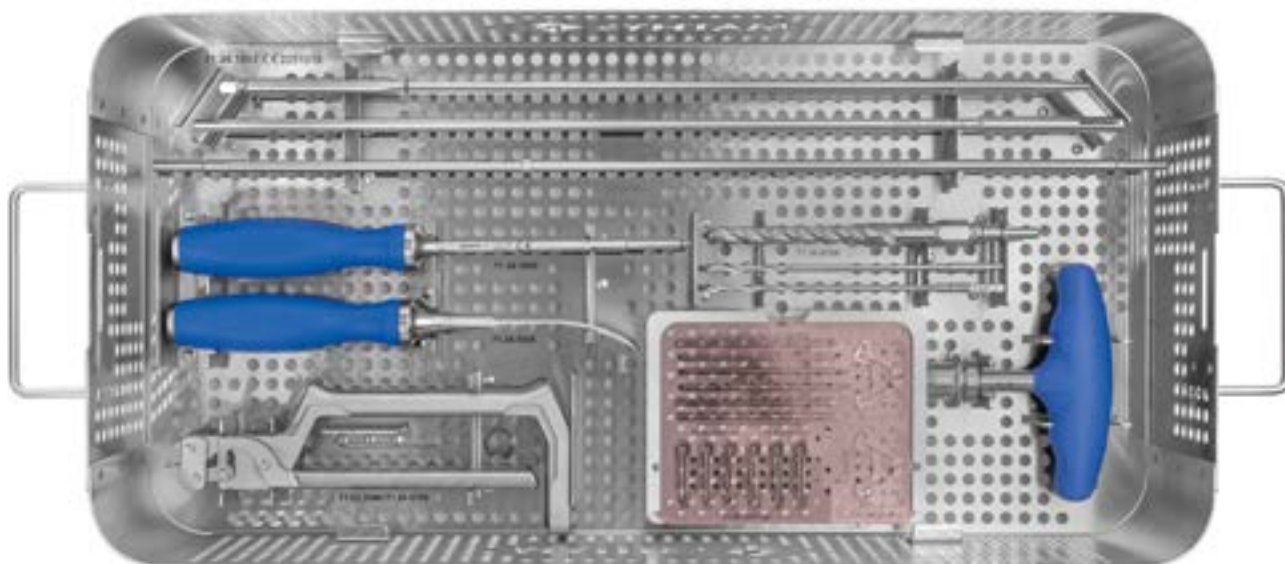
| | |
|---|-----|
| balanSys 3-Peg Patella FLAT 71.34.0080A | 112 |
| balanSys 3-Peg Patella STANDARD 71.34.0081A | 112 |

| | |
|----------------------------|------------|
| Measuring templates | 114 |
|----------------------------|------------|

Not all products are available in all countries.

leggera Basic Set 71.34.9193A

No Picture / 71.34.1056 **leggera Set Lid**



71.34.1057 leggera Basic Set Tray



| Item no. | Description | Qty. |
|----------------|-----------------|------|
| 10.935-RAL5010 | Silicone Handle | 1 |

| Item no. | Description | Qty. |
|------------|---------------------|------|
| 71.02.3054 | balanSys pin 3.2/80 | 6 |

| Item no. | Description | Qty. |
|------------|-------------------------------|------|
| 71.34.1047 | balanSys Pin with Head 3.2/30 | 4 |

| Item no. | Description | Qty. |
|------------|---------------------|------|
| 71.34.0798 | balanSys Pin Pliers | 1 |

| Item no. | Description | Qty. |
|----------|------------------|------|
| 315.310 | AO Drill bit 3.2 | 2 |

| Item no. | Description | Qty. |
|------------|------------------------------|------|
| 71.34.0100 | balanSys drill bit 8.5/11 mm | 1 |

| Item no. | Description | Qty. |
|------------|------------------------------------|------|
| 71.34.1048 | balanSys Osteophyte Chisel, curved | 1 |

| Item no. | Description | Qty. |
|------------|----------------------|------|
| 71.34.1049 | balanSys Screwdriver | 1 |

| Item no. | Description | Qty. |
|------------|-----------------------------|------|
| 71.34.0793 | balanSys Intramedullary Rod | 1 |

| Item no. | Description | Qty. |
|------------|------------------------------|------|
| 71.34.1008 | balanSys Alignment Rod Short | 1 |

| Item no. | Description | Qty. |
|------------|-----------------------------|------|
| 71.34.1009 | balanSys Alignment Rod Long | 1 |

| Item no. | Description | Qty. |
|------------|------------------------------|------|
| 71.34.1055 | balanSys Adapter Trial Inlay | 1 |



| Item no. | Description | Qty. |
|------------|------------------------------------|------|
| 71.02.1005 | balanSys Trs. rubber band 3x25x300 | 1 |

| Item no. | Description | Qty. |
|------------|--------------------------|------|
| 71.34.1050 | balanSys reference plate | 2 |

| Item no. | Description | Qty. |
|------------|------------------------|------|
| 71.34.0792 | balanSys Tibial Stylus | 1 |

| Item no. | Description | Qty. |
|------------|-------------------------|------|
| 71.02.3005 | balanSys bone retractor | 2 |

| Item no. | Description | Qty. |
|------------|-----------------------|------|
| 71.34.0833 | balanSys TRS Proximal | 1 |

| Item no. | Description | Qty. |
|------------|---------------------|------|
| 71.34.1001 | balanSys TRS Distal | 1 |

| Item no. | Description | Qty. |
|------------|---------------------------|------|
| 71.34.0835 | balanSys TRS Ankle Holder | 1 |

| Item no. | Description | Qty. |
|------------|----------------------------|------|
| 71.34.0834 | balanSys TRS Cutting Guide | 1 |

| Item no. | Description | Qty. |
|------------|-------------------------------|------|
| 71.34.0999 | balanSys TRS Eminentia Shakle | 1 |

| Item no. | Description | Qty. |
|------------|------------------------------------|------|
| 71.34.1000 | balanSys TRS Intramedullary Shakle | 1 |

