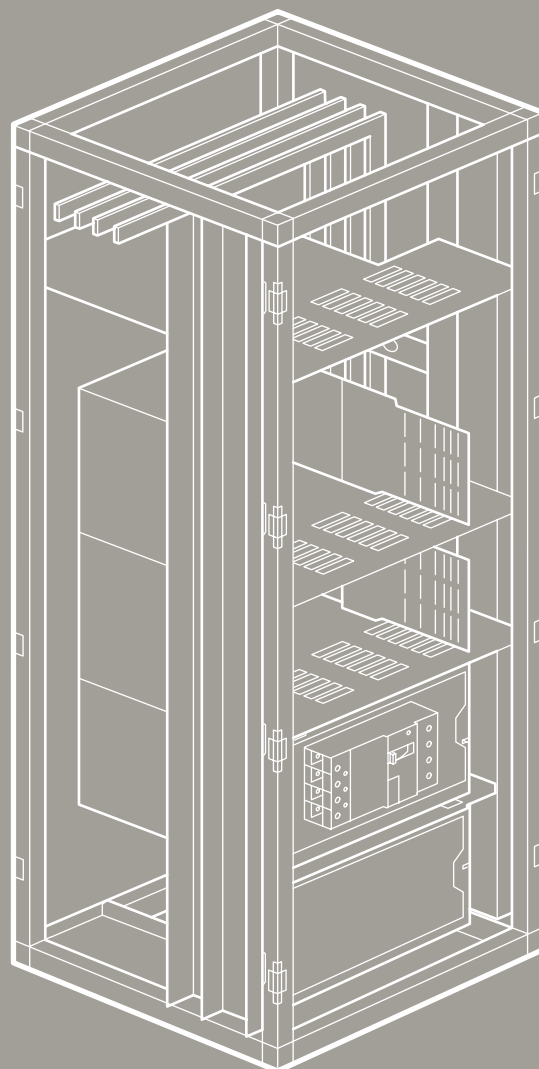


Forms of separation



WORKSHOP SPECIFICATIONS

Contents

1

■ WHAT IS THE PURPOSE OF FORMS?	2
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■ FORM 2b	6
■ FORM 3a	10
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What is the purpose of forms?

2

Standard EN 60439-1 defines the internal separation of assemblies into 4 types of form, each form being divided into two groups “a” and “b” (2a, 2b, 3a, 3b, 4a and 4b).

This internal separation is achieved in XL³ 4000 enclosures by using metallic or insulating barriers or screens.

It is used to divide the panel into closed protective spaces in order to achieve four objectives.

- To protect against direct contact with dangerous parts of neighbouring functional units (the degree of protection must be at least equal to IP xxB).
- To protect against the entry of solid objects. The degree of protection must be at least equal to IP 2x (degree of protection IP 2x covers degree of protection IP xxB).
- To limit the spread of electric arcs.
- To facilitate panel maintenance operations.

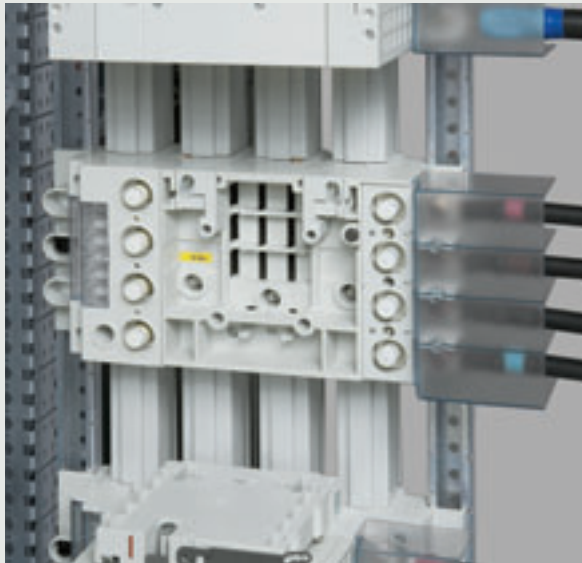
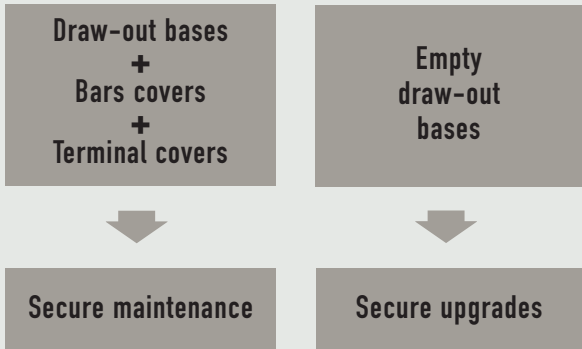
The main objective is to ensure the availability of the power supply in the event of a fault or if work is being carried out on the panel.

XL³ 4000 enclosures and their accessories can be used to create all types of form.

! The partitioning inserted to create forms limits the natural ventilation of the panel and can therefore result in overheating. It will inevitably increase the size and cost of the panel, both in terms of labour and components.

XL-PART, AN ALTERNATIVE TO FORMS

The XL-Part system is particularly suitable if the possibility of performing maintenance or upgrade operations on the panel without switching off all power to the assembly is required.



3

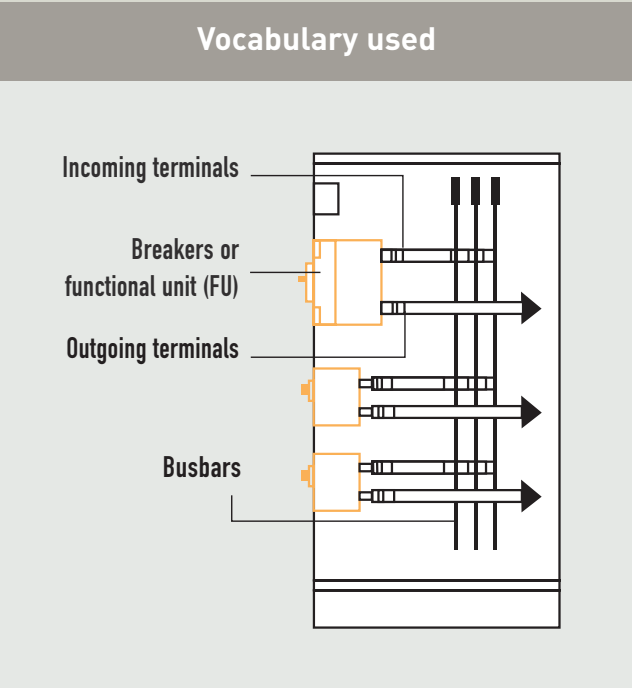
STANDARDS INFORMATION

Standards on forms refer to functional units (FU). A functional unit is part of an assembly comprising all the mechanical and electrical elements used to perform a single function.

In the case of distribution panels, the functional units are almost exclusively made up of the protection device, its auxiliaries and their fixing components.

For simplification purposes, a form in the XL³ system is usually constructed from the level of form below it. For example, form 3b is constructed from form 2b by adding additional components, in this case horizontal separation screens.

Forms are subject to agreement between the panel manufacturer and the user.



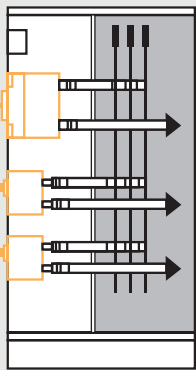
Form 2a

Devices separated from busbars.

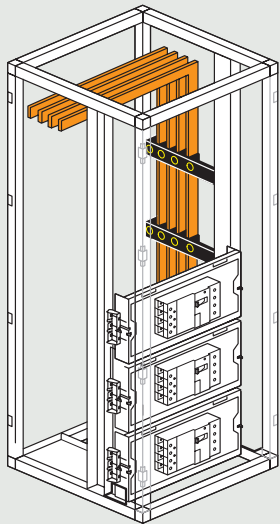
4

5

A REQUIREMENTS OF STANDARD



Separation of busbars from functional units (FU).
Terminals for external conductors do not need to be separated from busbars.



B LEGRAND SOLUTION

The simplest way of creating a 2a form in XL³ 4000 enclosures is to:


- mount the breakers horizontally
- connect the breakers on rear terminals

By doing this, the fixing plates of the breakers create a natural division between the functional units and the busbars placed behind the functional uprights.


The usable enclosure depths are 725 mm and 975 mm.

If the usable space has to be filled in, solid plates should be used:

- Height 100 mm, Cat. No. 206 40
- Height 200 mm, Cat. No. 206 47
- Height 400 mm, Cat. No. 206 48



If connection on the rear terminals is not possible because the back of the panel cannot be accessed, a vertical busbar can be mounted in a cable sleeve. This busbar is then separated from the functional units using separation kits Cat. No. 205 33/34.



In this case, the configuration of the panel will be identical to that used for form 2b.

C MOUNTING STEPS

1. Top or bottom separation kit Cat. No. 208 91/99

These dividers are used to fully isolate the functional units mounted in front of the functional uprights from the busbar compartment located behind the functional uprights.

These top and bottom dividers should be fitted systematically.



2. Horizontal plates

Joining horizontal plates along the entire height of the enclosure creates a screen that separates the breakers from the busbars at the rear.



3. Gap between 2 plates

If 2 adjacent plates are used to mount breakers that are significantly different in size, or if one of the breakers is fitted with a motor for example, the resulting significant gap between the plates means that IP xxB is no longer achieved between the front section (functional units) and the rear section of the enclosure (busbars).



The solution therefore consists of inserting a horizontal partitioning plate in the gap between the two mounting plates. IP xxB is now achieved.



