



PASSION FOR POWER.

TECHNICAL INFORMATION

Assembly of Mi Power Distribution Boards up to 630 A

Power Switchgear and Controlgear Assemblies (PSC) in accordance with IEC 61439-2



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Mi Power Distribution Boards up to 630 A

- in accordance with IEC 61439-2
- combinable enclosure system
- degree of protection IP 65
- made from polycarbonate
- protection class II, 

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Hensel specialist consultant on-site at www.hensel-electric.de

Assembly
Video



Interfaces according to IEC 61439-2

- For protected outdoor installation
- Degree of protection IP 65
- Combinable enclosure system, extendible in all directions
- 6 enclosure sizes in a grid of 150 mm
- EMC compliant busbar system
- Wall- or floor-mounting
- For operation by electrotechnical skilled / unskilled persons
- Protection class II up to a rated current of 630 A
- Flexible through standardised and tested kits
- Spacious connection areas



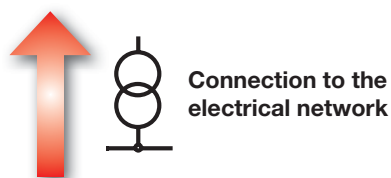
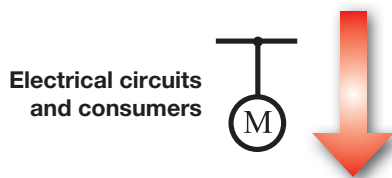
BLACK BOX
 with the 4 interfaces
 for the rating of
 power switchgear
 assemblies



Mi Power Distribution Board

Combinable enclosure system, insulation-enclosed, totally insulated, IP 65, **for the assembly of power switchgear and controlgear assemblies (PSC) up to 630 A in accordance with IEC 61439-2.**

Electrical functions are compliant with the applicable requirements of IEC 61439-2.



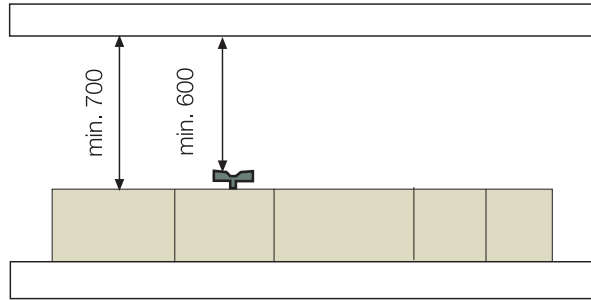
- Electric circuit / final circuit
- Circuit-breaker up to 630 A
- Switch disconnector up to 630 A
- Fuse switch disconnector up to 630 A
- Bus-mounted fuse base up to 63 A
- Cable connection from top/bottom
- Connection: conductors from copper / aluminum
- Optional connection of CEE sockets according to EN 60309 and sockets with earthing contact

- Rated voltage $U_n = 690 \text{ V a.c.} / 1000 \text{ V d.c.}$
- Rated current I_n up to 630 A
- Circuit-breaker up to 630 A
- Switch disconnector up to 630 A
- Fuse switch disconnector up to 630 A
- 5-conductor system
- Cable connection from top/bottom

Country-specific requirements have to be observed!

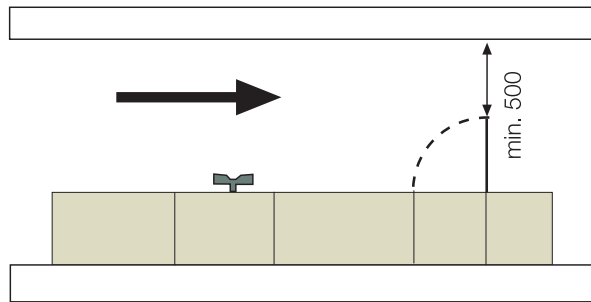
Installation site

Switchgear assemblies must be set up so that the minimum aisle widths are not exceeded.



Aisle width

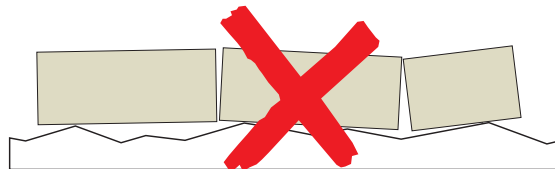
The aisle width in front of switchgear assemblies with drives, e.g. switches, must be at least 600 mm.



Building evacuation route

For distribution boards with lids or doors opening against the direction of evacuation, aisle widths must have a minimum of 500 mm.

Switchgear assemblies must be set up torsion-free, assembled and fixed.



Mi Distribution Boards

Installation and Ambient Conditions

Installation Areas and Degrees of Protection

Country-specific requirements have to be observed!

Requirements of German standard DIN VDE 0100 Part 737 for compliance with IP degree of protection

1. Requirement

Protection against ingress of water for all electrical equipment (devices) with the appropriate encapsulation (2nd characteristic numeral)

1.1. Minimum requirement for electrical equipment:



Note for outdoor installation:

„Protected outdoors“

Electrical equipment has to be protected from precipitation (like rain, snow or hail) as well as from direct sunlight.

„Non-protected outdoors“

Electrical equipment can be exposed to precipitation or direct sunlight.

With both assembly sites the climatic effects on the installed equipment must be observed, for example, high or low ambient temperatures or condensation.

1.2. Minimum requirements for electrical equipment, that must withstand higher environmental stresses:

degree of protection IP X 4

with **non-direct** jets of water within occasional cleaning procedures, e.g. agriculture



degree of protection IP X 5

with **non-direct** jets of water within operational cleaning procedures, e.g. carwash



degree of protection IP X 5 and additional consultation with the manufacturer:

with **direct** jets of water within occasional cleaning procedures of enclosures, e.g. butcher's shop



Country-specific requirements have to be observed!

2. Requirement of German Standard DIN VDE 0100 Part 737

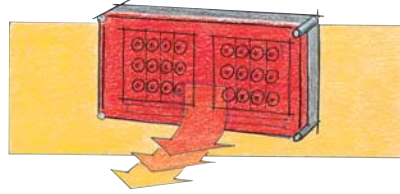
2.1 Electrical equipment must be selected taking into account the external influences to which they may be exposed. Proper operation and the effectiveness of the required degrees of protection must be assured.

Note: Data from the manufacturer!

How does condensed water occur in enclosures with a high degree of protection?

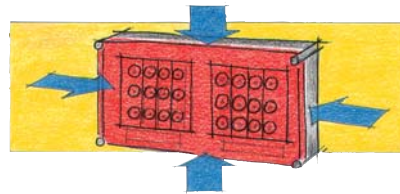
Condensed water only forms in enclosures with a higher degree of protection than IP 54 due to temperature difference from inside to outside. Humidity can not evaporate because of the high degree of protection of the enclosure.

System switched on.



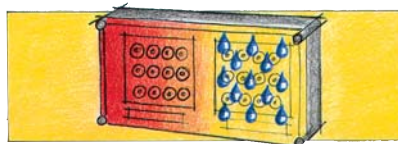
The internal temperature is higher than the external temperature due to the power dissipation of the built-in devices.

System switched on.



The warm air inside the enclosure attempts to accumulate moisture. This comes from outside through the seal as the enclosures are not gas-tight.

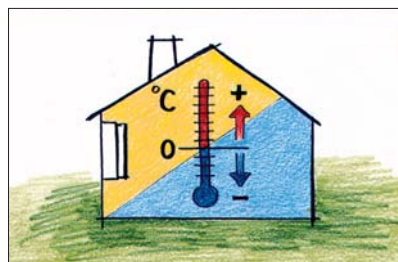
System switched off.



The internal temperature is reduced by cooling down the system e.g. by switching off the loads. The cooler air emits moisture which is collected as condensed water on the cooling inner surfaces.

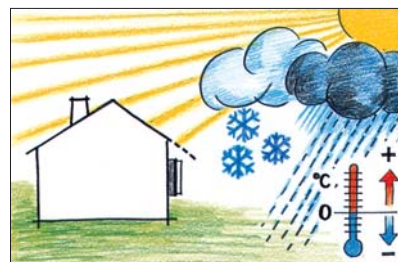
How does condensed water occur in enclosures with a high degree of protection?

Formation of condensed water for **indoor installations:**



In areas where high levels of air humidity and large temperature fluctuations are expected e.g. in laundry rooms, kitchens., car washes etc.

