Enclosures for explosive atmospheres
Introduction

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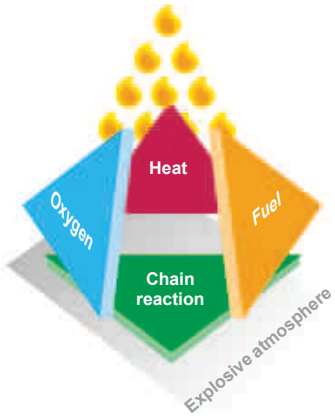

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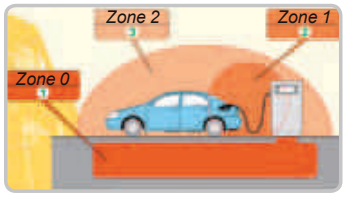

P8500061-26

Potentially explosive atmospheres: important information

> What is ATEX?

■ It is a term commonly used to describe potentially EXplosive ATmospheres and standards for protection systems and equipment.
■ Two European directives, ATEX 99/92/CE and ATEX 94/9/CE, and international standards IEC 60079 and IEC 61241, harmonized with EN European standards, apply to this field.

> How is a potentially explosive atmosphere defined according to ATEX?

■ An potentially explosive atmosphere is defined as a mix of flammable substances in the form of gas, vapour, dust (cloud or deposit) which, in air and under normal atmospheric conditions, can completely or partially catch fire in the form of an explosion when exposed to a source of ignition.

> Classification of an explosive atmosphere

■ They are classified into groups and zones according to directive 99/92/CE and IEC standards as follows:

Destination	Categories/presence of potentially explosive atmosphere	Hazardous zones	Atmosphere
Group I Mines	**M1 and M2**	**Gas and dust (G & D)**	
Group II surface Industries	1 Permanent or frequent	**Zone 0:** gas and vapour	G
		Zone 20: mist and dust	D
	2 Occasional	**Zone 1:** gas and vapour	G
		Zone 21: mist and dust	D
	3 Rare	**Zone 2:** gas and vapour	G
		Zone 22: mist and dust	D

Equipment for potentially explosive atmospheres

■ Since 1st July 2003, European directive ATEX 94/9/CE has made it compulsory to use certified electric or non-electric equipment when it must be installed in zones with explosive atmospheres (gas or dust).
■ Certification must be provided by a body which is notified according to the same directive.
■ The body notifies its assessment of the quality of the production and certifies that the product complies with the health and safety demands defined in the directive and the international standards.
■ The certificate shows the category of the product by marking, and thus the zone and atmosphere in which it can be used.
■ The standards define the following types of protection for electric equipment:

Electrical equipment				
CENELEC	**IEC**	**Gas: symbol of the types wof protection**	**CENELEC/IEC**	**Powder: symbol of the types of protection**
EN 60079-0	IEC 60079-0	General rules	IEC/EN 61241-0	General rules
EN 50015	IEC 60079-6	**o**-oil immersion	IEC/EN 61241-1	**tD**-protection by enclosures
EN 50016	IEC 60079-2	**p**-pressurised enclosures	IEC/EN 61241-4	**pD**-protection by pressurisation
EN 50017	IEC 60079-5	**q**-powder filling	IEC/EN 61241-11	**iD**-protection by intrinsic safety
EN 60079-1	IEC 60079-1	**d**-flameproof enclosures	IEC/EN 61241-18	**mD**-protection by encapsulation
EN 60079-7	IEC 60079-7	**e**-increased safety		
EN 50020	IEC 60079-11	**i**-intrinsic safety		
EN 60079-15	IEC 60079-15	**n**-type of protection "n"		

■ Enclosures are certified as components. They will be assembled with other ATEX electrical, pneumatic and hydraulic components, among others to form a final solution which, in turn, must be ATEX-certified and subject to a declaration of conformity.

Definition

Product directive 94/9/CE:
defines the manufacturers' obligations.

Personal protection directive 99/92/CE:
defines the users' obligations.

Degree of protection:
In hazardous areas, equipment is required to offer a minimum degree of protection of IP54, but it can be tested or certified with a higher degree of protection.

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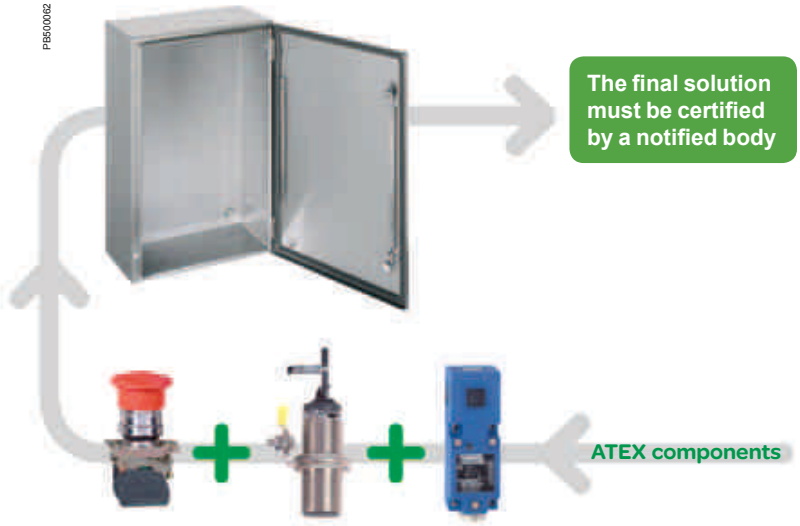


Fields of application of Schneider Electric ATEX enclosures

> 3 **Material solutions** for wall-mounting enclosures

Steel **Stainless-steel** **Polyester**

Three types of enclosures

■ All the wall-mounting enclosures presented in this brochure comply with standards for protection against the increased risk of explosion in atmospheres charged with gas (G) and/or dust (D).

■ The Schneider Electric offer, designed to be used in group II, is classified as category 2.

Destination	Categories/presence of potentially explosive atmosphere	Hazardous zones	Atmosphere
Group I Mines	M1 and M2	Gas and dust (G & D)	
Group II surface Industries	1 Permanent or frequent	**Zone 0:** gas and vapour	G
		Zone 20: mist and dust	D
	2 Occasional	**Zone 1:** gas and vapour	G
		Zone 21: mist and dust	D
	3 Rare	**Zone 2:** gas and vapour	G
		Zone 22: mist and dust	D

Zone of application of Schneider Electric ATEX wall-mounting enclosures.

■ Category 2 products can be used as category 3.

■ Our products are qualified for increased safety "e" (Ex e) but not for explosionproof safety "d" (Ex d).

■ The marking of the wall-mounting enclosures is shown page 542.

■ The wall-mounting enclosures offer a degree of protection IP66 according to EN 60529, exceeding the recommendations of the ATEX directive.

■ Certification of our production sites and inspection procedures guarantees observance and consistency of the quality level.

Enclosures for explosive atmospheres
Introduction

PB501817-54

> Industrial environments, equipment rooms

Spacial S3DEX steel enclosure

- The **Spacial S3DEX steel enclosure** is certified by the LCIE with no. LCIE 02ATEX0037U (component certification).
- Ten sizes: from 300 x 200 x 150 mm to 1000 x 800 x 300 mm.
- Degree of protection: IP66.
- Ambient temperature limits: -20°C ≤ Ta ≤ +40°C.
- Resistance to external mechanical impacts: IK10.
- Structured finish, epoxy-polyester powder paint, RAL 7035 grey colour.

