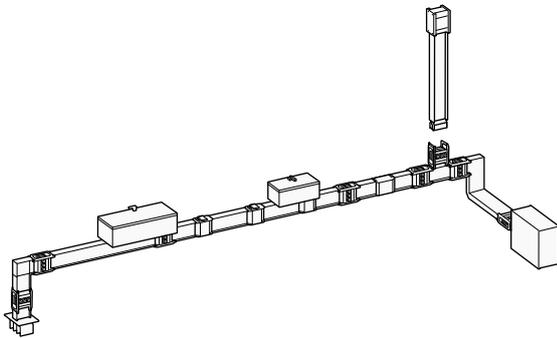


Prefabricated Busbar System XCP-HP Aluminum 4000 A



SUMMARY

Page

1. Technical features.....	1
2. Composition.....	3
3. Accessories.....	7
4. Conformity.....	12

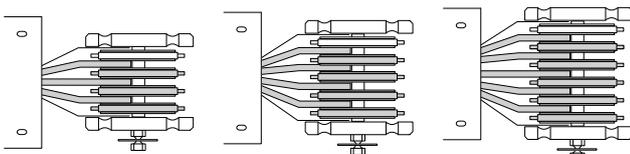
1. TECHNICAL FEATURES

The prefabricated busbar system XCP-HP is characterised by higher performances on energy saving and higher short circuit withstand. It is designed to work at 50°C of ambient temperature: ideal for heavy duty applications, higher temperature environments and installations where high energy efficiency is required.

Thermal correction factor for ambient temperatures

Ambient temperatures	KT factor
-5°C	1.38
-0°C	1.34
10°C	1.28
15°C	1.25
20°C	1.21
25°C	1.18
30°C	1.15
35°C	1.11
40°C	1.07
45°C	1.04
50°C	1
55°C	0.96
60°C	0.92
65°C	0.88
70°C	0.84

The range is designed to trunk several bars into a single structure, which facilitates its installation compared to independant busbars. Three combinations of conductors are available:

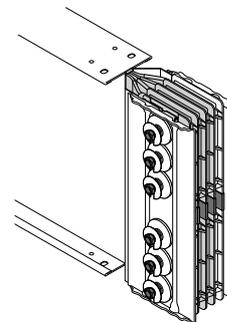


3 Conductors.

4 Conductors.

5 Conductors.

XCP-HP Aluminum 4000 A has a double bar trunking system.



■ 1.1 Dimensions

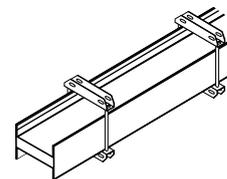
The length and the heights vary according to the rating, but are the same or all three combinations of conductors (3, 4 or 5 conductors): L 125 mm x H 480 mm.

■ 1.2 Degree of protection

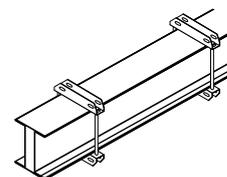
IP55 ou IP65 (for energy transportation only) on demand.

■ 1.3 Installation modes

Flat position.



Edgewise position.



Prefabricated Busbar System

XCP-HP Aluminum 4000 A

1. TECHNICAL FEATURES (continued)

■ 1.4 Technical data by conductors configuration

The datas in this section correspond to a 50 Hz frequency. For 60 Hz frequency, please contact Legrand.

		3 conductors 3P + PE	4 conductors 3P + N + PE	5 conductors- functional earth 3P + N + PE + FE	5C-double neutral 3P + 2N + PE
Overall dimension of the busbars	L x H [mm]	125 x 480			
Rated operational voltage	U _e [V]	1000			
Rated insulation voltage	U _i [V]	1000			
Frequency	f [Hz]	50			
Rated short time current (1 s)	ICW [kA] eff	150			
Peak current	I _{pk} [kA]	330			
Allowable specific energy for three-phase fault	I ² t [MA ² s]	22500			
Rated short-time current of the neutral bar (1 s)	ICW [kA] eff	-	150	150	150
Peak current of the neutral bar (1 s)	I _{pk} [kA]	-	307	307	307
Rated short-time current of the protective circuit (1 s)	ICW [kA] eff	90			
Peak current of the protective circuit	I _{pk} [kA]	198			
Phase resistance at 20°C	R ₂₀ [mΩ/m]	0.012			
Phase reactance (50 Hz)	X [mΩ/m]	0.006			
Phase impedance	Z [mΩ/m]	0.014			
Phase resistance to thermal conditions	R [mΩ/m]	0.018			
Phase impedance to thermal conditions	Z [mΩ/m]	0.019			
Neutral resistance	R ₂₀ [mΩ/m]	-	0.012	0.012	0.006
Functional Earth resistance (FE)	R ₂₀ [mΩ/m]	-	-	0.012	-
Functional Earth reactance (FE)	X [mΩ/m]	-	-	0.006	-
Resistance of the protective bar (PE 1)	RPE [mΩ/m]	0.068	0.068	0.136	0.136
Resistance of the protective bar (PE 2)	RPE [mΩ/m]	0.014			
Resistance of the protective bar (PE 3)	RPE [mΩ/m]	0.025			
Reactance of the protective bar	XPE [mΩ/m]	0.016			
Resistance of the fault loop (PE 1)	R _o [mΩ/m]	0.080	0.080	0.148	0.148
Resistance of the fault loop (PE 2)	R _o [mΩ/m]	0.027			
Resistance of the fault loop (PE 3)	R _o [mΩ/m]	0.037			
Reactance of the fault loop (50 Hz)	X _o [mΩ/m]	0.02			
Impedance of the fault loop (PE 1)	Z _o [mΩ/m]	0.083	0.083	0.150	0.150
Impedance of the fault loop (PE 2)	Z _o [mΩ/m]	0.035			
Impedance of the fault loop (PE 3)	Z _o [mΩ/m]	0.043			
Zero-sequence short-circuit average resistance phase-N	R _o [mΩ/m]	-	0.017	0.017	0.010
Zero-sequence short-circuit average reactance phase-N	X _o [mΩ/m]	-	0.008	0.008	0.005
Zero-sequence short-circuit average impedance phase-N	Z _o [mΩ/m]	-	0.018	0.018	0.114
Zero-sequence short-circuit average resistance phase-PE	R _o [mΩ/m]	0.072	0.072	0.140	0.072
Zero-sequence short-circuit average reactance phase-PE	X _o [mΩ/m]	0.018			
Zero-sequence short-circuit average impedance phase-PE	Z _o [mΩ/m]	0.074	0.074	0.141	0.074
Voltage drop with distributed load ΔV [V/(m*A)]10 ⁻⁵	cos (ϕ) = 0.70	14.6			
	cos (ϕ) = 0.75	15.1			
	cos (ϕ) = 0.80	15.6			
	cos (ϕ) = 0.85	16.0			
	cos (ϕ) = 0.90	16.3			
	cos (ϕ) = 0.95	16.4			
	cos (ϕ) = 1.00	15.6			

