

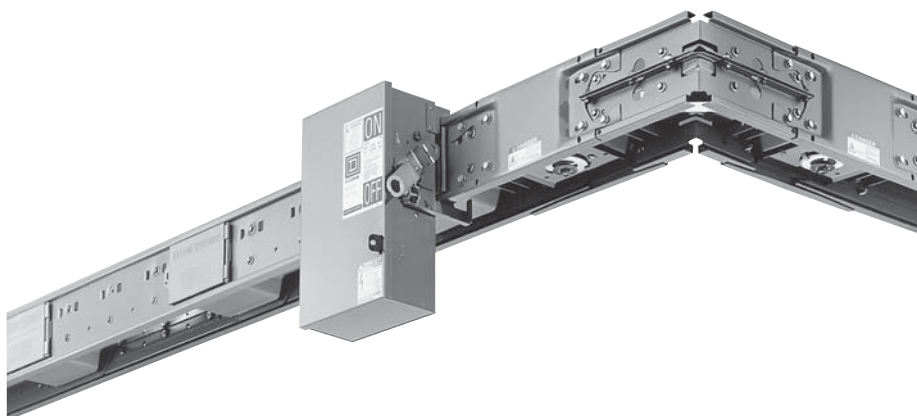
Busway Systems

Catalog

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Class 5600



by **Schneider** Electric

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Section 1—Product Features

Square D™ brand I-Line™ Busway, manufactured by Schneider Electric, offers a complete line of compatible, sandwich-type feeder and plug-in busway lengths and fittings. It allows maximum flexibility, ease of installation, and offers electrical efficiency in the distribution of low voltage power for both commercial and industrial applications.

I-Line busway has been used to supply power in thousands of installations throughout the world for more than four decades. Our broad range of I-Line busway products include I-Line plug-in style from 225–600 A with aluminum or copper conductors, and I-Line II plug-in and feeder styles from 800–4000 A with aluminum conductors and up to 5000 A with copper conductors. I-Line and I-Line II busway are constructed in three-pole and four-pole full neutral configurations for system voltages to 600 V and are rated to allow 100% of the current to flow continuously.

Busway installation is quick and easy. The compact, totally-enclosed design is lightweight and easy to handle. Labor studies have shown that a 75% savings in installation time is not uncommon when comparing I-Line busway with cable and conduit installations. This significant reduction in installation time can result in total installed cost for busway being significantly lower than other distribution methods.

In addition, a wide variety of busway components and plug-in units are in stock for fast delivery.

When you need busway, select the best: I-Line busway. Our design and construction has been time-tested in many years of use throughout the world. No matter how you compare, I-Line busway is your solid first choice!

Sandwich Construction

I-Line feeder and plug-in busway both utilize sandwich-type construction to provide superior voltage drop characteristics, even at low power factors.

Steel housing sides and aluminum tops and bottoms have been carefully designed to reduce component weight and minimize the hysteresis and eddy current losses that are common in steel housings.

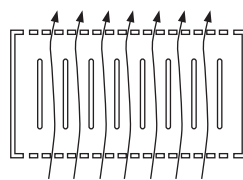
Plug-in busway ratings that utilize two or three bus bars per phase have a phase paralleling feature at the joint assembly of each straight length. This helps equalize bus bar loading when plugs are mounted on one side only.

The plug-in housing has notches along the top rail for easy alignment and installation of plug-in units.

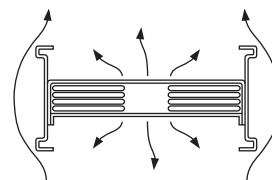
Within the same ampere rating, all I-Line II busway lengths and fittings are fully compatible between feeder and plug-in styles using standard universal tie channels (housing “splice plates”) supplied with each component.

Totally-Enclosed Housing

Ventilated busway depends on free air movement through a perforated housing to cool the bus bars. Unless mounted in its preferred position (for maximum bus bar cooling), ventilated busway must be derated. Ventilated housing also permits dirt accumulation and offers limited protection of bus bars due to open ventilating slots in the housing.



Ventilated Housing



I-Line II Totally-Enclosed Housing

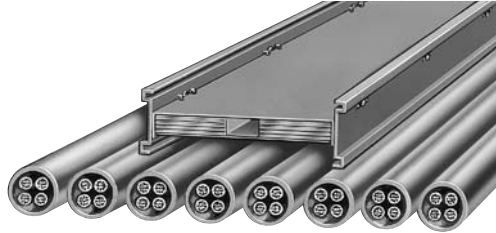
Section 1—Product Features

Compact Size

I-Line busway has a modern “totally-enclosed housing” design requiring no derating regardless of mounting position. Because the housing has no ventilating holes, the entry of dirt and possibility of accidental contact with bus bars is greatly reduced.

Compact Size

I-Line II busway is compact. The small size means it can be used in locations where feeder circuits would not otherwise be possible. Efficient use of light-weight raw materials is an additional factor in I-Line busway’s compact design.



I-Line Busway Compact Design

Finish

I-Line busway users get a tough, durable uniform polyester powder coat paint finish, making their busway installations functional and attractive for years to come.

Insulation

All bus bars are insulated using Class B rated, 266 °F (130 °C) vendor certified, materials to prolong insulation life. I-Line busway insulation consists of two layers of heat-formed polyester film surrounding each bus bar. On plug-in busway lengths, all insulation is notched at the openings to allow plug-in unit mounting.

I-Line II busway uses the same two layers of polyester film to insulate the bus bars in indoor busway while outdoor busway utilizes powder-coated epoxy insulation for the bus bars. Both types of insulation offer high quality dielectric strength and long life expectancy.

Plating

Bus bars for I-Line and I-Line II busway are plated to ensure low surface-to-surface contact resistance and to minimize surface corrosion. Aluminum bus bars are electroplated with a coat of tin after preparation with the ALSTAN 80 process. Copper bus bars are plated with a layer of silver that is flashed onto the surface of the bus bars.

Dielectric Testing

Underwriters Laboratories (UL) and the Canadian Standards Association (CSA) require a one-time dielectric test for all new busway designs prior to certification. This test, at two times rated voltage plus 1000 Vac (2200 Vac), is intended to confirm the integrity of the insulation system. I-Line busway passes this test.

Every length and fitting of our busway must also pass a 7500 Vdc “hi-pot” test before shipment from the factory. This additional test helps ensure the highest quality busway possible.

Visi-Tite® One Bolt Joint



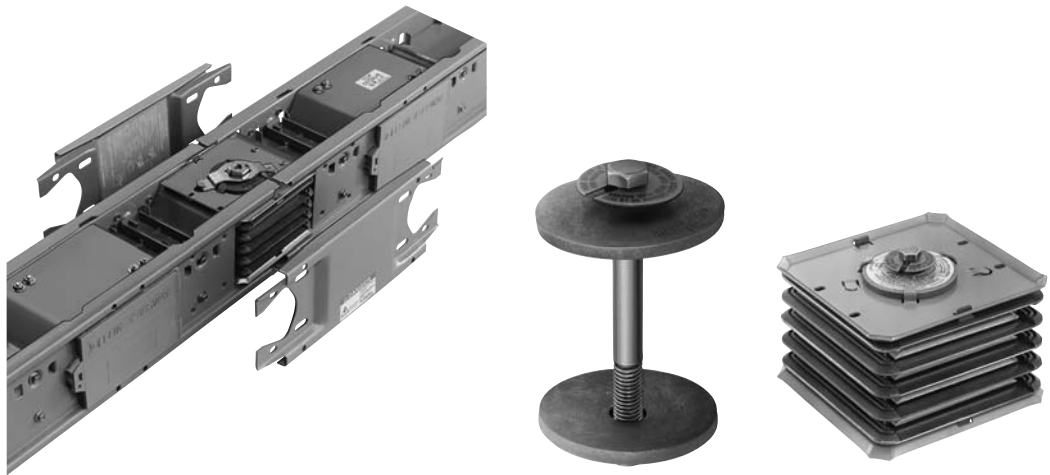
Visi-Tite Bolt

I-Line busway incorporates the “one bolt” joint principle. This joint design uses a high-strength (Grade 5) Visi-Tite® bolt to provide a clamping force of over 4000 pounds. The force is distributed over the contact area by a pair of large diameter, spring steel cupped conical washers. On higher ampere ratings (2000 A or above) two or three joint bolts are used—one for each set of bus bars. Our “one bolt” principle replaces older designs that required up to 32 nuts, bolts, and washers for each set of bus bars. The Visi-Tite torque indicating joint bolt is standard on all busway joints. Insulated and at ground potential, the bolt and nut are both captive to reduce installation time.

Fast, accurate torquing is a snap with Visi-Tite double-headed bolts. There’s no need for a torque wrench. Use any long handled wrench to tighten the outer bolt head until it twists off and releases a red plastic warning disc. Any disc remaining during inspection indicates an improperly torqued joint. For maintenance of the joint or when busway is relocated, the Visi-Tite bolt should be tightened to 70 lb-ft +/- 10 lb-ft (94.92 N•m +/- 13.56 N•m) with a torque wrench.

EZ Joint Pak™ Connector Assembly

I-Line II busway offers an improved single-bolt joint package that can be removed and replaced with an isolation joint pak to electrically isolate busway sections for load shifting and maintenance. It can also be relocated to the opposite end of a length to take care of last minute job changes. The EZ Joint Pak™ Connector Assembly is shipped pre-assembled with each I-Line II busway length or fitting, providing minimum job site installation labor. The Visi-Tite bolt is a standard feature on all assemblies.



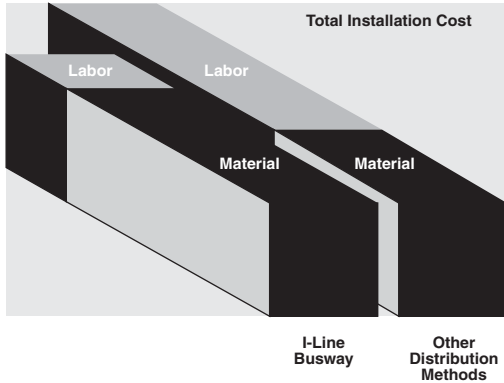
EZ Joint Pak Connector Assembly

Labor Savings

I-Line II busway installs quicker than other forms of low voltage power distribution. Also, the labor required to install I-Line II busway is often much lower. This results in an overall reduction in total installation cost.

Section 1—Product Features

Tie Channels



Reduction in Installation Cost

Tie Channels

I-Line II busway uses one set of universal tie channels for all ampere ratings of busway—both feeder and plug-in. This helps speed up busway installation.

Internal Smoke/Gas Barriers

Continuous air spaces inside I-Line II busway housing are closed off with special barriers to help prevent the spread of smoke and gases in the event of a fire in the area of the busway installation. This standard internal barrier allows busway to extend through walls or floors without creating open space for a “chimney effect” fire path.

I-Line busway from 225–600 A requires installation of a special internal barrier for wall or floor penetrations.

Short Circuit Strength

I-Line busway housing construction gives high short circuit ratings. On some feeder busway, additional short circuit strength is gained by wrapping the bus bar sandwich with epoxy saturated fiberglass tape. This results in ratings of up to 200,000 RMS symmetrical for 4000 A and 5000 A feeder busway.

On plug-in busway, molded plug-in opening insulators provide additional short circuit strength. Full short circuit bracing extends across the plug-in opening to protect the plug-in connections.

I-Line busway has been tested under actual short circuit conditions at the Schneider Electric High Power Laboratory in Cedar Rapids, Iowa. These tests confirm I-Line busway can withstand extremely high short circuit levels. Some ratings actually stand up to tests at 200,000 RMS symmetrical amperes!

Voltage Drop

I-Line busway voltage drop is low because of its extremely low reactance. This efficient design allows power to be delivered in an installation with the highest efficiency possible. This makes I-Line busway ideal for efficient power distribution in commercial or industrial facilities.

Outdoor Busway

Outdoor feeder busway is furnished with a housing construction employing a special gasketed design to prevent the entry of rain. Unique engineering and design features allow field installation in any mounting position while still maintaining outdoor integrity. This product symmetry provides for proper installation in all instances. The Visi-Tite bolt is also standard on outdoor busway.

Universal Fittings

I-Line II busway fittings are designed for use with feeder and plug-in busway straight lengths as well as for continuations of service entrance busway runs. The compact universal fittings allow maximum layout flexibility without the need for special built-to-order combination fittings.

Quality

All I-Line busway products are manufactured in a Schneider Electric facility that has been registered by Underwriters Laboratories, Inc. to:

- ISO9001: 2008 ALL
- EN29001: 1994
- BS5750 Part 1: 1994
- ANSI/ASQCQ91: 1994

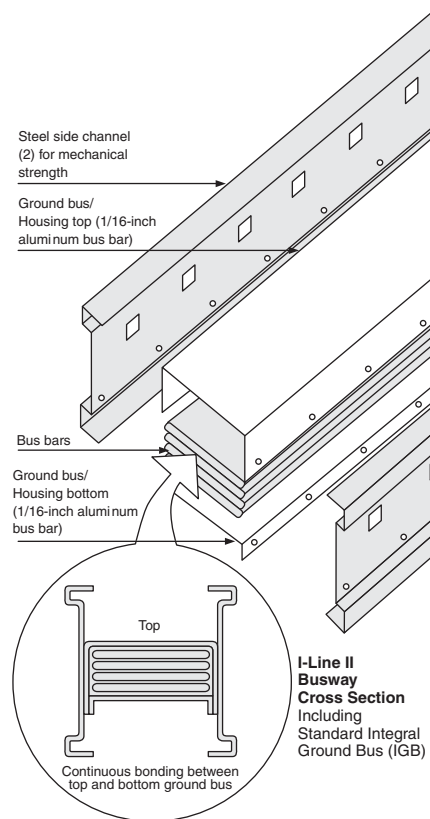
Integral Ground Bus

I-Line II busway (800–5000 A) is built with an innovative Integral Ground Bus (IGB) system, proven by many years of use on original I-Line busway installations.

In simple terms, IGB utilizes two 1/16-inch thick ground bus bars to form the housing top and bottom. This provides an integral 50% capacity ground path. Equally important, the two ground bus bars completely encircle the phase conductors and provide a very effective high level ground path for ground faults. Copper integral ground is available as an option.

We believe a properly designed ground should be included on all distribution systems. I-Line II busway includes IGB as a standard feature on every rating from 800–5000 A. Integral ground bus is available as an option on 225–600 A busways.

We offer many products and services to fulfill the need for complete and reliable grounding throughout your electrical system. Consult your local Schneider Electric representative for assistance in this very important aspect of proper electrical design.



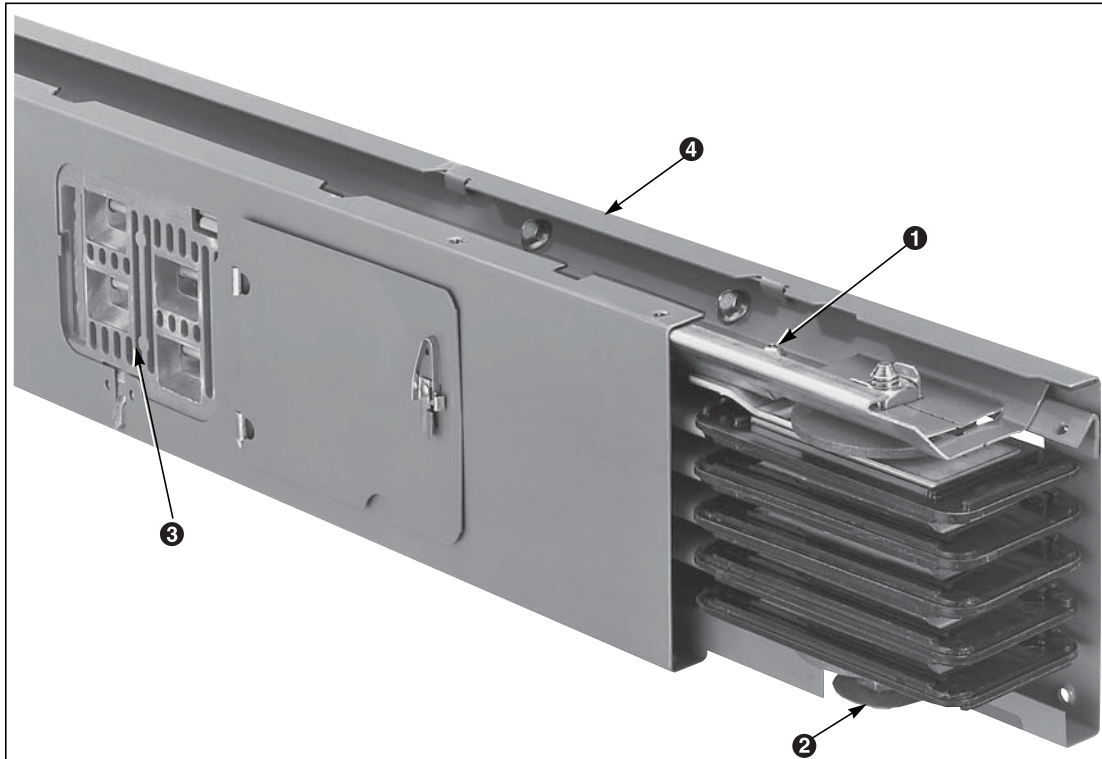
I-Line II Busway Cross Section

Section 1—Product Features

Integral Ground Bus

Section 2—Construction

Plug-In Busway 225–600 A



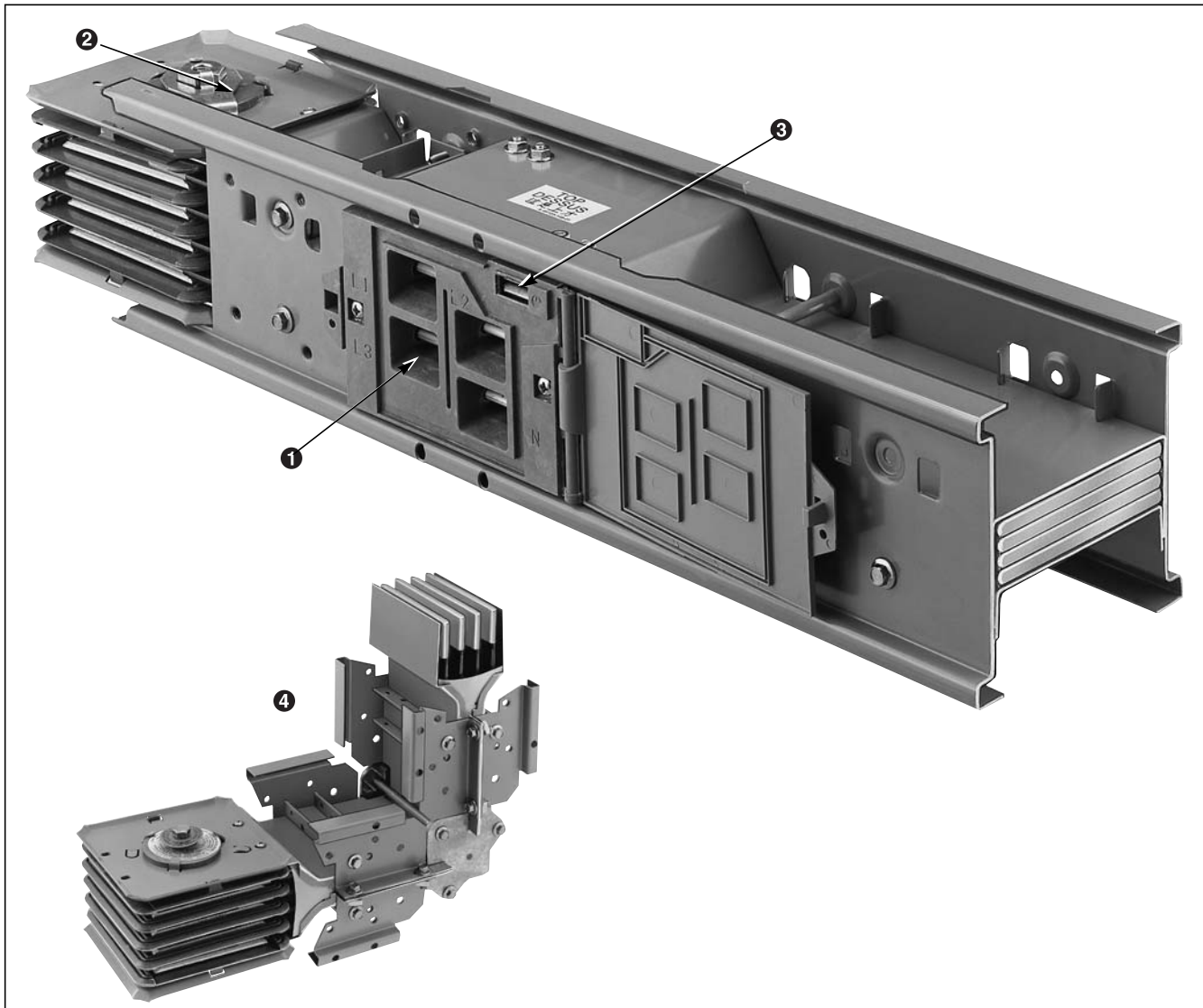
1. Integral Ground Bus (IGB)—furnished as an optional feature for I-Line™ busway and rated at 50% capacity of the nameplate amperage rating of the busway. The conductor is aluminum and is the top part of the housing itself.
2. Visi-Tite bolt—a double-headed bolt furnished for all joint connectors to ensure proper torque for each connection. A cupped conical washer is also included to ensure equal distribution of pressure across the full joint surface area.
3. Plug-in openings—furnished standard with plug-in openings on 2 ft (61 cm) centers on both sides of I-Line busway. The openings include a hinged door that covers the opening when it is not in use. A 600 A maximum capability is at each plug-in opening. Hangers for the busway fit without blocking access to the plug-in opening.
4. Enclosure—a three-piece formed housing with plug-in openings supported by molded rigid insulators.

NOTE: Insulation for I-Line busway is two full-length layers of Class B rated, 266 °F (130 °C) vendor certified, polyester film.

Section 2—Construction

Plug-In Busway 800–5000 A

Plug-In Busway 800–5000 A

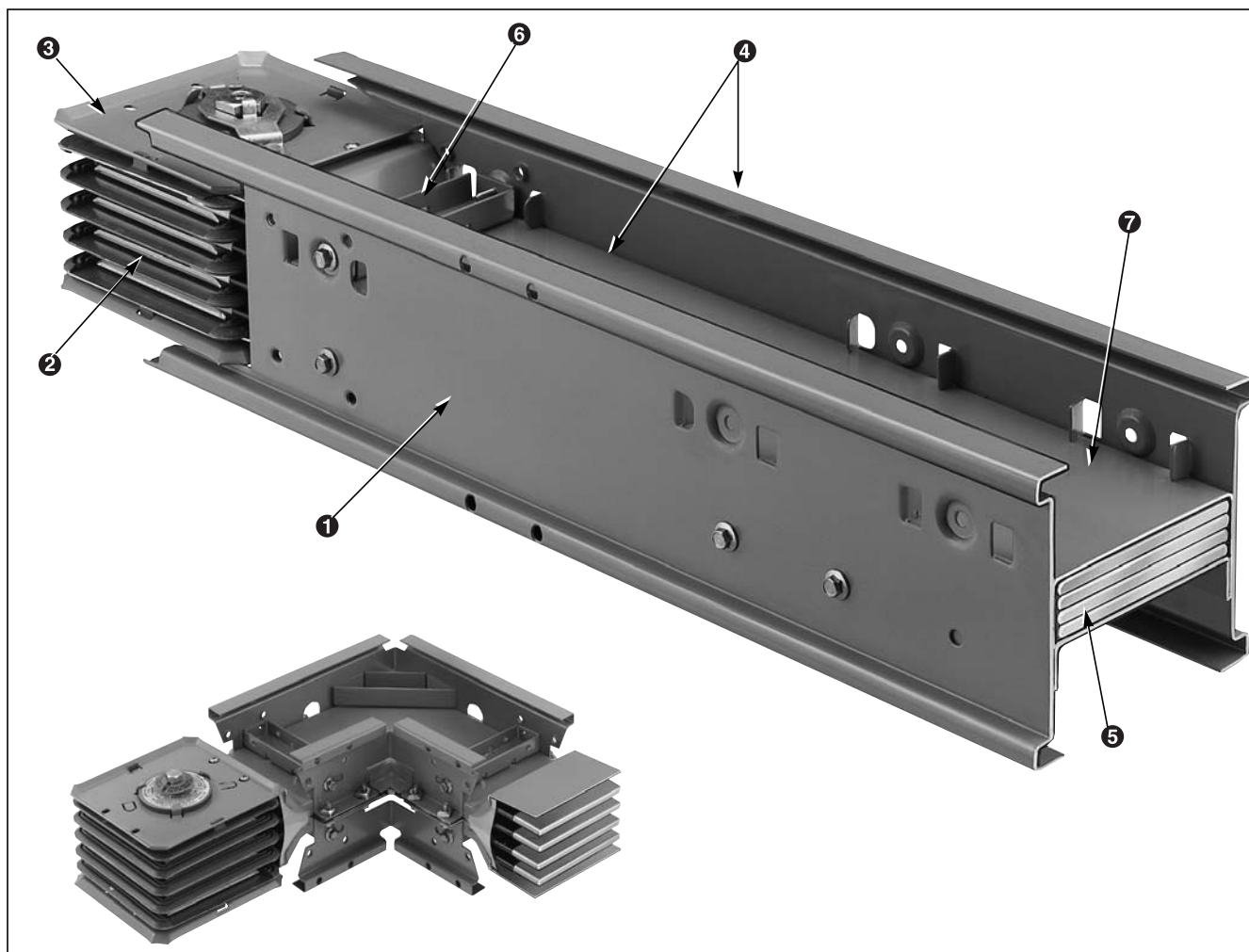


1. Molded plug-in opening insulator—adds insulation and support at plug-in contact area.
2. EZ Joint Pak connector assembly—includes like-phase connector on higher ampere ratings with more than one conductor per phase (plug-in bus only).
3. Ground jaw for plug-in unit—has a “blow-on” design similar to phase jaw connection.
4. Fittings—includes elbows, tees, and flanged ends that are easily removed and refitted with the use of our EZ Joint Pak assembly without disturbing adjacent lengths.

NOTES:

- Internal barriers are standard on both feeder and plug-in busway. All interior spaces are barriered to stop hot gases.
- Hangers fit both feeder and plug-in busway without blocking access to openings.
- I-Line plug-in units (15–1600 A) fit both original and I-Line II busway.
- I-Line II plug-in busway with sandwich construction also includes features depicted for feeder style on page 19.

Indoor Feeder Busway 800–5000 A



1. Steel housing channels—provides mechanical strength.
2. Molded extra-strength glass fiber interphase barriers.
3. EZ Joint Pak connector assembly—removable for isolation or maintenance. Includes Visi-Tite bolt.
4. Steel/aluminum housing—reduces hysteresis and eddy current losses on feeder and plug-in busway.
5. Plated aluminum or copper bus bars.
6. Surge clamps for added short circuit strength.
7. Integral Ground Bus (IGB)—two, 1/16-inch thick aluminum bus bar. Also serves as top and bottom housing.

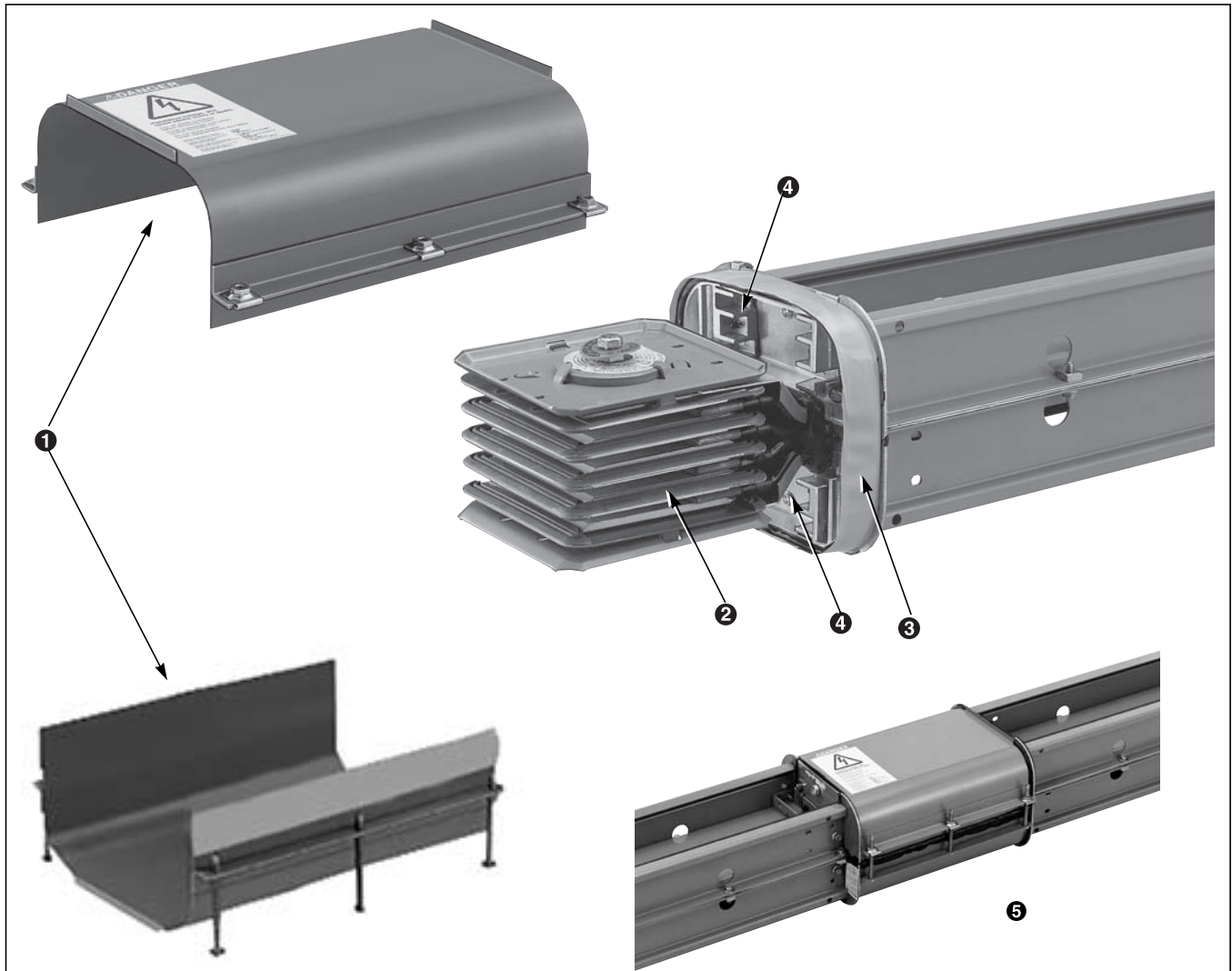
NOTES:

- Polyester powder paint process—provides lasting uniform performance.
- Housing sizes—the same for I-Line II feeder and plug-in busway. Same accessories fit both.
- Insulation—Class B rated, 266 °F (130 °C) vendor certified
- Optional Fiberglass tape and epoxy resin—improves short circuit strength (Type AFH2/CFH2).

Section 2—Construction

Outdoor Feeder Busway 800–5000 A

Outdoor Feeder Busway 800–5000 A



1. Joint covers— two-piece joint cover with quick-fasten nut for speedy installation of the busway.
2. EZ Joint Pak—same joint pack used on our indoor I-Line II busway is continued in our outdoor feeder design.
3. Flanged collar—simple installation of the joint covers is assisted by a smooth flange surface with the joint sealant strip factory installed. Removal of the sealant's protective paper covering and installation of the joint covers with the quick fasten nut, seal the joint from contamination by water.
4. Removable drain plug—outdoor feeder design includes removable drain plugs to allow condensation to escape from the joints. These drain plugs should be removed only as described in the installation instructions for outdoor feeder busway.
5. Completed joint—assembled joint with all installation activities complete.

NOTE: Supports are required on 5 ft (152 cm) centers for vertical mounting or 10 ft (305 cm) for horizontal mounting. Normally, the support for outdoor busway is in the form of a T-stand type device, which is customer supplied. However, hangers are available from Schneider Electric when drop rods can be utilized.

Section 2—Construction

Outdoor Feeder Busway 800–5000 A

Listed below are the four basic types of busway applications:

- Service Entrance Run
- Plug-In Type Horizontal Run
- Plug-In Type Vertical Run
- Feeder Type Tie Run

In addition to the information that is electronically entered into the Product Selectors, the additional information needed to engineer a busway run is listed below. **A busway run can consist of more than one type of application.**

Busway Order Entry Checklist

Type of Application				
1	2	3	4	
S E R V I C E	H O R I Z O N T A L	V E R T I C A L	T I E	Busway Order Entry Checklist Order Number: _____ Completed by: _____ Field Office: _____ Date: _____ (X) = Required Information
X	X	X	X	A. Layout sketch of busway run
X	X	X	X	B. All necessary dimensions
X	X	X	X	C. Positions of equipment (fronts or rears)
X	X	X	X	D. Phasing of existing equipment or equipment by others
X	X		X	E. Location of walls (if applicable)
		X		F. Location of floors (floor to floor dimensions)
X	X		X	G. Wall thickness (if applicable)
		X		H. Floor thickness
X			X	I. Location of roof (if applicable)
X			X	J. Roof thickness (if applicable)
X	X	X	X	K. Special requirements noted on busway sketch (e.g., special lugs, critical dimensions)
X				L. Indicate appropriate service device (e.g., tap box, service head, x'fmer. tap, bussed)
X	X	X	X	M. Equipment details if connecting busway to other than Schneider Electric equipment
	X	X		N. Indicate location of plug-in busway on sketch
		X		O. Indicate the side of the busway that the plug-in units are to be mounted
		X		P. Indicate if there are any curbs where busway passes through floors
		X		Q. Curb thickness (in addition to the floor thickness)
		X		R. Indicate type of vertical hangers (spring or fixed)
X	X	X	X	S. If connecting to existing I-Line™, indicate bolt or slot connection
X	X	X	X	T. If connecting to other than Schneider Electric busway, send a piece of that busway to Oxford
X	X	X	X	U. Switchboard identification markings noted on busway sketch

NOTES:

1. For detailed illustrations, refer to pages 21–31.
2. Lack of all required information causes delays in order processing and can affect the delivery schedule.
3. If additional assistance is required, contact Schneider Electric at 1-888-SQUARE D (1-888-778-2733).

Section 2—Construction
Outdoor Feeder Busway 800–5000 A

Section 3—Application Data

The Four Types of Busway Runs

There are four major types of busway applications. Figures 1 through 4 illustrate the basic systems.

Service Entrance Run

Figure 1 is a typical service entrance run from a utility transformer to a switchboard. Cables connect directly to the busway. (Generally a combination outdoor-indoor application.)

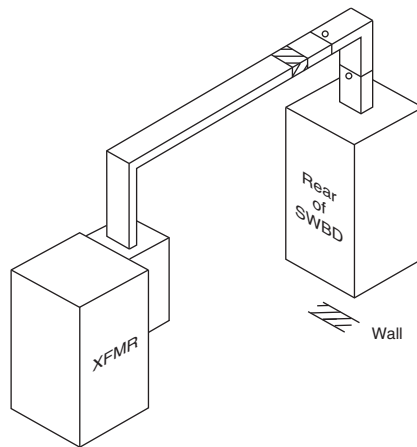


Figure 1: Typical Service Entrance Run (Utility Transformer to a Switchboard)

Plug-In Type Vertical Riser

Figure 2 is a simple plug-in riser fed by a switchboard. (Always an indoor application.)

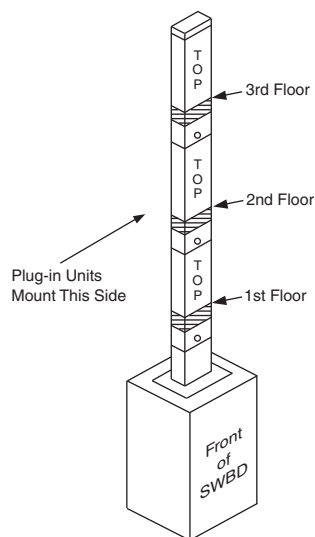


Figure 2: Plug-In Riser Fed by Switchboard

Section 3—Application Data

The Four Types of Busway Runs

Plug-In Type Horizontal Run

Figure 3 is a simple plug-in run fed by a switchboard through a tee. (Always an indoor application.)

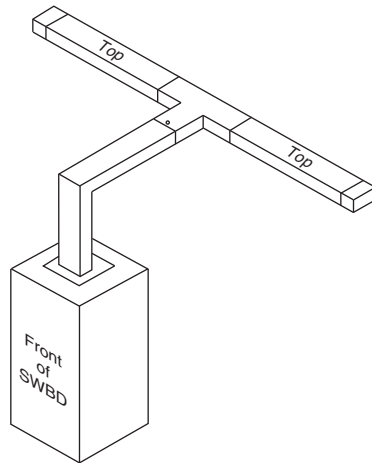


Figure 3: Plug-In Riser Fed by Switchboard through a Tee

Feeder Type Tie Run

Figure 4 is a typical feeder run between two switchboards. (Generally an indoor application.)

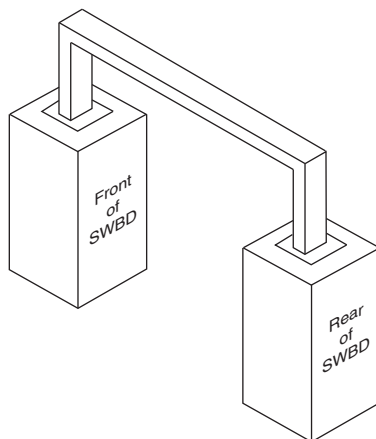


Figure 4: Feeder Run between Two Switchboards

Service Entrance Runs

I-Line II busway can be used as a service entrance conductor to bring power from a utility transformer into a distribution switchboard. Cable or solid bussing is used to connect to the transformer.

When the transformer is connected to the busway using cables, the governing electrical code can specify height clearance requirements for the cables.

Figure 5 illustrates the dimensions to be considered when planning this type of run.

Service Heads

If the busway specifications or local utility require that the service entrance cable-to-busway termination is enclosed in a weatherproof box, then a service head should be ordered.

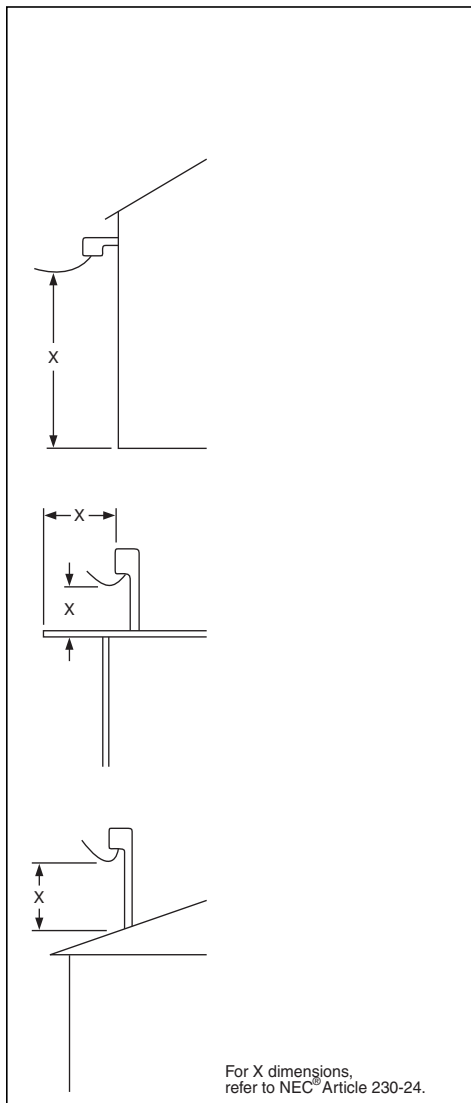


Figure 5: Typical Connection of Transformer to Busway using Cables

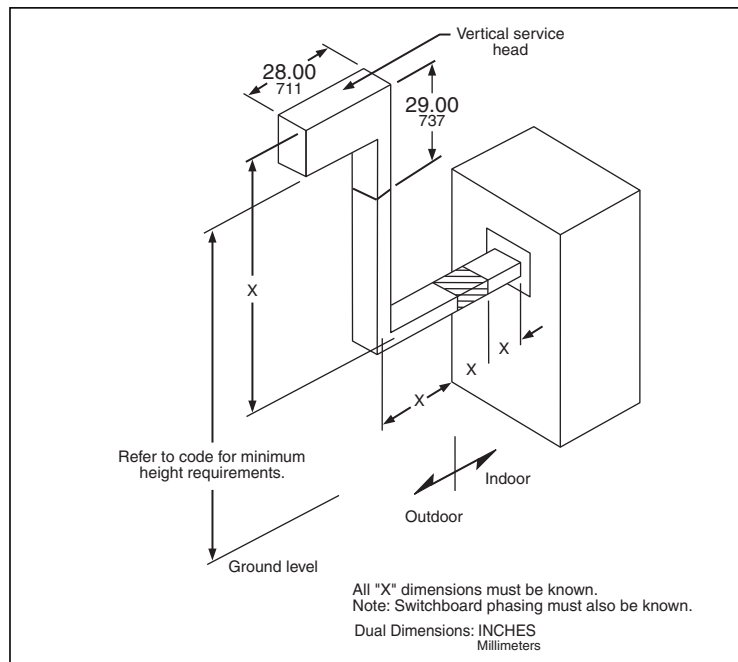


Figure 6: Typical Vertical Service Head Application

If the flatwise busway elevation is too low to allow a cable connection that would comply with the electrical code, the vertical service head (SV) could solve this issue. The SV is attached to busway that exits the rear of the switchboard (see Figure 6) and is turned upward or is attached to busway that exits the top of a switchboard and penetrates the roof utilizing a drip flange and roof collar (see Figure 7 on page 26).

If a vertical service head extends through a roof, the roof must be sealed around the busway. To do this, a fixed collar must be factory assembled onto the section of busway that penetrates the roof. The contractor can then flash from the collar to the roof. A roof flange kit can be ordered from the factory to make the flashing job easier. The kit consists of a drip flange and a roof collar. When installed, the roof collar must be sealed to ensure that no moisture gets indoors. The roof flange kit will accommodate a roof slope up to one inch per foot. See Detail A in Figure 7 on page 26.

Section 3—Application Data

Service Entrance Runs

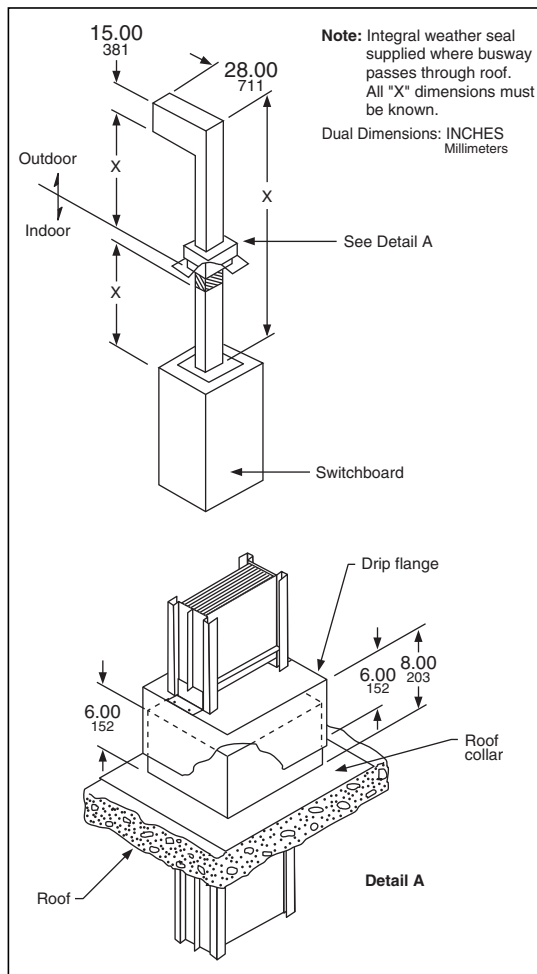


Figure 7: Vertical Service Head Penetrating a Roof

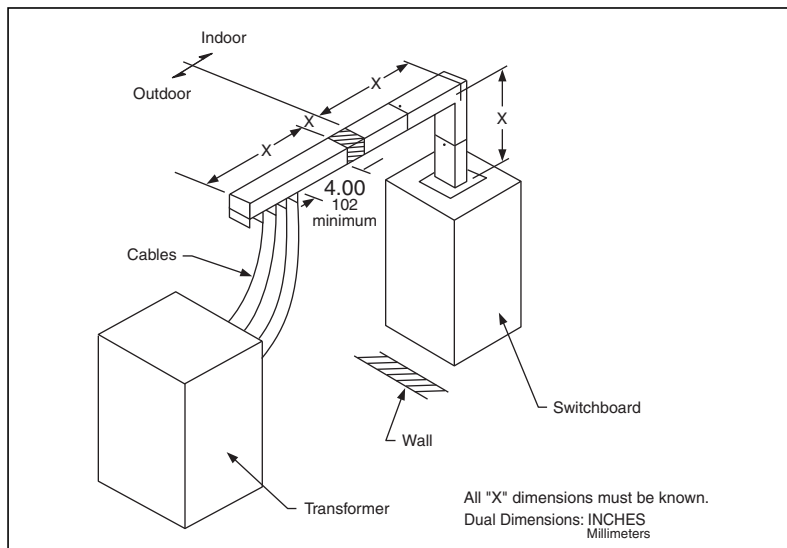


Figure 8: Transformer Tap for One Three-Phase Transformer

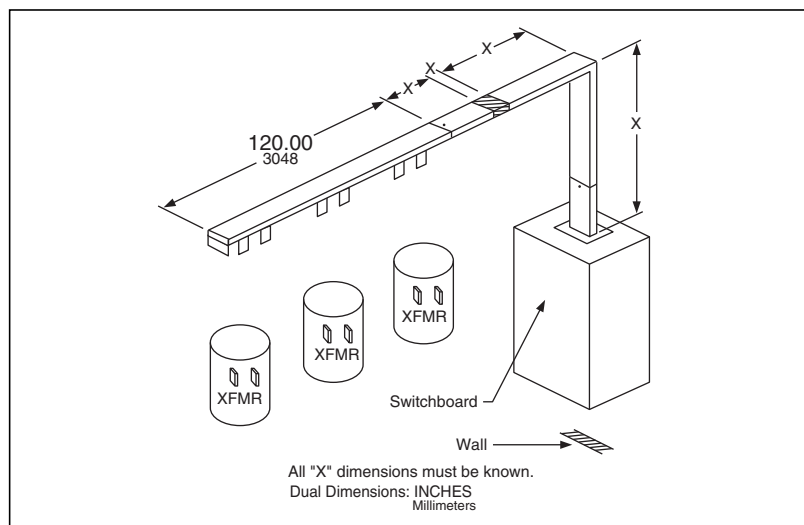


Figure 9: Transformer Tap for Three Single-phase Transformer

Transformer Taps

A transformer tap performs the same function as a service head, except that the lugs and bussing that the service entrance cables are connected are not enclosed in a weather-proof enclosure.

A flatwise service head (SB) with the box removed is therefore a transformer tap (SF). An SF is a transformer tap for one three-phase transformer. Figure 8 illustrates a typical SF service entrance run.

If three single-phase transformers are supplied by the utility to deliver power to the customer, a separate transformer tap has been designed for this application. This transformer tap is known as a “TTF” and is shown in Figure 9.

Bussed Transformer Connections

If required, the factory can provide a bussed transformer connection. **This type of connection will include flexible connectors from the low voltage spades of the transformer to the busway connectors.** These flexible connectors allow for busway expansion and contraction on the low voltage spades. Positioning of these flexible connectors is critical for proper alignment between the busway and transformer.

Bussed transformer connections are made for two types of transformers. One type has a low voltage throat as shown in Figure 10, and the other is a padmount type with a low voltage compartment shown in Figure 11 on page 28.

Phasing

With bussed transformer connections, it is necessary to properly coordinate the phasing of the transformer and of the switchboard it supplies. Schneider Electric can coordinate the phasing for you. Simply supply the name of the transformer manufacturer and phasing details of the low voltage side.

Other Service Entrance Connections

Occasionally, the customer or local utility will require a service entrance connection that differs from our standards. In this case, be sure to inform your Schneider Electric representative of any special dimensions, such as required height of service head from ground or floor, spacing between phase bars, number and type of lugs, distance from lugs to wall, phasing, etc.

