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INSTALLATION, OPERATIONS AND MAINTENANCE MANUAL

ReliaGear™ busway

Plug-in and feeder busway

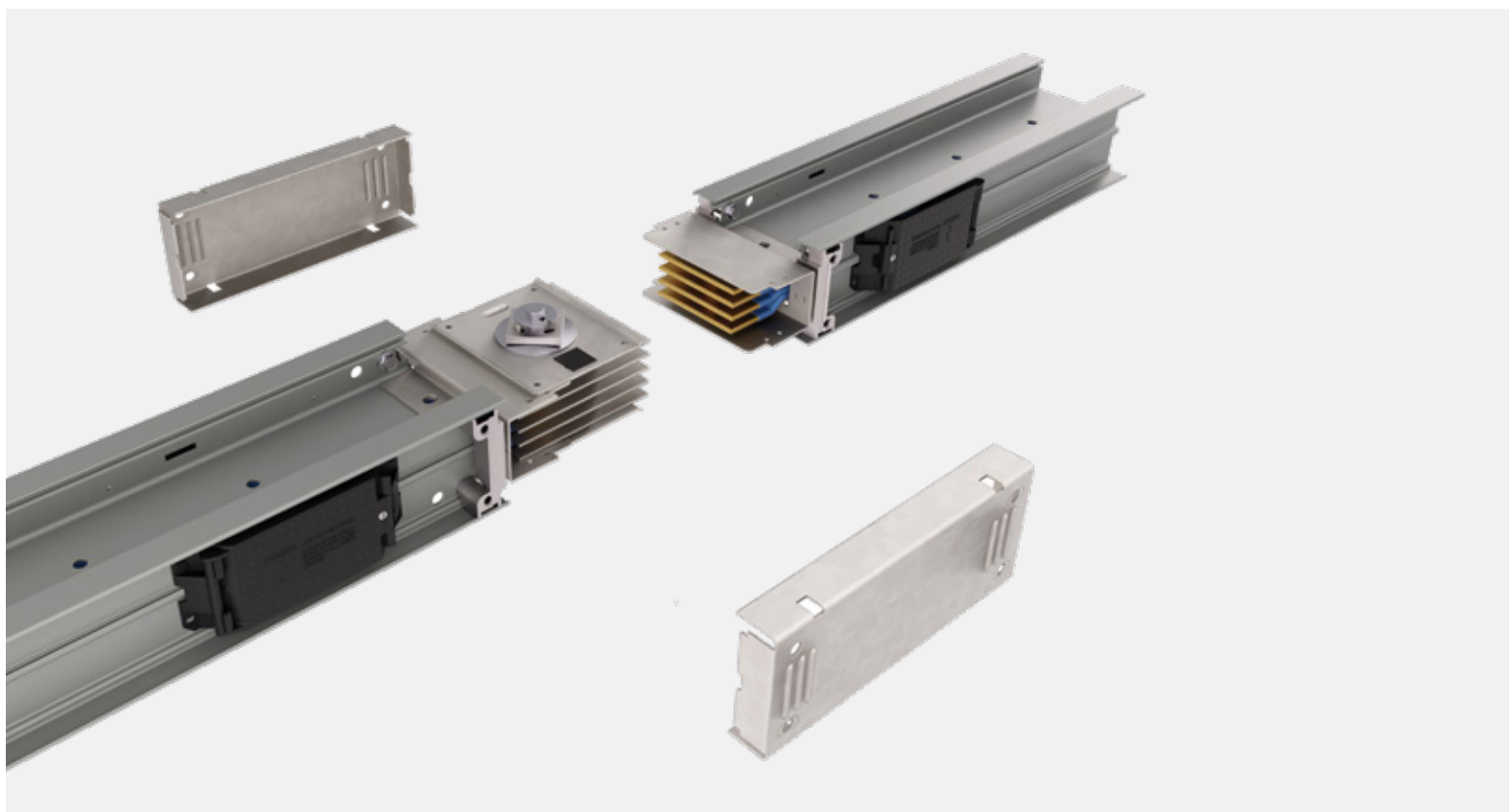


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Warranty and general information

Read the following hazard classifications carefully, and fully inspect the equipment for any identifiable hazards prior to installation, operation, or maintenance. The following classifications listed below will appear throughout this document or on labels located on the equipment. These are standard symbols defined by ANSI Z535.4-2011 which were established for recognition of potential hazards which pose risk to life and property. The classification is based on the probability and severity of injury if the hazard is not avoided. Please follow instructions, warnings, labels, and codes for proper installation, operation and maintenance of equipment and devices. Only Qualified Persons, as defined by NFPA 70, should provide installation, operation, and maintenance on this equipment and devices.

Danger symbol/Warning symbol

The addition of either symbol to a "Danger" or "Warning" safety label indicates that an electrical hazard exists that will result in personal injury if the instructions are not followed.



This is a safety alert symbol. It is used to alert you to potential physical injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



Danger: Indicates a hazardous situation which, if not avoided, will result in death or serious injury.



Warning: Indicates a hazardous situation that, if not avoided, could result in death or serious injury.



Caution: Indicates that if the hazard is not avoided could result in minor or moderate injury.



Notice: Is used to notify of practices not related to personal injury.

Trademarks

ReliaGear™ busway

All third-party trademarks are the property of their respective owners.

Warranty

This document is based on information available at the time of publication. While efforts have been made to ensure accuracy, the information contained herein does not cover all details or variations in hardware and software, nor does it provide for every possible contingency in connection with installation, operation, and maintenance. Features may be described herein that are not present in all hardware and software systems.

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No warranties of merchantability or fitness for purpose shall apply. Contact your local sales office if further information is required concerning any aspect of ReliaGear busway operation or maintenance.

Installing ReliaGear™ busway

Storage precautions

Before storing, unpack sufficiently to make a check of the busway for possible concealed damage resulting from shipping and handling. If damage has occurred, notify the shipper immediately. If the busway is free of damage, restore the packing until ready for installation.

Store indoors in a clean, dry area, preferably close to the installation points.

Protect the busway from mechanical damage and any contact with or exposure to corrosive fumes, liquids, salts, or concrete.

Failure to store and protect the busway properly can cause serious damage and will void the warranty.

NOTICE

Notice: No busway, including outdoor rated, is weatherproof until completely and properly installed.

NOTICE

Notice: Aucune canalisation pour barres omnibus, incluant celles classées pour l'extérieur, n'est à l'épreuve de l'eau jusqu'à ce qu'elle soit installée complètement et correctement.

Pre-installation procedure

When possible, deliver the busway to its installation location before unpacking. Large labels on each shipping carton or crate designate the items contained. Additionally, each busway piece is identified with an item number label.

Inspect each busway piece for possible damage or contamination. A thin layer of lubricant has been added to facilitate installation. Contact surfaces must be clean. However, do not attempt to polish contact surfaces.

Check to ensure that joint insulators are not damaged or cracked and are firmly in place. Megohm test each piece before installation.

Installation of ReliaGear busway

Establish the bus bar phase sequence (Ø side is labeled) to determine how the busway is to be installed, so that correct phasing is maintained throughout the system. Note that phase transposition lengths, when furnished, may relocate the Ø to the opposite side of a busway run.

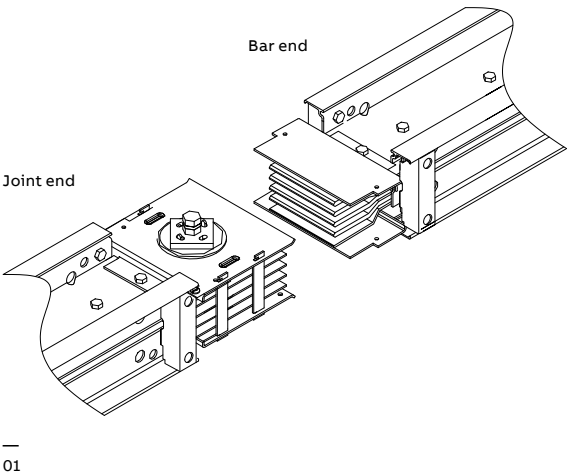
—
01
The bar end and joint
end of the busway

—
02
Minimum clearances
to be maintained in
various installations

Each busway piece has a "bar end" and a "joint end," as illustrated in Figure 1. Normally the busway is oriented end for end with bar ends pointing away from the source. Also, the Ø side should be oriented down for horizontal plug-in applications.