Prefabricated Busbar System XCP-HP Aluminum 4000 A

1. TECHNICAL FEATURES (continued)

		3 conductors 3P + PE	4 conductors 3P + N + PE	5 conductors- functional earth 3P + N + PE + FE	5C-double neutral 3P + 2N + PE
Weight (PE 1)	p [kg/m]	45.8	54.3	62.9	62.9
Weight (PE 2)	p [kg/m]	57.1	65.7	74.2	74.2
Weight (PE 3)	p [kg/m]	49.5	58.0	66.6	66.6
Fire load	[kWh/m]	15.8	21.0	26.3	26.3
Degree of protection	IP	55/65*			
Insulation material thermal resistance		B/F**			
Losses for the Joule effect at nominal current	P [W/m]	863			
Ambient temperature min/max (daily average)**	[°C]	-5/+70			

*IP65 available on demand for straight feeder lines.

**Class F available on demand.

Over 50°C, it will be necessary to derate the busbar. For ambient temperatures under -5°C contact the technical support.

2. COMPOSITION

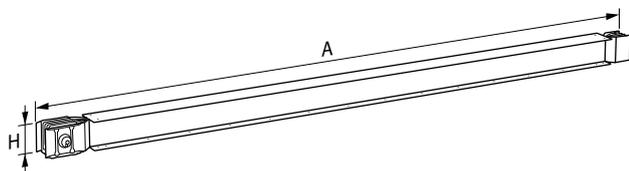
2.1 Straight elements

Designed for transport and distribution (with tap off outlets) of highpower energy. Supplied with its pre-installed monobloc.

Reference temperature	50°C
Protection degree	IP55
Length (min/max)	500/3000 mm
Standard length	3000 mm
Thickness of metal sheet	1.5 mm
Number of conductors	3, 4 ou 5
Paint	RAL 7035
Composition	Halogen free

Straight element for transport

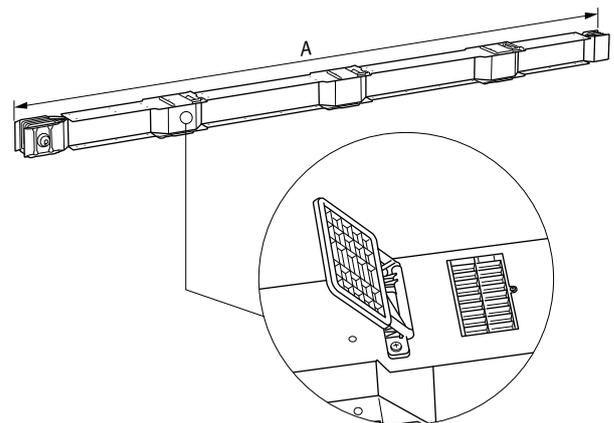
The insulation between bars is ensured by a double sheet made with polyester film class B (130°C), and class F (155°C) thermal resistance available on demand. All plastic components have a V1 self-extinguishing degree (as per UL94); they are fire retardant and comply with the glowwire test according to standards.



Dimensions	
Length A (min/max)	500/3000 mm
Standard length	3000 mm
H	480 mm

Straight element for distribution

It is supplied with its pre-installed monobloc and it has tap-off outlets on each sides.



Dimensions

Length A (min/max)	1000/3000 mm
Length A standard	3000 mm
H	480 mm

Tap-off boxes compatibility:

Length A	Tap-off boxes
1001-1250 mm	Type 1 and 3 removable boxes
1250-3000 mm	Any type of removable box

Straight elements for distribution have outlets on the upper side at preset distances of 850 mm on both sides*.

Length A	Number of outlets
3000 mm	3 + 3
1001-1500 mm	1 + 1
1501-2000 mm	2 + 2
2001-2500 mm	2 + 2
2501-2999 mm	3 + 3

*It is possible to have the outlets in special positions.

Prefabricated Busbar System XCP-HP Aluminum 4000 A

2. COMPOSITION (continued)

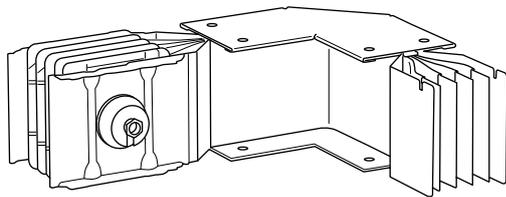
Tap-off outlets combination available on demand:

Length A	Number of outlets (on demand)
1501-2000 mm	1 + 1
2001-2500 mm	1 + 1
2501-2999 mm	1 + 1 and 2 + 2
3000 mm	1 + 1 and 2 + 2

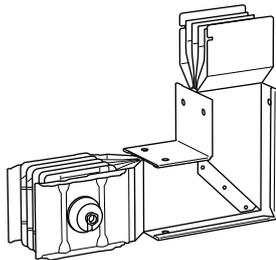
■ 2.2 Elbow

Supplied with a pre-installed monobloc, these elements allow any change of direction with standard or special solutions.

