

# Installation for **RCP** busbar systems.





# **INDEX**

Warnings	3
Handling	4
Handling for vertical installation	7
Good reception	<b>9</b>
Notification	<b>9</b>
Storage of Hardware and Chemical Components	10
Installation instructions	11
Distance and dimensions	12
Type of supports	15
Rules for support installation	18
Junction installation	<b>22</b>
Junction IP 68-55	32
Fire barrier	33
Switchboard connection	35
Final test and periodic inspections	36
Contact us	38



### **WARNINGS**

These instructions are provided to ensure appropriate storage, correct installation, and efficient use of the system.

Note: carefully read these instructions upon receipt of the material and before installing the system, and putting it into operation.

The installation must be completed by competent and suitably trained personnel, as prescribed by IEC 11-27 and 50110-1:2004-11 (IEC 11-48) standards, corresponding international standards, or specific applicable standards of the individual countries of installation.

In order to guarantee the safety of personnel, the installation activities must only be carried out with the power voltage disconnected, unless otherwise stated.

### **WARNING**

When working with electric systems, pay particular attention to the risk of electric shock. Electric shocks can cause serious injury, or even death.

NOTE: Do not tamper or perform modifications to products manufactured by BTicino S.p.A. without written authorization by manufacturer.

BTicino S.p.A. does not authorize any kind of repairs. All tampering, or modifications not authorized in writing by BTicino S.p.A. will void the product warranty.

# WARNING HAZARD OF CRUSHING, FRACTURES AND CHEMICAL EXPOSURE

- Wear personal protective equipment 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 cast resin busbar systems.
- Work with extreme caution and follow the instructions provided in the manual.
- Follow all the safety instructions described in the material safety data sheets while working with chemicals.
- Failure to follow these instructions can result in death, serious injury, or equipment damage.













# HANDLING

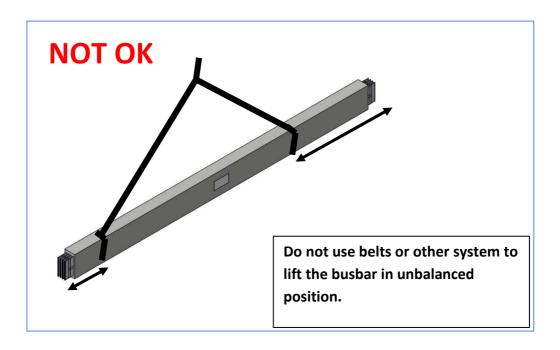
When handling the material, comply with the regulations for safety in the workplace pursuant Leg. Decree No. 81 dated 09/04/2008 (Consolidated act on safety in the workplace).

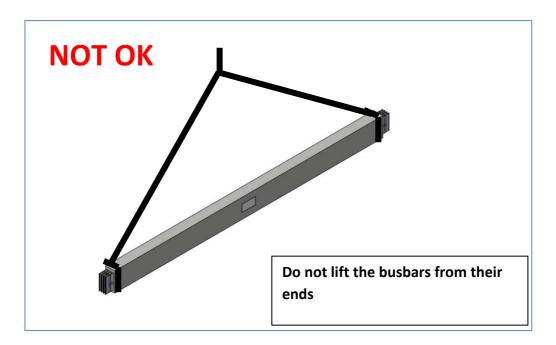
Follow the indications supplied to prevent damage to materials, or risks to personnel.

Below are the instructions to follow for a correct material handling.

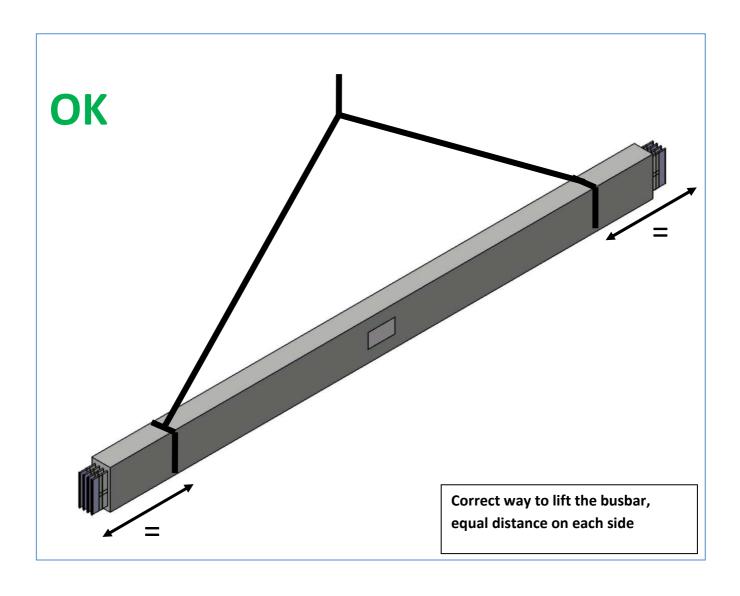
- 1 Always pay the utmost attention when opening packages.
- 2 To open wooden cases, in which the materials are dispatched to protect them, use a claw hammer.
- 3 Handle the busbars with due care and attention. Do not subject busbars to torsions, dents, violent impact, or sharp movements that may damage their internal components.
- 4 Do not lift the busbars from their ends. This could not just damage the busbar, but also cause injury to the personnel carrying out the operation. When using a crane to install the busbar, use nylon slings to balance the weight.
- 5 When not installing the busbar immediately upon receipt, ensure appropriate storage for the time required before installation, following the storage instructions.
- 6 Do not drag the busbar along the floor. This could cause irreversible damage.
- 7 To correctly move busbars, cranes shall be used. These would enable to lift the busbars from the floor very easily.
- 8 Do not move already assembled busbars, as this would cause stress at the point of the electric joint.





