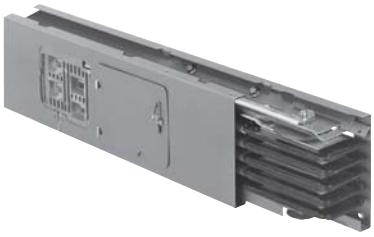
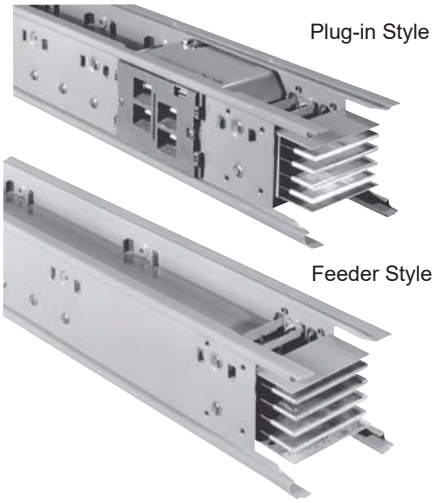
Busway Systems

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 11—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 themostatically 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.

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, rated to 266 °F (130 °C)

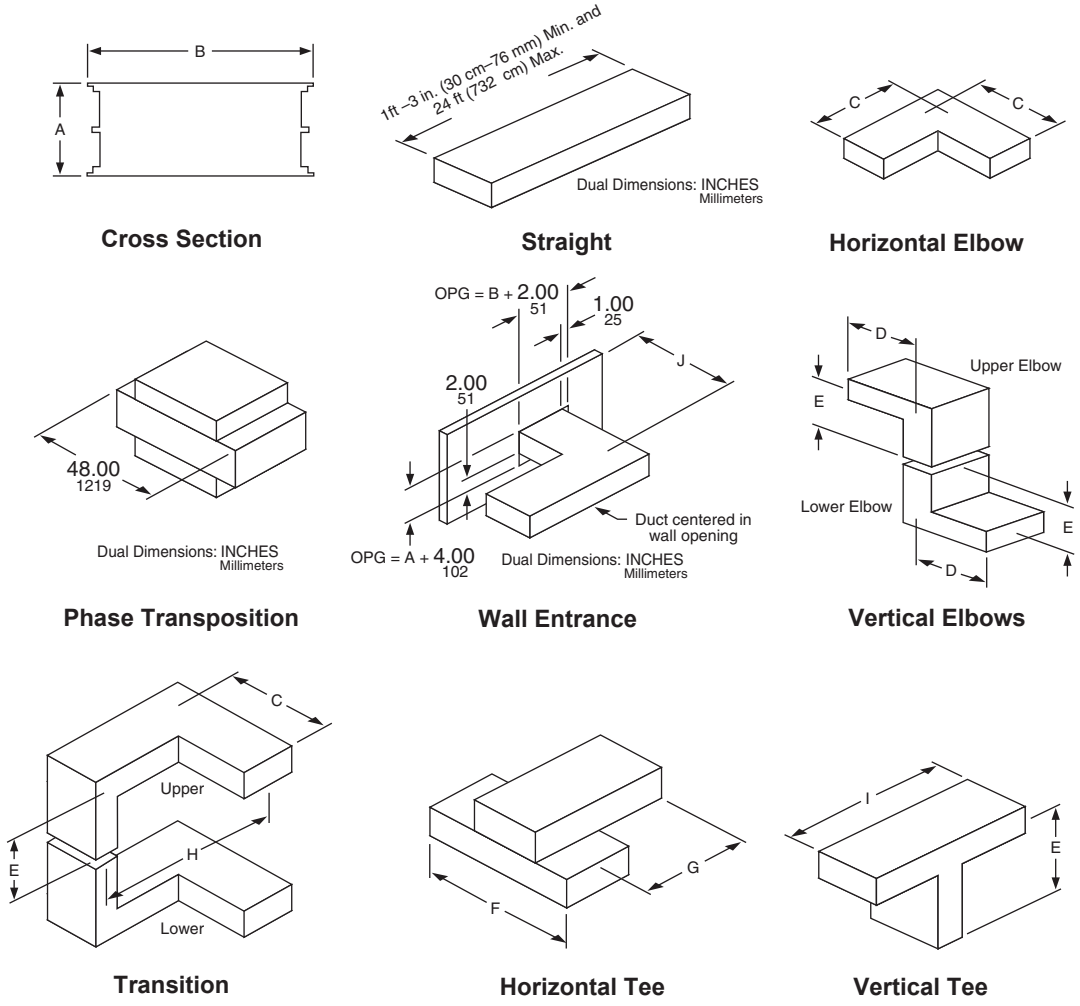


Figure 135: Standard Construction Installation
(for weights/dimensions, see Table 115 on page 145)

