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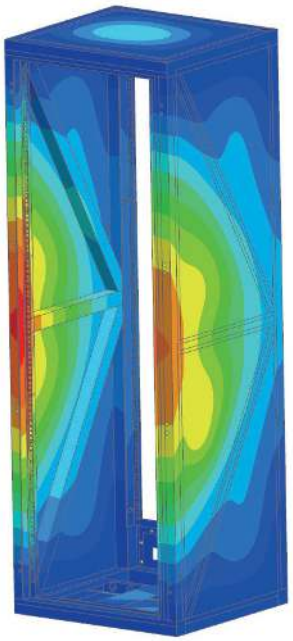
INDUSTRIAL ENCLOSURE SOLUTIONS

SOLUTIONS DELVALLE

EARTHQUAKE ENCLOSURE





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WE PUT AT YOUR DISPOSAL

We offer over **50 years** providing solutions to demanding customers who require very specific characteristics and behaviour according to the sector and their needs.

WHEREVER YOU GO

We are committed to working closely with our customers, providing them with **exceptional service** and offering an advanced and extensive range of products with very competitive prices.

HIGH STANDARD OF QUALITY AND SERVICES

We only use materials provided by companies who offer the very **highest quality**, suitable and certified products. Our success is due to top quality assurance: ISO 9001, SGS, UL, TÜV, ISO 14000 and ISO45001.

CUSTOMIZE TOTALLY YOUR ENCLOSURE

Our production systems can give custom-made solutions **on demand.** Every colour from RAL chart is available to be personalized. A variety of protection standards thanks to our own painting facilities.

EU

100%
Entirely designed and manufactured in Europe

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Confidentiality, reliability & quality

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Please contact our technical sales department

A team of professionals with high experience and ability to solve all your queries



EARTHQUAKE PROTECTION FOR ELECTRICAL ENCLOSURE

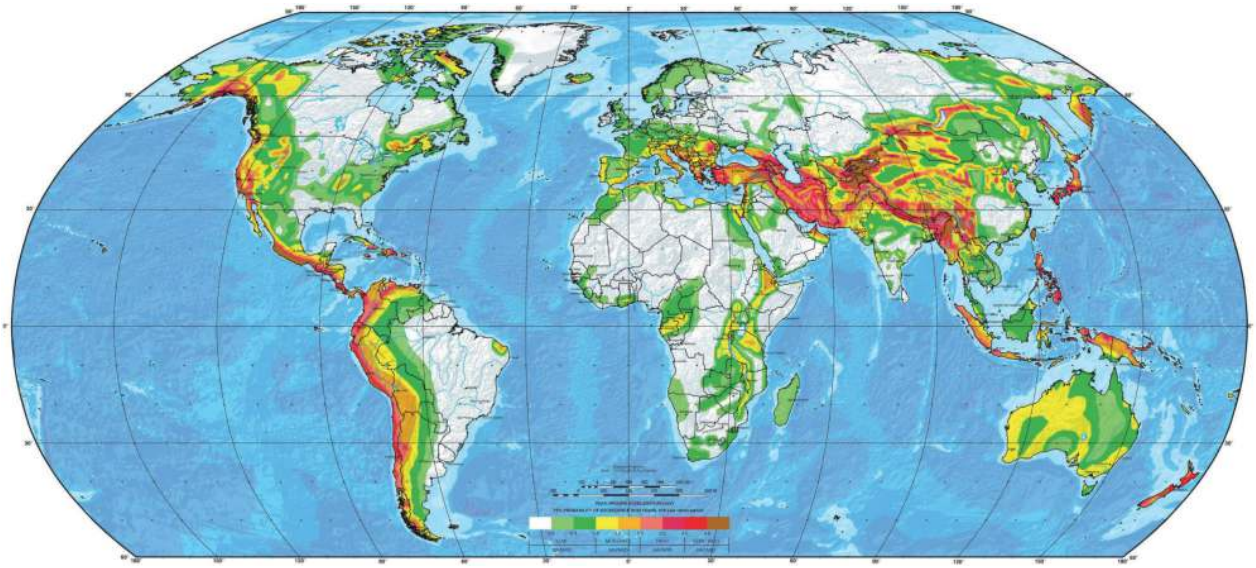
Seismic rated enclosures play an extremely important role because if they cannot withstand the earthquake, the entire system is going to fail

Natural forces have always posed a threat to humans and repeatedly cause numerous deaths and serious damage to property. Whilst extreme meteorological occurrences, such as storm surges, floods and heat waves, can be forecast relatively accurately these days, earthquakes remain relatively difficult to predict.

