

SM6

MV distribution
factory built assemblies
at your service

Anglais

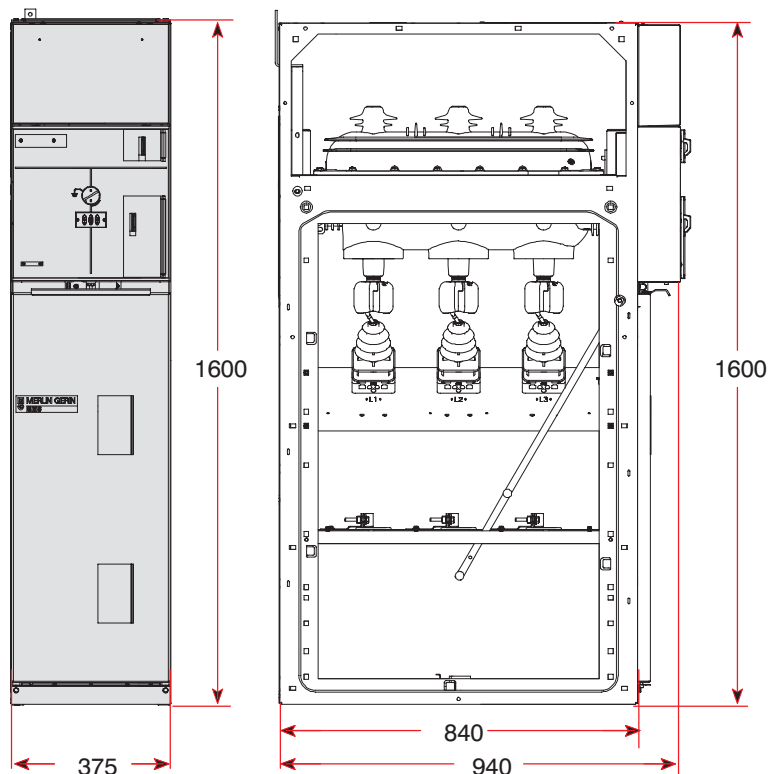
civil engineering guide

for 400–630A cubicles

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375 mm wide cubicles

IM

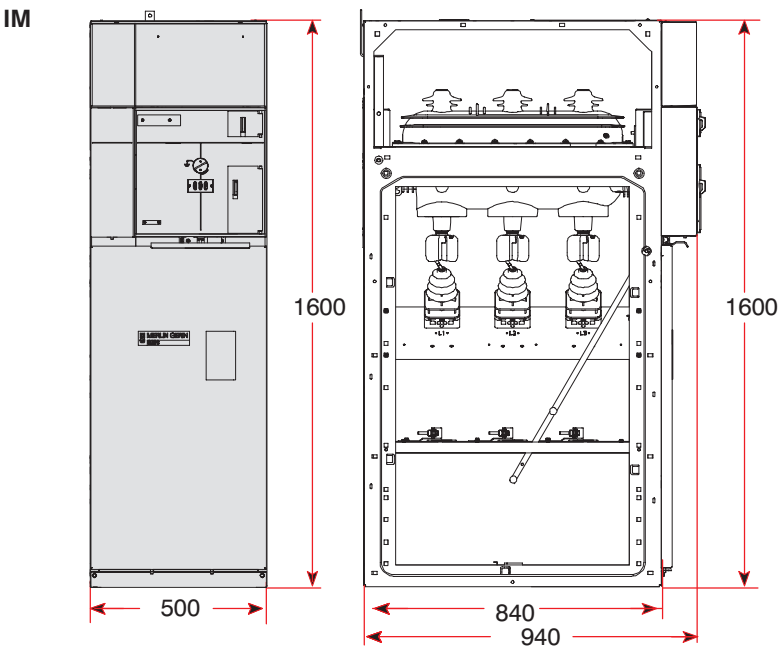


type of cubicle	height (mm) (1)	width (mm)	depth in (mm)	weight (kg)
IM, IMB	1600	375	940	120
PM,QM, QMB	1600	375	940	130
CM	1600	375	940	190
GBM	1600	375	940	120
GAM2	1600	375	940	120
SM	1600	375	940	120
TM	1600	375	940	190

Add to height:
(1) 450 mm, if low voltage case for protection and control/monitoring.

To obtain a homogeneous switchboard, all the cubicles (except for **GIM** and **GEM**) can accommodate a LV case.

500 mm wide cubicles

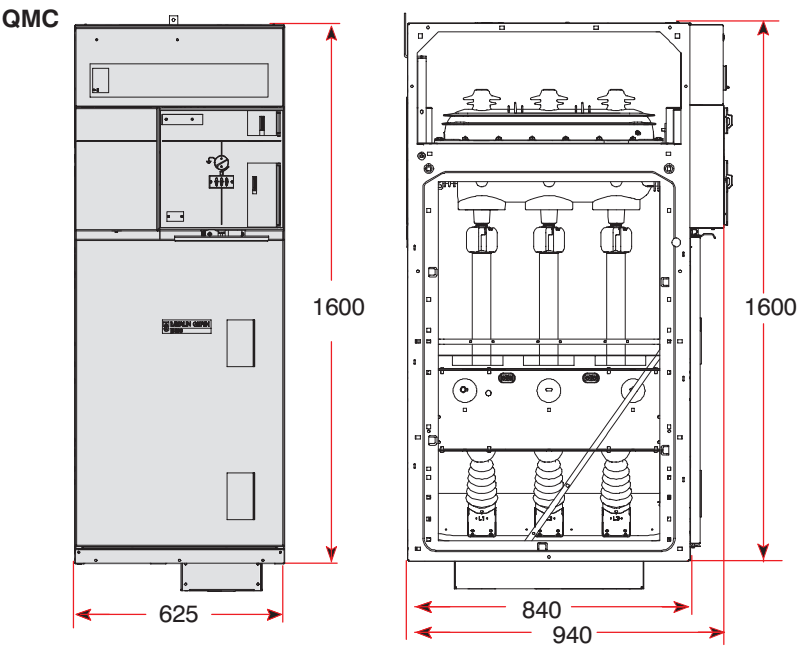


type of cubicle	height (mm) (1)	width (mm)	depth in (mm)	weight (kg)
IM, IMB	1600	500	940	200
QM	1600	500	940	150
CM2	1600	500	940	210
GAM	1600	500	1020	120
SM	1600	500	940	120

Add to height:
(1) 450 mm, if LV case for protection and control/monitoring.

To obtain a homogeneous switchboard, all the cubicles (except for **GIM** and **GEM**) can accommodate a LV case.

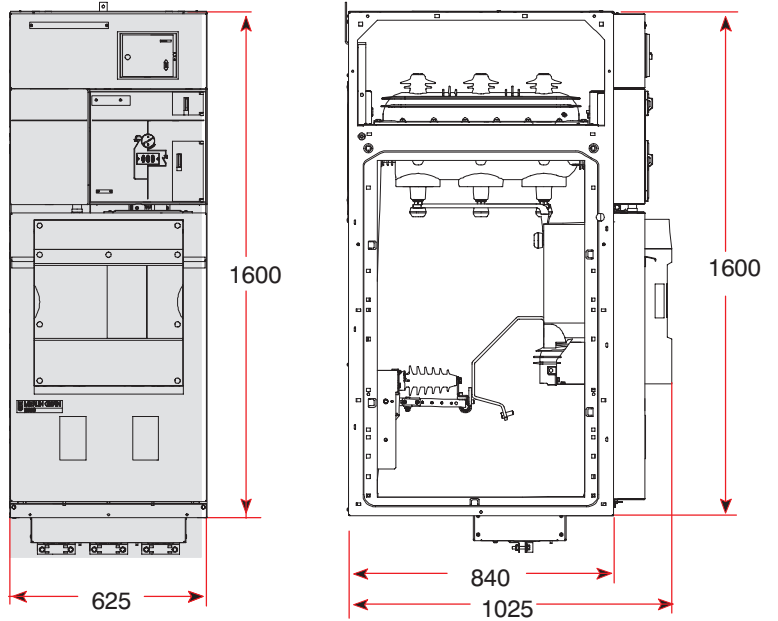
625 mm wide cubicles



type of cubicle	height (mm) (1)	width (mm)	depth in (mm)	weight (kg)
QMC	1600	625	940	230

625 mm wide cubicles

DMV-S



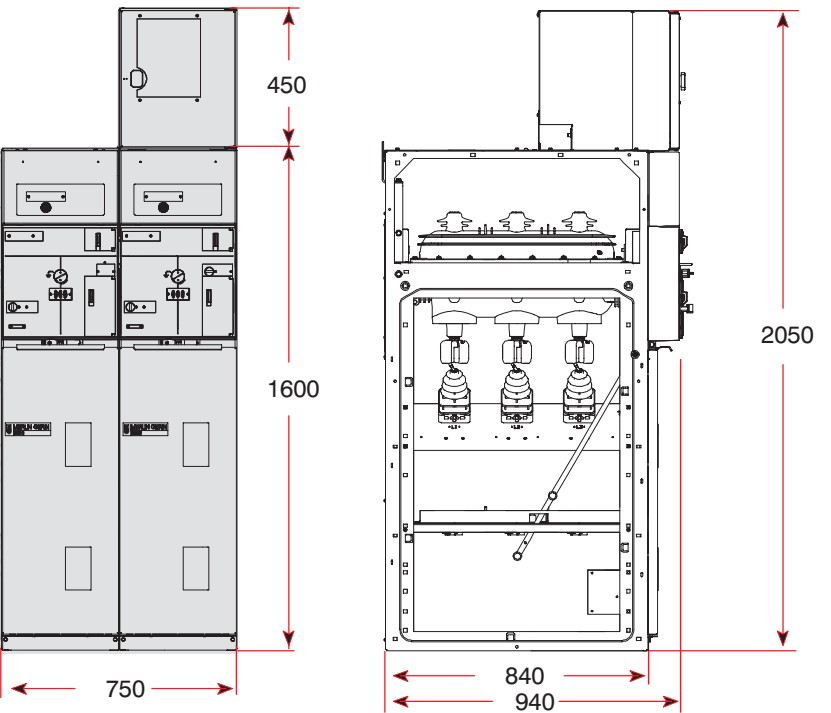
type of cubicle	height (mm) (1)	width (mm)	depth in (mm)	weight (kg)
DMV-S	1600	625	1025	260
DMV-A, DMV-D	1680	625	1025	340

Add to height:
(1) 450 mm, if LV case for protection and control/monitoring.