In vertical riser installations, it is easier to lower the busway into place than it is to raise it.

If installation drawings have been furnished, information regarding the orientation of the busway and location of the Ø side, as well as other pertinent data including busway sequencing, will be furnished. These drawings should be followed carefully to ensure a proper busway system.



Where to start

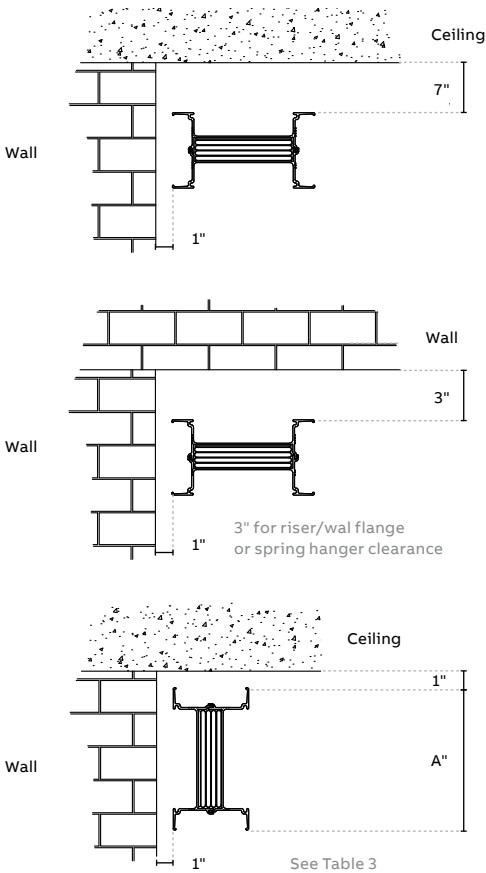
Start the installation, if at all possible, at the most critical point, such as a main feed box, switchboard or switchgear, elbow, or other critical fitting or termination.

Obstructions

Where a busway run must pass through a wall or floor, an opening one inch larger than the busway cross-section should be provided. Joints and plug outlets may not occur inside walls or floors per the NEC. A flange is available to mask the opening after the busway is installed.

Minimum clearances

Figure 2 illustrates the minimum clearances that must be maintained in various installation situations.



Ø 4" minimum provides clearance for 30–100 A fusible plugs.
7" minimum for 200 A fusible plugs.
8" minimum for all other plugs. See Tables 1, 2, and 3.

Installing indoor busway

Horizontal mounting

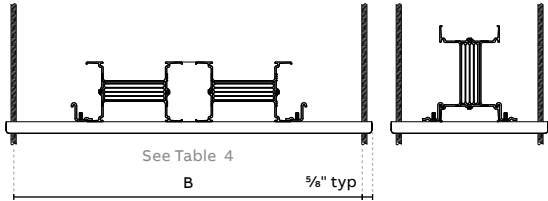
03
Dimensions between
drop rods for dual-
hanger installations

04
Single-rod hanger
with one stack a.
(standard) mounted
flat and b. mounted
edgewise

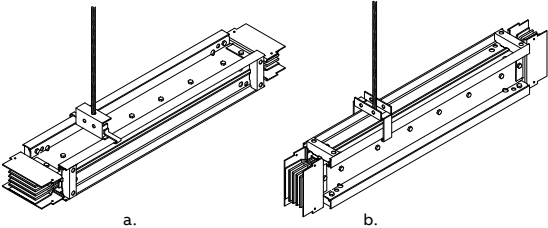
Overhead support
For overhead-supported busway, 1/2-inch drop rods are recommended with a maximum 10-foot spacing. Drop rods and other hardware must be furnished by the installer. Figure 3 illustrates mounting dimensions for typical installations.

- Maintain good alignment of the drop rods along the busway run.
- Do not support busway at the joints.
- After the busway is secured in the hangers, adjust the hangers on the rods for the correct elevation.
- Sway braces (furnished by the installer) may be required to keep the run straight or to prevent rotation.

Wall or column support
Single-rod hangers, as shown in Figure 4, may be used for mounting busway on walls or columns with the addition of an angle support supplied by the installer.



03



04

Vertical mounting
Support busway on maximum 16-foot centers. Use Table 7 to determine the number of springs required based on busway weight, as listed in Table 4, Table 5 and Table 8. Select the spring hanger based on the seismic load; amperage and vertical support spacing mentioned in Table 1 and 2.

Table 1: Selection of spring hanger based on Seismic load and amperage

Code board	Spring hanger/ catalogue number	Seismic level	Amperage	Vertical spacing (Ft)
IEEE-693-1997 HIGH, IBC -2003	SBR"X"	SDS=1.0G IP = 1.5	225A-2000A copper and 225A - 3000A aluminum	Less than or equal to 16 foot centers
			2500A copper	Less 12 foot centers
			4000A aluminum	Less 13 foot centers

Does not include 3000A-5000A 4W CU Vertical and 4000A-5000A 3W CU Vertical

Table 2: Selection of spring hanger based on seismic load

Code board	Spring hanger/ catalogue number	Seismic level	Amperage	Vertical spacing (Ft)
IEEE-693-2005 HIGH, IBC -2006	SBSR"X"	SDS=1.67G, IP = 1.5	225A-5000A copper and 225A - 4000A aluminum	Less than or equal to 12 foot centers
			225A-5000A copper and 225A - 4000A aluminum	Less than or equal to 16 foot centers
		SDS=1.33G, IP = 1.5	225A-5000A copper and 225A - 4000A aluminum	Less than or equal to 12 foot centers
			225A-5000A copper and 225A - 4000A aluminum	Less than or equal to 16 foot centers

Table 3: Busway and hanger mounting dimensions, as illustrated in Figures 2 and 3

Bars per phase	Ampere rating		Dimensions, in.	
	Copper	Aluminum	Busway A	Hanger B
1	225–800	225–600	4 ³ / ₈	10 ³ / ₄
	1000	-	5	
	1200	800	5 ⁵ / ₈	
	1350	1000	6 ¹ / ₈	
	1600	1200	7	
	2000	1350	8 ¹ / ₂	
	-	1600	9 ¹ / ₄	
	2500	-	10 ¹ / ₄	
	-	2000	11	
	3000	-	15	
2	-	2500	15 ¹ / ₂	26
	4000	3000	18	
	5000	-	21 ¹ / ₂	
	-	4000	23	
	-	-	-	

After placing the length of busway through the floor, follow this procedure to assemble hangers to the busway, as illustrated in Figure 5 Figure 6 and 6a. For convenience in assembly, step 8 may be completed before the hangers are attached to the busway.

NOTICE

Notice: Check that the initial height is 8 inches, as shown in Figure 6.

NOTICE

Notice: Veuillez vous assurer que la hauteur initiale est de 8 pouces, tel que montré à la Figure 6.

1. Loosen the hanger bolt A, shown in Figure 5.
2. Assemble the hangers to each side of the busway.
3. Position the hangers on the busway so that the base channel (B) rests on the floor or other support. A floor flange (C) may be placed under the hanger, but it will not support the busway weight.
4. Fit the hanger clamps (G) to the busway housing and hand tighten the hanger bolts (A).
5. Anchor the base channels to their supports.
6. Tighten the hanger bolts (A).
7. Install the next length and make the joint assembly (see the instructions for joining lengths below). 8. If springs are furnished, they must be adjusted as shown in Figure 6 at this time. Determine the required dimension H of the hanger springs, found on the layout drawing or by using the formula,

$$H = 5 \frac{5}{8} - \frac{W}{150}$$

$$B = \frac{\text{Busway wt/ft} \times \text{ft/floor} + \text{devices on floor}}{\text{Total number of springs/floor}}$$

Using the final adjusting nuts (E), set the springs on the hangers to the dimension H. With the springs adjusted, hold nut (E) in position and tighten jam nut (F) against nut (E) to retain the spring setting. Tighten all jam nuts (F) using this procedure.

Note that when you are calculating the dimension H for the bottom floor of a riser with an elbow and busway directly below the floor, the following must be included in the footage calculation, as shown in Figure 6C.