Table 115: Power-Zone™ Metal-Enclosed Busway—Minimum Dimensions and Other Specifications

Voltage and Material	Ampere Rating	Wt (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	29	8.00	203	21.00	533	22.00	559	11.38	289	15.00	381	10.76	46	44.29	45.58
	1600	33	8.00	203	21.00	533	22.00	559	11.38	289	15.00	381	8.50	65	43.46	44.28
	2000	47	10.00	254	21.00	533	22.00	559	12.38	314	16.00	406	5.79	70	37.05	37.50
	2500	54	14.00	356	21.00	533	22.00	559	14.38	365	18.00	457	4.71	88	29.23	29.61
	3200	75	14.00	356	27.00	686	25.00	635	14.38	365	18.00	457	3.91	120	31.84	32.08
	4000	111	14.00	356	36.00	914	30.00	762	14.38	365	18.00	457	3.47	166	41.93	42.07
	5000	131	24.00	610	42.00	1067	33.00	838	19.38	492	23.00	584	2.78	209	42.54	42.63
	6000	147	28.00	711	42.00	1067	33.00	838	21.38	543	25.00	635	2.41	260	24.76	24.88
Aluminum 600	1200	21	8.00	203	21.00	533	22.00	559	11.38	289	15.00	381	13.41	58	43.46	45.48
	1600	26	10.00	254	21.00	533	22.00	559	12.38	314	16.00	406	8.76	67	37.05	38.07
	2000	32	14.00	356	21.00	533	22.00	559	14.38	365	18.00	457	6.16	74	28.79	29.44
	2500	37	14.00	356	27.00	686	25.00	635	14.38	365	18.00	457	5.61	105	31.84	32.33
	3200	47	14.00	356	27.00	686	25.00	635	14.38	365	18.00	457	4.10	126	41.93	42.13
Copper 5000 and 15000	1200	34	14.00	356	27.00	686	25.00	635	14.38	365	18.00	457	15.09	65	56.50	58.48
	1600	41	14.00	356	27.00	686	25.00	635	14.38	365	18.00	457	8.50	65	54.37	55.03
	2000	55	14.00	356	30.00	762	27.00	686	14.38	365	18.00	457	5.79	70	51.20	51.53
	2500	64	14.00	356	36.00	914	30.00	762	14.38	365	18.00	457	4.71	88	48.76	48.98
	3000	85	14.00	356	36.00	914	30.00	762	14.38	365	18.00	457	4.03	109	42.88	43.07
	4000	125	14.00	356	36.00	914	30.00	762	14.38	365	18.00	457	3.47	166	41.93	42.07
	5000	143	24.00	610	42.00	1067	33.00	838	19.38	492	23.00	584	2.78	209	42.54	42.63
	6000	162	28.00	711	42.00	1067	33.00	838	21.38	543	25.00	635	2.41	260	24.76	24.88
Aluminum 5000 and 15000	1200	30	14.00	356	27.00	686	25.00	635	14.38	365	18.00	457	13.41	58	54.37	56.00
	1600	34	14.00	356	30.00	762	27.00	686	14.38	365	18.00	457	8.76	67	51.20	51.95
	2000	41	14.00	356	36.00	914	30.00	762	14.38	365	18.00	457	6.16	74	48.32	48.71
	2500	44	14.00	356	30.00	762	27.00	686	14.38	365	18.00	457	5.68	107	42.52	42.89
	3000	55	14.00	356	36.00	914	30.00	762	14.38	365	18.00	457	4.32	117	41.93	42.15
Copper 38000	600	84	24.00	610	51.00	1295	37.00	940	24.00	610	23.00	584	15.44	17	76.97	78.50
	1200	84	24.00	610	51.00	1295	37.00	940	24.00	610	23.00	584	15.44	67	76.97	78.50
	1600	89	24.00	610	51.00	1295	37.00	940	24.00	610	23.00	584	10.76	83	68.89	69.73
	2000	93	24.00	610	51.00	1295	37.00	940	24.00	610	23.00	584	8.37	100	62.93	63.48
	2500	111	24.00	610	51.00	1295	37.00	940	24.00	610	23.00	584	4.68	88	53.83	54.03
	3000	120	24.00	610	51.00	1295	37.00	940	24.00	610	23.00	584	3.99	108	53.39	53.54
Aluminum 38000	600	78	24.00	610	51.00	1295	37.00	940	24.00	610	23.00	584	25.46	27	76.97	81.07
	1200	79	24.00	610	51.00	1295	37.00	940	24.00	610	23.00	584	17.23	74	68.89	71.01
	1600	81	24.00	610	51.00	1295	37.00	940	24.00	610	23.00	584	13.41	58	68.06	69.36
	2000	82	24.00	610	51.00	1295	37.00	940	24.00	610	23.00	584	11.33	136	62.28	63.30

