

STANDPUNKT



integrated
stumble
control!

a new era of
walking safety!



Simply move
well!

Unitos Smart

Simply move well!

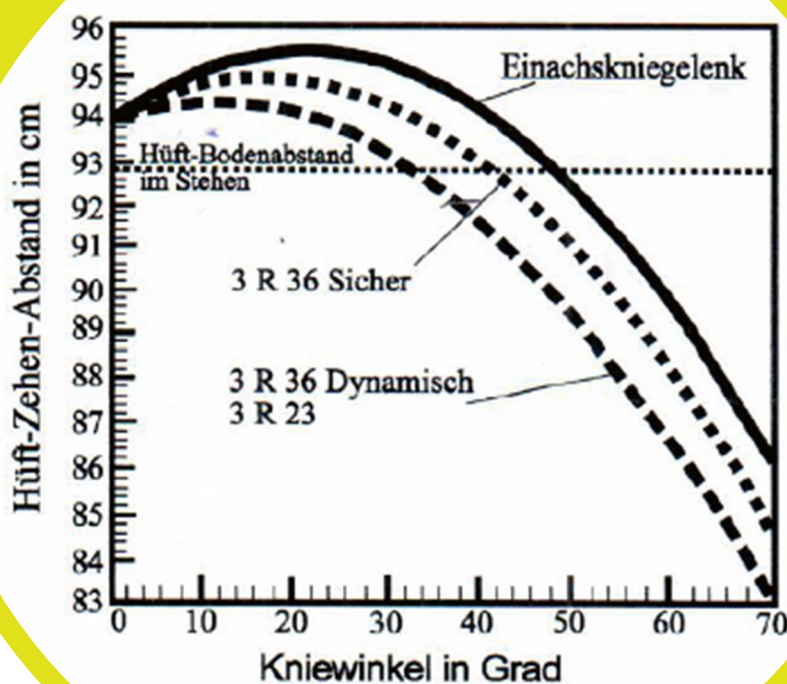
What sounds so obvious, is for many transfemoral K1 and K2 amputees just the opposite. Nowadays, modern prosthesis systems have numerous functions from swing phase control and stance phase control to bicycle mode and golf mode. There are many options.

Especially amputees with a low degree of mobility are still struggling with their prosthesis even though there is already a vast selection. Why do these problems still exist? Despite all the developments of the past years it might be interesting to reconsider the well-known phenomenon of insufficient ground clearance in the swing phase. Every technician will have heard of it during his or her apprenticeship. In everyday life, this problem doesn't seem to exist.

We, as STANDPUNKT, think of this phenomenon as the biggest challenge in above knee prosthetics. If the distance between hip-joint and toe during flexion of the knee (in the swing phase) is enlarged, the amputee can be in danger of stumbling. This enlargement is due to the fact that there's no dorsiflexion of the foot during the swing phase.

Depending on the construction of the knee joint this distance increases by 6-15 mm. To guarantee the highest level of safety for the amputee, it's important to turn this leg elongation enlargement into a leg shortening.

To achieve this shortening, it is necessary to implement a knee flexion of at least 40 degrees.



graphic design according to
Stevens and Childress



Unitos Smart



Dorsiflexion in swing phase

In most cases the amputee is not able to achieve this angle on his own. This is where the concept of STAND-PUNKT comes in.

With the UNITOS Smart we created a prosthesis which directly connects a polycentric knee joint with the ankle joint. This idea is based on human muscle chains. This connection enables the amputee to actively raise his foot (dorsiflexion) during swing phase so the distance between hip joint and toe is reduced.