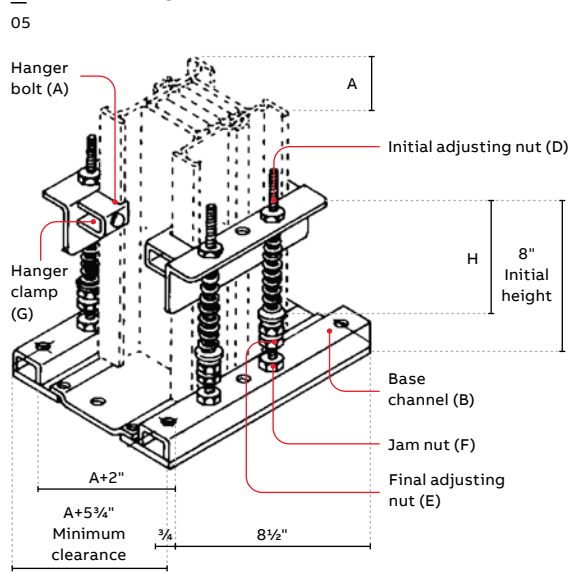
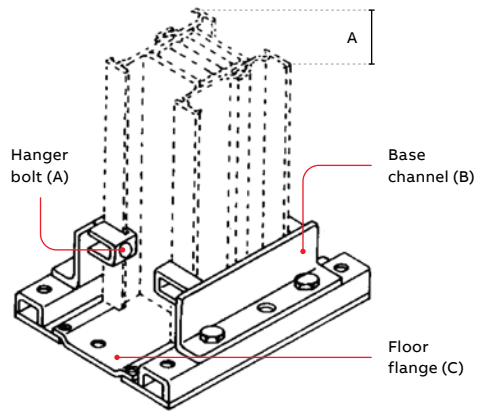
- Busway below the floor to the elbow,
- The elbow,
- 8 feet of horizontal busway.

9. After the busway run is installed and all "H" dimensions are set to the required settings, starting at the top hanger raise the initial adjusting nuts (D) of all hangers to the top of the spring studs. The studs are crimped to hold the nuts in the uppermost position.

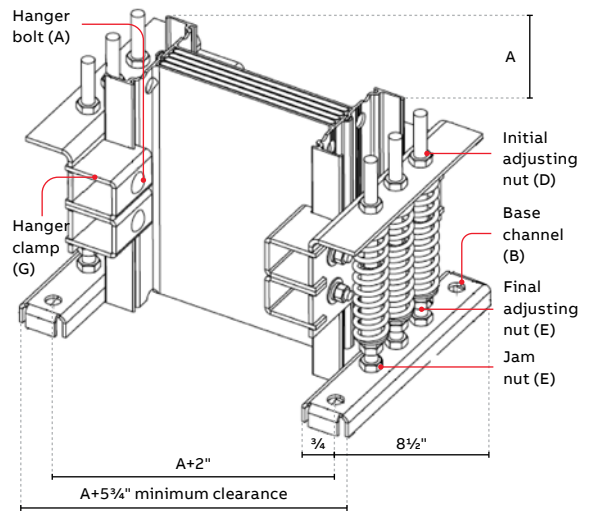
NOTICE

Notice: Failure to properly adjust the spring hangers could damage the bus and void the warranty.

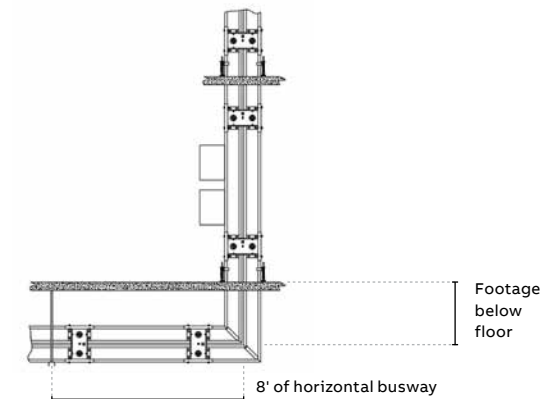
- 05
Rigid riser hanger
installation
- 6A
Spring riser hanger
installation
- 6B
Seismic Spring riser
hanger installation
(Cat No: SBSR"X")
- 6C
Busway footage needed
for H calculations
with horizontal bus
below the floor



6A



6B



6C

Table 4: Dimensions for SACE®Tmax® XT circuit breaker bus plug

Rating (amps)	ABB device	Length "L" [in/mm] (hanger to hanger)	Width "W" [in/mm]	Depth "D" [in/mm] (top of handle to bottom of stab base shield)	Plug dimensions
					Plug-in outlets
125	XT2	20.00/508	9.8/249	12.5/318	1
250	XT4	20.00/508	9.8/249	12.5/318	1
500	XT5	37.75/959	18.50/470	17.2/437	2
800	XT7	37.75/959	18.50/470	17.2/437	2

⌘ Maximum distance from the busway housing to the handle tip.

⌘ For ground fault option, increase width by 2.125 inches and length by 6.00 inches.

Table 5: Dimensions for types OS/OT fusible switch bus plugs, as shown in Figures 7 and 8

Rating (amps)/ Fuse type	ABB device	Length		Width		Depth		Plug-in outlets
		in	mm	in	mm	in	mm	
30 H	OT100	23	584	12.5	318	14	356	1
60 H	OT100	23	584	12.5	318	14	356	1
100 H	OT100	23	584	12.5	318	14	356	1
200 H	OT200	23	584	12.5	318	14	356	1
200 H Extended	OT200	30	762	12.5	318	14	356	1
400 H	OT400	37.2	945	22.5	572	18.9	480	2
600 H	OT600	42	1067	22.5	572	21.63	549	2
30 R	OT200	23	584	12.5	318	14	356	1
60 R	OT200	23	584	12.5	318	14	356	1
100 R	OT200	23	584	12.5	318	14	356	1
200 R	OT400	37.2	945	22.5	572	18.8	478	2
400 R	OT600	42	1067	22.5	572	21.7	551	2
600 R	OT800	42	1067	22.5	572	21.7	551	2
30 J	OS30	16	406	9.75	248	14	356	1
60 J	OS60	16	406	9.75	248	14	356	1
100 J	OS100	16	406	9.75	248	14	356	1
200 J	OS200	24.8	630	17	432	18.5	470	2
400 J	OS400	24.8	630	17	432	18.5	470	2
600 J	OS600	32.3	820	22.75	578	21.75	552	2

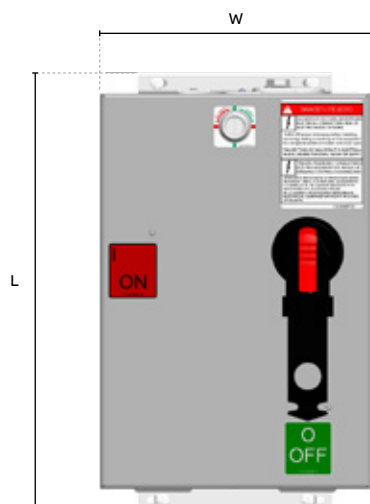
Table 6: Number of busway springs required per busway weight

Busway weight, lb	No. of springs required per floor
0–600	2
601–1200	4
Over 1200	6

Table 7: Busway weights

Amperes	Busway weight, lb/ft							
	Copper				Aluminum			
	3 Wire	3 wire ground	4 Wire	4 wire ground	3 Wire	3 wire ground	4 Wire	4 wire ground
225	8	9	9	10	5	5	6	6
400	8	9	9	10	5	5	6	6
600	8	9	9	10	5	5	6	6
800	8	9	9	10	6	6	7	8
1000	10	11	12	12	7	8	8	9
1200	12	13	15	16	8	9	9	10
1350	14	16	17	19	9	10	10	11
1600	16	18	20	22	10	11	12	13
2000	21	24	26	29	12	13	15	16
2500	26	30	33	37	17	18	20	21
3000	32	36	40	44	19	21	23	25
3200	34	38	43	47	21	23	24	25
4000	42	47	52	58	25	30	30	32
5000	52	59	66	73	-	-	-	-
6000	-	-	86	95	-	-	-	-

- 07
Bus plugs with door
hinges at the left
(less than 400 A)
- 08
Bus plugs with door
hinges at the bottom
(400 A and above)



The door hinges at the left end. The L and W dimensions are shown over the largest part of the plug.