Table 115: Power-Zone Metal-Enclosed Busway—Minimum Dimensions and Other Specifications *(continued)*

Voltage and Material	Ampere Rating	Wt (Lb)	Dimensions										Resistance Microhms Per Phase Per Foot	Watt Loss Per 3-Phase Foot	Reactance Microhms Per Foot	Impedance Microhms Per Foot
			F		G		H		I		J					
			IN	mm	IN	mm	IN	mm	IN	mm	IN	mm				
Copper 600	1200	29	48.00	1219	22.00	559	18.25	464	28.00	711	17.00	432	10.76	46	44.29	45.58
	1600	33	48.00	1219	22.00	559	18.25	464	28.00	711	17.00	432	8.50	65	43.46	44.28
	2000	47	48.00	1219	22.00	559	19.25	489	30.00	762	17.00	432	5.79	70	37.05	37.50
	2500	54	48.00	1219	22.00	559	21.25	540	34.00	864	17.00	432	4.71	88	29.23	29.61
	3200	75	60.00	1524	25.00	635	24.25	616	34.00	864	20.00	508	3.91	120	31.84	32.08
	4000	111	60.00	1524	30.00	762	28.75	730	34.00	864	25.00	635	3.47	166	41.93	42.07
	5000	131	60.00	1524	33.00	838	36.75	933	44.00	1118	28.00	711	2.78	209	42.54	42.63
	6000	147	60.00	1524	33.00	838	38.75	984	48.00	1219	28.00	711	2.41	260	24.76	24.88
Aluminum 600	1200	21	48.00	1219	22.00	559	18.25	464	28.00	711	17.00	432	13.41	58	43.46	45.48
	1600	26	48.00	1219	22.00	559	19.25	489	30.00	762	17.00	432	8.76	67	37.05	38.07
	2000	32	48.00	1219	22.00	559	21.25	540	34.00	864	17.00	432	6.16	74	28.79	29.44
	2500	37	60.00	1524	25.00	635	24.25	616	34.00	864	20.00	508	5.61	105	31.84	32.33
	3200	47	60.00	1524	25.00	635	24.25	616	34.00	864	20.00	508	4.10	126	41.93	42.13
Copper 5000 and 15000	1200	34	60.00	1524	25.00	559	24.25	616	34.00	864	20.00	508	15.09	65	56.50	58.48
	1600	41	60.00	1524	25.00	559	24.25	616	34.00	864	20.00	508	8.50	65	54.37	55.03
	2000	55	60.00	1524	27.00	686	25.75	654	34.00	864	22.00	589	5.79	70	51.20	51.53
	2500	64	60.00	1524	30.00	762	28.75	730	34.00	864	25.00	635	4.71	88	48.76	48.98
	3000	85	60.00	1524	30.00	762	28.75	730	34.00	864	25.00	635	4.03	109	42.88	43.07
	4000	125	60.00	1524	30.00	762	28.75	730	34.00	864	25.00	635	3.47	166	41.93	42.07
	5000	143	60.00	1524	33.00	838	36.75	933	44.00	1118	28.00	711	2.78	209	42.54	42.63
	6000	162	60.00	1524	33.00	838	38.75	984	48.00	1219	28.00	711	2.41	260	24.76	24.88
Aluminum 5000 and 15000	1200	30	60.00	1524	25.00	559	24.25	616	34.00	864	20.00	508	13.41	58	54.37	56.00
	1600	34	60.00	1524	27.00	686	25.75	654	34.00	864	22.00	589	8.76	67	51.20	51.95
	2000	41	60.00	1524	30.00	762	28.75	730	34.00	864	25.00	635	6.16	74	48.32	48.71
	2500	44	60.00	1524	27.00	686	25.75	654	34.00	864	22.00	589	5.68	107	42.52	42.89
	3000	55	60.00	1524	30.00	762	28.75	730	34.00	864	25.00	635	4.32	117	41.93	42.15
Copper 38000	600	84	84.00	2134	37.00	940	45.88	1165	48.00	1219	33.00	838	15.44	17	76.97	78.50
	1200	84	84.00	2134	37.00	940	45.88	1165	48.00	1219	33.00	838	15.44	67	76.97	78.50
	1600	89	84.00	2134	37.00	940	45.88	1165	48.00	1219	33.00	838	10.76	83	68.89	69.73
	2000	93	84.00	2134	37.00	940	45.88	1165	48.00	1219	33.00	838	8.37	100	62.93	63.48
	2500	111	84.00	2134	37.00	940	45.88	1165	48.00	1219	33.00	838	4.68	88	53.83	54.03
	3000	120	84.00	2134	37.00	940	45.88	1165	48.00	1219	33.00	838	3.99	108	53.39	53.54
Aluminum 38000	600	78	84.00	2134	37.00	940	45.88	1165	48.00	1219	33.00	838	25.46	27	76.97	81.07
	1200	79	84.00	2134	37.00	940	45.88	1165	48.00	1219	33.00	838	17.23	74	68.89	71.01
	1600	81	84.00	2134	37.00	940	45.88	1165	48.00	1219	33.00	838	13.41	58	68.06	69.36
	2000	82	84.00	2134	37.00	940	45.88	1165	48.00	1219	33.00	838	11.33	136	62.28	63.30

