



## Introducing the Össur Mechanical Knee Range Additional Knee Joint Portfolio

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## Activity Levels: K Level Classification

- **K 0** None prosthetic user
- **K 1** Has the ability or potential to use a prosthesis for transfers or ambulation in level surfaces at a fixed cadence. Typical of the limited and unlimited household ambulator.
- **K 2** Has the ability or potential for ambulation with the ability to traverse low-level environment barriers such as curbs, stairs or uneven surfaces. Typical of the limited community ambulator.
- **K 3** Has the ability or potential for ambulation with variable cadence. Typical of the community ambulatory who has the ability to traverse most environmental barriers and may have vocational, therapeutic or exercise activity that demands prosthetic use beyond simple locomotion.
- **K 4** Has the ability or potential for prosthetic ambulation that exceeds basic ambulation skills, exhibiting high impact, stress or energy levels. **Typical of the prosthetic demands of the child, active adult or athlete.**

# Overview



**Balance Knee OFM2**



**Balance Knee OFM1**



**OP2 Knee**



**OP4 Knee**



**Paso Knee**



**OH7 Knee**



**OH5 Knee**



**OHP3 Knee**



**OP5 Knee**



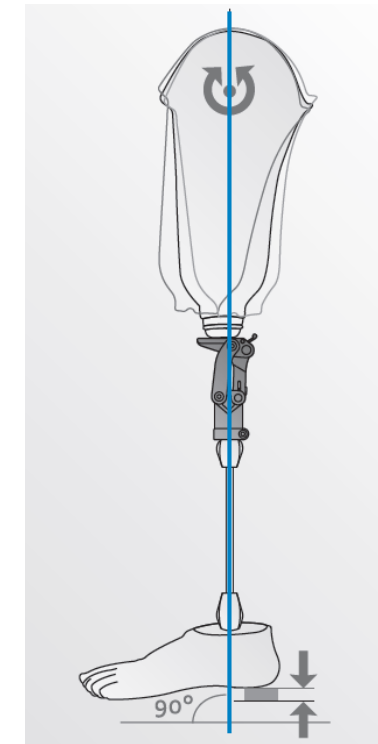
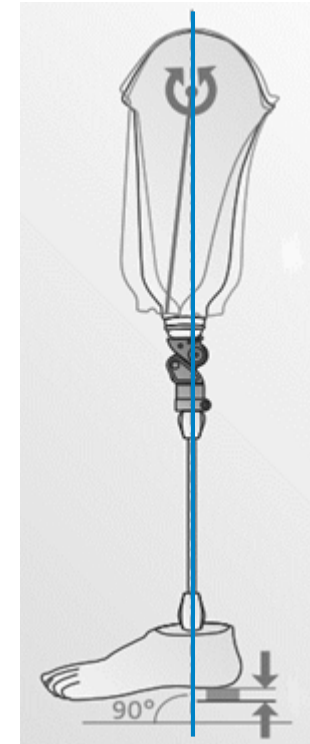
## Alignment recommendation

### Monocentric

- Alignment reference line from bisection of socket on ischial level should pass 5 – 15 mm anterior to the pivot axis of the knee and the posterior 1/3 of the foot

### Polycentric

- Alignment reference line from bisection of socket on ischial level should pass through the pivot axis of the knee and the posterior 1/3 of the foot
- Pivot axis is the most proximal anterior axis



## Monolock Knee – *Mechanical monocentric locking knee joint*

- Indications for use
  - Transfemoral amputation
  - K-Level 1
  - Maximum user weight 125 kg
- Properties
  - Optional release of lock with single function lever
  - Durable, light aluminium construction
  - Low build height for long residual limbs
  - Lanyard release and lever



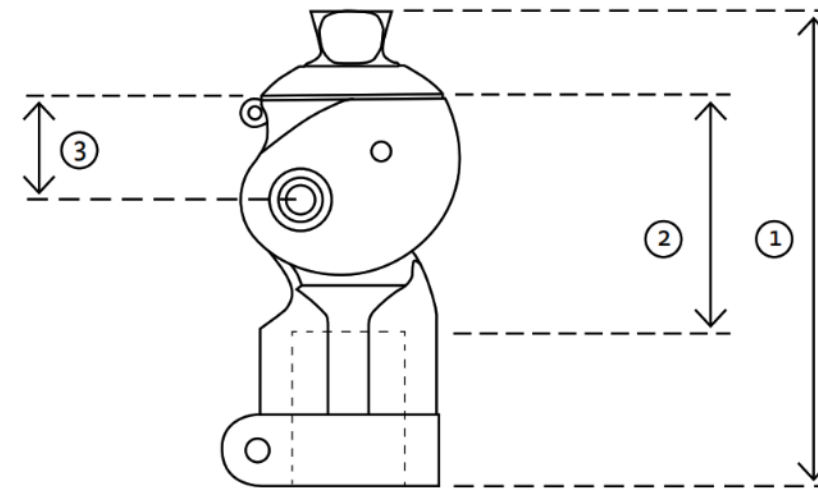
### PRODUCT INFORMATION

Part#	Description
1725120	Monolock Knee

# Monolock Knee – Product Characteristics

## Technical Specifications

- 1: Overall fitted height (total height): 100 mm
- 2: Effective fitted height (build height): 47 mm
- 3: Fitted height (knee center to top): 22 mm
- Weight: 275 gr
- Maximum flexion angle: 140°
- Material: Aluminium



# Balance Knee OM8 – Mechanical polycentric knee joint

- Indications
  - Transfemoral amputation
  - K-Level 1 and 2
  - Maximum user weight 136 kg

Features	Benefits
4-bar geometry	Stance phase stability Low voluntary control required Mid swing shortening
Adjustable geometry with stance release setting	Earlier / later stance release
Integrated extension spring	Adjustable extension to optimise extension speed
Adjustable axis friction setting	Adjustable friction of the axis to optimise extension speed





# Balance Knee OM8 – Adjustments

- Extension spring setting
  - Clockwise (+): Increase extension assist
  - Anti-clockwise (-): Decrease extension assist
- Axis friction setting
  - Clockwise (+): Increase axis friction
  - Anti-clockwise (-): Decrease axis friction
- Stance release setting
  - Clockwise (+): earlier stance release, more dynamic
  - Anti-clockwise (-): later stance release, more safety

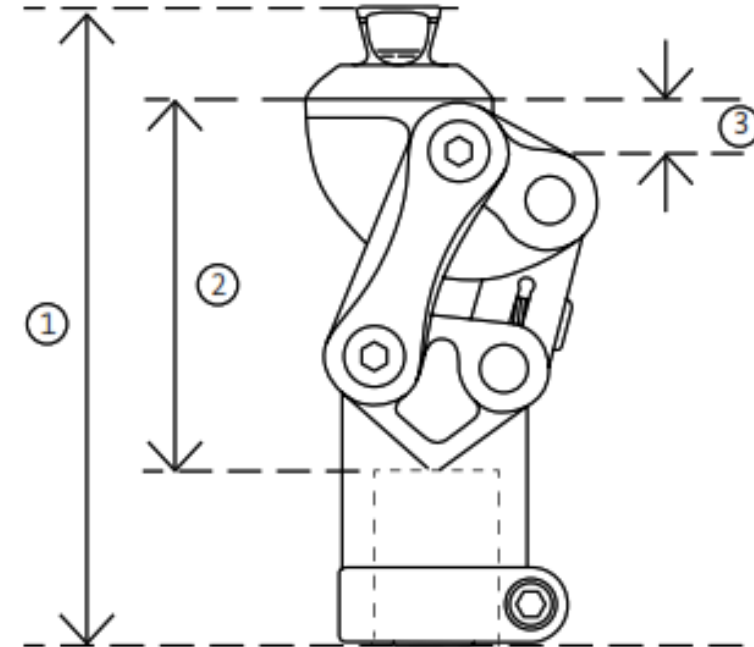




# Balance Knee OM8 – Product Characteristics

## Technical Specifications

- 1: Overall fitted height (total height): 128 mm
- 2: Effective fitted height (build height): 76 mm
- 3: Fitted height (knee center to top): 12 mm
- Weight: 450 gr
- Maximum flexion angle: 160°
- Material: Aluminium



