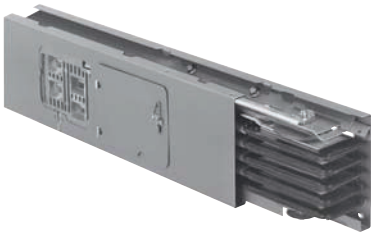
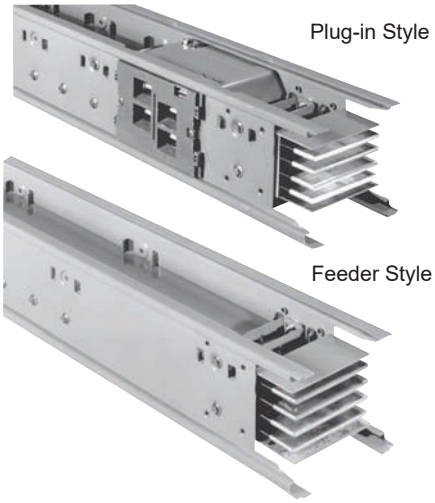
Busway Systems

Catalog
5600CT9101R03/18
2018
Class 5600

Powerbus™ 100-400 A



I-Line™ Plug-in Busway 225-600 A



I-Line II Busway 800-5000 A

Power-Zone™ Busway

I-Line Plug-in Units

SQUARE D™

by Schneider Electric

Section 1—I-Line™ 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, and ease of installation, and offers electrical efficiency in the distribution of low voltage power for both commercial and industrial applications.

Our design and construction have been time-tested by many years of use throughout the world. I-Line busway has been used to supply power in thousands of installations throughout the world for 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 available for fast delivery.

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 all-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 de-rated. Ventilated housing also permits dirt accumulation and offers limited protection of bus bars due to the open ventilation slots.

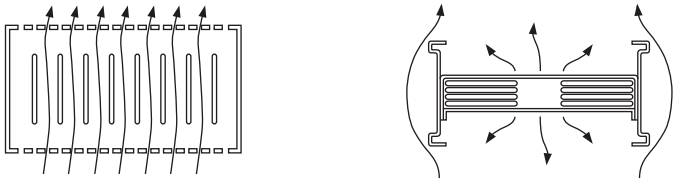


Figure 1: Ventilated Housing (left) and I-Line II Totally Enclosed Housing (right)

I-Line busway has a modern “totally enclosed housing” design requiring no de-rating regardless of mounting position. Because the housing has no ventilation 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.

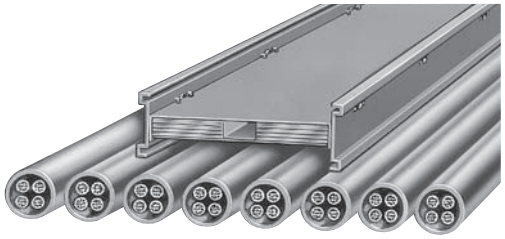


Figure 2: Compact Design

Finish

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

Insulation

UL 857 *Standard for Busways* requires busway systems to be designed not to exceed a total operating temperature of 203 °F (95 °C). The polyester film and epoxy insulation systems used in the high quality design of I Line II busway provides improved thermal and electrical characteristics over the UL requirements.

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

Figure 3: 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.