Enclosures play an extremely important role because if they cannot withstand the earthquake, the entire system is going to fail. This makes earthquake protection for enclosures a key factor in all the relevant standards. However, this aspect can never be considered in isolation, but rather the surrounding building and all the installed components must also comply with the relevant requirements as well. Thus a suitable enclosure alone will not suffice if the system needs to remain operational after, or even during, an earthquake. In addition, the installed components must also meet the requirements of the appropriate standard and the functioning of the entire system must be proved under test conditions.

In order to evaluate the relevance of earthquake protection for electrical installations, an overview must first be established of the damage that can potentially occur in an earthquake, including any consequential damage that might arise if an electrical system fails.

The frequency of the vibrations that occur during an earthquake generally ranges between 0.3 Hz and 50 Hz. The stresses these vibrations exert on a switchgear system can cause both malfunctions and structural damage to the entire system.



Measuring technology for earthquakes

Scales of magnitude are based on measurements taken by seismometers, which measure the local vibrations in the Earth's surface in terms of speed, acceleration and displacements. Calculations using these measurements can indicate the strength of the earthquake. The best-known scale of magnitude is the Richter scale, which was developed in the 1930s and is still used today for this purpose. The magnitude according to the Richter scale is calculated using measurements taken by a special kind of seismometer near to the earthquake's epicenter (at a distance of 100 km), which is why it is also frequently called the 'local magnitude scale'.

The probability of an earthquake is important for risk assessment

Besides categorizing earthquakes according to strength, their intensity or magnitude, another important aspect is the probability that an earthquake of a given strength will occur.

Earthquake risk zones are defined in order to facilitate a reasonable risk assessment. For instance, there are five earthquake zones in the United States. Zone 0 is where strong earthquakes can be practically ruled out, whereas earthquakes of quite a large magnitude are relatively probable in zone 4. Parts of the U.S. federal state of California are typical examples of earthquake zone 4. The requirements relating to earthquake protection for IT and telecommunications installations, and for electrical infrastructure installations, are often based on these earthquake zones.

COUNTRY	AT	DE	CH	FR	IT	GR	USA
NORM	ÖN 1998-1	DIN EN 1998-1	SIA 261	NF EN 1998-1	OPCM 28	GNA 1998-1	1997 UBC
ZONE 0	a < 0,035g	0,0g					0,0g
ZONE 1	0,035g < a < 0,05g	0,04g	0,06g	a < 0,07g	a < 0,05g	a < 0,16g	0,075g
ZONE 2	0,05g < a < 0,075g	0,06g	0,1g	0,07g < a < 0,11g	0,05g < a < 0,15g	0,16g < a < 0,24g	0,15g
ZONE 3	0,075g < a < 0,1g	0,08g	0,13g	0,11g < a < 0,16g	0,15g < a < 0,25g	0,24g < a < 0,36g	0,3g
ZONE 4	0,1g < a		0,16g	0,16g < a < 0,3g	0,25g < a < 0,3g		0,4g

Overview of current standards

Earthquake protection is important from various points of view. Furthermore, the applicable standards also differ according to the geographical location of the market. Building standards play a small role in the construction of earthquake-resistant electrical switchgear systems. However, as electrical systems are for the most part installed in buildings, these standards also play a certain role.

IEEE STD 693

The 693 [IEE05] standard issued by the Institute of Electrical and Electronics Engineers (IEEE) specifies the parameters for earthquake-resistant switchgear. It defines the test methods for complete switchgear systems and for individual components such as power circuit-breakers.

IEC 61587-2

IEC 61587-2:2011 specifies seismic tests for cabinets and racks accommodated with IEC 60917 and 60297 series. It applies, in whole or in part, only to the mechanical structures of cabinets and racks for electronic equipment according to the above cited series of standards, while it does not apply to the electronic equipment or systems deemed to be installed within these mechanical structures.

