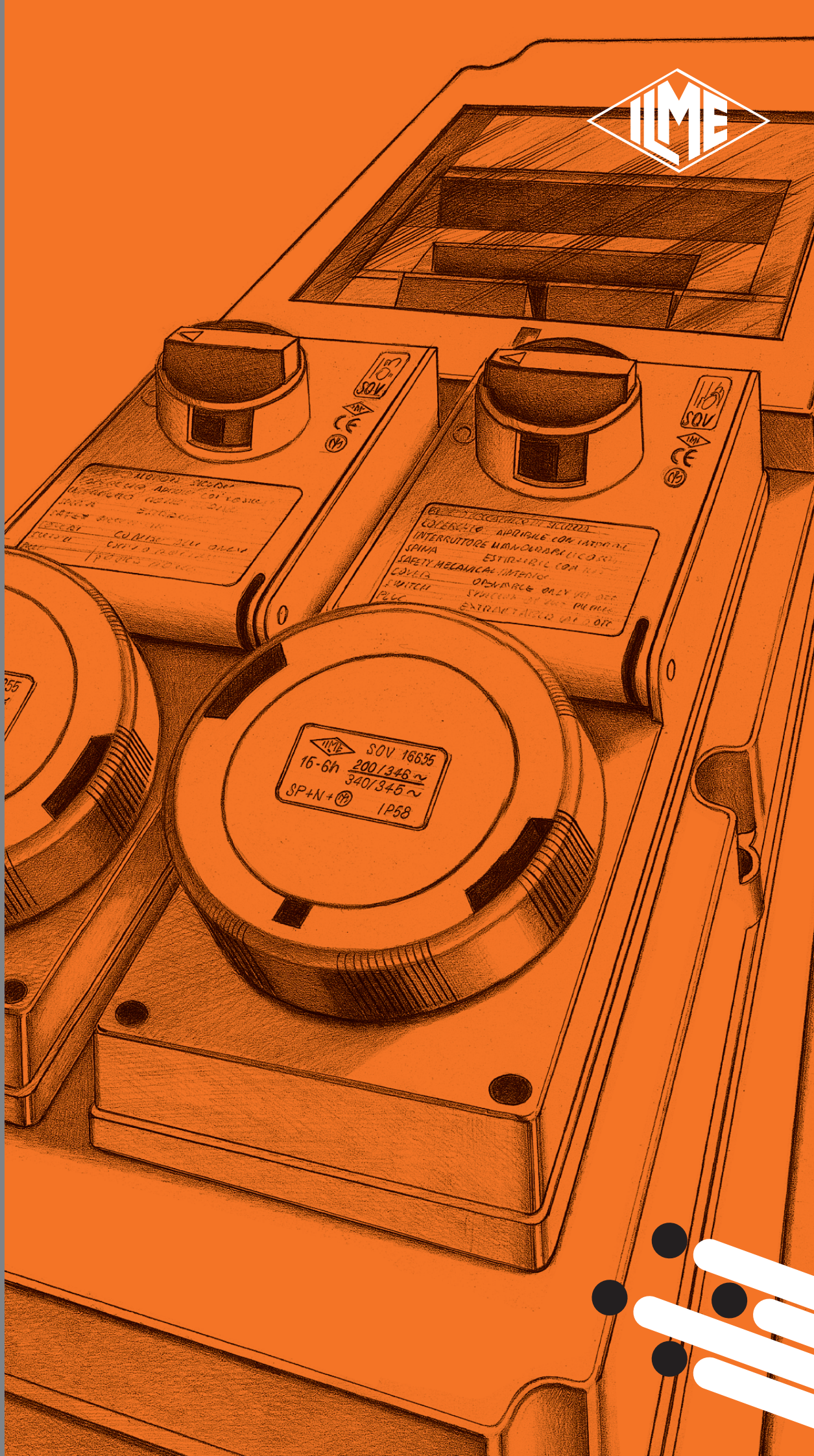
SQV interlocked switched socket-outlets for FM distribution boards

