

**ottobock.**

# Dynamic Vacuum System

Simply simple



Quality for life

# A unique vacuum thanks to an innovative system

The Dynamic Vacuum System (DVS) for prosthesis users with a transtibial amputation combines two important features: it integrates innovative technology while remaining very easy to use. The Dynamic Vacuum System is an active vacuum system which adjusts itself to the needs of the user in a dynamic manner. But what does that mean, and why does it offer significant advantages? Let us introduce you to the Dynamic Vacuum System.





## Simply simple

### **Active:**

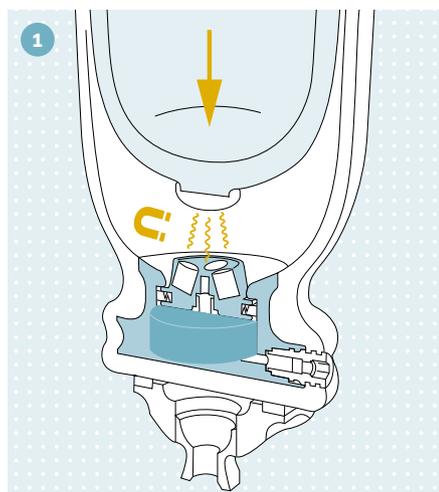
The Dynamic Vacuum System generates a continuous vacuum in both the stance and swing phases. This sets it apart from passive systems, such as valve systems, where a vacuum is only generated in the swing phase. With active vacuum systems like the Dynamic Vacuum System, however, the prosthesis has a tighter fit to the residual limb, which improves the user's perception of the ground beneath them. Another special feature is that the vacuum level dynamically adjusts to the user's activity level. If the user increases his or her activity, for example, the system's pumping output – and thus the vacuum level – also increase until the pistoning in the socket is reduced to a minimum.

### **Easy:**

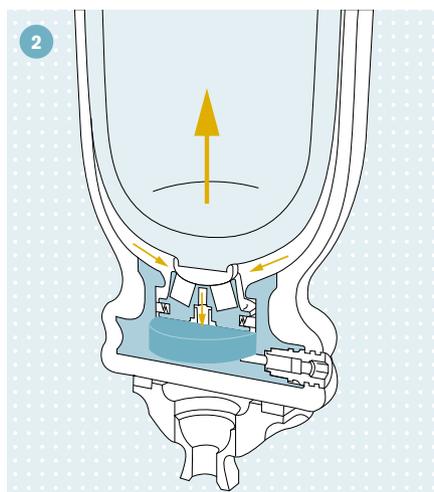
Fitting a patient with the Dynamic Vacuum System should be as easy as possible for you. That's why, during the development process, we focused on ensuring that you can fabricate this active vacuum system using any common plaster cast technique. You can also easily integrate the system into the socket using familiar fabrication procedures. For this reason, no certification is required. The patients benefit first and foremost from the system's low weight and ease of use: They put on their liner, step into the socket, roll up the knee sleeve and are on their way.

# Functionality

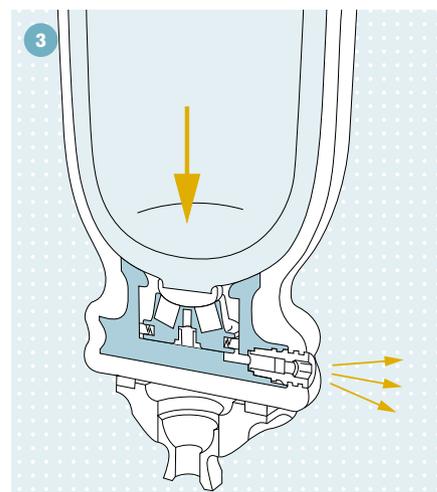
## Simply



After the user steps into the socket, magnetic coupling occurs between the liner and the piston.



During the swing phase, the piston moves in the proximal direction due to the centrifugal force. The difference in pressure between the inside of the socket and the cylinder chamber results in a flow of air from the socket to the cylinder chamber.