Optional instruments

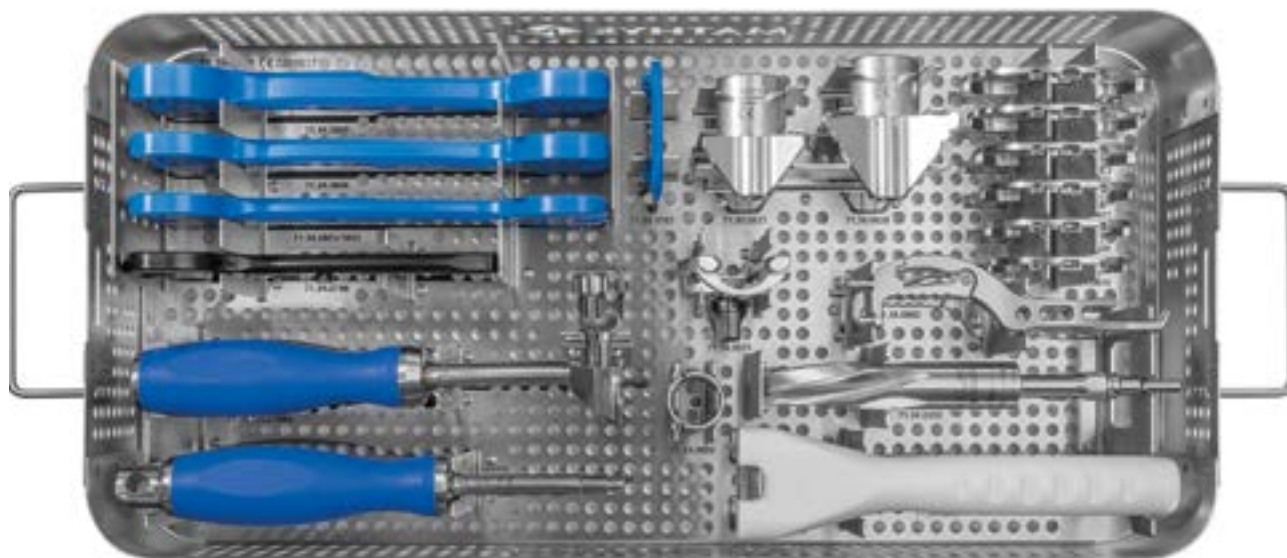
| Item no. | Description | Qty. |
|------------|--|------|
| 71.34.1054 | balanSys Paddle Corrective Cutting Guide | 1 |

| Item no. | Description | Qty. |
|------------|-----------------------------------|------|
| 71.34.0836 | balanSys Corrective Cutting Guide | 1 |

| Item no. | Description | Qty. |
|------------|--|------|
| 71.34.1077 | balanSys TRS Eminentia Shakle rotating | 1 |

leggera Tibia Set 71.34.9194A

No Picture / 71.34.1056 **leggera Set Lid**



71.34.1059 leggera Tibia Set Tray



| Item no. | Description | Qty. |
|------------|--------------------------|------|
| 71.34.0800 | balanSys Tibial Impactor | 1 |



| Item no. | Description | Qty. |
|------------|---------------------------------|------|
| 71.34.0802 | balanSys Holder Tibial Template | 1 |



| Item no. | Description | Qty. |
|------------|-----------------|------|
| 71.34.0200 | balanSys Reamer | 1 |



| Item no. | Description | Qty. |
|------------|-----------------------------|------|
| 71.34.0819 | balanSys Tibial Template 64 | 1 |
| 71.34.0820 | balanSys Tibial Template 67 | 1 |
| 71.34.0821 | balanSys Tibial Template 70 | 1 |
| 71.34.0822 | balanSys Tibial Template 75 | 1 |
| 71.34.0823 | balanSys Tibial Template 80 | 1 |
| 71.34.0824 | balanSys Tibial Template 85 | 1 |



| Item no. | Description | Qty. |
|------------|---------------------------------|------|
| 71.34.0825 | balanSys Chisel Centering Guide | 1 |



| Item no. | Description | Qty. |
|------------|-----------------------------------|------|
| 71.34.0826 | balanSys Attachment Milling Guide | 1 |



| Item no. | Description | Qty. |
|------------|---------------------------|------|
| 71.34.0827 | balanSys Fin Chisel 59–70 | 1 |
| 71.34.0828 | balanSys Fin Chisel 59–85 | 1 |



| Item no. | Description | Qty. |
|------------|------------------------|------|
| 71.34.0829 | balanSys Chisel Handle | 1 |



| Item no. | Description | Qty. |
|------------|--|------|
| 71.34.1052 | balanSys Positioner for Tibial Plateau | 1 |



| Item no. | Description | Qty. |
|-------------|---------------------------------------|------|
| 71.34.0805* | balanSys Spacer Block Tibia 8/9 | 1 |
| 71.34.0806* | balanSys Spacer Block Tibia 10.5/11.5 | 1 |
| 71.34.0807 | balanSys Spacer Block Tibia 13/15.5 | 1 |

* balanSys PE Inlays 9mm and 11.5 mm are available in vitamys only.



| Item no. | Description | Qty. |
|------------|--------------------------------|------|
| 71.34.0795 | balanSys Spacer Shift Plate +5 | 1 |



| Item no. | Description | Qty. |
|------------|-----------------------------|------|
| 71.34.0796 | balanSys Spacer Block Femur | 1 |

Optional instruments



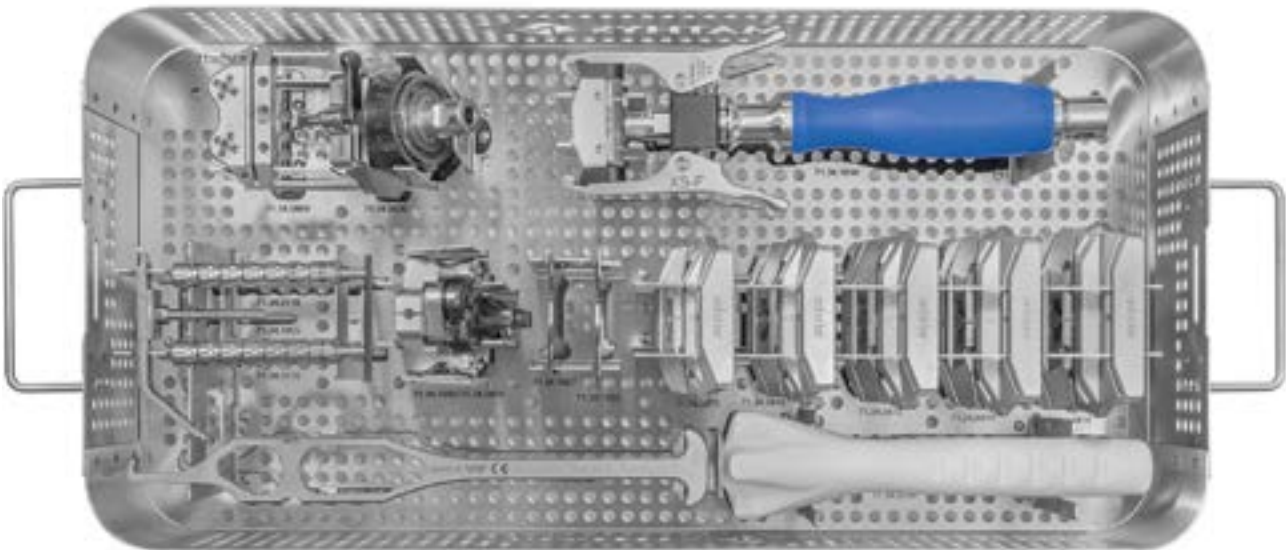
| Item no. | Description | Qty. |
|------------|------------------------------------|------|
| 71.34.1053 | balanSys Spacer Block Tibia 8/10.5 | 1 |



| Item no. | Description | Qty. |
|------------|---------------------------------------|------|
| 71.34.0886 | balanSys Positioner Tibial Plateau RP | 1 |

leggera Femur Set Bone Oriented 71.34.9195A

No Picture / 71.34.1056 **leggera Set Lid**



71.34.1060 leggera Femur Set BO Tray



| Item no. | Description | Qty. |
|------------|--------------------------------------|------|
| 71.34.0839 | balanSys Femur Sizing/Rotation Guide | 1 |

| Item no. | Description | Qty. |
|------------|----------------------|------|
| 71.34.0830 | balanSys Angle Guide | 1 |

