

**Storage, installation and maintenance for
MS busbar systems**

MINISBARRE (MS)

BUSBAR FROM 63, 100 AND 160 A

The compact solution for medium power distribution



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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 CEI 11-27 and 50110-1:2004-11 (CEI 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.

STORAGE INSTRUCTIONS

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** Do not use belts or other systems to lift them to the junction windows, or the expansion cap. This may damage the busbars.
- 6** When not installing the busbar immediately upon receipt, ensure appropriate storage for the time required before installation, following the storage instructions.
- 7** Do not drag the busbar along the floor. This could cause irreversible damage.
- 8** To correctly move busbars, cranes may be used. These would enable to lift the busbars from the floor very easily.

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 IT-PostVenditaZucchini@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 not to 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 material can be transported and stored at a temperature between -25°C and +55°C.

INSTALLATION INSTRUCTIONS

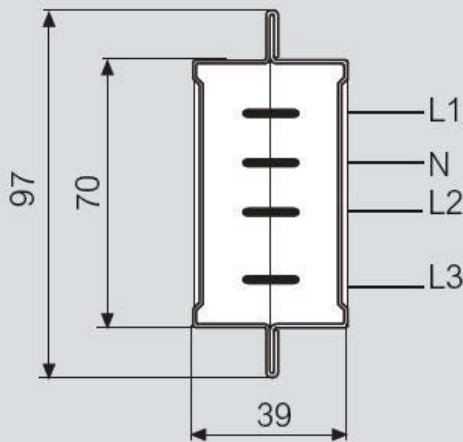
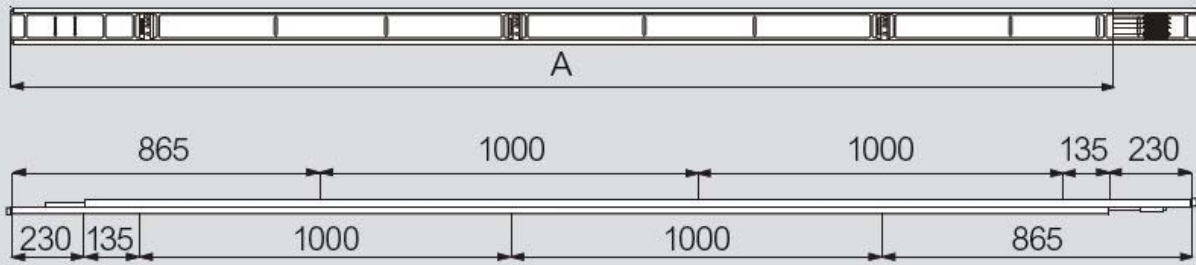
Before the installation, all material should be inspected for damage.

When installing the busbars comply with the following:

- 1** do not position the busbars near pipes containing liquids.
- 2** for the installation only use bracketing systems supplied by BTicino, and follow the instructions found in the catalogue or enclosed with the item.
- 3** only use accessories supplied by BTicino.
- 4** check that the operating voltage coincides with that indicated on the product plate.
- 5** check that the system operating current does not exceed the product rated current, downgrading it if required.
- 6** check if the busbar capacity must be downgraded (for example due to high ambient temperature, presence of harmonics, etc.)
- 7** do not install the standard product in particular environments (high concentration of chlorine, explosive atmosphere, etc.).
- 8** for outdoor installations, protect the busbar with a protection canopy. The IP55 protection degree can be affected by unsuitably protected outdoor installation.
- 9** Should the load of the conductors with current "I" be near the nominal capacity , the possibility of electrical disturbance must be accounted for.
- 10** The area in which the busbar is to be installed must be assessed to see if it is suitable for the type of product that has been chosen (proximity to excessive heat sources, presence of corrosive fumes, etc).

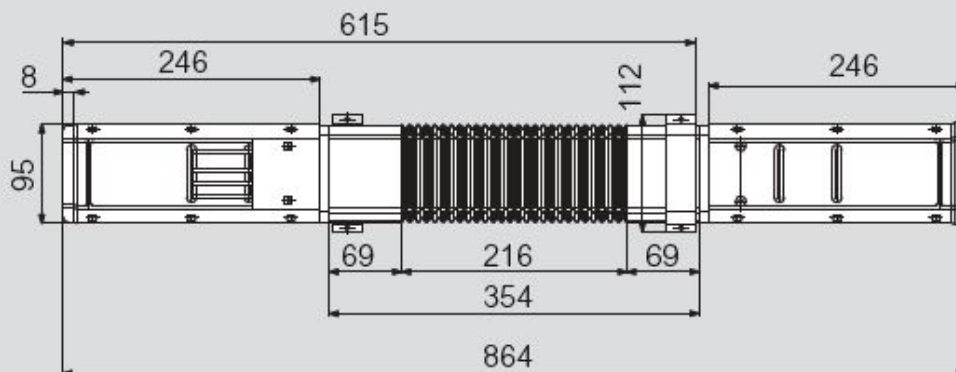


Dimensional data



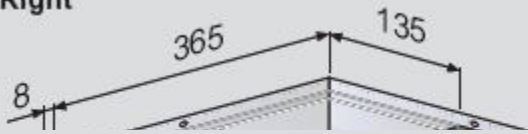
In (A)	Item code	A (m)	Weight (kg)
63	51530101	3	7,890
	51530116	2	5,260
	51530115	1,5	3,945
	51530114	1	2,630
	51530112	< 1,5	-
	51530113	> 1,5	-
100	51510101	3	7,890
	51510116	2	5,260
	51510115	1,5	3,945
	51510114	1	2,630
	51510112	< 1,5	-
	51510113	> 1,5	-
160	51520101	3	9,290
	51520116	2	6,190
	51520115	1,5	4,645
	51520114	1	3,100
	51520112	< 1,5	-
	51520113	> 1,5	-

Flexible joint (Art. 51511261 and 51521261)



Horizontal elbow

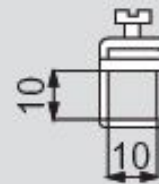
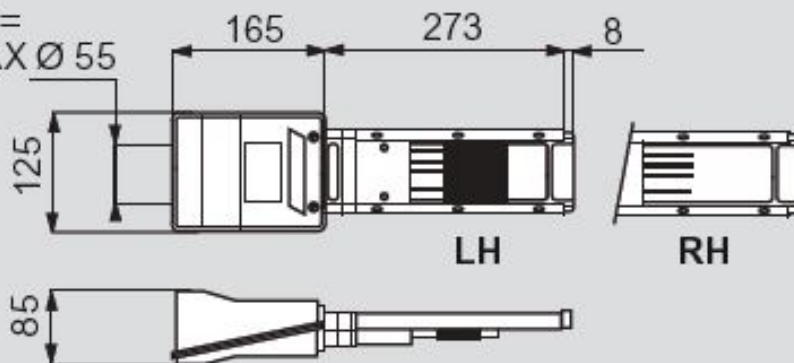
Right



Dimensional data

MS63 - MS100

d 1 =
MAX Ø 55

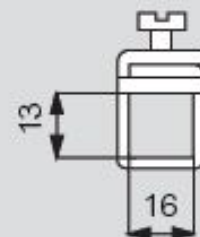
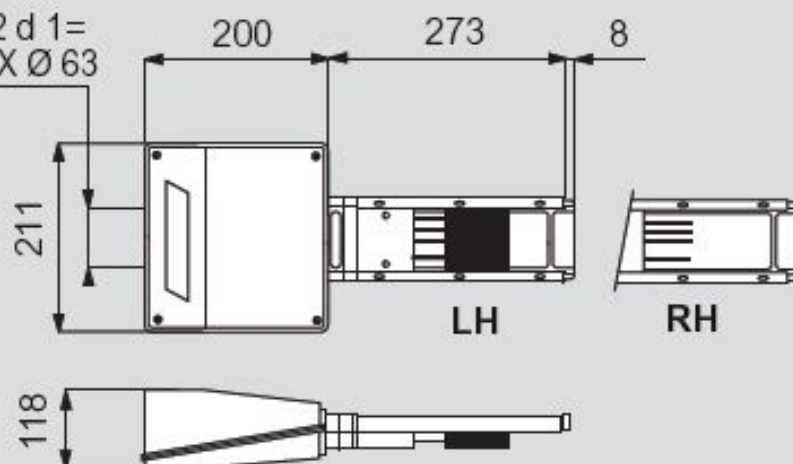


Cable max
Section 35 mm²

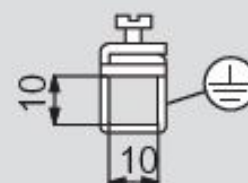
Item code	Weight (kg)
51511051 (RH)	1,732
51511052 (LH)	1,874

