

#### **4. IEM Outdoor Metal Enclosed Air Interrupter Switchgear 15KV**

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Section 16361 OUTDOOR METAL ENCLOSED AIR INTERRUPTER SWITCHGEAR

##### **Part 1 General**

##### **1.1 CONDITIONS AND REQUIREMENTS:**

- A. Refer to the Drawings, General Conditions, Supplementary Conditions, and Division 01 Requirements.

##### **1.2 DESCRIPTION**

Medium voltage free standing, outdoor Non-Walk-in Metal Enclosed (Air Interrupter Main and Feeder Switches) Switchgear.

##### **1.3 RELATED SECTION**

- A. Section 03300, Cast-in-Place Concrete.
- B. Section 16110, Field Test and Operational Check.
- C. Section 16121; Medium Voltage Cable.
- D. Section 16170, Grounding and Bonding.
- E. Section 16195, Electrical Identification.
- F. Section 16950, Electrical Sensing and Measurement.

##### **1.4 REFERENCES**

- A. ANSI C12.1 - Code for Electrical Metering.
- B. ANSI/IEEE C37.20.3 - Standard for metal enclosed interrupter switchgear.
- C. ANSI/IEEE 48 Standard Test Procedures and Requirements for High Voltage Circuit Alternating Current Cable Termination's.
- D. ANSI 61, Gray finishes for Industrial Apparatus and Equipment.

##### **1.5 SUBMITTALS:**

- A. Submit shop drawings for equipment and component devices under provisions of Section 01300.
- B. Submit shop drawings indicating outline dimensions, enclosure construction, shipping splits, lifting and supporting points, electrical single line diagram, and equipment electrical ratings.
- C. Submit manufacturer's installation instructions under provisions of Section 01300.

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- D. Product Data: Provide electrical characteristics and connection requirements, standard model design tests, and options.

1.6 OPERATION AND MAINTENANCE DATA:

- A. Submit operation and maintenance data under provisions of Section 01730.
- B. Included copy of manufacturer's certified drawings in project record documents.
- C. Include maintenance instructions for cleaning methods; cleaning materials recommended.

1.7 QUALITY ASSURANCE:

- A. Manufacturer: Company specializing in medium voltage metal enclosed switchgear with at least five years documented experience. The manufacturer of the Load Interrupter Switches need not be the same manufacturer as of the switchgear.

1.8 DELIVERY, STORAGE AND HANDLING:

- A. Deliver products to site under provisions of Section 01600.
- B. Store and protect product under provisions of 01600.
- C. Accept equipment onsite and inspect for shipping damage.
- D. Protect equipment from weather and moisture by covering with heavy plastic or canvas and by maintaining heat within enclosure in accordance with manufacturers' instructions.

1.9 EXTRA MATERIALS/ACCESSORIES:

- A. Submit maintenance materials under provisions of Section 01700.
- B. Provide one set of spare control fuses for each set installed.

**PART 2 PRODUCTS**

2.1 ACCEPTABLE MAUNFACTURERS:

- A. Industrial Electric Mfg. (IEM). Phone: (800) 576-8724 Fax: (510) 490-8365

2.2 DESCRIPTION

- B. Maximum/Minimum Ambient Termpérature: -30/110 Deg. F.
- C. Altitude: 3,300 Feet above sea level.
- D. Meet requirements for use as service disconnecting means.

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- E. Meet requirements for equipment installed accessible only to qualified individuals.

### 2.3 RATINGS

- A. Nominal Voltage: 15KV, three-phase, 60Hz.
- B. Voltage and Insulation Levels: Conform to ANSI C37.20.
- C. Main Bus Ampacity: 600 amperes continuous copper bus, minimum or as indicated on drawings.
- D. Ground Bus: Copper, full length of switchgear.

