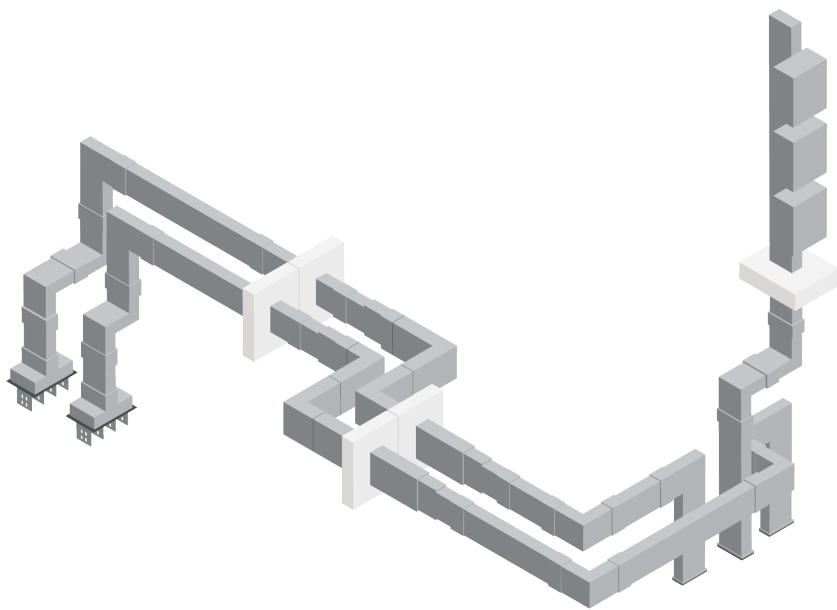


# Canalis KR

## Cast Resin Busbar Trunking System

### Installation Manual

NVE58348-04  
12/2025



# Legal Information

The information provided in this document contains general descriptions, technical characteristics and/or recommendations related to products/solutions.

This document is not intended as a substitute for a detailed study or operational and site-specific development or schematic plan. It is not to be used for determining suitability or reliability of the products/solutions for specific user applications. It is the duty of any such user to perform or have any professional expert of its choice (integrator, specifier or the like) perform the appropriate and comprehensive risk analysis, evaluation and testing of the products/solutions with respect to the relevant specific application or use thereof.

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# Safety Information

## Important Information

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



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



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

<b>⚠ DANGER</b>
<b>DANGER</b> indicates a hazardous situation which, if not avoided, <b>will result in</b> death or serious injury.

<b>⚠ WARNING</b>
<b>WARNING</b> indicates a hazardous situation which, if not avoided, <b>could result in</b> death or serious injury.

<b>⚠ CAUTION</b>
<b>CAUTION</b> indicates a hazardous situation which, if not avoided, <b>could result in</b> minor or moderate injury.

<b>NOTICE</b>
<b>NOTICE</b> is used to address practices not related to physical injury.

## Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

## Essential Safety Instructions

### ⚠ WARNING

#### HAZARD OF CRUSHING AND FRACTURES

- Wear Personal Protective Equipment (PPE) when handling and installing the products (long sleeved jacket, trousers, gloves, safety shoes, helmet, and safety glasses).
- Only personnel who have been trained in safety regulations may work on construction sites to install busbar trunking system.
- Work with extreme caution and follow the instructions provided in the manual.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**



# About the Document

## Document Scope

This manual provides instructions for the installation of the Canalis KR Cast Resin Busbar Trunking System.

This manual is intended for trained personnel.

## Validity Note

The characteristics of the products described in this document are intended to match the characteristics that are available on [www.se.com](http://www.se.com). As part of our corporate strategy for constant improvement, we may revise the content over time to enhance clarity and accuracy. If you see a difference between the characteristics in this document and the characteristics on [www.se.com](http://www.se.com), consider [www.se.com](http://www.se.com) to contain the latest information.

## Environmental Data

For product compliance and environmental information, refer to the Schneider Electric Environmental Data Program.

## Related Documents

Title of documentation	Reference number
Canalis KR Catalog	DEBU031EN

To find documents online, visit the Schneider Electric download center ([www.se.com/ww/en/download/](http://www.se.com/ww/en/download/)).

## Information on Non-Inclusive or Insensitive Terminology

As a responsible, inclusive company, Schneider Electric is constantly updating its communications and products that contain non-inclusive or insensitive terminology. However, despite these efforts, our content may still contain terms that are deemed inappropriate by some customers.

# Pre-Installation Setup

## Equipment and Tools

### ⚠ WARNING

#### HAZARD OF EQUIPMENT DAMAGE

Improper handling can result in equipment damage or personal injury.



**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

## Introduction

Use an appropriate lifting and handling equipment to ensure protection and efficient installation of the Canalis KR Cast Resin Busbar Trunking System. Always follow local safety regulations and manufacturer guidelines when operating lifting devices.







## Equipment for Lifting and Handling

The following table lists the lifting and handling equipment required for the installation of Canalis KR Cast Resin Busbar Trunking System.

Equipments/Tools	Description
	Crane or forklift truck with a minimum fork length of 2 m and a lifting capacity of 4.5 tons or higher.
	Two slings for handling

## Equipment for Mounting and Installing the Supports

The following table lists the necessary tools, equipment, and supplies required for the installation of the Canalis KR.

Equipments/Tools	Description
	Drilling machine capable of drilling through concrete
	Set of flat or ring spanners (10...22 mm)
	Socket wrench with sockets (10...22 mm)
	Set of screwdrivers
	Metal hammer
	Measuring tape (metric)
	Carpenters square
	Levelling instrument (spirit level and laser)

## Equipment for Establishing and Testing the Electrical Connections






The following table lists the necessary tools, equipment, and supplies required for the testing of the Canalis KR.

Equipments/Tools	Description
	Industrial hot air blower gun
	Nylon cleaning pads (Scotch Brite red or similar)
	Insulation tester, megohmmeter (1000 V)
	Torque wrench (40...90 N.m)

## Equipment for Casting

The following table lists the necessary tools, equipment, and supplies required for the casting of the Canalis KR.

Equipments/Tools/Chemicals	Description
	Casting mould
	Spray bottle for demoulding agent
	Clamping tools
	Industrial mixer (1200 W, with rotation speed control)
	Rubber hammer
	Spatula
	Mason trowel

Equipments/Tools/Chemicals	Description
	Cleaning agent
	Grinding stone
	Rubber cloth
	Wooden plank (5...7 mm thick)
	Cleaning brush

## Chemicals and Casting Equipment Supplied with Canalis KR

The following table lists the necessary chemical, equipment, and supplies required for the casting of the Canalis KR.

Equipments/Tools/Chemicals	Description
	<p>Resin and hardener (KRB0000RH1)</p>
	<p>Demoulding agent (KRB0000DA1)</p>
	<p>Mineral filler (KRB0000MF1)</p>
	<p>Mixing bucket of 10 liters (KRB0000MB1)</p>

**NOTE:**

- A separate bucket must be ordered specifically for the resin mix.
- Allocate minimum two buckets per day for resin mixing, based on an average of five fillings. Actual requirements may vary depending on operational conditions.

## Mineral Filler

Materials	Minimum quantity supplied	Commercial Reference
Mineral filler	One kit of mineral filler in waterproof carton box of 12 kg sand	KRB0000MF1

## Resin and Hardener

Materials	Minimum quantity supplied	Commercial Reference
Resin	One box of resin (component A) 1.9 kg	KRB0000RH1
Hardener	One box of hardener (component B) 0.6 kg	

## Quantity of Casting Moulds

Rating of the trunking (A)		Quantity	Number of junctions
KRA	KRC		
800...5000	1000...6300	One mould	4 <sup>(1)</sup>

## Amount of Demoulding Agent for Connections

Rating of the trunking (A)		Connections	Quantity of demoulding agent (Commercial Reference: KRB0000DA1)
KRA	KRC		
800...1250	1000...1600	1...20	1 box
1600...2500	2000...3200	1...15	1 box
3200...5000	4000...6300	1...10	1 box

<sup>(1)</sup> A minimum of 4 moulds per line is required to simultaneously mould all junctions of short runs.

## Average Required Quantity per Junction

Rating of the trunking (A)		Number of conductors	Standard		Fire-resistant	
KRA	KRC		Quantity of resin and hardener (Fraction of the box of resin/hardener) (Commercial Reference: KRB0000RH1)	Quantity of mineral filler (Fraction of one kit of sand to mineral filler) (Commercial Reference: KRB0000MF1)	Quantity of sets per one junction vertical (Commercial Reference: KRB0000RH1)	Quantity of sets per one junction vertical (Commercial Reference: KRB0000MF1)
800	1000	3, 4 or 5	0.70		0.85	
1000	1350	3 or 4	0.80		0.85	
		5	0.90		0.95	
1250	1600	3 or 4	0.80		1.10	
		5	1.00		0.95	
1600	2000	3 or 4	1.00		1.20	
		5	1.20		1.20	
2000	2500	3 or 4	1.20		1.45	
		5	1.40		1.45	
2500	3200	3 or 4	1.30		1.70	
		5	1.50		1.55	
3200	4000	3 or 4	2.00		1.80	
		5	2.20		2.40	
4000	5000	3 or 4	2.10		2.65	
		5	2.30		2.50	
5000	6300	3 or 4	2.30		-	
		5	2.70		-	

## Preparing the Mixture

- Proportion of the components: One box of resin + one box of hardener + one bucket of mineral filler.
- Quantity needed: The amount of resin mix required for one junction varies based on the busway size, as indicated in the table above.
- Example: Quantity to order for one line of KRC1600 3L + N with nine junctions and one line of KRC2500 3L + N with 20 junctions:
  - Resin + hardener:  $(0.8 \times 9) + (1.2 \times 20) = 31.2 \rightarrow 32$  references (KRB0000RH1)
  - Mineral filler:  $(0.8 \times 9) + (1.2 \times 20) = 31.2 \rightarrow 32$  references (KRB0000MF1)
- Installation Temperature:
  - Casting is possible between 5...35 °C, with optimal conditions at 15...25 °C.
  - Store and mix materials in a warm room, when the environment is cold. When the environment is hot, use a cooled room.
  - Ensure that the temperature of busway and conductor is 5 °C or higher prior to casting.

**NOTE:** The proposed quantities consider that some junctions might need separate mixture batches and that some mixture might be discarded.

# Receiving and Handling

## Scope of Delivery

All materials are packaged and shipped with a delivery note, packing list, and short installation instructions.

## Receiving the Goods

Follow these instructions after the materials are received:

- Note the information symbols and labels on the packaging. Pay attention to safety labels.
- Verify that the documentation and material match with your installation project.
- Verify that the material is in proper condition and free from transport damage.
- Verify that all components are supplied and function as intended, and indicated in the documentation.
- Submit claims for malfunctioning or damaged materials in writing to Schneider Electric within 30 days of receiving the shipment.

**NOTE:**

- Schneider Electric is not responsible for repair or replacement if the claim is not submitted within 30 days of receiving the shipment.
- The item number on the packaging, the element number on the elements and the project manual helps you to identify where the parts have to be installed in the layout.

## Proper Handling of Materials

<b><i>NOTICE</i></b>
<p><b>HAZARD OF BREAKAGE</b></p> <ul style="list-style-type: none"><li>• Proceed with caution and pay attention to personnel safety. Use necessary equipment for correct handling.</li><li>• Do not use abrasive or metal slings for lifting the elements.</li><li>• Do not use steel cables or hooks for lifting the elements.</li><li>• Do not remove the protective foil over the conductors during handling.</li></ul> <p><b>Failure to follow these instructions can result in equipment damage.</b></p>

The cast resin busbar is a piece of electrical equipment and should be handled with care. Follow the below instructions for handling the cast resin:

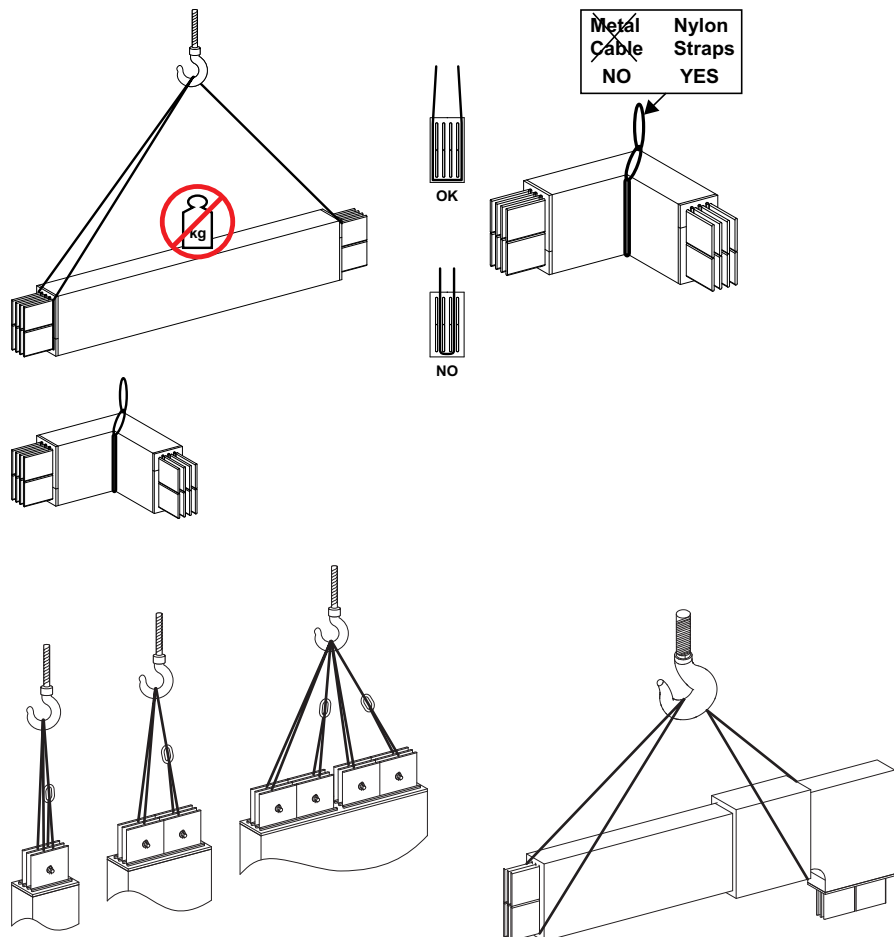
- Always keep the boxes in an upright position.
- Do not stack more than two pallets.