—
07

NOTICE

Notice: On vertical riser applications use a minimum of 18" of un-supported flexible conduit connecting to bus plugs.

Joining lengths

Use the following procedure to join two lengths of busway:

1. Remove at least one joint cap, shown in Figure 9 and Figure 10, from the two pieces to be joined, retaining the bolts.
2. Align the sections to be joined by matching up the Ø SIDE labels attached to the ends of each section.
3. If necessary, loosen the joint bolt slightly.
4. Slide the sections together. Ensure that the busbars interweave the insulators, as shown in Figure 11, Figure 12, and Figure 13.



WARNING

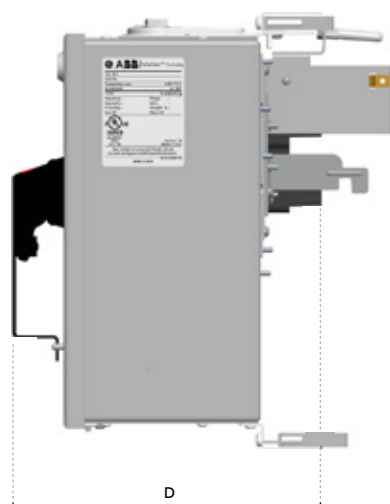
Warning: The housing-ground side plates must pass between the outside insulators and the joint-ground side plates to avoid a phase-to-ground short circuit.



WARNING

Avertissement: Les plaques de côté reliant le boîtier à la mise à la terre doivent passer entre les isolateurs extérieurs et les plaques de côté du joint à la terre pour éviter un court-circuit de phase à la terre.

5. In nominal position, the standard distance between the joint cap bolt holes is 10 1/4 inches for outdoor busway, as shown in Figure 11.



The door hinges at the bottom. L and W dimensions are shown over the largest part of the plug.

—
08

On indoor busway, the standard distance between the two housings is 8 3/8 inches, in nominal position, as shown in Figure 11. An alignment line marked "N" on the joint cap window should line up with the edge of the housing at nominal position. However, the joint is also adjustable, as shown in Figure 12 and Figure 13. Simply move the sections in or out to the desired length, as shown, and remove the twist-outs in both joint caps (outdoor only) if needed, as shown in Figure 10.

NOTICE

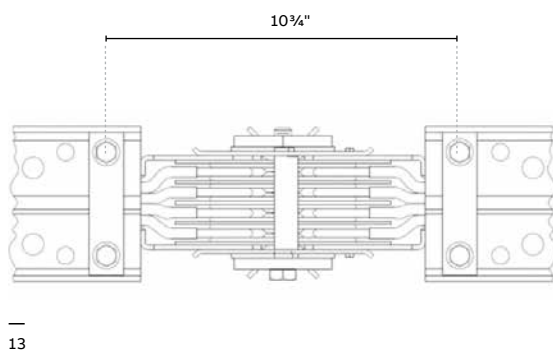
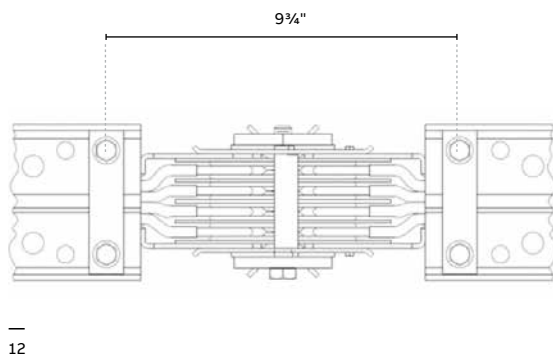
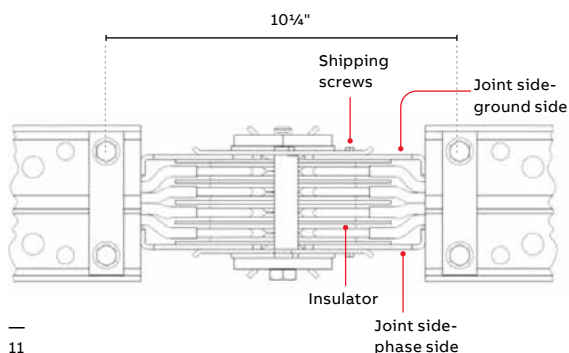
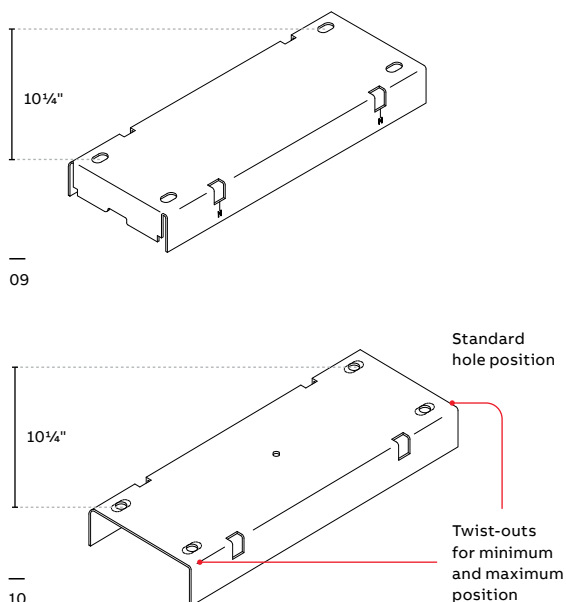
Notice: If any adjustments are made in Step 5, remove the shipping screws and center the joint between the two housings.

NOTICE

Notice: Retirer les vis d'expédition et centrer le raccord entre les deux habitacles sitout ajustement est apporté à la fiche-boîtier à l'étape 5.

6. If the joint caps are not already in place, reattach them and hand-tighten the mounting screws.
7. When joining indoor busway, use a 3/8-16 x 5/8" bolt to attach the joint cap to the housing spacer. Older busway may use a 5/16" x 2" bolt.
8. Inspect the busway run for straightness in all planes and make any adjustments necessary for good alignment.

- 09 Indoor joint cap
- 10 Outdoor joint cap
- 11 Busway joint at the standard distance
- 12 Busway joint at the minimum distance
- 13 Busway joint at the maximum distance



9. Grease has been applied to the joint bolt head and threads to reduce friction. Do not remove this grease.
10. Tighten the joint bolt with a 5/8" or 16-mm socket wrench until the smaller, top head breaks off. When the Belleville washers on both sides are flattened, the bolt is fully tightened. If the optional Joint-Guard™ torque-indicating bolt is used, tighten using a 3/4" or 19-mm socket torque wrench set at 50ft-lb (68N-m). The color indicator should turn fully black and can be viewed periodically to insure proper torque.

NOTICE

Notice: The bolt head may be relocated to the opposite side of the busway to improve accessibility.

NOTICE

Notice: La tête du boulon peut être repositionnée sur le côté opposé de la canalisation pour barres omnibus pour la rendre plus accessible.

11. Tighten all 3/8" joint cap screws to 25 lb-ft (34 N-m) with a 9/16" or 14-mm socket wrench and all 5/16" joint cap screws to 10 lb-ft (14 Nm) with a 1/2" or 12-mm socket wrench.
12. During installation, occasionally megohm test the assembly to check for any improperly made joints. Resistance should not drop below 1 megohm per 100 feet of busway.
13. Megohm test the complete run before energizing.

—
14
Installing an
expansion length

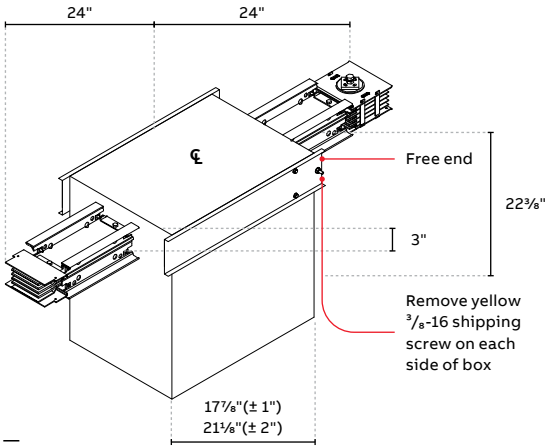
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15
Installing an end box

Expansion lengths

Expansion lengths compensate for thermal expansion of a long busway run or for differential expansion between two buildings spanned by a busway run. One end wall of the expansion box is free to move, but only after two yellow 3/8-16 x 7/8 shipping screws.

