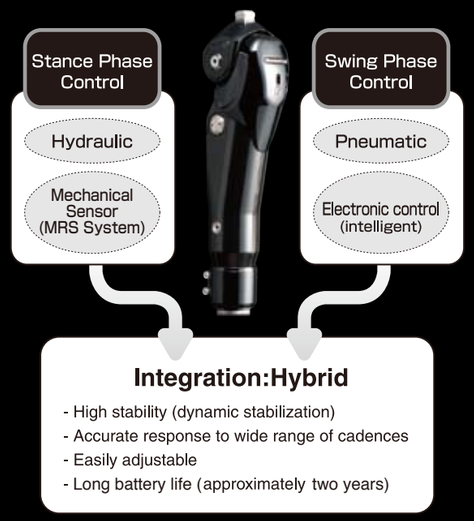
Hybrid Knee

Product Information

Hybrid Knee is applicable for community and workplace ambulators with the ability or potential to alternate their feet when descending ramps or stairs and vary their cadence. Hybrid Knee is ruggedly built to exacting tolerances to meet the needs of moderate to high activity amputees.

SPECIFICATIONS

Model No.	NI-C311	NI-C313
Proximal Connection	Male Pyramid Adapter	Screw Head
Total Length	296mm	292mm
A ref. measurement	38mm	38mm
B ref. measurement	214mm	
Weight	1375g	1385g
Max. Knee Flexion Angle	140 deg.	
Max. Body Weight	125kg (100kg for High Active User) Compliance with ISO 10328 P6 (A-125kg)	
Mobility Grade	Mid ~ High Active Ambulator	



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Nabtesco
Technologies For Your Smile

Hybrid Knee

Integration of hydraulic, pneumatic and electronic control

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The Ultimate Alliance

Hybrid Knee is the seamless fusion of two most reliable and advanced technologies developed for prosthetics today, combined to act optimally for maximum stability and efficiency throughout the gait cycle. The harmonius teamwork of the hydraulic stance phase control embodied in the Mechanism of Reaction Force Sensing (MRS) system and the systematic proficiency of the microprocessor-controlled pneumatic swing phase, assures complete stability and effortless walking.

Renewed Confidence

Mechanism of Reaction Force Sensing (MRS) : Utilizing a linkage system, the MRS system detects and measures the ground reaction force with each step and moderates the hydraulic pressure accordingly to allow smooth bending. Lack of dependence on electrical power ensures continuous stance phase control in all circumstances and in all environmental conditions. Thus even amputees requiring excessive stability can achieve faster walking speeds and easier progression with the Hybrid Knee.

Intuitive Gait Assimulation

Microprocessor Controll Swing Phase : Gait speed of each and every step is automatically measured by the microprocessor, resulting in a precise, proportional response in the pneumatic pressure. Whether an amputee is walking briskly across a crowded street, climbing an inclined road or strolling along a grassy lane in the park, the Hybrid Knee will respond at a consistently supportive and appropriate level.

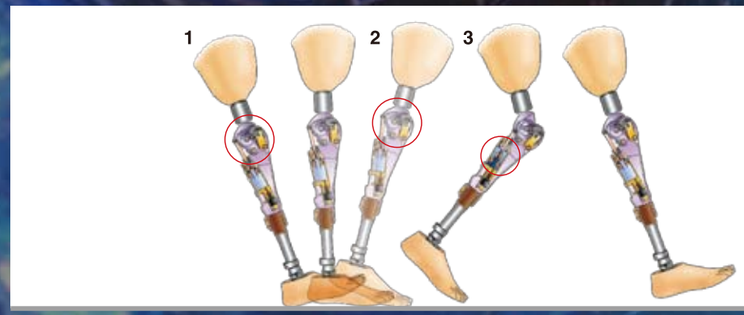
Fluid and Light-Weight

Lighter Swing Weight due to concentration at the Knee Axis : Unlike other microprocessor controlled knees, amputees require very little momentum to initiate knee flexion with the Hybrid Knee. Hybrid Knee's pneumatic swing phase control provides lower resistance and complete independent control from stance phase, resulting in maximum comfort for the wearer with easier and smoother transistions.

Note : photographs of Hybrid Knee used in this leaflet are new version which will be introduced in August 2010

Intelligence at Work

The seamless integration of technology between the hydraulic system and microprocessor-controlled pneumatic system ensures optimal utilization of the benefits of each at the most effective moment in the gait cycle.



1. HEEL STRIKE :

Function - MRS system closes valves in the hydraulic damper, increasing hydraulic resistance and preventing knee from unexpected bending.

Benefits:

- Independently adjusts for individual needs.
- Continuously Available stance control, even if battery is completely exhausted.

2. LATE STANCE :

Function - MRS system opens valves in the hydraulic damper, reducing hydraulic resistance and enabling knee to bend smoothly.

Benefits:

- Proportional response ; Sensing point and damping resistance are adjustable.
- Energy Efficient Yielding Function allows comfortable walking on uneven terrain.

3. SWING PHASE :

Function - Microprocessor detects gait speed of wearer and automatically adjusts pneumatic pressure to match user's cadence.

Benefits:

- No Overcompensation - Amputee has no need to swing residual limb strongly.
- Lower Resistance & Lighter Swing - Wearer is more comfortable and consumes less energy with each stride.

Intelligent Results

Step Over Step - Of huge significance to every amputee is the ability to walk downstairs and inclines step over step. Because Hybrid Knee's yielding resistance is set independently of the swing phase, yielding resistance can be set to the exact needs of the wearer without causing the swing phase to become heavier.

4. YIELDING -

Function - MRS system closes valves in the hydraulic damper to increase hydraulic resistance.

Benefits:

- Alternating Foot Descent - Wearer experiences increased confidence and decreased fatigue due to the ability to traverse and descend at his or her own speed and comfort level.
- Independent Control - Setting Swing & Stance independently assures gait symmetry in all facets of individuals' own cycle.

MRS System

MRS(Mechanism of Reaction-force Sensing) system is an unique mechanical sensor, and can detect the position for the ground-reaction-force. This system automatically controls the knee's stability according to the walking status.