## PRODUCT INFORMATION

Part#	Description
1723178	Balance Knee OM8

# Balance Knee OFM2- *Mechanical monocentric knee joint with weight activated brake and dual locking function*

- Indications

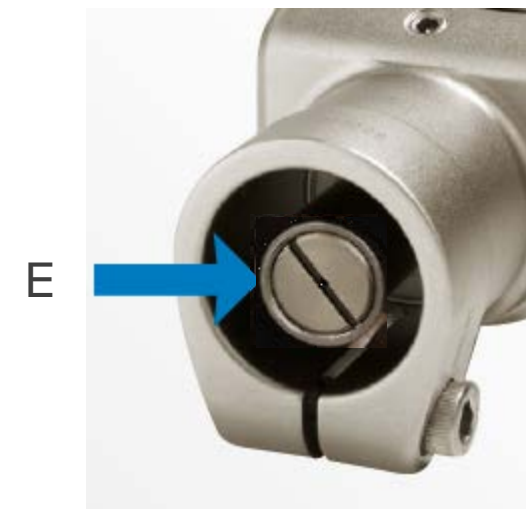
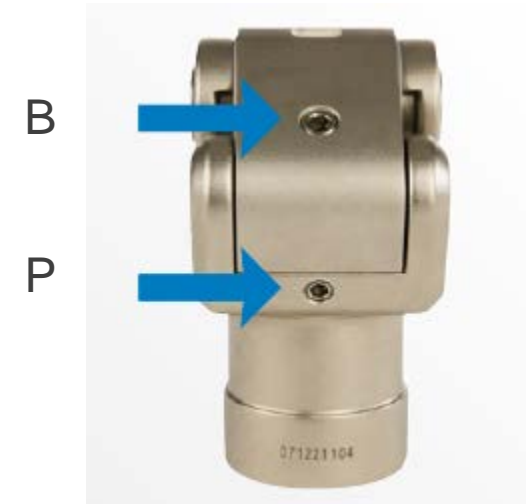
- Transfemoral amputation
- K-Level 1 and 2
- Maximum user weight 125 kg



Features	Benefits
Finely Adjustable weight activated brake	Individual adjustable stance safety. Less effort and more confidence during walking for the in-house and limited outdoor ambulator
Integrated extension spring	Adjustable extension to optimise extension speed for the individual user
Optional Lock	High degree of safety, ideal for interim use

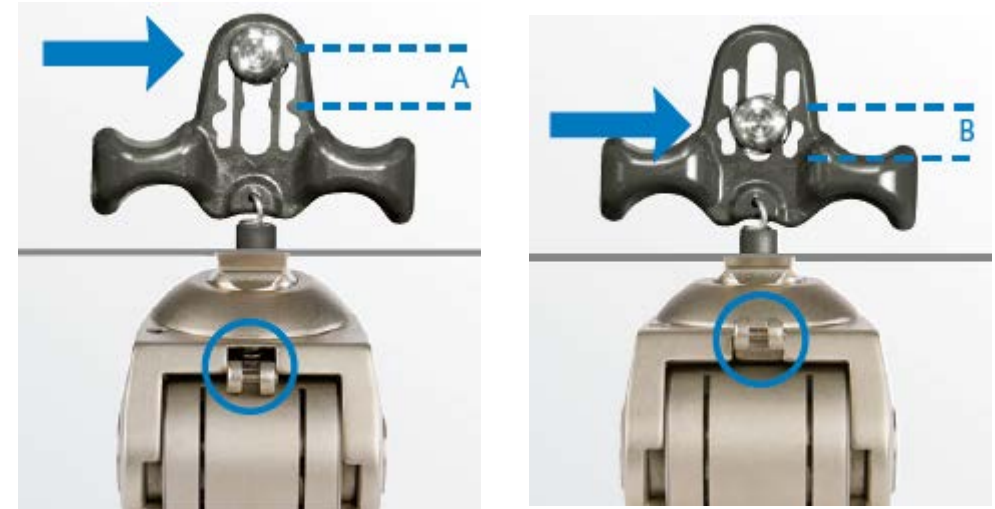
## Balance Knee OFM2 – Adjustments

- Brake sensitivity adjustment (B)
  - Clockwise (-): Decrease sensitivity
  - Anti-clockwise (+): Increase sensitivity
- Extension assist setting (E)
  - Clockwise (+): Increase extension assist
  - Anti-clockwise (-): Decrease extension assist
- Brake play screw (P)
  - Adjust only if play is present after long term use
  - If the knee shows excess play tighten screw (+)
  - Over tightening will cause excessive swing friction
  - Clockwise (-): Reduce brake play
  - Anti-clockwise (+): Increase brake play



## Balance Knee OFM2 – Manual Locking function

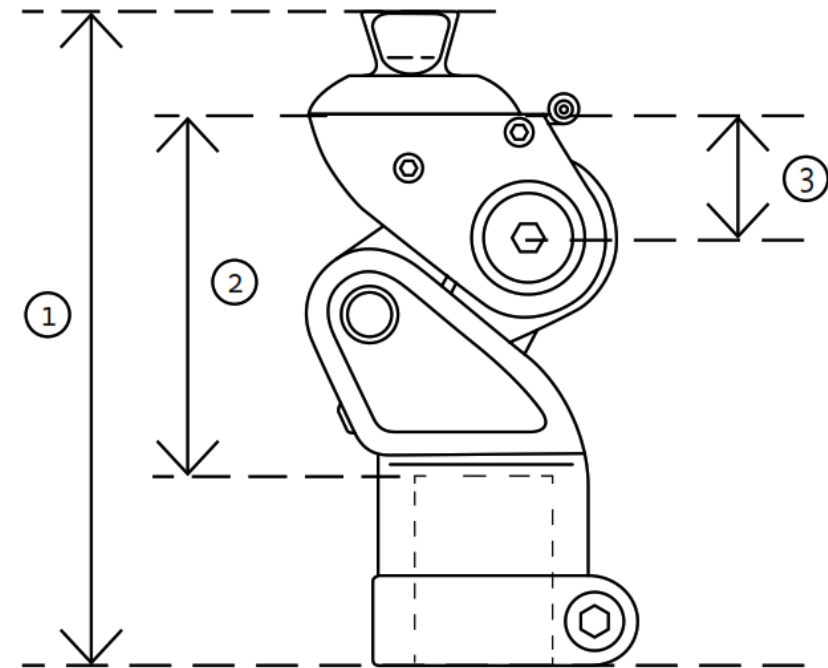
- Double function lever (by user)
  - Position A: Locked knee + situation-linked actuation
  - For example when sitting down.
  - Pull lever up gently to unlock
  - Position B: Knee function permanently free used as a mechanical knee joint with brake function
  - Pull lever up completely to keep unlocked
- Deactivation of locking function (by CPO)
  - Press release lever upwards and hold
  - Tighten the screw into the release lever
  - **Important:** Always secure release screw with Loctite
  - Can replace dual function lever



# Balance Knee OFM2 – Product Characteristics

## Technical Specifications

- 1: Overall fitted height (total height): 115 mm
- 2: Effective fitted height (build height): 63 mm
- 3: Fitted height (knee center to top): 23 mm
- Weight: 495 gr
- Maximum flexion angle: 145 °
- Material: Aluminium



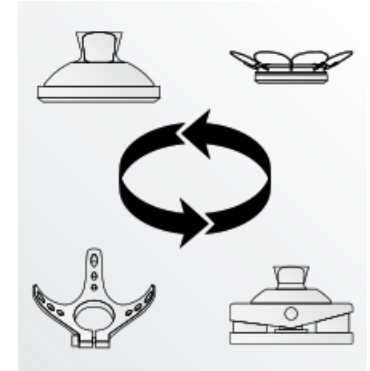
## PRODUCT INFORMATION

Part#	Description
1721120	Balance Knee OFM2

## Balance Knee OFM1 – Mechanical polycentric knee joint with dual locking function

- Indications

- Transfemoral or knee disarticulation amputation
- K-Level 1 and 2
- Maximum user weight 136 kg

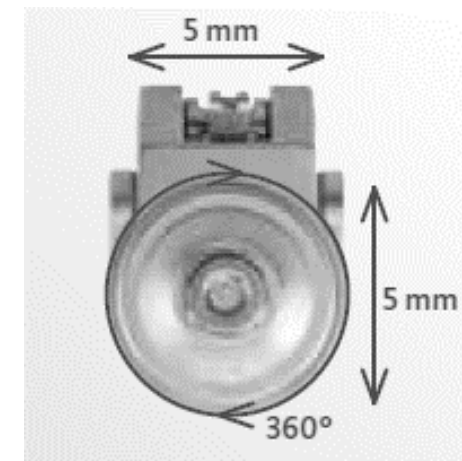
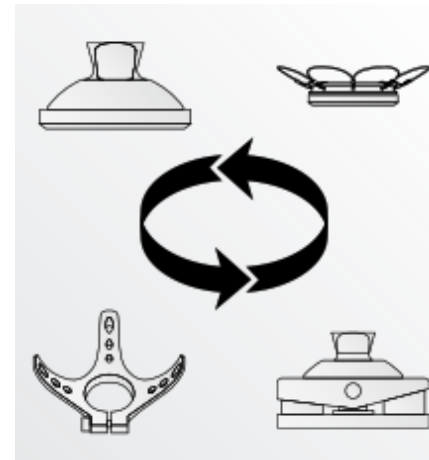