To obtain a homogeneous switchboard, all the cubicles (except for **GIM** and **GEM**) can accommodate a LV case.

750 mm wide cubicles

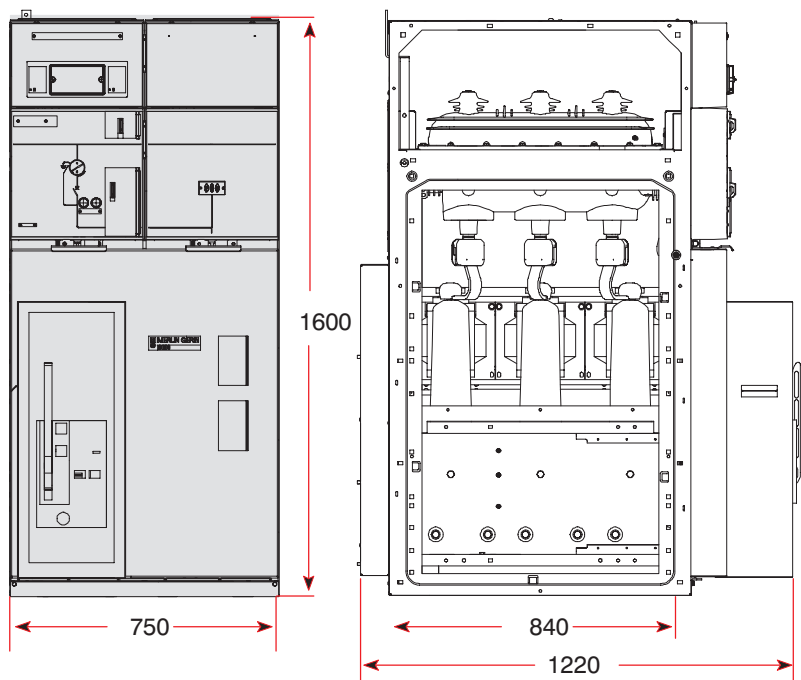
NSM



type of cubicle	height (mm) (1)	width (mm)	depth in (mm)	weight (kg)
NSM-cables/ NSM-bars	2050	750	940	260

750 mm wide cubicles

DM1-A



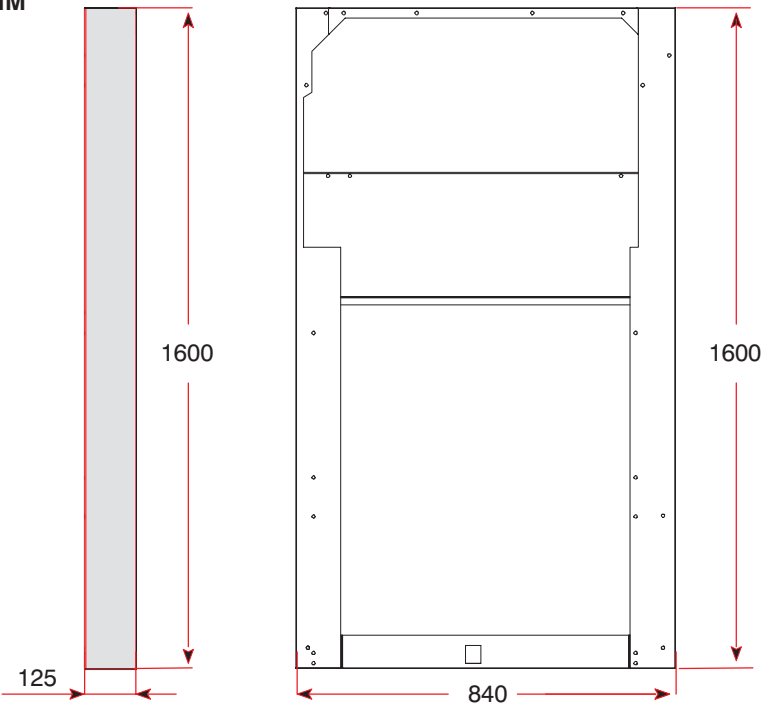
type of cubicle	height (mm) (1)	width (mm)	depth in (mm)	weight (kg)
CRM	2050	750	940	390
DM1-A,DM1-D	1600 (1)	750	1220	400
DM1-W,DM1-Z,DM2				
DM1-S	1600 (1)	750	1220	260
GBC-A, GBC-B	1600 (1)	750	1020	290

Add to height:
(1) 450 mm, if LV case for protection and control/monitoring.

To obtain a homogeneous switchboard, all the cubicles (except for **GIM** and **GEM**) can accommodate a LV case.

125 mm wide cubicles

GIM

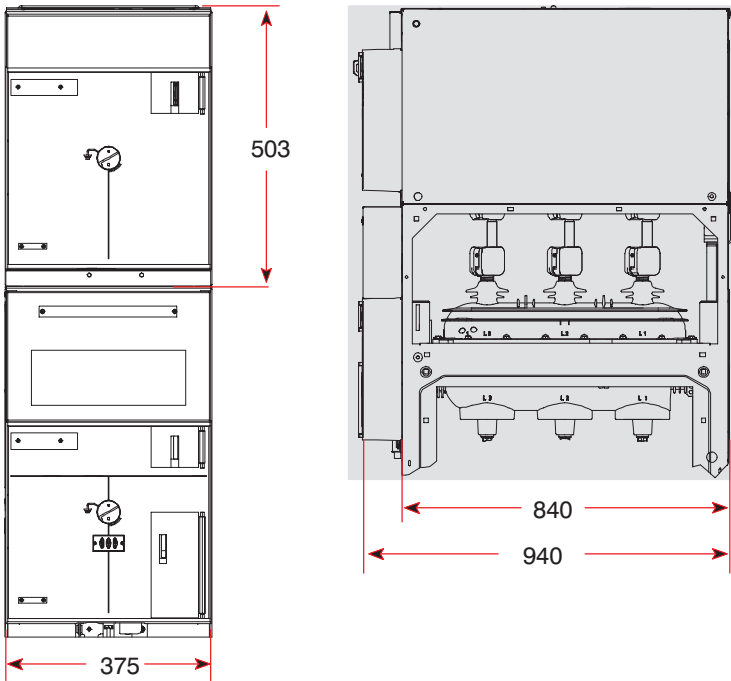


type of cubicle	height (mm) (1)	width (mm)	depth in (mm)	weight (kg)
GIM	1600	125	840	30
GEM	1600	125	920/1060*	30/35*

*for VM6 extension/1060 mm depth, 35 kg circuit-breaker

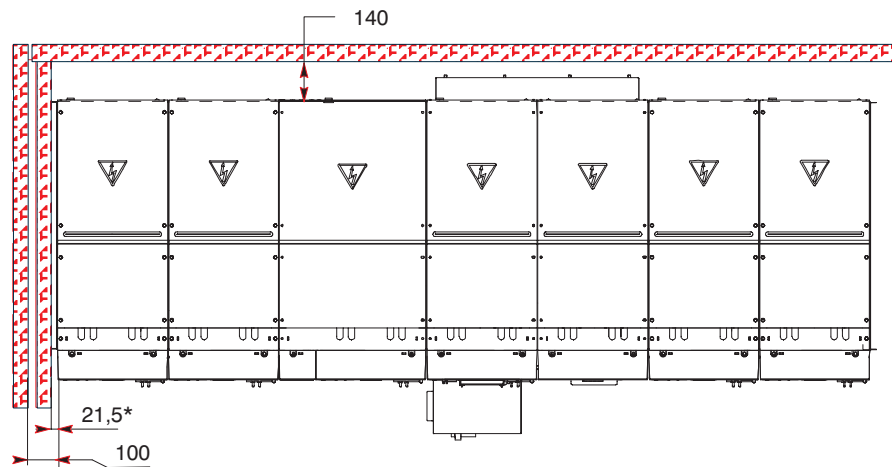
EMB function

Installed on 630A cubicles.
IM 375mm or **DM1-A**
(except if LV case
or compartment with top cable
connection is already installed).



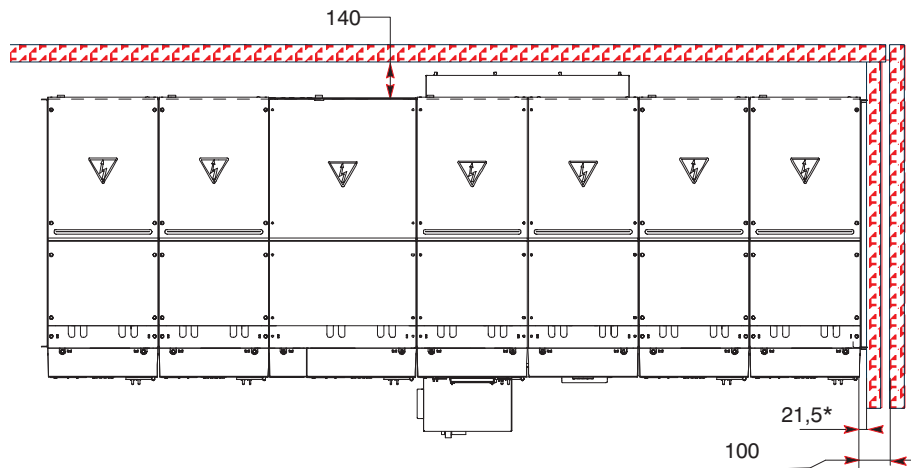
type of cubicle	height (mm) (1)	width (mm)	depth in (mm)	weight (kg)
EMB	503	375	940	70

layout in the substation



Installation of switchboard to the right of the wall.