### 2.4 LOAD INTERRUPTER SWITCHES

- A. Provide quick-make, quick-break manual operating mechanism utilizing heavy duty, stored energy coil springs.
- B. Speed of opening and closing of the switch shall be independent of the operator. The switch blades cannot be teased to any intermediate positions.
- C. Provide separate main and spring loaded make and break arcing contacts.
- D. Arc interruption shall take place only in the arc chutes which release de-ionizing gas to assist in extinguishing the arc. There shall be no arcing between the main blades and the stationery contacts.
- E. Provide grounded metal safety barrier which shall prevent inadvertent contact with any live part, yet allows for a full view inspection of the switch blade position of all three phases.
- F. Provide a gasketed tempered glass viewing window in the switch compartment door to allow visual inspection of the condition and position of the switch blades.
- G. Safety Interlocking: Interlock switch and enclosure door so that:
  - 1. Door can be opened only when switch is in open position.
  - 2. Switch cannot be closed unless the door is closed.
- H. Electrical Ratings:
  - 1. System voltage: 12.47KV
  - 2. Impulse withstand: 95KV
  - 3. Momentary short circuit rating: 40,000 AIC
  - 4. Main Bus Rating: 600A Minimum

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## 2.5 POWER FUSES

1. Current limiting fuses positively held in position with provision for easy removal and replacement from front without the use of special tools. Fuse size shall meet fuse manufacturer's recommendation for the electrical load served.
2. Provide one set of spare refills for each fused switch shown. Mount in a holder on the inside of the fuse compartment door.

## 2.6 FABRICATION:

- A. Construction: Each equipment bay shall be a separately constructed cubicle assembled to form a rigid free standing unit. Minimum sheet metal thickness shall be 11-gauge steel on all exterior surfaces. Adjacent bays shall be securely bolted together to form an integrated rigid structure. To assist installation and maintenance of bus and cables, the rear covers shall be removable. Each individual unit shall be braced to prevent distortion. Outdoor Non-Walk-in enclosure shall be provided with cross-hatched sloped roof.
- B. The metal enclosed switchgear shall be fully assembled, inspected and tested at the factory prior to shipment. Large line ups shall be split to permit normal shipping and handling as well as for ease of rejoining at the job site.
- C. Provide added rigidity using steel member gussets in all corners of structures.
- E. Provide Dimensions as Required on Drawings.
- F. All steel members shall be painted.
- G. All Power Connections shall be Torqued and Marked in Switchgear Manufacturers Assemblies Facility.

## 2.7 FACTORY FINISHING:

- A. All steel parts, except galvanized (if used) shall be cleaned and zinc phosphate pretreatment applied prior to paint application.
- B. Paint Application: Provide powder coat paint process. Paint color shall be ANSI 61 light gray, TGIC polyester powder, applied electrostatically through air, or paint as required by drawings.

## **PART 3 EXECUTION**

### 3.1 EXAMINATION:

- A. Visually inspect switchgear for evidence of damage and verify that surfaces are ready to receive work.

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- B. Visually inspect to confirm that all items and accessories are in accordance with spec.

and drawings.

- C. Verify field measurements are as shown on shop drawings.
- D. Verify that required utilities (e.g. control voltage for heater circuits on outdoor switchgear) are available, in proper location, and ready for use.
- E. Beginning of installation means installer accepts existing surface conditions.
- F. Seismic qualification to meet Seismic Zone 4.

### 3.2 INSTALLATION:

- A. Install in accordance with manufacturer's instructions, applicable requirements of the NEC and in accordance with recognized industry practices.
- B. Use jumper cables, as provided by the switchgear manufacturer, to connect the primary Intermediate Class Surge arrestors (where indicated on drawings).
- C. Bending of high voltage cable should be avoided or minimized. All necessary bends should meet at least the minimum radii specified by the cable manufacturer.

### 3.3 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed by the installing contractor under provisions of section [01400 and 01410].
- B. Visually inspect for physical damage.
- C. Perform torque of all bolted bus connections, including cable terminations.
- D. Check torque of all bolted bus connections, including cable terminations.
- E. Verify key interlock operation (where indicated on drawings).
- F. Perform insulation resistance tests per manufacturers' published instructions.
- G. Perform low frequency withstand tests according to ANSI/IEEE C37.20.2 paragraph 5.5.

**END OF SECTION**