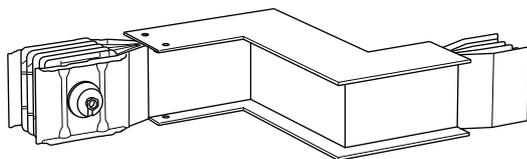
Horizontal



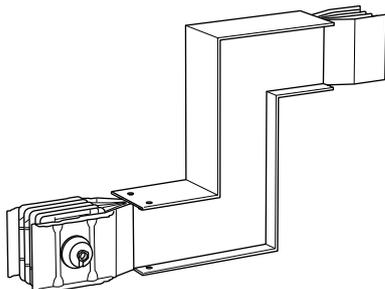
Vertical



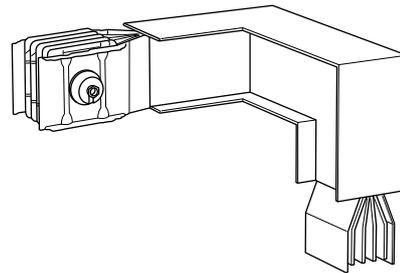
Double horizontal



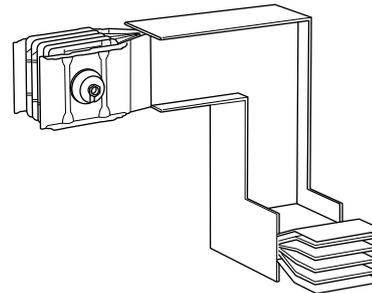
Double vertical



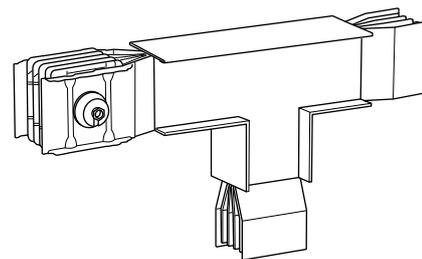
Double horizontal + vertical



Double vertical + horizontal

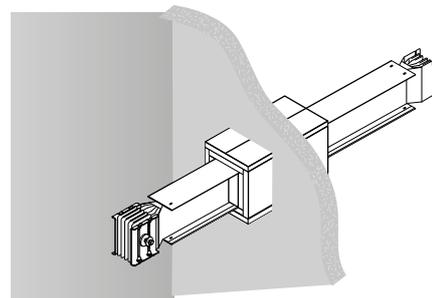


T (horizontal and vertical)



■ 2.3 Fire barrier elements S120 EI120 (EN 1366-3)

When the busbar system crosses fire resistant walls or ceilings, it must be fitted with appropriate fire barriers. The fire barrier must always be positioned in the middle of the fire resistant wall or ceiling crossed by the busbar.



Dimensions	L 630 mm x H 480 mm
Type of fire barrier	Internal and External

To comply to the Certification of Fire resistance it is necessary to install both internal (not required in few ratings) and external fire barrier supplied by Legrand.

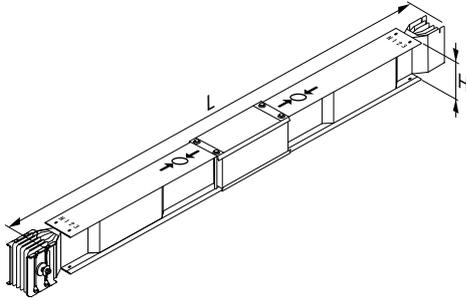
Once the installation is done, all cavities must be sealed with material meeting current regulations for the required building fire resistance class.

Prefabricated Busbar System XCP-HP Aluminum 4000 A

2. COMPOSITION (continued)

2.4 Expansion element

The expansion element can absorb expansion and contraction of both the busbar system section and the building.
Maximum permitted length: ± 50 mm approximately.



Dimensions: L 1500 mm x H 480 mm.

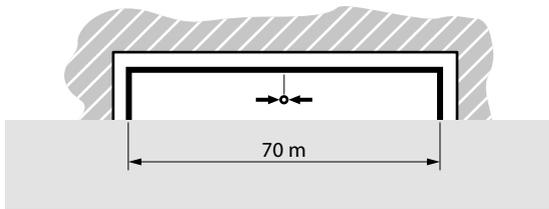
Conditions of installation

The expansion element must be fitted near the expansion joints of the building and in straight sections of the line (horizontal and/or vertical) longer than 40 m. In this case, expansion elements must be installed at a regular spacing of 40 m long maximum.

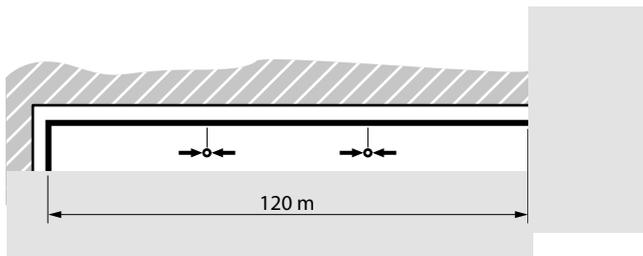
No expansion element is necessary when:

- the line section is not straight,
- the straight line section is less or equals 40 m long.