## Lifting with Forklift Truck

- Use a forklift with a minimum lifting capacity of 4.5 tons for proper container loading and unloading.
- Use a forklift with a minimum fork length of 2 m to lift the pallets from the narrow side (0.8 m).
- Use rubber covers on the fork to prevent scratching the surface of elements.
- Ensure that the elements are not damaged during transportation.

## Lifting the Elements with Slings

- Use fabric slings to suspend the cast resin busbar elements.
- Always use straps with double noose to lift the elements. Ensure that the straps can handle the weight.
- Ensure that the lifting slings are wrapped around all the conductors as displayed below.



**NOTE:** In difficult installation conditions, a limited busbar assembly can be casted and lifted.

# Storage of Hardware and Chemical Components

## Storage Area for Chemicals and Equipment

The material storage area must:

- Be stable and level.
- Be protected against extreme temperature, water penetration, and dampness.
- Be protected against fire, dust, water, direct sunlight, and welding sparks.
- Not be used as a gangway or for assembling other equipment.

## General Rules for Storage of Equipment and Chemicals

### **NOTICE**

#### **HAZARD OF DEGENERATION DURING STORAGE**

- Do not remove the special protective foil before the elements are in their final place and ready to be connected. If the protective packing is damaged, check the contact surfaces and clean them if necessary. Clean the ground resin area with sandpaper.
- Do not store the cast resin mix in direct sunlight or at temperatures below 5 °C or above 35 °C.

**Failure to follow these instructions can result in equipment damage.**

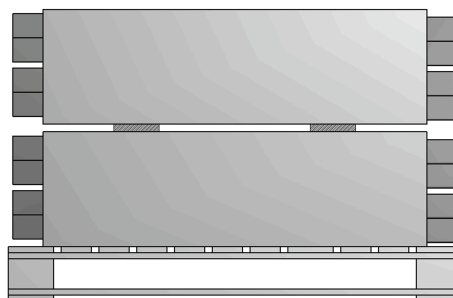
## Storage of Equipment

It is recommended:

- To store the material in the original transport packing.
- To stack up to two pallets of straight elements on top of each other.
- To store the elements of the double system (aluminium conductor with more than 2500 A and copper conductor with more than 3200 A) flat on top of each other.
- To secure elements with a strap retainer.

Do not stack other elements such as end-feed units, form parts, boxes, frames, cable connections, and similar items.

**Figure 1 - Stacking of elements**



**Figure 2 - Storage of elements**



## Storage of Chemicals

The temperature of cast resin, hardener, demoulding agent and filler must be:

- 5...70 °C at storage and transportation.
- 15...40 °C, during mixing and 24 hours before use.

The liquid epoxy resin must be packed and labeled as per IATA standards.

**Figure 3 - Storage of chemicals**



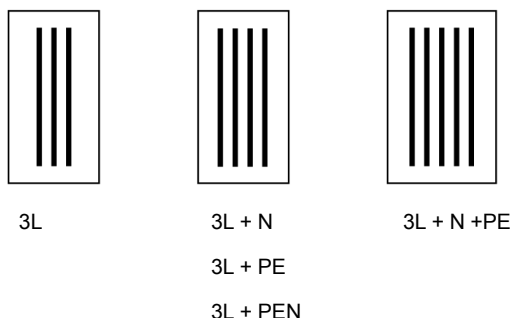
# Layout and Supports

## General Rules

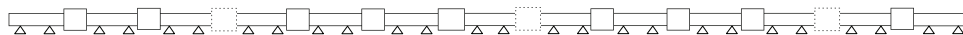
Review the layout plan and identify the locations and type of supports required before the installation.

Consider the following factors when you design the supports:

- Feasibility of fixed points for run layouts, can be horizontal or verticals, and eventual accessories.
- Ensure that the supports have sufficient carrying capacity to support the weight of the cast resin busbar trunking system plus 90 kg, in accordance with IEC/EN 61439-6.
- The elements consist of three to five conductors and can be configured as: 3L, 3L + N, 3L + PE, 3L + PEN, and 3L + N + PE, as displayed in the following figure.



- The conductors are insulated using cast epoxy resin - RAL 7030.
  - Degree of protection is IP68.
  - Insulation voltage is 1000 V.
- The weight of the elements varies based on their rating. There are nine ratings available, ranging from 800 to 5000 A for aluminum conductors and from 1000 to 6300 A for copper conductors. The cross-sectional area and weight of the different ratings are displayed in Figure 4, page 20.
- Global planning to improve the casting-process mastering:
  - It is recommended not to mold all the consecutive joints on the same day. Leave some intermediate blocks unmolded to allow for troubleshooting, if any issues occur. Mold these remaining blocks on the following days.
  - Install the junction blocks on the same day they are cast. If any blocks were temporarily installed earlier for geometric adjustments, replace them on the casting day and store them for drying before further installation.

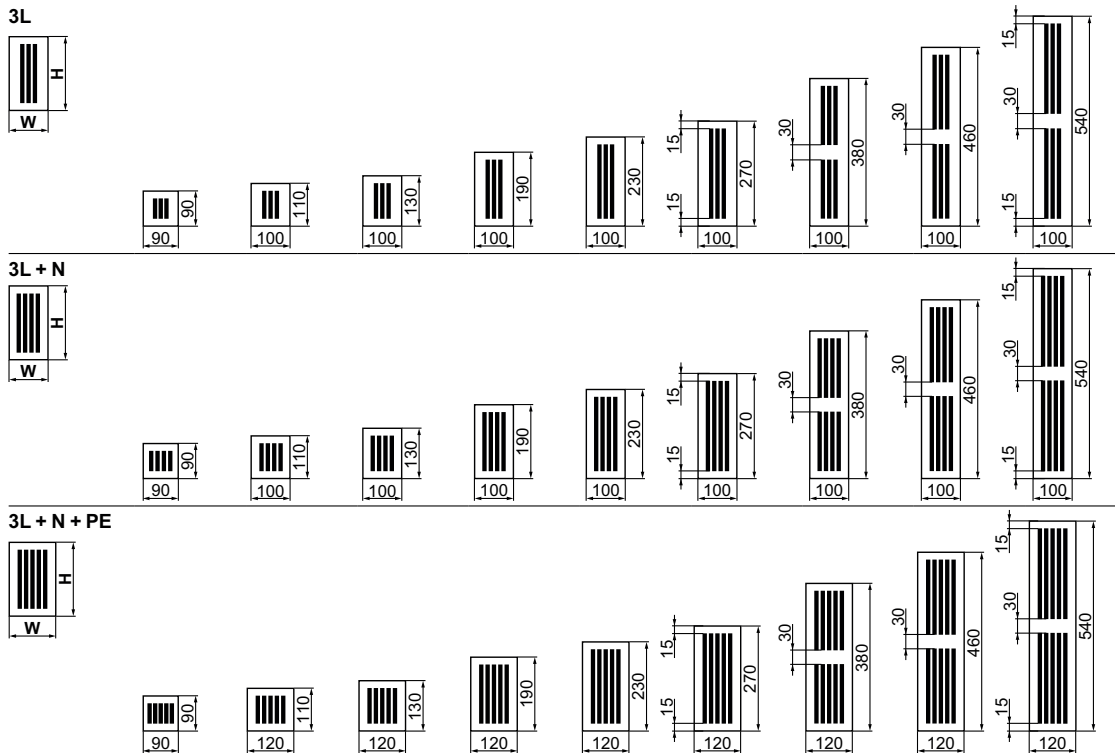


Rating (A)	Aluminium	800	1000	1250	1600	2000	2500	3200	4000	5000
Bar cross-section (mm)		60 x 6	80 x 6	100 x 6	160 x 6	200 x 6	240 x 6	2 x (160 x 6)	2 x (200 x 6)	2 x (240 x 6)
Weight 3L (kg/m)		21	26	30	43	52	61	85	102	120
Weight 3L + N (kg/m)		22	29	34	48	58	68	95	115	125
Weight 3L + N + PE (kg/m)		22	35	40	58	69	81	113	137	161

Rating (A)	Copper	1000	1350	1600	2000	2500	3200	4000	5000	6300
Bar cross-section (mm)		60 x 6	80 x 6	100 x 6	160 x 6	200 x 6	240 x 6	2 x (160 x 6)	2 x (200 x 6)	2 x (240 x 6)
Weight 3L (kg/m)		30	36	43	64	77	92	126	155	182
Weight 3L + N (kg/m)		31	41	48	72	87	103	142	174	205
Weight 3L + N + PE (kg/m)		34	49	59	87	105	125	172	211	249

Figure 4 - Trunking Cross Sections

Dimensions



# Cast Resin

## General Rules to Work with Cast Resin

Ensure the following when working with cast resin:

- The resin is clear and in liquid form. Do not use it if it appears milky or crystallized.
- Check the best-before date on the label. If expired, procure fresh resin. Never exceed the specified best-before date.
- Ensure that the filler material is dry.

## Handling and Safety Precautions

### **▲ WARNING**

Observe the following precautionary measures when handling resin and other chemicals:

- Ventilate the work site properly.
- Do not eat, drink, or smoke at the work site.
- Use protective goggles, gloves, and overalls.
- Avoid inhaling any vapor or fumes, and wear a safety mask to prevent accidental inhalation.
- Apply protective cream over any unprotected areas of skin to avoid sensitization.
- In the event of unintentional spillage, clean with inert absorbent material (such as sand) and store the contaminated material in a suitable container before disposal.
- The filled containers of resin and hardener must be either incinerated or stored according to local regulations.
- After work, wash your hands with warm water and soap.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

## Material Safety Data Sheets

The following are the material safety data sheets for the chemical products:

- Aqua Release 1026S
- BKS1
- BKS2
- Quartz Sand

# Installation

## Installation of Supports

The cast resin busbar trunking system must be installed using the supporting structures of the building like wall beams or stands, along with system-specific supports, threaded rods, and C-profiles.

<b>▲ CAUTION</b>
<p><b>HAZARD OF IMPROPER INSTALLATION</b></p> <ul style="list-style-type: none"> <li>• Study and understand the layout plan before mounting the supports.</li> <li>• Consider the recommended separation distance between the supports during mounting.</li> <li>• The supports must be leveled so that the busbar elements are leveled after installation.</li> <li>• The supports must be able to bear the weight of the busbar elements.</li> </ul> <p><b>Failure to follow these instructions can result in injury or equipment damage.</b></p>

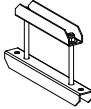
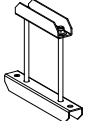
## Types of Support

There are two types of support:

- Horizontal support
- Vertical support

## Horizontal Support

Type ZA1 provides horizontal, flat support for the busbar trunking and type ZA2 provides horizontal, edgewise support for the busbar trunking. Each consists of a single angle bracket. It is recommended to maintain a distance of 1.5 m between horizontal types of support.

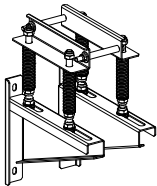
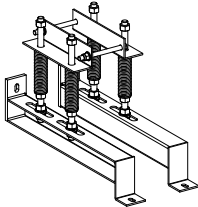
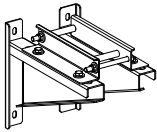
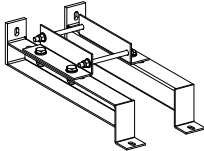
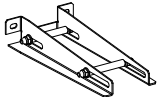
Horizontal type	Support name
	ZA1 - Horizontal Flat Support
	ZA2 - Horizontal Edgewise Support

## Vertical Support

Vertical supports are used to fix sections of a vertical run to the structure of the building. These can be used for fixing busbar trunking elements to a wall, to a wall bracket, and to the floor.

These features provide height and depth adjustment, as well as spring adjustment, to ensure distribution of the load at each floor.

These features also help prevent the transmission of building forces to the busbar trunking, including expansion and vibration.

Vertical type	Support name
	ZA5 - Vertical Wall Spring Support
	ZA6 - Vertical Floor Spring Support
	ZA7 - Vertical Wall Fix Point Support
	ZA8 - Vertical Floor Fix Point Support
	ZA9 - Vertical Wall Guiding Support

The dimensions of the supports to be used for elements with different ratings and polarities are described in the Canalis KR Catalog.

**NOTE:**

- Hanging structures and accessories that are not listed in the catalog or price list should be identified separately and procured through an alternative process to ensure readiness for installation.
- Do not fully tighten intermediate supports to allow for thermal expansion.
  - 40 N•m at the corners when fixed point required.
  - 55 N•m at vertical supports.
  - 5 N•m at the top bracket to allow the busbar to slide during thermal expansion.

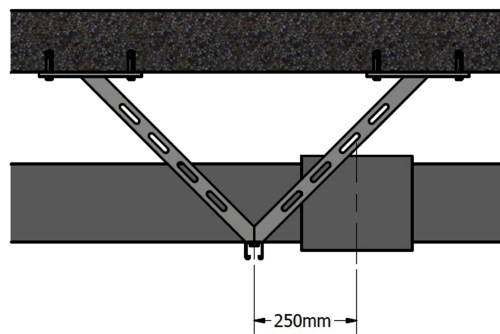
## Mounting the Supports

### Rules for Mounting the Supports

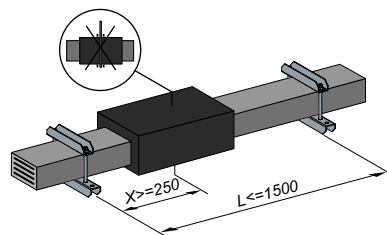
The following are the general rules for mounting the supports:

- Before mounting the supports, identify their types and intended locations.
- Ensure that all the elements are supported.
- Whenever possible, use two supports for each element to facilitate easier and more accurate levelling during installation.
- Ensure that the support does not coincide with a joint block.
- Maintain a minimum distance of 250 mm between the center of the joint block and the support.
- Keep the maximum distance of 1.5 m between horizontal supports for straight busbar runs.
- Use supporting structures with transverse stays when using fixed-point supports, as displayed in the following figure.
- Maintain the minimum distance between the installed elements, walls, and ceilings when installing the supports, as displayed in the following figures.