(*) minimum dimension to ensure proper operation of device.



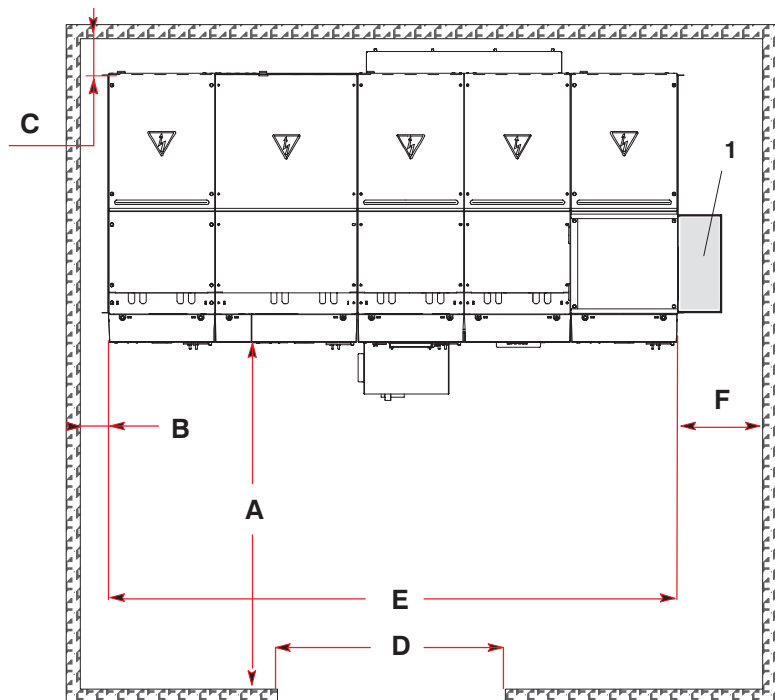
Installation of switchboard to the left of the wall.

(*) minimum dimension to ensure proper operation of device.

7897512EN indice : A

surface required for operation and maintenance

1 : wiring riser trunking option



A : this dimension must be equal to 1200mm for the **Circuit-breaker** extraction operation.

B : this dimension varies from 21.5 to 100 mm

C : the minimum dimension is 140 mm

D : access to substation: this dimension varies according to switchboard composition: 750 mm wide circuit-breaker cubicle

E : this dimension depends on the functional units making up the switchboard

F : dimension identical to **B** except if wiring riser trunking option.

In this case **F**=300 mm.

standard cubicle

A ; access to substation

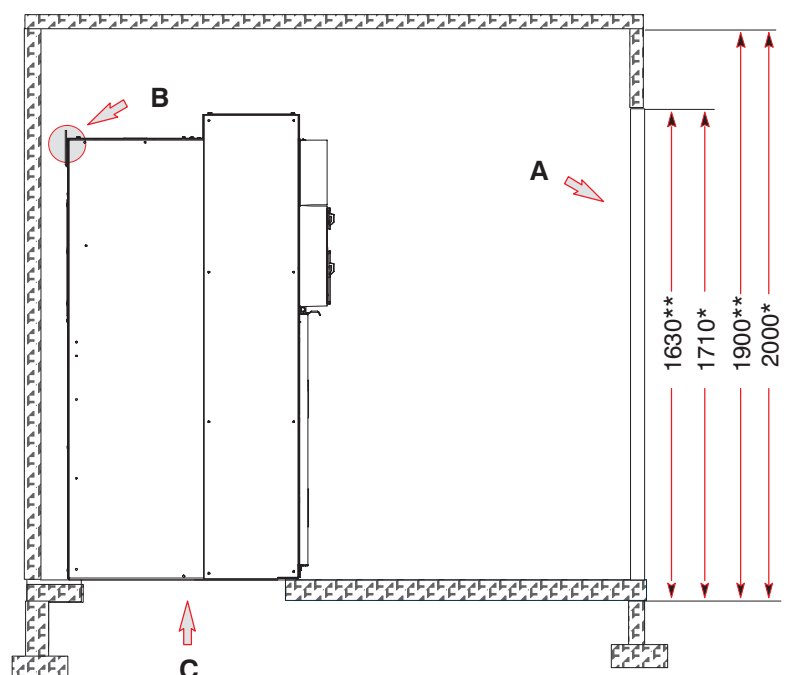
B : earth busbar

C : reserved space for MV cable insertion

Recommendation:

*minimum dimension (in mm) with the wiring
or Sepam trunking option (series 20)** minimum dimension without option

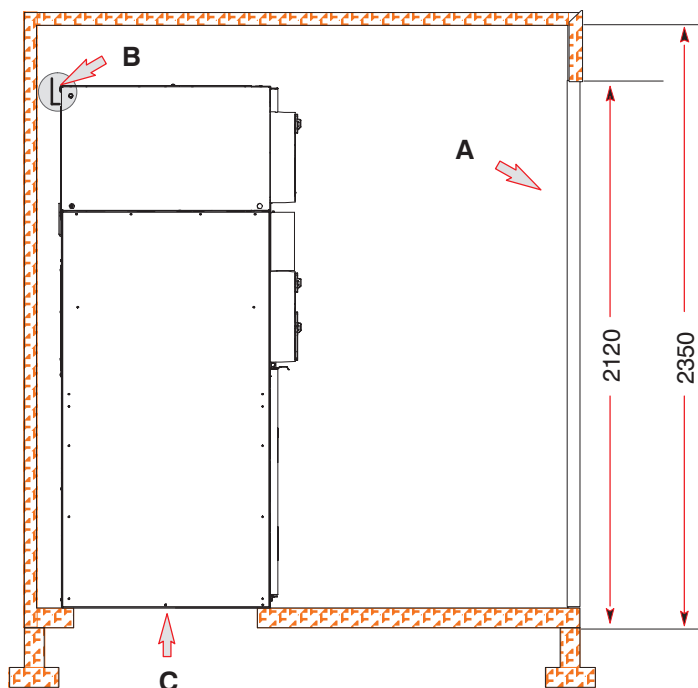
NB: these dimensions must be increased by 350 mm with base option.



cubicle with EMB

- A** : access to substation
B : earth busbar
C : reserved space for MV cable insertion

NB: these dimensions must be increased by 350 mm with base option.

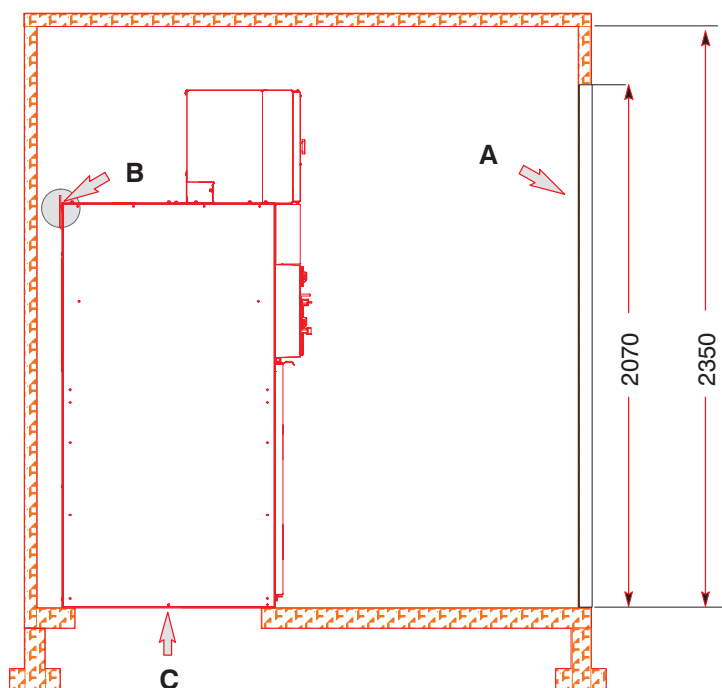


cubicle with LV case

(e.g.: NSM type)

- A** : access to substation
B : earth busbar
C : reserved space for MV cable insertion

NB: these dimensions must be increased by 350 mm with base option.



top cable connection of compartment

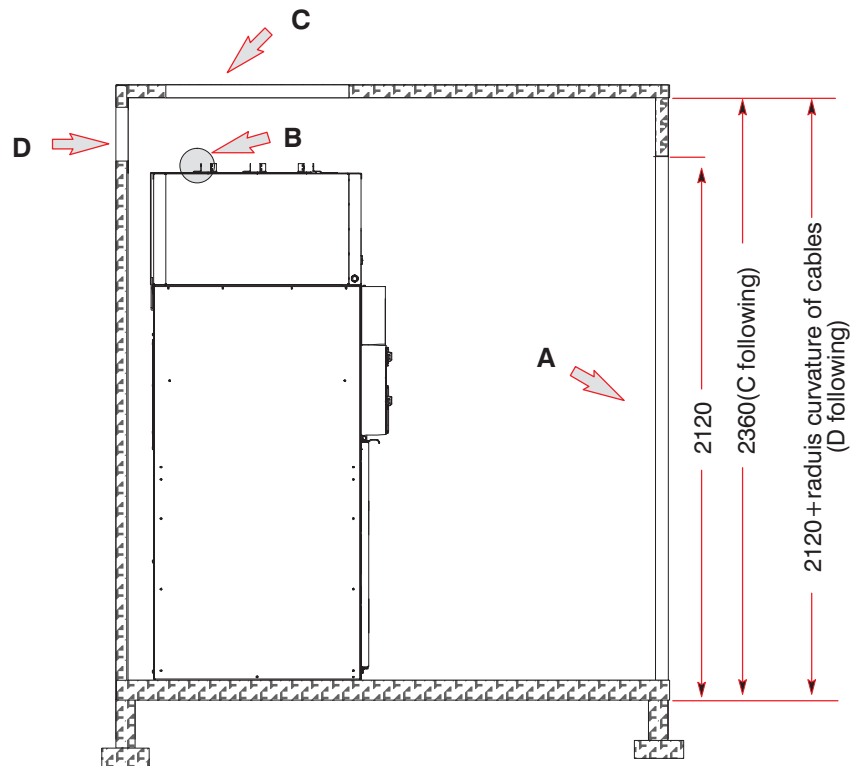
- A** : access to substation
B : earth busbar
C : insertion of cables by the top
D : insertion of cables by the rear
or side

Height of substation must allow
for the radius of curvature of cable
cross-section.

see paragraph:

Civil engineering with duct

NB: these dimensions must be
increased by 350 mm with base
option.