Formation of condensed water in **protected outdoor installations** (protected against weather influences) **or unprotected outdoor** installations:

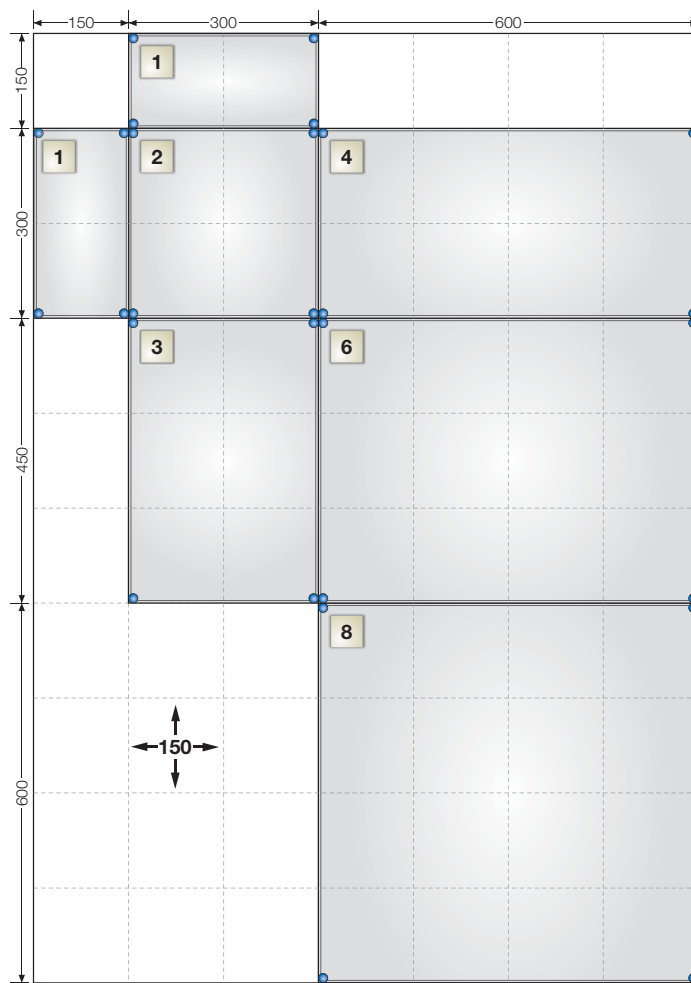
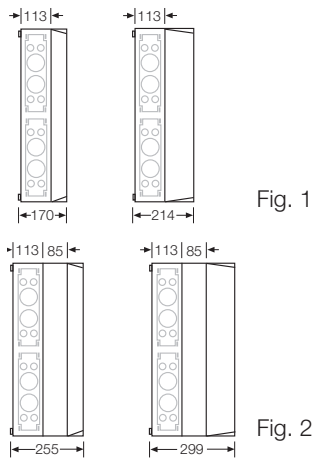


Here condensed water can be formed dependent on the weather, high air humidity, direct sunlight and temperature differences compared to the wall.

The **modular design** in a basic grid of 150 mm allows free design of the outer form. The enclosures can be combined in all directions. Combinable in all directions to follow given requirements on site.

Different enclosure depths allow the installation of equipment of different heights (Fig. 1).

With an extension frame the depth of the enclosure sizes 4 and 8 can be extended by 85 mm (Fig. 2).



Enclosure walls with metric knockouts

Wall 1

- 1 x M 20
- 1 x M 32/40



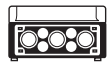
Wall 2

- 2 x M 20
- 10 x M 25
- 1 x M 32/40



Wall 3

- 4 x M 25
- 3 x M 40/50



Wall 4

- 1 x M 20
- 4 x M 25
- 1 x M 32/40
- 3 x M 40/50



Wall 5

- 8 x M 32
- 4 x M 40/50



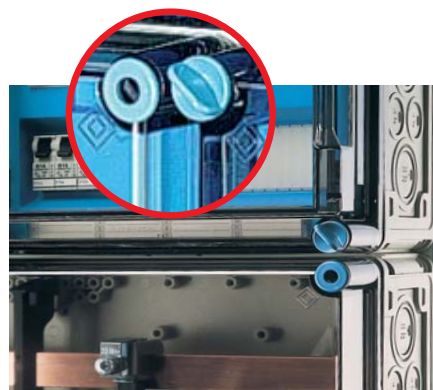
Wall 6

- 4 x M 20
- 20 x M 25
- 2 x M 32/40



Access and operation

Clear separation of the operation areas for unskilled persons and areas to which only electrotechnical skilled persons have access.



- Depending on the electrical function operate the cover manually (for unskilled persons) or with tool (for skilled persons)



- Lid lock prevents unauthorised opening of the cover



- A hinged lid for simple operation of equipment

**Lid hinges
Mi ZS 20**

For operating installation device within a large area.

The lid keeps permanently connected to the box. When assembling several boxes, the insertion can only be carried out for the external boxes.



Usable in Mi boxes:


Back-stop of lids	Position of box: vertical				Position of box: horizontal			
	left	right	top	bottom	left	right	top	bottom
Size 1:	●	●	●	●	●	●	●	●
Size 2:	●	●	●	●	●	●	●	●
Size 3:	●	●	●	-	-	-	●	●
Size 4:	●	●	●	-	-	-	●	●

**Heavy-duty hinge joints
Mi ZS 40**

For operating installation device within a large area.

The lid keeps permanently connected to the box.

Wall connectors or flanges are necessary for assembly.

Lid is fastened with plastic screw to secure the total insulation .



**Hinge for lids
Mi ZS 60**

For large-area operation of installation device within enclosures with extension frames.

The lid keeps permanently connected to the box.



Assembly of Mi distribution boards according to assembly draft

Pre-assembled and tested enclosures with electrical functions



Knock out of box walls for electrical connection and cable entry

Box walls are knocked out for the electrical connection within the distribution board.

For the assembly of the enclosures, the appropriate openings of the wedge joints are knocked out as well.



Assembly of boxes

For sealing the boxes in position, a self-adhesive gasket is stuck to the box wall (applies to closed box walls, too).

The box assembly is carried out by a wedge connection.

To increase stability, press wall clamps onto the box fins.

Use a wall separator for subdividing 300 mm box walls into two 150 mm walls for flange or box mounting.



Connections of cables

Connect cables strain-relieved and pressure-relieved.

Cable entry

Close knockouts/openings for the cable entry according to the specified degree of protection.



Covering of cable entry with cable entry cover

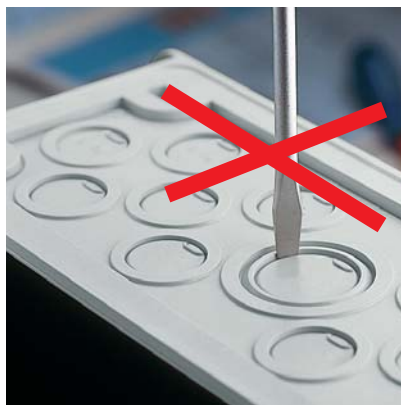
Flanges

Attach flanges by means of 4 wedge links and 1 clamp to the box wall.



Cable entry

Knock out the appropriate cable entries within flanges or box walls with screwdriver.



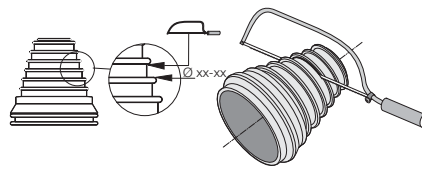
Assembly of cable insertion

Knock out the respective box wall and saw out the upper box fin next to the wedge fastening.

Screw mount the cable insertion and insert the rubber entries.



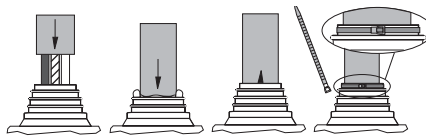
Adjust stepped grommet on the cable diameter.



Insert cable and fix it with cable ties.



Insert the cable into the box from the front.



Box fin

Mount removable box fin between two boxes to provide an easier wiring across two boxes.

