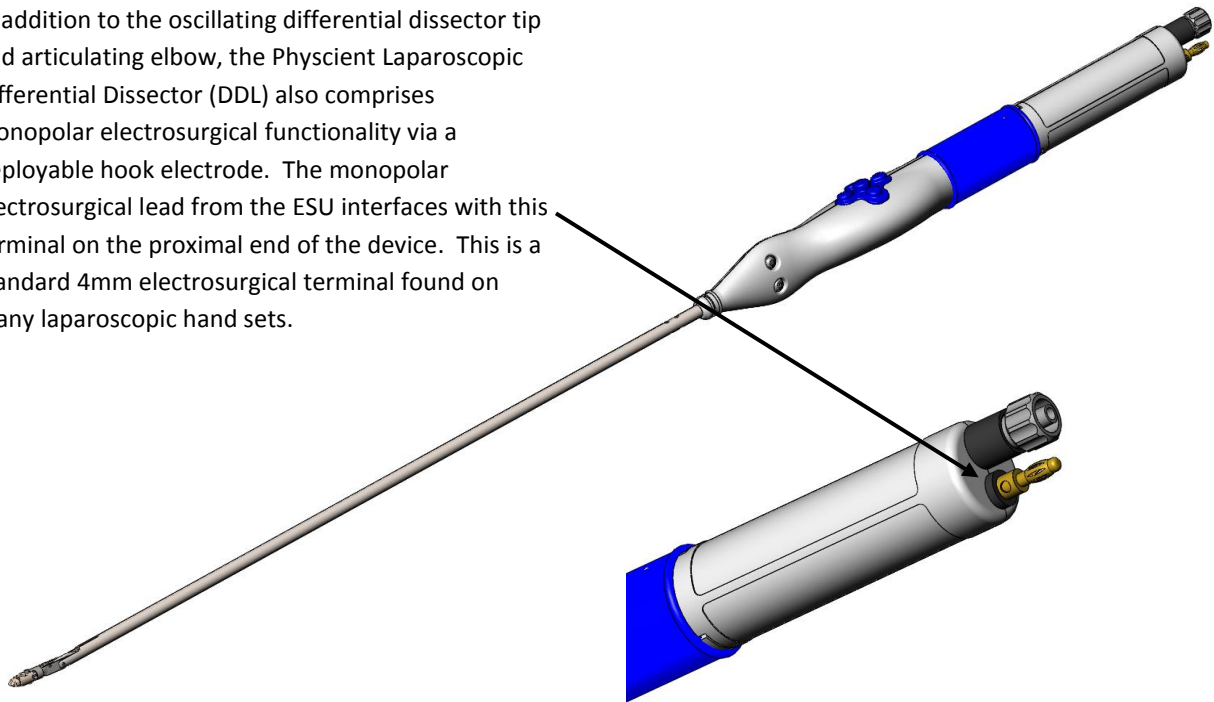
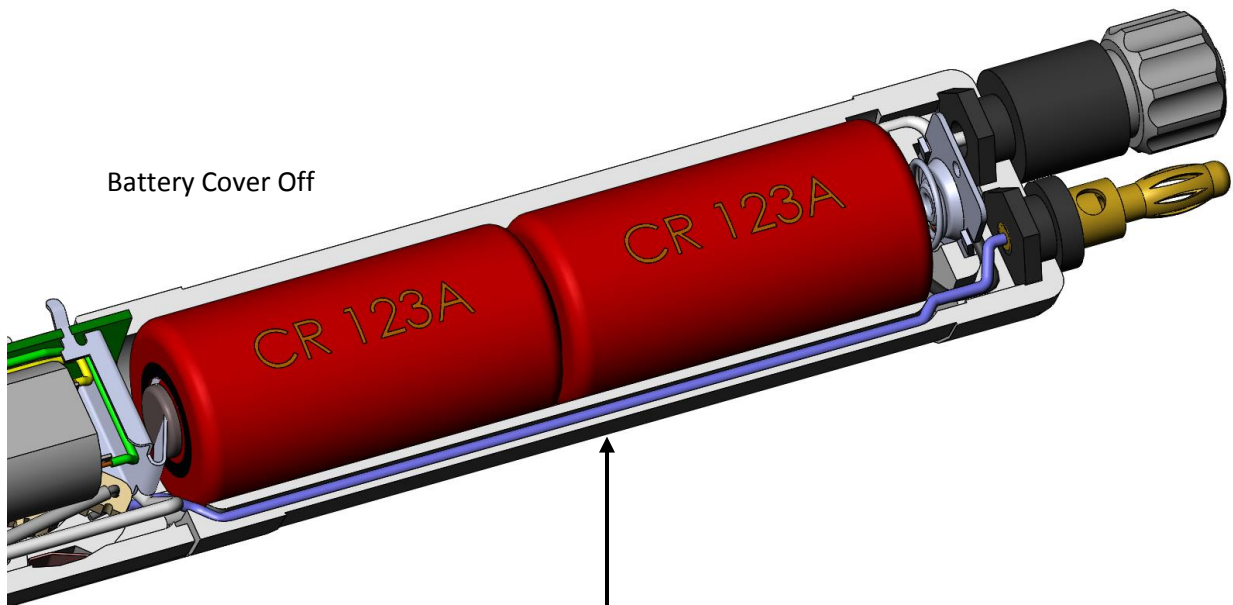