| Item no. | Description | Qty. |
|------------|-------------------------------|------|
| 71.34.0804 | balanSys Distal Cutting Guide | 1 |

| Item no. | Description | Qty. |
|------------|---------------------------------------|------|
| 71.34.1006 | balanSys Femur Rotation Bearing Large | 1 |
| 71.34.1007 | balanSys Femur Rotation Bearing Small | 1 |



| Item no. | Description | Qty. |
|------------|---|------|
| 71.34.0118 | balanSys Handle Femoral Siz./Rot. Guide | 2 |

| Item no. | Description | Qty. |
|------------|-----------------------|------|
| 71.34.1005 | balanSys Femur Stylus | 1 |

| Item no. | Description | Qty. |
|------------|--------------------------|------|
| 71.34.0788 | balanSys Femur Extractor | 1 |

| Item no. | Description | Qty. |
|------------|-----------------------|------|
| 71.34.1014 | balanSys Femur Holder | 1 |

| Item no. | Description | Qty. |
|------------|-------------------------------|------|
| 71.34.0811 | balanSys 4in1 Cutting Guide A | 1 |
| 71.34.0812 | balanSys 4in1 Cutting Guide B | 1 |
| 71.34.0813 | balanSys 4in1 Cutting Guide C | 1 |
| 71.34.0814 | balanSys 4in1 Cutting Guide D | 1 |
| 71.34.0815 | balanSys 4in1 Cutting Guide E | 1 |

| Item no. | Description | Qty. |
|------------|---------------------------|------|
| 71.34.0799 | balanSys Femoral Impactor | 1 |

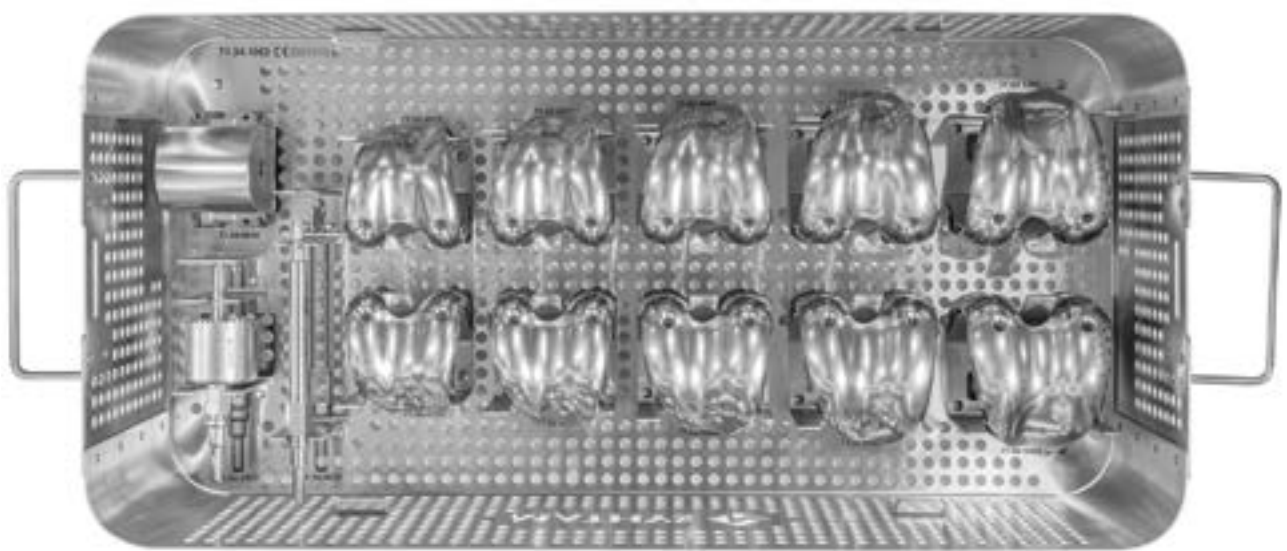
Optional instruments

| Item no. | Description | Qty. |
|------------|---|------|
| 71.34.1003 | balanSys Femur Sizing/Rotation Guide AP | 1 |

| Item no. | Description | Qty. |
|------------|---|------|
| 71.34.1078 | balanSys Femur Rot. Bearing Short Large | 1 |
| 71.34.1079 | balanSys Femur Rot. Bearing Short Small | 1 |

leggera Trial Set CR/UC 71.34.9196A

No Picture / 71.34.1056 **leggera Set Lid**



71.34.1063 leggera Trial Set CR/UC Tray



| Item no. | Description | Qty. |
|------------|--------------------------------|------|
| 71.34.0023 | balanSys Drill Bit with stop 6 | 1 |



| Item no. | Description | Qty. |
|------------|---------------------------|------|
| 71.34.0840 | balanSys Trochlea Bushing | 1 |

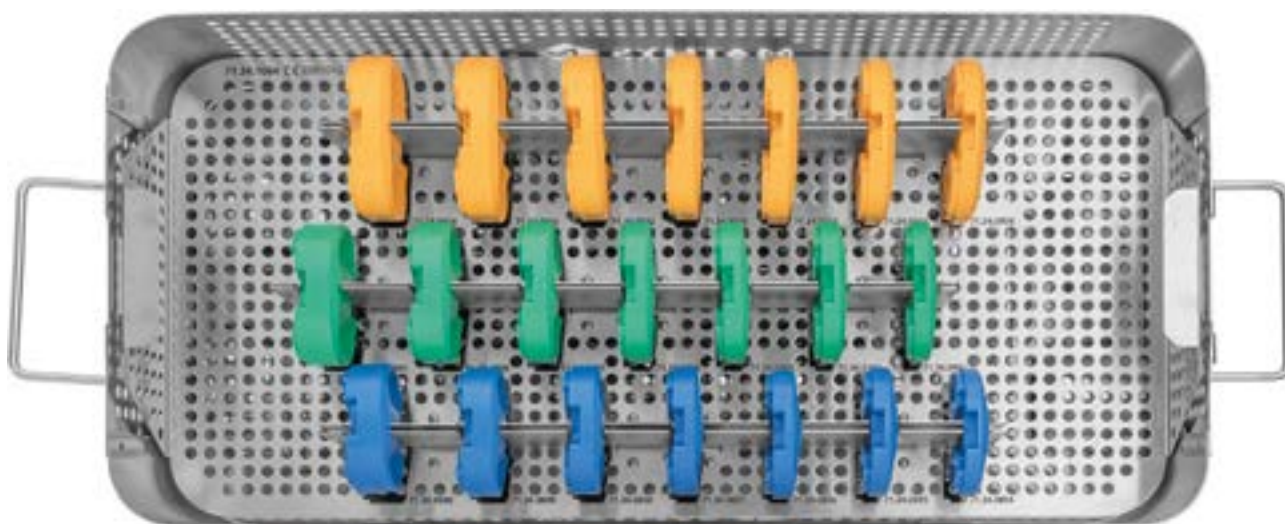


| Item no. | Description | Qty. |
|------------|------------------------------|------|
| 71.02.4001 | balanSys trial femur A left | 1 |
| 71.02.4002 | balanSys trial femur A right | 1 |
| 71.02.4301 | balanSys trial femur B left | 1 |
| 71.02.4302 | balanSys trial femur B right | 1 |
| 71.02.4601 | balanSys trial femur C left | 1 |
| 71.02.4602 | balanSys trial femur C right | 1 |
| 71.02.4901 | balanSys trial femur D left | 1 |
| 71.02.4902 | balanSys trial femur D right | 1 |
| 71.02.5201 | balanSys trial femur E left | 1 |
| 71.02.5202 | balanSys trial femur E right | 1 |



