GE Consumer & Industrial
Electrical Distribution

Spectra Series™ Busway

imagination at work

Spectra Series™ Busway. All the muscle without the weight.

GE engineers have broken the weight barrier with Spectra Series™ busway. Its computer-designed, all-aluminum housing is up to 50% lighter than comparable wire and conduit – and lighter than competitors' busway – while providing the current-carrying capacity (up to 5,000 amps) and short-circuit protection you've always counted on from GE busway.

Less weight means big labor savings.
Since Spectra Series busway is lighter than other busways, its easier to handle and hang. You save on labor and installation time (per NECA labor standards). This may lower your total installed cost by up to 75% versus wire and conduit.

Epoxy insulation protects your investment.
GE has applied more than three decades of experience with material coatings to bring advanced epoxy insulation technology to Spectra Series busway. Our special Class B 130°C Blue Coat™ epoxy insulation provides tougher, longer life (50 years expected) than mylar, PVC, and glass tape used by other manufacturers.

A load of extras.
Both plug-in and feeder configurations offer identical low voltage drop. In fact, it's one of the most efficient busway systems available.

Our exclusive adjustable joint connector allows quick ±1/2" busway length adjustment – right in the field. This new level of flexibility makes it easy to cope with unexpected building variations during installation.

Spectra Series busway also includes our specially designed belleville spring washer that retains over 90% of its original contact pressure. So you get a more secure, reliable and virtually maintenance-free joint.

Our new busway can often be hung with a unique GE hanger that employs just a single drop rod. Plug-assist and plug-position locators make installation a snap (even on larger plugs). And 50% housing ground is standard. Internal ground is available for both aluminum and copper busway.

Tip the scale in your favor. Choose Spectra Series busway from GE

Quick Index	Pages

Put the Busway Tool Kit to work for you!

GE's Busway Tool Kit is a collection of electronic tools that quickly and easily answers customers' questions, calculates costs savings for contractors, provides layout assistance to specifiers, and delivers value engineering to distributors.

Labor Calculator compares the labor costs of installing lighter GE busway versus Square D busway.

Cable Converter – calculates how busway costs to compare to pipe and wire.

Speculator answers busway-related electrical questions.

Autobus allows specifiers, electrical contractors and others to design and engineer busway in 3-D AutoCAD® format.

The Busway Toolkit is available on-line at www.geelectrical.com/elitenet or order the two-CD set (DEU-060) from GE.

State-of-the-Art Busway Systems

All Spectra Series™ bus bars are integrity-tested with 5000 Vac – for absolute performance confidence.

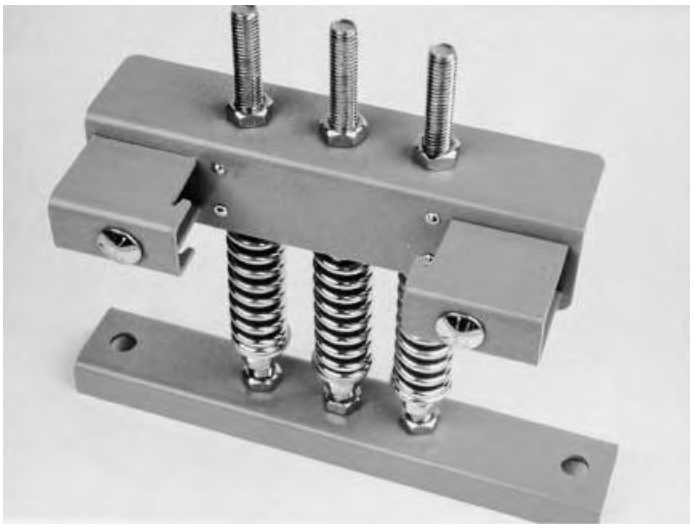
Automated process applies durable baked-enamel ANSI 61 finish (tough .10" thick aluminum 6061-T6 housings) – for consistent, repeatable quality and protection.

Our experts closely monitor production performance – to help protect your investment.

Easiest-to-Install Busway – Ever.

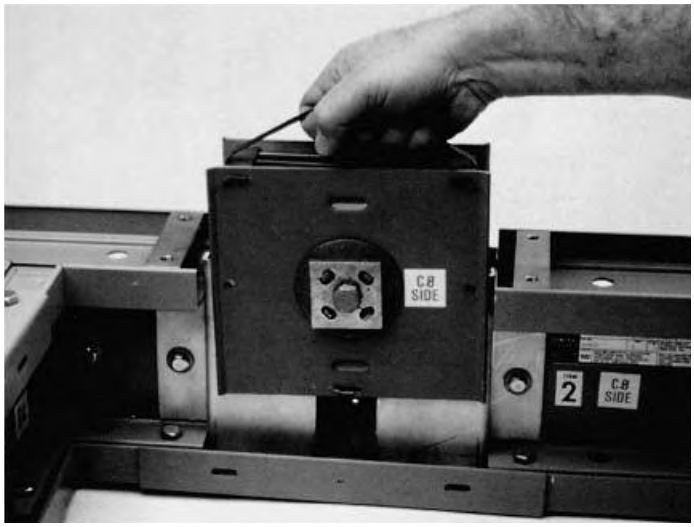
Spectra Series™ busway features an aluminum housing that cuts busway weight up to 50% – reducing installation costs. Single bolt joint with positive torque connection at 50 ft.-lbs. is standard. See the back cover for optional Joint Guard™ bolt.

Sections can be hung every 10 feet with just a single drop rod hanger standard up to 2000 amp aluminum or 1600 amp copper. Spectra bus is extremely light – enough to lighten ceiling loads up to 50%.



Easy-to-install, rugged vertical riser hanger supports simplify busway installation and adjustment.

For secure, flexible long-term reliability and minimal maintenance, Spectra busway offers up to ±1/2" adjustable joints with belleville spring washers that do not require re-torquing.



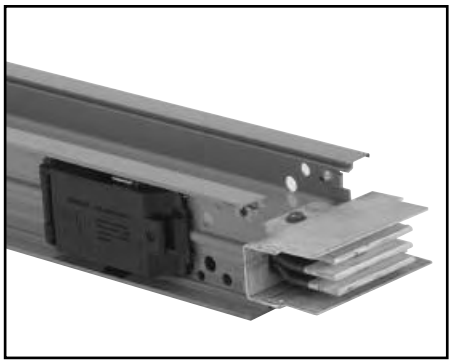
Flex-A-Joint™ removable isolation joints allow individual sections to be conveniently taken out of service with minimum downtime or interruption of power. Accepts Flex-A-Tap™ bolted power take-off devices up to 1600 amps at every joint, plug-in or feeder.

Plug-assist and plug-position locators simplify connection – assuring positive, safe installation.

See General Electric installation instructions, publication number DEH-40087 for recommended low maintenance procedures.

Note: It is a good practice to de-energize the busway when installing or removing plugs. Please follow all guidelines in GE publication DEH-40087 carefully.

Electrical Data



Spectra Series feeder busway

Integrated housing ground resistance

Spectra Series busway's all-aluminum housing provides an extremely low impedance ground path with less resistance (more continuous current capacity) than internal ground bus bars for both copper and aluminum systems.

Spectra Series busway's integrated housing ground resistance values exceed NEC 250-94 standards for minimum ground conductors.

Plug-in outlet grounding is supplied with tin-plated copper tabs bolted to the aluminum housing for superior continuity through standard bus plug ground stabs. An internal ground bus bar (50% capacity, .125 inch thick) is also available to provide a complete system.

Table 5.1

Bar Width	DC Resistance Ohms x 10^{-3}/100 ft. @ 75° C		
	Integrated Housing Ground	Aluminum Internal① 50% Ground Bus	Copper Internal 50% Ground Bus
0.750	0.65	18.67	10.74
1.125	0.64	12.44	7.16
1.625	1.31	8.62	5.15
1.750	0.61	8.00	4.60
2.250	1.21	6.22	3.72
2.875	1.12	4.87	2.91
3.375	1.06	4.15	2.48
4.000	1.04	3.50	2.10
4.250	0.97	3.29	1.95
4.500	0.95	3.11	1.84
5.750	0.85	2.44	1.44
6.500	0.80	2.15	1.27
7.500	0.74	1.86	1.07
8.250	0.71	1.70	1.00

① The housing could satisfy 50% ground bus conductor requirements. An internal aluminum ground bar offers no electrical advantage and is not available in the Spectra II option.

Busway applications with harmonics

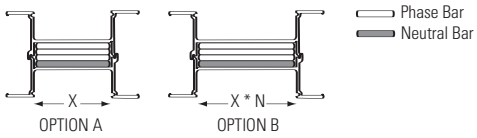
For busway applications where non-linear loads are present, first determine the specific non-linear load condition for the application. Once the non-linear load condition is established, Spectra Series busway should be derated in accordance with Option A; see Table 5.2 and Fig. 5.1 below.

Where full nameplate loading is required, Spectra Series busway should be sized in accordance with Option B; see Table 5.2 and Fig. 5.1 below. By increasing the width of both the phase and neutral bars equally, the busway will operate within UL heat rise limits at full nameplate rating, while also carrying up to twice the rated current in the neutral conductor.

Table 5.2

Non-linear Load (Neutral Harmonic Current / Total Phase Current)	Option A			Option B	
	Derating Factor	Phase Bar Width	Neutral Bar Width Width	Phase Bar Width	Neutral Bar Width
0.00	1.000	X	X	Not Required	
1.00	0.866	X	X	X * 1.15	X * 1.15
1.25	0.811	X	X	X * 1.23	X * 1.23
1.50	0.756	X	X	X * 1.32	X * 1.32
1.75	0.703	X	X	X * 1.42	X * 1.42
2.00	0.655	X	X	X * 1.53	X * 1.53

Figure 5.1



Note: Please contact your local GE Consumer & Industrial sales office for additional information on application of busway with non-linear loads.

Short-circuit ratings

The Spectra Series busway design provides predictable, consistent strength and high short-circuit ratings.

The ratings shown below are UL recognized rms symmetrical amps for both feeder and plug-in phase-to-phase and phase-to-ground. Tests were run at three cycles minimum per UL standards. Additional tests were run at six cycles. Spectra Series busway is third party certified by KEMA to be in compliance with IEC439-1 and -2 short circuit withstand test for 1 and 3 seconds.

The short-circuit rating of the busway system with protective devices that are part of the busway, such as power takeoffs and reducers, is equal to the lower of the short-circuit rating of the protective device or the busway with which the fitting is used. For example, a fusible power takeoff rated 200,000 amps with Class J fuses when installed on a busway rated 150,000 amps would have a rating of 150,000 amps.

Standard short-circuit busway ratings can be given a higher UL Listed short-circuit rating when protected by specific J, T, R and Class L fuses as shown below.

Table 6.1
Short-Circuit Ratings Plug-In and Feeder

Amp Rating	Aluminum (kA)			Copper (kA)		
	3 and 6 Cycles	1 Sec.	3 Secs.	3 and 6 Cycles	1 Sec.	3 Secs.
225①	30/50	11/24	6/14	30/50	17/40	10/21
400①	42/85	17/24	10/14	30/50	17/40	10/21
600①	50/85	28/24	16/14	42/85	25/40	15/21
800	100	42	24	85	40	21
1000	100	50	29	100	51	29
1200	125	62	36	100	65	37
1350	150	84	49	100	76	44
1600	150	95	55	125	95	55
2000	150	121	70	150	129	75
2500	200	132	76	150	150	107
3000	200	169	97	200	191	110
4000	200	200	140	200	200	149
5000	–	–	–	200	200	200

① Use the first value when selecting Spectra Series II busway.

Table 6.2
Maximum Fuse Sized for Increased Short-Circuit Protection to either 100KA or 200KA

Amp Rating		Max "L" Fuse Sizes For Increased Short-Circuit Rating	
AL	CU	100KA	200KA
225	225	1200②	800①
400	400	1200②	800①
–	600	1200②	800①
600	800	2000②	1200②
–	1000	–	2000②
800	1200	–	2500②
1000	1350	–	2500②
1200	1600	–	3000②
1350	2000	–	4000②
1600	–	–	4000②
2000	2500	–	4000②

① Also 600J, 800T or 400R
② Also 600J, 800T or 600R

Standards

Spectra Series busway conforms to the latest revisions of: NEMA BU-1; ANSI/UL857; federal spec W-B-811b; cUL. Can comply with IEC 439-1 and 2. Contact factory for details.

Electrical Data

Busway operation at other frequencies

Spectra Series busway continuous current ratings are for 50/60 Hz frequency. For 400 Hz operation, de-rate bus to 85% load.

Effect of ambient temperature on busway operation

Graph 7.1 illustrates the effect of various ambient temperature conditions on busway operating temperature. Spectra Series busway utilizes NEMA Class B 130°C insulation. This chart can be used to determine bus operating parameters in accordance with various standards.

Note : The Blue coat epoxy insulation of GE-Spectra Busway has earned "Class B – 130 deg C UL recognition in accordance with UL857". This superior insulation enables GE-Spectra Busway to operate satisfactorily at 50 deg C ambient.

Graph 7.1
Effect of ambient temperature on busway operation

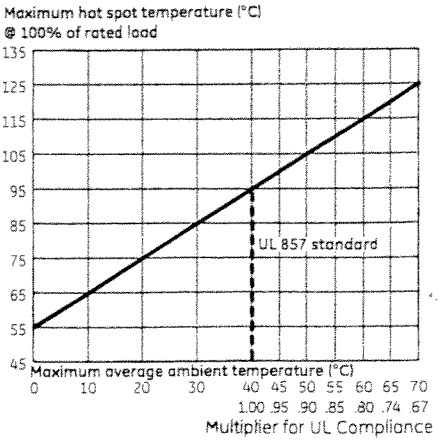
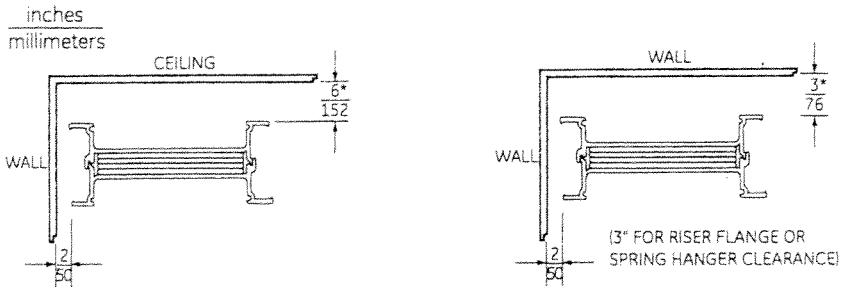
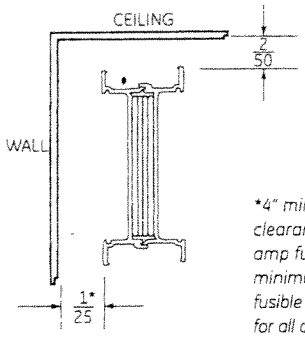


Fig. 7.1
Plug-In or Feeder, One or Two Stack



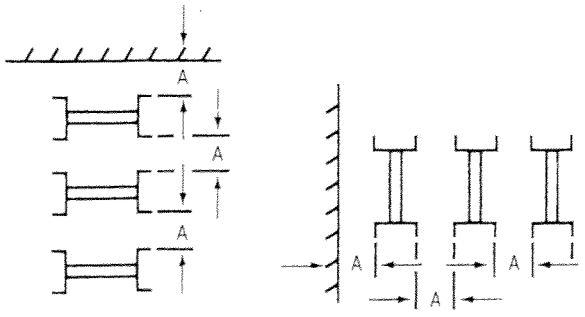


4" minimum provides clearance for 30-100 amp fusible plugs. 7" minimum for 200 amp fusible plugs. 8" minimum for all other plugs.

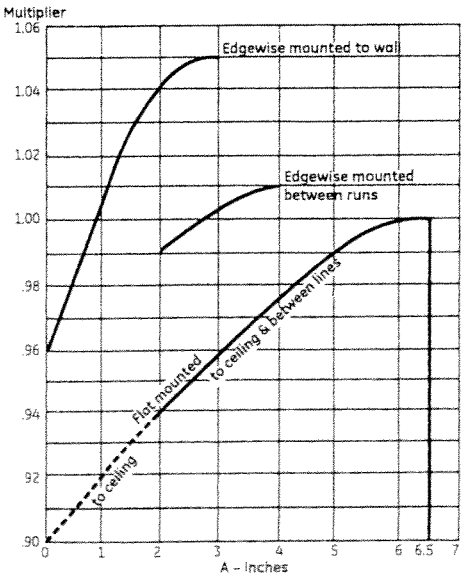
Proximity

Below is a drawing that shows the possible positions of busways relative to walls and to each other. Refer to Graph 7.2 for the proper multiplier required to maintain a 55°C rise in a 40°C ambient.

If horizontally mounted busways are three high, there is an additional multiplying factor of 0.95 for the top run and 0.975 for the center run. The average current hours per week the busway runs at full load will need to be taken into account to determine if the installation requires derating as shown in Graph 7.2.



Graph 7.2



Voltage drop: plug-in or feeder

Table 8.1

Spectra Series busway has excellent low-voltage-drop values. Minimum reactance (X) is due to very close bar spacings (sandwiched construction) and a non-magnetic housing. Values shown are identical for plug-in and feeder.

60 Hz values shown. For 50 Hz, multiply reactance (X) by 0.83 and resistance values do not change. For 400 Hz, multiply reactance by 3.9 and multiply resistance by 1.4. Calculate new voltage drop V_d = amps load X $\sqrt{3}$ (R cos Θ + X sin Θ) ft/100, where cos Θ = Power Factor. Contact your local GE representative for a free copy of the Busway Tool Kit (DEU-066) to help with electrical calculations.