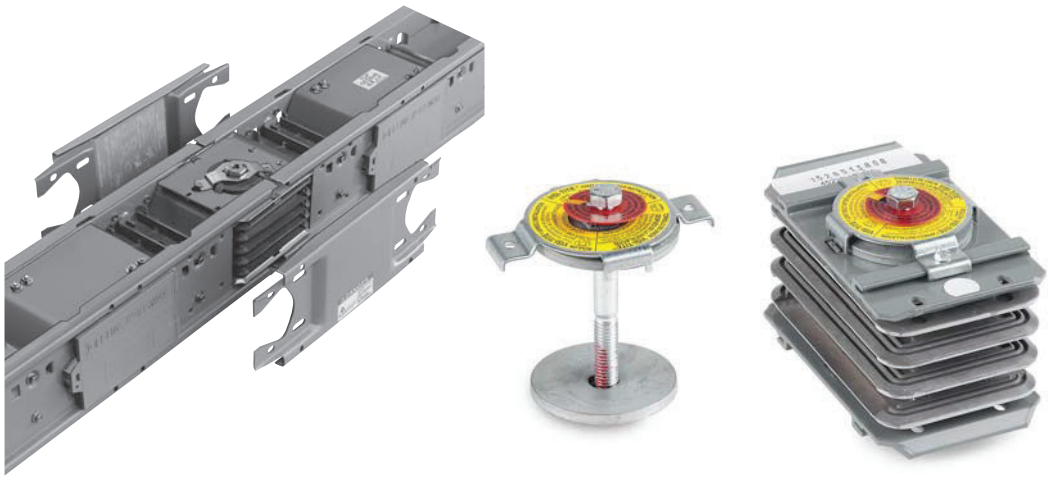


Figure 4: EZ Joint Pak Connector Assembly

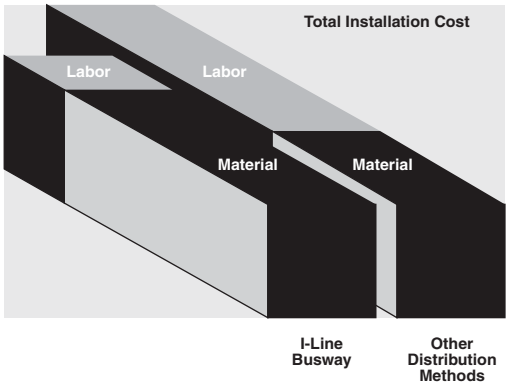


Figure 5: Reduction in Installation Cost

Labor Savings

I-Line II busway installs quicker than other forms of low voltage power distribution. Also, the labor cost required to install I-Line II busway is often much lower. This results in an overall reduction in total 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. For a description of these ratings, see Table 1, Table 2, Table 3, and Table 4 on pages 42 and 43.

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.

Outdoor busway is normally installed as an IP65 application. To install as an IP66 application, see instruction bulletin no. 45123-922-01.

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 to ISO9001: 2015.

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.