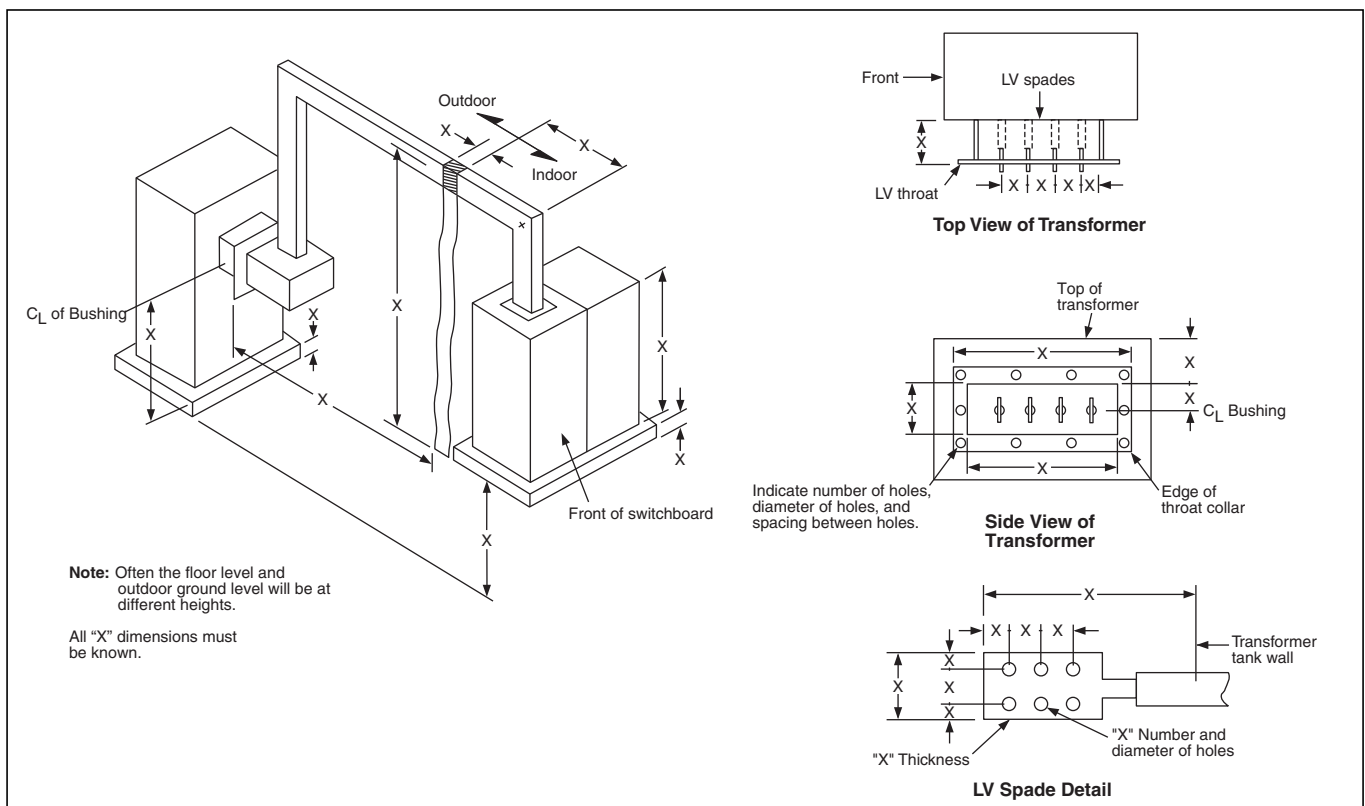


Figure 10: Information Needed for Bussed Transformer Connection (Throat Type)

Section 3—Application Data

Service Entrance Runs

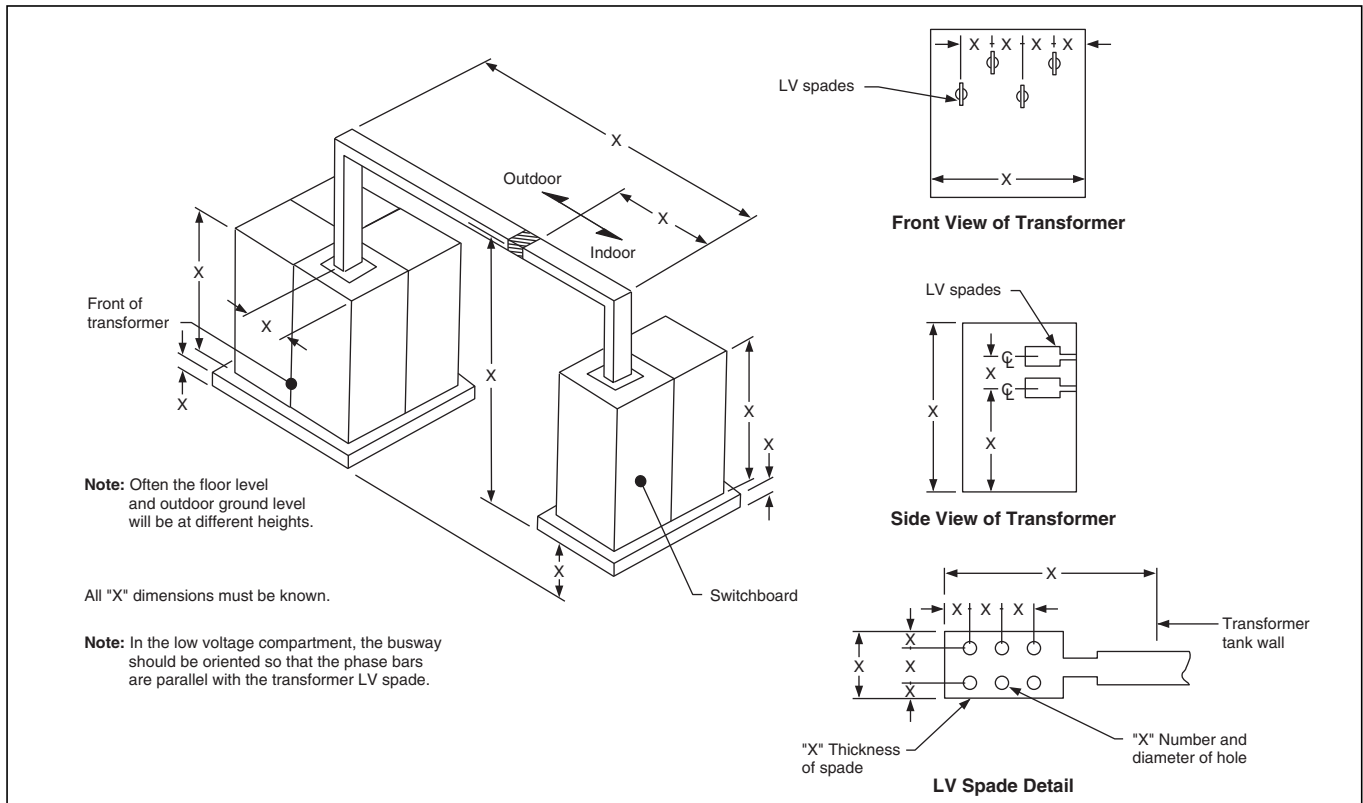


Figure 11: Information Needed for Bussted Transformer Connection (Pad Mount Type)

Plug-In Busway Horizontal Run

Plug-in busway is used as a means of bringing power from a distribution switchboard to multiple loads throughout a building or manufacturing facility.

Phasing

A typical I-Line II plug-in run is shown in Figure 12 on page 29. The phasing shown on the plug-in busway is “GABCN” top to bottom, with the top located as shown for a horizontal run. This phasing arrangement must always be followed so that proper phasing of the plug-in units is ensured (see Detail A). Because this busway phasing must be followed, it is the busway that will determine the phasing of the switchboard.

NOTE: Plug-in busway has the integral ground bus plug-in jaw on the top side only.

Identification

When submitting busway run sketches for review, ensure that the plug-in busway sections are marked (P).

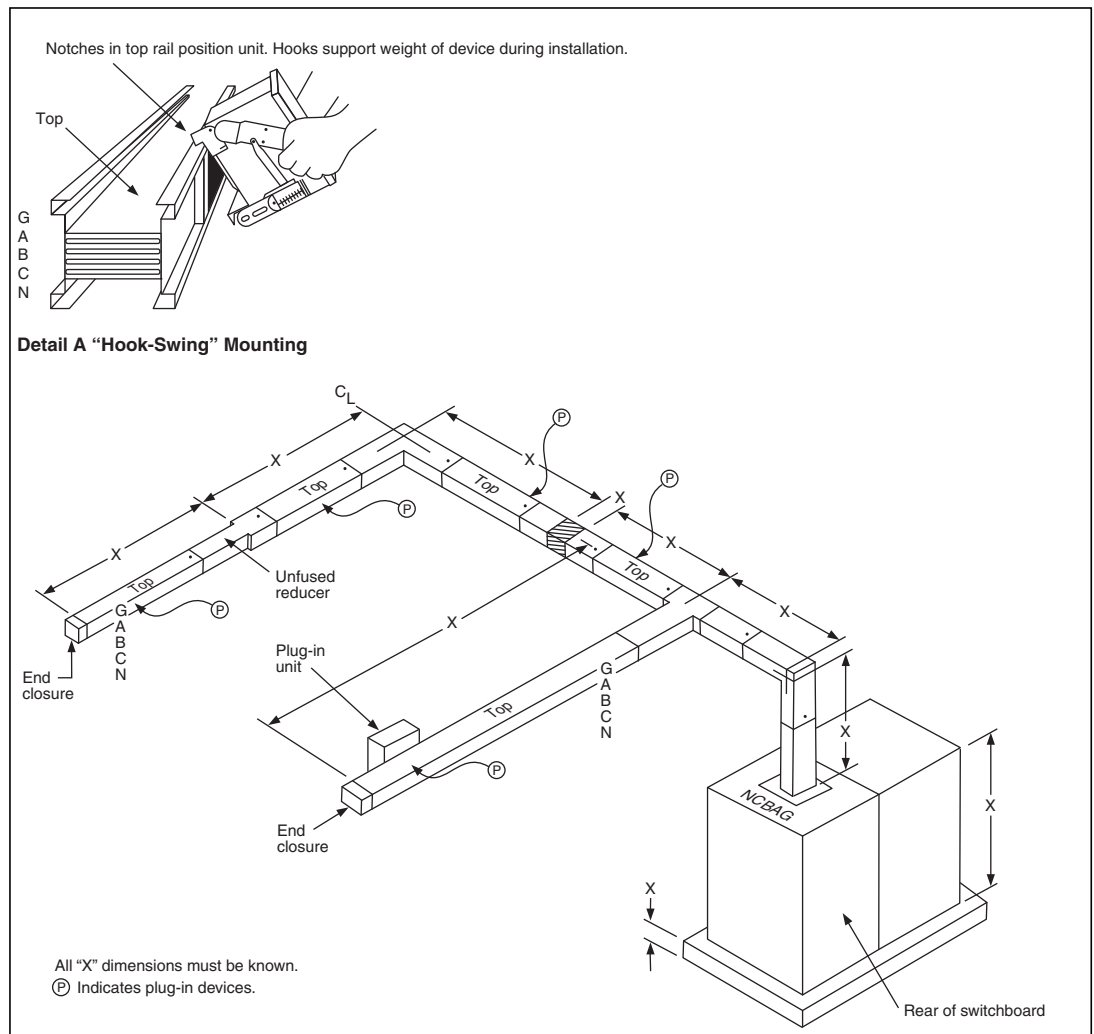


Figure 12: Measurements Needed for a Typical Plug-In Type Run

Section 3—Application Data

Plug-In Risers

Plug-In Risers

I-Line II plug-in busway can be utilized for the entire vertical riser. There is no need to use feeder busway to penetrate the floors. This feature enables the use of more plug-in openings per floor of the riser. (Plug-in risers under 800 A require internal barriers where the busway passes through a floor.)

Dimensions

The riser in Figure 14 has been fully dimensioned. Note that the feeder style busway has been used out of the switchboard and the two 120-inch (3048 mm) sections of plug-in style busway on the second and third floor do not have a joint located in or near the floor. Refer to page 32 for a discussion and detail of joint accessibility requirements.

Figure 13 shows typical dimensions that are known to ensure an accurate installation: floor-to-floor height, floor thickness, exact layout of multiple run riser, closet dimensions, the type and quantity of plug-in tap units per floor, which side of the busway the units should mount on, and (if necessary) the desired height of the units from the floor.

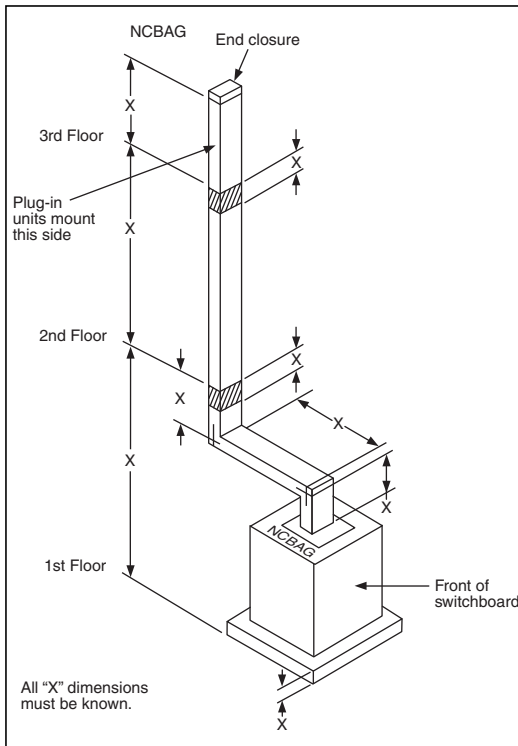


Figure 13: Typical Information Needed for Riser

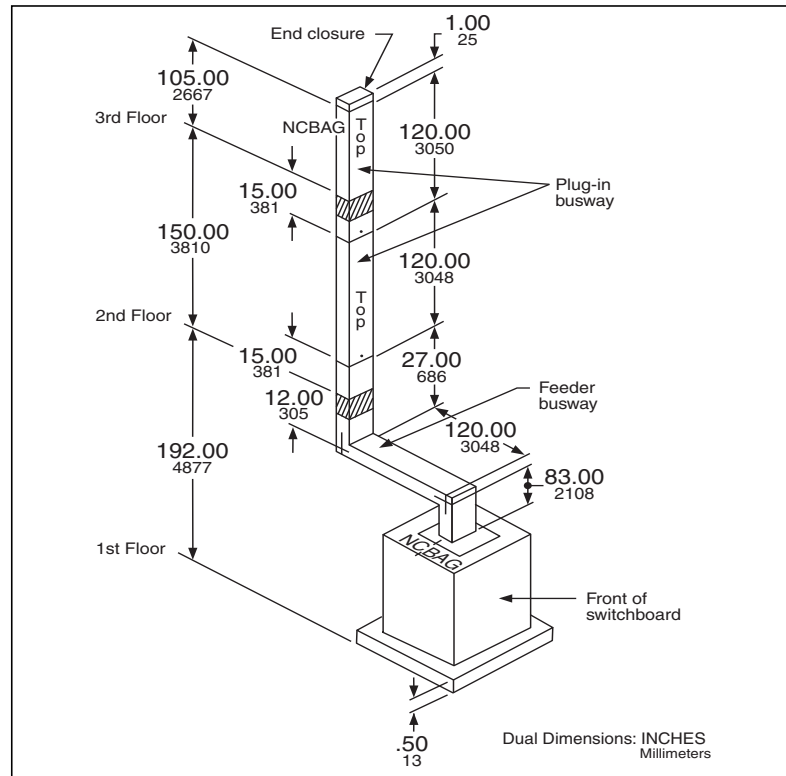


Figure 14: Typical Layout—800 A Rise

Riser Installation and Phasing

Circuit breaker type 250 A and below and the 30 A, 60 A, and 100 A fusible type plug-in units can be mounted on either side of the busway in riser installations.

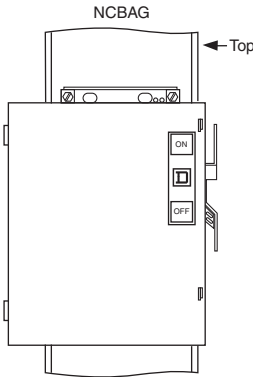


Figure 15: Correct Orientation of Riser Busway

When fusible type plug-in units are being supplied, the location of the plug-in unit determines the phasing of the busway. NEC Article 404.6 and CEC Article 14.502 state: *“Single throw knife switches shall be mounted so that gravity will not tend to close them”*. It is essential that the busway is oriented with the correct side available for the insertion of the units.

To determine the correct busway orientation (based on where the plug-in units mount for your installation), please contact your local representative for assistance and coordination.

Figure 15 shows the correct mounting and phasing of the riser busway and plug-in unit.

NOTE: It is **imperative** that the face labelled “TOP” is installed as shown on the installation drawings provided with your project.

Special Manufacturer’s Recommendation

NEC requires that a waterproof curb is installed at each floor opening where busway passes through (see Figure 16). An unprotected floor opening can act as a funnel for plumbing leaks, sprinkler system leaks, fluid spills, and other types of contamination.

The cost of removing and replacing a contaminated busway length far exceeds the cost for including a waterproof curb when the floors are poured.

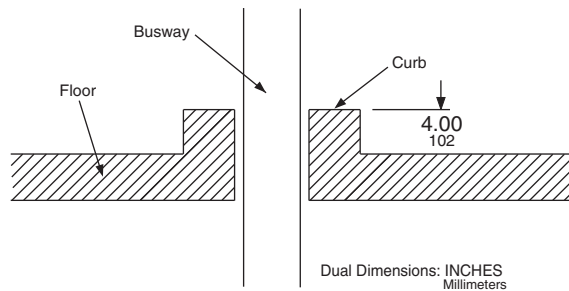


Figure 16: Waterproof Curb Recommended at Floor Opening

Once busway is installed through a floor opening, the remaining unused area must be filled to prevent smoke from passing floor-to-floor (chimney effect) in case of fire in the building. Some recommended materials available are fire rated foam and caulk. Grouting is also acceptable, but must be applied in a very dry form to prevent water and contaminants from entering the busway once the grouting cures and the water leeches out. Check with your local inspector to determine the appropriate materials to use in filling the void around the busway.

Plug-In Units

When entering an order, the factory must know not only which side of the busway the plugs will mount on, but also the type and quantity of plugs to use on each floor. Also, notify the factory if the plugs need to be mounted at a certain height from the floor.

Hangers

Spring hangers are recommended for riser applications. When properly installed and maintained, spring hangers compensate for expansion and contraction of the busway, as well as shrinkage of the building. In riser applications, support for busway must be provided at intervals not exceeding 16 ft (488 cm).

Section 3—Application Data

Feeder Runs

Feeder Runs

Feeder type runs are normally used for distributing power to loads that are concentrated in one area. Typical connections are switchboard-to-switchboard tie runs (see Figure 17), or a switchboard feeding a remote motor control center (MCC).

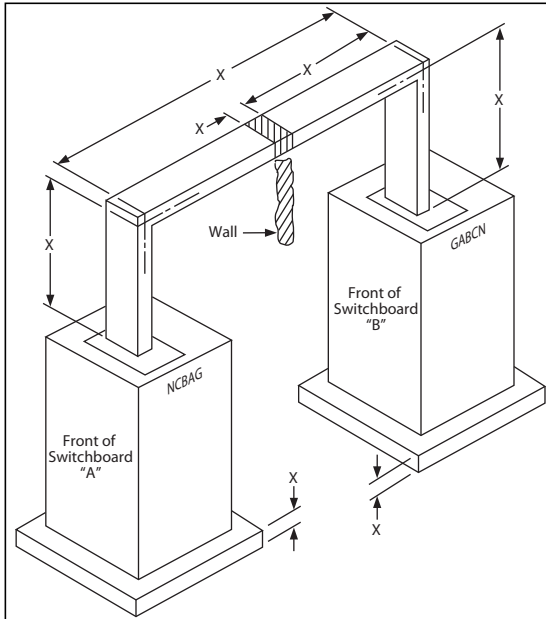


Figure 17: Measurements Needed for Feeder Type Run

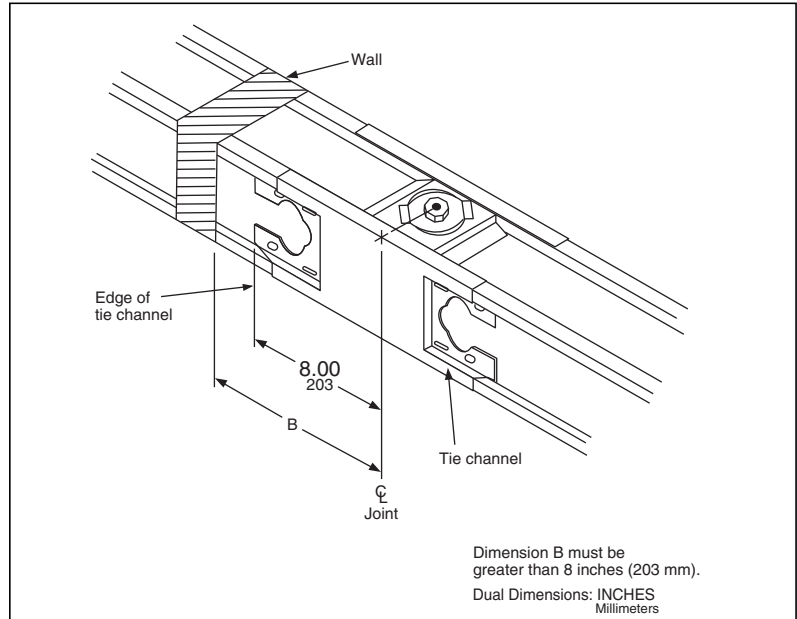


Figure 18: Joint Accessibility Requirements

Busway Through Walls and Floors

When 800–5000 A busway extends through a wall or floor, feeder or plug-in busway can be used. For runs under 800 A, plug-in busway will be used throughout. In all cases, wall or floor location must be specified.

According to CEC Article 12.2000 and NEC Article 368.10, busway must be installed so that supports and joints are accessible for maintenance purposes after installation. This implies that no part of the tie channel can be inside the wall. Therefore, the distance from the center line of the joint to the wall must be greater than the distance from the center to the edge of the tie channel (see Figure 18). If the dimensions of the tie channel cannot easily be determined, it is best to keep the joint at least 12 inches (305 mm) from the wall. This will ensure proper joint clearance for any type of busway passing through a wall or floor.

Section 4—Layout and Measurement

Layout and Measurement of Busway Installations

Laying out and measuring a busway job does not require specialized tools or skills. The following list of tools will usually be sufficient:



- 100 ft (3048 cm) tape measure
- Plumb bob/chalk line
- 25 ft x 1 in. (762 cm x 25 mm) tape measure
- Felt tip marker or crayon
- 6 ft (183 cm) wooden ruler

For the following example, let's assume you want to feed a new motor control center (MCC) with busway from a new distribution switchboard. Using illustrations, we will step through the layout process to determine the busway orientation and dimensions. When completed, we will have a single line isometric drawing showing the proposed busway layout.

Known Information

From the bid documents, specifications, and/or factory drawings, the following information is known:

- Busway is to be 1600 A, 3Ø4W 50% GND aluminum feeder busway. Width is determined to be 8.84 in. (225 mm).
 - Switchboard is 7 ft x 7.5 in. (213 cm x 191 mm) high, 3 ft (91 cm) wide, and 2 ft (61 cm) deep. Busway connection to be in top center.
 - Motor control center is 7 ft x 7.5 in. (213 cm x 191 mm) high with a 1 ft (30 cm) additional height pull box for busway connection; 20 in. (508 mm) wide; 20 in. (508 mm) deep. Busway connection is in top center.
 - Bottom of busway (B.O.B.) to be installed 16 ft (488 cm) above finished floor (A.F.F.) unless obstructed.
1. Determine the physical size of the busway housing.

This information lets you know how far to stay away from obstructions. In our example Figure 19, the busway is 8.84 in. (225 mm) wide and 5.88 in. (149 mm) high (9 in. x 6 in. (229 mm x 152 mm) nominal).

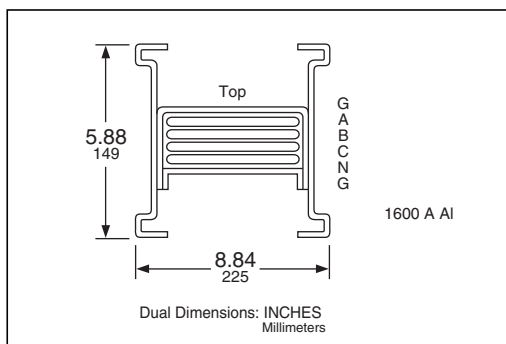


Figure 19: Physical Size of Busway Housing

2. Review the area where the busway could be installed (if not already specified).

Note special conditions such as building expansion joints, steel changes, HVAC equipment, and plumbing lines.

Section 4—Layout and Measurement

Known Information

3. Measure all dimensions from fixed points.
Measure dimensions such as columns, walls, or other building structures. Try to leave at least 4 in. (102 mm) between the busway and any obstructions. Figure 20 shows the switchboard and MCC locations, the obstructions, and the dimensions to fixed points.
4. Start dimensional layout from the fixed end.
Sketch the proposed busway routing, noting elevations and obstructions (see Figure 21 on page 35).
5. Route the busway above the bottom chord of the building steel, unless specified.
For industrial applications, this protects the busway from damage by forklifts, cranes, etc. The busway must be supported by drop rods or from below. Do not route busway where it cannot be adequately supported.
6. When selecting the elevation for plug-in busway, remember that overcurrent devices (plug-in units) can require different mounting clearances.
Referring to the sample busway layout (see Figure 21 on page 35), enough information is known to tabulate the amount of busway footage needed and the required fittings (e.g., flanged ends, elbows). A copy of the figure could help your local representative with pricing your job and also could be forwarded to the factory to aid in preparation of approval or record drawings.

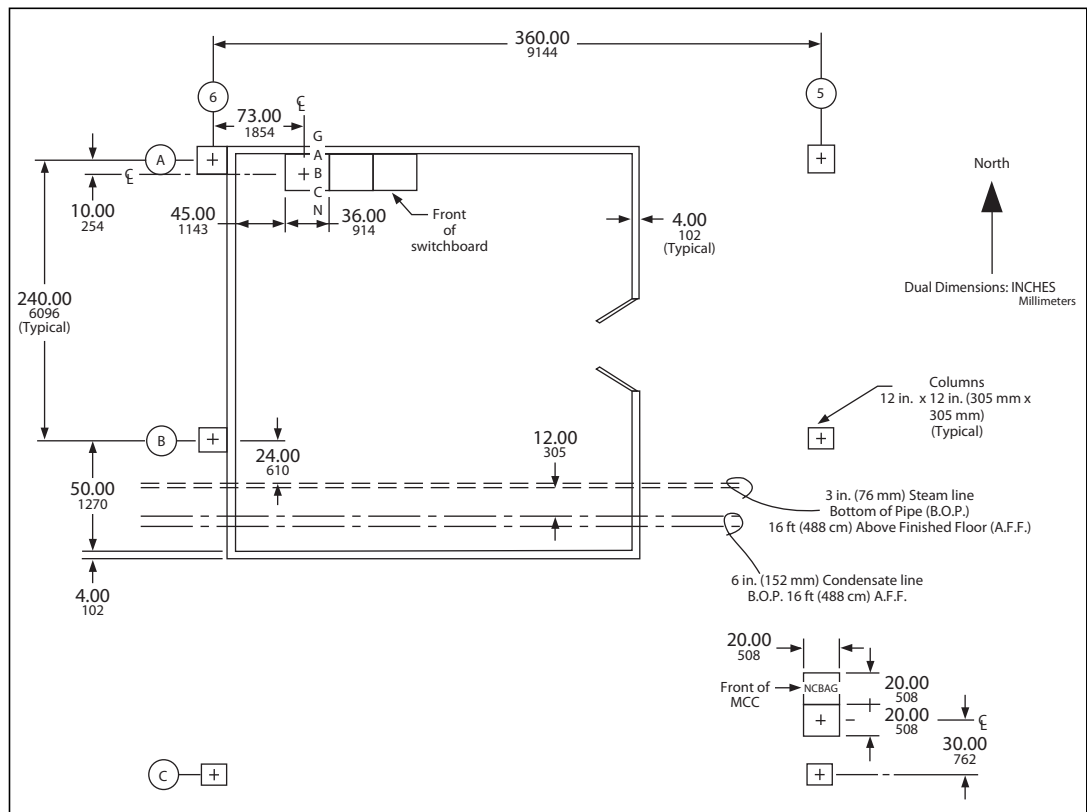


Figure 20: Plan View Switchboard, MCC, and Obstructions

Section 4—Layout and Measurement Known Information

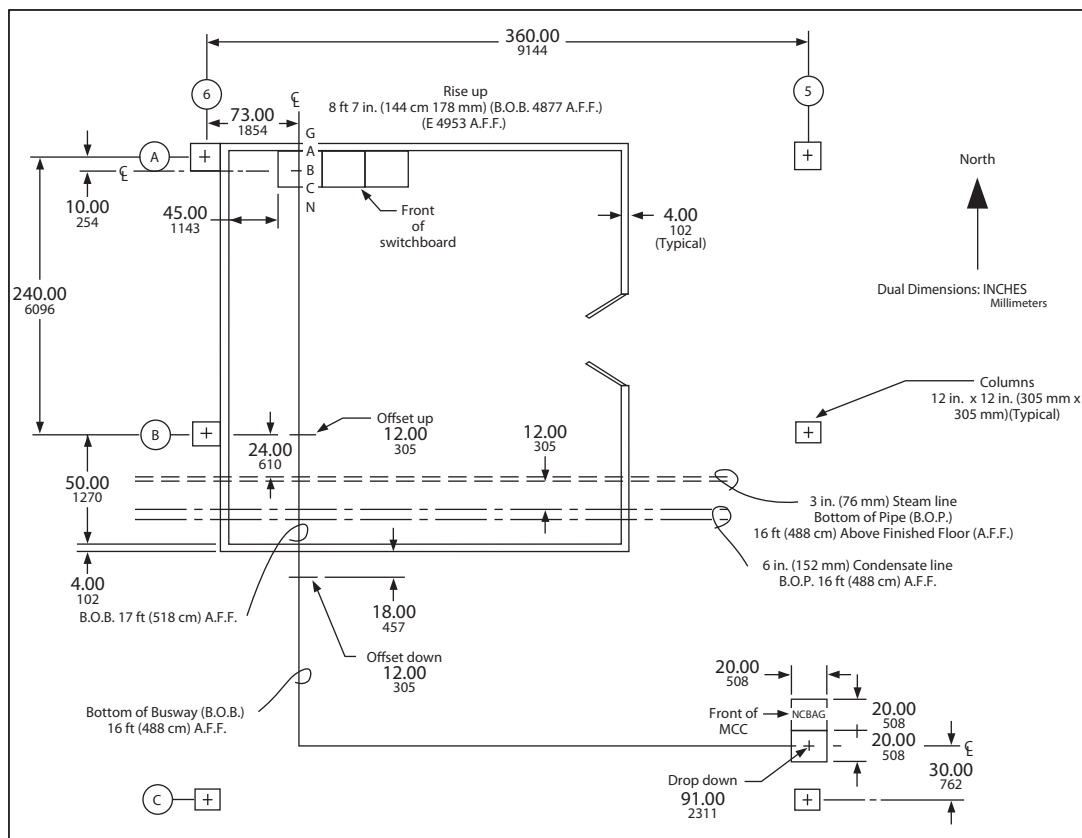


Figure 21: Proposed Busway Layout

Section 4—Layout and Measurement
Known Information

Section 5—Installation, Special Features, and Services

Installation Recommendations

To make the busway installation proceed as quickly and efficiently as possible, a few preliminary steps should be taken.

1. Familiarize yourself with the busway routing. If record drawings were supplied by the factory, have a copy accessible to the installers.
2. Inspect busway for damage when received. Store busway in a clean, dry location.
3. Have the following recommended tools available for the busway installation:



- 1/2-in. (13 mm) nut driver or socket and ratchet
 - Torque wrench or breaker bar with 5/8-inch (16 mm) head
 - 3/4-in. (19 mm) socket for torque wrench or breaker bar
 - Busway assembly tool (AT-2) for 800–5000 A (provided by Schneider Electric)
 - Level
 - Tape measure or 6 ft (488 cm) wooden ruler
 - Busway insulation tester (“megger,” 1000 V recommended)
4. Carefully read the installation instructions for all devices and NEMA Publication BU 1.1 provided with the busway before installing any of the equipment. This will help ensure proper installation and operation procedures are followed for the busway system being installed. Note the instructions call for the busway to be “meggered” before and after installation.
 5. Install busway hangers and supports. The most common method of supporting the busway hangers is threaded drop rods (or all thread), the installer must supply.
 6. Anticipate the weight of the objects being installed so the necessary lifting devices and manpower are available.
 7. If any problems are encountered or questions arise, contact your local Schneider Electric representative.
 8. Once the installation of the busway is complete, the NEMA Publication BU 1.1 should be delivered to the facility owner for his or her use in operating and maintaining the busway system.

Painting Installed Busway Systems

A busway system, that includes plug-in units, can be painted after installation. However, all precautions must be taken to prevent the paint from coming in contact with conductors and insulation. All nameplates and labels (safety labels, serial number labels, UL Labels, etc.) must remain visible and legible.

Hanger Spacing

Maximum support intervals include:

- Vertical mounting
 - indoor—16 ft (488 cm)
 - outdoor—5 ft (152 cm)
- Horizontal mounting
 - indoor—10 ft (305 cm)
 - outdoor—5 ft (152 cm)

Maintenance Recommendations

⚠ DANGER HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH • Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E. • This equipment must be installed and serviced only by qualified personnel. • Perform such work only after reading and understanding all of the instructions contained in this bulletin. • Turn off all power supplying this equipment before working on or inside equipment. • Before performing visual inspections, tests, or maintenance on this equipment, disconnect all sources of electric power. Assume all circuits are live until they are completely de-energized, tested, and tagged. Pay particular attention to the design of the power system. Consider all sources of power, including the possibility of backfeeding. • Always use a properly rated voltage sensing device to confirm power is off. • Handle this equipment carefully and install, operate, and maintain it correctly in order for it to function properly. Neglecting fundamental installation and maintenance requirements lead to personal injury, as well as damage to equipment or other property. • Disconnect the neutral connection at any Surge Protective Device (SPD) or other electronic device prior to performing electrical insulation resistance tests; reconnect to the device after testing. • Carefully inspect your work area and remove any tools and objects left inside the equipment. • Replace all devices, doors, and covers before turning on power to this equipment. • All instructions in this bulletin assume that the customer has taken these measures before performing maintenance or testing. Failure to follow these instructions will result in death or serious injury.
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General Danger Safety Label

NEMA Publication BU 1.1 is provided with each busway project as a guide for proper installation, operation, and maintenance of busway products. This publication addresses such areas as inspection of all electrical joints and terminals for tightness, prevention the entry of water and contaminants into the busway, instructions for what to do if water and contaminants do enter the busway, and other maintenance topics. This publication is also available upon request by contacting your local Schneider Electric representative.

Other publications Schneider Electric recommends to help ensure the highest quality of product performance are as follows:

- NFPA 70—National Electrical Code (U.S.)
- NFPA 70B—Maintenance of Electrical Equipment
- NEMA BU 1—Busway Standard published by the National Electrical Manufacturers Association
- CSA C22.1—Canadian Electrical Code, Part 1

Section 5—Installation, Special Features, and Services

Special Busway Construction

Special Busway Construction

This section outlines requirements for busways with features other than our standard.

Special Paint

I-Line™ busway can be provided in colors other than ANSI 49 gray for an additional fee. The special color requested should be specified by an ANSI color code at the time of order entry. With typically lengthened lead times for special color parts, it is imperative to provide this information as early as possible in the order process so delivery commitments can be met.

Low Current Density Busway

Some customers require a lower current density busway than our standard for rigorous duty in their installation. Schneider Electric has developed a range of busway for the most commonly requested current density of 1000 A per square inch for copper busway and 750 A per square inch for aluminum busway. If you require this current density for your installation, specify it, and we can meet your need. If you have requests for another specific current density, contact your local Schneider Electric representative.

Riser Plug-In Busway

Schneider Electric also offers an I-Line II plug-in busway specifically designed for installation in riser closets of high-rise buildings. This plug-in busway has a plug-in door on the front side that faces out into the room. The back of the busway, that faces the wall, is blanked off with a feeder bus side rail.

This design provides a plug-in busway ideally suited for riser cabinets and gives the customer only the necessary plug-in openings. The catalog number for this device is the same as our plug-in busway, except an R is substituted for the P. (Example: if the standard plug-in busway prefix is AP2512G, the riser busway prefix is AR2512G.)

Splash Resistant Busway

Some indoor busway is subject to occasional water exposure, such as roof leaks or sprinklers. While this application does not require the full protection of outdoor busway, additional protection is needed for the indoor busway. The splash resistant feature is tested to the International IEC 60529 standard and is rated as IP54. This rating specifies protection from dust ("limited ingress permitted with no harmful deposits") and water ("splashed from all directions with limited ingress permitted").

This feature is available as an option with indoor plug-in and feeder busway. It is identified by the addition of "M54" at the end of the standard catalog number. To maintain the UL label, however, an IP54 rating product needs to be sized as a "Low Current Density Busway."

Harmonic Busway

To properly allow for the impact of total harmonic distortion (THD), a busway solution must address both the current capacity of the neutral and the ability to dissipate the heat generated with the maximum anticipated load. The increased neutral currents will result in additional heating of all phase conductor bars, therefore de-rating of the busway is necessary.

With the Schneider Electric harmonic busway solutions, the neutral is sized to carry the full current of the expected harmonic load, while the increased cross section of the phase conductors dissipate the added heat generated within the busway.

There are two harmonic busway offers available:

- **15%<THD<35%** rating (letter X in the catalog number)
- **THD>35%** rating (letter Y in the catalog number)

For example, if the standard busway prefix is AP2512G, the THD>35% harmonic busway prefix is APY2512G.

Section 5—Installation, Special Features, and Services

Services

Seismically Qualified Busway

I-Line busway has been seismically qualified to meet the seismic provisions of the International Building Code (IBC), California Building Code (CBC), and ASCE/SEI 7 based on triaxial shake table testing following the code recognized test protocol ICC ES AC156. All qualification shake table testing was conducted by an independent test facility to verify compliance to an $I_p = 1.5$ by verifying post test equipment functionality as required by ASCE 7 for equipment that is part of a seismic designated system.

The shake table earthquake simulation subjected the busway test specimens to dynamic demands that can be more severe than the earthquake codes for most locations. A certificate of self certification is available on request from your local sales office and is based on site specific code defined seismic demand requirements for the installed location information supplied to Schneider Electric.

The qualified busway equipment must be installed, anchored, and restrained in accordance with Schneider Electric installation guidelines. For the purpose of seismic restraint design, the center of gravity is centrally located for all outside linear dimensions for each section or device (as listed along with their respective weights). Anchorage of equipment to the primary building structure is required to validate seismic certification of the equipment. The structural engineer or design engineer of record is responsible for design of the code compliant seismic restraint system for the building equipment. Schneider Electric is not responsible for the specification and performance of seismic restraint and anchorage systems.

Services

Schneider Electric offers a wide range of services to make the use of I-Line busway as simple and easy as possible. A summary of these services follows:

Busway Measuring and Layout Service

Schneider Electric can provide full-site measuring and coordination of a busway installation. This service is ideal for large complicated projects requiring close coordination with other services. This service must be requested at the time of specification and order entry. Refer requests for this service to your local Schneider Electric representative.

Emergency Service

Trained and qualified busway personnel are on call 24 hours a day to assist in your emergency busway needs. Call 1-888-SQUARE D (1-888-778-2733).

“Missing Link” Program

The “Missing Link” program is designed specifically to help a customer correct last minute changes to a project using busway. Those changes could include an unplanned obstruction requiring the busway to be rerouted, incorrect measurement of the busway run, or the need to order additional pieces to supplement busway previously ordered. The program applies to the United States, Canada, and Mexico, and guarantees shipment of factory-built busway in five to seven working days or we pay for the premium freight. For complete details of the program, contact Schneider Electric at 1-888-SQUARE D (1-888-778-2733).

How To Properly Measure Your Missing Link Dimensions

All missing link dimensions should be measured to the nearest whole inch from centerline of joint to centerline of joint, or centerline of joint to centerline of busway.

As shown in Figure 22, diagram “A—Straight Lengths,” the centerline of the joint is located at the joint bolt on the end with a joint pack installed. If the joint pack is not installed, the centerline of the joint is one inch (25 mm) from the end of the bus bars.

If it is necessary to measure an elbow, the dimensions X and Y (shown in Figure 22, diagram “B—Elbows”) are all that’s needed. Be sure to measure from centerline of joint (as described above) to centerline of busway housing. You must also specify whether an edgewise or flatwise elbow is required. The table on page 72 lists the standard minimum elbow dimensions for each amperage.

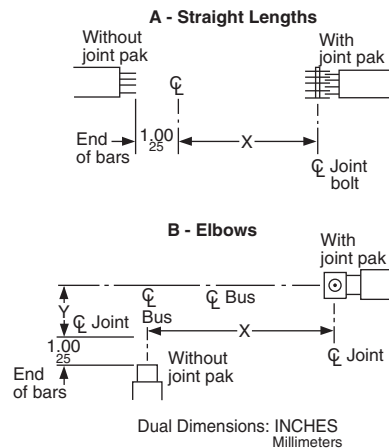


Figure 22: Missing Link Dimensions

Section 5—Installation, Special Features, and Services
Services

Section 6—Electrical Data

Electrical Data

- **Standards:** UL857 (File Number E22182); CSA C22.2 No. 27-1973 (File Number LL-61778)
- **Systems:** ac—3Ø3W, 3Ø4W, 1Ø2W, 1Ø3W, DC-2 Pole. All neutrals are 100% capacity.
- **Voltage:** 600 Volts ac/dc, 50 Hz and 60 Hz
- **Ground:** 50% capacity as standard for 800–5000 A, as an option on 225–600 A
- **Enclosure:** Indoor and outdoor (800–5000 A only)

Short Circuit Ratings: UL 3-Cycle Test (kA, RMS Symmetrical)

Ampere Rating	Aluminum				Copper			
	AOF2 / AF2	AOFH2 / AFH2	AP / AP2	APH / APH2	COF2 / CF2	COFH2 / CFH2	CP / CP2	CPH / CPH2
225	—	—	22	—	—	—	22	—
400	—	—	22	42	—	—	22	42
600	—	—	22	42	—	—	22	42
800	50	85	50	75	50	85	50	75
1000	50	100	50	100	50	85	50	75
1200	50	100	50	100	50	100	50	100
1350	50	100	50	100	50	100	50	100
1600	50	100	50	100	50	100	50	100
2000	100	150	125	150	50	100	65	100
2500	100	150	125	150	100	150	125	150
3000	100	150	125	150	100	150	125	150
3200	—	—	—	—	100	150	125	150
4000	150	200 ¹	200	—	150	200 ¹	200	—
5000	—	—	—	—	150	200 ¹	200	—

¹ Certain fittings are UL rated at 150 kA RMS symmetrical.

Short Circuit Ratings: 6-Cycle and 30-Cycle Tests (kA, RMS Symmetrical)

Ampere Rating	Aluminum				Copper			
	AF2, AOF2, AP2		AFH2, AOFH2, APH2		CF2, COF2, CP2		CFH2, COFH2, CPH2	
	6-Cycle	30-Cycle	6-Cycle	30-Cycle	6-Cycle	30-Cycle	6-Cycle	30-Cycle
800	42	35	75	52	42	35	65	45
1000	50	35	100	70	50	35	75	52
1200	50	35	100	70	50	35	100	70
1350	50	35	100	70	50	35	100	70
1600	50	35	100	70	50	35	100	70
2000	100	70	150	105	50	35	100	70
2500	100	70	150	105	100	70	150	105
3000	100	70	150	105	100	70	150	105
3200	—	—	—	—	100	70	150	105
4000	150	105	200 ¹	140 ¹	150	105	200 ¹	140 ¹
5000	—	—	—	—	150	105	200 ¹	140 ¹

¹ Certain fittings are rated at 150 kA and 105 kA (RMS symmetrical).

NOTE: Short circuit rating values are for thermal rated busway. Contact Schneider Electric for other options such as current density rated, harmonic rated, and IP54 rated.

Section 6—Electrical Data

Electrical Data

Short Circuit Ratings: KA, RMS Symmetrical (Series Connected with a Fuse)

Ampere Rating	Aluminum				Copper			
	AF2	AFH2	AP / AP2	APH / APH2	CF2	CFH2	CP / CP2	CPH / CPH2
225	—	—	200	—	—	—	200	—
400	—	—	100	200	—	—	100	200
600	—	—	50	200	—	—	50	200
800	100	200	200	200	100	200	200	200
1000	100 ¹	200 ¹	100 ¹	200 ¹	100 ¹	200 ¹	200 ¹	200 ¹
1200	100	200	100	200	100	200	100	200
1350	100 ²	200 ²	100 ²	200 ²	100 ²	200 ²	100 ²	200 ²
1600	100	200	100	200	100	200	100	200
2000	—	200	200	200	—	200	100	200
2500	—	—	200	200	—	200	200	200
3000	—	—	200	200	—	—	200	200
3200	—	—	—	—	—	—	200	200
4000	200	—	—	—	200	—	—	—
5000	—	—	—	—	200	—	—	—

NOTE: 225–600 A busway are connected in series with a Class J or T fuse; 800–5000 A are connected in series with a Class L fuse. All ratings are tested in compliance with UL/CSA standards. All ratings apply for three-pole and four-pole busway.

¹ A 1200 A fuse is used in series.

² A 1600 A fuse is used in series.

Impedance Values

Line-to-Neutral (Milliohms Per 100 Feet)

Ampere Rating	Aluminum Busway			Copper Busway		
	R	X ₆₀ Hz	X ₅₀ Hz	R	X ₆₀ Hz	X ₅₀ Hz
225	7.30	3.42	2.85	4.06	3.75	3.12
400	3.71	2.60	2.17	2.13	2.30	1.92
600	2.04	1.59	1.32	2.13	2.30	1.92
800	2.67	.91	.76	1.86	1.10	.92
1000	2.15	.74	.62	1.63	.96	.80
1200	1.62	.60	.50	1.17	.76	.63
1350	1.36	.53	.44	1.05	.70	.58
1600	1.05	.45	.37	.88	.61	.51
2000	.88	.37	.30	.78	.51	.42
2500	.71	.30	.25	.54	.38	.32
3000	.53	.23	.19	.48	.34	.28
3200	—	—	—	.40	.27	.23
4000	.41	.14	.12	.35	.21	.17
5000	—	—	—	.25	.17	.14

NOTE: Impedance values are for busway operating at 176 °F (80 °C) temperature.

Resistance Values for Aluminum Integral Ground Bus

Ampere Rating 3Ø3W and 3Ø4W	DC Resistance (Milliohms per 100 Feet)	
	Aluminum Phase Conductors	Copper Phase Conductors
225	8.1	8.1
400	6.4	6.4
600	5.3	6.4
800	4.0	4.4
1000	3.5	4.0
1200	3.2	3.5
1350	3.0	3.4
1600	2.8	3.0
2000	2.2	3.0
2500	2.0	2.2
3000	1.8	2.0
3200	—	1.7
4000	1.7	1.7
5000	—	1.7

NOTE: Resistance values are for integral ground bus operating at 176 °F (80 °C) temperature.

Section 6—Electrical Data

Voltage Drop Data (60 Hz At Rated Load)

Voltage Drop Data (60 Hz At Rated Load)

The values expressed below are based on a single concentrated load at the end of the busway run. For distributed loading, divide the values shown by two (2).

Power Factor—Average Phase Line-To-Line Voltage Drop in Volts Per 100 ft (3048 cm)

Ampere Rating	Power Factor – Aluminum Busway							Power Factor – Copper Busway						
	100	90	80	70	50	30	20	100	90	80	70	50	30	20
225	2.845	3.141	3.076	2.943	2.577	2.125	1.875	1.582	2.061	2.143	2.151	2.057	1.869	1.748
400	2.570	3.099	3.137	3.086	2.845	2.489	2.279	1.476	2.023	2.137	2.171	2.118	1.963	1.856
600	2.120	2.628	2.687	2.664	2.491	2.212	2.043	2.214	3.034	3.205	3.256	3.177	2.944	2.785

Aluminum Busway—Average Phase Line-to-Line Voltage Drop in Volts Per 100 ft (3048 cm)

Ampere Rating	Aluminum Busway – Power Factor %											
	100	95	90	85	80	75	70	60	50	40	30	20
800	3.700	3.908	3.879	3.809	3.716	3.609	3.490	3.229	2.942	2.636	2.313	1.975
1000	3.724	3.938	3.910	3.841	3.748	3.641	3.522	3.260	2.972	2.664	2.340	2.001
1200	3.367	3.588	3.574	3.519	3.442	3.350	3.248	3.018	2.764	2.490	2.200	1.895
1350	3.180	3.408	3.402	3.356	3.288	3.205	3.111	2.899	2.663	2.408	2.136	1.850
1600	2.910	3.154	3.162	3.130	3.076	3.007	2.927	2.744	2.535	2.307	2.063	1.804
2000	3.048	3.296	3.302	3.266	3.208	3.134	3.049	2.854	2.634	2.394	2.137	1.866
2500	3.074	3.326	3.333	3.298	3.239	3.165	3.080	2.884	2.662	2.420	2.162	1.888
3000	2.754	2.989	3.000	2.970	2.920	2.856	2.781	2.608	2.412	2.197	1.966	1.722
4000	2.841	3.001	2.979	2.925	2.854	2.772	2.681	2.480	2.260	2.025	1.777	1.518

Copper Busway—Average Phase Line-to-Line Voltage Drop in Volts Per 100 ft (3048 cm)

Ampere Rating	Copper Busway – Power Factor %											
	100	95	90	85	80	75	70	60	50	40	30	20
800	2.577	2.924	2.984	2.994	2.976	2.941	2.893	2.766	2.609	2.428	2.227	2.009
1000	2.823	3.201	3.266	3.276	3.256	3.217	3.164	3.024	2.852	2.653	2.433	2.194
1200	2.432	2.803	2.877	2.899	2.893	2.869	2.830	2.723	2.584	2.420	2.236	2.034
1350	2.455	2.844	2.923	2.949	2.946	2.924	2.888	2.783	2.645	2.482	2.298	2.095
1600	2.439	2.845	2.932	2.963	2.965	2.947	2.914	2.816	2.683	2.525	2.344	2.144
2000	2.702	3.119	3.202	3.227	3.222	3.195	3.153	3.035	2.881	2.700	2.496	2.271
2500	2.338	2.735	2.822	2.854	2.858	2.842	2.812	2.719	2.594	2.443	2.271	2.080
3000	2.494	2.921	3.015	3.051	3.055	3.039	3.008	2.910	2.777	2.617	2.434	2.230
3200	2.217	2.573	2.648	2.673	2.672	2.653	2.621	2.527	2.405	2.258	2.093	1.910
4000	2.425	2.758	2.817	2.828	2.813	2.781	2.736	2.619	2.472	2.303	2.115	1.911
5000	2.165	2.517	2.590	2.616	2.615	2.598	2.567	2.477	2.358	2.215	2.054	1.876

NOTES:

- For balanced 3-phase line-to-line voltage drop 4-wire busway, use values from tables.
- For balanced 3-phase line-to-neutral voltage drop, multiply values from tables by .577.
- For single-phase voltage drop, multiply values from tables by 1.15.
- For other than rated current, multiply values from tables by $\frac{\text{Actual Current}}{\text{Rated Current}}$
For different lengths, multiply values from 60 Hz tables by $\frac{\text{Actual Footage}}{100 \text{ ft}}$
- Voltage drop calculations for 50 Hz can be made by substituting the appropriate "x" value from page 46 into samples No.1 and 2 above.
- For other frequency values (e.g., 400 Hz), contact your local Schneider Electric representative for assistance.

