

SECTION 16300 (26 13 00)

MEDIUM VOLTAGE DISTRIBUTION EQUIPMENT

Part 1 -Design Directives

Every building served from the medium voltage distribution system will be supplied with a loop or disconnect switch. These switches shall be metal enclosed 5 or 15 kV, 600 amp, three pole, gang-operated switches. The door of each switch shall have a window to allow viewing of the switch position. When the building is served from the medium voltage loop a loop switch shall be specified.

Every medium voltage loop switch assembly shall be configured to have two non-fused disconnect switches and one or more fused disconnects depending on the number of loads served. The loop switch assembly shall be designed and installed as a single unit with all enclosures having the same physical dimensions.

- HVL type loop switches shall be rear connected and rear accessible working space (30" minimum).
- HVLcc switches shall have rear access working space (30" minimum) or the loop feed sections shall be positioned on the ends of the line-up with 30" working space made available.

The loop switch assembly shall be mounted in the center of a concrete housekeeping pad that is a minimum of two inches and a maximum of four inches high and eight inches larger in length and width than the assembly footprint. The edges of all housekeeping pads shall be chamfered.

Phase and ground buswork in and between all switches shall be hard drawn copper with 98% conductivity.

The loop switch assembly shall be provided with an equipment grounding bus that, when assembled, is continuous throughout the interior of all switches, and located in the rear of the assembly.

5 and 15 kV switches shall be:

- Schneider Electric metal-clad air switch, Type HVL. Grounding bails on line/feeders (see requirements below).
- Schneider Electric compact SF6 switch, HVLcc. 20" width, with switch operated grounding provision on line/feeder side.
- S&C Vista SF6 vault type switch with electronic relay protection, with switch operated integral ground provision on line/feeder side.
- G&W SF6 loadbreak switch with integral ground and fault interrupting on line side.

Grounding bails (for metal-clad air switches): Provisions for the connection of workman's grounds (grounding bails) at each phase of all cable termination points shall be provided by ball and socket grounding studs with insulated covers. These grounding devices shall be installed at the factory and be manufactured by A. B. Chance #C600-2102 stud with C406-0416 cover or Salisbury #21191 stud with 21236 cover. On all 4160V and 13.2kV main switchgear, grounding bails shall be installed so as to be safely accessible on the de-energized side of the loop while the main bus remains energized (ie., as the campus electric distribution system is operated as a loop). A grounding bus shall be installed so as to be easily accessible and within a maximum of 10 ft. from the grounding bails.

Station class surge arrestors shall be provided at the following locations based on system voltage:

- 5 kV systems: Arrestors shall be installed at the cable termination point of each fused switch only. The arrestor rating shall be 3kV (2.55kV MCOV).
- 13.2 kV systems: Arrestors shall be installed at the cable termination point of each non-fused switch only. The arrestor rating shall be 12kV (10.2kV MCOV).

Fused switches shall be equipped with type E current limiting fuses. Fused switches shall be supplied with a set of spare fuses and provisions to store the spares inside the switch or in a wall mounted cabinet.

Kirk key interlocks shall be supplied between the low voltage main circuit breaker and the fused disconnect switch that serves that system only.

Fused and non-fused medium voltage disconnect switches shall be supplied with provisions to lock the access doors (front and rear) and to lock the switch in the open position.

The switches shall be specified with compression crimp lugs of the proper number and size for each cable connection.

Loop switch assemblies shall be equipped with mimic bus labeling (decals) on the front doors

Renovation projects in older buildings normally cannot support the space requirements of medium voltage metal clad air switches. In these cases, the College allows the specification of SF₆ insulated switches manufactured by S & C Electric Co., or G&W Electric. These compact devices are rated 15kV and can be mounted to the floor, wall or ceiling. Cable connections are made via Elastimold modular connectors.

Part 2 -Products

Square D, by Schneider Electric
S&C Electric Company
G&W Electric

Part 3 -Execution

Loop and disconnect switches shall be securely fastened to the housekeeping pad with anchor bolts.

Metal enclosed switch line-ups shall be wired either through the bottom or top.

All conduits serving medium voltage switches shall be rigid. These conduits shall have grounding bushings at each entry into the switch.

Metal-clad air switches, type HVL shall be rear connected and rear accessible, with 30" minimum working space.

HVLcc switches shall have rear access working space (30" minimum) or the loop feed sections shall be positioned on the ends of the line-up with 30" working space made available.

Prior to energizing main electric gear:

- a. Require short circuit & overcurrent protection coordination study with arc flash hazard analysis to be submitted and approved by the engineer of record and FO&M Engineering during submittals process with a final, stamped approved copy to FO&M as part of commissioning and close-out.
- b. Require equipment Start-up and Testing to be submitted, reviewed by engineer or record and FO&M Engineering as part of Commissioning.
- c. Contractor shall meet with FOM-Engineering and FOM-Electrical Shop at minimum 60 days prior to energizing to plan/confirm schedule.
- d. FOM Electrical Shop must be contacted for energizing with a minimum notice of one week.
- e. See "Dartmouth College FO&M Electrical Energizing Requirements" document for Contractor's responsibilities prior to energizing.