7897512EN indice : A

reminder

Recommendation for environmental withstand.

Under certain climatic conditions, the condensation phenomenon may occur.

By simple means it is possible to enhance the behaviour of MV substations and to minimise the risk of appearance of condensation and thus of corona discharge phenomena.

■ main factors may be responsible for this phenomenon:

1 substation architecture (dimension and replacement of ventilation systems, type of materials used).

2 climatic environment of MV/LV (very damp area, fog, precipitation, orientation and pollution)

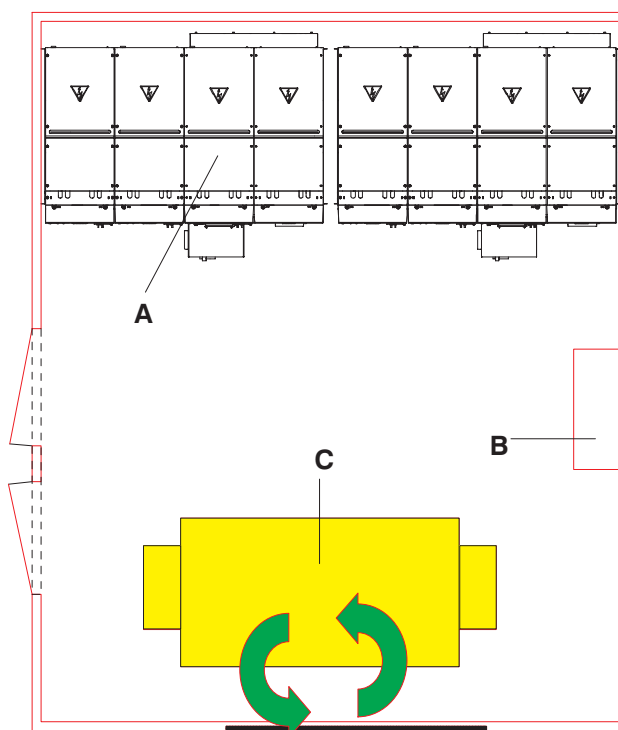
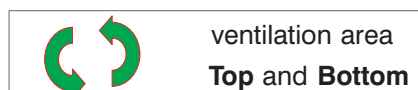
3 technology and/or implementation of cable ends

environmental details

A : MV switchboard

B : LV enclosure

C : transformer



solutions

1 substation architecture:

adapt ventilation cross-section to power loss in the substation to minimise temperature differences.

Eliminate ventilation in the environment in the immediate vicinity of the MV modular switchboard.

Encourage suitable ventilation (top and bottom) by convection around the transformer.

2 the HV/LV substation environment:

guarantee tightness of the substation and of the cable pits. Provide baffle type ventilation systems to limit direct penetration. Install anti-condensation resistances in the cubicles

Cable ends:

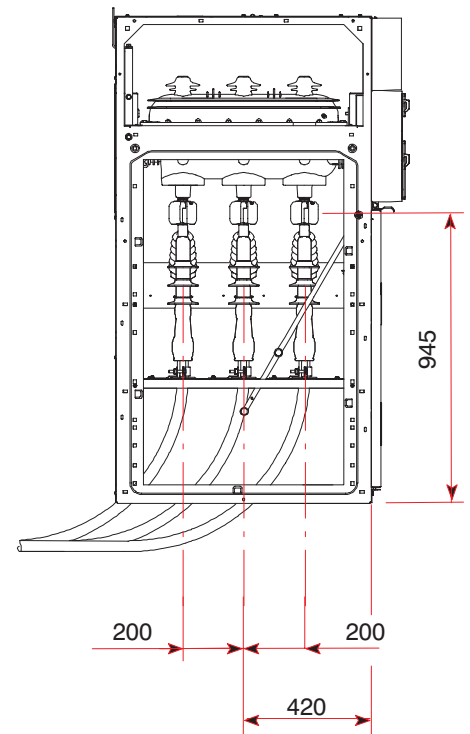
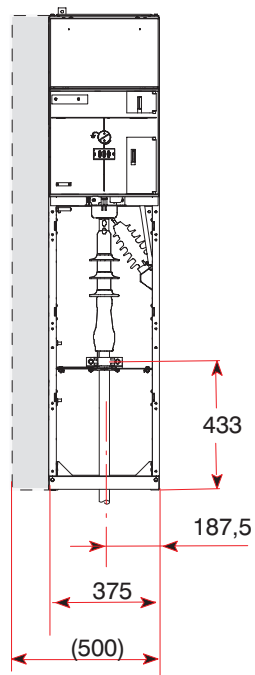
incorrect implementation of cold technology cable ends will result in dielectric stresses that will also generate the corona discharge phenomenon in harsh conditions.

7897512EN indice : A

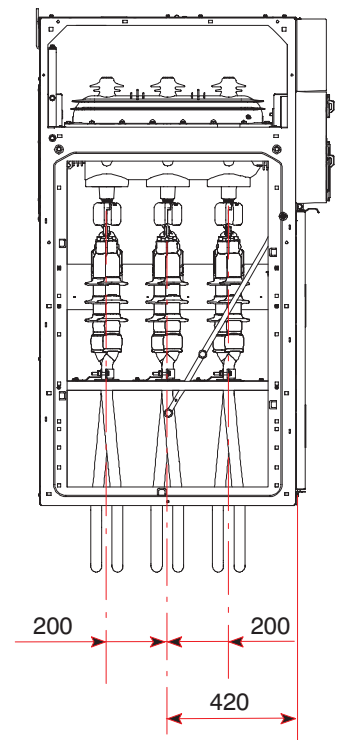
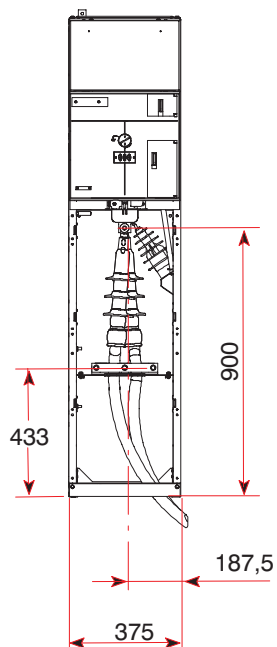
switch cubicle