Telcordia GR-63-CORE (Bellcore)

Although the GR-63-CORE [Tel02] generic requirements originally developed by Bellcore – now Telcordia – for telecommunications are not a formal standard as such, they form a very commonly stipulated requirement in contracts, especially in the United States. The basic premise is that systems – such as data centres – need to offer a high level of structural resilience to various influences such as moisture, fire, pollutants and earthquakes. The document refers to the designated zones in the United States (zones 0 to 4), where zone 0 represents a very low risk and zone 4 a high risk of earthquakes.

DIN EN/IEC 60068-3-3

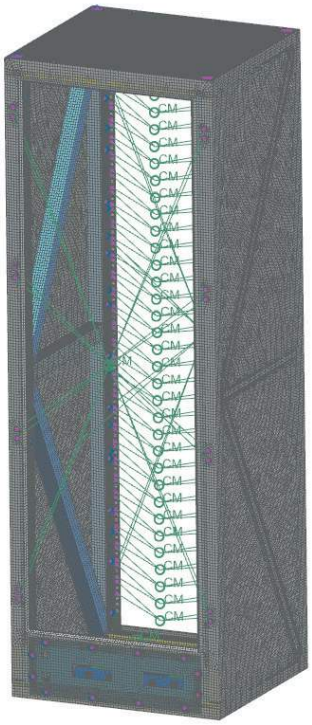
IEC 60068-3-3, identical to DIN EN 60068-3-3 [Beu93] in Germany and Europe, is primarily a guideline for checking electrical devices for seismic resistance. The standard distinguishes between a general and a specific seismic class. The specific seismic class should be used where knowledge of the seismic movement exists based on the local geographical situation or the building in which the device is to be installed.

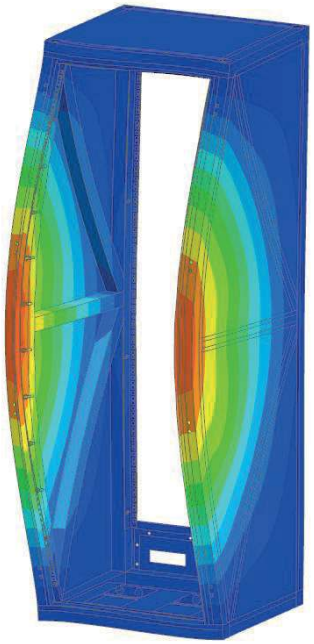
IEC60068-3-3 GROUND ACCELERATION REFERENCE	SEISMIC CHARACTERISTICS				
	DESCRIPTION	G M/S	RICHTER SCALE MAGNITUDE	ZONE UBC	INTENSITY MSK
AG2	Intensity between weak and medium	2	> 5,5	0 I	> VII
AG3	Intensity between medium and strong	3	5,5 a 7,0	2 - 3	VII a IX
AG5	Intensity between strong and very strong	5	> 7,0	4	> IX

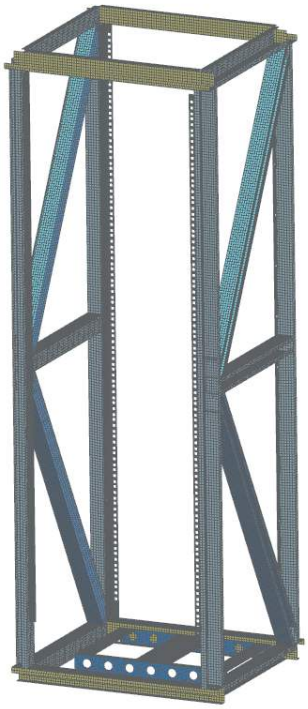
Typical test methods

Finite element method

The finite element method (FEM) is a widely used method for numerically solving differential equations arising in engineering and mathematical modeling. Typical problem areas of interest include the traditional fields of structural analysis, heat transfer, fluid flow, mass transport and electromagnetic potential.