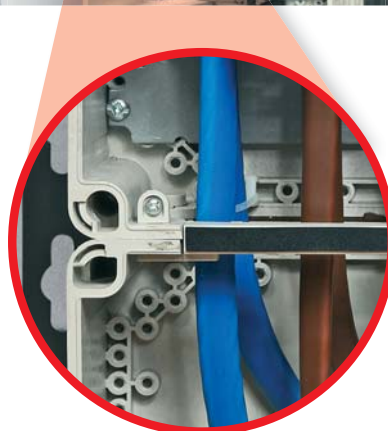
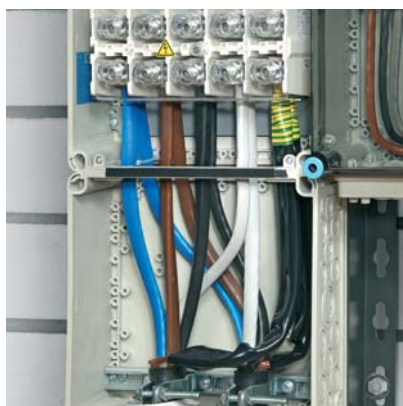
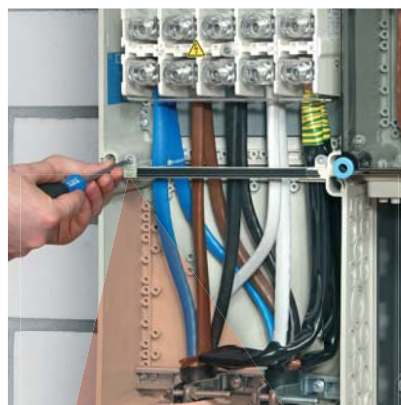
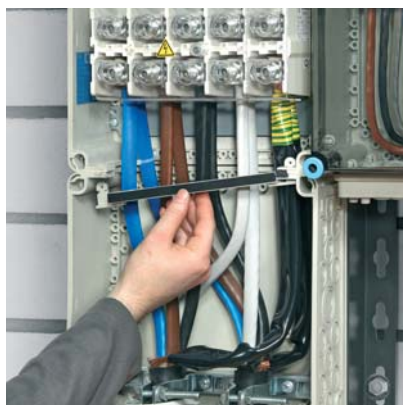
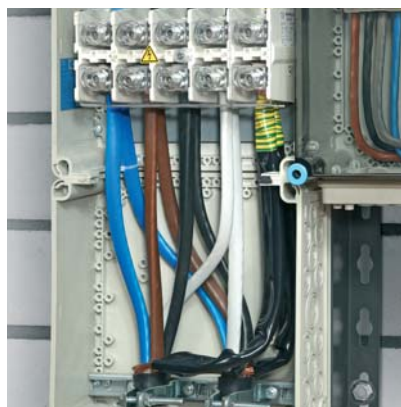
Saw out box fin in side wall.

Insert cables across two boxes and connect them.

Insert box fin into the openings for the box connection and mount with screws.

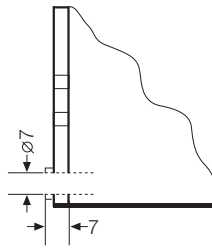
The box fin Mi GS 30 provides for a mechanical connection between two boxes.

Degree of protection IP 65 is maintained.



Wall mounting

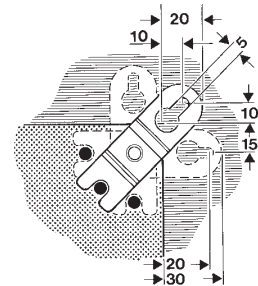
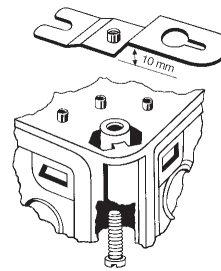
directly through the base of the box



External brackets

for external box fixing

Mi AL 40 (4 brackets)



Mounting profile

for wall-mounted installation of Mi-Distribution boards, steel profile, 1950 mm long, dividable in the grid of 150 mm.

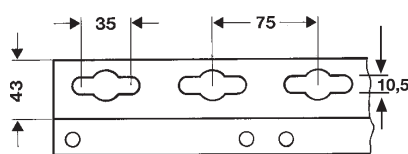
Mi MS 2



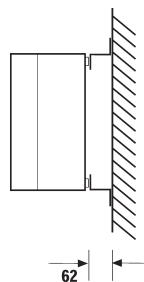
Note:

Please fix mounting profile in vertical position to enable a cable routing behind the assembly.

For cutting the required profile length fix mounting profile e.g. with a clamp to a desk.



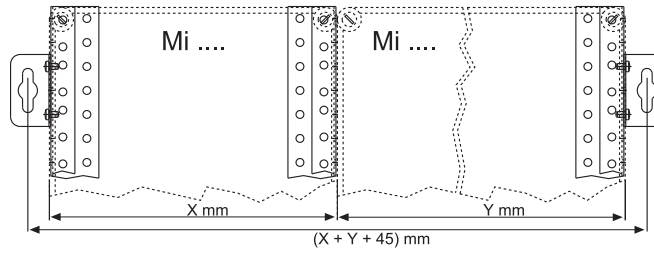
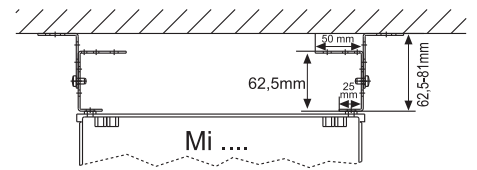
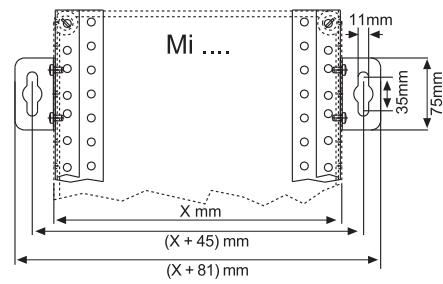
Fixing matrix of mounting profile



Transport

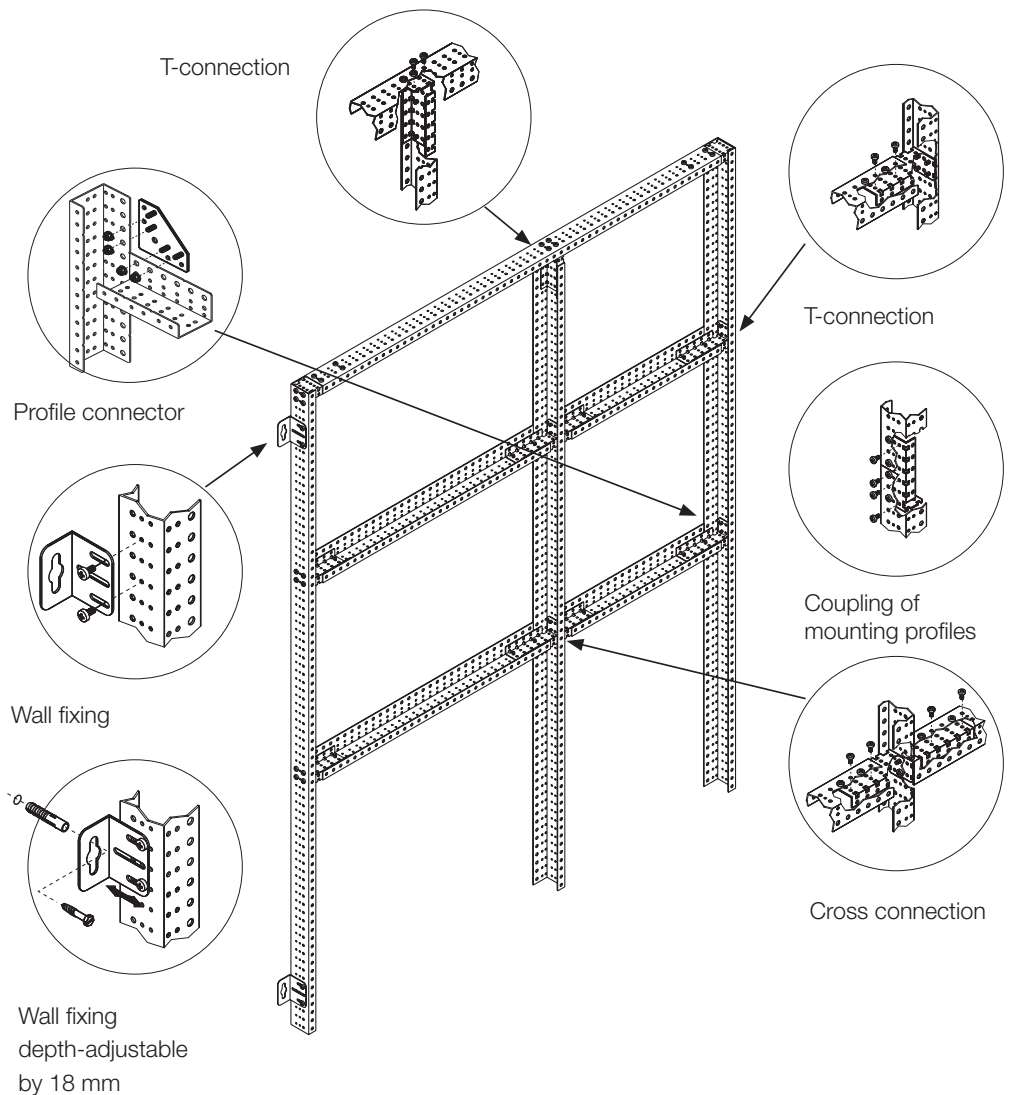
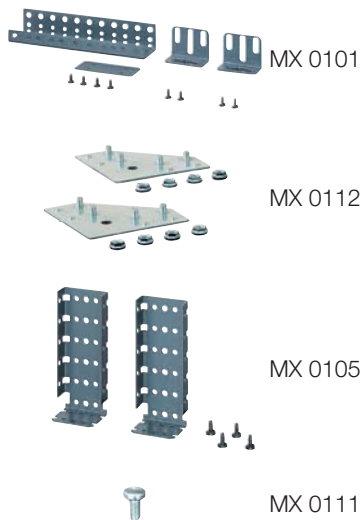
Regarding transportation its recommendable to protect the assembly against deflection. For that please screw the assembly to a solid timber.

