

Installation Guide

Introduction

This installation guide is designed to assist in the safe handling and installation of the Vertiv™ Cast Resin busbar system. These instructions are in addition to normal safe working practices as required by local health and safety regulations.

Storage

Store all materials received from Vertiv™ Powerbar onsite in a secure location. Make sure that all materials are in an area protected against dampness, water ingress, and any extremes of temperature.

Handling the Bar

When handling the Vertiv™ Cast Resin busbar system lengths, make sure to handle with care. Make sure to carry the bar by its main body, do not lift at the ends as this may damage the conductors. Always follow necessary safety regulations when lifting heavy objects or using lifting equipment as and when required.

Initial Preparation

Prepare the work area in accordance with local safety requirements. Adhere to site safety and general conditions of good working practices. Make sure that the PPE is worn at all times during installation. Unpack the tool kit provided and make sure you have all additional tools and equipment required available onsite before casting the joints.

NOTE: After joint casting has begun, it must continue without interruption.

Refer to the General recommendation list to ensure successful installation of the busbar.



NOTE: The product is IP68 rated after casting of the joint is complete. For further assistance, contact Vertiv.

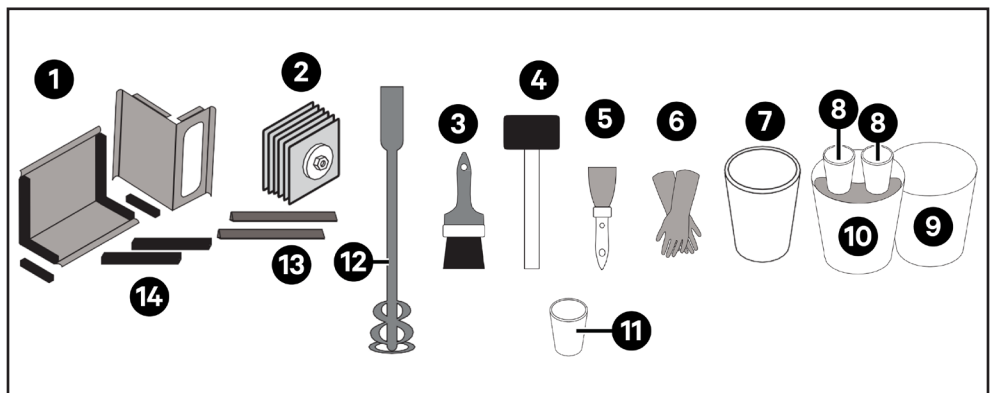
General Recommendation

- Approved PowerBar installers are to perform the installation.
- Check the number and dimensions of the crate/pallet against the shipping receipt.
- Make sure adequate and certified lifting equipment is available.
- Protect the installation from the elements using covers and/or tenting where required.
- Store resins and hardeners as recommended and ensure the shelf life and expiration dates are not exceeded.
- Mark out the complete route before commencing the installation of the busbar elements.

NOTE: If a toolkit item is missing, contact Vertiv before proceeding. Keep the tools handy before installation.

- Before starting installation, read and fully understand this installation guide.
- Before casting joints, carrying out pre-installation inspection/meggering
- Cast joints before performing installation, inspection, insulation, and resistance testing.
- Start the installation of the busbar at one end (preferably at the switch board) and work progressively to the another end.
- Do not cast joints with an insulation reading lower than 10 MΩ at 1000 VDC. If insulation reading is lower than 10 MΩ, identify the fault and rectify. Contact your local Vertiv representative if necessary.
- Verify that polymer concrete mixes have not expired.
- Do not store product in direct sunlight/ rain or temperatures condition.
- Do not cast in ambient temperatures lower than 5 °C or low humidity.

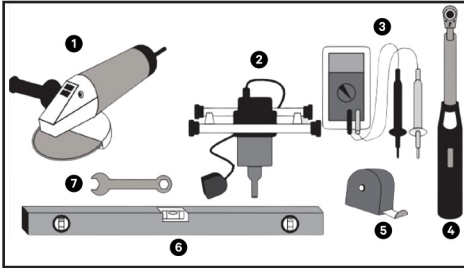
Toolkit Items



Item	Description	Item	Description
1	Mould	8	Resin
2	Joint pack	9	Empty mixing bucket
3	Paint brush	10	Joint pack casting mix
4	Rubber mallet	11	Mould release
5	Spatula	12	Mixer unit
6	2 pairs of rubber gloves	13	2 Locking sliders
7	Hardner	14	8 Rubbers

NOTE: Make sure the following tools are readily available before beginning the installation:

General Tools

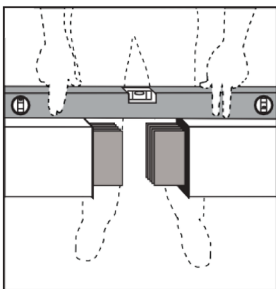


Item	Description
1	Masonry grinding wheel
2	Portable concrete mixer
3	Megger
4	Torque wrench
5	Tape measure
6	Spirit level
7	19 mm spanner

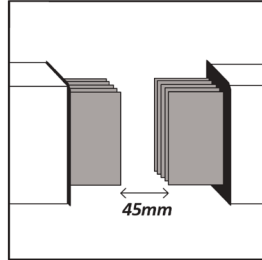
Phase A: Preparation

1. Inspect all busbar upon arrival, checking for any damages. Report any damages found immediately to Vertiv, preferably with a photograph. Make sure that the busbar is level and plumb and that adjacent sections are aligned.