		Rated Load Amps	Bar Width x 1/4" Thickness		Ohms x 10^{-3}/100 Ft. Line-to-Neutral			Voltage Drop – Concentrated Load① Line-to-Line/100 Ft. @ 100% Rated Load, 25°C Amb. Power Factor							
			IN	MM	R	X	Z	.3	.4	.5	.6	.7	.8	.9	1.0
Aluminum	Spectra Series II	225	0.750	19	9.11	3.75	9.85	2.46	2.76	3.04	3.30	3.53	3.72	3.83	3.55
		400	1.125	29	6.38	3.12	7.10	1.69	1.87	2.04	2.19	2.32	2.42	2.46	2.21
		600	1.750	44	4.32	2.35	4.92	3.68	4.03	4.36	4.65	4.89	5.06	5.11	4.49
	Spectra Series	225	1.625	41	4.09	1.28	4.29	.95	1.09	1.23	1.36	1.47	1.57	1.65	1.59
		400	1.625	41	4.20	1.28	4.39	1.72	1.98	2.22	2.46	2.67	2.86	3.01	2.91
		600	1.625	41	4.52	1.28	4.70	2.68	3.10	3.50	3.88	4.24	4.56	4.81	4.70
		800	2.875	73	2.48	.79	2.60	2.08	2.38	2.67	2.94	3.19	3.41	3.57	3.44
		1000	3.375	86	2.17	.68	2.27	2.25	2.58	2.90	3.20	3.47	3.71	3.90	3.76
		1200	4.25	108	1.73	.55	1.81	2.17	2.49	2.79	3.07	3.33	3.56	3.73	3.60
		1350	5.75	146	1.24	.41	1.31	1.78	2.04	2.28	2.51	2.71	2.89	3.03	2.90
		1600	6.50	165	1.12	.36	1.18	1.88	2.16	2.42	2.66	2.89	3.08	3.23	3.10
		2000	8.25	210	.89	.29	.94	1.88	2.15	2.41	2.65	2.88	3.07	3.21	3.08
		2500	(2)4.50	114	.82	.26	.86	2.14	2.45	2.75	3.03	3.29	3.52	3.69	3.55
		3000	(2)5.75	146	.64	.21	.67	2.04	2.33	2.61	2.87	3.11	3.32	3.47	3.33
		4000	(2)8.25	210	.45	.14	.47	1.86	2.14	2.40	2.65	2.88	3.08	3.23	3.12
Copper	Spectra Series II	225	0.750	19	5.10	3.75	6.33	1.99	2.13	2.26	2.36	2.43	2.47	2.43	1.99
		400	0.750	19	5.58	3.75	6.72	1.82	1.96	2.09	2.20	2.28	2.33	2.31	1.93
		600	1.125	29	3.86	3.12	4.96	2.15	2.29	2.41	2.50	2.56	2.58	2.51	2.01
	Spectra Series	225	1.625	41	2.33	1.28	2.66	.75	.82	.89	.94	.99	1.03	1.03	.91
		400	1.625	41	2.38	1.28	2.70	1.34	1.47	1.59	1.70	1.79	1.85	1.87	1.65
		600	1.625	41	2.48	1.28	2.79	2.04	2.25	2.44	2.61	2.75	2.86	2.90	2.58
		800	1.625	41	2.62	1.28	2.92	2.78	3.08	3.35	3.60	3.81	3.97	4.04	3.63
		1000	2.25	57	1.90	.98	2.14	2.61	2.87	3.12	3.33	3.52	3.65	3.70	3.29
		1200	2.875	73	1.49	.79	1.69	2.50	2.74	2.97	3.17	3.34	3.46	3.50	3.10
		1350	3.375	86	1.27	.68	1.44	2.41	2.65	2.86	3.05	3.21	3.33	3.37	2.97
		1600	4.25	108	1.00	.55	1.14	2.29	2.51	2.71	2.88	3.03	3.13	3.16	2.77
		2000	5.75	146	.73	.41	.84	2.11	2.31	2.49	2.65	2.78	2.88	2.90	2.53
		2500	7.50	191	.57	.32	.65	2.06	2.26	2.43	2.59	2.72	2.81	2.83	2.47
		3000	(2)4.00	102	.53	.29	.58	2.26	2.48	2.68	2.86	3.00	3.11	3.14	2.73
		4000	(2)5.75	146	.37	.21	.42	2.16	2.36	2.54	2.70	2.83	2.92	2.94	2.56
		5000	(2)7.50	191	.28	.16	.32	2.05	2.24	2.41	2.56	2.69	2.77	2.79	2.42

① For plug-in distributed loads divide by 2

$$\text{Actual voltage drop} = V_d \text{ (from Table)} \times \frac{\text{actual load}}{\text{rated load}} \times \frac{\text{actual distance (ft)}}{100 \text{ feet}}$$

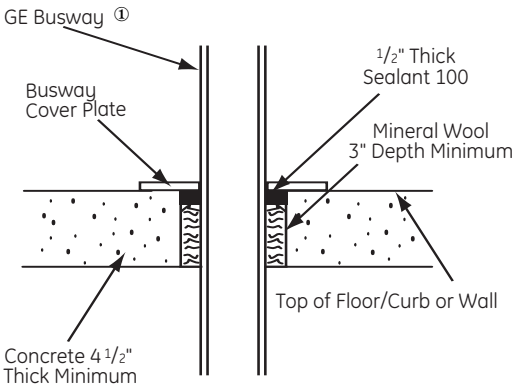
Physical Data

UL firestop system

UL Listed through-penetration firestop system is available for use with GE busway systems. The system is listed in the UL Fire Resistance Directory under XHEZ, System C-AJ-6003 with F rating = 3 hours and T rating = 1/2 hour for aluminum bars and T rating = 0 hours for copper bars.

The contractor installs a mineral wool batt (4 PCF Nominal) as shown below, on-site during the busway installation process. For riser applications, the system is used in combination with a standard GE spring hanger and floor flange. For horizontal applications, the system is used in combination with two wall flanges (one per side). See publication DEH-40087 for installation instructions.

Fig. 9.1



Note: Check with local NTL codes for curb required in riser applications.

① Spectra Series II busway requires feeder.

Table 9.1
Cubic Inches Required per Floor and Wall

Amperage	Sealant 100 Floor		Sealant 100 Wall	
	Al	Cu	Al	Cu
225-600	17	17	34	34
800	21	17	42	34
1000	22	18	44	42
1200	23	20	46	44
1350	27	22	54	46
1600	28	23	56	54
2000	33	27	66	56
2500	46	33	92	66
3000	53	44	106	92
4000	66	53	132	106
5000	–	66	–	132

Sealant 100 standard tube equals 19 in^3

This information is provided as a guideline for typical fire-stop systems. If you have an annulus (or opening) greater than 1 inch beyond the busway enclosure, you will need to determine the proper amount of fire-stop material based on Fig. 9.1. Quantities are based on application of recommended amount of material; more may be required if over-application occurs.

Spectra Series™ busway seismic certification facts

General

The complete standard commercial offering of Spectra Series busway is certified to IBC-2003 levels if I_p=1.5, 4 Sds=1, IEEE-693-1997 Moderate level @ 2.5 amplification, High level with 1.25 amplification and UBC Zone 4 seismic conditions.

Table 10.1

Maximum Acceptable Parameters	Vertical Riser Configuration	Horizontal Configuration
Acceptable Orientations	Edgewise & Flatwise	Edgewise & Flatwise
Maximum Ratings	2500A Max Copper / 4000A Max Aluminum	5000A Max Copper / 4000A Max Aluminum
Maximum Voltage	600 V Max	600 V Max
Service	3- & 4-Wire	3- & 4-Wire
Distribution	Plug-In & Feeder	Plug-In & Feeder
Hangers	Standard Floor Flange Kit with Standard Spring Hanger Assembly	Standard Hanger System using Trapeze Hangers & Clips
Maximum Hanger Spacing	12 feet	10 feet
Full Threaded Drop Rod	Standard ½" Rod	Standard ½" Rod
Drop Rod Connection ①	Not Applicable	Must be **BOLTED** through Ceiling/Floor using standard hardware①
Distribution Equipment Connection (Pbd., Swbd, Swgr, MCC, etc.)	Standard Flanged-End Stub – Special Hardware & connections NOT Required	Standard Flanged-End Stub – Special Hardware & connections NOT Required.
Bus Plugs	All Types Acceptable	All Types Acceptable
Fittings	All Types Acceptable	All Types Acceptable
Cable Tap Boxes	All Types Acceptable	All Types Acceptable
End Boxes	All Types Acceptable	All Types Acceptable
Acceptable Applications & Constructions	Indoor, Drip-Proof & Outdoor	Indoor, Drip-Proof & Outdoor
Proximity To Walls	Standard ①	Standard ①

① Drop rod must be bolted through ceiling/floor and secured on both sides with standard washers and nuts.

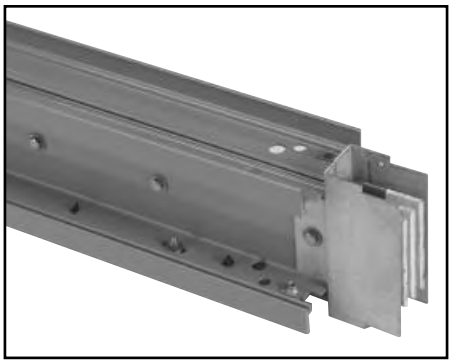
Summary

These parameters for seismic conditions are identical to the complete standard commercial offering of Spectra Series busway. **Therefore, Spectra Series busway can be used in applications in above seismic conditions without restrictions, special bracing, connections, or hangers.** Plus, Spectra Series busway can connect to equipment (panelboards, switchboards, motor control centers, switchgear, etc.) using standard flanged end stubs, cable tap boxes, and bus plugs.

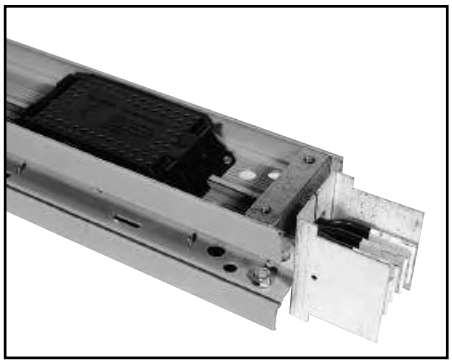
Physical Data

Straight lengths: dimensions and weights

inches
millimeters



Spectra Series II busway



Spectra Series plug-in busway

Fig. 11.1
One bar per phase

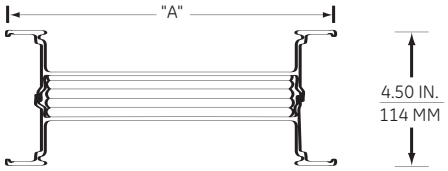


Fig. 11.2
Two bars per phase

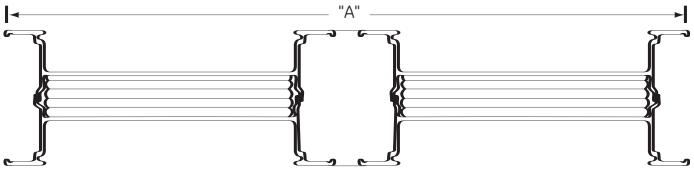


Fig. 11.3
One bar per phase plug-in and feeder

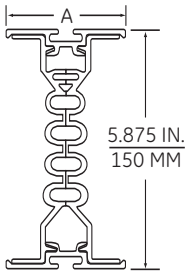


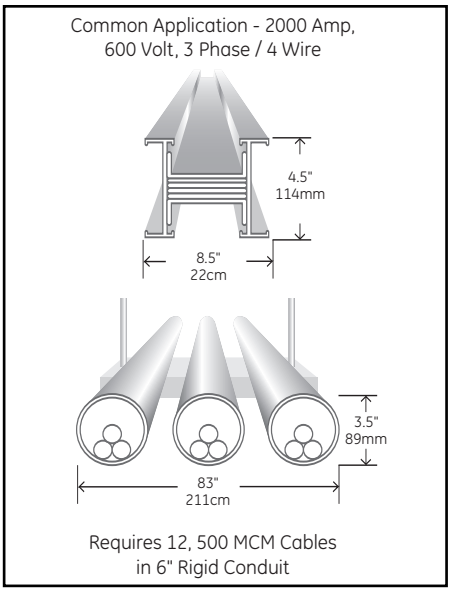
Table 11.1
Plug-in and Feeder, all bus UL Listed @600 Volts

		AC Ampere Rating	Fig. No.	Standard Bar				+1 Bar				DC Ampere Rating	Approximate Weight lbs./ft.	
				"A" Width		Bar Sizes Width x Thickness		"A" Width		Bar Size				
				Inches	MM	Inches	MM	Inches	MM	Inches	MM		3-Wire	4 Wire
Aluminum	Spectra Series II	225	11.3	3.00	76	.75 x .25	19 x 6	-	-	-	-	225	5	5
		400	11.3	3.38	86	1.13 x .25	29 x 6	-	-	-	-	600	6	6
		600	11.3	4.00	102	1.75 x .25	44 x 6	-	-	-	-	800	7	8
	Spectra Series	225	11.1	4.38	111	1.63 x.25	41 x 6	4.38	111	1.63	41	600	5	6
		400	11.1	4.38	111	1.63 x.25	41 x 6	4.38	111	1.63	41	—	5	6
		600	11.1	4.38	111	1.63 x.25	41 x 6	5.00	127	2.25	57	800/1000	5	6
		800	11.1	5.63	143	2.88 x.25	73 x 6	6.13	156	3.38	86	1350	6	7
		1000	11.1	6.13	156	3.38 x.25	86 x 6	7.00	178	4.25	108	1600	7	8
		1200	11.1	7.00	178	4.25 x.25	108 x 6	7.25	184	4.50	114	—	8	9
		1350	11.1	8.50	216	5.75 x.25	146 x 6	9.25	235	6.50	165	2500	9	10
		1600	11.1	9.25	235	6.50 x.25	165 x 6	11.00	279	8.25	210	—	10	12
		2000	11.1	11.00	279	8.25 x.25	210 x 6	15.00	381	(2)4.25	(2)108	3000	12	15
		2500	11.2	15.50	394	(2)4.50 x.25	(2)114 x 6	18.00	457	(2)5.75	(2)146	4000	17	20
		3000	11.2	18.00	457	(2)5.75 x.25	(2)146 x 6	19.50	495	(2)6.50	(2)165	—	19	23
		3200	11.2	19.5	495	(2)6.50 x.25	(2)165 x 6	-	-	-	-	5200	21	24
		4000	11.2	23.00	584	(2)8.25 x.25	(2)210 x 6	-	-	-	-	6000	25	30
Copper	Spectra Series II	225	11.3	3.00	76	.75 x .25	225	-	-	-	-	225	7	7
		400	11.3	3.00	76	.75 x .25	600	-	-	-	-	600	7	7
		600	11.3	3.38	86	1.13 x .25	800	-	-	-	-	800	8	9
	Spectra Series	225	11.1	4.38	111	1.63 x.25	41 x 6	4.38	111	1.63	41	800	8	9
		400	11.1	4.38	111	1.63 x.25	41 x 6	4.38	111	1.63	41	—	8	9
		600	11.1	4.38	111	1.63 x.25	41 x 6	4.38	111	1.63	41	—	8	9
		800	11.1	4.38	111	1.63 x.25	41 x 6	5.00	127	2.25	57	1000/1200	8	9
		1000	11.1	5.00	127	2.25 x.25	57 x 6	5.63	143	2.88	73	1350/1600	10	12
		1200	11.1	5.63	143	2 7/8 x.25	73 x 6	6.13	156	3.38	86	—	12	15
		1350	11.1	6.13	156	3.38 x.25	86 x 6	7.00	178	4.25	108	2000	14	17
		1600	11.1	7.00	178	4.25 x.25	108 x 6	7.25	184	4.50	114	2500	16	20
		2000	11.1	8.50	216	5.75 x.25	146 x 6	9.25	235	6.50	165	3000	21	26
		2500	11.1	10.25	260	7.50 x.25	191 x 6	11.00	279	8.25	210	4000	26	33
		3000	11.2	14.50	368	(2)4.00 x.25	(2)102 x 6	15.00	381	4.00	102	5000	32	40
		3200	11.2	15.50	394	(2)4.50 x.25	(2)114 x 6	-	-	-	-	5200	34	43
		4000	11.2	18.00	457	(2)5.75 x.25	(2)146 x 6	19.50	495	(2)6.50	(2)165	6000	42	52
		5000	11.2	21.50	546	(2)7.50 x.25	(2)191 x 6	23.00	584	(2)8.25	(2)210	8000	52	66

Comparison to wire and conduit

Estimates based on material costs alone often exclude the substantial cost savings and ease of installation available with the lighter, more compact Spectra Series busway. Labor savings can be significant, often resulting in lower total installed cost and the ability to free up time to complete more jobs.

A **Labor Estimating Manual**, which uses NECA labor units, is available to assist in estimating and comparing the amount of labor required to install busway and wire and conduit. This manual, along with the "Total Installed Cost Worksheet" in the back of the manual, is a valuable, simple tool used to estimate and compare the total cost for busway and wire and conduit. See General Electric publication number GEZ-7737. Your local GE Account Manager can also assist you.

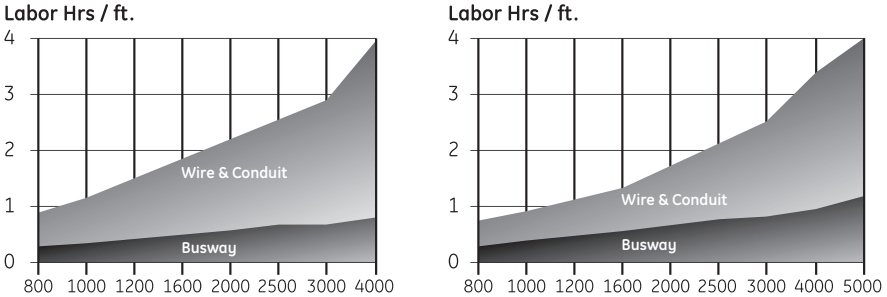


Spectra Series busway requires less space than wire and conduit

Benefits of busway over wire and conduit

- Lower installed cost
- Smaller size, lighter weight
- Better efficiency
- No cutters, benders, oils, jellies, grease, scrap or cable reels
- Future expansion flexibility
- Higher short-circuit ratings
- Lower voltage drop
- Higher integrity and reliability

Fig. 12.1
Installation Labor Costs



Aluminum Conductor **Copper Conductor**

Spectra Series Busway plug-in labor measurements are the same as feeder labor measurements

Table 12.1
Compact Size

	Width	
Amperes	**AL**	**CU**
225-600	4.375	4.375
800	5.625	4.375
1000	6.125	5
1200	7	5.625
1350	8.5	6.125
1600	9.25	7
2000	11	8.5
2500	15.5	10.25
3000	18	14.5
4000	23	18
5000	–	21.5

Dimensions
Representative in inches for aluminum and copper housings. All depths are 4.5".