Examples:



70 m long straight line section = 1 expansion element at the center

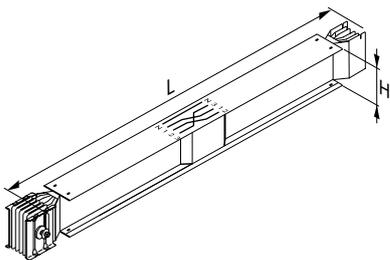


120 m long straight line section = 2 expansion elements, one every 40 m

2.5 Phase transposition elements

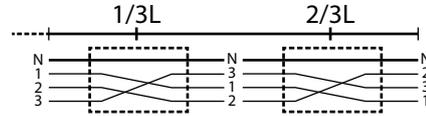
Phase balancing element

Straight elements with phase balancing are used to reduce and balance mutual phase reactance and impedance in case of long lines.



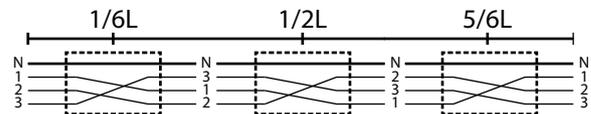
Dimensions : L 1200 mm x H 480 mm.

For particular long sections (> 100 meters) it is recommended to install two transposition elements (one at 1/3 and one at 2/3), to balance the electric system impedance.



That way, it will be possible to have along the installation path all the possible combination of reciprocal positions among phases, minimising load losses.

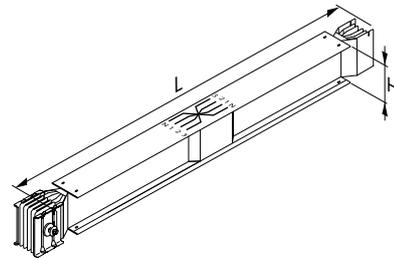
If it's necessary to have the same phase sequence at the start and the end, use 3 phase balancing elements.



Phase inversion elements

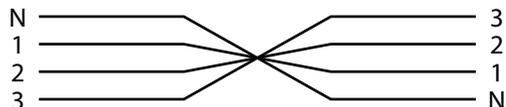
It is used in the connections between the transformer and the electric board, or in the connection between electric boards, when the starting sequence is different to the arrival sequence.

BEWARE: use phase inversion elements only for transport paths, and not for derivations. For any doubts please contact Legrand.



Dimensions : L 1200 mm x H 480 mm.

Electric scheme:



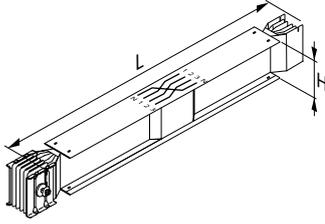
Neutral rotation element

It is used to adapt the sequence of the busbar phases to the sequence of the connections required at the ends of the connections, if they are different. In the connection between electric boards, the neutral jump is normally used, as only the neutral position is normally identified.

BEWARE: use neutral rotation elements only for transport paths, and not for derivations. For any doubts please contact Legrand.

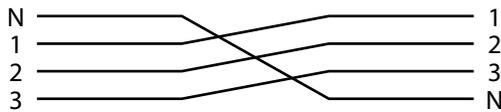
Prefabricated Busbar System XCP-HP Aluminum 4000 A

2. COMPOSITION (continued)



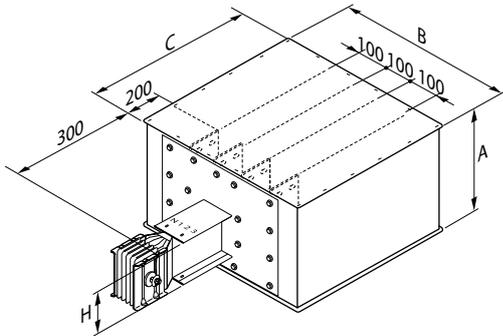
Dimensions : L 1000 mm x H 480 mm.

Electric scheme:



2.6 Feed unit

It is used at the end of the lines, when the busbar must be powered using cables.



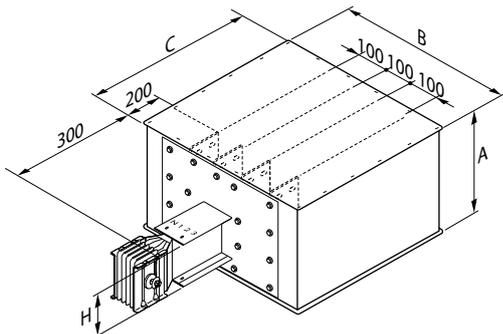
Dimensions	
A	600 mm
B	615 mm
C	810 mm
H	480 mm
Connection holes	Ø9

Available versions:

- with monobloc,
- without monobloc,
- special dimensions on demand.

Rising main feed unit

It is used at the departure of the riser main lines, when the busbar must be placed close to the wall and powered using cables. It allows the busbar to be installed 40 mm away from the wall.



Dimensions

A	600 mm
B	615 mm
C	810 mm
H	480 mm
Connection holes	Ø9

Available versions:

- with monobloc,
- without monobloc,
- special dimensions on demand.

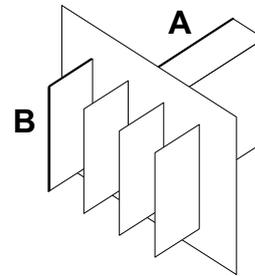
2.7 Connection interface

Standard connection interface

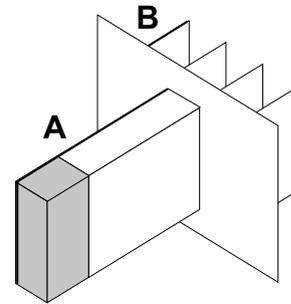
It is used at the end of the lines to connect the busbar to boards or transformers.