PB501818-56

> Laboratories, agri-business industry, specific hygiene and corrosion demands

Spacial S3XEX stainless-steel enclosure

- The **Spacial S3XEX stainless-steel enclosure** is certified by the LOM with no. LOM 09ATEX3068U (component certification).
- Seven sizes: from 300 x 200 x 150 mm to 1000 x 800 x 300 mm.
- Degree of protection: IP66.
- Ambient temperature limits: -20°C ≤ Ta ≤ +60°C.
- Resistance to external mechanical impacts: IK10.
- Scotch-Brite® brushed finish.

PB501819-58

> Seaside, petrochemical, severely corrosive environments

Thalassa PLMEX polyester enclosure

- The **Thalassa PLMEX polyester enclosure** is certified by the LOM with no. LOM 10ATEX3051U (component certification).
- Seven sizes: from 307 x 255 x 164 mm to 1056 x 852 x 350 mm.
- Degree of protection: IP66.
- Ambient temperature limits: -20°C ≤ Ta ≤ +60°C.
- Resistance to external mechanical impacts: IK10.
- Black colour.

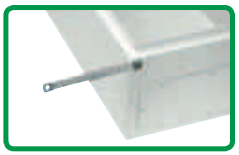
[!] In accordance with the ATEX directive

- The enclosures bear the marking shown page 542.
- The enclosures offer a degree of protection of IP66 according to EN 60629, reaching the highest dust protection according to ATEX standards.
- The certification of our production sites and inspection procedures guarantees the observance and regularity of the quality level.

Protective of all applications in ATEX II2 or II3 areas –surface installations with occasional or rare risks– thanks to ATEX-certified steel, stainless-steel and polyester enclosures.

Enclosures for explosive atmospheres
Introduction

PB500411-32



Personnel safety
Blind nut for external earth connection.

PB500407-32

Earthing studs welded to the door and inside the body.

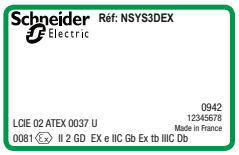
PB502986-32

Robust
The chassis is mounted on four 10-mm shouldered backstuds.

PB500413-32

The 4 fixing holes are blocked by 4 crimped blind nuts.

DB300871

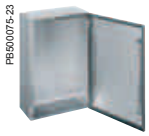


Label
Example of specific ATEX marking (description: page 542).

DB300073-27

Enclosures for explosive atmospheres

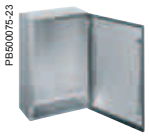
Characteristics, accessories



Characteristics	Spacial S3DEX	Spacial S3XEX
	The enclosures have the following marks: Ⓔx II 2 GD Ex e IIC Gb Ex tb IIIC Db IP6X according to ATEX directive 94/9/EC and standards EN 60079-0, EN 60079-7, EN 60079-31. Compared with the universal Spacial wall-mounting enclosure, the Spacial S3DEX enclosure has: ■ The four fixing holes blocked by four crimped blind nuts. ■ One crimped M8 blind nut for an external earth connection (braid not supplied). **Enclosure body** ■ 4 M8 x 25 shouldered backstuds for mounting the mounting plate and the step slides leaving a space of 10 mm behind them. ■ Welded earthing stud for equipotential connection between the door and the body. **Door** ■ Standard enclosure supplied with a double-bar lock. ■ Equipotential connection between the door and the body by means of the M6 x 16 earthing screws. ■ Removable and reversible door, opening to 120°. ■ Simple reversal of linkage. ■ Maximum load: 50 kg/m². ■ Perforated rails on the door: 2 vertical rails from H = 400 mm, 2 vertical rails and 2 horizontal rails from W = 800 mm. ■ Ambient temperature limits: -20°C ≤ Ta ≤ +40°C.	The enclosures have the following marks: Ⓔx II 2 GD Ex e II tD A21 IP6X according to ATEX directive 94/9/EC and standards EN 60079-0, EN 60079-7, EN 61241-0 and EN 61241-1. ■ Single-piece body (cross-shaped structure). Gutter-shaped front profile. ■ 2 perforated vertical profiles on the door (from a height of 600 mm), with drill holes with a diameter of 4.25 mm and a pitch of 25 mm for installing accessories. ■ Door reinforcement frame (from a height of 1000 mm), cross-section of 20 mm x 15 mm, with drill holes with a diameter of 5 mm and a pitch of 25 mm. ■ Standard closure with 3-mm double-bar lock (chrome-plated zamak). ■ 2 closure points for heights of more than 500 mm. ■ Stainless-steel hinges screwed onto the body of the enclosure, making it easier to remove and invert the door. Opening angle: 120°. ■ M6 x 16 screws on the door and on the body, allowing equipotential connection. ■ The wall-fixing lugs are compulsory; they are blocked by sealing plugs. The 4 fixing holes are blocked by 4 crimped blind nuts. □ 304 stainless-steel: reference **NSYPFCX**. □ 316L stainless-steel: reference **NSYPFC2X**. ■ One crimped M6 blind nut for an external earth connection (braid not supplied). ■ Authorised ambient temperature limits: -20°C ≤ Ta ≤ +60°C.
Material	Steel	Stainless-steel material AISI 304L (316L on request)
Finish	Structured finish, epoxy-polyester powder paint	Scotch-Brite® brushed finish
Colour	RAL 7035 grey	-
Ingress protection rating	IP66 (enclosures with single door)	IP66
Mechanical protection rating	IK10	IK10

[!] The accessories of the Spacial standard wall-mounting enclosures can be installed in the Spacial S3DEX wall-mounting enclosures. However, plastic accessories should not be used, due to the risk of a static charge.

[!] The accessories of the Spacial S3X enclosure can be installed in the Spacial S3XEX enclosure. However, plastic accessories should not be used, due to the risk of a static charge.

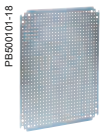


Characteristics			Spacial S3DEX	Spacial S3XEX	Thalassa PLMEX	Accessories	
Dimensions (mm)						Mounting plates	
						Plain	Silkscreened
Height	Width	Depth	References				
300	200	150	**NSYS3DEX3215**	**NSYS3XEX3215**	-	**NSYMM32**	-
	300	200	**NSYS3DEX3320**	-	-	**NSYMM33**	-
308	255	160	-	-	**NSYPLMEX3025**	**NSYMM3025**	-
400	300	200	**NSYS3DEX4320**	**NSYS3XEX4320**	-	**NSYMM43**	**NSYMS43**
	400	200	**NSYS3DEX4420**	-	-	**NSYMM44**	**NSYMS44**
430	330	200	-	-	**NSYPLMEX43**	**NSYMM43**	**NSYMS43**
500	400	200	**NSYS3DEX5420**	**NSYS3XEX5420**	-	**NSYMM54**	**NSYMS54**
530	430	200	-	-	**NSYPLMEX54**	**NSYMM54**	**NSYMS54**
600	400	200	-	**NSYS3XEX6420**	-	**NSYMM64**	**NSYMS64**
		250	**NSYS3DEX6425**	-	-	**NSYMM64**	**NSYMS46**
	600	250	**NSYS3DEX6625**	-	-	**NSYMM66**	**NSYMS66**
647	436	250	-	-	**NSYPLMEX64**	**NSYMM64**	**NSYMS64**
700	500	250	**NSYS3DEX7525**	**NSYS3XEX7525**	-	**NSYMM75**	**NSYMS75**
747	536	300	-	-	**NSYPLMEX75**	**NSYMM75**	**NSYMS75**
800	600	250	-	**NSYS3XEX8625**	-	**NSYMM86**	**NSYMS86**
		300	**NSYS3DEX8630**	-	-	**NSYMM86**	**NSYMS86**
847	636	300	-	-	**NSYPLMEX86**	**NSYMM86**	**NSYMS86**
1000	800	300	**NSYS3DEX10830**	**NSYS3XEX10830**	-	**NSYMM108**	-
1056	852	350	-	-	**NSYPLMEX108**	**NSYMM108**	-