Table 12.2
Low Weight

Amperes	AL3W	4W	CU3W	4W
225-600	4	5	6	7
800	6	7	8	9
1000	7	8	10	12
1200	8	9	12	15
1350	9	10	14	17
1600	10	12	16	20
2000	12	15	21	26
2500	17	20	29	37
3000	19	23	32	40
4000	25	30	42	52
5000	–	–	58	74

Pounds / 1 Foot
Representative for aluminum and copper housings with 3 wire and 4 wire applications.

Physical Data

Spectra Series busway provides optimum performance in the most demanding applications. Through superior design and applied materials technology, it assures uptime and reliability, even in severe-duty weather environments.

Weather protection: features and benefits

- Industry Exclusive WEATHERSHIELD™ Epoxy Joint Insulators designed for long life. Joint Bolt access via easily removable, UL listed/cUL certified Raintight Santoprene Plugs.
- Extra drainage channels through die cast housing spacers help eliminate standing water near joints.
- Gasketing materials rated for extreme temperatures, -40 to 250 degrees F.
- Internal sealants rated for use in extreme temperature environments of -40 to 200 degrees F.
- All Gaskets and Sealants tested to verify superior UV resistance and excellent stability when subjected to long term thermal aging.

Construction options

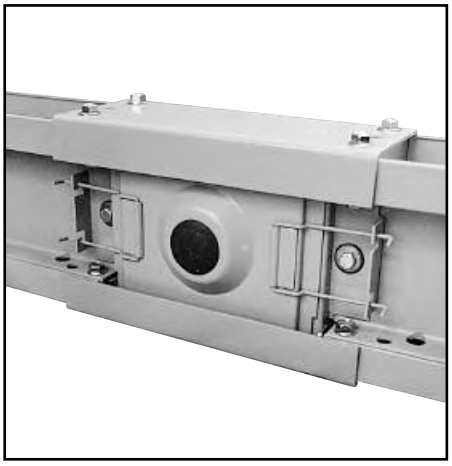
Table 13.1

Construction Type		IEC Degree of Protection	Joint Insulator
Indoor (NEMA 1)	Feeder, Plug-in, Riser	IP-40	Standard
Drip-proof①	Feeder, Plug-in, Riser	IP-43	Standard
Splash-proof①	Feeder, Plug-in, Riser	IP-54	Weathershield
Outdoor (NEMA 3R)①	Feeder (Only)	IP-65/66	Weathershield

① Excludes joint elbow and Spectra Series II

The materials and processes used in these construction options are the result of an intensive Design for Six Sigma (DFSS) design and testing process. These products combine high reliability with new features that reduce assembly time by more than 50%. The joint shield, as shown in the photo below, uses an integral spring latch clamping system. This system provides optimum gasket compression at all joint connections, and eliminates the need for additional joint cover hardware.

The Splash-proof and Outdoor designs feature an industry-exclusive 100% epoxy insulation system throughout the bus and joints. This system includes GE Bluecoat™ epoxy on the bus bars and WEATHERSHIELD™ insulators in the joints.



Innovative joint shield design provided with drip-proof, splash-proof, and outdoor bus.

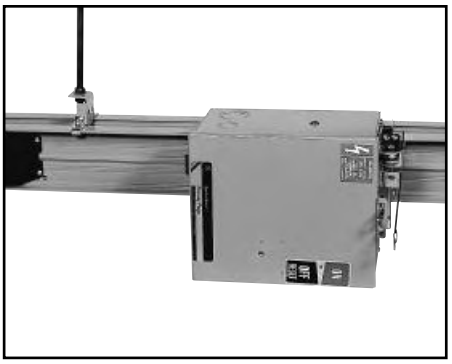
Complete outdoor run of Spectra Series busway.

Straight lengths: plug-in and feeder

Spectra Series busway is available in ratings from 225-5000 amps in both feeder and plug-in using common joint and housing parts (excluding Spectra Series II).

Plug-in lengths are available in 2-, 4-, 6-, 8-, and 10-foot lengths, and feeder lengths are also available in 2- to 10-foot lengths in ⅛-inch increments. The ± ½-inch (13 mm) adjustable, removable joint is attached to one end of each section (AKA "joint-end").

Plug-in busway has up to 10 unobstructed, usable plug outlets, standard as shown (trapeze hanger positions may obstruct some openings). Vertical riser plug-in busway is also available with plug outlet openings on one side (when the other side is inaccessible) for even greater value. Plug outlet covers are molded of tough, impact and chemical resistant polycarbonate thermoplastic.



Spectra Series plug-in bus with bus plug

Plug-in flatwise mounted

Unless otherwise specified, horizontal runs of plug-in busway will be furnished with the phase, Ø side label on the bottom of the busbar stack so that plug On/Off position pointer, and labels will be visible from the floor. Operating handles can be installed on the end walls (for hook stick access). Additionally, vertical risers of plug-in busway will be furnished with the phase Ø side label on the right so that the line-side of the plug will be up, and operating handle will be on the right side.

inches
millimeters

Fig. 14.1
Plug outlet locations

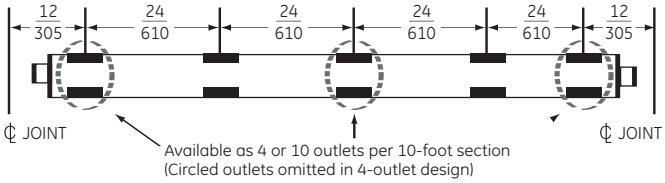
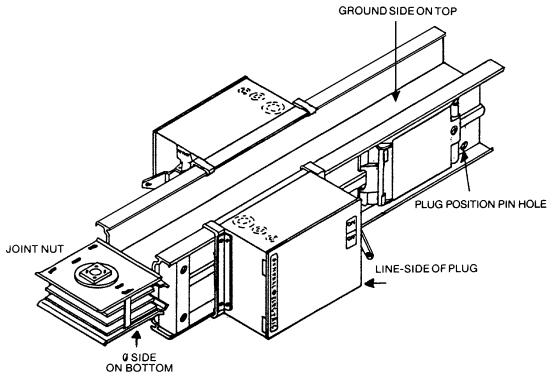


Fig. 14.2
Typical plug mounting



Physical Data

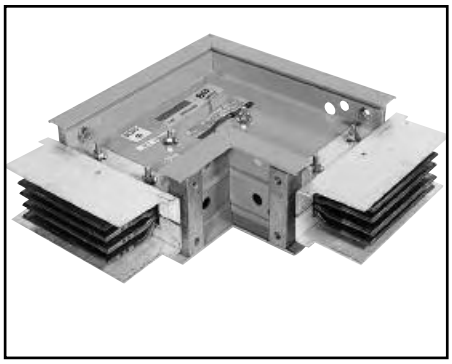
Fittings

Spectra Series busway has a complete family of fittings to meet virtually all layout requirements using the compact minimum sizes shown. Special turns such as flat angles greater than 90° and crosses are also available.

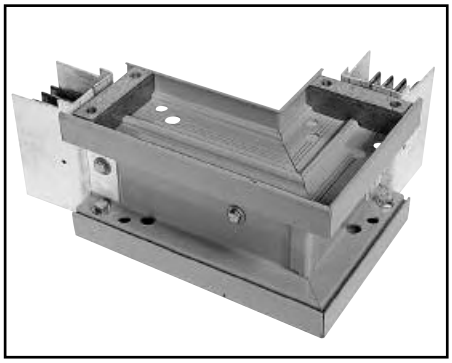
Nomenclature for completely defining the turn is defined by looking into the joint end with phase Ø side facing down on the busway as shown in Fig. 15.1.

Each piece of busway is labeled to maintain proper phasing. All turn dimensions are defined from the centerline of the joint end to the centerline of the busways as "X", "Y", and "Z" (where applicable) leg lengths. Tables 16.1 - 16.4 Dimensions listed are standard. Variable leg lengths are available in ⅛" increments (except joint elbows). The total footage of any one fitting cannot exceed 10 feet in length.

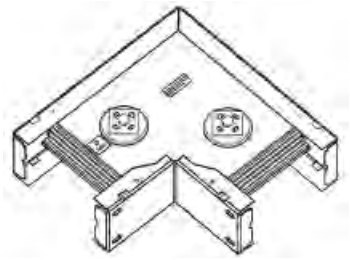
Note: Offsets and combination elbows are typically used only when standard elbows will not fit.



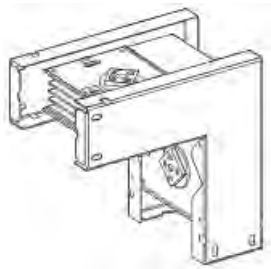
Flatwise elbow



Edgewise elbow

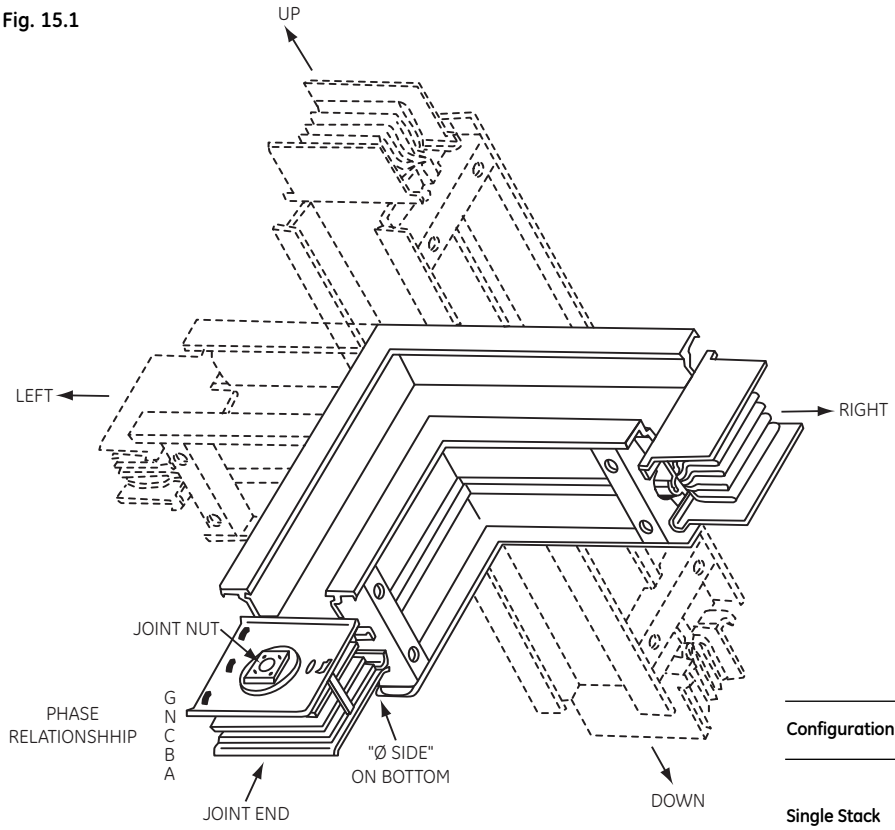


Flatwise joint elbow (indoor only)



Edgewise joint elbow (indoor only)

Fig. 15.1



Configuration	Amperage	Bar Width	Centerline to Centerline Dimensions			
			Flatwise Joint Elbow		Edgewise Joint Elbow	
			Inches	MM	Inches	MM
Single Stack	Al 225-800 / Cu 225-1200	1.63-2.88	3	76	6	152
	Al 1000-1200 / Cu 1350-1600	3.38-4.50	4	102	6	152
	Al 1350-2000 / Cu 2000-2500	5.75-8.25	5	127	6	152
Double Stack	Al-2500 / Cu-3000	4.25-4.5	8	203	6	152
	Al-3000 / Cu-4000	5.75-6.50	10	254	6	152
	Al-4000 / Cu-5000	7.5-8.25	12	305	6	152

For use in applications where joint elbows do not apply, e.g., variable lengths, drip-proof, splash-proof and outdoor.

Table 16.1
Flat Elbows

	Amps	Standard Dimensions				
		X Inches	X MM	Y Inches	Y MM	Z
Aluminum	225-1350	12	305	12	305	—
	1600-3000	18	457	18	457	—
	4000	24	610	24	610	—
Copper	225-2000	12	305	12	305	—
	2500-4000	18	457	18	457	—
	5000	24	610	24	610	—

Table 16.2
Flat Tees

	Amps	Standard Dimensions					
		X Inches	X MM	Y Inches	Y MM	Z Inches	Z MM
Aluminum	225-1200	12	305	12	305	12	305
	1350-3000	18	457	18	457	18	457
	4000	24	610	24	610	24	610
Copper	225-1600	12	305	12	305	12	305
	2000-4000	18	457	18	457	18	457
	5000	24	610	24	610	24	610

Table 16.3
Flat Offsets

	Amps	Standard Dimensions					
		X Inches	X MM	Y Inches	Y MM	Z Inches	Z MM
Aluminum	225-1350	12	305	5	127	12	305
	1600-3000	18	457	5	127	18	457
	4000	24	610	8	203	24	610
Copper	225-2000	12	305	5	127	12	305
	2500-4000	18	457	5	127	18	457
	5000	24	610	9	229	24	610

Table 16.4
Combination Elbows

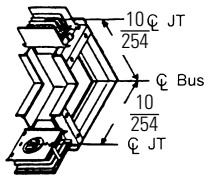
	Amps	Standard Dimensions					
		X Inches	X MM	Y Inches	Y MM	Z Inches	Z MM
Aluminum	225-1350	10	254	8	203	12	305
	1600-2500	10	254	12	305	18	457
	3000-4000	10	254	16	406	24	610
Copper	225-2000	10	254	8	203	12	305
	2500-3000	10	254	12	305	18	457
	4000-5000	10	254	16	406	24	610

Turns

inches
millimeters

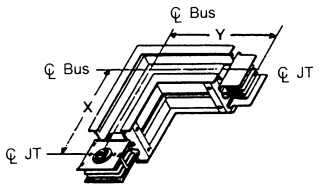
Elbows – Drip proof, splash proof & outdoor only

Up or down elbows (Edgewise)



Up elbow shown

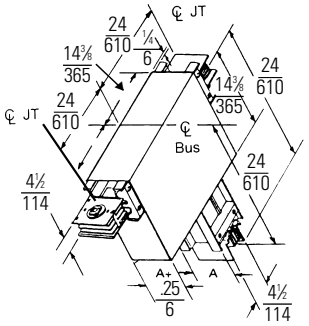
Left or right elbows (Flat)



Right elbow shown

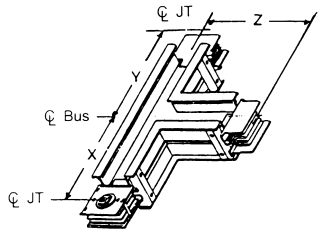
Tees

Up or down tees (Edgewise)



Down tee shown

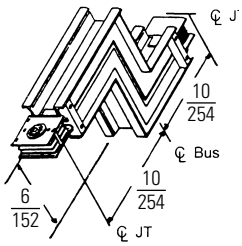
Left or right tees (Flat)



Right tee shown

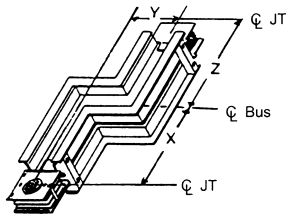
Offsets

Up or down offsets (Edgewise)



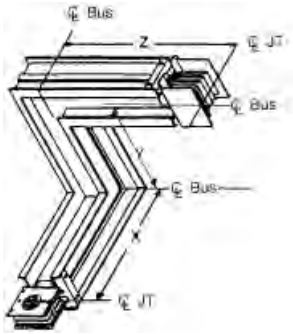
Down offset shown

Left or right offsets (Flat)

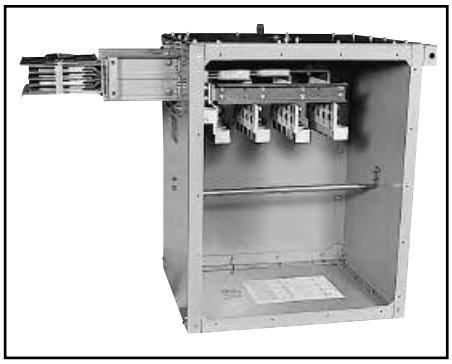


Right offset shown

Combination Elbow



Physical Data



End cable tap box (with side removed)

Cable Tap Boxes

Spectra Series tap boxes are used where a run of busway is fed by cable and conduit. Our corner post design permits removal of up to three side walls for cable access/entrance and for greater flexibility and installation ease. Lugs are provided as shown in Table 17.1. Universal lug terminal plates are *available* to accept almost all NEMA and non-NEMA mechanical and compression lugs. (Maximum 1⅞ inches wide).
48 mm

IMPORTANT: Certain local/city code requirements can affect the dimensions, number of lugs furnished, lug position, etc. of fittings. In these situations, refer to factory.

Table 17.1

Number of Bars Per Phase	Amp	Dimensions, Cable Bending Space and Lug Data								"C" Cable Bend Space		Number of #2-600 MCM Lugs Per Phase①
		Aluminum				Copper						
		W		H②		W		H②				
		Inches	MM	Inches	MM	Inches	MM	Inches	MM	Inches	MM	
1	225	17	432	26	660	17	432	26	660	15	381	1
	400	17	432	26	660	17	432	26	660	15	381	2
	600	17	432	26	660	17	432	26	660	15	381	2
	800	17	432	26	660	17	432	26	660	15	381	3
	1000	17	432	26	660	17	432	26	660	15	381	3
	1200	20	508	29	737	20	508	29	737	18	457	4
	1350	20	508	29	737	20	508	29	737	18	457	4
	1600	20	508	29	737	20	508	29	737	18	457	5
	2000	26	660	29	737	26	660	29	737	18	457	6
	2500	–	–	–	–	26	660	29	737	18	457	8
2	2500	26	660	29	737	–	–	–	–	18	457	8
	3000	33	838	34	864	33	838	34	864	23	584	9
	4000	33	838	34	864	33	838	34	864	23	584	12
	5000	–	–	–	–	39	991	34	864	23	584	15

① Mechanical type (CU-AL wire) lugs standard; crimp type optional. One ground lug standard through 3000-Amp CU. Two ground lugs standard for 4000-Amp AL, 5000-Amp CU. Optional one ground lug per phase lug.
② Box size may change when using some compression type lugs. Check with factory.