MS160

n° 2 d 1 =
MAX Ø 63



Cable max
Section 70 mm²

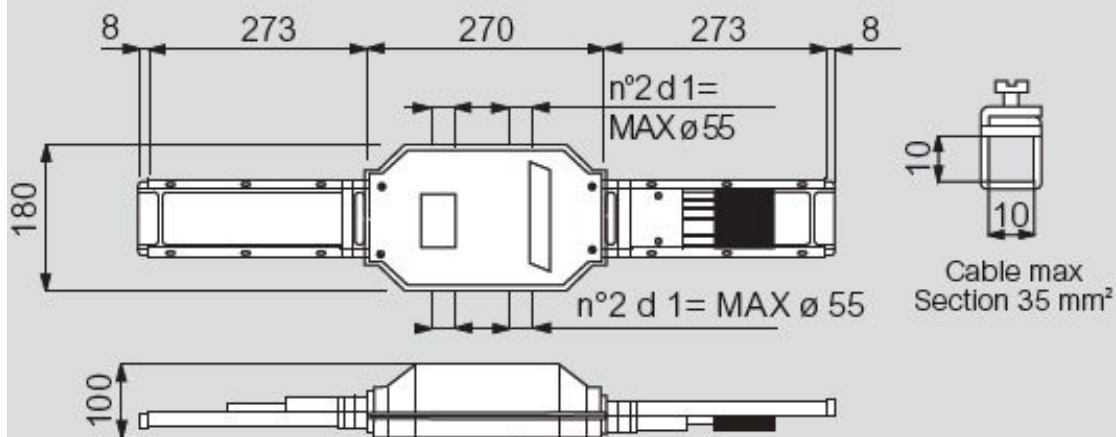


Cable max
Section 35 mm²

Item code	Weight (kg)
51521051 (RH)	2,218
51521052 (LH)	2,360

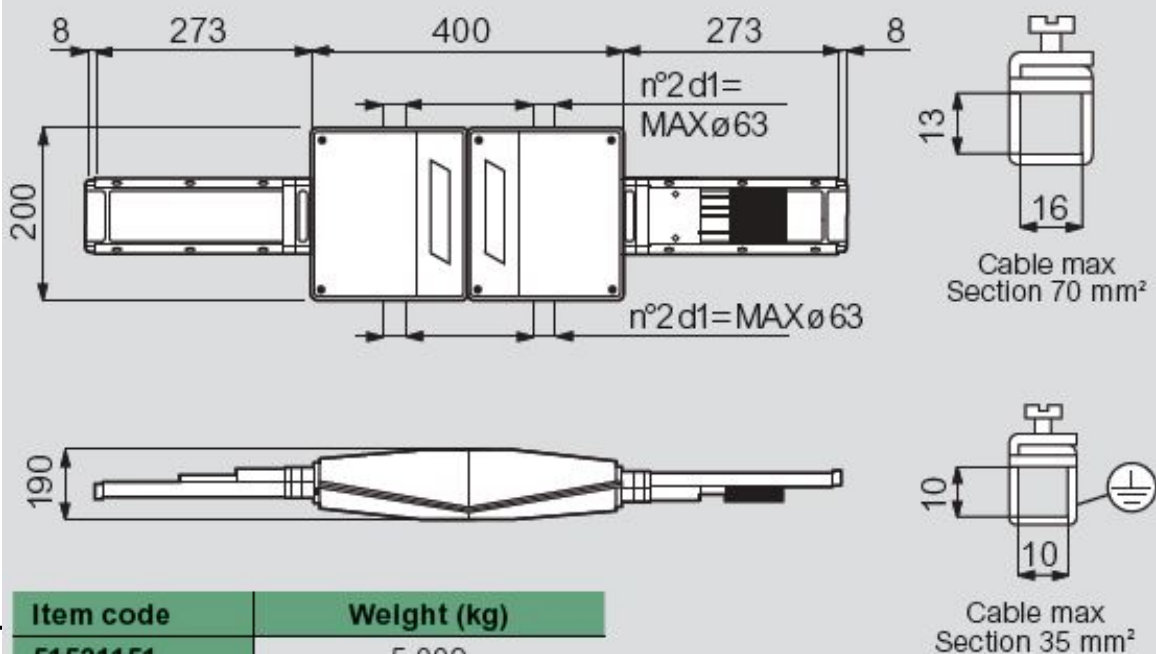
Versions with switch disconnecter are also available on request.

Intermediate feed unit MS63 - MS100



Item code	Weight (kg)
51511151	3,500

MS160



Item code	Weight (kg)
51521151	5,000

Cable max
Section 35 mm²



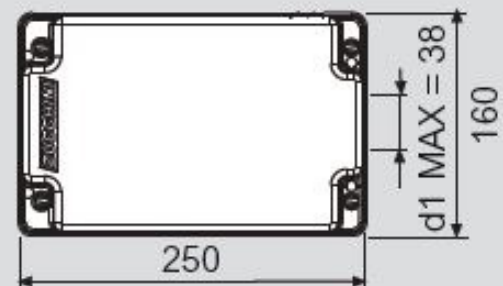
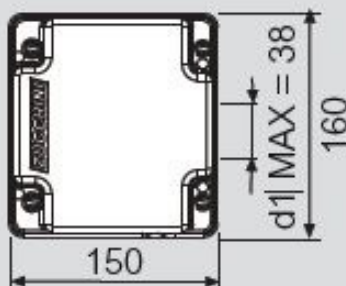
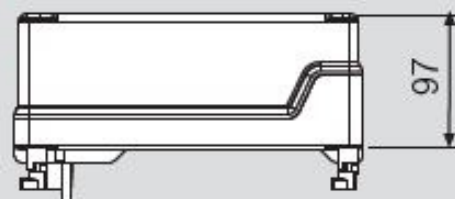
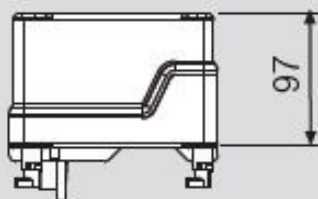
ACCESSORIES

Cat.Nos

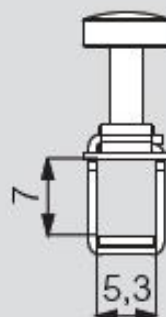
Installation accessories

- 51501351 End cover
- 51500161 IP55 joint cover (one set for each junction)
- 51500160 IP55 outlet cover (6 every 3m straight element)
- 51002002 suspension bracket (1 bracket every 2 metres)

Dimensional data



Item code	Weight (kg)
51515071	0,680
51515076	0,680
51515077	0,950
51515078	0,950
51515072	0,730
51515073 *	0,930
51515074 *	0,960
51515075 *	0,990

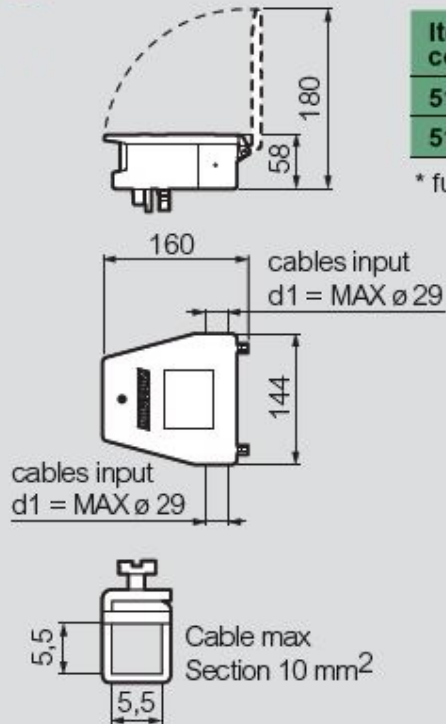


Cable max
Section 16 mm²

Energy withstand 400.000 A2s
Power loss 10 W
Total insulating Tap-off box
* Power loss 16 W

Dimensional data

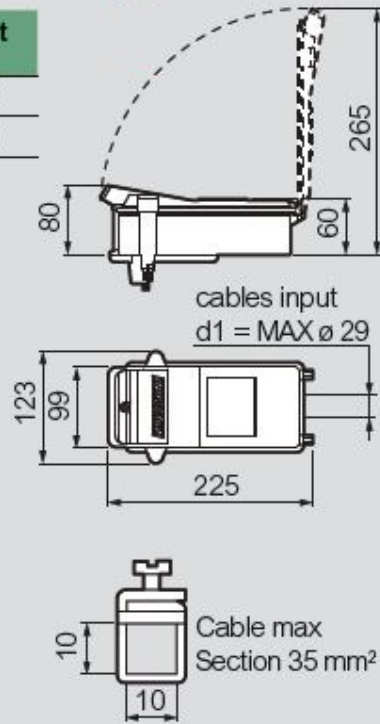
Art. 51515051
In= 16 A



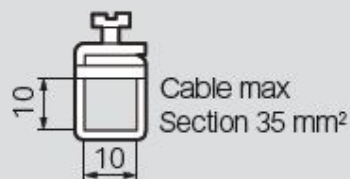
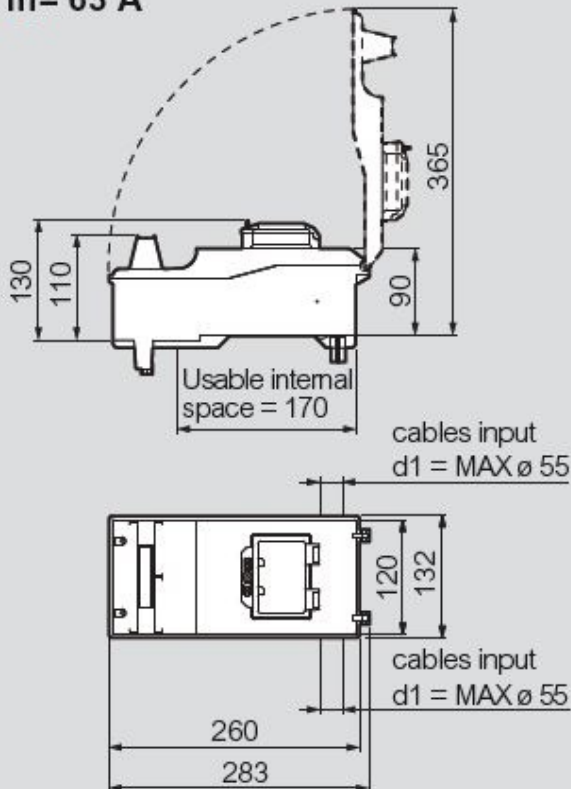
Item code	Weight (kg)
51515051	0,908
51515052	0,908

* fuses not provided

Art. 51515052
In= 50 A









In= 63 A



Item code	Weight (kg)
51515057	1,100
51515056	1,200
51515067	1,100

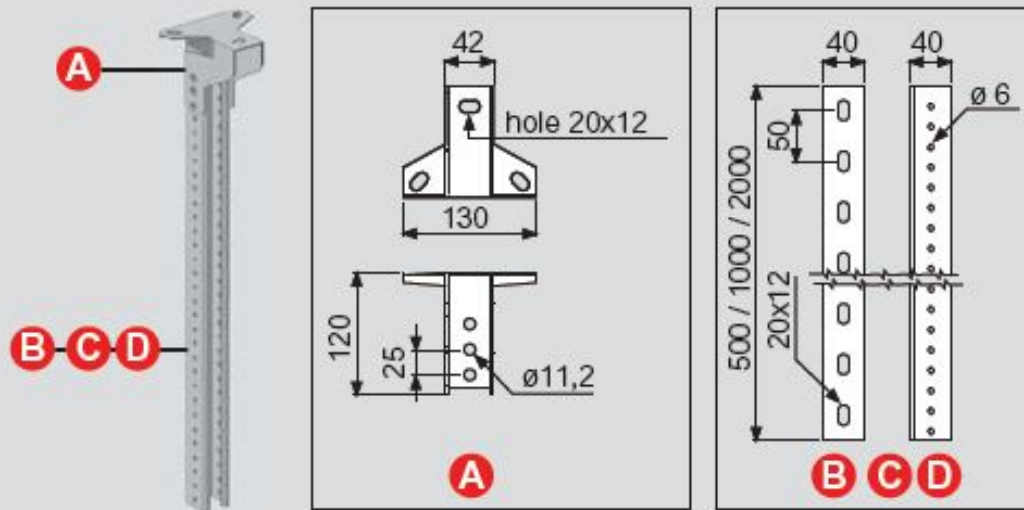
Energy withstand 400.000 A²S
Power loss 20W