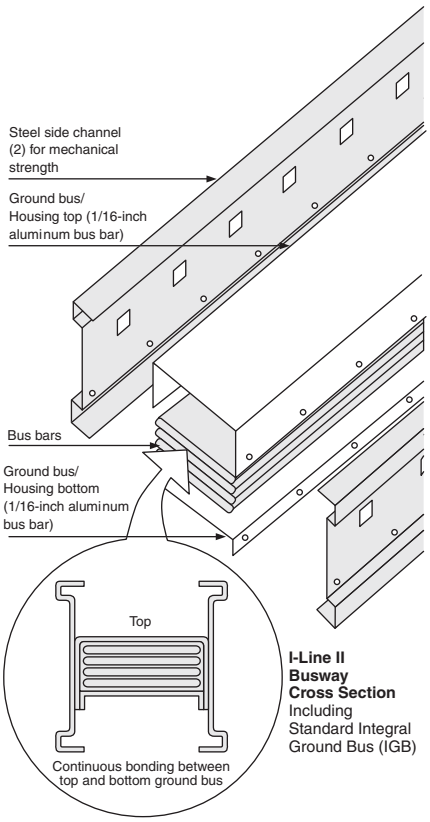


Figure 6: I-Line II Busway Cross Section

Section 2—I-Line™ Construction

Plug-In Busway 225–600 A

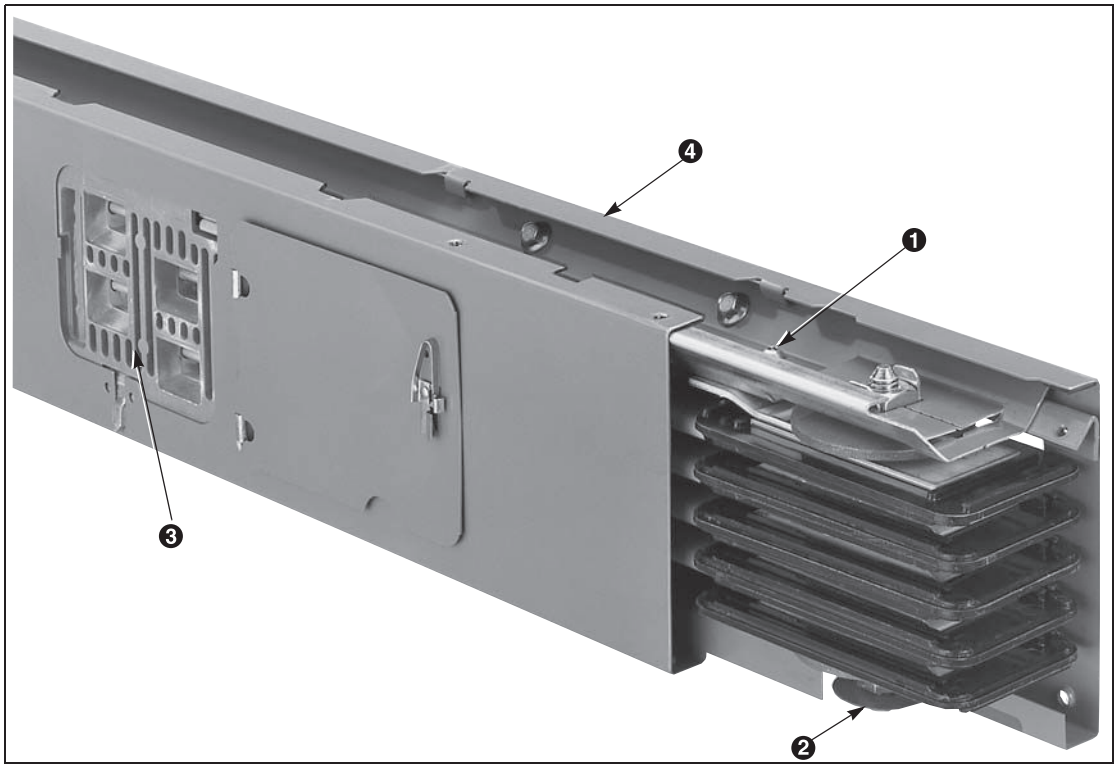


Figure 7: Plug-In Busway 225–600 A

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 meets UL 857 requirements.