HORIZONTAL DIVIDERS

→ See table of mounting applications on **page 22**

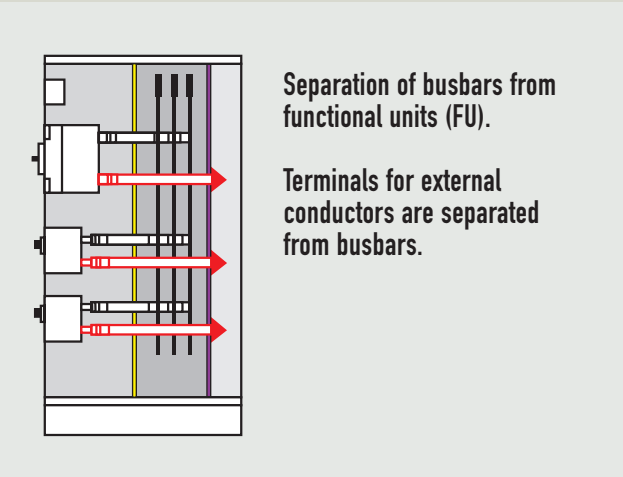
Form 2b

Form 2a + terminals for external conductors separated from busbars

6

7

A REQUIREMENTS OF STANDARD



B LEGRAND SOLUTION

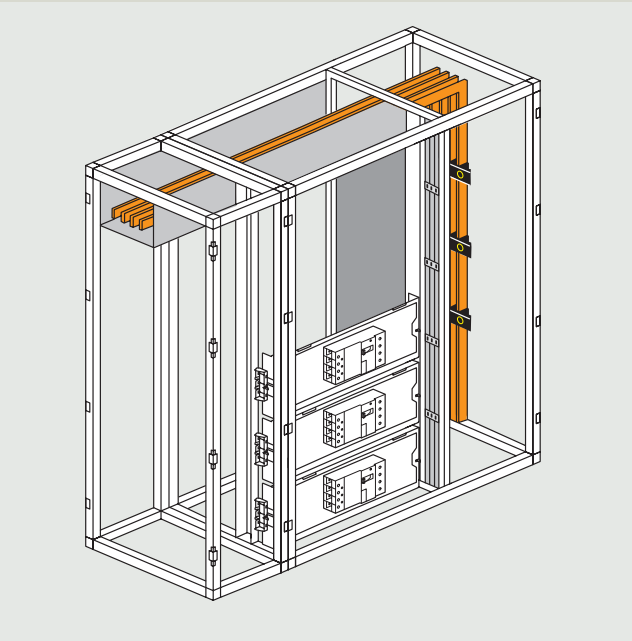
1. Connection of devices on front terminals

The simplest way of creating a 2b form in XL³ 4000 enclosures is to:

- place the distribution busbar (vertical) in a cable sleeve
- connect the breakers on front terminals
- fit the incoming terminals of breakers with terminal shields.

The distribution busbar is separated from the functional units by using a vertical separation kit between the enclosure and the cable sleeve Cat. No. 205 33/34.

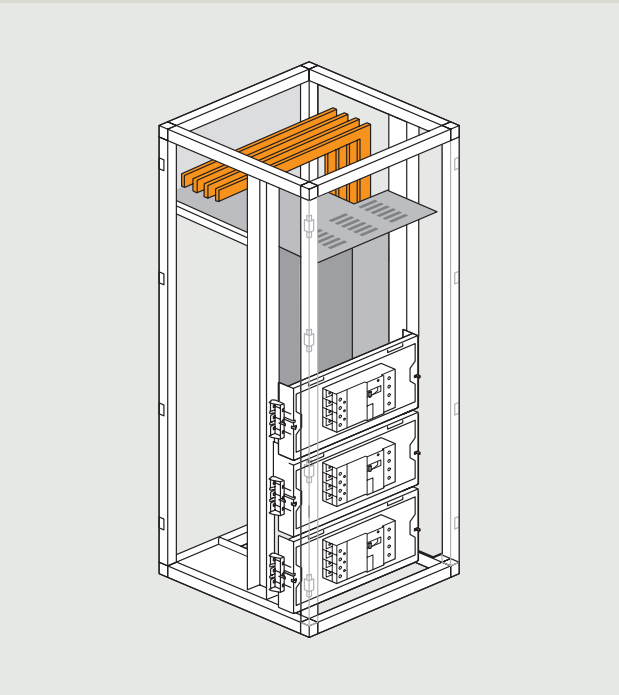
The horizontal main busbar is separated from the functional units by using horizontal separation kits.



Use of a cable sleeve for external conductors is only necessary if it facilitates connection to the breakers.

+	<ul style="list-style-type: none">➤ All enclosure widths can be used (475, 725 and 975 mm).➤ Enclosures can be wall-mounted (no access to the back required).
-	<ul style="list-style-type: none">➤ Use of an external cable sleeve and an internal cable sleeve (large width)

2. Connection of devices on rear terminals

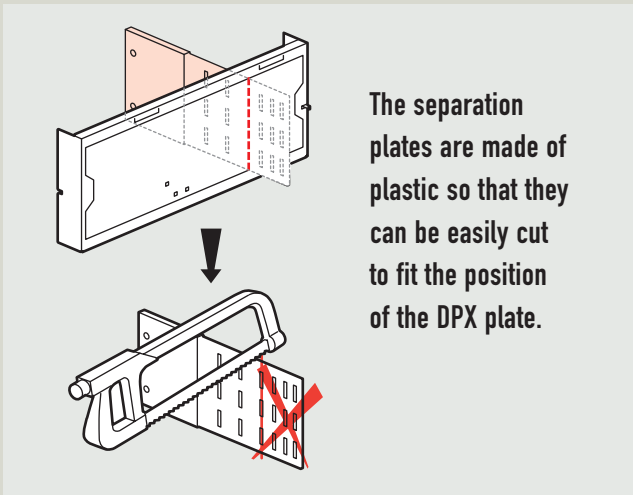


In this configuration, the busbar is placed behind the functional uprights. It is separated using vertical separation kit Cat. No. 208/84/85 in order to isolate the incoming section (busbar) from the outgoing section (outputs).

As the depth of DPX mounting plates can be adjusted, dividers must be used for rear busbars in order to complete separation between the incoming and outgoing connections of devices.

Three heights of divider are available for rear busbars depending on the type of DPX plate they are fitted in:

- Height 200 mm Cat. No. 208 77 for DPX 125, 160 and 250 ER
- Height 300 mm, Cat. No. 208 78 for DPX 250 and 630
- Height 400 mm, Cat. No. 208 79 for DPX 1600.



+	<ul style="list-style-type: none">➤ Small enclosure depths (no cable sleeves)
-	<ul style="list-style-type: none">➤ Access to the back of the panel is required➤ Large depths (725 mm or 975 mm)

XL-PART SYSTEM

➔ See section on "XL-Part and form 2b"

Form 2b (continued)

8

C MOUNTING STEPS

1. Connection of devices on front terminals

This example is of an enclosure measuring 725 mm deep to be fitted with a 4000 A busbar in the top horizontal position. A partial chassis must therefore be created (cutting of functional uprights) in order to free up all of the space inside the enclosure to house the busbar. Separation kits for busbars Cat. No. 205 38 (enclosure) and 208 75 (cable sleeve) are firstly installed around the busbar.



Cat. No. 208 75 | Cat. No. 205 38

The front part of the kit for external cable sleeve Cat. No. 208 75 is then installed. For kit Cat. No. 205 38, a 300 mm high solid faceplate must be used. The side separation kit between the enclosure and internal cable sleeve Cat. No. 205 34 is installed after being cut to 300 mm (200 mm if busbar \leq 1600 A).



Front divider | Cat. No. 205 34

! The vertical separation kit between the enclosure and cable sleeve Cat. No. 205 33/34 can only be used for cables or flexible bars with a maximum thickness of 20 mm. For DPX 1600, it must be replaced by side divider Cat. No. 205 96 (see page 14).



Installation of the solid faceplate completes partitioning of the main busbar and distribution busbar. The devices can now be mounted horizontally or vertically.

! It is advisable to place a yellow label with the word "BUSBAR" on each removable element protecting a busbar.

9

2. Connection of devices on rear terminals

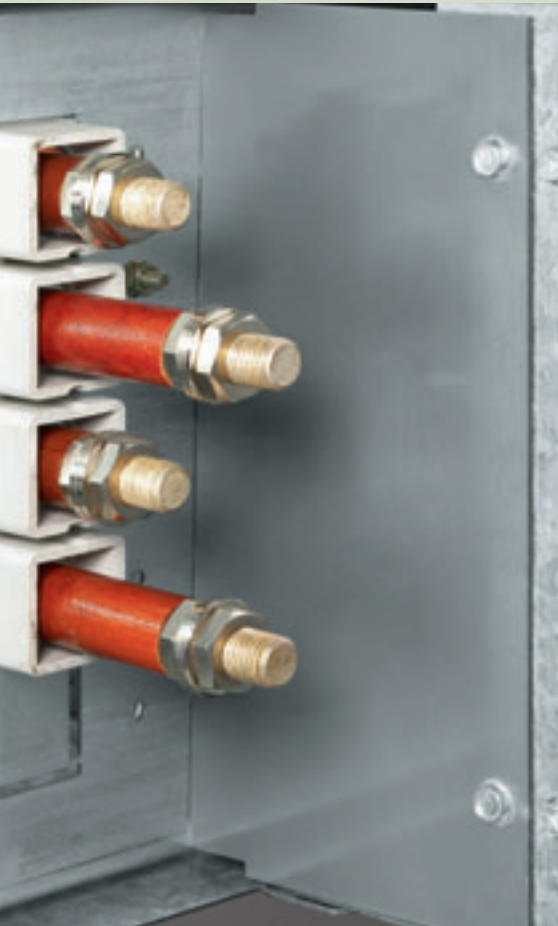
Partitioning for horizontal busbar Cat. No. 208 93/94 is mounted at the top of the enclosure. It is connected to the vertical partitioning for rear busbars Cat. No. 208 84/85. This partitioning completes separation of the distribution busbar.



Cat. No. 208 93/94 | Cat. No. 208 93/94 | Cat. No. 208 84/85

To complete the configuration, vertical separation kit Cat. No. 205 93/94, between an internal cable sleeve and external cable sleeve, or between enclosures, is installed between the left-hand functional upright and the rear structural upright. This plate must be used whenever several columns are joined together (enclosures or cable sleeves). The front side of the partitioning for horizontal busbars is closed with a 200 or 300 mm faceplate (depending on the busbar used) or with an adjustable solid plate. The latter can be fitted with a modular rail if required (see "Modular equipment" on page 24).

Plastic partitions for rear busbars are used to complete separation between the incoming and outgoing connections of devices. They are mounted on the vertical partitioning for rear busbars using 2 x M6 screws. They must be cut to length to fit the position of the DPX plate. All possible lengths are determined by pre-cut sections.