Type of tap-off boxes

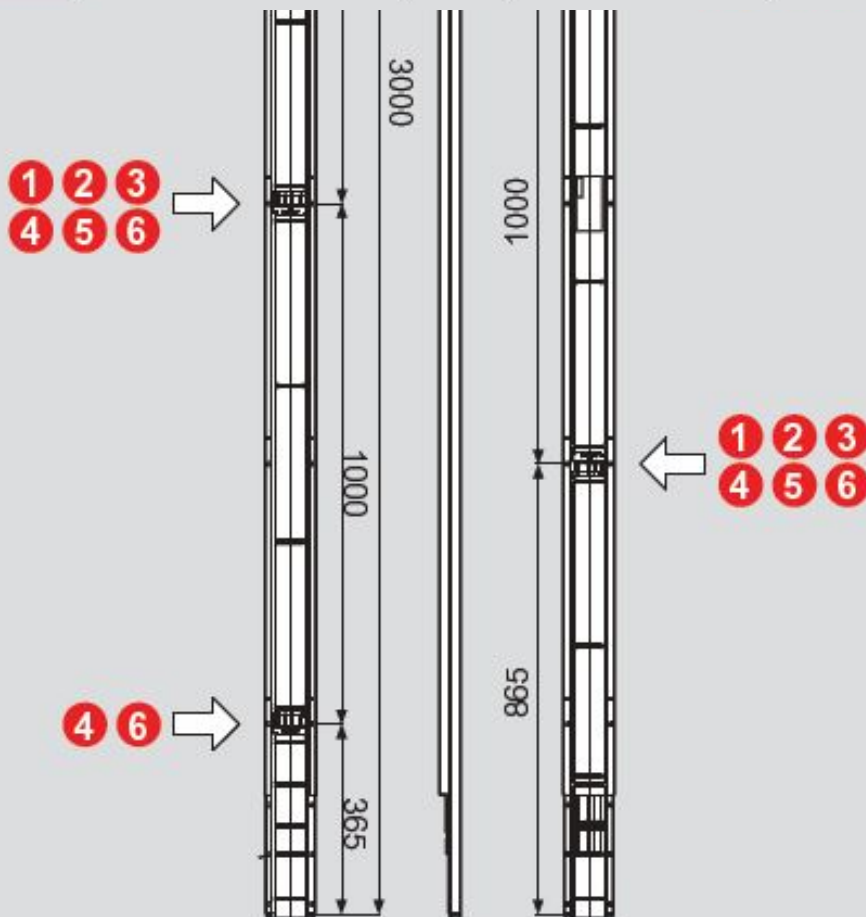
<p>1</p>  <p>51515071</p>	<p>2</p>  <p>51515073</p>
<p>1</p>  <p>51515076 - 51515077 - 51515078</p>	<p>2</p>  <p>51515074</p>
<p>1</p>  <p>51515072</p>	<p>2</p>  <p>51515075</p>

Dimensional data

Ceiling bracket holder



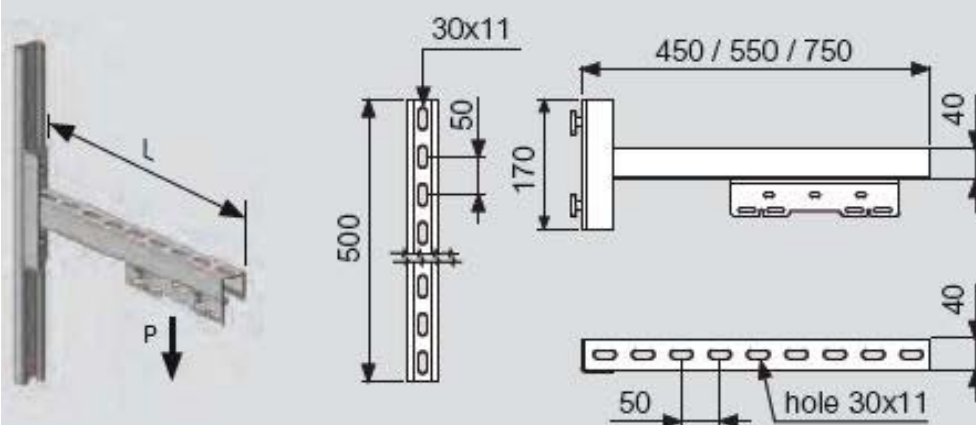
Item code	Description	Fig.	Weight (kg)
50632201	Ceiling flange	A	0,66
50632202	U-shaped bar L=0,5 m	B	1,0
50632203	U-shaped bar L=1 m	C	1,5
50632204	U-shaped bar L=2 m	D	2,0



Brackets for vertical elements

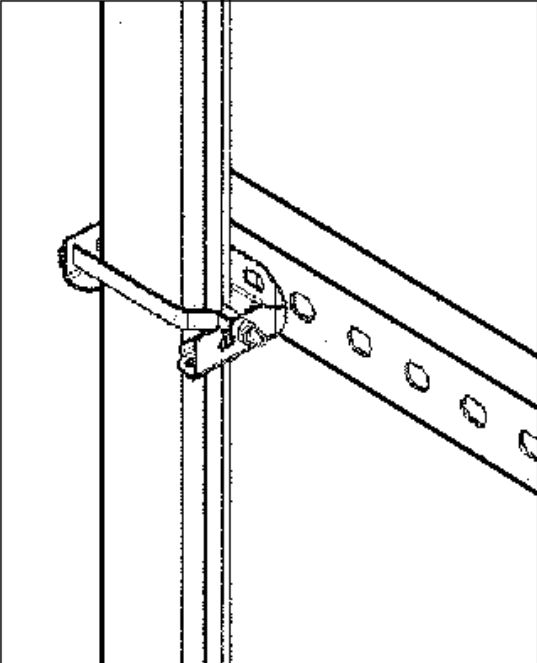
Item code	Weight (kg)	
5040 37 11 D	1,05	1 bracket at the base of the riser mains max 4 m.
5040 37 12 E	1,20	1 bracket every 300 kg

Wall bracket holder

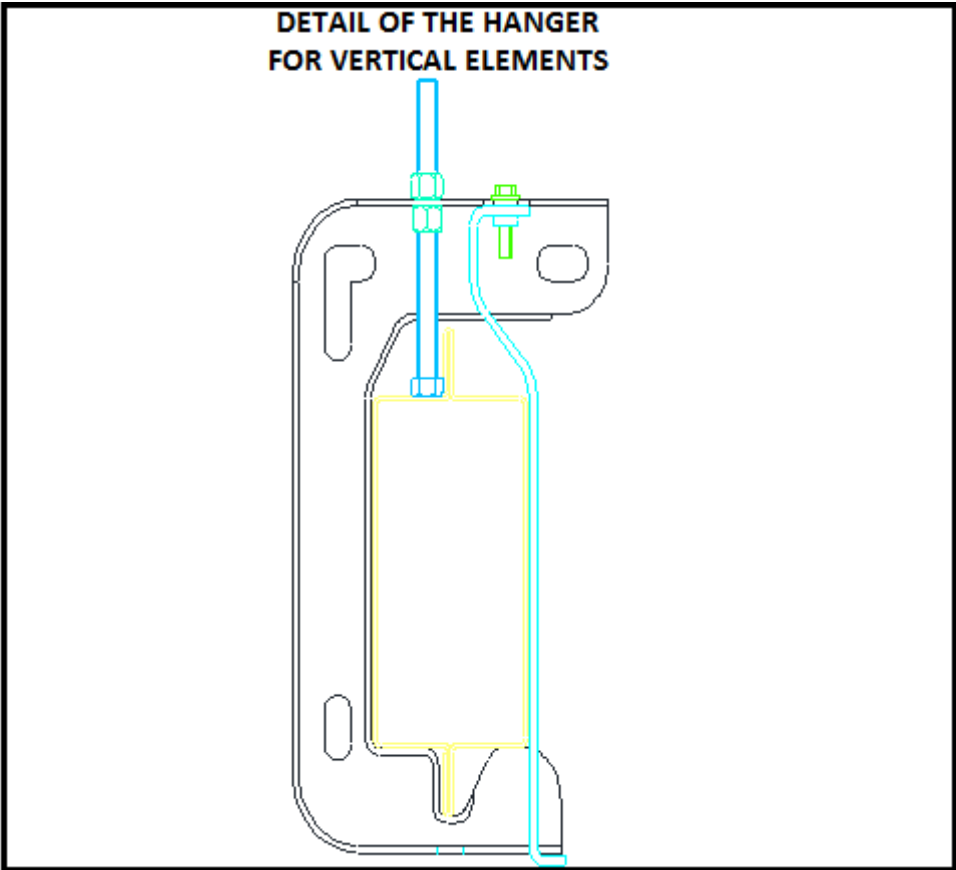


Item code	length	max weight	Weight (kg)
5063 22 12	L= 0,45 m	p max = 80 kg	2,80
5063 22 13	L= 0,55 m	p max = 68 kg	3,00
5063 22 14	L= 0,75 m	p max = 50 kg	3,50

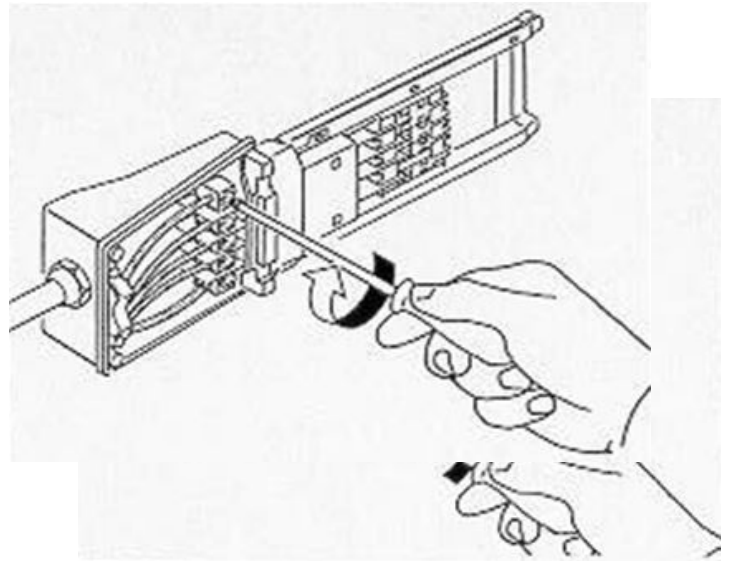
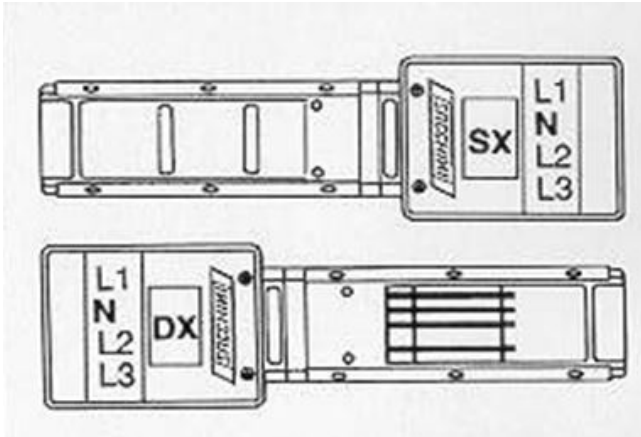
BRACKETS FOR VERTICAL ELEMENTS