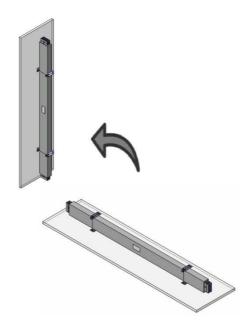


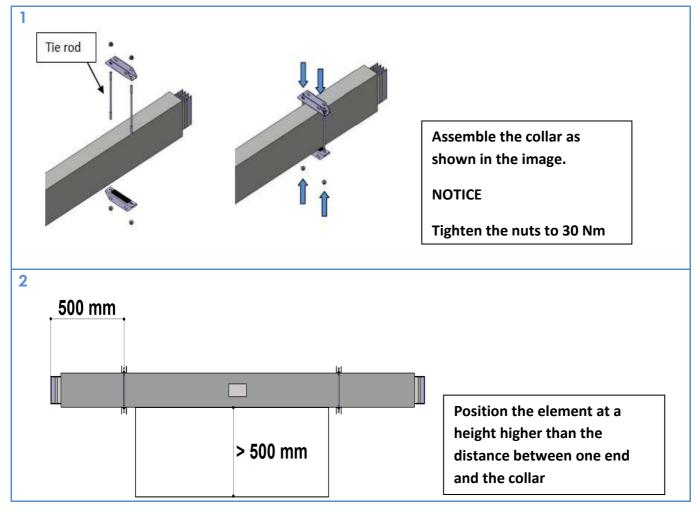




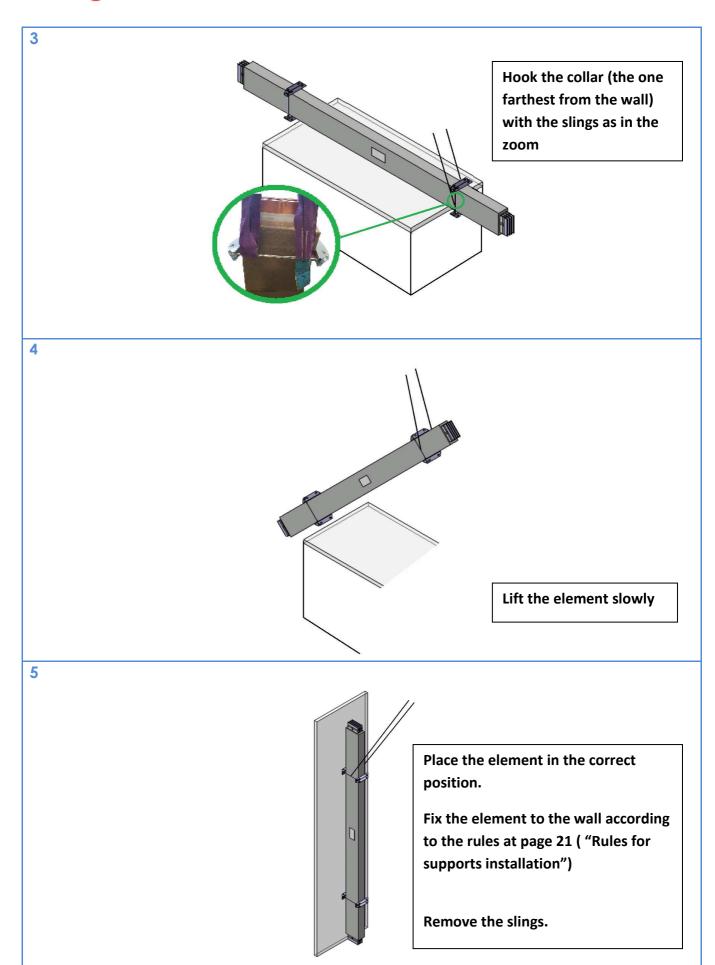


# HANDLING FOR VERTICAL INSTALLATION











### **GOOD RECEPTION**

Upon receipt of the goods check the following:

- 1 integrity of the packaging, and the goods, if delivered in a see-through package
- 2 consistency of the material with the Delivery Note and the packing list, if supplied
- 3 consistency of the material with the order acknowledgement details In case of any disclaims, please inform us in writing following the instructions found in the notifications section.

### **NOTIFICATIONS**

In case of any disclaim, please forward your official complaint to the ITPostVenditaZucchini@bticino.it e-mail address, including the notification form MODZ017.

Ensure that the MODZ017 form is correctly filled in, as this will enable us to answer more promptly to your notification. This means that all fields must be completed, including a detailed description of the disclaim.

Whenever possible, with each notification, attach photos of the items affected. When notifying that a wrong item has been received, please indicate the item code no. found on the packaging, and the item code no. found on the part (if possible include a photo of the labels).

In case of damaged material, attach photos of the affected part and the packaging (if present).

In case of hidden damage (outer packing undamaged, material inside damaged), or if the transport was the responsibility of BTicino, please contact us immediately so that we may initiate a complaint procedure against the freight forwarder.

We remind you that the maximum limit for a hidden damage complaint is 7 days from the receipt of goods.



We recommend that upon receiving the goods, the integrity of the packaging is checked WITH THE FREIGHT FORWARDER PRESENT. If you find that the packaging has suffered damage and/or collisions of varying degree, please write MATERIAL RECEIVED DAMAGED on the Delivery Note, to enable us to initiate a complaint procedure against the freight forwarder. If the freight forwarder stops you from indicating on the Delivery Note that the goods have been received in damaged condition, or from performing the visual inspection, we suggest that you DO NOT ACCEPT THE DELIVERY. This procedure will enable us to immediately initiate the complaint procedure against the freight forwarder, and to quickly replace any damaged material received. If the transport is at your charge, we recommend that you immediately issue a complaint against the freight forwarder.

If you require technical support intervention from us, tick the appropriate box in the MODZ017 form. We remind you that this technical support intervention may entail a fee (ANIE tariffs, plus out-of-pocket expenses) in case of installation problems and/or malfunctioning or damage caused by the customer.

## **STORAGE**

Below are the instructions to follow for a correct storage of the materials. Failure to comply with the indications supplied may cause damage to the materials, and make the product warranties void.

Store the material in a dry place, protected from weather conditions such as rain and humidity, to prevent the formation of condensation inside the busbars.

Also ensure that the busbars are protected from smoke, water, soil, mud, dust, or dirt in general. Position the material in a way that prevents a physical damage to it. We recommend to not store the busbars outside.

It is recommended that the material is stored indoor, in a dry location. In case of storing the busbars outside for short-medium periods, ensure that it is appropriately protected, to avoid accidental infiltration of water, which will result in them being damaged.

The busbars can be transported and stored at a temperature between -25°C and +55°C. Do not store the cast resin mix in direct sunlight, below 5 °C or above 40 °C. (Prior to casting, store all the junction kit components at a temperature between 18°C and 25°C for at least 24h.)



