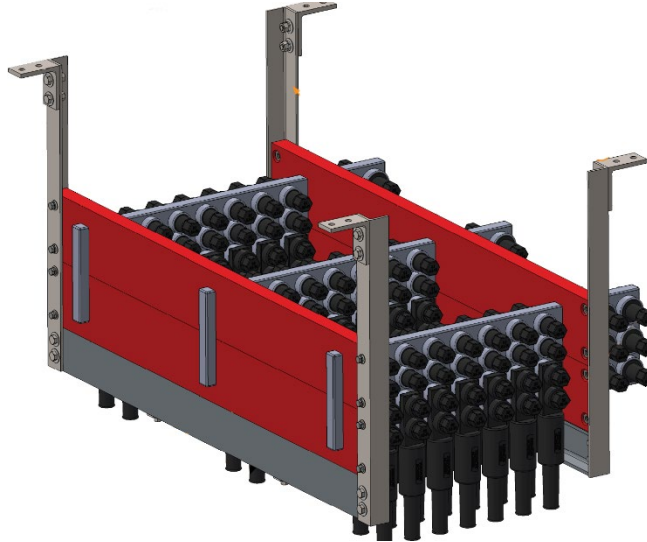


Bus Bars, Submersible, EPDM-Insulated, Modular



1. Scope

This standard covers the requirements for modular, EPDM-insulated, submersible bus bars. This standard applies to the following Seattle City Light (SCL) stock numbers:

Stock No.	Description
014646	Assembly that includes 4 bus bar sections (80 cable connections) per phase, connection and insulating plates and all necessary hardware to assemble (except cable lug kits and sealing plugs)
014647	Cable lug kit with one 500 kcmil insulated lug and two clamping plugs
014648	Sealing plug (for unused cable positions; two per position)
014649	Connection plate kit
014650	Insulating connection plate kit
014651	Connection plate clamping plug
014652	Connection plate sealing plug
014653	Offset adapter kit
014654	Bus bar section with 20 cable positions and connection bolts on both ends
014655	Bus bar section with 28 cable positions and connection bolts on one end
014656	Lug clamping plug
014711	Cable lug kit with on 4/0 AWG insulated lug and two clamping plugs

Standard Coordinator
Brett Hanson

Standards Engineering Supervisor
Brett Hanson

Division Director
Bob Risch

2. Application

Modular bus bars are installed in vaults to connect transformer secondary conductors to customer services. Modular bus bars can take the place of an Integral Web Channel Bus (IWCB). Modular bus bars are suitable for submersible applications. Because they are coated, they reduce the risk of inadvertent contact with energized parts.

Lugs with clamping plugs and sealing plugs are stocked separately and must be ordered on a job-specific basis to accommodate the number and configuration of customer cables or bus connections and resulting unused cable positions. Confirm with Network Service Engineering prior to placing an order.

Clamping plugs contain an interior metallic spring tensioned contact face to provide contact pressure to the insulated lug. Sealing plugs do not contain this feature and are used only on unoccupied lug positions. Both clamping and sealing plugs indicate their recommended torque levels on the exterior face.

3. Conflict

Where conflict exists, the following order of precedence shall apply:

1. Seattle City Light purchase order (PO)
2. City of Seattle General Terms and Conditions
3. This standard
4. Other industry standards

4. Requirements

Bus bar sections shall be modular and constructed of copper and coated with an EPDM rubber insulating medium that ensures a submersible design suitable for 25 feet of saltwater submersion for 7 continuous days.

Threaded studs and clamping system shall maintain clamping pressure throughout design life and allow for lugs to be connected/disconnected on each side of bus while maintaining opposite side connection.

Each bus bar assembly shall ship with all the necessary mounting brackets, hardware, and fiberglass insulating boards necessary for complete installation in ceiling channels.

Bus shall be rated per Table 4.

Table 4. Bus Bar Electrical Ratings

Continuous current rating	4500 A
Overload current rating	5100 A
Suitable voltages	125/216 V and 277/480 V

5. Testing

Design testing shall be performed to verify submersion and current ratings. Visual inspection at the factory shall be performed after molding and assembly of lugs and plugs for defects or voids in insulation.

Test reports shall be provided upon request.

6. Design Changes

Manufacturer shall inform SCL in writing of all design changes that could affect the understood or published capabilities of the product.

7. Packaging

Product shall be packaged to prevent damage during shipping, handling, and storage.

Each standard package shall be legibly marked with the following information.