Item code	Description
51002004	brackets for vertical elements

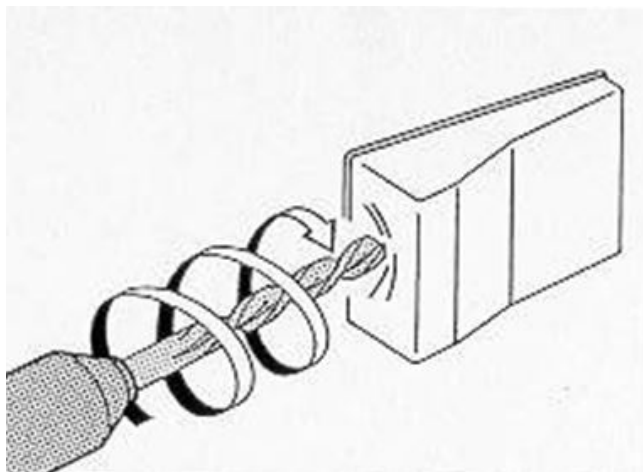


Preparation of the end feed unit



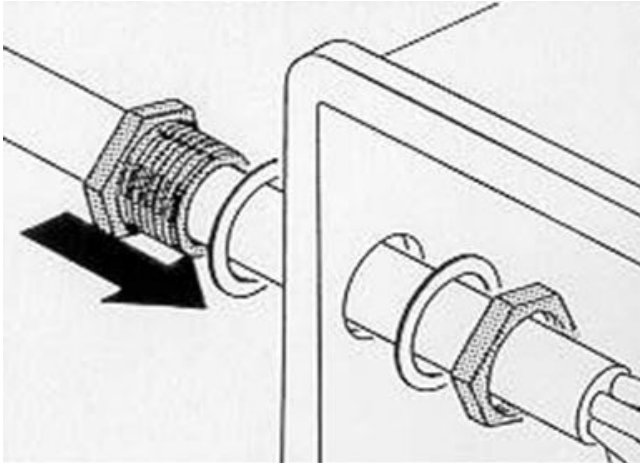
A) PREPARATION OF THE END FEED UNIT
 Prepare the LH or RH end feed unit based on the neutral position.

A1) PREPARATION OF THE END FEED UNIT
 Open the feed unit cover. Ensure that it is the required one , LH or RH according to the position of Neutral "N"



A2) PREPARATION OF THE END FEED UNIT
 Drill a hole to accommodate the type of cable fitting to be assembled.

WARNING
 Ensure that the cable to be connected is not energized

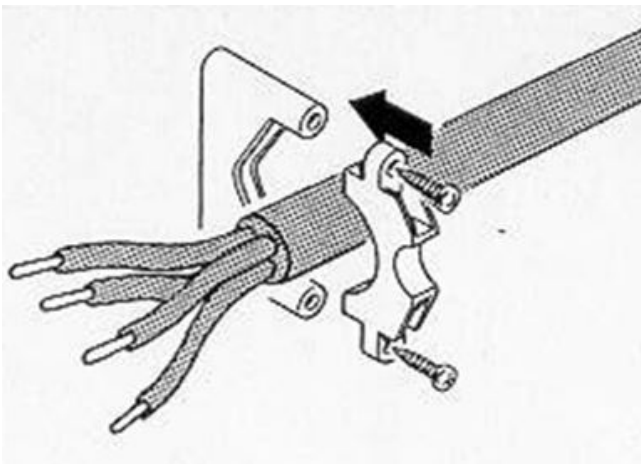


A3) PREPARATION OF THE END FEED UNIT

Allowing a suitable external tolerance, insert the cable into the cable fitting (MS100 n°1 Pg36 – MS160 n°2 Pg48 not supplied) and into the end feed unit.

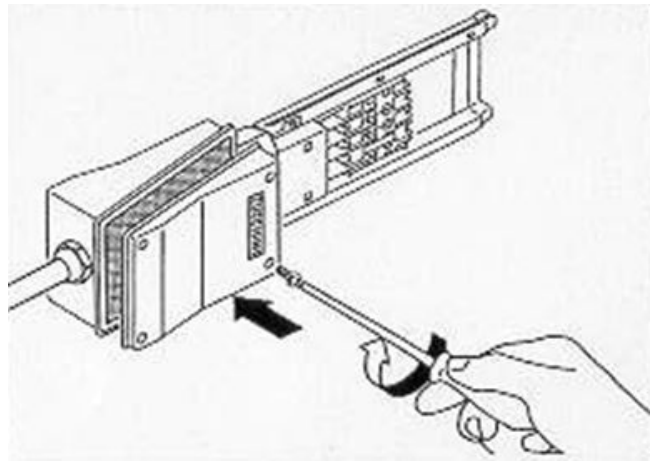
A4) PREPARATION OF THE END FEED UNIT

Connect the cable conductors according to the electrical scheme and tighten the terminals.



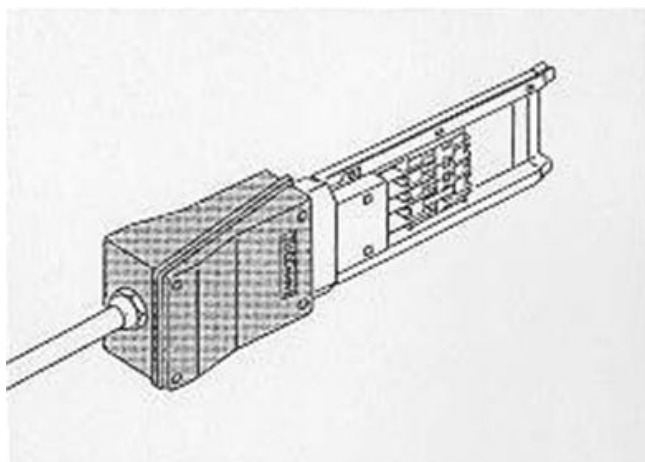
A5) PREPARATION OF THE END FEED UNIT

Fasten the cable with the cable clamp and tighten the dedicated screws.



A6) PREPARATION OF THE END FEED UNIT

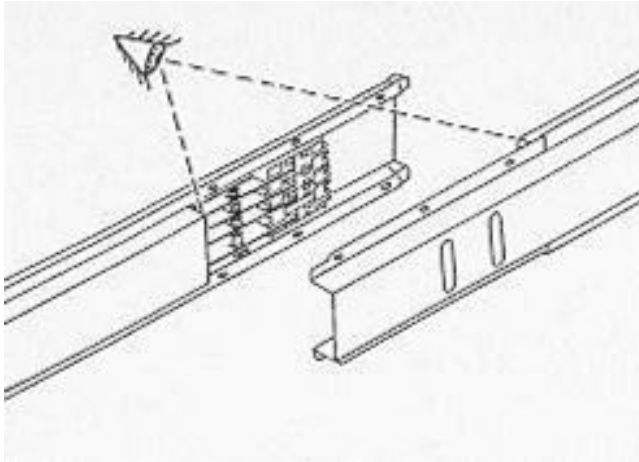
Re-fit the end fit cover.



A7) PREPARATION OF THE END FEED UNIT

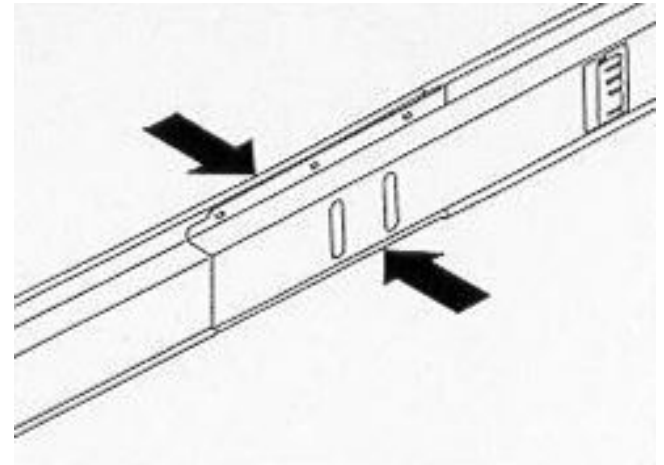
This completes the wiring of the end feed unit.

Assembly of an IP40 installation



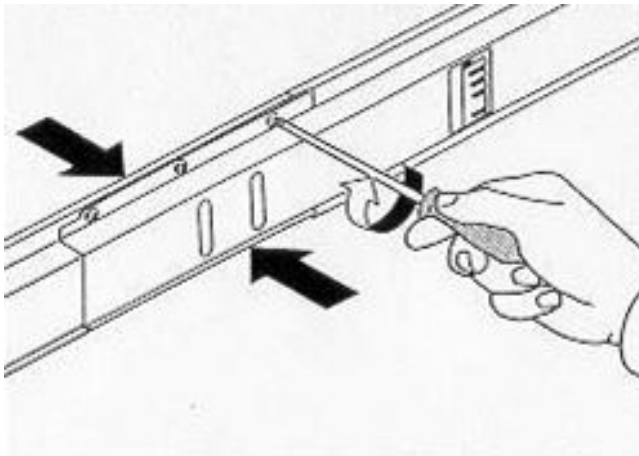
B) ASSEMBLY OF AN IP40 INSTALLATION

Ground set the straight lengths according to the direction of the joints and neutral position.



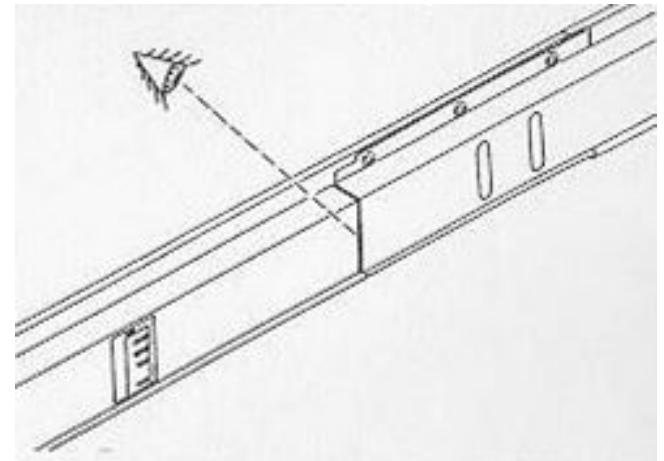
B1) ASSEMBLY OF AN IP40 INSTALLATION

Overlap and join the two straight lengths using a slight pressure as shown in the drawing.