# PRELIMINARY INSTALLATION INSTRUCTIONS

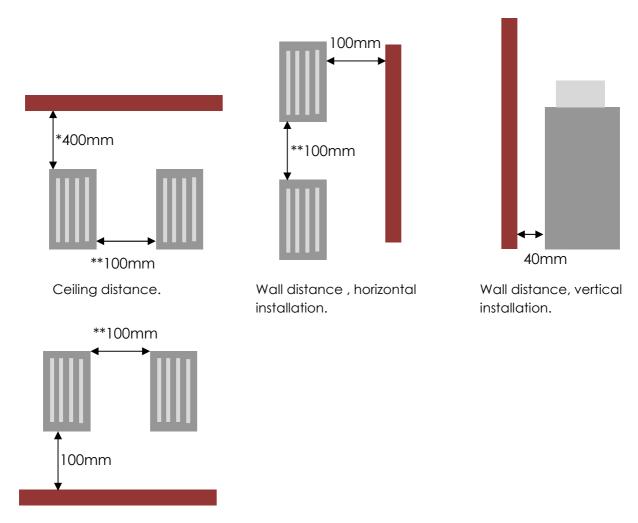
Before the installation, all material should be inspected for damage. When installing the busbars comply with the following:

- 1 For the installation only use bracketing systems supplied by BTicino, and follow the instructions found in the catalogue or enclosed with the item.
- 2 Only use accessories supplied by BTicino.
- 3 Check that the element's position coincides with what indicated on the project drawing.
- 4 Check that the system operating current does not exceed the product rated current, downgrading it if required.
- 5 Check if the busbar capacity must be downgraded (for example due to high ambient temperature, presence of harmonics, etc.)
- 6 Before using the junction kit checks that the resin is clear and liquid. Do not use the resin if it is milky or crystallized. Check that the filler material/sand is dry.
- 7 The minimal temperature to pour the junction is 5°C.
- 8 Before start pouring the junction be sure that all the elements of the line are in the correct position.



# Distances and dimensions

During the placement of the busbar elements pay attention to distance from the ceiling, wall and floor. Below the minimum distance:



Floor distance.

The minimum distances are important to avoid problems during the pouring of the cast resin junction.

These distances are applied to every RCP rating (from 630A to 6300A).

<sup>\*</sup>Minimum reccomended distance to be able to pour the resin mixture in the junction \*\* This distance can be reduced to 80mm if the supports are not installed one beside the other and NEVER with the solutions 5000A Al and 6300A Cu.



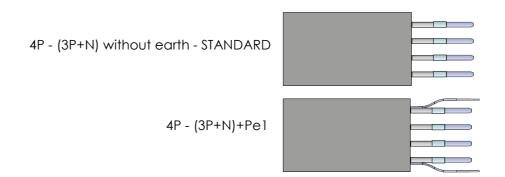
If you do not use supports supplied by Bticino to fix the busbar, you must verify the support capacity load of your supports. You can use the following technical data:

	RCP – 4 CONDUCTROS – ALUMINIUM*											
			SINGLE BARS DOUBLE BARS								2 x 2 DOUBLE	
Rating	Α	630	800	1000	1250	1600	2000	2500	3200	4000	500	00
Weight (RCP Standard 4P)	Kg/m	29.2	35.4	35.4	37.5	46.9	57.6	72.7	91.2	110.3	72.7	72.7
Weight (4P+PE 1)	Kg/m	29.9	36.3	36.3	38.4	47.8	58.5	74.4	93	112.1	74.4	74.4

<sup>\*</sup>For more information contact us or check the RCP catalog

	RCP – 4 CONDUCTROS – COPPER*											
			SINGLE BARS DO							ARS		3200 JBLE .RS
Rating	Α	800	1000	1250	1600	2000	2500	3200	4000	5000	63	00
Weight (RCP Standard 4P)	Kg/m	41.1	50.4	50.4	65.1	71.4	89	127	141	173.6	127	127
Weight (4P+PE 1)	Kg/m	41.9	51.3	51.3	65.9	72.3	89.9	129	143	175.4	129	129

\*For more information contact us or check the RCP catalog





	RCP – 5 CONDUCTROS – ALUMINIUM*											
			SINGLE BARS DOUBLE BARS							2 x 2 DOUBLE		
Rating	Α	630	800	1000	1250	1600	2000	2500	3200	4000	500	00
Weight (RCP Standard 5C)	Kg/m	39	48.2	48.2	52.4	67.1	83.1	102	131	160.5	102	102
Weight (5C+PE 1)	Kg/m	39.8	49.1	49.1	53.3	68	83.9	104	133	162.3	104	104

<sup>\*</sup>For more information contact us or check the RCP catalog

	RCP – 5 CONDUCTROS – COPPER*											
			SINGLE BARS DOUBLE BARS							2 x 3 DOl BA	JBLE	
Rating	Α	800	1000	1250	1600	2000	2500	3200	4000	5000	63	00
Weight (RCP Standard 5C)	Kg/m	48.2	59.3	59.3	76.7	84.5	105	150	166.6	205.7	150	150
Weight (5C+PE 1)	Kg/m	49	60.2	60.2	77.6	85.4	106	152	168.4	207.5	152	152

<sup>\*</sup>For more information contact us or check the RCP catalog

	RCP – 3 CONDUCTROS – ALUMINIUM*											
				SINGLE	E BARS		DOUBLE BARS			2 x 2 DOUBLE		
Rating	Α	630	800 1000 1250 1600 2000 2500 3200 4000 5000							00		
Weight (RCP Standard 3C)	Kg/m	23.9	28.8	28.8	30.4	38	46.6	59.1	74	89.3	59.1	59.1
Weight (3C+PE 1)	Kg/m	24.6	29.7	29.7	31.3	38.9	47.5	60.9	75.8	91.1	60.9	60.9

<sup>\*</sup>For more information contact us or check the RCP catalog

	RCP – 3 CONDUCTROS – COPPER*											
			SINGLE BARS DOUBLE BA							ARS		3200 JBLE JRS
Rating	Α	800	1000	1250	1600	2000	2500	3200	4000	5000	63	00
Weight (RCP Standard 3C)	Kg/m	32.4	40.2	40.2	50	57.8	71.2	97.5	114.4	138.9	97.5	97.5
Weight (3C+PE 1)	Kg/m	33.2	41.1	41.1	50.9	58.7	72.1	99.3	116.2	139.88	99.3	99.3