Available versions:

- right version (without monobloc),



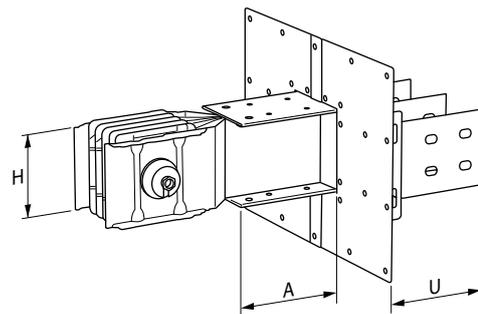
- left version (with monobloc),



- special solutions on demand.

For example: length, spacing between bar conductors, drilling, etc.

Interface with exit bars for panel boards



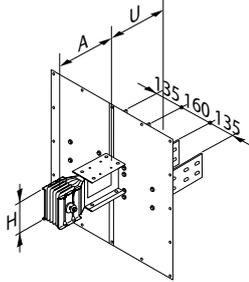
Prefabricated Busbar System XCP-HP Aluminum 4000 A

2. COMPOSITION (continued)

Dimensions for all type of bars

U (min/max)	150/400 mm
U standard	200 mm
A (min/max)	200/1299 mm
A standard	300 mm
H	480 mm

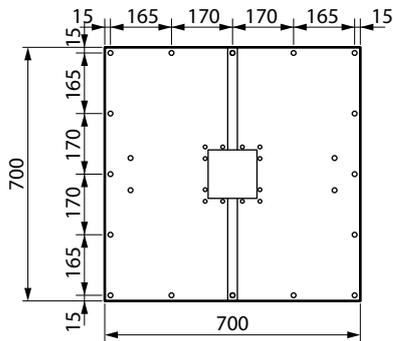
Interface with exit bars for transformers



Dimensions for all type of bars

U (min/max)	300/400 mm
A (min/max)	200/1299 mm
H	480 mm

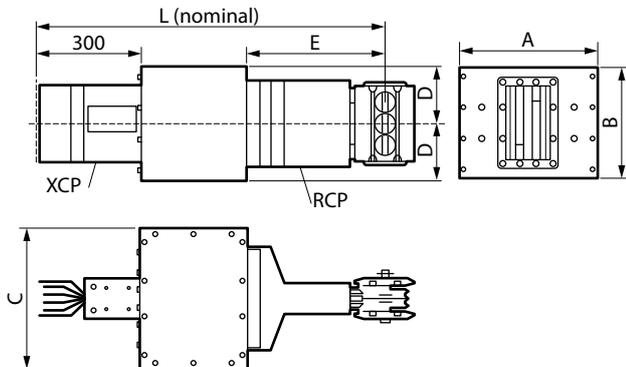
Flange size details.



3. ACCESSORIES

3.1 Adapter (IP68-IP65)

It is used to joint XCP and RCP elements.



Dimensions for conductor combinations 3C, 4C, 5C

A	400 mm
B	560 mm
C	310 mm
D	280 mm
E	400 mm
L	1000 mm

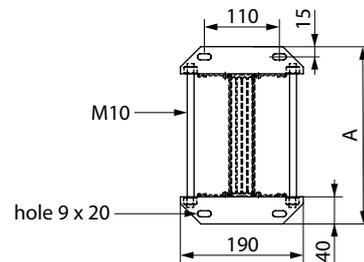
3.2 Brackets

Brackets solutions are adapted and certified for any type of installation, even the most difficult environments:

- installations subjected to strong vibrations,
- installations in seismic environments.

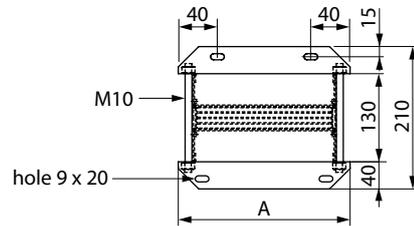
Horizontal suspension brackets

Edgewise installation:



A = 560 mm.

Flat installation:



A = 530 mm.

Brackets for vertical elements

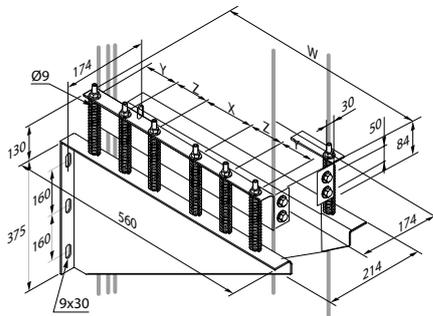
Suspension	Type of bracket
Wall brackets	Bracket with springs
	Rigid bracket
	Rigid bracket with springs
Floor brackets	Bracket only
	Bracket for naval application
	Anti-seismic bracket

*Contact Legrand for more details.

Prefabricated Busbar System XCP-HP Aluminum 4000 A

3. ACCESSORIES (continued)

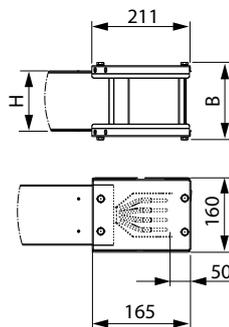
For brackets with springs, the 12 springs type is suggested:



Dimensions	
W	480 mm
X	80 mm
Y	90 mm
Z	90 mm

3.3 End cover IP55

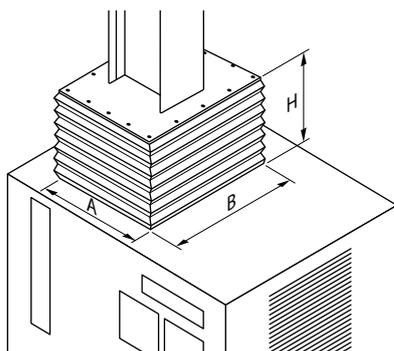
The end cover is the component that ensures an IP55 protection degree at the end of the line.



Dimensions	
H	480 mm
B	520 mm

3.4 Protective bellow

It is recommended for the protection of the interface connection on panel boards, dry-type transformer with enclosure and oil-type transformers.