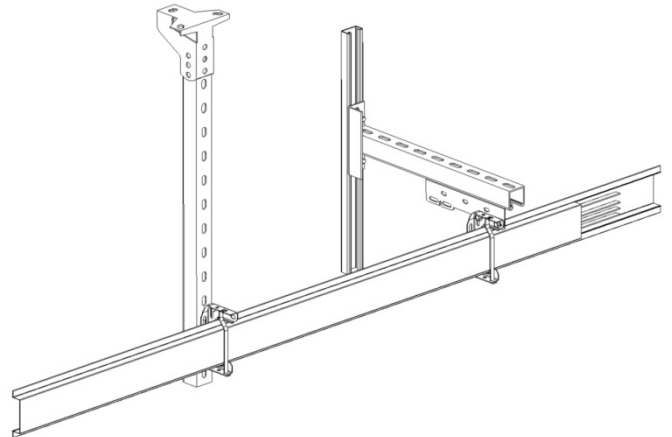
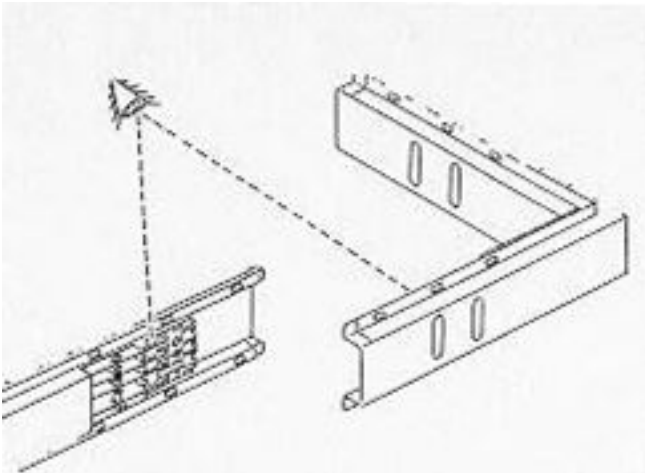
B2) ASSEMBLY OF AN IP40 INSTALLATION

Fasten the lengths with the 6 screws provided and tighten completely.



B3) ASSEMBLY OF AN IP40 INSTALLATION

Warning check that connection blades are well in contact with each other.

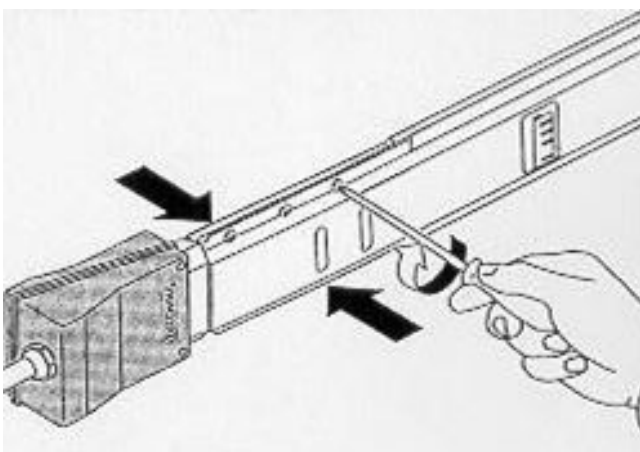


B4) ASSEMBLY OF AN IP40 INSTALLATION

Join other corresponding components by following the instructions given in points B1,B2,B3. Based on the course to follow and the neutral position, choose the most suitable component.

B5) ASSEMBLY OF AN IP40 INSTALLATION

Fasten the suspension clamps to the lengths and assemble them.

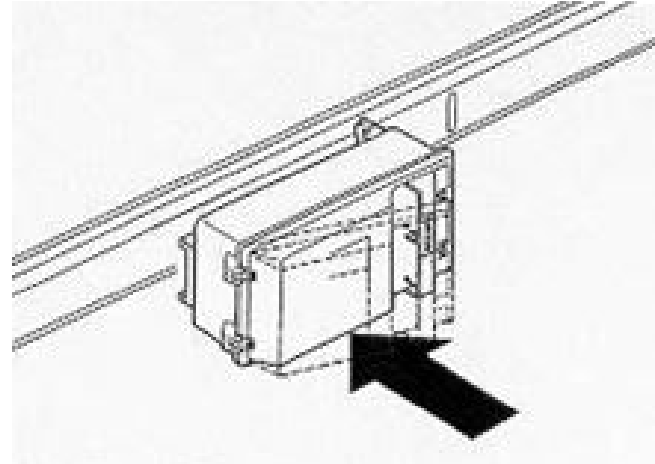
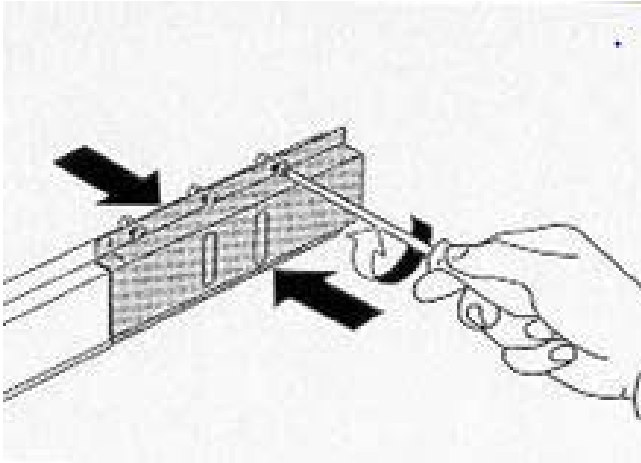


B6) ASSEMBLY OF AN IP40 INSTALLATION

According to neutral “N” connect the previously prepared RH or LH end feed unit (see preparation of end feed unit) and act as per straight lengths tightening the 6 screws properly.

WARNING :the mechanical casing joint screws must be properly tightened to ensure maximum continuity of the protective circuit (PE)

End cover assembly



C) END COVER ASSEMBLY

Position and fasten the end cover by tightening the 6 mechanical joint screws.

C1) END COVER ASSEMBLY

Insert the tap-off unit (see single accessories preparation).

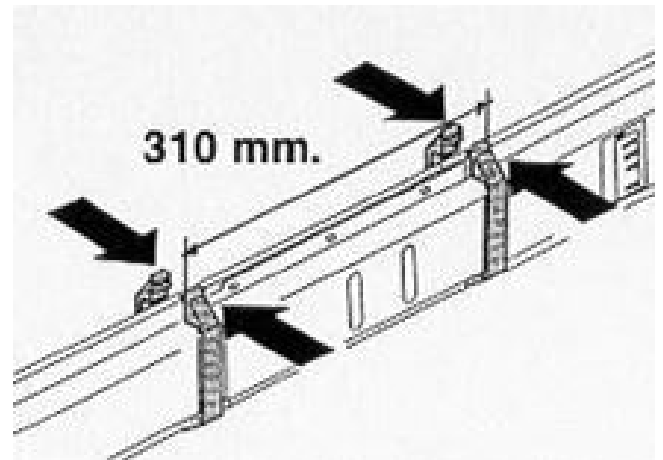
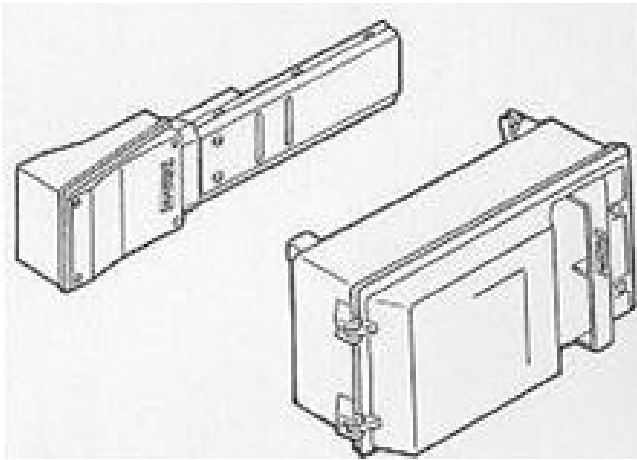


WARNING DANGER OF ELETRIC SHOCK

Before putting the line under voltage ensure that no cables or wires are exposed.

Once the assembly has been completed ensure once again that the whole run has been properly aligned. At this stage the assembly of the IP40 installation is complete.

Assembly of an IP55 installation

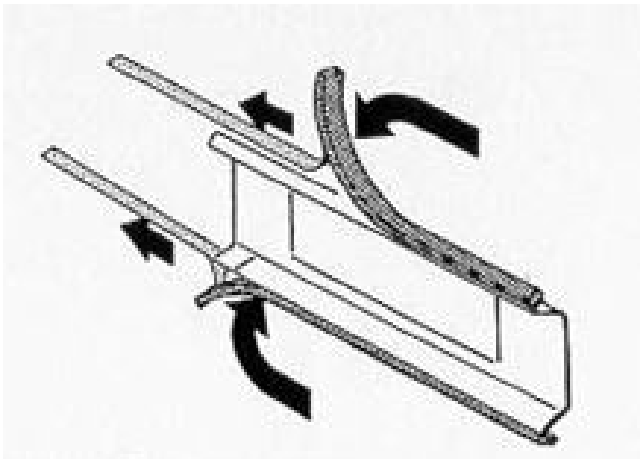


D) ASSEMBLY OF AN IP55 INSTALLATION

Before installing the IP55 installation, check that the feed unit and tap-off units are equipped with gaskets, then proceed in the same way as for the IP40 version, with the following additions.

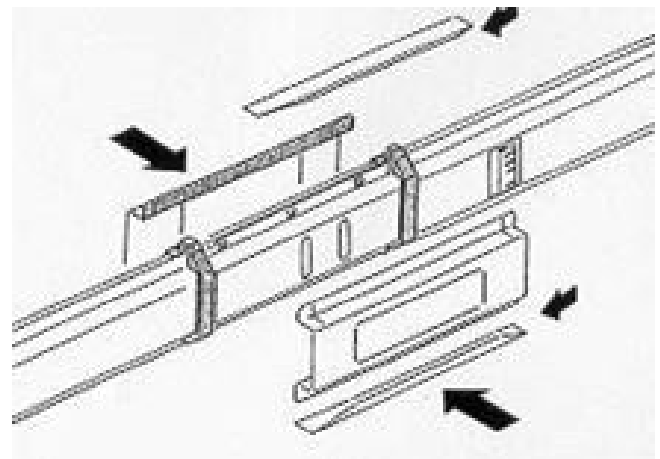
D1) ASSEMBLY OF AN IP55 INSTALLATION

Apply the transversal gaskets to the busbar as indicated in the drawing.



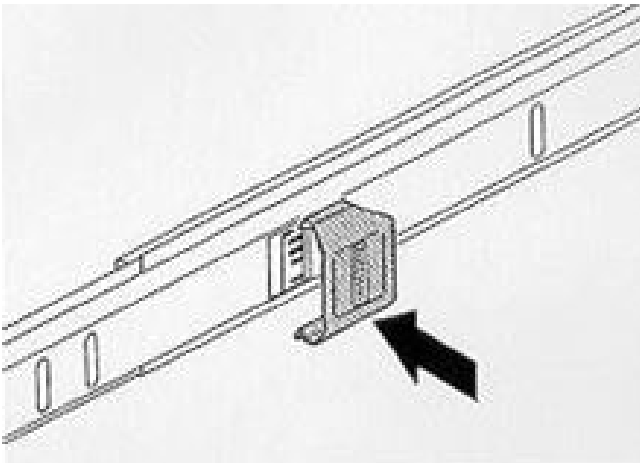
D2) ASSEMBLY OF AN IP55 INSTALLATION

Stick the longitudinal gaskets as indicated in the drawing.