Enclosures for explosive atmospheres
Characteristics, accessories

Characteristics	Thalassa PLMEX		
	The enclosures have the following marks: Ⓔx II 2 GD Ex e II Ex tD A21 IP66 according to ATEX directive 94/9/EC and standards EN 60079-0, EN 60079-7, EN 61241-0 and EN 61241-1. **Specific ATEX characteristics** ■ The surface resistance is < 109 Ω. ■ Ambient temperature limits: -20°C ≤ Ta ≤ +60°C. ■ The enclosures must be fixed by 4 stainless-steel lugs, which are mounted in inserts to be placed on the rear of the enclosure, in horizontal or vertical position. Ref.: **NSYPFXPLM**.		
Colour	RAL 9004 black		
Ingress protection rating	IP66		
Mechanical protection rating	IK10		
References	**NSYPLMEX3025**	**NSYPLMEX43/54/64/75/86**	**NSYPLMEX108**
Built-in canopy	No	Yes	Yes
Opening	120°	180°	180°
Pins	Stainless-steel	Polyamide	Stainless-steel
Locking system	2 double-bar lock	2 double-bar lock	1 lock with doublebar insert and 4-point closure
Lock outside sealed zone	No	Yes	Yes
Notch system for DIN rails every 25 mm	No	Yes	Yes
Mounting plate assembly	Installed studs	Inserts and studs	Inserts and studs

Accessories for Thalassa PLM enclosures can be installed in Thalassa PLMEX enclosures.
However, plastic accessories should not be used, due to the risk of a static charge.



NSYAEFPFSC / NSYAEFPFXSC

NSYPFXPLM

Microperforated	Telequick	Mixed symmetrical chassis	Wall-fixing lugs Steel	Wall-fixing lugs Stainless-steel	Step slides	Padlocking
-	**NSYMR32**	-	**NSYAEFPFSC**	**NSYAEFPFXSC**	-	-
NSYMF33	**NSYMR33**	**NSYMD33**	**NSYAEFPFSC**	**NSYAEFPFXSC**	**NSYSDCR200**	-
-	**NSYMR3025**	-	-	**NSYPFXPLM**	-	-
NSYMF43	**NSYMR43**	**NSYMD43**	**NSYAEFPFSC**	**NSYAEFPFXSC**	**NSYSDCR200**	-
NSYMF44	-	-	**NSYAEFPFSC**	**NSYAEFPFXSC**	**NSYSDCR200**	-
NSYMF43	**NSYMR43**	-	-	**NSYPFXPLM**	**NSYDPLM200**	**NSYKPLM**
NSYMF54	**NSYMR54**	**NSYMD54**	**NSYAEFPFSC**	**NSYAEFPFXSC**	**NSYSDCR200**	-
NSYMF54	**NSYMR54**	-	-	**NSYPFXPLM**	**NSYDPLM200**	**NSYKPLM**
NSYMF64	**NSYMR64**	**NSYMD64**	-	**NSYPFXPLM**	**NSYSDCR200**	-
NSYMF64	**NSYMR64**	**NSYMD64**	**NSYAEFPFSC**	**NSYAEFPFXSC**	**NSYSDCR250**	-
NSYMF66	**NSYMR66**	**NSYMD66**	**NSYAEFPFSC**	**NSYAEFPFXSC**	**NSYSDCR250**	-
NSYMF64	**NSYMR64**	-	-	**NSYPFXPLM**	**NSYDPLM250**	**NSYKPLM**
NSYMF75	**NSYMR75**	**NSYMD75**	**NSYAEFPFSC**	**NSYAEFPFXSC**	**NSYSDCR250**	-
NSYMF75	**NSYMR75**	-	-	**NSYPFXPLM**	**NSYDPLM300**	**NSYKPLM**
NSYMF86	**NSYMR86**	**NSYMD86**	-	**NSYPFXPLM**	**NSYSDCR250**	-
NSYMF86	**NSYMR86**	**NSYMD86**	**NSYAEFPFSC**	**NSYAEFPFXSC**	**NSYSDCR300**	-
NSYMF86	**NSYMR86**	-	-	**NSYPFXPLM**	**NSYDPLM300**	**NSYKPLM**
NSYMF108	**NSYMR108**	**NSYMD108**	**NSYAEFPFSC**	**NSYAEFPFXSC**	**NSYSDCR300**	-
NSYMF108	**NSYMR108**	-	-	**NSYPFXPLM**	**NSYDPLM350**	**NSYBCPL**

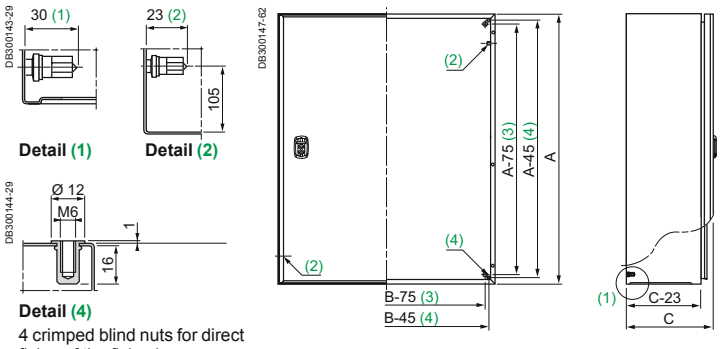
Enclosures for explosive atmospheres
Dimensions

Spacial S3DEX

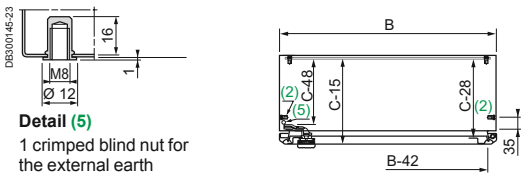
1-door enclosure

A: Height
B: Width
C: Depth

(1) 4 M8 x 25 mm backstuds.
(2) 2 M6 x 17.5 mm earthing studs.
(3) Stud centre-to-centre distance.
(4) Crimped blind nut centre-to-centre distance.
(5) Blind nut for external earth.

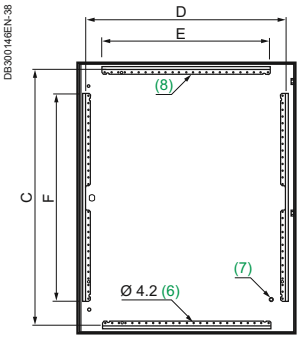


4 crimped blind nuts for direct fixing of the fixing lugs



1 crimped blind nut for the external earth

Perforated rails on the door

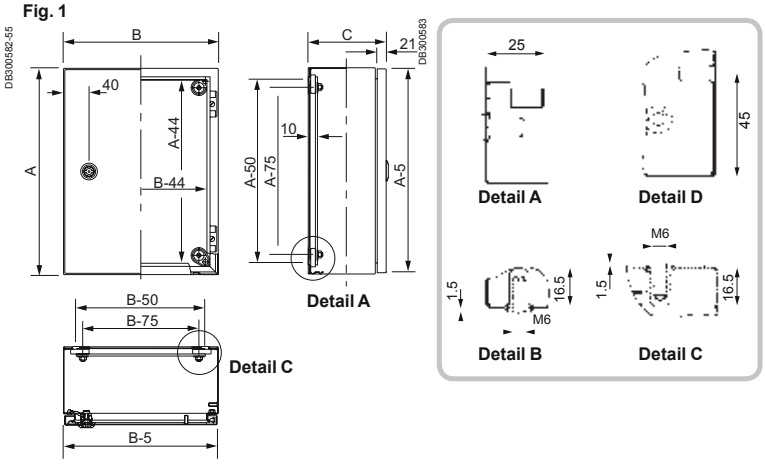


(6) Perforations with a pitch of 25 mm.
(7) 1 M6 x 17.5 mm earthing stud.
(8) The doors of enclosures with dimensions of less than 800 x 600 mm do not have horizontal wire guides.