<sup>\*</sup>For more information contact us or check the RCP catalog

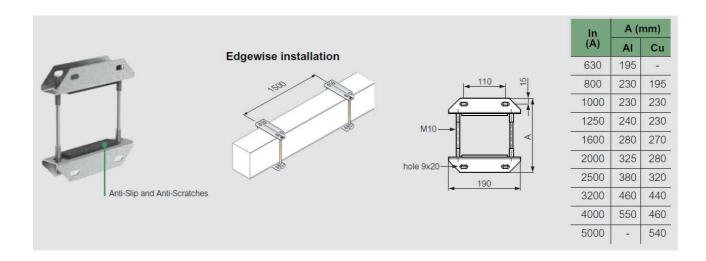


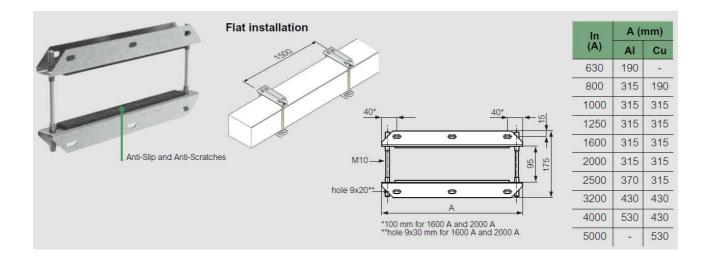
# Types of supports

There are brackets for vertical and for horizontal suspension, on request we have brackets solution for aggressive environments.

### HORIZONTAL SUSPENSION BRACKET

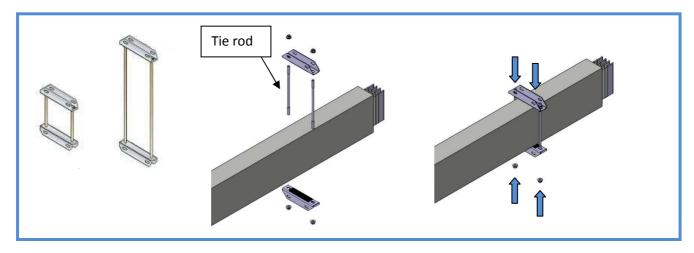
The brackets enable sturdy installation of the busbar to the system support structures. The recommended installation distance between brackets is 1.5 meters







# **ASSEMBLY**



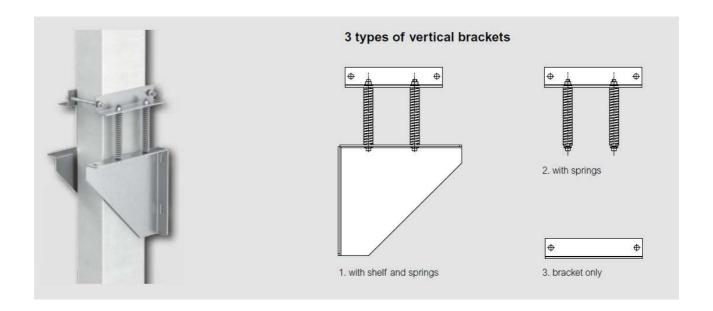
# NOTICE

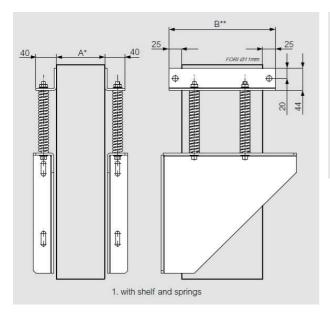
Tighten the nuts to 30 Nm.

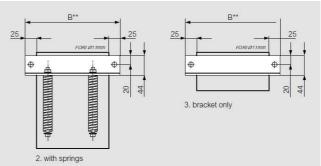


# **VERTICAL SUSPENSION BRACKET**

In case of rising mains, thanks to pre-load springs (see page 18), these brackets absorb the forces pressing on the busbar and direct any expansion in a precise direction. They therefore operate as a limitation, and support the traction and compression forces of the busbar trunking system.







A\*: Depending of the quantity of requested conductors

B\*\*: Depending of the rating of busbar



# **Rules for supports installation**

- 1 A support shall never coincide with a junction
- 2 For easier leveling, always use two supports for each element.
- 3 Always maintain a distance of at least **530 mm** between the center of junction and the support on one side of the junction to be able to assemble the junction kit.
- 4 The minimum distances between the installed elements, walls, and ceilings must be taken into account while installing the supports, as shown before ( distance and dimension Paragraph ).
- 5 Mount all supports in the corresponding locations before installing the cast resin busbar trunking system.
- 6 Mark the anchorage holes on the wall, using the support as a template.
- 7 Use the appropriate anchor bolts for the weight to be supported (see the table below).
- 8 Ensure the support has the correct number of springs (see the table below).

MATERIAL	RATING (A)	QUANTITY OF SPRINGS	MAX LOAD PER BRACKET (KG)
	630	4	300
	800	4	300
	1000	4	300
	1250	4	300
AL	1600	6	300
	2000	8	600
	2500	8	600
	3200	12	600
	4000	12	600
	800	4	300
	1000	4	300
	1250	4	300
	1600	6	300
CU	2000	6	300
	2500	8	600
	3200	8	600
	4000	12	600
	5000	12	600



# **NOTICE**

For the case of 5000 A (AI) and 6300 A (Cu), please, consider the following indications.