- Manufacturer identification
- Seattle City Light stock number
- Product description
- Quantity

Each shipping container shall be legibly marked with the following information.

- Seattle City Light purchase order number

8. Issuance

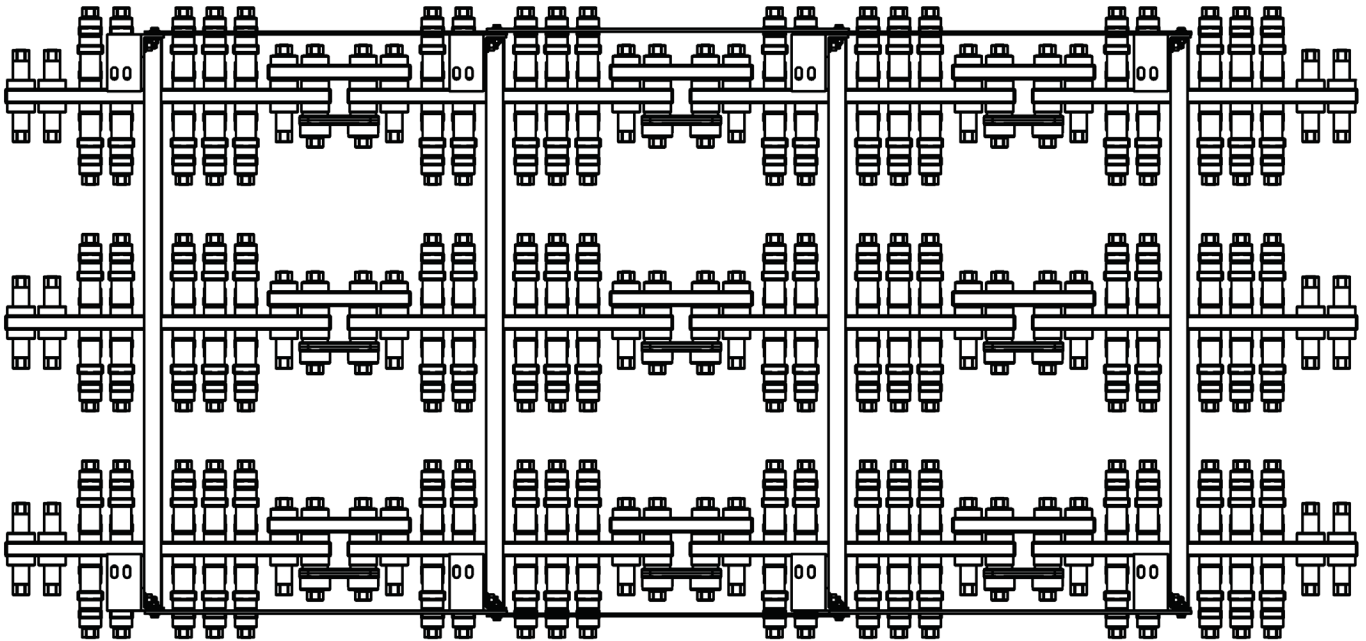
Stock Unit: EA

9. Approved Manufacturers

9.1 Assembly

Stock No.	Richards Mfg. Catalog No.	Description
014646	IBB-SCL-CEILING	Assembly that includes 4 bus bar sections (80 cable connections) per phase, 72 connection plate sealing plugs, and connection and insulating plates and all necessary hardware to assemble (except cable lug kits and sealing plugs).

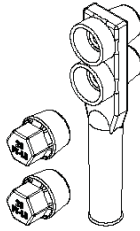
Figure 9.1. Assembly



9.2 Cable Lug Kit

Stock No.	Richards Mfg. Catalog No.	Description
014647	IBBL-18-RB	Kit with one 500 kcmil insulated cable lug and two clamping plugs. RB indicates insulation is rolled back from lug end for easier crimping.
014711	IBBL-12-RB	Kit with one 4/0 AWG insulated cable lug and two clamping plugs.

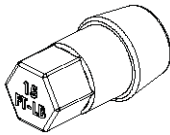
Figure 9.2. Kit



9.3 Sealing Plug

Stock No.	Richards Mfg. Catalog No.	Description
014648	IBB-P1-PLUG-BUS	Sealing plug (for unused cable positions; two per position).

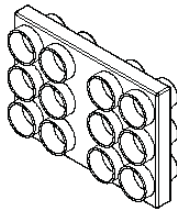
Figure 9.3. Sealing Plug



9.4 Connection Plate Kit

Stock No.	Richards Mfg. Catalog No.	Description
014649	IBB-SPLICE-SCL	Connection plate kit to join two bus bar sections. Kit includes 12 connection plate clamping plugs.