IM, IM(500), SM, NSM

single-core dry cables with short ends



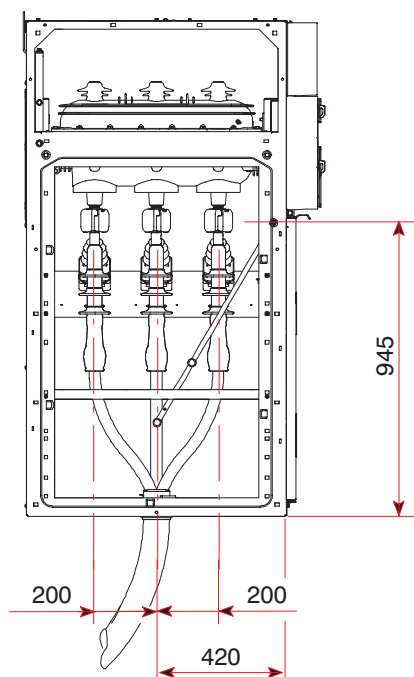
2 single-core dry cables per phase



switch cubicle

IM, IM(500), SM, NSM

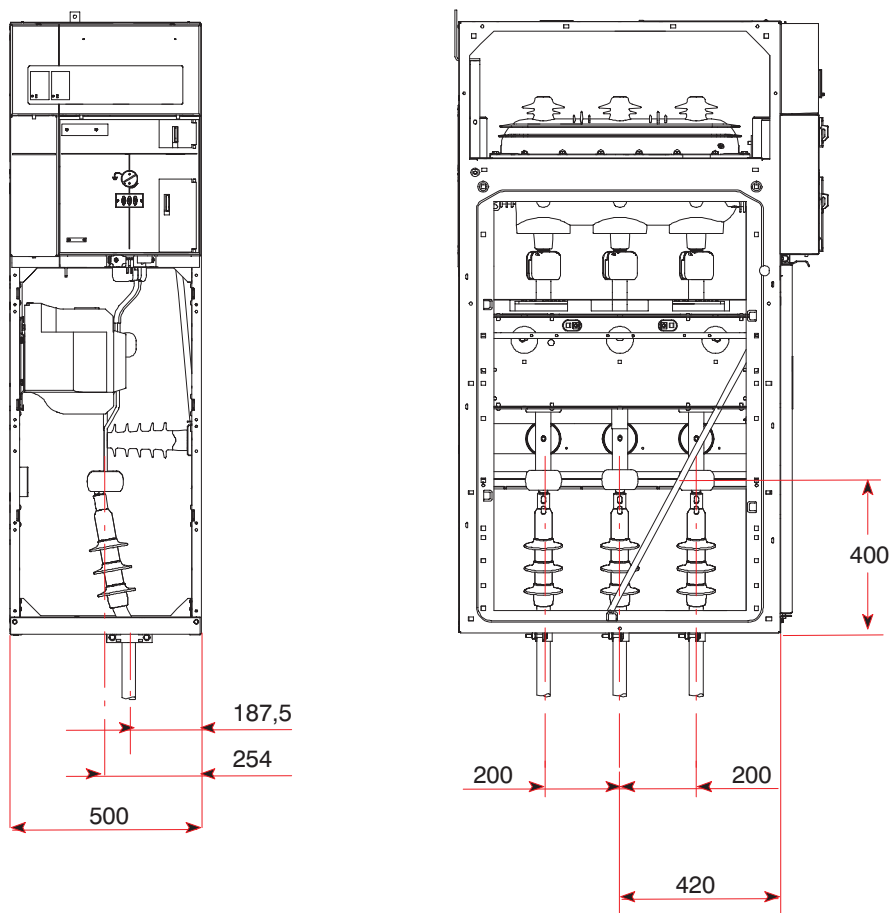
three—core dry cables with short ends



switch cubicle with CT

IMC cubicle

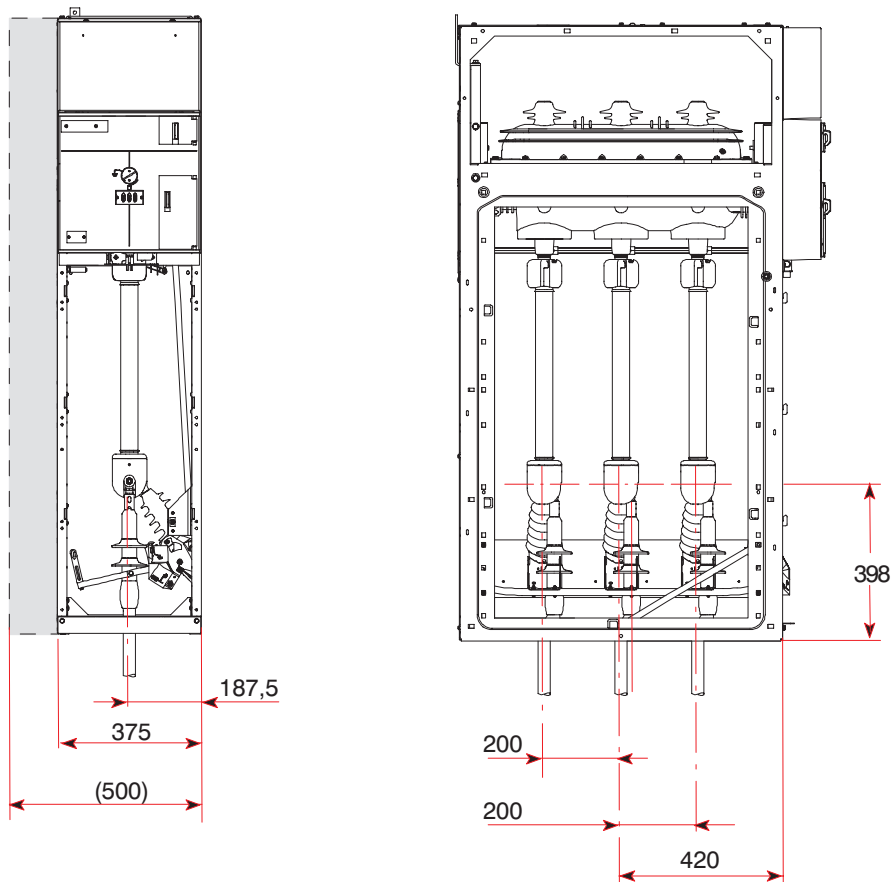
single—core dry cables with short ends



fuse – switch cubicles

PM, QM, QM(500) cubicle

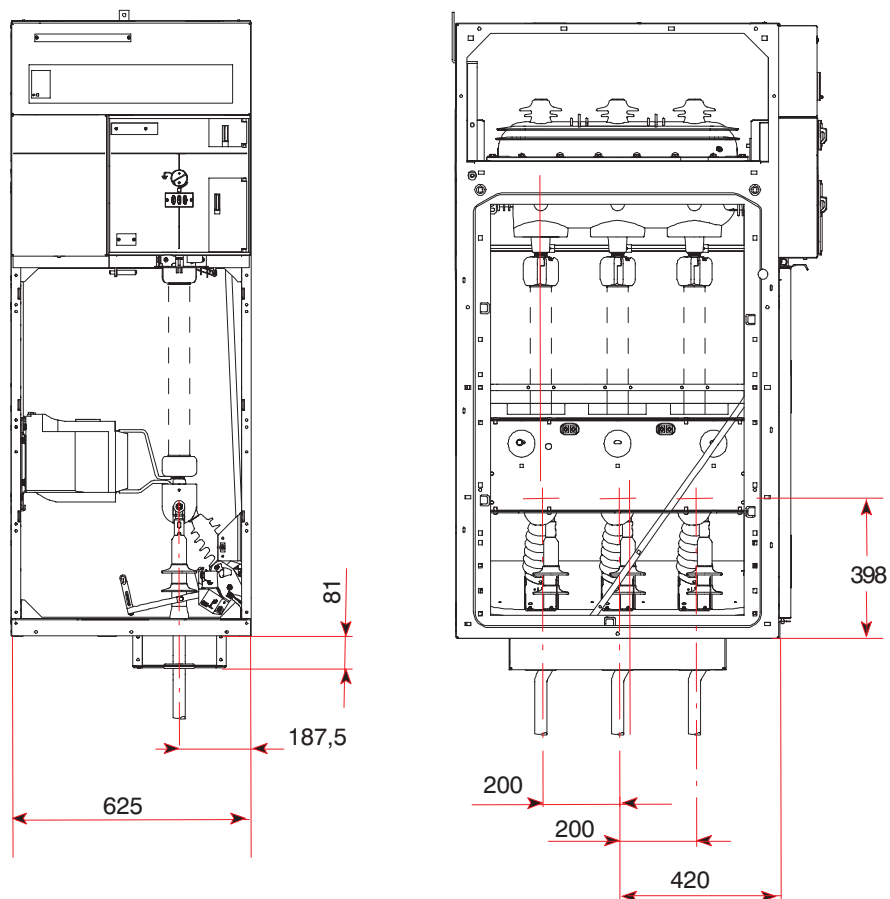
single – core dry cables with short ends