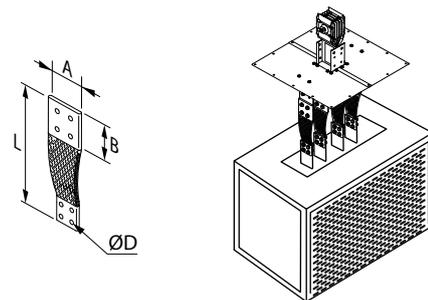
Dimensions

Types	A	B	H
Bellow	700 mm	700 mm	400 mm
Bellow only	600 mm	760 mm	
Double Bellow	710 mm	920 mm	

For more details on protective covers for outdoor applications, please contact Legrand.

3.5 Flexible braid connections

It is used to connect the transformer to the connection interface of the busbar when mechanically uncoupling the two elements is required to prevent the transmission of vibrations.



Dimensions

L (min)	300 mm
L (max)	> 750 mm

These accessories have to be adapted to specific requirements.

When ordering, please specify the dimensions of A, B, Ø D holes on both transformer and busbar side, and length L.

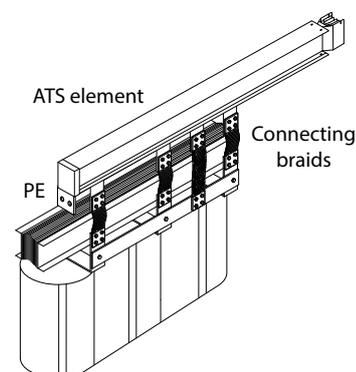
The distance between the phases can be designed according to your need.

For customized solutions, with special drillings or for insulated flexible braid, please contact our technical department.

3.6 ATS element

It is used to connect to electric boards or transformers and is similar to straight elements.

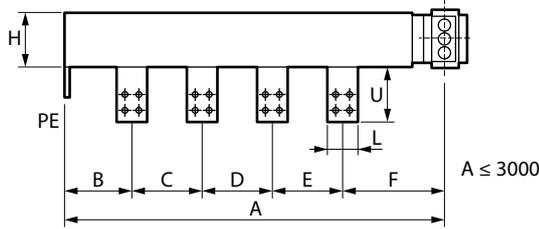
It may be used for connection to both cast resin and oil transformers. The ATS element allows the installation of connection interfaces directly on the vertical section of the transformer terminals.



ATS elements are designed ad-hoc, while considering the construction limits summarized below:

Prefabricated Busbar System XCP-HP Aluminum 4000 A

3. ACCESSORIES (continued)



Minimum distances

H	480 mm
B	245 mm
C	255 mm
D	
E	
F	380 mm
L	210 mm
U	200 mm

For special dimensions, please contact Legrand.

3.7 Tap-off boxes

Rated current: 32 A-630 A.

It is used for connecting and energizing electric loads.

Available fibre-glass or metal sheet and equipped with a sectioning cover that can be installed and removed while the busbar is energised.

Type of tap-off boxes:

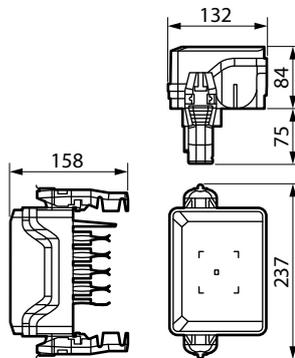
- for circuit breakers (compatible with Legrand's MCCB (not provided),
- available with hinged cover or with completely removable cover),
- with fuse carriers (fuses not included),
- with switch fuse (AC23) and a fuse carrier,
- empty,
- empty bolt-on type (to be installed on the junction on any rating elements, with or without tap-off outlets).

Dimensions (mm)

Fiber-glass taf-off boxes

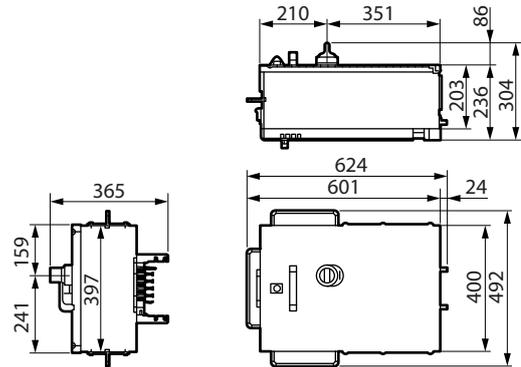
Type 1

- (32 A)-with fuse carriers.

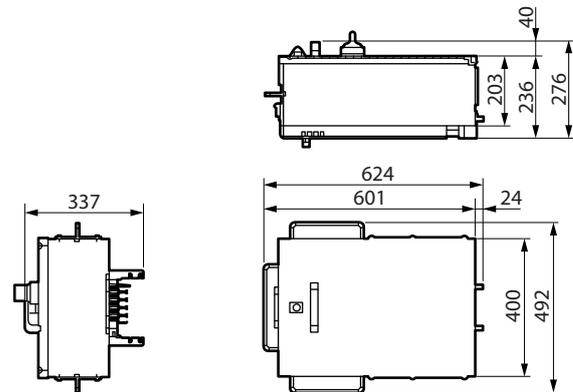


Type 2

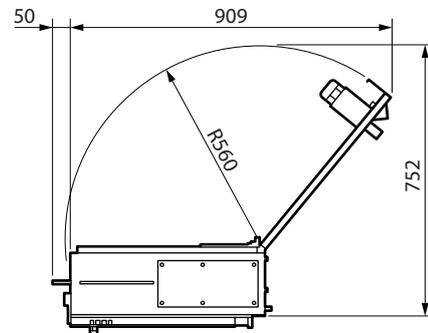
- (63 A/160 A)-MCCB ready,



- (63 A/125 A/160 A)-with fuse carriers/empty,

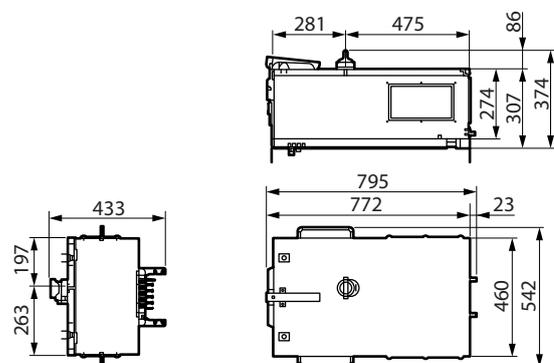


- Total dimensions with cover open.