Enclosure (8)		Perforated rails on the door (mm)			
Height (A) (mm)	Width (B) (mm)	Vertical		Horizontal	
		F	D	E	C
400	300	320	237	-	-
	400	320	337	-	-
600	400	370	337	-	-
	600	370	537	-	-
700	500	470	437	-	-
800	600	570	537	-	-
1000	800	770	737	620	949

Spacial S3XEX

Fig. 1



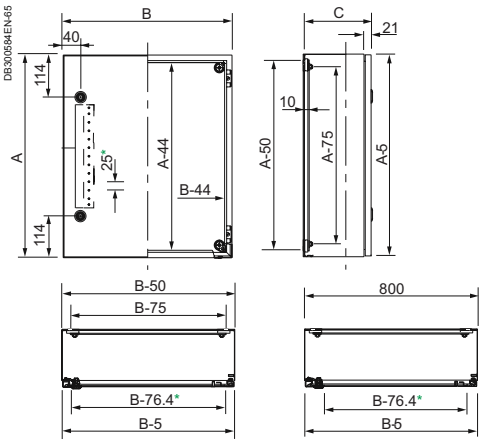
Enclosures for explosive atmospheres
Dimensions

Spacial S3XEX

External dimensions (mm)			
Height (A)	**Width (B)**	**Depth (C)**	**Fig.**
300	200	150	1
400	300	200	1
500	400	200	2**
600	400	200	2
700	500	250	2
800	600	250	2
1000	800	300	3

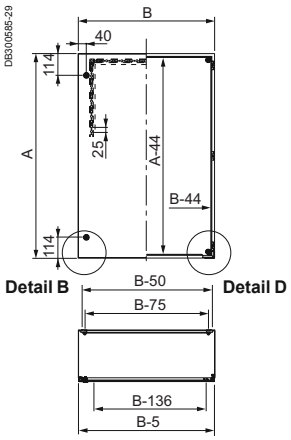
*** Without door reinforcement.*

Fig. 2



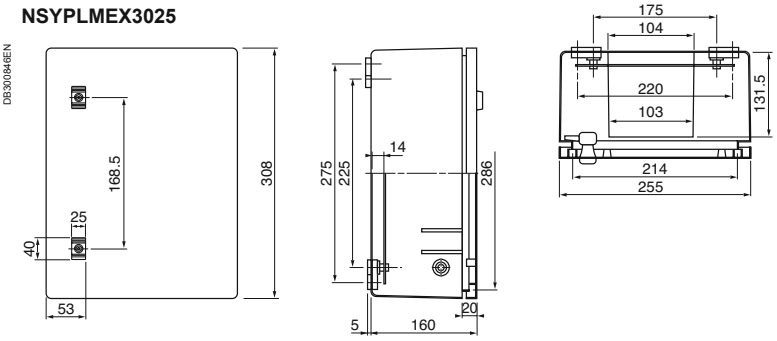
* *Door reinforcement.*

Fig. 3

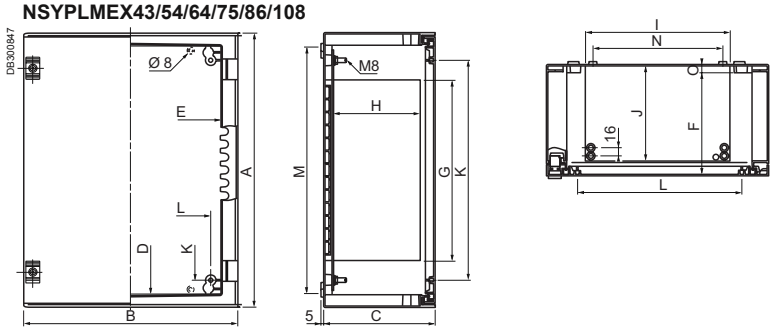


Thalassa PLMEX

NSYPLMEX3025



NSYPLMEX43/54/64/75/86/108



Dimensions (mm)										Bottom screw and door bosses		Fixing	
A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**O**	**References**
430	330	200	380	260	181	247	150	179	168	325	225	13	**NSYPLMEX43**
530	430	200	480	360	181	347	150	279	168	425	325	13	**NSYPLMEX54**
647	436	250	580	360	228	388	192	279	212	525	325	13	**NSYPLMEX64**
747	536	300	680	460	278	487	241	379	261	625	425	15	**NSYPLMEX75**
847	636	300	780	560	278	587	241	479	261	725	525	15	**NSYPLMEX86**
1056	852	350	980	760	327	775	280	680	300	925	725	15	**NSYPLMEX108**

Enclosure certifications

Product certifications are awarded for enclosures as components.

Aim of the certification Range	International standard for electric power enclosures	Standards for industrial equipment and UL classification	Marine environment classification or approval for protection and resistance to vibrations	ATEX	Outdoor Heavy Duty	Low-voltage switchgear and controlgear assemblies
	Standard/Directive IEC 62208	UL508A and CAN CSA C22-2 no. 14	Rules of certifying bodies	European directive no. 94/9/EC EN 60079-0 and -7 EN 61241-0 and -1	IEC 61439-5 ISO 12.944 IEC 61969-3	IEC 61439-1&2
Spacial						
SF	● ●	●	● ●			
SFHD	● ●				●	
SFP						●
SM	● ●	●	●			
S3D	● ●	●	● ● ●	● (1)		
S3HD	●				●	
SBM	●	●	● ● ●			
SFX						
SMX	●	●				
S3X	●	●	●	● (1)		
Thalassa						
PLA	● ●	●	●			
PLAT	● ●					
PLAZ	● ●					
PLATZ	● ●					
PLD	●					
PHD	●				●	
PLM	● ●	●	●	● (1)		
PLS	●	● (3)				
TBS/TBP	●	● (2)				
ClimaSys						
CV		●				
CU		●				
CE		●				
CR		●				
CC		●				

(1) ATEX certifications relate to an adapted part of the range. These ranges are distinguished by their EX endings.
(2) Only TBP.
(3) Transparent cover in process.

Official certification body										
Bureau Veritas	LCIE (Bureau Veritas)	Bureau Veritas Marine Division	TUV Rheiland Group	Underwriters Laboratories	Laboratorio Oficial J.M. Madariaga	Det Norske Veritas	Germanischer Lloyd	Lloyd´s Register	Dekra	Asefa
PB500048	PB500049	PB500048	PB500050	PB500051	PB500052	PB500053	PB500054	PB600055		DB300966
●	●	●	●	●	●	●	●	●	●	●

International enclosure standard
Standards IEC 62208*

PB500056-57

Empty enclosures for low-voltage switchgear and controlgear assemblies. General rules.

Application
For empty enclosures before adding the user's switchgear, in the condition as supplied by the manufacturer.

Field of application
Demands for testing the enclosures to be used as part of the switchgear assemblies for voltages of less than 1000 V alternating current and 1500 V direct current.