Fig. 17.1
End Tap Box: Feeder or Plug-In

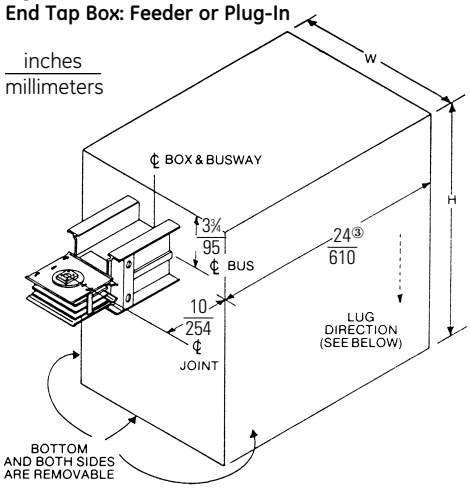


Fig. 17.2
Standard Box Down Position, Side View

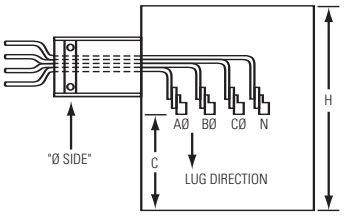
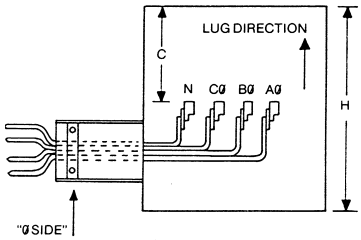


Fig. 17.3
Inverted Box Up Position, Side View



Note: Smaller special purpose end cable tap boxes are available. Contact the factory for details.

③ 24 dimension changes to 28 for 5000-Amp or if optional one ground lug per phase lug is required.
610 711

Alternate Cable Tap Boxes

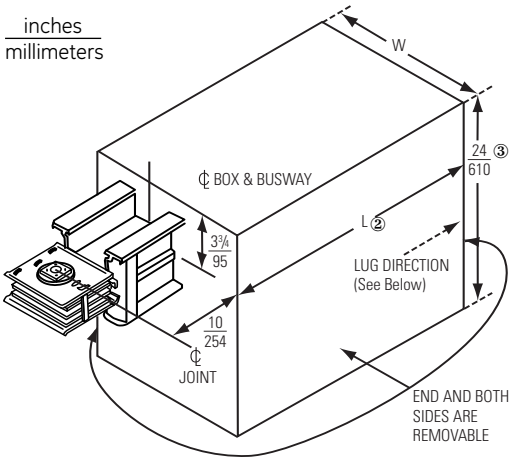
Table 18.1

Number of Bars Per Phase	Amp	Dimensions, Cable Bending Space and Lug Data								"C" Cable Bend Space		Number of #2-600 MCM Lugs Per Phase①
		Aluminum				Copper						
		W		L②		W		L②				
		Inches	MM	Inches	MM	Inches	MM	Inches	MM	Inches	MM	
1	225	17	432	26	610	17	432	26	660	15	381	1
	400	17	432	26	610	17	432	26	660	15	381	2
	600	17	432	26	610	17	432	26	660	15	381	2
	800	17	432	26	610	17	432	26	660	15	381	3
	1000	17	432	26	610	17	432	26	660	15	381	3
	1200	20	508	29	737	20	508	29	737	18	457	4
	1350	20	508	29	737	20	508	29	737	18	457	4
	1600	20	508	29	737	20	508	29	737	18	457	5
	2000	26	660	29	737	26	660	29	737	18	457	6
	2500	–	–	–	–	26	660	29	737	18	457	8
2	2500	26	660	29	737	–	–	–	–	18	457	8
	3000	33	838	34	864	33	838	34	864	23	584	9
	4000	33	838	34	864	33	838	34	864	23	584	12
	5000	–	–	–	–	39	991	34	864	23	584	15

① Mechanical type (CU-AL wire) lugs standard; crimp type optional. One ground lug standard through 3000-Amp CU. Two ground lugs standard for 4000-Amp AL, 5000-Amp CU. Optional one ground lug per phase lug.

② Box size may change when using some compression type lugs. Check with factory.

Fig. 18.1
Alternate End Tap Box: Feeder or Plug-In



Note: Smaller special purpose end cable tap boxes are available. Contact the factory for details.

③ 24/610 dimension changes to 28/711 for 5000-Amp or if optional one ground lug per phase lug is required.

Fig. 18.2
Standard Box Down Position, Side View

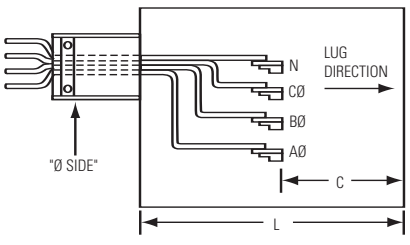
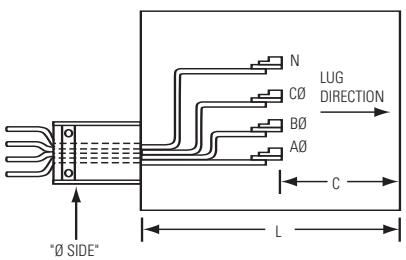


Fig. 18.3
Inverted Box Up Position, Side View



Physical Data

Center Cable Tap Boxes

Table 19.1

Number of Bars Per Phase	Amp	Dimensions, Cable Bending Space and Lug Data												Cable Bend Space		Number of #2-600 MCM Lugs Per Phase①
		Aluminum						Copper								
		W②		E		L		W②		E		L				
		Inches	MM	Inches	MM	Inches	MM	Inches	MM	Inches	MM	Inches	MM	Inches	MM	
1	225	24	610	4 ⅜	111	20	508	24	610	4 ⅜	111	20	508	15	381	1
	400	24	610	4 ⅜	111	20	508	24	610	4 ⅜	111	20	508	15	381	2
	600	24	610	4 ⅜	111	20	508	24	610	4 ⅜	111	20	508	15	381	2
	800	24	610	4 ⅜	111	20	508	24	610	4 ⅜	111	20	508	15	381	3
	1000	24	610	4 ⅜	111	20	508	24	610	4 ⅜	111	20	508	15	381	3
	1200	30	762	6	152	28	711	30	762	6	152	28	711	18	457	4
	1350	30	762	6	152	28	711	30	762	6	152	28	711	18	457	4
	1600	30	762	6	152	28	711	30	762	6	152	28	711	18	457	5
	2000	36	914	9	229	28	711	36	914	9	229	28	711	18	457	6
	2500	—	—	—	—	—	—	36	914	9	229	32	813	18	457	8
2	2500	36	914	9	229	32	813	—	—	—	—	—	—	18	457	8
	3000	48	1219	12 ¾	324	39	991	48	1219	12 ¾	324	39	991	23	584	9
	4000	48	1219	12 ¾	324	39	991	48	1219	12 ¾	324	39	991	23	584	12
	5000	—	—	—	—	—	—	48	1219	12 ¾	324	46	1168	23	584	15
2000 Amp (Max) Center Branch Tap Boxes																
1	2500	—	—	—	—	—	—	36	914	9	229	28	711	18	457	6
2	2500	36	914	9	229	28	711	—	—	—	—	—	—	18	457	6
	3000	43	1092	12 ¾	324	28	711	43	1092	12 ¾	324	28	711	18	457	6
	4000	43	1092	12 ¾	324	28	711	43	1092	12 ¾	324	28	711	18	457	6
	5000	—	—	—	—	—	—	43	1092	12 ¾	324	28	711	18	457	6

① Mechanical type (CU-AL wire) lugs standard; crimp type optional. One ground lug standard through 3000-Amp CU. Two ground lugs standard for 4000-Amp AL, 5000-Amp CU. Optional one ground lug per phase lug.

② Box size may change when using some compression type lugs. Check with factory.

Fig. 19.1
Center Tap Box: Feeder or Plug-In

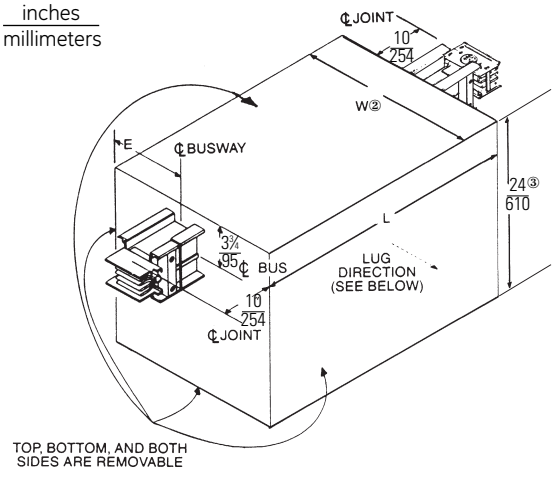


Fig. 19.2
Inverted Box Up Position, Side View

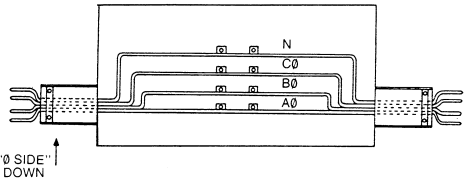
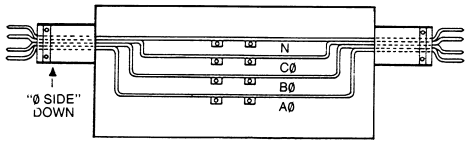


Fig. 19.3
Standard Box Down Position, Side View



③ 24 (610) dimension changes to 28 (711) for 5000-Amp or if optional one ground lug per phase lug is required.

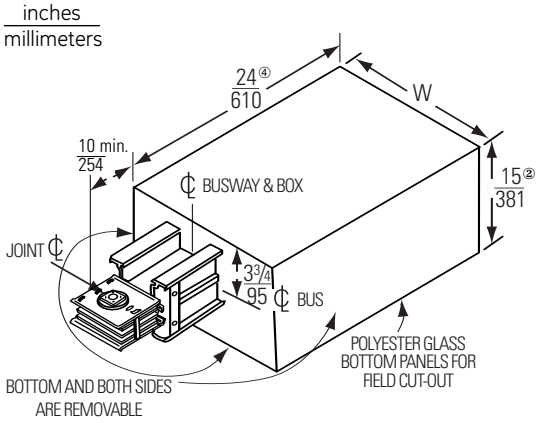
Transformer Taps

Table 20.1
Dimensions for Three Phase End Tap

Number of Stacks	Amp	Dimensions and Lug Data				Number of #2-600 MCM Lugs Per Phase①
		Aluminum W②		Copper W②		
		Inches	MM	Inches	MM	
1	600	17	432	17	432	2
	800	17	432	17	432	2
	1000	17	432	17	432	2
	1200	20	508	20	508	3
	1350	20	508	20	508	3
	1600	20	508	20	508	3
	2000	26	660	26	660	4
	2500	–	–	26	660	5
2	2500	26	660	–	–	–
	3000	33	838	34	864	6
	4000	33	838	34	864	8
	5000	–	–	39	991	10

① Mechanical type (CU-AL wire) lugs standard; crimp type optional. One ground lug standard through 3000-Amp CU. Two ground lugs standard for 4000-Amp AL, 5000-Amp CU. Optional one ground lug per phase lug.

Fig. 20.1
Three-Phase End Tap



④ 24 (610) dimension changes to 28 (711) for 5000-Amp or if optional one ground lug per phase lug is required.

Table 20.2
Dimensions for Single Phase End Tap

Number of Stacks	Amp	Dimensions and Lug Data				Number of #2-600 MCM Lugs Per Phase③
		Aluminum W②		Copper W②		
		Inches	MM	Inches	MM	
1	1000	16	406	–	–	2
	1200	16	406	16	406	3
	1350	20	508	16	406	3
	1600	20	508	16	406	3
	2000	20	508	20	508	4
	2500	–	–	20	508	5
2	2500	24	610	–	–	5
	3000	32	813	24	609	6
	4000	32	813	32	813	8
	5000	–	–	32	813	10

② Box size may change when using some compression type lugs. Check with factory.

③ Mechanical type (CU-AL wire) lugs standard; crimp type optional. One ground lug standard through 3000-Amp CU. Two ground lugs standard for 4000-Amp AL, 5000-Amp CU. Optional one ground lug per phase lug.

Fig. 20.2
Single-Phase Transformer Taps

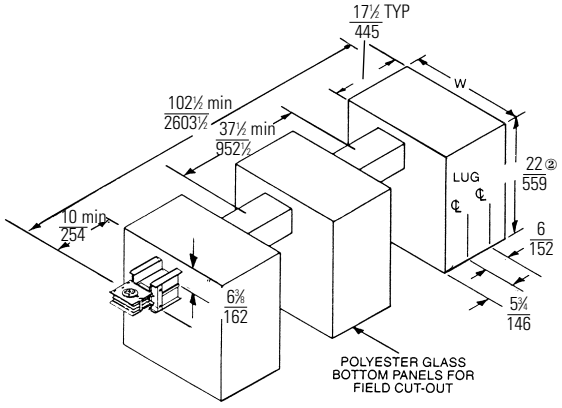
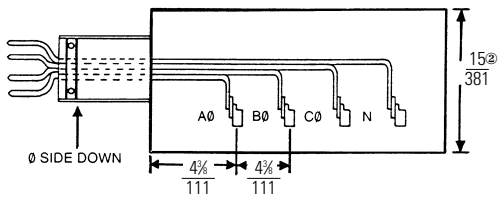


Fig. 20.3
Standard Lug Position



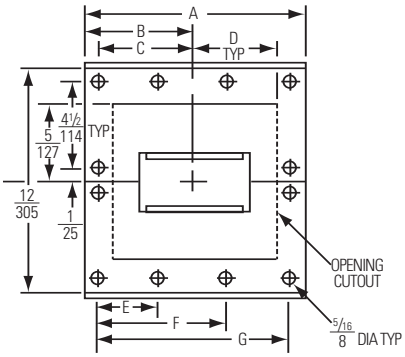
Physical Data

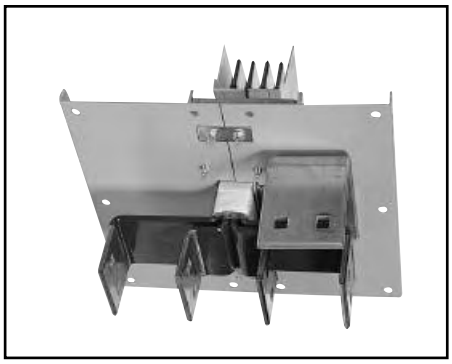
Flanged end stub

Provides a universal stub for field connections (customer connection only).

inches
millimeters

Fig. 21.2
Flanged End without Lugs, 1 Bar per Phase





Flanged end stub

Note: Special OEM stubs are available. Contact the factory for details.

Flanged end without lugs cutout and drilling pattern

Fig. 21.1
Flanged End without Lugs

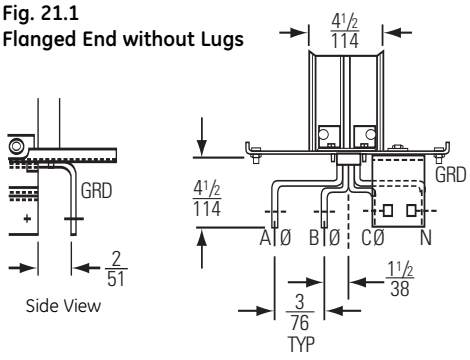
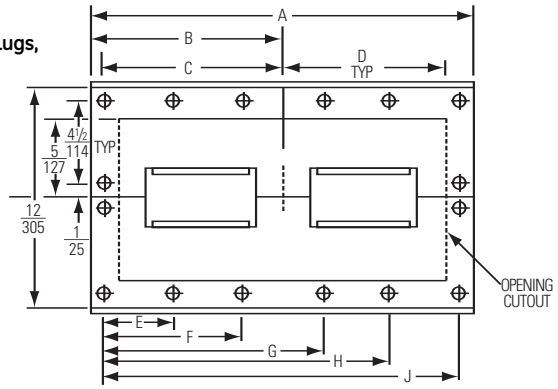


Fig. 21.3
Flanged End without Lugs, 2 Bars per Phase



Bar hole pattern

(1 Stack and 2 Stack are same. All holes are .438 (11) x .562 (14) rect.)

Fig. 21.4

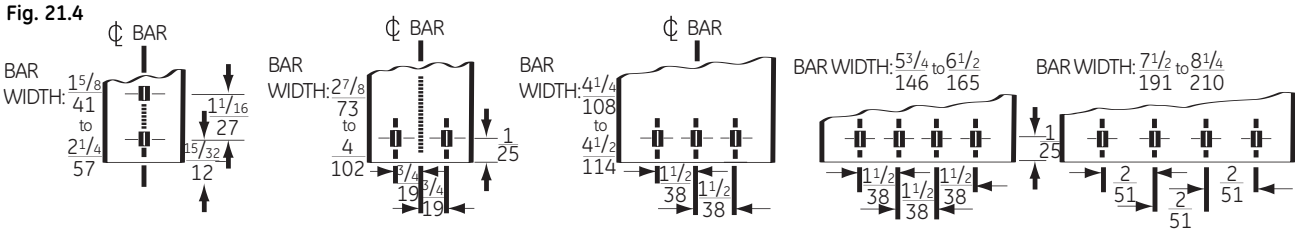
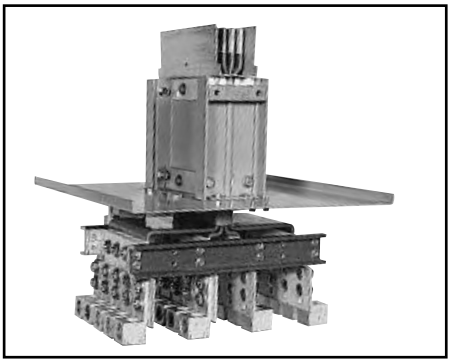


Table 21.1
Flanged End without Lugs

	Amps	Figure	A	B	C	D	E	F	G	H	J
Aluminum Copper	225-1200 255-1600	21.2	11½ 292	5¾ 146	5¼ 133	4¾ 121	5¼ 133	–	10½ 267	–	–
Aluminum Copper	1350-2000 2000-2500	21.2	15¼ 387	7⅝ 194	7⅛ 181	6⅝ 168	4¾ 121	9½ 241	14¼ 362	–	–
Aluminum Copper	2500 3000	21.3	19¾ 502	9⅞ 251	9⅜ 238	8⅞ 225	4 11/16 119	9⅜ 238	14 1/16 357	–	18¾ 476
Aluminum Copper	3000-4000 4000-5000	21.3	27¼ 692	13⅝ 346	13⅛ 333	12⅝ 321	5¼ 133	10½ 267	15¾ 400	21 533	26¼ 667

Flanged end with lugs

Lugs are provided as shown in Table 17.1. Universal lug terminal plates are *available* to accept almost all NEMA and non-NEMA mechanical and compression lugs. (Maximum 1⅞ inches / 48 mm wide).



