

Nabtesco

Technologies For Your Smile

6-Bar Hydraulic Knee NK-6

Symphony™



p-MRS system



Bouncing/Stance Flex



Smooth Hydraulic
Cylinder



Selective Lock

CE

Introducing New 6-Bar Hydraulic Knee Joint

The NK-6 *Symphony*™

New Nabtesco Knee, the NK-6 *Symphony* has an unique 6-Bar polycentric structure, which provides stability in the stance phase. An original mechanical sensing mechanism, the p-MRS system automatically detects the walking status and then controls the stability accordingly. The stance flexion feature and the smooth swing phase by a hydraulic cylinder provide a comfortable gait to the user.

p-MRS system

p-MRS (Polycentric-Mechanism of Reaction force Sensing) system is an innovative mechanical sensor, which functions from ground force reactions. The p-MRS system reacts to the position of the center-of-mass, and the knee joint controls its stability according to the position. From the heel-strike to the mid-stance, the p-MRS system locks the knee geometrically to prevent knee instability, and then at the pre-swing, it naturally and smoothly releases from locking for the transition to the swing phase.

Adjustable Stance Flexion

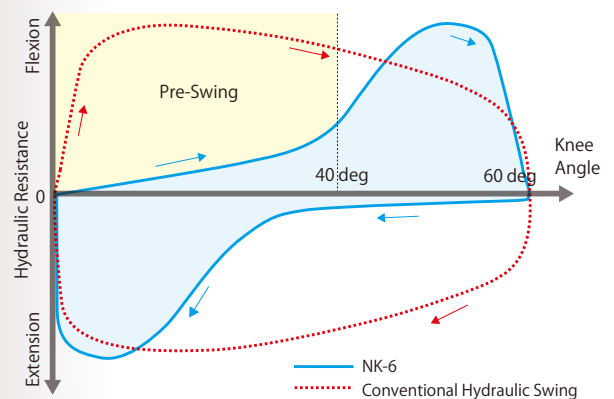
The knee joint provides a stance flexion during from the heel contact to the mid-stance. This feature results in absorbing shocks at the heel-strike and reducing bobbing of center-of-mass. The amount of the stance flexion can be easily adjusted to max. 10 degrees by tightening or loosening the adjusting screw placed at the bottom of the knee joint. The hydraulic cylinder also helps to dampen the knee motion for smooth stance extension.



Smooth Hydraulic Cylinder

By optimizing the layout of the hydraulic cylinder, the hydraulic cylinder has two great characteristics.

- 1) Initiating swing is very easy and light, and as a result, the user has reduced initial knee flexion resistance and less energy consumption compared to conventional hydraulic knee joints.
- 2) The cylinder is very powerful and is compact in hydraulic design and responds widely to various cadence.



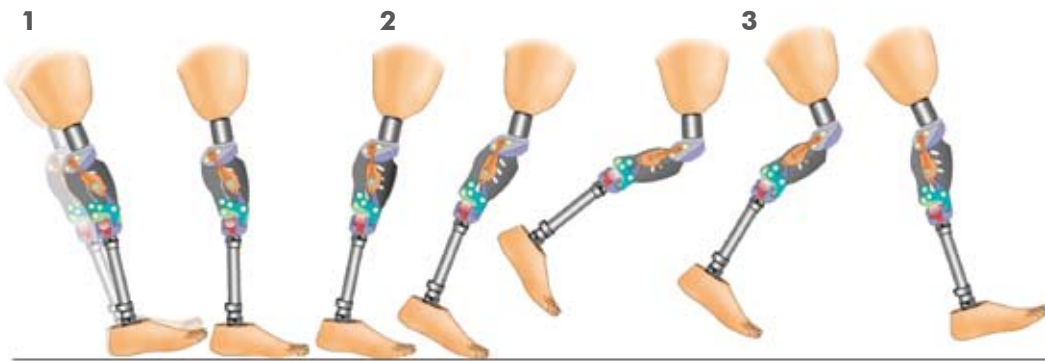
Selective Lock (Option)

A Selective Lock system is optionally available for NK-6 *Symphony*. This function helps the user by providing maximum stability when needed. It's an useful function for the user, for example, in gardening, ascending a ladder, walking on snowy roads, during rehabilitation/training or other occasions whenever the user needs maximum stability. This function prevents knee buckling, but the stance flexion is still available even in the lock mode.



Gait Control

The p-MRS System seamlessly switches the swing phase to the stance phase, and leads to a smooth and natural gait during ambulation.



1. Heel Contact:

The p-MRS System immediately locks the knee joint geometrically for the user's safety, and limits knee flexion to a maximum 10 degrees.