Section 6—Electrical Data
Voltage Drop Sample Calculations (60 Hz)

Voltage Drop Sample Calculations (60 Hz)

Sample No. 1	Sample No. 2
1000 A aluminum busway at 50% power factor–60 Hz	1000 ampere copper busway at 50% power factor–60 Hz
Voltage Drop $= \sqrt{3} I (R \cos \varnothing + x \sin \varnothing)$ $= \sqrt{3} \times 1000 (.00215 \times .50 + .00074 \times .866)$ $= 2.97 \text{ Volts/100 ft - concentrated load}$	Voltage Drop $= \sqrt{3} I (R \cos \varnothing + x \sin \varnothing)$ $= \sqrt{3} \times 1000 (.00163 \times .50 + .00096 \times .866)$ $= 2.85 \text{ Volts/100 ft - concentrated load}$ $= \frac{2.85}{2} = 1.43 \text{ Volts/100 ft - distributed load}$

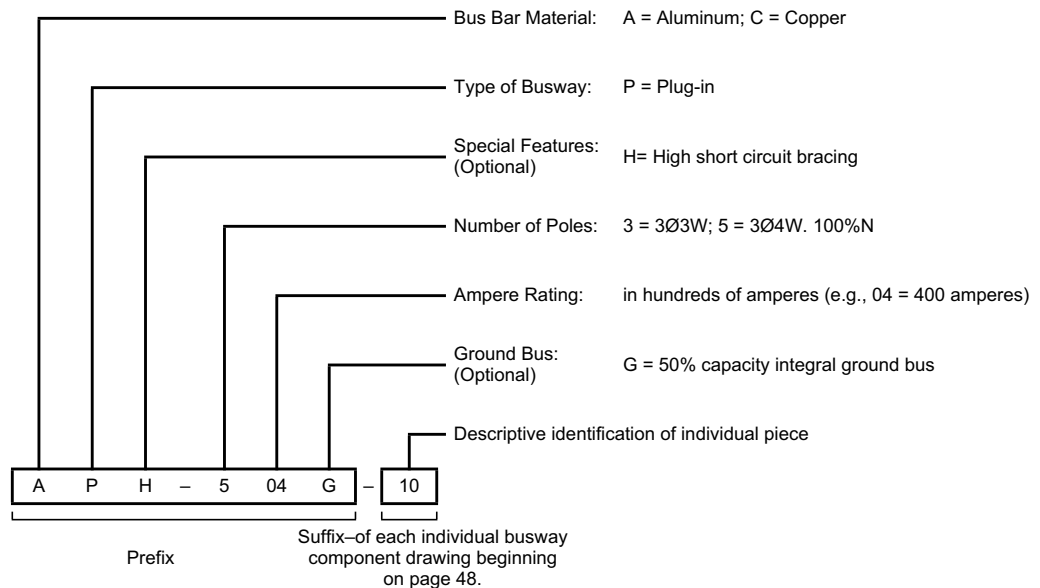
Section 7—225–600 A I-Line™ Busway

I-Line™ Busway Catalog Numbering System

Catalog numbers are composed of two basic parts: the **prefix** (as below), plus the **suffix** of each individual busway component on pages 48–53.

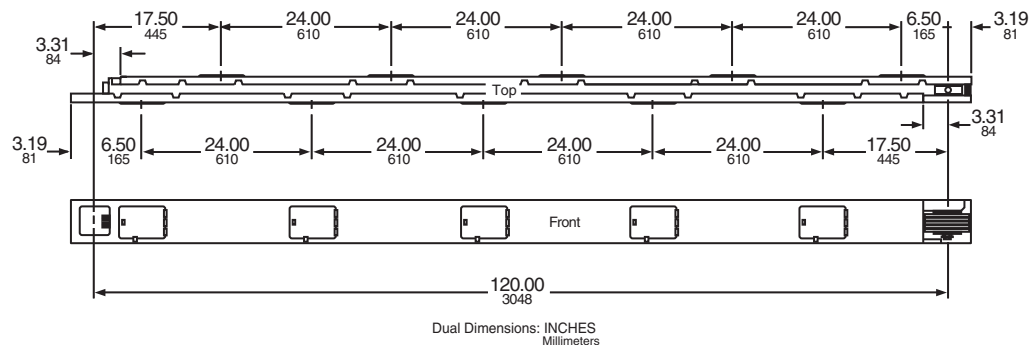
The **prefix** contains necessary busway information except individual component descriptive details that are defined as the **suffix**. The catalog number **prefix** will generally remain unchanged throughout a busway run while the **suffix** will vary with each individual length or fitting selected.

A few devices, such as hangers, wall flanges, etc., do not follow the exact pattern described above. For these exceptions, a complete listing of device catalog numbers is shown with the individual device drawing(s) on pages 58–60.



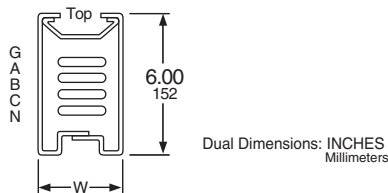
Section 7—225–600 A I-Line™ Busway
Straight Lengths

Straight Lengths



Catalog Number Suffix	-10	-6
Standard Length–Feet	10	6
Standard Length–Meters	3.05	1.83
Number of Plug-In Openings	10	6

Cross Section



Cross-Section–Aluminum Content and Weight

Aluminum Ampere Rating	Width		Bus Bars Per Phase		Weights			
					3-Pole		4-Pole	
	IN	mm	IN	mm	Lb/Ft	kg/m	Lb/Ft	kg/m
225	2.25	57	(1) .25x0.94	(1) 6x24	6.1	9.1	6.4	9.5
400	3.38	86	(1) .25x2.00	(1) 6x51	7.5	11.2	7.9	11.8
600	4.75	121	(1) .25x3.38	(1) 6x86	9.4	14.0	10.6	15.8

Cross-Section–Copper Content and Weight

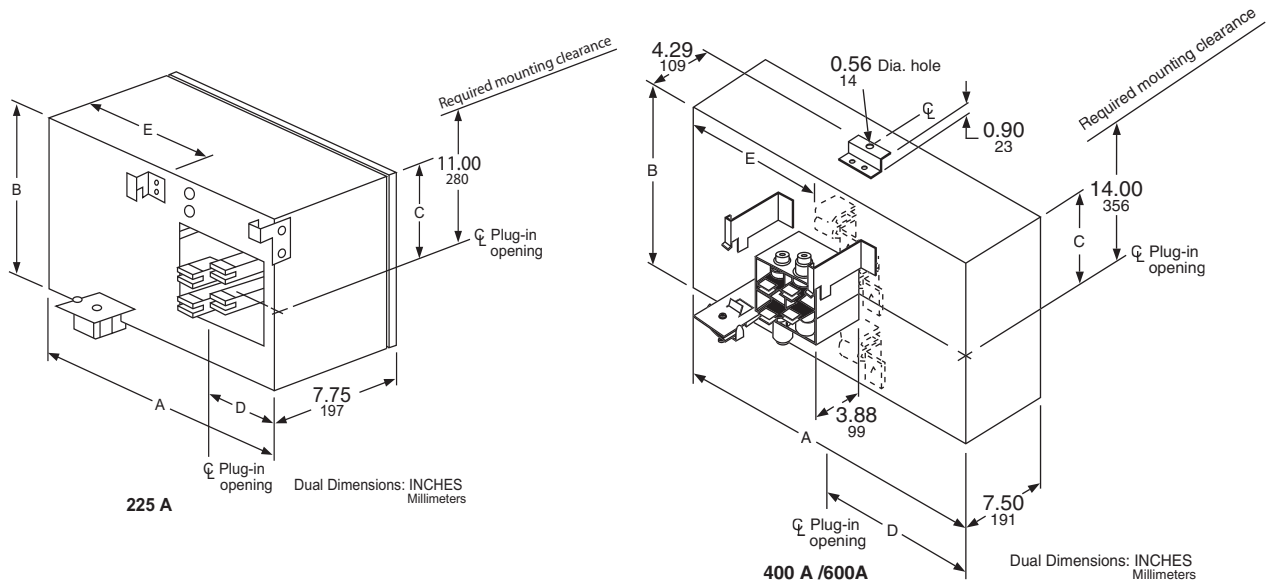
Copper Ampere Rating	Width		Bus Bars Per Phase		Weights			
					3-Pole		4-Pole	
	IN	mm	IN	mm	Lb/Ft	kg/m	Lb/Ft	kg/m
225	2.25	57	(1) .25x0.94	(1) 6x24	8.3	9.8	9.3	10.4
400	3.38	86	(1) .25x2.00	(1) 6x51	12.1	18.0	13.9	20.7
600	3.38	86	(1) .25x2.00	(1) 6x51	12.1	18.0	13.9	20.7

Section 7—225–600 A I-Line™ Busway Joint Detail

Joint Detail



Cable Tap Boxes (Plug-In)



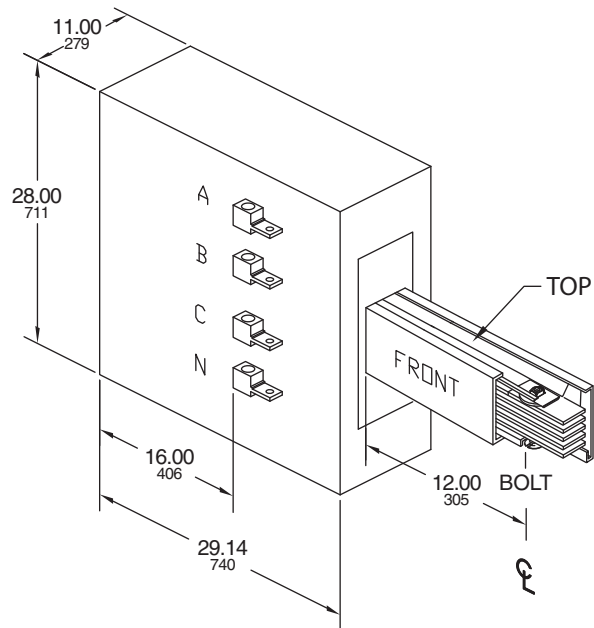
Cable Tap Boxes (Plug-In)—Dimensions and Other Specifications

Ampere Rating	A		B		C		D		E ¹		Lugs Per Phase and Neutral	Ground Lug	Catalog Number (With Ground Bus)			
	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm			3-Pole	Weight	3Ø4W 100% N	Weight
225	16.38	416	8.42	216	3.90	100	3.30	83	9.45	267	1-300 kcmil	1 – #6-2/0	PTB-302G	18.25 lb	PTB-502G	19.00 lb
400	25.95	659	18.44	468	9.76	248	7.50	191	14.00	356	2-600 kcmil	2 – 1/0 kcmil	PBTB-306G	60.00 lb	PBTB-506G	62.00 lb
600	25.95	659	18.44	468	9.76	248	7.50	191	14.00	356	2-600 kcmil	2 – 1/0 kcmil	PBTB-306G	60.00 lb	PBTB-506G	62.00 lb

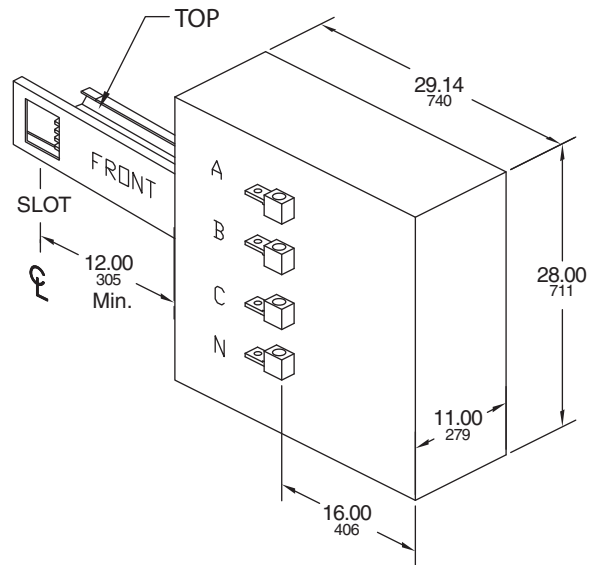
¹ Lugs in plug-in tap boxes can be reversed in field so that end of lugs point in opposite direction from that shown on drawing (400 A and 600 A only).

Section 7—225–600 A I-Line™ Busway
Cable Tap Boxes (End)

Cable Tap Boxes (End)



Bolt Suffix 12ETBB

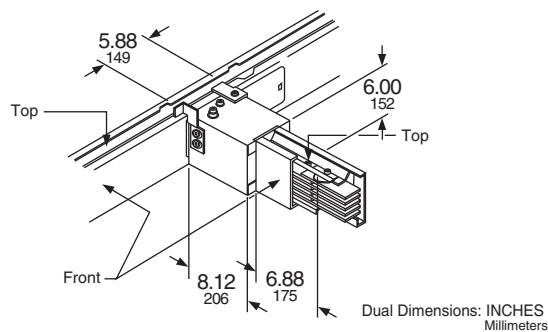


Slot Suffix 12ETBS

Cable Tap Boxes (End)—Dimensions and Other Specifications

Ampere Rating	Weight (lbs.)				Lugs Per Phase and Neutral	Ground Lugs
	3-pole		4-pole			
	Aluminum	Copper	Aluminum	Copper	1/0–600 Kcmil	#6–300 Kcmil
225	Contact your Schneider Electric representative for information concerning availability.					
400	156	179	162	195	2	2
600	164	179	173	195	2	2

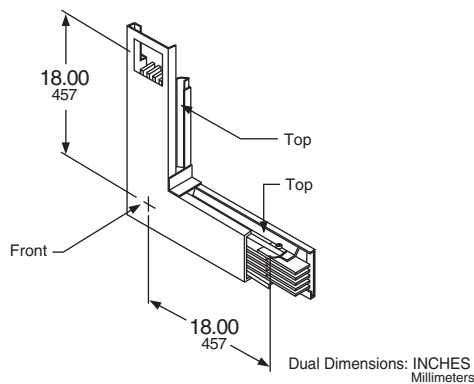
Tees



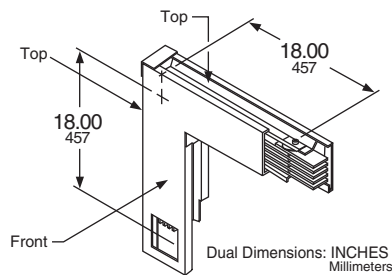
Tees–Application Data

Ampere Rating (Tee Leg)		Catalog Number (Without Ground Bus)		Catalog Number (With Ground Bus)	
Aluminum	Copper	3-Pole	3Ø4W 100% N	3-Pole	3Ø4W 100% N
225	225	PTT-2-3W	PTT-2-4W	PTT-2-3WG	PTT-2-4WG
400	400	PTT-3-3W	PTT-3-4W	PTT-3-3WG	PTT-3-4WG
—	600	PTT-3-3W	PTT-3-4W	PTT-3-3WG	PTT-3-4WG
600	—	PTT-4-3W	PTT-4-4W	PTT-4-3WG	PTT-4-4WG

Elbows



Top Inside Elbow: Catalog Number Suffix–LTI



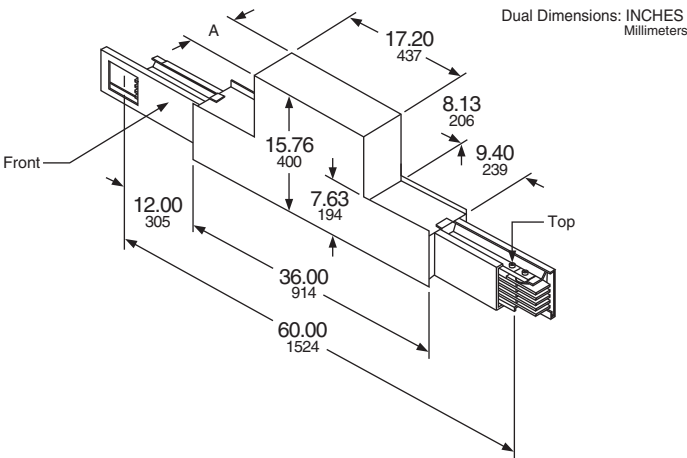
Top Outside Elbow: Catalog Number Suffix–LTO

Section 7—225–600 A I-Line™ Busway
Expansion Fitting

Expansion Fitting

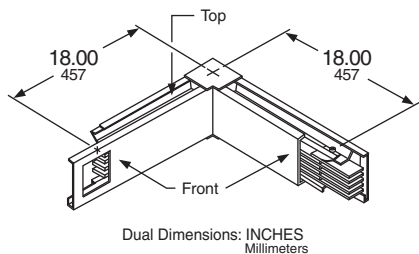
Expansion Fitting–Application Data

Ampere Rating		A	
Aluminum	Copper	IN	mm
225	225	4.51	114
400	400	5.57	141
—	600	5.57	141
600	—	6.95	176

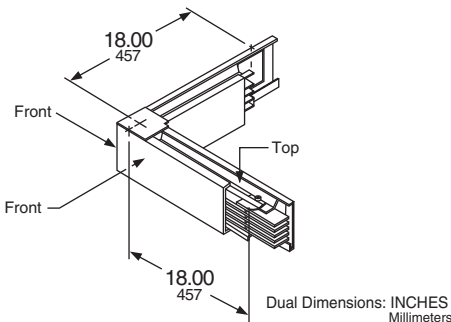


NOTE: Expansion joint permits ± 1.5 in. ± 38 mm expansion. Use recommended only when busway passes through building expansion joint.

Catalog Number Suffix–EJ

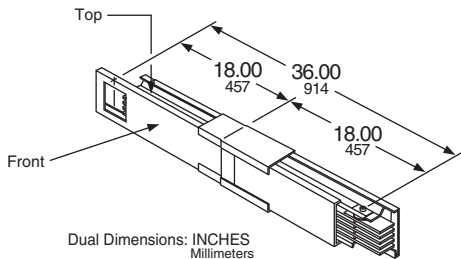


Front Inside Elbow: Catalog Number Suffix–LFI



Front Outside Elbow: Catalog Number Suffix–LFO

Unfused Reducer



Unfused Reducer–Catalog Number Suffix

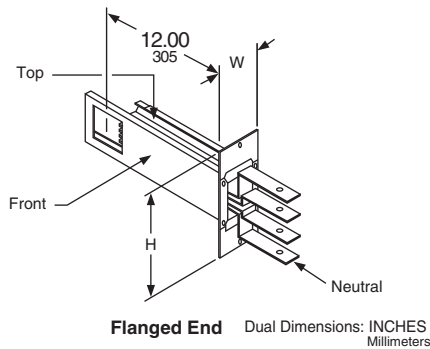
Bolt End Ampere Rating	Slot End Ampere Rating		
	225	400	600
225	—	—	—
400	-R02	—	—
600	-R02	-R04 ¹	—

¹ Aluminum busway only.

NOTE: The National Electrical Code (Article 364-11) states that overcurrent protection is required where busways are reduced in ampacity except for certain industrial applications.

Section 7—225–600 A I-Line™ Busway Flanged End Cutout And Drilling Template

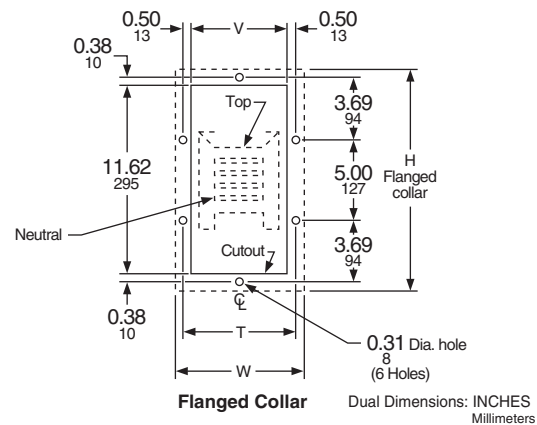
Flanged End Cutout And Drilling Template



Catalog Number Suffix—FES 12 (Slot End)/
FEB 12 (Bolt End)

Flanged End–Cutout Dimensions

Ampere Rating		H		W		V		T	
Aluminum	Copper	IN	mm	IN	mm	IN	mm	IN	mm
225	225	13.38	340	4.44	113	2.44	62	3.44	87
400	400	13.38	340	5.50	140	3.50	89	4.50	114
—	600	13.38	340	5.50	140	3.50	89	4.50	114
600	—	13.38	340	6.88	175	4.88	124	5.88	149



Section 7—225–600 A I-Line™ Busway Flanged End Details

Flanged End Details

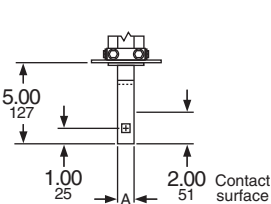


Figure 1

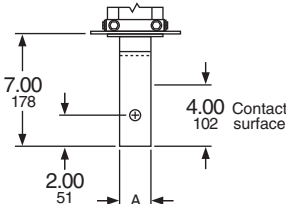
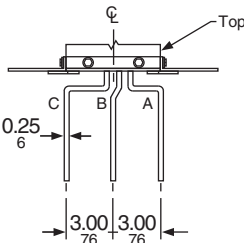


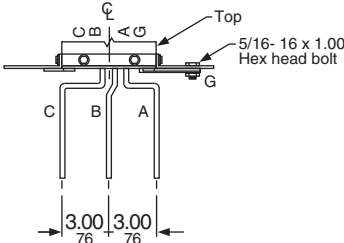
Figure 2

Flanged End–Dimensions

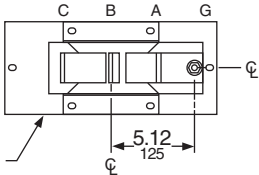
Ampere Rating		Fig.	A	
Aluminum	Copper		IN	mm
225	225	1	0.94	24
400	400	2	2.00	51
—	600	2	2.00	51
600	—	2	3.38	86



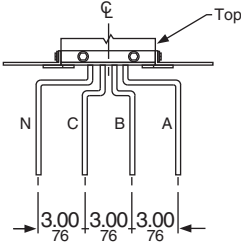
3-Pole



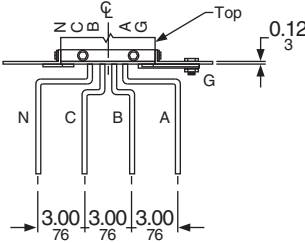
3-Pole with Ground Bus



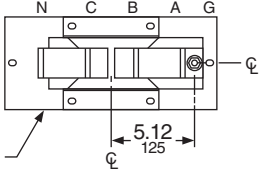
3-Pole with Ground Bus
 (Bottom View)



4-Pole



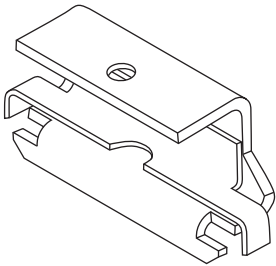
4-Pole with Ground Bus



4-Pole with Ground Bus
 (Bottom View)

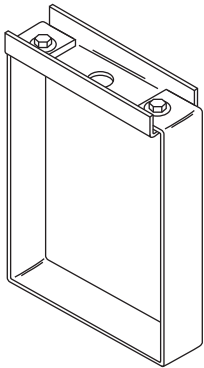
Dual Dimensions: INCHES
 Millimeters

Flatwise Hanger



Flatwise Hanger

Edgewise Hanger



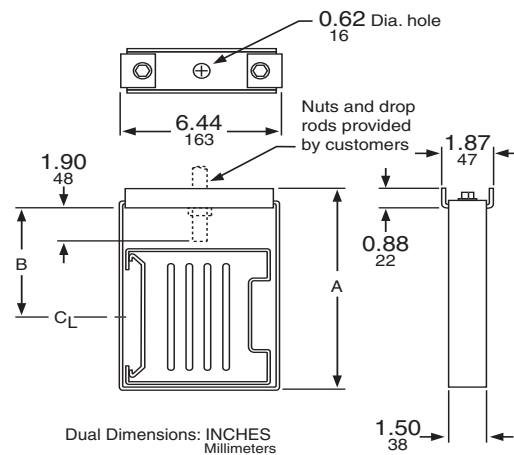
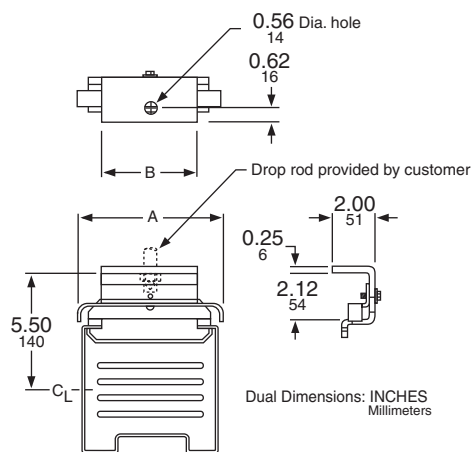
Hanger (Horizontal Flatwise)–Application Data

Ampere Rating		A		B		Catalog Number
Aluminum	Copper	IN	mm	IN	mm	
225	225	2.65	67	1.06	27	HP-2-F
400	400	3.71	94	1.44	36	HP-3-F
—	600	3.71	94	1.44	36	HP-3-F
600	—	5.09	129	2.82	72	HP-5-F

Hanger (Horizontal Edgewise)–Application Data

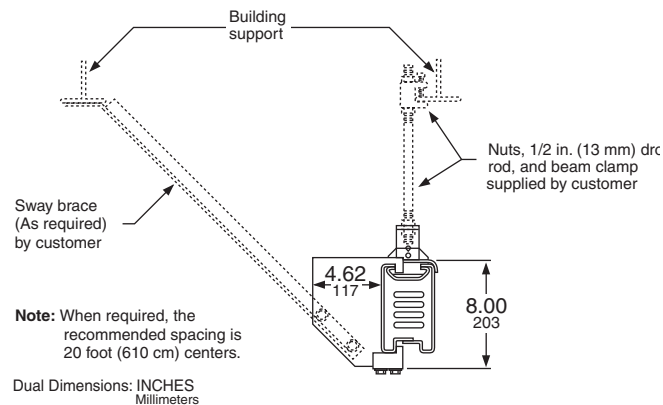
Ampere Rating		A		B		Catalog Number
Aluminum	Copper	IN	mm	IN	mm	
225 ¹	225 ¹	6.29	160	3.57	91	HP-3-E
400	400	6.29	160	3.57	91	HP-3-E
—	600	6.29	160	3.57	91	HP-3-E
600	—	7.67	195	4.26	108	HP-5-E

¹ Hanger spacing on 5 foot centers maximum when mounted edgewise.



Section 7—225–600 A I-Line™ Busway
Sway Brace Collar

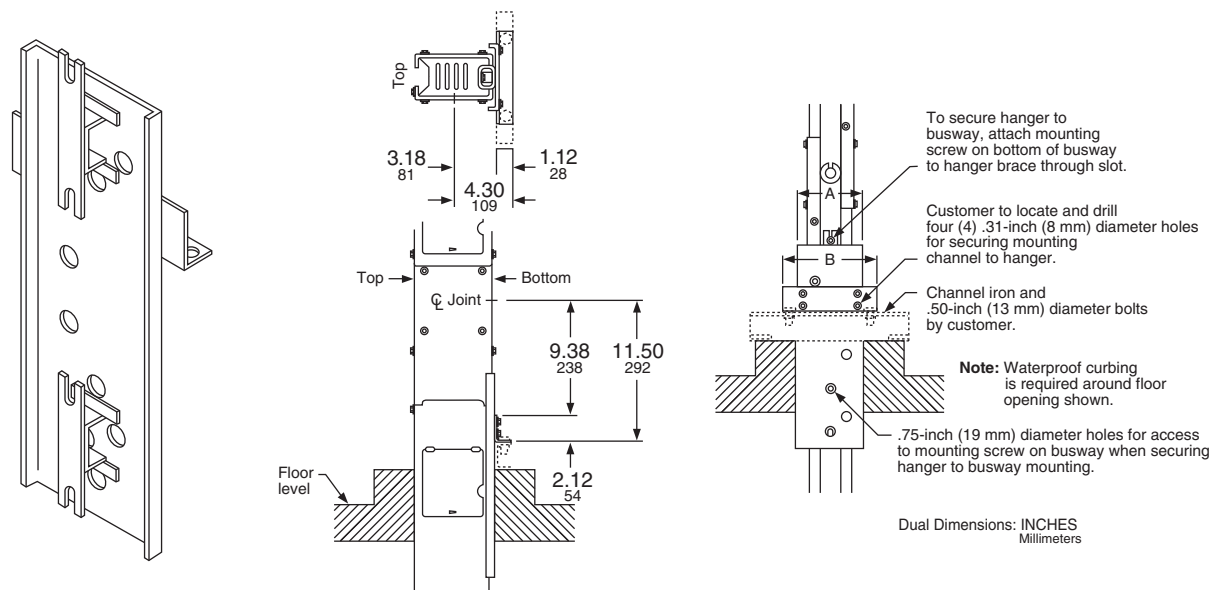
Sway Brace Collar



Catalog Number HP-1-SBC

Sway braces are used when only one side of the busway is heavily loaded with tap-off units or when other factors could cause possible swaying of the busway.

Vertical Hanger



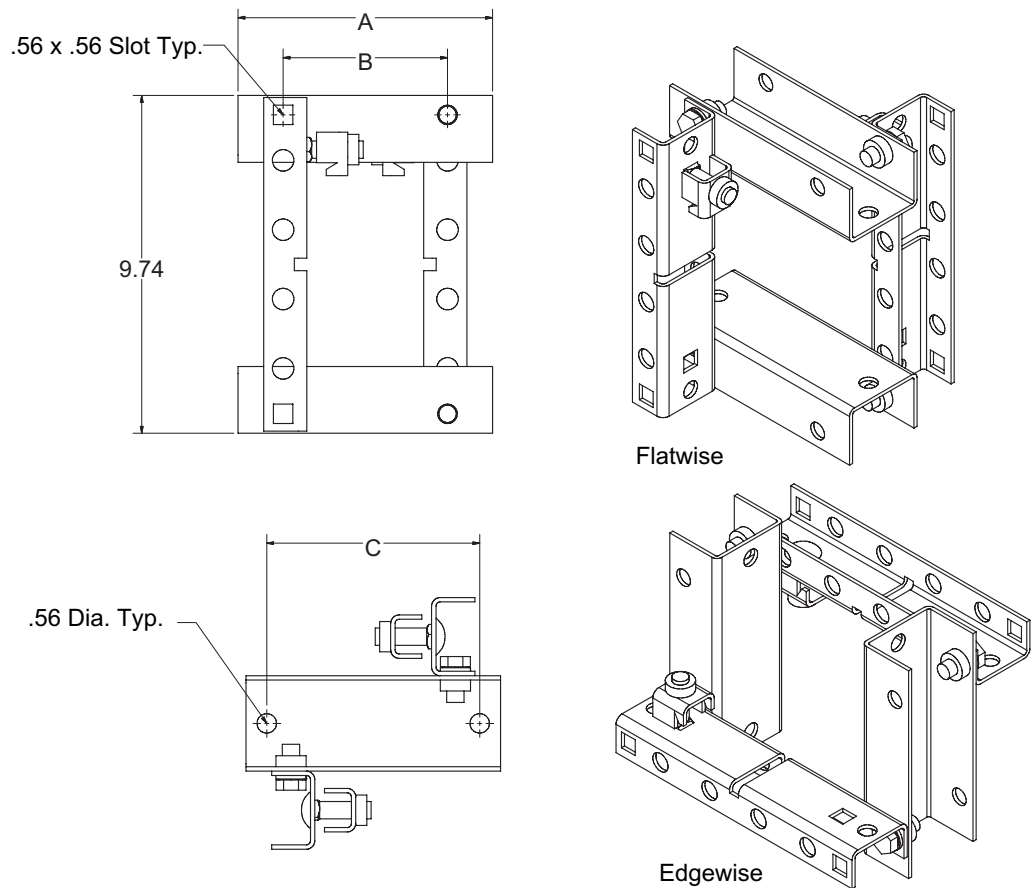
Vertical Spring Hanger--Dimensions and Catalog Numbers

Ampere Rating		A		B		Catalog Number
Aluminum	Copper	IN	mm	IN	mm	
225	225	4.28	109	6.54	166	HP-2-V
400	400	5.32	135	7.58	192	HP-3-V
—	600	5.32	135	7.58	192	HP-3-V
600	—	6.70	170	8.96	228	HP-4-V

NOTE: Dimensions shown apply for 4 ft (122 cm), 6 ft (183 cm), 8 ft (244 cm), and 10 ft (305 cm) straight lengths only. Consult your local Schneider Electric representative for dimensions that apply for fractional straight lengths.

Section 7—225–600 A I-Line™ Busway
Horizontal Seismic Hanger

Horizontal Seismic Hanger

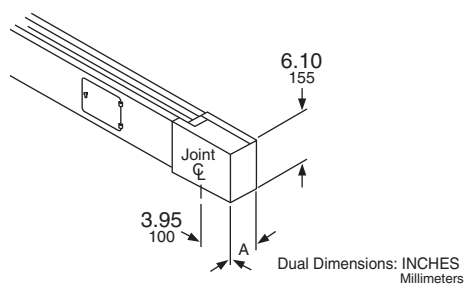


Seismic Hanger—Dimensions

Ampere Rating (A)		Catalog Number	A		B		C	
Aluminum	Copper		IN	mm	IN	mm	IN	mm
225	225	HP2SH	6.21	158	3.61	92	5.01	127
400	400 / 600	HP3SH	7.34	186	4.74	120	6.14	156
600	—	HP5SH	8.71	221	6.11	155	7.51	191

NOTE: For seismic applications, seismic hangers must be used for horizontally-mounted busway. Standard vertical hangers should be used for vertically-mounted busway.

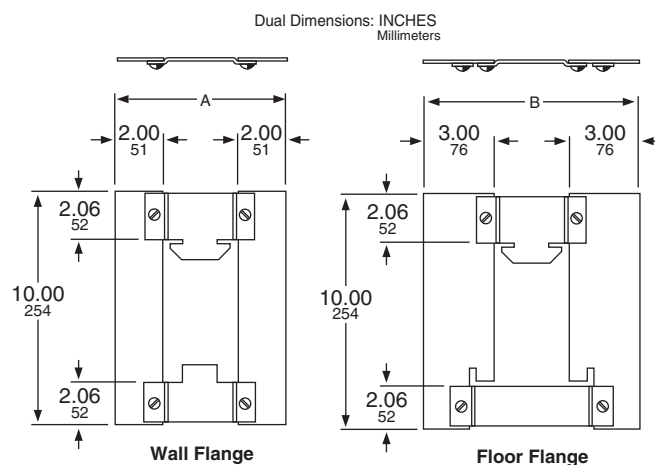
End Closure



End Closure—Dimensions and Catalog Number

Ampere Rating		A		Catalog Number
Aluminum	Copper	IN	mm	
225	225	2.66	68	ACP-2-EC
400	400	3.52	89	ACP-3-EC
—	600	3.52	89	ACP-3-EC
600	—	4.90	124	ACP-4-EC

Wall and Floor Flange

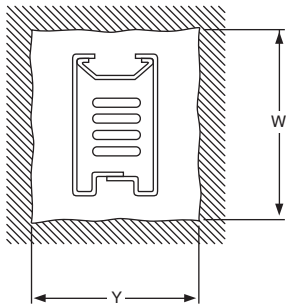


Wall and Floor Flange—Application Data

Ampere Rating		A		B		Catalog Number	
Aluminum	Copper	IN	mm	IN	mm	Wall Flange	Floor Flange
225	225	6.28	160	8.34	212	ACP-2-WF	ACP-2-FF
400	400	7.34	186	9.40	239	ACP-3-WF	ACP-3-FF
—	600	7.34	186	9.40	239	ACP-3-WF	ACP-3-FF
600	—	8.72	221	10.78	274	ACP-4-WF	ACP-4-FF

Section 7—225–600 A I-Line™ Busway
Required Wall and Floor Openings

Required Wall and Floor Openings



Ampere Rating		Straight Length		Flanged Ends		Flatwise Elbow							Edgewise Elbow						
						W	Wall Thickness						Y ¹	Wall Thickness					
4 IN 102 mm	8 IN 203 mm	12 IN 305 mm	16 IN 406 mm	20 IN 508 mm	24 IN 610 mm		4 IN 102 mm	8 IN 203 mm	12 IN 305 mm	16 IN 406 mm	20 IN 508 mm	24 IN 610 mm							
Y ¹							W												
225	225	6 IN 152 mm	8 IN 203 mm	6 IN 152 mm	15 IN 381 mm	8 IN 203 mm	8 IN 203 mm	10 IN 254 mm	12 IN 305 mm	14 IN 356 mm	16 IN 406 mm	18 IN 457 mm	6 IN 152 mm	13 IN 330 mm	15 IN 381 mm	17 IN 432 mm	19 IN 483 mm	21 IN 533 mm	23 IN 584 mm
400	400	7 IN 178 mm		7 IN 178 mm			9 IN 229 mm	11 IN 279 mm	13 IN 330 mm	15 IN 381 mm	17 IN 432 mm	19 IN 483 mm	7 IN 178 mm						
—	600	7 IN 178 mm		7 IN 178 mm			9 IN 229 mm	11 IN 279 mm	13 IN 330 mm	15 IN 381 mm	17 IN 432 mm	19 IN 483 mm	7 IN 178 mm						
600	—	8 IN 203 mm		8 IN 203 mm			11 IN 279 mm	13 IN 330 mm	15 IN 381 mm	17 IN 432 mm	19 IN 483 mm	21 IN 533 mm	8 IN 203 mm						

¹ Dimension allows clearance for vertical hanger. Subtract one inch (25 mm) for horizontal mounted busway.

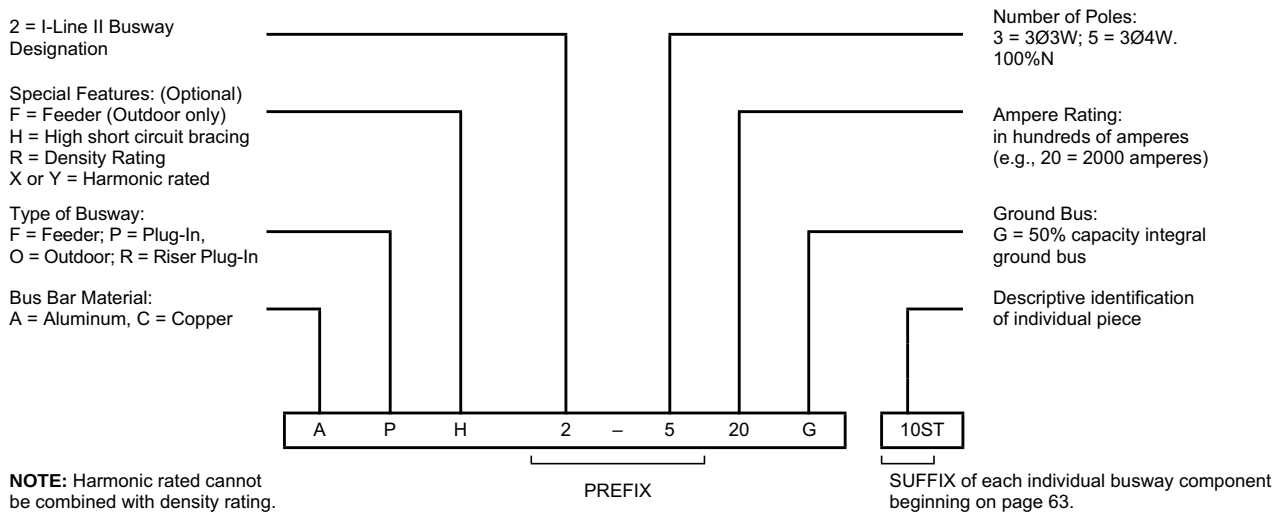
Section 8—800–5000 A Busway

Busway Catalog Numbering System

Catalog numbers are composed of two basic parts—the **prefix** (as below), plus the **suffix** of each individual busway component on pages 63–86.

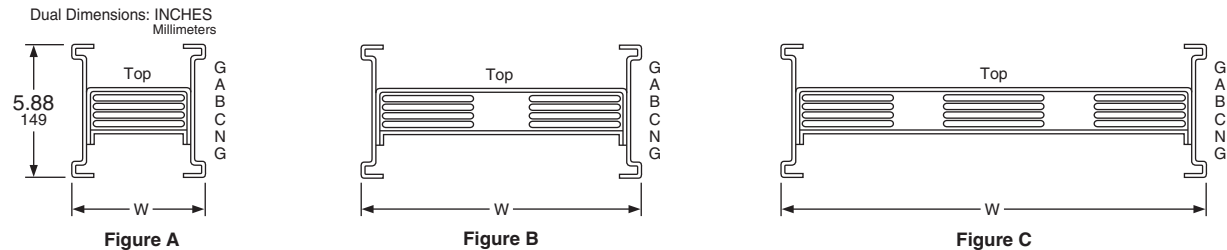
The **prefix** contains necessary busway information except individual component descriptive details that are defined as the **suffix**. The catalog number **prefix** will generally remain unchanged throughout a busway run while the **suffix** will vary with each individual length or fitting selected.

A few devices, such as hangers, wall flanges, etc., do not follow the exact pattern described above. For these exceptions, a complete listing of device catalog numbers is shown with the individual device drawing(s) on pages 81–94.

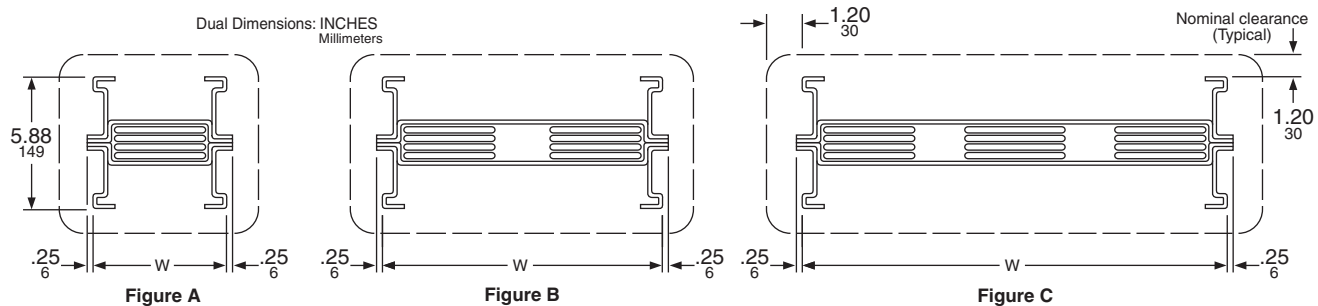


Section 8—800–5000 A Busway
Cross Sections—Plug-In and Indoor Feeder Lengths

Cross Sections—Plug-In and Indoor Feeder Lengths



Cross Sections—Fittings and All Outdoor Feeder



Note: Dotted line indicates the profile of the joint covers for Outdoor Feeder busway. The profile for indoor fittings is the same as the busway itself.

Cross-Sections—Aluminum Content and Weight

Ampere Rating	W		Fig.	Bus Bars Per Phase		Weights—Feeder				Weights—Plug-In			
						3-Pole		4-Pole		3-Pole		4-Pole	
	IN	mm		IN	mm	Lb/Ft	Kg/M	Lb/Ft	Kg/M	Lb/Ft	Kg/M	Lb/Ft	Kg/M
800	4.34	110	A	One – .25 x 3.00	One – 6 x 76	9.1	13.5	10.0	14.9	11.2	16.7	12.1	18.0
1000	5.34	136	A	One – .25 x 4.00	One – 6 x 102	10.1	15.0	11.3	16.8	12.2	18.2	13.4	19.9
1200	6.34	161	A	One – .25 x 5.00	One – 6 x 127	11.1	16.5	12.5	18.6	13.2	19.6	14.6	21.7
1350	7.34	186	A	One – .25 x 6.00	One – 6 x 152	12.1	18.0	13.8	20.5	14.2	21.1	15.9	23.7
1600	8.84	225	A	One – .25 x 7.50	One – 6 x 191	13.8	20.5	15.8	23.5	15.9	23.7	17.9	26.6
2000	12.72	323	B	Two – .25 x 4.50	Two – 6 x 114	19.1	28.4	22.5	33.5	21.2	31.5	24.6	36.6
2500	16.22	412	B	Two – .25 x 6.00	Two – 6 x 152	22.1	32.9	26.7	39.7	24.2	36.0	26.8	39.9
3000	18.72	475	B	Two – .25 x 7.50	Two – 6 x 191	25.1	37.3	30.6	45.5	27.2	40.5	32.7	48.7
4000	25.60	650	C	Three – .25 x 6.50	Three – 6 x 165	33.9	50.4	40.4	60.1	36.0	53.6	42.5	63.2

Cross-Sections—Copper Content and Weight

Ampere Rating	W		Fig.	Bus Bars Per Phase		Weights—Feeder				Weights—Plug-In			
						3-Pole		4-Pole		3-Pole		4-Pole	
	IN	mm		IN	mm	Lb/Ft	Kg/M	Lb/Ft	Kg/M	Lb/Ft	Kg/M	Lb/Ft	Kg/M
800	3.84	98	A	One – .25 x 2.50	One – 6 x 64	12.1	18.0	14.6	21.7	14.2	21.1	16.7	24.8
1000	4.34	110	A	One – .25 x 3.00	One – 6 x 76	13.8	20.5	16.7	24.9	15.9	23.7	18.8	28.0
1200	5.34	136	A	One – .25 x 4.00	One – 6 x 102	16.8	25.0	20.8	31.0	18.9	28.1	22.9	34.1
1350	5.84	148	A	One – .25 x 4.50	One – 6 x 114	18.3	27.2	22.8	33.9	20.4	30.4	24.9	37.1
1600	6.74	171	A	One – .25 x 5.40	One – 6 x 137	21.1	31.4	27.5	40.9	23.2	34.5	29.6	44.0
2000	7.84	199	A	One – .25 x 6.50	One – 6 x 165	24.3	36.2	30.8	45.8	26.4	39.3	32.9	49.0

NOTES:

- For required wall and floor openings, refer to page 95.
- Values are for thermal-rated busway. Contact Schneider Electric for other options such as density rated, harmonic rated, and IP54 rated.

Section 8—800–5000 A Busway Straight Lengths—Feeder

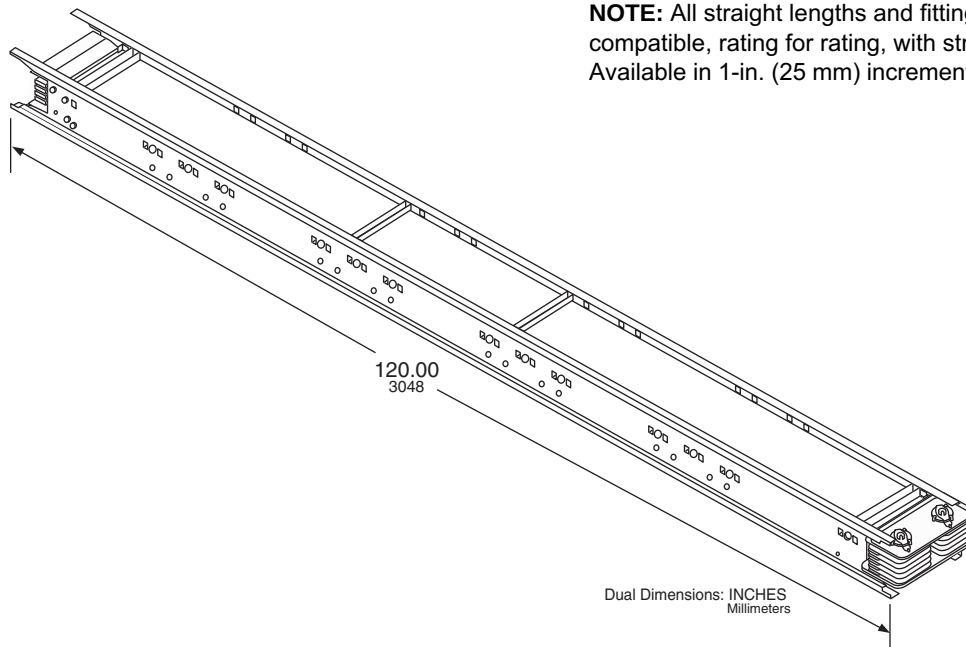
Cross-Sections—Copper Content and Weight (continued)

Ampere Rating	W		Fig.	Bus Bars Per Phase		Weights—Feeder				Weights—Plug-In			
						3-Pole		4-Pole		3-Pole		4-Pole	
	IN	mm		IN	mm	Lb/Ft	Kg/M	Lb/Ft	Kg/M	Lb/Ft	Kg/M	Lb/Ft	Kg/M
2500	12.72	323	B	Two – .25 x 4.50	Two – 6 x 114	38.7	57.6	47.7	71.0	40.8	60.7	49.8	74.1
3000	15.22	387	B	Two – .25 x 5.00	Two – 6 x 127	42.7	63.5	51.7	76.9	44.8	65.2	53.8	80.1
3200	16.22	412	B	Two – .25 x 6.00	Two – 6 x 152	48.9	72.7	60.2	89.5	55	81.8	62.3	92.7
4000	23.60	599	C	Three – .25 x 4.50	Three – 6 x 114	59.1	87.9	72.6	108.0	61.2	91.1	74.7	111.2
5000	25.10	638	C	Three – .25 x 6.00	Three – 6 x 152	72.6	108.0	90.6	134.8	74.7	111.2	92.7	137.9

NOTES:

- For required wall and floor openings, refer to page 95.
- Values are for thermal-rated busway. Contact Schneider Electric for other options such as density rated, harmonic rated, and IP54 rated.

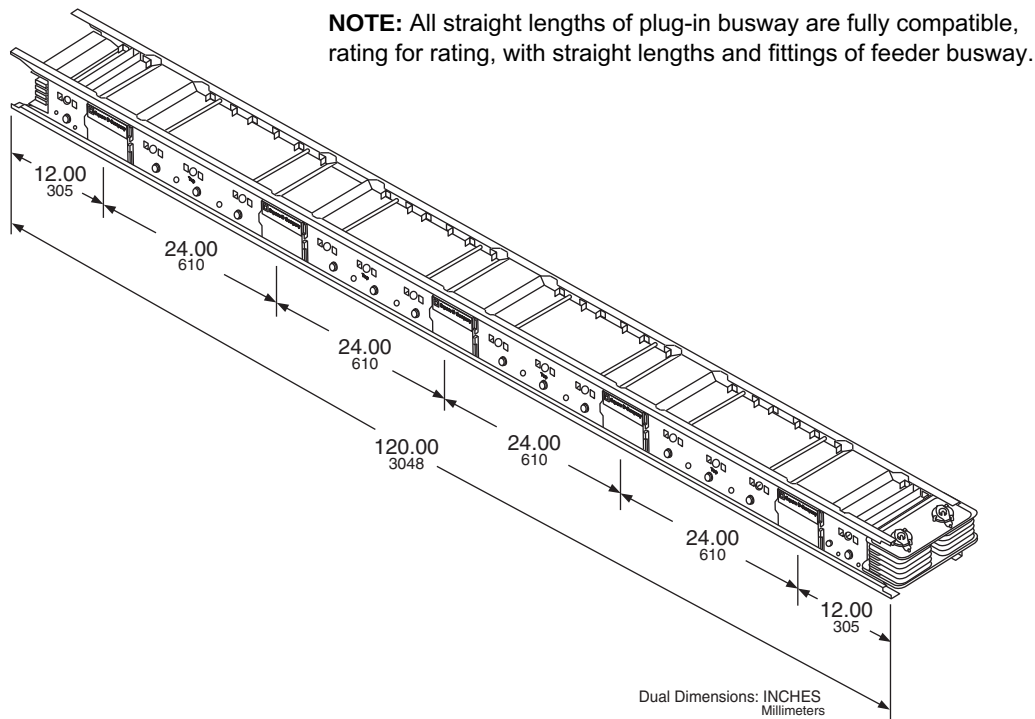
Straight Lengths—Feeder



NOTE: All straight lengths and fittings of feeder busway are fully compatible, rating for rating, with straight lengths of plug-in busway. Available in 1-in. (25 mm) increments from 16–120 in. (406–3048 mm).