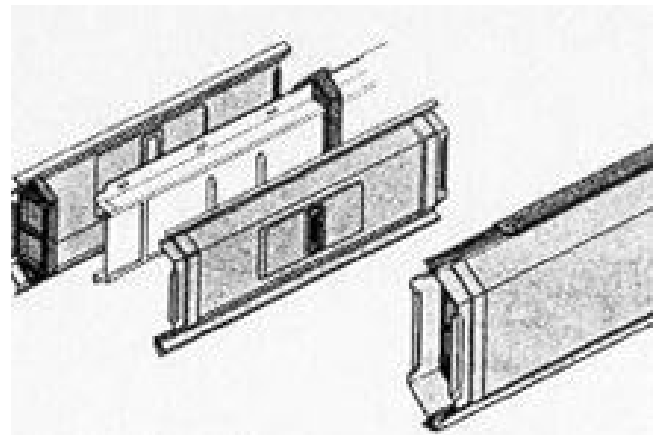
D3) ASSEMBLY OF AN IP55 INSTALLATION

Assemble the joint rigidity sleeves, ensuring that the gasket is properly seated, then close them with the proper sliders.



D4) ASSEMBLY OF AN IP55 INSTALLATION

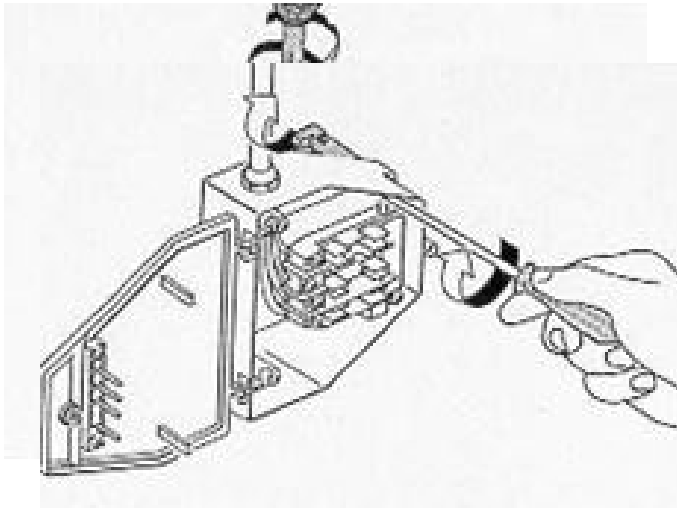
Cover unused tap-off outlets using the tap-off outlet cover.



D5) ASSEMBLY OF AN IP55 INSTALLATION

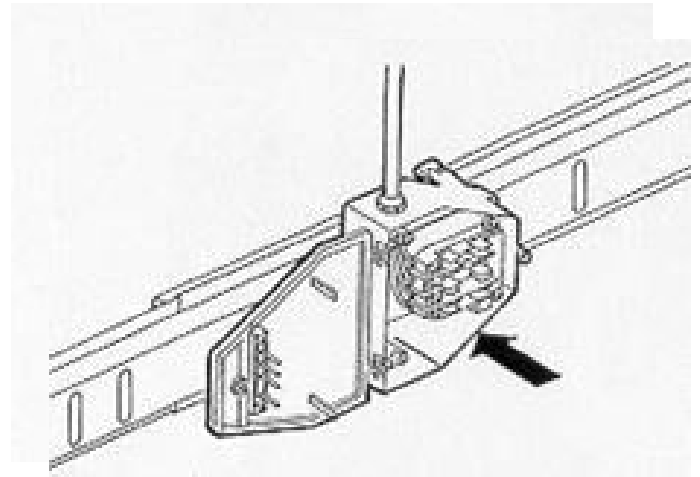
Sleeves with gaskets must also be added to the end cover. After this, the IP55 installation is complete.

Preparation of 16A tap-off units



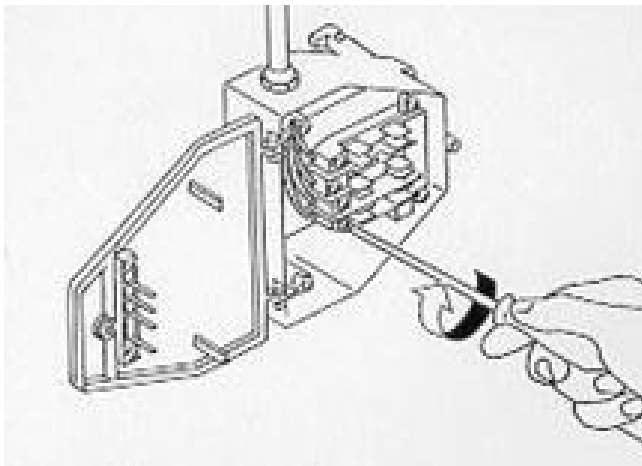
E) PREPARATION OF 16A TAP-OFF UNITS

Make a hole according to the cable grommet to be assembled (Max 1+1 Pg21).



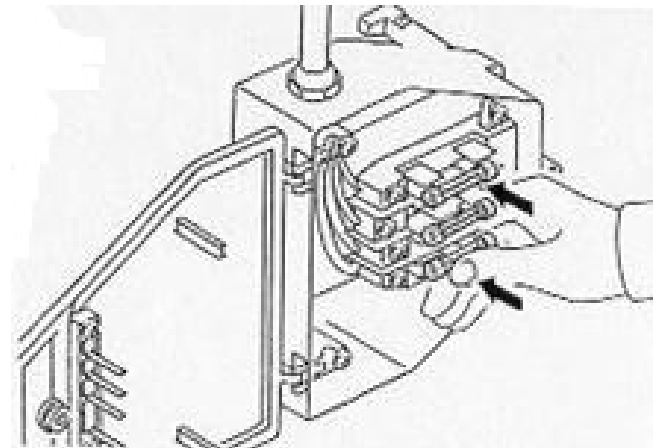
E1) PREPARATION OF 16A TAP-OFF UNITS

Unscrew the screw, open the cover and remove any remaining residue caused by the drilling of the unit.



E2) PREPARATION OF 16A TAP-OFF UNITS

Insert the cable into the cable grommet, connect the cable conductors according to the electrical scheme and tighten the clamps well.

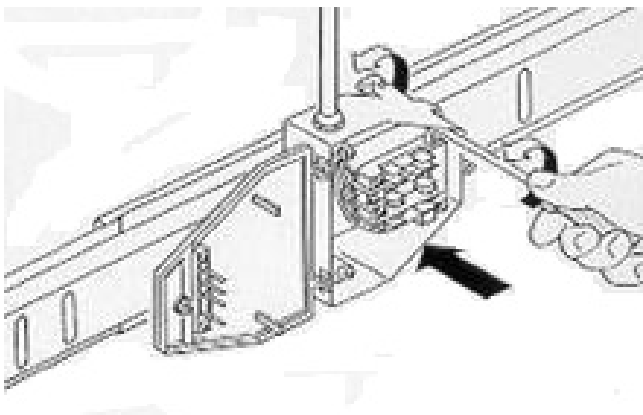


E3) PREPARATION OF 16A TAP-OFF UNITS

Insert the fuses (CH 10X32) into the correct holders.

E4) PREPARATION OF 16A TAP-OFF UNITS

Rotate the hooking feet clockwise to 90°.

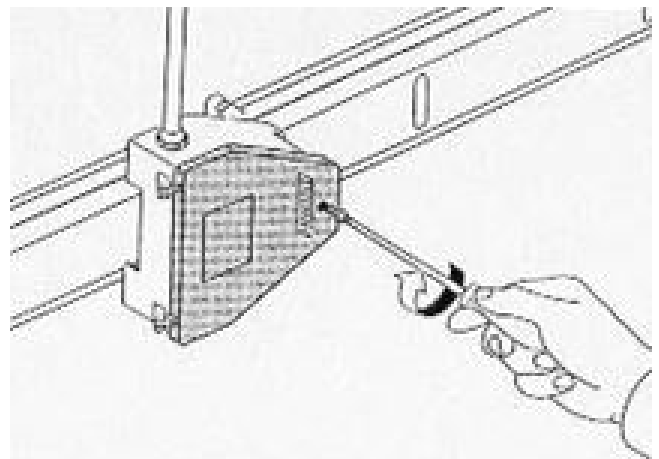


E6) PREPARATION OF 16A TAP-OFF UNITS

By pressing the tap-off against the busbar length rotate the feet 90° so that both of them will hook to the length.

E5) PREPARATION OF 16A TAP-OFF UNITS

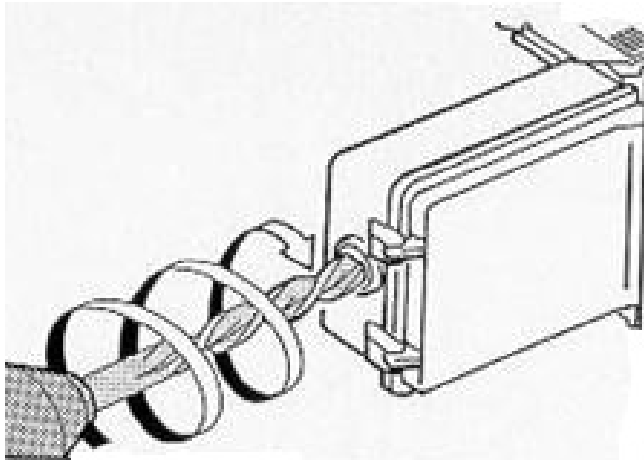
To fit the tap-off unit insert the metal fittings into the tap-off outlet. The tap-off outlet shutters open automatically by plugging in the tap-off unit.



E7) PREPARATION OF 16A TAP-OFF UNITS

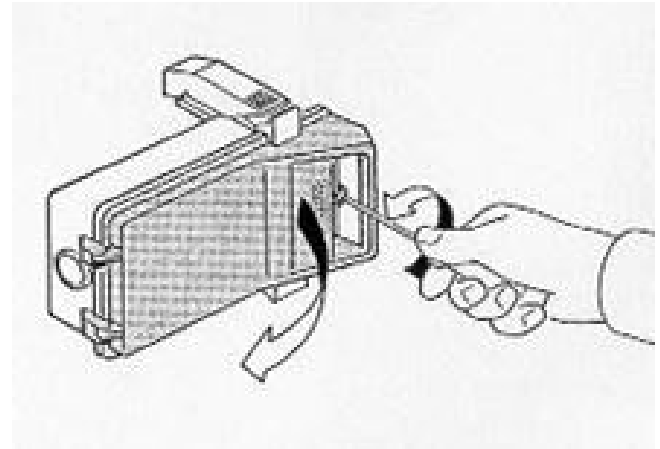
Please note that the cover is equipped with a safety device in order to avoid the cover closing involuntarily and the accidental activation of loads fed from the tap-off box. To close the lid apply slight pressure to the device. Close the lid and tighten the screws.