Plug-In Busway 800–5000 A

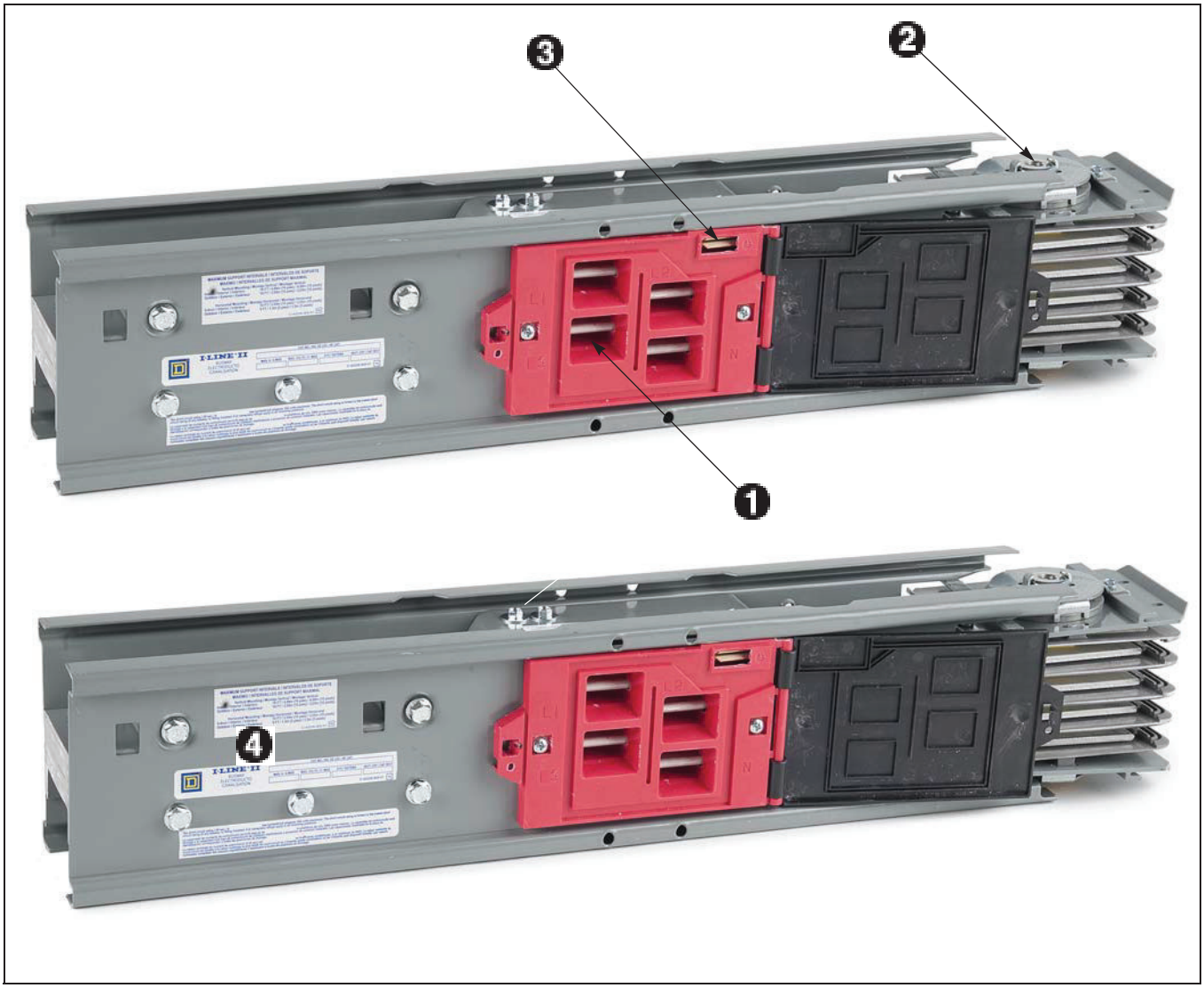


Figure 8: Plug-In Busway 800–5000 A

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.

NOTE:

- 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 the feeder-style features shown on page 21.