Information supplied by the manufacturer
■ Commercial trademark of the manufacturer: Schneider Electric.
■ Mechanical characteristics, materials, conditions for use.
■ Conditions for use:
Ambient air temperature for outdoor installations: -25 to +40°C.
■ Atmospheric conditions for outdoor installations: the humidity can temporarily reach 100% at a temperature of 25°C.
■ Transport and storage conditions: from -25 to +55°C; for limited periods not exceeding 24 h: up to +70°C.

** European standard EN 62208 is identical to IEC 62208. European countries publish this standard according to the body in each country (for example BS EN 62208 in the UK).*

PB500057-57

Standard tests of standard IEC 62208

■ Static loads: test 1.25 x maximum admissible load during 1 hour.
■ Lifting: applicable to enclosures with lifting accessories.
■ Axial loads of metal inserts: 500 N for 10 seconds for M8 inserts.
■ IK code: test according to standard IEC 62262 with pendulum impact tester. After testing, the enclosure keeps its IP rating.
■ IP rating: test according to standard IEC 60529. Degree of protection against access to dangerous parts and the penetration of solid bodies and against the penetration of water.
■ Thermal stability at a temperature of 70 °C: 7 days.
■ Resistance to heat: ball test at 70 °C (1).
■ Resistance to abnormal heat and to fire: glow wire test according to IEC 60695-2-10 and IEC 60695-2-11 (1).
■ Dielectric strength: 5000 V (1).
■ Protection circuit continuity (2): resistance not to exceed 0.1 ohm.
■ Weather resistance: duration 500 h (cycle: rain 5 minutes + UV lamp 25 minutes).
■ Corrosion resistance:
□ For indoor enclosures:
- 6 cycles of 24 hours of the damp heat test at 40 °C and relative humidity of 95%.
- 2 cycles of 24 hours of the salt mist test at 35 °C.
□ For outdoor enclosures:
- 12 cycles of 24 hours of the damp heat test at 40 °C and relative humidity of 95%.
- 14 cycles of 24 hours of the salt mist test at 35 °C.

Our empty enclosures are marked CE according to the Low-Voltage Directive (LVD). It is the responsibility of the final equipment manufacturer to respect regulations in force.

(1) Information required for enclosures made from insulating material.
(2) For metal enclosures.

Selection of enclosures

Selection according to the IP protection degrees

The degrees of protection, explained on the next page, is an important element when selecting the enclosures.
The following table shows the protection degrees of the enclosures.

Name	Range	IP40	IP41	IP42	IP43	IP44	IP54	IP55	IP65	IP66
Metal industrial boxes	Spacial SBM							● (4)		● (4)
Metal derivation boxes	Spacial SDB							●		
Steel universal wall-mounting enclosures	Spacial S3D							● (1)		●
Steel modular distribution wall-mounting enclosures	Spacial S3DM									●
Terminal wall-mounting enclosures	Spacial S3DB									●
EMC steel wall-mounting enclosures	Spacial S3HF							●		
HMI steel wall-mounting enclosures	Spacial S3CM						●			
ATEX steel wall-mounting enclosures	Spacial S3DEX									●
Stainless-steel wall-mounting enclosures	Spacial S3X									●
ATEX stainless-steel wall-mounting enclosures	Spacial S3XEX									●
Steel floor-standing enclosures	Spacial SM							●		
Steel suitable enclosures	Spacial SF							●		
Stainless-steel floor-standing enclosures	Spacial SMX							●		
Stainless-steel suitable enclosures	Spacial SFX							●		
Steel control desks	Spacial SD							●		
Stainless-steel control desks	Spacial SDX							●		
Thermoplastic industrial boxes	Thalassa TBS-TBP									●
Polyester modular boxes	Thalassa PLS								●	
Polyester wall-mounting enclosures	Thalassa PLM									●
ATEX polyester wall-mounting enclosures	Thalassa PLMEX									●
Polyester floor-standing enclosures	Thalassa PLA (2)					●	●		●	
	Thalassa PLD				●		● (3)			

(1) Double door.
(2) Different IP depending on the version. See introduction in Thalassa PLA section.
(3) With gasket.
(4) Different IP depending on the version: Spacial SBM flat box: IP66 - Spacial SBMC FL21 entry box and Spacial SBMB Bus box: IP55.

Selection according to the environment

The location of the enclosures and the physical, chemical and climatic conditions to which they are exposed will determine the model to be used.

- Steel enclosures are particularly well suited to indoor use in industrial environments.
- Stainless-steel enclosures are particularly well suited to corrosive environments or areas where specific hygiene demands are applicable.
- Polyester enclosures are particularly well suited to severe corrosive atmospheres, indoors or outdoors.

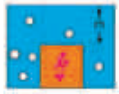
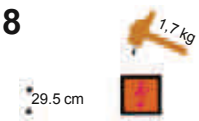
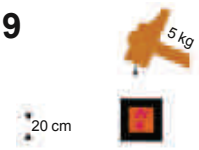
Enclosures made from insulating materials guarantee total insulation, reducing electric hazards for persons.
The main characteristics of the plastic materials of our enclosures and their chemical strength are given on page 540.

Further help for making the selection is given by the NEMA or UL classification of the enclosure, see page 537.

Degrees of protection provided by enclosures

■ The degrees of protection provided by the enclosures are defined by standards IEC 60529 (IP) and IEC 62262 (IK).
■ Degrees of protection are indicated by the letters IP followed by two characteristic numerals. The numerals show the degree of protection offered by the enclosure against access to dangerous parts, the penetration of of solid bodies (1st numeral), and against the penetration of liquids (2nd numeral).
■ The protection against external mechanical impact is indicated by the letters IK followed by a characteristic group numeral.

Note: *Many EN European standards are harmonised with international IEC standards.*
This is the case with enclosure protection standards:
- EN 60529 = IEC 60529.
- EN 62262 = IEC 62262.

	IP	IK
First numeral Protection against solid bodies	**Second numeral** Protection against liquids	Mechanical protection
0 No protection	**0** No protection	**0** No protection
1  Protected against solid bodies larger than 50 mm (e.g.: incidental contact with the hand)	**1**  Protected against vertically falling water droplets (condensation)	**1**  Impact energy: 0.150 Joules
2  Protected against solid bodies larger than 12 mm (e.g.: finger contact)	**2**  Protected against water droplets deflected at up to 15° from vertical	**2**  Impact energy: 0.200 Joules
3  Protected against solid bodies larger than 2.5 mm (tools, wires)	**3**  Protected against rainwater at up to 60° from vertical	**3**  Impact energy: 0.350 Joules
4  Protected against solid bodies larger than 1 mm (fine tools, small wires)	**4**  Protection against water spray from all directions	**4**  Impact energy: 0.500 Joules
5  Protected against dust (no harmful deposits)	**5**  Protected against low-pressure water jets from all directions	**5**  Impact energy: 0.700 Joules
6  Totally dust tight	**6**  Protected against powerful water jets from all directions	**6**  Impact energy: 1.00 Joules
	7  Protected against the effects of immersion	**7**  Impact energy: 2.00 Joules
	8  Protected against prolonged effects of immersion under pressure	**8**  Impact energy: 5.00 Joules
		9  Impact energy: 10.00 Joules
		10  Impact energy: 20.00 Joules

Classification of electrical equipment enclosures according to NEMA and UL

NEMA and UL are standardisation bodies, commonly recognised in North America, which have issued classifications of enclosures according to the protection offered in various environments.
These classifications are similar.
The 1st table below summarises this classification, which does not include potentially explosive areas. The detailed recommendations of this classification are given on the next page.
The 2nd table indicates the classification of our enclosures.
These classifications appear in our UL certifications (see Certification technical annex on page 532).
Certification according to the UL classification guarantees the corresponding NEMA classification by equivalence.