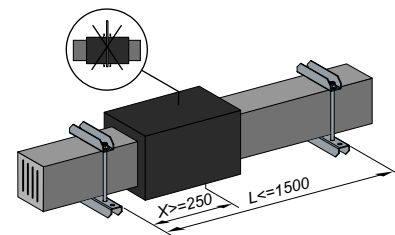
**Figure 5 - Using a transverse stay for a fixed point**



**Figure 6 - Recommended flatwise distance between a joint block and a support and between two supports**

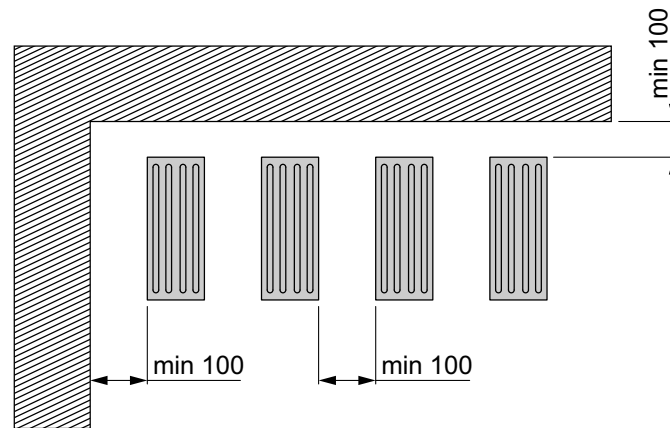


**Figure 7 - Recommended edgewise distance between a joint block and a support and between two supports**



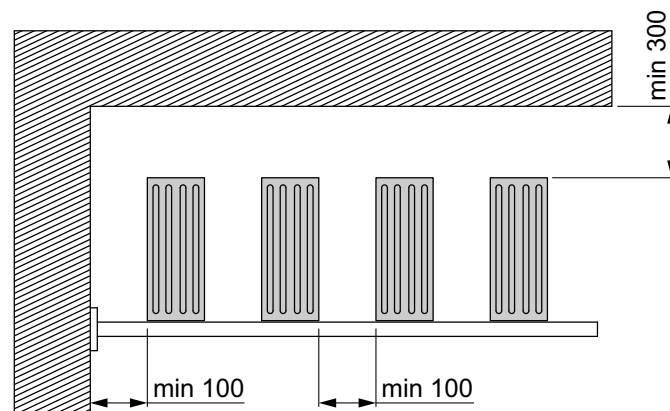
### Vertical Installation

**Figure 8 - Minimum distances between the elements and walls in a vertical installation**



### Horizontal Installation

**Figure 9 - Minimum distances between the elements, walls, and ceiling in a horizontal installation**



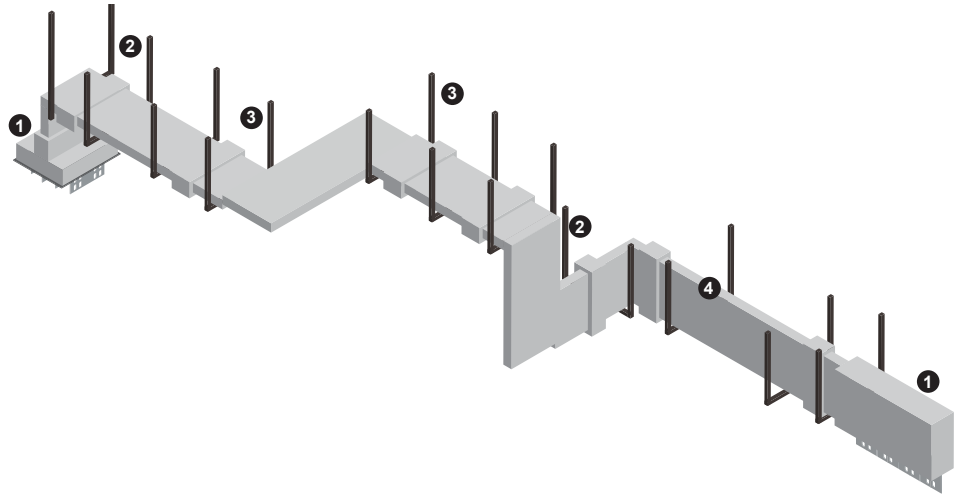
**NOTE:** The dimensions in the above figures are measured in millimeters (mm).

- For horizontal installations, maintain a minimum gap of 300 mm between the ceiling and the busway to allow proper installation of junctions. If space is highly constrained, reduce the gap to 150 mm, only if necessary.

## Terminal Elements, Vertical Branches, Elbows, and Z Shaped Elements (Zeds)

The following are the rules for mounting supports intended for terminal elements, vertical branches, elbows, and zeds:

- Terminals (1) must be fixed on own supports without the support of transformers or switchboards.
- Vertical branches (2) must be supported as close as possible to the elbow angle.
- Elbows and zeds (3) must be supported individually.
- Supports must be installed near to junctions (4) at a minimum distance of 250 mm.



1. Terminals
2. Vertical branches
3. Elbows and Zeds
4. Junctions

## Mounting the Supports

To mount the supports:

1. Ensure that the installation plan and the rules regarding support installation are followed, refer to *Layout and Supports*, page 19.
2. Mount the supports on to the support structures of the building. Fix supports with bolts and anchors.
3. Level and align the supports.

## Ceiling, Wall, and Floor Support Attachment

### Mounting the Supports Underneath a Ceiling

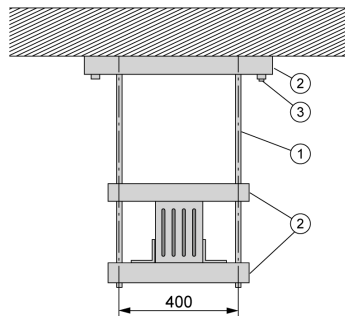
The mounting set consists of the following components:

- Two M10 or stainless M12 threaded rods for connecting the C-profile.
- Two C-profiles.
- Four lock nuts with securing washers.

To mount the supports on the ceiling:

1. Ensure that the ceiling and the supports are strong enough to hold the weight of the system.
2. Attach the supports to the ceiling.
3. The C-profile can be used for horizontal element installation, element in widthwise or edgewise position.

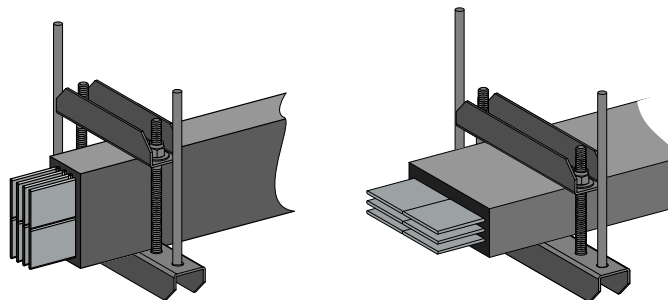
**Figure 10 - Example of a ceiling mounted element: suspended Installation**



- 1 Threaded rods suspension
- 2 C-profiles
- 3 Anchor bolts

4. Once the ceiling supports are installed, place the elements on the ceiling supports, align them properly, and then secure in place. For more information, refer to *Preparing and Installing the Cast Resin Busbar Elements*, page 33.

**Figure 11 - Elements with supports attached**



**NOTE:** Additionally, 2 m length rod is provided for ceiling support.

## Mounting the Wall Supports

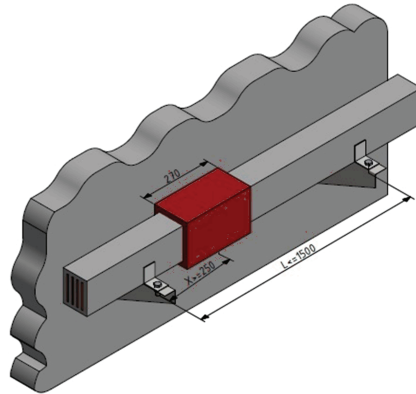
A wall support consists of a wall beam and a set of terminal clamps.

**NOTE:** The customer must provide the wall beams, if not specifically designed, confirmed, and ordered separately from Schneider Electric.

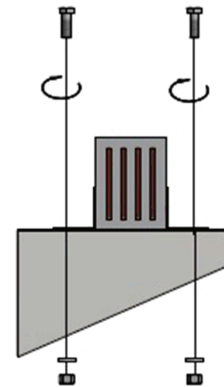
To attach the wall supports:

1. Attach the suspension support (wall beam) to the wall or another suitable structural support.
2. Insert additional transverse stays when mounting fixed point supports.

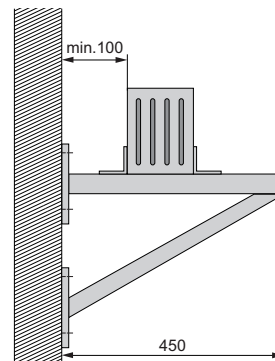
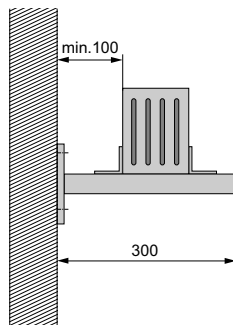
**Figure 12 - Fixed wall supports**



**Figure 13 - Elements installed on wall supports using terminal clamps**



3. Maintain a minimum of 100 mm from the wall to the busways, as displayed in the following figures.

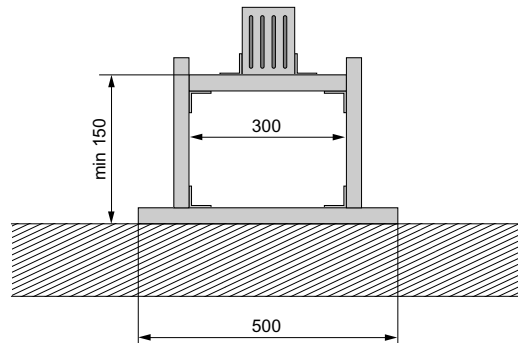


## Mounting the Floor Supports

The rules for mounting the floor supports are the same as those for the ceiling and wall supports.

For the minimum dimensions required for the installation, refer to the following figure.

**Figure 14 - Example of a floor mounted element: elevated installation**



## Supports for Vertical Installation on Walls

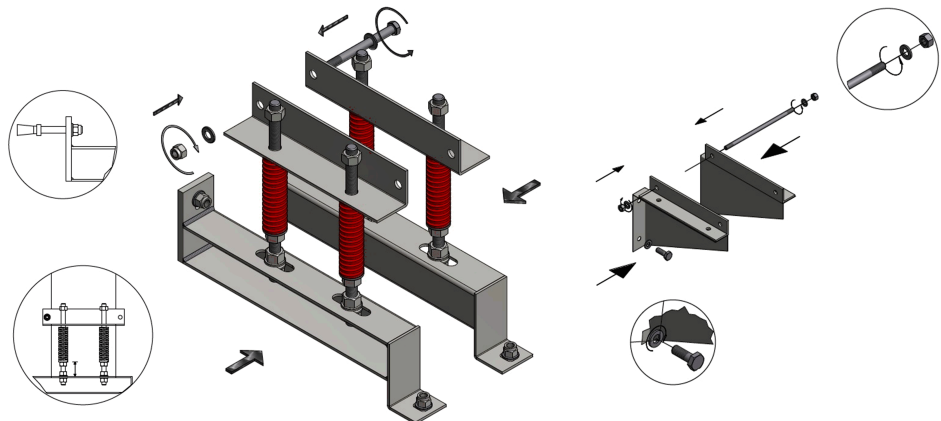
Vertical busways are anchored using fixed supports at the base; as the installation height increases, additional components such as spring hangers, intermediate guides, and expansion units are progressively required.

General principles for the support system of vertical runs:

1. Supports must be mounted at distances of 3 m (maximum).
2. The initial support of the run must be a fixed point, while the subsequent ones must use springs.
3. Intermediate guides can be utilized to help prevent lateral movements.
4. Before installing the cast resin busbar trunking system, mount all supports in their respective locations.
5. Mark the anchorage holes on the wall using the support as a template.
6. During the final height adjustment, remove the upper nuts to allow thermal expansion in operation.
7. Use the appropriate anchor bolts for the weight to be supported.

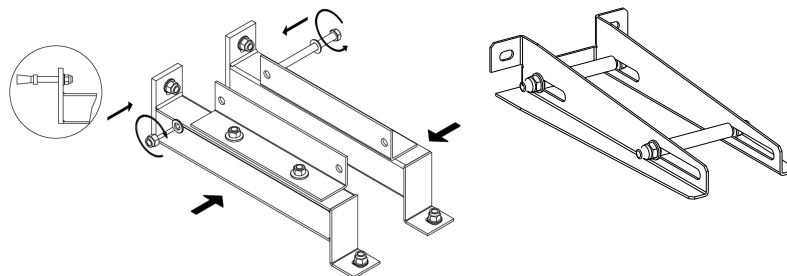
### NOTE:

- Vertical runs must be supported by dedicated supports supplied by Schneider Electric.
- Depending on the building configuration, supports can be mounted on the floor or on the wall.



Floor support with spring hanger support ZA6

Wall fixed point support ZA7



Intermediate guide ZA8

Vertical wall guiding support ZA9

# Installing the Raising Main System Guideline

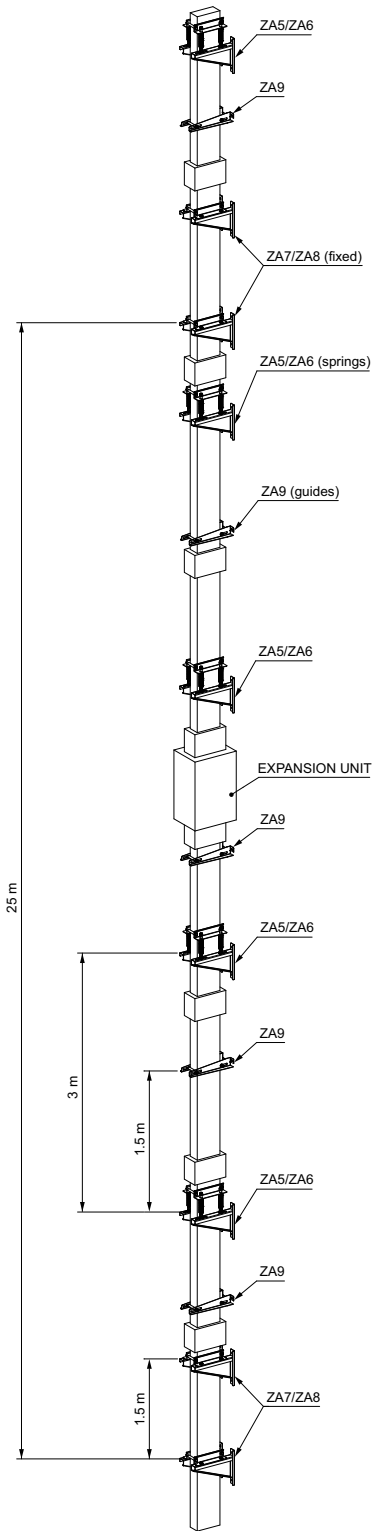
## KR Busway Trunking Support

The trunking supports fix sections of a vertical run to the building structure. This type of fixing support offers the following advantages:

- Installation options:
  - Wall mounting
  - Wall bracket mounting
  - Floor mounting
- Adjustable height and depth.
- Spring adjustment for load distribution on each floor.
- Helps prevent building forces from affecting the busbar trunking (expansion and vibration).