U profiles for constructing a mounting frame



Mounting profile

To stabilize larger distributions boards for the transport and assembly on site.



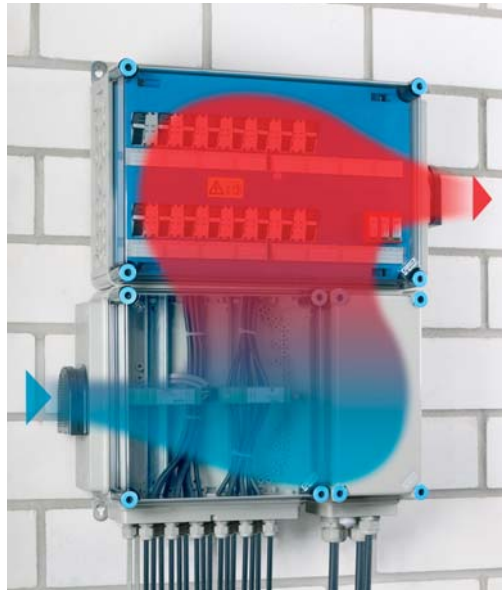
Installation

Measures against Condensation Forming in Enclosures

Ventilation flange

Mi BF 44

For ventilation of Mi distribution boards in the event of extremely high internal temperatures or a risk of water condensation. For vertical installation on box walls, degree of protection IP 44.

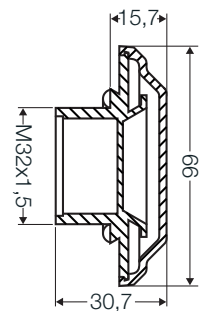
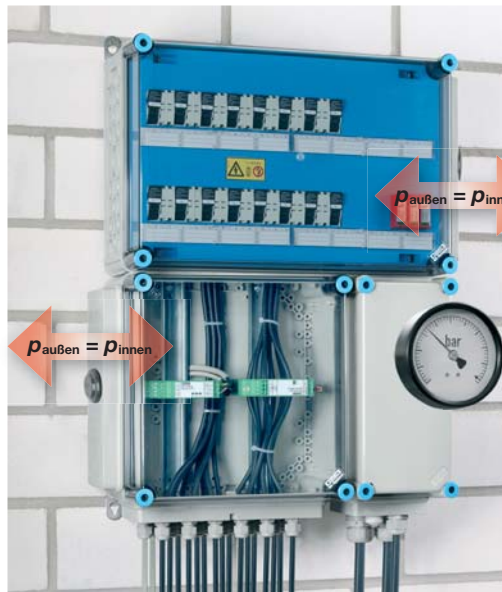


Mi BF 44

Pressure compensation element

BM 32

for the reduction of condensation by pressure compensation in power distribution systems.



BM 32

Combi climate glands

KBM / KBS ...

for reduction of condensation by pressure compensation

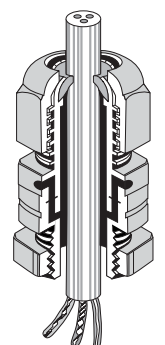
Via an inserted climate membrane they ensure pressure compensation between enclosure interior and ambient air. Ingress of water through the cable gland is prevented. The degree of protection of the enclosure is obtained!



KBM ...



KBS ...

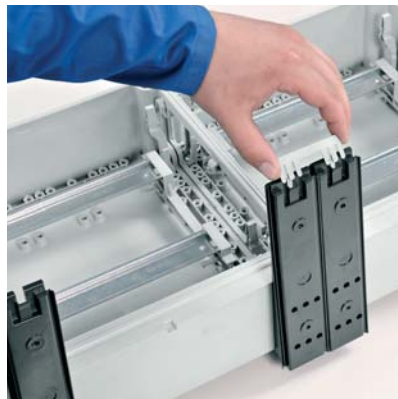


Canopy for the unprotected installation outdoors

Knock out box wall and assemble flange with pre-mounted canopy to the box.

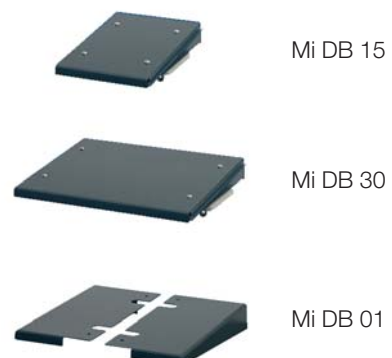


In case of box assembly connect trusses with stop plate.



Mount canopy and/or canopy end plate

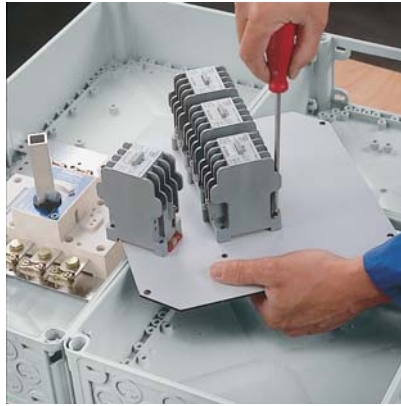
Hint:
Insert canopy end plate under the canopy until it hits back-stop.



Device installation on mounting plates or DIN rails

Fasten installation devices on mounting plates with self-threading screws.

Screw mounting plate onto base of box.



Mount DIN rails directly onto base of boxes or on spacers Mi DS .. in heights of 25 or 50 mm.



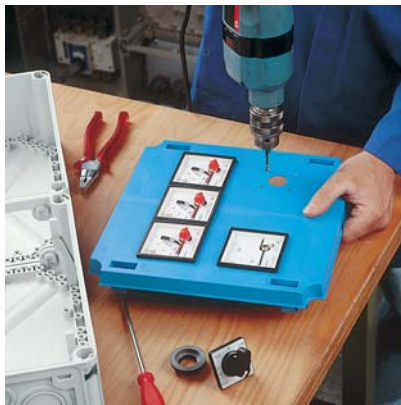
Installation of equipment in cover plates

Pre-drill the sections at the corners and saw out with piercing saw. Use saw blades with rough teeth for plastics.

Screw support for the protection cover Mi EP .. onto base of box.

Attach protection cover.

Close unused equipment openings in protection covers with attached blanking strips.



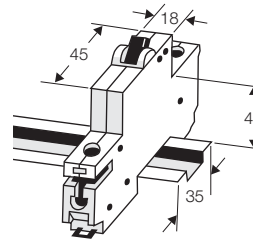
Device installation in circuit breaker boxes

Circuit breaker boxes can be fitted with any DIN rail equipment, if per row (12 modules 12x18 mm) the assigned backup fuse won't exceed 80 A.



PE and N terminals for copper conductors (installed)

Dimension of 1 module:
1 Module = 18 mm



Note to Mi Circuit breaker boxes:

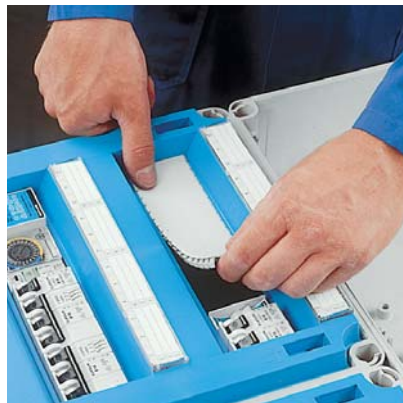
Spare equipment openings in protection covers are to be covered with blanking strips to prevent accidental contact (blanking strips are enclosed for 50 % of equipment openings)


Dimensions according to DIN 43880
for DIN rail mounted device

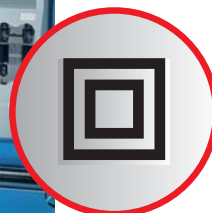
Protection covers

Cover unused equipment openings with blanking strips to prevent accidental contact.