Install the expansion length and the remaining busway run, as shown in Figure 14. All but the farthest busway supports beyond the box's free end must be nonrigid, such as spring hangers for riser (vertical) busway or drop rod assemblies on a horizontal run. Before energizing the run, remove the two yellow 3/8-16 x 7/8 shipping screws, one on each side of the box, as identified by two labels on each side.

- Tips for installing expansion lengths:
- The label and shipping screws are near the box's free end;
 - Use a 9/16" (15mm) socket wrench to remove the 3/8-16 shipping screws.
 - An elbow below a riser that is supported by a drop rod less than 8 feet from the elbow should be considered rigidly mounted.



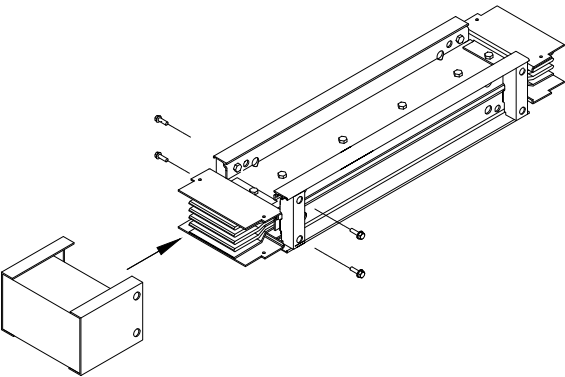
14

Installing an end box

An end box, as shown in Figure 15, is available to isolate phases and seal the end of a run.

The installation process is as follows:

1. Place the box over the end of the busway.
2. Secure the end box to the busway with the 5/16" x 2" screws provided.
3. Secure the end box to the busway with the 3/8-16 x 5/8" screws provided



15

Table 8: ReliaGear busway torque requirements

Bolt size	Torque (ft-lbs)
1/4-20 low carbon	6–10
1/4-20 med carbon	8–12
5/16-18 med carbon	14–18
3/8-16 low carbon	14–18
3/8-16 med carbon	22–26
1/2-13 low carbon	32–36
1/2-13 med carbon	32–36
1/2-13 joint thru bolt	50–55

Installing drip-proof, splash-proof, and outdoor busway

Install busway according to the instructions for indoor busway, with the following exceptions for outdoor joints. Figure 19 illustrates the assembly of a typical drip-proof, splash-proof, or outdoor busway joint. Sequence numbers on the figure refer to the steps below.

1. Inspect the ends of the bus and joint assembly for damage. Outdoor and splash-proof joints should have green Weathershield™ epoxy insulators. (Red insulators are for indoor and drip-proof applications.) Joint caps and shields are packed separately.
2. Maintain the proper phasing of the sections to be joined by matching up the Ø SIDE labels attached to the ends of each section. Loosen the joint bolt slightly, if necessary, and slide the sections together.

WARNING

Warning: Be sure that the busbars interleave the insulators, as shown in Figure 11, Figure 12, and Figure 13. The housing-ground side plates must pass between the outside insulators and the joint-ground side plates to avoid a phase-to-ground short circuit.

WARNING

Avertissement: Assurez-vous que les barres omnibus intercalent les isolateurs, tel que montré aux Figure 11, Figure 12 et Figure 13. Les plaques de côté reliant le boîtier à la mise à la terre doivent passer entre les isolateurs extérieurs et les plaques de côté du joint à la terre pour éviter un court-circuit de phase à la terre.

3. The joint cap can be used as a gage (reversed, with the gasket out) to set the desired length dimension across the joint.

NOTICE

Notice: Remove the shipping screws and center the joint between the two lengths of busway when adjusting to the maximum length.

NOTICE

Notice: Enlever les vis de l'expédition et centrer le joint entre les deux longueurs de la canalisation pour barres omnibus lorsque vous faites l'ajustement de la longueur maximale.

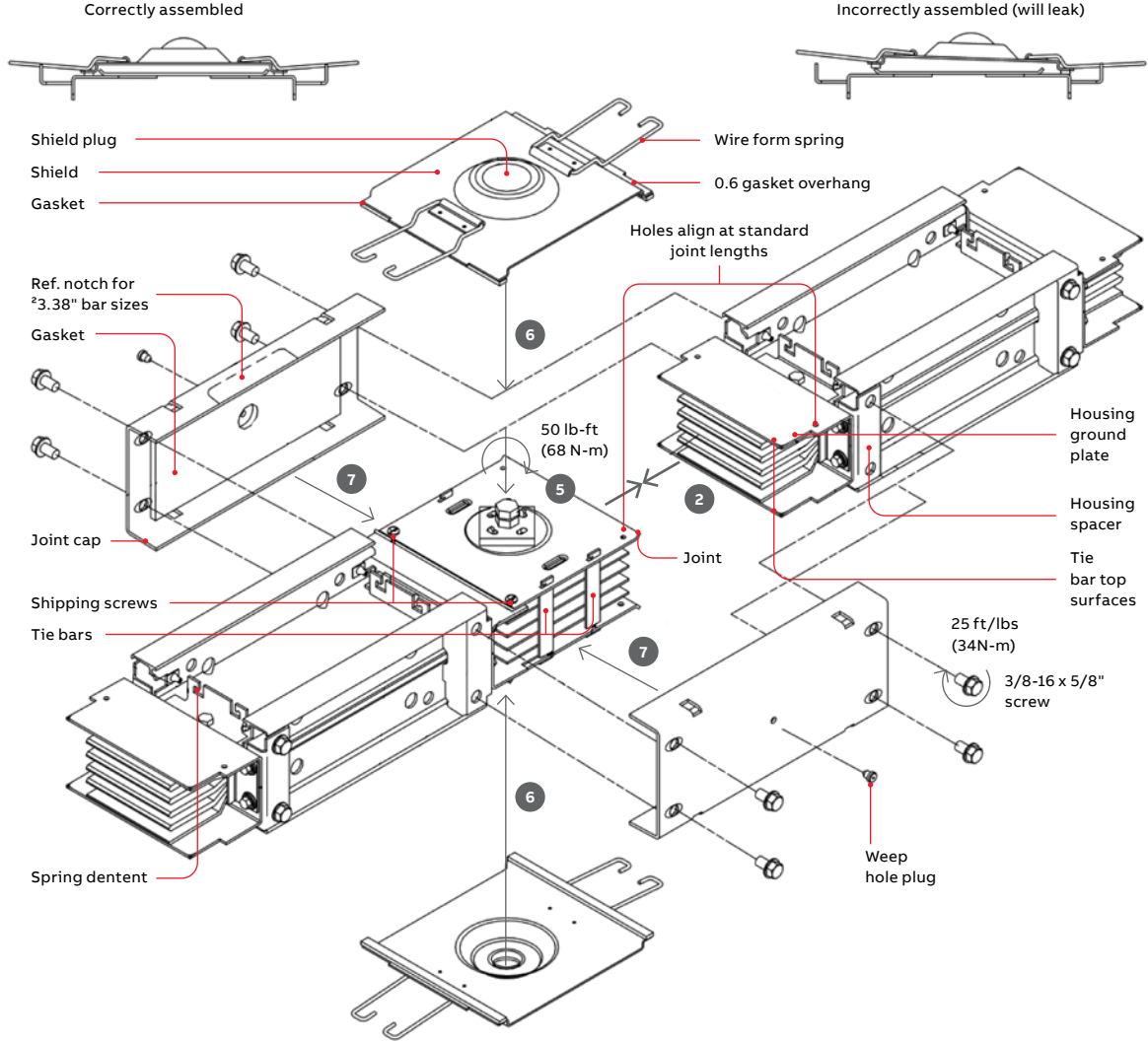
4. The joint is $\frac{1}{8}$ " narrower than the housing ground plates and should be kept within the width of the ground plates to ensure the best seal to the joint cap gasket. The joint will be centered laterally if the tie bars are flush against the tie bar stop surfaces of the housing ground plates and the bus is in good edge-wise alignment across the joint.
5. Inspect the busway run for straightness in all planes and make any adjustments necessary for good alignment. Tighten the joint bolt to 50 lb-ft (68 N-m). If the optional Joint-Guard™ torque-indicating bolts are used, tighten the bolt until the color indicator turns fully black $\pm 1/4$ turn.
6. Set the shields in place bridging the joint. Align the edges of the shields with the edges of the housing ground plates and fasten the shields with the wire-form springs onto the spring detents, as shown in Figure 17. (To secure larger shields, first attach two diagonally opposite spring legs, slide the shield into alignment, then fasten the remaining legs.) Note that lower shields are not required and are not provided with IP43 and drip-proof horizontal flat-mounted busway.