Type 3

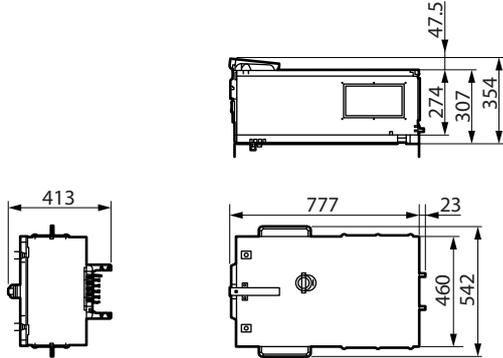
- (250 A)-MCCB ready,



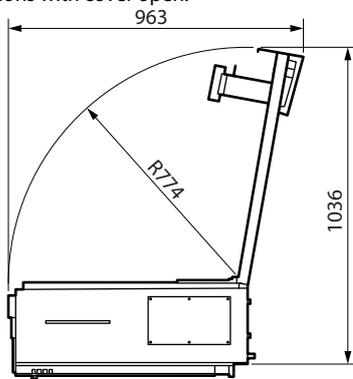
Prefabricated Busbar System XCP-HP Aluminum 4000 A

3. ACCESSORIES (continued)

- (250 A)–with fuse carriers/empty,



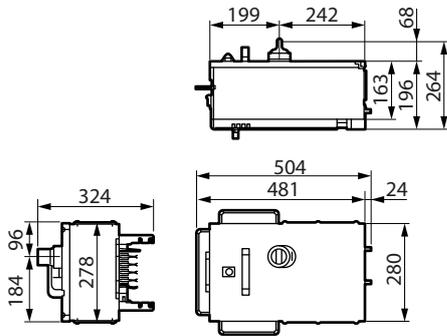
- Total dimensions with cover open.



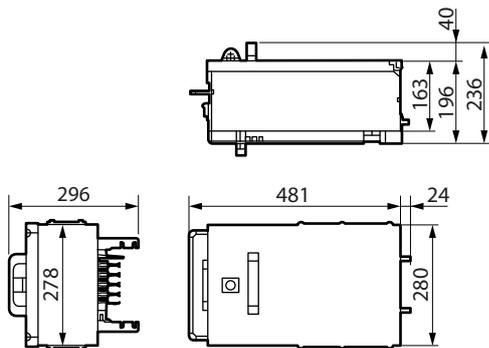
Metal tap-off box

Type 1

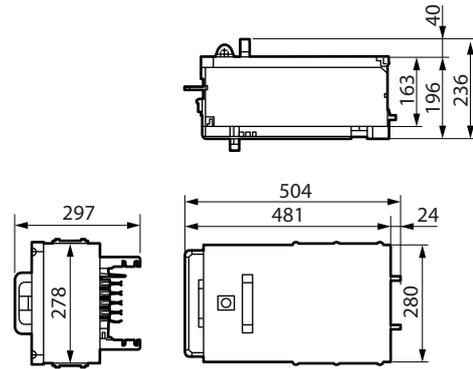
- (63 A/125 A/160 A)–MCCB ready,



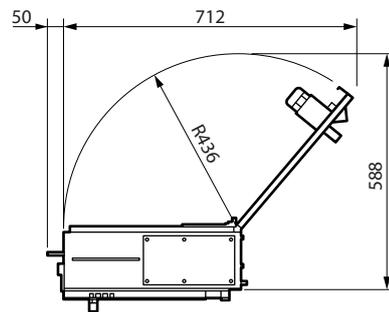
- (63 A/125 A/160 A)–with fuse carriers,



- (63 A/125 A/160 A)–empty,

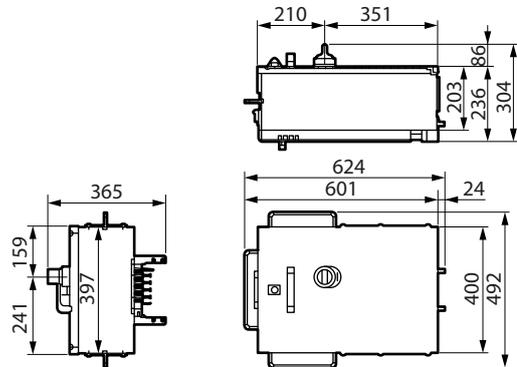


- Total dimensions with cover open.

