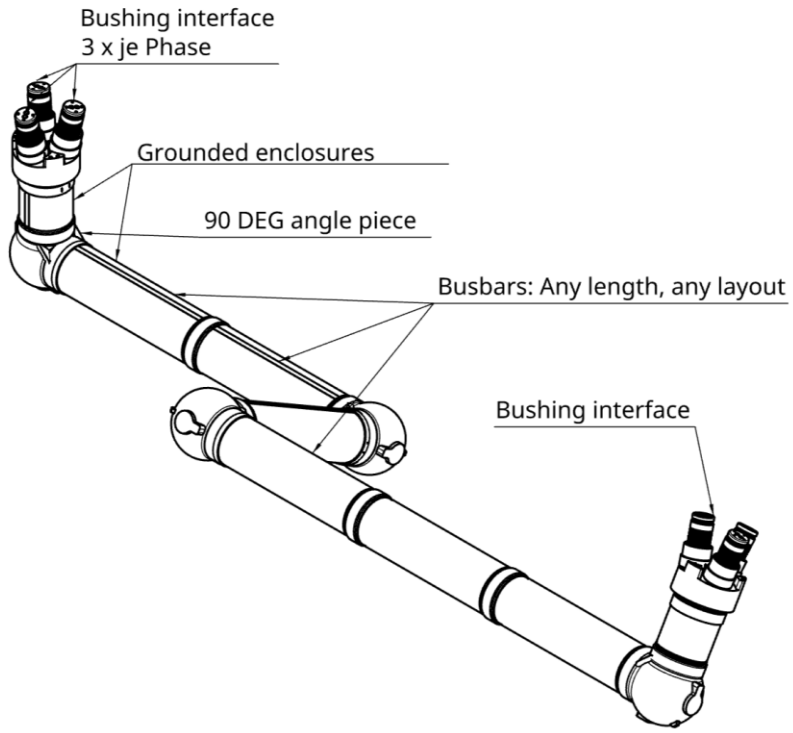
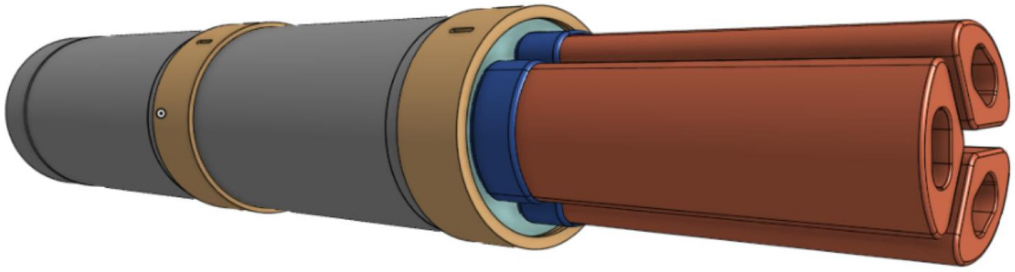
Hivoduct «Space power cables» are medium voltage and high-voltage cables for electrical energy transmission in space. Space power cables are highly efficient, robust, low weight, maintenance free, and non-flammable cables which use vacuum as main insulation media.

# Spacer Power Cable 24 kV, 3150 A

Space power cables enable high-voltage and high-current connections in space by connecting both ends with a a combination of straight busbars and angle pieces to fit any given layout. They are 3- phase enclosed with vacuum as the main insulation medium. They can be engineered for any layout and transport requirements, see one example below.




The key features for use in space are the robust, grounded aluminum enclosures with a quick assembly fitting design which allows fast and easy assembly and disassembly and full flexibility for transport to space. It uses the available vacuum as main insulation medium and requires a minimum number of insulators to withstand the high radiation in space.



Additional features are the reduced outside magnetic fields and versatility in layouts.

## Technical Parameters

| Parameter | Value | Information |
|---|---|---|
| **Transmission capacity** | **130 MW** | 3-phase transmission capacity. |
| Rated voltage | **24 kV** | |
| Rated current | **3150 A** | |
| Insulation media | **Vacuum** | Vacuum in space |
| Inside pressure | **0 bar** | |
| Conductor | **3100 mm²** | Aluminum; High conductivity > 28 m/Ω*mm² |
| Enclosure | **7300 mm²** | Aluminum; Anticorodal. Nonflammable. |
| Short circuit current | **63 kA, 1 s** | |
| AC Test voltage | **50 kV** | Partial discharge level: < 5 pC @ 175 kV |
| BIL Test voltage | **+/- 125 kV** | |
| Capacitance | **35-60 pF/m** | Between phases and phase to ground. |
| AC Resistance | **~10 µOhm/m** | |
| Enclosure Temp. | **< 65°C** | @ 3150 A for > 8 h without forced cooling. |
| Vacuum pump conn. | **Festo KD 1/4** | Pluggable socket. |
| Contact system | **Spiral contacts** | Contacts silver plated |
| Transport unit weight | **Any** | Choose transport unit size and weight. |
| Transport length | **Any** | Choose transport unit size. |
| Shipping assembly | **Transport units** | Final assembly in space using fittings. |
| Grounding | **Fully grounded** | Grounding connections on wall cover. |
| Life expectancy | **> 40 years** | Expected lifetime. |
| Reusable Materials | **Aluminium** | |
| | | |

Other ratings and features on request.

## Applications

Hivoduct space cables enable the construction of electrical networks in space, on the Moon, and on Mars. Large bases may require generation and transmission capacity in the 100 MW range. Electricity generation will be done at low voltage level using solar PV. To limit size and weight of transformers, medium voltage Space Cables for 100 MW will be required. Spacer Power Cables can transmit at high rated currents efficiently and safely and will build the backbone for space electrification.