## Installation Principles

When installing KR rising mains, use the specified supports mentioned in the table along with the expansion unit in the vertical rising mains. Although there is no height restriction for rising mains with KR cast resin busway, it is essential to adhere to the provided design guidelines for the support system.



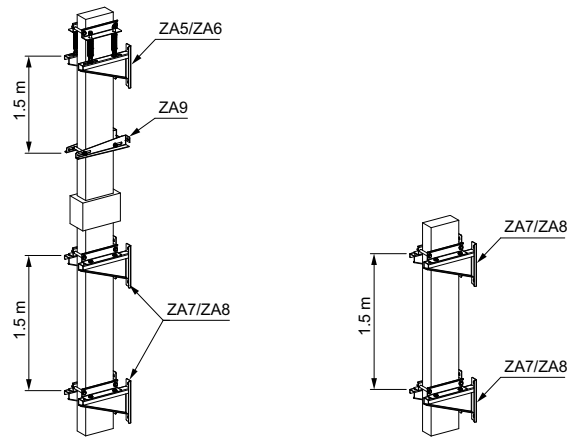
Height of busway	Support type			
	Fixed	Springs	Guides	
	ZA7 or ZA8 (every 1.5 m)	ZA5 or ZA6 (every 3 m)	ZA9 (between ZA5 or ZA6)	Expansion unit (every 25 m)
0...6 m	✓	–	–	–
6...12 m	✓ Only two at bottom	✓	✓	–
12 m or higher	✓ two at bottom and after every 25 m	✓	✓	✓

### General guidelines:

- In any riser, two fixed supports type ZA7 or ZA8 are required at the bottom of a riser.
- In any riser, a support is required every 1.5 m. It can be fixed supports, just guides or guides with springs.
 

**NOTE:** In special cases, the maximum of 2 m distance is accepted between the supports locally but need to adjust on other places to keep an average of 1.5 m.
- For small risers up to 6 m, only fixed support ZA7 or ZA8 is required.
- For medium risers beyond 6 m, spring supports ZA5 or ZA6 is required with a distance of 3 m, and guiding supports ZA9 is required in between two spring supports.
 

**NOTE:** For risers of 6 to 12 m, only one section (at the bottom) must be equipped with two fixed supports and other sections must be extended freely across the guides and spring supports.
- For large risers of higher than 12 m, previous guidelines must be followed and in the middle of each 25 m sections, install an expansion unit to compensate the extension, and install two units of ZA7 or ZA8 after every 25 m.



# Installation of Busbar Elements

## Introduction

After positioning the supports, start the installation of the busbar elements.

## Preparing and Installing the Cast Resin Busbar Elements

### Overview

This section explains how the cast resin busbar elements are installed on the supports. At this stage, the supports are installed in accordance with the installation plan.

### General Instructions for Installation

Follow these instructions during the installation process:

- Start the installation by connecting the switchboard.
- Continue towards the transformer, sub-distribution board, and loads.
- Install the elements in accordance with the planned layout as indicated in the installation drawings supplied.
- Connect the sections of up to a maximum of six units to facilitate the insulation test.
- For handling reasons, keep a straight element as the last connected unit.

### Installing the Cast Resin Busbar Elements

Follow these instructions for installing the cast resin busbar elements:

- Position elements at the desired location using slings or other lifting lugs.
- Ensure that elements are correctly positioned in relation to the adjoining elements.
- Secure the cast resin busbar trunking system by tightening the threaded rods on the supports. Use the nuts and fixing screws provided with the supports.
- When installing adjoining elements, ensure that the spacing between their end conductors is  $30 \pm 5$  mm.

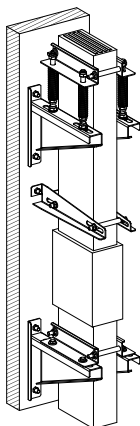
### Installing the Cast Resin Busbar Elements Vertically on Wall-mounted Brackets

To mount vertical installations on the walls:

1. Install the entire vertical busway run on the mounted supports without including any junction blocks. These junction blocks are to be installed just before the concrete casting sequence. However, some junction blocks may be temporarily positioned during installation to facilitate product adjustment.

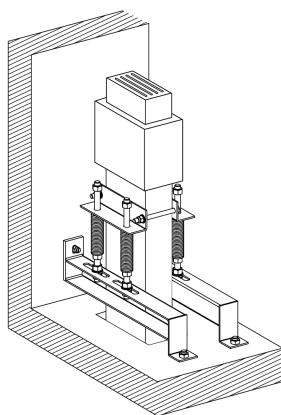
2. After installing the entire vertical run, tighten the nuts on the threaded rods with the springs on the ZA5 supports and set the desired height of the element.

**NOTE:** During the final height adjustment, remove the upper nuts from the top of springs to allow thermal expansion in operation.



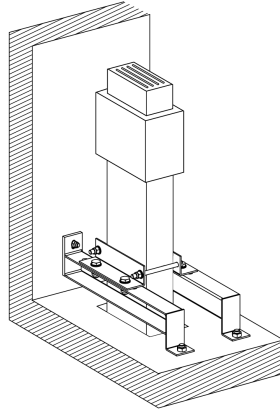
Completing the installation of a cast resin busbar element on ZA5, ZA9, and ZA7 (top to bottom) supports

3. For floor spring support such as intermediate building slabs, install the vertical runs on spring supports mounted on the floor as displayed in the following figure. Follow step 2 for the vertical adjustment of the run.



Installing the vertical elements on ZA6 spring supports mounted on the floor

4. When fixed supports are required to secure the busway, install the vertical runs on fixed-point supports mounted on the floor as displayed in the following figure.



Installing a vertical element on a ZA8 fixed-point support mounted on the floor

## Expansion Unit

### Mounting the Expansion Unit

#### ⚠ CAUTION

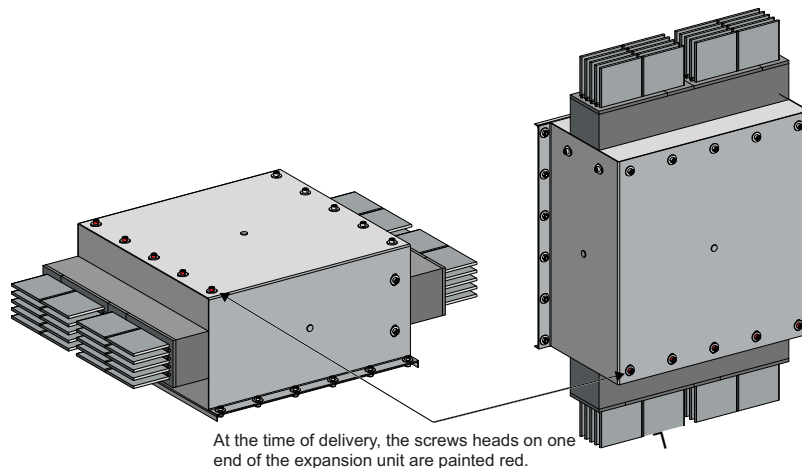
##### HAZARD OF IMPROPER INSTALLATION

- Do not install supports in the expansion areas.
- Do not attach the expansion elements to the supports, as this results in the temperature-dependent expansion of the run not fully compensated.
- Attach one support in front of the expansion area and one behind it to ensure that the element is fixed correctly. Two support points are provided for each expansion unit.
- Do not remove the screws without having first installed the two elements adjoining the expansion unit in their final position.

**Failure to follow these instructions can result in injury or equipment damage.**

To mount the expansion unit:

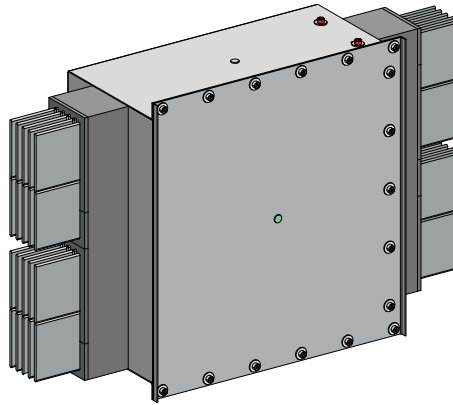
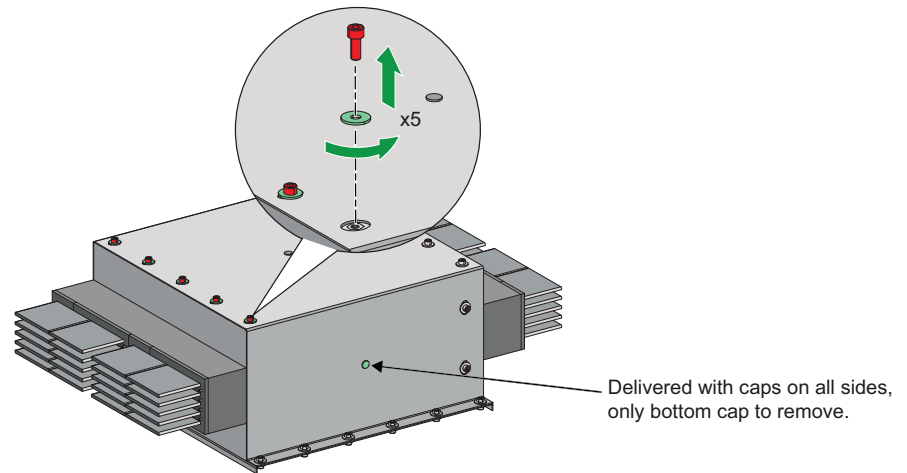
1. Ensure that the expansion unit is blocked by the screws marked in red (delivery condition).



2. Install the expansion unit in the same way as any other cast resin busbar trunking system element in the position indicated in the installation drawing. Follow the assembly instructions for connecting elements.
3. Place the expansion unit on the support system.
4. Before releasing the expansion unit, install the following busbar trunking system element and attach it to the corresponding flanges.

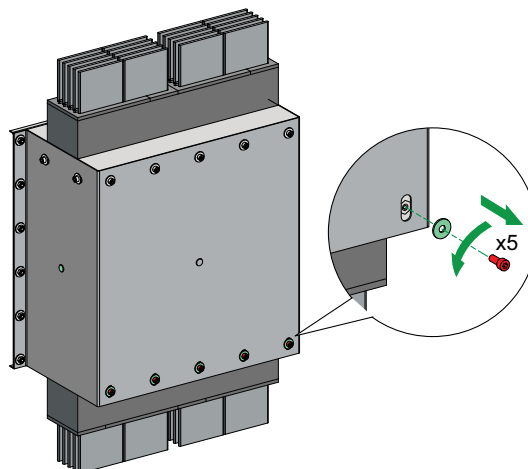
## Releasing the Expansion Unit

1. Remove the red screws from the expansion unit to enable it to move freely.
2. **Horizontal Edgewise or Flatwise Mount:** Remove the right side red screws from the expansion unit to enable it to move freely and remove only bottom cap for both edgewise and flatwise orientation.



3. **Vertical Mount:** Install the expansion unit with the red screws securely fastened at the bottom. Once the installation of the entire vertical busway system is fully completed, remove the bottom red screws from the expansion unit to enable it to move freely.

**NOTE:** Once the element installation is complete, ensure that the fixed screws are positioned at the top.



# Junction Block Installation and Testing

## Establishing and Testing the Electrical Connection

### Safety Instructions

#### **NOTICE**

##### **HAZARD OF IMPROPER CONNECTION**

- Plan the installation of the connections in advance to avoid subsequent problems.
- Ensure that all contact surfaces are clean and free of impurities.
- Ensure that the junction block is exactly in-between two elements to be joined.
- Do not knock or hit the junction block hard when you insert it. Instead, insert it carefully to avoid damaging the elements. A rubber hammer can be used as an aid.
- Double check phase sequence on all terminal elements using a voltmeter.
- Before casting, check the insulation resistance using an insulation tester with 1000 V rating. For more information on insulation resistivity, refer to the Preparing the Elements for Connection, page 38 topic.

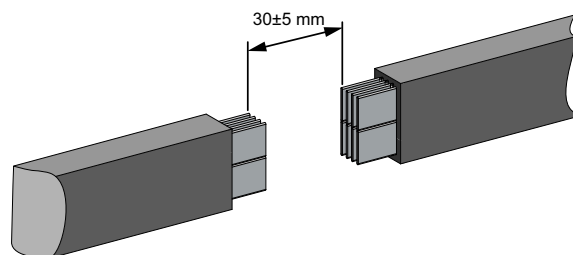
**Failure to follow these instructions can result in equipment damage.**

### Preparing the Elements for Connection

To prepare the elements for connection:

1. Ensure that the distance between the conductor ends of two cast resin busbar elements (junction) is  $30\pm 5$  mm.

**Figure 15 - Distance between busbar to enable proper connection**

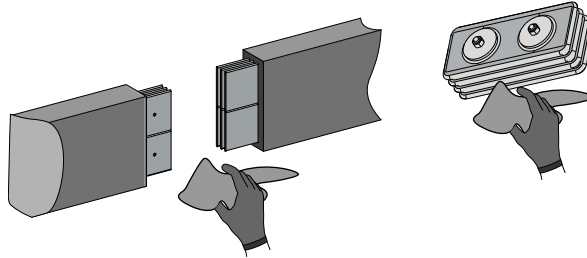


2. Ensure that the cast resin busbar elements to be connected are aligned and leveled.

**NOTE:** Both busbars must be fully supported and securely fixed to the wall, floor, or ceiling.

3. Clean the contact surfaces of busbar conductors and junction block with a polishing fleece, if:
  - The elements are stored for long.
  - The conductor-end protective packing is damaged.
  - The conductors have become contaminated, wet, or corroded.