| Item no. | Description | Qty. |
|------------|--------------------------|------|
| 71.02.3023 | balanSys trochlea reamer | 1 |

leggera Trial Set CR/UC 71.34.9196A



71.34.1064 leggera Trial Set CR/UC Insert

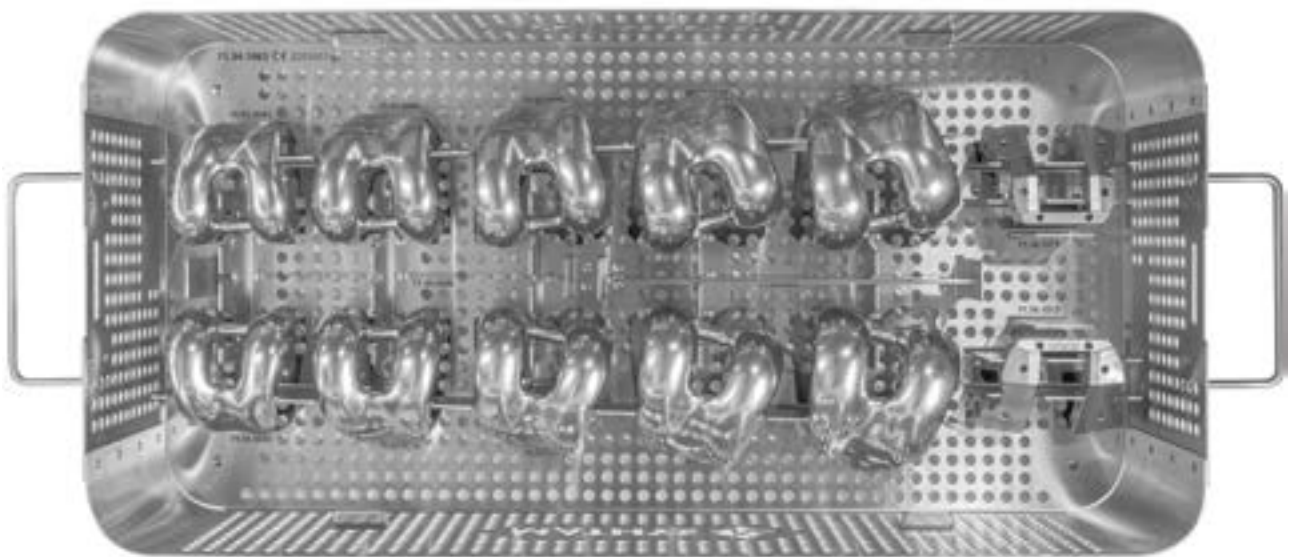


| Item no. | Description | Qty. |
|-------------|---------------------------------------|------|
| 71.34.0894 | balanSys CR/UC Trial Inlay 64–67/8 | 1 |
| 71.34.0895* | balanSys CR/UC Trial Inlay 64–67/9 | 1 |
| 71.34.0896 | balanSys CR/UC Trial Inlay 64–67/10.5 | 1 |
| 71.34.0897* | balanSys CR/UC Trial Inlay 64–67/11.5 | 1 |
| 71.34.0898 | balanSys CR/UC Trial Inlay 64–67/13 | 1 |
| 71.34.0899 | balanSys CR/UC Trial Inlay 64–67/15.5 | 1 |
| 71.34.0900 | balanSys CR/UC Trial Inlay 64–67/18 | 1 |
| 71.34.0901 | balanSys CR/UC Trial Inlay 70–75/8 | 1 |
| 71.34.0902* | balanSys CR/UC Trial Inlay 70–75/9 | 1 |
| 71.34.0903 | balanSys CR/UC Trial Inlay 70–75/10.5 | 1 |
| 71.34.0904* | balanSys CR/UC Trial Inlay 70–75/11.5 | 1 |
| 71.34.0905 | balanSys CR/UC Trial Inlay 70–75/13 | 1 |
| 71.34.0906 | balanSys CR/UC Trial Inlay 70–75/15.5 | 1 |
| 71.34.0907 | balanSys CR/UC Trial Inlay 70–75/18 | 1 |
| 71.34.0908 | balanSys CR/UC Trial Inlay 80–85/8 | 1 |
| 71.34.0909* | balanSys CR/UC Trial Inlay 80–85/9 | 1 |
| 71.34.0910 | balanSys CR/UC Trial Inlay 80–85/10.5 | 1 |
| 71.34.0911* | balanSys CR/UC Trial Inlay 80–85/11.5 | 1 |
| 71.34.0912 | balanSys CR/UC Trial Inlay 80–85/13 | 1 |
| 71.34.0913 | balanSys CR/UC Trial Inlay 80–85/15.5 | 1 |
| 71.34.0914 | balanSys CR/UC Trial Inlay 80–85/18 | 1 |

* balanSys PE Inlays 9mm and 11.5mm are available in vitamys only.

leggera Trial Set PS 71.34.9197A

No Picture / 71.34.1056 **leggera Set Lid**



71.34.1063 **leggera Trial Set CR/UC Tray**



| Item no. | Description | Qty. |
|------------|---------------------------------|------|
| 79.02.0040 | balanSys PS trial femur A right | 1 |
| 79.02.0041 | balanSys PS trial femur A left | 1 |
| 79.02.0042 | balanSys PS trial femur B right | 1 |
| 79.02.0043 | balanSys PS trial femur B left | 1 |
| 79.02.0044 | balanSys PS trial femur C right | 1 |
| 79.02.0045 | balanSys PS trial femur C left | 1 |
| 79.02.0046 | balanSys PS trial femur D right | 1 |
| 79.02.0047 | balanSys PS trial femur D left | 1 |
| 79.02.0048 | balanSys PS trial femur E right | 1 |
| 79.02.0049 | balanSys PS trial femur E left | 1 |

| Item no. | Description | Qty. |
|------------|--|------|
| 71.34.1011 | balanSys Femur Box Cutting Guide A/B/C | 1 |
| 71.34.1012 | balanSys Femur Box Cutting Guide D/E | 1 |

| Item no. | Description | Qty. |
|------------|---------------------------|------|
| 71.34.0691 | balanSys Chisel 25 mm A–F | 1 |