Section 8—800–5000 A Busway
Straight Lengths—Plug-In (Indoor Only)

Straight Lengths—Plug-In (Indoor Only)

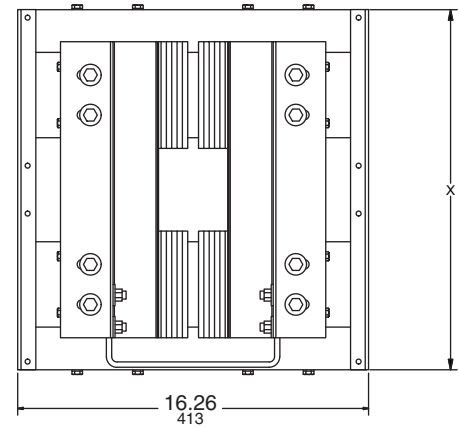
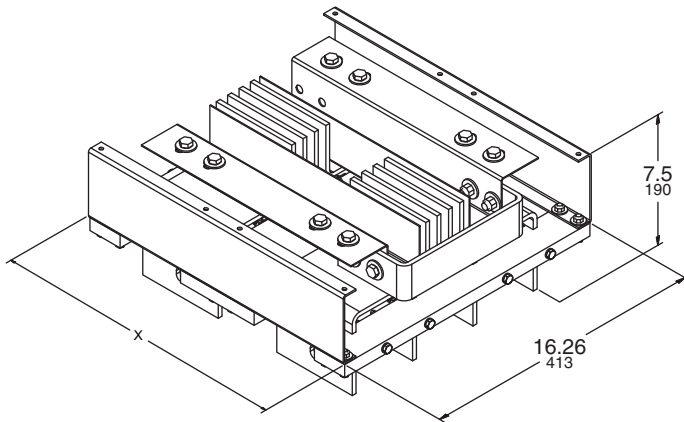


Straight Lengths-Catalog No. Suffix

Catalog Number Suffix	-10ST	-8ST	-6ST	-4ST
Standard Lengths—Feet	10 ft	8 ft	6 ft	4 ft
Standard Lengths—Meters	3.05 m	2.44 m	1.83 m	1.219 m
Number of Plug-In Openings	10	8	6	4

Section 8—800–5000 A Busway Qwik Flange (Indoor Only)

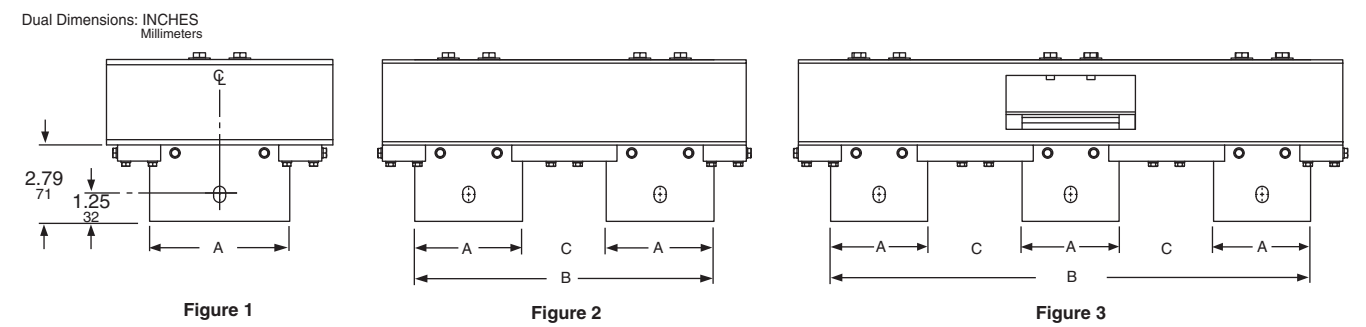
Qwik Flange (Indoor Only)



Qwik Flange—Catalog Number Suffix -QF

Amperage Rating		X	
Aluminum	Copper	IN	mm
—	800	10.52	267
800	1000	10.52	267
1000	1200	10.52	267
—	1350	10.52	267
1200	—	10.52	267
—	1600	10.52	267
1350	—	10.52	267
—	2000	10.52	267
1600	—	10.52	267
2000	2500	14.34	364
2500	—	17.84	453
—	3000	16.84	428
—	3200	17.84	453
3000	—	20.34	517
—	4000	25.22	641
4000	—	27.22	691
—	5000	26.72	679

Section 8—800–5000 A Busway Qwik Flange (Indoor Only)

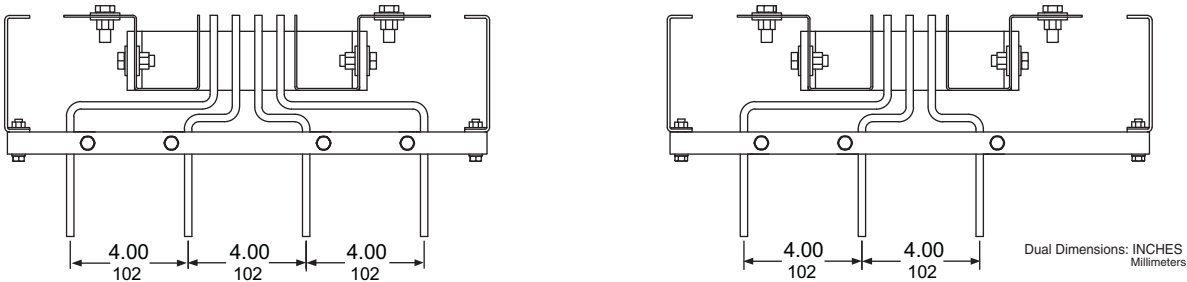


Aluminum Qwik Flange–Application Data

Aluminum Ampere Rating	Fig.	A		B		C	
		IN	mm	IN	mm	IN	mm
800	1	3.00	76	—	—	—	—
1000	1	4.00	102	—	—	—	—
1200	1	5.00	127	—	—	—	—
1350	1	6.00	152	—	—	—	—
1600	1	7.50	191	—	—	—	—
2000	2	4.50	114	11.38	289	2.38	60
2500	2	6.00	152	14.88	378	2.88	73
3000	2	7.50	191	17.38	441	2.38	60
4000	3	6.50	165	24.26	616	2.38	60

Copper Qwik Flange–Application Data

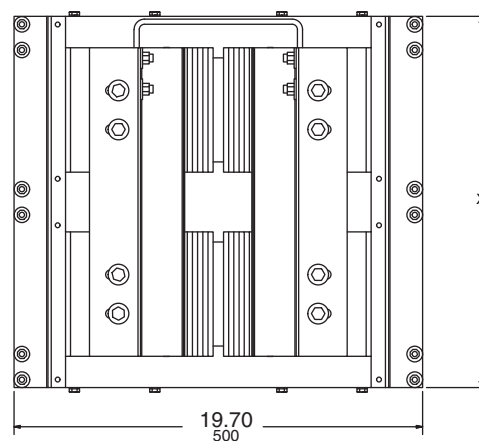
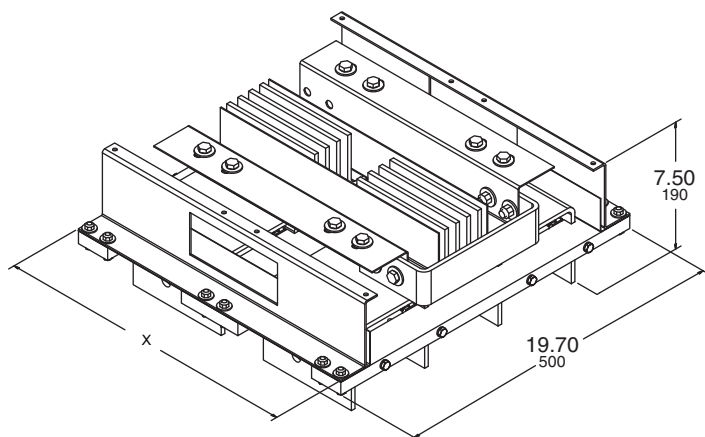
Copper Ampere Rating	Fig.	A		B		C	
		IN	mm	IN	mm	IN	mm
800	1	2.50	64	—	—	—	—
1000	1	3.00	76	—	—	—	—
1200	1	4.00	102	—	—	—	—
1350	1	4.50	114	—	—	—	—
1600	1	5.40	137	—	—	—	—
2000	1	6.50	165	—	—	—	—
2500	2	4.50	114	11.38	289	2.38	60
3000	2	5.00	127	13.88	353	3.88	86
3200	2	6.00	152	14.88	378	2.88	73
4000	3	4.50	114	22.26	565	4.38	111
5000	3	6.00	152	23.76	604	2.88	73



Qwik flanges and closing plates are typically shipped with the switchboard/switchgear. The Qwik flange closing plate closes the gap between the busway and the top of the gear. If a separate Qwik flange or closing plate kit is needed, the catalog numbers can be created by adding the suffix "QF" or "CP" respectively to the prefix of the busway being installed. For example: AF2530G**QF** or CF2312G**CP**.

NOTE: Refer to "Detail of Phase Bussing Connections in a Switchboard" on page 73.

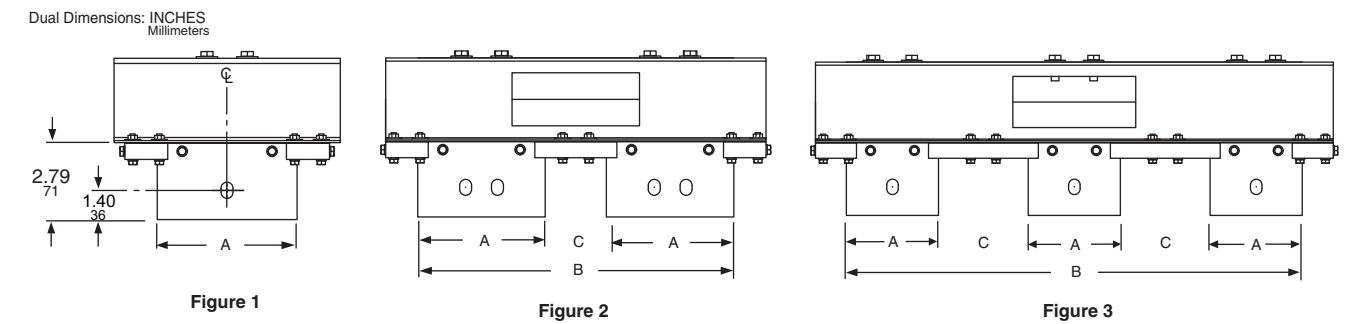
New Qwik Flange (Indoor Only)



New Qwik Flange—Catalog Number Suffix -NQF

Amperage Rating		X	
Aluminum	Copper	IN	mm
—	800	10.52	267
800	1000	10.52	267
1000	1200	10.52	267
—	1350	10.52	267
1200	—	10.52	267
—	1600	10.52	267
1350	—	10.52	267
—	2000	10.52	267
1600	—	10.52	267
2000	2500	14.40	366
2500	—	17.90	455
—	3000	16.90	430
—	3200	17.90	455
3000	—	20.40	519
—	4000	25.28	643
4000	—	27.28	693
—	5000	26.78	680

Section 8—800–5000 A Busway New Qwik Flange (Indoor Only)

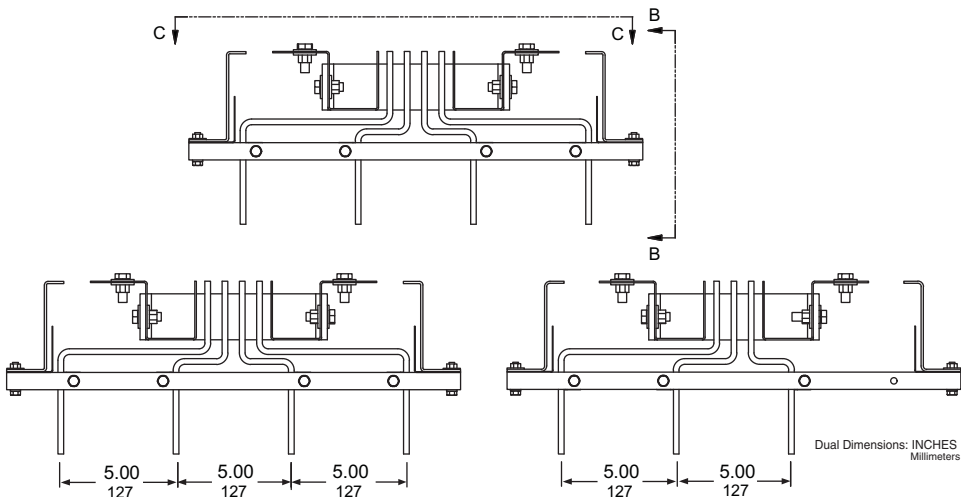


Aluminum New Qwik Flange–Application Data

Aluminum Ampere Rating	Fig.	A		B		C	
		IN	mm	IN	mm	IN	mm
800	1	3.00	76	—	—	—	—
1000	1	4.00	102	—	—	—	—
1200	1	5.00	127	—	—	—	—
1350	1	6.00	152	—	—	—	—
1600	1	7.50	191	—	—	—	—
2000	2	4.50	114	11.38	289	2.38	60
2500	2	6.00	152	14.88	378	2.88	73
3000	2	7.50	191	17.38	441	2.38	60
4000	3	6.50	165	24.26	616	2.38	60

Copper New Qwik Flange–Application Data

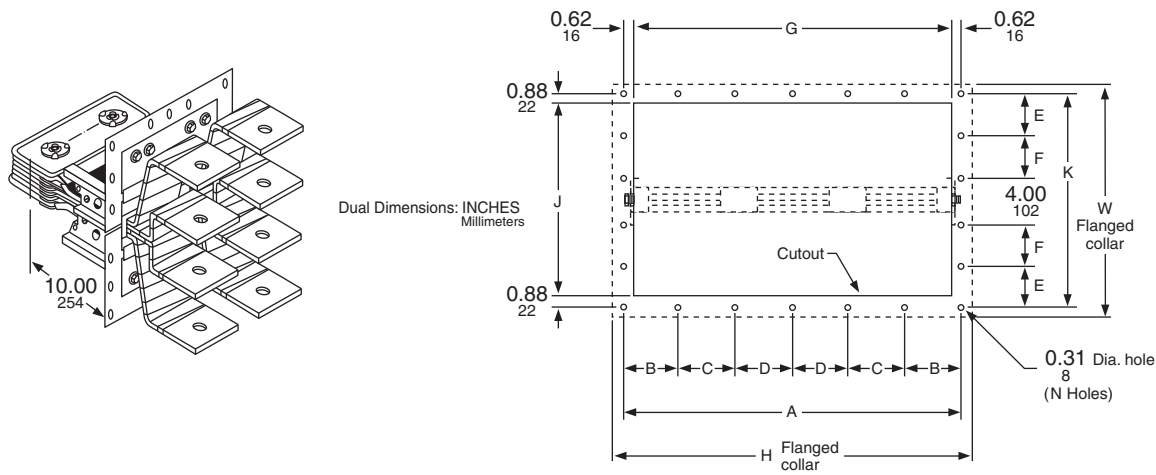
Copper Ampere Rating	Fig.	A		B		C	
		IN	mm	IN	mm	IN	mm
800	1	2.50	64	—	—	—	—
1000	1	3.00	76	—	—	—	—
1200	1	4.00	102	—	—	—	—
1350	1	4.50	114	—	—	—	—
1600	1	5.40	137	—	—	—	—
2000	1	6.50	165	—	—	—	—
2500	2	4.50	114	11.38	289	2.38	60
3000	2	5.00	127	13.88	353	3.88	86
3200	2	6.00	152	14.88	378	2.88	73
4000	3	4.50	114	22.26	565	4.38	111
5000	3	6.00	152	23.76	604	2.88	73



New Qwik flanges and closing plates are typically shipped with the switchboard/switchgear. The new Qwik flange closing plate closes the gap between the busway and the top of the gear. If a separate new Qwik flange or closing plate kit is needed, the catalog numbers can be created by adding the suffix "NQF" or "CP" respectively to the prefix of the busway being installed. For example: AF2530GNQF or AF2530GCP.

NOTE: Refer to "Detail of Phase Bussing Connections in a Switchboard" on page 73.

Flanged End



Flanged End: Catalog Number Suffix–10FEB

Flanged Collar Hole Location and Spacing

Ampere Rating		N Holes	Hole Location and Spacing													
			A		B		C		D		K		E		F	
Aluminum	Copper		IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm
—	800	10	6.38	162	3.19	81	—	—	—	—	11.75	296	3.88	98	—	—
800	1000	10	6.38	162	3.19	81	—	—	—	—	11.75	296	3.88	98	—	—
—	1200	10	7.00	178	3.50	89	—	—	—	—	11.75	296	3.88	98	—	—
1000	1350	10	8.00	203	4.00	102	—	—	—	—	11.75	296	3.88	98	—	—
1200	—	10	9.00	229	4.50	114	—	—	—	—	11.75	296	3.88	98	—	—
1350	1600	10	10.00	254	5.00	127	—	—	—	—	11.75	296	3.88	98	—	—
1600	2000	16	12.88	327	4.25	108	—	—	—	—	17.75	451	3.46	88	3.42	87
2000	2500	16	14.88	378	5.00	127	—	—	—	—	17.75	451	3.46	88	3.42	87
2500	3000	18	18.88	480	4.75	121	4.69	119	—	—	17.75	451	3.46	88	3.42	87
—	3200	18	18.88	480	4.75	121	4.69	119	—	—	17.75	451	3.46	88	3.42	87
3000	—	20	21.75	552	4.38	111	4.37	111	—	—	17.75	451	3.46	88	3.42	87
4000	4000	22	27.75	705	4.62	117	4.63	118	4.63	118	17.75	451	3.46	88	3.42	87
—	5000	22	27.75	705	4.62	117	4.63	118	4.63	118	17.75	451	3.46	88	3.42	87

Flanged Collar and Cutout Dimensions

Ampere Rating		L		H		W				G		J	
						3-Pole		4-Pole					
Aluminum	Copper	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm
—	800	10.00	254	7.38	187	12.82	326	13.18	335	5.12	130	10.00	254
800	1000	10.00	254	7.38	187	12.82	326	13.18	335	5.12	130	10.00	254
—	1200	10.00	254	8.00	203	12.82	326	13.18	335	5.76	145	10.00	254
1000	1350	10.00	254	9.00	229	12.82	326	13.18	335	6.75	171	10.00	254
1200	—	10.00	254	10.00	254	12.82	326	13.18	335	7.76	196	10.00	254
1350	1600	10.00	254	11.00	279	12.82	326	13.18	335	8.75	222	10.00	254
1600	2000	10.00	254	13.88	352	18.82	478	19.18	487	11.63	295	16.00	406

Section 8—800–5000 A Busway
Flanged End

Flanged Collar and Cutout Dimensions (continued)

Ampere Rating		L		H		W				G		J	
						3-Pole		4-Pole					
Aluminum	Copper	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm
2000	2500	10.00	254	15.88	403	18.82	478	19.18	487	13.63	346	16.00	406
2500	3000	10.00	254	19.88	505	18.82	478	19.18	487	17.63	448	16.00	406
—	3200	10.00	254	19.88	505	18.82	478	19.18	487	17.63	448	16.00	406
3000	—	10.00	254	22.75	578	18.82	478	19.18	487	20.50	521	16.00	406
4000	4000	10.00	254	28.75	730	18.82	478	19.18	487	26.50	673	16.00	406
—	5000	10.00	254	28.75	730	18.82	478	19.18	487	26.50	673	16.00	406

Dual Dimensions: INCHES
Millimeters

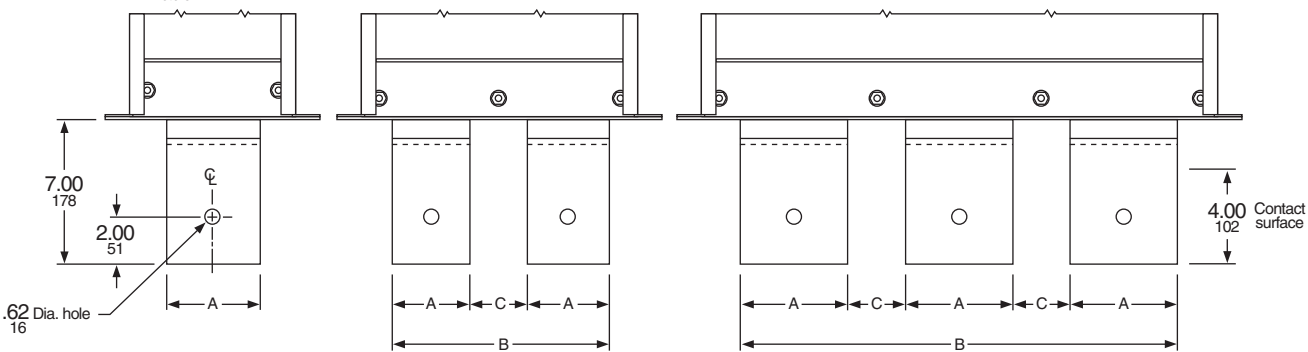


Figure 1

Figure 2

Figure 3

Section 8—800–5000 A Busway Flanged End

Aluminum Flanged End—Application Data

Aluminum Ampere Rating	Fig.	A		B		C	
		IN	mm	IN	mm	IN	mm
800	1	3.00	76	—	—	—	—
1000	1	4.00	102	—	—	—	—
1200	1	5.00	127	—	—	—	—
1350	1	6.00	152	—	—	—	—
1600	1	7.50	191	—	—	—	—
2000	2	4.50	114	11.38	289	2.38	60
2500	2	6.00	152	14.88	378	2.88	73
3000	2	7.50	191	17.38	441	2.38	60
4000	3	6.50	165	24.26	616	2.38	60

Copper Flanged End—Application Data

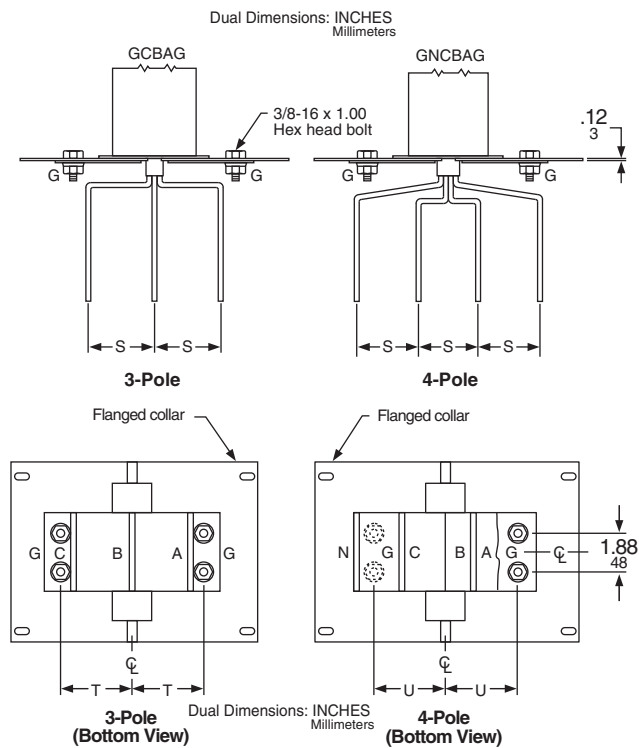
Copper Ampere Rating	Fig.	A		B		C	
		IN	mm	IN	mm	IN	mm
800	1	2.50	64	—	—	—	—
1000	1	3.00	76	—	—	—	—
1200	1	4.00	102	—	—	—	—
1350	1	4.50	114	—	—	—	—
1600	1	5.40	137	—	—	—	—
2000	1	6.50	165	—	—	—	—
2500	2	4.50	114	11.38	289	2.38	60
3000	2	5.00	127	13.88	353	3.88	99
3200	2	6.00	152	14.88	378	2.88	73
4000	3	4.50	114	22.26	565	4.38	111
5000	3	6.00	152	23.76	604	2.88	73

Flanged End—Flanged Collar Hole Location and Spacing

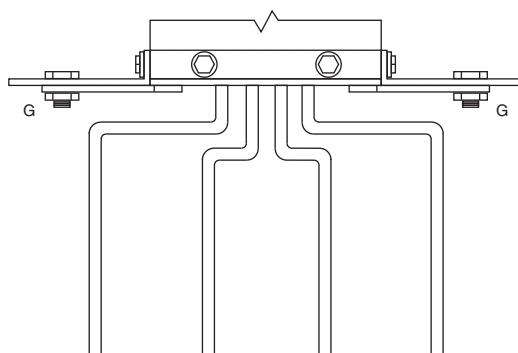
Ampere Rating		S		T		U	
Aluminum	Copper	IN	mm	IN	mm	IN	mm
—	800	3.00	76	3.62	92	3.81	97
800	1000	3.00	76	3.62	92	3.81	97
—	1200	3.00	76	3.62	92	3.81	97
1000	1350	3.00	76	3.62	92	3.81	97
1200	—	3.00	76	3.62	92	3.81	97
1350	1600	3.00	76	3.62	92	3.81	97
1600	2000	3.00	76	6.62	169	6.81	173
2000	2500	5.00	127	6.62	169	6.81	173
2500	3000	5.00	127	6.62	169	6.81	173
3000	—	5.00	127	6.62	169	6.81	173
—	3200	5.00	127	6.62	169	6.81	173
4000	4000	5.00	127	6.62	169	6.81	173
—	5000	5.00	127	6.62	169	6.81	173

NOTE: Refer to "Detail of Phase Bussing Connections in a Switchboard" on page 73.

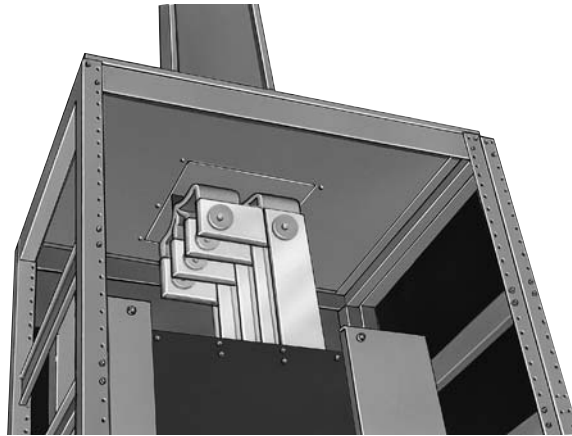
Section 8—800–5000 A Busway
Qwik Flange and Flanged End Termination Details



Qwik Flange and Flanged End Termination Details



Section 8—800–5000 A Busway Detail of Phase Bussing Connections in a Switchboard



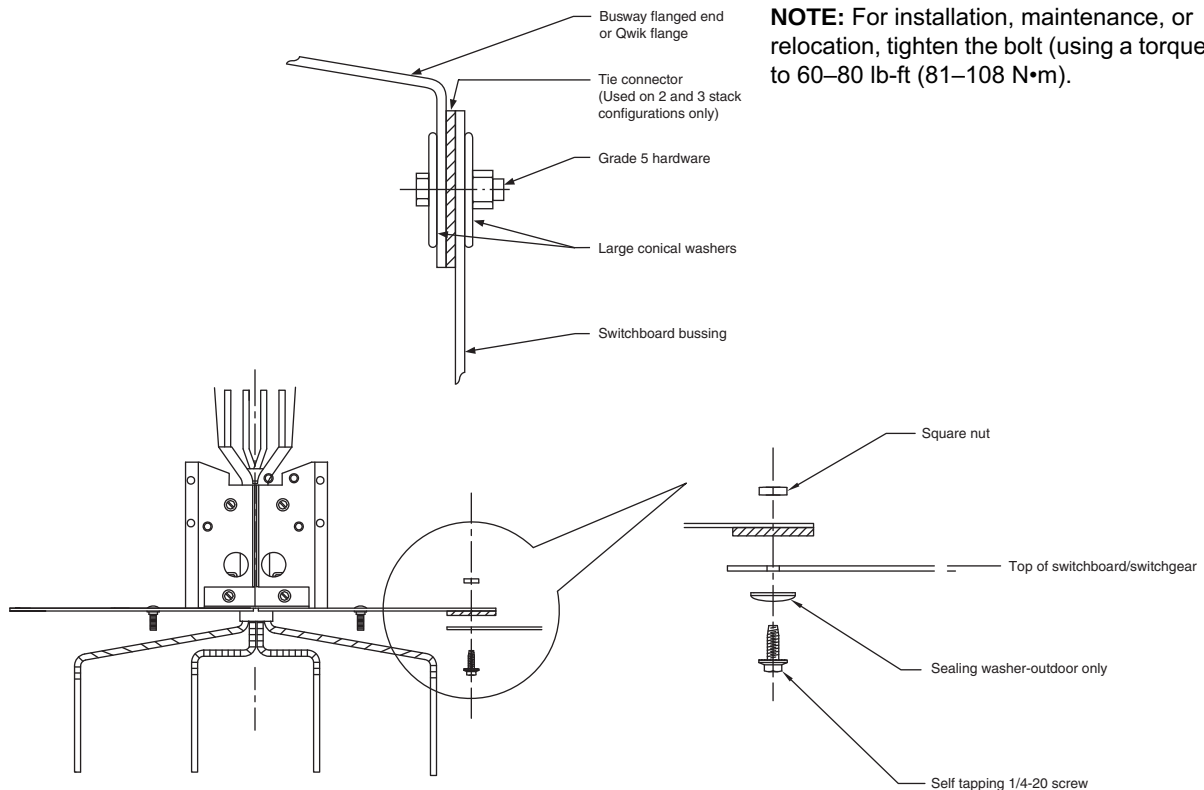
CAUTION

HAZARD OF EQUIPMENT DAMAGE

Improper contact pressure can cause overheating and equipment failure. Use 3-inch (76 mm) conical washers and Grade 5 hardware to ensure proper contact pressure.

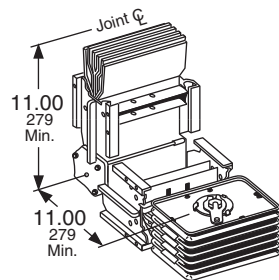
Failure to follow this instruction can result in equipment damage.

Detail of Phase Bussing Connections in a Switchboard

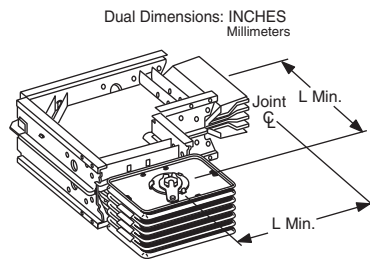


Section 8—800–5000 A Busway
Elbows

Elbows



Edgewise: Catalog Number
Suffix–LEM11

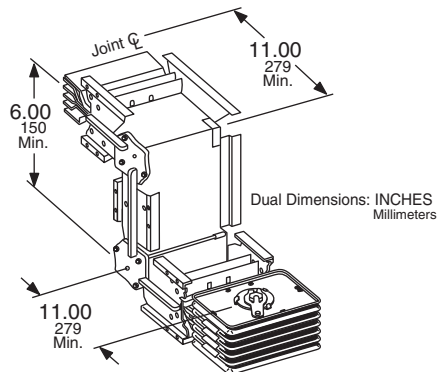


Flatwise
Flatwise: Catalog Number
Suffix–LFM

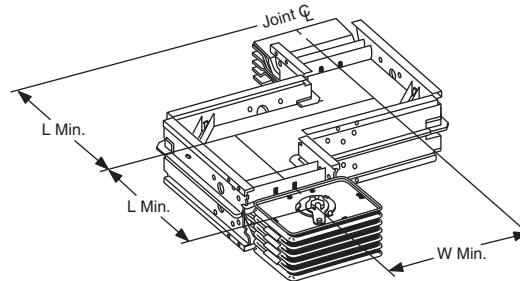
Flatwise Elbows–Application Data

Ampere Rating		L		Catalog Number Suffix
Aluminum	Copper	IN	mm	
—	800	11.00	279	-LFM11
800	1000	11.00	279	-LFM11
1000	1200	12.00	305	-LFM12
1200	1350	12.00	305	-LFM12
—	1600	12.00	305	-LFM12
1350	2000	13.00	330	-LFM13
1600	—	13.00	330	-LFM13
2000	2500	15.00	381	-LFM15
—	3000	16.00	406	-LFM16
2500	—	17.00	432	-LFM17
—	3200	17.00	432	-LFM17
3000	—	18.00	457	-LFM18
—	4000	21.00	533	-LFM21
—	5000	21.00	533	-LFM21
4000	—	22.00	559	-LFM22

Offset Elbows



Edgewise: Catalog Number Suffix–OE



Flatwise: Catalog Number Suffix–OF

Flatwise Offset–Application Data

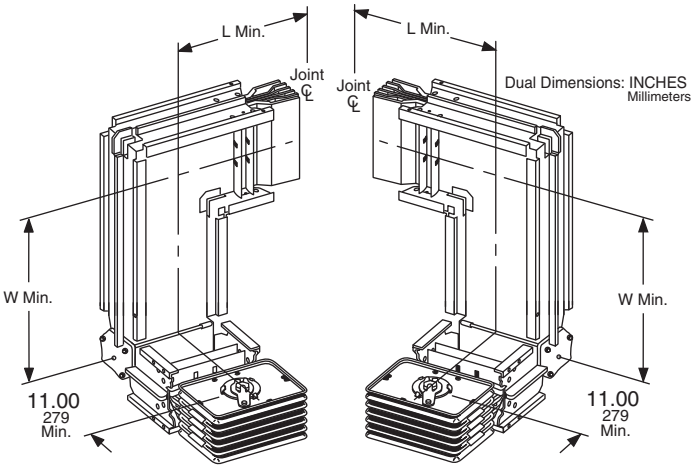
Ampere Rating		L		W	
Aluminum	Copper	IN	mm	IN	mm
800	800/1000	11.00	279	4.00	100
1000	1200	12.00	305	4.00	100
—	1350	12.00	305	4.00	100
1200	1600	12.00	305	6.00	150
1350	—	13.00	330	9.00	229
—	2000	13.00	330	9.00	229
1600	—	13.00	330	10.00	254
2000	2500	15.00	381	14.00	356
2500	—	17.00	432	16.00	406
—	3000	16.00	406	16.00	406
—	3200	17.00	432	16.00	406
3000	—	18.00	457	18.00	457
4000	—	22.00	559	25.00	635
—	4000	21.00	533	23.00	584
—	5000	21.00	533	25.00	635

Section 8—800–5000 A Busway
Double Elbows

Double Elbows

Double Elbows–Application Data

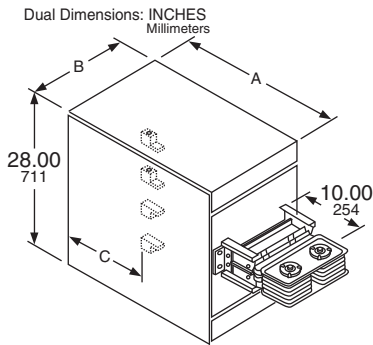
Ampere Rating		L		W	
Aluminum	Copper	IN	mm	IN	mm
800	800/1000	11.00	279	7.00	178
1000	1200	12.00	305	8.00	203
—	1350	12.00	305	8.00	203
1200	1600	12.00	305	8.00	203
1350	—	13.00	330	9.00	229
—	2000	13.00	330	9.00	229
1600	—	13.00	330	9.00	229
2000	2500	15.00	381	12.00	305
2500	—	17.00	432	14.00	356
—	3000	16.00	406	13.00	330
—	3200	17.00	432	14.00	356
3000	—	18.00	457	15.00	381
4000	—	22.00	559	18.00	457
—	4000	21.00	533	17.00	432
—	5000	21.00	533	18.00	457



Catalog Number Suffix-DL

Catalog Number Suffix-DR

Cable Tap Box (End)



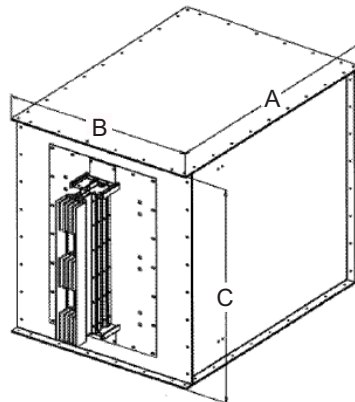
Indoor Catalog Number Suffix-ETBMB

Indoor Cable Tap Box (End)–Application Data

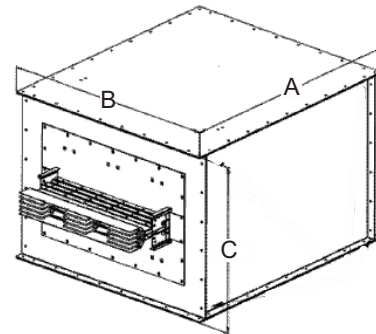
Ampere Rating		Indoor						Lugs Per Phase and Neutral 1/0-600 kcmil	Ground Lugs	
		A		B		C			#6-300 kcmil	1/0-600 kcmil
Aluminum	Copper	IN	mm	IN	mm	IN	mm			
800	800	29.14	740	11.00	279	16.00	406	3	3	—
1000	1000	29.14	740	11.00	279	16.00	406	4	4	—
1200	1200	29.14	740	11.00	279	16.00	406	4	4	—
1350	1350	29.14	740	14.88	378	16.00	406	5	5	—
1600	1600	29.14	740	14.88	378	16.00	406	6	6	—
—	2000	29.14	740	14.88	378	16.00	406	7	7	—
2000	—	29.14	740	16.88	429	16.00	406	7	7	—
2500	2500	39.38	1000	20.88	530	26.00	660	9	—	9
—	3000	39.38	1000	20.88	530	26.00	660	10	—	10
—	3200	39.38	1000	20.88	530	26.00	660	11	—	11
3000	—	39.38	1000	23.76	604	26.00	660	10	—	10
4000	4000	39.38	1000	29.76	756	26.00	660	14	—	14
—	5000	39.38	1000	29.76	756	26.00	660	17	—	17

Section 8—800–5000 A Busway Cable Tap Box (End)

NOTE: There is a 1.5 in. (38 mm) lip around the perimeter of the top and bottom cover and the two sidewalls.



Edgewise



Flatwise

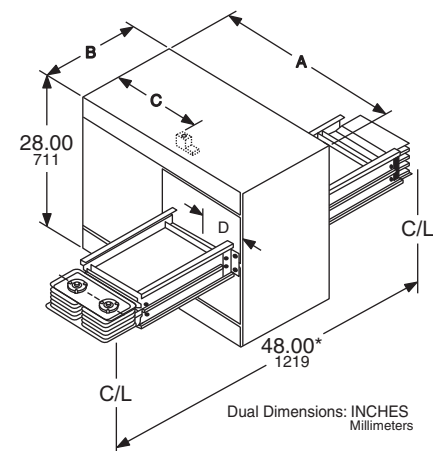
Outdoor Catalog Number Suffix—ETBSEW (Edgewise) or ETBS (Flatwise)

Outdoor Cable Tap Box (End)—Application Data

Ampere Rating		Outdoor—Edgewise						Outdoor—Flatwise					
		A		B		C		A		B		C	
Aluminum	Copper	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm
800	800	32.14	816	30.78	782	15.22	387	32.14	816	18.00	457	28.00	711
1000	1000	32.14	816	30.78	782	15.22	387	32.14	816	18.00	457	28.00	711
1200	1200	32.14	816	30.78	782	15.22	387	32.14	816	18.00	457	28.00	711
1350	1350	32.14	816	30.78	782	19.10	485	32.14	816	21.88	556	28.00	711
1600	1600	32.14	816	30.78	782	19.10	485	32.14	816	21.88	556	28.00	711
—	2000	32.14	816	30.78	782	19.10	485	32.14	816	21.88	556	28.00	711
2000	—	32.14	816	30.78	782	21.10	536	32.14	816	23.88	607	28.00	711
2500	2500	42.38	1076	30.78	782	25.10	638	42.38	1076	27.88	708	28.00	711
—	3000	42.38	1076	30.78	782	25.10	638	42.38	1076	27.88	708	28.00	711
3000	—	42.38	1076	30.78	782	27.98	711	42.38	1076	30.76	781	28.00	711
4000	4000	42.38	1076	30.78	782	34.32	872	42.38	1076	37.10	942	28.00	711
—	5000	42.38	1076	30.78	782	34.32	872	42.38	1076	37.10	942	28.00	711

Section 8—800–5000 A Busway
Cable Tap Box (Center)

Cable Tap Box (Center)



* 3000 A / 3200 A / 4000 A / 5000 A Center Tap Box
Length—60 in. (1524 mm)

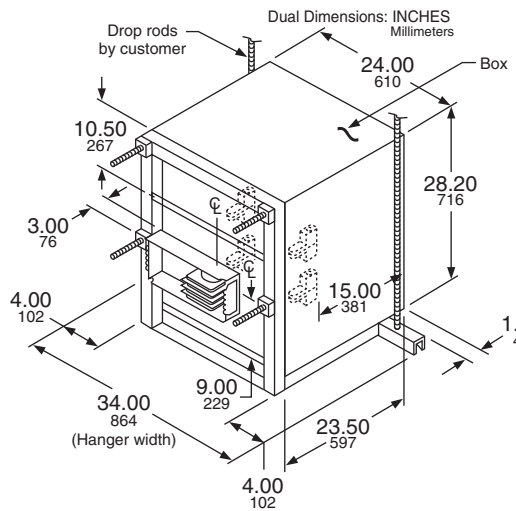
Catalog Number Suffix–CTB

Cable Tap Box (Center)–Dimensions and Lug Specifications

Ampere Rating		A		B		C		D		Lugs Per Phase and Neutral 1/0-600 kcmil	Ground Lugs	
Aluminum	Copper	IN	mm	IN	mm	IN	mm	IN	mm		#6 - 300 kcmil	1/0-600 kcmil
800	800	35	889	14	356	16	406	7.27	185	3	3	—
1000	1000	35	889	14	356	16	406	7.27	185	4	4	—
1200	1200	35	889	14	356	16	406	7.27	185	4	4	—
1350	1350	35	889	14	356	16	406	7.27	185	5	5	—
1600	1600	35	889	14	356	16	406	7.27	185	6	6	—
—	2000	35	889	14	356	16	406	7.27	185	7	7	—
2000	—	41.70	1059	20	508	17.60	447	10.28	261	7	7	—
—	2500	41.70	1059	20	508	17.60	447	10.28	261	9	—	9
2500	—	41.70	1059	20	508	17.60	447	10.28	261	9	—	9
3000	3000	60.00	1524	22	559	29	737	16	406	10	—	10
—	3200	41.70	1059	20	508	17.60	447	10.28	261	11	—	11
4000	4000	63.00	1600	32	813	26	660	19.00	483	14	—	14
—	5000	63.00	1600	32	813	26	660	19.00	483	17	—	17

Section 8—800–5000 A Busway Cable Tap Box (Bolt On)

Cable Tap Box (Bolt On)



Cable Tap Box (Bolt On)–Lug Specifications and Catalog Numbers

Ampere Rating	Lugs Per Phase and Neutral	Ground Lugs	Catalog Number	
			3Ø3W ¹	3Ø4W ¹
800	6 - 1/0-600	3 - 1/0-600	PTB316G__ ²	PTB516G__ ²
1000				
1200				
1350				
1600				

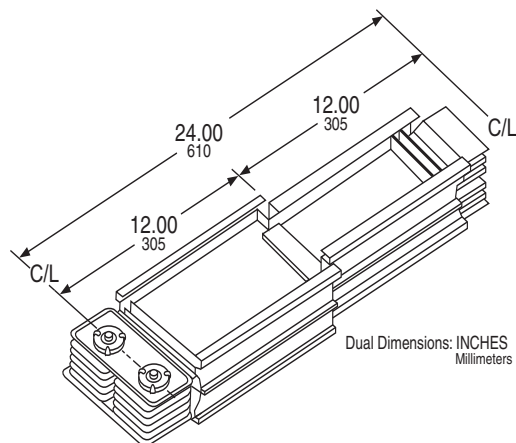
NOTES:

- Box can be moved to opposite end in field (Vertical Only). 20.2-inch (513 mm) clearance required from ϕ of busway, for mounting bolt-on tap boxes when box is on top; and 10.0-inch (254 mm) required mounting clearance when box is on the bottom.
- Cannot be used on 800 A Copper I-Line II busway.

¹ Can be used only on plug-in busway with the same number of poles (e.g., do not use 3-pole units on 3Ø4W busway or 3Ø4W units on 3-pole busway). Cannot be mounted in the last opening on either side of a busway run.

² Add "H" on the end of the catalog number for units that will be **horizontally-mounted busway** and "V" for units that will be **vertically-mounted busway**. These mounting frames are NOT interchangeable.

Unfused Reducer (Indoor Only)



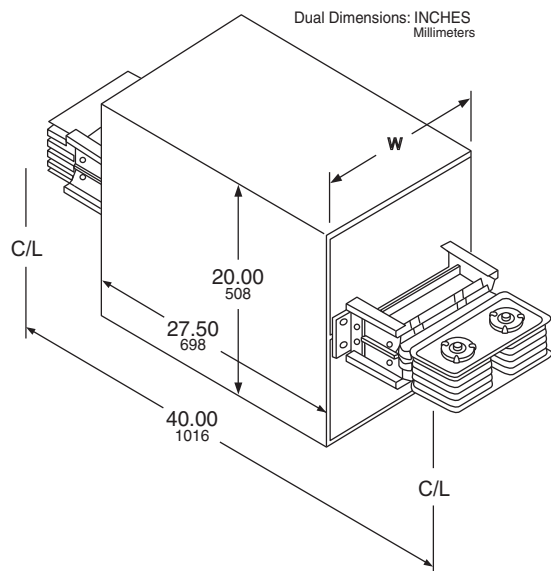
Unfused Reducer (Indoor)–Ampere Ratings and Catalog No. Suffix

Bolt End Ampere Rating	Catalog Number Suffix and Slot End Ampere Rating									
	400	600	800	1000	1200	1350	1600	2000	2500	3000
800	-R04	-R06	—	—	—	—	—	—	—	—
1000	-R04	-R06	-R08	—	—	—	—	—	—	—
1200	-R04	-R06	-R08	-R10	—	—	—	—	—	—
1350	—	-R06	-R08	-R10	-R12	—	—	—	—	—
1600	—	-R06	-R08	-R10	-R12	-R13	—	—	—	—
2000	—	—	-R08	-R10	-R12	-R13	-R16	—	—	—
2500	—	—	—	-R10	-R12	-R13	-R16	-R20	—	—
3000	—	—	—	-R10	-R12	-R13	-R16	-R20	-R25	—
3200	—	—	—	—	-R12	-R13	-R16	-R20	-R25	-R30
4000	—	—	—	—	—	—	-R16	-R20	-R25	-R30
5000	—	—	—	—	—	—	—	-R20	-R25	-R30

NOTE: The National Electrical Code (Article 364-11) states that overcurrent protection is required where busways are reduced in ampacity except for certain industrial applications.

Section 8—800–5000 A Busway
Expansion Fitting (Indoor Only)

Expansion Fitting (Indoor Only)



Catalog Number Suffix—EJ

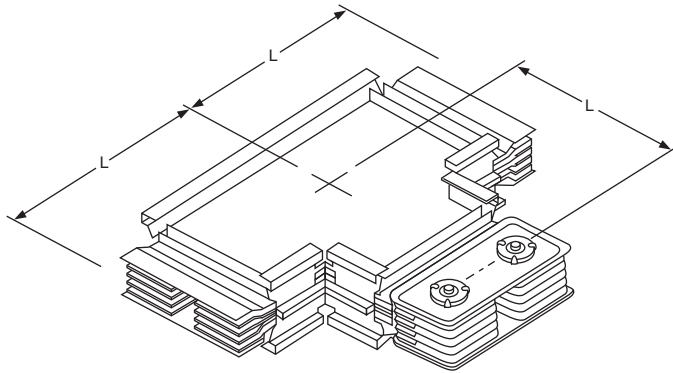
Expansion Fitting (Indoor)

Ampere Rating		W	
Aluminum	Copper	IN	mm
800	800	13.50	343
1000	1000	13.50	343
1200	1200	13.50	343
1350	1350	17.38	441
1600	1600	17.38	441
—	2000	17.38	441
2000	2500	19.38	492
2500	3000	23.38	594
3000	—	26.25	667
—	3200	23.38	594
4000	4000	32.25	819
—	5000	32.25	819

NOTES:

- Expansion joint permits 1.50 inches (38 mm) of expansion or contraction.
- An expansion fitting should be used under the following conditions: whenever a busway run crosses a building expansion, when a long straight run of busway does not contain any elbows, or both ends of the run are fixed.

Tees



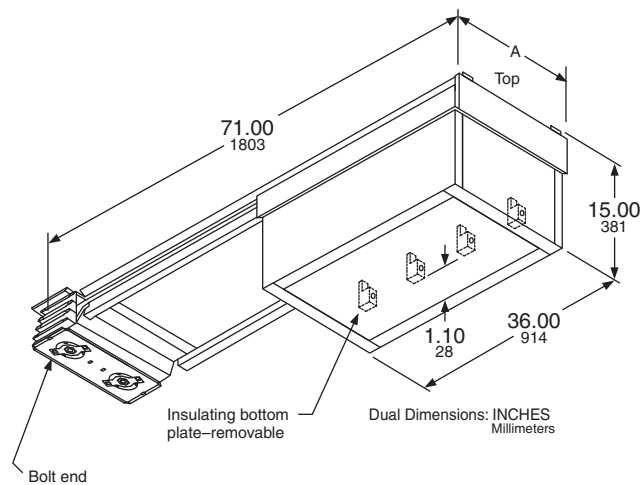
Tees—Dimensions and Catalog No. Suffix

Ampere Rating		L		Catalog Number Suffix
Aluminum	Copper	IN	mm	
—	800	11.00	279	-33TFS11B11S11
800	1000	11.00	279	-33TFS11B11S11
1000	1200	12.00	305	-36TFS12B12S12
1200	1350	12.00	305	-36TFS12B12S12
—	1600	12.00	305	-36TFS12B12S12
1350	2000	13.00	330	-39TFS13B13S13
1600	—	13.00	330	-39TFS13B13S13
2000	2500	15.00 ¹	381 ¹	-45TFS15B15S15
—	3000	16.00 ¹	406 ¹	-48TFS16B16S16
2500	—	17.00 ¹	432 ¹	-51TFS17B17S17
3000	—	18.00 ¹	457 ¹	-54TFS18B18S18
—	3200	17.00	432	-51TFS17B17S17
—	4000	21.00 ¹	533 ¹	-63TFS21B21S21
—	5000	21.00 ¹	533 ¹	-63TFS21B21S21
4000	—	22.00 ¹	559 ¹	-66TFS22B22S22

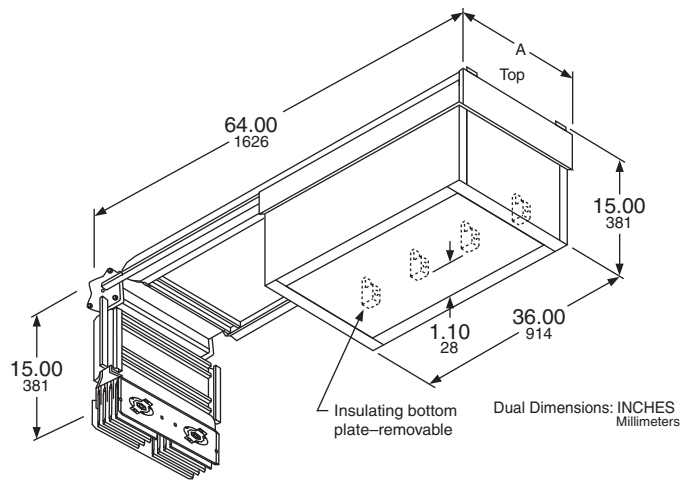
¹ Add 1 inch (25 mm) for L Dimensions of outdoor tees.