Preparation of 25/50A tap-off unit



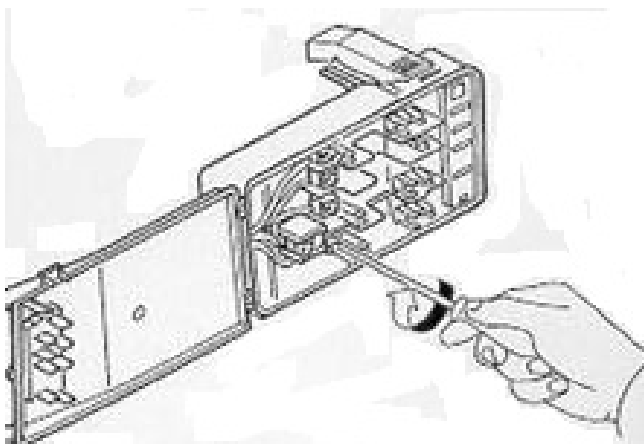
F) PREPARATION OF 25/50A TAP-OFF UNITS

Make a hole according to the cable grommet which is to be assembled (Max Pg29).



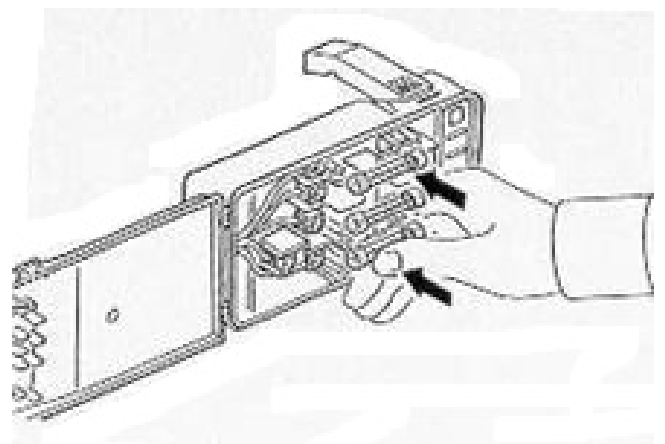
F1) PREPARATION OF 25/50A TAP-OFF UNITS

Unscrew the screw, open the cover and remove any remaining residue caused by the drilling of the unit.



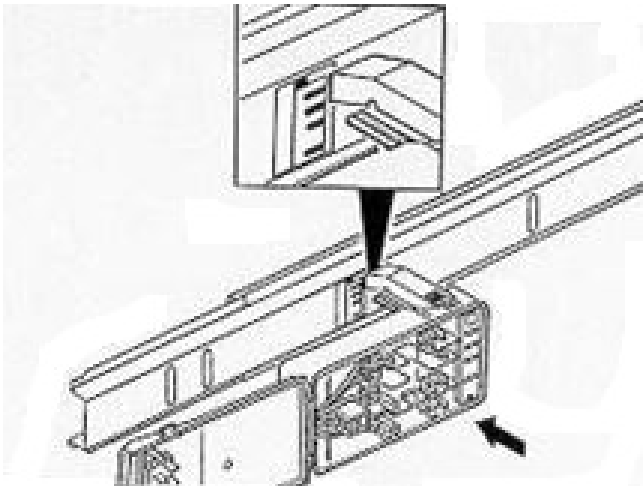
F2) PREPARATION OF 25/50A TAP-OFF UNITS

Insert the cable into the cable grommet, connect the cable conductors according to the electrical scheme and tighten the clamps well.



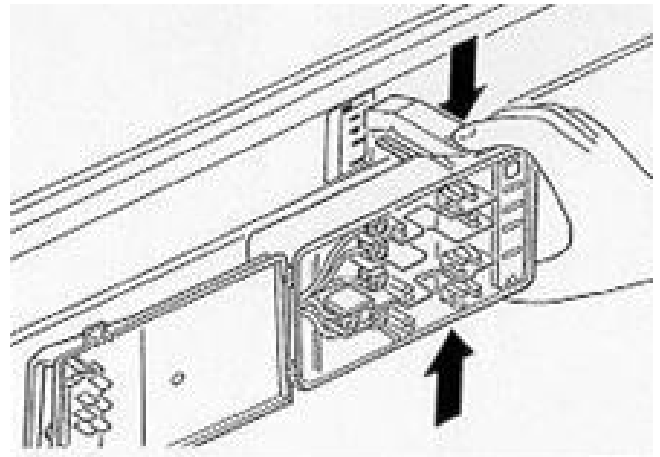
F3) PREPARATION OF 25/50A TAP-OFF UNITS

Insert the fuses (CH 14X51) into the correct holders.



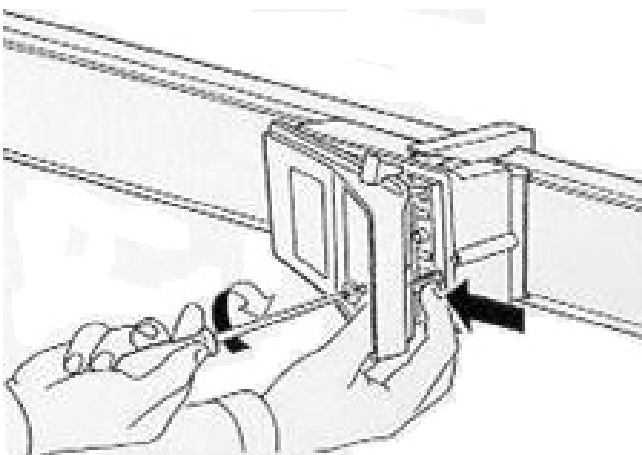
F4) PREPARATION OF 25/50A TAP-OFF UNITS

Respecting the sense of assembling, insert the metal fittings into the tap-off outlet keeping the fixing arms pressed in.



F5) PREPARATION OF 25/50A TAP-OFF UNITS

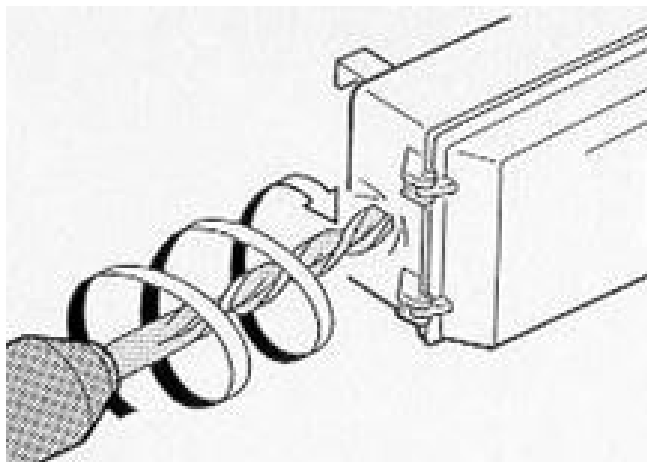
The tap-off outlet shutters open automatically by plugging in the tap-off unit.



F6) PREPARATION OF 25/50A TAP-OFF UNITS

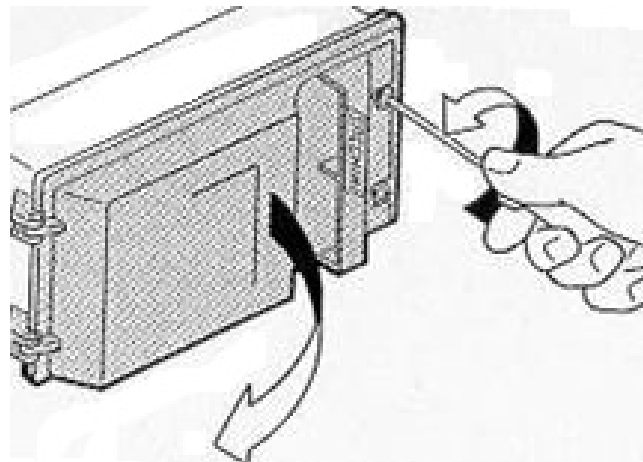
Please note that the cover is equipped with an safety device in order to avoid the cover closing involuntarily and the accidental activation of loads fed from the tap-off box. To close the lid apply slight pressure to the device. Close the lid and tighten the screws.

Preparation of 63A tap-off unit



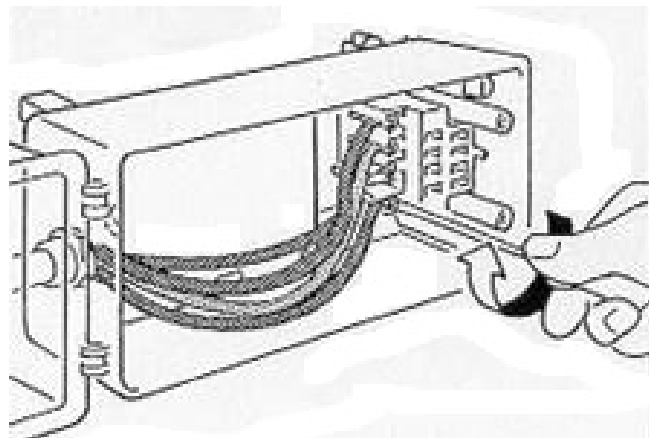
G) PREPARATION OF 63A TAP-OFF UNITS (BASE & CIRCUIT BRAKER PREPARATION)

Make a hole according to the cable grommet which is to be assembled (Max Pg36).



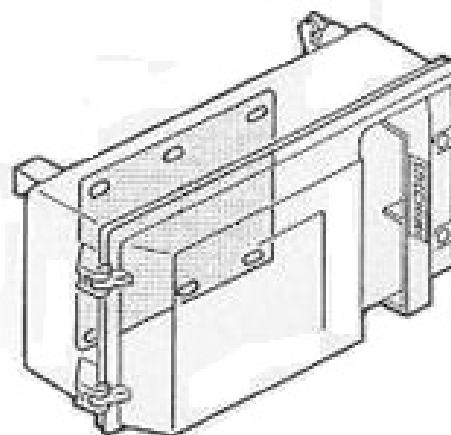
G1) PREPARATION OF 63A TAP-OFF UNITS (BASE & CIRCUIT BRAKER PREPARATION)

Unscrew the screws, open the cover and (only on the version with circuit breakers) remove the accessories. Remove any remaining residue caused by the drilling of the unit.