- Vertical solution (only one):

in the picture it is shown how to install a rising main for these two ranges 5000 A (Al) and 6300 A (Cu);

The minimum distance between two busbars is 100 mm;

- Necessary brackets:

RCP 5000 A (AI) = consider 2 brackets of 2500 A (AI)

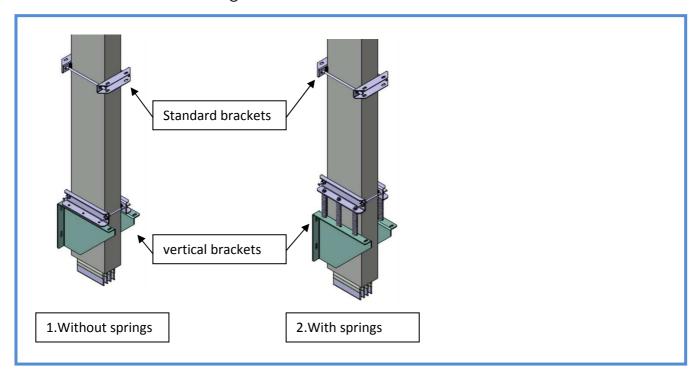
RCP 6300 A (Cu) = consider 2 brackets of 3200 A (Cu)



The distance between two elements should be **more than 100 mm** 



There are two different configurations:

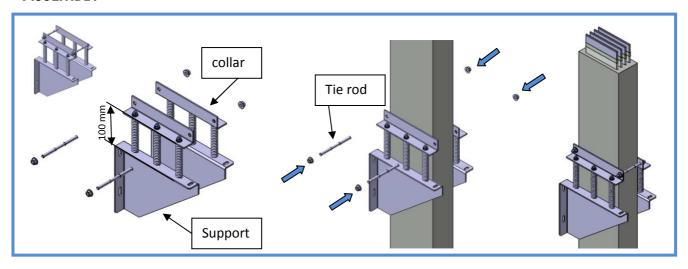


**Configuration 1**: use this configuration if the section line is <u>between 2 an 4 meters</u>. The vertical bracket must be secured to the wall; the standard bracket must be secured to shelves which can guarantee the load. The normal distance between standard brackets should be 1.5 meters.

**Configuration 2**: use this configuration if the section line is <u>over 4 meters</u>. The vertical bracket must be secured to the wall; the standard bracket must be secured to shelves which can guarantee the load. The normal distance between standard brackets should be 1.5 meters.



# **ASSEMBLY**



# **NOTICE**

All 3 types of brackets for the vertical solution will be installed as shown in the previous picture. ( with shelf and springs / with springs / bracket only )

If you use vertical brackets without springs you must fix at first the tie rods and the collar on the busbar and then fix the collar on the support.

Tighten the nuts to 30 Nm.



# **Junction** installation

### **WARNINGS**

- 1 Read all the instruction sheet (attached with mould kit) before starting the installation
- 2 Ensure that all contact surfaces are clean and free of impurities.
- 3 Ensure that the monoblock is exactly in-between two elements to be joined.
- 4 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.
- 5 Double check phase sequence on all terminal elements using a voltmeter.
- **6** Before casting, check the insulation resistance using an insulation tester with 1000 V rating. The insulation resistance for each element should be  $\geq$  100 M  $\Omega$ .
- 7 Prior to casting, store all the junction kit components at a temperature between 18°C and 25°C for at least 24h.
- 8 Before casting make sure that the element corresponds to the ones shown in the drawing (check item no. and reference present in the label).
- 9 Do not eat, drink, or smoke on the work site.
- 10 Use protective overalls, gloves, glasses, and masks.
- 11 In the event of unintentional spillage, clean with inert absorbent material (sand) and store the contaminated material in an appropriate container before disposal.
- 12 Ensure good ventilation of working areas and avoid inhalation of vapor.
- 13 Before mixing resin and hardener be sure resin is clear and without crystallization.
- 14 Do not cast at ambient temperature below 5°c or above 35°.
- 15 Delay casting if the required ambient temperatures cannot be maintained for a minimum of 6 hours.
- 16 Wash hands thoroughly with soap and warm water after work.
- 17 Before start pouring the junction be sure that all the elements of the line are in the correct position.



### **PROCEDURE**

Before starting ensure to have all the materials:

- 1 Resin and hardener ( ZU-65200002R / ZU-65200003R\* ).
- 2 Filler mix and bucket (ZU-65200001R).
- 3 Mould kit with release agent.
- 4 Rubber hammer
- 5 Industrial mixer (rated 750 W or above)
- 6 Clamping tools (only for vertical junction)
- 7 Metallic rasp or grinding stone
- 8 Silicone/silicone gun

\*For junction casting in environment temperature between 5°C to 18°C , you have to use the code ZU-65200003R

For junction casting in environment temperature between 18°C to 35°C , you have to use the code ZU-65200002R

One junction kit (resin + hardener + filler) could be used for more than a junction, please check the tables below:

		RCP 4 CONDUC	TORS JUNC	TION	
Material	Rating (A)	Number of junction per kit	Material	Rating (A)	Number of junction per kit
	630	2,50		800	2,50
	800	2,65		1000	2,65
	1000	2,65		1250	2,65
ALI	1250	2,70		1600	2,20
ALUMINIUM	1600	2,30	COPPER	2000	2,30
	2000	1,90	PE	2500	1,90
M	2500	1,40	_~	3200	1,15
	3200	1,15		4000	1,15
	4000	1,00		5000	1,00
	5000	0,70		6300	0,55

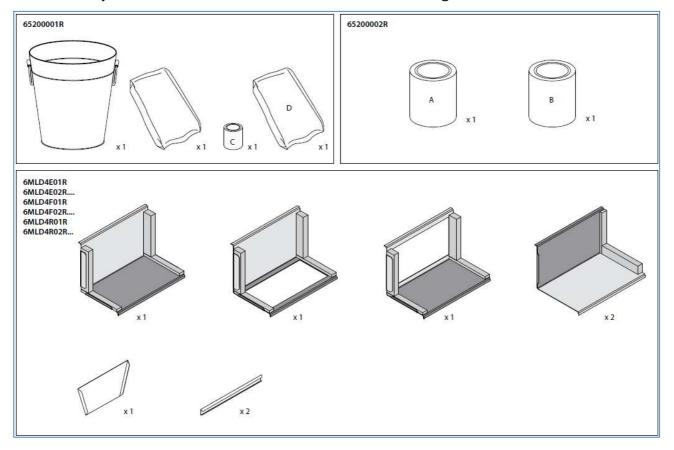


		RCP 3 CONDUC	TORS JUNC	TION	
Material	Rating (A)	Number of junction per kit	Material	Rating (A)	Number of junction per kit
	630	3,00		800	3,00
	800	3,00		1000	3,00
	1000	3,00		1250	3,00
ALI	1250	3,00		1600	2,60
M	1600	2,60	Ş	2000	2,60
ALUMINIUM	2000	2,15	COPPER	2500	2,15
M	2500	1,60	~	3200	1,30
	3200	1,30		4000	1,30
	4000	1,25		5000	1,25
	5000	0,80		6300	0,65