Features	Benefits
2-in-1 function	Locking possibility when needed
4-bar geometry	Stance phase stability Low voluntary control required Mid swing shortening
Integrated extension spring	Adjustable extension to optimise extension speed
Choice of 4 proximal adapters	Rotation and shift adjustments possible (exc IKF) Users can have the option of stance flexion for shock absorption, or adapters with low build heights for short residual limbs



## Choice of 4 Proximal adapters

- The following knees have 4 options for proximal adapters: **OFM1, OP5, OHP3, OH5, OH7, Paso**
- 4 different proximal connections:
- **Male pyramid:**
  - 5mm AP/ML shift
  - 360° rotation possible
- **3-prong adapter:**
  - 5mm AP/shift
  - 360° rotation possible
- **Loop adapter:**
  - Can tilt up to 10° using rotatable discs (1970847)
  - 360 rotation possible
- **IKF adapter:** Stance flexion bumpers
  - Shock absorption
  - No shift or rotation

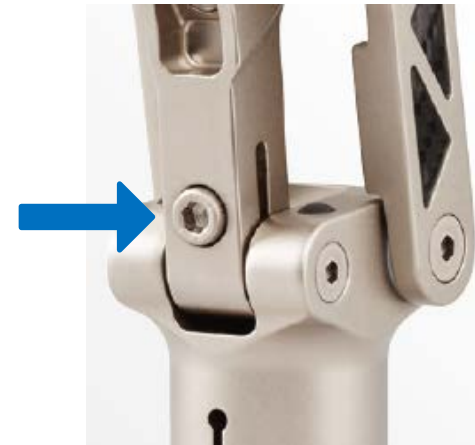


**1610600: Aluminium tube plus bonded titanium female pyramid; 136kg**



## Balance Knee OFM1 – Adjustment

- Extension assist setting:
  - Clockwise (+): Increase extension assist
  - Anti-clockwise (-): Decrease extension assist
  
- Axis friction setting:
  - Clockwise (+): Increase axis friction
  - Anti-clockwise (-): Decrease axis friction



## Balance Knee OFM1 – Manual Locking function

- Double function lever (by user)

- Position A: Locked knee + situation-linked actuation
- For example when sitting down.
- Pull lever up gently to unlock
  
- Position B: Knee function permanently free used as a mechanical knee joint with brake function
- Pull lever up completely to keep unlocked



- Deactivation of locking function (by CPO)

- Press release lever upwards and hold
- Tighten the screw into the release lever
  
- **Important:** Always secure release screw with Loctite
- Replace dual function lever:



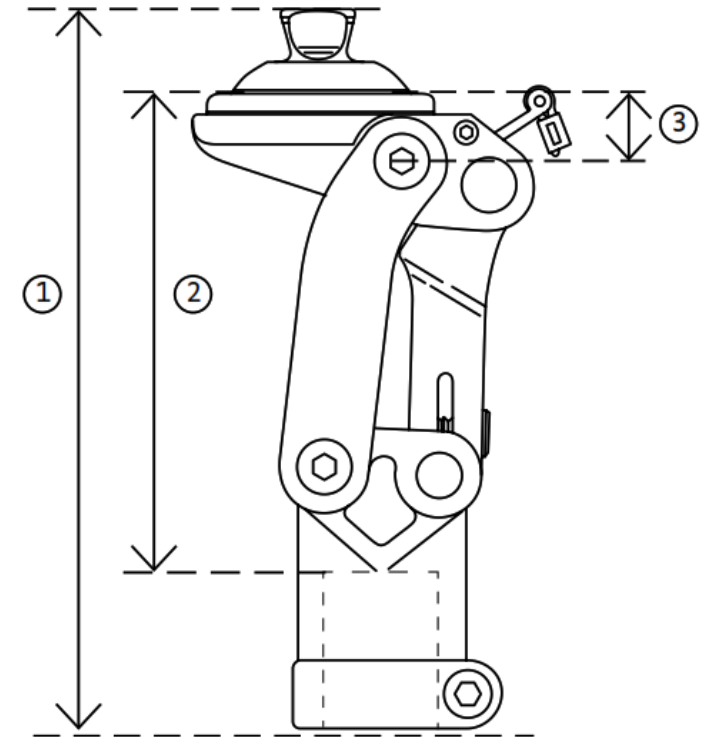
# Balance Knee OFM1 – Product Characteristics

## Technical Specifications

- 1: Overall fitted height (total height): 159 mm
- 2: Effective fitted height (build height): 107 mm
- 3: Fitted height (knee center to top): 18 mm
- Weight: 640 gr
- Maximum flexion angle: 150°
- Material: Aluminium

## PRODUCT INFORMATION

Part#	Description
1721126	Balance Knee OFM1 with pyramid
1721127	Balance Knee OFM1 with IKF adapter
1721128	Balance Knee OFM1 with loop adapter
1721129	Balance Knee OFM1 with 3 arm adapter



## OP2 Knee – Pneumatic, polycentric knee joint with adjustable flexion and extension resistance

- Indications

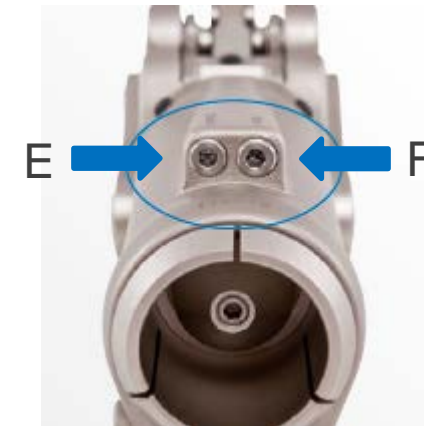
- Transfemoral amputation
- K-Level 2 and 3
- Maximum user weight 125 kg

Features	Benefits
Adjustable geometry with stance release setting	Earlier / later stance release
4-bar geometry	Stance phase stability Low voluntary control required Mid swing shortening
Pneumatic swing phase control: Flexion and extension can be set independently	Adjustable flexion and extension damping. Variable walking speeds
Slim design	Easier cosmetic finishing



# OP2 Knee – Adjustments

- Stance release setting:
  - Clockwise: earlier stance release, more dynamic
  - Anti-clockwise: later stance release, more safety
- Flexion valve setting (F):
  - Clockwise (+): Increase flexion damping
  - Anti-clockwise (-): Decrease flexion damping
- Extension valve setting (E):
  - Clockwise (+): Increase extension damping
  - Anti-clockwise (-): Decrease extension damping



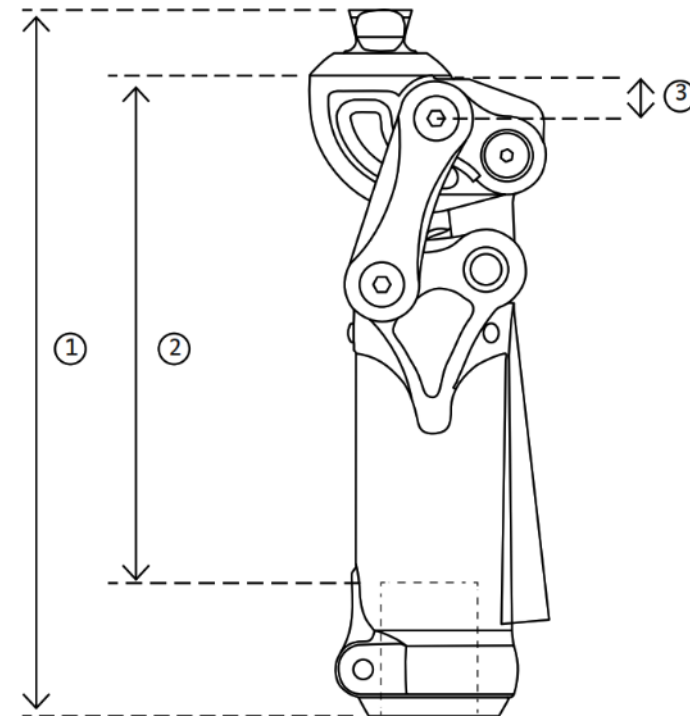
# OP2 Knee – Product Characteristics

## Technical Specifications

- 1: Overall fitted height (total height): 195 mm
- 2: Effective fitted height (build height): 160 mm
- 3: Fitted height (knee center to top): 18 mm
- Weight: 650 gr
- Maximum flexion angle: 160°
- Material: Aluminium