Environment and protection	Classification												
	1	2	3	3R	3S	4	4X	5	6	6P	12	12K	13
Indoor use	●	●	●	●	●	●	●	●	●	●	●	●	●
Outdoor use			●	●	●	●	●		●				
Incidental contact with the equipment	●	●	●	●	●	●	●	●	●	●	●	●	●
Dirt	●	●	●	●	●	●	●	●	●	●	●	●	●
Drips and gentle splashes of non-corrosive liquids		●	●	●	●	●	●	●	●	●	●	●	●
Rain, frost* and snow			●	●	●	●	●		●	●			
Frost**					●								
Dust, fibres and particles in suspension			●		●	●	●		●	●	●	●	●
Built-up dust, fibres and particles in suspension			●		●	●	●	●	●	●	●	●	●
Clouds of dust			●		●	●	●		●	●			
Splashes and jets of water						●	●		●	●			
Gentle splashes and leaks of oil or non-corrosive coolants											●	●	●
Drips, splashing and spraying of oil or non-corrosive coolants													●
Corrosive agents							●			●			
Occasional temporary immersion									●	●			
Occasional prolonged immersion										●			

** The operation of the external mechanisms is not required when the enclosure is covered with frost.*
*** The operation of the external mechanisms is required when the enclosure is covered with frost.*

Enclosures		Type of protection (1)												
Name	Range	1	2	3	3R	3S	4	4X	5	6	6P	12	12K	13
Steel wall-mounting enclosures	S3D (1)	●	● (3)	● (3)	● (3)		● (3)	● (3)	●			●	● (4)	●
	S3HF	●	●	●	●				●			●		●
Stainless-steel wall-mounting enclosures	S3X (2)	●	● (3)	● (3)	● (3)		● (3)	● (3)	● (3)			●	● (4)	● (3)
Steel floor-standing enclosures	SM	●	● (3)	● (3)	● (3)		● (3)		● (3)			●	●	●
Steel suitable enclosures	SF	●										●	●	
Stainless-steel floor-standing enclosures	SMX	●	● (3)	● (3)	● (3)		● (3)	● (3)	● (3)			●	●	●
Stainless-steel suitable enclosures	SFX	●										●	●	
Thermoplastic boxes	TBP	●		●		●	●	●				●		
Polyester modular boxes	PLS	●	●	●	●	●	●	●				●		●
Polyester wall-mounting enclosures	PLM	●	●	●	●	●	●	●	●			●	●	●
Polyester floor-standing enclosures	PLA	●	●	● (3)	● (3)	● (3)	● (3)	● (3)	● (3)			●		●

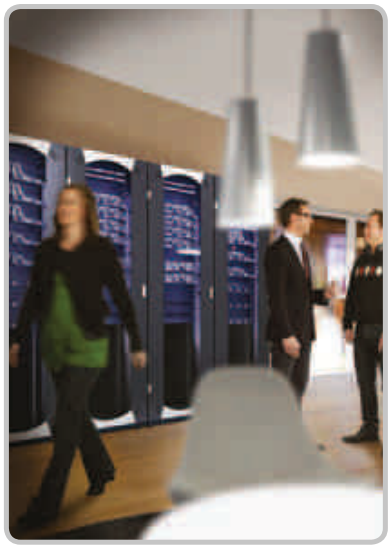
(1) Also S3DM, S3DEX, S57 and S3DC.
(2) Also S3XEX.
(3) 1 door.
(4) 2 doors.

Components		Type of protection (4)												
Name	Range	1	2	3	3R	3S	4	4X	5	6	6P	12	12K	13
Ventilation system	CV											●	●	
Thermal regulation system	CC											●	●	

(4) In some ranges the classification depends on the model and version. The detailed protection types are indicated in the UL certifications.

Classification of electrical equipment enclosures according to NEMA and UL

PB500063-55



PB500064-55

The enclosures must protect the equipment against environmental conditions and protect the personnel against the risk of incidental contact with the equipment. The following classifications (Type) are required according to the required uses and prescriptions:

Type	Use	Prescription
1	Indoor use	The enclosure provides protection for the personnel against incidental contact with the internal equipment and protects said equipment against dirt.
2	Indoor use	It provides protection for the personnel against incidental contact with the internal equipment and protects said equipment against dirt, drips and gentle splashes of non-corrosive liquids.
3	Indoor and outdoor use	The enclosure provides protection for the personnel against incidental contact with the internal equipment and protects said equipment against dirt, rain, sleet, snow, windblown and resists the formation of ice on the outside.
3R	Indoor and outdoor use	The enclosure provides protection for the personnel against incidental contact with the internal equipment and protects said equipment against dirt, rain, sleet, snow and resists the formation of ice on the outside.
3S	Indoor and outdoor use	The enclosure provides protection for the personnel against incidental contact with the internal equipment and protects said equipment against dirt, rain, sleet, snow and windblown dust. The external mechanism must continue to work even when layers of ice are formed.
4	Indoor and outdoor use	The enclosure provides protection for the personnel against incidental contact with the internal equipment and protects said equipment against dirt, rain, sleet, snow, windblown dust, splashes and hose-directed water and resists the formation of frost on the outside.
4x	Indoor and outdoor use	The enclosure provides protection for the personnel against incidental contact with the internal equipment and protects said equipment against dirt, rain, sleet, snow, windblown dust, splashes, hose-directed water and resists corrosion and the formation of ice on the outside.
5	Indoor use	The enclosure provides protection for the personnel against incidental contact with the internal equipment and protects said equipment against dirt, settling airborne dust, lint, fibres, flyings, drips and gentle splashes of non-corrosive liquids.
6	Indoor and outdoor use	The enclosure provides protection for the personnel against incidental contact with the internal equipment and protects said equipment against dirt, rain, sleet, snow, hose-directed of water, the entry of water during occasional temporary submersion to a limited depth and resists the formation of ice on the outside.
6P	Indoor and outdoor use	The enclosure provides protection for the personnel against incidental contact with the internal equipment and protects said equipment against dirt, rain, sleet, snow, hose-directed water, the entry of water during prolonged submersion to a limited depth and resists corrosion and the formation of ice on the outside.
12	Indoor use (without knockouts)	The enclosure provides protection for the personnel against incidental contact with the internal equipment and protects said equipment against dirt, dust, fluff, fibres, particles in suspension, drips and gentle splashes of non-corrosive liquids as well as gentle splashes or leaks of oil and non-corrosive coolants.
12K	Indoor use (enclosures with pre-routing)	The enclosure provides protection for the personnel against incidental contact with the internal equipment and protects said equipment against dirt, dust, lint, fibres flyings drips and gentle splashes of non-corrosive liquids as well as gentle splashes or leaks of oil and non-corrosive coolants.
13	Indoor use	The enclosure provides protection for the personnel against incidental contact with the internal equipment and protects said equipment against dirt, dust, lint, fibres flyings and the spraying, splashing, and seepage leaks of water, oil or non-corrosive coolants.

Note: *The above recommendations aim to explain the NEMA and UL classifications, but are not the official texts of NEMA or UL.*
The exact definitions provided by the Organisations are those of standards NEMA 250 and UL 50E.

Polyester base coating properties

PB500058-56

Product type

Thermosetting polyester resins based powder coating modified by epoxy resins and designed for decoration and to prevent corrosion.
The performance of this coating is superior to conventional epoxy powders in terms of: colour stability, temperature resistance and weather resistance.
Grey RAL 7035; appearance: structured.