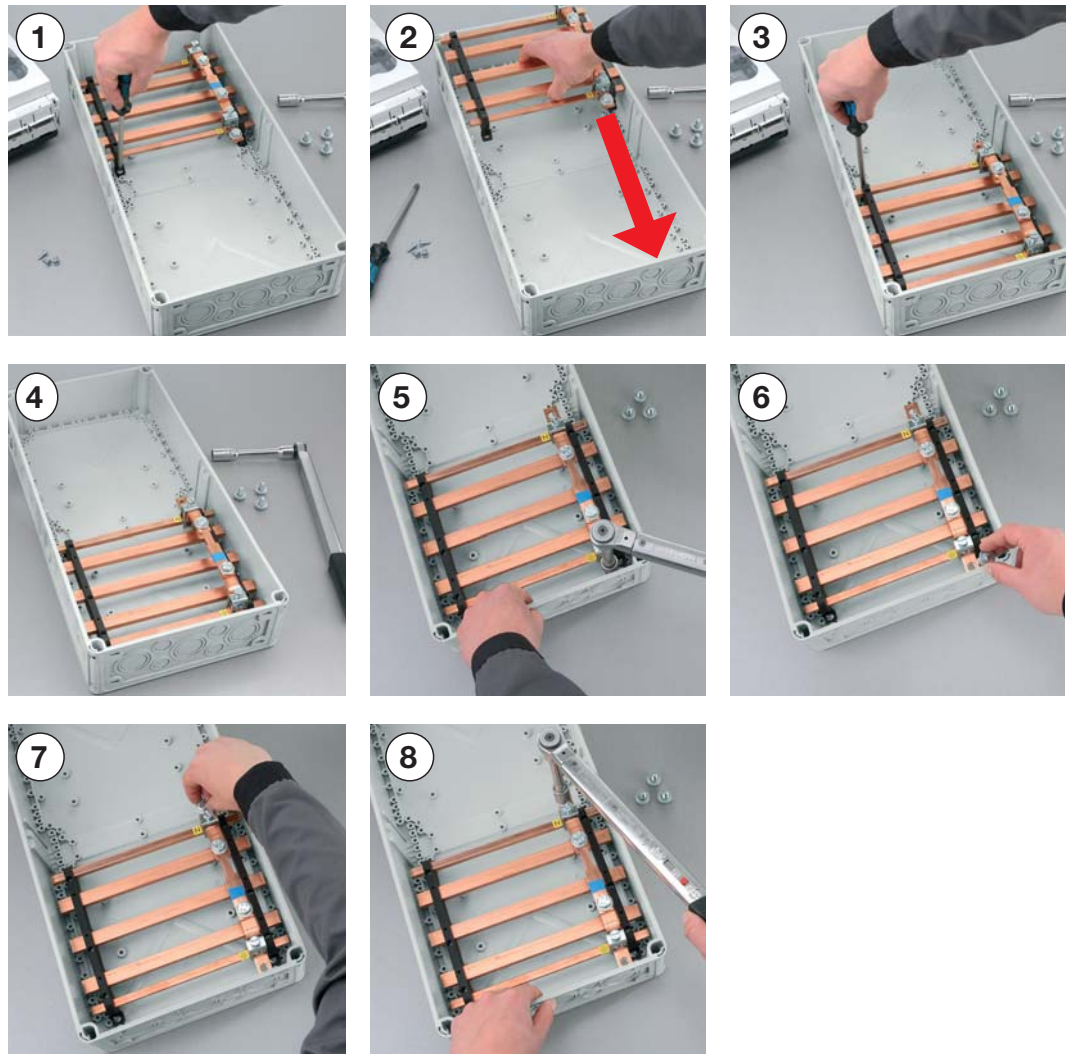
Provide for total protection against access to hazardous parts for accessible devices and busbar-mounted equipment.



Protection class II, 
(Total insulation)

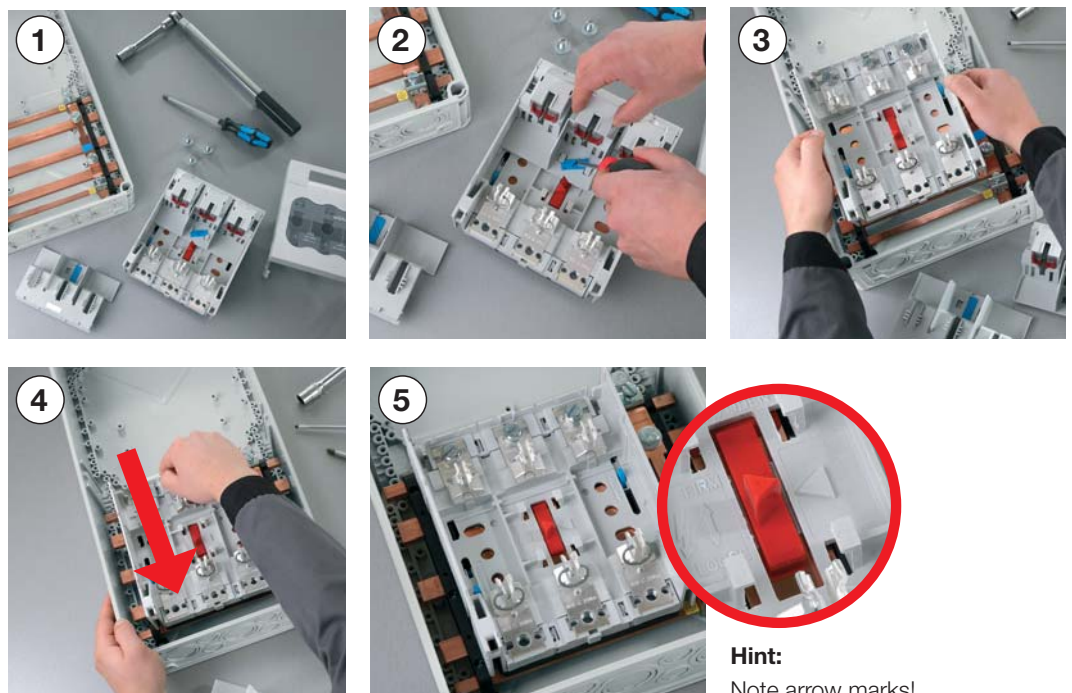


Change position of busbar system within enclosure



Mounting

Bus-mounted HRC 1-fuse switch disconnecter
(Manufacturer: Wöhner)



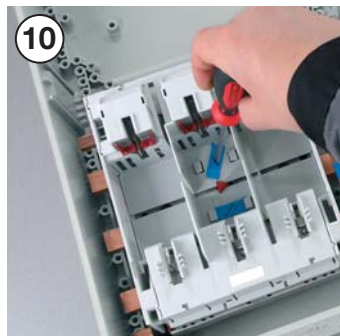
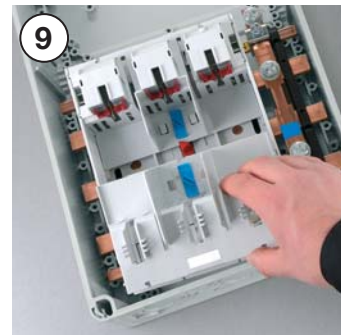
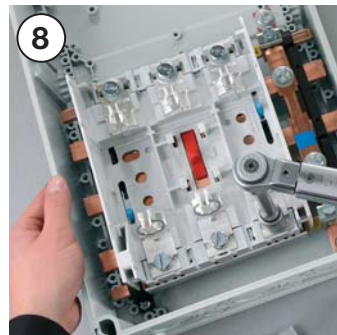
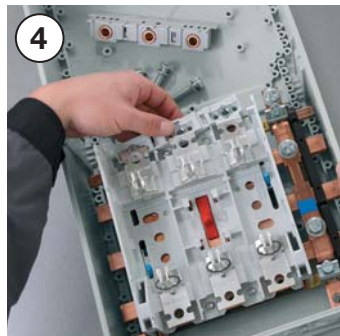
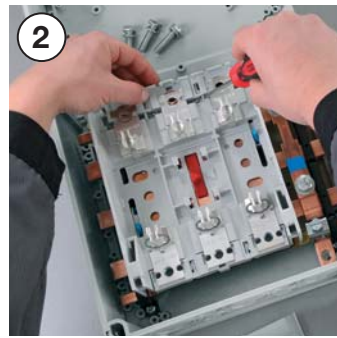
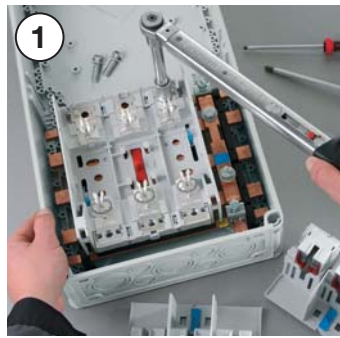
Hint:
Note arrow marks!