7. Attach the two joint caps (gaskets inward) with the four bolts provided. Depending on which bolt is provided, tighten the 3/8-16 x 5/8" bolts to 25 lb-ft (34 N-m) or the 5/16" x 2" bolt to 14-18 ft/lbs (19-24 N-m) . Exception: 5000 ampere busway uses eight bolts per joint cap. Assembled joint caps are illustrated in Figure 18 and Figure 19.
 8. During installation, megohm test at 1000 VDC the assembly occasionally to check for improperly connected joints. The resistance should not drop below one megohm per 100 feet of busway.
 9. Before energizing, the complete run of bus should be megohmed at 1000 VDC. Resistance should not drop below one megohm per 100 feet of busway.
 10. For UL Outdoor and NEMA 3R rated installations: Remove only downward facing weep-hole plugs and shield plugs so that condensation and accumulated moisture can drain out as suggested by these standards.
 11. For IEC 529 IP43, IP54, IP65, or IP66 rated installations: Do not remove the weep-hole plugs during installation if the busway is to meet any of these water-spray ratings. Remove (and be sure to reinstall) the plugs only as a maintenance procedure to determine if water has entered the busway.
- Use a reversed joint cap (gasket side out) as a joint-length gauging tool or align the holes in the joint and housing ground plates.
 - Use a straight edge, string, level, plumb line, and square to set runs.
 - Use a 3/4-inch or 19-mm socket wrench on joint bolts, and tighten to 50 lb-ft (68 N-m).
 - Depending on which cap bolt is provided, use a 9/16-inch (14-mm) socket wrench and tighten to 25 lb-ft (34 N-m) for the 3/8 bolts or a 1/2-inch (12-mm) socket wrench and tighten to 14-18 lb-ft (19-24 N-m) for the 5/16 bolts.
 - Do not adjust the joint length with the shields or caps installed, as this will damage the gaskets.
 - Cap gaskets should be replaced whenever a joint cap is removed, except that if a cap gasket has been compressed and taken a set, it may be reused if:
 - It is reinstalled in exactly the same location and orientation without any joint readjustment. Use the compressed outline in the gasket to set this location.
 - It has recovered to 80% of its original thickness within 12 hours. In this case, it may be reused in any location as if it were new.
 - Spare gaskets are provided.
 - Call Service at (888) 437-3765, option 6 to ask installation questions.
 - If any parts are damaged during shipment or installation, replacement parts should be ordered from the factory. On-site repairs of damaged parts should not be attempted.

Installation tips

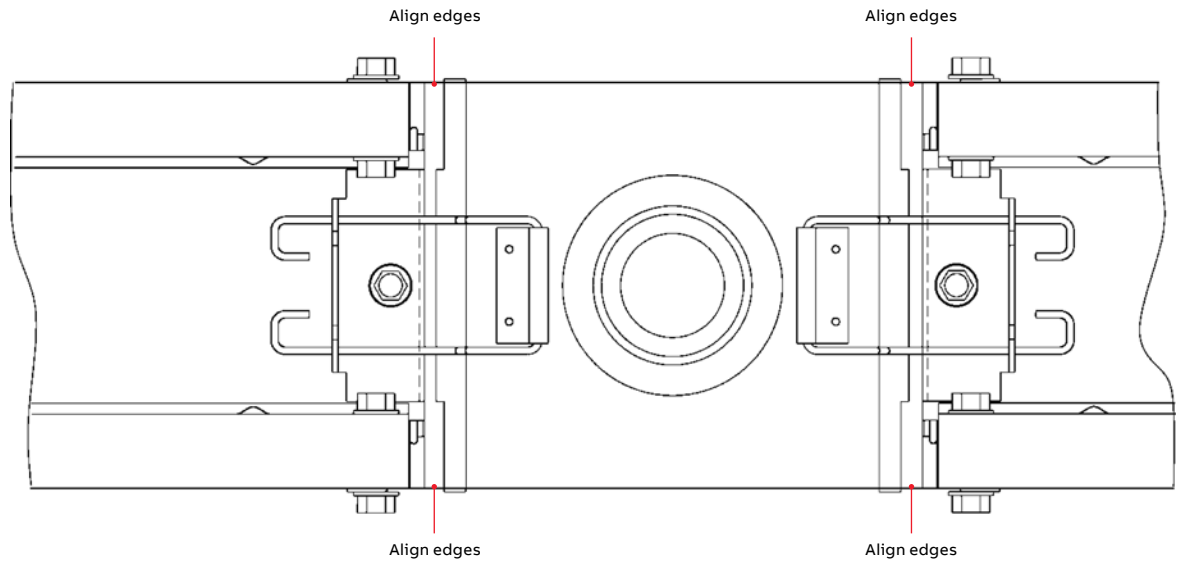
- Outdoor busway is only rated as such when it is completely and properly installed. ABB normally recommends setting and tightening joints at the nominal length and sealing each joint as the installation proceeds. The contractor should consider the weather and the need to seal each joint versus the need to make length adjustments later.

16
Assembly of a typical drip-proof, splash-proof, or outdoor busway joint. Correct and incorrect assembly of joint shields is illustrated

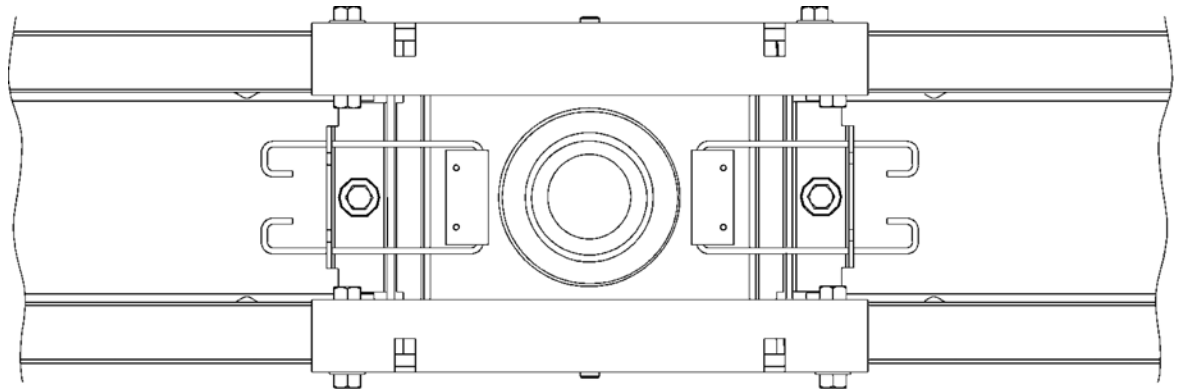


Note: Bottom shields are not included with IP43-rated and drip proof flat-mounted horizontal busway

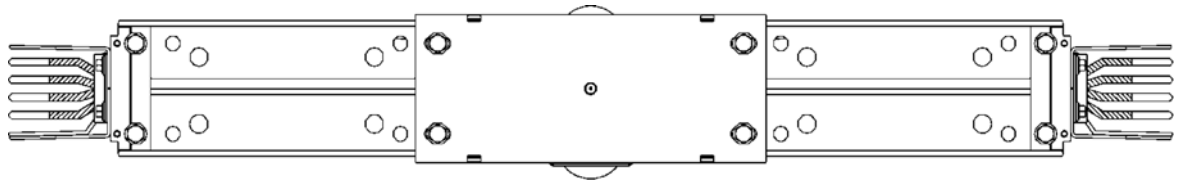
—
17
Assembly shown without
joint caps, wireform
springs connected



—
18
View of completed
joint assembly with
joint caps installed



—
19
View of completed
joint assembly
showing joint caps



Installing an end box

An end box, as shown in Figure 23, is available to isolate phases and seal the end of a run.