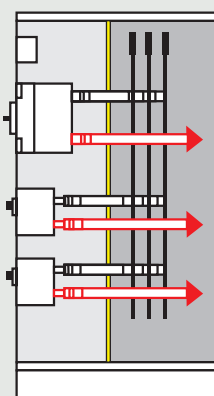


Form 3a

Form 2a + devices separated from each other

10

A REQUIREMENTS OF STANDARD



Separation of busbars from functional units (FU) and separation of all functional units from each other.

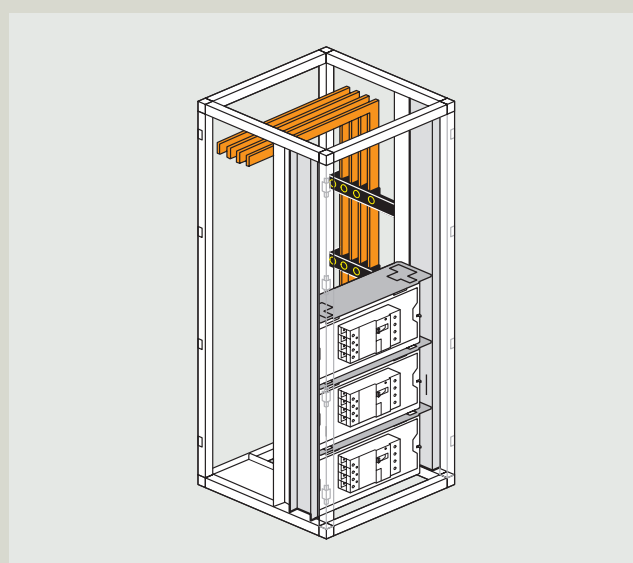
Terminals for external conductors do not need to be separated from busbars.

B LEGRAND SOLUTION

In order to create a 3a form, start by creating a 2a form and systematically add the following:

- horizontal dividers between breakers
- the front panel side partitioning kit.

Once the faceplates are mounted, the functional units are completely separated from each other. The breakers are "enclosed" in a defined space.



As in the case of form 2a, if connection to the rear terminals is not possible because the back of the panel cannot be accessed, a vertical busbar can be mounted in a cable sleeve. This busbar is then separated from the functional units using separation kit Cat. No. 205 34. In order to separate functional units from each other, horizontal separation kits Cat. No. 208 92 or 205 92 should be used together with side partitions with end pieces (output terminals side) Cat. No. 205 97/98/99. As in the case of any connection to the front of the enclosure, DPXs should be fitted with terminal shields. In this case, the configuration of the panel will be identical to that used for form 3b (or 4a).



11

C MOUNTING STEPS

1. Top or bottom separation kits Cat. No. 208 91/99

These dividers are used to fully isolate the functional units mounted in front of the functional uprights from the busbar compartment located behind the functional uprights.

These top and bottom dividers should be fitted systematically.



2. Horizontal plates

Joining horizontal plates along the entire height of the enclosure creates a screen that separates the breakers from the busbars at the rear.



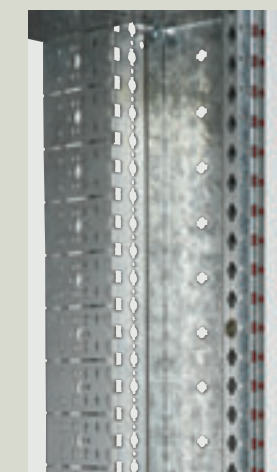
3. Horizontal dividers between breakers

Partitioning Cat. No. 208 92 is used for 24-module enclosures, and partitioning Cat. No. 205 92 is used for 36-module enclosures.



4. Front panel side partitioning

The side partitions Cat. No. 208 90 are fitted between the functional uprights and the faceplate support uprights.



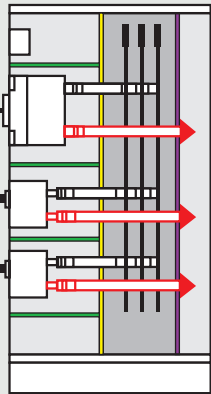
Form 3b

Form 2b + terminals for external conductors separated from busbars

12

13

A REQUIREMENTS OF STANDARD



Separation of busbars from functional units and separation of all functional units from each other.

Terminals for external conductors are separated from busbars.

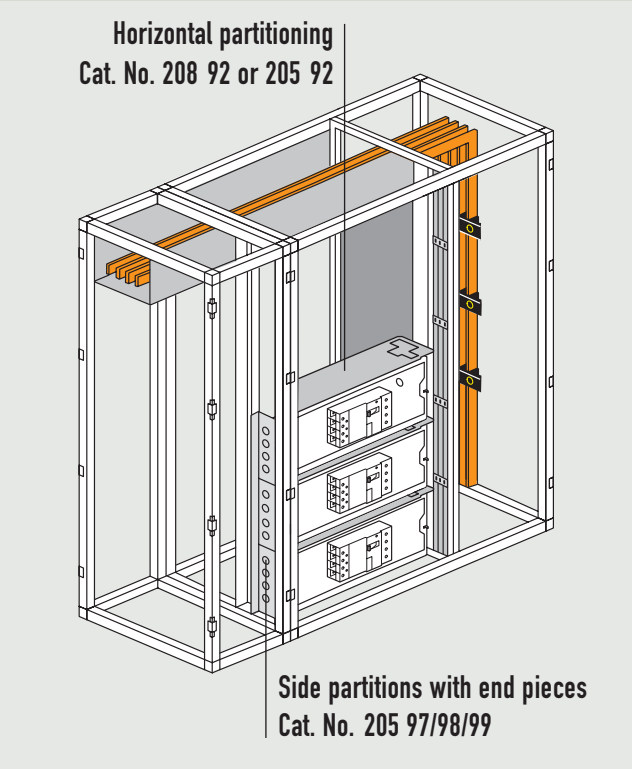
B LEGRAND SOLUTION

1. Connection of devices on front terminals

To produce a 3b form using XL³ 4000 enclosures, create a 2b form and systematically add the following:

- horizontal dividers between the functional units
- side partitions with end pieces.

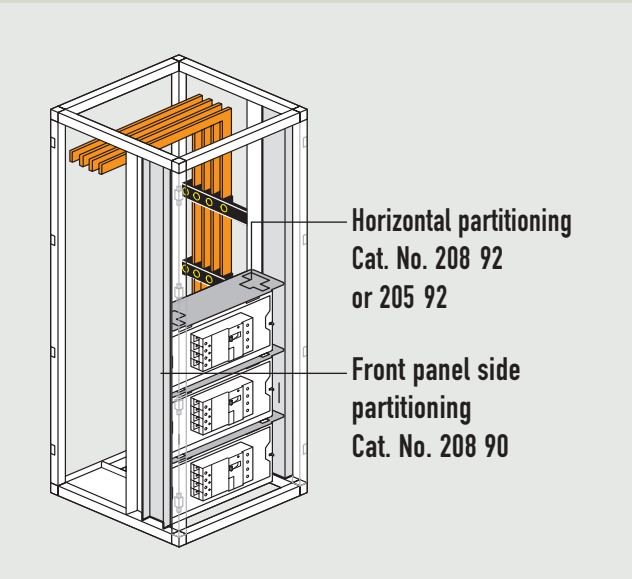
These additional dividers are used to create an enclosed space around the FUs and therefore separate them from each other.



Use of a cable sleeve for external conductors is only necessary if it facilitates connection to the breakers.

+	<ul style="list-style-type: none">➤ All enclosure widths can be used (475, 725 and 975 mm).➤ Enclosures can be wall-mounted (no access to the back required).
-	<ul style="list-style-type: none">➤ Use of an external cable sleeve and an internal cable sleeve (large width).

2. Connection of devices on rear terminals



To produce a 3b form using XL³ 4000 enclosures, create a 2b form and systematically add the following:

- horizontal dividers between the functional units
- side partitions either side of the functional units.

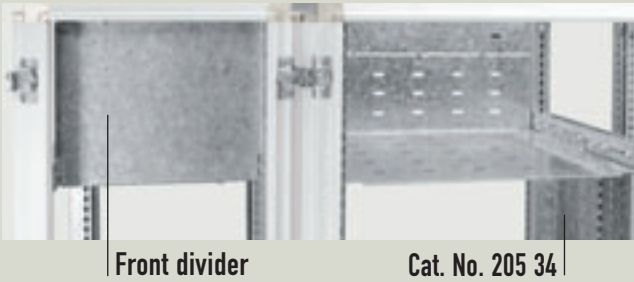
Once the faceplates are mounted, the functional units are completely separated from each other. The breakers are “enclosed” in a defined space.

+	<ul style="list-style-type: none">➤ Small enclosure depths (no cable sleeves)
-	<ul style="list-style-type: none">➤ Access to the back of the panel is required➤ Large depths (725 mm or 975 mm)


C MOUNTING STEPS

1. Connection of devices on front terminals

This example is of an enclosure measuring 725 mm deep to be fitted with a 4000 A busbar in the top horizontal position. A partial chassis must therefore be created (cutting of functional uprights) in order to free up all of the space inside the enclosure to house the busbar. Separation kits for busbars Cat. No. 205 38 (enclosure) and 208 75 (sleeve) are firstly installed around the busbar.



The front part of the kit for external cable sleeve Cat. No. 208 75 is then installed. For kit Cat. No. 205 38, a 300 mm high solid faceplate must be used. The side separation kit between the enclosure and internal cable sleeve Cat. No. 205 34 is installed after being cut to 300 mm (200 mm if busbar ≤1600 A).



The vertical separation kit between the enclosure and cable sleeve Cat. No. 205 33/34 can only be used for cables or flexible bars with a maximum thickness of 20 mm. For DPX 1600, it must be replaced by side divider Cat. No. 205 96 (see page 14).

Form 3b (continued)

14

Installation of the solid faceplate completes partitioning of the main busbar and branch busbar. The devices can now be mounted horizontally or vertically.



Mount the horizontal partitions Cat. No. 208 92 or 205 92 so as to separate the breakers from each other. Partitioning Cat. No. 208 92 is used for 24-module enclosures, and partitioning Cat. No. 205 92 is used for 36-module enclosures.