Device Installation

Changing connection of HRC 1 Fuse Switch Disconnectors

Changing direction of cable connection of a HRC1 fuse switch disconnecter (Manufacturer: Wöhner) **from the bottom to top connection.**

Only possible with busbar systems 400 A!





EMC compliant busbar system

As standard with N/PEN conductors:

- with the same current carrying capacity as phase conductors
- most favourable for EMC compliance in the area of phase conductors



Rated values for voltages

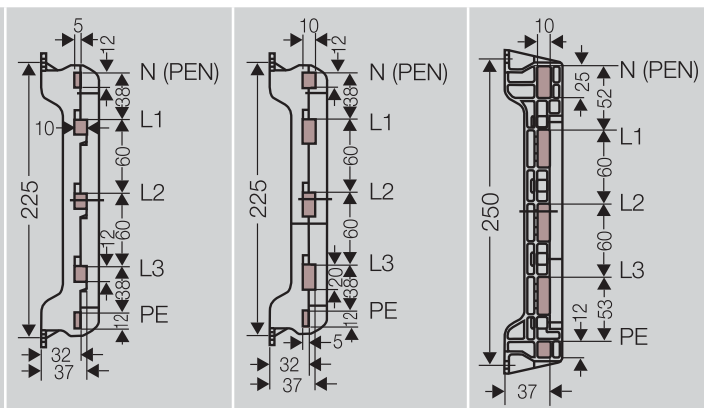
rated voltage	$U_n = 690 \text{ V a.c.}$
rated insulation voltage	$U_i = 690 \text{ V a.c., } 1000 \text{ V d.c.}$

Rated values of currents

Busbars	250 A	400 A	630 A
rated busbar current	250 A	400 A	630 A
rated short-time withstand current	$I_{cw} = 15 \text{ kA} / 1 \text{ s}$	$I_{cw} = 15 \text{ kA} / 1 \text{ s}$	$I_{cw} = 21 \text{ kA} / 1 \text{ s}$
rated peak withstand current resistance	$I_{PK} = 30 \text{ kA}$	$I_{PK} = 30 \text{ kA}$	$I_{PK} = 45 \text{ kA}$
Power dissipation of busbar system length: 1 meter	42.7 W/m	63.8 W/m	102.3 W/m

Position of busbars

For containing short-circuit resistance the distance between busbar supports must not exceed 300 mm.



Equipment for busbar supports

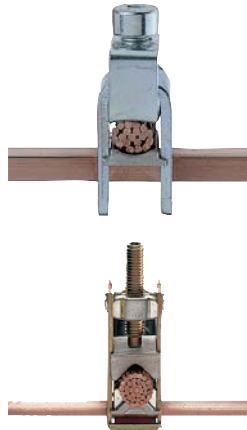
	Mi ST 25	Mi ST 41	Mi ST 63
L1, L2, L3	12x10 mm	20x10 mm	30x10 mm
N	12x5 mm	12x10 mm	25x10 mm
PE	12x5 mm	12x5 mm	12x10 mm

Possible combinations of busbars with different rated currents

Busbar connector	Rated current of busbars	Rated current of busbars	
Hint:			
Busbar systems 250 A and 400 A must not be combined with 630 A-busbar systems!			
Mi SV 25	250 A	250 A	
Mi SV 25	250 A	400 A	
Mi SV 45	400 A	400 A	
Mi SV 45	630 A	630 A	

Direct connection of conductors to busbars

Capacity of terminals for direct busbar connection see HENSEL Catalogue.



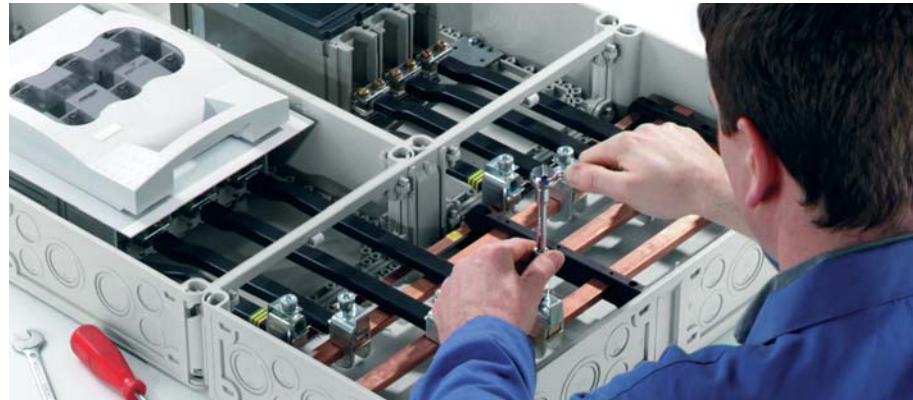
Mi-Verteiler Zubehör		ENYMOD		Mi-Verteiler Zubehör		ENYMOD	
Typ	Leitungsquerschnitt	Spannung	Leitungsart	Busbarbreite	Busbarhöhe	Abstand	Abstand
KS 16 F	1,5-16 mm ²	~ 600 V	~ 1,5-16 mm ²	~ 6 mm	~ 8 mm	~ 12 mm	~ 12 mm
KS 16 Z	1,5-16 mm ²	~ 600 V	~ 1,5-16 mm ²	~ 6 mm	~ 8 mm	~ 12 mm	~ 12 mm
KS 35 F	6-35 mm ²	~ 600 V	~ 6-35 mm ²	~ 6 mm	~ 8 mm	~ 18 mm	~ 18 mm
KS 35 Z	6-35 mm ²	~ 600 V	~ 6-35 mm ²	~ 6 mm	~ 8 mm	~ 18 mm	~ 18 mm
KS 70 F	10-70 mm ²	~ 600 V	~ 10-70 mm ²	~ 6 mm	~ 8 mm	~ 21 mm	~ 21 mm
KS 70 Z	10-70 mm ²	~ 600 V	~ 10-70 mm ²	~ 6 mm	~ 8 mm	~ 21 mm	~ 21 mm
KS 120 F	20-120 mm ²	~ 600 V	~ 20-120 mm ²	~ 6 mm	~ 8 mm	~ 25 mm	~ 25 mm
KS 120 Z	20-120 mm ²	~ 600 V	~ 20-120 mm ²	~ 6 mm	~ 8 mm	~ 25 mm	~ 25 mm
KS 240/12	16-240 mm ²	~ 600 V	~ 16-240 mm ²	~ 6 mm	~ 8 mm	~ 28 mm	~ 28 mm
KS 150	16-150 mm ²	~ 600 V	~ 16-150 mm ²	~ 6 mm	~ 8 mm	~ 28 mm	~ 28 mm
KS 180	16-180 mm ²	~ 600 V	~ 16-180 mm ²	~ 6 mm	~ 8 mm	~ 28 mm	~ 28 mm
KS 240 V	16-240 mm ²	~ 600 V	~ 16-240 mm ²	~ 6 mm	~ 8 mm	~ 28 mm	~ 28 mm
KS 300	16-300 mm ²	~ 600 V	~ 16-300 mm ²	~ 6 mm	~ 8 mm	~ 28 mm	~ 28 mm

Wiring

Assignment of terminals for direct busbar connection to cross sections and enclosures with electrical functions.

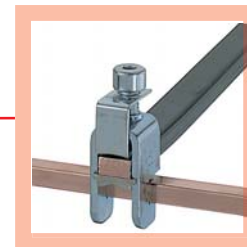
Electrical connection 100 A up to 630 A from busbars to electrical equipment.

Wiring strip from laminated copper, insulated, supplied length 2 meters.



Connection of wiring strip Mi VS ... with terminal for direct busbar connection KS ...

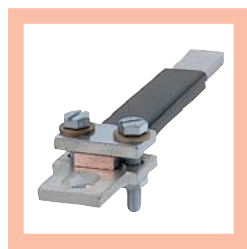
Wiring strip
Mi VS ...