The installation process is as follows:

1. Fasten the isolation joint to the end of the run with two screws.
2. Assemble the box over the isolation joint but do not fasten the wireform springs.
3. Loosely assemble the gasketed joint caps to set the box position to 10 1/4 inches long. Do not remove the joint cap knockouts.
4. Fasten the springs and then tighten the cap bolts.

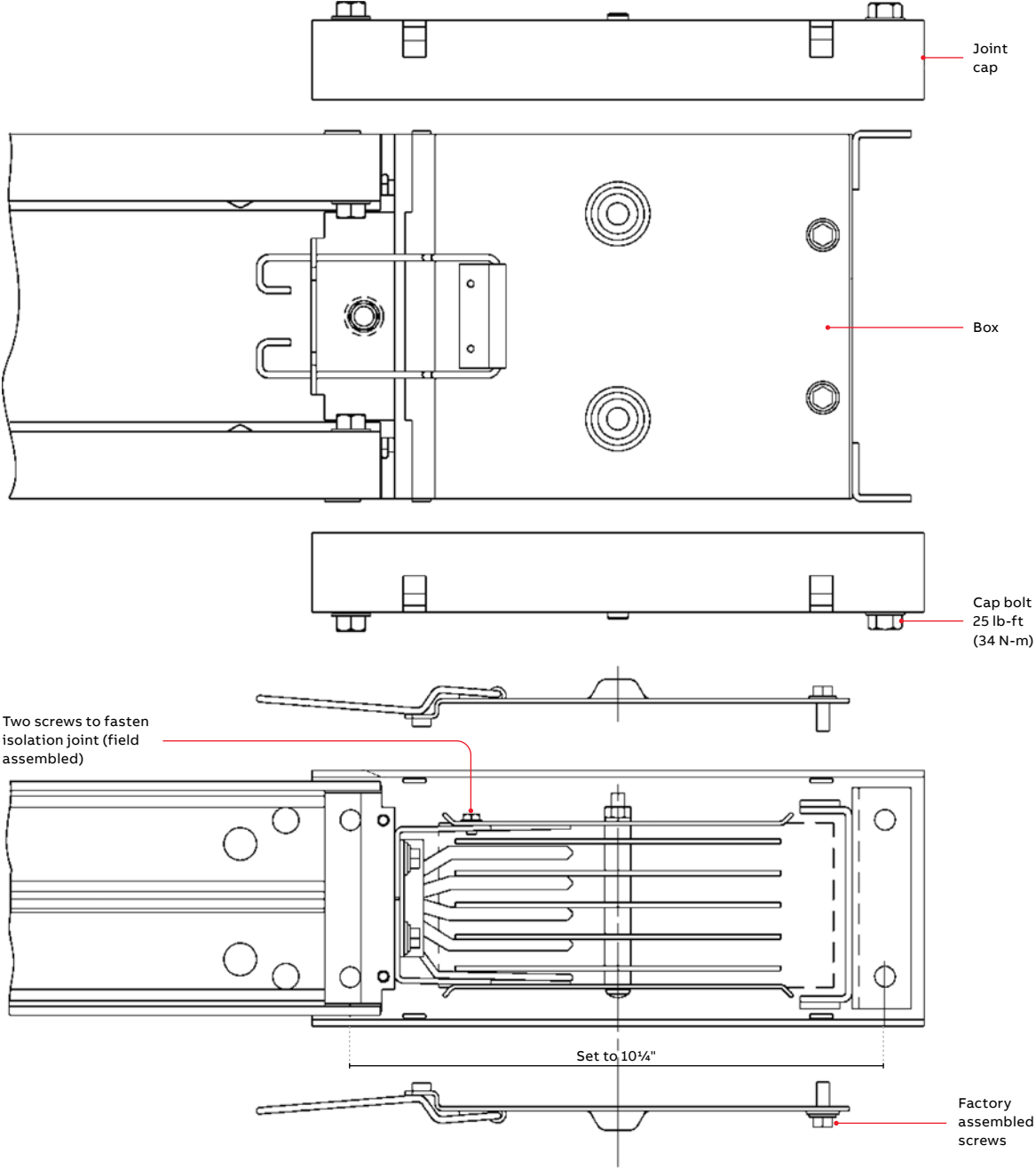


Warning: Failure to fasten the isolation joint with screws may result in serious injury or death.



Avertissement: Il y a risques de blessures graves ou même de mort si le joint d'isolation n'est pas attaché avec des vis.

—
20
End box installed
on the end of a run



Busway maintenance procedures

Protecting the busway from contamination

Be particularly careful during installation to protect the busway from contaminants. Should the busway become contaminated with water, it should be replaced. Contact ABB for instructions.

Maintenance procedures

A periodic maintenance schedule should be established to obtain the best service from the busway. An annual check and overall maintenance procedure for the busway, busplug devices, and all connections should be followed as a minimum requirement. Equipment subject to highly repetitive operation may require more frequent maintenance.

Keep a permanent record of all maintenance work. The record should include a list of periodic checks and tests, the dates they were performed, the condition of the equipment, and any repairs or adjustments. Maintenance employees should follow all recognized safety practices, such as those contained in the National Electrical Code, OSHA, and in company or other safety regulations.

Inspecting the busway

- The busway should be periodically inspected to spot trouble areas or changes in operating condition.
- Remove any accumulations of dust, dirt, or other

foreign matter.

- Eliminate moisture from leaks or condensation dripping from pipes.
- Check for any equipment installed near the busway that might cause damage because of external heating.
- Inspect the Belleville washers at the joint to ensure that the springs are flat. Flat washers indicate that proper joint pressure is being maintained. It is not necessary to recheck the torque on joint bolts so long as the visual check is satisfactory. If the washers are not flat, it is recommended to de-energize the
- Busway, completely loosen the joint bolt and re-tighten.

Inspecting current-carrying components



Warning: De-energize the busway before performing any of the following operations. Failure to do so may result in serious injury or death.



Avertissement: Mettez hors tension la canalisation pour barres omnibus avant d'entreprendre n'importe laquelle des opérations suivantes. Il y a risques de blessures graves ou de mort, si cette procédure n'est pas respectée.

- To check joints covered by a shield, as shown in Figure 19, carefully pry out the rubber plug by sliding a screwdriver tip under the plug, pressing in slightly toward the hole center, and prying out. (The bolt head is usually on the side of the bus marked Ø SIDE, but the installer may have reversed the bolt). Tighten the bolt to 50 lb-ft (68 N-m). Clean the outer surface of the shield. Reinstall the rubber plug by hooking in one edge and pressing the plug in place.

NOTICE

Notice: It is important to press the center of the plug inward several times to center it in the hole. Liquid soap can be used to lubricate the plug for re-installation.

NOTICE

Notice: Il est important de presser plusieurs fois le centre de la fiche boîtier pour le centrer dans le trou. On peut utiliser du savon liquide pour lubrifier la fiche boîtier si on la réinstalle.

- Carefully inspect all visible electrical joints and terminations for tightness of bolts, nuts, and other fasteners.
- Check for signs of overheating at joints, terminations, and fuse clips.

- Check for deterioration in insulating material or melting of sealing compound.
- Ensure that the condition that caused any overheating has been eliminated.
- Check for missing or broken parts, proper spring tension, free movement, rust or corrosion, dirt, excessive wear, arc spatter, sooty deposits, and tracking. Clean or replace parts as required.
- After Seismic event check for proper spring tension and yielding of spring hanger parts. Replace parts as required.
- Megohm test at 1000 VDC the system before re-energizing. The resistance should not be below 1 megohm per 100 feet of busway.

For general instructions regarding handling, installation, operation, and maintenance of busway systems rated at 600 volts or less, see NEMA Publication BU1.

Additional procedures for inspection, thermal scanning, safety practices, and maintenance are described in ANSI/NFPA Standard 70B, "Recommended Practice for Electrical Equipment Maintenance" available from the National Fire Protection Association, Quincy, Massachusetts.