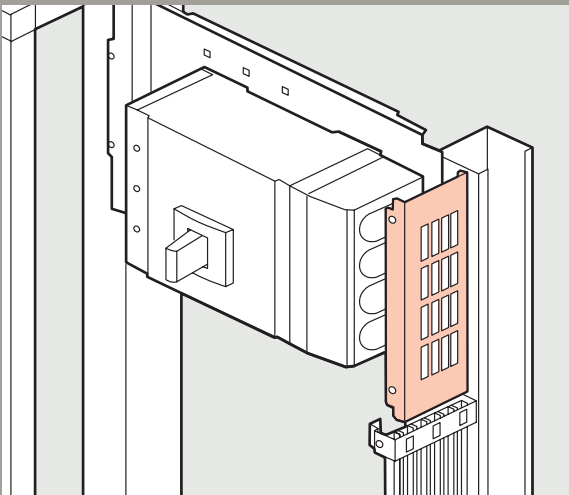


Install the side partitions with end pieces on the side of output terminals Cat. No. 205 97/98/99 and the side separation kit between the enclosure and internal cable sleeve Cat. No. 205 34. As in the case of form 2b, do not forget to fit the breakers with incoming terminal shields.

! It is advisable to place a yellow label with the word “BUSBAR” on each removable element protecting a busbar.

Side divider for DPX 1600

Kit Cat. No. 205 96 is used to feed the connection from DPX 1600 to the cable sleeve for forms 2b, 3b and 4a (front terminal connection).



In this case, divider Cat. No. 205 33/34 must be cut and adjusted to fit the side divider of DPX 1600. Four cut-outs are provided to feed 4 flexible bars per phase, but it is also possible to cut the insulation to allow busbars with a larger cross-section to pass through.

15

2. Connection of devices on rear terminals

Partitioning for horizontal busbar Cat. No. 208 93/94 is mounted at the top of the enclosure. It is connected to the vertical partitioning for rear busbars Cat. No. 208 84/85. This partitioning completes separation of the vertical distribution busbar.



Cat. No. 205 93/94	Cat. No. 208 93/94	Cat. No. 208 84/85
-----------------------	-----------------------	-----------------------

Vertical separation kit Cat. No. 205 93/94, between an internal cable sleeve and external cable sleeve, or between enclosures, is installed between the left-hand functional upright and the rear structural upright. This plate must be used whenever several columns are joined together (enclosures or cable sleeves). The front side of the partitioning for horizontal busbars is closed with a 200 or 300 mm faceplate (depending on the busbar used) or with an adjustable solid plate. The latter can be fitted with a modular rail if required (see “Modular equipment” on page 24).

Plastic partitions for rear busbars are used to complete separation between the incoming and outgoing connections of devices. They are mounted on the vertical partitioning for rear busbars using 2 x M6 screws. They must be cut to length to fit the position of the DPX plate. All possible lengths are determined by pre-cut sections.



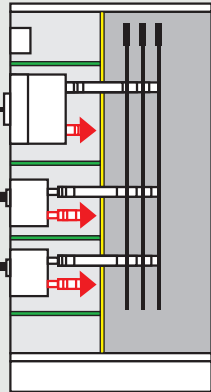
Mount the horizontal partitions so as to separate the breakers from each other (see previous page). Install the side partitions Cat. No. 208 90.

Form 4a

Form 3a + terminals for external conductors separated from each other but in the same compartment as the associated functional unit

16

A REQUIREMENTS OF STANDARD

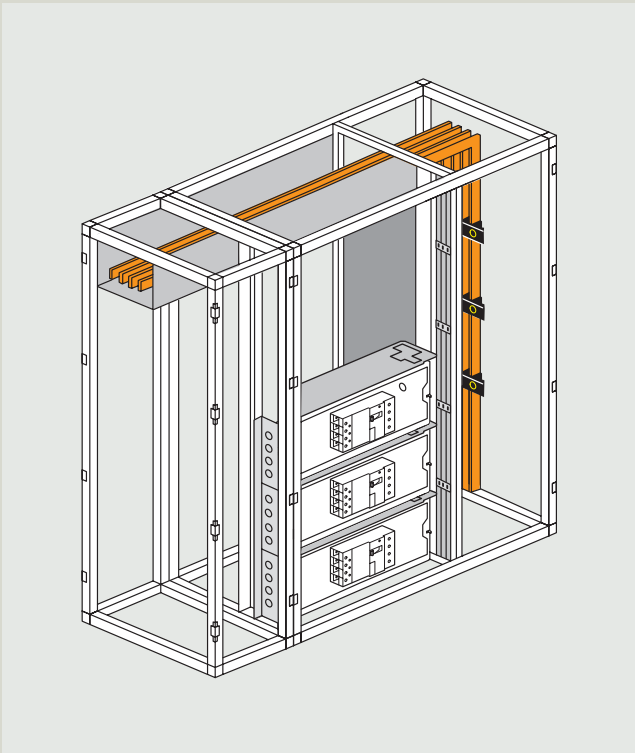


Separation of busbars from functional units and separation of all functional units (FU) from each other including the terminals for external conductors which are an integral part of the functional unit.

Terminals for external conductors are in the same compartment as the functional unit.

B LEGRAND SOLUTION

The design of form 3b, with connection on front terminals can also be used to create form 4a. The terminals for external conductors, located on the breakers, are completely separated from each other.



- +

➤ All enclosure widths can be used (475, 725 and 975 mm).

➤ Enclosures can be wall-mounted (no access to the back required).
- ➤ Use of an external cable sleeve and an internal cable sleeve (large width).

17

C MOUNTING STEPS

This example is of an enclosure measuring 725 mm deep to be fitted with a 4000 A busbar in the top horizontal position. A partial chassis must therefore be created (cutting of functional uprights) in order to free up all of the space inside the enclosure to house the busbar. Separation kits for busbars Cat. No. 205 38 (enclosure) and 208 75 (cable sleeve) are firstly installed around the busbar.



The front part of the kit for external cable sleeve Cat. No. 208 75 is then installed. For kit Cat. No. 205 38, a 300 mm high solid faceplate must be used.

The side separation kit between the enclosure and internal cable sleeve Cat. No. 205 34 is installed after being cut to 300 mm (200 mm if busbar ≤1600 A). Installation of the solid faceplate completes partitioning of the main busbar and vertical distribution busbar.

!

The vertical separation kit between the enclosure and cable sleeve Cat. No. 205 33/34 can only be used for cables or flexible bars with a maximum thickness of 20 mm. For DPX 1600, it must be replaced by side divider Cat. No. 205 96 (see page 14).



Mount the horizontal partitions Cat. No. 208 92 or 205 92 so as to separate the breakers from each other. Partitioning Cat. No. 208 92 is used for 24-module enclosures, and partitioning Cat. No. 205 92 is used for 36-module enclosures.



Install the side partitions with end pieces on the side of output terminals Cat. No. 205 97/98/99 and the side separation kit between the enclosure and internal cable sleeve Cat. No. 205 34.

As in the case of form 2b, do not forget to fit the breakers with incoming terminal shields.

!

It is advisable to place a yellow label with the word “BUSBAR” on each removable element protecting a busbar.

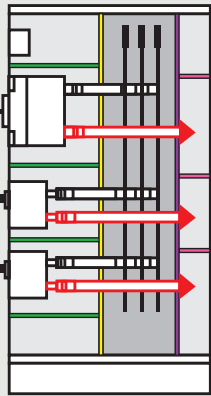
Form 4b

Form 4a + terminals for external conductors
separated from each other and from functional units

18

19

A REQUIREMENTS OF STANDARD



Separation of busbars from functional units and separation of all functional units from each other including terminals for external conductors. Terminals for external conductors are not in the same compartment as the associated functional unit but in separate individual compartments.

B LEGRAND SOLUTION

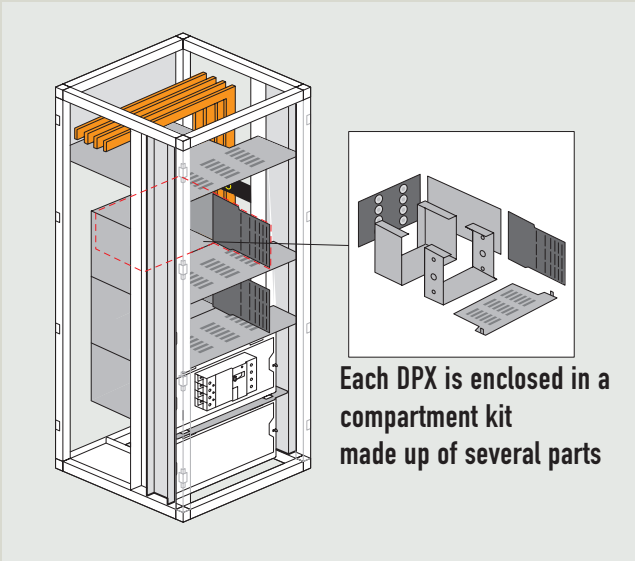
The following 3 constraints must be observed when creating form 4b enclosures:

- devices must be mounted horizontally
- devices must be connected on rear terminals
- the vertical distribution busbar must be positioned on the right-hand side of the enclosure.

Three special compartment kits are available for the different sizes of MCCB:

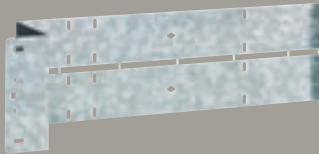
- Cat. No. 208 87: compartment height 200 mm for DPX 125, 160 and 250 ER
- Cat. No. 208 88: compartment height 300 mm for DPX 250 and 630
- Cat. No. 208 89: compartment height 400 mm for DPX 1600.

These compartment kits are stacked on top of each other and thus create the partitioning for the vertical distribution busbar.