Indoor Feeder Busway 800–5000 A

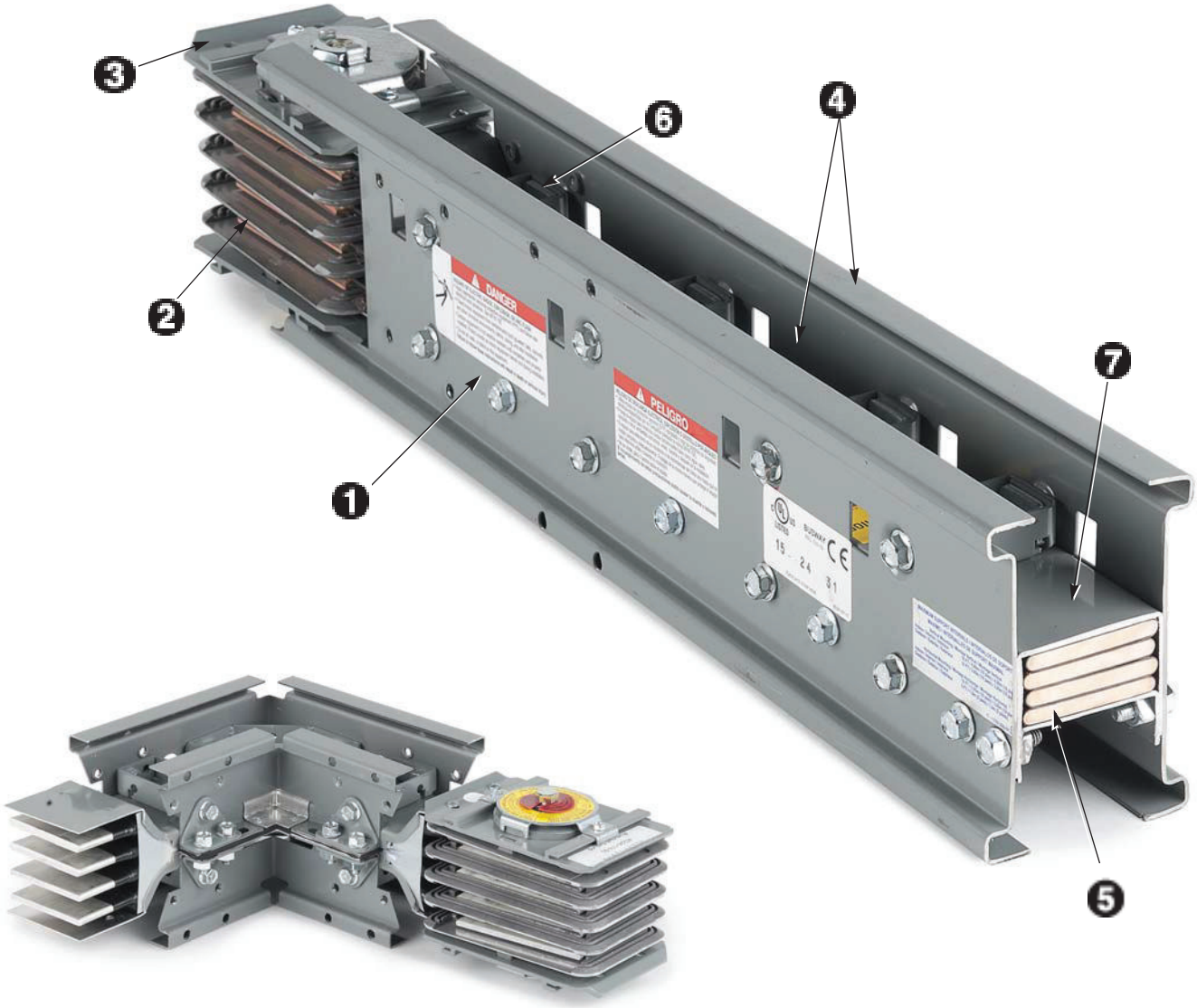


Figure 9: Indoor Feeder Busway 800–5000 A

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.

NOTE:

— 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 for I-Line busway meets UL 857 requirements.