leggera Trial Set PS 71.34.9197A



71.34.1066 leggera Trial Set PS Insert



| Item no. | Description | Qty. |
|-------------|------------------------------------|------|
| 71.34.0923 | balanSys PS Trial Inlay 64–67/8 | 1 |
| 71.34.0924* | balanSys PS Trial Inlay 64–67/9.0 | 1 |
| 71.34.0925 | balanSys PS Trial Inlay 64–67/10.5 | 1 |
| 71.34.0926* | balanSys PS Trial Inlay 64–67/11.5 | 1 |
| 71.34.0927 | balanSys PS Trial Inlay 64–67/13 | 1 |
| 71.34.0928 | balanSys PS Trial Inlay 64–67/15.5 | 1 |
| 71.34.0929 | balanSys PS Trial Inlay 64–67/18 | 1 |
| 71.34.0930 | balanSys PS Trial Inlay 64–67/20.5 | 1 |
| 71.34.0931 | balanSys PS Trial Inlay 70–75/8 | 1 |
| 71.34.0932* | balanSys PS Trial Inlay 70–75/9 | 1 |
| 71.34.0933 | balanSys PS Trial Inlay 70–75/10.5 | 1 |
| 71.34.0934* | balanSys PS Trial Inlay 70–75/11.5 | 1 |
| 71.34.0935 | balanSys PS Trial Inlay 70–75/13 | 1 |
| 71.34.0936 | balanSys PS Trial Inlay 70–75/15.5 | 1 |
| 71.34.0937 | balanSys PS Trial Inlay 70–75/18 | 1 |
| 71.34.0938 | balanSys PS Trial Inlay 70–75/20.5 | 1 |
| 71.34.0939 | balanSys PS Trial Inlay 80–85/8 | 1 |
| 71.34.0940* | balanSys PS Trial Inlay 80–85/9 | 1 |
| 71.34.0941 | balanSys PS Trial Inlay 80–85/10.5 | 1 |
| 71.34.0942* | balanSys PS Trial Inlay 80–85/11.5 | 1 |
| 71.34.0943 | balanSys PS Trial Inlay 80–85/13 | 1 |
| 71.34.0944 | balanSys PS Trial Inlay 80–85/15.5 | 1 |
| 71.34.0945 | balanSys PS Trial Inlay 80–85/18 | 1 |
| 71.34.0946 | balanSys PS Trial Inlay 80–85/20.5 | 1 |

* balanSys PE Inlays 9 mm and 11.5 mm are available in vitamys only.

leggera Trial Set CR/UC Add. Sizes 71.34.9198A

No Picture / 71.34.1056 **leggera Set Lid**

No Picture / 71.34.1067 **leggera Trial Set CR/UC Add. Sizes Tray**



| Item no. | Description | Qty. |
|------------|--------------------------------|------|
| 71.34.0809 | balanSys 4in1 Cutting Guide XS | 1 |
| 71.34.0810 | balanSys 4in1 Cutting Guide S | 1 |
| 71.34.0816 | balanSys 4in1 Cutting Guide F | 1 |



| Item no. | Description | Qty. |
|------------|-----------------------------|------|
| 71.34.0818 | balanSys Tibial Template 59 | 1 |
| 71.34.0801 | balanSys Tibial Template 62 | 1 |



| Item no. | Description | Qty. |
|------------|-------------------------------|------|
| 71.34.0355 | balanSys trial femur XS left | 1 |
| 71.34.0356 | balanSys trial femur XS right | 1 |
| 71.34.0504 | balanSys trial femur S left | 1 |
| 71.34.0505 | balanSys trial femur S right | 1 |
| 71.34.0371 | balanSys trial femur F left | 1 |
| 71.34.0372 | balanSys trial femur F right | 1 |



| Item no. | Description | Qty. |
|-------------|---------------------------------------|------|
| 71.34.0887 | balanSys CR/UC Trial Inlay 59–62/8 | 1 |
| 71.34.0888* | balanSys CR/UC Trial Inlay 59–62/9 | 1 |
| 71.34.0889 | balanSys CR/UC Trial Inlay 59–62/10.5 | 1 |
| 71.34.0890* | balanSys CR/UC Trial Inlay 59–62/11.5 | 1 |
| 71.34.0891 | balanSys CR/UC Trial Inlay 59–62/13 | 1 |
| 71.34.0892 | balanSys CR/UC Trial Inlay 59–62/15.5 | 1 |
| 71.34.0893 | balanSys CR/UC Trial Inlay 59–62/18 | 1 |

* balanSys PE Inlays 9 mm and 11.5 mm are available in vitamys only.

leggera Trial Set PS Add. Sizes 71.34.9199A

No Picture / 71.34.1056 **leggera Set Lid**

No Picture / 71.34.1068 **leggera Trial Set PS Add. Sizes Tray**



| Item no. | Description | Qty. |
|------------|---------------------------------------|------|
| 71.34.1010 | balanSys Femur Box Cutting Guide XS/S | 1 |
| 71.34.1013 | balanSys Femur Box Cutting Guide F | 1 |



| Item no. | Description | Qty. |
|------------|----------------------------|------|
| 71.34.0690 | balanSys Chisel 22 mm XS/S | 1 |



| Item no. | Description | Qty. |
|------------|----------------------------------|------|
| 71.34.0382 | balanSys PS trial femur XS left | 1 |
| 71.34.0383 | balanSys PS trial femur XS right | 1 |
| 71.34.0247 | balanSys PS trial femur S left | 1 |
| 71.34.0248 | balanSys PS trial femur S right | 1 |
| 71.34.0399 | balanSys PS trial femur F left | 1 |
| 71.34.0400 | balanSys PS trial femur F right | 1 |



| Item no. | Description | Qty. |
|-------------|------------------------------------|------|
| 71.34.0915 | balanSys PS Trial Inlay 59–62/8 | 1 |
| 71.34.0916* | balanSys PS Trial Inlay 59–62/9 | 1 |
| 71.34.0917 | balanSys PS Trial Inlay 59–62/10.5 | 1 |
| 71.34.0918* | balanSys PS Trial Inlay 59–62/11.5 | 1 |
| 71.34.0919 | balanSys PS Trial Inlay 59–62/13 | 1 |
| 71.34.0920 | balanSys PS Trial Inlay 59–62/15.5 | 1 |
| 71.34.0921 | balanSys PS Trial Inlay 59–62/18 | 1 |
| 71.34.0922 | balanSys PS Trial Inlay 59–62/20.5 | 1 |

* balanSys PE Inlays 9 mm and 11.5 mm are available in vitamys only.