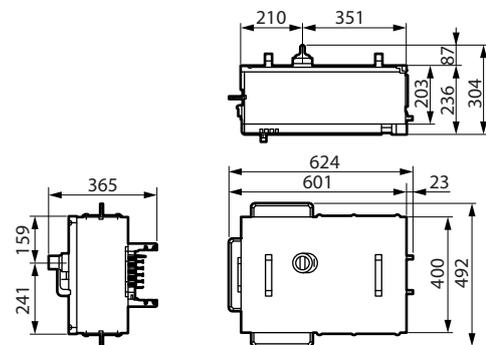


Type 2

- (250 A)–MCCB ready,



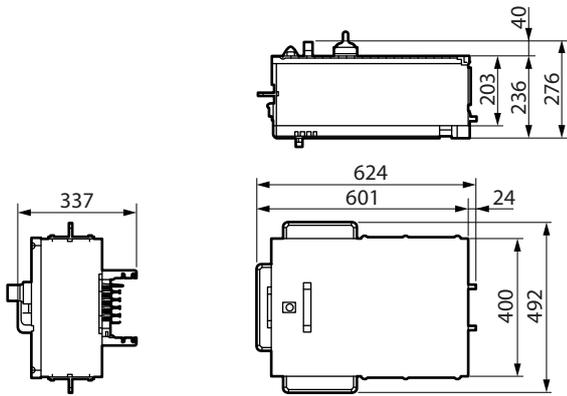
- (250 A)–MCCB ready (removable cover),



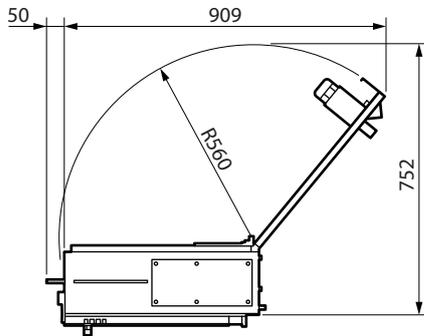
- (250 A)–empty/with fuse carriers,

Prefabricated Busbar System XCP-HP Aluminum 4000 A

3. ACCESSORIES (continued)

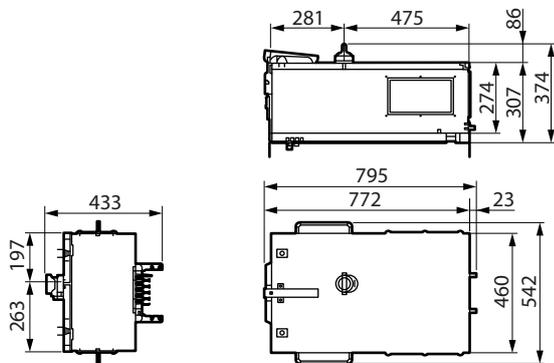


- Total dimensions with cover open.

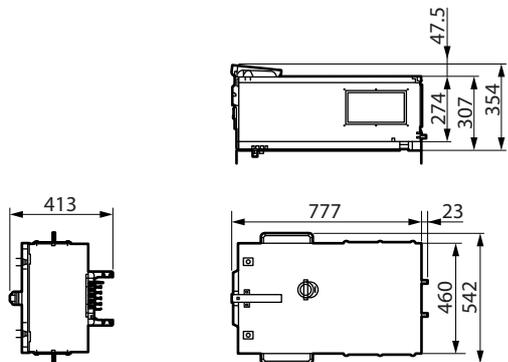


Type 3

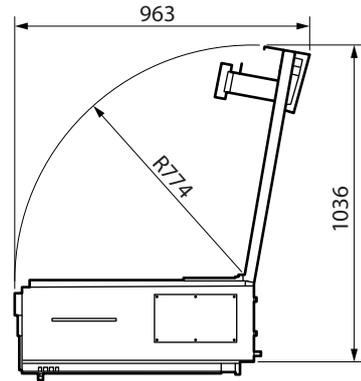
- (400 A/630 A)-MCCB ready,



- (400 A/630 A)-with fuse carriers,

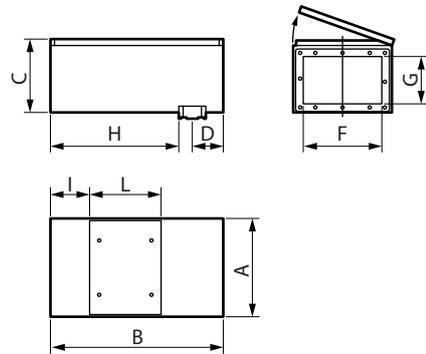
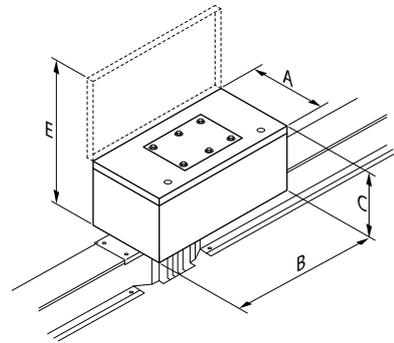


- Total dimensions with cover open.



Metal empty tap-off boxes bolt-on type

Available rating current: from 125 A to 1250 A.



F x G → cables entry.
H-usable internal space.
L-internal metal plate.

Dimensions (mm)

In [A]	A	B	C	D	E	F	G	H	I	L
125	365	630	270	115	630	290	180	465	142	260
250										
400										
630	400	750	280	115	675	290	180	585	227	295
800	450	1050	300	115	745	380	210	885	254	545
1000										
1250										

Prefabricated Busbar System

XCP-HP Aluminum 4000 A

4. CONFORMITY

XCP-HP range is conform to the following standards:

- NF C 15-100: Low voltage electric installation.
- EN 61439-1: Low voltage equipment set-Part 1: General rules.
- EN 61439-6: Low voltage equipment set-Part 6: Prefabricated Busbar System (Ranking index France standards: C 63-421-6).
- UL 94: Tests for Flammability of Plastic Materials for Parts in Devices and Appliances.
- EN 60332-3-10: Tests on electric and optical fibre cables exposed to fire.
- Part 3-10: Tests for the assessment of the vertical flame spread of vertically mounted bunched wires or cables-Equipment.
- NF EN 10327: Strips et smooth steel sheet continuously coated by hot immersion for cold moulding. Technical delivery conditions.
- EN 1366-3: Technical installations fire resistance tests-Part 3: Calking.
- IEC 60085: Electric isolation-Thermal assessment and designation.