+

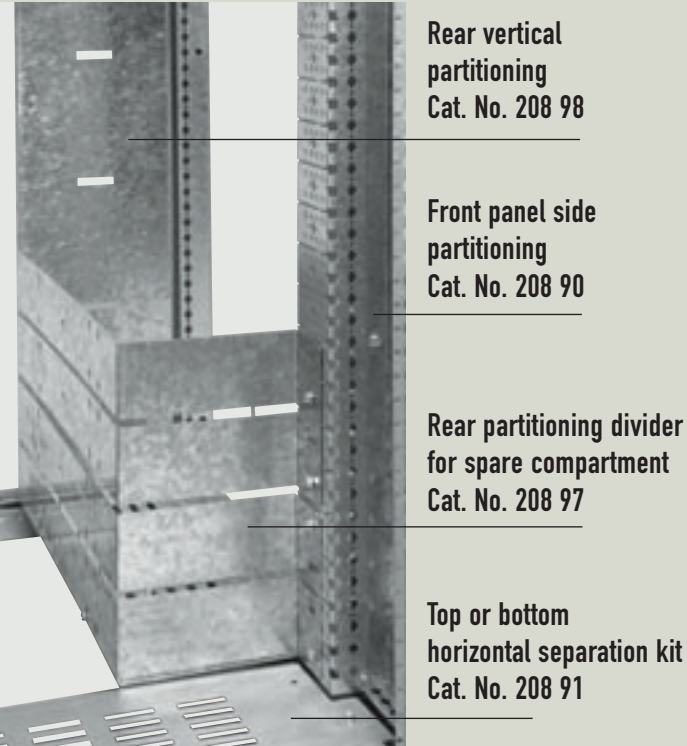
If a spare compartment is required at the bottom of the enclosure, the partitioning divider for a spare compartment Cat. No. 208 97 should be used in order to ensure continuous partitioning of the vertical busbar. This plate is 200 mm high and is pre-cut halfway up if a height of 100 mm is required. It is therefore possible to create spare compartments of any height.



C MOUNTING STEPS

1. Partitioning of busbars

All the partitioning for main and distribution busbars shown below must be fitted first.



Horizontal busbar partitioning
Cat. No. 208 94

Kit for vertical separation between enclosures
Cat. No. 205 94

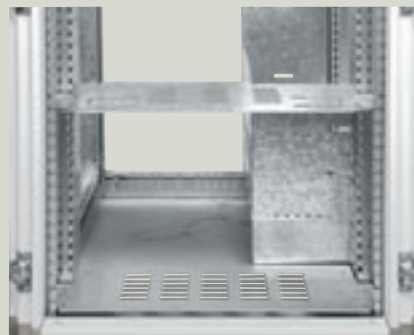
In the example shown above, the partitioning divider for a spare compartment is made up of 2 plates Cat. No. 208 98, giving a compartment of 2 x 200 mm i.e. 400 mm.

Form 4b (continued)

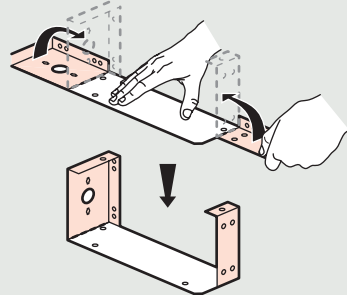
20

2. Mounting DPX compartment kits

Install the front plate. Mounting is identical to the horizontal partitioning for functional units Cat. No. 208 92 and 205 92.

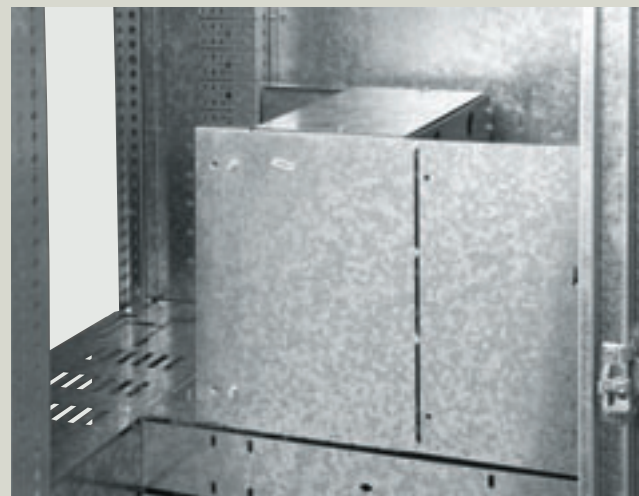


Fix the compartments to the front plate, after bending them into a "U" shape



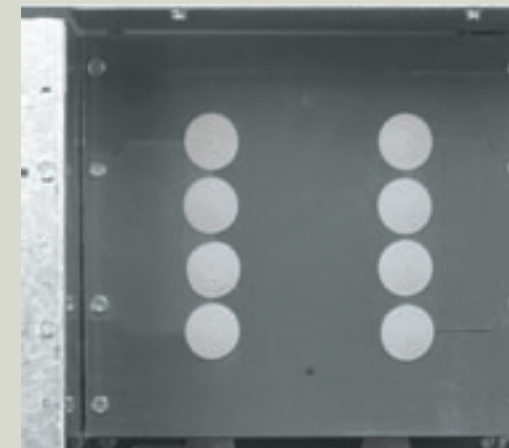
Fit the side panel onto the compartment(s) and to rear vertical partitioning Cat. No. 208 98.

All of these panels stacked along the height of the enclosure create the side partitioning for the vertical distribution busbar.



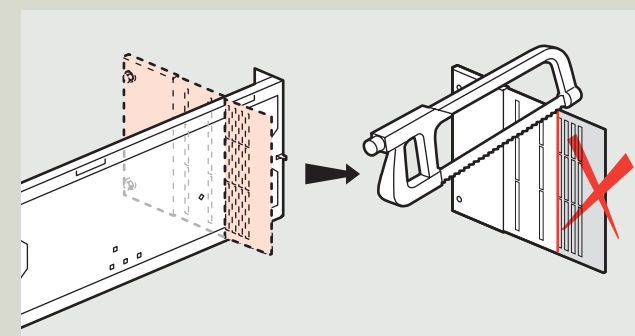
+ There are two types of compartment, "a standard compartment" with a limited depth and an "extension compartment" with a greater depth. This extension compartment must only be used if a larger connection volume is required for the rear terminals of devices (e.g. cables with a large cross-section).

Close the rear of the compartment using isolating plates and cable glands. The isolating plates are divided into several parts to facilitate mounting of the end pieces.



Stacking of DPX compartments Cat. No. 208 87/88/89 allows very rapid and simple partitioning of the entire enclosure while complying with all the separation requirements of form 4b.

In order to separate the incoming and outgoing connections, an insulated plate must be mounted between the rear terminals. This must be cut to length to fit the position of the DPX plate (adjustable). It is mounted using 2 screws inserted into the compartment.



21

Mounting applications
requiring horizontal dividers

If a gap exists between 2 DPX mounting plates, a horizontal divider should be mounted between the 2 plates concerned in order to guarantee IP xxB within the FUs.

The table opposite shows the mounting applications for which a horizontal divider (Cat. No. 208 92 or 205 92) must be inserted between 2 plates.

If a gap exists between 2 DPX mounting plates, a horizontal divider should be mounted between the 2 plates concerned in order to guarantee IP xxB within the FUs.		DPX 125 /160/250 ER						DPX 250/630								DPX 1600 front terminals						DPX 1600 rear terminals						
		Fixed	Plug-in	Rotary handle/Fixed	Rotary handle/Plug-in	Motor-operated handle/Fixed	Motor-operated handle/Plug-in	Fixed	Plug-in	Draw-out	Rotary handle/Fixed	Rotary handle/Plug-in	Rotary handle/Draw-out	Motor-operated handle/Fixed	Motor-operated handle/Plug-in	Motor-operated handle/Draw-out	Fixed	Draw-out	Rotary handle/Fixed	Rotary handle/Draw-out	Motor-operated handle/Fixed	Motor-operated handle/Draw-out	Fixed	Draw-out	Rotary handle/Fixed	Rotary handle/Draw-out	Motor-operated handle/Fixed	Motor-operated handle/Draw-out
DPX 125/160/250 ER front/rear terminals	Fixed		•		•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Plug-in	•					•		•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Rotary handle/Fixed				•		•		•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Rotary handle/Plug-in	•		•				•		•			•	•	•	•		•		•	•	•		•		•	•	•
	Motor-operated handle/Fixed	•					•		•	•		•	•	•	•	•		•		•	•	•	•	•	•	•	•	•
	Motor-operated handle/Plug-in	•	•	•		•		•			•				•			•		•	•	•	•		•		•	•
DPX 250/630 front/rear terminals	Fixed				•		•		•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Plug-in	•		•				•		•			•	•	•	•		•		•	•	•	•	•	•	•	•	•
	Draw-out	•	•	•	•	•		•	•		•			•			•	•		•	•	•		•		•	•	•
	Rotary handle/Fixed	•					•			•		•	•	•	•	•		•		•	•	•	•	•	•	•	•	•
	Rotary handle/Plug-in	•	•	•		•		•			•				•			•		•	•	•		•		•	•	•
	Rotary handle/Draw-out	•	•	•	•	•		•	•		•							•		•	•	•		•		•	•	•
	Motor-operated handle/Fixed	•	•	•		•		•	•		•			•			•	•		•	•	•		•		•	•	•
	Motor-operated handle/Plug-in	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•		•			•	•		•		•	•
	Motor-operated handle/Draw-out	•	•	•	•	•		•	•		•							•		•	•	•		•		•	•	•
DPX 1600 front terminals	Fixed	•	•	•				•							•			•		•	•	•		•		•		•
	Draw-out	•	•	•	•	•	•	•	•	•	•	•	•		•	•		•					•		•			
	Rotary handle/Fixed	•	•	•				•							•			•		•	•	•		•		•		•
	Rotary handle/Draw-out	•	•	•	•	•	•	•	•	•	•	•	•	•		•			•				•		•			
	Motor-operated handle/Fixed	•	•	•	•	•	•	•	•		•	•		•			•		•									
	Motor-operated handle/Draw-out	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•		•				•		•			
DPX 1600 rear terminals	Fixed	•	•	•		•		•	•		•				•			•		•		•		•		•		•
	Draw-out	•	•	•	•	•	•	•	•	•	•	•	•		•	•		•				•		•				
	Rotary handle/Fixed	•	•	•		•		•	•		•				•			•		•	•	•		•		•		•
	Rotary handle/Draw-out	•	•	•	•	•	•	•	•	•	•	•	•	•		•							•		•			
	Motor-operated handle/Fixed	•	•	•	•	•	•	•	•	•	•	•	•	•		•		•					•		•			
	Motor-operated handle/Draw-out	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•						•		•			

Modular equipment

24

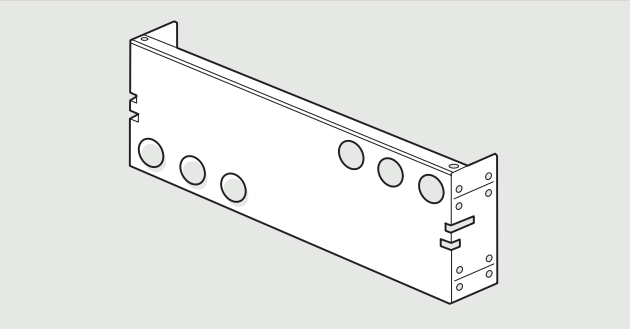
It is rare for main LV distribution boards not to require the use of one or two modular rails for mounting measuring devices, protective devices for auxiliary circuits, terminals or simply a number of modular MCBs used to protect secondary circuits. For these applications, the relevant modular rows must be separated.