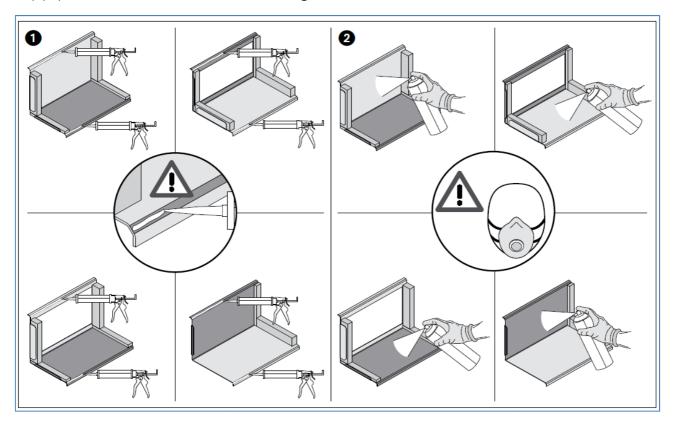
		RCP 5 CONDUC	TORS JUNC	TION	
Material	Rating (A)	Number of junction per kit	Material	Rating (A)	Number of junction per kit
	630	2,40		800	2,40
	800	2,50		1000	2,50
	1000	2,50		1250	2,50
ALI	1250	2,60		1600	2,10
ALUMINIUM	1600	2,30	COPPER	2000	2,20
Z	2000	1,85	PER	2500	1,90
M	2500	1,40	~	3200	1,10
	3200	1,10		4000	1,10
	4000	1,10		5000	1,00
l	5000	0,70		6300	0,55



Ensure the junction kit and the mould kit are not damaged:



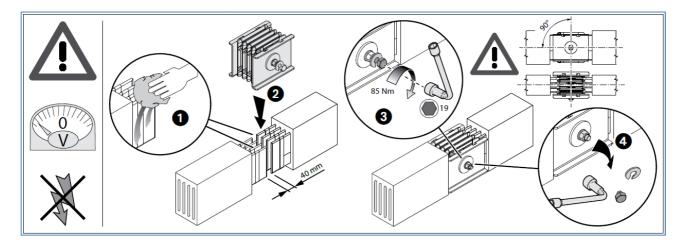
Apply the sealant and the release agent:





Ensure the correct position of the RCP elements, the distance between bars must be 40mm. Clean the bar's surface, do not remove the surface treatment (if applied). Fit the monoblock between the copper or aluminum conductors from above or below. Align it so that it extends equally on all sides. If necessary, gently knock the monoblock into place using a rubber hammer.

When the junction block is aligned, tighten the connecting bolt until braking up the nut.



### **NOTICE**

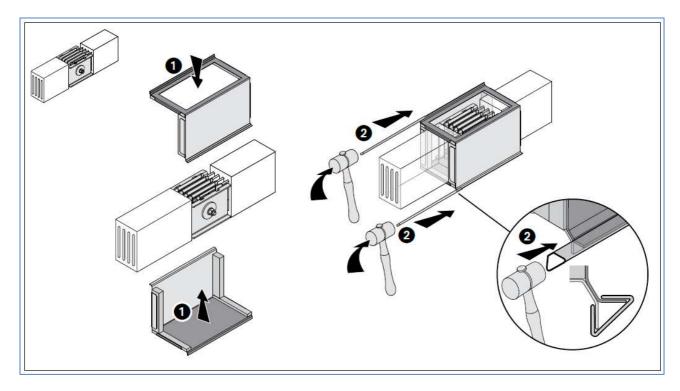
Dry possible wet parts with hot air at a temperature not higher than 80 °C and remove residues with mild reagents (e.g. trichlorethene) not corroding or creating abrasion on surface treatment (zinc, tin, silver coating) or on contact surface (copper).

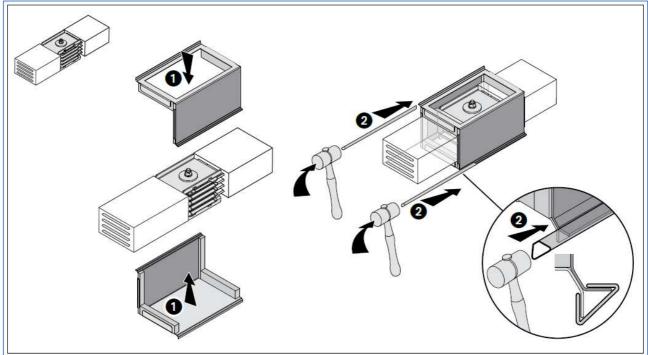
Blocks correctly adhere on bars (use a 0.05mm thickness gauge), i.e. conducting parts fully make contact.

Insulation test at 1000V, with minimum value of 100 MOhm, for each element. The insulation test has to be carried out between phases, between phases and neutral, and between every single phase and the earth ( when required ). If results are unsuccessful, identify the element and in case replace it or carry out further tests.



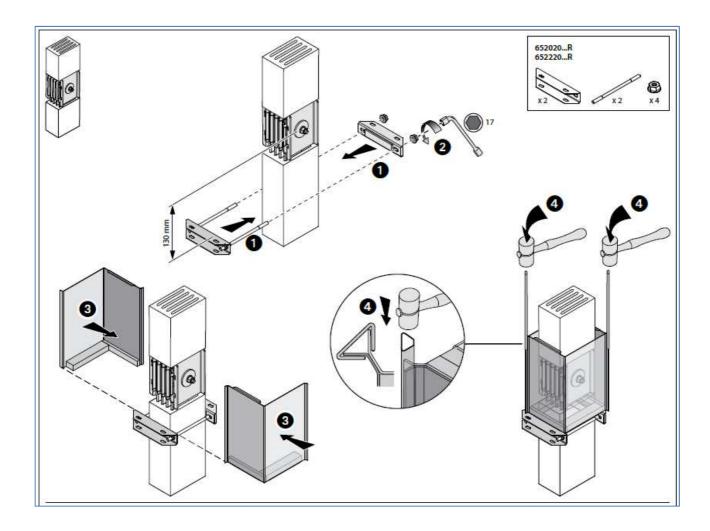
Place the mould on the mechanical connection and secure it with the two C-profiles.