Section 8—800–5000 A Busway
Service Head Flatwise

Service Head Flatwise



Catalog Number Suffix—71SB



Catalog Number Suffix—79LESBS15T64

Service Head Flatwise–Lug Specifications

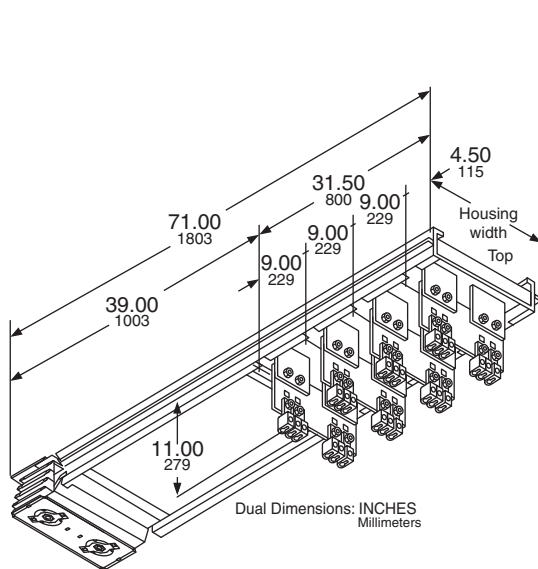
Ampere Rating	A	Lugs Per Phase and Neutral 1/0-600 kcmil	Ground Lugs #6-300 kcmil
800	Housing Width Plus 2.23 57	2	2
1000		3	3
1200		4	3
1350		4	3
1600		4	4
2000		5	5
2500		7	6
3000		8	7
3200		9	8
4000		10	9
5000		13	11

NOTE: Other lengths available. Contact your local Schneider Electric representative for assistance.

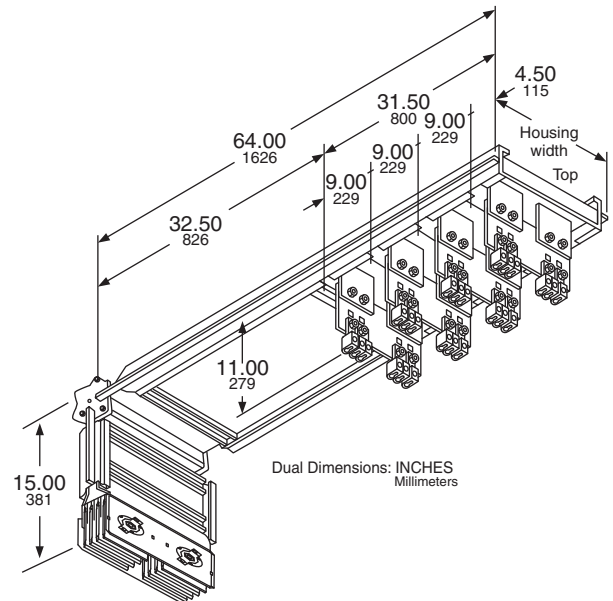
NOTE: Service entrance devices come standard with an outdoor type joint pack.

Section 8—800–5000 A Busway Transformer Tap (One 3Ø Transformer)

Transformer Tap (One 3Ø Transformer)



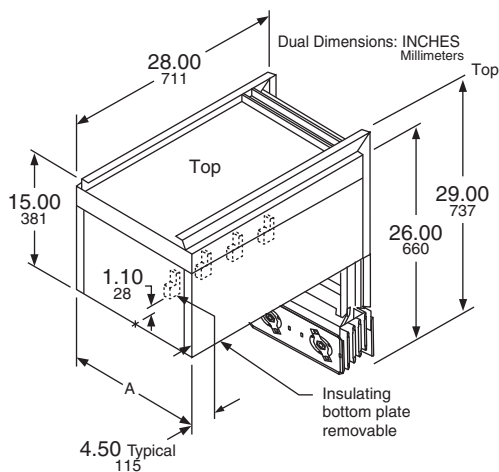
Catalog Number Suffix—71SF



Catalog Number Suffix—79LESFS15T64

Service entrance devices can be ordered with an indoor type joint pack for those applications where the service head is outdoors and penetrates a wall such that the first joint is indoors. **Service entrance devices come standard with an outdoor type joint pack.**

Service Head Vertical



Catalog Number Suffix—29SV

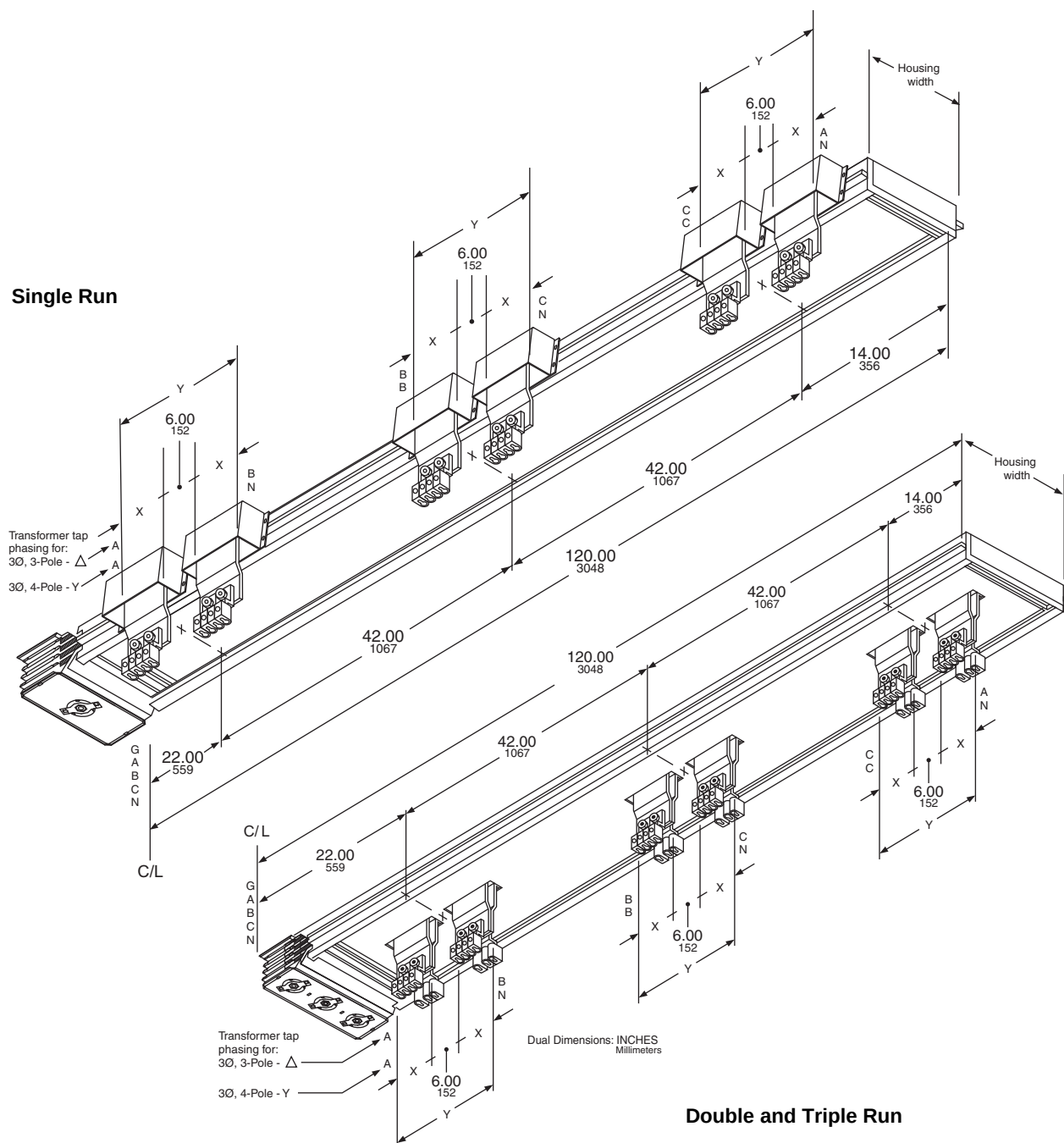
Service Head Vertical—Lug Specifications

Ampere Rating	A	Lugs Per Phase and Neutral 1/0-600 kcmil	Ground Lugs #6-300 kcmil
800	Housing Width Plus <u>2.23</u> 57	2	2
1000		3	3
1200		4	3
1350		4	3
1600		4	4
2000		5	5
2500		7	6
3000		8	7
3200		9	8
4000		10	9
5000		13	11

NOTES: Other lengths available. Contact your local Schneider Electric representative.

- Vertical service heads must be braced or supported near top, to withstand weight of cables, ice, wind, etc.
- Refer to NEC Article 230.24 for required clearance of service drops over roof overhang or the ground.

Transformer Tap (Three 1Ø Transformers)



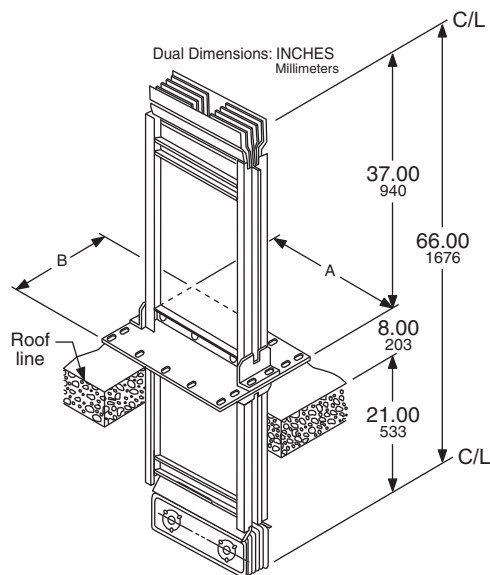
Catalog Number Suffix—TTF

Section 8—800–5000 A Busway Straight Length with Flanged Collar

Transformer Tap—Dimensions and Lug Specifications

Ampere Rating		X		Y		Lugs Per Phase and Neutral 1/0-600 kcmil	Ground Lugs #6-300 kcmil
Aluminum	Copper	IN	mm	IN	mm		
—	800	2.50	63	16.00	406	2	2
800	1000	3.00	76	16.50	419	2	2
1000	1200	4.00	102	17.50	444	3	3
—	1350	4.50	114	18.00	457	4	3
1200	—	5.00	127	18.50	470	4	3
—	1600	5.40	137	18.90	480	4	4
1350	—	6.00	152	19.50	495	4	3
—	2000	6.50	165	20.00	508	5	5
1600	—	7.50	190	21.00	533	4	4
2000	—	4.50	114	15.00	381	5	5
—	2500	4.50	114	15.00	381	7	6
2500	—	6.00	152	18.00	457	7	6
—	3000	5.00	127	16.00	406	8	7
3000	—	7.50	191	21.00	533	8	7
—	3200	6.00	152	18	457	9	8
—	4000	4.50	114	15.00	381	10	9
4000	—	6.50	165	19.00	483	10	9
—	5000	6.00	152	18.00	457	13	11

Straight Length with Flanged Collar



Catalog Number Suffix—66 FCS37B29

Straight Length with Flanged Collar—Dimensions

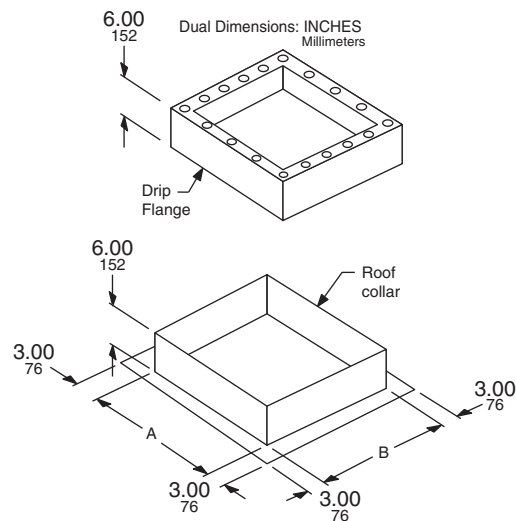
Ampere Rating		A		B ¹	
Aluminum	Copper	IN	mm	IN	mm
—	800	9.38	238	13.18	335
800	1000	9.38	238	13.18	335
—	1200	11.00	279	13.18	335
1000	1350	11.00	279	13.18	335
1200	—	12.00	305	13.18	335
1350	1600	13.00	330	13.18	335
1600	2000	15.88	403	19.18	487
2000	2500	17.88	454	19.18	487
2500	3000	21.88	556	19.18	487
—	3200	21.88	556	19.18	487
3000	—	24.75	629	19.18	487
4000	4000	30.75	781	19.18	487
—	5000	30.75	781	19.18	487

NOTE: Other lengths and configurations available. Contact your local Schneider Electric representative for assistance.

¹ 4-Pole dimensions. For 3-Pole dimensions subtract .32.

Section 8—800–5000 A Busway
Roof Flange Kit

Roof Flange Kit

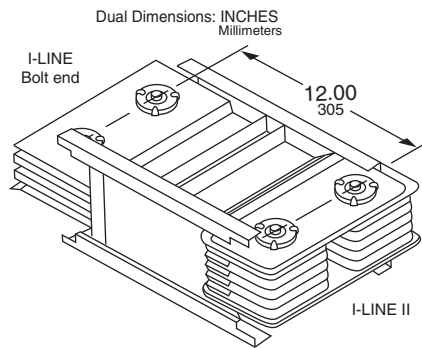


Roof Flange Kit—Catalog Numbers

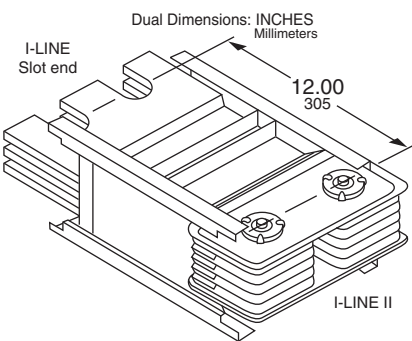
Ampere Rating		Catalog Number
Aluminum	Copper	
—	800	ACF-38-RF
800	1000	ACF-38-RF
—	1200	ACF-53-RF
1000	1350	ACF-53-RF
1200	—	ACF-63-RF
1350	1600	ACF-67-RF
1600	2000	ACF-78-RF
2000	2500	ACF-13-RF
2500	3000	ACF-15-RF
—	3200	ACF-15-RF
3000	—	ACF-19-RF
4000	4000	ACF-24-RF
—	5000	ACF-24-RF

- NOTES:**
- Roof flange kit will accommodate roof slope up to one inch per foot. The roof flange kit consists of one drip flange and one roof collar and must be ordered separately from the straight length with flange collar (66FCS37B29).
 - For “A” and “B” dimensions, refer to table titled “Straight Length with Flanged Collar—Dimensions” on page 85.

Adapter (Indoor Only)



Catalog Number Suffix—12B



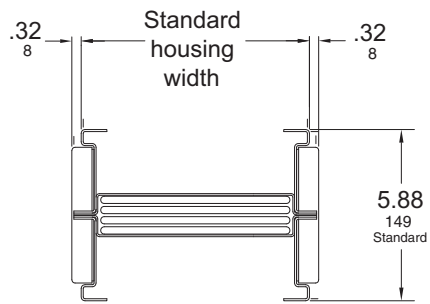
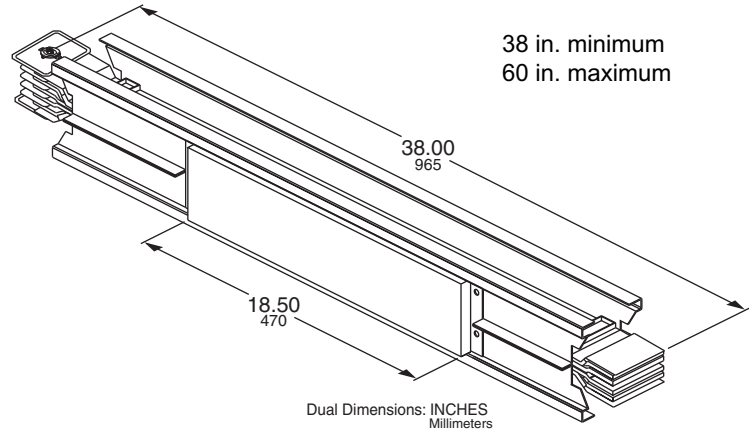
Catalog Number Suffix—12S

NOTE: Contact the factory if connecting to Series I I-Line™ busway before ordering for coordination of joint and adapter details.

Section 8—800–5000 A Busway Phase Transition (Indoor Only)

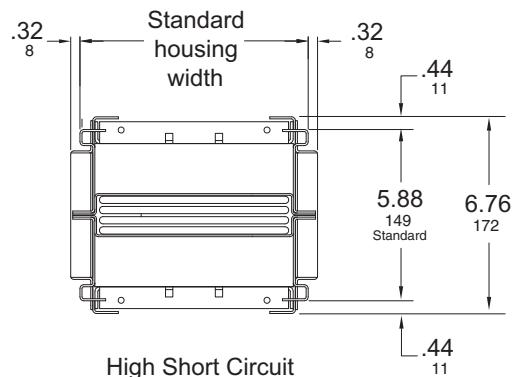
Phase Transition (Indoor Only)

3-Pole	Catalog # Suffix
180° Transition	xx-38PT
4-Pole	Catalog # Suffix
180° Transition	xx-38PT
180° Neutral Transition	38PTN
A and C Phase Transition	38PTAC



Standard Short Circuit

.64 in. (16 mm) wider than standard housing width.



High Short Circuit

.64 in. (16 mm) wider than standard housing width.
.88 in. (22 mm) wider than standard housing height.

Phase Transition X-Section

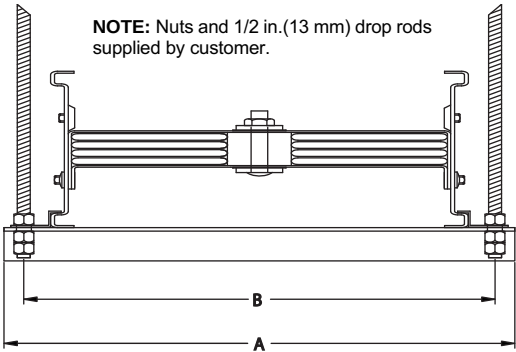
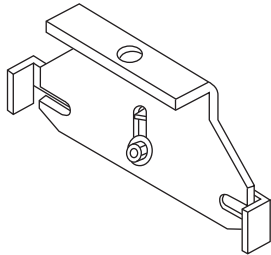
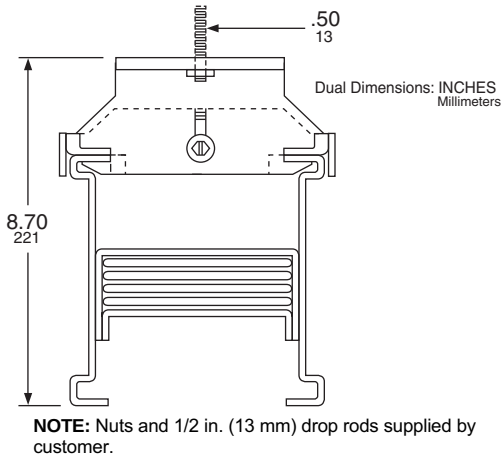
Section 8—800–5000 A Busway Horizontal Flatwise Hanger

Horizontal Flatwise Hanger

NOTE: See the hanger spacing installation requirements in “Hanger Spacing” on page 35.

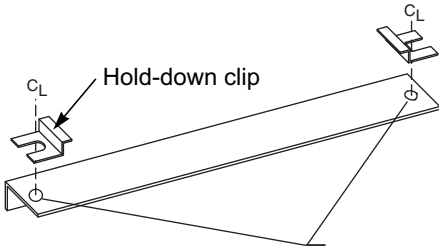
Hanger (Horizontal Flatwise)—Catalog Numbers

Ampere Rating		Catalog Number
Aluminum	Copper	
—	800	HF-38-F
800	1000	HF-43-F
1000	1200	HF-53-F
—	1350	HF-58-F
1200	—	HF-63-F
—	1600	HF-67-F
1350	—	HF-73-F
—	2000	HF-78-F
1600	—	HF-88-F



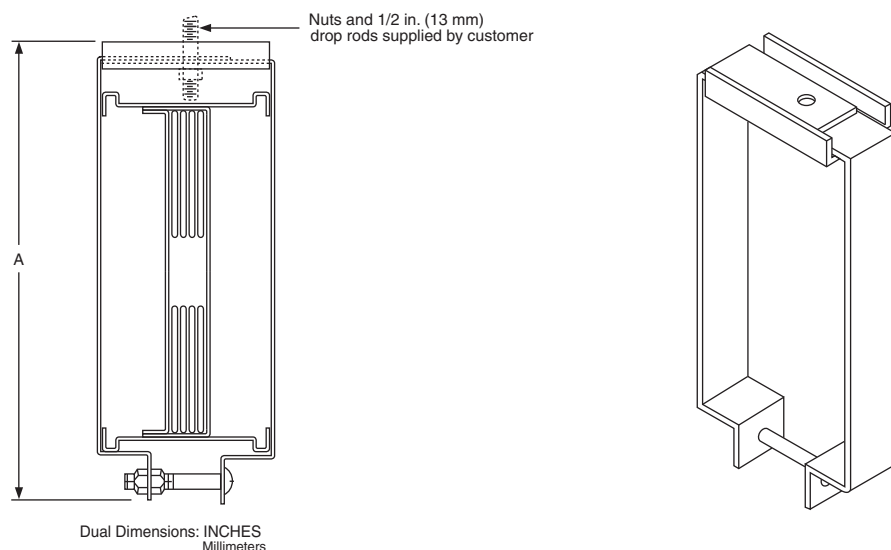
Hanger (Horizontal Flatwise)—Catalog Numbers and Dimensions

Ampere Rating		Catalog Number	A		B	
Aluminum	Copper		IN	mm	IN	mm
2000	2500	HF-13-F	16.22	412	14.72	374
—	3000	HF-15-F	18.72	475	17.22	437
2500	3200	HF-16-F	19.72	501	18.22	463
3000	—	HF-19-F	22.22	564	20.72	526
—	4000	HF-24-F	27.10	688	25.60	650
—	5000	HF-25-F	28.60	726	27.10	688
4000	—	HF-26-F	29.10	739	27.60	701



NOTE: Hold-down clips may be ordered separately (catalog no. 45110-200-01). Two are required for each hanger. Please contact your local Schneider Electric representative.

Horizontal Edgewise Hanger

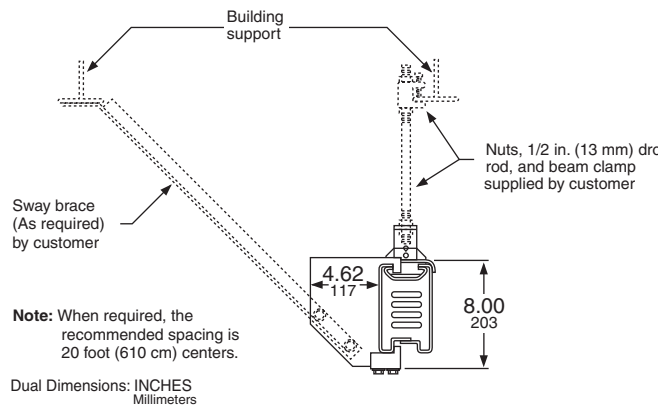


Hanger (Horizontal Edgewise)—Dimensions and Catalog Numbers

Ampere Rating		A		Catalog Number
Aluminum	Copper	IN	mm	
800	800	8.36	212	HF-43-E
—	1000	8.36	212	HF-43-E
1000	1200	9.86	250	HF-58-E
—	1350	9.86	250	HF-58-E
1200	1600	10.86	276	HF-67-E
1350	2000	11.86	301	HF-78-E
1600	—	13.86	339	HF-88-E
2000	2500	17.24	438	HF-13-E
—	3000	19.74	501	HF-15-E
2500	3200	20.74	527	HF-16-E
3000	—	24.12	613	HF-19-E
—	4000	28.12	714	HF-24-E
4000	5000	29.62	752	HF-26-E

Section 8—800–5000 A Busway
Sway Brace Collar

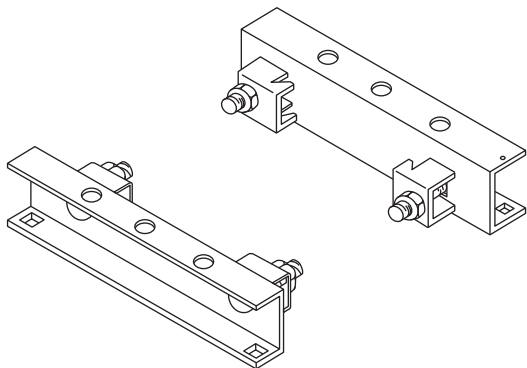
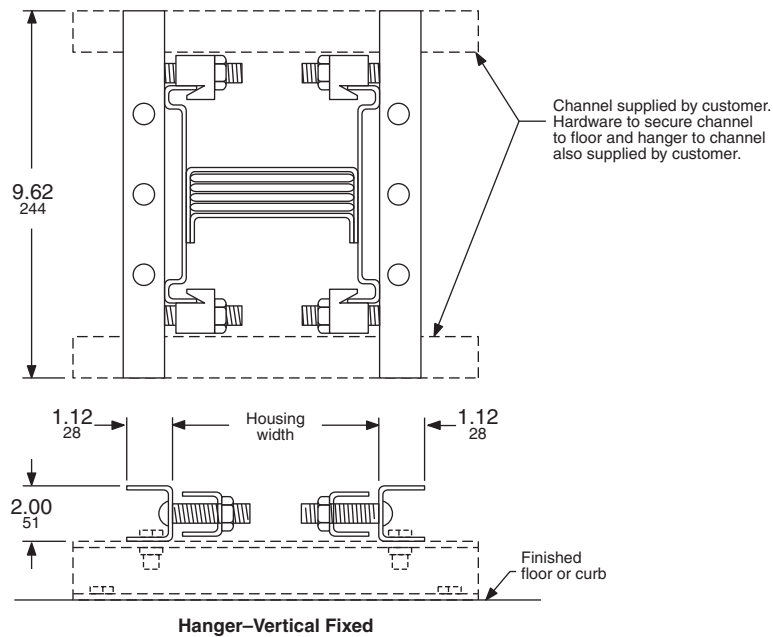
Sway Brace Collar



Catalog Number HP-1-SBC

Sway braces are used when only one side of the busway is heavily loaded with tap-off units or when other factors could cause possible swaying of the busway.

Vertical Fixed Hanger

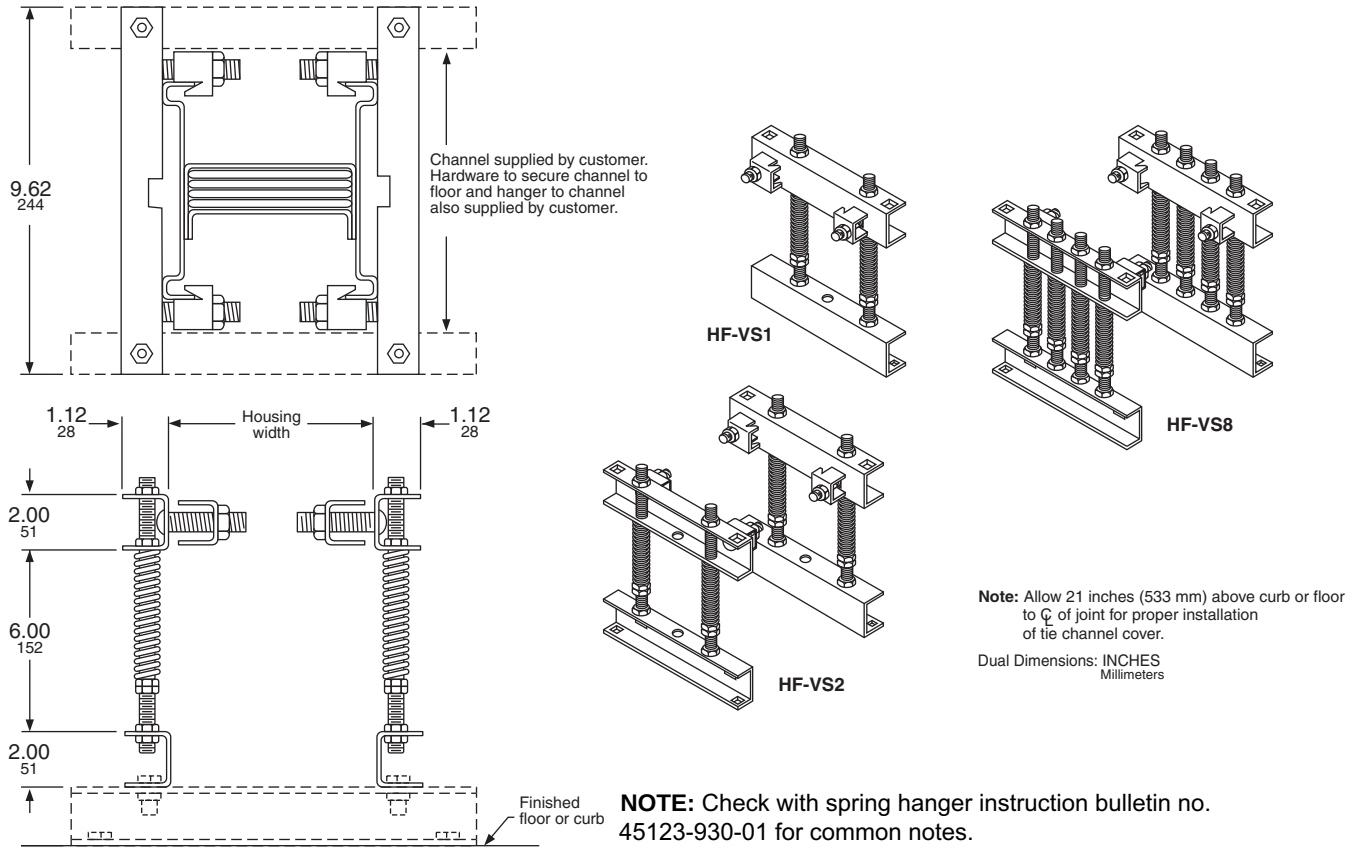


Catalog Number HF-V

Note: Allow 13.25 inches (337 mm) above curb or floor to ϕ of joint for proper installation of tie channel cover.

Dual Dimensions: INCHES
Millimeters

Vertical Spring Hanger



Vertical Spring Hanger—Catalog Numbers

Ampere Rating		Housing Reference	Catalog Number
Thermal			
Aluminum	Copper		
—	800	3.84	HFVS1
800	1000	4.34	HFVS1
—	1200	5.34	HFVS1
1000	—	5.34	HFVS1
1200	—	6.34	HFVS1
1350	—	7.34	HFVS1
—	—	7.84	HFVS1
1600	—	8.84	HFVS1
—	1350	5.84	HFVS2
—	—	6.34	HFVS2
—	1600	6.74	HFVS2
—	2000	7.84	HFVS2
2000	—	12.72	HFVS2
2500	—	16.22	HFVS2

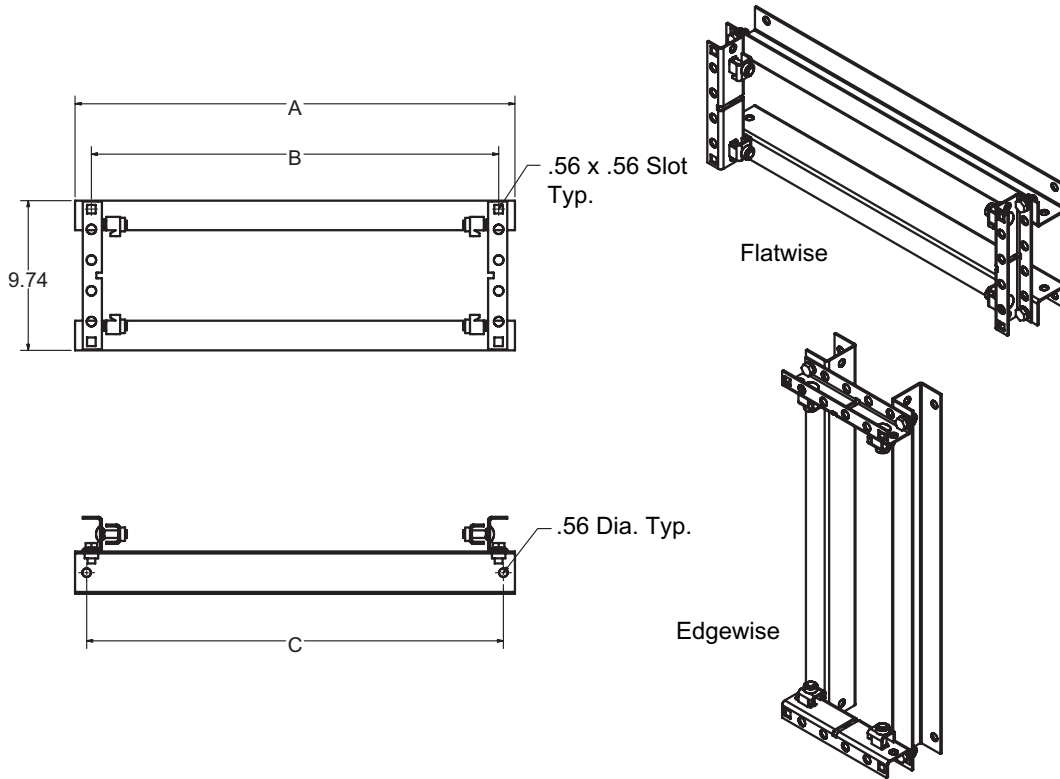
Section 8—800–5000 A Busway

Vertical Spring Hanger

Vertical Spring Hanger—Catalog Numbers *(continued)*

Ampere Rating		Housing Reference	Catalog Number
Thermal			
Aluminum	Copper		
—	2500	12.72	HFVS8
—	3000	15.22	HFVS8
—	3200	16.22	HFVS8
3000	—	18.72	HFVS8
—	4000	23.60	HFVS8
—	5000	25.10	HFVS8
4000	—	25.60	HFVS8

Horizontal Seismic Hanger



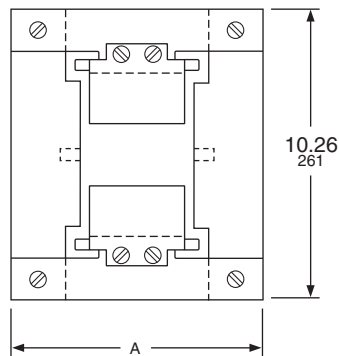
Horizontal Seismic Hanger—Dimensions

Ampere Rating		Catalog Number	A		B		C	
Aluminum	Copper		IN	mm	IN	mm	IN	mm
—	800	HF38SH	7.34	186	5.22	133	5.84	148
800	1000	HF43SH	7.84	199	5.72	145	6.34	161
1000	1200	HF53SH	8.84	225	6.72	171	7.34	186
—	1350	HF58SH	9.34	237	7.22	183	7.84	199
1200	—	HF63SH	9.84	250	7.72	196	8.34	212
—	1600	HF67SH	10.24	260	8.12	206	8.74	222
1350	—	HF73SH	10.84	275	8.72	221	9.34	237
—	2000	HF78SH	11.34	288	9.22	234	9.84	250
1600	—	HF88SH	12.34	313	10.22	260	10.84	275
2000	2500	HF13SH	16.22	412	14.10	358	14.72	374
—	3000	HF15SH	18.72	475	16.60	422	17.22	437
2500	3200	HF16SH	19.72	501	17.60	447	18.22	463
3000	—	HF19SH	22.22	564	20.10	511	20.72	526
—	5000	HF25SH	28.60	726	26.48	673	27.10	688
—	4000	HF24SH	27.10	688	24.98	634	25.60	650
4000	—	HF26SH	29.10	739	26.98	685	27.60	701

NOTE: For seismic applications, seismic hangers must be used for horizontally-mounted busway. Standard vertical hangers should be used for vertically-mounted busway.

Section 8—800–5000 A Busway
Wall and Floor Flange

Wall and Floor Flange

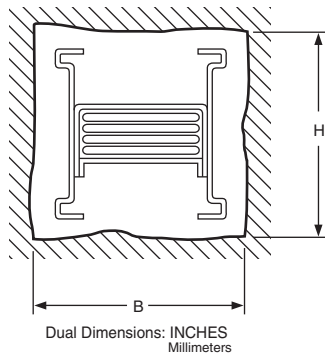


Four-Piece Closing Plate for Finished Look

Wall and Floor Flange—Dimensions and Catalog Numbers

Ampere Rating		A		Catalog Number
Aluminum	Copper	IN	mm	
—	800	8.32	211	ACF-38-WF
800	1000	8.82	224	ACF-43-WF
1000	1200	9.82	249	ACF-53-WF
—	1350	10.32	262	ACF-58-WF
1200	—	10.82	275	ACF-63-WF
—	1600	11.22	285	ACF-67-WF
1350	—	11.82	300	ACF-73-WF
—	2000	12.32	313	ACF-78-WF
1600	—	13.32	338	ACF-88-WF
2000	2500	17.20	437	ACF-13-WF
—	3000	19.70	500	ACF-15-WF
2500	3200	20.70	526	ACF-17-WF
3000	—	23.20	589	ACF-19-WF
—	4000	28.08	713	ACF-24-WF
—	3200	20.7	526	ACF-17-WF
—	5000	29.58	751	ACF-25-WF
4000	—	30.08	764	ACF-26-WF

Section 8—800–5000 A Busway Wall and Floor Flange



Required Wall / Floor Opening

Wall and Floor Flange—Dimensions

Ampere Rating		Indoor Str. Lnth.		Outdoor Str. Lnth.		Fl. End		Flatwise Elbow ¹							Edgewise Elbow ¹						
								H	B (Various Wall Thickness)						B	H (Various Wall Thickness)					
									4	8	12	16	20	24		4	8	12	16	20	24
Aluminum	Copper	B	H	B	H	B	H														
—	800	6	8	8	9	10	15	8	9	11	13	15	17	19	6	12	14	16	18	20	24
800	1000	6	8	9	9	10	15	8	10	12	14	16	18	20	6	12	14	16	18	20	22
1000	1200	7	8	10	9	11	15	8	12	14	16	18	20	22	7	12	14	16	18	20	22
—	1350	8	8	10	9	12	15	8	12	14	16	18	20	22	8	12	14	16	18	20	22
1200	—	8	8	11	9	13	15	8	13	15	17	19	21	23	8	12	14	16	18	20	22
1350	1600	9	8	12	9	14	15	8	14	16	18	20	22	24	9	12	14	16	18	20	22
—	2000	10	8	12	9	17	21	8	15	17	19	21	23	25	10	12	14	16	18	20	22
1600	—	11	8	13	9	17	21	8	17	19	21	23	25	27	11	12	14	16	18	20	22
2000	2500	15	8	17	9	19	21	8	22	24	26	28	30	32	15	12	14	16	18	20	22
—	3000	17	8	20	9	23	21	8	26	28	30	32	34	36	17	12	14	16	18	20	22
2500	3200	18	8	21	9	23	21	8	27	29	31	33	35	37	18	12	14	16	18	20	22
3000	—	21	8	23	9	26	21	8	31	33	35	37	39	41	21	12	14	16	18	20	22
—	4000	26	8	28	9	32	21	8	37	39	41	43	45	47	26	12	14	16	18	20	22
—	5000	27	8	30	9	32	21	8	40	42	44	46	48	50	27	12	14	16	18	20	22
4000	—	28	8	30	9	32	21	8	40	42	44	46	48	50	28	12	14	16	18	20	22

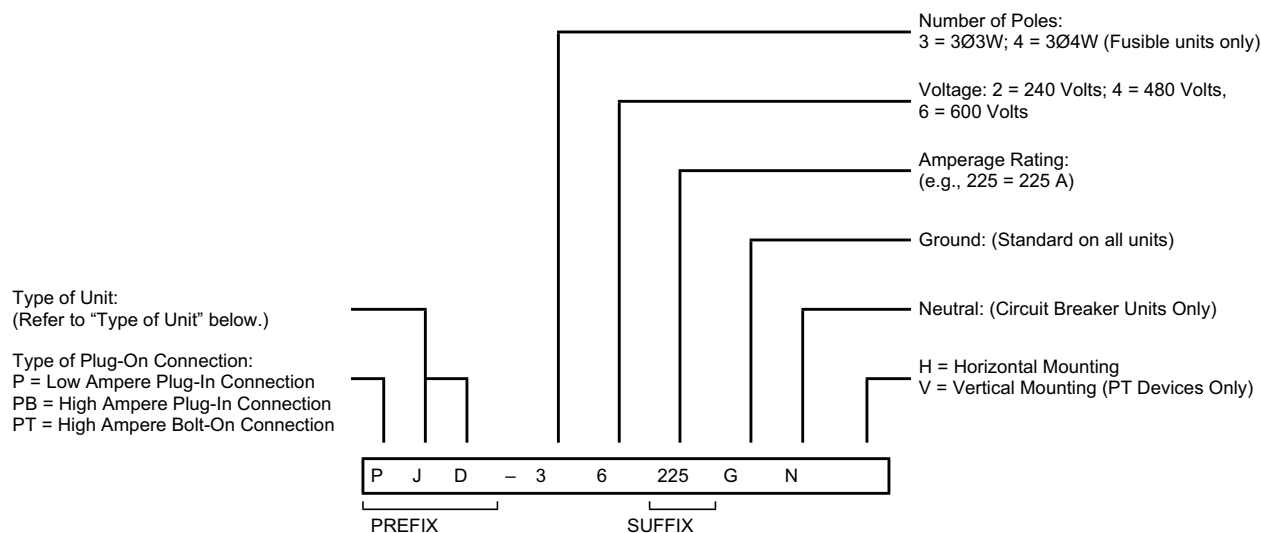
¹ Wall thickness is in inches. To convert to millimeters, multiply the thickness in inches by 25.4.

Section 8—800–5000 A Busway Wall and Floor Flange

Section 9—Plug-In Units—Bus Plugs

Plug-In Catalog Numbering System

Catalog numbers are composed of two basic parts—the **prefix** plus the **suffix**. The **prefix** contains the general descriptive details of the plug-in unit and outline on pages 98–120. The **suffix** defines the exact device type.



Type of Unit

Max. Amperage for Unit Types

Type	Amperage
Q-Fusible Unit	1600 A Maximum
S-Fusible Vertical Riser Unit	200 A Only
FA-FA Frame Circuit Breaker Unit	100 A Maximum
FH-FH Frame Circuit Breaker Unit	100 A Maximum
FI-FI Frame Circuit Breaker Unit	100 A Maximum
HD-HD Frame Circuit Breaker Unit	150 A Maximum
HG-HG Frame Circuit Breaker Unit	150 A Maximum
HJ-HJ Frame Circuit Breaker Unit	150 A Maximum
HL-HL Frame Circuit Breaker Unit	150 A Maximum
JD-JD Frame Circuit Breaker Unit	250 A Maximum
JG-JG Frame Circuit Breaker Unit	250 A Maximum
JJ-JJ Frame Circuit Breaker Unit	250 A Maximum
JL-JL Frame Circuit Breaker Unit	250 A Maximum
KI-KI Frame Circuit Breaker Unit	250 A Maximum

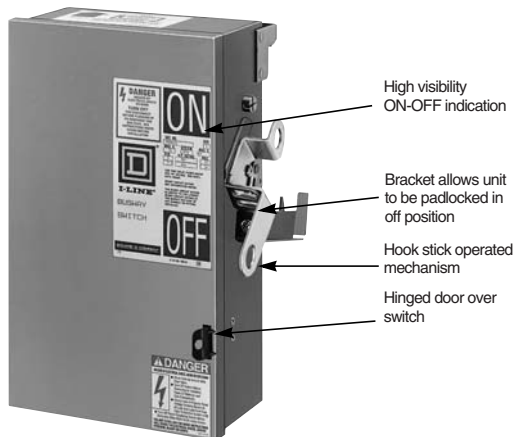
Type	Amperage
LA-LA Frame Circuit Breaker Unit	400 A Maximum
LC-LC Frame Circuit Breaker Unit	600 A Maximum
LH-LH Frame Circuit Breaker Unit	400 A Maximum
LI-LI Frame Circuit Breaker Unit	600 A Maximum
MG-MG Frame Circuit Breaker Unit	800 A Maximum
MJ-MJ Frame Circuit Breaker Unit	800 A Maximum
PG-PG Frame Circuit Breaker Unit	1200 A Maximum
PJ-PJ Frame Circuit Breaker Unit	1200 A Maximum
RG-RG Frame Circuit Breaker Unit	1600 A Maximum
RJ-RJ Frame Circuit Breaker Unit	1600 A Maximum
RL-RL Frame Circuit Breaker Unit	1600 A Maximum

NOTE: Special purpose plug-in devices are not defined by this catalog numbering system. Consult the factory for cataloging details of these devices.

Section 9—Plug-In Units—Bus Plugs Compatibility

Compatibility

All plug-in units in this catalog can be used on original I-Line as well as I-Line II busway. There is no need to stock two different types of units.



Fusible Unit

Fusible

Plug-in switches that are 30, 60, 100, 200, 400, and 600 A contain a heavy-duty safety switch mechanism.

Switches that are 800–1600 A contain a molded case switch and fuses.

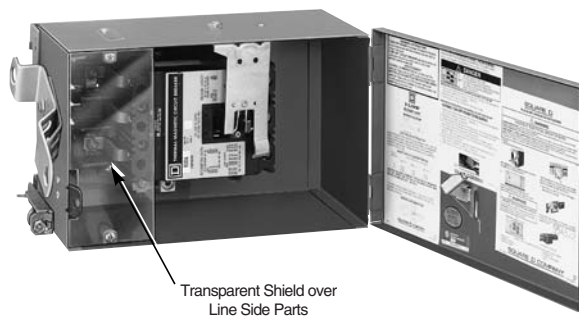
Circuit Breakers

Molded case circuit breaker plug-in devices are available in frame sizes of 100 A (FA)—1600 A (RG) with standard, high-interrupting, current-limiting, and solid-state trip circuit breakers.

The operating handle gives visual indication of tripped status for all devices as well as floor operable reset on all devices. The FA frame circuit breaker unit would fit into the same enclosure as the standard molded case breaker shown below.

The mounting and the interlock are identical to the fusible unit shown above.

The short circuit ratings for circuit breaker devices are listed on page 101.



Standard Molded Case Circuit Breaker

Section 9—Plug-In Units—Bus Plugs

Plug-In Device Mounting

Plug-In Device Mounting



Plug-in units are positioned along the busway length by notches in the busway housing top that accept the mounting hooks of the plug-in unit. This aligns the plug-in unit connectors with the plug-in opening. After the unit is positioned on the busway it is allowed to swing down into the plug-in opening where the connectors make contact with the bus bars. This is accomplished in a “hook-swing” sequence of motions.

Interlock

Plug-in devices rated for 30–250 A are interlocked with the busway housing to prevent installation or removal of the unit when the disconnect is turned ON. All devices incorporate an interlock to prevent the door over the disconnect from being opened when the unit is ON. This door interlock can be defeated from outside the unit.

Grounding

All plug-in units come with standard grounding means. A grounding spring cuts through the busway paint and forms an electrical ground continuity. An equipment ground is established before the phase jaws make contact with the bus bars by means of a grounding stab, which then makes contact with two ground jaws on the busway. A ground lug on the inside of the plug-in unit is provided for the purpose of attaching a ground wire.

Splash Resistant Feature (Optional)

Plug-in units installed on IP54 busway also require protection to occasional water exposure, such as roof leaks or sprinklers. The plug-in unit splash resistant feature is tested per the IEC 60529 standard and is rated IP54.

This feature is available as an option for most plug-in unit enclosures and is identified by the addition of “M54” at the end of the standard catalog number.

IP54 plug-in units are designed to only be installed on I-Line II IP54 busway.