If needed, dry the contact surfaces with an industrial drier before inserting the junction block.

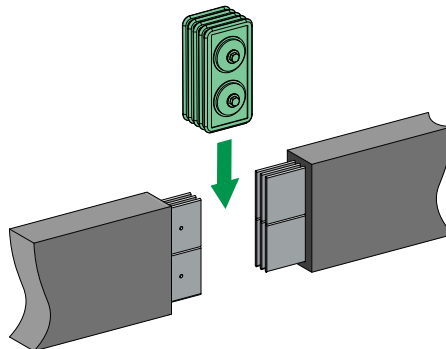


4. Check the insulation resistance of each element:
  - A value of  $\geq 1 \text{ G}\Omega$  is considered normal for products received from deliveries and stored under good conditions.
  - If a single product displays an insulation resistance below  $200 \text{ M}\Omega$ , do not install it until the insulation resistance is restored.
  - During the installation process, and as the run length increases due to multiple castings, a reduction in insulation resistance values is expected. However, the consistency of these values must be continuously monitored and validated.

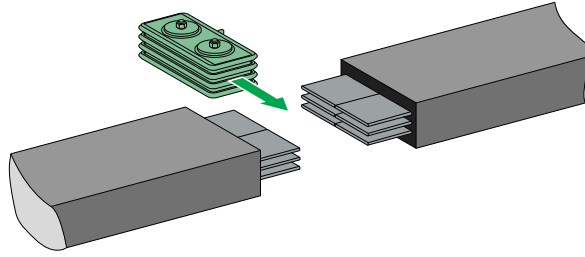
## Establishing the Electrical Connection

To establish the electrical connection:

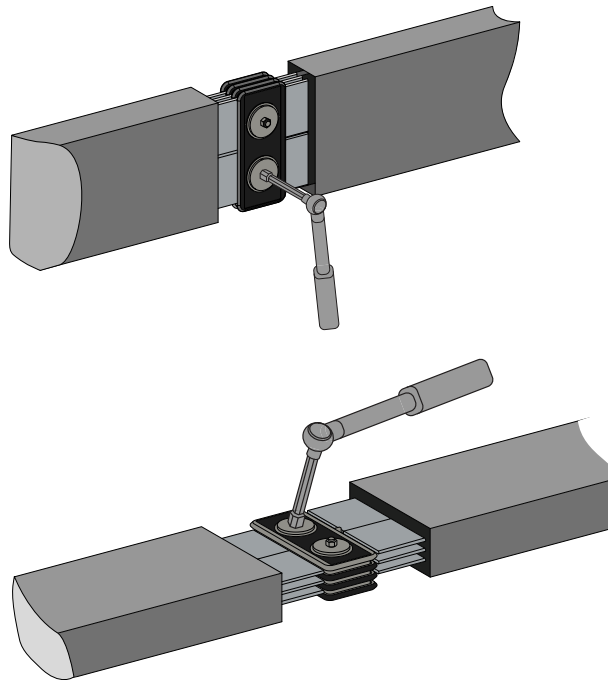
1. Insert the junction block between the copper or aluminum conductors from above or below. Align it such that it extends equally on all sides.
2. After verifying proper positioning of the components, gently tap the junction block into place using a rubber hammer, if necessary.



- For flatwise busway installations, the correct positioning of the junction block is with the screw head facing upward and the nut positioned underneath.



- When the junction block is aligned, tighten the connecting bolt. Tighten to 45 N.m using a torque wrench for junction blocks with bolt size 17 mm or to 84 N.m for junction blocks with bolt size 19 mm.



## Testing the Electrical Connection

### DANGER

#### HAZARD OF ELECTRIC SHOCK AND ARC FLASH

The testing of electrical connections must be performed by trained and qualified personnel only.

**Failure to follow these instructions will result in death or serious injury.**

After connecting a sub-section (maximum of 6 elements), carry out the following tests:

- Insulation testing: Using a megohmmeter, check the insulation resistance between each phase or neutral <sup>(2)</sup> and earth (the casing, if it is connected to earth).

Preliminary reminder: According to IEC 60364-6 (and 61.3.3) standard, and for a complete busway the insulation values must be:

- Rated voltage < 500 V  $U_{test\ DC} = 500\ V$   $R_i \geq 1\ M\Omega$ .
- Rated voltage > 500 V  $U_{test\ DC} = 1000\ V$   $R_i \geq 1\ M\Omega$ .

**NOTE:** Values such as 1 M $\Omega$ , as specified by the IEC standard, are not suitable for a reliable cast resin busway. Refer to the recommendations for Canalis KR, provided later in this topic.

- PE protective circuit equipotential: According to IEC 61439-1, using an ohmmeter, check the PE protective circuit continuity by visual inspection and random continuity testing.

Canalis KR system – insulation resistance guidelines:

- For single elements, a minimum of  $R_i \geq 200\ M\Omega$  is required to proceed with installation.
- For assembled and casted products, insulation resistance values of over 100 M $\Omega$  should be observed.
- For long runs, lower insulation resistance values are acceptable.

<sup>(2)</sup> There is no neutral insulation if the neutral is connected to or used as the earth.

# Casting

## Casting Procedure

### Safety Instructions

#### **⚠ WARNING**

##### **HAZARD OF TOXICITY AND POISONING**

Follow these safety instructions while working with the chemicals:

- Ventilate the work site properly.
- Do not eat, drink, or smoke at the work site.
- Use protective goggles, gloves, and overalls.
- Apply protective cream over any unprotected areas of skin to avoid sensitization.
- In the event of unintentional spillage, clean with inert absorbent material (such as sand) and store the contaminated material in a suitable container before disposal.
- The filled containers of resin and hardener must be either incinerated or stored according to local regulations.
- After work, wash your hands with warm water and soap.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

## Mould Preparation – Applying Demoulding Agent

### ⚠ CAUTION

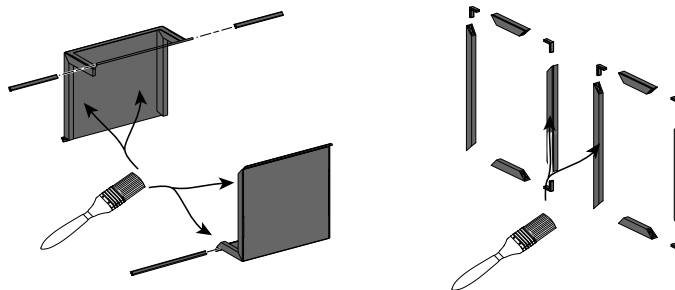
#### HAZARD OF IMPROPER CONNECTION

Ensure that the ground resin part (2 cm) on the busbar ends is not contaminated with demoulding agent. In case of such contamination, the joint resin cannot connect properly with the cast resin busbar elements, and IP68 of the system is not achieved.

**Failure to follow these instructions can result in injury or equipment damage.**

To apply the demoulding agent to the moulds:

1. Using a clean brush, apply a thin and uniform layer of demoulding agent to all internal surfaces of the casting moulds and seals. Before the agent begins to dry, gently wipe all treated surfaces with a clean, lint-free tissue to ensure consistent coverage and prevent uneven buildup.

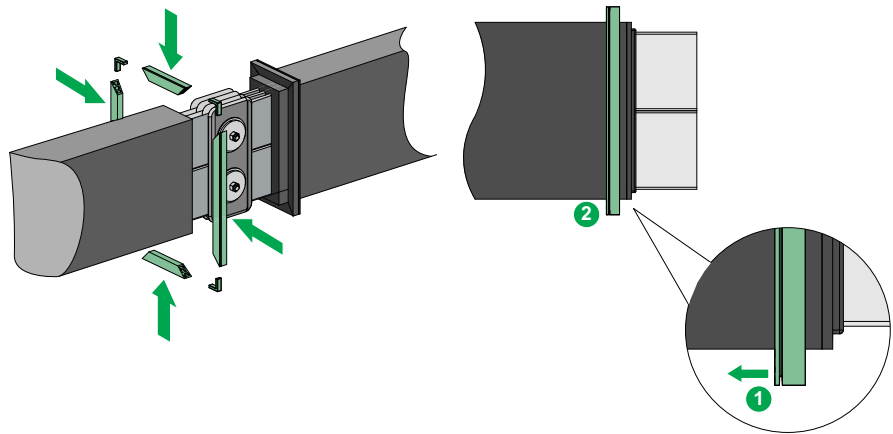


#### NOTE:

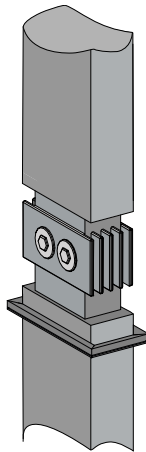
- Do not apply lubricant to the rough surfaces located at the busway extremities.
- After removing any excess liquid from the mould and its accessories, allow sufficient drying time before proceeding with installation. Under normal conditions, a minimum of 15 minutes is generally observed to ensure proper drying.

2. Apply the neoprene seals to both sides of the mould (tongue and groove).

#### Horizontal Edgewise or Flatwise Installation



#### Vertical Installation

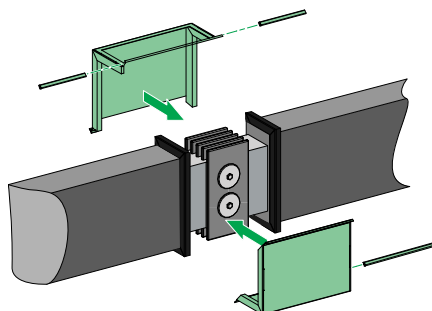


#### NOTE:

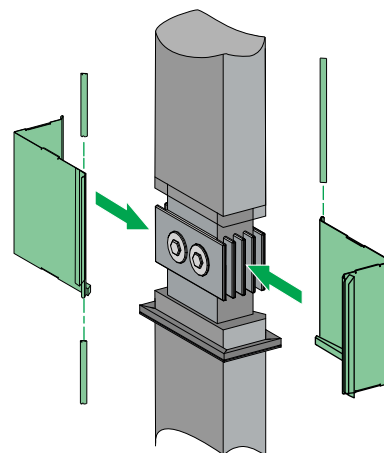
- To face the gasket frame accurately, use the alignment markings on busbar. Ensure that the grooves on the gasket are oriented outward, facing the joint.
- For vertical busbar installations, a gasket frame is required only on the bottom element.
- In vertical mould casting applications, one short gasket can be cut into two sections and placed on each side to stabilize the mould. A wooden support must be used to facilitate resin pouring and maintain mould alignment against resin weight, during the curing time.

- Place the mould on the mechanical connection (joint block) and secure it with the two slide-on locks. In case of a vertical run, use a clamp under the mould to keep it in place for the time of casting.

Horizontal Installation



Vertical Installation

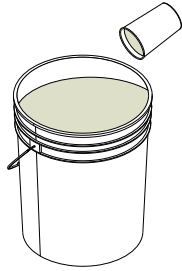
**NOTE:**

- Once the mould is installed, use a flashlight to find any potential holes from which the resin could leak and use duct tape to cover them.
  - Clamp it while installing the fixing profile on the edges (one slide-on locks can be cut to two smaller pieces, if applying the long one was too difficult).
  - Cover the end of the mould or wrap it with plastic foil, if casting later (do not prepare for a next day installation – risk of condensation).
  - Clamp wooden planks below the vertical mould and fire-rated Promat to prevent the casting mould from sliding downward.
- Prepare as many casting moulds as possible to cast in same day. Ensure that the casting mould overlaps the insulation on both ends of cast resin busbar, so that the minimum 2 cm of insulation is visible inside the mould.

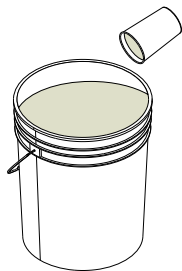
## Preparing and Filling the Casting Mixture

To prepare the casting mixture and fill the moulds:

1. Pour the resin (component A) into a clean empty bucket.



2. Pour the hardener (component B) into the bucket with the resin.



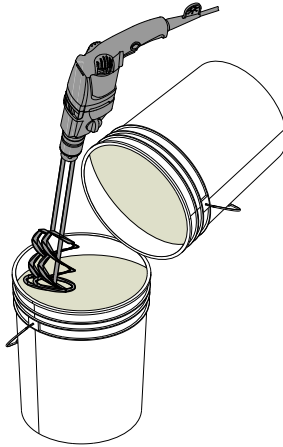
**NOTE:**

- Remove the caps from the resin and hardener containers before use.
  - Do not alter the specified mixing ratio under any circumstances.
  - If multiple kits are required for a single junction, prepare and use them sequentially as needed.
  - Do not begin pouring a junction unless it is completed before the curing process begins.
  - Mix resin and hardener only when ready to pour, to avoid premature curing.
3. Prepare the casting mixture by pouring the resin (Component A) into an empty container, followed by the hardener (Component B). Mix thoroughly using an industrial mixer (rated at 1200 W with rotation speed control) for approximately 30 seconds, or until the mixture becomes homogeneous. High power mixing is recommended when the ambient temperature is around 20 °C.



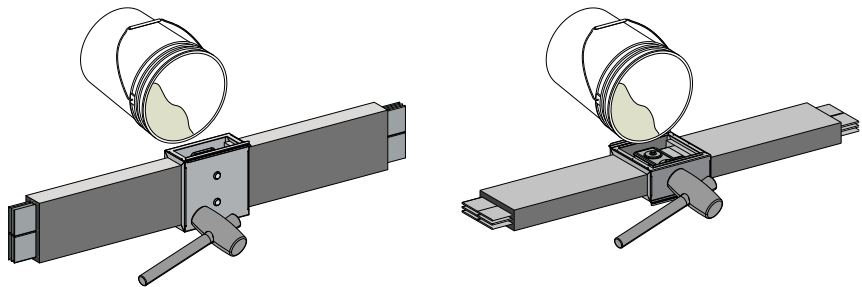
4. Gradually add the filler material (sand) into the prepared resin and hardener mixture in three stages:
  - First, add 50% of the total filler quantity and mix thoroughly.
  - Then, add 30% and continue mixing.
  - Finally, add the remaining 20% and mix until the compound reaches a homogeneous consistency.