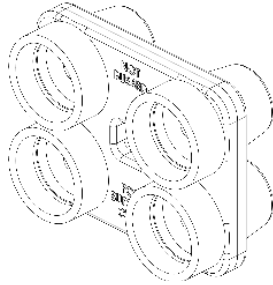
Figure 9.4. Connection Plate Kit



9.5 Insulating Connection Plate Kit

Stock No.	Richards Mfg. Catalog No.	Description
014650	IBB-SPLSUP0-SCL	Insulating connection plate kit to join two bus bar sections structurally, but not electrically. Kit includes 4 connection plate clamping plugs and 20 connection plate sealing plugs.

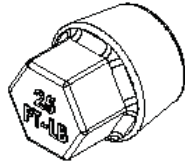
Figure 9.5. Insulating Connection Plate Kit



9.6 Connection Plate Clamping Plug

Stock No.	Richards Mfg. Catalog No.	Description
014651	IBB-P2-PLUG-SPLICE	Clamping plug (for each connection plate or insulating connection plate position).

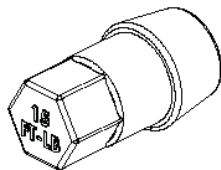
Figure 9.6. Connection Plate Clamping Plug



9.7 Connection Plate Sealing Plug

Stock No.	Richards Mfg. Catalog No.	Description
014652	IBB-P2-PLUG-BUS	Sealing plug (for each unused connection plate position).

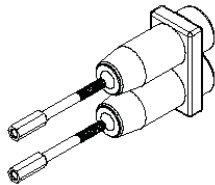
Figure 9.7. Connection Plate Sealing Plug



9.8 Offset Adapter Kit

Stock No.	Richards Mfg. Catalog No.	Description
014653	IBBL-OFFSET	Offset adapter kit (extends bus out from bus section face to allow two cables to be installed in the same vertical column and be routed the same direction).

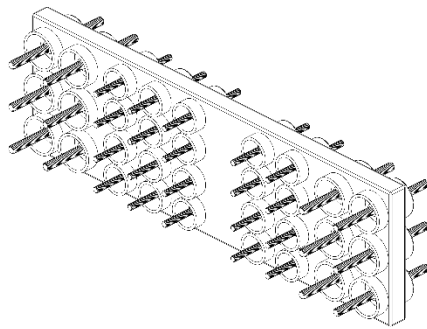
Figure 9.8. Offset Adapter Kit



9.9 Bus Bar Section, 20 Cable Positions

Stock No.	Richards Mfg. Catalog No.	Description
014654	IBB28-2	Bus bar section with 20 cable positions and connection bolts on both ends.

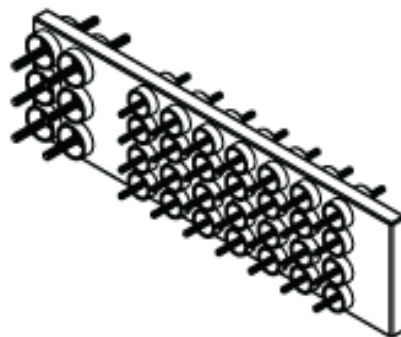
Figure 9.9. Bus Bar, 20 Cable Positions



9.10 Bus Bar Section, 28 Cable Positions

Stock No.	Richards Mfg. Catalog No.	Description
014655	IBB1-28-12	Bus bar section with 28 cable positions (14 on each face) and connection bolts on one end.

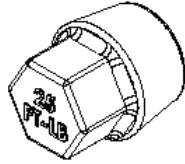
Figure 9.10. Bus Bar Section, 28 Cable Positions



9.11 Lug Clamping Plug

Stock No.	Richards Mfg. Catalog No.	Description
014656	IBB-P1-PLUG-LUG	Lug clamping plug (two are included in each cable lug kit).

Figure 9.11. Lug Clamping Plug



10. Sources

Arya, Shayan; Network Service Engineer and subject matter expert for 6308.48 (shayan.arya@seattle.gov)

Hansen, John; Network Crew Chief and subject matter expert for 6308.48 (john.hansen@seattle.gov)

Hanson, Brett; SCL Standards Engineer, subject matter expert, and originator of 6308.48 (brett.hanson@seattle.gov)

Richards Manufacturing, Inc., IBB Ordering Guide, Document # IBB1117