Interlock



Grounding Spring

Section 9—Plug-In Units—Bus Plugs

Special Purpose Plug-In Devices

Special Purpose Plug-In Devices

- Combination motor starter from NEMA Size 0–Size 2: fusible or circuit breaker primary disconnect
- Lighting contactor: 30 A, 60 A, 100 A, fusible disconnect
- Magnetic contactor from NEMA Size 0–Size 2: Fusible or circuit breaker primary disconnect
- Ground detector and neutralizer: used to provide means for indicating grounds on an ungrounded 3-phase system and to create a discharge path for static electricity. Consult the factory for dimensional details.
- Capacitor banks: 2.5 kVAR–30 kVAR auxiliary devices mount directly on busway prewired for use with separate fusible or circuit breaker disconnect. Consult the factory for dimensional details.
- Single-phase transformer plug-in devices from 1 kVA–10 kVA: auxiliary devices mount directly on busway prewired for use with separate fusible or circuit breaker disconnect. Consult the factory for dimensional details.
- Surge protection devices: 160 kA and 240 kA, circuit breaker disconnect

Special Purpose Plug-In Devices—Horsepower Rating

UL Horsepower Rating		Motor–3-Phase Horsepower Rating	
	Plug-In Unit Ampere Rating	Fusible Switch	
		Standard	Maximum
240 Vac	30	3	7.5
	60	7.5	15
	100	15	30
	200	25	60
	400	—	—
	600	—	—
480 Vac	30	5	15
	60	15	30
	100	25	30
	200	50	125
	400	—	—
	600	—	—
600 Vac	30	7.5	20
	60	15	50
	100	30	60
	200	60	150
	400	125	350
	600	250	500

Section 9—Plug-In Units—Bus Plugs

Interrupting Capacity of Fusible Switch Plug-In Units

Interrupting Capacity of Fusible Switch Plug-In Units



Type PQ Fusible Switch Low Ampere Plug-In Connection

Fusible Switch Plug-In Units Capacity

Catalog Number Prefix	Current Rating	Fuse Class (Includes 240 V, 480 V, and 600 V)		
		K or H	J	R
PQ	30	10,000	200,000	200,000
PQ	60	10,000	200,000	200,000
PQ	100	10,000	200,000	200,000
PQ & PS	200	10,000	200,000	200,000
PBQ	400	10,000	100,000	100,000
PBQA	400	—	100,000	100,000
PBQ	600	10,000	100,000	100,000

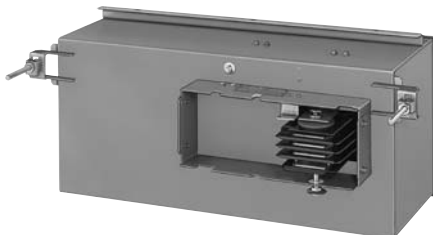
Interrupting Capacity of Circuit Breaker Plug-In Units

Circuit Breaker Plug-In Units Capacity

Catalog Number Prefix	Trip Range (Amperes)	Interrupting Rating—RMS Symmetrical Amperes		
		240 Vac	480 Vac	600 Vac
With Molded Case Circuit Breakers				
PFA	15–100	25000	18000	14000
PFH	15–100	65000	25000	18000
PFI	15–100	100000	100000	—
PKI	125–250	100000	100000	—
PHD	15–150	25000	18000	14000
PHG	15–150	65000	35000	18000
PHJ	15–150	100000	65000	25000
PHL	15–150	125000	100000	50000
PJD	175–250	25000	18000	14000
PJG	175–250	65000	35000	18000
PJJ	175–250	100000	65000	25000
PJL	175–250	125000	100000	50000
PBLA	250–400	42000	30000	22000
PBLC	300–600	100000	65000	35000
PBLI	300–600	200000	200000	100000
PBLX	100–600	100000	65000	35000
PTMG	300–800	65000	35000	18000
PTMJ	300–800	100000	65000	25000
PTPG	250–1200	65000	35000	18000
PTPJ	250–1200	100000	65000	25000
PTRG	600–1600	65000	35000	18000
PTRJ	600–1600	100000	65000	25000
PTRL	600–1600	125000	100000	50000



Type PBLA Circuit Breaker High Ampere Plug-In Connection



Type PTMG Circuit Breaker High Ampere Bolt-on Connection

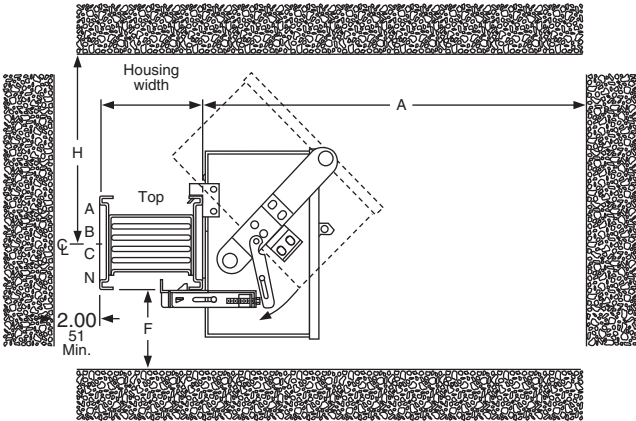
Section 9—Plug-In Units—Bus Plugs

Required Clearances for Plug-In Unit Mounting

Required Clearances for Plug-In Unit Mounting

NOTES:

- 1. Check these dimensions carefully before installing busway lengths.
- 2. For required working clearances, consult the National Electrical Code/Canadian Electrical Code.



Required Clearances for Plug-In Unit Mounting

Circuit Breaker		A		F		H	
Cat. No. Prefix	Ampere Rating	IN	mm	IN	mm	IN	mm
PFA, PFH	15–100	20.87	530	2.12	54	10.00	254
PFI	15–100	25.63	651	2.38	60	11.00	279
PHD, PHG, PHJ, PHL	15–150	25.63	651	2.38	60	11.00	279
PJD, PJG, PJJ, PJL	175–250	25.63	651	2.38	60	11.00	279
PKI	125–250	25.63	651	2.38	60	11.00	279
PBLA, PBLH	250–400	35.69	906	5.62	142	15.00	381
PBLX, PBLC, PBLI	300–600	35.00	889	8.00	203	20.00	508
PTMG, PTMJ, PTPG, PTPJ	250–1200	37.00	940	10.25	260	13.75	349
PTRG, PTRJ, PTRL	600–1600	41.81	1062	12.59	320	13.84	352
Fusible Switch		A		F		H	
Cat. No. Prefix	Ampere Rating	IN	mm	IN	mm	IN	mm
PQ	30	15.22	387	7.98	203	8.00	203
	60	15.22	387	7.98	203	8.00	203
	100	15.22	387	11.98	304	8.00	203
	200	27.50	699	15.00	381	15.00	381
PS	200	27.50	699	9.00	229	12.00	305
PBQ	400	48.00	1219	7.25	184	18.00 ¹	457
	600	48.00	1219	7.25	184	18.00 ¹	457
PTQ	800	53.90	1369	8.75	222	9.50	241
	1000	53.90	1369	8.75	222	9.50	241
	1200	57.00	1448	10.25	260	13.75	349
	1600	57.00	1448	10.25	260	13.75	349

¹ Horizontal only. This dimension is 14 in. (356 mm) for vertical applications.

Vertical Mounting

Fusible Units

Fusible switch plug-in units (30–100 A) mount on either side of the vertical busway and comply with NEC Article 404.6 and CEC Article 14.502 concerning gravity tending to close a switch blade. With unit mounted on one side of the busway, the operating handle is on top and when mounted on the opposite side, the handle is on the bottom. The 200 A fusible unit (“PS”) mounts only on the front of the busway. (“TOP” sticker on the busway is on the right.) The operating handle is on the right side of the mounted unit.

The 400–1600 A fusible units mount only on the front of the busway. The operating handle is on the cover.

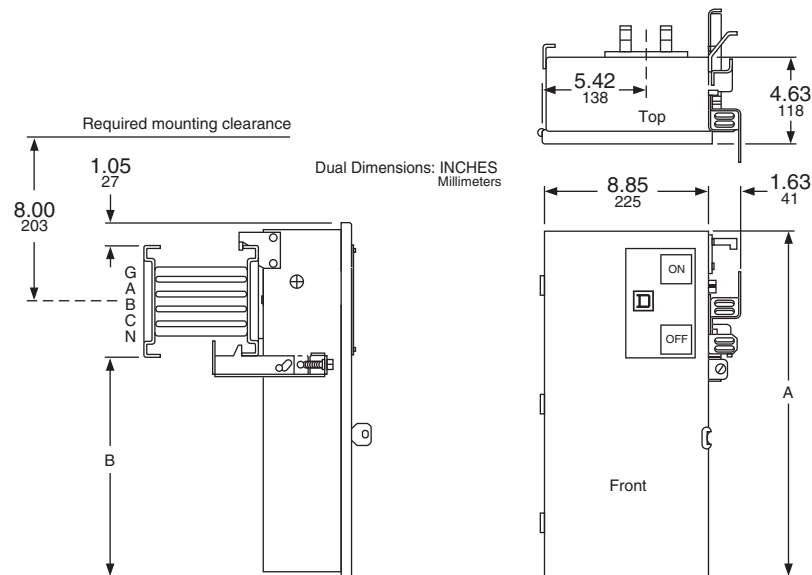
NOTE: Orientation of the busway is essential for proper mounting of plug-in units. The busway must be positioned so that the top marking is to the right and the neutral position is to the left.

Circuit Breaker Units

Circuit breaker plug-in units (15–250 A) can be installed on both sides of a riser. However, when the handle of the plug-in unit is operated vertically rather than rotationally or horizontally, the handle in the up position must be the ON position.

Section 9—Plug-In Units—Bus Plugs
Fusible Switch Plug-In Units—30–100 A (Type “PQ”)

Fusible Switch Plug-In Units—30–100 A (Type “PQ”)



Fusible Switch Plug-In Units—30–100 A (Type “PQ”) Specifications

Fusible Switch		Weight		Lugs Per Phase		Lugs Per Neutral		Ground Lugs		A		B	
Cat. No. Prefix	Ampere Rating	Lb	Kg	Qty.	Size	Qty.	Size	Qty.	Size	IN	mm	IN	mm
PQ	30	15.0	33.0	1	#12 – #2	1	#12 – #1/0	1	#10 – #2	14.95	379	7.98	203
	60	15.0	33.0	1	#12 – #2	1	#12 – #1/0	1	#10 – #2	14.95	379	7.98	203
	100	17.0	37.5	1	#12 – #1/0	1	#12 – #1/0	1	#10 – #2	18.97	480	11.98	304

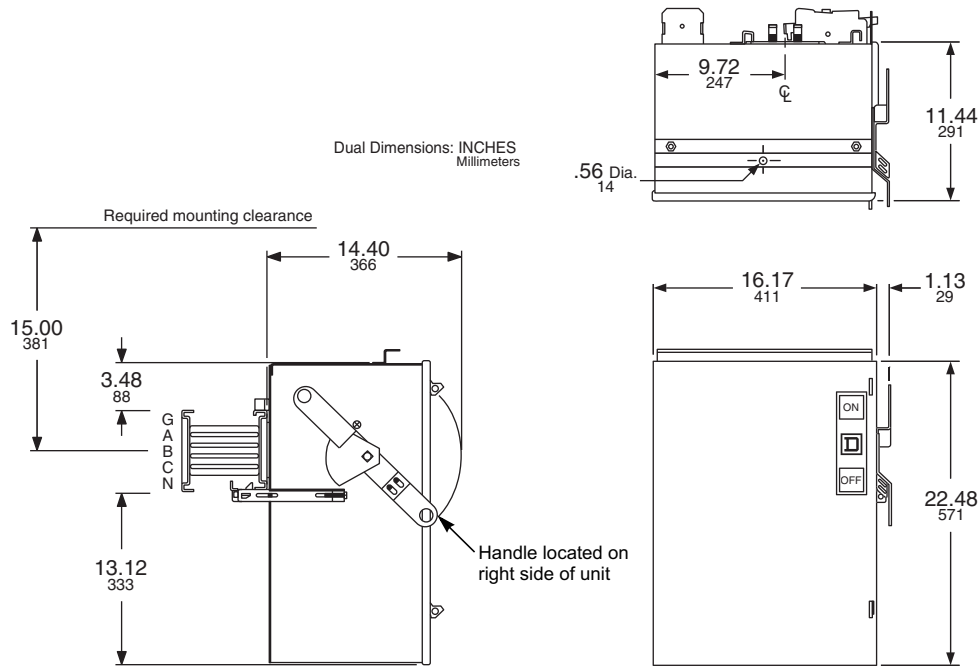
NOTE: A PQ100N kit is available to convert a 3-wire unit to a 4-wire unit.

NOTE: These units are available with the IP54 option. Contact Schneider Electric for IP54 enclosure dimensions.

Section 9—Plug-In Units—Bus Plugs

Fusible Switch Plug-In Unit—200 A (Type “PQ”)

Fusible Switch Plug-In Unit—200 A (Type “PQ”)



Fusible Switch Plug-In Unit—200 A (Type “PQ”) Specifications

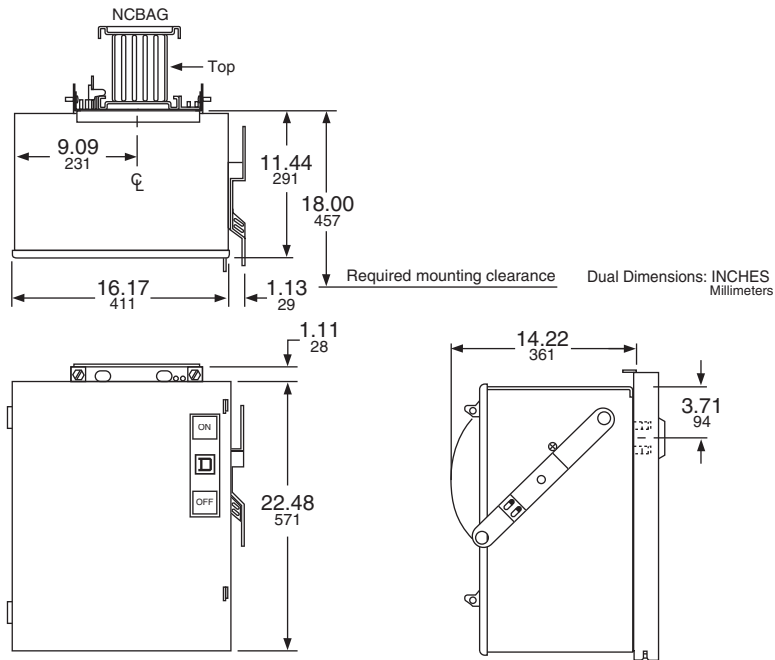
Fusible Switch		Weight (Approx.)		Lugs Per Phase and Neutral		Ground Lugs	
Cat. No. Prefix	Ampere Rating	Lb	Kg	Qty.	Size	Qty.	Size
PQ ¹	200	71	32	1	#6-300 kcmil	1	#10-2/0

¹ 200 A “PQ” units are for use primarily on horizontally-mounted busway. Refer to “PS” units for use primarily on vertically-mounted busway.

NOTE: These units are available with the IP54 option. Contact Schneider Electric for IP54 enclosure dimensions.

Section 9—Plug-In Units—Bus Plugs
Fusible Switch Plug-In Unit—200 A (Type “PS”)

Fusible Switch Plug-In Unit—200 A (Type “PS”)



Fusible Switch Plug-In Unit—200 A (Type “PS”) Specifications

Fusible Switch		Weight (Approx.)		Lugs Per Phase and Neutral		Ground Lugs	
Cat. No. Prefix	Ampere Rating	Lb	Kg	Qty.	Size	Qty.	Size
PS ¹	200	71	32	1	#6-300 kcmil	1	#10-2/0

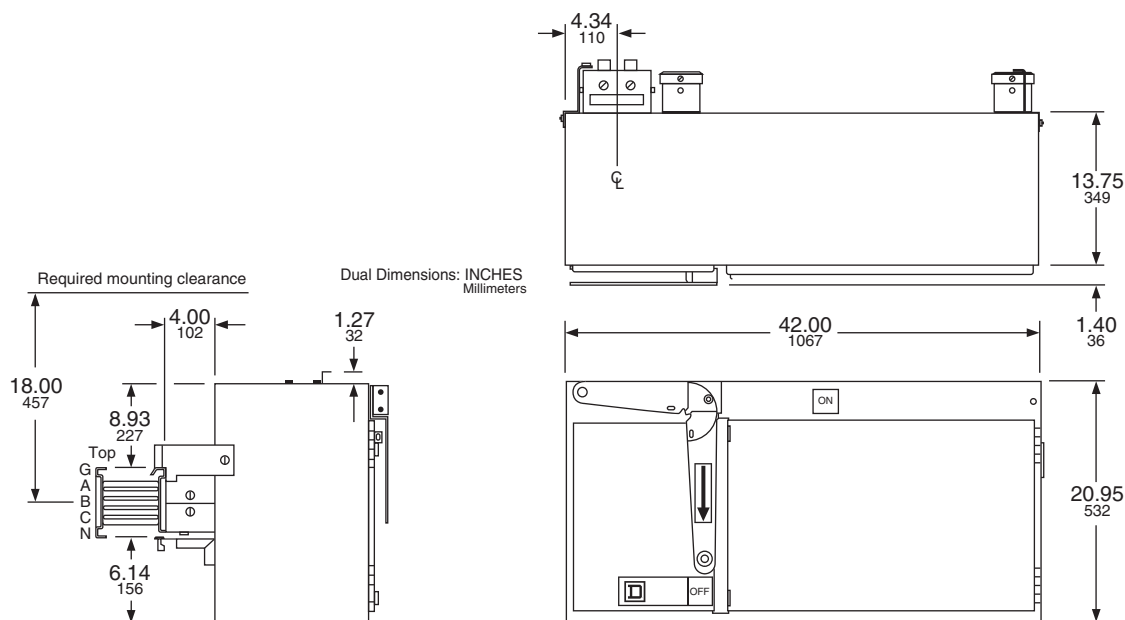
¹ 200 A “PS” units for use on one side of vertically-mounted busway only. To determine proper mounting side for this unit, position busway “TOP” marking to the right (same side as unit operating handle) and the neutral bus bar to the left as shown in top view of drawing. Refer to “PQ” units for use on horizontally-mounted busway.

NOTE: These units are available with the IP54 option. Contact Schneider Electric for IP54 enclosure dimensions.

Section 9—Plug-In Units—Bus Plugs

Fusible Switch Plug-In Unit—400 A and 600 A (Type “PBQ”)

Fusible Switch Plug-In Unit—400 A and 600 A (Type “PBQ”)



Fusible Switch Plug-In Unit—400 A and 600 A (Type “PBQ”) Specifications

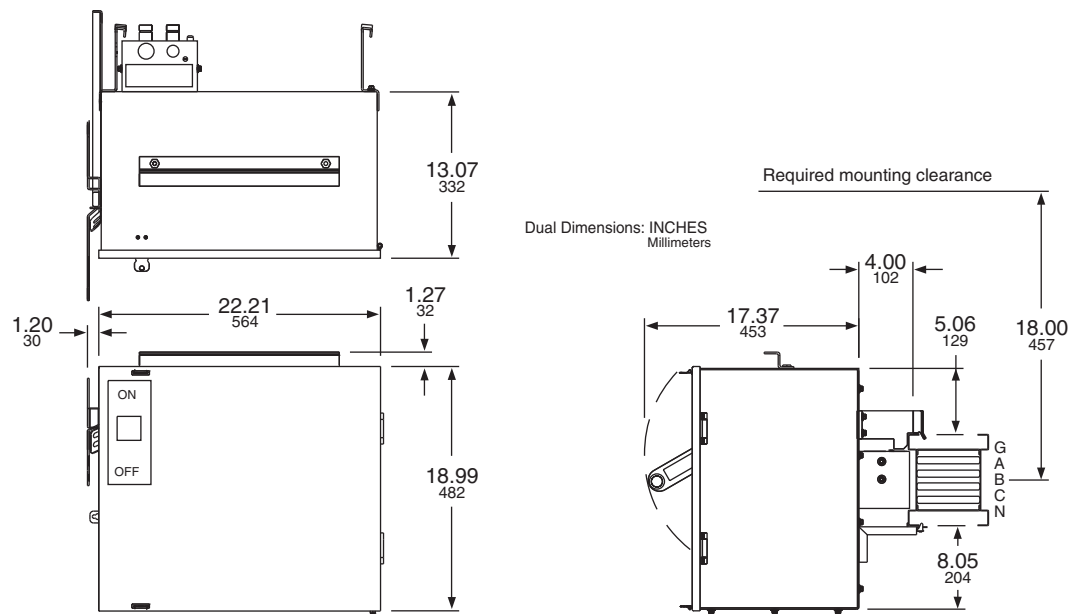
Fusible Switch		Weight (Approx.)		Lugs Per Phase and Neutral		Ground Lugs	
Cat. No. Prefix	Ampere Rating	Lb	Kg	Qty.	Size	Qty.	Size
PBQ ¹	400 and 600	195	89	2	1/0-600 kcmil	1	#6-300 kcmil

NOTE: For vertical riser applications for I-Line II busway, order auxiliary kit catalog number PBQ-4060-RMK. This kit is not suitable for installation on I-Line™ busway from 225–600 A in a vertical riser mounting.

¹ 400 A and 600 A “PBQ” units plug into one opening, but requires space equal to two plug-in openings.

Section 9—Plug-In Units—Bus Plugs
Fusible Switch Plug-In Unit—400 A (Type “PBQA”)

Fusible Switch Plug-In Unit—400 A (Type “PBQA”)



Fusible Switch Plug-In Unit—400 A (Type “PBQA”) Specifications

Fusible Switch		Weight (Approx.)		Lugs Per Phase and Neutral		Ground Lugs	
Cat. No. Prefix	Ampere Rating	Lb	Kg	Qty.	Size	Qty.	Size
PBQA ¹	400	118	53.5	1	#1-600 kcmil	1	#6-300

¹ PBQA units for use on horizontally-mounted busway only.

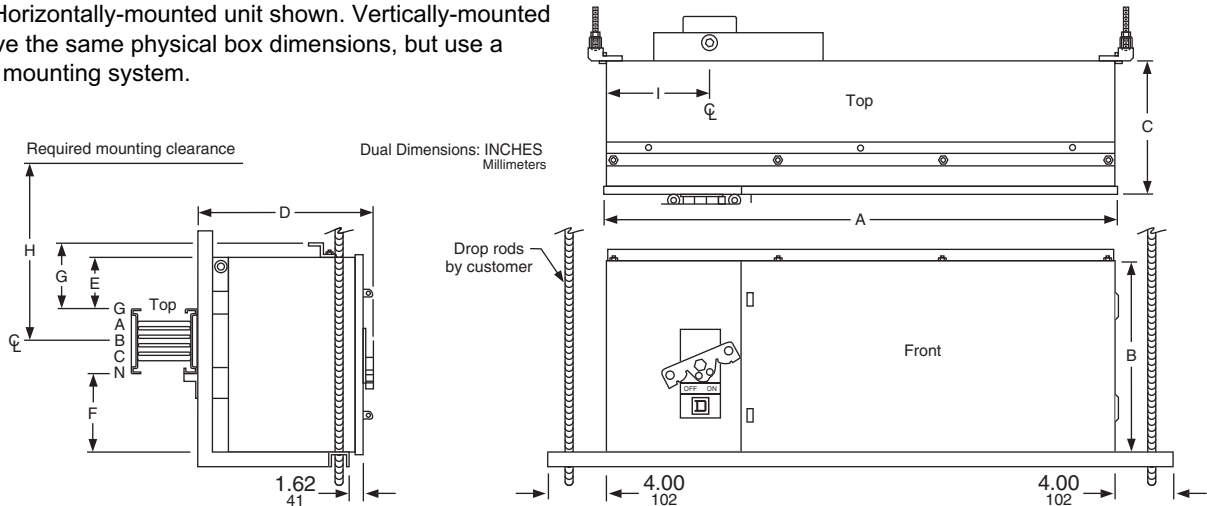
NOTE: Lugs are compression type.

Section 9—Plug-In Units—Bus Plugs

Fusible Switch Bolt-On Units—800–1600 A (Type “PTQ”)

Fusible Switch Bolt-On Units—800–1600 A (Type “PTQ”)

NOTE: Horizontally-mounted unit shown. Vertically-mounted units have the same physical box dimensions, but use a different mounting system.



NOTE: Bolt-on units can be used only on plug-in busway (800–4000 A—except 800 A copper I-LINE II) with the same number of poles (e.g., do not use 3-pole unit on 3Ø4W busway, or 3Ø4W unit on 3-pole busway).

Fusible Switch Bolt-On Units — 800–1600 A (Type “PTQ”) Dimensions

Fusible Switch		A		B		C		D		E		F		G		H		I	
Cat. No. Prefix	Ampere Rating	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm
PTQ	800	49.75	1264	18.62	473	12.40	315	16.50	416	4.75	121	7.75	197	6.03	153	9.50	241	5.75	146
	1000	49.75	1264	18.62	473	12.40	315	16.50	416	4.75	121	7.75	197	6.03	153	9.50	241	5.75	146
	1200	56.25	1429	24.25	616	16.00	406	20.10	510	9.00	229	9.25	235	10.28	261	13.75	349	9.00	229
	1600	56.25	1429	24.25	616	16.00	406	20.10	510	9.00	229	9.25	235	10.28	261	13.75	349	9.00	229

Fusible Switch Bolt-On Units — 800–1600 A (Type “PTQ”) Specifications

Fusible Switch		Weight		Lugs Per Phase and Neutral		Ground Lugs	
Cat. No. Prefix	Ampere Rating	Lb	Kg	Qty.	Size	Qty.	Size
PTQ ¹	800	230.00	103	3	1/0-600	2	#1-600I
	1000	230.00	103	3		2	
	1200	350.00	159	6		2	
	1600	350.00	159	6		3	

NOTE: This unit requires a special hanger that is mounting orientation specific. Add “H” on the end of the catalog number for units that will be mounted horizontally, and “V” for units that will be mounted vertically. These mounting frames are NOT interchangeable.

¹ “PTQ” units plug into one opening, but require space equal to three plug-in openings. See dimension A.

Section 9—Plug-In Units—Bus Plugs
Circuit Breaker Plug-In Units—15–250 A

Circuit Breaker Plug-In Units—15–250 A

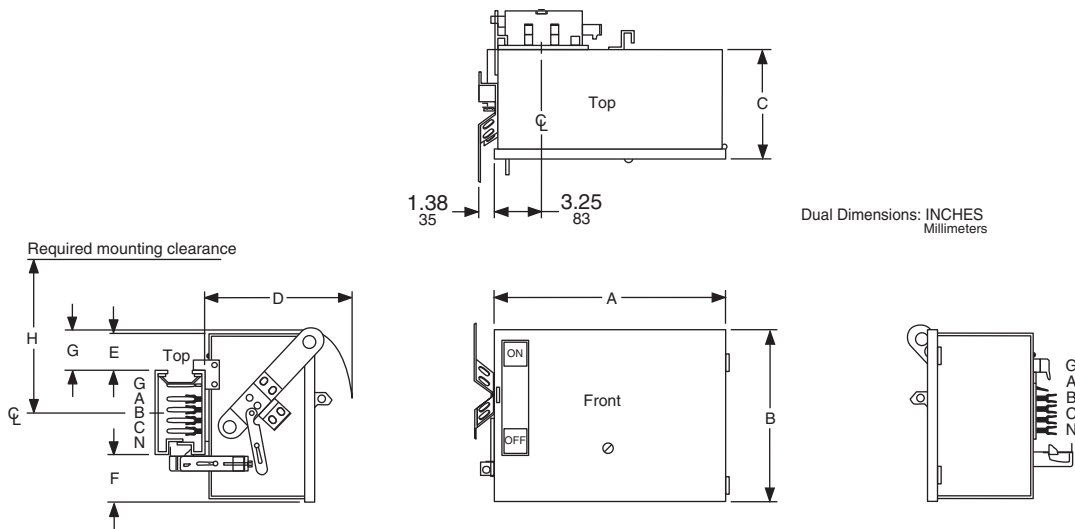
Circuit Breaker Plug-In Units—15–250 A Dimensions

Circuit Breaker		A		B		C		D		E		F		G		H	
Cat No. Prefix	Trip Range (Amperes)	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm
PFA, PFH	15–100	13.00	330	8.25	210	6.62	168	8.62	219	1.12	28	1.12	28	2.00	51	10.00	254
PHD, PHG, PHJ, PHL	15–150	20.30	516	8.50	216	8.00	203	9.12	232	1.00	25	1.38	35	2.00	51	11.00	279
PJD, PJG, PJJ, PJL	175–250	20.30	516	8.50	216	8.00	203	9.12	232	1.00	25	1.38	35	2.00	51	11.00	279

Circuit Breaker Plug-In Units—15–250 A Specifications

Circuit Breaker		Weight		Lugs Per Phase and Neutral		Ground Lugs	
Cat No. Prefix	Trip Range (Amperes)	Lb	Kg	Qty.	Size	Qty.	Size
PFA, PFH	15–30	28	13	1	#14 - 4	1	#10 - #2
PFA, PFH	35–100	28	13	1	#14 - 1/0	1	#10 - #2
PHD, PHG, PHJ, PHL	15–30	32.00	15	1	#14 - #10	1	#6 - #2/0
PHD, PHG, PHJ, PHL	35–150	32.00	15	1	#8 - #3/0	1	#6 - #2/0
PJD, PJG, PJJ, PJL	175–250	32.00	15	1	#3/0 - 350 kcmil	1	#6 - #2/0

NOTE: H and J units are available with the IP54 option. Contact Schneider Electric for IP54 enclosure dimensions.



Section 9—Plug-In Units—Bus Plugs

I-Limiter® Current-Limiting Circuit Breaker Plug-In Units—15–250 A

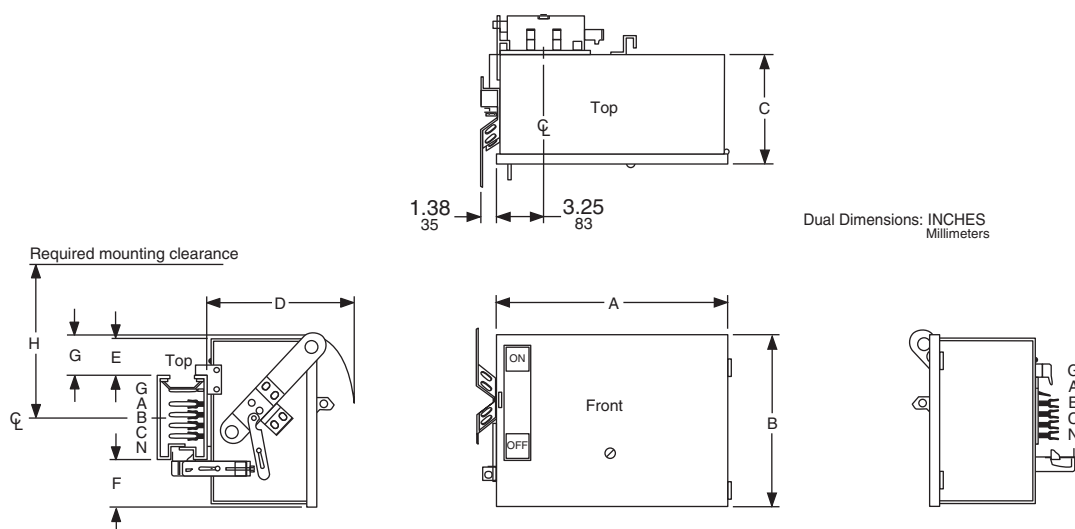
I-Limiter® Current-Limiting Circuit Breaker Plug-In Units—15–250 A

I-Limiter Current-Limiting Circuit Breaker Plug-In Units—15–250 A Dimensions

Circuit Breaker		A		B		C		D		E		F		G		H	
Cat. No. Prefix	Trip Range (Amperes)	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm
PFI	15–100 A	16.38	416	8.50	216	8.00	203	9.12	232	1.00	25	1.38	35	2.00	51	11.00	279
PKI	125–250 A	16.38	416	8.50	216	8.00	203	9.12	232	1.00	25	1.38	35	2.00	51	11.00	279

I-Limiter Current-Limiting Circuit Breaker Plug-In Units—15–250 A Specifications

Circuit Breaker		Weight (Approx.)		Lugs Per Phase and Neutral		Ground Lugs	
Cat. No. Prefix	Trip Range (Amperes)	Lb	Kg	Qty.	Size	Qty.	Size
PFI	15–30 A	32.0	15	1	#14 – 4	1	#6 – 1/0
PFI	35–100 A	32.0	15	1	#14 – 1/0	1	#6 – 1/0
PKI	125–250 A	53.0	24	1	#6 – 300 kcmil	1	#10 – #2



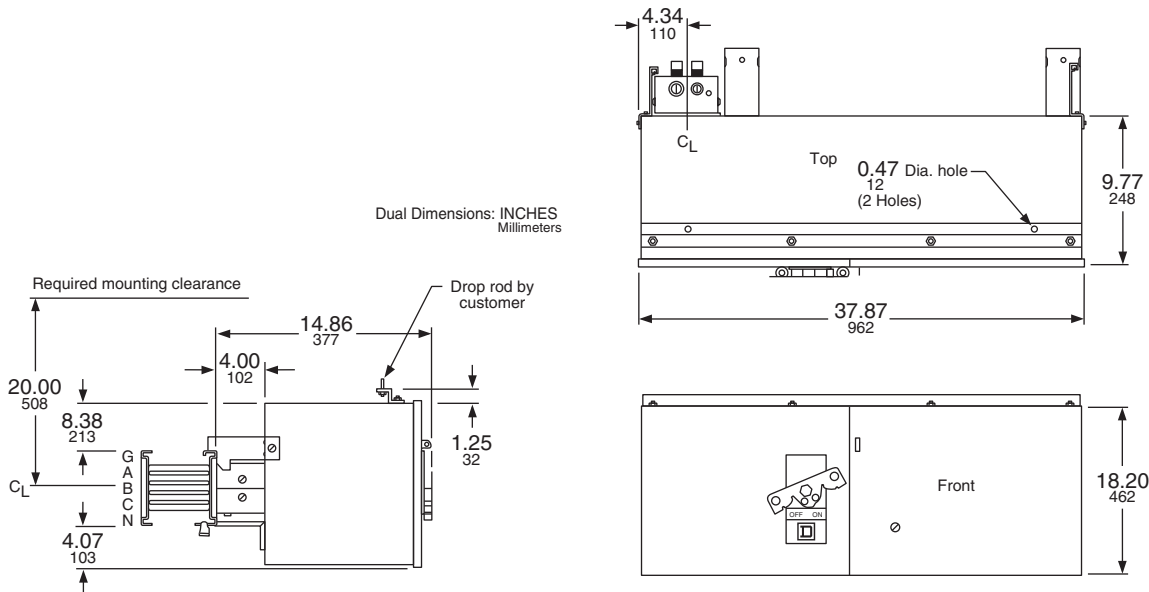
Section 9—Plug-In Units—Bus Plugs
I-Limiter® Current-Limiting Circuit Breaker Plug-In Units—300–600 A

I-Limiter® Current-Limiting Circuit Breaker Plug-In Units—300–600 A

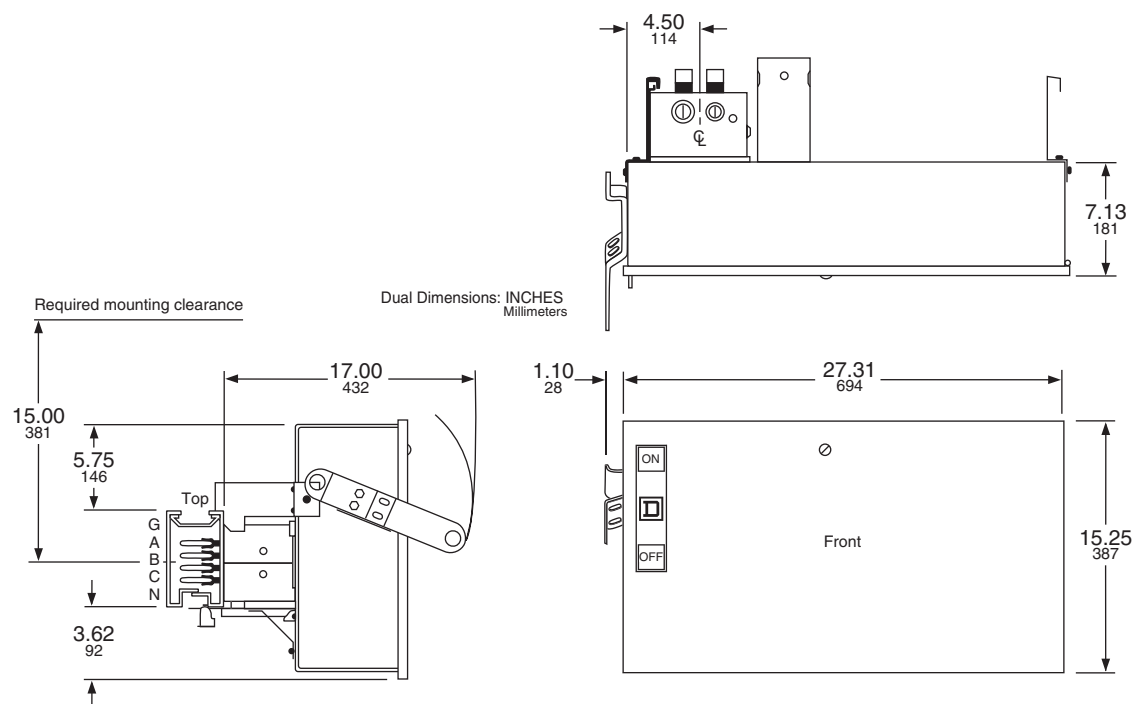
I-Limiter Current-Limiting Circuit Breaker Plug-In Units—300–600 A Specifications

Circuit Breaker		Weight (Approx.)		Lugs Per Phase		Ground Lugs	
Cat. No. Prefix	Triple Range (Amperes)	Lb	Kg	Qty.	Size	Qty.	Size
PBLXI, PBLI	300–600	127.0	58	2	1/0-600 kcmil	1	#6 – 300 kcmil

NOTE: These units plug into one opening, but require space equal to two plug-in openings.



Circuit Breaker Plug-In Units—250–400 A



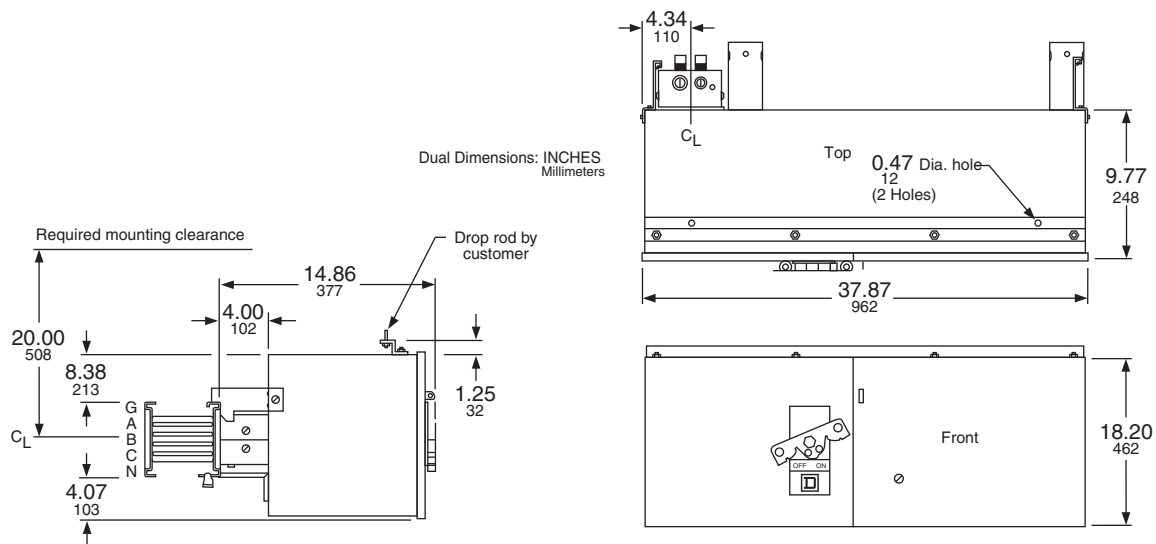
Circuit Breaker Plug-In Units—250–400 A Specifications

Circuit Breaker		Weight (Approx.)		Lugs Per Phase and Neutral		Ground Lugs	
Cat. No. Prefix	Triple Range (Amperes)	Lb	Kg	Qty.	Size	Qty.	Size
PBLA, PBLH	250–400	78	35	1	#1 – 600 kcmil	1	#6 – 300 kcmil

NOTE: These units plug into one opening, but require space equal to two plug-in openings.

Section 9—Plug-In Units—Bus Plugs
Circuit Breaker Plug-In Units—300–600 A

Circuit Breaker Plug-In Units—300– 600 A



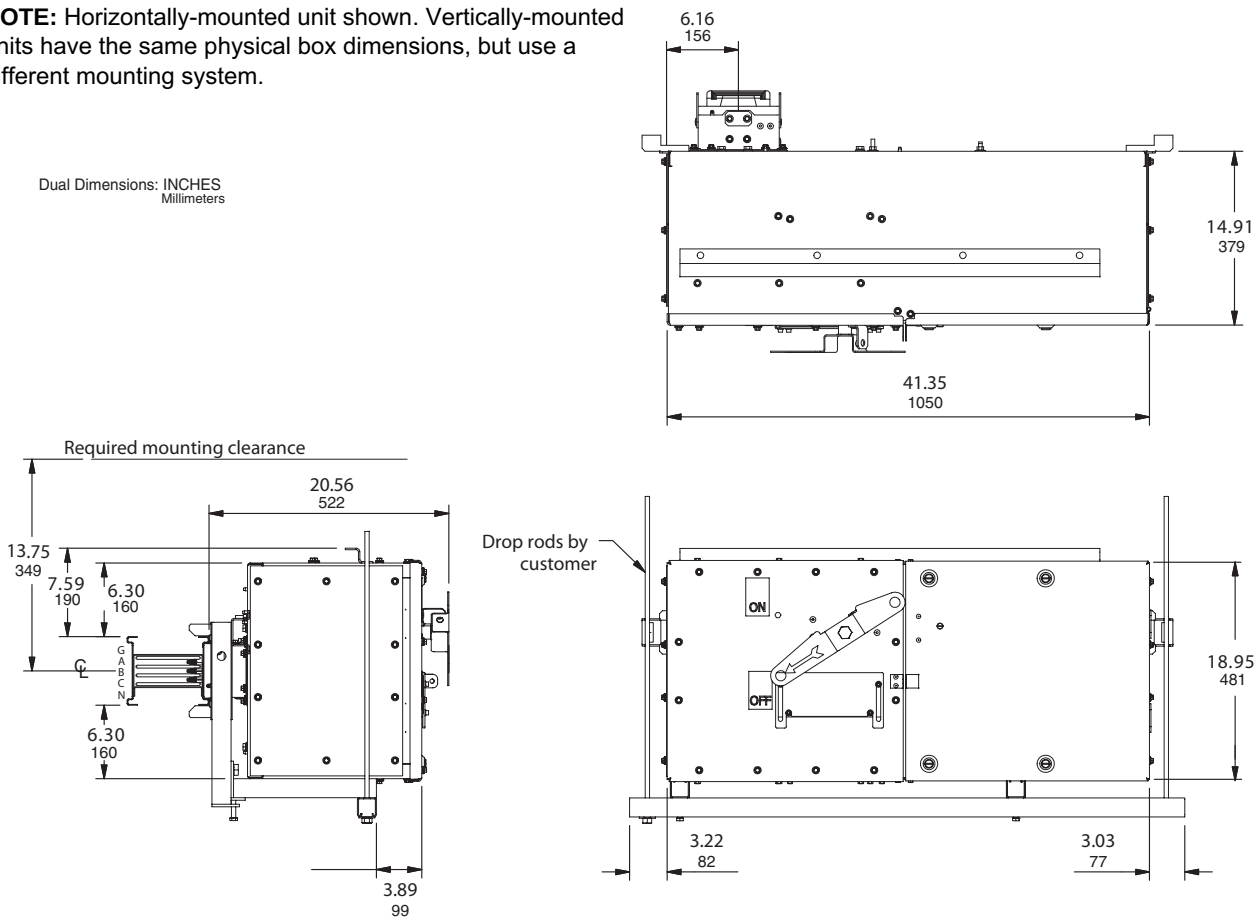
Circuit Breaker Plug-In Units—300–600 A Specifications

Circuit Breaker		Weight (Approx.)		Lugs Per Phase		Ground Lugs		Lugs On Neutral	
Cat. No. Prefix	Triple Range (Amperes)	Lb	Kg	Qty.	Size	Qty.	Size	Qty.	Size
PBLC, PBLE, PBLX	300-600	127.0	58	2	1/0-600 kcmil	1	#6 – 300 kcmil	2	1/0 – 600 kcmil

NOTE: These units plug into one opening but require space equal to two plug-in openings.

Circuit Breaker Bolt-On Units—250–1200 A

NOTE: Horizontally-mounted unit shown. Vertically-mounted units have the same physical box dimensions, but use a different mounting system.



NOTE: Bolt-on units to be used only on plug-in busway with the same number of poles. Not for use on 800 A copper busway.

Circuit Breaker Bolt-On Units—250–1200 A Specifications

Circuit Breaker		Weight (Approx.)		Lugs Per Phase and Neutral		Ground Lugs	
Cat. No. Prefix	Triple Range (Amperes)	Lb	Kg	Qty.	Size	Qty.	Size
PTMG, PTMJ	300-800	284	92	3	3/0 – 500 kcmil	4	6 – 300 kcmil
PTPG, PTPJ	250-800	284	92	3			
	1000-1200	304	101	4			

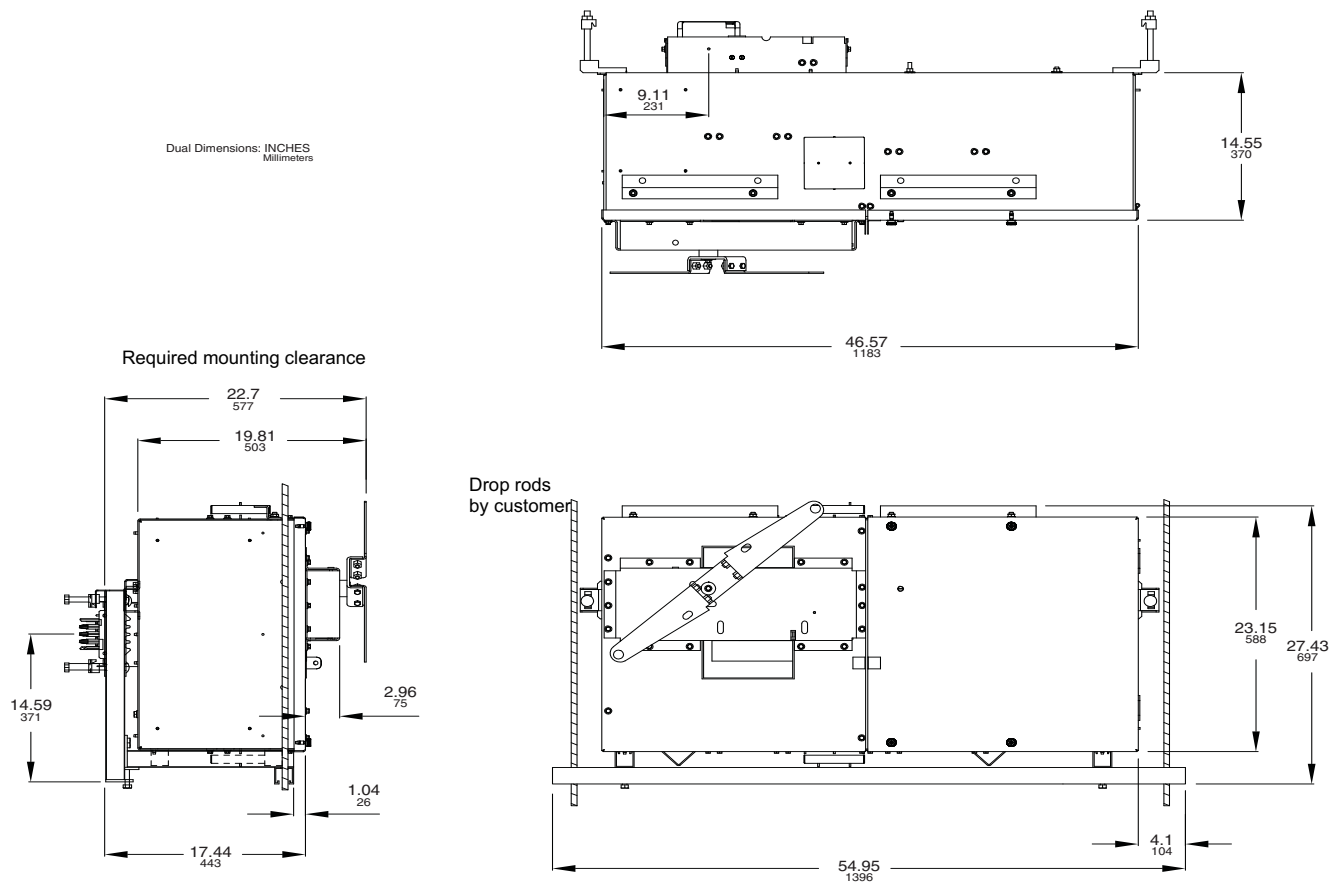
NOTE: These units plug into one opening, but require space equal to two plug-in openings.

NOTE: These units are available with the IP54 option and will be the same enclosure dimensions as shown above.

Section 9—Plug-In Units—Bus Plugs
Circuit Breaker Bolt-On Units—600–1600 A

Circuit Breaker Bolt-On Units—600–1600 A

NOTE: Horizontally-mounted unit shown. Vertically-mounted units have the same physical box dimensions, but use a different mounting system.



NOTE: Bolt-on units to be used only on plug-in busway (800–4000 A—except 800 A copper I-Line II) with the same number of poles (e.g., do not use 3-pole unit on 3Ø4W busway or 3Ø4W unit on 3-pole busway).

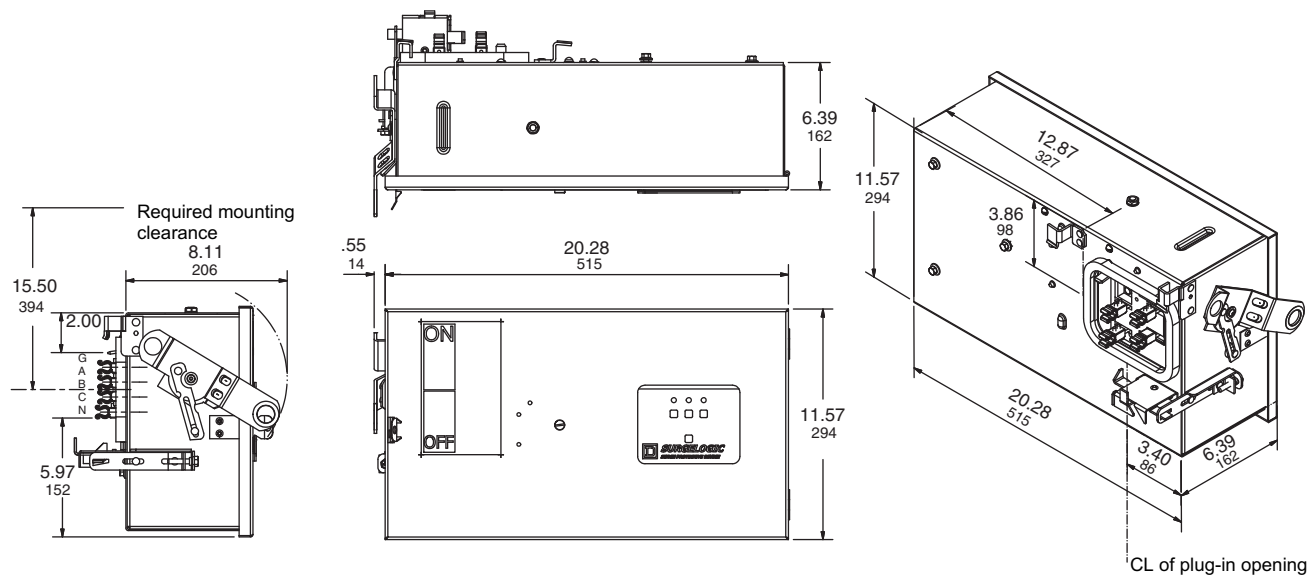
Circuit Breaker Bolt-On Units—600–1600 A Specifications

Circuit Breaker		Weight (Approx.)		Lugs Per Phase and Neutral		Ground Lugs	
Cat. No. Prefix	Triple Range (Amperes)	Lb	Kg	Qty.	Size	Qty.	Size
PTRG, PTRJ, PTRL	600–1600	315	143	6	#1– 600 kcmil	6	#6 – 300 kcmil

NOTE: These units plug into one opening, but require space equal to two plug-in openings.

NOTE: These units are available with the IP54 option. Contact Schneider Electric for IP54 enclosure dimensions.