For level 3 and 4 forms, it is obviously not possible to separate each modular device from its neighbouring one. This is why the devices on a modular row are grouped into a single functional unit (FU).

A CREATING PARTITIONING FOR FORMS 2a and 2b

The adjustable solid plate Cat. No. 206 47 (height 200 mm), if placed behind the functional uprights, forms a screen that isolates the rear busbar compartment from the FU compartment in front of the functional uprights.

This plate has pre-cut holes designed to house 6 cable glands (supplied) for the insertion of conductors and complies with IP xxB.



Reversible plate fitted with Ø 38 mm cable glands

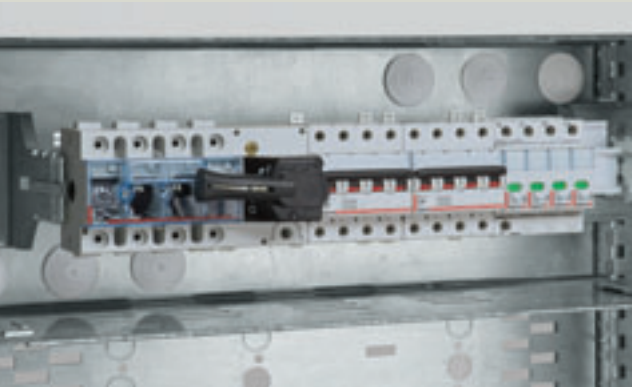
End piece capacity	
Type of conductor	Maximum number per cable gland
Cables 3 x 1.5 mm ² with insulation	8
Cables 3 x 1.5 mm ² without insulation	14
Wire 10 mm ²	15

The end pieces are arranged so as not to obstruct modular rail Cat. No. 206 00. This also prevents outgoing and incoming wires from crossing each other.

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B CREATING PARTITIONING FOR FORMS 3a, 3b, 4a and 4b

For these higher separation levels, modular rows must be separated from each other and from the other functional units as well as being separated from the busbars.



Horizontal partitions Cat. No. 208 92 or 205 92 and front panel side partitioning kit Cat. No. 208 90 should therefore be added.

! It is advisable to place an isolating device at the head of the row in order to be able to isolate all of the power supply from the row

DMX kits

The creation of forms with DMX ACBs requires the use of specific kits

26

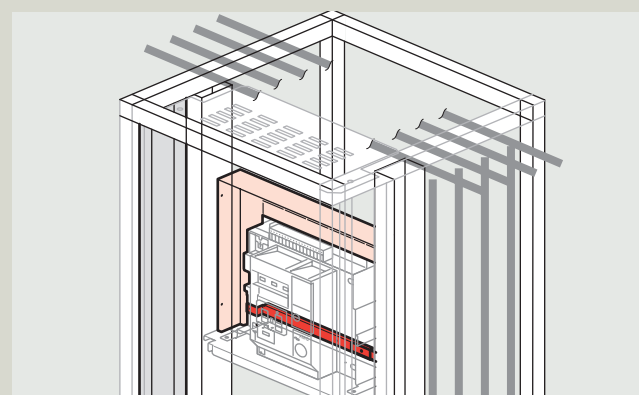
There are 2 types of DMX kit:

- "front panel" DMX kits Cat. No. 208 80/81 for forms 2a and 3a
- "complete" DMX kits Cat. No. 288 82/83 for all other levels of form.

A "FRONT PANEL" DMX KITS

"Front panel" DMX kits Cat. No. 208 80 for 24-module enclosures (width 725 mm) and Cat. No. 208 81 for 36-module enclosures (width 975 mm) are used for forms 2a and 3a to separate the front of the functional units from the rear part reserved for connections and busbars.

For form 3a, the functional units must also be separated from each other by inserting horizontal separation kits Cat. No. 208 92 or 205 92.

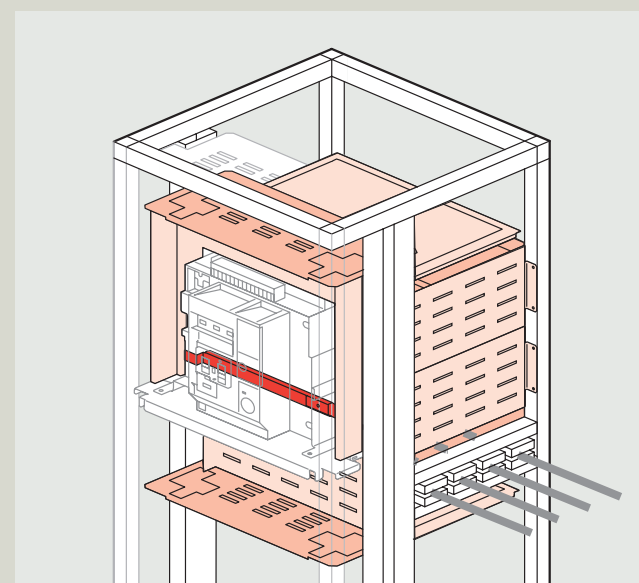


B "COMPLETE" DMX KITS

Like "front panel" kits, "complete" DMX kits Cat. No. 208 82 for 24-module enclosures (width 725 mm) and Cat. No. 208 83 for 36-module enclosures (width 975 mm) separate the front part of the functional unit from the rear part (connections and busbars)

but also partition off the connection area and the transfer busbar if present.

For forms 3b, 4a and 4b, it is necessary to add horizontal separation kits Cat. No. 208 92 or 205 92 between the different functional units.



! DMX 2500 ACBs can be mounted in 24-module width enclosures. In this case, DPXs can also be installed in the same enclosure.

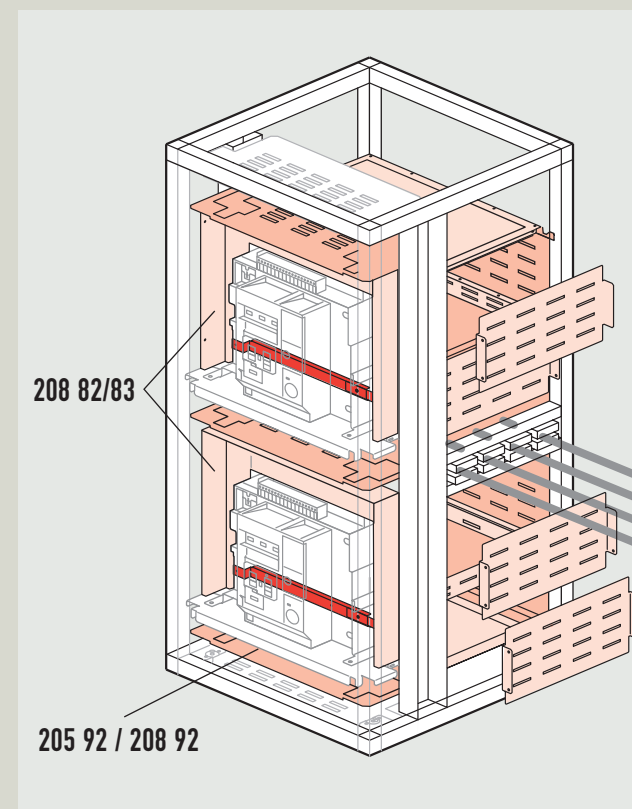
However, DMX-L 2500, DMX-L 4000 and DMX 4000 ACBs can only be fitted in 36-module enclosures. Mounting plug-in or draw-out DPXs in the same column is therefore not possible.

It is however possible to mount DPX 125, 160 and 250 ER on a rail using 2-position rail Cat. No. 206 50.

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C SUPPLY INVERTER

To create a 2b, 3b, 4a and 4b supply inverter, two "complete" kits Cat. No. 208 82/83 must be used.



Both DMXs are connected to the transfer bus bar located between the ACBs.

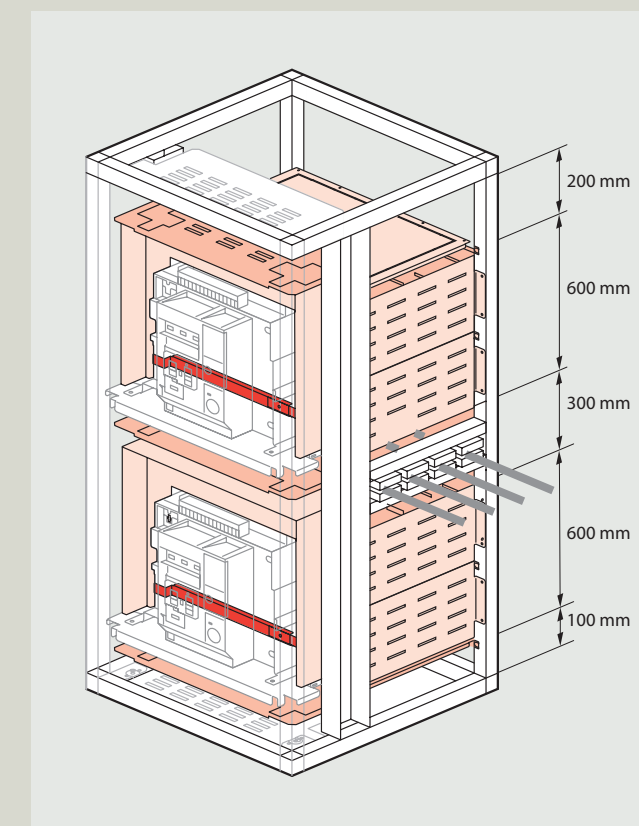
"Complete" kits contain partitioning for the transfer busbar. The height of this partitioning is 300 mm.

One of the two partitions will not be used.

The height of the partitioning of each DMX is 600 mm. The total height used for complete partitioning in the case of a supply inverter is 1500 mm.

This therefore leaves 300 mm of usable height in the enclosure that can be split into 200 mm at the top and 100 mm at the bottom, or vice versa.

DMXs receive their power supply through the top and bottom of the enclosure using this free space.