The total mixing time should be approximately three minutes to ensure uniform distribution and optimal casting quality.

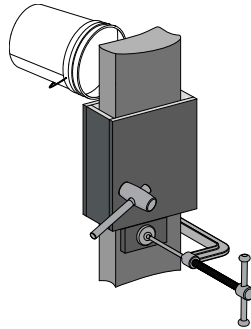


5. For horizontal installations, position the junction block with the bolt head facing upward and the nut downward to minimize air entrapment along the thread. Slowly and steadily pour the prepared cast resin mixture into the casting mould until it reaches the upper edge. Gently tap the mould with a rubber hammer to release any trapped air bubbles. Do not overfill the mould. Level the surface using a putty knife or mason's trowel to ensure a smooth finish.

**NOTE:** For a few minutes, use a spatula or mason trowel to check and remove hypothetical bubbles.



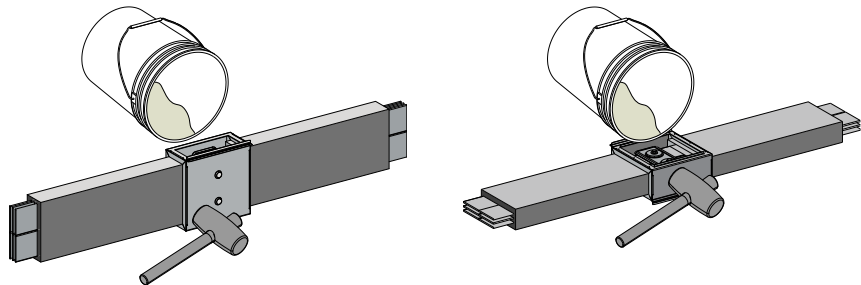
For vertical installations, begin by pouring the resin mixture into the casting mould from one side. Once the mould is filled, reposition it vertically by pressing it firmly into place. Use pre-cut rubber pieces to align and stabilize the casting mould vertically at the resin pouring end. This ensures proper positioning and prevents leakage or misalignment during curing.



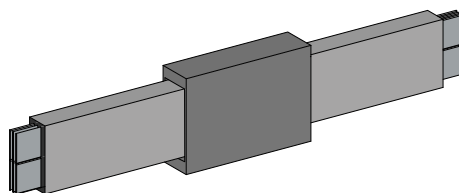
**NOTE:**

- Rubber hammer is the most adapted. Electrical tools are not recommended during casting sequence.
  - Use the rubber hammer for 20...60 s, and repeat the process one or more times, if needed.
6. Clean all tools immediately after use and ensure they are completely dry. Use suitable solvents such as methylene chloride or acetone. Follow local regulations when using chemical products.
- TIP:** Clean the mixer tool by starting in a bucket of clean gravel and cloths.
7. Inspect the casting mould to verify if the resin has settled. If required, carefully top up the mould with additional resin until it reaches the brim. Avoid both overfilling and leaving the final center below the surface. Smooth the surface using a mason's trowel to ensure a clean and level finish.

**NOTE:** Avoid drafts and ambient temperature below 5 °C.



8. Allow the cast resin mix to harden.
- NOTE:** The hardening time is usually around 5 to 14 hours. See table below for the required hardening times at various ambient temperatures.
9. Remove the reusable steel casting mould after hardening. Clean all dried resin from the mould parts before reuse.
10. Use a grinding stone to clean the edges and remove any uneven spots on the joint casting. Like the overall system, the joint meets the requirements of IP68.



11. Perform an insulation test after the resin has cured completely. The insulation resistance values must be higher than 100 MΩ. For long runs, lower insulation resistance values are acceptable.

**NOTE:** The full insulation capacity of the resin is achieved only after complete polymerization. Until fully cured, the resin remains conductive and must not be considered electrically insulating.

The following table indicates the maximum time before which the mix must be used and the corresponding hardening time based on the ambient temperature:

Ambient temperature (°C)	Maximum time before which the mix must be used (minutes)	Hardening time (hours)
25	20...25	5
15	25...30	7
10	30...35	10
5	35...40	14

## Checking the Electrical Connection

After casting a sub-section, perform tests on the electrical connection. For more information, refer to [Testing the Electrical Connection](#), page 41.

## Specific Components

### Cable Feeder IP55 and IP68 Connection to Switchboards and Transformers

#### Cable Feeder Units

The following are the two types of feed units:

- Type ER: This type of feed units allow the busbar trunking to be connected to a switchboard busbar or to the terminals of an oil-immersed transformer or generator.
- Type EL: This type of feed units allow optimal connection to the busbar trunking.

These listed feed units can be connected to:

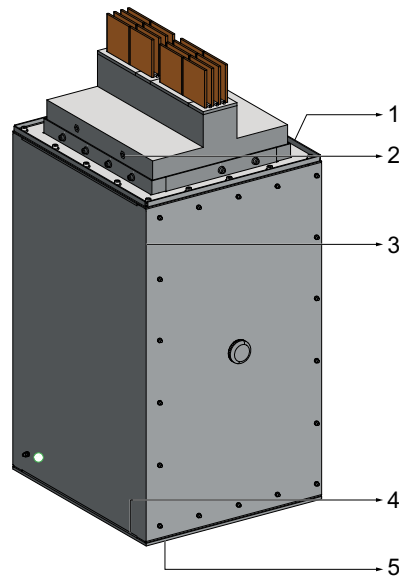
- Busbar directly
- Flexible bars and connection plates
- Braids
- Cables

The feed units can be standard or made to measure. For more information about the feed units, refer to [Canalis KR Catalog](#).

#### Preparation of Component for the Installation

- The cable feeders need to be supported with the existing structure on site.
- For the final positioning of the cables and the cable feed units, cable feed brackets must be prepared at the desired location.
- No mechanical load must fall on the electrical cables.
- To avoid accidental displacement, the cable box must be firmly connected to the fastenings.
- The fastening elements of the cable feeder box must be connected to the earthing system  $< 0.1 \Omega$ .

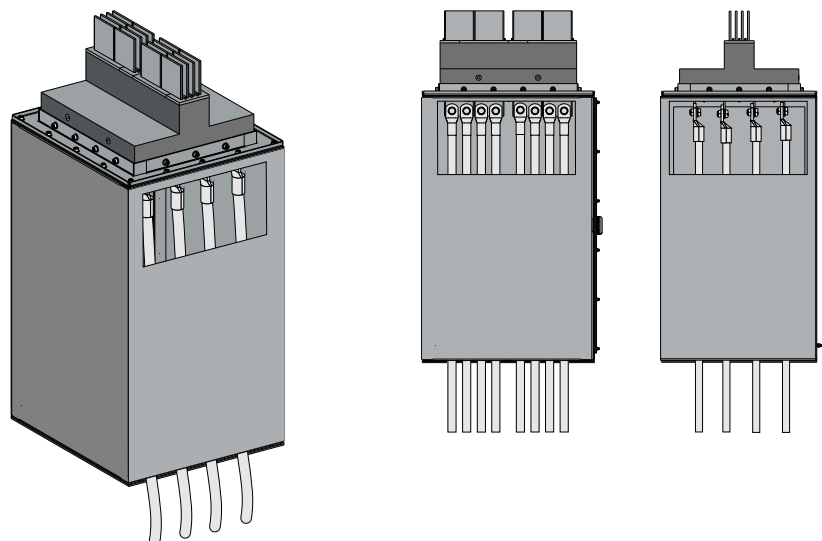
## Cable Feeder – IP55



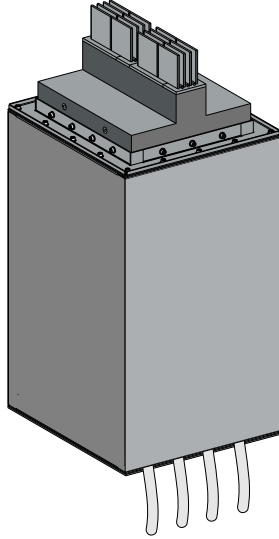
1. Stainless steel flange
2. M10 or M12 nuts (both sides)
3. Stainless steel box
4. Rubber gasket
5. Aluminium plate (4 mm)

To install the cables in cable feeder IP55:

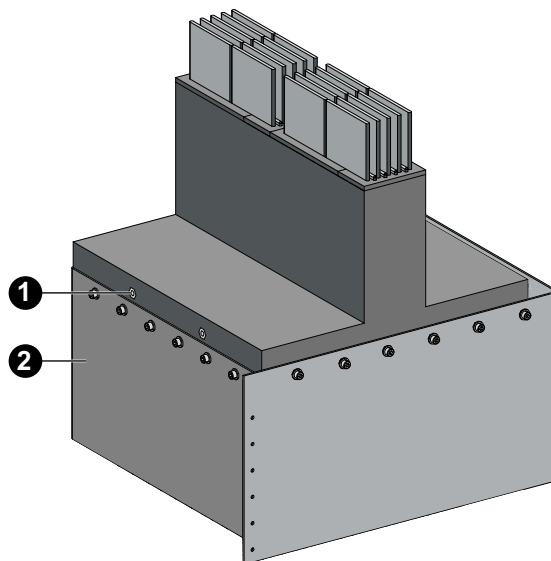
1. The bottom plate – 4 mm ALU must be drilled onsite for installing cable glands for entering the cables.
2. To ensure proper installation and electrical safety, follow these steps:
  - Position the cables on the connection pads provided at the lugs.
  - Tighten the cables using the specified torque to ensure proper contact.
  - Connect the box to earth using the external earthing point for potential equalization.
  - Install the bottom plate, ensuring insulation gasket is placed between the plate and the box.



3. Install the maintenance window cover on the box with insulation gasket placed between the cover plate and the box.



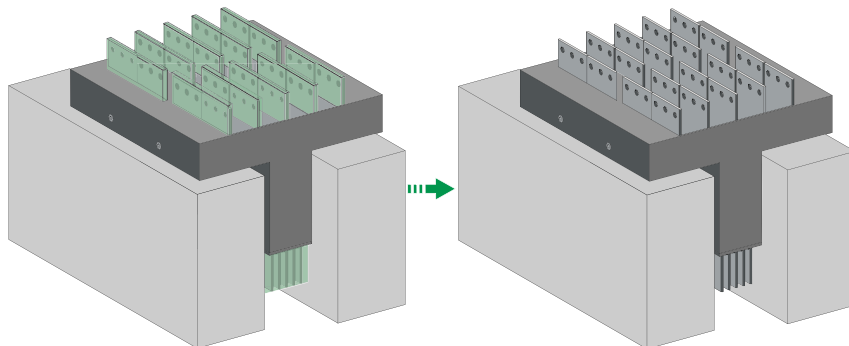
## Cable Feeder – IP68



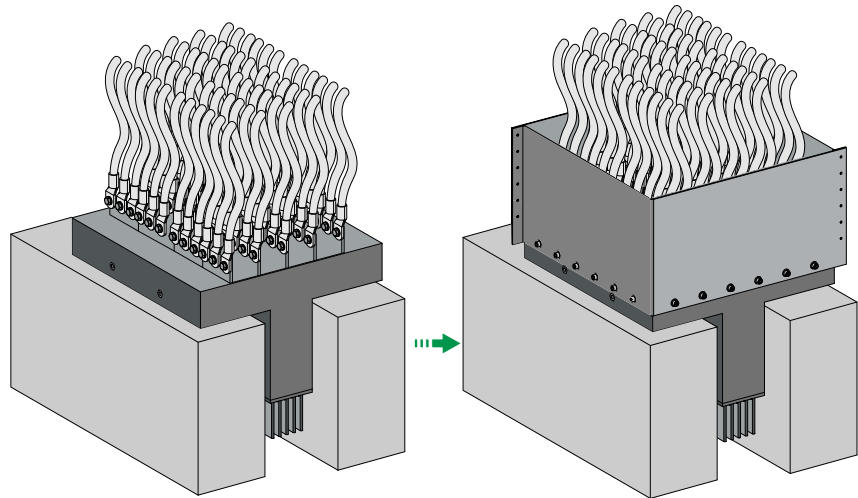
- 1. M10 or M12 nuts on both side
- 2. Stainless steel casing

To install the cables and resin fill in cable feeder IP68:

- 1. Position the cable feeder such that the connection pads are oriented upwards. Support the assembly on wooden blocks to elevate the conductors and prevent mechanical stress or damage during handling. Remove all packaging material surrounding the connection pads to prepare for subsequent operations.



2. Position the power cables onto the designated connection pads of the cable feeder. Secure the connections by tightening them to the specified torque values. Mount the casting mould onto the cable feeder element, ensuring proper alignment and sealing. Connect the enclosure to the earthing system using the external earthing point to ensure potential equalization.

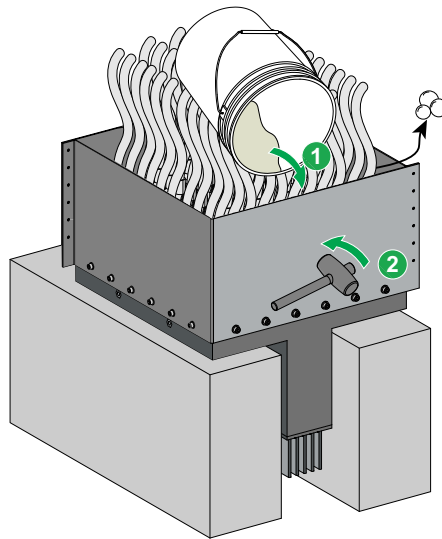


3. Secure the cables in the designated position using appropriate temporary fixation methods to ensure complete stability and prevent any displacement during the casting process.
4. After checking insulation resistivity, prepare the required quantity of resin as specified in the following table, and pour it into the mould immediately after preparation.