Surge Protective Devices



Surge Protective Devices—Surge Capacity

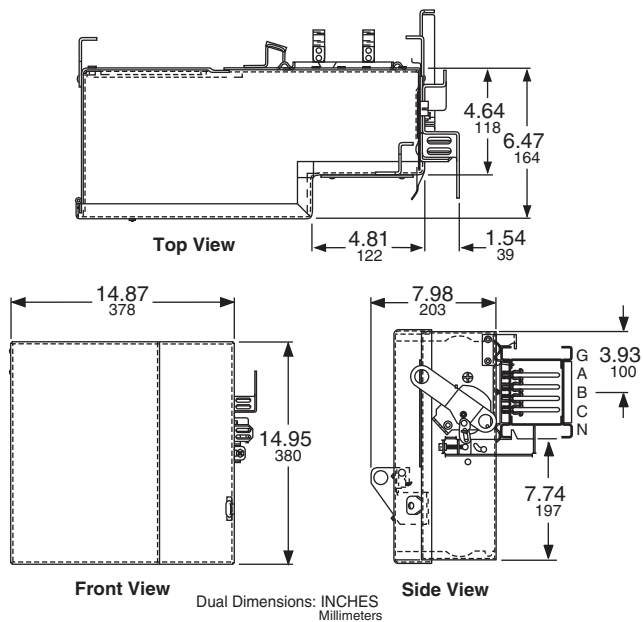
160,000 Amperes Per Phase			
Voltage Rating	Catalog Number	Weight	
		Lbs	Kgs
208Y/120 Vac	PIU21MA16	34	16
240Y/120 Vac	PIU31MA16	34	16
480Y/277 Vac	PIU41MA16	34	16
600Y/347 Vac	PIU81MA16	34	16
240,000 Amperes Per Phase			
Voltage Rating	Catalog Number	Weight	
		Lbs	Kgs
208Y/120 Vac	PIU21MA24	34	16
240Y/120 Vac	PIU31MA24	34	16
480Y/277 Vac	PIU41MA24	34	16
600Y/347 Vac	PIU81MA24	34	16

NOTE: These devices are available with the IP54 option.

Section 9—Plug-In Units—Bus Plugs

Combination Fusible Switch and Starter / Lighting Contactor / Contactor

Combination Fusible Switch and Starter / Lighting Contactor / Contactor



Fusible Switch and Starter / Lighting Contactor / Contactor

Cat. No. Prefix	Starter or Contactor Size	Lighting Contactor Size	Fusible Switch Rating
PSS, PSC	0-1	—	30–60 A
	2	—	60 A
	2	—	100 A
PSL	—	30 A	30 A
	—	60 A	60 A
	—	100 A	100 A

NOTE: All device ratings fit in the same enclosure dimensions as shown above.

Fusible Switch Starters and Contactors—Ratings and Dimensions

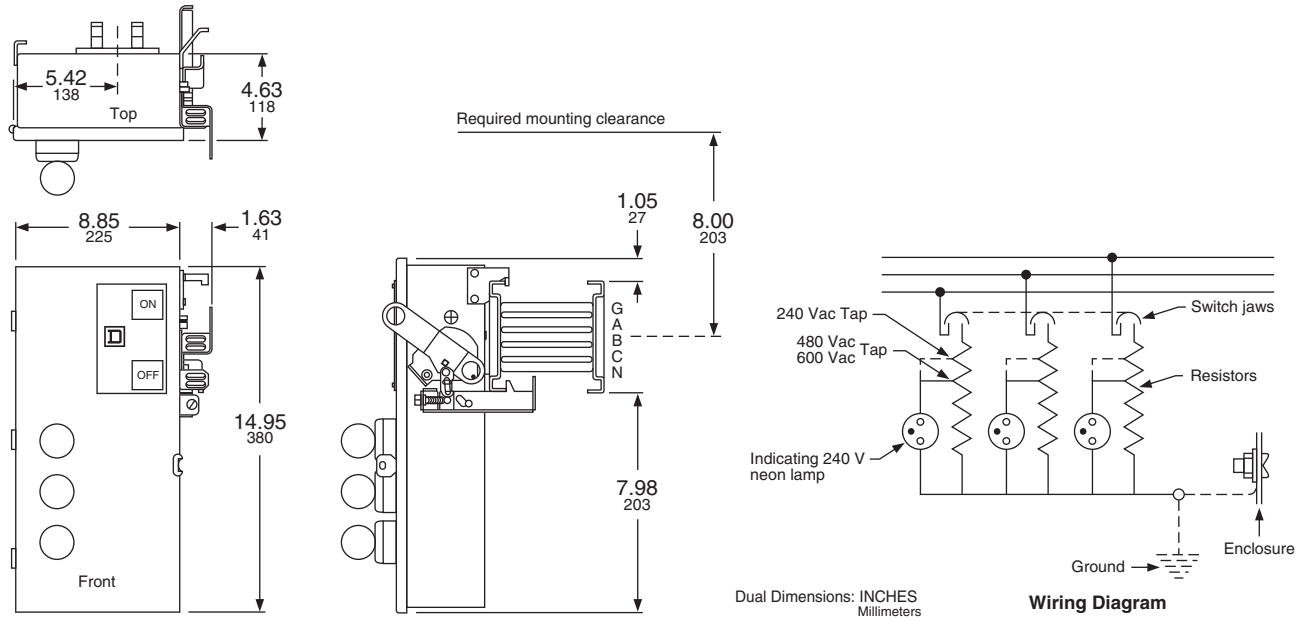
Fusible Switch Starter and Contactor			A		F		H	
Cat. No. Prefix	Starter or Contactor Size	Switch Rating	IN	mm	IN	mm	IN	mm
PSS, PSC	0 – 1	30-60 A	27.40	696	2.13	54	10.00	254
	2	60 A	29.58	751	3.38	86	10.00	254
	2	100 A	33.42	849	9.38	238	12.00	305

Fusible Switch Lighting Contactor		A		F		H	
Cat. No. Prefix	Contactor and Switch Rating	IN	mm	IN	mm	IN	mm
PSL	30 A ¹	29.58	751	3.38	86	10.00	254
	30 ² – 60 – 100 A	33.42	849	9.38	238	12.00	305

¹ 30 A unit with electrically held contactor.

² 30 A unit with mechanically held contactor.

Ground Detector and Neutralizer



NOTE: The ground detector and neutralizer plug-in unit consists of a disconnect, a high resistance connection from each phase-to-ground, and neon indicating lights wired in parallel with the resistors. The resistors provide a discharge path for high transient voltages that can be impressed temporarily on the busway system.

The neon indicating lights provide visual indication of grounds in a 3Ø3W ungrounded system. Operation of the lights is such that under normal conditions all three lights glow dimly under half voltage. If one phase goes to ground, the indicating light associated with that phase goes out while the other two assume full brilliance under full voltage conditions.

Ground Detector and Neutralizer—Catalog Numbers and Weights

Voltage Rating	Catalog Number	Weight	
		Lb	Kg
240 Vac	PGD-3200G	16.0	35
600 Vac	PGD-3600G	16.0	35

Combination Circuit Breaker and Starter—Contactor



Circuit Breaker and Contactor			A		B		C		D		E		F		G		H	
Cat. No. Prefix	Starter or Contactor Size	Breaker Rating	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm
PBS, PBC	0, 1, 2	15-90 A	20.42	519	9.76	248	6.19	157	8.50	216	1.00	25	2.75	70	1.63	41	10.00	254

Section 10—Suggested Busway Specifications

1.0 General

1.1 Quality Assurance

All busway products shall be manufactured in a facility that is Quality Systems Registered by Underwriters Laboratories (UL) to:

- ISO9001: 2000
- EN29001: 2000
- BS5750 Part 1: 2000
- ANSI/ASQCQ91: 2000

1.2 Regulatory Requirements

Underwriters Laboratories Listing

- A. All straight lengths, fittings, and plug-in units shall be UL Listed.
- B. This listing shall include mounting of the busway in any position (e.g., horizontal flatwise, horizontal edgewise, and vertical) without derating.

1.3 Delivery, Storage, and Handling

Refer to NEMA Type Publication BU1.1, which is a guide for proper installation, operation, and maintenance of busway products.

1.4 Maintenance

Refer to NEMA Type Publication BU1.1, which is a guide for proper installation, operation, and maintenance of busway products.

2.0 Products

2.1 Manufacturers

All busway shall be I-Line™/ I-Line II busway, manufactured by Schneider Electric.

2.2 Manufactured Units

General

- A. Furnish and install a complete low impedance prefabricated busway distribution system as shown on the plans.
- B. Busway shall be ___ Volts, ___ phase ___ wire with 50% capacity integral ground bus.
- C. The ampere ratings, approximate footage, fitting, plug-in units, etc., are shown on the plan. The electrical contractor shall be responsible for routing the busway to coordinate with the other trades. Final field measurements shall be made by the contractor prior to release of the busway for fabrication by the manufacturer.

Section 10—Suggested Busway Specifications

2.0 Products

Short Circuit Rating and Tests

- A. The short circuit rating of the busway shall be (consulting engineer's calculated required rating ___)RMS symmetrical amperes, which is the ultimate anticipated short circuit current available at the source.
- B. The short circuit rating of the busway shall be determined according to UL Standards 857. This rating must be based upon actual tests at the rated short circuit current.

2.3 Basic Construction

Housing

- A. The busway housing shall be constructed of code gauge steel and aluminum to reduce hysteresis and eddy current losses and shall be provided with a suitable protective finish of ANSI 49 gray epoxy paint.
- B. The busway housing shall be totally enclosed non-ventilated for protection against mechanical damage and dust accumulation.
- C. The totally-enclosed housing shall be manufactured by the busway manufacturer. Modifications of busway to make it totally enclosed by other than the busway manufacturer voids the manufacturer's warranty. Busway so modified is unacceptable without the written consent of the manufacturer.

Joints

- A. The busway joint shall be of the one-bolt type that utilizes a high strength steel bolt(s) and conical washers to maintain proper pressure over a large contact surface area.
- B. The bolt shall be torque-indicating and at ground potential.
- C. The bolt shall be two-headed design to indicate when proper torque has been applied and require only a standard long handle wrench to be properly activated.
- D. Access shall be required to only one side of the busway for tightening joint bolts.
- E. On busway 800 A and above, it shall be possible to remove any joint connection assembly to allow electrical isolation or physical removal of a busway length without disturbing adjacent busway lengths.

Bus Bars

- A. Bus bars shall be plated.
- B. Each bus bar shall be insulated with Class B rated, 266 °F (130 °C) vendor certified, polyester film or epoxy powder coated materials.
- C. The temperature rise at any point in the busway shall not exceed 131 °F (55 °C) rise above ambient temperature when operating at rated load current.
- D. Both feeder and plug-in busway (800 A and above) shall be of sandwich construction, meaning no air gaps shall exist between bus bars except at plug-in openings.

Plug-In Openings

- A. On plug-in busway, there shall be five deadfront, hinged cover-type plug-in openings on each side of 10-foot (305 cm) lengths.
- B. All openings shall be usable simultaneously.
- C. Busway shall be installed so that plugs are side mounted to permit practical use of all ten plug-in openings.
- D. Each phase position of a plug-in opening shall be individually insulated.
- E. It shall be possible to inspect the plug-in opening and bus bars prior to the installation of the plug-in unit.

Section 10—Suggested Busway Specifications

3.0 Execution

2.4 Support of Busway

- A. Hanger spacing shall be noted on layout drawings and shall not exceed manufacturer's recommendations.
- B. Indoor feeder and plug-in busway shall be approved for hanger spacing of up to 10 ft (305 cm) for horizontally mounted runs and 16 ft (488 cm) for vertically-mounted runs. Outdoor feeder busway shall be approved for spacing of up to 5 ft (152 cm) for horizontally-mounted runs or 10 ft (305 cm) for vertically-mounted runs.

2.5 Voltage Drop

- A. The voltage drop (input voltage minus output voltage) specified shall be based on the busway operating at full rated current and at stabilized operating temperature in 86 °F (30 °C) ambient.
- B. The three-phase, line-to-line voltage drop shall not exceed 3.1 Volts per hundred feet at 40% power factor concentrated load that exist during motor starting.
- C. The line-to-line voltage drop shall not exceed 4.0 Volts per hundred feet at the load power factor that produces maximum voltage drop in the busway.

2.6 Plug-In Units

- A. Plug-in units shall be [circuit breaker type] [fusible switch type with visible blade quick-make and quick-break mechanism].
- B. Plug-in units that cannot be operated directly from the floor shall be equipped with suitable means for hookstick operation.
- C. The interrupting rating of circuit breaker plug-in units shall be ___ RMS symmetrical amperes.

2.7 Plug-In Unit Safety Devices

- A. Each plug-in unit rated 100 A or below shall be mechanically interlocked with the busway housing to prevent installation or removal of plug-in units while the switch is in the ON position, and be equipped with an operating handle that always remains in control of the switching mechanism.
- B. Plug-in enclosures shall make positive ground connection with the ground bus before the jaws make contact with the phase bars.
- C. The ground method shall be such that it cannot be defeated by future painting of the busway housing.
- D. The plug-in units shall be equipped with internal barriers to prevent accidental contact of fish tape and conductors with live parts on the line side of the protective device during time of wire pulling.
- E. Covers of all plug-in units must have interlocks to prevent the cover from being opened when the switch is in the ON position.

3.0 Execution

3.1 Installation

- A. Install busway and accessories in accordance with manufacturer's instructions. Additional instructions are detailed in NEMA Type publication BU1.1, which is provided with the equipment by the electrical manufacturer.
- B. Install busway length with expansion fitting at each location where busway run crosses building expansion.
- C. Provide curb around interior floor penetrations.
- D. Install busway with integral weather seal located where busway penetrates [exterior wall] [roof]. Provide [wall] [roof] flange and seal around opening to maintain weather tight installation.

Section 10—Suggested Busway Specifications
3.0 Execution

Section 11—Powerbus™ Plug-in Busway

Product Descriptions

Powerbus™ plug-in busway, manufactured by Schneider Electric, was designed specifically to address the low power distribution needs of industrial and commercial customers. Schneider Electric has applied 50 years of experience in the busway business to develop a reliable low power distribution system that will reduce installation time and cost, as well as provide the flexibility to make future modifications quickly and easily to processes and facilities.

Powerbus Busway System

General Information

Powerbus construction consists of a light-weight electrical grade all-aluminum housing with silver-plated copper conductor bars for maximum electrical efficiency. The total product offering includes straight sections, fittings, accessories, and plug-in units for a total installation. The busway is available in 225 A (240 V) and 100 A (600 V) power ratings in either natural or black color options.

Straight sections of busway are offered in 4 ft (1.5 m) and 10 ft (3 m) lengths. Each opening is rated IP2x against solid object ingress (International Standards IP Protection Classification). Fittings include left and right elbows, tap boxes, and crosses, with accessory items such as hangers, end closures, and wall flanges completing the basic system. For the standard housing offer, there are 10 plug-in openings per 10 ft / 120 in. (3 m / 3048 mm) of busway. For the enhanced housing offer, there are 20 plug-in openings per 10 ft / 120 in. (3 m / 3048 mm) of straight length and 6 plug-in openings per 4 ft / 48 in. (1.5 m / 1500 mm) of straight length. Plug-in units are available in a wide variety of ready-to-assemble and factory-assembled devices.

Splash Resistant Busway System

System reliability and zero downtime is a major concern to busway users. We have designed Powerbus to meet the stringent requirements of the International Standard IEC-60529 to ensure that failures because of contamination, especially water, are avoided.

With standard mounting, the straight sections and fittings are protected to IP54 ratings. This means they are protected from dust that would interfere with the operation of the equipment, as well as water sprayed or splashed from all around the busway at a rate of 2.64 gal/minute (10 L/min.). When busway is installed using the side-mount hangers, the busway will only be protected to an IP40 rating.

Powerbus plug-in units are protected to NEMA 1 as standard. The system degree of protection can be increased to IPX3 (PBPQOR busway only using our standard receptacles) or IP54 with the installation of an optional sealing boot accessory. IPX3 provides protection from water sprayed at up to 60° from the vertical, while IP54 provides dust and water protection to match the busway. The degree of protection for PBPQOR busway can be increased to IPX3 or IP54 using the appropriately rated receptacles.

PBPQOD busway with IP54 protection must be factory ordered.

Seismically Qualified Busway

Powerbus has been seismically qualified to meet the seismic provisions of the International Building Code (IBC), California Building Code (CBC), and ASCE/SEI 7 based on triaxial shake table testing following the code recognized test protocol ICC ES AC156. All qualification shake table testing was conducted by an independent test facility to verify compliance to an $I_p = 1.5$ by verifying post test equipment functionality as required by ASCE 7 for equipment that is part of a seismic designated system.

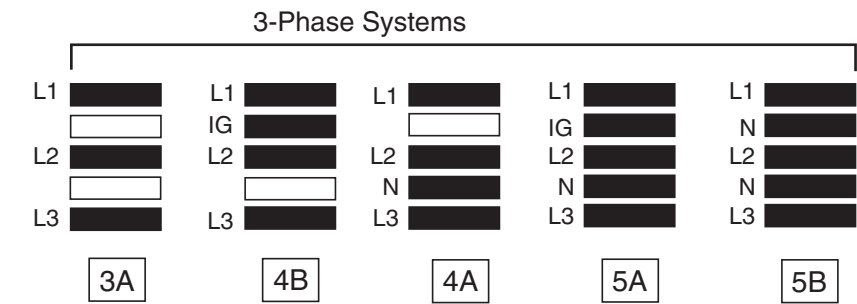
Section 11—Powerbus™ Plug-in Busway
Powerbus Busway System

The shake table earthquake simulation subjected the busway test specimens to dynamic demands that can be more severe than the code design earthquake for most locations. A certificate of self certification is available on request from your local sales office and is based on site specific code defined seismic demand requirements for the installed location information supplied to Schneider Electric.

The qualified busway equipment must be installed, anchored, and restrained in accordance with Schneider Electric installation guidelines. For the purpose of seismic restraint design, the center of gravity is centrally located for all outside linear dimensions for each section or device (as listed along with their respective weights). Anchorage of equipment to the primary building structure is required to validate seismic certification of the equipment. The structural engineer or design engineer of record is responsible for design of the code compliant seismic restraint system for the building equipment. Schneider Electric is not responsible for the specification and performance of seismic restraint and anchorage systems.

Busbar Configuration

Powerbus can be supplied with up to five (5) conductor bars to accommodate a wide range of electrical systems. This includes 200% neutral capability to address applications where harmonic currents are a concern. Powerbus can also provide an isolated ground for electrical systems that require a “clean” ground, in addition to the standard integral ground.



NOTE: Single phase systems are also available. Contact your local Schneider Electric representative.

Maintenance-Free Joint

For maximum reliability, the Powerbus joint employs a high-pressure, spring-type copper connection that requires no maintenance after installation.

Physical and Electrical Data

Short-Circuit Rating

Product	Short-Circuit Current Rating KA, RMS Symmetrical		Impedance ¹ Line-to-Neutral (milliohms / 100 ft)			DC Resistance ¹ of Aluminum Housing Ground (milliohms / 100 ft)
	UL 3-Cycle Test	Series-Connected with Fuse ²	R	X60 Hz	X50 Hz	
225 A	22 kA	200 kA	6.40	4.00	3.33	1.15
100 A	14 kA	200 kA	15.34	7.59	6.32	1.25

¹ Busway impedance and housing ground resistance are at 176 °F (80 °C) operating temperature
² Busway connected in series with a Class J or Class T fuse

Section 11—Powerbus™ Plug-in Busway Powerbus Busway System

Voltage Drop

Product	Voltage Drop (60 Hz @ Rated Load)					
	(Average Phase Line-to-Line Voltage Drop in Volts / 100 ft for Varying Power Factors)					
	100%	90%	80%	70%	60%	50%
225 A	2.494	2.923	2.929	2.858	2.742	2.596
100 A	2.657	2.964	2.914	2.799	2.646	2.467

NOTES:

- Values shown are based on single concentrated load at the end of a busway run. For distributed loading, divide the values shown by two (2).
- For balanced 3-phase line-to-line voltage drop of 4-wire busway, use values from the table above.
- For balanced 3-phase line-to-neutral voltage drop, multiply values by 0.577.
- For single-phase voltage drop, multiply values by 1.15.
- For other than rated current, multiply values by the ratio of: Actual Current ÷ Rated Current
- For total voltage drop, multiply values by the ratio of: Actual Length ÷ 100 ft
- Voltage drop calculations for 50 Hz can be made by substituting the appropriate value from Table 1. For other frequency values, contact Schneider Electric at 1-888-778-2733.

Physical Data

Product	Weights (Based on Busbar Configuration)					Busbar Size
	3 bar	4 bar		5 bar		(The same bar size is used for all configurations.)
						
	3A	4B	4A	5A	5B	
	225 A	4.5 lb/ft	5.1 lb/ft		5.8 lb/ft	
100 A	2.9 lb/ft	3.2 lb/ft		3.4 lb/ft	3.4 lb/ft	.125 x 0.500 inches (3 x 13 mm)

(The same bar size is used for all configurations.)

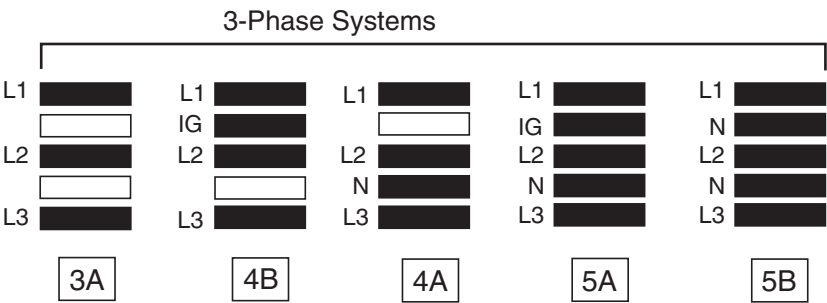
Section 11—Powerbus™ Plug-in Busway
Powerbus Busway System

Catalog Numbering System

Busway Catalog Numbering System

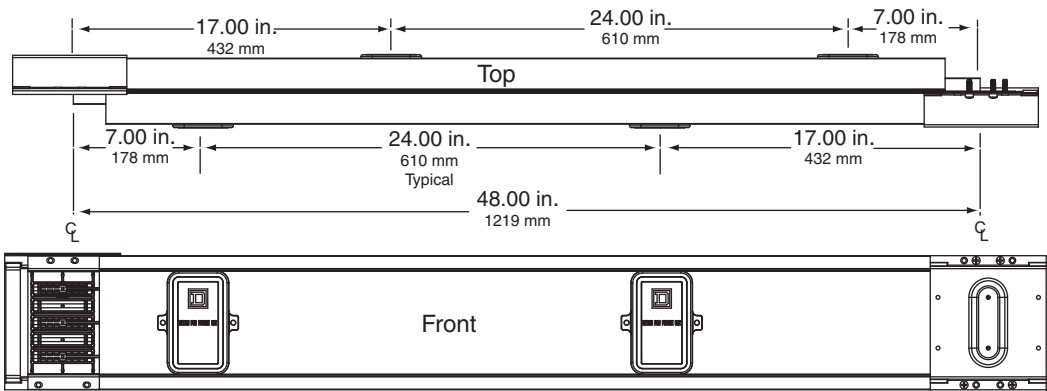
PB	CP	4A Busbar Configuratio n	225 Amperage Rating	ST Type of Device	120 Length	Housing Color
PB = Powerbus	CP = Copper Plug-In Standard (10 plug-in openings per 10 ft / 120 in. (3 m / 3048 mm) CE = Copper Plug-In Enhanced (20 openings per 10 ft / 120 in. (3 m / 3048 mm) CF = Copper Fitting	Refer to the "Busbar Configuration" below.	100 = 100 A 225 = 225 A	ST = Straight Length	120 = 10 ft 048 = 4 ft	Blank = Natural Aluminum B = Black Aluminum
				LL = Elbow Left		
				LR = Elbow Right		
				CR = Cross		
				TB = End Tap Box		

Busbar Configuration



Dimensions—Straight Lengths, Fittings, and Accessories

Straight Lengths—Standard Offer



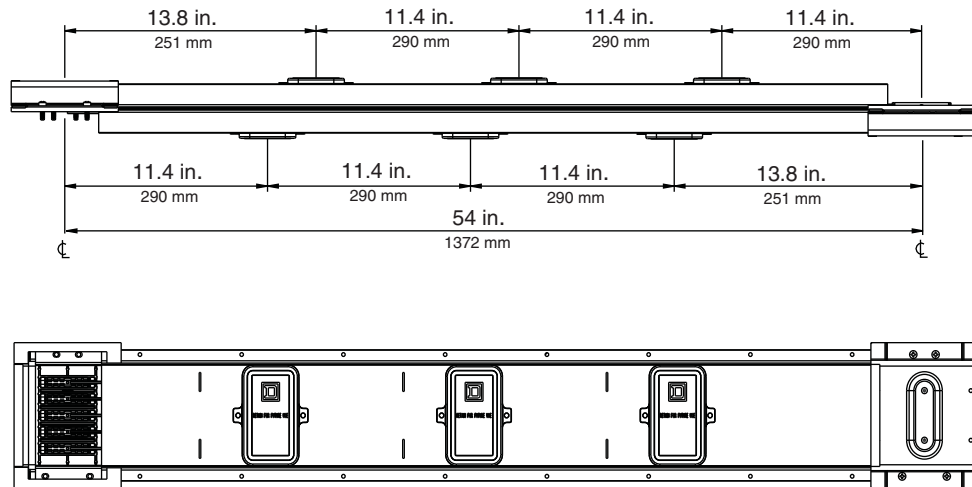
Catalog Numbers: PBCP[‡]225ST048, PBCP[]100ST048

‡ To complete the catalog number, insert the configuration type from the "Busbar Configuration" on page 128.

NOTE: Four-foot straight length shown for clarity. Ten-foot straight length is similar, PBCP[]225ST120, PBCP[]100ST120.

Section 11—Powerbus™ Plug-in Busway Powerbus Busway System

Straight Lengths—Enhanced Offer

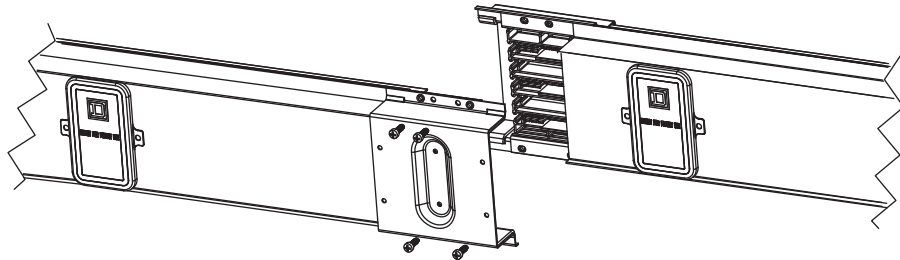


Catalog Numbers: PBCE[‡]225ST048, PBCE[]100ST048

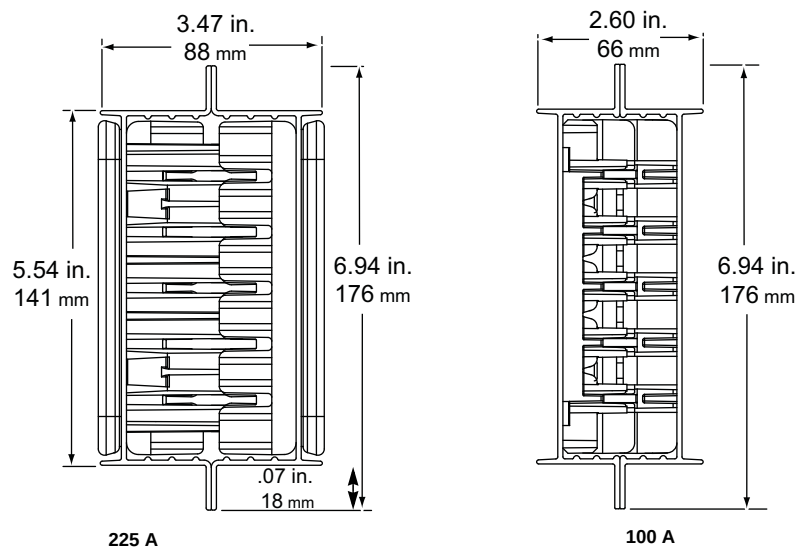
‡ To complete the catalog number, insert the configuration type from the “Busbar Configuration” graphic on page 128.

NOTE: Four-foot straight length shown for clarity. Ten-foot straight length has 10 openings on each side. Catalog numbers are PBCE[]225ST120 and PBCE[]100ST120.

Joint Detail

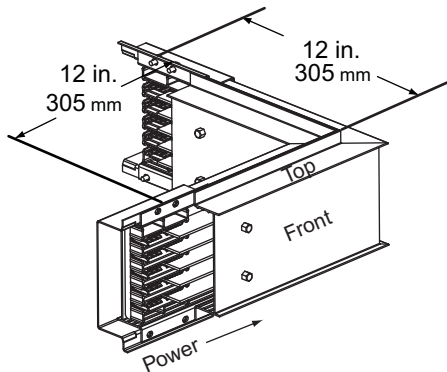


Cross Sections



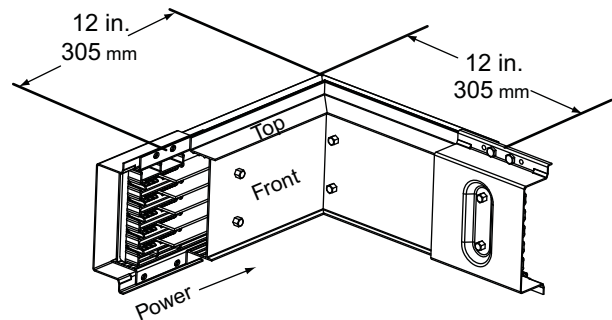
Section 11—Powerbus™ Plug-in Busway Powerbus Busway System

Elbow Left



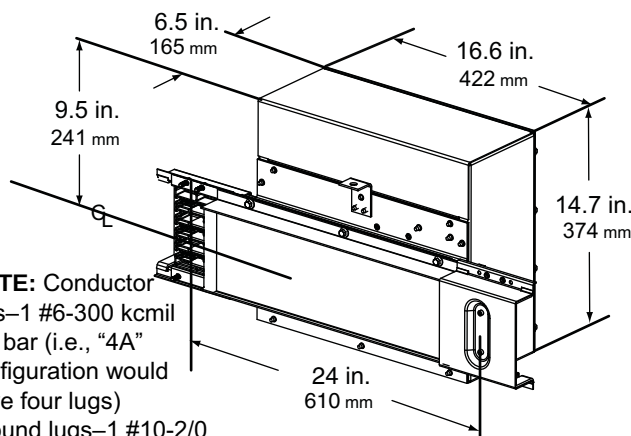
Catalog Number: 225 A = PBCF[‡]225LL, 100 A = PBCF[‡]100LL

Elbow Right



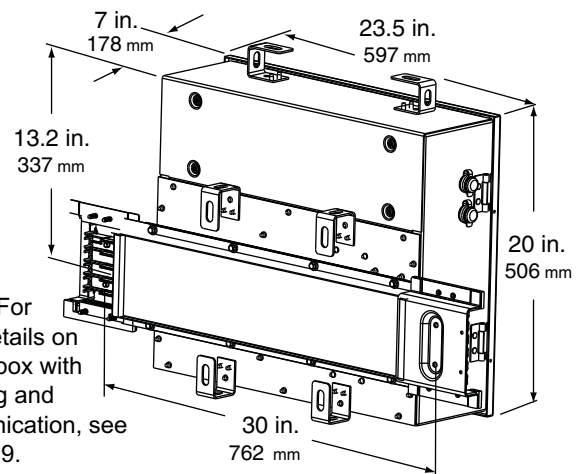
Catalog Number: 225 A = PBCF[‡]225LR, 100 A = PBCF[‡]100LR

Tap Box



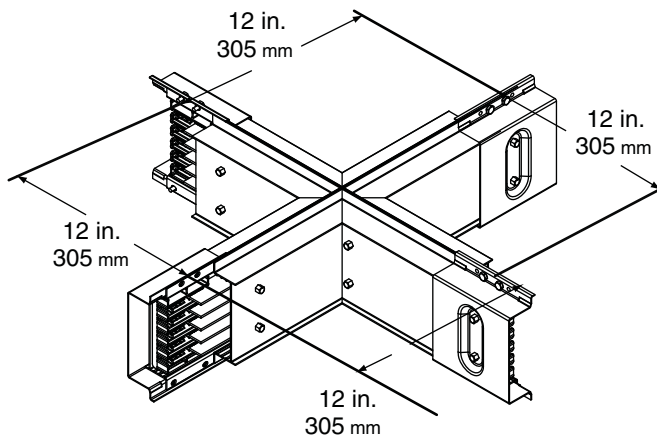
Catalog Number: 225 A = PBCF[‡]225TB, 100 A = PBCF[‡]100TB

Tap Box with Metering and Communication



Catalog Number:
Bottom Feed Unit: 225 A = PBCF[‡]225TBM()U, 100 A = PBCF[‡]100TBM()U,
Top Feed Unit: 225 A = PBCF[‡]225TBM()L, 100 A = PBCF[‡]100TBM()L

Cross

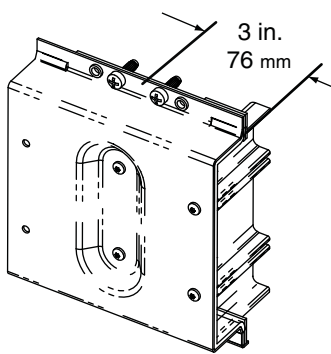


Catalog Number: 225 A = PBCF[‡]225CR, 100 A = PBCF[‡]100CR

‡ To complete the catalog number, insert the configuration type from the “Busbar Configuration” on page 128.

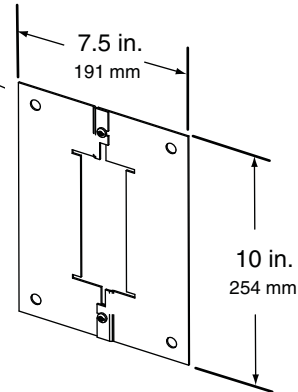
Section 11—Powerbus™ Plug-in Busway Powerbus Busway System

End Closure



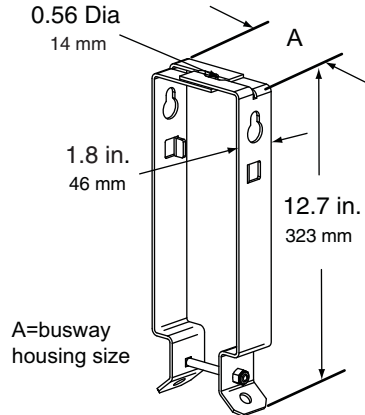
Catalog Number:
225 A = PB225EC
100 A = PB100EC

Wall Flange



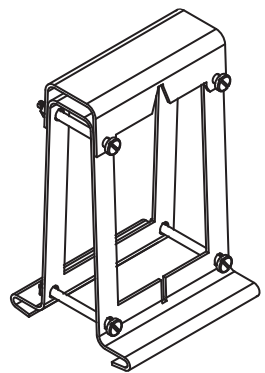
Catalog Number:
225 A = PB225WF
100 A = PB100WF

Standard Hanger■



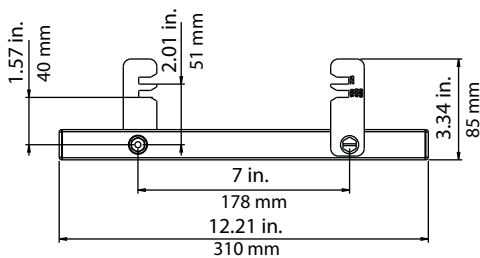
Catalog Number:
225 A = PB225HF
100 A = PB100HF

Support Clamp



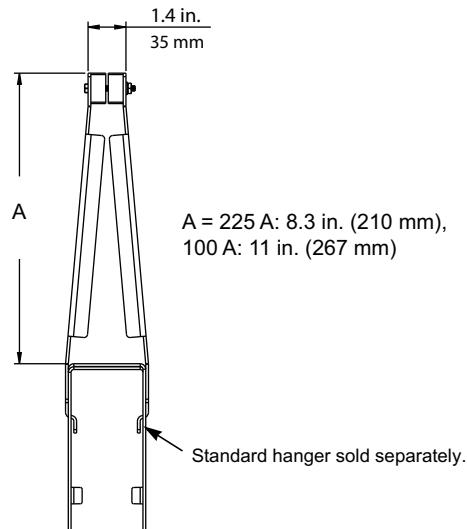
Catalog Number:
PB225SC_ (Suitable for 225 A and 100 A busway. Insert 4 or 6 for fastening clamp to 4-inch or 6-inch I-Beam)

Side-Mount Hanger■



Catalog Number:
225 A = PB225HFW
100 A = PB100HFW

Vertical Sway Brace■



A = 225 A: 8.3 in. (210 mm),
100 A: 11 in. (267 mm)

Standard hanger sold separately.

Catalog Number:
225 A = PB225VSB
100 A = PB100VSB

■ Nuts and drop rods provided by customer.

Section 11—Powerbus™ Plug-in Busway

Powerbus Plug-In Units

Powerbus Plug-In Units

General Information

Powerbus plug-in units provide a safe, reliable, and easy-to-use method for tapping power off the busway exactly where it is needed. FA units are rated maximum of 100 A / 600 V, and QO/QOR/QOD units are rated 100 A / 240 V. All units are protected to NEMA 1. An optional kit can raise the level of protection to IP54 on FA/QO units; the same kit raises a receptacle-type unit (QOR) to IPX3. QOD units can be ordered with IP54 rating from the factory only.

Ready-to-Assemble Plug-In Units

These (“enclosure only”) devices have provisions for field-mounting of a variety of FA or QO type circuit breakers and receptacles if required:

- Tap Box (Plug-In): For cabling power from busway
- FA Plug-In Unit: With provisions to accommodate field-installed FA circuit breakers
- QO Plug-In Unit: With provisions to accommodate field-installed QO circuit breakers
- QOR Plug-In Units: With provisions to accommodate field-installed QO circuit breakers plus receptacles

NOTE: Only three breaker spaces are available for all the units listed above.

Factory-Assembled Plug-In Units

As a convenient option, Schneider Electric will factory install the FA or QO circuit breakers (and receptacles, if desired) into the enclosure and completely wire them so the units are ready for immediate installation onto the busway as soon as they arrive in the field.

QOD plug-in units are factory-installed with QOU circuit breakers plus drop cords and connectors.

NOTES:

- The QOD devices are only available as factory-assembled.
- Six breaker spaces are available for the QOD unit.

Circuit Breakers

Circuit Breaker	Ampere Rating	Number of Poles
QO	10–100 ¹	1, 2, or 3
QOB		
QOU		
QOGFI	15–60	
QOBGFI		
FA	15–100	3

¹ QO/QOB/QOU is 70 A maximum on single-pole circuit breakers.

Receptacles

Receptacle	Ampere Rating	Number of Poles
Duplex—Commercial	10–30	1, 2, or 3
Duplex—Industrial		
Duplex—Isolated Ground		
Locking		
Locking—240 V		

Section 11—Powerbus™ Plug-in Busway

Powerbus Plug-In Units

Ratings

Plug-In Device	Standard Rating	Optional Rating ¹
Tap Box ²	IP54	Same
QOR	NEMA 1	IPX3 using optional kit, PBP54100QO IP54 using optional kit, PBP54100QO IP54 using optional kit, PBP54100FA
QO	NEMA 1	
FA	NEMA 1	
QOD ³	NEMA 1	IP54 only factory assembled

¹ The degree of protection can be increased to IP43 or IP54 using the appropriately rated receptacles.

² The tap box with metering will only have an IP40 rating.

³ IP54 only available for a maximum of three breaker spaces.

Catalog Numbering System

Ready-to-Assemble Plug-In Unit Catalog Numbering System¹

PB	P	QOR	5A	100	PX3
		Type of Device	Plug-In Jaw Configuration	Maximum Amperage Rating	IP Rating
PB = Powerbus	P = Plug-In Device	QO = QO circuit breaker only	Refer to the "Busbar Configuration Table" on page 134.	100	PX3 = IPX3 P54 = IP54
		QOR = QO circuit breaker and receptacle			
		FA = FA circuit breaker			
		TB = Tap Box			

¹ The circuit breakers and receptacles are provided by others.

Factory-Assembled Plug-In Unit Catalog Numbering System

PB	P	QOR	5A	100	P54	M1	15B
		Type of Device	Plug-In Jaw Configuration	Maximum Amperage Rating	IP Rating	Receptacle Configuration	Circuit Breaker and Rating
PB = Powerbus	P = Plug-In Device	QO = QO circuit breaker only	Refer to the "Busbar Configuration Table" on page 134.	100	PX3 = IPX3 (QOR only) P43 = IP43 P54 = IP54	Refer to the "Receptacle/Circuit Breaker Type Configuration" Table below and the "Plug-In Units (Factory-Assembled)" Tables on page 136.	15 = 15 Amp QO
		QOR = QO circuit breaker and receptacle					15B = 15 Amp QOB
		FA = FA circuit breaker					20 = 20 Amp QO
		TB = Tap Box					20B = 20 Amp QOB

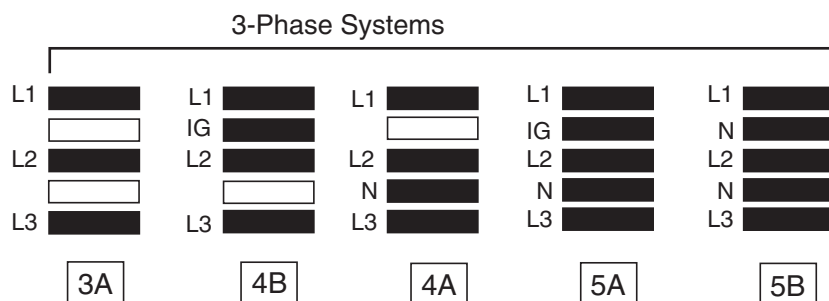
Factory-Assembled Plug-In Unit Catalog Numbering System—QOD Devices

PBP	QOD	4A	100	P54	O	F	O	L21	15	H
	Type of Device	Plug-In Jaw Configuration	Maximum Amperage Rating	Protection Rating	1st Circuit Breaker Position	2nd Circuit Breaker Position	3rd Circuit Breaker Position	Connector Type	Circuit Breaker Amperage Rating	SCCR Ratings
Powerbus plug-in device	QOD = QOU breaker with drop cords	Refer to the "Busbar Configuration Table" on page 134.	100 A	Blank = NEMA 1 P54 = IP54	Use and drop cord length Refer to "Drop Cord Lengths for QOD Devices" on page 134.	Use and drop cord length Refer to "Drop Cord Lengths for QOD Devices" on page 134.	Use and drop cord length Refer to "Drop Cord Lengths for QOD Devices" on page 134.	Refer to the "NEMA Receptacles (R) and Connectors (C)" on page 138.	15–60 A	Blank = 10 kA H = 22 kA

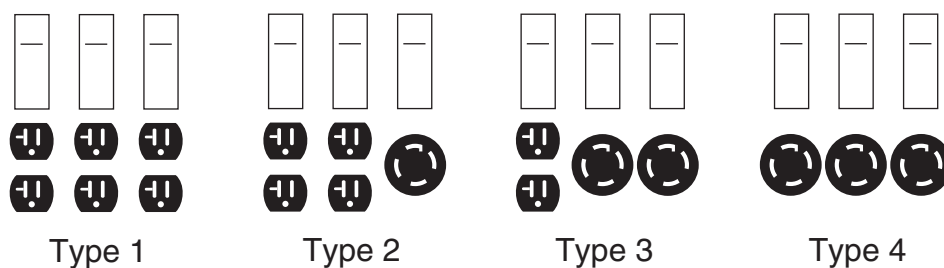
Section 11—Powerbus™ Plug-in Busway

Powerbus Plug-In Units

Busbar Configuration Table



Receptacle/Circuit Breaker Type Configuration



Drop Cord Lengths for QOD Devices

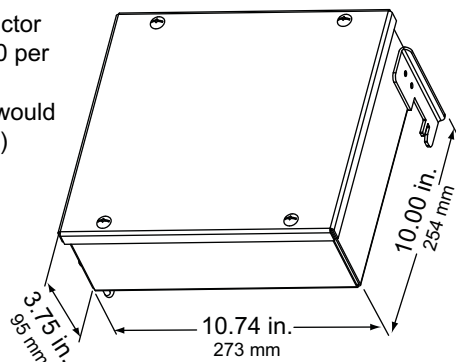
Positions											
B	C	D	E	F	G	H	I	J	K	L	O
2 ft (0.6 m)	3 ft (0.9 m)	4 ft (1.2 m)	5 ft (1.5 m)	6 ft (1.8 m)	7 ft (2.0 m)	8 ft (2.4 m)	9 ft (2.7 m)	10 ft (3.0 m)	11 ft (3.4 m)	12 ft (3.7 m)	OPEN (No breaker/drop cord for this position)

Section 11—Powerbus™ Plug-in Busway Powerbus Plug-In Units

Plug-In Units (Ready-to-Assemble)

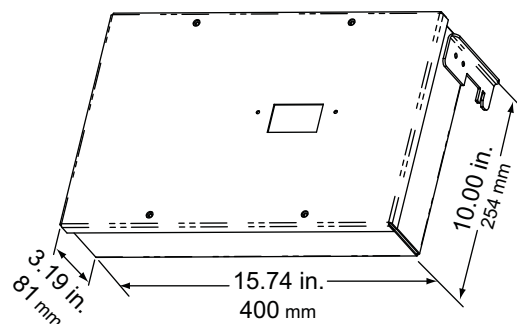
Tap Box (For Conduit-Cable)
Weight: 10 lbs. (5 kg)

NOTE: Conductor lugs—1 #14-1/0 per bar (i.e., “4A” configuration would have four lugs)
Ground lugs—1 #14-1/0



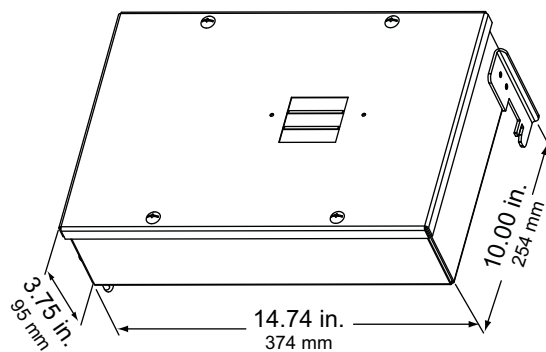
Busbar Configurations	Catalog Number
3A	PBP TB 3A 100
4B	PBP TB 4B 100
4A	PBP TB 4A 100
5A	PBP TB 5A 100

FA Unit (Provision for One 3-Phase FAP Breaker)
Weight: 13 lbs. (6 kg)



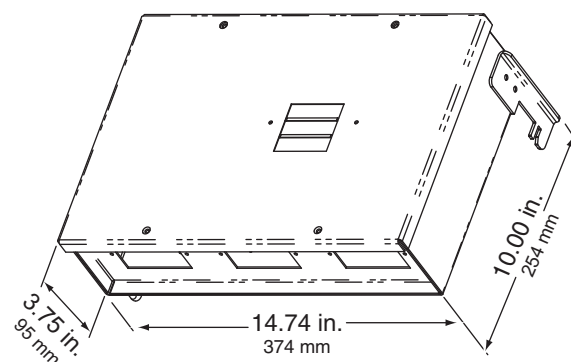
Busbar Configurations	Catalog Number
3A	PBP FA 3A 100
4B	PBP FA 4B 100
4A	PBP FA 4A 100
5A	PBP FA 5A 100

QO Unit (Provision for Three QO/QOB Breakers)
Weight: 13 lbs. (6 kg)



Busbar Configurations	Catalog Number
3A	PBP QO 3A 100
4B	PBP QO 4B 100
4A	PBP QO 4A 100
5A	PBP QO 5A 100

QOR Unit (Provision for Three QO/QOB Breakers and Three Receptacles)
Weight: 13 lbs. (6 kg)



Busbar Configurations	Catalog Number
3A	PBP QOR 3A 100
4B	PBP QOR 4B 100
4A	PBP QOR 4A 100
5A	PBP QOR 5A 100

NOTE: For both Isolated Ground (IG) or 200% Neutral ready-to-assemble units, use configuration 5A.

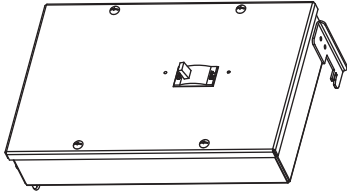
Section 11—Powerbus™ Plug-in Busway

Powerbus Plug-In Units

Plug-In Units (Factory-Assembled)

FA Unit with Circuit Breaker—600 V Maximum

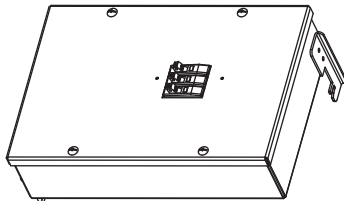
FA Unit with Circuit Breaker
Weight: 17 lbs. (8 kg)



Breaker Rating	Catalog Number				
	3A Configuration	4B Configuration	4A Configuration	5A Configuration	5B Configuration
15	PBPFA3A100A015	PBPFA4B100A015	PBPFA4A100A015	PBPFA5A100A015	PBPFA5B100A015
20	PBPFA3A100A020	PBPFA4B100A020	PBPFA4A100A020	PBPFA5A100A020	PBPFA5B100A020
30	PBPFA3A100A030	PBPFA4B100A030	PBPFA4A100A030	PBPFA5A100A030	PBPFA5B100A030
40	PBPFA3A100A040	PBPFA4B100A040	PBPFA4A100A040	PBPFA5A100A040	PBPFA5B100A040
50	PBPFA3A100A050	PBPFA4B100A050	PBPFA4A100A050	PBPFA5A100A050	PBPFA5B100A050
60	PBPFA3A100A060	PBPFA4B100A060	PBPFA4A100A060	PBPFA5A100A060	PBPFA5B100A060
70	PBPFA3A100A070	PBPFA4B100A070	PBPFA4A100A070	PBPFA5A100A070	PBPFA5B100A070
80	PBPFA3A100A080	PBPFA4B100A080	PBPFA4A100A080	PBPFA5A100A080	PBPFA5B100A080
90	PBPFA3A100A090	PBPFA4B100A090	PBPFA4A100A090	PBPFA5A100A090	PBPFA5B100A090
100	PBPFA3A100A100	PBPFA4B100A100	PBPFA4A100A100	PBPFA5A100A100	PBPFA5B100A100

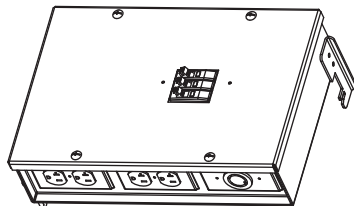
QO/QOR Units with Circuit Breakers and Receptacles—120 V¹

QO Unit with Circuit Breaker
Weight: 14 lbs. (6 kg)



Circuit Breaker		Catalog Number		
Rating	Type	4A Configuration	5A Configuration	5B Configuration
Type 1—Three (3) Circuit Breakers Plus (3) Duplex Receptacles				
15	QO	PBPQOR4A100M115	PBPQOR5A100M115	PBPQOR5B100M115
15	QOB	PBPQOR4A100M115B	PBPQOR5A100M115B	PBPQOR5B100M115B
20	QO	PBPQOR4A100M120	PBPQOR5A100M120	PBPQOR5B100M120
20	QOB	PBPQOR4A100M120B	PBPQOR5A100M120B	PBPQOR5B100M120B
Type 2—Three (3) Circuit Breakers Plus (2) Duplex Receptacles and (1) Single Locking Receptacle				
15	QO	PBPQOR4A100M215	PBPQOR5A100M215	PBPQOR5B100M215
15	QOB	PBPQOR4A100M215B	PBPQOR5A100M215B	PBPQOR5B100M215B
20	QO	PBPQOR4A100M220	PBPQOR5A100M220	PBPQOR5B100M220
20	QOB	PBPQOR4A100M220B	PBPQOR5A100M220B	PBPQOR5B100M220B
Type 3—Three (3) Circuit Breakers Plus (1) Duplex Receptacle and (2) Single Locking Receptacles				
15	QO	PBPQOR4A100M315	PBPQOR5A100M315	PBPQOR5B100M315
15	QOB	PBPQOR4A100M315B	PBPQOR5A100M315B	PBPQOR5B100M315B
20	QO	PBPQOR4A100M320	PBPQOR5A100M320	PBPQOR5B100M320
20	QOB	PBPQOR4A100M320B	PBPQOR5A100M320B	PBPQOR5B100M320B
Type 4—Three (3) Circuit Breakers and (3) Single Locking Receptacles				
15	QO	PBPQOR4A100M415	PBPQOR5A100M415	PBPQOR5B100M415
15	QOB	PBPQOR4A100M415B	PBPQOR5A100M415B	PBPQOR5B100M415B
20	QO	PBPQOR4A100M420	PBPQOR5A100M420	PBPQOR5B100M420
20	QOB	PBPQOR4A100M420B	PBPQOR5A100M420B	PBPQOR5B100M420B

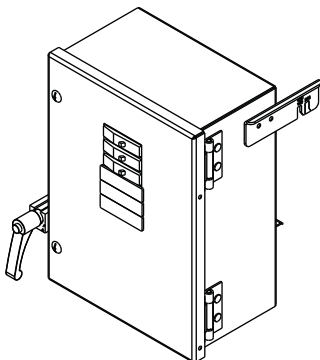
QOR Unit with Circuit Breaker and Receptacles
Weight: 15 lbs. (7 kg)



¹ Additional circuit breakers include QO-GFI, QO-HID, QO-K, and QO-EPD. Other factory-assembled units available using receptacles shown below. Consult your nearest Schneider Electric sales office.