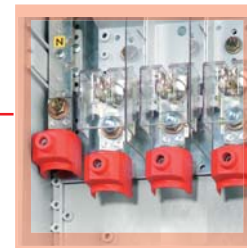
Terminals for direct connection on busbars

Direct connection of wiring strip Mi VS ... to electrical equipment with flat contact M 10 with wiring supply terminal for direct connection of laminated copper wiring strip Mi VA ...

Terminal for connection of wiring strips Mi VA ...



Connection of cables to devices with flat contact M 10 with terminal for direct connection DA 240.



Terminal for direct connection DA 240

Example:

Wiring with wiring strip Mi VS 400, terminals for direct connection on busbars and wiring strip connection terminals VA 400.

Connection of aluminum conductors

I. Chemical basics

The special conducting characteristics of aluminum can be seen in the fact that the surface of an aluminum conductor is immediately covered in a **non-conducting oxide layer** upon exposure to oxygen.

This characteristic leads to an increase in the temporary resistance between the aluminum conductors and the terminal body.

This can lead to terminal overheating and in the worst case fire.

Despite these special conditions, aluminum conductors can be connected if the terminal used is appropriate and the following conditions are taken into consideration when connecting.

II. Special terminal requirements for the connection of aluminum conductors

The suitability of terminal for connections with aluminum conductors needs to be evaluated and confirmed by the terminal manufacturer.

1. These terminals will thus meet the requirements for an aligned **electrochemical voltage sequence**. A disintegration of the base material (aluminum) will be prevented.
2. The terminal has an appropriate shape and surface to penetrate the grease layer or a very thin oxide layer on the aluminum conductor upon connection.

III. Appropriate preparation and handling of aluminum conductors



The non-insulated conductor ends need to have the oxide layer carefully scraped clean using a knife for example. In doing so no files, sand paper or brushes may be used.



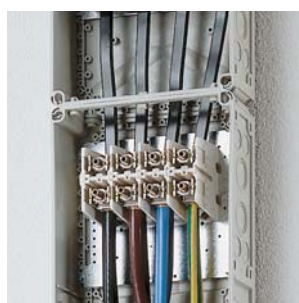
Immediately after removing the oxide layer, the conductor end needs to be rubbed with an acid and alkali free grease such as technical vaseline and then immediately connected to the terminal. This in turn prevents oxygen from forming a non-conducting oxide layer.



Due to the flow tendency in aluminum the terminals need to be tightened before start up and after the first **200 operating hours** (note the appropriate torque).



The steps listed above need to be repeated if the conductor is removed and re-connected. I.e. the conductor has to be scraped again, greased and immediately connected, because it will be connected at a different position.

Wiring
Terminals for Incoming Cables, FIXCONNECT® Plug-in Terminals


2-5-pole, for copper and aluminum conductors, to be assembled in Mi empty boxes sizes 2 to 8, pre-mounted on mounting plate 300 x 300 mm, with fixing screws.

Terminal for incoming cables	Mi VE 120, 4-pole Mi VE 125, 5-pole		Mi VE 240, 4-pole Mi VE 245, 5-pole		Mi VE 302, 2-pole Mi VE 303, 3-pole Mi VE 304, 4-pole		
Rated connecting capacity	150 mm ²		240 mm ²		300 mm ²		
Current carrying capacity	250 A		400 A		630 A		
Tightening torque	20 Nm		40 Nm		50 Nm		
Clamping units per pole	2	4	2	4	2	4	
Type of conductor copper/aluminum sol (round)		16-50	16-50	25-50	25-50	-	35-70
Type of conductor copper/aluminum s (round), f (flexible)		16-150	16-70	25-240	25-120	150-300	35-185
Type of conductor copper/aluminum sol (sector)		50-150	50-70	50-185	50-120	150-185	95-185
Type of conductor copper s (sector)		35-150	35-70	35-240	35-120	150-240	95-185
Type of conductor aluminum s (sector)		50-120	35-50	95-185	50-95	150-240	95-185
Outgoing Cu-strip	Mi VS 100 up to Mi VS 630		Mi VS 100 up to Mi VS 630		Mi VS 630		

Prior to connection, aluminum conductors must be prepared according to the appropriate technical recommendations, see technical information Aluminum conductors.

N and PE-FIXCONNECT® plug-in terminal
Rated connecting capacity of PE and N terminals

Clamping unit	Corresponding cross-sections / copper			
	max. number	from - to max.	max. number	from - to max.
	1	25 mm ² , s	1	25 mm ² , f
	1	16 mm ² , s	1	16 mm ² , f
	1	10 mm ² , sol	1	10 mm ² , f
	3	6 mm ² , sol	1	6 mm ² , f
	3	4 mm ² , sol	1	4 mm ² , f
	4	2.5 mm ² , sol	1	2.5 mm ² , f
	4	1.5 mm ² , sol	1	1.5 mm ² , f
	Tested as connecting terminal for several conductors of the same cross-sections for using in one circuit			
	1	1.5 - 4 mm ² , sol	1	1.5 - 4 mm ² , f
				Without end ferrule; clamping unit has to be opened with a tool when conductor is inserted.

Current carrying capacity of N bar: 80 A All terminals are secured against self-loosening.

Routine test protocol in accordance with IEC 61439-1

Serial No.	Type of testing*	Content of routine test	IEC 61439 Section	Result of routine test	Test engineer
1	S	Degree of protection of cabinets /enclosures (sealings, protection covers)	11.2	i. O.	



The manufacturer must specify measures that must be implemented to maintain the designated degree of protection.

Check that seals and covers were installed according to the manufacturer's instructions.

Serial No.	Type of testing*	Content of routine test	IEC 61439 Section	Result of routine test	Test engineer
4	S	Incorporation of built-in components	11.5	i. O.	
7	P	Mechanical operation (actuating elements lockings)	11.8	i. O.	



The effectiveness of mechanical actuating elements, interlocks and locks including those associated with removable parts shall be checked.

Serial No.	Type of testing*	Content of routine test	IEC 61439 Section	Result of routine test	Test engineer
2	S/P	Creepage and clearance distances	11.3	i. O.	
5	S/P	Internal electrical circuits and connections	11.6	i. O.	
6	S	Terminals for external conductors	11.7	i. O.	
8	P	Dielectric properties	11.9	>200 MΩ	



The clearances between different potentials should be greater than the values in Table 1 of the standard. We recommend a minimum distance of 10 mm.



Conductors must be checked for consistency with circuit diagrams and bolted connections have to be checked at random.

Serial No.	Type of testing*	Content of routine test	IEC 61439 Section	Result of routine test	Test engineer
3	S/P	Protection against electric shock and integrity of protective circuits	11.4	i. O.	
9	P	Wiring, operational performance and function	11.10	i. O.	



The protective circuits shall be subjected to a test for integrity of electrical connection.



A power-frequency withstand test shall be performed on all circuits in accordance with IEC 61439-1 Section 10.9.2 for a duration of 1 s. The test voltage for power switchgear and controlgear assemblies with a rated insulation voltage between 300-690 V a.c. is 1,890 V. The test values for different rated insulation voltages are given in Table 8 of IEC 61439-1.

*Type of testing S: visual inspection
Type of testing P: testing with mechanical or electrical test equipment

Marking

It is to provide for a manufacturer's label.
This must be easily legible in the assembly connected.
Example: Germany



<p>Elektro-Strom Musterstraße 123, 58765 Musterhausen</p>	Baujahr: 2013
<p>Schaltgerätekombination nach DIN EN 61439-3 Bemessungsspannung: 230/400 V Bemessungsstrom: 125 A Schutzart: IP 65 Schutzklasse: □</p>	

The CE marking shall be made on the basis of European legislation.

Check list for the conformity assessment procedure

Example: Germany

Checkliste zum Konformitätsbewertungsverfahren

Firma: **Elektro-Strom**
(Elektrohandwerksbetrieb) **Musterstraße 123, 58765 Musterhausen**

Auftrag:
Projekt: **Schreinerei Müller**
Typ: **6359**

Niederspannungs-Schaltgerätekombination oder Verteiler

Energie-Schaltgerätekombination nach DIN EN 61439-2 (VDE 0660-600-2)
 Installationsverteiler für die Bedienung durch Laien nach DIN EN 61439-3 (VDE 0660-600-3)
 Installationskleinverteiler und Zählerplätze AC 400 V nach DIN VDE 0603-1

1. Technische Unterlagen

Geltungsbereich der Niederspannungsrichtlinie 2006/95/EG

Listen oder andere Dokumentationen des ursprünglichen Herstellers für Niederspannungs-Schaltgerätekombinationen oder Verteiler. (Wichtiger Inhalt: Name und Anschrift des ursprünglichen Herstellers sowie Typbezeichnung, zutreffende Norm, Beschreibung des Erzeugnisses)
 Montage- und Installationshinweise des/der ursprünglichen Hersteller.
 Schaltplan, Aufbauzeichnung, Stückliste
 Durchführung der Stückprüfung nach DIN EN 61439-1 (VDE 0660-600)
 Prüfprotokoll für Stückprüfung (Blatt 3) ist Bestandteil der Unterlagen.