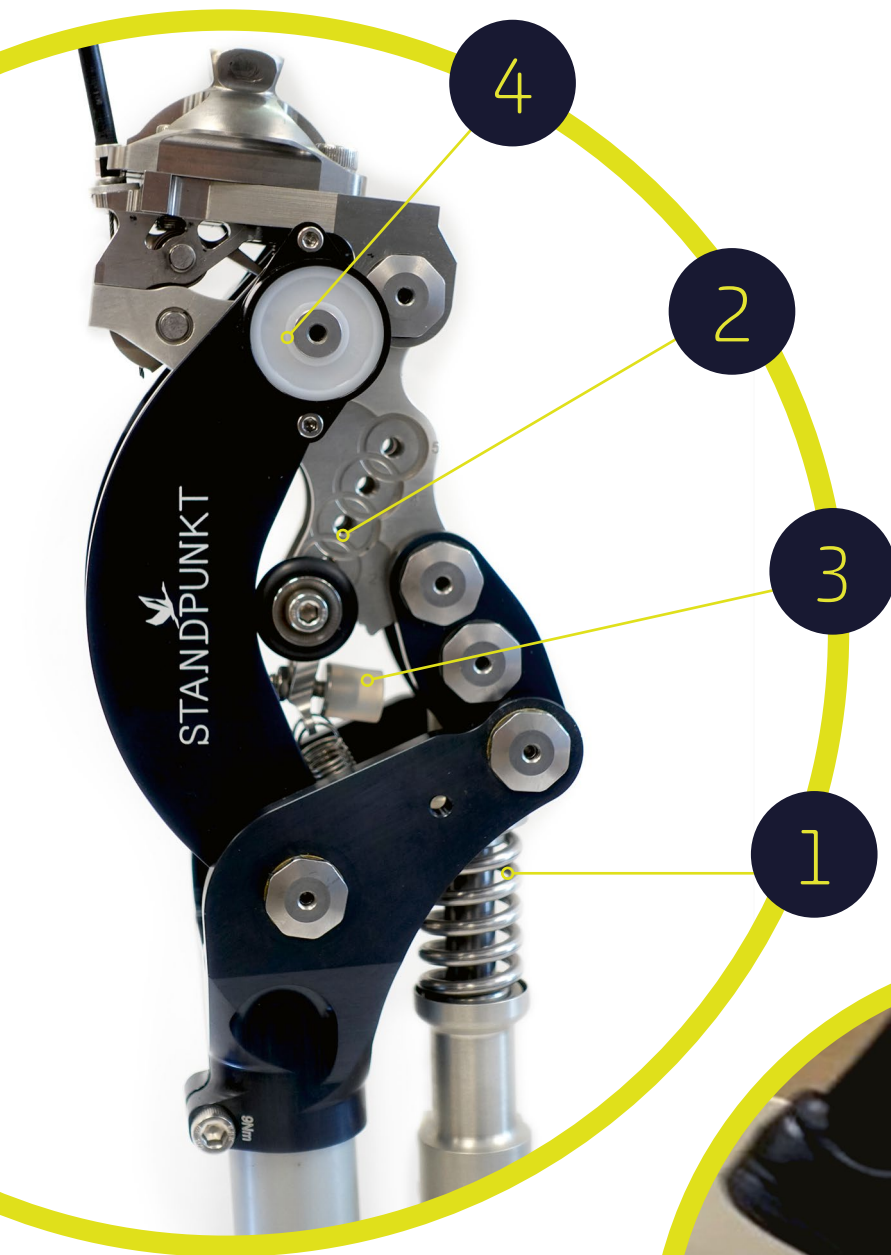
With the "active dorsiflexion", which is directly controlled by the knee joint, the distance between hip joint and toe remains constant from the very beginning until the end of flexion.

This interaction results in a high degree of ground clearance.

Because the ground clearance is initiated early, a significantly smaller squat angle is sufficient to swing the prosthesis through safely

The effort during walking is reduced while safety is increased.

Functions and features



All images are representations of the prototype.

Function 1, Heel damping and plantarflexion up to 30 °:

The ankle joint enables a plantarflexion up to 30° during heel striking. This feature not only improves walking on flat surfaces, but it also allows the amputee to safely walk on inclined surfaces. Because of the positive influence on the ground reaction forces the knee joint is prevented from bending unintentionally.

Function 2, Limitation of flexion:

The limitation of flexion of UNITOS Smart can be adjusted in 5 stages. You can start with a safe setting where user errors don't lead to falling due to uncontrolled knee bending. During therapy you can increase the angle of knee flexion step by step to create more comfort. A locking unit (manual use) makes it possible to sit down.

Function 3, Adjustable axle geometry:

To control and adapt the stance phase to the user, the polycentrics' axle geometry is steplessly adjustable. A silicone damper damps the final position and enhances walking comfort.

Function 4, Adjustable swing phase damping:

You can adjust the velocity of extension/flexion movement in 6 steps by using friction breaks so the gait can be individually set to the user

Knee flexion	Ground clearance with Endurance foot
1 (10 degrees)	- 1,5 mm
2 (12 degrees)	- 4 mm
3 (15 degrees)	- 4,5 mm
4 (25 degrees)	- 8 mm
5 (40 degrees)	- 27 mm

Sitting function:

The dorsiflexion of the foot during knee flexion gives you the possibility to place your foot on its full surface even if the squat angle is more than 90°. This helps the user e.g., when he is using a wheelchair.



Wheelchair function:

You can lock the knee joint while driving a wheelchair so you can move without your prosthesis touching the ground.





Safety first!

We created UNITOS Smart for users with a transfemoral prosthesis that have a high need for safety. UNITOS Smart enables effortless and physiological walking. It's adaptable to the therapeutic process without the user having to change his individual style of walking.

Target group:

- K1 and K2 amputees
- Slow walkers
- Anxious, unsecure walkers
- Amputees with less muscle strength



Matthias Klopf and Johannes Klopf – CEOs

STANDPUNKT

STANDPUNKT by Klopf GmbH
Remlinger Straße 21
97292 Holzkirchen
www.standpunkt.net

CONTACT US:
MAIL info@standpunkt.net

More information and
videos of example
movements are available
at standpunkt.net