Seismic test platform

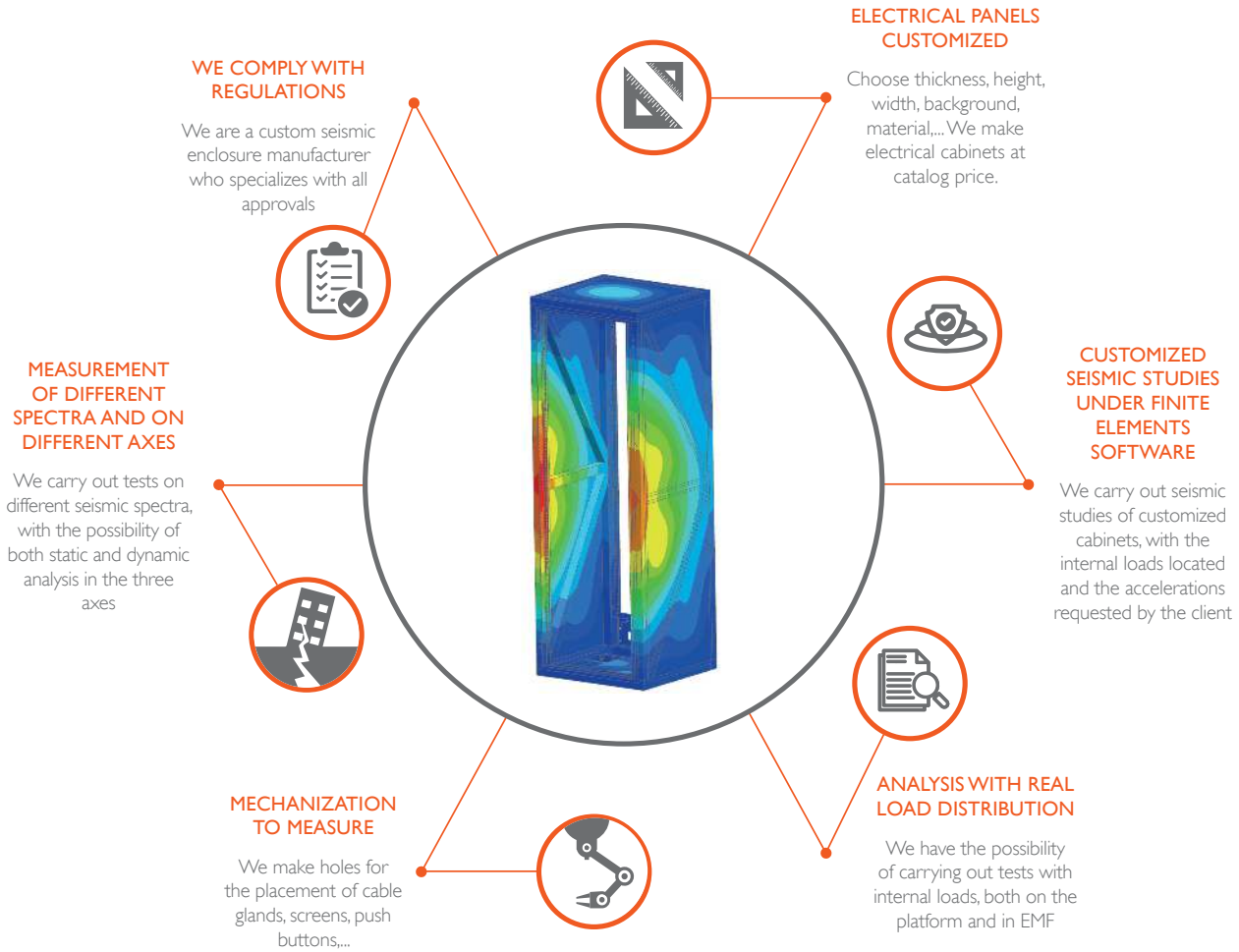
The purpose of the study offers different vibration tests in controlled situations in the laboratory to prepare the different equipment, products and materials to situations of seismic movements.

INTEGRAL SOLUTIONS FOR SEISMIC ELECTRICAL ENCLOSURES

WE WILL OFFER A QUICK RESPONSE AND A PERSONALIZED SOLUTION

Formats, materials, thickness, conditions, air conditioning, certificates, normatives, delicate environments ... we are able to give you a solution and an economic response.

We hybridize the technological and market capabilities to respond to such competitive and varied sectors as: petrochemical, food, renewable energy, pharmaceutical, maritime, offshore,...



From Delvallebox we offer tightness, robustness and security so that your project obtains the maximum guarantees at the best market price. We have passed all the tests and Normative Nema Type1 -3r -4x -12, under UL American Normative.

What for the rest of manufacturers of enveloping metal structures are extras, for us it is a service that we make available to the clients, not only our fabrications are totally customizable, but also we facilitate the task of their installation with small details that make We are highly valued by installers and customers.