Flanged end stub with lugs

Flanged end with lugs cutout and drilling pattern

Fig. 22.1
Flanged End with Lugs, 1 Bar per Phase

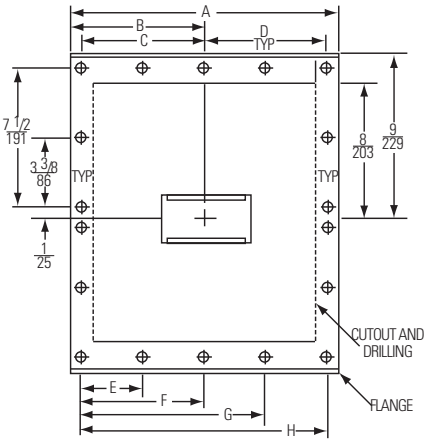


Fig. 22.2
Flanged End with Lugs, 2 Bars per Phase

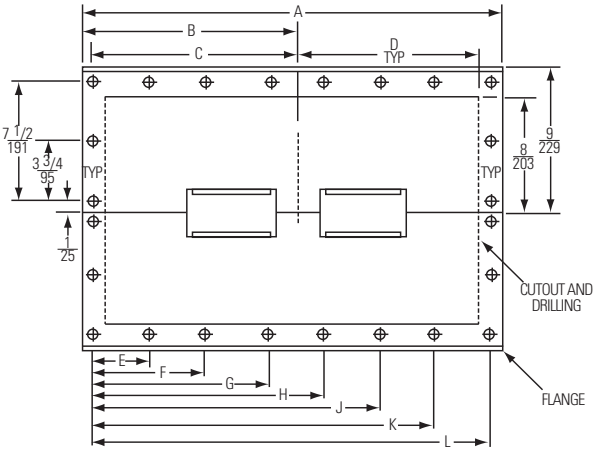


Table 22.1
Flanged End with Lugs

	Amps	Figure	A	B	C	D	E	F	G	H	J	K	L
Aluminum Copper	225-600 225-1000	22.1	14 356	7 178	6½ 165	6 152	4½ 114	8½ 216	NA	13 330	NA	NA	NA
Aluminum Copper	800-1000 1200-1350	22.1	15⅛ 384	7 9/16 192	7 1/16 179	6 9/16 167	4 11/16 119	9 7/16 240		14⅛ 359			
Aluminum Copper	1200 1600	22.1	16¼ 413	8⅛ 206	7 5/8 194	7⅛ 181	5⅛ 130	10⅛ 257		15¼ 387			
Aluminum Copper	1350-1600 2000	22.1	18¼ 464	9⅛ 232	8 5/8 244	8⅛ 206	5¾ 146	11½ 292		17¼ 438			
Aluminum Copper	2000 2500	22.1	20 508	10 254	9½ 241	9 229	4¾ 121	9½ 241	14½ 362	19 483			
Aluminum	2500	22.2	25½ 648	12¾ 324	12¼ 311	11¾ 298	4⅞ 200	9¾ 248	4¾ 375	19⅝ 498			24½ 622
Copper	3000	22.2	24 610	12 305	11½ 292	11 279	6⅝ 108	13¼ 337	19¾ 502	NA			21½ 546
Aluminum	3000	22.2	27 686	13½ 343	13 330	12½ 318	5¼ 133	10½ 267	15½ 394	20¾ 527			26 660
Copper	4000	22.2	31½ 800	15¾ 400	15¼ 387	14¾ 375	4⅜ 111	8¾ 222	13⅛ 333	17⅜ 441	21¾ 552	26⅛ 664	30½ 775
Aluminum	4000	22.2	32 813	16 406	15½ 394	15 381	4½ 114	9 229	13½ 419	17½ 445	22 559	26½ 673	31 787
Copper	5000	22.2	37 940	18½ 470	18 457	17½ 445	6 152	12 304	18 457	24 608	30 762	NA	36 914

Note: For quantity and size of lugs, refer to Cable Tap Box, page 17, Table 17.1.

Physical Data

Switchboard/switchgear stub

Spectra Series offers full factory coordination to other GE equipment as shown. Other entrance combinations are available. Refer to company. Straight and elbow stubs ar available with flange to ℄ joint or elbow dimensions per Table 23.1.

Table 23.1
Stubs, Switchboard Ends

	Amps	Minimum Stub Dimensions"A"①					
		Straight Stubs		Edgewise Elbows		Flat Elbows	
		Inches	MM	Inches	MM	Inches	MM
Aluminum	225-600	8	203	6	152	4	102
	800-1200	8	203	6	152	5	127
	1350	8	203	6	152	6	152
	1600-2000	8	203	6	152	8	203
	2500	8	203	6	152	10	254
	3000	8	203	6	152	11	279
	4000	8	203	6	152	13	330
Copper	225-800	8	203	6	152	4	102
	1000-1600	8	203	6	152	5	127
	1600-2000	8	203	6	152	6	152
	2500	8	203	6	152	8	203
	3000	8	203	6	152	10	254
	4000	8	203	6	152	11	279
	5000	10	254	6	152	14	356

① Add 2 inches to dimensions shown for GE Type AKD-8/10 Switchgear.

Fig. 23.1

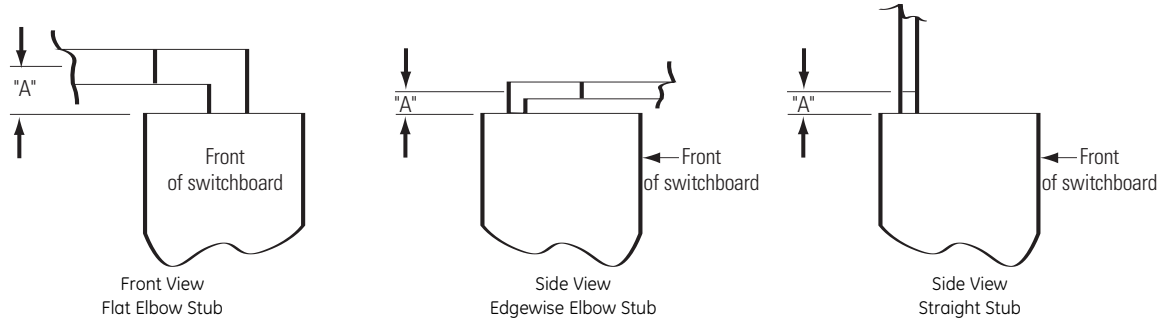
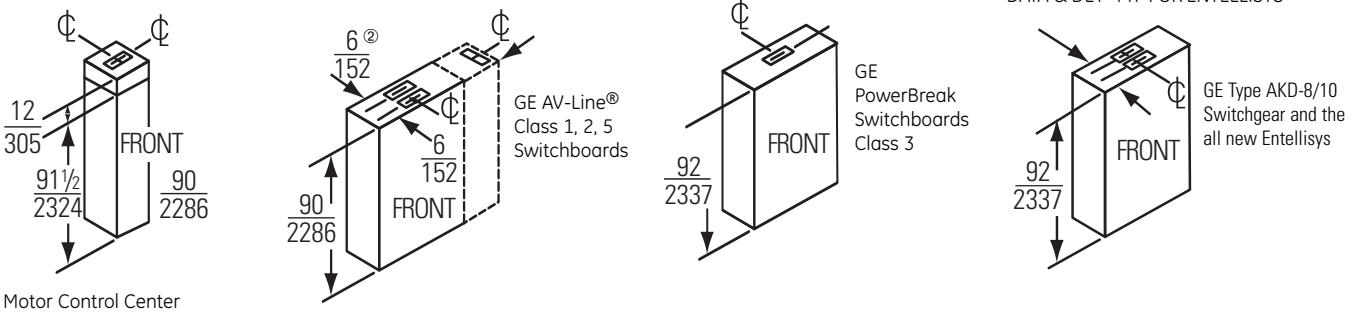


Fig. 23.2



② Standard dimension 6" from rear may vary and must be coordinated with switchboard factory.

Spectra Series busway fittings

Dimensions

Power takeoffs (PTO)

Spectra Series Flex-A-Tap™ joints accept bolted power takeoff devices up to 1600 amps for many applications.

The compact size and flexibility resulting from the modular design allow takeoffs to be mounted at any joint, whether feeder or plug-in. See Fig. 24.1.

Bolt-On Tap	Amp Rating
Fusible-Switches (600A QMW Only)	600
Molded-Case Circuit Breakers (KM & PB Only)	1600A Max
Cable Boxes	1600 Max

inches
millimeters

Fig. 24.1
Bolt on, Flex-A-Tap
For PTO Selection, see Table 29.1

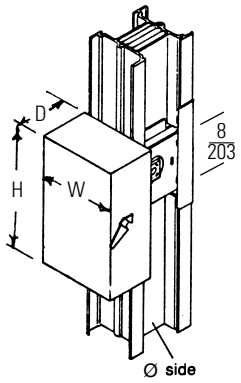


Table 24.1
Flex-A-Tap Device

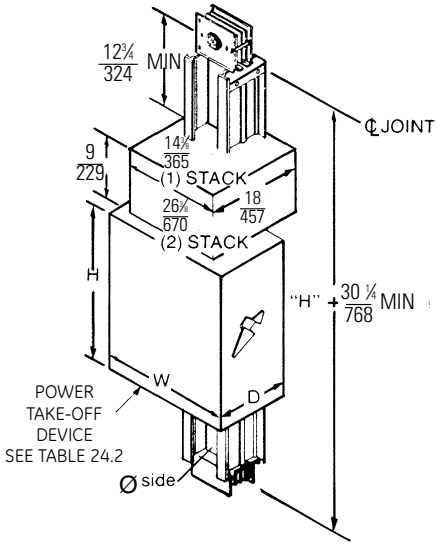
Device	"H"		"W"		"D"	
	IN	MM	IN	MM	IN	MM
Cable Tap Box	54	1372	24	610	15½	394
KM	66	1676	19$^{3}/_{32}$	490	15½	394
QMW 600A	66	1676	19$^{3}/_{32}$	490	15½	394
Power Break II	63	1600	24$^{3}/_{32}$	617	18	457

Table 24.2
Power Takeoff and Device Dimensions

Rating	Type	"H"		"W"		"D"	
		IN	MM	IN	MM	IN	MM
100A	QMR	17.75	451	9.38	238	6.75	171
200A	QMR	24.38	619	15.50	394	7.25	184
400A	QMR	18	457	18.50	470	17.56	446
400A	QMW	18	457	18.50	470	17.56	446
600A	QMR	24	610	18.50	470	17.56	446
800A &1200 A	QMR	45.13	1146	36.75	933	12.75	324
225A	FJ	17.75	451	9.75	248	7.75	197
400A	JJ	24	610	15.50	394	10.75	273
600A	JK	24	610	15.50	394	10.75	273
600-800A	KM	36	914	15.50	394	10.75	273
1200A	KM	45.50	1156	15.50	394	10.75	273
400A	TB4 Tri-Break®	30	762	15.50	394	10.75	273
600A	TB6 Tri-Break	44.75	1137	15.50	394	10.75	273
800A	TB8 Tri-Break	44.75	1264	15.50	394	10.75	273
150A	TE & TB1	17.75	451	9.75	248	6.75	171

Note: Contact your local GE representative for catalog numbers.

Fig. 24.2
Flatwise PTO Section
For PTO Selection, see Table 29.2



Physical Data

Power takeoffs (PTO) (cont.)

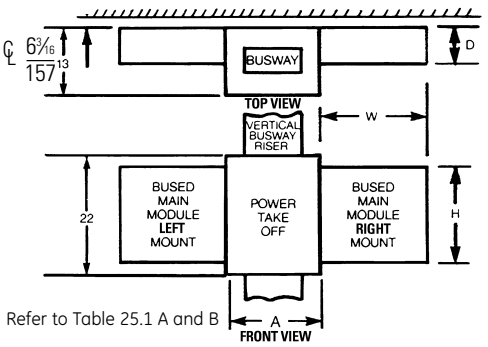
Table 25.1.A
Meter Mod™ III bused. Main module.

Catalog Number/Frame	Dimensions					
	W		H		D	
	IN	MM	IN	MM	IN	MM
Bused Main Breakers						
TMP3BR4/TJK4	19	483	18	457	5.94	151
TMP3BL6/TJK6	19	483	18	457	5.94	151
TMP3BR6/TJK6	19	483	18	457	5.94	151
TMP3BL8/TKM8	20	508	18	457	7.88	200
TMP3BR8/TKM8	20	508	18	457	7.88	200
TMP3BL10/TKM10	20	508	18	457	7.88	200
TMP3BR10/TKM10	20	508	18	457	7.88	200
TMP3BL12/TKM12	20	508	18	457	7.88	200
TMP3BR12/TKM12	20	508	18	457	7.88	200
Bused Main Switches						
TMP3FL4/TFUSE400	19	483	18	457	5.94	151
TMP3FR4/TFUSE400	19	483	18	457	5.94	151
TMP3FL6/TFUSE600	19	483	18	457	5.94	151
TMP3FR6/TFUSE600	19	483	18	457	5.94	151

Table 25.1.B

Amps	Bar Per Ø	Bar Width		"A"	
		IN	MM	IN	MM
225-1600 Al 225-2000 Cu	1	1.625	41	16.75	425
		2.225	57		
		2.875	73		
		3.375	86		
		4.250	108		
		4.500	114		
2000 Al 2500 Cu		5.750	146	20.00	508
		6.500	165		
		8.250	210		
2500 Al 3000 Cu	2	4.250	108	25.00	635
		4.000	102		
3000 Al 4000 Cu		5.750	146	28.75	730
4000 Al 5000 Cu		8.250	210	32.00	813

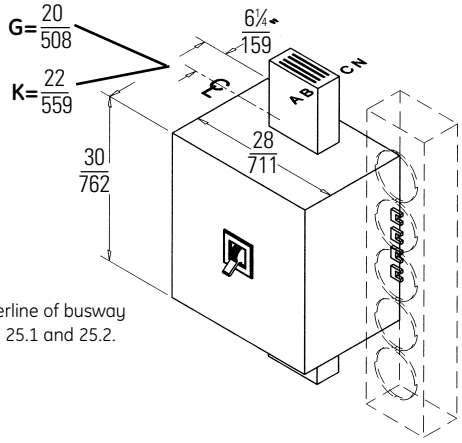
Fig. 25.1
Meter Mod™ III PTO Section
For PTO Selection, see Table 30.1



Note: Contact your local GE representative for catalog numbers.

Fig. 25.2
Meter-mod Metering (in line device)
Available for G&K frame Spectra C/B only
For PTO Selection, see Table 31.1

inches
millimeters



Note: Allow 6 5/8" from centerline of busway to the wall for Figures 25.1 and 25.2.

Wall, ceiling and floor flanges

Flanges are used to close wall openings when busway runs pass through walls, ceilings and floors. See Table 26.1. Hole pattern aligns with spring riser brackets. See Fig. 34.1. See Table 27.1 for "A" dimension.

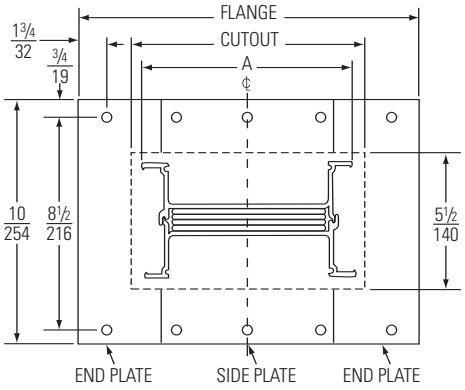
Note: Floor or wall opening should be 1" (25 mm) larger than applied busway.

Table 26.1
Flange and cutout dimensions

Ampere	Dimensions			
	Flange		Cutout	
	IN	MM	IN	MM
Aluminum				
225	9⅞	251	5⅜	137
400	9⅞	251	5⅜	137
600	9⅞	251	5⅜	137
800	11⅛	283	6⅝	168
1000	11⅝	295	7⅛	181
1200	12½	318	8	203
1350	14	356	9½	241
1600	14¾	375	10¼	261
2000	16½	419	12	305
2500	21	533	16½	413
3000	23½	597	19	483
4000	28½	724	24	610
Copper				
225	9⅞	251	5⅜	137
400	9⅞	251	5⅜	137
600	9⅞	251	5⅜	137
800	9⅞	251	5⅜	137
1000	10½	267	6	152
1200	11⅛	283	6⅝	168
1350	11⅝	295	7⅛	181
1600	12½	318	8	203
2000	14	356	9½	241
2500	15¾	400	11¼	286
3000	20	508	15½	394
4000	23½	597	19	483
5000	27	686	22½	572

inches
millimeters

Fig. 26.1

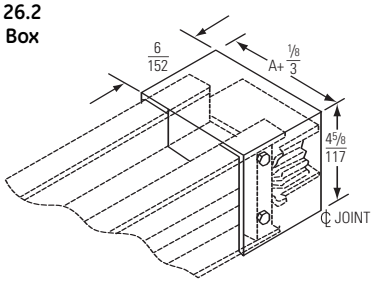


Cutout allows ½", 13mm on all sides of busway.

End Boxes

End boxes are used to terminate busway runs. No joint is required. End surface of box adds 6" (152 mm) to length of drip-proof, splash-proof and outdoor runs. See Table 27.1 for "A" dimension. Box is secured via joint cap bolts.

Fig. 26.2
End Box



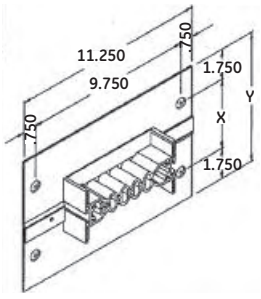
Floor/Wall Flanges

Note: Floor or wall opening should provide ½" clearance all around the busway.