transformer protection with CT

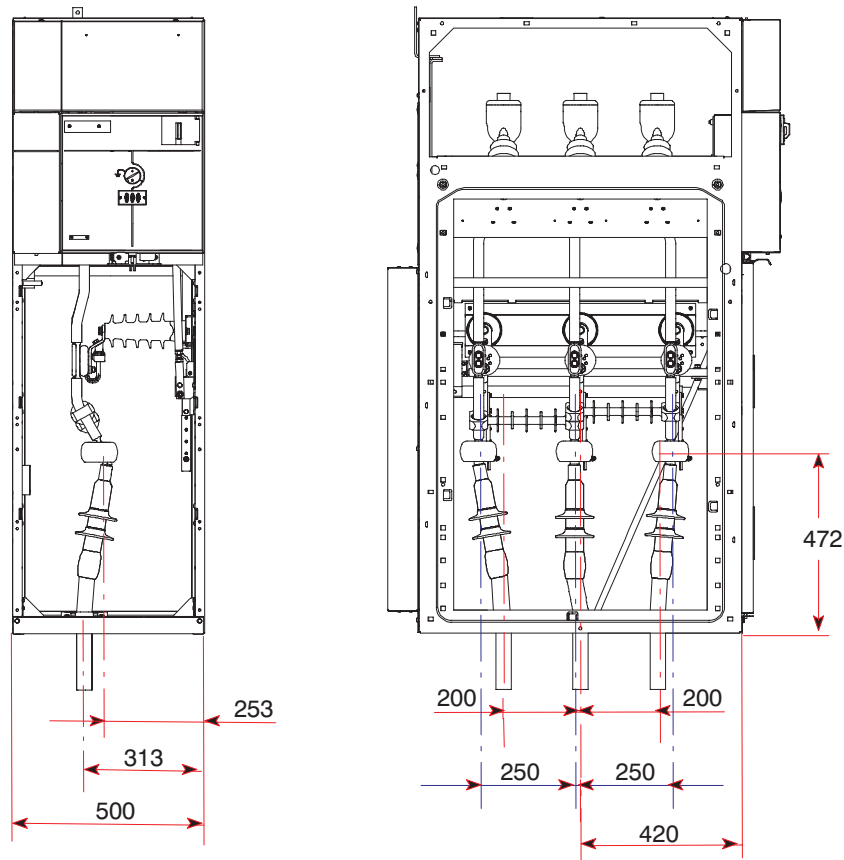
QMC cubicle

single – core dry cables



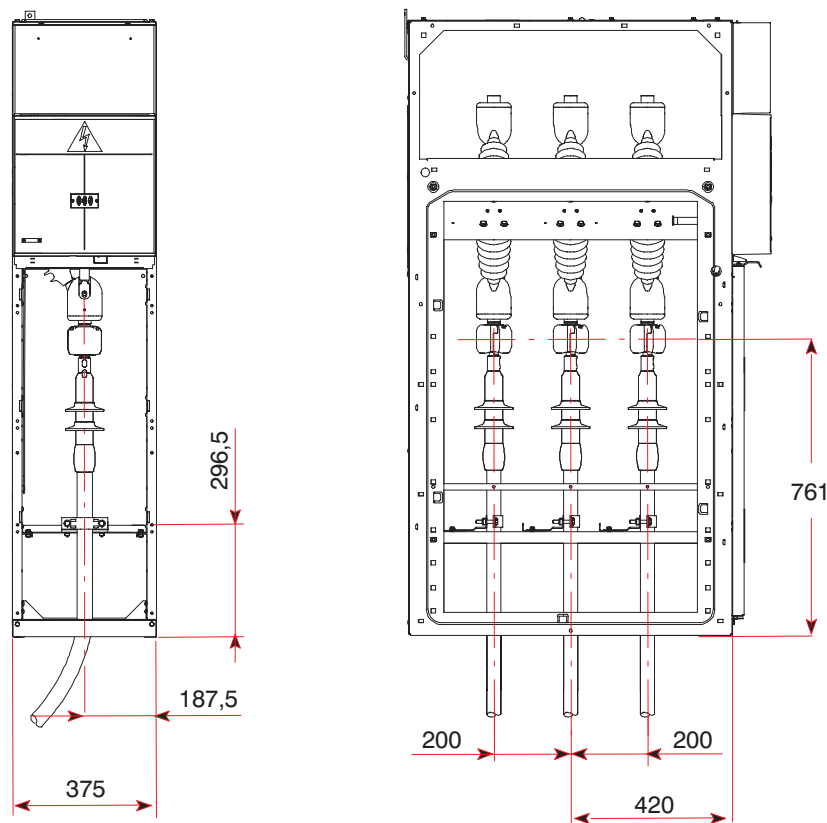
GAM cubicles

single-core dry cables
with short ends



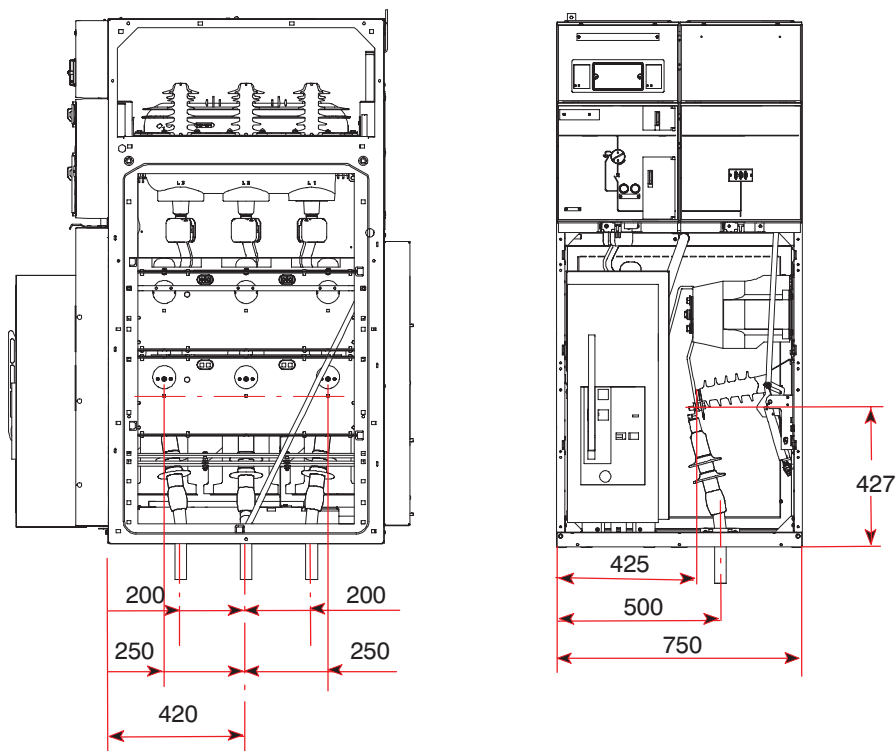
GAM2 cubicles

single-core dry cables
with short ends

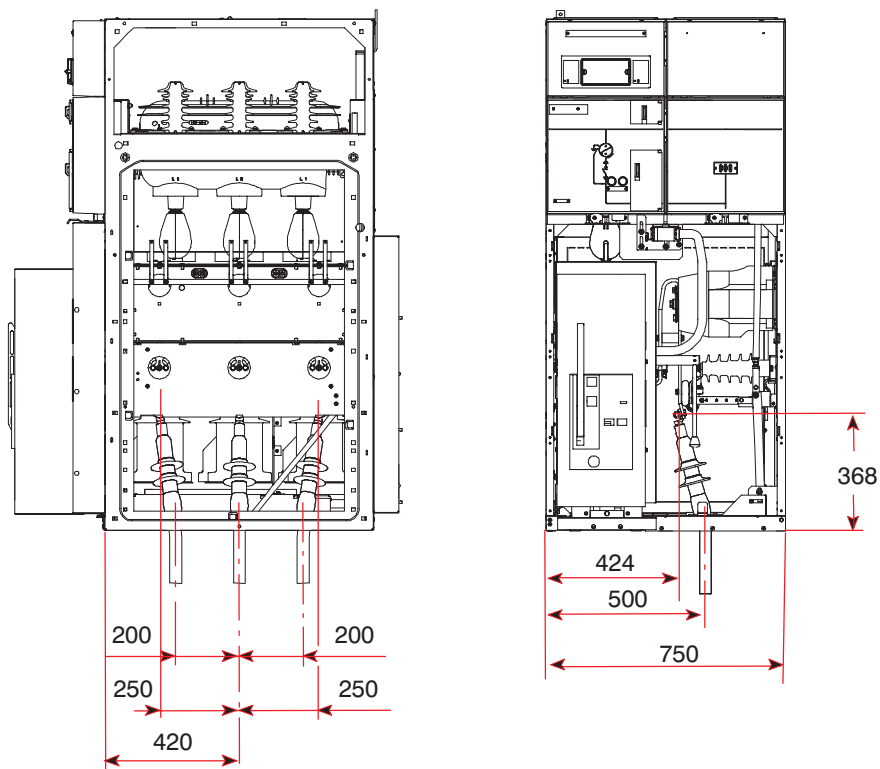


DM1 – A circuit–breaker cubicles

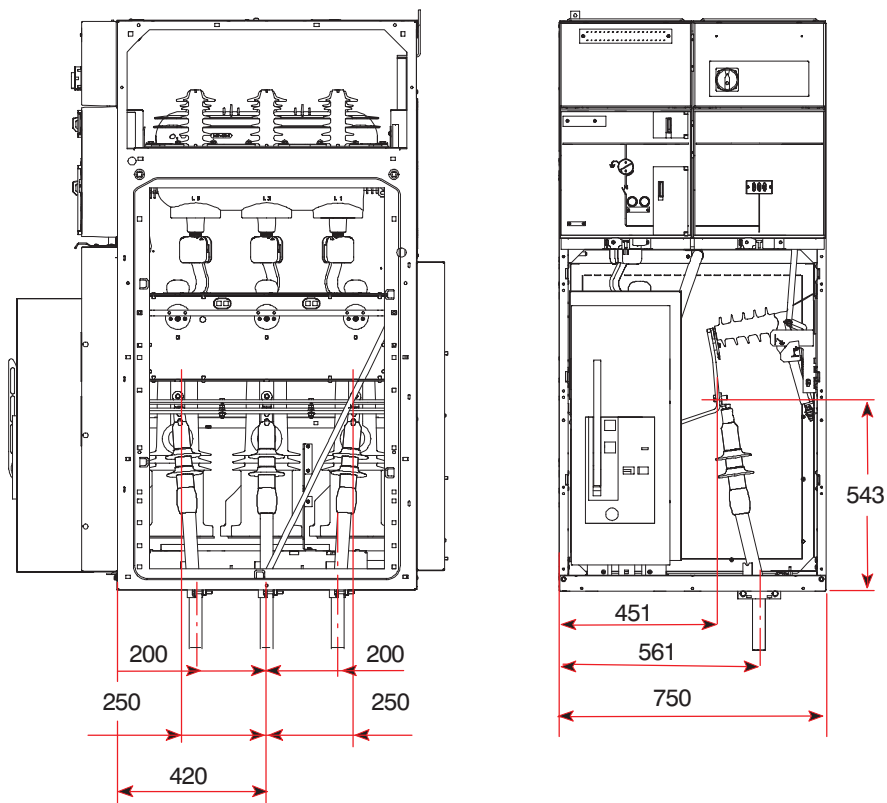
single–core dry cables with short ends



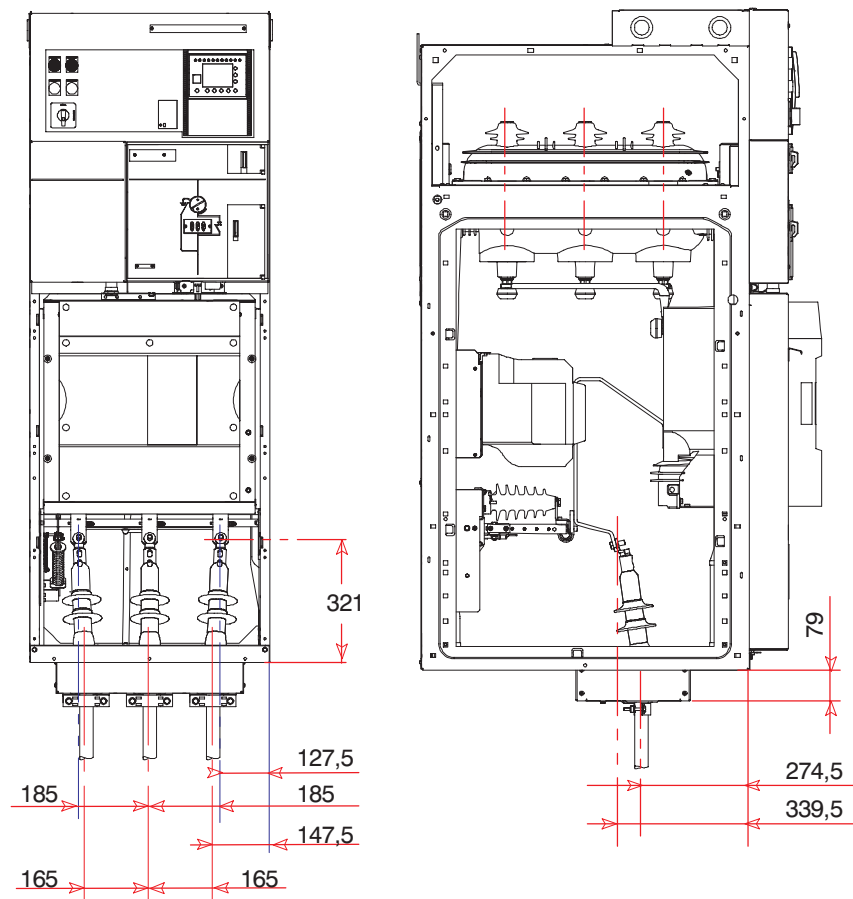
DM1 – W circuit–breaker cubicles



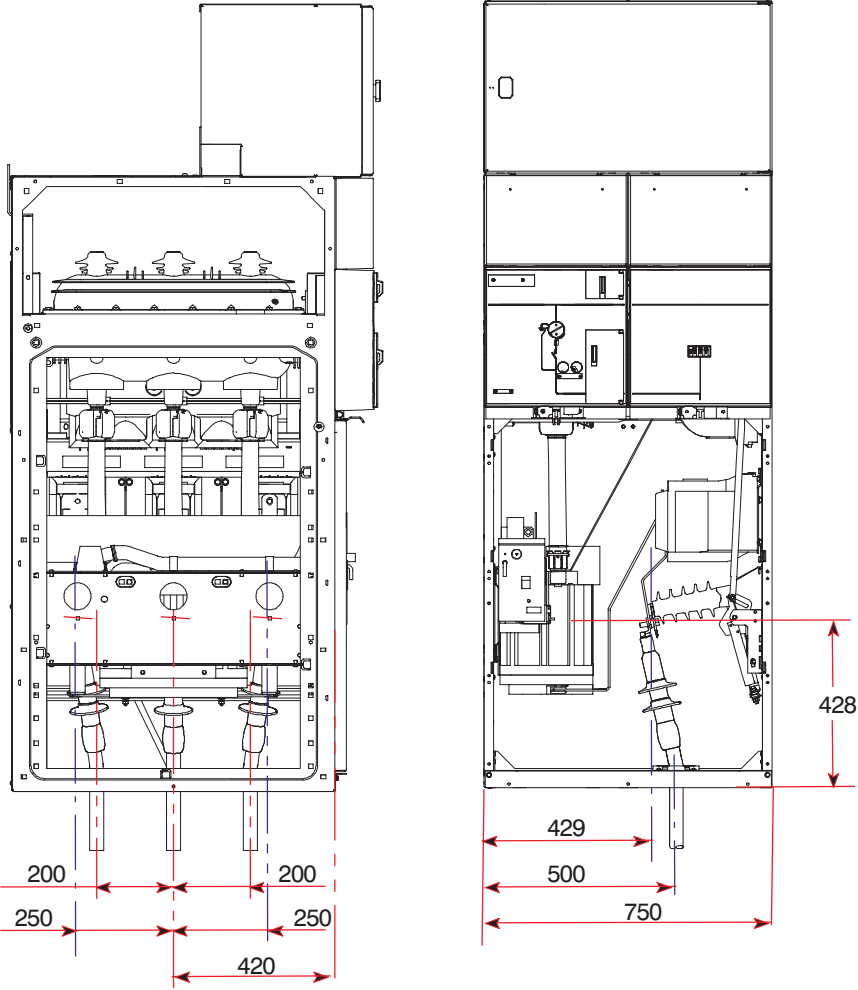
DM1 – S circuit – breaker cubicles



DMV – A, DMV – S circuit – breaker cubicles



**CRM circuit – breaker
cubicles**



bottom connection of cables

depth of ducts according to cables

400–630A cubicles

single-pole cables		cubicle up to 630A		
cable cross-section (mm ²)	radius of curvature	IM, SM, NSM-cables NSM-bars	IMC, CRM, DM1-A, DM1-W, GAM, DM1-S	PM, QM, QMC (1)