We machine the inside and outside of the closet, so you save time and dedicate it to what really contributes to your business. All our cabinets are guaranteed with an anti-corrosion guarantee and the painted cabinets allow to offer superior resistance.

SEISMIC REINFORCED ELECTRICAL ENCLOSURE IP66



Examples

More Resistance Tanks to Structural Reinforcement for Maximum Durability

Seismic reinforced enclosure, single or double door, manufactured in stainless steel AISI 304L - EN 1.4306 finely polished, to IP55 or IP66.
The design with structural reinforcements and special hinges on high resistance doors, allows our reinforced electrical cabinets to resist large weights both on the structure and on the doors, whilst also housing heavy elements inside.
The seismic enclosures have been vigorously tested and have withstood tests for the strongest seismic activity, offering the customer high level protection in areas where seismic activity is a possibility.
They can be installed outdoors, with vandal proof duraluminium lever lock.
The seismic reinforced enclosure is provided with exterior plastic protection which prevents scratches when handling and positioning the automats inside the cabinet. This cover can be easily removed at the customer's premises.
Optionally rack mountable panel.

FOR MORE INFORMATION CLICK HERE

ADVANTAGES

- Broad assembly area with great accessibility.
- Great strength as a whole.
- Door opens to 120°, standard door opening to the left specify for a right side.
- Standard with toggle clasp made of stainless steel.
- Great versatility, so it can be applied to almost any field.
- Delvalle supplies any measurements required including custom built holes and cut outs both for the door and enclosure.
- Distribuited load 1000 kg.

SEISMIC REINFORCED ELECTRICAL ENCLOSURE IP66

APPLICATIONS

Specially designed for areas where they will be subject to constant vibration or high seismic stress.



10 YEARS STAINLESS ANTICORROSIVE **GUARANTEE**

5 YEARS MECHANICAL PARTS **GUARANTEE**

OPTIONS

- Rack systems.
- Up to IP69K -DIN 40050-9.
- Custom made based on your needs.
- Plinths/base
- All types of ventilation and climate control.
- Cable entry cover.
- Manufactured in painted galvanized steel.
- Manufactured in stainless steel AISI 316L.
- Mounting plate insulator (bakelite) or stainless steel.
- EMC version according to EEC 2014/30/UE of electromagnetic compatibility.