Physcient Differential Dissector Electrosurgery Explanation

In addition to the oscillating differential dissector tip and articulating elbow, the Physcient Laparoscopic Differential Dissector (DDL) also comprises monopolar electrosurgical functionality via a deployable hook electrode. The monopolar electrosurgical lead from the ESU interfaces with this terminal on the proximal end of the device. This is a standard 4mm electrosurgical terminal found on many laparoscopic hand sets.

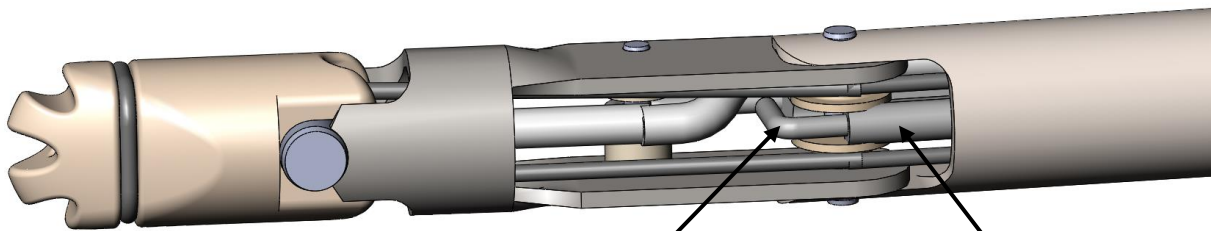
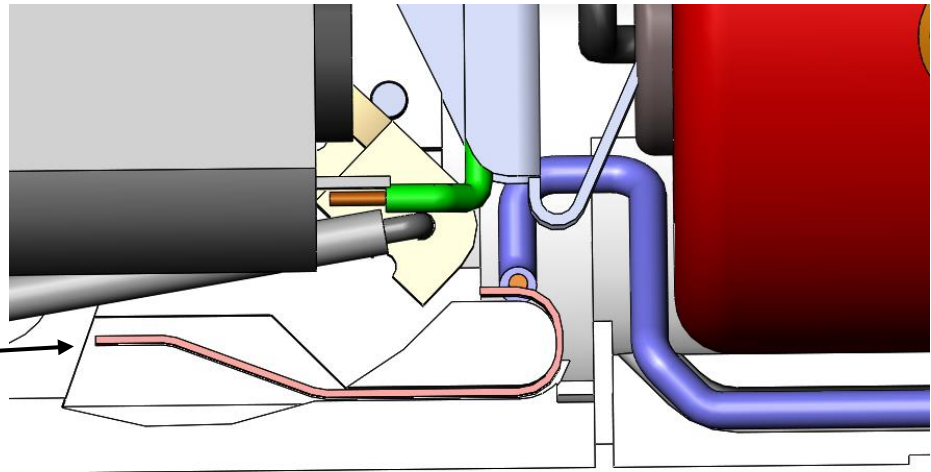