ENGLISH



The Company and the Product

INDUSTRIA LOMBARDA MATERIALE ELETTRICO SpA has been operating **in Milan since 1938,** in particular in the electrotechnical sector for the manufacturing of equipment for industrial installations.
ILME reflects the traditional **entrepreneurial spirit of Lombardy,** and has enjoyed continuous expansion for over half a century.
The company has carved an important role for itself in the main world markets, also operating directly in the countries that have assumed world leadership in the field of automation, including Germany and Japan.
In the **electrical connection** sector with applications in industrial automation, characterised by **top performance** and utmost **reliability needs,** ILME is today the acknowledged partner of many leading companies worldwide.
The company's fundamental values are: **product innovation,** original solutions,

excellent **price-quality ratio,** a customer-oriented **sense of service,** ethical behaviour and an environmentally-friendly approach.

To promote the continuing improvement of its **qualitative results,** ILME has always encouraged its collaborators to work with utmost **responsibility and participation.**
The company focuses on a series of benefits to the user, including research into the most suitable materials, high quality and safe cabling, a rapid turnaround and readily available services.

CE marking

As from 1 January 1997, in order to launch electrical products on the European market the manufacturer must ensure these bear the relevant CE marking, in line with the Low Voltage Directive 73/23/EEC * (implemented in Italy as law 18-10-1977 no. 791) and its modification 93/68/EEC * (implemented in Italy as L. D. 25-11-1996 no. 626/96, published in the supplement to the Gazzetta Ufficiale of 14-12-1996).

Said marking must be placed on the product - or, if this is not possible, on the packaging, the instructions for use or the warranty certificate - and acts as a declaration by the manufacturer that the product complies with all relevant EU directives.

ILME products bear the CE marking on the product or packaging.

Almost all ILME products fall under the Low Voltage Directive. A declaration of compliance is required before applying the CE marking. This document, to which the market is not directly entitled, must be made available to the control authorities (in Italy the Ministry for Industry, Commerce and Handicraft) at all times. In it, the manufacturer declares the technical safety standard(s) followed to manufacture the product. These standards must be, in decreasing order of preference:

- a European standard (EN prefix)
- a European harmonisation document (HD prefix)
- an international IEC standard
- a national standard
- in the absence of reference standards, the manufacturer's internal specifications, guaranteeing compliance with the directive's basic safety requirements.

Compliance with harmonised technical standards (i.e. ratified by the CENELEC) constitutes presumtion of conformity to the directive's basic safety requirements.
The CE marking of ILME products results from said products' declaration of conformity to harmonised standards or international IEC standards.
Through the CE marking, ILME declares full compliance, not merely with the directive's basic safety requirements, but also with those international or national EU standards on which voluntary safety certification markings are based (e.g. IMQ and VDE).
In this way, ILME intends to award the CE marking the value of self-certification in terms of safety, given the loss in legal value of voluntary certifications issued by third parties, ratified by directive 93/68/EEC *.
Notwithstanding the above, practically all ILME products still bear voluntary conformity markings.

This EC declaration of conformity becomes null and void when the assembly of products includes one or more components not manufactured by us and without EC approval.

*** Note:** New legal reference for the Low Voltage Directive is 2006/95/EC which is the consolidated edition of Directive 73/23/EEC + Directive 93/68/EEC.

On March 29, 2014, the new Low Voltage directive 2014/35/EU has been published on the Official Journal of the European Union, as a recast of the previous directive 2006/95/EC. It will enter into force on April 20, 2016.

The SQ integrated modular system sockets series

The SQ series is designed to meet flexibility, cost-effectiveness and versatility requirements for the creation of distribution boards of industrial socket-outlets. Successfully tested for reliability, this series, in combination with PLUSO Series industrial plugs and FM, FC and QM Series enclosures, offers an integrated modular system.

Their unique features make ILME socket-outlets suitable for applications including:
- manufacturing industry;
- service industry (stores, trade fairs etc.);
- agriculture and livestock;
- residential and similar installations (e.g.: common areas of condominiums, basements and garages, community buildings, kitchens, etc.).