Geltungsbereich der EMV-Richtlinie 2004/108/EG

Ergänzung der technischen Unterlagen durch Herstellerunterlagen für alle elektronischen Einbaugeräte und Geräte, die Elektronik beinhalten (Montage- und Installationshinweise).
 Konformitätserklärung des Geräteherstellers, mit der die Übereinstimmung des Produkts mit den Anforderungen der EMV-Richtlinie bestätigt wird. Ein Hinweis in den Begleitunterlagen ist gleichwertig und entsprechend aufzubewahren.

2. Erstellung der Konformitätserklärung (siehe Blatt 2)
 3. Anbringung der CE-Kennzeichnung (siehe Blatt 2)

Konformitätsbewertungsverfahren durchgeführt:

Musterhausen, 08.01.2013
(Ort/Datum der Ausstellung)

Elektro-Strom
(Name/Unterschrift oder gleichwertige Kennzeichnung des Befugten)

Zutreffendes bitte ankreuzen

© Zentralverband der Deutschen Elektro- und Informationstechnischen Handwerke (ZVEH) 07/2012

Konformitätserklärung

Wir
(Anschrift des Elektrohandwerksbetriebs)
Elektro-Strom
Musterstraße 123
58765 Musterhausen

erklären in alleiniger Verantwortung, dass das Produkt

Zählerplatz Energie-Schaltgerätekombinationen Installationsverteiler für die Bedienung durch Laien
 Installationskleinverteiler

(Bezeichnung, Typ, Katalog- oder Auftrags-Nr.)
ENYSTAR

auf das sich diese Erklärung bezieht, mit der/jen folgenden Norm(en) übereinstimmt und gebaut ist.

Niederspannungs-Schaltgerätekombination oder Verteiler

Energie-Schaltgerätekombination nach DIN EN 61439-2 (VDE 0660-600-2)
 Installationsverteiler für die Bedienung durch Laien nach DIN EN 61439-3 (VDE 0660-600-3)
 Installationskleinverteiler und Zählerplätze AC 400 V nach DIN VDE 0603-1

Das bezeichnete Produkt entspricht damit den Bestimmungen folgender Europäischer Richtlinien:
 Niederspannungsrichtlinie 2006/95/EG
 EMV-Richtlinie 2004/108/EG
 (z. B. bei elektronischen Betriebsmitteln, eingebaut in Schaltgerätekombination oder Verteiler nach der Reihe DIN EN 61439-1 (VDE 0660-600))

Anbringung der CE-Kennzeichnung: **Elektro-Strom** (Datum) **08.01.2013**

Musterhausen, 08.01.2013 **Elektro-Strom**
(Ort und Datum der Ausstellung) (Name und Unterschrift oder gleichwertige Kennzeichnung des Befugten)

Mit dieser Preisangebotsklärung versichert der Hersteller die Übereinstimmung mit den genannten Richtlinien und Normen.
 Diese Konformitätsangabe entspricht DIN EN 17050-1 „Allgemeine Kriterien für Konformitätsangaben von Anbietern“.
 *) In Verbindung mit der Herstellerkennzeichnung sichtbar auf der Niederspannungs-Schaltgerätekombination oder dem Verteiler angebracht, ggf. auch erst nach dem Öffnen der Tür lesbar.

Zutreffendes bitte ankreuzen

© Zentralverband der Deutschen Elektro- und Informationstechnischen Handwerke (ZVEH) 07/2012

Country-specific requirements have to be observed!

Power switchgear and controlgear assembly (PSC),

Verification according to IEC 61439-1/-2

Distribution boards intended to be operated by ordinary persons (DBO),

Verification according to IEC 61439-1/-3

Customer:

Order number:

Project:

Workshop:

Testing performed:

No.	Type of test- ing*	Content of routine test	IEC 61439 Section	Result of routine test	Test engineer
1	S	Degree of protection of cabinets /enclosures (sealings, protection covers)	11.2	<input type="text"/>	<input type="text"/>
2	S/P	Creepage and clearance distances	11.3	<input type="text"/>	<input type="text"/>
3	S/P	Protection against electric shock and integrity of protective circuits	11.4	<input type="text"/>	<input type="text"/>
4	S	Incorporation of built-in components	11.5	<input type="text"/>	<input type="text"/>
5	S/P	Internal electrical circuits and connections	11.6	<input type="text"/>	<input type="text"/>
6	S	Terminals for external conductors	11.7	<input type="text"/>	<input type="text"/>
7	P	Mechanical operation (actuating elements, lockings)	11.8	<input type="text"/>	<input type="text"/>
8	P	Dielectric properties	11.9	<input type="text" value="MΩ"/>	<input type="text"/>
<p>A power-frequency withstand test shall be performed on all circuits in accordance with IEC 61439-1 Section 10.9.2 for a duration of 1 s. The test voltage for power switchgear and controlgear assemblies with a rated insulation voltage between 300-690 V a.c. is 1,890 V. The test values for different rated insulation voltages are given in Table 8 of IEC 61439-1.</p>				Test voltage values	<input type="text" value="V a.c."/>
<p>Alternatively, for switchgear assemblies with a protective device in the power supply and a rated current up to 250 A applies: Measurement of the insulation resistance with an insulation tester at a voltage of at least 500 V d.c. The test is passed with an insulation resistance of at least 1000 Ω / V.</p>				Insulation resistance	<input type="text" value="Ω/V"/>
9	P	Wiring, operational performance and function	11.10	<input type="text"/>	<input type="text"/>

S - Visual inspection

P - Testing with mechanical or electrical test equipment

Installer:

Test engineer:

Date:

Date:

**Erklärung
der EG-Konformität**

Declaration of EC-Conformity

Nr. K 2010a

Das Produkt,
The product

Typ / Type:	Mi-Verteiler Mi-Distributor Typ / type: Mi
Hersteller: <i>Manufacturer</i>	Gustav Hensel GmbH & Co. KG Gustav-Hensel-Straße 6 57368 Lennestadt
Beschreibung: <i>Description:</i>	Niederspannungs-Schaltgerätekombination „PSC“ Low-voltage switchgear and controlgear assemblies “PSC”

auf das sich diese Erklärung bezieht, stimmt mit folgenden Normen oder normativen Dokumenten überein:
to which this declaration relates is in conformity with the following standard(s) or normative document(s):

Norm / Standard:	DIN EN 61439-2 EN 61439-2 IEC 61439-2
------------------	------------------------------------------------------

und entspricht den Bestimmungen der folgenden EG-Richtlinie(n):
and is in accordance with the provisions of the following EC-directive(s)

**Niederspannungs-Richtlinie 2006/95/EG
Low voltage directive 2006/95/EC**

**EMV-Richtlinie (EMC) 2004/108/EG
Electromagnetic Compatibility (EMC) Directive 2004/108/EC**

Diese Konformitätserklärung entspricht der Europäischen Norm EN 17050-1 „Allgemeine Anforderungen für Konformitätserklärungen von Anbietern“. Das Unternehmen Gustav Hensel GmbH & Co. KG ist Mitglied von ALPHA, Gesellschaft zur Prüfung und Zertifizierung von Niederspannungsgeräten e.V.. Diese Erklärung gilt weltweit als Erklärung des Herstellers zur Übereinstimmung mit den oben genannten internationalen und nationalen Normen.

This Declaration of Conformity is suitable to the European Standard EN 17050-1 “General requirements for supplier’s declaration of conformity”. The company Gustav Hensel GmbH & Co. KG is member of ALPHA, Association for testing and certification of low voltage equipment. The declaration is world-wide valid as the manufacturer’s declaration of compliance with the requirements of the a.m. national and international standards.

Jahr der Anbringung der
CE-Kennzeichnung: **2012**
Year of affixing CE-Marking.

Ausstellungsdatum: **01.03.2014**
Date of issue:

Gustav Hensel GmbH & Co. KG



R. Cater
- Technische Geschäftsleitung -
- *Technical Managing Director* -



Gustav Hensel GmbH & Co. KG
Industrial Electrical Power Distribution Systems

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