Busway installation checklist

Job Number: _____

Customer ID Number: _____

Run Identification: _____

Amp Rating: _____

Service: _____

- | | | |
|--|-----|--------------------------|
| 1. Was there any shipping damage? Report any minor damage or missing parts to the factory. Be sure to include the item number. | No | <input type="checkbox"/> |
| 2. Proper storage before actual installation: | | |
| a. Were bus components kept clean and dry? | Yes | <input type="checkbox"/> |
| b. Were bus components exposed to corrosive fumes, liquids, salts, or concrete materials? | No | <input type="checkbox"/> |
| 3. Have you read this installation instruction book? | Yes | <input type="checkbox"/> |
| 4. Bus exposure during installation. | | |
| a. Were bus components kept clean and dry? | Yes | <input type="checkbox"/> |
| b. Were bus components exposed to corrosive fumes, liquids, salts, or concrete materials? | No | <input type="checkbox"/> |
| c. Was there any mechanical damage due to handling? | No | <input type="checkbox"/> |
| 5. Did each piece of bus get a pre-installation megohm test? (Individual pieces should megohm test as infinite resistance. Consult the factory if you experience a lower reading.) | Yes | <input type="checkbox"/> |
| 6. Mounting and support. | | |
| a. Is each 10 feet of bus run supported, including any vertical sections? (Closer supporting may be required, based on job specifications.) | Yes | <input type="checkbox"/> |
| b. Does any support interfere with a bus joint? | No | <input type="checkbox"/> |
| c. Are any bus terminations to other equipment used as support? (Busway weight should not bear on equipment, such as switchgear, switchboards, or transformers.) | No | <input type="checkbox"/> |
| 7. Is the bus installed level and plumb? | Yes | <input type="checkbox"/> |

- | | | |
|--|-----|--------------------------|
| 8. Was a periodic megohm test performed as this run was installed? (After every two or three items or as critical items are installed. Joints should be tightened for all megohm testing.) | Yes | <input type="checkbox"/> |
| 9. Has the bus been inspected for proper phasing? | Yes | <input type="checkbox"/> |
| 10. Are all joint bolts properly tightened to 50 lb-ft (68 N-m) torque? | Yes | <input type="checkbox"/> |
| 11. On vertically mounted bus using spring hangers, were the correct settings verified? (See Figure 6 in the installation instructions.) | Yes | <input type="checkbox"/> |
| 12. Did you check for proper clearances for the bus at floors, walls, ceilings, other bus, and trades? (Never use cement to seal between the bus and floors or walls.) | Yes | <input type="checkbox"/> |
| 13. Have all shipping screws been removed from expansion lengths? | Yes | <input type="checkbox"/> |
| 14. Have nonrigid hangers been used beyond the free end of expansion lengths (except at the farthest end) to allow the busway to expand toward the expansion box? | Yes | <input type="checkbox"/> |
| 15. Was all foreign material removed from the installed bus? | Yes | <input type="checkbox"/> |
| 16. Was a final megohm test performed when all bus was installed? (Record readings on the separate sheet provided.) | Yes | <input type="checkbox"/> |

- | | | |
|--|-----|--------------------------|
| 17. Verify the orientation of weep holes. Are all open weep holes in joint caps, elbows and shields facing downward? (Do not remove shield plugs or weep-hole plugs in top or side positions.) | Yes | <input type="checkbox"/> |
| 18. Are all drain holes clear in both bus and joint caps? (All construction debris removed.) | Yes | <input type="checkbox"/> |
| 19. Were joints assembled within the width of the housing ground plates? (See outdoor step 4.) | Yes | <input type="checkbox"/> |
| 20. Are 3/8" joint cap bolts properly tightened to 25 ft-lb (34 N-m), and all 5/16" joint cap bolts tightened to 14-18 ft-lb (19-24 N-m)? | Yes | <input type="checkbox"/> |
| 21. Were shields aligned at the edges of housing ground plates and all springs seated properly? | Yes | <input type="checkbox"/> |
| 22. Were isolation joints screwed in place before end boxes (when present) were installed? | Yes | <input type="checkbox"/> |
| 23. Were joint cap knockouts left in to set end boxes to 10 1/4 inches, as shown in Figure 20 of 1VAL098202-MB? | Yes | <input type="checkbox"/> |

Note: Please list any exceptions made to this checklist and any other comments related to the installation of this run of bus:

Installation Contractor

This checklist is intended to insure a sound installation of the busway. It is not intended to cover all items related to the installation, successful startup, and long-term use of the product and in no way relieves the contractor of his obligation to meet all specification and code requirements.

Signed:

Date:



Pre-energizing megohm readings

<div><div>Date</div><div>Run ID</div><div>A-G</div><div>B-G</div><div>C-G</div><div>N-G</div><div>A-B</div><div>A-C</div><div>B-C</div><div>A-N</div><div>B-N</div><div>C-N</div></div>	<div><div>Date</div><div>Run ID</div><div>A-G</div><div>B-G</div><div>C-G</div><div>N-G</div><div>A-B</div><div>A-C</div><div>B-C</div><div>A-N</div><div>B-N</div><div>C-N</div></div>	<div><div>Date</div><div>Run ID</div><div>A-G</div><div>B-G</div><div>C-G</div><div>N-G</div><div>A-B</div><div>A-C</div><div>B-C</div><div>A-N</div><div>B-N</div><div>C-N</div></div>	<div><div>Date</div><div>Run ID</div><div>A-G</div><div>B-G</div><div>C-G</div><div>N-G</div><div>A-B</div><div>A-C</div><div>B-C</div><div>A-N</div><div>B-N</div><div>C-N</div></div>	<div><div>Date</div><div>Run ID</div><div>A-G</div><div>B-G</div><div>C-G</div><div>N-G</div><div>A-B</div><div>A-C</div><div>B-C</div><div>A-N</div><div>B-N</div><div>C-N</div></div>
<div><div>Date</div><div>Run ID</div><div>A-G</div><div>B-G</div><div>C-G</div><div>N-G</div><div>A-B</div><div>A-C</div><div>B-C</div><div>A-N</div><div>B-N</div><div>C-N</div></div>	<div><div>Date</div><div>Run ID</div><div>A-G</div><div>B-G</div><div>C-G</div><div>N-G</div><div>A-B</div><div>A-C</div><div>B-C</div><div>A-N</div><div>B-N</div><div>C-N</div></div>	<div><div>Date</div><div>Run ID</div><div>A-G</div><div>B-G</div><div>C-G</div><div>N-G</div><div>A-B</div><div>A-C</div><div>B-C</div><div>A-N</div><div>B-N</div><div>C-N</div></div>	<div><div>Date</div><div>Run ID</div><div>A-G</div><div>B-G</div><div>C-G</div><div>N-G</div><div>A-B</div><div>A-C</div><div>B-C</div><div>A-N</div><div>B-N</div><div>C-N</div></div>	<div><div>Date</div><div>Run ID</div><div>A-G</div><div>B-G</div><div>C-G</div><div>N-G</div><div>A-B</div><div>A-C</div><div>B-C</div><div>A-N</div><div>B-N</div><div>C-N</div></div>
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Field check piece procedure

—
21
Measuring ReliaGear
busway for a field check

Important notes

This program is designed to provide flexibility on critical jobs in which exact dimensions are not known at the time of the order. To determine the length of the piece to be inserted, measure the opening length “Y” (end of bar to centerline of joint) or “Z” (end of bar to end of bar). See Figure 21 below. Field check pieces are for straight lengths of feeder only (indoor and all weather-proof enclosures). This is the way to measure all Reliagear busway pieces.

Field check piece	Amperes	Run #	3W/ 4W/ G	90° elbows (either Y or Z)	
				Y	Z
1					
2					
3					
4					
5					

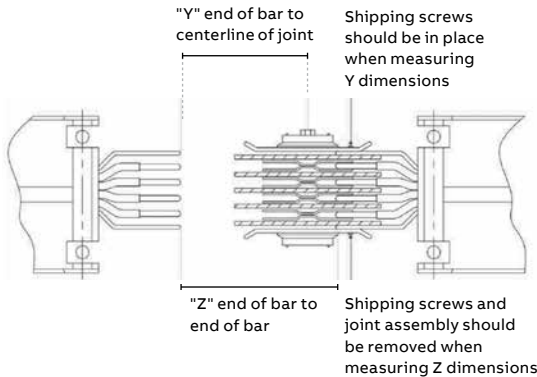


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