The socket-outlets are supplied in the version designed for electrical panels, without base box (optional) and feature an extremely compact modular structure.

The product's construction allows four different assembly solutions:
- in ILME FM, FC and QM Series enclosures for the creation of distribution boards;
- on board industrial machines, fastened through an appropriate window;
- wall mounted, using the optional single base box;
- flush mounted, using the optional single base box.

The following types of socket-outlets are available:

Horizontal 145x115 mm socket-outlets

- SQ type
interlocked socket-outlets without fuse carrier, IP44, 16A.

Vertical 231x89 mm socket-outlets

- SQE and SQE.5 types
interlocked socket-outlets without fuse carrier, IP44 and IP55, 16A and 32A;

- SQV and SQV.5 types
interlocked socket-outlets without fuse carrier, IP44 and IP55, 16A and 32A;

- SQT 16220 type
socket-outlet with safety transformer, IP55, 24V.

A new combined switch-disconnector-fuse unit has been introduced in SQV type socket-outlets for easy, quick and safe fuse cartridge insertion and removal.

SQE - SQE.5
interlocked switched socket-outlets without fuse carrier
16A, 32A (IP44)
16A, 32A (IP55)

pages 8-9

SQV - SQV.5
interlocked switched socket-outlets with fuse carrier
16A, 32A (IP44)
16A, 32A (IP55)

pages 10-11

SQ
interlocked switched socket-outlets without fuse carrier

16A (IP44)

page 12

SQT
socket-outlets with safety transformer
16A (IP55)

page 13

SQC 923 CS
enclosures for wall-mounting SQE, SQV, SQA and SQT socket-outlets
SQC 923 ME
Rubber frame for enclosures

page 14

SQC 1114 CS
enclosures for wall-mounting SQ socket-outlets

page 14

FM 1043 CL/PQ/SQV/DSQV
distribution box systems

dimensions
100 x 430 x 95

pages 22-23

FM 3236 CL/PI/PIN/SQ
distribution box systems

dimensions
320 x 360 x 135

pages 24-25

FM 2451 CL/PI/PIN
FM 2451 SQ/SQV/DSQV
distribution box systems

dimensions
240 x 510 x 135

pages 26-27

FM 3251 CL/PI
FM 3251 SQ/SQV/DSQV
distribution box systems

dimensions
320 x 510 x 135

pages 28-29

FM 4272 CL/PI/SQ/SQV
distribution box systems

dimensions
420 x 720 x 135

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FM 3221
supplementary enclosures
dimensions 320 x 210 x 135

FM 3236/2451/3251 CI
frames for flush-mounting

page 32

FM 88 RC/CV/RQ/RBT
FM 811 CV
covers

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FM 68 CV
FM 910 CVU/RC/CV/RI
FM 910 RBT/CVF/RAV
FM 1114 CV
covers

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FM 923 CVU/CV/CVF
FM 923 RAV/RBT
covers

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FM 32 MT
BC SFT
complementary parts and accessories

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FM GD 18/25/35
FM 2510 MI
FM 1043 CO
FM 416
FM 18 ET
complementary parts and accessories
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QP V - QG V
site boards

QM V S2
site boards

pages 39-40

PB...PI
extra-low voltage
socket-outlets

16A, 32A (IP44)

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PEW 216 PQF
low voltage
socket-outlet
(Schuko®)

10A, 16A (IP67)

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PE...PI - PEW...PI
inclined flush-mounting
socket-outlets, low voltage
from over 50V up to 690V

16A, 32A (IP44)
16A, 32A (IP67)

pages 42-43

PE...PIF - PEW...PIF
inclined flush-mounting
socket-outlets, low voltage
from over 50V up to 690V

16A (IP44)
16A (IP67)

page 43

PE...PQ - PEW...PQ
straight flush-mounting
socket-outlets, low voltage
from over 50V up to 690V

16A, 32A (IP44)
16A, 32A (IP67)

pages 44-45

PE...PQF - PEW...PQF
straight flush-mounting
socket-outlets, low voltage
from over 50V up to 690V

16A (IP44)
16A (IP67)