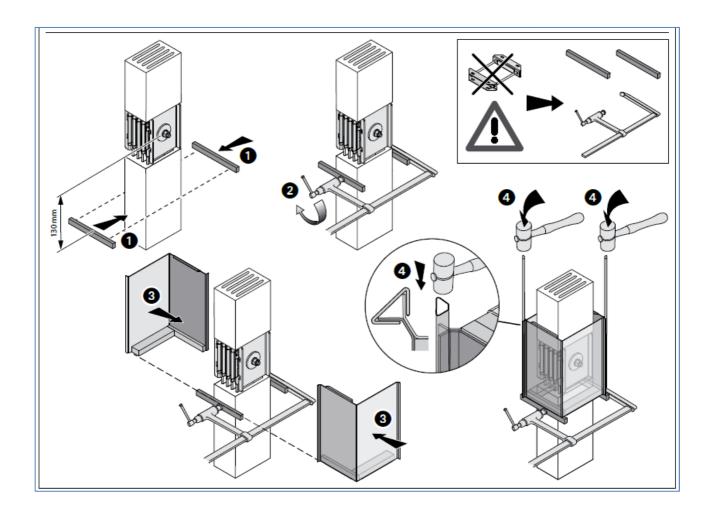


In vertical junction use a bracket to keep the mould in the correct position ( horizontal suspension bracket - edgewise installation)





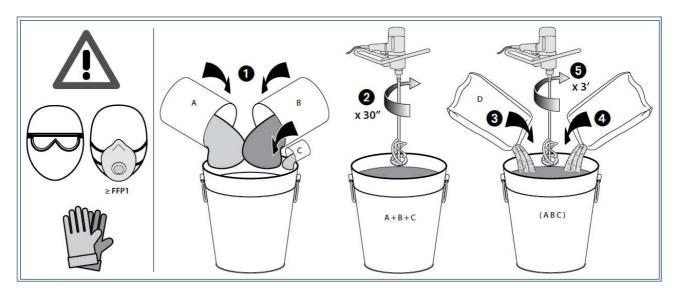
If you do not have a bracket or you prefer it, you can use two blocks and one clamping tool to keep the mould in the correct position (in the second case make sure that the blocks do not damage the busbar's surface. We recommend using wooden blocks for this solution.):



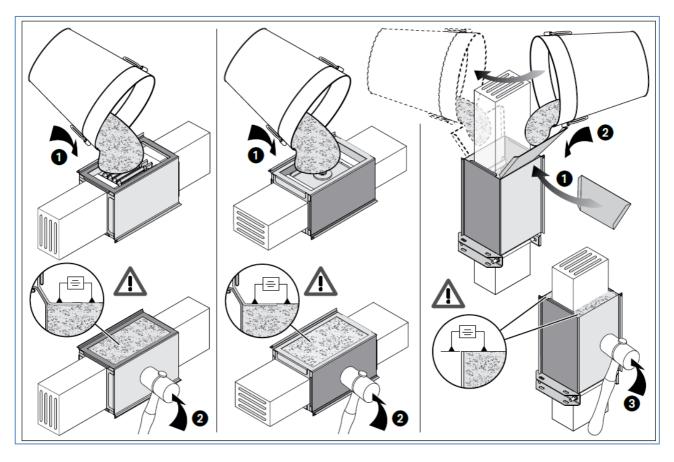


Mix all the component, checks the correct sequences in the following pictures. If the temperature is below 18°C you must add an additive ( ZU-65200003R ) to the resin during the operation 1.

During this process use mask with protection grade FFP1.

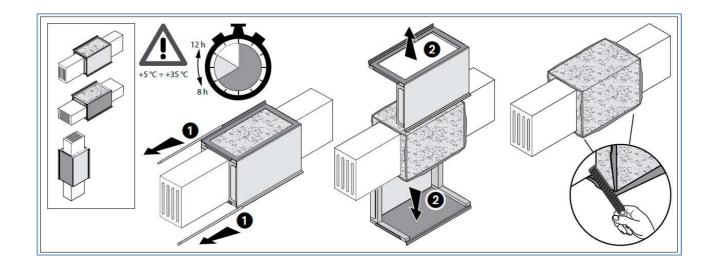


Pour the mix into the mould carefully. Use a rubber hammer to help the air bubbles go away. Check after 20 mins. If the resin has settled and it is not in the correct level (it is visibly underneath the brim of the cast molds), pour again up to the brim.





Allow the cast resin mix to harden then, remove the mould and use a metallic rasp to clean the edges.



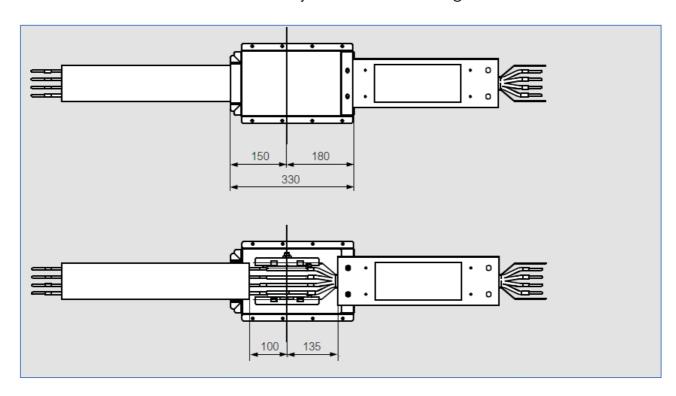


# **Junction IP68-IP55**

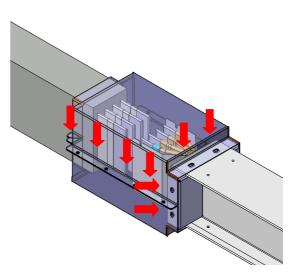
The RCP busbar system is compatible with SCP busbar system.