When the user places their weight on the prosthesis in the stance phase, the air is ejected from the cylinder chamber. Two one-way valves – in the piston and in the cylinder – prevent the air from flowing back.

A vacuum develops after just a few steps. Unlike in a valve system, this vacuum occurs not only in the swing phase, but also in the stance phase. Pistoning in the socket is reduced to a minimum.

The Dynamic Vacuum system generates a vacuum level which adjusts itself dynamically to the user's walking speed. If the user walks faster, pistoning increases and the vacuum rises accordingly. The vacuum also adjusts itself to the weight of the prosthesis and the diameter of the residual limb, reducing pistoning to a minimum. Rotational stability also occurs in the stance phase.

With the Dynamic Vacuum System, an active vacuum of up to 250 mbar is produced in both the swing and the stance phases.

In comparison, with a passive vacuum system the user generates no vacuum in stance phase.

# The advantage Simple

For young, old and everyone in between: As a prosthetist, you can fit many of your users with the Dynamic Vacuum System. Thanks to its straightforward fabrication process, no certification is required.

The system is completely sealed to prevent dirt from penetrating into it. This is a real advantage for the user. Plus, the system is especially lightweight.

Due to its small size, it's also easy to get good cosmetic results when integrating the Dynamic Vacuum System into a prosthesis. What's more, its tight fit allows for combinations with state-of-the-art feet.

## Discover what users have to say about the Dynamic Vacuum System.

*"My whole routine has become easier, and above all, I'm able to really fulfill my role as a mother now."*

Julia, 39 years

*"Nothing can stop me."*

James, 47 years

*"I used to be quite hesitant when I was walking, but now I can go wherever I'd like without any problems; I am completely confident with the new prosthesis."*

Erna, 59 years

*"Thanks to the DVS, I'm even able to do Nordic walking with my friend."*

Katharina, 59 years

*"I am now able to wear a prosthesis for more than eight hours and be out and about all day without any problems."*

David, 46 years

# For a direct connection

## The Dynamic Vacuum System liner



We developed a copolymer liner specifically for the system. The liner establishes a direct connection to the vacuum pump with its distal connector.

A magnetic coupling occurs between the liner and the pump's piston for this purpose. The liner material is tear-resistant and protects sensitive areas on the residual limb. Its medical white oil nourishes the skin in measured doses. The liner material is thermoformable, allowing prosthetists to easily adapt the liner's form to the user's individual residual limb shape.

What's more, the excess textile on the proximal end can be flipped over the socket brim to protect the knee sleeve.

	4 cm from distal end		30 cm from distal end	
	Min.	Max.	Min.	Max.
S	150	220	200	270
M	180	260	230	360
MP	200	280	330	500
L	250	330	360	550
LP	280	400	400	600
XL	300	450	430	650

- Measure the residual limb circumference 4 cm and 30 cm above the distal end of the residual limb and select the liner size which corresponds to this measurement, or the next smallest size.



### ProFlex sealing sleeve

We recommend using the ProFlex sealing sleeve for sealing the vacuum system. It is anatomically shaped and made of durable copolymer (TPE). It also features an exterior textile cover.

Anatomical shape means:

- The 15° pre-flexion makes bending the knee easier and reduces the formation of wrinkles in the hollow of the knee.
- The conical shape ensures comfortable pressure distribution in the area of the thigh and optimal adhesion to the prosthetic socket.
- The pre-shaped patella section reduces the pressure on the patella through the entire range of movement.

# Technical data

## Dynamic Vacuum System pump

Article number	4R220	4R220=1
Max. body weight	Up to 150 kg	-
System height	37 mm	27 mm
Weight	210 g	110 g
Spare parts	4X320 piston, 4X339 fixation ring, 4X322 valve bushing for lamination adapter, 4X326 dummy set, 4X338 wrench, 4X314 spacer plate	4X320 piston, 4X339 fixation ring, 4X322 valve bushing for lamination adapter, 4X326=1 dummy set, 4X338 wrench

## Dynamic Vacuum System liner

### Article no. (order example)

Reference no. = Size

6Y94=\*-F = M