### PRODUCT INFORMATION

Part#	Description
1724120	OP2 Knee



## OP4 Knee – *Pneumatic, monocentric knee joint with weight activated brake*

- Indications

- Transfemoral amputation
- K-Level 2 and 3
- Maximum user weight 100 kg

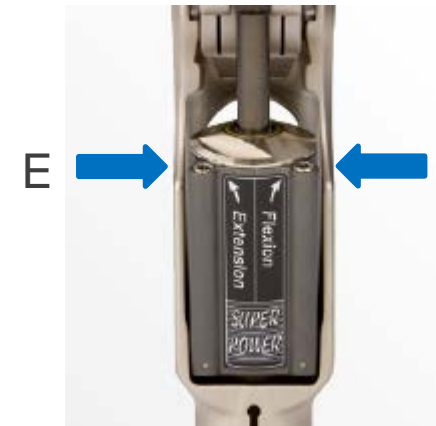
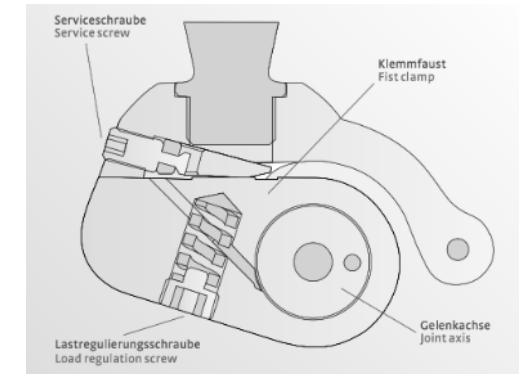
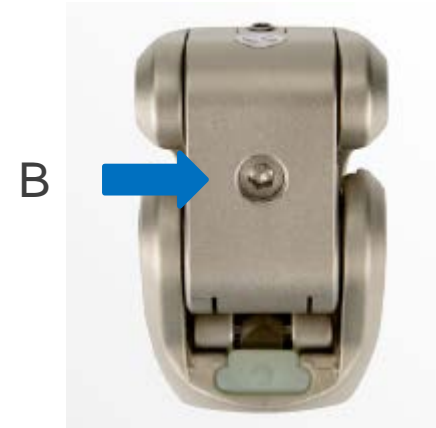
Features	Benefits
Adjustable weight activated brake	Individual adjustable stance safety
Pneumatic swing phase control	Adjustable flexion and extension damping Variable walking speeds





# OP4 Knee – Adjustment

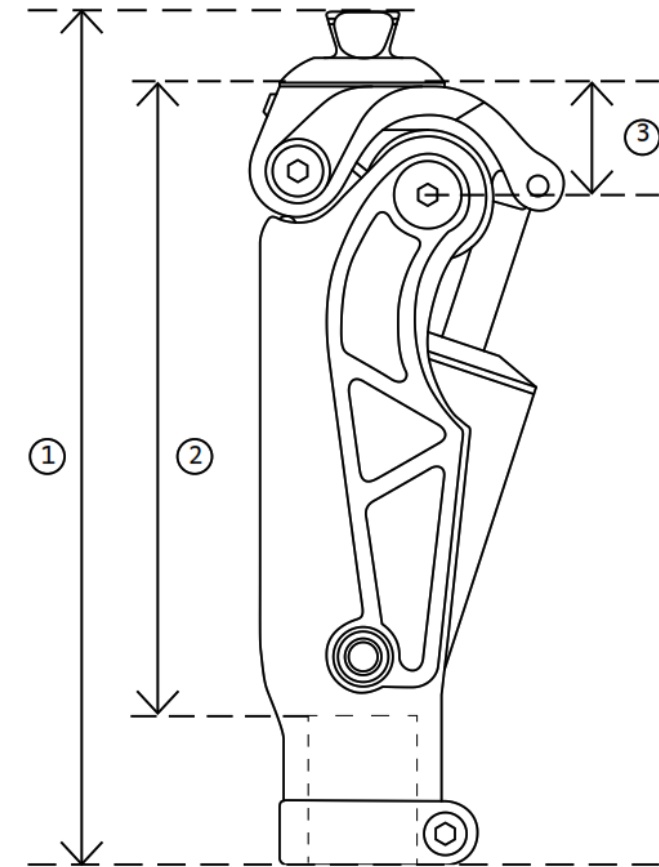
- Brake sensitivity adjustment (B):
  - Clockwise (-): Decrease sensitivity
  - Anti-clockwise (+): Increase sensitivity
- Flexion valve setting (F):
  - Clockwise (+): Increase flexion damping
  - Anti-clockwise (-): Decrease flexion damping
- Extension valve setting (E):
  - Clockwise (+): Increase extension damping
  - Anti-clockwise (-): Decrease extension damping
- Brake play screw (P)
  - Adjust only if play is present after long term use
  - If the knee shows excess play tighten screw (+)
  - Over tightening will cause excessive swing friction
  - Clockwise (-): Reduce brake play
  - Antir-clockwise (+): Increase brake play



# OP4 Knee – Product Characteristics

## Technical Specifications

- 1: Overall fitted height (total height): 198 mm
- 2: Effective fitted height (build height): 146 mm
- 3: Fitted height (knee center to top): 26 mm
- Weight: 680 gr
- Maximum flexion angle: 145°
- Material: Aluminium



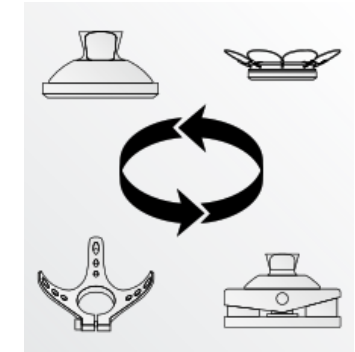
### PRODUCT INFORMATION

Part#	Description
1720185	OP4 Knee

## OP5 Knee – Pneumatic, polycentric knee joint with adjustable flexion and extension resistance

- Indications

- Transfemoral or knee disarticulation amputation
- K-Level 2 and 3
- Maximum user weight 125 kg



Features	Benefits
4-bar geometry	Stance phase stability Low voluntary control required Mid swing shortening
Pneumatic swing phase control	Adjustable flexion and extension damping Variable walking speeds
Choice of 4 proximal adapters	Rotation and shift adjustments possible (exc IKF) Users can have the option of stance flexion for shock absorption, or adapters with low build heights for short residual limbs



## OP5 Knee – Adjustment

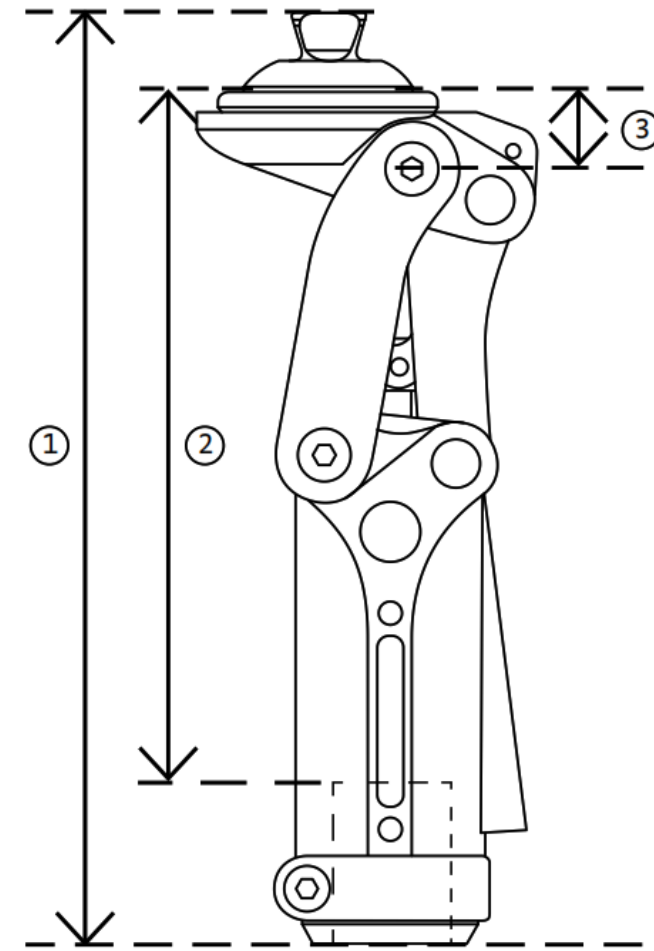
- Flexion valve setting (F):
  - Clockwise (+): Increase flexion damping
  - Counter-clockwise (-): Decrease flexion damping
- Extension valve setting (E):
  - Clockwise (+): Increase extension damping
  - Counter-clockwise (-): Decrease extension damping



