

SECTION 16318

MEDIUM VOLTAGE METAL ENCLOSED SWITCHGEAR

PART 1 GENERAL

1.1 SUMMARY

A. Scope

1. Provide 1 assembly of 5 KV, indoor metal enclosed, dead front, air interrupter, load break, fused disconnect switches. The switchgear appurtenances and accessories shall include, but not necessarily be limited to, the following:
 - a. Switch assembly, as indicated.
 - b. Two-position (open-close), three-pole, gang-operated, 600 amperes, load-interrupting, air-interrupter switches with stored-energy operating mechanisms.
 - c. Main bus, rated 600 amperes, 4.16 KV.
 - d. Furnish loose, all necessary splice plates, connectors, cable, bus and other hardware as required for connections between shipping sections, for installation by others.

B. Work Included

1. Receiving and unloading of the equipment upon arrival at the Project Site, including all rigging, moving within the Project Site, and installation.
2. All wiring and solderless compression type lugs external to the switches, including connections between the switches and medium voltage metal clad vacuum breaker.
3. Final assembly of shipping sections and installation in place, including electrical interconnections between shipping sections, using the splice plates, connectors, cable, hardware, etc., shipped loose.
4. Testing, adjusting, and placing of the equipment into operation.

C. Reference Specifications

1. Electrical General Provisions - SECTION 16010.
2. Basic Materials and Methods - SECTION 16050.

1.2 RELATED WORK SPECIFIED UNDER OTHER SECTIONS

1.3 QUALITY CONTROL

A. Source Quality Control

1. Construction, rating and tests. Comply with the latest requirements of ANSI, IEEE, NEMA and UL Standards.
2. Where testing has been performed on essentially identical equipment under actual Standards conditions, and test data is certified and submitted for proof, no new tests are required.
3. Power frequency withstand tests at 4.16 KV (rms) for one minute shall be made at the factory on each assembly in accordance with the requirements of ANSI Standard C37.20. Operation of all devices shall be checked before shipment.

B. Installation And Checkout

1. Provide the services of a fully qualified field engineer at the site, as may be required by the OWNER'S REPRESENTATIVE, to provide guidance during the installation of the switchgear, to check out the work of the installing contractor, and to instruct the OWNER'S REPRESENTATIVE in the care and operation of the equipment.
2. The field engineer will be required to inspect the installation, make whatever adjustments he deems necessary to assure that the switchgear is ready to be energized and put into service, and shall be authorized to sign the following statement on behalf of the Supplier:

“The undersigned certifies that, as a responsible agent of his organization, he has inspected the equipment, and that it is ready to be placed in service.

“The equipment has been field inspected, adjusted per the manufacturer's instruction booklets, where necessary, and complies with the approved shop drawings.”

1.4 SUBMITTALS

- A. Furnish submittals for items that are identified in this SECTION by a different typeface and a bracketed code (e.g., *Item [L]*). Refer to SECTION 01340 for definition of codes for types of submittals and the administrative requirements governing submittal procedure. Additional submittal requirements pertaining to this SECTION are specified herein under this Article.
- B. *Shop Drawings [B,D,P]*: Submit manufacturer's certified prints showing assembly of units, outline dimensions and weights, shipping lengths, location of conduits, wiring diagrams, installation drawings and a complete bill of material, for each assembly.
- C. *Test reports [T]*: Submit on all factory tests. Submit certified test reports of previous tests on essentially identical equipment under actual conditions, not simulated, for momentary test on bus, and momentary and interrupting tests on switches.
- D. *Guarantee [G]* the unit to meet the operating conditions, capacity and performance conditions as specified and to remain serviceable for two years after project acceptance. If either the unit or accessories fail to meet operating requirements or if failure of any part occurs during the guarantee period, rework or replace the affected items promptly to meet the CONTRACT requirements at no cost to the OWNER.

1.5 MAINTENANCE DATA AND OPERATING INSTRUCTIONS

- A. Furnish, per SECTION 01730, operating and maintenance manuals for instructions for operation and maintenance of equipment and list of recommended spare parts.

1.6 ACCESSORIES

- A. Furnish one complete set, for each assembly of special tools and accessories required for the operation and maintenance of the switching equipment.

PART 2 PRODUCTS

2.1 FABRICATION AND MANUFACTURE

A. Manufacturers

1. General Electric
2. Siemens Energy & Automation
3. Square D
4. Eaton/Cutler Hammer

B. Switchgear Assemblies

1. Each shall consist of a metal enclosed compartment containing a manually operated, air immersed, load break, disconnect switch and fuses of the number, rating and type indicated.
2. Interrupter Switches. Load break, three pole, two position, externally gang operated, rated 5 KV (60 KV BIL), 600 amperes continuous and interrupting, 58,000 amperes momentary, mounted on NEMA rated insulators for the voltage rating and BIL specified. Equip switches with a quick-make, quick-break device to open and close the switch independently of the speed with which the operating handle is moved. Provide visual inspection through safety-glass front window and indication on the handle mechanism of the blade position.
3. Cable Entrance Sections. From above or below as indicated. Provide adequate space for the makeup and bracing of stress relief terminations. Equip incoming line terminals with 2-hole NEMA pads and solderless compression type lugs, manufacturer's standard, for cable sizes and materials indicated. Provide bolted removable plates for access to the compartment.

C. General Features

1. Make up all bus of high conductivity bar copper and mount on rugged insulating supports. Provide bus with continuous and short circuit current ratings equal to those of the metal enclosed switches.
2. Bus support insulators shall be porcelain or cast cycloaliphatic plastic material. "Glastic" (glass-polyester) insulators are not acceptable.
3. Provide a 1/4 inch x 2 inch copper ground bus the full length of the line-up. Provide lugs for 4/0 AWG copper grounding conductor at each end.
4. Make terminal connections of all Cable Entrance Sections readily accessible from the front for making up cable connections. Silver-plate contact surfaces of all bus and connections.
5. Switchgear Assembly Supporting Structure. Deformed, welded and bolted sheets and shapes, with rear portion containing bus bars and supports, with space for cables entering from above or below. Do not locate accessory items in the rear bus compartments. Place interrupter switches, fuses and operating mechanisms in the front portion.
6. Finish exterior and interior surfaces of the entire assembly with a synthetic lacquer or enamel, ANSI-61 (match existing).
7. Cubicle doors shall be equipped with rotary latch type padlockable handles. Switch shall be operable by means of a removable handle without opening a door. Handle storage provisions shall be made externally.

8. Provide station class surge arresters connected at the incoming terminations and securely grounded to the metal structure.
9. Provide nameplates with suitable engraved letters on each compartment door. Use laminated black plastic nameplates with white engraved letters.

PART 3 EXECUTION

3.1 TESTING AND DELIVERY

- A. Perform factory tests on the equipment as specified. Notify the OWNER two weeks in advance of testing to be performed so that the OWNER may have the option to witness testing.
- B. Upon successful completion of test, deliver the equipment to the Project Site.

3.2 INSTALLATION

- A. Assemble and anchor the equipment.
- B. Perform and report upon all ELECTRICAL ACCEPTANCE TESTS and adjustments required by SECTION 16999 of this SPECIFICATION.

END OF SECTION

Revision History	
Date	Rev. No.
A	0
B	0
C	0
02-19-09	0

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