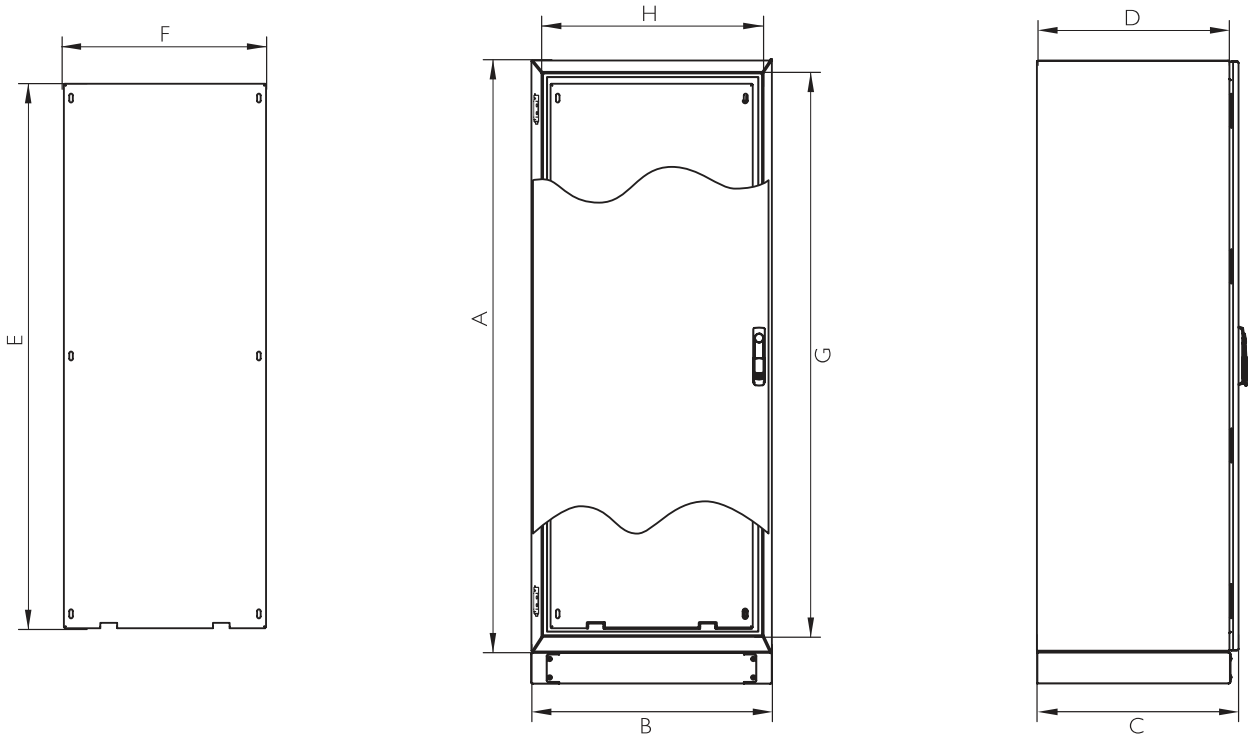
NORMATIVE

- IEEE STD 693.
- IEC 61587-2.
- Telcordia GR-63-CORE (Bellcore).
- DIN EN/IEC 60068-3-3.
- Seismic qualification specification certificates 8484-CE-005-E.
- Norm UNE EN 60068-3-3 Environment at and seismic testing methods.
- Norm IEEE-344, Institute of American electrical and electronic Engineers. RoHs compliant.
- Regulations Board of the Nuclear Security.
- IP66 (W) Norm IEC EN 62208 EN 60529.
- Maximum IK10 resistance Norm IEC 62208 and EN 50102
- Our electrical panels are built to CE standards 2014/35/UE.
- RoHs compliant.
- UL approval Nema 4x, 12, 3r, 1. Nº File E342220.
- Maximum voltage 1000 V.
- Temperature resistant: -40°C +100°C (short time +160°C).
- Option silicone gasket: from -60°C to +180°C (short time up to +350°C).

SEISMIC REINFORCED ELECTRICAL ENCLOSURE IP66

PLAN 1 DOOR

CLICK HERE TO DOWNLOAD
THE FILES CAD - PLANS - CERTIFICATES



REFERENCES 1 DOOR

These references belong to the model of stainless steel AISI 304L, if you want painted galvanized steel. replace "MVAC" of the reference principle with "MVGC". Ex: MVGC166040SI.