Mechanical properties

Test conditions: steel samples with a thickness of 10/10e mm.
Degreasing using biodegradable surface-active agents.
Film thickness: 60 microns.

Bonding (scratching and adhesive tape)	ISO 2409	Class 1
Ericksen stamping	ISO 1520	≥ 7 mm
Direct impact resistance	ISO 6272	> 1 kg/70 cm
Indirect impact resistance	ISO 6272	> 1 kg/20 cm
Bending around conical mandrel	ISO 6860 - ASTM D 522-88	Maximum cracking of 70 mm, without the paint coming loose

Chemical properties

Tests conducted at ambient temperature on phosphated samples covered with a 150 to 200 micron film:

Film intact.

Film attacked (blistering, yellowing, loss of gloss).

Number of months			2	4	6	8	10	12
Acid	Acetic	20 %						
	Sulphuric	30 %						
	Nitric	30 %						
	Phosphoric	30 %						
	Hydrochloric	30 %						
	Lactic	10 %						
	Citric	10 %						
Base	Soda	10 %						
	Ammonia	10 %						
Water	Distilled water							
	Sea water							
	Tap water							
	Diluted chloride bleach							
Solvents	Petrol							
	Higher alcohols							
	Aliphatics							
	Aromatics							
	Ketones-esters							
	Tri-perchlorethylene							

Physical properties

Temperature resistance: -40°C and 100 hours at +150°C (colour: white).
Gloss retention: good.

Resistance to corrosion

Compliance with standard IEC 62208 for outdoor installations: 288 h of humid heat and 336 h of salt mist.

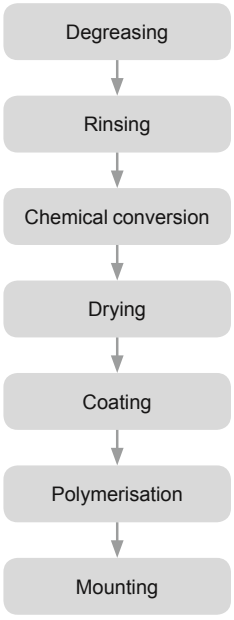
Polyester base coating properties

Nuclear decontamination
Applicable to colours RAL 7035 and AFNOR A550.
Standard NFT 30901. Percentage of decontamination for contamination by fission products. Please consult us for further details.

Accelerated aging
Standard IEC 62208: 500 h UV according to ISO 4892 (method A) (adherence of the coating with minimum retention of 50% on the grid according to ISO 2409).

Fire behaviour
Class M1 (self-extinguishing material).
Class M0 (for coating on a metal base).

Manufacturing process



Properties of the plastic materials
Mechanical, electrical, physical and fire-resistance properties

Plastic materials generally used to manufacture our products:
- ABS.
- Polycarbonate.
- PVC (polyvinyl chloride).
- Bayblend® = PC + ABS.
- Polyester reinforced with fibreglass.
- Altuglas.
- Polypropylene.
- Polystyrene.
- Polyamide 6 and 12.
- SBS.

Specifications	Standards	Units	ABS	Polycarbonate	PVC	Bayblend®	Polyester	SBS
Mechanical properties								
Tensile strength	ISO 257	MPa	44	> 65	45	35	85	5
Tensile strain	ISO 527	%	12	> 110	120 to 150	40	0	600
Impact resistance	ISO 179	kJ/m²	125	No breakage	25	No breakage	60	No breakage
Notching resistance	ISO 179	kJ/m²	19	25	20	25	50	-
Electrical properties								
Stress point	IEC 60112	-	-	250-300	> 600	> 550	> 600	-
Surface strength	IEC 60093	ohm	1015	> 1015	> 1013	> 1014	≥1012	> 1013
Dielectric strength	IEC 60243	kV/mm	16.5	> 30	30	24	18-20	20
Specific resistivity	IEC 60093	ohm³cm	1015	> 1016	≥ 1015	1016	≥ 1012	> 1016
Physical properties								
Softening temperature (Vicat B)	ISO 306	°C	95	145-150	79-80	115	(1)	80
Temperature resistance	-	°C	-40...+90	-50...+125	-20...+65	-35...+90	-50...+150	-40...+120
Water absorption	ISO 62	%	0.2 - 0.45	0.15	< 0.1	0.2	0.2	-
Specific weight	ISO 1183	kg/dm³	1.04	1.21	1.4	1.12	1.85	0.3 in 24 h
Fire resistance								
Oxygen index	ISO 4589	%	19	26	45-50	22	24.4	18
Glow wire resistance, 2 mm	IEC 60695-2	°C	650	960	960	750	960	750° (1.5 mm)
Glow wire resistance, 3 mm	IEC 60695-2	°C	650	960	960	750	960	NA

(1) No softening of the polyester.

Specifications	Standards	Units	Altuglas	Polypropylene	Polystyrene	Polyamide 6	Polyamide 12
Mechanical properties							
Tensile strength	ISO 257	MPa	30	35	24	40	30
Tensile strain	ISO 527	%	5	400	36	200	300
Impact resistance	ISO 179	kJ/m²	20	20	63	No breakage	No breakage
Notching resistance	ISO 179	kJ/m²	3	5	50	31.2	15
Electrical properties							
Stress point	IEC 60112	-	-	-	KB175	KB175	KB180
Surface strength	IEC 60093	ohm	≥ 1014	-	> 1013	1012	5 x 1010
Dielectric strength	IEC 60243	kV/mm	13-15	20	≤ 40	23	55
Specific resistivity	IEC 60093	ohm³cm	> 1015	> 1016	> 1015	1011	3 x 1011
Physical properties							
Softening temperature (Vicat B)	ISO 306	°C	120-122	75 (vicat A)	79	230	140
Temperature resistance	-	°C	-20...+80	-10...+80	-15...+60	-20...+100	-50...+125
Water absorption	ISO 62	%	< 0.5	0.1 in 24 h	0.1 in 24 h	1.6	1.5
Specific weight	ISO 1183	kg/dm³	1.18	0.91	1.06	1.14	1.03
Fire resistance							
Oxygen index	ISO 4589	%	18.5	18	18	24	22
Glow wire resistance, 2 mm	IEC 60695-2	°C	-	650	650	750	650
Glow wire resistance, 3 mm	IEC 60695-2	°C	960	650	650	850	650

Properties of the plastic materials
Resistance to chemical agents

The table shows:
- The concentration of the chemical agent in %; sat = saturation.
- The resistance of the material:
  +: Resistant.
  O: Limited resistance.
  –: Not resistant.

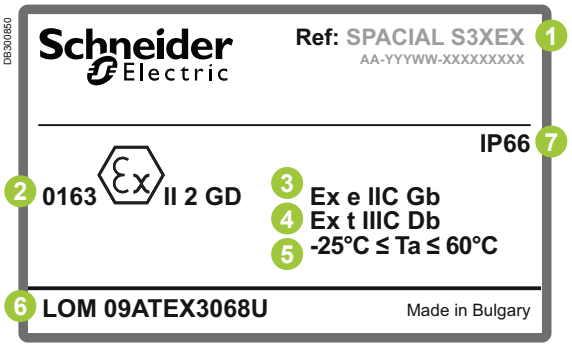
Plastic materials generally used to manufacture our products:
- ABS.
- Polycarbonate.
- PVC (polyvinyl chloride).
- Bayblend® = PC + ABS.
- Polyester.
- Altuglas.
- Polypropylene.
- Polystyrene.
- Polyamide 6 and 12.
- SBS.