Battery Cover Off

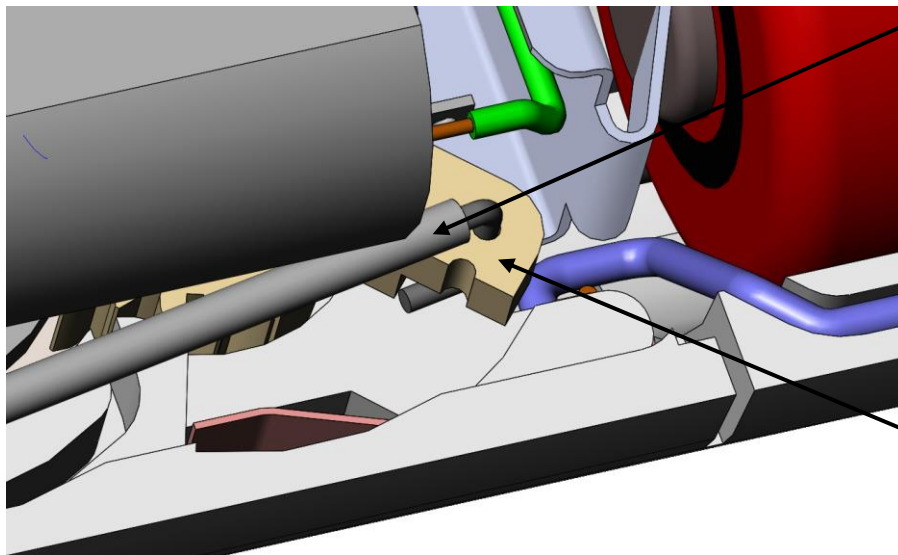


The monopolar electrosurgical current travels in this conductor from the terminal to a contactor on the distal side of the batteries.

The electrosurgical conductor terminates via solder on a copper beryllium leaf spring that is held captive in the injection molded ABS handle.



When the electrosurgical functionality is not in use, the hook electrode is in a stored position as shown here. This is the distal end of the electrode located at the tip of the device. This portion of the device is in contact with patient tissue. Also, The PTFE insulation is shown covering the electrode. This insulation covers the electrode all the way back down the shaft and into the device.



The proximal end of the electrosurgical electrode is attached to a control horn shown here:

PTFE insulation is continuous from the tip all the way to here.

The control horn is in this position when the electrode is stored and not in use.