Outdoor Feeder Busway 800–5000 A

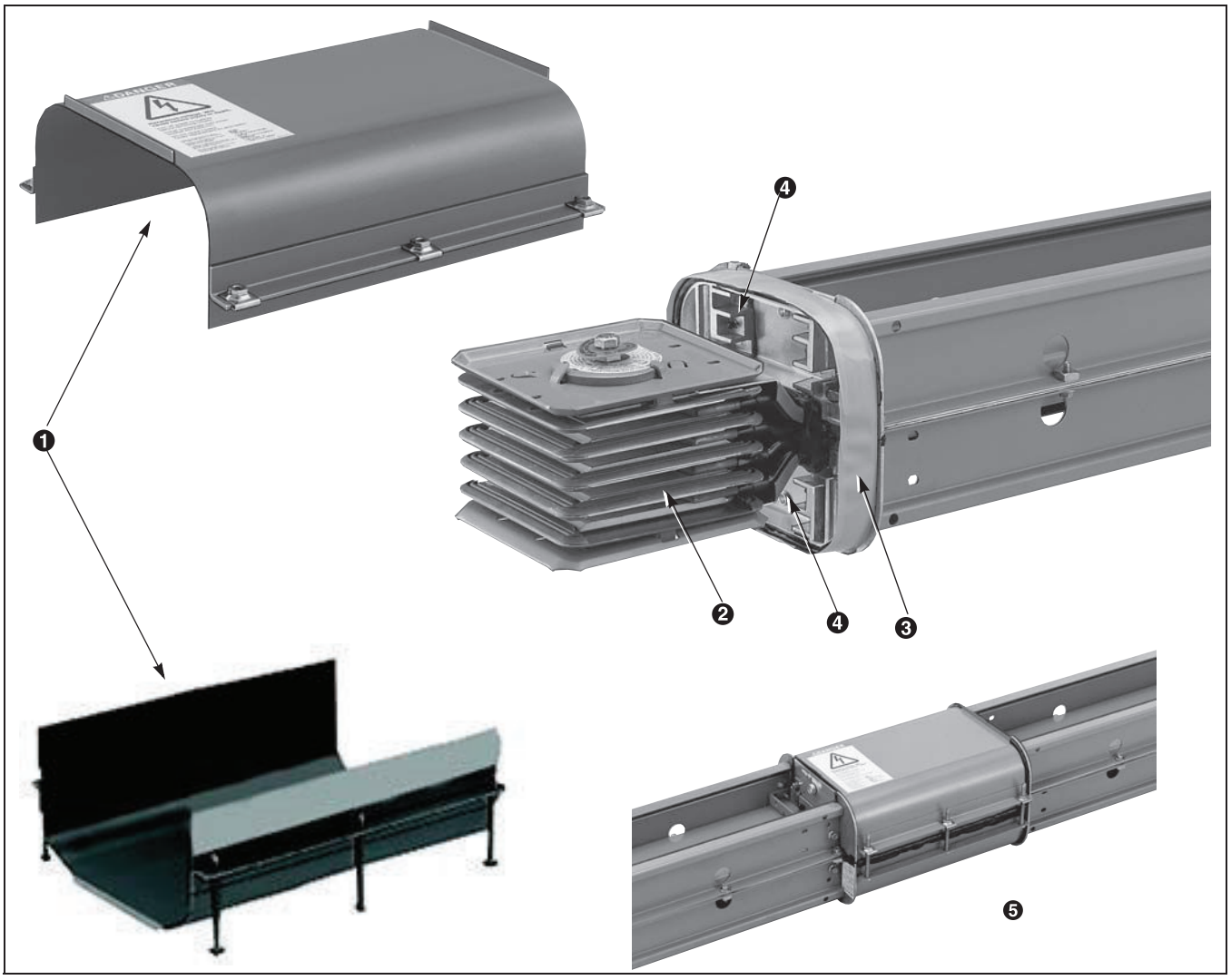


Figure 10: Outdoor Feeder Busway 800–5000 A

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 a factory-installed joint sealant strip. Removing the sealant's protective paper covering and installing the joint covers with the quick fasten nut, seal the joint from water contamination.
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. Outdoor feeder busway can be installed to achieve an IP66 environmental rating with drain plugs and sealing strips located per the I-Line II Outdoor Feeder Busway instruction bulletin document no. 45123-922-01.
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.

Busway Order Entry Checklist

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 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	
SERVICE	HORIZONTAL	VERTICAL	TIE	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 on which 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, contact your local representative
X	X	X	X	U. Switchboard identification markings noted on busway sketch

NOTES:

1. For detailed illustrations, refer to pages 24–33.
2. Missing information will cause delays in order processing and can affect the delivery schedule.
3. If additional assistance is required, contact Schneider Electric at 1-888-778-2733.