Benefit:

Appropriate amount of stance flexion provides a comfortable walking. Amount of the Stance-Flexion is adjustable according to the user's gait.

2. Late Stance:

When the p-MRS System detects ground reaction force at toe, the knee joint naturally releases the lock and smoothly shifts to the swing phase.

Benefit:

No special gait training is required to the user for releasing the lock at terminal stance. The p-MRS system seamlessly releases the geometric lock.

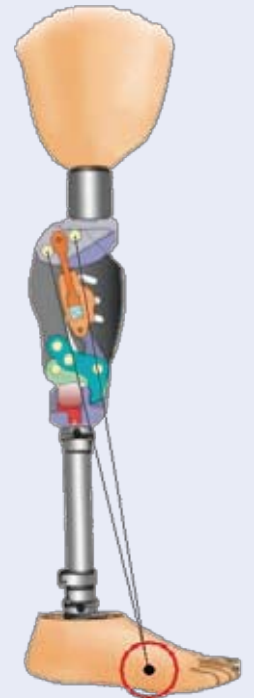
3. Swing Phase:

A compact and powerful hydraulic cylinder naturally responds to various walking speeds.

Benefit:

At the pre-swing phase, initiating the swing is very light compared with conventional hydraulic knees. Installed adjustable extension assist spring helps to keep full extension at the terminal swing.

p-MRS System



Sensing Point

p-MRS system is an originally developed mechanical sensor utilizing a principle of the polycentric link system. This detects the position of the ground reaction force around the sensing point, and automatically control the knee's stability.

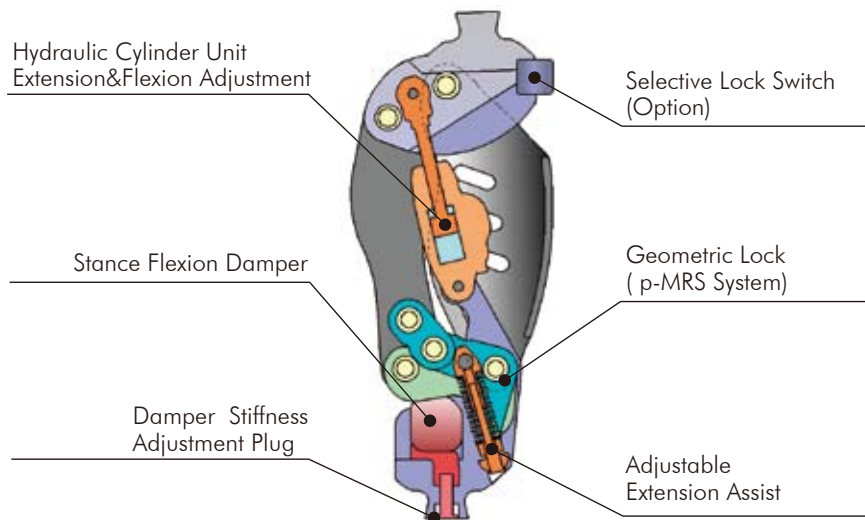
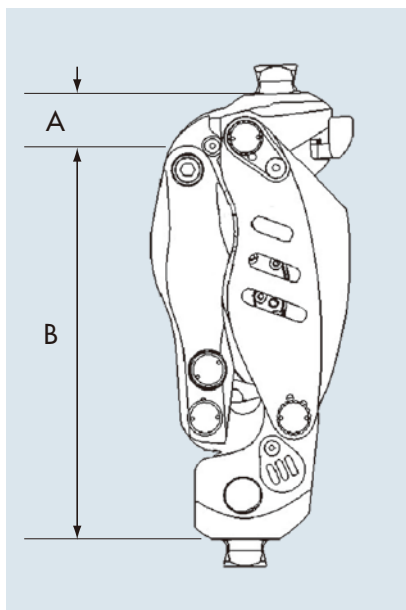


NK-6 *Symphony*™

SPECIFICATIONS



Model No.	NK-6	NK-6+L	NK-6 SH	NK-6 SH +L
Proximal Connection	Male Pyramid Adapter		Screw Head	
Selective Lock	–	○	–	○
Total Length	197mm		191mm	
A ref. measurement	14mm		14.5mm	
B ref. measurement	156mm		156mm	
Weight	890g	940g	930g	980g
Max. Knee Flexion Angle	170 deg.			
Material	Titanium & Aluminum			
Max. Body Weight	125kg (100kg For Hip Prosthesis & High Active User) Compliance with ISO 10328 P6(A-125kg)			
Mobility Grade	Low ~ Mid Active (K-Level 2+3, Mobility Class 2+3)			



Specifications are subject to change without notice.

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