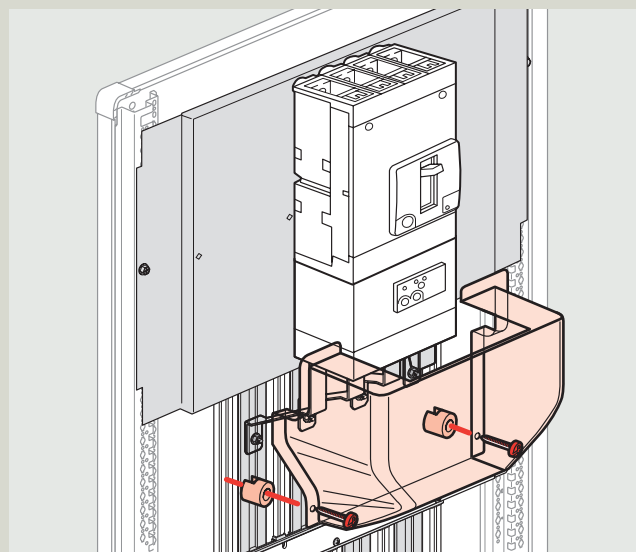


XL-Part and form 2b

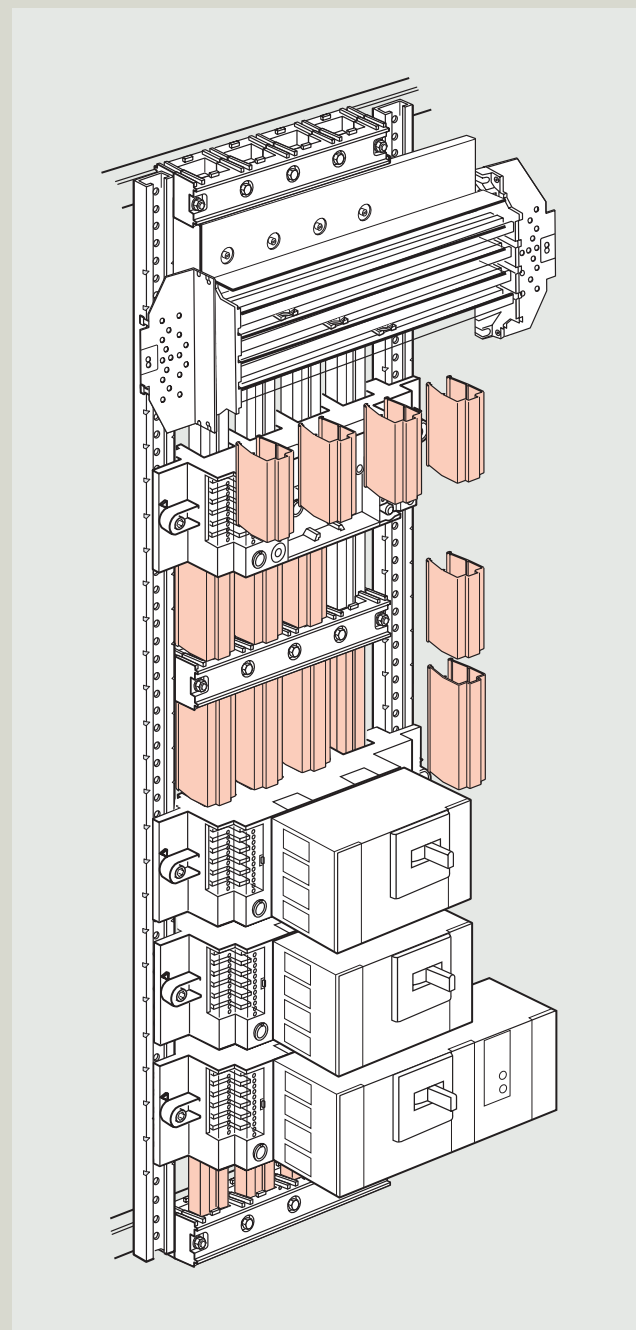
28

Use of XL-Part 400, 800 and 1600 column chassis components ensures compliance with the requirements of form 2a or 2b when using XL³ 400/800/4000 enclosures.

The isolating profiles for C-section bars Cat. No. 098 20, 373 80 and 373 33 must be used to separate the column busbar from the functional units. Similarly, isolating protection kit Cat. No. 098 79 should be used to isolate the unused section of the bars from the 250 A or 400 A row distribution blocks.



For the XL-Part 400 column chassis, IP xxB protective screens are also available for DPX 250 and 630 linking kits.



Mounting several DPXs on the same plate

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As a general rule, in a distribution board, a circuit breaker is considered to be an FU (see standard definition on page 3).

From form 3 upwards, FUs must be separated from each other. For this reason, breakers are mounted horizontally to allow the insertion of dividers between the mounting plates.

However, in order to contain the size of electrical boards, "small" MCCBs such as DPX 125 and 160 can be grouped together on the same row (maximum of 4 DPX 125 or 3 DPX 160) provided that these devices are used to perform a single function.

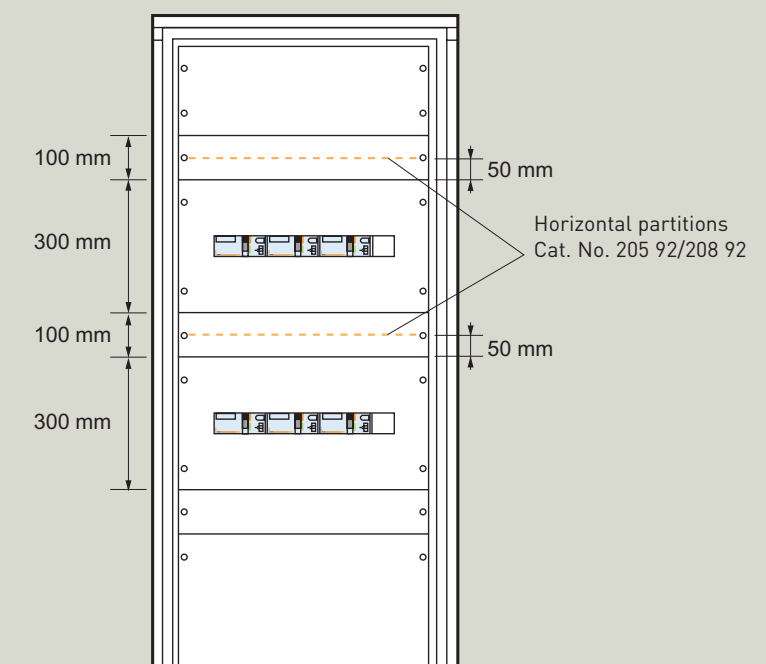
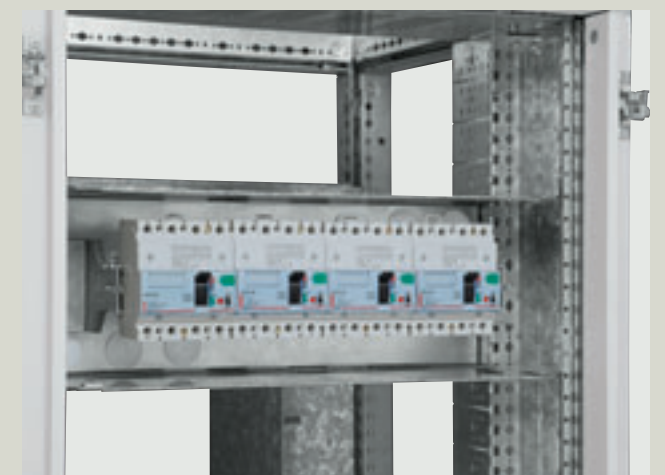
In this case, DPXs are mounted vertically, either on a rail (see section on XL-Pro2), or on plate Cat. No. 206 10/206 12.

When mounting DPX 160 MCCBs, the height of the special faceplates is 300 mm.

Depending on the cross-section of the cables used, the connection space may not be large enough.

In this case, it is advisable to insert a 100 mm high adjustable solid plate Cat. No. 206 40 between 2 DPX plates. It is also advisable to add 100 mm high solid faceplates to the front (as many solid faceplates as there are 100 mm high plates).

For form 3, the horizontal dividers between functional units Cat. No. 205 92/208 92 must be placed at the centre of the 100 mm high solid plates. The increase in volume achieved through the additional 100 mm allows problem-free connection of 3 DPX 160 MCCBs.



XL-Pro²

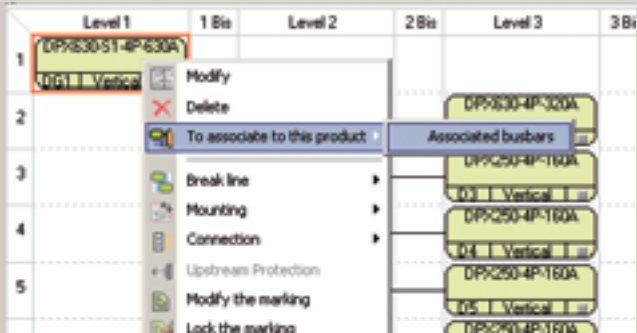
30

A INPUT DATA

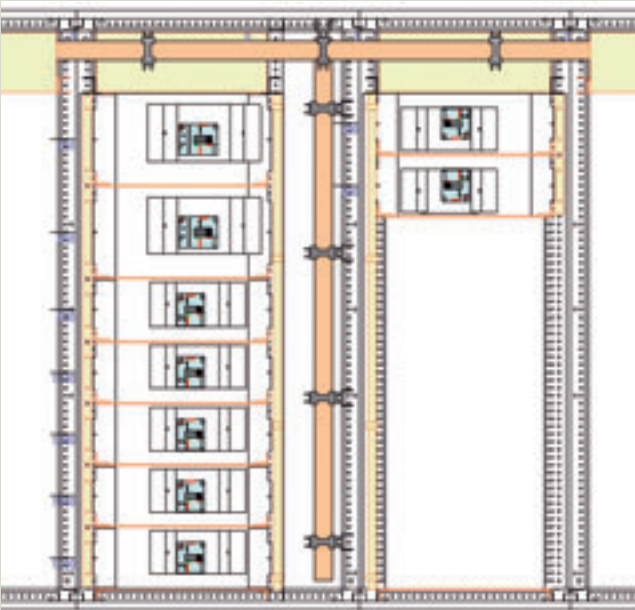
To produce a design that includes forms, two mandatory pieces of information must be entered:

- the choice of product (DPX – DMX – DX)
- the associated busbar.