Rating of the trunking (A)		Number of conductors	Resin sets required to cast in the cables
KRA	KRC		
800	1000	3 or 4	2.30
		5	2.90
1000	1250	3 or 4	2.80
		5	3.50
1250	1600	3 or 4	3.30
		5	4.10
1600	2000	3 or 4	4.90
		5	6.10
2000	2500	3 or 4	5.90
		5	7.4
2500	3200	3 or 4	6.90
2500	3200	5	8.60
3200	4000	3 or 4	13.70
		5	17.10
4000	5000	3 or 4	16.60
		5	20.70
5000	6300	3 or 4	19.40
		5	24.30

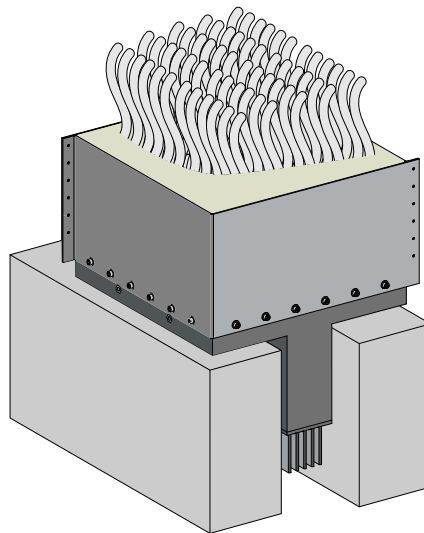
**NOTE:** A reserve margin of 5 to 10% is included in the listed quantities to account for material handling and application tolerances.

5. Slowly pour the prepared resin into the mould, ensuring a continuous and even flow. Tap the mould using a rubber mallet to release any trapped air bubbles.



6. When the resin has fully cured (minimum 8 hours), proceed to position the cable feeder element into its final location. The mould remains securely placed on the busbar throughout the curing period and mount the cable feeder onto the designated supports.

**NOTE:** It is optional to keep the casting mould on the element even after installation is completed.



## Transformer or Switchboard Connection Unit

The end feed units connect lines to transformers, switchboards, and generators, both mechanically and electrically.

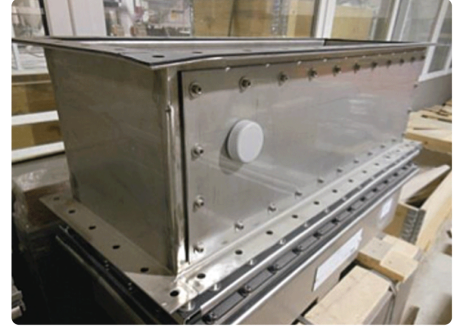
The mechanical connection is possible with an assembly flange using boxes, adapter flanges, sealings, and bellows in accordance with the project design.

**NOTE:** The dimensions of the terminal elements, protective flanges, and covers must be calculated prior to ordering, by using the methods specified in the Canalis KR Catalog.

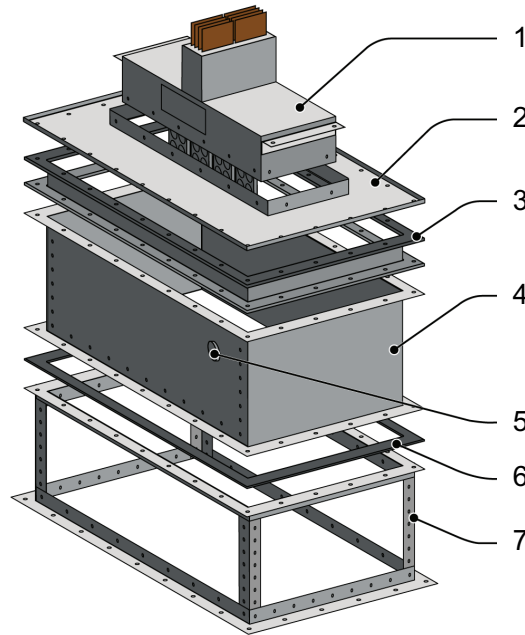
**Figure 16 - Terminal element**



**Figure 17 - Adapter box**



**Figure 18 - Transformer/Switchboard connection unit**



1. Terminal element
2. Stainless steel flange
3. Neoprene bellows with stiffener
4. Stainless steel adaptor box
5. Breather (both sides)
6. Special neoprene gasket
7. Transformer box

## Preparing the Connection to the Terminal Element

To prepare the terminal element for connection:

1. Ensure that the switchboard or transformer mounting surface is flat.
2. Prepare the cut outs.
3. Reinforce the switchboard or transformer mounting surface in accordance with the weight of the terminal element.

The switchboard or transformer must contain fixtures for mechanically securing the terminal element. The weight of the terminal element must not be allowed to fall on the electrical connections (copper connection, flexibles and so on).

## Installation in the Transformer or Switchboard

After storage and transport to the installation location, mechanically secure the terminal element in the transformer or switchboard. And then, electrically connect the terminal element to the busbar or circuit breaker.

## Fixing the Terminal Element Mechanically

To fix the terminal elements mechanically:

1. Fix the power cables of the terminal element in the transformer or switchboard mechanically. Ensure that there is no mechanical load on the electrical cables.
2. Attach the cover plate to the transformer or switchboard enclosure. Observe the distribution board specifications relating to the degree of protection. If required, use additional sealant to achieve degree of protection higher than IP55.

## Connecting the Terminal Element Electrically

To connect the terminal element electrically:

1. Remove the protective transportation devices.
2. Carry out the electrical connection in accordance with the terminal specifications and the information provided by the distribution board manufacturer. Consider the dimension of the connecting material in accordance with these specifications.

# Fire-Resistance Barrier

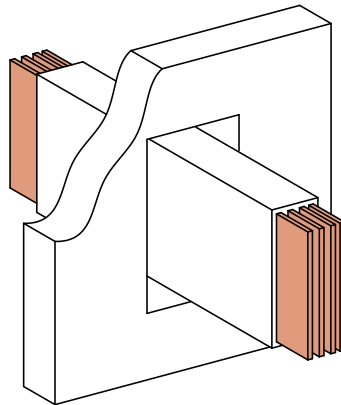
## Regulations

If the cast resin busbar run passes through a wall or a shaft, a fire-resistance barrier may be required. The regular busway provides 60 minutes of fire resistance time. For greater protection levels of up to 120 minutes, a fire kit has to be installed on busway through the wall. The gap between the busbar trunking and the concrete should be filled with the appropriate product (not supplied by Schneider Electric).

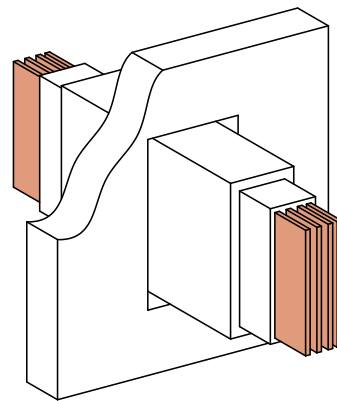
Do not install the fire-resistance barrier through any junction (monoblock).

Canalis KR complies with busbar trunking standard IEC 61439-6 with respect to resistance to flame propagation and fire resistance in building penetrations.

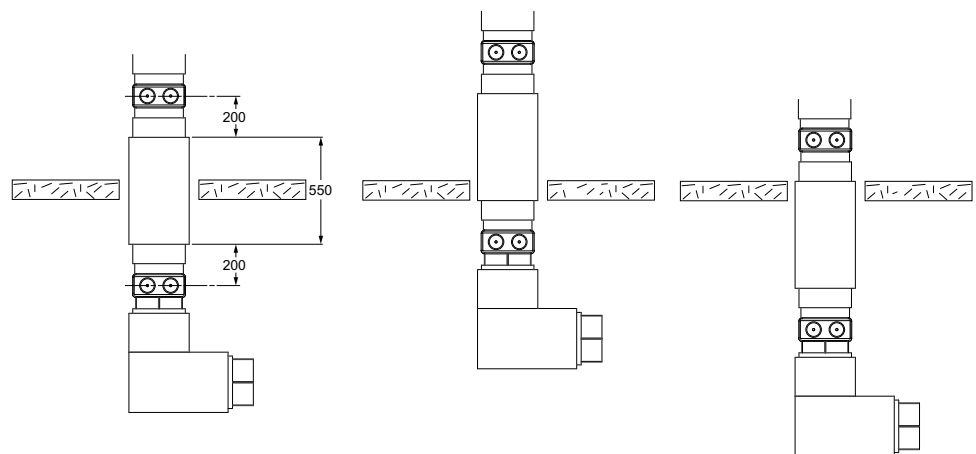
**Figure 19 - Standard product (S60)**



**Figure 20 - Fire barrier kit (S120)**



**Figure 21 - Fire barrier installation**

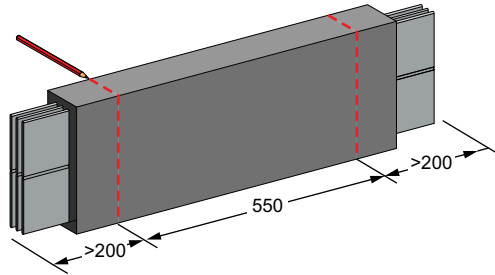


**NOTE:**

- Ensure proper alignment of the moulding sequence before pouring the cast material.
- The dimensions in the above figure is measured in millimeters (mm).

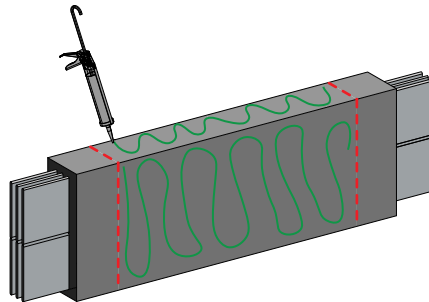
## Preparation of Fire Barrier (S120) Component for the Installation

1. Mark the designated position where the fireproof Promatect® layer is to be installed.

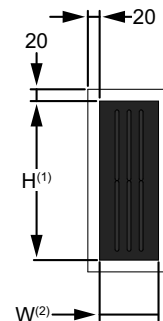
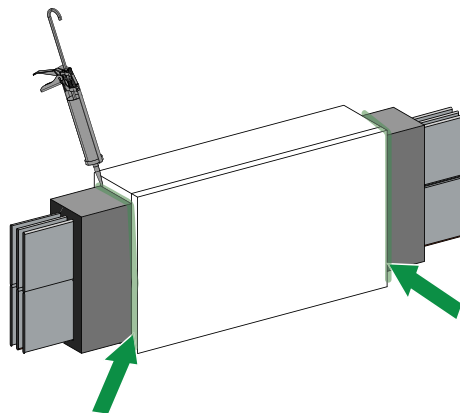
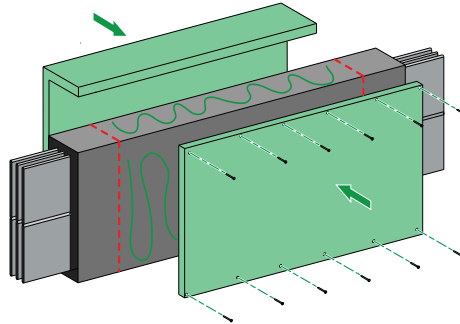


The dimensions in the above figure is measured in millimeters (mm).

2. Apply Promaseal® Mastic uniformly between the marked boundaries on all four sides.



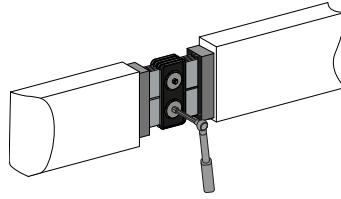
3. Secure both side panels of the Promat® enclosure using appropriate screws. Once installed, apply Promaseal Mastic uniformly around both ends of the fireproof layer, ensuring complete coverage around the busbar. The fireproof layer maintains a consistent thickness of 20 mm in all directions.



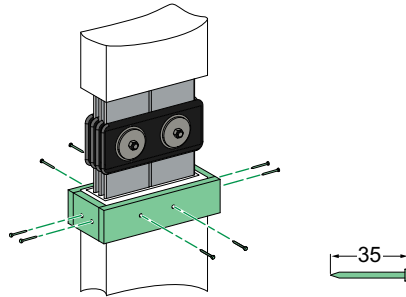
(1) and (2) dimension, refer to the table in the Layout and Supports topic.

## Preparation of Vertical Fire Rated Monoblock Casting

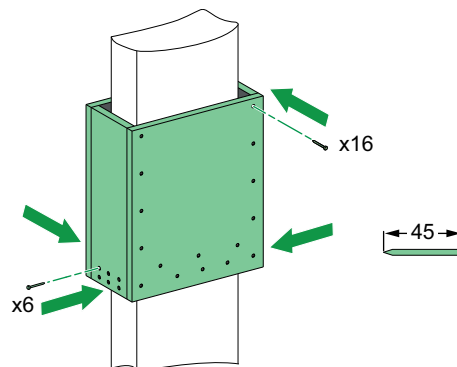
1. Installation up to the junction block is similar to the standard product. For more information, refer to the Junction block installation and testing, page 38.



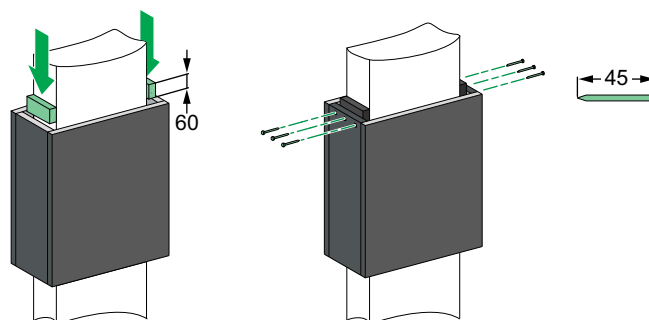
2. Assemble the bottom frame securely around the busbar. Fix the mounting plates onto the Promat fireproof layer using 35 mm self-tapping screws.



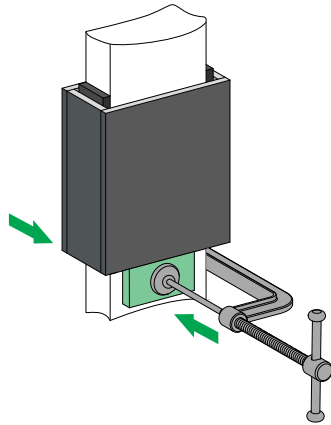
3. Install the side plates on all four sides of the assembly using 45 mm self-tapping screws. Ensure that each plate is securely fastened to the adjacent plates and to the previously assembled bottom frame around the busbar.