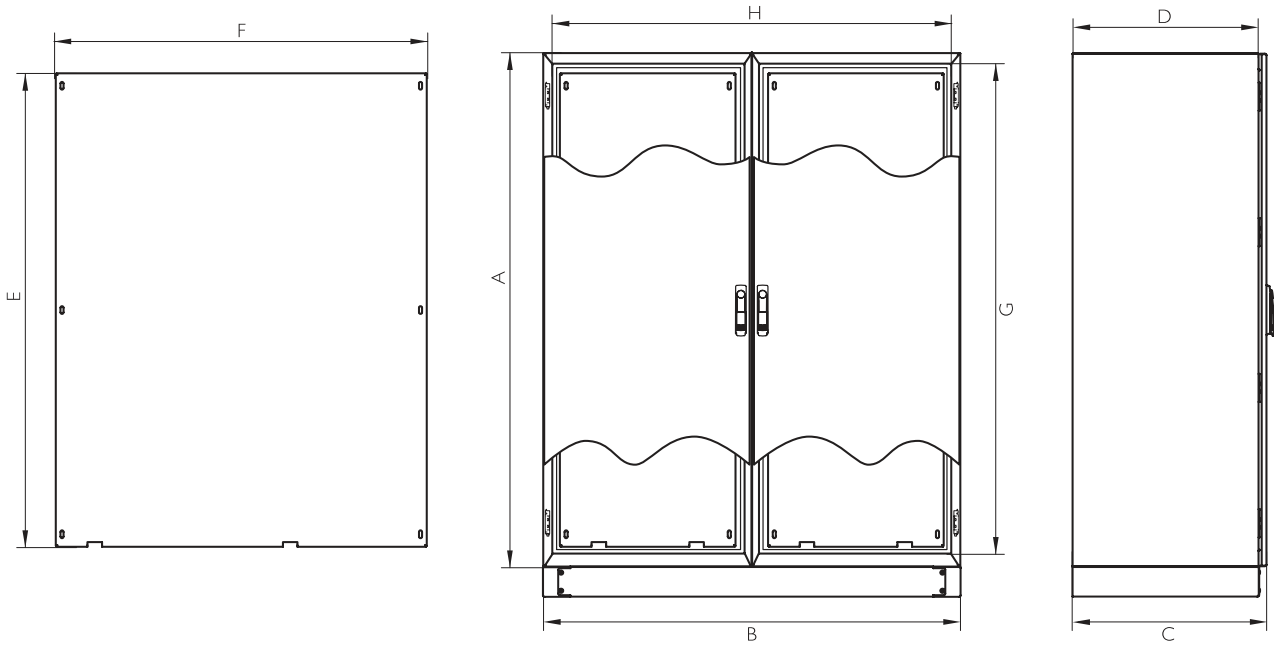
REFERENCES	DIMENSIONS (mm)							
BLIND DOOR	HEIGHT - A -	WIDTH - B -	DEPTH - C -	INSIDE HEIGHT - G -	INSIDE WIDTH - H -	INSIDE DEPTH - D -	MACHINABLE SIDE AREA (F-15 mm by each side)	PLATE MEASURE-MENT -ExF-
MVAC166040SI	1650	600	400	1540	490	375	355	1520x470
MVAC168040SI	1650	800	400	1540	690	375	355	1520x670
MVAC161040SI	1650	1000	400	1540	890	375	355	1520x870
MVAC186040SI	1800	600	400	1690	490	375	355	1670x470
MVAC188040SI	1800	800	400	1690	690	375	355	1670x670
MVAC186050SI	1800	600	500	1690	490	475	455	1670x470
MVAC188050SI	1800	800	500	1690	690	475	455	1670x670
MVAC181040SI	1800	1000	400	1690	890	375	355	1670x870
MVAC181050SI	1800	1000	500	1690	890	475	455	1670x870
MVAC206040SI	2000	600	400	1890	600	375	355	1870x470
MVAC208040SI	2000	800	400	1890	800	375	355	1870x670
MVAC208050SI	2000	800	500	1890	800	475	455	1870x670
MVAC201040SI	2000	1000	400	1890	890	375	355	1870x870
MVAC201050SI	2000	1000	500	1890	890	475	455	1870x870
Version: Normative UL. Nema 4x, 12, 3r and 1				Add "UL" to the reference. Ex "MVAC166040SIUL"				
Version: Stainless steel AISI 316L				Add "_6" to the reference. Ex "MVAC166040SI_6"				