Table 26.2
Floor/Wall Flange Dimensions (inches)

Bar Width	X	Y
.750	5.000	8.500
1.125	5.375	8.875
1.750	6.000	9.500

Fig. 26.3
Floor/Wall Flange Cutout and Drilling Detail



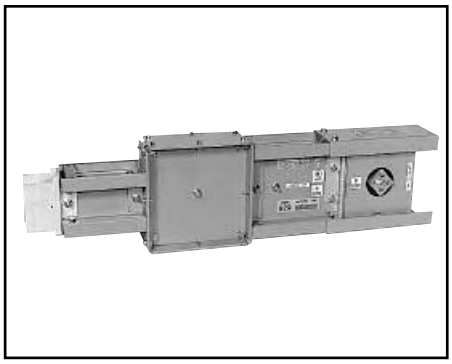
Physical Data

No fuse reducers

Table 27.1
"A" Dimensions

No. of Stacks	Amp	Aluminum		Copper	
		IN	MM	IN	MM
1	225	4.38	111	4.38	111
	400	4.38	111	4.38	111
	600	4.38	111	4.38	111
	800	5.63	143	4.38	111
	1000	6.13	156	5.00	127
	1200	7.00	178	5.63	143
	1350	8.50	216	6.13	156
	1600	9.25	235	7.00	178
	2000	11.00	279	8.50	216
	2500	—	—	10.50	260
2	2500	15.50	394	—	—
	3000	18.00	457	14.50	368
	4000	23.00	584	18.00	457
	5000	—	—	21.50	546

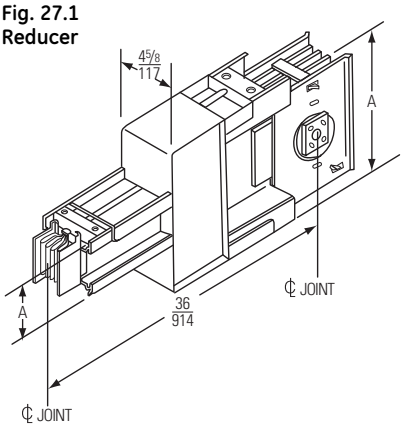
NOTE: Per NEC 368.17 (B), a no-fuse reduced busway shall not exceed 50 feet in length and have a current rating at least 1/3 the rating of the upstream overcurrent protective device.



No fuse reducer

inches
millimeters

Fig. 27.1
Reducer



Adapter/reducer cubicle with overcurrent device

Table 28.1

QMR Reducers

QMR Switch	Line Side	L		W		D	
		IN	MM	IN	MM	IN	MM
225A & 400A	1 Stack	48	1219	24	610	14½	368
	2 Stack	48	1219	24	610	14½	368
	3 Stack	48	1219	36	914	14½	368
	Lugs	48	1219	24	610	14½	368
600A	1 Stack	48	1219	24	610	14½	368
	2 Stack	48	1219	24	610	14½	368
	3 Stack	48	1219	36	914	14½	368
	Lugs	48	1219	24	610	14½	368
800A, 1000A & 1200A	1 Stack	52	1321	36	914	13	330
	2 Stack	52	1321	36	914	13	330
	3 Stack	52	1321	36	914	13	330
	Lugs	52	1321	36	914	13	330

FJ 4B Reducers

FJ 4B Switch	Line Side	L		W		D	
		IN	MM	IN	MM	IN	MM
225A	1 Stack	40	1016	18	457	13	330
	Lugs	40	1016	18	457	13	330

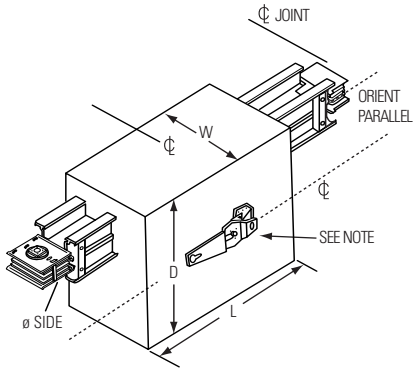
JJ & JK C/B Reducers

CB Switch	Line Side	L		W		D	
		IN	MM	IN	MM	IN	MM
225A, 400A & 600A	1 Stack	40	1016	18	457	13	330
	2 Stack	40	1016	24	610	13	330
	Lugs	40	1016	18	457	13	330

KM C/B Reducers

KM CB Switch	Line Side	L		W		D	
		IN	MM	IN	MM	IN	MM
800A, 1000A & 1200A	1 Stack	42	1067	18	457	14	356
	2 Stack	42	1067	24	610	14	356
	3 Stack	42	1067	36	914	14	356
	Lugs	42	1067	18	457	14	356

Fig. 28.1
Reducer Cubicle
For cubicle selection, see Table XX.X



Note: For QMR Fusible 800,1000 and 1200 amp models, handle located on the bottom side of the cubicle. For standard flatwise mounted busway. Contact your local GE representative for catalog numbers.

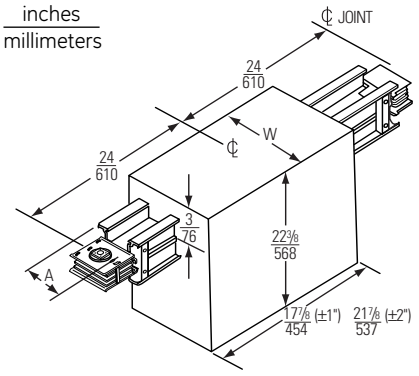
Expansion lengths – thermal expansion ± 1" – building expansion ± 2"

Consideration should be given to the effects of thermal expansion. The ± 1" expansion fittings may be necessary for long straight runs. Contact GE for specific applications. The use of the ± 2" expansion fitting is recommended when the busway run crosses a building expansion joint.

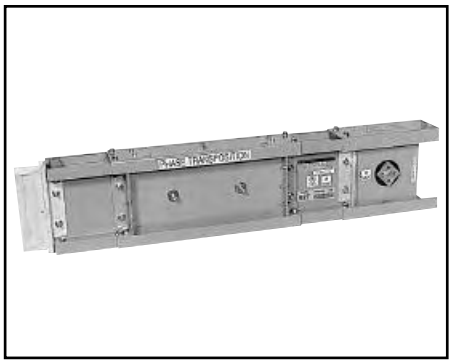
Table 28.2
"W" Dimensions

No. of Stacks	Amp	Aluminum		Copper	
		IN	MM	IN	MM
1	225	16	406	16	406
	400	16	406	16	406
	600	16	406	16	406
	800	16	406	16	406
	1000	17⅜	448	16	406
	1200	17⅜	448	16	406
	1350	21⅛	549	17⅜	448
	1600	21⅛	549	17⅜	448
	2000	21⅛	549	21⅛	549
	2500	—	—	21⅛	549
2	2500	29	737	—	—
	3000	29	737	29	737
	4000	33⅜	854	29	737
	5000	—	—	33⅜	854

Fig. 28.2
Expansion Length



Physical Data



Phase transposition

Transposition lengths

A transposition length is available in any dimension from three feet through 10 feet (3M). Standard lengths are 36" and 42". "A" dimension varies with ampere rating. See Table 27.1 for "A" dimension.

inches
millimeters

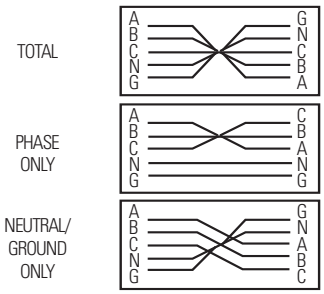
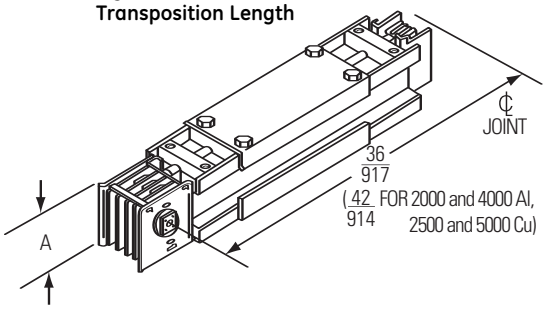


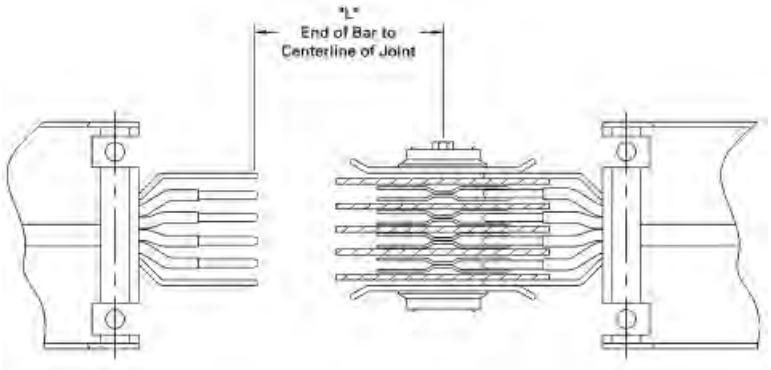
Fig. 29.1
Transposition Length



Busway field check pieces/replacement pieces

A field check piece is a length of busway inserted into a run after the major portion of that run has been installed. To determine the length of the piece to be inserted, measure the opening length L between the ends of the bars on the bar side to the center line of the joint as shown in Fig. 29.2 below. Subtract .875 inches and this is equal to the busway length X measured from the center lines of joint to joint and is the way to measure all Spectra Series busway pieces.

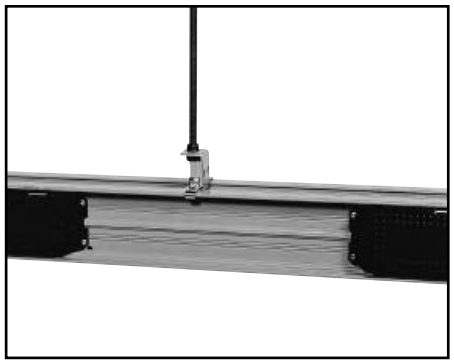
Fig. 29.2
Measuring Spectra busway for a field check.



Joints with ± ½-inch adjustability

Every Spectra Series busway is supplied with up to ± ½-inch adjustable joint as standard. The modular joint pack is preassembled to one end of each piece of busway and shipped in the "nominal" position. The joint caps have four housing mounting holes (eight on 5000 amp Copper) that contain twistouts permitting expansion or contraction of the joint up to ½ inch in either direction.

Hangers



Standard clevis hanger

Vertical mounting – spring hangers *(Must be ordered separately)*

Spring hangers should be ordered to support the busway at each floor if the distance from floor to floor is less than 16 feet. When the floor-to-floor span is more than 16 feet, supports and additional spring hangers are required on 16-foot centers maximum. The quantity of springs supplied is based on busway weight. Simple adjustment procedures are included with installation instructions. Mounting holes align with floor flanges.

Cat. No. (SBR "X") where "X" = Quantity of springs (1 or 2) on each side of hanger (single spring up to 600 lbs. per floor).

Floor opening size refer to Table 11.1 for "A" dimension.

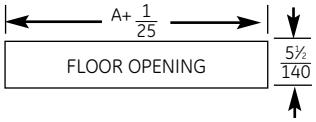
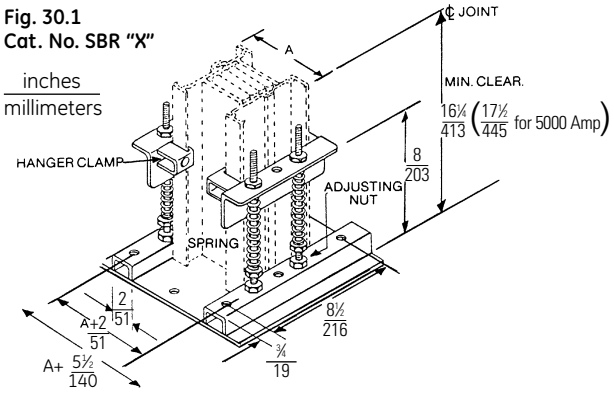


Fig. 30.1
Cat. No. SBR "X"



Minimum Clearance

Horizontal mounting – 1 stack clevis hangers

(1 furnished every 10 feet. Requires (1) .50 inch diameter drop rods. Drop rods by others.)

One Stack Flatwise Hangers

Aluminum		Copper	
Catalog Number	**Ampere Range**	**Catalog Number**	**Ampere Range**
SBF16	225-600	SBF16	225-800
SBF28	800	SBF22	1000
SBF33	1000	SBF28	1200
SBF42	1200	SBF33	1350
SBF57	1350	SBF42	1600
SBF65	1600		
SBF82	2000		

Bar Width (Inches)		
16 = 1.63	33 = 3.38	57 = 5.75
22 = 2.25	42 = 4.25	65 = 6.50
28 = 2.88	45 = 4.50	82 = 8.25

Fig. 30.2
One Stack (Standard) Flatwise
Cat. No. SBF "XX"
(See table at left)

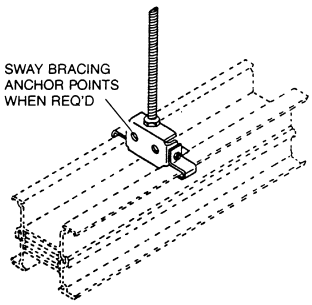
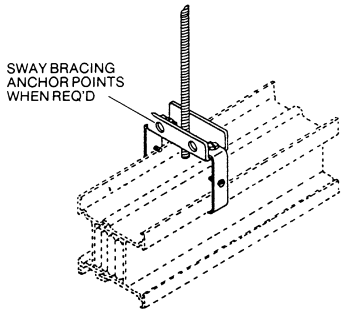


Fig. 30.3
One Stack Edgewise
Cat. No. SBE45
(Up to 2000 Amp Max)



Horizontal mounting – trapeze hangers

(1 furnished every 10 feet. Requires (2) .50 inch diameter drop rods. Drop rods by others.)

One or Two Stack Flatwise Trapeze

Catalog Number	Stacks	Bar Widths	"W"	
			Inches	MM
SBT E	(1)	1.63" - 4.25"	10.25	260
SBT F	(1)	5.75" - 8.25"	14.00	356
SBT G	(2)	4.25 " - 4.50"	18.50	470
SBT H	(2)	5.75" - 6.50"	22.50	572
SBT J	(2)	8.25"	26	660

Fig. 30.4

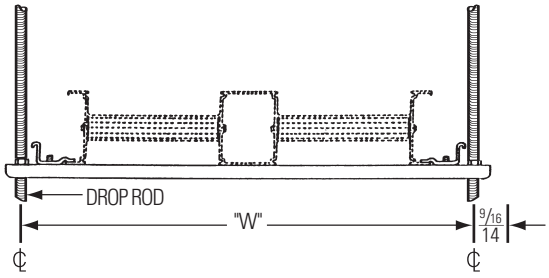
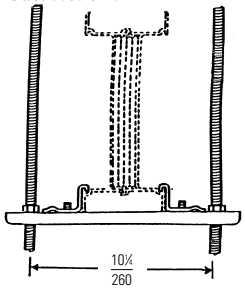
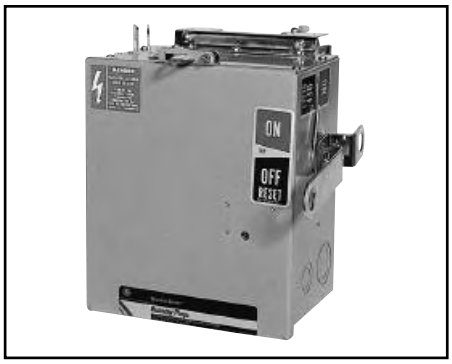


Fig. 30.5
Edgewise Trapeze
Cat. No. SBTE



Plugs



Switch-operated fusible plugs are equipped with type QMR quick-make, quick-break mechanisms, in ratings from 30 to 600 amps, 240 and 600 volts. Positive pressure NEC fuse clips are furnished standard. They are also available with class "J" or "R" fuse clips.

Circuit breaker plugs are available with molded case circuit breakers, in ratings from 15 to 800 amps, 240 to 600 volts.

Both fusible and circuit breaker Spectra Series busway plugs have:
- Plug assist mechanism standard on plugs rated above 100 amps.
- A cover interlock that prevents opening the cover when the switching device is in the "ON" position. The interlock can be defeated by operating the release mechanism through the door. However, by bending down a tab inside the cover, the interlock becomes non-defeatable.
- A device interlock that prevents the switching device from being accidentally operated when the cover is open.
- A provision to padlock the plug in the "OFF" position when the cover is closed (suitable for single padlock with a 5/16-inch shank).
- A handle that can be mounted either on the side or end of the plug. In addition, the handle may be mounted in one of two positions at each location.
- A handle that can be operated by a hook stick.
- A safety interlock that prevents insertion or removal of the plug when in the "ON" position.
- Positive locator pin for exact, safe positioning.
- Both drip-proof (IP45) and splash-proof (IP54) plugs are available.

Table 31.1
Recommended Type QMR and QMW① Fusible Switch Combinations

Fusible Switch		Fuse		Short-Circuit Rating in Ampere RMS Symmetrical
Type	Amperes	U/L Class	Description	
QMR	30-600	H/NEC	One-Time	10,000
		R	Current Limiting Rejection	200,000
		J	Current Limiting Rejection	200,000

The interrupting rating of the fuse must equal or exceed the short-circuit rating of the switch. If it is lower, then the interrupting rating of the switch is the same as for the fuse. Both QMR and QMW switches have no short-circuit ratings if renewable fuses are used.

① For type QMW, refer to factory.

Table 31.2
Fusible Plug Horsepower Ratings②

Device Rating	3-Phase Horsepower Ratings					
	With NEC Fuses			With Time Delay Fuses		
In Amperes	240 Volts	480 Volts	600 Volts	240 Volts	480 Volts	600 Volts
30	3	5	7½	10	20	20
60	7½	15	15	20	40	50
100	15	25	30	30	60	75
200	25	50	60	60	125	150
400	50	100	125	125	250	350
600	75	150	200	200	400	500

② Ratings are based on NEC Article 430. Horsepower ratings for plugs with NEC fuses are based on one-time fuses having minimum time delay. When time delay fuses are used, the horsepower ratings are maximum for the plug.

Table 31.3
Circuit Breaker Plug Interrupting Ratings③

Circuit Breaker		Trip Range Rating in Amperes	Interrupting Ratings in Thousand Amperes RMS Symmetrical		
Frame	Number of Poles		120-V or 240-V	480-V	600-V
Standard Frames					
TEB	1, 2, 3	15-100	10	—	—
TED	1	15-50	14	—	—
TED4	3	15-100	18	14	—
TED6	3	15-150④	18	14	14
TFJ⑤, TFK⑤	2, 3	70-225	25	22	22
TJJ, TJK4	2, 3	125-400	42	30	22
TJK6	2, 3	250-600	42	30	22
TKMB	2, 3	300-800	42	30	22
Hi-Break® Frames					
THED⑤	2-3	15-150④	65	25	18
THFK⑤	2-3	70-225	65	25	22
THJK4	2-3	125-400	65	35	25
THKMB	2-3	300-800	65	35	25
Tri-Break® Frames					
TB1	2-3	15-100	200	200	200
TB4	3	125-400	200	200	200
TB6	3	300-600	200	200	200
TB8	3	600-800	200	200	200

③ These are maximum ratings regardless of the busway rating.
④ 110-150-amp trip ratings are available for 3-pole only.
⑤ 2-pole rated 480 Vac Max.