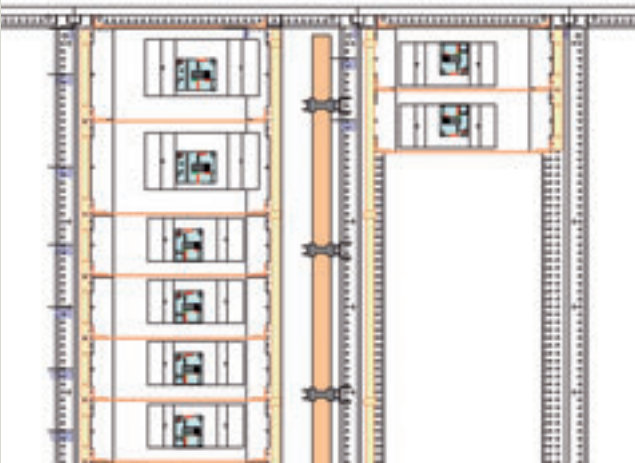
A busbar can be associated with the main device either in the “Nomenclature” module (Cabling products > Associated busbars and distribution blocks) or in the “Arrangement” module (right-click on the breaker, select “Associate with this product” and then “Associated busbars”).



! The busbar must be “top horizontal” or “side vertical” as these are the only distribution arrangements that can be partitioned in forms. If the assembly consists of more than two enclosures, the vertical busbars must be automatically connected using a top horizontal busbar. The horizontal busbar can be removed later if necessary.




XL-Pro² automatically creates branch busbars and the cable sleeves used to mount them.

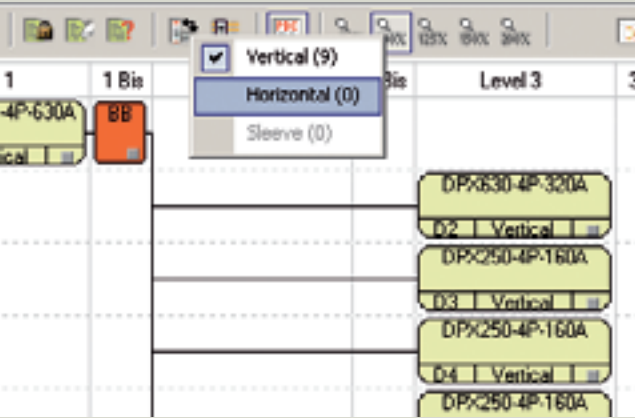


In the example above, the top horizontal busbar was eventually removed as it was not necessary to keep it.

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B ARRANGEMENT


Regardless of the level of form required, the reference position for DPXs is one of horizontal mounting. In the “Arrangement” window, select all the devices and use the right-hand mouse button to select “Mounting” then “Horizontal” (or click directly on the icon ). All of the devices selected will be transformed into a horizontal mounting position (if this was not already the case).



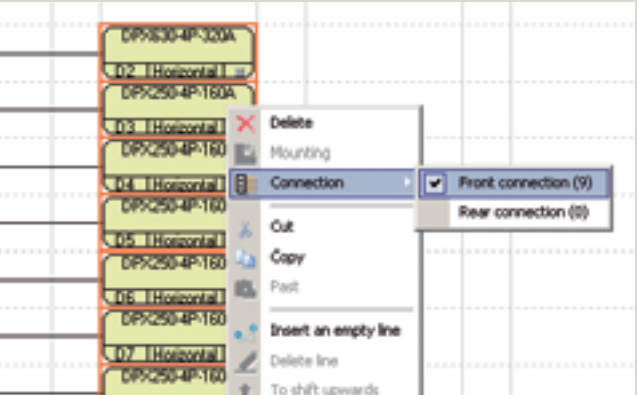
If the DPXs are not positioned horizontally, XL-Pro² will do this automatically when the type of form is chosen, except in the case of supply inverters.

! For horizontally mounted supply inverters, select the inverter from the “Arrangement” window and use the right-hand mouse button to select “Inverter mounting” and then “Horizontal”.

Depending on the installation of the panel, select whether devices will be connected via front terminals or rear terminals.

In the “Arrangement” window, select all the devices and use the right-hand mouse button to select “Connection” then “Front Terminals” or “Rear Terminals” (or click directly on the icon ).

All of the devices selected will be transformed into front terminal or rear terminal connections depending on the choice made.

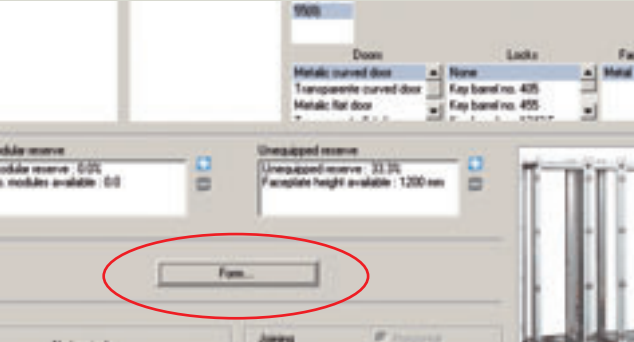


XL-Pro² (continued)

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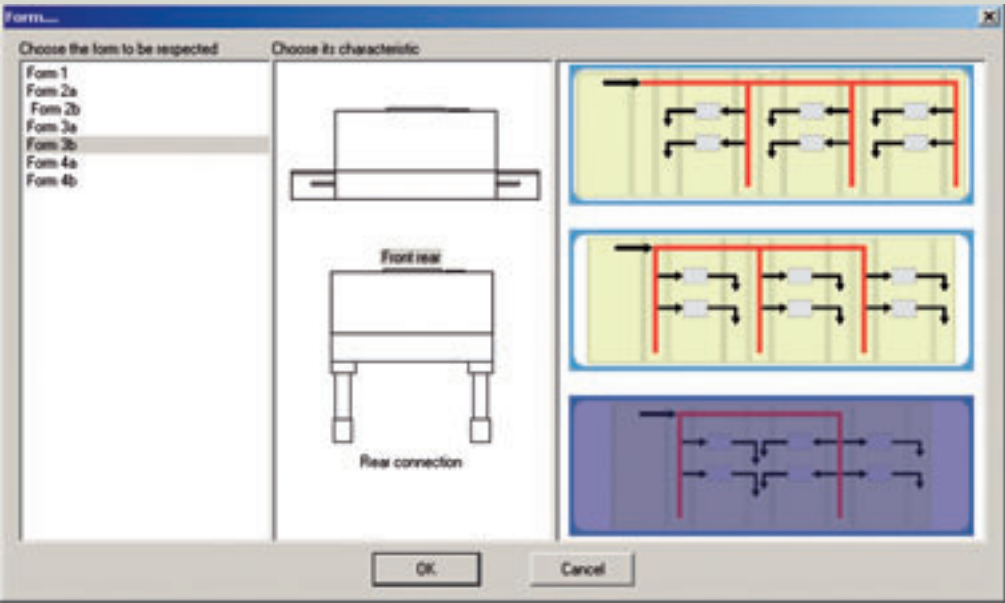
C SELECTING ENCLOSURES

Products are selected in the same way as for a standard design.
In the “Enclosures” window click on the “Forms...” button. If the panel does not have an associated busbar, XL-Pro² suggests adding one.



- A window divided into 3 sections opens allowing the user to select:
1. the level of form required
 2. the type of connection (front terminal or rear terminal)
 3. the circuit diagram (power supply from the right, left or a “head-to-tail” power supply)


The “head-to-tail” circuit diagram is used to limit the number of branch busbars (and therefore the quantity of copper used) but it requires alternate mounting of breakers in the same enclosure assembly. In this case, the direction of opening must be clearly marked in order to eliminate any ambiguity.

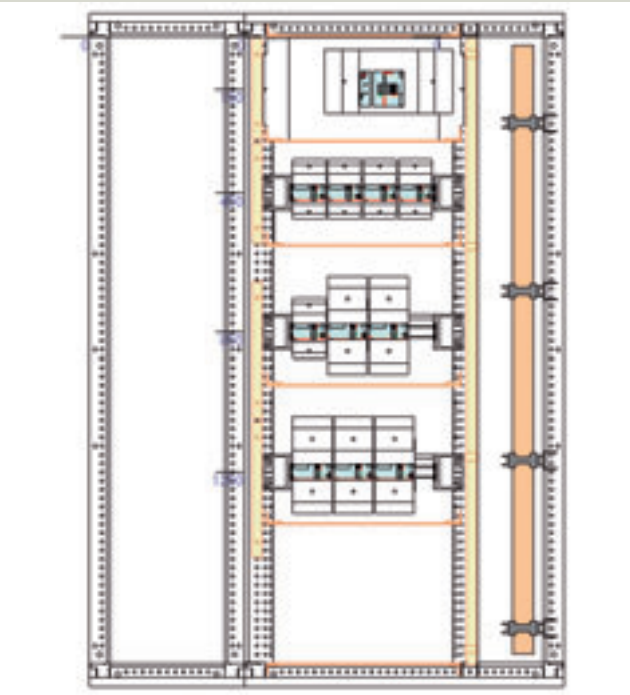


D PREVIEW

Once this information has been entered, XL-Pro² recalculates which enclosures are compatible.
If the message “No family accepts the products selected” appears, this means that a product is incompatible with the enclosure configurations used to create the level of form required.
Example: technical impossibility of mounting a DPX-IS horizontally as mounting plates only exist for mounting in a vertical position.
For these specific cases related to DPX-IS isolating switches, it is advisable to use special plates and faceplates for vertical mounting, with connection on the front terminals, and to partition the space between the mounting plates using adjustable solid plates.

E VERTICAL MOUNTING OF DPX 125 AND 160 MCCBS

On page 29 we describe how 3 or 4 DPX 125 or 160 MCCBs can be grouped in the same functional unit (mounting on a plate or rail), provided certain conditions are complied with.
By default, XL-Pro² groups DPX 125 and 160 MCCBs onto the same rail. It is however possible to separate each of these DPXs and revert to a standard configuration (1 DPX = 1 FU). To do this, select the relevant DPXs in the “Arrangement” window, then click on “Mounting” followed by “Horizontal” (or click directly on the icon ). All of the devices selected will be transformed into a horizontal mounting position.





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