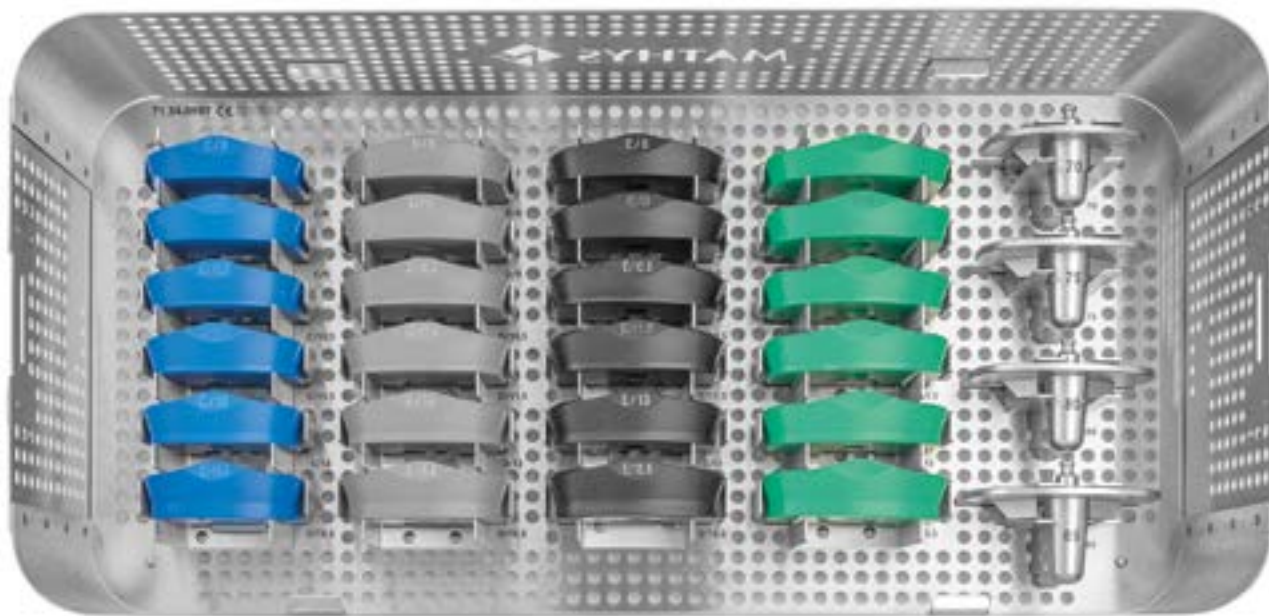
| Item no. | Description | Qty. |
|------------|--------------------------------|------|
| 71.34.0809 | balanSys 4in1 Cutting Guide XS | 1 |
| 71.34.0810 | balanSys 4in1 Cutting Guide S | 1 |
| 71.34.0816 | balanSys 4in1 Cutting Guide F | 1 |



| Item no. | Description | Qty. |
|------------|-----------------------------|------|
| 71.34.0818 | balanSys Tibial Template 59 | 1 |
| 71.34.0801 | balanSys Tibial Template 62 | 1 |

balanSys Trial Set RP 71.34.9060A (optional)

No Picture / 71.34.1056 **leggera Set Lid**



71.34.0997 **balanSys Trial Set 6-RP Tray**

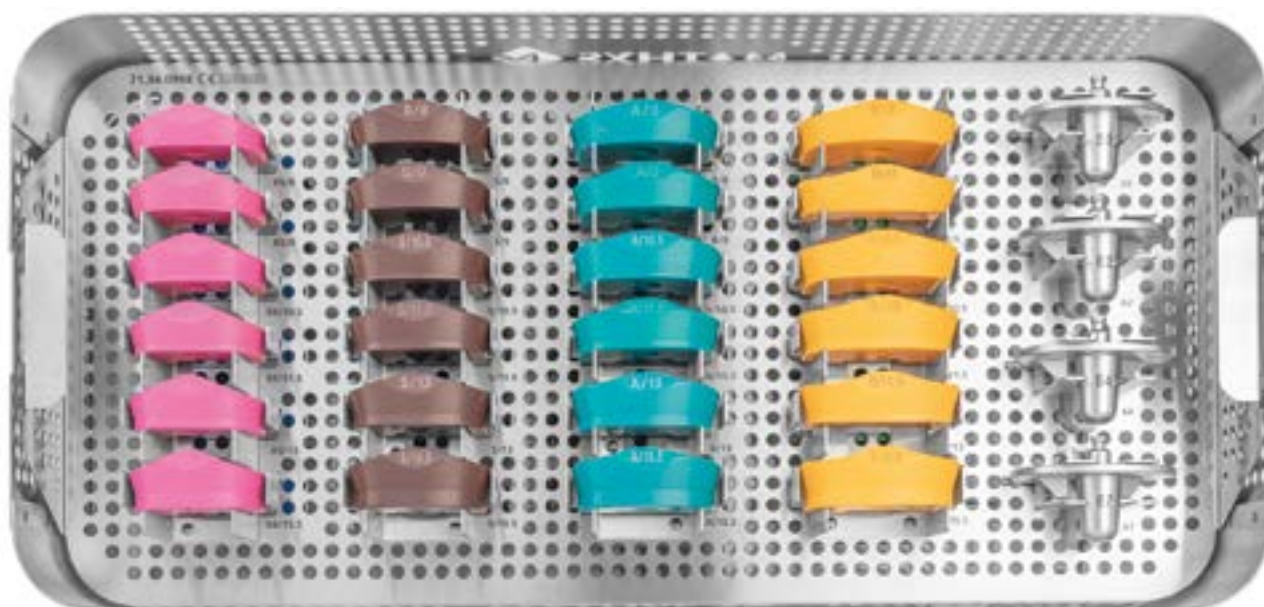


| Item no. | Description | Qty. |
|------------|-------------------------------------|------|
| 71.34.0297 | balanSys RP Trial Tibial Plateau 70 | 1 |
| 71.34.0298 | balanSys RP Trial Tibial Plateau 75 | 1 |
| 71.34.0299 | balanSys RP Trial Tibial Plateau 80 | 1 |
| 71.34.0300 | balanSys RP Trial Tibial Plateau 85 | 1 |

| Item no. | Description | Qty. |
|-------------|-----------------------------------|------|
| 71.34.0574 | balanSys RP PE Trial Inlay C/8 | 1 |
| 71.34.0989* | balanSys RP PE Trial Inlay C/9 | 1 |
| 71.34.0575 | balanSys RP PE Trial Inlay C/10.5 | 1 |
| 71.34.0990* | balanSys RP PE Trial Inlay C/11.5 | 1 |
| 71.34.0576 | balanSys RP PE Trial Inlay C/13 | 1 |
| 71.34.0577 | balanSys RP PE Trial Inlay C/15.5 | 1 |
| 71.34.0580 | balanSys RP PE Trial Inlay D/8 | 1 |
| 71.34.0991* | balanSys RP PE Trial Inlay D/9 | 1 |
| 71.34.0581 | balanSys RP PE Trial Inlay D/10.5 | 1 |
| 71.34.0992* | balanSys RP PE Trial Inlay D/11.5 | 1 |
| 71.34.0582 | balanSys RP PE Trial Inlay D/13 | 1 |
| 71.34.0583 | balanSys RP PE Trial Inlay D/15.5 | 1 |
| 71.34.0586 | balanSys RP PE Trial Inlay E/8 | 1 |
| 71.34.0993* | balanSys RP PE Trial Inlay E/9 | 1 |
| 71.34.0587 | balanSys RP PE Trial Inlay E/10.5 | 1 |
| 71.34.0994* | balanSys RP PE Trial Inlay E/11.5 | 1 |
| 71.34.0588 | balanSys RP PE Trial Inlay E/13 | 1 |
| 71.34.0589 | balanSys RP PE Trial Inlay E/15.5 | 1 |
| 71.34.0429 | balanSys RP PE Trial Inlay F/8 | 1 |
| 71.34.0995* | balanSys RP PE Trial Inlay F/9 | 1 |
| 71.34.0430 | balanSys RP PE Trial Inlay F/10.5 | 1 |
| 71.34.0996* | balanSys RP PE Trial Inlay F/11.5 | 1 |
| 71.34.0431 | balanSys RP PE Trial Inlay F/13 | 1 |
| 71.34.0432 | balanSys RP PE Trial Inlay F/15.5 | 1 |

* balanSys PE Inlays 9 mm and 11.5 mm are available in vitamys only.

balanSys Trial Set RP 71.34.9060A (optional)