Separation depth plate 20mm

SEISMIC REINFORCED ELECTRICAL ENCLOSURE IP66

PLAN 2 DOORS

CLICK HERE TO DOWNLOAD
THE FILES CAD - PLANS - CERTIFICATES

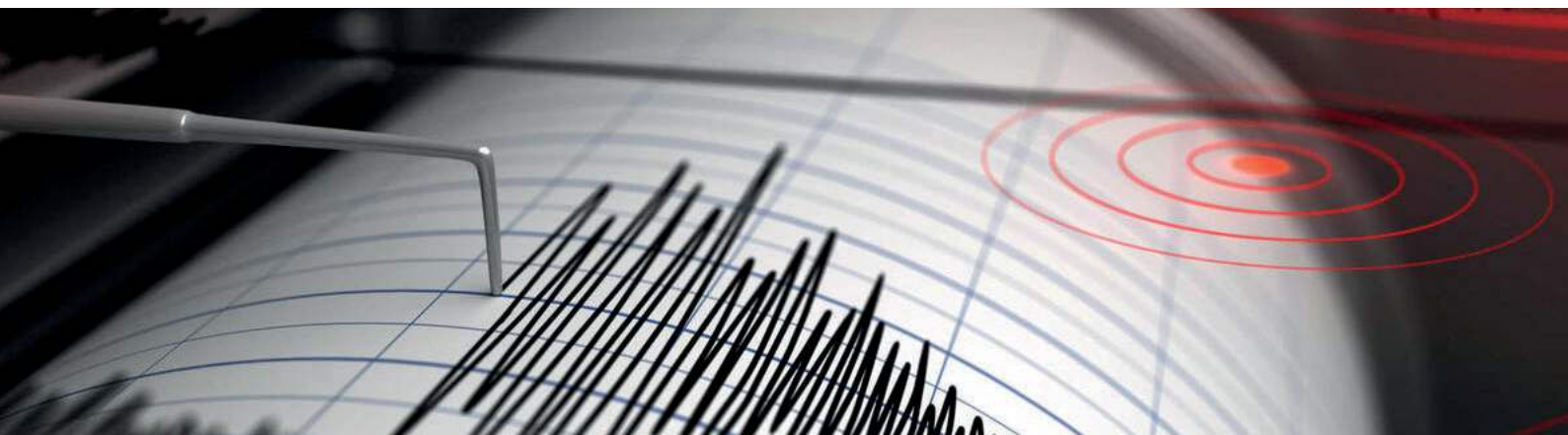


REFERENCES 2 DOORS

These references belong to the model of stainless steel AISI 304L, if you want painted galvanized steel. replace "MVAC" of the reference principle with "MVGC". Ex: MVGC161240DSI

REFERENCES	DIMENSIONS (mm)							
BLIND DOOR	HEIGHT - A -	WIDTH - B -	DEPTH - C -	INSIDE HEIGHT - G -	INSIDE WIDTH - H -	INSIDE DEPTH - D -	MACHINABLE SIDE AREA (F-15 mm by each side)	PLATE MEASURE-MENT -ExF-
MVAC161240DSI	1650	1200	400	1540	1090	375	355	1520x1070
MVAC181240DSI	1800	1200	400	1690	1090	375	355	1670x1070
MVAC181250DSI	1800	1200	500	1690	1090	475	455	1670x1070
MVAC201240DSI	2000	1200	400	1890	1090	375	355	1870x1070
MVAC201250DSI	2000	1200	500	1890	1090	475	455	1870x1070
MVAC201440DSI	2000	1400	400	1890	1290	375	355	1870x1270
MVAC201450DSI	2000	1400	500	1890	1290	475	455	1870x1270
MVAC201640DSI	2000	1600	400	1890	1490	375	355	1870x1470
MVAC201650DSI	2000	1600	500	1890	1490	475	455	1870x1470
Version: Normative UL. Nema 4x, 12, 3r and 1				Add "UL" to the reference. Ex "MVAC161240DSIUL"				
Version: Stainless steel AISI 316L				Add "_6" to the reference. Ex "MVAC161240DSI_6"				

Separation depth plate 20mm



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CUSTOMIZED ENCLOSURE SOLUTIONS DELVALLE

Delvalle has more than 50 years of experience using the latest technology to implement and obtain the most innovative products on offer to all our customers. Delvalle is an ideal partner, combining an advanced and wide range of products at very competitive prices.

The customized manufacture of all electrical enclosures and cabinets Delvallebox is carry out with the most advanced technical methods and with the precision and consciousness of a craftsman. This makes the difference from competitors and is the best way to gain our customers´ trust.
In Delvallebox we bear in mind that customers perceive the quality very clearly. In every product (for instance, in the cabinets here presented) safety and useful solutions are what customers value most.



STAINLESS STEEL INDUSTRIAL ENCLOSURES



OUTDOOR ELECTRICAL ENCLOSURES



GLOBAL ELECTRICAL SOLUTIONS FOR URBAN AREAS



GALVANIZED STEEL ELECTRICAL ENCLOSURES



SLOPED ROOF
ENCLOSURES - HYGIENIC

ATEX INDUSTRIAL ENCLOSURES



INDUSTRIAL ENCLOSURES IP66, IP67, IP68 AND IP69K

Buy direct from manufacturer of custom made IP66, IP67, IP68 and IP69K heavy duty industrial and waterproof electrical enclosures AISI 304L and 316L made by standard IEC 60529. Delvalle has tested all sizes and dimensions of waterproof enclosures according to EN 60529:2018. All weather resistant enclosures are more than simply rainproof, they meet a minimum of Nema 4X and IP66, IP67, IP68 and IP69k requirements to ensure your electronics are protected. From Juntion boxes to industrial enclosures, Delvalle weatherproof enclosures offer a wide range of sizes and styles to keep your project waterproof.





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ELECTRICAL ENCLOSURES

CLIMATE CONTROL
COOLING FOR ENCLOSURES



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