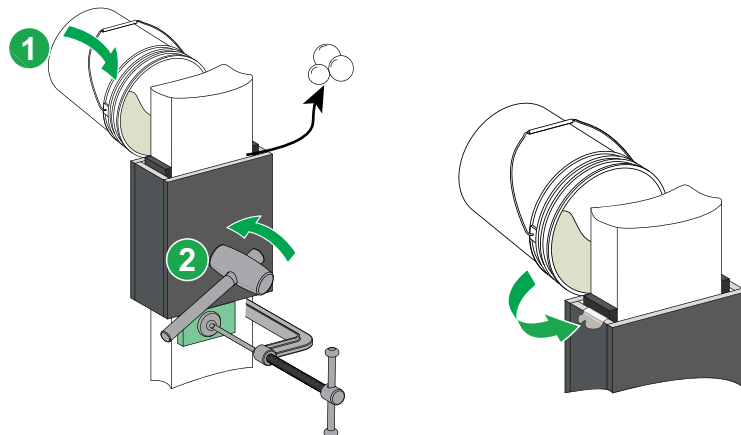
4. Insert two 60 mm top plates into position from the top. Ensure that two opposite sides remain open: one to facilitate resin casting and the other to allow air evacuation during the filling process. Secure the top plates externally using 45 mm self-tapping screws.



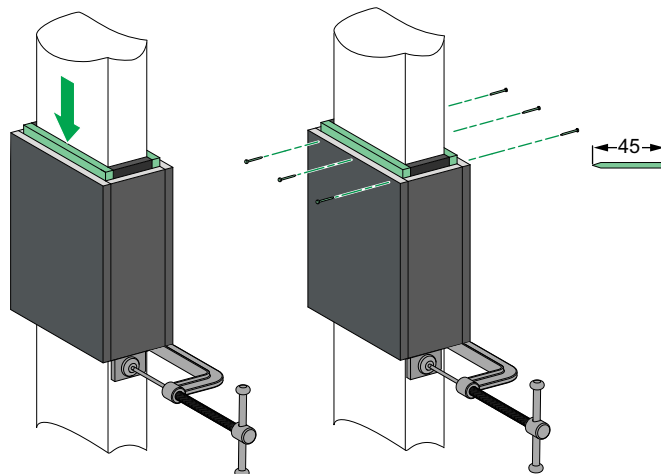
- Position a clamp beneath the casting mould to hold it securely in place during the resin casting process. To prevent damage to the Promat fireproof layer, do not apply the clamp directly onto its surface. Instead, insert two wooden spacer plates between the Promat layer and the clamp jaws to distribute pressure evenly and maintain structural integrity.



- Proceed to cast the resin mixture through the designated gaps at the top of the enclosure. Ensure that one side remains open to allow air to escape during the filling process. Gently tap the mould with a rubber mallet to facilitate the release of trapped air bubbles. Continue filling until the resin reaches the brim of the previously installed top plates. For improved control and accuracy during casting, the use of a funnel is recommended. For more information related to resin preparation guidelines, refer to *Preparing and Filling the Casting Mixture*, page 46.

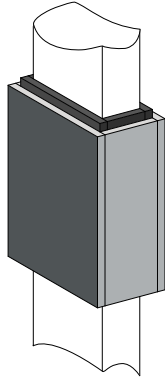


- Insert the remaining two top plates into position from above. Secure the plates externally using 45 mm self-tapping screws.



8. Clamps used to secure the mould during casting may be removed only after the resin is fully cured.

**NOTE:** Casting mould must remain in place for E90 fire-rated joints.



# KR or KT Adapter

## The Canalis KR or KT Adapter

Canalis KR is made of copper or aluminum conductors encapsulated in epoxy resin IP68.

Canalis KT is made of copper or aluminum conductors isolated by polyester films and protected by a metallic enclosure IP55.

The KR or KT adapters enable the interconnection of the two systems. Both ranges including adapters, are certified under the IEC 61439-1/6 standard.

Figure 22 - The KR/KT Adapter

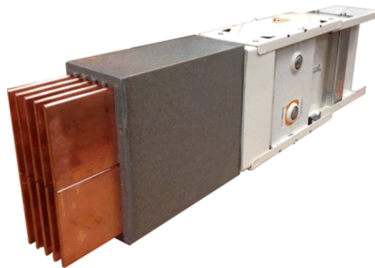
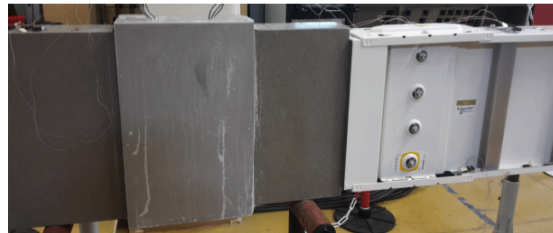


Figure 23 - The KR/KT Adapter in Use



The design of the PE conductor is different in Canalis KR and in Canalis KT. So, carefully select the correct reference as indicated in the following table.

Canalis KR				Canalis KT		
Cond. config.	Cross sections	Nb of cond.		Nb of cond.	Cross sections	Cond. config.
3L	No PE	3		<b>KR●●●●RT33</b>		3L+PE
3L+PE	PE = 100%L	4		<b>KR●●●●RT43</b>		3L+PE
3L+N / 3L+PEN	N = 100%L PEN = 100%L	4		<b>KR●●●●RT44</b>		3L+N+PE / 3L+PEN
3L+N+PE	N = 100% PE = 100%L	5		<b>KR●●●●RT54</b>		3L+N+PE
3L+N+PE	N = 100%L PE = 100%L	5		<b>KR●●●●RT55</b>		3L+N+PER

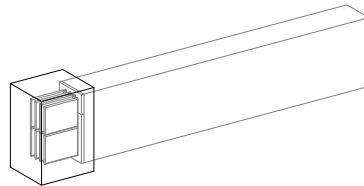
**NOTE:** The KR or KT adapter is not provided with Canalis KR and must be ordered separately with Canalis KT products.

# End Cover Component and Reduction Unit

## End Cover Component

Consider the following details for end cover casting:

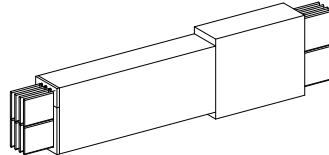
- The cast-on cap protect the busway end for future extensions. The conductor ends are protected with a shrink tube, and then resin is molded to encapsulate.
- This shrink tube provides insulation and environmental protection and can be easily removed during line extensions without damaging the conductors.
- The set of resin mix to cast end cover is 60% of normal junction block.
- The delivered kit contains the end cover mould and shrink tube to protect end of the conductors.



## Reduction Unit

To connect fire resistant products to standard ones, use Reduction Units (RU).

- The nominal rating of this unit corresponds to the maximum capacity of the smaller slide.
- The large side has the dimensions of the upper rating.



# Commissioning

## Safety Instructions

### ⚠ WARNING

#### HAZARDOUS VOLTAGE

Proceed with extreme caution and follow the instructions carefully.

Only authorized persons trained in electrical installation practices must carry out the following actions:

- Establish zero potential.
- Prevent the system from being switched on again.
- Document the switching operations.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

## Commissioning Instructions

Follow these instructions before the electrification of the line:

1. Insulate the cast resin busbar trunking system from the connections to transformers, switches, meters, and so on.
2. Ensure that all connections are fully tightened. Follow the instructions relating to tightening torques (visual inspection with record of results).
3. Check all suspensions and supports. All the fixing studs and screws of the supports must be tightened.
4. Ensure that all tap-off units and tapping equipment are disconnected (Off position).
5. Carry out an insulation resistance test to ensure that there are no short circuits or earth failures in the system (phase-earth, phase-neutral, and phase-phase).

**NOTE:** Readings vary depending on the length of the run, the number, and size of conductors and the level of moisture in the atmosphere.

6. Record the measured values in an insulation test report.

**NOTE:** Verify that the poles on the cast resin busbar trunking system and those on the transformers, switches, meters, and so on, correspond correctly on electrification.

## Electrifying the Line

### **DANGER**

#### **HAZARDOUS VOLTAGE**

Exercise these precautions during electrification of the line:

- Qualified personnel must be present for the first time when the line is electrified.
- Hazardous situations can be encountered when the cast resin busbar trunking system conductors are electrified for the first time. Therefore, follow the relevant instructions along with the country-specific regulations valid in each case.
- Undetected short circuit or earth failures caused by incorrect installation can lead to serious consequences after voltage is applied.

**Failure to follow these instructions will result in death or serious injury.**

Follow these rules to electrify the line:

- Ensure that there is no electrical load in the cast resin busbar trunking system when it is being electrified for the first time. Check the entire system to ensure that none of the electrical loads connected to the system are switched on.
- You must electrify the line step by step, starting at the power supply and moving towards the loads. The principal elements must be electrified first, followed by the feed equipment and finally, the secondary element circuits.
- After the line has been electrified, equipment such as lights, contactors, heaters, and motors can be switched on.
- Faults caused by short circuits must trigger the protective device for the feeder unit in the manner prescribed by the official regulations. Ensure that the system is de-energized before you eliminate the cause of the fault.

Observe the following safety rules:

- Disconnect from the mains.
- Ensure that the system is de-energized.
- Secure against re-connection.
- Carry out earthing and short circuiting.
- Provide protection from adjacent live parts.

# ATEX Recommendations

## General Rules

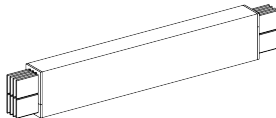
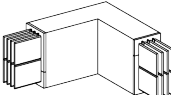
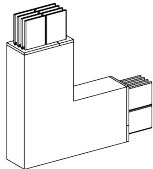
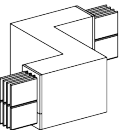
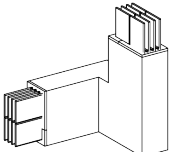
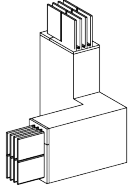
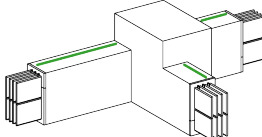
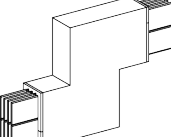
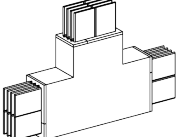
Resin encapsulated products of the busbar trunking system Canalis KRA and Canalis KRC are considered as devices of group II category 3G, according to directive 2014/34/EU, appendix I.

According to directive 99/92/EG (ATEX 137) busbar trunking system can be used in zone 2, as well as gas groups II A, II B, and II C, which are potentially explosive atmospheres due to flammable substances in temperature ranges of T1 to T5.

Resin encapsulated products of the busbar trunking system Canalis KRA and Canalis KRC, produced according to directive 2014/34/EU Appendix I, are devices of the group II category 3D and can be used in zone 22 according to directive 99/92/EG (ATEX 137) and in areas of dust groups III A, III B, and III C (flammable dusts).

Follow the requirements EN 60079-14:2014 during the operation or installation procedure.




## Eligible Resin Encapsulated Elements

<p><b>KR••••ET••• straight feeder lengths</b></p>	<p><b>KR••••LP•• flat elbow</b></p>	<p><b>KR••••LC•• edgewise</b></p>
		
<p><b>KR••••ZP•• flat zed unit</b></p>	<p><b>KR••••CP•1 edgewise and flat zed</b></p>	<p><b>KR••••CP•2 edgewise and flat zed</b></p>
		
<p><b>KRC••••TD• flatwise tee</b></p>	<p><b>KR••••ZC•• edgewise zed unit</b></p>	<p><b>KRC••••TC• edgewise elbow unit</b></p>
		

# ATEX Markings on the Labels of Busbar Trunking Elements

Busbar trunking elements suitable for installation in explosion hazard (EX) environments have a label that includes all the necessary ATEX markings:

- Allowable temperature range
- Allowable EX environments and EX symbol
- SEV registration number
- Short circuit currents
- Rated voltage
- Rated current
- Note to read the manual

<b>Canalis® KR</b> <b>KRA4000ET430</b> KR 4X4000AL STRAIGHT FEEDER LENGTH KR 4X4000AL Прямая секция Product Description (other language)  <b>X = 3000</b>		L1,L2,L3,PEN  <b>In = 4000A</b> <b>Ui = 1000V</b> <b>f = 50... 60 Hz</b> <b>Icw = 100kA</b> <b>Ipk = 220kA</b> -20°C ≤ Tamb ≤ +35°C <b>IP68</b>	EN 61439-6 IEC 61439-6 <b>CE</b> <b>UK CA</b> II 3G Ex mc IIC T5 Gc II 3D Ex mc IIC T96 °C Dc SEV 17 ATEX 0169 X Attention - read Manual Made in Switzerland Сделано в Швейцарии Швейцарияда жасалган
<b>POS: T21C-01</b>		*20305500100000	
7599940-10  Bar code / Code à barres	Visa: 	Schneider Electric Industries SAS 35, rue Joseph Monier CS 30323 F - 92506 Rueil Malmaison Cedex 	

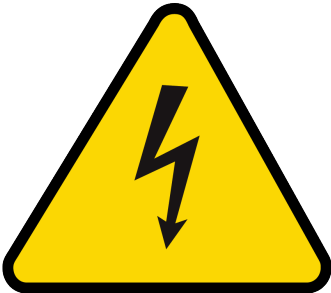

## Special Instructions and Conditions for EX Environments

An yearly inspection of the following system components is recommended, as applicable to each individual project.

Electrostatic charging of the insulation is to be prevented in the following manner. Maintenance and cleaning work is only to be carried out after ensuring that the atmosphere is free of explosion hazard substances.

The insulation material of the entire busbar trunking system in an EX environment is to be thoroughly checked for damage and cracks.

Elements suitable for installation in EX environments have the following label:

	 <b>WARNING</b>
	<p><b>HAZARD OF ELECTROSTATIC DISCHARGES</b></p> <ul style="list-style-type: none"> <li>• Ensure the atmosphere is free of explosive hazardous substances before working on maintenance and cleaning.</li> <li>• Read and follow instruction manual.</li> </ul> <p><b>Failure to follow these instructions can result in death or serious injury</b></p>



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As standards, specifications, and design change from time to time, please ask for confirmation of the information given in this publication.

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