71.34.0998 **balanSys Trial Set 6-RP Insert**



| Item no. | Description | Qty. |
|------------|-------------------------------------|------|
| 71.34.0418 | balanSys RP Trial Tibial Plateau 59 | 1 |
| 71.34.0294 | balanSys RP Trial Tibial Plateau 62 | 1 |
| 71.34.0295 | balanSys RP Trial Tibial Plateau 64 | 1 |
| 71.34.0296 | balanSys RP Trial Tibial Plateau 67 | 1 |

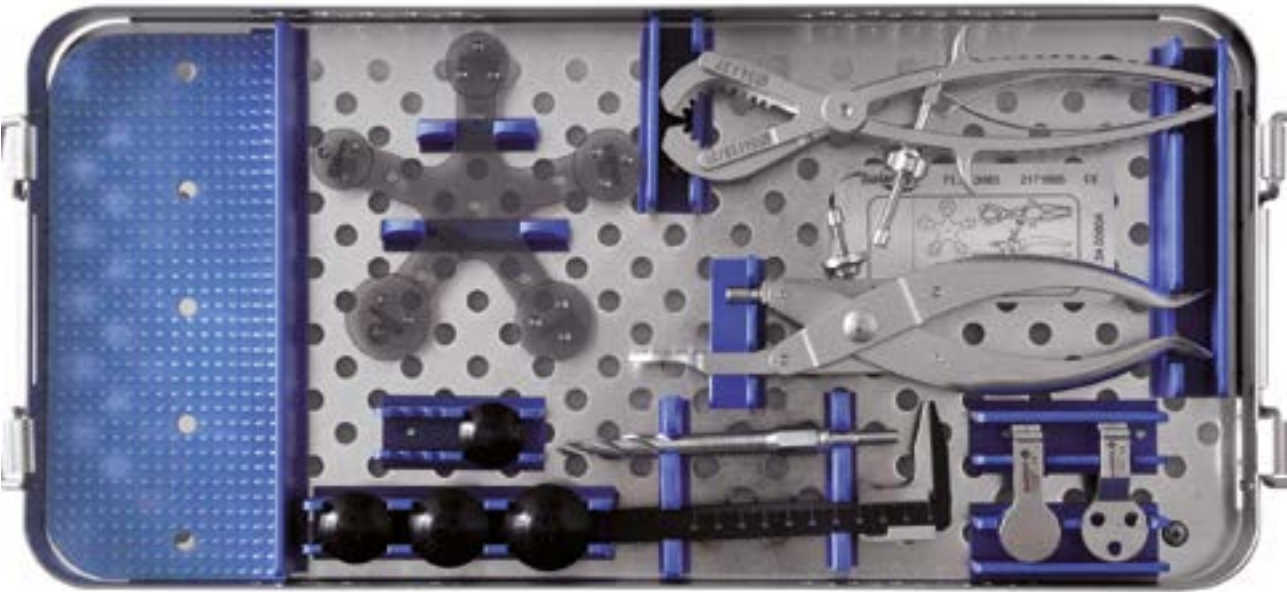
| Item no. | Description | Qty. |
|-------------|------------------------------------|------|
| 71.34.0413 | balanSys RP PE Trial Inlay XS/8 | 1 |
| 71.34.0981* | balanSys RP PE Trial Inlay XS/9 | 1 |
| 71.34.0414 | balanSys RP PE Trial Inlay XS/10.5 | 1 |
| 71.34.0982* | balanSys RP PE Trial Inlay XS/11.5 | 1 |
| 71.34.0415 | balanSys RP PE Trial Inlay XS/13 | 1 |
| 71.34.0416 | balanSys RP PE Trial Inlay XS/15.5 | 1 |
| 71.34.0301 | balanSys RP PE Trial Inlay S/8 | 1 |
| 71.34.0983* | balanSys RP PE Trial Inlay S/9 | 1 |
| 71.34.0302 | balanSys RP PE Trial Inlay S/10.5 | 1 |
| 71.34.0984* | balanSys RP PE Trial Inlay S/11.5 | 1 |
| 71.34.0303 | balanSys RP PE Trial Inlay S/13 | 1 |
| 71.34.0304 | balanSys RP PE Trial Inlay S/15.5 | 1 |
| 71.34.0562 | balanSys RP PE Trial Inlay A/8 | 1 |
| 71.34.0985* | balanSys RP PE Trial Inlay A/9 | 1 |
| 71.34.0563 | balanSys RP PE Trial Inlay A/10.5 | 1 |
| 71.34.0986* | balanSys RP PE Trial Inlay A/11.5 | 1 |
| 71.34.0564 | balanSys RP PE Trial Inlay A/13 | 1 |
| 71.34.0565 | balanSys RP PE Trial Inlay A/15.5 | 1 |
| 71.34.0568 | balanSys RP PE Trial Inlay B/8 | 1 |
| 71.34.0987* | balanSys RP PE Trial Inlay B/9 | 1 |
| 71.34.0569 | balanSys RP PE Trial Inlay B/10.5 | 1 |
| 71.34.0988* | balanSys RP PE Trial Inlay B/11.5 | 1 |
| 71.34.0570 | balanSys RP PE Trial Inlay B/13 | 1 |
| 71.34.0571 | balanSys RP PE Trial Inlay B/15.5 | 1 |

* balanSys PE Inlays 9 mm and 11.5 mm are available in vitamys only.

balanSys 3-Peg Patella FLAT 71.34.0080A

No Picture / 71.34.0082

balanSys Lid 3-Peg Patella FLAT

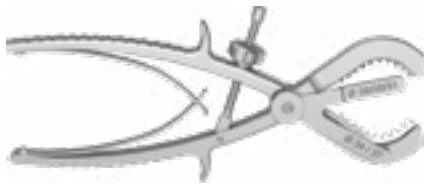


balanSys 3-Peg Patella Standard 71.34.0081A

No Picture / 71.34.0084

balanSys Lid 3-Peg Patella STANDARD

71.34.0083 balanSys Tray f/ patella 3 pegs FLAT

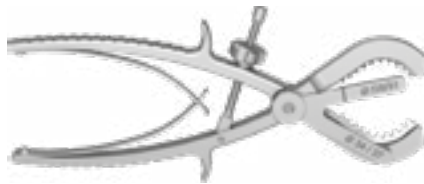


| Item no. | Description |
|------------|--|
| 71.34.0071 | balanSys Patella resection pliers flat |



| Item no. | Description |
|------------|---------------------------------------|
| 71.34.0708 | balanSys Trial patella 3 pegs flat 26 |
| 71.34.0075 | balanSys Trial patella 3 pegs flat 28 |
| 71.34.0076 | balanSys Trial patella 3 pegs flat 31 |
| 71.34.0077 | balanSys Trial patella 3 pegs flat 34 |
| 71.34.0078 | balanSys Trial patella 3 pegs flat 37 |

