

SECTION 11 86 00 – AIRCRAFT GROUND POWER CABLE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Aircraft cables used to provide 400 hertz ground power to aircraft.

1.2 RELATED SECTIONS

- A. Drawings, General Provisions of the Contract, including General and Special Conditions, as well as General electrical materials and methods of installation apply to work of this section.

1.3 REFERENCES

- A. The latest approved version or edition, by the authority having jurisdiction, of the following codes, references and standards shall apply. If the authority having jurisdiction has not approved or adopted a particular code, reference, or standard, the latest published edition shall be applicable.
 - 1. NFPA 70 - National Electrical Code; National Fire Protection Association.
 - 2. MIL-C-7974
 - 3. MIL-C-5756
 - 4. MS25488
 - 5. 2017 City of Phoenix Aviation Department Design Manual

1.4 SUBMITTALS

- A. Product Data: Provide manufacturer's catalog cut sheets.
- B. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- C. Special Tools List: Provide a list of any special tools required to perform any field performable maintenance tasks.
- D. UL certification per 1.6.B.

1.5 OPERATION AND MAINTENANCE MANUALS

- A. Provide six (6) bound copies, and three (3) electronic copies (external hard drive) of the approved, Operation and Maintenance fourteen (14) days prior to Substantial Completion.
- B. The manuals shall fully describe each product, system, or subsystem numbered logically and separated into sections and contained in rigid plastic binders with identification inserted in clear plastic pockets on front and spine of each binder. Manuals shall be assembled in accordance with ATA 101

- C. The content of the manuals shall be limited to information and data that specifically apply to products provided and shall include, at minimum, a general description, theory of operation, routine normal and special operating instructions and sequences. Also included shall be routine maintenance procedures and guides for troubleshooting, disassembly and reassembly instructions, and recommended spare parts list including current prices and sources.
- D. Wiring diagrams and schematics shall be incorporated into the manuals to clearly show features such as controls, switches, instruments, and indicators by name and location.
- E. Special Tools List: Provide a list of any special tools required to perform any field performable maintenance tasks.
- F. Spare Parts List: Provide manufacturer's recommended spare parts list.

1.6 QUALITY CONTROL

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. UL Compliance: Cables shall be UL or ETL approved by a nationally recognized testing laboratory at the time of bid. Submit verification with bid submittals.

1.7 DELIVERY, STORAGE, AND PROTECTION

- A. Provide units which do not require disassembly and reassembly because of movement into the final location and follow manufacturer's written instructions.
- B. Deliver equipment as a factory-assembled cable with protective crating and covering.
- C. Store equipment and material in suitable facilities until delivery, installation, and acceptance by the Owner.
- D. Coordinate the delivery acceptance of this equipment at the job site. Receive, offload, store and protect this equipment until such time as it has been installed and accepted by the Owner.
- E. Properly dispose of all waste, including, but not limited to, packaging, crates, etcetera.

1.8 WARRANTY

- A. Manufacturer shall provide a complete one (1) year warranty on all aircraft ground power cables. Said warranty shall commence on the date of Substantial Completion, per Division 01 Specification Section 01 77 00.01 – Closeout Procedure- System Acceptance. This warranty shall not be required to cover normal wear and tear or abuse by the end users, but shall cover factory defects and failures.
- B. Shipping and handling charges for warranty parts are the responsibility of the provider.
- C. Warranty Services shall be commenced with on site representation, by qualified repair technicians, within 72 hours from the request of the Owner.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. 400 Hertz Cable With Aircraft Power Plug
 - 1. Physical Characteristics:
 - a. Configuration: Single Jacketed configuration cable.
 - b. Bend Radius Minimum: 10.0" (25.4 cm).
 - c. Diameter: 1.65" (4.19 cm).
 - d. Length: As indicated on the drawings.
 - e. Weight Per Foot: 2 lbs. (0.9 KG)
 - 2. Environmental Characteristics:
 - a. Temperature Range: -67° F to +130° (-55° C to +55° C).
 - b. Storage Temp Range: -67° F to +150° F (-55° C to +65° C).
 - c. Humidity: 0 to 100%.
 - d. Bundling: Single Jacketed
 - 3. Electrical Characteristics:
 - a. Voltage Rating: 600 VAC maximum
 - b. Ampacity: 260 amperes
 - c. Frequency: 400 Hertz
 - d. Voltage Drop: 3.0 Volts. Measured at 90 kVA, 0.8 power factor on 65 ft. cables.
 - e. Voltage Unbalance: 0.20 Volts. Measured at 90kVA, 0.8 power factor on 65 ft. cables.
 - 4. Removable Plug Section:
 - a. Assembly shall include one (1) female connector to mate with the male aircraft connector.
 - b. Easily changed or replaced in the field with bolted connections.
 - c. Molded tapered strain relief at plug/cable interface.
 - 5. Components:
 - a. Power Conductors: 6 - #4 AWG Class M stranding.
 - b. Neutral Conductor: 1 - #1 AWG Class M stranding.
 - c. Control Conductor: 18 - #18 AWG Class M stranding.
 - d. Outer Jacket: Pressure extruded rayon-reinforced black neoprene 0.17: (0.43cm) nominal wall.

2.2 MANUFACTURER

- A. JBT AeroTech.
- B. J&B Aviation (ITW GSE).
- C. MCM Engineering.
- D. U.S. Airmotive.
- E. Page GSE.

- F. BKW GSE.
- G. Substitutions: None

2.3 MARKINGS

- A. Cables shall be marked in accordance with Articles 310-11 and 400-6 (NEC) which states all conductors and cables shall be marked to indicate the following information:
 - 1. Maximum rated voltage for which the conductor was listed.
 - 2. Type of rating on insulation.
 - 3. The manufacturer's name, trademark, or other distinctive marking by which the organization responsible for the product can be readily identified.
 - 4. The AWG size or circular-mil area.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Installation services shall be provided by an installing contracting company that has a minimum of three (3) years documented experience of successful installations on projects of similar size and scope.
- B. Install in accordance with manufacturer's instructions.
- C. The units shall not hinder or restrict the boarding bridge from operating within its full designed operating range.
- D. Arrange installation of cables to provide adequate clearance for service and maintenance.
- E. The cables shall be properly aligned and adjusted before final acceptance.
- F. Commission equipment. Provide complete functional testing to the satisfaction of the Owner. Complete all punchlist items.
- G. Wire mesh strain reliefs shall be utilized at termination locations.
- H. Reutilize any existing gatebox output extensions, breakaway devices, or attachment methods as necessary and as applicable.

3.2 INTERFACE WITH OTHER WORK

- A. Cable shall be sufficiently stored after installation and during other construction activities to prevent cable from lying on the ramp where it is susceptible to damage by construction traffic.
- B. The cable or its associated installation hardware shall not hinder or restrict the PBB from operating within its full designed operating range. Ensure aircraft cables are installed in such a manner as to prevent damage to any components throughout the full range of PBB motion.

3.3 FIELD QUALITY CONTROL

- A. Test for electrical continuity and short circuits.

3.4 STARTING EQUIPMENT

- A. Demonstrate proper operation of equipment to Owner.

END OF SECTION 11 86 00