NOTE: Misaligned joint surfaces causes stress on the joint pack resulting in poor electrical connections and eventually joint failure.

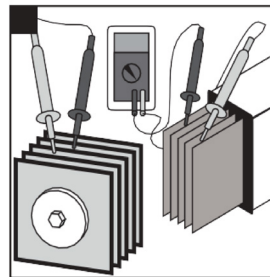


2. Set the distance between the conductors of the adjacent busbar sections to 45 mm (± 1 mm).



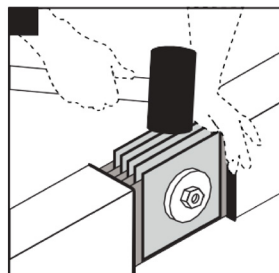
Phase B: Installing the Joint

3. Megger both the adjacent sections of busbar and the joint pack before installing joint into the busbar system. Record the readings and check for irregularities between the phases.

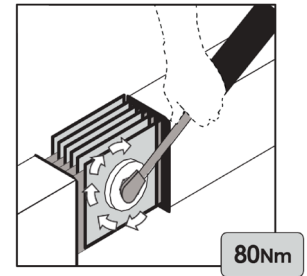


4. Install the joint using only hand pressure and the rubber mallet. The joint is designed to have minimal clearance to maintain good electrical contact.

NOTE: Do not strike the joint or busbar with a hard object.

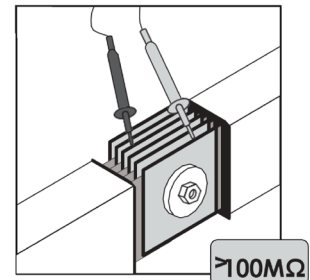


5. Tighten the joint with a calibrated torque wrench. Torque level to be set at 80 Nm.



6. After installing the joint between two adjacent sections, megger the complete installation again. Minimum recommended insulation resistance values vary for different countries, industries, and supply voltages. Most recommend a minimum of 1 M Ω , but the ideal value should be excess of 100 M Ω .

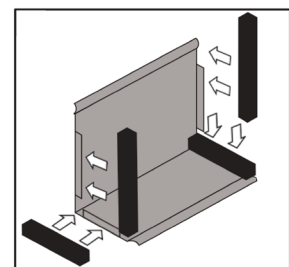
NOTE: Make sure that each conductor is meggered. Record the values.



Phase C: Installing the Joint Mold

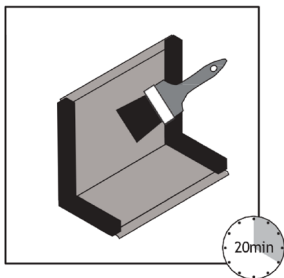
7. After the megger test is completed, unpack the joint mold parts and inspect for any damage. A can of wax based mold release agent and mold rubbers are included in the delivery package. Fix new mold rubbers to the steel mold as shown in the figure below.

NOTE: Each mold can be used up to three times.



- Use the paint brush and gloves provided to apply one layer of mold release agent to the inner surfaces of the steel mold parts/mold rubbers. Allow twenty (20) minutes drying time. This ensures the mold can be easily removed after casting, leaving the mold in a reusable condition for the next joint.

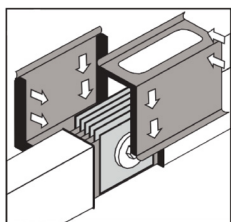
NOTE: Wearing gloves is mandatory from this step.



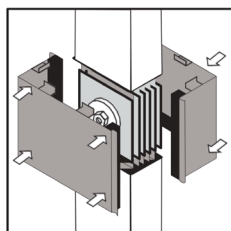
- Install both halves of the joint mold around the busbar as shown in figure, with the opening for pouring of the polymer concrete mix facing upwards. After installation, make sure the mold is centered to the joint.

NOTE: The distance from the end of the busbar to the start of the rubber must be 17 mm (± 1 mm).

Horizontal Mold

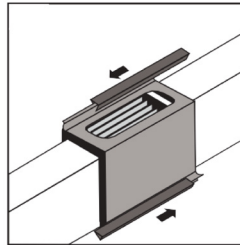


Vertical Mold

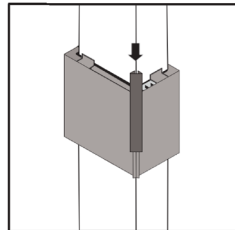


- Insert mold locking slide. Adjust the rubbers to make sure that they are aligned correctly. This ensures the quality of the cast is maintained and prevents leakage of the polymer concrete during casting.