# OP5 Knee – Product Characteristics

## Technical Specifications

- 1: Overall fitted height (total height): 195 mm
- 2: Effective fitted height (build height): 160 mm
- 3: Fitted height (knee center to top): 18 mm
- Weight: 770 gr
- Maximum flexion angle: 145°
- Material: Aluminium



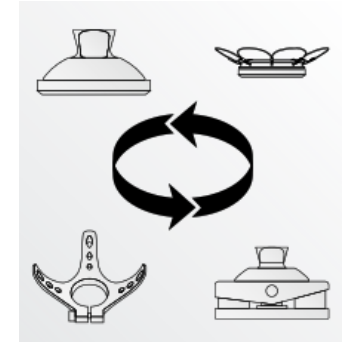
### PRODUCT INFORMATION

Part#	Description
1720180	OP5 Knee with pyramid
1720182	OP5 Knee with IKF adapter
1720181	OP5 Knee with loop adapter
1720183	OP5 Knee with 3 arm adapter

## OHP3 Knee – Pneumatic, polycentric knee joint with variable stance phase dynamics

- Indications

- Transfemoral or knee disarticulation amputation
- K-Level 2 and 3
- Maximum user weight 125 kg



Features	Benefits
Closing geometry frame design	Different location of instant center of rotation leading to more dynamics
4-bar geometry	Stance phase stability Low voluntary control required Mid swing shortening
Very powerful pneumatic swing phase control	Higher degree of flexion and extension damping
Choice of 4 proximal adapters	Rotation and shift adjustments possible (exc IKF) Users can have the option of stance flexion for shock absorption, or adapters with low build heights for short residual limbs