NOTES:

1. Ampere ratings are based on a maximum conductor rise of 149 °F (65 °C) in a 104 °F (40 °C) ambient in compliance with the temperature limits of ANSI/IEEE C37.23.
2. Resistance, watt loss, and impedance values are calculated using a maximum conductor temperature rise of 149 °F (65 °C) and a normal 68 °F (20 °C) ambient.
3. Weights and dimensions are for standard 3-phase, totally enclosed, non-ventilated aluminum enclosures. 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 your local Schneider Electric representative 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; 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 your local Schneider Electric representative 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.

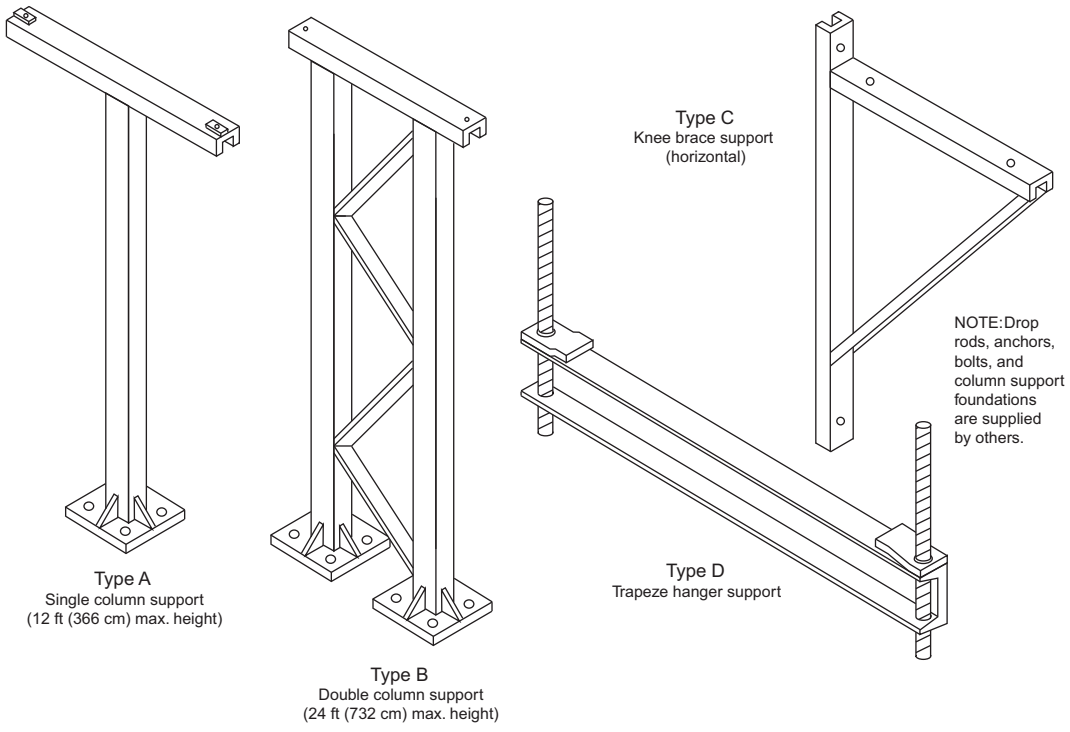


Figure 136: Bus Supports

Layout and 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 (3) 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).