		depth D (mm) all directions		
		P1	P2	P3
50	370	140	400	350
75	400	150	430	350
95	440	160	470	350
120	470	200	500	
150	500	220	550	
185	540	270	670	
240	590	330	730	
300	692	430	830	

(1) for QMC: D3=450 mm

NB: to determine the depth D of a simple switchboard duct, you need to consider the cubicle and the cables that call for maximum depth.

For a double duct, you must allow for each depth D by type of cubicle and orientation of cables.

bottom connection

All cubicles:

- with duct
- with raising

The depth D of ducts is given opposite for standard cables of the single-pole dry type (for three-pole cables, **consult us**).

Elimination or reduction of the duct is achieved either by installing a raiser (supplied as an option) or by placing cubicles on a 350 mm concrete base.

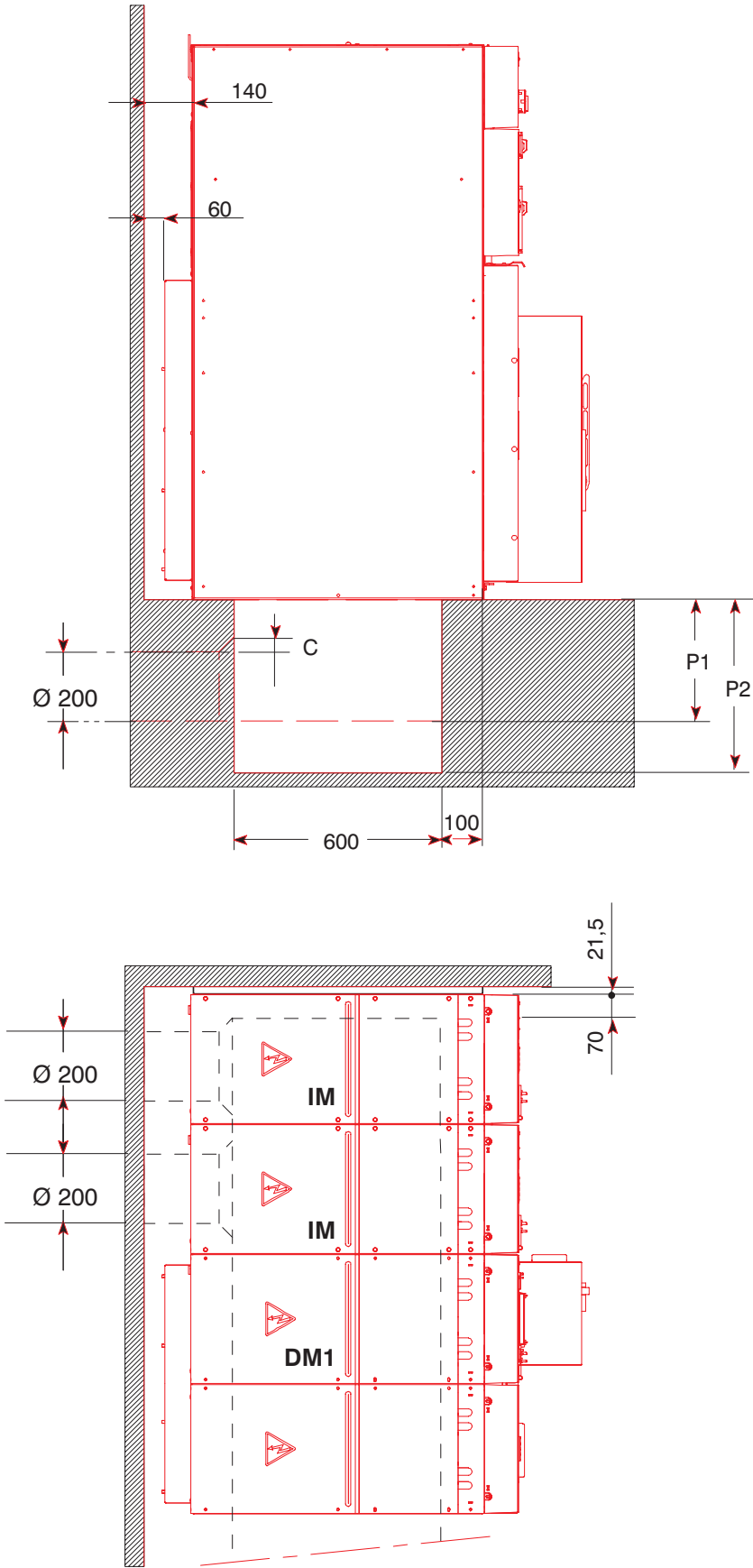
Caution: if the switchboard has a **DM1-W** cubicle, provide a circuit-breaker extraction truck (option).