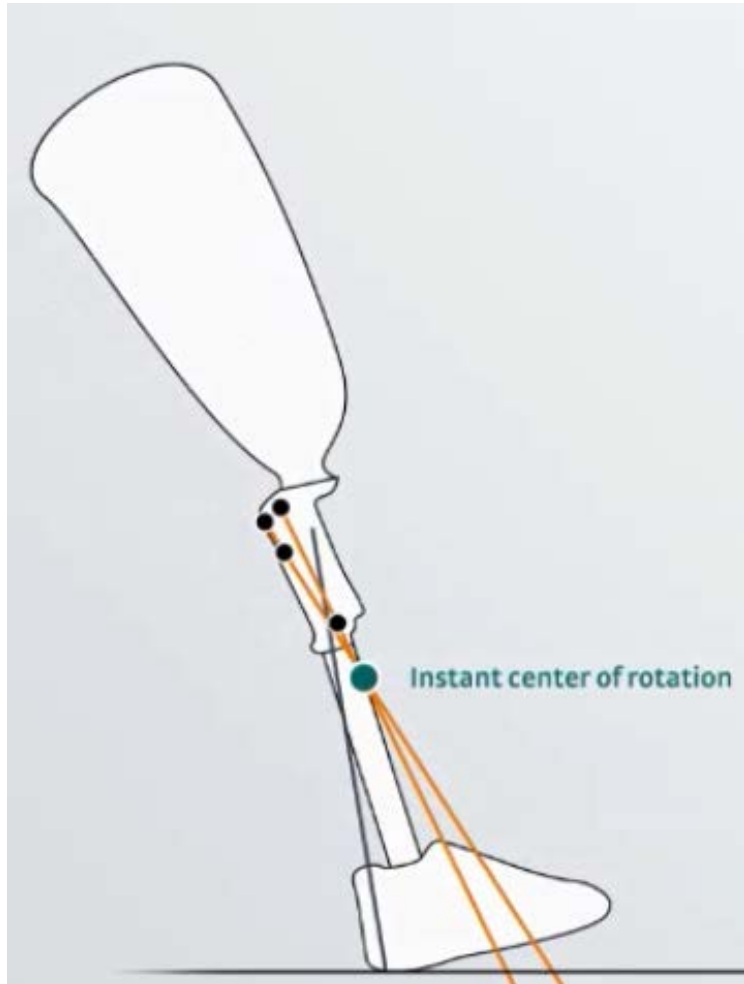


# Polycentric knee joints in comparison



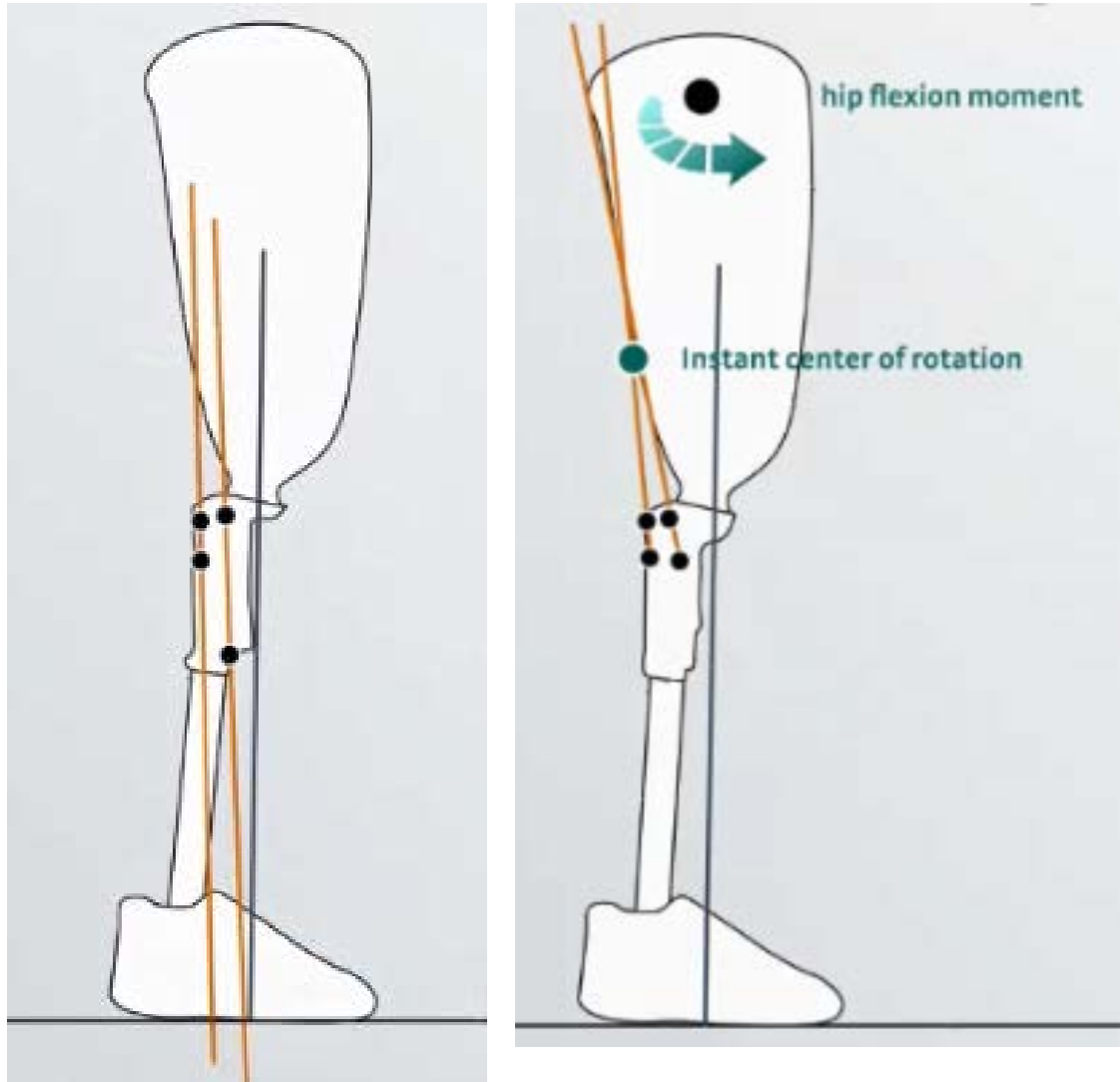


## Closing geometry- Initial contact



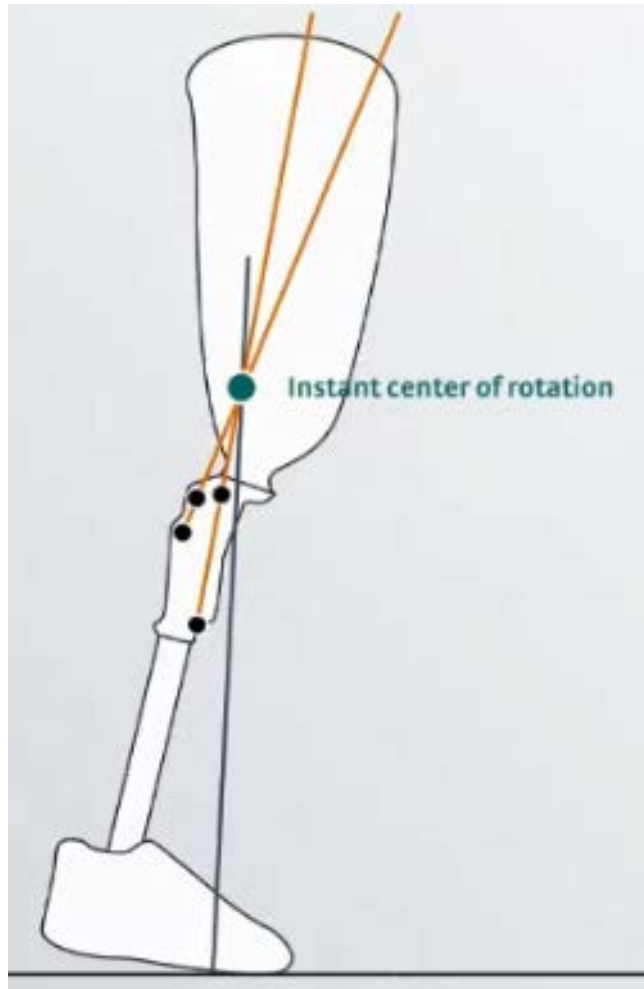
- At Initial contact the instantaneous center of rotation is in front and below the ground reaction force.
- The knee is fully extended and inherently stable even if the user creates a hip flexion moment
- Loading the knee at heel contact will push the knee into extension, increasing safety at heel contact

# Closing Geometry- Midstance



- At midstance the instantaneous centre of rotation is moving through the floor due to the design of the knee axis
- The front and rear bars move into a parallel position
- The ICOR then moves to be proximal and posterior
- The GRF is therefore still anterior to the knee, maintaining stability until the toe is loaded and a hip flexion moment is initiated

## Closing Geometry-Terminal stance

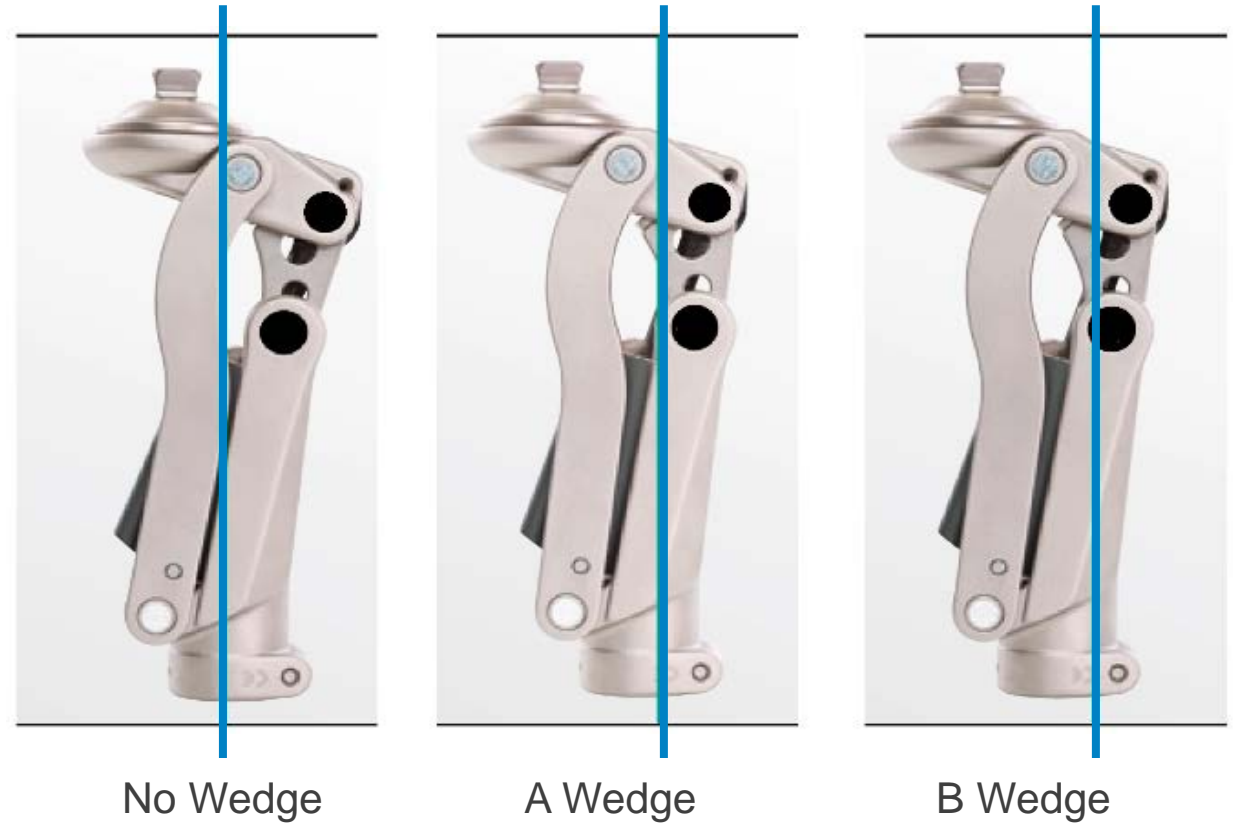


- Once the toe is loaded and a hip flexion moment has been initiated the GRF will move posterior to the ICOR
- The knee will flex and allow for swing phase
- This level of safety created by the closing geometry of the knee is comparable to the safety that the geometric lock provides in the Total Knee range
- This safety element only works if no wedges are used in the knee

# OHP3 Knee – Adjustable Stance Release

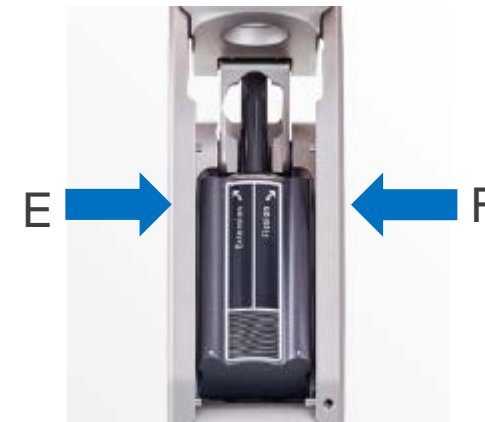
OHP3 comes with A and B wedges

- Without wedge:
  - later stance release
  - Closing geometry creates increased safety
- With A wedge:
  - Closing geometry disengaged
  - earlier stance release-more dynamic
- With B wedge:
  - Closing geometry disengaged
  - even earlier stance release- more dynamic for more active users