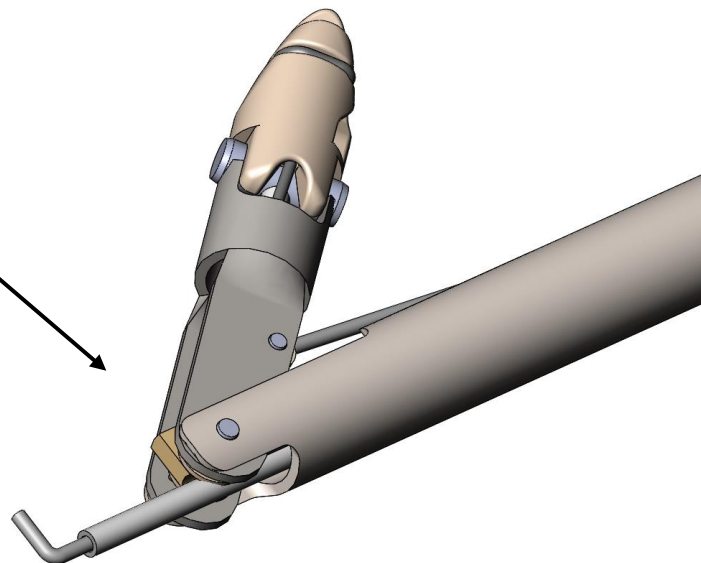
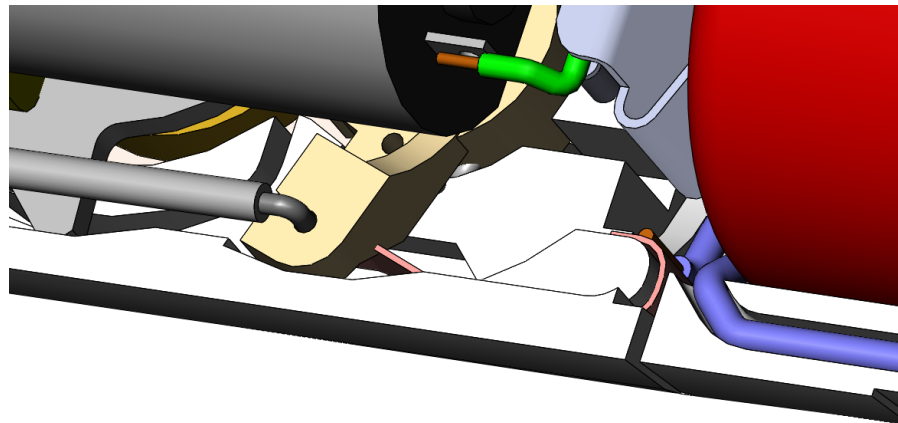
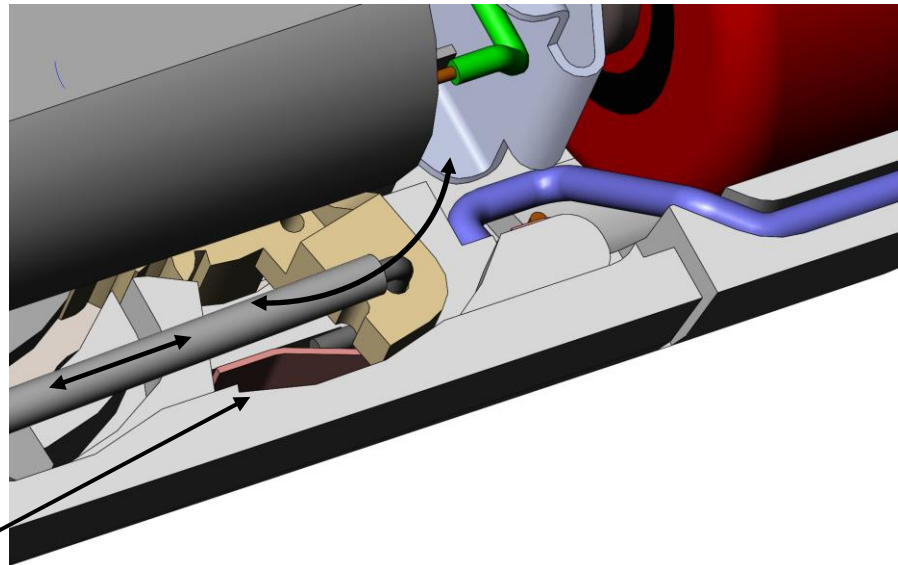
The separation of the electrode from the leaf spring ensures that when the electrode is in the stored position, the surgeon cannot inadvertently step on the cut or coag pedal and energize the electrode.

When the surgeon wishes to utilize electrosurgery, they actuate a button to deploy the electrosurgical hook. Via a microprocessor, electronics, a motor and gears the control horn rotates thereby driving the electrode out.

As the control horn rotates the electrode swings into proximity of, and eventually makes firm contact with the copper beryllium leaf spring.

Once this contact is made, the electrode conductive path is closed all the way from the electrosurgical generator to the hook at the distal end of the device. When the surgeon steps on the cut or coag pedal, electrosurgical current flows through the device and patient.

This is what the distal end of the device looks like when the electrosurgical hook is fully deployed and the electrosurgical current path has been closed inside the device.



Cross Section of DDL Shaft:

- 5mm OD x 4mm ID 316 SS welded seam tube
- 0.65mm OD semi-rigid carbon steel elbow articulation push / pull rod.
- PEEK spacer only present at the last 15mm of the distal end
- 0.75mm ID x 1.2mm OD PTFE tube for carrying saline irrigation to the surgical field
- 0.48mm OD, nylon coated, 7x7 construction, stainless steel wire rope, pull-pull cables that drive the oscillating differential dissector tip
- 0.75mm ID x 1.2mm OD PTFE insulating sheath
- 0.65mm OD carbon steel, semi-rigid electro-surgical electrode. This electrode has a hook shape formed in it at the distal end, and engages the deployment control horn inside the handle.