71.34.0085 balanSys Tray f/ patella 3 pegs STANDARD



| Item no. | Description |
|------------|--|
| 71.34.0070 | balanSys Patella resection pliers raised |



| Item no. | Description |
|------------|---------------------------------|
| 71.02.3063 | balanSys trial patella 3-peg 28 |
| 71.02.3064 | balanSys trial patella 3-peg 31 |
| 71.02.3065 | balanSys trial patella 3-peg 34 |
| 71.02.3066 | balanSys trial patella 3-peg 37 |



| Item no. | Description | Qty. |
|------------|-----------------------------------|------|
| 71.02.2201 | balanSys Patella universal pliers | 1 |

| Item no. | Description | Qty. |
|------------|--|------|
| 71.34.0074 | balanSys Patella drill guide to pliers | 1 |

| Item no. | Description | Qty. |
|------------|--|------|
| 71.34.0073 | balanSys Patella cementing aid to pliers | 1 |

| Item no. | Description | Qty. |
|------------|---------------|------|
| 71.02.3061 | Drill bit 5.5 | 1 |



Optional instruments

NOT part of the standard configuration and must be ordered separately:

| Item no. | Description | Qty. |
|------------|-------------------------------|------|
| 71.34.0079 | balanSys patella sizing guide | 1 |

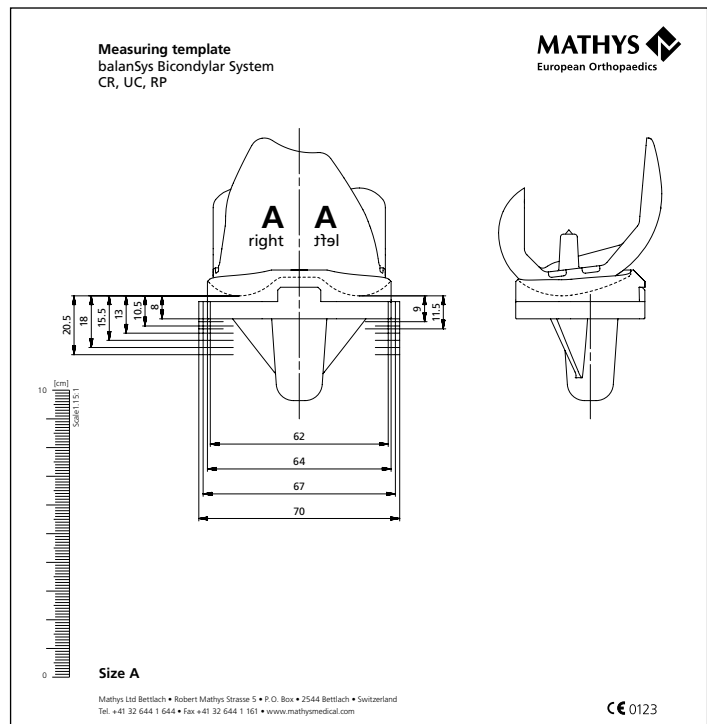
| Item no. | Description | Qty. |
|------------|---------------------------|------|
| 71.02.3002 | balanSys Patella calliper | 1 |

9. Instruments

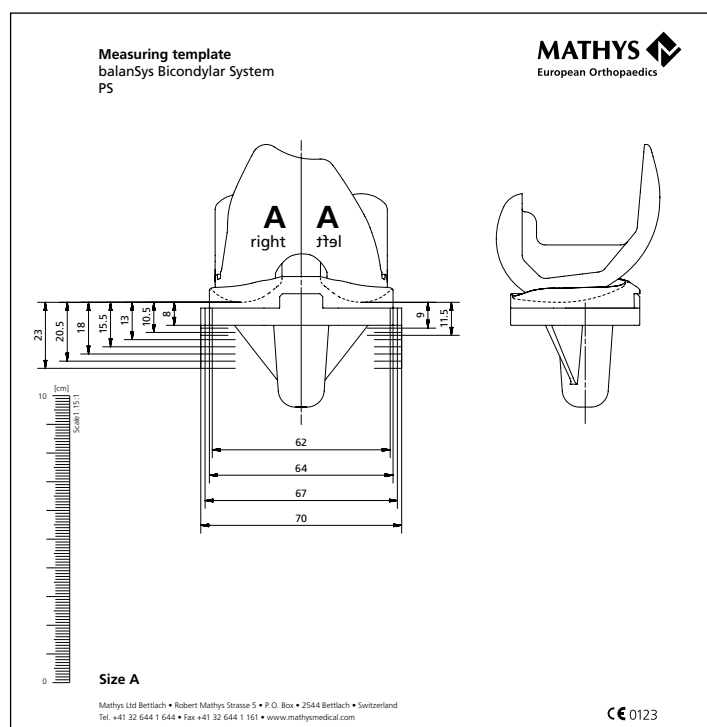
9.1 Measuring templates

balanSys BICON Knee System 330.030.034

Suitable for CR, UC and RP



balanSys PS Knee System 330.030.035



10. Symbols and abbreviations



Manufacturer



Correct



Incorrect



Caution



Open



Close

Click! Engage snap mechanism

CR Cruciate Retaining

UC Ultra Congruent

PS Posterior Stabilized

RP Rotating Platform

ACL Anterior Cruciate Ligament

PCL Posterior Cruciate Ligament

MCL Medial Collateral Ligament

LCL Lateral Collateral Ligament

TRS Tibia Reference System

IFU Instruction For Use

| | | | |
|------------------|--|-----------------------|---|
| Australia | Mathys Orthopaedics Pty Ltd Artarmon, NSW 2064 Tel: +61 2 9417 9200 info.au@mathysmedical.com | Italy | Mathys Ortopedia S.r.l. 20141 Milan Tel: +39 02 4959 8085 info.it@mathysmedical.com |
| Austria | Mathys Orthopädie GmbH 2351 Wiener Neudorf Tel: +43 2236 860 999 info.at@mathysmedical.com | Japan | Mathys KK Tokyo 108-0075 Tel: +81 3 3474 6900 info.jp@mathysmedical.com |
| Belgium | Mathys Orthopaedics Belux N.V.-S.A. 3001 Leuven Tel: +32 16 38 81 20 info.be@mathysmedical.com | New Zealand | Mathys Ltd. Auckland Tel: +64 9 478 39 00 info.nz@mathysmedical.com |
| France | Mathys Orthopédie S.A.S 63360 Gerzat Tel: +33 4 73 23 95 95 info.fr@mathysmedical.com | Netherlands | Mathys Orthopaedics B.V. 3001 Leuven Tel: +31 88 1300 500 info.nl@mathysmedical.com |
| Germany | Mathys Orthopädie GmbH «Centre of Excellence Sales» Bochum 44809 Bochum Tel: +49 234 588 59 0 sales.de@mathysmedical.com «Centre of Excellence Ceramics» Mörsdorf 07646 Mörsdorf/Thür. Tel: +49 364 284 94 0 info.de@mathysmedical.com «Centre of Excellence Production» Hermsdorf 07629 Hermsdorf Tel: +49 364 284 94 110 info.de@mathysmedical.com | P. R. China | Mathys (Shanghai) Medical Device Trading Co., Ltd Shanghai, 200041 Tel: +86 21 6170 2655 info.cn@mathysmedical.com |
| | | Switzerland | Mathys (Schweiz) GmbH 2544 Bettlach Tel: +41 32 644 1 458 info@mathysmedical.com |
| | | United Kingdom | Mathys Orthopaedics Ltd Alton, Hampshire GU34 2QL Tel: +44 8450 580 938 info.uk@mathysmedical.com |

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