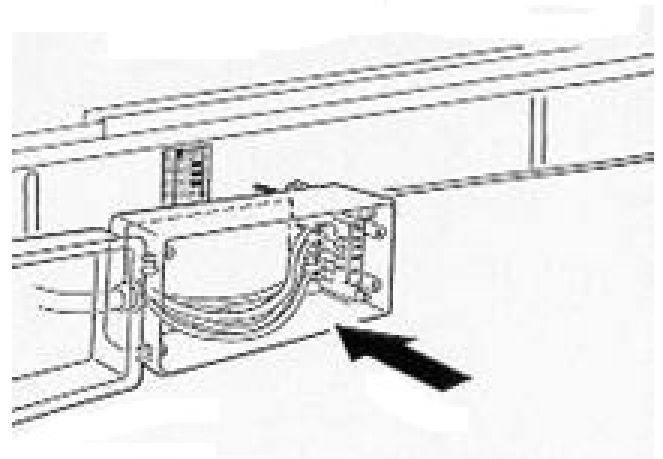
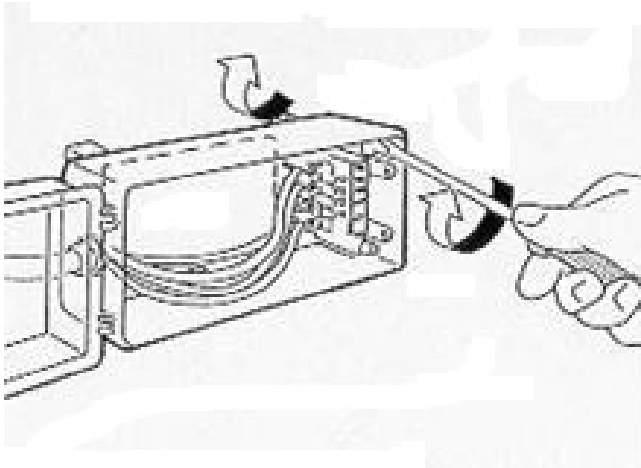
G2) PREPARATION OF 63A TAP-OFF UNITS (BASE & CIRCUIT BRAKER PREPARATION)

Insert the cable through the cable grommet, connect the cable conductors according to the electrical scheme and tighten the clamps well. (only on the version with circuit breakers assemble the Din rail according to the instructions found inside. After this, the electric connection must be carried out on the circuit breaker and the unit terminals).



G3) PREPARATION OF 63A TAP-OFF UNITS (BASE & CIRCUIT BRAKER PREPARATION)

The internal plate may also be used for fixing auxiliary equipment as long as it is of suitable dimensions.

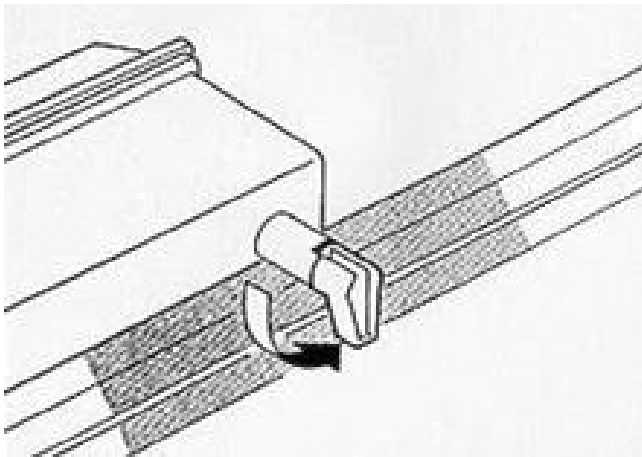


**G4) PREPARATION OF 63A TAP-OFF UNITS
(BASE & CIRCUIT BRAKER PREPARATION)**

Rotate the hooking feet 90° (towards the label). Assemble the two fastened metallic feet onto the tap-off unit.

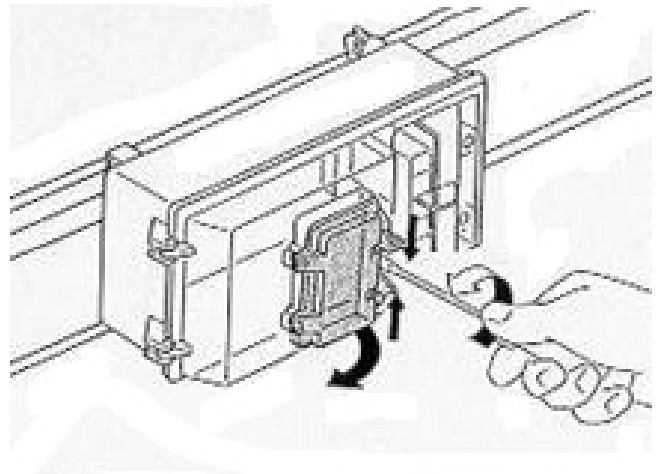
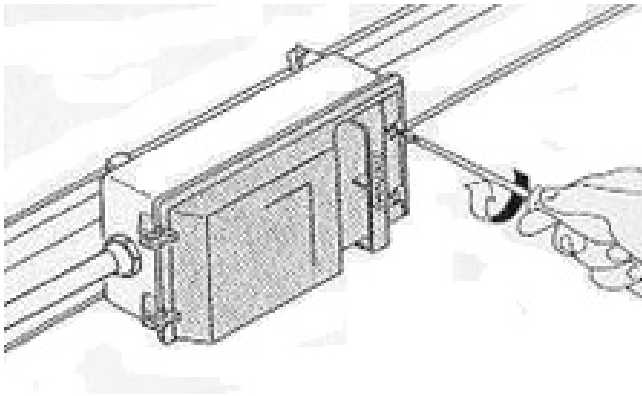
**G5) PREPARATION OF 63A TAP-OFF UNITS
(BASE & CIRCUIT BRAKER PREPARATION)**

Respecting the sense of assembling, insert the metal fittings into the tap-off outlet keeping the fixing arms pressed in. The tap-off outlet shutters open automatically by plugging in the tap-off unit.



**G6) PREPARATION OF 63A TAP-OFF UNITS
(BASE & CIRCUIT BRAKER PREPARATION)**

Rotate the feet 90° so that both of them will hook to the busbar length.

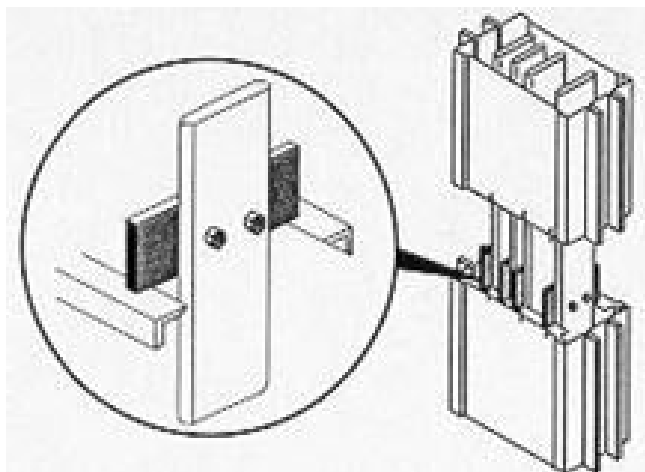


G7) PREPARATION OF 63A TAP-OFF UNITS (BASE & CIRCUIT BRAKER PREPARATION)

Please note that the cover is equipped with an safety device in order to avoid the cover closing involuntarily and the accidental activation of loads fed from the tap-off box. To close the lid apply slight pressure to the device. Close the lid and tighten the screws.

G8) PREPARATION OF 63A TAP-OFF UNITS (BASE & CIRCUIT BRAKER PREPARATION)

Only for the circuit breaker version. To operate the circuit breaker it is not necessary to open the cover, it will be enough to enter from the service door.



FOR INSTALLATIONS REQUIRING FIRE BARRIERS OR THRUST SUPPORT UNIT PLEASE CONTACT OUR ENGINEERING DEPARTMENT TO CONFIRM THE POSITION

INSPECTION, CONTROL AND MAINTENANCE INSTRUCTIONS FOR PLANTS WITH MS BUS DUCT

BUS DUCT INSPECTIONS AFTER INSTALLATION

ELECTRICAL SAFETY TESTS

Carry out all tests described in the applicable technical installation standards, such as the insulating test between phases and to earth at 500 V with a minimum value of 10 M Ω , for every line stretch.

If the insulating value is lower than 10 M Ω , it is necessary to verify the plant completely, starting from the insulating parts of each block. If the insulation is still inadequate, divide the plant in two parts and verify the single stretch to identify the element with low insulation. Continue the splitting, if the insulation keeps being inadequate.

If insulation test is made to every peice the value minimal is 50 MOhm.

THERMAL TESTS

After having run the plant at the maximum working current, and having 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.

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

BUS DUCT ANNUAL PERIODIC INSPECTIONS TO BE CARRIED OUT ONE YEAR AFTER ENERGIZING AND EVERY OTHER FOLLOWING YEAR

THERMAL TESTS

After having run the plant at the maximum working current for at least 6 hours, carry out a thermal test, taking in particular consideration the points where labels had been glued during installation (See previous point). If the measured temperature ($DT = T_{\text{measured}} - T_{\text{ambient}}$) is higher than 55 K or is 15 K higher than the temperature measured during installation, contact the Customer Care for the Zucchini Brand. This thermal test can be carried out with contact temperature sensors, optical pyrometers or thermal cameras.

TAP-OFF BOXES INSPECTIONS AFTER INSTALLATION

These inspections have to be always carried out with a non-energized plant and after having earthed the phases of the tap-off box, in order to unload possible static discharges in the downstream circuit (with an insulated device).

Plug-in

Verify the contact resistance between the clamp before the protective device and the relative bar in the up-river outlet. If resistance is higher than $50\mu\text{Ohm}$, the tap-off box could have been mounted incorrectly. Take off the tap-off box, verify the plug-block and the outlet of the element. If the outlet is broken and the contacts have entered the bulb, replace the box and mark the outlet as out of service. Insert a new box in another outlet and do not use the broken one again.

N.B. Never use an outlet when problems have occurred during the installation of the tap-off box, or when the tap-off box has been replaced because it was out of service.

THERMAL TESTS

Carry out a thermal test on the cover near the lock, using contact temperature sensors, optical pyrometers or thermal cameras. The test has to be carried out with tap-off boxes that have been running at working current for at least 6 hours.

TAP-OFF BOXES ANNUAL PERIODIC INSPECTIONS

Carry out a thermal test on the cover near the lock, using contact temperature sensors, optical pyrometers or thermal cameras. The test has to be carried out with tap-off boxes that have been running at working current for at least 6 hours.

If the measured relative temperature ($DT = T_{\text{measured}} - T_{\text{ambient}}$) is higher than 55 K or is 15 K higher than the temperature measured during installation, contact the Customer Care for the Zucchini Brand.

Verify if joining screws are correctly tightened.

For further information or explanations please contact our Customer Care for the Zucchini Brand.

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