## OHP3 Knee – Adjustments

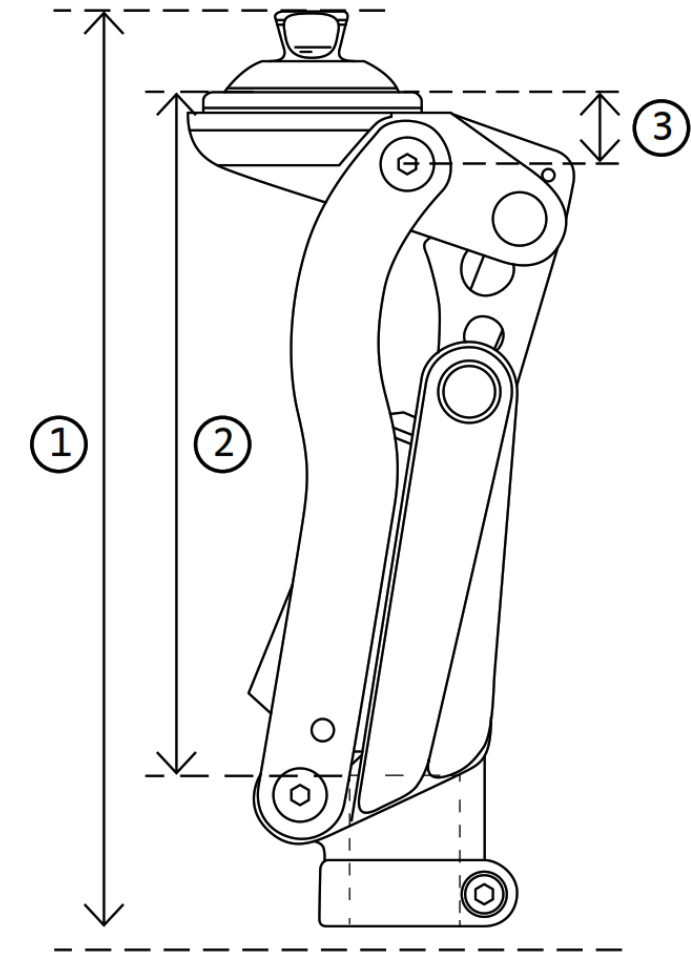
- Stance release setting:
  - Without wedge = later stance release, more safety
  - With A wedge = safety and dynamics
  - With B wedge = earlier stance release, more dynamics
- Flexion valve setting (F):
  - Clockwise (+): Increase flexion damping
  - Counter-clockwise (-): Decrease flexion damping
- Extension valve setting (E):
  - Clockwise (+): Increase extension damping
  - Counter-clockwise (-): Decrease extension damping



# OHP3 Knee – Product Characteristics

## Technical Specifications

- 1: Overall fitted height (total height): 210 mm
- 2: Effective fitted height (build height): 157 mm
- 3: Fitted height (knee center to top): 17 mm
- Weight: 875 gr
- Maximum flexion angle: 150°
- Material: Aluminium

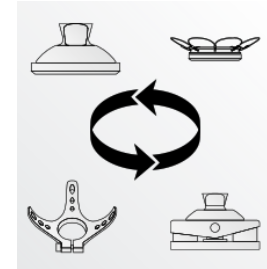


## PRODUCT INFORMATION

Part#	Description
1728170	OHP3 Knee with pyramid
1728171	OHP3 Knee with IKF adapter
1728172	OHP3 Knee with loop adapter
1728173	OHP3 Knee with 3 arm adapter

# OH5 Knee – Polycentric knee joint with 3-valve hydraulics

- Indications
  - Transfemoral or knee disarticulation amputation
  - K-Level 3 and 4
  - Maximum user weight 100 kg



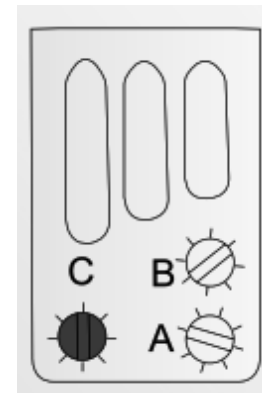
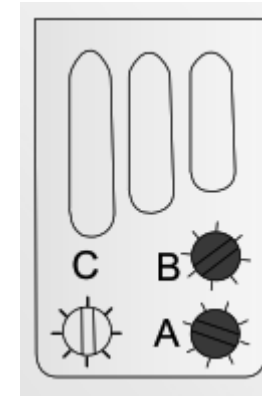
Features	Benefits
Closing 4-bar geometry	Increased stance phase stability Low voluntary control required Mid swing shortening
3-valve hydraulic swing control	Accommodation to changes in walking speed
Choice of 4 proximal adapters	Rotation and shift adjustments possible (exc IKF) Users can have the option of stance flexion for shock absorption, or adapters with low build heights for short residual limbs





## OH5 Knee – Adjustments

- Valve A – Controls 60° to 150° flexion angle
  - Clockwise (+): Increase flexion damping
  - Counter-clockwise (-): Reduce flexion damping
  - Controls excessive heel rise
  
- Valve B – Controls 0° to 60° flexion angle
  - Clockwise (+): Increase flexion damping
  - Counter-clockwise (-): Reduce flexion damping
  - Controls initial flexion
  - Assists in extension
  - Critical in slow walking
  
- Valve C – Extension setting
  - Clockwise (+): Increase extension damping
  - Counter-clockwise (-): Reduce extension damping



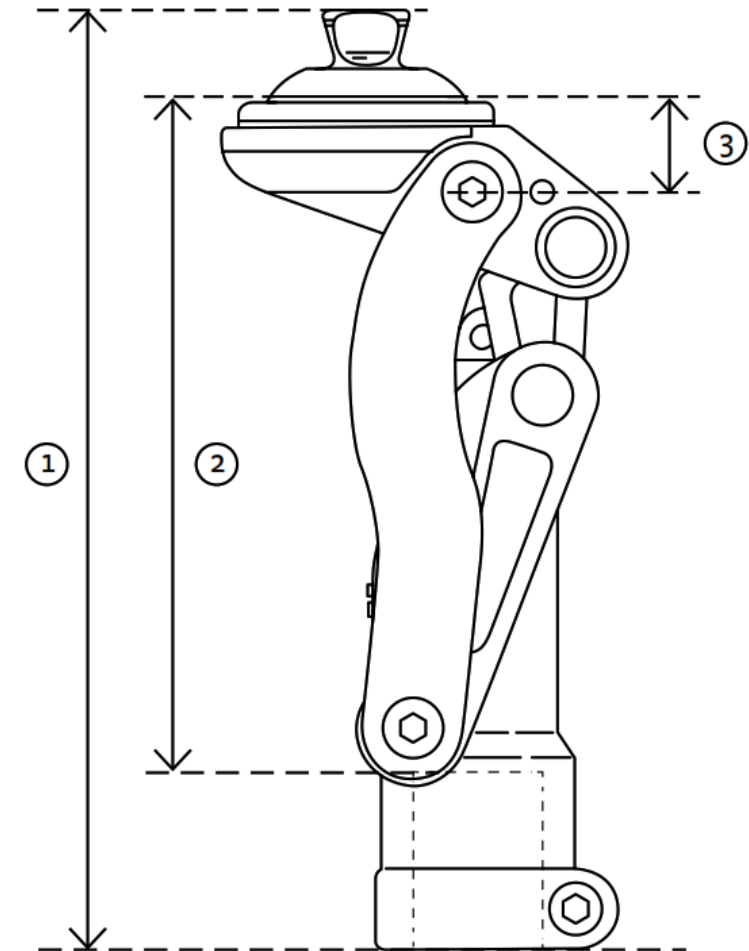
# OH5 Knee – Product Characteristics

## Technical Specifications

- 1: Overall fitted height (total height): 184 mm
- 2: Effective fitted height (build height): 132 mm
- 3: Fitted height (knee center to top): 17 mm
- Weight: 830 gr
- Maximum flexion angle: 150°
- Material: Aluminium

## PRODUCT INFORMATION

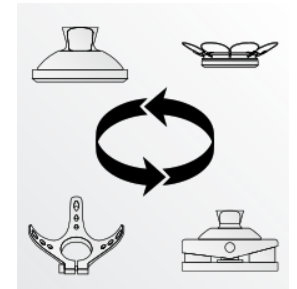
Part#	Description
1722176	OH5 Knee with pyramid
1725176	OH5 Knee with IKF adapter
1722175	OH5 Knee with loop adapter
1722177	OH5 Knee with 3 arm adapter



# OH7 Knee –Polycentric knee joint with 3-valve hydraulics and dynamic set

- Indications

- Transfemoral or knee disarticulation amputation
- K-Level 3 and 4
- Maximum user weight 136 kg

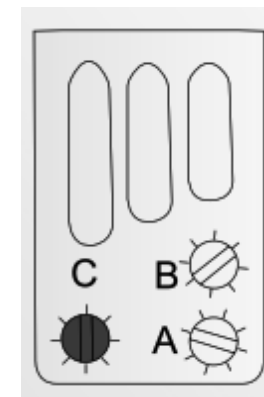
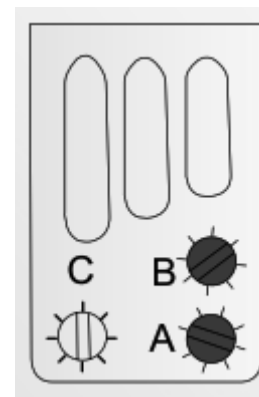


