

SECTION 16112

BUSWAYS

PART 1 GENERAL

1.1 SUMMARY

- A. Description of Systems
 - 1. Provide busway systems as indicated or specified.
- B. Products Furnished But Not Installed Under This Section
 - 1. Furnish four hook sticks of suitable length for operation of plug-in units from the floor.

1.2 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. Include complete data on each item. Coordinate the items as they relate to the work, prior to submittal.

1.3 EXTRA STOCK

- A. Furnish number of spare plug-in fused switch and circuit breaker units as specified and indicated for the OWNER'S future use.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Plug-In Busway
 - 1. *Plug-In Busways and Components [U]*: Totally enclosed, nonventilated, low impedance type per NEMA Standard BU-1 and ANSI/UL 857, consisting of standardized assemblies of insulated bus bars in a rigid formed sheet metal enclosure and components. Furnish straight sections, cable tap boxes, end closures, support brackets and plug-in circuit breaker or fused switch units as indicated. Furnish 3 phase, 3 wire, as indicated, with voltage rating as indicated, complete with integral ground bus.
 - a. General Electric
 - b. Siemens Energy & Automation, Inc. - ITE
 - c. Square D
 - d. Eaton/Cutler-Hammer
 - 2. Continuous Current Rating. As indicated; rating indicated is the minimum required when busway is installed in the flatwise, edgewise, or vertical position relative to the floor.

Provide ground bus of capacity equal to one-half of a phase bus. Plug-in bus duct shall be designed so that, at its continuous rating, no part shall exceed a 55 degC temperature rise above a 40 degC ambient temperature.

3. Minimum Short Circuit Rating. As indicated; 65,000, RMS symmetrical amperes at 480 volts.
4. Conductors. High conductivity copper bar (with maximum current density of 1000 amperes per square inch) tin or silver plated at all joints, connections and plug-in openings. Fully insulate conductors, except for stab points, with a PVC, reinforced fiber glass or mylar material having a temperature rating of not less than 105 degC.
5. Plug-in Openings. Provide at two foot intervals on each side of straight duct; stagger openings on opposite sides of duct so all openings, 10 in a ten foot length, are usable at the same time.
6. *Plug-in Units - General [U]*: Fabricated assemblies of equipment enclosed in metal housings with hinged cover door for access to equipment, adequate conduit knockouts, necessary clamps for attachment of the housing to the bus duct enclosure, and with high contact pressure silver or tin plated stabs to engage phase and ground bus bar. Equip units with ground bus stabs as required.
7. Plug-in Fusible Switch Units. Equipped with fusible disconnect switch having an external operating handle arranged for both manual and hook-stick operation and interlocked with the cover door such that the door cannot be opened unless the switch is open. Operating mechanism must clearly indicate the “on” and “off” position of the switch and have provision for locking the switch in the “on” or “off” position with three 5/16 inch shackle padlocks. Provide 3 pole, visible blade, quick-make, quick-break switch rated 600 volts, with horsepower rating in sizes up to 200 amperes, and of current rating indicated. Provide UL Class R type fuse clips for size fuse as indicated on the DRAWINGS.
8. Expansion joints. Provide at each building expansion joint with additional expansion joints for each 200 foot of straight runs or more frequently if recommended by the busway manufacturer. Expansion joint shall provide for a minimum of plus or minus 2 inches movement.

B. Feeder Busway

1. *Feeder busways and Components [U]*: For service entrance and distribution shall include busway sections, hangers and fittings in accordance with NEMA Publication No. BU-1 and ANSI/UL 857 “Busways”.
 - a. Cutler Hammer Product, Eaton Corp.
 - b. General Electric
 - c. Siemens Energy & Automation, Inc. - ITE
 - d. Square “D”
2. Busway sections and fittings. Include straight sections, elbows, adapters and end flanges consisting of prefabricated bus-bars in a protective enclosure.
3. Busway. Totally enclosed, non-ventilated, low impedance type for 480 volts, 3 phase, 3 wire, 60 Hertz operation, with ground bus. Busway shall be rated in amperes as indicated for service entrance and for distribution. The specified ampere rating shall be considered to be the minimum current carrying capacity of the busway when installed in the edgewise position in which the bus bars are vertical with respect to the floor. The maximum allowable temperature rise, including joints, shall not exceed 55 degC, rise above a 40 degC, ambient.

4. Bus. Consist of standardized assemblies of formed metal sheets to form a rigid enclosure of the insulators and the bus bars.
5. Busway conductor. Fabricated from 98% conductivity pure copper. Bus bar conductors shall be fully insulated. The temperature rating of bus bar insulating material shall carry a minimum rating of 105 degC. Minimum thickness shall be 20 mils with PVC, reinforced fiberglass or mylar as acceptable materials. Insulating material shall not support combustion or absorb moisture. All current carrying joint connections shall be tin or silver plated.
6. Hangers. Provide as indicated with a minimum of two per ten foot section.
7. Minimum short circuit rating. As indicated; 75,000 RMS amperes symmetrical at 480 volts for distribution.
8. Ground bus capacity equal to ½ the capacity of the phase bus.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install horizontal runs of plug-in busway and feeder busway level and parallel to walls and ceilings at the location and elevation indicated. Install all vertical offsets plumb. Mount plug-in busway edgewise with all plug-in openings available for use.
- B. Provide busway supports, hangers, and accessories as required for the complete installation. Rigidly suspend run of busway and support from building structure at intervals of 8 feet as a maximum. Sway brace busway systems at intervals of 20 feet as a maximum. Where rods are used as supports, use rods of 1/2 inch diameter as a minimum. Provide special supports as required.
- C. Protect busway, expansion fittings and accessories shall not be installed before the building roof is weather tight, also it shall be protected from the weather before and after installation.
- D. Provide identification labels and high voltage warning labels on busways at intervals not exceeding 64 feet as indicated on SECTION 16050 - Appendix "A".
- E. Provide identification labels on all busway plug-in units and cable tap box connections as indicated in SECTION 16050 - Appendix "A".
- F. Location of busway shall be coordinated with other utilities and building structures to provide clearance in front of bus plugs and accessibility to bus plugs from the floor and as required by NEC.
- G. Maximum busway deflection shall not exceed 1/240 of span after bus plugs have been installed.
- H. Busway shall be installed with phase orientation G, A, B, C top to bottom, left to right, front to back. Provide busway phase transposition section as required for proper orientation entering unit substation secondary breaker sections. Phase transposition of busway will not be permitted within the unit substation.

END OF SECTION

Revision History	
Date	Rev. No.
A	0
B	0
D	0
E	0
F	0
02-19-09	0

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