Table 32.1
Spectra RMS™ Circuit Breaker Busway Plugs

Construction	Spectra① Frame Type	Trip Range (Amps)	Old Frame Type	Trip Range (Amps)	Spectra Frame② IC Ratings			Old Frame IC Ratings		
					240V	380, 415 480V	600V	240V	480V	600V
Standard Frames	—	—	TEB	15-100	—	—	—	10	—	—
	SED	15-150	TED4	15-100	18	14	14	18	14	—
	SED	15-150	TED6	15-100	18	14	14	18	14	14
	SFH	70-250	TFJ	70-225	65	25	18	25	22	18
	SFH	70-250	TFK	70-225	65	25	18	25	22	18
	SGH4	125-400	TJJ	125-400	65	35	25	42	30	22
	SGH4	125-400	TJK4	125-400	65	35	25	42	30	22
	SGH6	250-600	TJK6	250-600	65	35	25	42	30	22
	SGH6	250-600	TJ4V	150-600	65	35	25	42	30	22
	SKH	300-800	TKM8	300-800	65	50	25	42	30	22
	SKH	300-800	TK4V	800	65	50	25	42	30	22
Hi-Break® Frames	SEH	15-150	THED	15-100	65	25	18	65	25	18
	SFH	70-250	THFK	70-225	65	25	18	65	25	18
	SGH4	125-400	THJK4	125-400	65	35	25	65	35	25
	SGH6	250-600	THJK6	400-600	65	35	25	65	35	25
	SGH6	250-600	THJ4V	150-600	65	35	25	65	35	25
	SGH6	250-600	TJH	150-600	65	35	25	65	35	25
	SKH	300-800	THKM8	300-800	65	60	25	65	35	25
	SKH	300-800	TKH	300-800	65	50	25	65	50	25
Fuseless Current Limiting	SEP	15-150	THLC1③	15-100	200	100	25	200	150	—
	SFP	70-250	THLC2③	125-225	200	100	25	200	150	—
	SGP4	125-400	THLC4③	225-400	200	100	65	200	150	—
	SGP6	250-600	—	—	200	100	65	—	—	—
High Interrupting	SEL	15-150	TEL③	15-100	100	65	25	100	65	25
	SFL	70-250	TFL③	125-225	100	65	25	100	65	25
	SGL4	125-400	TLB4③	250-400	100	65	65	85	50	—
	SGL6	250-600	TJL4V	150-600	100	65	65	100	65	30
	SGL6	250-600	TJL	150-600	100	65	65	100	65	30
	SKL	300-800	TKL4V	400-800	100	65	65	100	65	42
	SKL	300-800	TKL	800	100	65	65	100	65	42

① Spectra RMS™ Circuit Breakers UL listed for Spectra Series™ Busway only.
② UL listed interrupting ratings in thousand amperes rms symmetrical ac volts.
③ Discontinued; replaced by Spectra Frame Type.

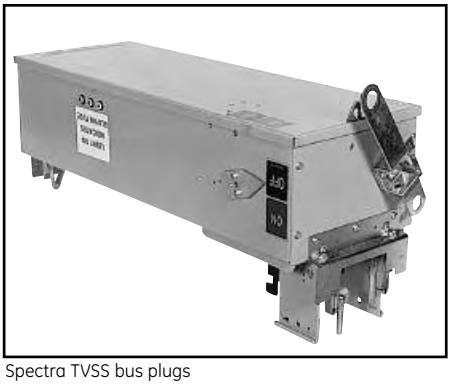
Spectra RMS™ Circuit Breaker Maximum IC Ratings (rms sym. kA)

Frame Type	240V	380, 415, 480V	600V
SED	18	14	14
SEH	65	25	18
SEL	100	65	25
SEP	200	100	25
SFH	65	25	18
SFL	100	65	25
SFP	200	100	25
SGH4	65	35	25
SGL4	100	65	65
SGP4	200	100	65
SGH6	65	35	25
SGL6	100	65	65
SGP6	200	100	65
SKH	65	50	25
SKL	100	65	42
SKP	200	100	65

Spectra Bus Plugs with TVSS Protection

Spectra bus plugs are available with integral TVSS devices (see Table 33.1 on next page) for a variety of location categories and exposure levels. Indicating lights communicate proper system operation. Ratings and specifications:

- Suitable for medium to high exposure, service entry or branch panel locations
- UL-1449, Second Edition; cUL and UL-1283 Recognized Component
- Maximum surge current ratings of 50kA, 80kA, and 100kA per mode — tested on a complete TVSS unit
- Repetitive surge current tested — ANSI/IEEE C62.41, Category C3: 100kA - 20,000 impulses; 80kA - 5,000 impulses; 50kA - 3,500 impulses
- Noise filtering up to -44dB at 100kHz
- Refer to FES-006 for UL-1449, Second Edition SVR Values
- Contact your GE representative for catalog numbers.



Spectra TVSS bus plugs

Plugs

Table 33.1
Spectra Bus Plugs with Tranquell TVSS Protection with Ground Fault

Nominal Voltage (Volts, RMS)	Configuration	65kA	80kA	100kA	Max. Cont. Overvoltage Capability (MCOV%)
120/240	1 Phase, 3 Wire + Ground	TPME120S06WC	TPME120S08WC	TPME120S10WC	125%
120Y/208	3 Phase, 4 Wire + Ground	TPME120Y06WC	TPME120Y08WC	TPME120Y10WC	125%
240 Delta	3 Phase, 4 Wire + Ground	TPME240D06WC	TPME240D08WC	TPME240D10WC	115%
120/240 Delta HL	3 Phase, 4 Wire + Ground	TPME240H06WC	TPME240H08WC	TPME240H10WC	115%
240Y/415	3 Phase, 4 Wire + Ground	TPME240Y06WC	TPME240Y08WC	TPME240Y10WC	130%
277Y/480	3 Phase, 4 Wire + Ground	TPME277Y06WC	TPME277Y08WC	TPME277Y10WC	115%
220Y/380	3 Phase, 4 Wire + Ground	TPME220Y06WC	TPME220Y08WC	TPME220Y10WC	145%
480 Delta	3 Phase, 4 Wire + Ground	TPME480D06WC	TPME480D08WC	TPME480D10WC	170%
347Y/600	3 Phase, 4 Wire + Ground	TPME347Y06WC	TPME347Y08WC	TPME347Y10WC	115%
600 Delta	3 Phase, 3 Wire + Ground	TME600D065WC	TME600D080WC	TME600D100WC	170%

Table 33.2
Spectra RMS™ Circuit Breaker Bus Plugs (Outer Dimensions)

Tier	Frame	Dimensions W Inches	W MM	L Inches	L MM	D Inches	D MM	Handle Height① Inches	Handle Height① MM	Weight (lbs.)	Plug-in Outlets	Figure
Lowest	SED	11.00	279	13.00	330	8.00	203	9.12	232	25	1	33.2
Low	SEH	11.00	279	13.00	330	8.00	203	9.12	232	25	1	33.2
	SFH	11.00	279	21.25	540	9.00	229	9.50	241	41	1	33.2
	SGH	16.75	425	26.50	673	12.00	305	9.5	241	91	2	33.3
	SKH②	16.75	425	36.50	927	12.00	305	18	457	160	2	33.3
Mid	SEL	11.00	279	13.00	330	8.00	203	9.12	237	25	1	33.2
	SFL	11.00	279	21.25	540	9.00	229	9.5	241	41	1	33.2
	SGL	16.75	425	26.50	673	12.00	305	18	457	91	1	33.3
	SKL②	16.75	425	36.50	927	12.00	305	18	457	160	2	33.3
Peak	SEP	11.00	279	13.00	330	8.00	203	9.12	232	25	1	33.2
	SFP	11.00	279	21.25	540	9.00	229	9.5	241	41	1	33.2
	SGP	16.75	425	26.50	673	12.00	305	18	457	91	1	33.3
	SKP②	16.75	425	36.50	927	12.00	305	18	457	160	2	33.3

① Maximum distance from enclosure bottom to handle tip.
② For ground fault option, increase width by 2.125 inches and length by 6.00 inches.

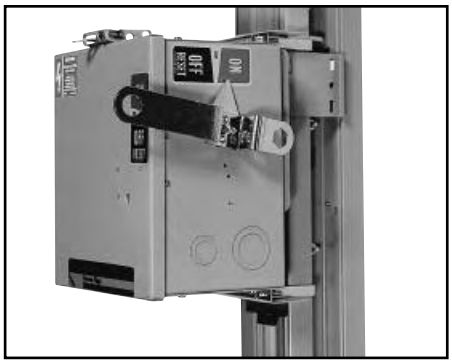
Table 33.3
Molded Case Circuit Breakers

Type	Frame	Dimensions W Inches	W MM	L Inches	L MM	D Inches	D MM	Figure
Standard and Hi-Break®	TEB, TED, THED	11.00	279	13.00	330	8.00	203	33.2
	TFJ, TFK, THFK	11.00	279	18.50	470	9.50	241	33.2
	TJJ, TJK4, TJK6, THJK4, THJK6	16.75	425	24.50	622	12.00	305	33.3
	TKM8, THKM8, THK	16.75	425	36.50	927	12.00	305	33.3
Fused Current Limiting	TB1	11.00	279	18.50	470	8.00	203	33.2
	TB4	16.75	425	30.50	775	12.00	305	33.3
	TB6, TB8			45.25	1149			

Table 33.4
Fusible Switches

Type	Amps	Weight (lbs.)	Voltage Rating	Dimensions W Inches	W MM	Length Standard Gutter Inches	Length Standard Gutter MM	Length Extender Inches	Length Extender MM	D Inches	D MM	Figure
QMR	30	24	240, 380, 415, 480, 600	11.25	286	13.00	330	18.63	473	8.75	222	33.2
	60	25						NA	NA			
	100	28				18.75	476					
	200	46		16.00	406			24.50	622			
	400	135		20.50	521			NA	NA	18.75	476	33.3
	600	160				24.50	622					

NA = Not Available



Vertical riser bus with plug installed

Fig. 33.1
Typical vertical application with Spectra Series riser busway

inches
millimeters

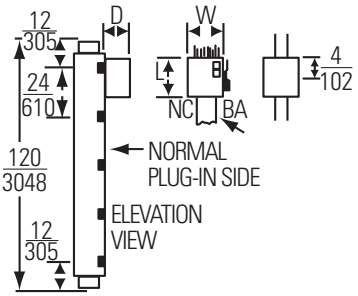


Fig. 33.2
Door hinges at left end.
All dimensions are shown over largest part of plug.

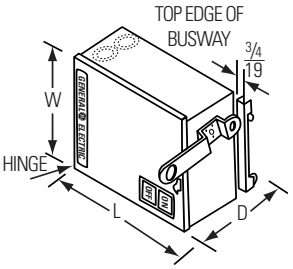
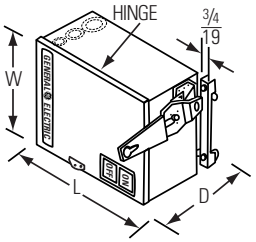


Fig. 33.3
Door hinges at top.
All dimensions are shown over largest part of plug.



Cataloging

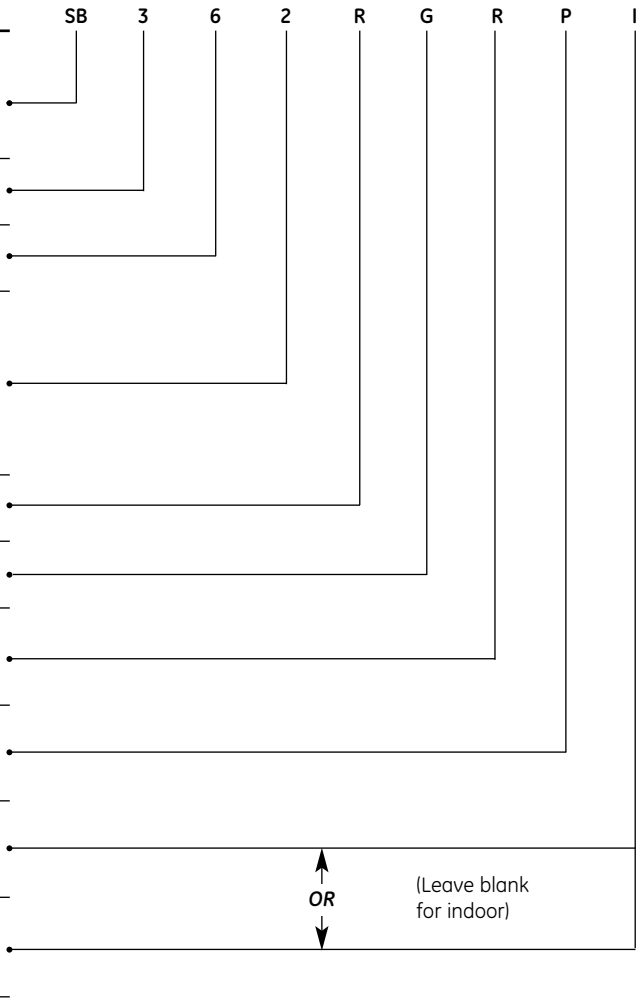
Busway plugs

Fusible bus plug catalog numbering system.

Refer to page 33 for enclosure sizes.

Table 34.1

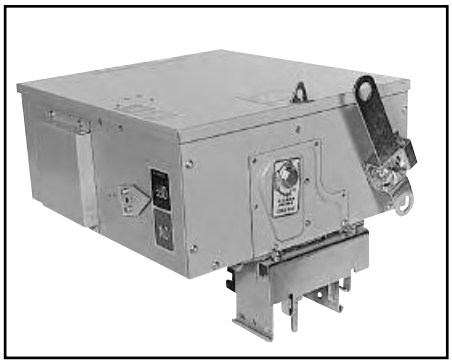
	Code	Description
Type	SB	Spectra Bus (Industrial)
	CSB*	Spectra Bus (Commercial)
	AC	Armor Clad
	FVK	FVK Bus
Service	3	3Ø 3W
	4	3Ø 4W
Volts	2	240 V
	6	380, 415, 480 V
Amps	1	30
	2	60
	3	100
	4	200
	5	400
	6	600
Switch	R	QMR
	W	QMW
Ground	G	Ground Stab (Std.)
Fuse Clips	R	Class R
	J	Class J
	Omit	Class H
Plug Assist	P	Plug Assist (Std. on 200-600)
	Omit	None
Drip Resistant (IP-45)	I	Cover & Base Gasketing
	Omit	None
Splash-Proof (IP-54)	Z	Cover & Base Extensive Gasketing/Sealing
	Omit	None



Notes:
All plugs provided with 2-600MCM/(2) 1/0 - 250MCM mechanical lug as standard.
Compression lugs available as an option.

* Plug assist option is available for 200 amp and greater only

Cataloging



Bus plug with plug assist

Plugs

A plug assist is furnished as standard on all plugs greater than 100 amps listed on this page. If plug assist is required on other plugs, add Suffix "P" to Catalog Number.

Grounding stab to engage internal or integrated housing ground bus is standard on all Spectra Series plugs. Mating stab is standard on Spectra Series plug-in busway.

All fusible plugs are furnished with Type "NEC" fuse clips as standard. Optional fuse clips are available.

Refer to page 33 for enclosure sizes.

Table 35.1
Switch-operated Fusible Plug with QMR Interrupter

Volts ac	Amps	3Ø-3W Catalog Number	3Ø-4W Catalog Number
240	30	SB 321RG	SB 421RG
	60	SB 322RG	SB 422RG
	100	SB 323RG	SB 423RG
	200	SB 324RG	SB 424RG
	400	SB 325RG	SB 425RG
	600	SB 326RG	SB 426RG
480 or 600	30	SB 361RG	SB 461RG
	60	SB 362RG	SB 462RG
	100	SB 363RG	SB 463RG
	200	SB 364RG	SB 464RG
	400	SB 365RG	SB 465RG
	600	SB 366RG	SB 466RG

Table 35.2
Combination Ground Detectors and Neutralizer
Flex-A-Plug Unit (Not UL Listed)

Volts	3Ø-3W Catalog Number
208-240	SB321NG
440-600	SB361NG

Table 35.3
Adapter Kits Convert Spectra Series Bus Plugs to Armor Clad
Ground stab included. See GE instructions pub no. GEH-5647

Amps	Catalog Number
30-100	SBAC1G
200-225	SBAC4G
440-600	SBAC5G

Table 35.4
Combination motor starter plugs-fusible and circuit breaker①
(3-pole, full-voltage, non-reversing, single-speed)
Includes 3 overload relays with manual reset

Nema Size	Max Hp Rating, 3-phase		With Fusible Switch Disconnect	With Circuit Breaker Disconnect
	240 Volts	440/550 Volts	Max Fuse Size, Amp	Max Trip Size, Amp
0	3	5	30	20
1	7½	10	60	50
2	15	25	100	70
3	30	50	200	100

① Order by description.

Busway plugs

Plug assist is furnished as standard on all circuit breaker plugs except in the 100-amp frame sizes. If plug assist is required on the 100-amp frame sizes, add Suffix "P" to Catalog Number.

Refer to page 33 for enclosure sizes.