Features	Benefits
4-bar geometry	Stance phase stability Low voluntary control required Mid swing shortening
Adjustable geometry with stance release setting	Earlier / later stance release
3-valve hydraulic swing control	Accommodation to changes in walking speed
Choice of 4 proximal adapters	Rotation and shift adjustments possible (exc IKF) Users can have the option of stance flexion for shock absorption, or adapters with low build heights for short residual limbs



# OH7 Knee – Adjustments

- Stance release setting
  - Without wedge = later stance release, more safety
  - With wedge = earlier stance release, more dynamics
  
- Valve A - Controls 60° to 150° flexion angle
  - Clockwise (+): Increase flexion damping
  - Counter-clockwise (-): Reduce flexion damping
  
- Valve B – Valve B – Controls 0° to 60° flexion angle
  - Clockwise (+): Increase flexion damping
  - Counter-clockwise (-): Reduce flexion damping
  
- Valve C – Extension setting
  - Clockwise (+): Increase extension damping
  - Counter-clockwise (-): Reduce extension damping



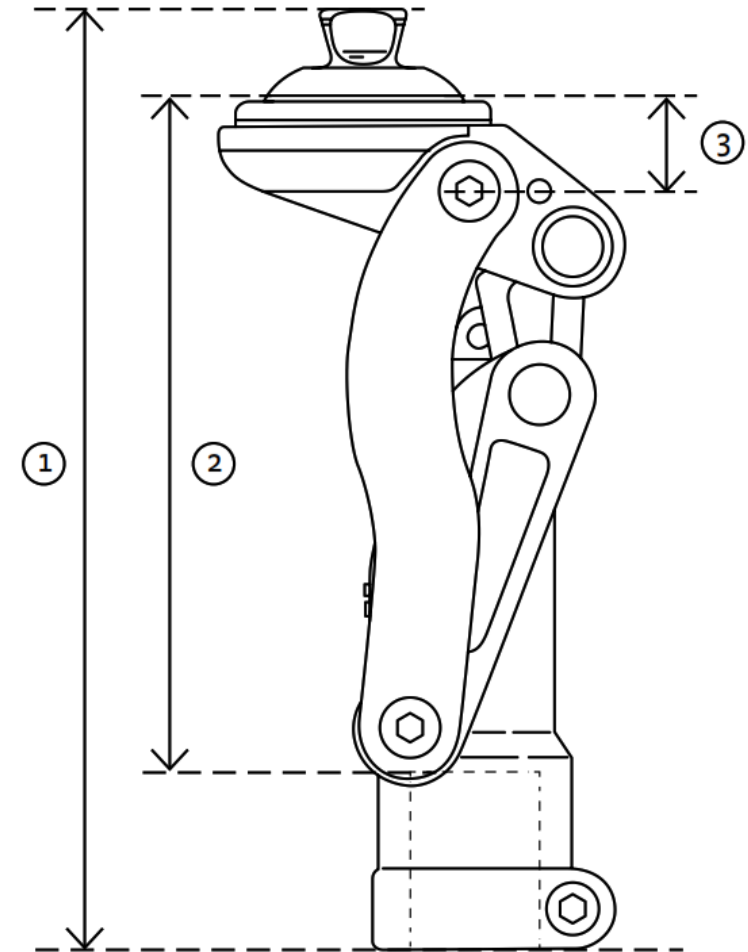
# OH7 Knee – Product Characteristics

## Technical Specifications

- 1: Overall fitted height (total height): 186 mm
- 2: Effective fitted height (build height): 134 mm
- 3: Fitted height (knee center to top): 19 mm
- Weight: 930 gr
- Maximum flexion angle: 150°
- Material: Aluminium + Carbon

## PRODUCT INFORMATION

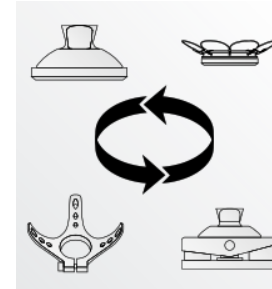
Part#	Description
1725180	OH7 Knee with pyramid
1725181	OH7 Knee with IKF adapter
1725182	OH7 Knee with loop adapter
1725183	OH7 Knee with 3 arm adapter



# Paso Knee – Polycentric knee joint with auto-adaptive pneumatic swing phase control

- Indications

- Transfemoral or knee disarticulation amputation
- K-Level 2, 3 and 4
- Maximum user weight 136 kg



Features	Benefits
Auto-adaptive swing phase control	Works <b>‘straight of the box’</b> , no adjustments required The knee adaptation to variable walking speed Adapts for smooth and powerful running 7km/hr +
Adjustable geometry with stance release setting	Earlier / later stance release
4-bar geometry	Stance phase stability Low voluntary control required Mid swing shortening (reduced trips and falls)
Choice of 4 proximal adapters	Rotation and shift adjustments possible (exc IKF) Users can have the option of stance flexion for shock absorption, or adapters with low build heights for short residual limbs



## Paso Knee – Adjustments

- Stance release setting
  - Without wedge:
    - later stance release
    - Closing geometry creates increased safety
  - With A wedge:
    - Closing geometry disengaged
    - earlier stance release-more dynamic
  - With B wedge:
    - Closing geometry disengaged
    - even earlier stance release- more dynamic for more active users
- Auto-adaptive swing phase control
  - Works straight 'out of the box' ready to use
  - The joint automatically sets the needed extension and flexion movement range
  - No valve to adjust





# Paso Knee – Auto-adaptive pneumatics



# Paso Knee- Varied cadence

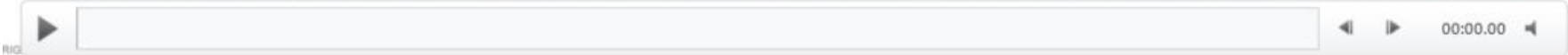


# Paso Knee- Slow walking





# Paso Knee- Medium Walking



# Paso Knee- Fast walking 7km/hr



# Paso Knee- Running 12km/hr

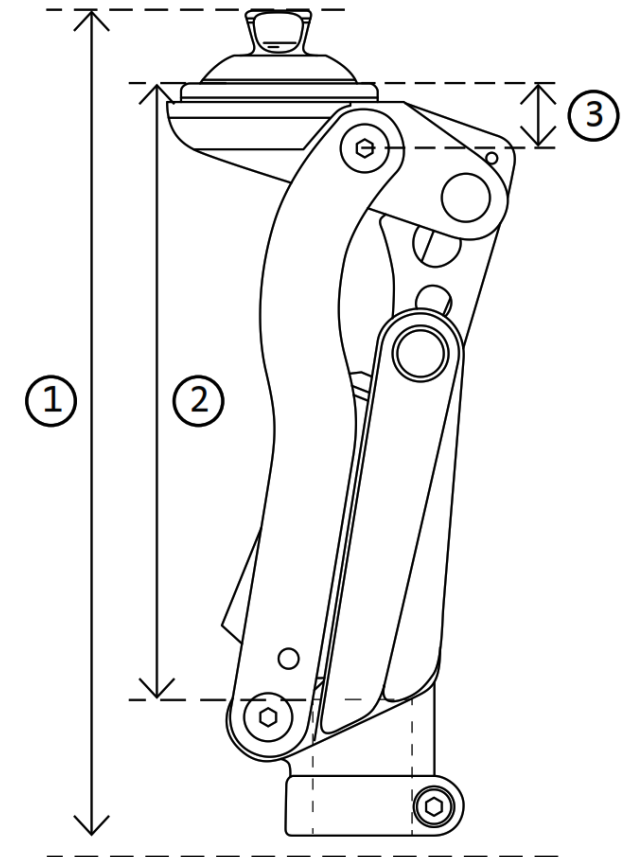


# Paso Knee – Product Characteristics

- 1: Overall fitted height (total height): 215 mm
- 2: Effective fitted height (build height): 158 mm
- 3: Fitted height (knee center to top): 18 mm
- Weight: 1050 gr
- Maximum flexion angle: 150°
- Material: Aluminium + Carbon

## PRODUCT INFORMATION

Part#	Description
1728180	Paso Knee with pyramid
1728181	Paso Knee with IKF adapter
1728182	Paso Knee with loop adapter
1728183	Paso Knee with 3 arm adapter





# WE IMPROVE PEOPLE'S MOBILITY