When you connect RCP with SCP the protection grade becomes IP55. The junction is very easy to install:

- 1 Check the correct position of RCP and SCP (see the picture below).
- 2 Check that the monoblock is the one already preassembled in the SCP element. It is very important to check this due to the fact that the SCP's monoblock might be bigger than the RCP monoblock for the same rating.
- 3 Fit the monoblock between the copper or aluminum conductors from above or below. If necessary, gently knock the monoblock into place using a rubber hammer.
- 4 When the junction block is aligned, tighten the connecting bolt until break up the nut.
- **5** Place the metallic caps to adapt the SCP's shape
- 6 Place the metallic cover over the junction and then tighten the screws.



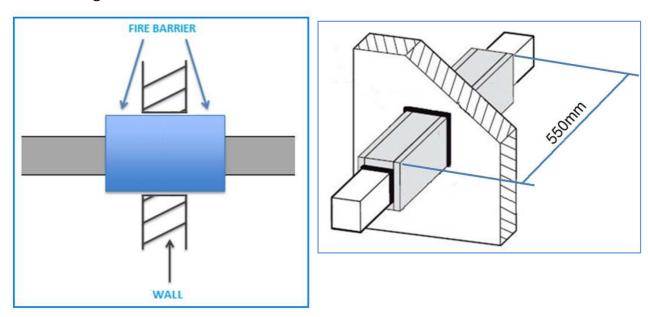




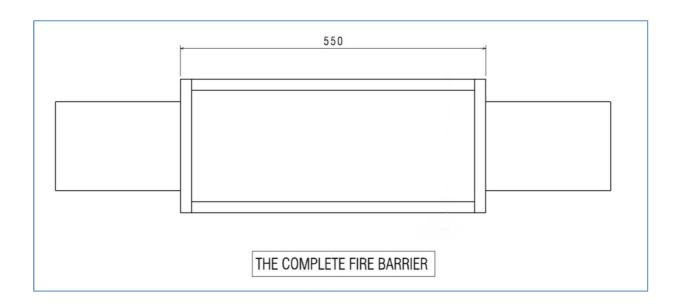


# Fire barrier

The fire barrier kit is composed of one part, through the wall. The total length is 550 mm.

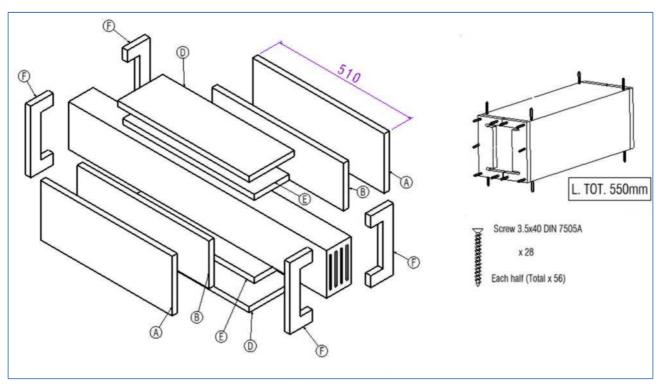


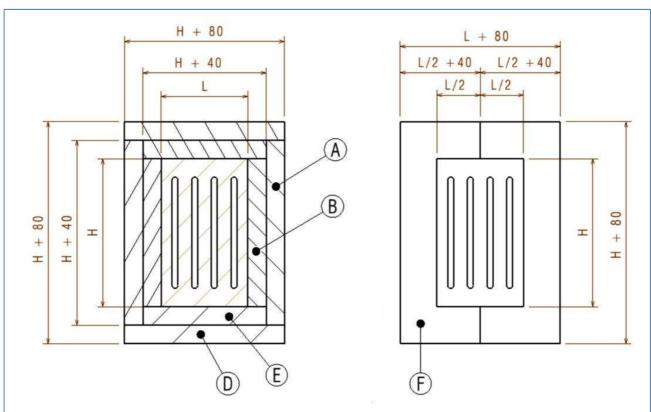
In the fire barrier kit there are 12 panels of fire resistant material, screw and mastic to fix the fire resistant sheet to the wall and to the RCP.





Once the barriers are assembled with screws, fill all the joints between panels with the promaseal paste and then work it with a putty knife to obtain a smooth and homogeneous aspect.





\*Check the RCP catalog for L and H dimensions



# Switchboard connection

On switchboard connections verify that:

- 1 the air distances between bars with different potentials are over 40 mm wide. If it is not the case, contact Eng. Dept. Zucchini Brand to evaluate the employment of correct insulating material.
- 2 the torque moment of connecting screws is correct (required values: 85 Nm for M12, 100 Nm for M14, 120 Nm for M16, 170 Nm for M18, 25 Nm for M8 and 50 Nm for M10).

The above mentioned inspections have to be carried out by personnel with a proper technical background and with controlling function/responsibility in the installation activities.



# Final test and periodic inspections

### **FINAL TEST**

Insulation test at 1000V, with minimum value of 1 MOhm, for the line. The insulation test has to be carried out between phases, between phases and neutral, and between every single phase and the earth ( when required ).

After having run the plant at the maximum working current, and let it work for at least 6 hours, carry out a thermal test. Stick labels on the hottest parts and mark them with progressive numbers to identify the element. Carry out the thermal test again on the labels. Fill the attached form with the measured values, together with ambient temperature and working current.

Thermal tests can be carried out with contact temperature sensors, with optical pyrometers or thermal cameras.

### PERIODIC INSPECTIONS

After having run the plant at the maximal working current for at least 6 hours, carry out a thermal test, taking in particular consideration the points where labels had been sticked during installation. Fill in the attached form with the measured values, together with ambient temperature and working current. If the measured temperature (DT) is 55 K or 15 K higher than the temperature measured during installation, get in contact with Customer Care Zucchini.

This thermal test can be carried out with contact temperature sensors, optical pyrometers or thermal cameras.

Perform a visual inspection of the entire line and verify the absence of cracks and crevices.



# Temperature form

PERSON IN CHARGE OF INSPECTION	
COMPANY ( if different from installing company )	
INSPECTION DATE	
SIGNATURE	

Check point n.	Measured T	Ambient T	Dt	lb

Dt = Measured T - Ambient T

Ib = Working current



For further information or explanation please get in contact with Customer CareZucchini.

Tel: 0365 332811 Fax: 0365 31934 E-mail: IT-PostVenditaZucchini@bticino.it