

ToughWare Prosthetics

Equilux™ VO/VC Terminal Device

INSTRUCTIONS FOR USE (IFU)



ToughWare Prosthetics' Equilux™ is a heavy-duty cable-operated terminal device (TD) that gives upper-limb amputees the ability to select voluntary opening (VO) or voluntary closing (VC) grasping modes "on the fly" as needed for tasks. A carbon-fiber composite frame minimizes weight while replaceable compliant gripping pads deliver stable, secure grasp.

MOUNTING & ATTACHMENT

The Equilux™ VO/VC TD can be used with quick-disconnect wrist systems (½-20 UNF thread), and it accepts standard large (9/32-inch) and some small (3/16-inch) control cable ball terminations. The control cable should be anchored on the lateral side of the user's forearm socket, proximal to the TD. Distances between the cable connection point on the actuation lever and this anchor point should be approximately the same between lever-on-top (anterior/VO mode) and lever-on-bottom (posterior/VC mode) positions for symmetric operation. Small differences usually present no problem, but large differences can affect the user's control. Correctly installed and adjusted, users should feel no significant difference in required cable excursion between modes. No harness adjustments should be necessary when switching between modes.

Equilux: "Equal Light" — When Day & Night are balanced and equal in length.

Why the Equilux™ with both VO & VC?

Because you need both.™

MODE SWITCHING

To switch from VC to VO operation ($VC \Rightarrow VO$), pull the actuation lever away from the central pivot to unlock it, **Figure 1**. Flip the actuation lever over to the other side of the pivot, **Figure 2**. This step requires practice, and the device can move quickly— hold the lever firmly! The lever may be easier to flip by starting with it pulled backward (proximal).

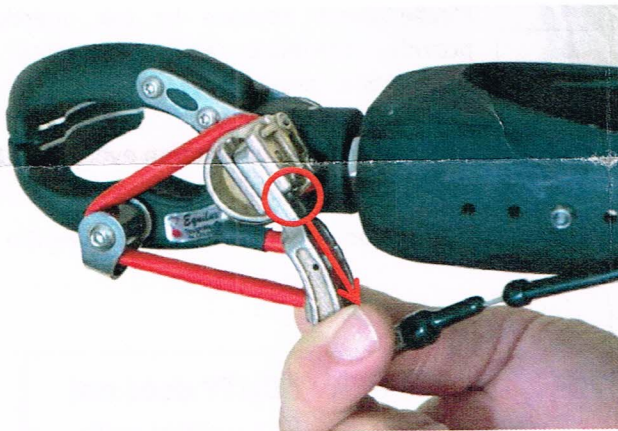


Figure 1: Pull actuation lever directly away from pivot to unlock, push towards pivot to re-lock.

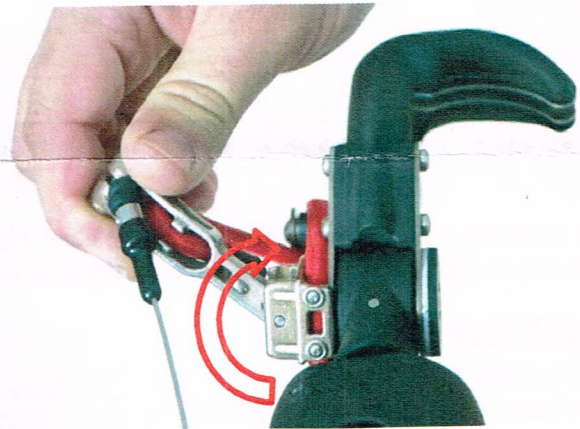


Figure 2: Flip the actuation lever to the other side of the pivot, then push towards pivot to re-lock.

This lock prevents the lever from being pulled sideways when the control cable is not aligned, for example using the Equilux™ with a variable-angle wrist. Do not attempt to flip the lever without first unlocking it. Re-lock the actuation



Figure 3: Push lever towards pivot to re-engage small bumps in lever slot and relock.

lever by pushing it back towards the pivot. The small bumps should re-seat in recesses on either side of the lever attachment slot, **Figure 3**.

To switch from VO back to VC, (**VO** ⇌ **VC**), reverse the process: Pull the lever away from the pivot, flip it over, and push it back toward the pivot to relock. With practice, switching modes becomes easier and intuitive to perform.

ToughWare’s Equilux™ VO/VC terminal device provides approximately 5 lbf (2.3 kg) tip pinch in VO mode. Should more pinch force be required, switch to VC mode.

It may be necessary to increase friction or lock rotatable wrist units to ensure the actuation lever can be flipped to switch grasping modes.

If necessary, light machine oil can be used to lubricate the main pivot and lever parts. Replacement gripping pad sets and tension (bungee) cords are available from ToughWare. For warranty questions, service or repair, or to order replacement parts, contact ToughWare Prosthetics.

WARNINGS

The Equilux™ is engineered for heavy-duty service, but must not be exposed to environments or uses that would harm the normal anatomical hand, including but not limited to temperatures, mechanical loads or impacts, high voltages, chemicals, or other damaging conditions as this is not only dangerous for the user, but also constitutes off-label use and voids any applicable warranty. Exposure to these conditions may cause damage that is not visible or immediately apparent, but that can lead to possible unexpected failure in the future. Users are responsible for protecting their own safety and that of others around them. All prosthetic components can fail—including the Equilux™ —so always use caution, and stay alert and vigilant to protect your own safety and that of other people around you!

Equilux™ VO/VC Terminal Device Specifications	
Weight	9.1 ounces (258 g)
Length	5.3 inches (13.5 cm)
VO Pinch Force	Approximately 5 lbf (2.3 kg)
VC Pinch Force	Approximately 60% of Input Cable Tension
Attachment	½-20 UNF Threaded Boss
Cable Receiver	9/32-inch, some 3/16-inch Ball Terminations

ToughWare’s switchable Equilux™ VO/VC technology is covered under US Patents 9,474,631 and 9,737,418, with additional patents pending.

Please don’t hesitate to ask questions or provide feedback and comments about ToughWare products. The best ideas for products and improvements come from those who use and rely upon them every day. We are always delighted to hear from you!

When returning product for service or repair, please ship items to our physical address with a note describing the reason for the return and provide a customer return shipping address:

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 have to be HEAVY!™**