Low Resistance, Low Heat Rise Contacts for Heart Assist Devices

Bal Conn® Electrical Contacts: superior power efficiency in a space-saving design

In heart assist devices, the small stuff matters. Details like contact electrical resistance in the power interconnect can have a big impact on device life and patient safety. The Bal Conn® electrical contact and SYGNUS® implantable contact system (a turnkey serial Bal Conn® and silicone seal configuration) offer ultra-low contact resistance of <10 milliohms in some size ranges. These proven solutions help devices—and designers—keep their cool and manage power more efficiently.

BAL SEAL® ENGINEERING

In the lead interconnects that manage power for VAD, pMCS, and catheter devices, no other contact can match the superior low electrical resistance and low heat generation of the Bal Conn and SYGNUS. Here's why:

Feature	Why is it relevant?	What's the benefit?
Compact Design	• Makes contact extremely power efficient, manages more power in less space than other contacts	• Supports drive toward smaller device sizes
Biocompatible Materials (Bal Conn®, Bal Spring®, and housing, plus seals in SYGNUS® system)	• Meet FDA requirements • Maximize conductivity • Minimize corrosion	• Promote patient safety • Ensure reliable device operation over long periods
Bal Spring® Contact Element	• Individual coils ensure multipoint contact	• Exhibits very low electrical resistance—less than 10 milliohms in some sizes • Retains lead with precise force • Minimizes heat rise, a potential cause of tissue damage • Ensures ultra-reliable delivery of power and signal • Prevents "tolerance stack-up" issues
Silicone Seal (SYGNUS contact system)	• Provides dielectric isolation • Protects against fluid ingress	• Ensures reliable operation • Eliminates need for internal development • Improves speed to market

Factors Impacting Heart Assist Device Interconnect Design

CONTACT RESISTANCE

- Generates heat, which can compromise patient comfort and safety
- Impacts device power efficiency, leading to reduced battery life, device performance and reliability issues

CORROSION

- Causes device malfunction over time
- Can require explant and/or device replacement in some cases
- Could compromise regulatory compliance

OPERATING REQUIREMENTS

- Perform in temperatures from ambient to body (68 °F to 104 °F)
- Deliver uninterrupted current of ~3-5 amps (typical) to the pump motor
- Withstand exposure to blood, body fluids
- Contribute minimal heat to protect against tissue damage
- Function reliably for life of device (from transplant bridge to destination therapy)
- Support both external power and fully implantable systems

Key Heart Assist Device Contact Design Considerations

- Low contact resistance for minimized heat rise and optimized power efficiency
- Corrosion resistance
- Ability to provide dielectric isolation, if required
- Made from biocompatible material, such as PTIR, that meets FDA requirements for implantable environments
- Reliability, with a design that provides built-in redundancy

Get a custom contact or contact system proposal in 3-5 working days and a prototype in 6-8 weeks. Leverage our engineering expertise, to save time and money in development and testing.

REQUEST A DESIGN

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