Section 11—Powerbus™ Plug-in Busway Powerbus Plug-In Units

QOD Units with Circuit Breakers, Drop Cords, and Connectors—120 V

 QOD Unit with Circuit Breaker Weight: 18 lbs. (8 kg ¹)	Circuit Breaker		NEMA Connector	Drop Cord Length	Catalog Number ²			
	Amps	Poles			4A	5A ³	5B	
	One (1) circuit breaker plus drop cord and connector							
	15 A	1	L5-15	3	PBPQOD4A100COOL515	PBPQOD5A100COOL515	PBPQOD5B100COOL515	
	20 A	1	L5-20	3	PBPQOD4A100COOL520	PBPQOD5A100COOL520	PBPQOD5B100COOL520	
	30 A	1	L5-30	3	PBPQOD4A100COOL530	PBPQOD5A100COOL530	PBPQOD5B100COOL530	
	15 A	2	L6-15	3	PBPQOD4A100COOL615	PBPQOD5A100COOL615	PBPQOD5B100COOL615	
	20 A	2	L6-20	3	PBPQOD4A100COOL620	PBPQOD5A100COOL620	PBPQOD5B100COOL620	
	30 A	2	L6-30	3	PBPQOD4A100COOL630	PBPQOD5A100COOL630	PBPQOD5B100COOL630	
	20 A	3	L21-20	3	PBPQOD4A100COOL2120	PBPQOD5A100COOL2120	PBPQOD5B100COOL2120	
	30 A	3	L21-30	3	PBPQOD4A100COOL2130	PBPQOD5A100COOL2130	PBPQOD5B100COOL2130	
	15 A	1	L5-15	6	PBPQOD4A100FOOL515	PBPQOD5A100FOOL515	PBPQOD5B100FOOL515	
	20 A	1	L5-20	6	PBPQOD4A100FOOL520	PBPQOD5A100FOOL520	PBPQOD5B100FOOL520	
	30 A	1	L5-30	6	PBPQOD4A100FOOL530	PBPQOD5A100FOOL530	PBPQOD5B100FOOL530	
	15 A	2	L6-15	6	PBPQOD4A100FOOL615	PBPQOD5A100FOOL615	PBPQOD5B100FOOL615	
	20 A	2	L6-20	6	PBPQOD4A100FOOL620	PBPQOD5A100FOOL620	PBPQOD5B100FOOL620	
30 A	2	L6-30	6	PBPQOD4A100FOOL630	PBPQOD5A100FOOL630	PBPQOD5B100FOOL630		
20 A	3	L21-20	6	PBPQOD4A100FOOL2120	PBPQOD5A100FOOL2120	PBPQOD5B100FOOL2120		
30 A	3	L21-30	6	PBPQOD4A100FOOL2130	PBPQOD5A100FOOL2130	PBPQOD5B100FOOL2130		

¹ Weight will vary based on the connector and length and number of drop cords.

² Up to three drop cords can be ordered per device for 1-pole and 2-pole breakers. Up to two drop cords can be ordered for 3-pole breaker. Drop cord lengths range from 2 to 12 feet, and lengths can be combined in same device.

³ Drop cord ground terminals are connected to the IG and are marked accordingly.

NOTES: NEMA and IEC connectors are available. Circuit breaker and drop cord positions are configurable. Consult your local Schneider Electric representative.

Section 11—Powerbus™ Plug-in Busway

Powerbus Plug-In Units

NEMA Receptacles (R) and Connectors (C)

Non-Locking Devices

Wiring	Voltage	15 A	20 A
2-Pole, 3-Wire, Grounding	120	5-15	5-20
2-Pole, 3-Wire, Grounding	240	6-15	6-20
3-Pole, 3-Wire, Grounding	120 / 240	14-15	14-20
3-Pole, 3-Wire, Grounding	3Ø 240	15-15	15-20

Locking Devices

Wiring	Voltage	15 A	20 A	30 A
2-Pole, 3-Wire, Grounding	120	L5-15	L5-20	L5-30
2-Pole, 3-Wire, Grounding	240	L6-15	L6-20	L6-30
3-Pole, 4-Wire, Grounding	120 / 240	—	L14-20	L14-30
3-Pole, 4-Wire, Grounding	3Ø 240	—	L15-20	L15-30
4-Pole, 5-Wire, Grounding	3ØY 120/208	—	L21-20	L21-30

NOTES: QOR plug-in units have 1.82 in. x 2.82 in. (46 mm x 72 mm) openings for receptacle bodies and 3.28 in. (83 mm) spacing #6-32 mounting holes. Additional NEMA connectors may be available. Contact your local Schneider Electric representative.

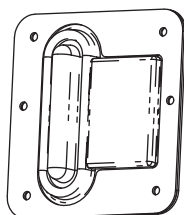
IEC 60309 Connectors¹

Wiring	Voltage	20 A	30 A	60 A
2-pole, 3-wire, Grounding	120	320C4	330C4	360C4
2-pole, 3-wire, Grounding	240	320C6	330C6	360C6
3-pole, 4-wire, Grounding	120/240	420C12	430C12	460C12
3-pole, 4-wire, Grounding	3Ø 240	420C9	430C9	460C9
4-pole, 5-wire Grounding	3ØY 120/208	520C9	530C9	560C9

¹ Additional connectors may be available. Consult your local Schneider Electric representative.

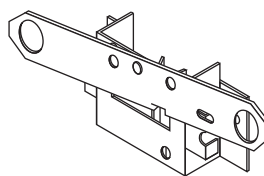
Plug-In Unit Accessories

IP54 Kit



Catalog Number:
FA Unit = PBP54100FA
QO Unit = PBP54100QO

Floor Operator Attachment



Catalog Number:
FA Unit = PBFO100FA
QO Unit = PBFO100QO

Plug-In Opening Cover



Catalog Number:
PBPIOCVR

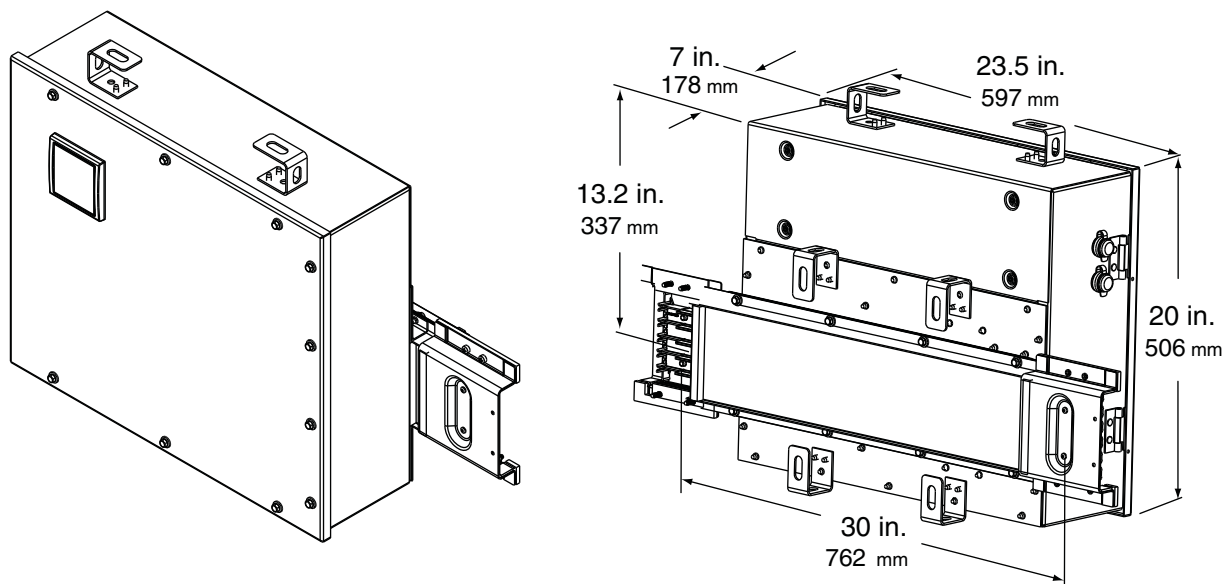
Additional Accessories

Description	Catalog Number
Reverse Feed Label Kit (FA unit only)	PBRFLKIT
Hookstick 8 ft (2.4 m)	515608
Hookstick 14 ft (4.3 m)	515614

Metering and Communication Options

The Powerbus™ tap box is available with an optional Powerlogic™ PM5350 meter and EGX-300 gateway. The power meter provides an integrated display and offers all the power and energy measurement capabilities required to monitor the busway run in a single 3.8 x 3.8 in. (96 x 96 mm) unit. The meter is easy to operate with intuitive navigation and self-guided menus. The EGX-300 gateway is an integrated, web-based gateway-server that provides the ability to remotely monitor the meter through an Ethernet connection. An Ethernet port is available on the enclosure for integration into any power monitoring and control system.

The tap box with the metering and communication option is available as either a bottom- or top-feed unit. If the power feed is incoming from the bottom or right side, then order the bottom-feed unit catalog number. If the power feed is incoming from the top or left side, then order the top-feed catalog number.

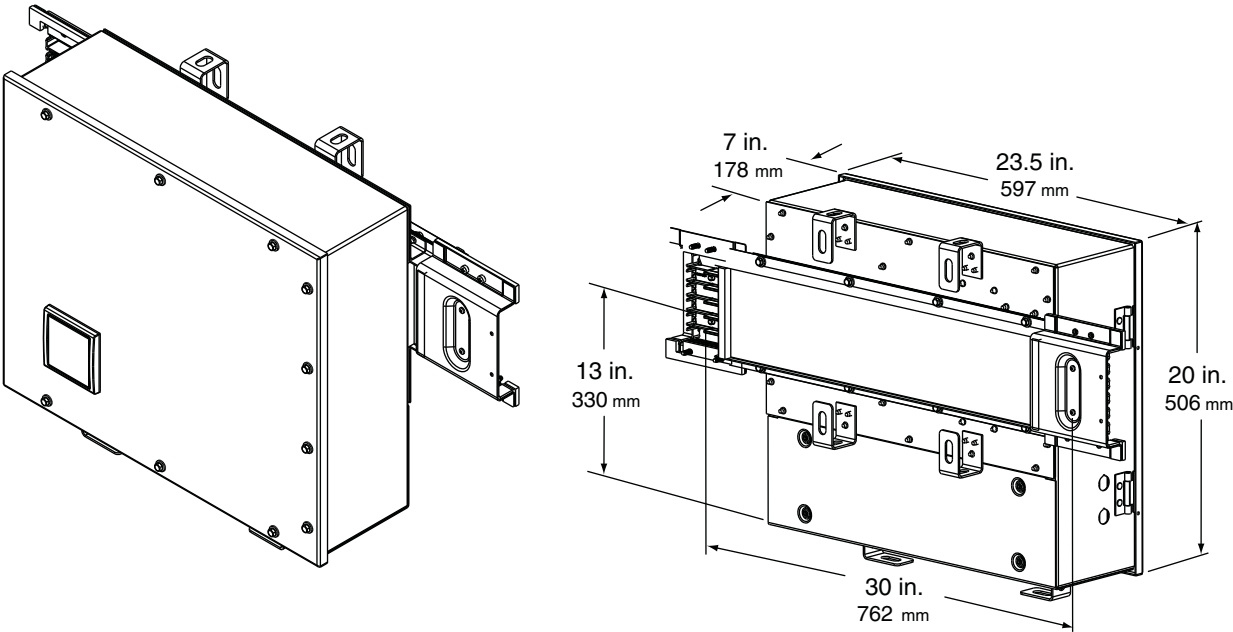


Bottom Feed Unit

Catalog number:

225 A = PBCF[]225TBM()U, 100 A = PBCF[]100TBM()U

Section 11—Powerbus™ Plug-in Busway
Metering and Communication Options



Top Feed Unit

Catalog number:

225 A = PBCF[]225TBM()L, 100 A = PBCF[]100TBM()L

NOTE: To complete the catalog number, insert the configuration type from the table “Busbar Configuration” on page 128.

The PM5350 meter will be tested at the factory before shipment, so the catalog suffix will vary based on the system voltage. Replace the “()” in the catalog numbers above with the meter suffix number in the table below that corresponds to the system voltage of the busway.

The 225 A unit is rated at 240 V maximum.

Meter Suffix	System Voltage
1	208Y/120 V 3Ph 4W
2	240 V 3Ph 3W

NOTE: Contact your local Schneider Electric representative for additional system voltages.

Section 11—Powerbus™ Plug-in Busway Metering and Communication Options

Powerbus Busway Suggested Specifications

1.0 General

1.1 Quality:

All busway products shall be manufactured in a facility that is Quality Systems Registered by Underwriters Laboratories (UL) to ISO9001.

1.2 Regulatory Requirements:

- a. All busway products shall be listed to Underwriters Laboratories Standard of Safety 857, which is jointly issued by UL (U.S.), CSA (Canada), and ANCE (Mexico).
- b. U.L. listing shall include mounting of the busway in any position without derating.
- c. Busway shall be constructed and installed in accordance with all applicable current sections of NEMA, ANSI, NOM, IEEE, and NFPA codes.

1.3 Storage, Handling, and Maintenance:

Refer to NEMA Publication BU1.1, which is a guide for proper installation, operation, and maintenance of busway products.

2.0 Products

2.1 Manufacturers:

All busway shall be Powerbus™ brand manufactured by Schneider Electric.

2.2 Manufactured Units:

- a. Furnish and install a complete prefabricated plug-in busway power distribution system as shown on the plans.
- b. The approximate footage, fittings, plug-in units, and accessories are shown on the plans. The electrical contractor shall be responsible for routing the busway to coordinate with other trades. The contractor prior to ordering of the busway components shall make final field measurements.
- c. Plug-in busway shall be rated 225 A at 240 Volts or 100 A at 600 Volts and be of the configuration required by the application (three-phase; with 100 percent or 200 percent neutral or without neutral; housing or isolated ground). Short-circuit ratings shall be 22,000 RMS symmetrical for 225 A busway or 14,000 RMS symmetrical for 100 A busway.

2.3 Busway Construction:

Housing:

- a. Busway shall be of the totally-enclosed type for protection against mechanical damage and resistance to dust and water. Standard level of protection for the busway straight lengths and fittings shall be to International Standards IP Protection Classification IP54 with standard mounting. Side-mounted busway shall be to Classification IP40.
- b. Housing material shall be electrical-grade extruded aluminum alloy 6063 for light weight and ease of handling in the field. Housing color shall be either natural or black aluminum finish.
- c. Each plug-in opening accessible by the removal of a plastic cover that shall be retained for future use. Replacement covers shall be available as standard parts from the manufacturer.

Section 11—Powerbus™ Plug-in Busway

Metering and Communication Options

Joints:

- a. Electrical connection shall be made at the joints by high-pressure spring type silver plated copper connectors. Mechanical connection shall utilize integral tie channels to fasten one section of busway to the next.
- b. All hardware required for joining sections shall be captive. Loose hardware will not be permitted.

Busbars:

- a. For maximum reliability and conductivity, all conductor bars shall be of silver plated alloy 110 copper.
- b. Busbars shall be firmly supported in the housing by molded insulators on alternate sides of the busway housing.
- c. Busbar insulators shall be of a type that isolates the jaws of a plug-in device from each other.

Plug-In Openings:

- a. Busway shall include a minimum of (10) plug-in openings for each 10 ft. length.
- b. All plug-in openings shall be usable simultaneously.
- c. Plug-in openings shall provide ingress protection to IP2X standard.

2.4 Plug-In Units:

- a. Units shall be of the circuit breaker type with provisions for mounting and options for factory-installation of circuit breakers and related wiring devices.
- b. Plug-in units shall offer suitable means for hookstick operation.
- c. Units shall include a means of securely fastening the device to the busway housing.
- d. Plug-in unit short circuit rating should be 10K AIC or greater.
- e. Plug-in unit enclosures should be rated NEMA Type 1 as standard and have optional IP54 capability. Plug-in units and plug-in busway rated at IP54 shall maintain this rating as a completely installed busway system.

2.5 Busway Support:

Hanger spacing shall not exceed 10 ft in length with standard mounting. Hanger spacing shall not exceed 5 ft in length when side-mounted. Manufacturer's standard hangers shall be used whenever possible.

Section 12—Power-Zone™ Metal-Enclosed Busway

General

Power-Zone™ metal-enclosed, non-segregated phase medium and low voltage bus systems are custom-designed and manufactured. Standard sizes and ratings and a complete line of components allow each system to be tailored to suit the requirements of each application, while at the same time provide the reliability that Schneider Electric products are known for providing.

Standard bus systems are available in four basic voltage classes: 600 V, 5 kV, 15 kV, and 38 kV with a full range of continuous self-cooled current ratings and momentary current ratings. Other voltage classes are available upon request.

The following components are also available for all sizes and ratings:

- equipment terminations
- horizontal and vertical elbows
- tee-taps
- phase transpositions
- expansion joints
- vibration joints
- misalignment joints
- wall and floor penetration assemblies
- fire and smoke barriers
- bus supports

Power-Zone bus design and construction is in strict accordance with ANSI Standard C37.23. It can be supplied with full, round edge 98% IACS copper or 57% IACS aluminum bars. Copper contact surfaces are silver-plated. Aluminum contact surfaces are tin-plated. All aluminum electrical connections are fitted with conical washers to maintain a constant contact pressure.

Standard hardware for conductor joints is plated steel for bare connections not exposed to weather or insulated connections where the bus rating does not exceed 5000 A. Hardware is stainless steel for bare connections exposed to weather and all connections where the bus ratings exceeds 5000 A.

With the exception of 600 V class, which is normally uninsulated, the bus conductors are insulated with a flame-retardant, non-hygroscopic, high dielectric strength fluidized bed epoxy insulation rated 266 °F (130 °C). The 5000 V and 15000 V busway joints are insulated with removable insulating boots, while the 38,000 V busway joints are taped.

The 5 kV and the 15 kV bus conductors are mounted and secured against short circuit forces in molded, track resistant, flame-retardant, non-hygroscopic support blocks of glass-reinforced polyester. The UL molded support insulators are ribbed to maximize both tracking distance and mechanical strength. They are spaced as appropriate to maintain the required short circuit strength of the bus. Semi-conducting silicone rubber corona suppression inserts are used between the conductor and support blocks. Porcelain is optional for 5 kV and 15 kV and is standard for 38 kV. The 600 V supports are glass-reinforced polyester.

The bus conductors are completely enclosed in a grounded metal housing for the protection of both personnel and property. The housings are fabricated from painted aluminum, steel, or stainless steel. Aluminum housings are standard and are recommended for current ratings above 2000 A due to the effects of hysteresis associated with ferrous, magnetic housing materials, such as steel.

On outdoor applications, bottom covers are equipped with screened breathers to eliminate the accumulation of moisture within the housing. In addition, manually or thermostatically controlled electric strip heaters are provided to aid condensation control.

To complete the system, a line of steel structural supports is also available for both indoor and outdoor applications.

Section 12—Power-Zone™ Metal-Enclosed Busway General

Standard Construction

- Housing Construction: totally-enclosed indoor or outdoor
- Housing Material: aluminum standard; Galvanized or stainless steel optional
- Conductors: silver-plated copper or tin-plated aluminum
- Conductor Supports: glass-reinforced polyester or porcelain
- Insulation: fluidized bed epoxy, 266 °F (130 °C)

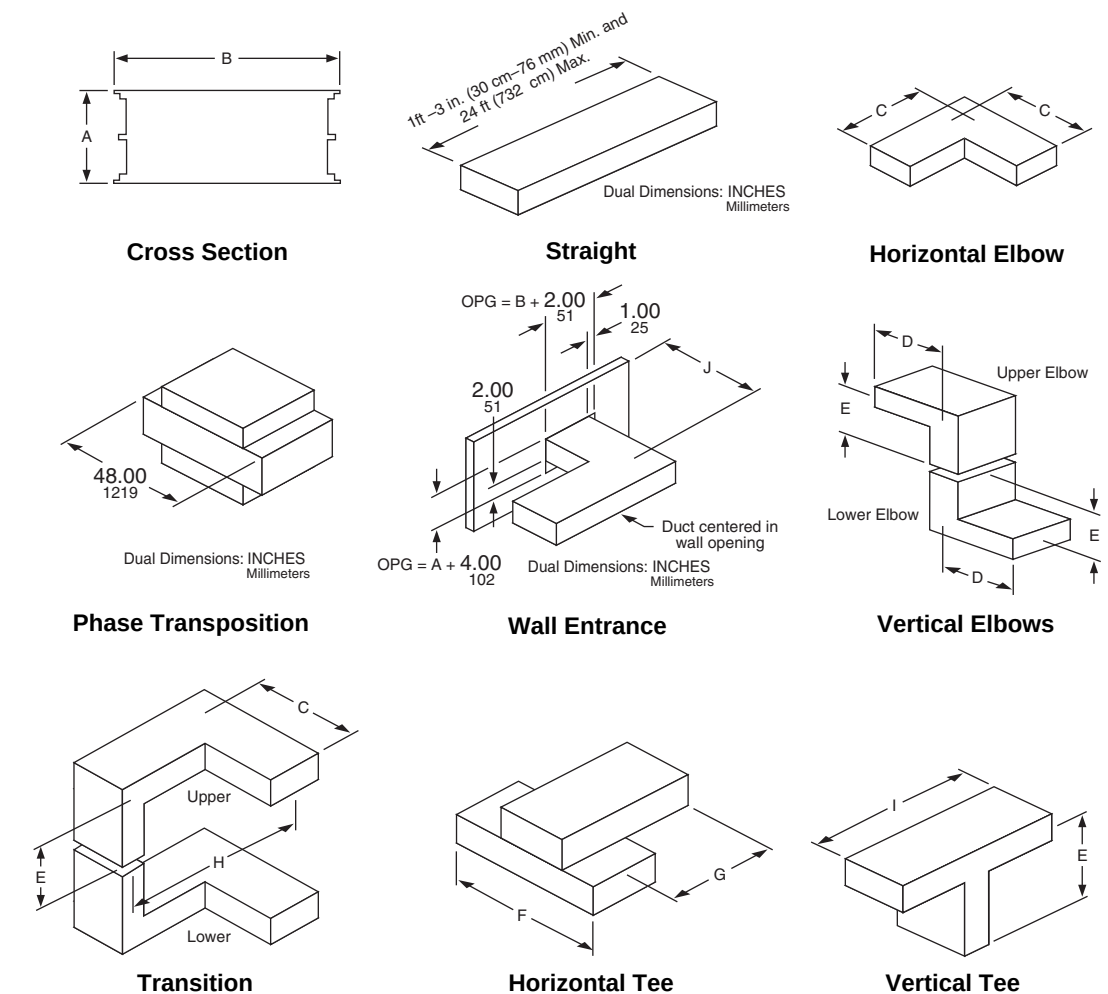


Figure 23: Standard Construction Installation

Section 12—Power-Zone™ Metal-Enclosed Busway General

Power-Zone™ Metal-Enclosed Busway—Minimum Dimensions and Other Specifications

Voltage and Material	Ampere Rating	Wt/Ft Lb	Dimensions										Resistance Microhms Per Phase Per Foot	Watt Loss Per 3-Phase Foot	Reactance Microhms Per Foot	Impedance Microhms Per Foot
			A		B		C		D		E					
			IN	mm	IN	mm	IN	mm	IN	mm	IN	mm				
Copper 600	1200	26	8.00	203	21.00	533	22.00	559	11.38	289	15.00	381	10.72	46	44.29	45.57
	1600	31	8.00	203	21.00	533	22.00	559	11.38	289	15.00	381	8.47	65	40.46	44.27
	2000	43	10.00	254	21.00	533	22.00	559	12.38	314	16.00	406	5.77	69	37.05	37.50
	2500	50	14.00	356	21.00	533	22.00	559	14.38	365	18.00	457	4.70	88	29.23	29.60
	3200	69	14.00	356	27.00	686	25.00	635	14.38	365	18.00	457	3.90	120	31.84	32.08
	4000	104	14.00	356	27.00	686	25.00	635	14.38	365	18.00	457	2.90	139	31.11	31.25
	5000	120	14.00	356	36.00	914	30.00	762	14.38	365	18.00	457	2.55	191	44.22	44.29
	6000	140	24.00	610	36.00	914	30.00	762	19.38	492	23.00	584	2.28	247	30.74	—
Aluminum 600	1200	19	8.00	203	21.00	533	22.00	559	11.38	289	15.00	381	13.41	58	43.46	45.48
	1600	23	10.00	254	21.00	533	22.00	559	12.38	314	16.00	406	8.76	67	37.05	38.07
	2000	29	14.00	356	21.00	533	22.00	559	14.38	365	18.00	457	6.16	74	28.79	29.44
	2500	33	14.00	356	27.00	686	25.00	635	14.38	365	18.00	457	5.61	105	31.84	32.33
Copper 5000 and 15000	1200	29	14.00	356	27.00	686	25.00	635	14.38	365	18.00	457	15.02	65	56.50	58.46
	1600	35	14.00	356	27.00	686	25.00	635	14.38	365	18.00	457	8.47	65	54.37	55.03
	2000	50	14.00	356	30.00	762	27.00	686	14.38	365	18.00	457	5.77	69	51.20	51.53
	2500	59	14.00	356	36.00	914	30.00	762	14.38	365	18.00	457	4.70	88	48.76	48.98
	3200	77	14.00	356	36.00	914	30.00	762	14.38	365	18.00	457	4.01	108	42.88	43.07
	4000	112	14.00	356	36.00	914	30.00	762	14.38	365	18.00	457	3.45	166	41.93	42.07
	5000	126	24.00	610	42.00	1067	33.00	838	19.38	492	23.00	584	2.77	208	42.54	42.63
	6000	150	24.00	610	42.00	1067	33.00	838	19.38	492	23.00	584	2.40	259	30.11	—
Aluminum 5000 and 15000	1200	27	14.00	356	27.00	686	25.00	635	14.38	365	18.00	457	13.41	58	54.37	56.00
	1800	30	14.00	356	30.00	762	27.00	686	14.38	365	18.00	457	8.76	67	51.20	51.95
	2000	37	14.00	356	36.00	914	30.00	762	14.38	365	18.00	457	6.16	74	48.32	48.71
	2500	40	14.00	356	30.00	762	27.00	686	14.38	365	18.00	457	5.68	107	42.52	42.89
Copper 38000	600	30	24.00	610	51.00	1295	37.00	940	24.00	610	23.00	584	15.37	17	76.97	78.49
	1200	30	24.00	610	51.00	1295	37.00	940	24.00	610	23.00	584	15.37	66	76.97	78.49
	1800	32	24.00	610	51.00	1295	37.00	940	24.00	610	23.00	584	10.72	82	68.89	69.72
	2000	35	24.00	610	51.00	1295	37.00	940	24.00	610	23.00	584	8.33	100	62.93	63.48
	2500	52	24.00	610	51.00	1295	37.00	940	24.00	610	23.00	584	4.66	87	53.83	54.03
	3200	61	24.00	610	51.00	1295	37.00	940	24.00	610	23.00	584	3.97	107	53.39	53.54
Aluminum 38000	600	27	24.00	610	51.00	1295	37.00	940	24.00	610	23.00	584	25.46	27	76.97	81.07
	1200	29	24.00	610	51.00	1295	37.00	940	24.00	610	23.00	584	17.23	74	68.89	71.01
	1800	30	24.00	610	51.00	1295	37.00	940	24.00	610	23.00	584	13.41	58	68.06	69.36
	2000	32	24.00	610	51.00	1295	37.00	940	24.00	610	23.00	584	11.33	136	62.28	63.30

Section 12—Power-Zone™ Metal-Enclosed Busway

General

Power-Zone Metal-Enclosed Busway—Minimum Dimensions and Other Specifications (continued)

Voltage and Material	Ampere Rating	Dimensions▲									
		F		G		H		I		J	
		IN	mm	IN	mm	IN	mm	IN	mm	IN	mm
Copper 600	1200	48.00	1219	22.00	559	18.25	464	28.00	711	17.00	432
	1600	48.00	1219	22.00	559	18.25	464	28.00	711	17.00	432
	2000	48.00	1219	22.00	559	19.25	489	30.00	762	17.00	432
	2500	48.00	1219	22.00	559	21.25	540	34.00	864	17.00	432
	3200	60.00	1524	25.00	635	24.25	616	34.00	864	20.00	508
	4000	60.00	1524	25.00	635	24.25	616	34.00	864	20.00	508
	5000	60.00	1524	30.00	762	28.75	730	34.00	864	25.00	635
	6000	60.00	1524	30.00	762	33.75	857	44.00	1118	25.00	635
Aluminum 600	1200	48.00	1219	22.00	559	18.25	464	28.00	711	17.00	432
	1600	48.00	1219	22.00	559	19.25	489	30.00	762	17.00	432
	2000	48.00	1219	22.00	559	21.25	540	34.00	864	17.00	432
	2500	60.00	1524	25.00	635	24.25	616	34.00	864	20.00	508
Copper 5000 and 15000	1200	60.00	1524	25.00	559	24.25	616	34.00	864	20.00	508
	1600	60.00	1524	25.00	559	24.25	616	34.00	864	20.00	508
	2000	60.00	1524	27.00	686	25.75	654	34.00	864	22.00	589
	2500	60.00	1524	30.00	762	28.75	730	34.00	864	25.00	635
	3200	60.00	1524	30.00	762	28.75	730	34.00	864	25.00	635
	4000	60.00	1524	30.00	762	28.75	730	34.00	864	25.00	635
	5000	60.00	1524	33.00	838	36.75	933	44.00	1118	28.00	711
	6000	60.00	1524	33.00	838	36.75	933	44.00	1118	28.00	711
Aluminum 5000 and 15000	1200	60.00	1524	25.00	559	24.25	616	34.00	864	20.00	508
	1800	60.00	1524	27.00	686	25.75	654	34.00	864	22.00	589
	2000	60.00	1524	30.00	762	28.75	730	34.00	864	25.00	635
	2500	60.00	1524	27.00	686	25.75	654	34.00	864	22.00	589
Copper 38000	600	84.00	2134	37.00	940	45.88	1165	48.00	1219	33.00	838
	1200	84.00	2134	37.00	940	45.88	1165	48.00	1219	33.00	838
	1800	84.00	2134	37.00	940	45.88	1165	48.00	1219	33.00	838
	2000	84.00	2134	37.00	940	45.88	1165	48.00	1219	33.00	838
	2500	84.00	2134	37.00	940	45.88	1165	48.00	1219	33.00	838
	3200	84.00	2134	37.00	940	45.88	1165	48.00	1219	33.00	838
Aluminum 38000	600	24.00	610	51.00	1295	37.00	940	24.00	610	23.00	584
	1200	24.00	610	51.00	1295	37.00	940	24.00	610	23.00	584
	1800	24.00	610	51.00	1295	37.00	940	24.00	610	23.00	584
	2000	24.00	610	51.00	1295	37.00	940	24.00	610	23.00	584

NOTES:

1. Performance values are calculated using a maximum conductor temperature rise of 149 °F (65 °C) and the full rated continuous current in a 68 °F (20 °C) ambient.
2. All data is based upon standard 3-phase totally enclosed non-ventilated aluminum enclosures.
3. The table information is based on standard Power-Zone bus construction. Other bus bar sizes and arrangements are available to meet the purchaser's required electrical characteristics and space considerations. Use of steel housing could require a derating of the busway. Consult the factory for more information.

Power-Zone Bus Standard Construction

- Bus Bar Material: copper and aluminum
- Bus Bar Plating:
 - Copper-silver (contact)
 - Aluminum-tin (contact)
- Insulation:
 - 600 V Uninsulated; fluidized bed epoxy optional
 - 5 kV, 15 kV, or 38 kV fluidized bed epoxy
- Bus Bar Supports: 5 kV, 15 kV Glass-reinforced polyester standard; porcelain optional; 38 kV porcelain standard
- Housing Material: aluminum standard (steel optional)

Bus Supports

Indoor trapeze hangers, outdoor single- or double-column supports, and wall-mounted knee braces are available. Outdoor structural steel supports are hot-dipped galvanized after fabrication or primed and painted after fabrication as required. Indoor supports are primed and painted to match the bus housing color.

Power-Zone™ bus is designed and constructed for unbraced spans of 12–20 ft (366–610 cm). Consult the factory for longer unbraced spans.

Recommended support heights, spacing, and locations are determined by the factory and shown on the bus drawings. Information on moments, reactions, and foundation loading (due to rain, wind, and snow) can be furnished upon request.

The bus assemblies are mounted to their respective supports by means of hold-down clip angles that permit longitudinal movement of the bus duct to eliminate stresses from thermal expansion and contraction.

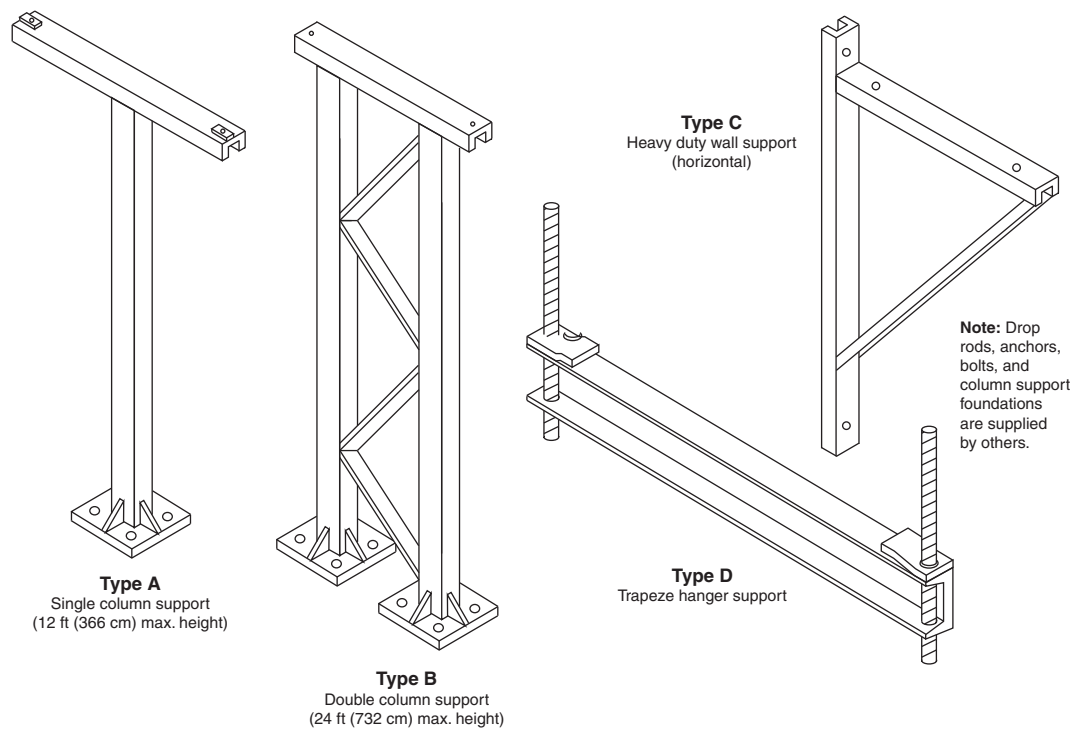


Figure 24: Bus Supports

Section 12—Power-Zone™ Metal-Enclosed Busway

General

Layout and Pricing Instructions

Fitting Description

- Non-segregated phase bus
- 600 V through 15 kV (1200–5000 A)
- Aluminum, steel, or stainless steel housing
- Aluminum or copper bus bars
- Insulated with fluidized bed epoxy (5 kV–38 kV)
- Complete line of fittings provides for any configuration
- Indoor trapeze and outdoor column supports
- For use in utilities, industrial, and commercial facilities

Power-Zone bus is custom designed, manufactured, and tested per ANSI Standard C37.23 to meet customer specifications. It is a completely coordinated package of equipment with all the auxiliary material and supports for connecting transformers, switchgear, MCCs, and motors in all types of utility, industrial, and commercial facilities.

Transformer Connection

This type of termination should be used whenever the bus is connecting to a transformer, motor, switch, or any connection where the bus bars are connecting to porcelain-mounted equipment terminals. It will include the same components as a flanged end plus one set of flexible braid-type connectors and a terminal box (if required.)

Generator Connection

All "Transformer Connection" information above applies to general connection with the addition that enclosure bellows should be included when the busway attaches to a generator.

Bushing Box (Weatherhead)

A bushing box is used on a service entrance run where the cable connection to the bus must be made via porcelain bushings. It is comprised of the same components as a transformer connection plus three-through stud-type apparatus bushings, bushing stud connectors (lug pads), and a strip heater.

Ground Bus

The bus housing is designed and constructed to provide an electrically continuous ground path. The side rails of the bus housings are capable of carrying the full-rated phase current continuously and, under short circuit conditions, are capable of carrying fault current for three (3) seconds. Consequently, a separate ground bus is not necessary unless specified.

Wall Entrance Seal

A wall entrance seal consists of an external wall frame and a vapor barrier that prevents air or vapor from passing from one room to another or from outdoors to indoors. One-, two-, and three-hour fire ratings are optional.

Equipment Entrance Seal

An equipment entrance seal should be used whenever a barrier is required to prevent the passing of flame and or gasses between the bus housing and the terminating equipment.

Expansion Fittings

An expansion fitting is used to counteract the strain placed on the bus due to the expansion and contraction of the building or the bus itself. One should be used whenever the bus run crosses a building expansion joint and whenever a straight run of bus exceeds 80 feet (2438 cm).

Section 12—Power-Zone™ Metal-Enclosed Busway

General

Housing Bellows (Misalignment) Collar

Required at terminations or wall penetrations when equipment vibrations or seismic forces cause damage to the bus. It can also be used to adjust for the “settling” of terminating equipment after installation.

Flanged Ends

A flanged end is used to terminate the bus into switchgear, motor control centers, switchboards, or any rigid bus-to-bus connection. It consists of a gasketed equipment flange, up to 1 foot (30 cm) of 3Ø-3W conductor (3Ø4W as applicable), necessary insulation tapes, and required bolting hardware. If additional conductor length is required, add to the footage price on a per foot basis.

Cable Tap Box

A cable tap box includes a gasketed and accessible termination box, lugs, necessary insulation tape (between bus and lugs only), and required bolting hardware. Lug sizes and quantity should be specified by purchaser.

Supporting Steel (Hangers)

Supports are not included in the “per foot” price of the bus and should be added on the basis of one for every 12 to 15 feet (366 to 457 cm). Indoor supports are a trapeze-type hanger while outdoor supports are a single- or double-column type support. Consult the factory for other type supports.

Hazardous Locations

Consult the factory for bus runs that are to be installed in a location that is classified as hazardous.

General Pricing Instruction

1. Prepare a layout sketch (if applicable) of the run(s) showing all dimensions in feet and inches, all wall and floor locations, and thicknesses and all fittings such as elbows, tees, flanged ends, cable tap boxes, expansion fittings, transformer connections, etc.
2. Add all dimensions together using the center line of the bus and adjust the total to the higher whole foot.
3. Multiply this total by the per foot price as determined by the type (indoor or weatherproof) (aluminum or copper) and the number of poles and any optional accessories (aluminum or steel enclosures, fiberglass or porcelain conductor supports, etc.). To this, add the charges for each of the elbows, tees, flanged ends, cable tap boxes, expansion fittings, transformer connections, etc.
4. The sum of these items plus the sum of any optional accessory is the price of the entire bus run.
5. Contact your local Schneider Electric representative for assistance in laying out or pricing this product.

Bus Footage

The per foot price of the bus can be a combination of several prices depending on the job specifications and requirements. Some of these options are special momentary rating, special housing material and/or finish, special conductor supports, heaters and thermostats, and ground bus.

Weatherproof Bus

Weatherproof bus is priced the same as indoor. In addition, all weatherproof runs must be equipped with strip heaters to eliminate condensation and, if applicable, a thermostat. A heater should be priced for every seven feet (213 cm) of bus and no more than 20 heaters can be controlled by one thermostat. Also, each bus run should have its own thermostat. The heaters operate at 120 V.

Section 12—Power-Zone™ Metal-Enclosed Busway
General

Typical Layout

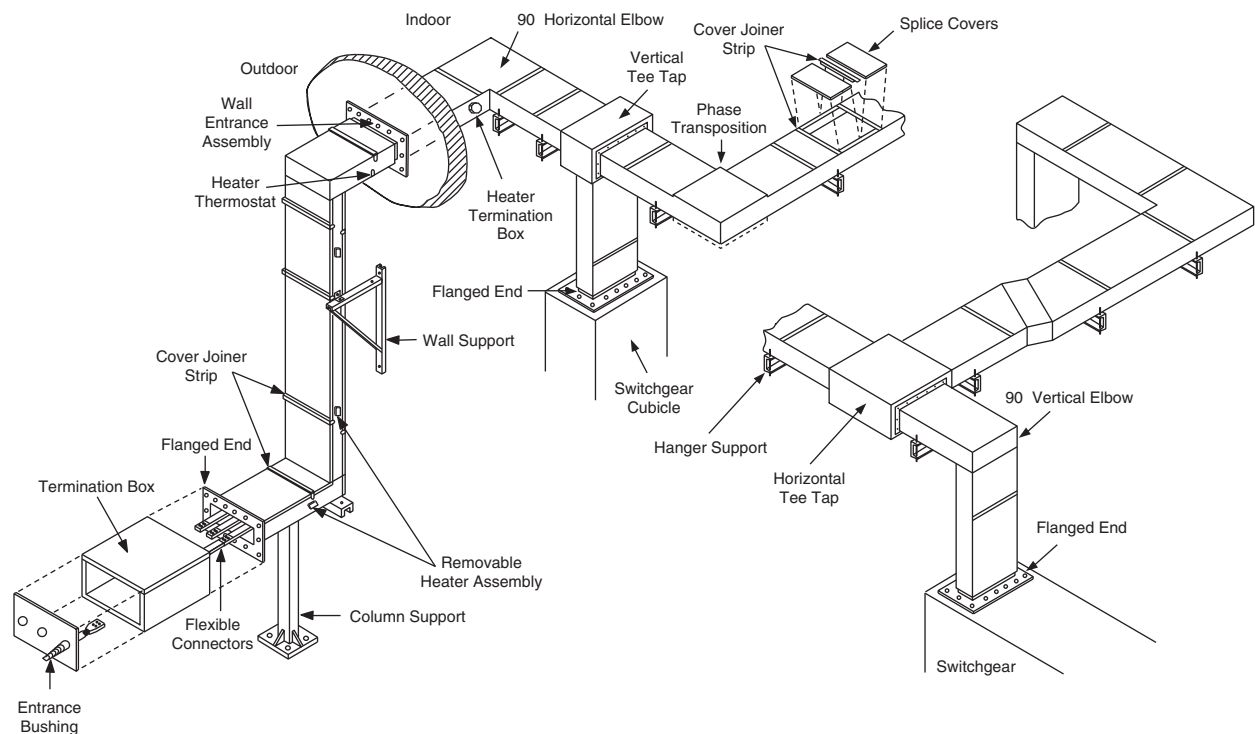


Figure 25: Typical Layout Example

Section 13—Power-Zone™ Metal-Enclosed Specifications

1.0 General

1.1 Section Includes

- A. This specification describes the electrical and mechanical requirements for metal-enclosed, 600 V through 38 kV class, 60 Hz feeder bus. The bus system described is to be suitable for indoor and outdoor installations, with nominal current ratings maintained in ambient temperatures to 104 °F (40° C).
- B. This specification covers only the general requirements of the bus duct assemblies. The specific requirements of each assembly (plan, arrangement, components, etc.) will be shown on drawings provided by the Purchaser. These drawings form the basis for manufacturing and installation drawings developed by the vendor.

1.2 References

The assemblies shall be constructed, wired and tested in accordance with all applicable sections of the latest listed standards and codes.

- NEMA—National Electrical Manufacturer Association
- ANSI C37.23—American National Standards Institute
- NFPA 70—National Electrical Code

2.0 Products

2.1 Manufacturers

Schneider Electric—Power-Zone Busway

2.1 Housing

- A. The bus duct shall be nonlouvered outdoors and indoors. Housing and accessory flanges, terminal enclosures, etc., shall be primed and painted [steel] [corrosion resistant aluminum] construction. All outdoor hardware exposed to the weather shall be stainless steel. Indoor hardware (unless in corrosive environment) shall be manufacturer's standard.
- B. Bus housing shall be steel or aluminum.
- C. Outdoor, totally-enclosed, nonlouvered housings shall be fitted with screened breathers and space heaters in sufficient quantity and rating to minimize condensation.
- D. Space heaters shall be completely factory wired except shipping split connection. Heaters shall be [thermostatically controlled] [manually controlled]. Heater wiring shall be [terminated in a junction box at designated end of bus housing] [provided with 3-ft (91 cm) coiled extension for connection into Purchaser's switchgear power source]. Heaters shall be rated at 240 V and operated at 120 V (half voltage) to maintain low heater surface temperature.
- E. All housing and flange gasketing shall be EPDM or other noncorrosive material, and shall be completely concealed for protection against deterioration.
- F. The temperature rise at any point on the housing shall not exceed 86 °F (30 °C) above an ambient temperature of 104 °F (40 °C).
- G. A fire resistant divider or barrier shall be provided at all points where the bus duct extends through building walls.

Section 13—Power-Zone™ Metal-Enclosed Specifications

2.0 Products

2.3 Phase Bus Bars

- A. Phase bus bars shall be of the metal-enclosed busway type.
- B. Bus bars shall be full round edge rectangular [98% IACS copper] [57% IACS aluminum] of sufficient cross-section to provide full current rating without exceeding a hot spot temperature rise of 149 °F (65 °C) in a 104 °F (40 °C) ambient.
- C. Phase bus bars shall be mounted and secured against movement during short-circuit in tracking-resistant, glass-reinforced polyester blocks, or an approved equal, spaced along the bus run as required to meet the short-circuit current rating. The support blocks can be ribbed to provide long creepage paths and fitted with corona suppressors, consisting of silicone rubber inserts between the insulated bus bars and support blocks.
- D. Phase bus bars, at 5 kV class and above, shall be insulated with epoxy, rated for continuous operation at 266 °F (130 °C).
- E. Contact surfaces of copper bus bars shall be silver plated electrically by tank or brush method. Contact surfaces of aluminum bus bars shall be electro-tinned. All bus bar connections shall be bolted.
- F. Bolts shall pass through the bus bar conductors, and shall be capable of being properly torqued and locked in place, to provide and maintain full and uniform pressure under all operating conditions. (Torque requirements in ft/lb shall be furnished by Manufacturer.)
- G. In no case shall the temperature of such bus bar joint exceed 149 °F (65 °C) above an ambient temperature of 104 °F (40 °C). An internal ground bus [shall] [shall not] be furnished that will electrically connect together all equipment connected to the bus duct.
- H. If the bus duct enclosure is so constructed and connected that it provides a continuous path for ground current, it serve as the ground bus. If the enclosure is used as the ground bus, a tooth-type lock washer shall be furnished under each bolt head and each nut at connections between sections of bus duct. If the enclosure is not so constructed, the bus duct shall be furnished with a(n) [aluminum] [copper] ground bar inside the housing. The ground bus shall have suitable terminating pads for Purchaser's connections to station ground system.
- I. Flexible connectors shall be provided for connecting bus to porcelain apparatus bushings. All necessary adapter bars and spacers, bolting hardware and insulating materials, for connections to transformer or switchgear terminals, shall be provided and the proper coordination of connections between bus and terminal equipment shall be the responsibility of the bus Manufacturer.
- J. Purchaser will provide Manufacturer with applicable switchgear and transformer drawings for matching and coordination requirements prior to fabrication.

2.4 Ratings

- A. The maximum hot-spot temperature rise at any point in the bus, at continuous rated load, shall not exceed 149 °F (65 °C) above an ambient temperature of 104 °F (40 °C).
- B. The ratings of the bus duct shall be:
 - Voltage Class: ____ Volts
 - Continuous Current Ratings: ____ Amperes
 - Short Circuit Rating: Momentary Current Amps ____ RMS asymmetrical.
 - Short Time Current Amps ____ RMS symmetrical. (Not less than short time ratings of protective devices.)
 - Basic Insulation Level (BIL): ____ kV

2.5 Supports

Bus duct supports shall be [indoor trapeze type] [outdoor column type with base plates for attaching to Purchaser's foundations] [knee-brace type for wall mounting].

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06/2012