Resistance to	ABS		Polycar-bonate		PVC		Bayblend®		Polyester		Altuglas		Polypro-pylene		Poly-styrene		Polyamide 6		Polyamide 12		SBS	
Acetone		–		–		–		–		–		O	100	+		–	100	+		+		+
Hydrochloric acid	15	+	10	+	30	+	20	+	30	+	sat	+	10	+		O	10	–	10	+	10	+
Citric acid			10	+	sat	+	10	+	100	+	sat	+	sat	+		+	10	O		+	10	+
Lactic acid	80	+	10	+	90	+	10	–	100	+	20	+	90	+		O	50 90	O –		+ +	sat	+
Nitric acid	30	+	10 100	+ –	50	+	10	+	20	+ +	10 100	+ –	25/ 50			O	2 10	O –		–	50	+
Phosphoric acid	85	+	100	+	sat	+		+	100	+	10 95	+ –	sat	+		O	2 10	O –	50	+		+
Sulphuric acid	50	+	50 100	+ –	96	+	30	+	70	+	30	+	96	+		O	3	–	10	+	96	+
Alcohol		O	96	+	96	+		–	50	O	50	O	96	+		+	96	O	96	+		+
Pure aniline		O		–	100	–		–		O		–	100	+			100	O	100	O		
Benzene		+	100	–		–		+		–		O	100	O			100	+		+		–
Liquid bromine			100	–		–		–					100	–					100	–		–
Liquid chlorine				–	100	–		–	sat	+		–	100	–			100	O		–	50	+
Sea water		+	100	+	100	+		+	100	+	100	+		–	100	+			100	+	sat	+
Petrol		+	100	+	100	O		–	100	+	100	O		–		–	100	+		+		–
Ether		–	100	O	100	–		–	100	O		+					100	+	100	+		–
Hexane		O		+		O		O		–			100	+			100	+	100	+		–
Oil and greases		+	100	+	100	+		O	100	+	100	O	100	+		–		+	100	+		–
Aromatic hydrocarbon		O		–		–		–		–		+	–			–		–		+		–
Fuel oil		O	100	O	100	+		–	100	+	100	–	100	+			100	+	100	+		–
Naphthalene					100	O		–	100	+	100	–	100	+			100	+	100	+		
Nitrobenzene		–		–	100	–		–				–	100	O				–		O		–
Phenol		–		–	sat	O		–	20	O		–	sat	+				–		–	10	O
Mineral salts				+		+		+		+		+		+						+		+
Iodine solution				O		–		+				–						+				
Toluene		–		–	100	–		–		+		O	100	O		–	100	+	100	+		–
Trichloroethylene		–		–	100	–		–		–		–	100	O		–	100	–	100	O		–
Urea			sat	+	sat	+		+					sat	+			10	+	sat	+	sat	O

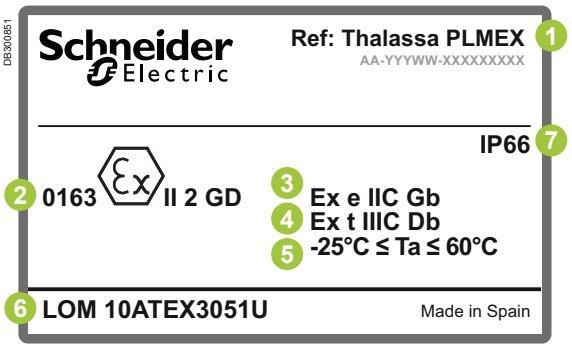
For other chemical agents, please contact us.
All this information is taken from the best sources and provided for information purposes only, with no commitment on our behalf.

Description of the marking label affixed to ATEX certified wall-mounting enclosures

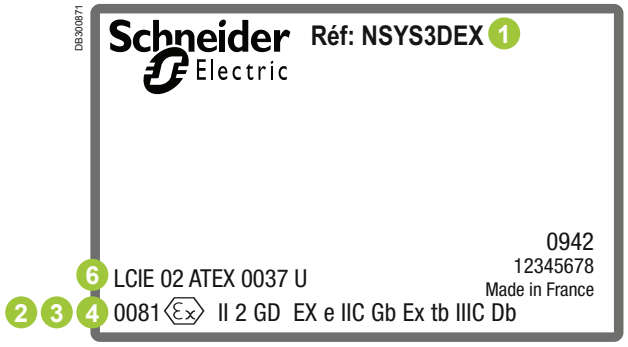
Spacial S3XEX



Thalassa PLMEX



Spacial S3DEX



1. Product range
2. **0163:** No. of the body
   : ATEX symbol according to the directive
   II: Surface industries
   2: Product category
   GD: Gas and dust
3. **Ex:** Product compliant with EN 60079-7 (gas)
   e: Increased safety
   II: Surface industries
4. **Ex:** Product compliant with EN 60079-31 (dust)
   t: Protection by t enclosure
5. **Ta:** Ambient temperature
6. No. of the CE certificate
7. **IP66:** Degree of protection

Download our ATEX certificates from our site.

How to select your enclosures & accessories?

Environment	
In what type of environment will you be installing your products?	■ Indoor industrial environments, use steel. ■ Indoor corrosive environments or with specific hygienic demands, use stainless-steel. ■ Severe corrosive environments, indoor or outdoor, use polyester enclosures. ■ Always think about the thermal issue. We have the right solution.
Is a canopy required?	A canopy is mandatory when liquid can fall on an enclosure. Our polyester enclosures (PLM and PLAT) are pre-equipped.
Technical requirements	
Are tightness and resistance to external mechanical impact needed in your case?	Each enclosure specifies its: ■ Tightness: IP. ■ Resistance to external mechanical impact: IK.
Have you any size-related installation constraints?	Check the dimensions of the enclosure: Height (H) x Width (W) x Depth (D) in mm.
What colours are available?	RAL 7035 is our standard on steel enclosures. Other colours are available on demand.
How do you install your enclosures?	Installation possible: ■ On a wall. ■ On the floor. ■ On a post. Available accessories: ■ Fixing lugs. ■ Plinths. ■ Post fixing devices. ■ Reinforcement for heavy load.
Door	
Need to see inside the enclosure?	Choice of: ■ Glazed doors. ■ Acrylic windows. ■ Control protection frames.
What type of lock do you want?	The type of lock is to be specified: ■ Inserts. ■ Keys. ■ Padlocks.
Do you need an earth connection?	Electrical continuity by earthing braids or leads available as accessories.
How will you mount your raceways to the door? On the uprights? On the rails?	They can be fixed thanks to: ■ Cable-duct supports. ■ Door cross-rails. ■ Cable ties.
Are doors opened for maintenance?	You may need: ■ Door stops. ■ Door switches.
Body or frame	
Where do the cables enter the enclosure from?	A large variety of cable entries available.
What functions should this cable-entry provide?	Our cable glands or membranes provide: ■ Thightness. ■ Cable supports.
Mounting accessories	
How will the equipment be installed inside your enclosure?	Several mounting plates according to your application: ■ Plain. ■ Micro-perforated (Telequick System). ■ Perforated (Telequick System). ■ Modular. ■ 19”.
Do you require cable accessories?	■ Cable ducts. ■ Cable cross rails. ■ Cable supports… … are available, see our catalogue for more details.
Thermal	
Do you need to cool? Heat? Dry?	■ Ventilation louvers. ■ Ventilation grilles. ■ Forced ventilations. ■ Resistance heaters. ■ Thermostats. ■ Calculations with ClimaSys software. Refer to our **Thermal Control** section.
Logistics and handling	
How do you handle the enclosures?	**Thanks to eyebolts and lifting brackets.**