Table 36.1
Circuit Breaker Plugs

Type Frame	Trip Amps	3Ø-3W Cat. No.	3Ø-4W Cat. No.
Standard Circuit Breakers①			
TEB 240 Volts	15	SB31EBG	SB41EBG
	20	SB32EBG	SB42EBG
	25	SB32.5EBG	SB42.5EBG
	30	SB33EBG	SB43EBG
	35	SB33.5EBG	SB43.5EBG
	40	SB34EBG	SB44EBG
	45	SB34.5EBG	SB44.5EBG
	50	SB35EBG	SB45EBG
	60	SB36EBG	SB46EBG
	70	SB37EBG	SB47EBG
	80	SB38EBG	SB48EBG
	90	SB39EBG	SB49EBG
	100	SB310EBG	SB410EBG
TED4 480 Volts	15	SB31ED4G	SB41ED4G
	20	SB32ED4G	SB42ED4G
	25	SB32.5ED4G	SB42.5ED4G
	30	SB33ED4G	SB43ED4G
	35	SB33.5ED4G	SB43.5ED4G
	40	SB34ED4G	SB44ED4G
	45	SB34.5ED4G	SB44.5ED4G
	50	SB35ED4G	SB45ED4G
	60	SB36ED4G	SB46ED4G
	70	SB37ED4G	SB47ED4G
	80	SB38ED4G	SB48ED4G
	90	SB39ED4G	SB49ED4G
	100	SB310ED4G	SB410ED4G
TED6 600 Volts	15	SB31ED6G	SB41ED6G
	20	SB32ED6G	SB42ED6G
	25	SB32.5ED6G	SB42.5ED6G
	30	SB33ED6G	SB43ED6G
	35	SB33.5ED6G	SB43.5ED6G
	40	SB34ED6G	SB4ED6G
	45	SB34.5ED6G	SB44.5ED6G
	50	SB35ED6G	SB45ED6G
	60	SB36ED6G	SB46ED6G
	70	SB37ED6G	SB47ED6G
	80	SB38ED6G	SB48ED6G
	90	SB39ED6G	SB49ED6G
	100	SB310ED6G	SB410ED6G
	110	SB311ED6G	SB411ED6G
	125	SB312.5ED6G	SB412.5ED6G
	150	SB315ED6G	SB415ED6G
TFJ 600 Volts	70	SB37FJG	SB47FJG
	80	SB38FJG	SB48FJG
	90	SB39FJG	SB49FJG
	100	SB310FJG	SB410FJG
	110	SB311FJG	SB411FJG
	125	SB312FJG	SB412FJG
	150	SB315FJG	SB415FJG
	175	SB317FJG	SB417FJG
	200	SB320FJG	SB420FJG
	225	SB322FJG	SB422FJG
TFK 600 Volts	70	SB37FKG	SB47FKG
	80	SB38FKG	SB48FKG
	90	SB39FKG	SB49FKG
	100	SB310FKG	SB410FKG
	110	SB311FKG	SB411FKG
	125	SB312FKG	SB412FKG
	150	SB315FKG	SB415FKG
	175	SB317FKG	SB417FKG
	200	SB320FKG	SB420FKG
	225	SB322FKG	SB422FKG
TJJ 600 Volts	125	SB312JJG	SB412JJG
	150	SB315JJG	SB415JJG
	175	SB317JJG	SB417JJG
	200	SB320JJG	SB420JJG
	225	SB322JJG	SB422JJG
	250	SB325JJG	SB425JJG
	300	SB330JJG	SB430JJG
	350	SB335JJG	SB435JJG
	400	SB340JJG	SB440JJG
TJK4 600 Volts	125	SB312JK4G	SB412JK4G
	150	SB315JK4G	SB415JK4G
	175	SB317JK4G	SB417JK4G
	200	SB320JK4G	SB420JK4G
	225	SB322JK4G	SB422JK4G
	250	SB325JK4G	SB425JK4G
	300	SB330JK4G	SB430JK4G
	350	SB335JK4G	SB435JK4G
	400	SB340JK4G	SB440JK4G
TJK6 600 Volts	250	SB325JK6G	SB425JK6G
	300	SB330JK6G	SB430JK6G
	350	SB335JK6G	SB435JK6G
	400	SB340JK6G	SB440JK6G
	450	SB345JK6G	SB445JK6G
	500	SB350JK6G	SB450JK6G
	600	SB360JK6G	SB460JK6G
TKM8 600 Volts	300	SB330KMG	SB430KMG
	350	SB335KMG	SB435KMG
	400	SB340KMG	SB440KMG
	450	SB345KMG	SB445KMG
	500	SB350KMG	SB450KMG
	600	SB360KMG	SB460KMG
	700	SB370KMG	SB470KMG
	800	SB380KMG	SB480KMG

① TEB, TED4, THED, TFJ and TJJ are fixed trip circuit breakers.

Cataloging

Table 37.1
Circuit Breaker Plugs *(continued)*

Type Frame	Trip Amps	3Ø-3W Cat. No.	3Ø-4W Cat. No.
Tri-Break® Circuit Breakers② (Includes Limiters)			
TB1 600 Volts	15	SB31B1E05	SB41B1E05
	20	SB32B1E05	SB42B1E05
	25	SB32.5B1E05	SB42.5B1E05
	30	SB33B1E05	SB43B1E05
	35	SB33.5B1E05	SB43.5B1E05
	40	SB34B1E05	SB44B1E05
	45	SB34.5B1E05	SB44.5B1E05
	50	SB35SB1E09	SB45B1E09
	60	SB36SB1E09	SB46B1E09
	70	SB37SB1E09	SB47B1E09
	80	SB38SB1E09	SB48B1E09
	90	SB39SB1E09	SB49B1E09
	100	SB310SB1E09	SB410B1E09
	110	SB311B1E10	SB411B1E10
	125	SB312.5B1E10	SB412.5B1E10
	150	SB315B1E10	SB415B1E10
TB4 600 Volts	125	SB312B4F14	SB412B4F14
	150	SB315B4F14	SB415B4F14
	175	SB317B4F14	SB417B4F14
	200	SB320B4F14	SB420B4F14
	225	SB322B4F14	SB422B4F14
	250	SB325B4F14	SB425B4F14
	300	SB330B4F14	SB430B4F14
	350	SB335B4F14	SB435B4F14
	400	SB340B4F14	SB440B4F14
TB6 600 Volts	300	SB330B6J14	SB430B6J14
	350	SB335B6J14	SB435B6J14
	400	SB340B6J14	SB440B6J14
	450	SB345B6J14	SB445B6J14
	500	SB350B6J14	SB450B6J14
	600	SB360B6J14	SB460B6J14
TB8③ 600 Volts	600	SB360B8K20	SB360B8K20
	700	SB370B8K20	SB370B8K20
	800	SB380B8K20	SB380B8K20

Type Frame	Trip Amps	3Ø-3W Cat. No.	3Ø-4W Cat. No.
Hi-Break® Circuit Breakers② (Includes Limiters)			
THED 600 Volts	15	SB31HED	SB31HED
	20	SB32HED	SB32HED
	25	SB32.5HED	SB32.5HED
	30	SB33HED	SB33HED
	35	SB33.5HED	SB33.5HED
	40	SB34HED	SB34HED
	45	SB34.5HED	SB34.5HED
	50	SB35HED	SB35HED
	60	SB36HED	SB336HED
	70	SB37HED	SB37HED
	80	SB38HED	SB38HED
	90	SB39HED	SB39HED
	100	SB310HED	SB310HED
	110	SB311HED	SB311HED
	125	SB312.5HED	SB312.5HED
	150	SB315HED	SB315HED
THFK 600 Volts	70	SB37HFK	SB37HFK
	80	SB38HFK	SB38HFK
	90	SB39HFK	SB39HFK
	100	SB310HFK	SB310HFK
	110	SB311HFK	SB311HFK
	125	SB312HFK	SB312HFK
	150	SB315HFK	SB315HFK
	175	SB317HFK	SB317HFK
	200	SB320HFK	SB320HFK
	225	SB322HFK	SB322HFK
THJK4 600 Volts	125	SB312HJK4	SB312HJK4
	150	SB315HJK4	SB315HJK4
	175	SB317HJK4	SB317HJK4
	200	SB320HJK4	SB320HJK4
	225	SB322HJK4	SB322HJK4
	250	SB325HJK4	SB325HJK4
	300	SB330HJK4	SB330HJK4
	350	SB335HJK4	SB335HJK4
	400	SB340HJK4	SB340HJK4
THKM8 600 Volts	300	SB330HKM	SB330HKM
	350	SB335HKM	SB335HKM
	400	SB340HKM	SB340HKM
	450	SB345HKM	SB345HKM
	500	SB350HKM	SB350HKM
	600	SB360HKM	SB360HKM
	700	SB370HKM	SB370HKM
	800	SB380HKM	SB380HKM

① TEB, TED4, THED, TFJ and TJJ are fixed trip circuit breakers.
② TBI is a fixed trip circuit breaker.
③ Not UL listed.

Spectra Series busway catalog numbering system

A comprehensive system that completely describes most lengths and fittings.

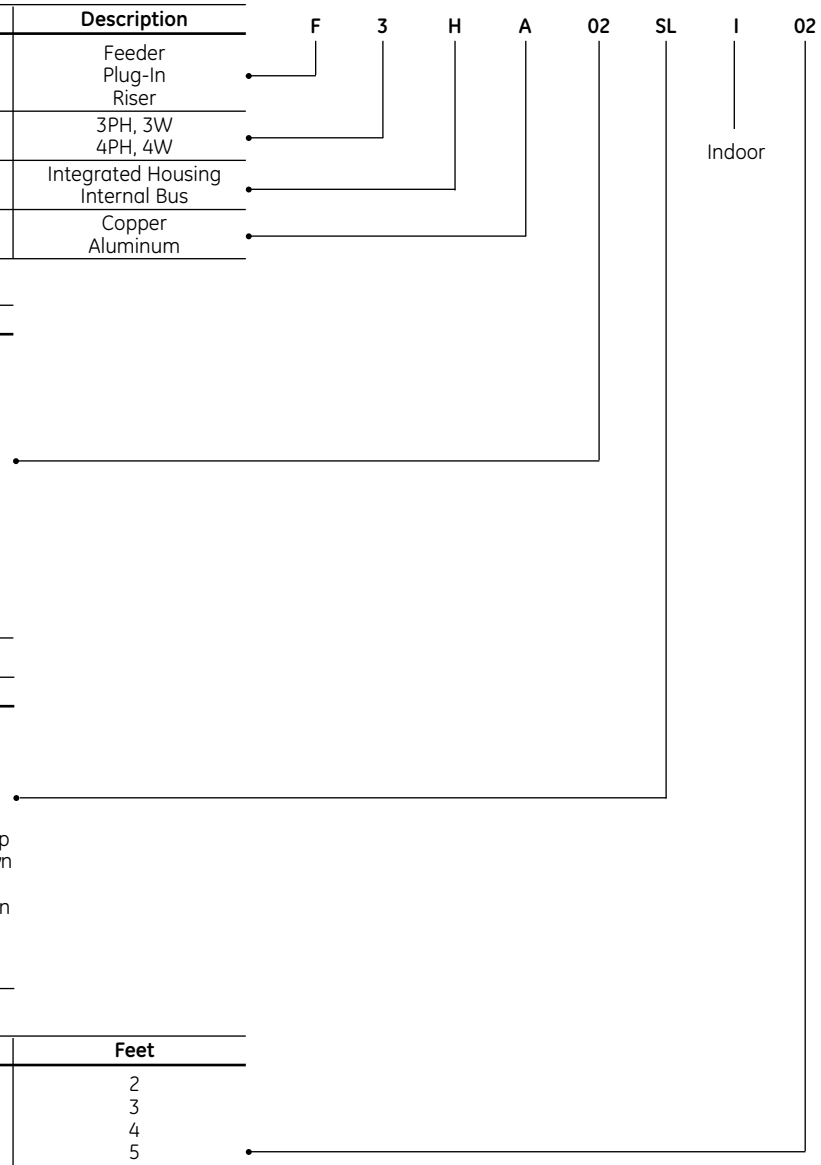
Table 38.1

	Code	Description
Type	F	Feeder
	P	Plug-In
	R	Riser
Service	3	3PH, 3W
	4	4PH, 4W
Ground	H	Integrated Housing
	G	Internal Bus
Conductor	C	Copper
	A	Aluminum

Code	Amps
02	225
04	400
06	600
08	800
10	1000
12	1200
13	1350
16	1600
20	2000
25	2500
30	3000
40	4000
50	5000

Code	Configurations
SL	Straight Length
EL	Elbow Left
ER	Elbow Right
EU	Elbow Up
ED	Elbow Down
CT	Center Cable Tap Box-Up
CB	Center Cable Tap Box-Down
TT	End Cable Tap Box-Up
TB	End Cable Tap Box-Down
EB	End Box
FE	Flanged End
FL	Flanged End with Lugs

Type	Code	Feet
Feeder	02	2
	03	3
	04	4
	05	5
	06	6
	07	7
	08	8
	09	9
	10	10
Plug-In Riser	02	2
	04	4
	06	6
	08	8
	10	10
Fittings	ST	(A)



(A) Refer to pages 15–16 for standard dimensions.

Guide Form Specifications

Drawing notes for Spectra Series™ Feeder and Plug-in busway

The following information should appear on the electrical drawings:

1. Amp rating, continuous.
2. Service: _____ phase, _____wire, _____volts, with or without internal ground.
3. Available short-circuit current at input end in amps rms symmetrical.
4. Maximum voltage drop and power factor at output end and whether load is distributed along run or concentrated at end of run.
5. Bus bar material (aluminum or copper).
6. Location of all fittings. For expansion fittings, show amount of compensation required as "± inches, total_____inches."
7. Limiting dimensions of busway width and depth where passing through walls or floors or around obstructions.
8. Mounting position of busway (flatwise, edgewise, or vertical riser).

Feeder busway specifications

Where shown on plans, furnish and install a totally enclosed, low-impedance busway system of the indicated ratings with all necessary fittings, power takeoffs, hanging devices and accessories.

Material and installation shall comply with all applicable codes, recommended practices, and standards of ANSI, IEEE, NEMA and UL. All components of the busway shall be UL Listed. Arrangements, details, and locations shall be as shown on the drawings and specified herein.

The housing shall be of extruded aluminum to provide maximum protection against corrosion from water and other contaminants normally encountered during construction. All hardware shall be plated to prevent corrosion.

Tie bolts shall brace aluminum housing and bars to withstand, without damage or permanent distortion, short-circuit currents of the magnitude shown on the drawings when tested in accordance with UL standard. Busway shall be finished in ANSI-61 grey enamel.

Joints shall be of the one-bolt removable/isolatable type with through-bolts that can be checked for tightness without deenergizing the system. It shall be possible to make up a joint from one side in the event the busway is installed against a wall or ceiling. The joint shall be so designed as to allow removal of any length without disturbing adjacent lengths. Belleville springs shall be provided to give positive pressure over complete contact area. Where required, the joint bolt shall provide a direct visual indication of pressure (tension) applied to the joint contact area. The means of visual indication shall be a color change in the head of the bolt. This indication shall remain accurate after multiple tightenings and loosenings of the bolt. All multi-stacks shall be phase collected.

The maximum hot-spot temperature rise at any point in the busway at continuous rated load shall not exceed 55°C above a maximum ambient temperature of 40°C in any position. (Ambient temperature averaged over 24-hour period.)

Bus bars shall be suitably plated at all joints and contact surfaces.

All insulation material shall be NEMA class B epoxy (130°C).

Horizontal runs of busway shall be UL Listed for hanging on 10-foot centers in any position. Vertical riser runs of busway shall be supported with rigid and/or spring hangers in positions indicated on plans (max 16' centers).

Final field measurements shall be made by the contractor prior to release for manufacture to assure coordination with other trades.

The busway shall be General Electric Spectra Series.

Plug-in busway specifications

Spectra Series II plug-in busway shall be identical to feeder construction and performance except:

There shall be four dead-front hinged cover type plug outlets as required to accommodate the plug installation. All outlets shall be usable simultaneously.

Plugs

Where shown on plans, furnish and install busway plugs of the types and ratings indicated. When applicable, plugs shall be UL labeled.

Housing shall completely enclose the switching device and shall be of sheet steel furnished in ANSI-61 grey enamel over a rust inhibitor. Provide stab shields that protect stabs and ground plug body to busway housing before stabs make power contact. Provide grounding terminal inside plug body and adequate shielding to prevent access to live parts when cover is open. A ground stab to engage grounding tab on busway and internal ground bus shall be provided. Provide means for padlocking cover and operating handle in "OFF" position. The operating handle shall be easily moved from end to side or vice versa so that it will be in the correct position to operate from the floor. All current-carrying parts shall be suitably plated.

Operating switch type plugs shall have positive quick-make, quick-break interrupter, and positive-pressure fuse clips. Provide a releasable cover interlock that prevents opening cover except when switch is in "OFF" position. This interlock shall be convertible to non-releasable type on the job. A releasable interlock preventing closing switch with cover open shall also be included, as well as interlock to prevent insertion or removal from busway when in "ON" position.

Circuit breaker type plugs shall have an interrupting rating of not less than_____amps rms symmetrical. They shall have a releasable cover interlock that prevents opening of cover except with breaker in "OFF" position. This interlock shall be convertible to non-releasable type on the job. An interlock to prevent insertion or removal from busway when in "ON" position shall be provided, as well as an interlock (releasable) to prevent closing circuit breaker with cover open.

Plug assists shall be furnished on all plugs over 100 amps that will mechanically engage or disengage the plug from the busway, but only when the plug is in the "OFF" position.

Notes

Field Drawing Page

Joint Guard™

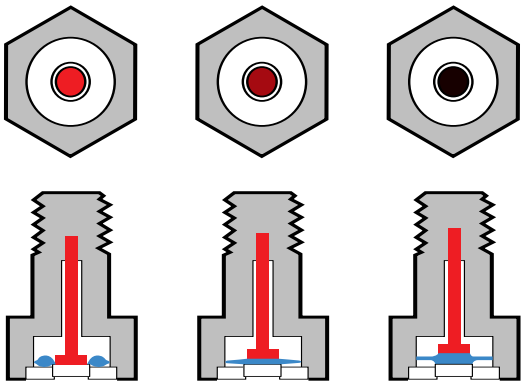
Positive torque indication. Time after time.

GE's *exclusive* Joint-Guard™ protection system shows you, with color, whether a busway joint is loose or tight. The center spot is bright red when a joint is loose and turns dark when proper torque is applied. It does this not just once — as with double-headed break-off bolts — but even after the repeated tightening and loosening so often required during installation. And it will keep on working that way for 30 years*.

Easy Maintenance. Joint-Guard simplifies periodic maintenance, too. Visual inspection, even from a distance, tells you whether the busway joint is properly torqued. No more unnecessary and labor-intensive re-torquing. It gets even easier: when combined with the superior torque retention design of GE's industry-leading Belleville washer, Joint-Guard bolts deliver the best solution for any maintenance program.

How it works

Joint-Guard technology was developed for the nuclear and aerospace industries. It measures the elongation of the busway joint bolt, and is more accurate that a torque wrench, which is subject to substantial variations in static and dynamic friction, depending on thread wear and lubrication.



*assumes busway operates 14 hours per day, six days per week, at 81% load in 25°C ambient

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