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, contact your local Schneider Electric representative.

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 should be added on the basis of one for every 12 to 15 feet (366 to 457 cm) of busway. Indoor supports are a trapeze-type hanger while outdoor supports are a single- or double-column type support. Consult your local Schneider Electric representative for other type supports.

Hazardous Locations

Consult your local Schneider Electric representative for bus runs that are to be installed in a location that is classified as hazardous.

General Layout 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. 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 7 feet (213 cm) of bus. 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.

Typical Layout

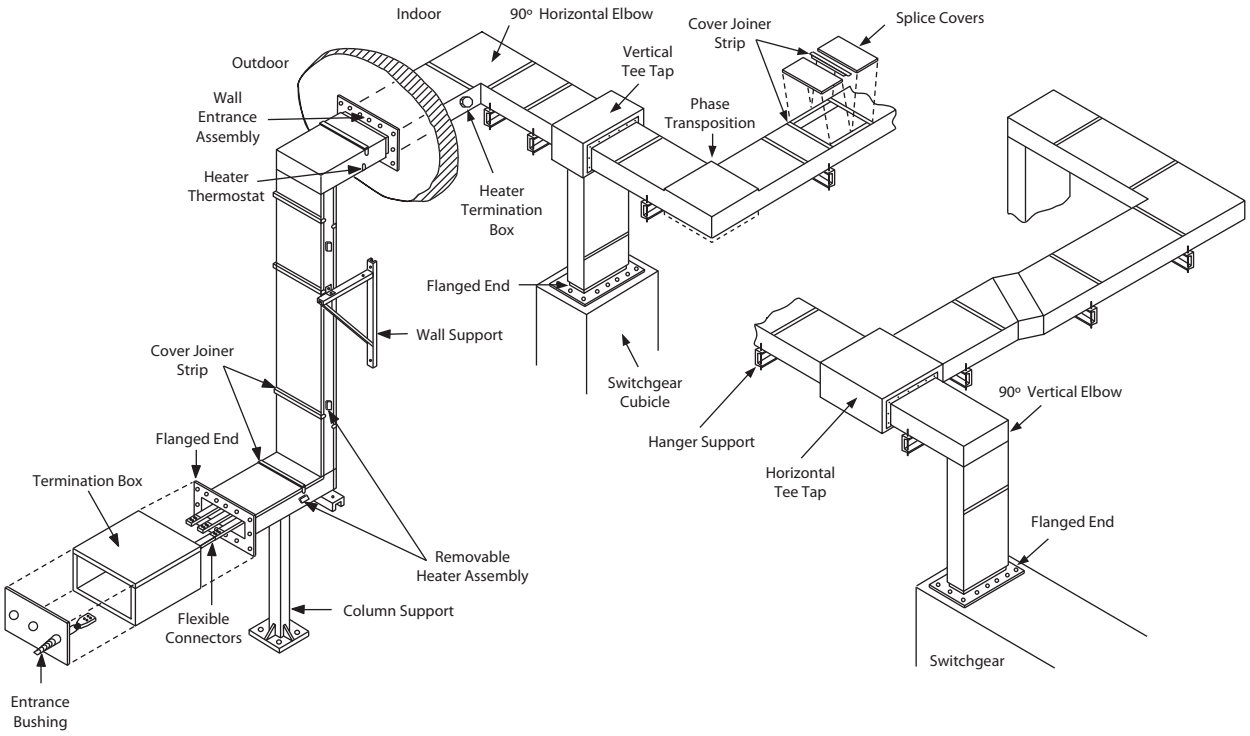


Figure 137: Typical Layout Example