Horizontal Mold



Vertical Mold



Phase D: Preparing the Polymer Concrete



NOTE: Polymer concrete comes in different mixes for different ambient temperatures. Specific information about the polymer concrete is printed on the packaging. Make certain that the product supplied matches the ambient temperature onsite on the day it is to be prepared. If this is not the case, steps must be taken to adjust the ambient temperature to suit such as space heating.

Appearance

Resin and hardener appearances must be clear and free of crystals.

- Resin - Clear or light colored
- Hardener - Dark honey colored

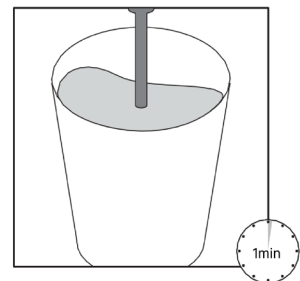
NOTE: Do not exceed the validity date on the label.

Refer to the table below for the temperature ranges covered by each type:

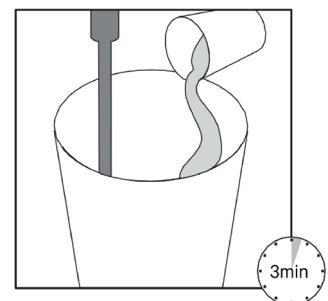
Item	Description
Type A	5 °C to 20 °C
Type B	20 °C to 35 °C
Type C	25 °C to 45 °C

NOTE: Remove the tins of resin and the silica gel packet before mixing. Make certain that the filler is absolutely dry.

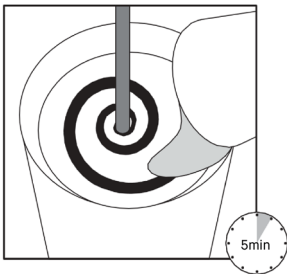
- Open the bucket containing sand. Inspect and ensure that the sand is free from moisture. Using the mixing unit supplied. Mix the sand thoroughly for one minute until homogeneous.



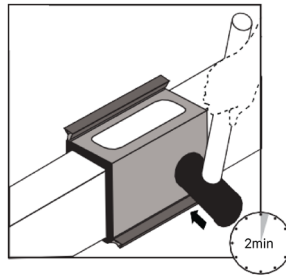
- Pour the contents of the resin and hardener containers into the supplied empty bucket. Mix them thoroughly with the mixing unit for three minutes.



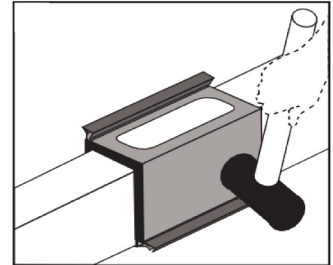
13. Pour the sand into the epoxy resin mixture in three equal stages mixing each time until homogeneous. Mix thoroughly for five minutes.



15. Gently tap the side of the mold with the rubber mallet so that the resin fills the complete joint and to vibrate out air pockets. Do this for two minutes per casting.



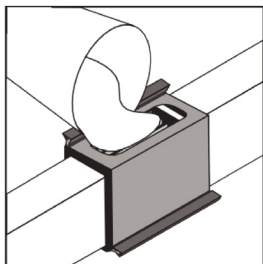
18. After eight hours, use the supplied mallet to tap the side of the steel mold, to separate it from the cast joint.



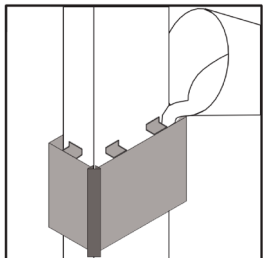
Phase E: Casting the Joint

14. Time is now limited. After mixing thoroughly, pour directly into the mold. Avoid shortage/ excess.
 - a. Demonstrates where to pour the mixture into the horizontal mold.
 - b. Demonstrates where to pour the mixture into the vertical mold.

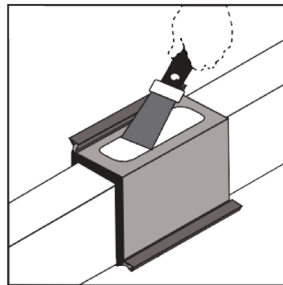
A. Horizontal Mold



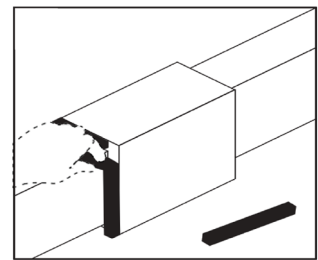
B. Vertical Mold



16. Verify that the mold is filled to the rim. Smooth the top surface with the spatula provided in the tool kit for a glossy finish.

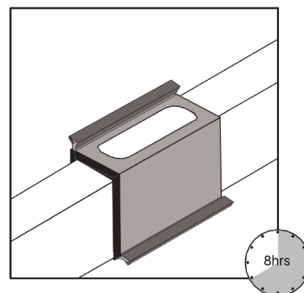


19. Remove the rubber molds. Excess material may leak from the mold. If this occurs, it can be removed using a masonry grinding wheel.



Phase F: Removing the Joint Mold

17. Allow eight hours for the polymer concrete mix to harden.



To contact Vertiv Technical Support: visit www.Vertiv.com

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