NB: for connection with nozzles, the chamfer **C** must comply with the following dimensions:

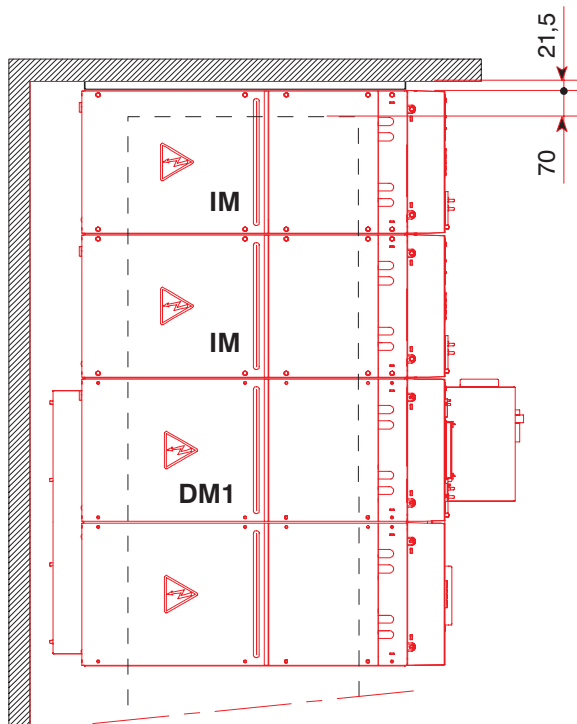
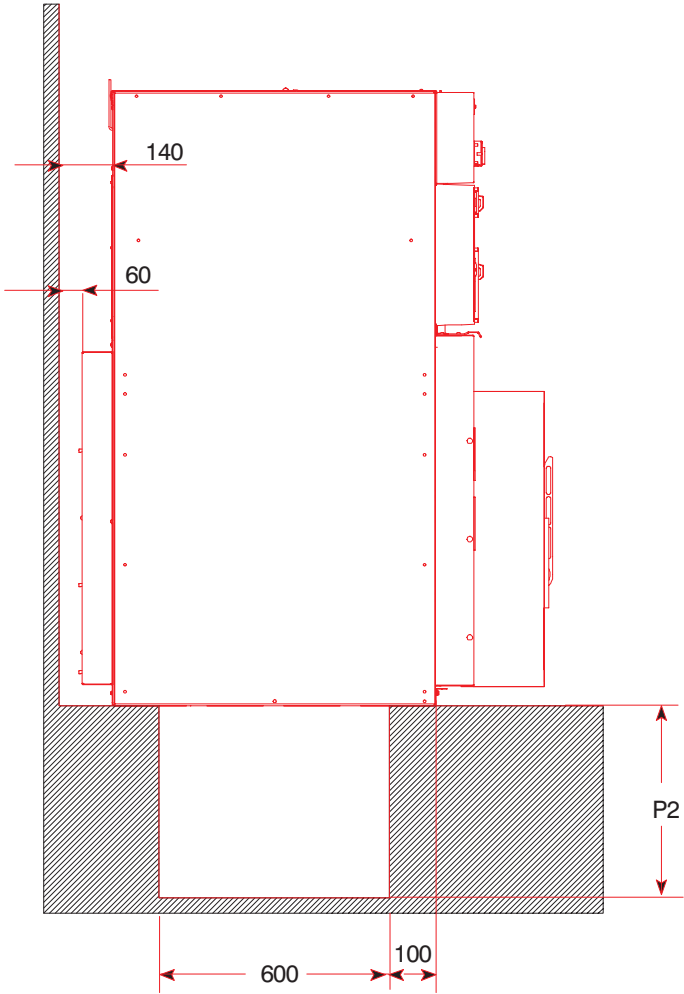
D1 = 375 mm or **D2/D3** = 150 mm

duct drawing

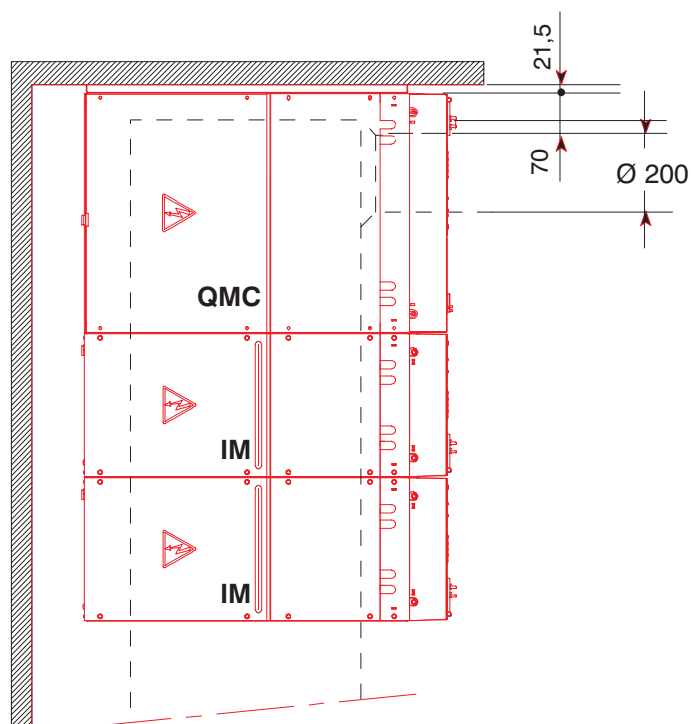
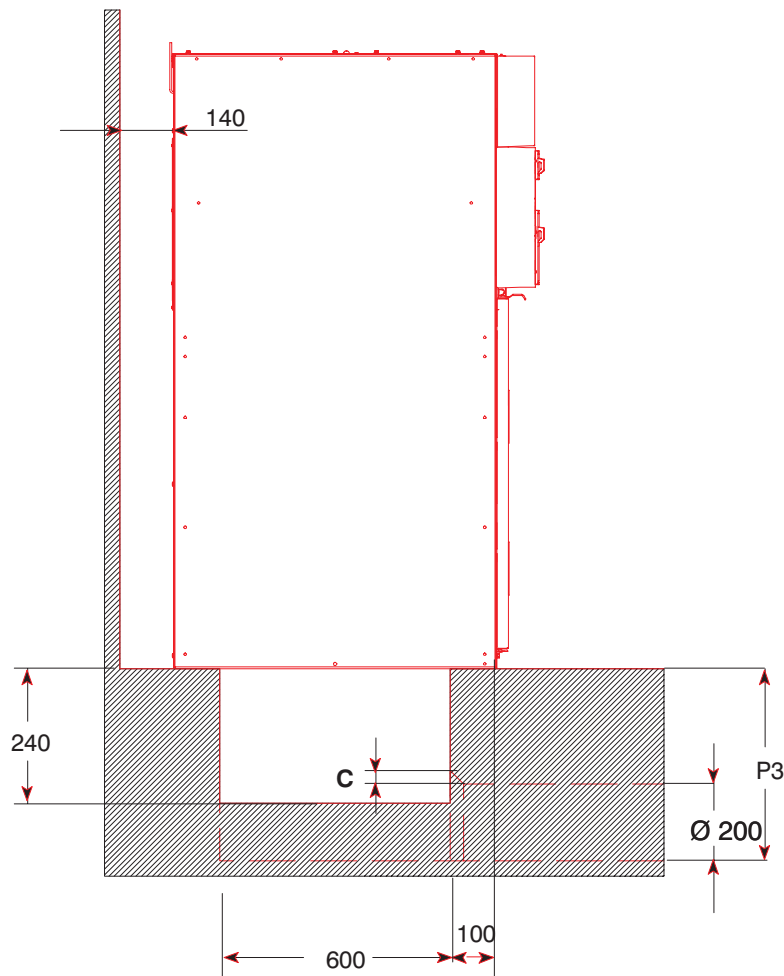
Incomer or feeder via the rear
with nozzles.



Side left or right incomer or feeder.



Front incomer or feeder
with nozzles.



preparing the floor

The cubicles are placed on a standard quality concrete floor, with or without duct, as per cable cross-section and type.

Civil engineering is the same for all 400–630A cubicles.

To reduce by 350 mm the depth of the ducts of 400–630A cubicles (thus enabling their elimination in many cases), you can raise cubicles by placing them on a concrete base produced by civil engineering.

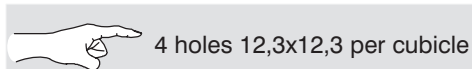
Cubicle raising:

- used to install cubicles in premises where ducts cannot be dug
- does not obstruct substation operations

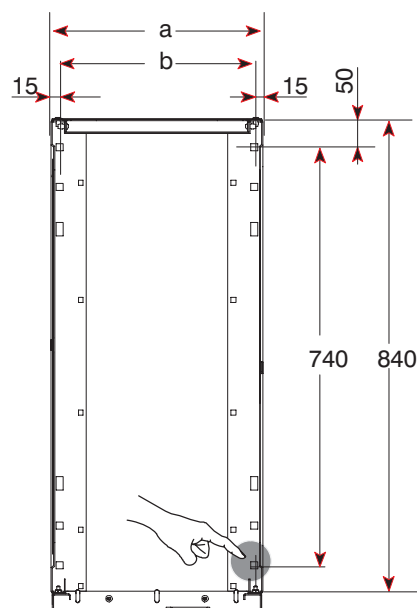
cubicle fastening with one another

The cubicles making up the substation are secured to one another by bolts (screws delivered with the cubicles).

fastening the cubicles to the floor



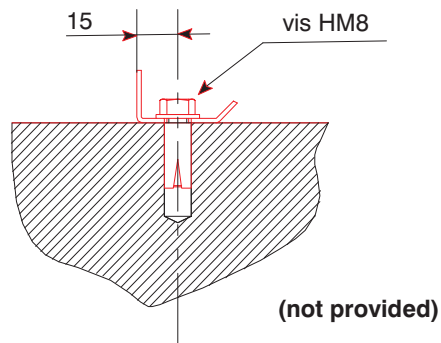
NB: for circuit-breaker and contactor cubicles, fastening is on the side opposite the switchgear.



a = cubicle width					
a (mm)	125	375	500	625	750
b (mm)	95	345	470	595	720

-
- for a switchboard of 3 cubicles or less, the 4 corners of the switchboard are fastened by:
 - M8 screws (not supplied) that are fastened in a nut fitted using a striking device,
 - or a floor threaded rod
 - for a switchboard with more than 3 cubicles, the fastening points must be determined according to installation requirements (earthquake withstand, etc.), each cubicle can be fastened to the floor.
 - position of fastening holes (b) as per cubicle width (a).

fastening example



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