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FC 252 QV
box for interlocked SQ
socket-outlets

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FC 2542 QV/QVT
mixed box for
interlocked switched
socket-outlets and modular
devices

page 48

FC 2525 BM
box for interlocked
switched socket-outlets

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FC 2542 BM/BMT
mixed box for
interlocked switched
socket-outlets and modular
devices

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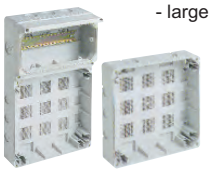

FC...MS
- small base box
- large base box

page 51

FC...CR/TS3/TS2/TS
- cover with alveolated
  structure
- covers for interlocked
  socket-outlets
- frame for half-covers

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FC...SR/SRT/SP
- half-cover with
  alveolated structure
- half-covers for modular
  devices
- half-covers for buil-in
  socket-outlets

page 53

FC / FM
- compartment covers for
  boxes FC...BM
- compartment covers for
  boxes FC...BM and QV

page 54

AS - AR - AF
complete insulating
cable gland

page 55

AR - AS
- insulating sealing plugs
- lock nuts

page 56

FC NP
union nipples including
gasket and lock nut

page 57

FC KFQ
board perforation kit

page 58


BLOCCO MECCANICO DI SICUREZZA
COPERCHIO : APRIBILE CON INTERRUTTORE SU '0'
INTERRUTTORE : MANOVRABILE CON SPINA INSERITA
SPINA : ESTRAIBILE CON INTERRUTTORE SU '0'
SAFETY MECHANICAL INTERLOCK
COVER : OPENABLE ONLY WITH SWITCH OFF
SWITCH : SWITCHABLE ONLY WITH PLUG INSERTED
PLUG : EXTRACTABLE ONLY WITH SWITCH OFF

General characteristics

This chapter illustrates the technical characteristics of SQ interlocked switched socket-outlets available in horizontal (SQ), vertical (SQE, SQV) and SQT configuration (with toroidal safety transformer).
These socket-outlets offer tested reliability and may be used, along with PLUSO plugs and FM and FC enclosures for industrial use, as modular solutions to configure distribution boards of industrial socket-outlets. ILME socket-outlets are designed to be used for:

- Industrial applications
- Services applications (commercial, exhibitions, etc.)
- Agricultural and livestock breeding applications
- Residential and similar applications (i.e. common areas of condominiums, cellars, garages, community buildings, kitchens, etc.)

Socket-outlets are supplied in models for board-mounting and without base box (optional). All models have a compact modular design that enables them to be installed in the following four types of installations:
- In FM, FC, QM, QP and QG enclosures for distribution and construction boards
- On machinery with a suitable fixing window
- On walls by means of the optional single box
- Flush-mounted by means of the optional single box

The following types of socket-outlets are available:

Horizontal 145 x 115 mm socket-outlets
- **SQ types** with interlock and without fuse carrier[1], IP44, 16A

Vertical 231 x 89 mm socket-outlets
- **SQE** and **SQE.5** types with interlock and without fuse carrier[1], IP44 and IP55, 16A and 32A
- **SQV** and **SQV.5** with interlock and fuse carrier[2], IP44 and IP55, 16A e 32A
- **SQT 16220** types with safety transformer[3] IP55, 16A (limited to 6A by power transformer)

Electrical Features

Rated frequency:
0 Hz (direct current), and from 50 Hz to 500 Hz, according to clock position.

Rated operating voltage:
the standard identifies two main types of use:
- extra-low voltage socket-outlets (and related plugs), (SELV safety requirements, in accordance with CEI 64-8 installation standard = HD 60344, IEC 60364), for max. rms voltage values of 50V;
- low voltage socket-outlets (and plugs) for rms voltage values above 50V and up to a maximum of 690V.

Polarity:
models are designed with:
- 2 poles (for extra-low voltage, 2P)
- 3, 4 e 5 poles (low voltage, 2P+⏚, 3P+⏚, 3P+N+⏚)

Rated current:
16A (extra-low voltage)
16A, 32A (low voltage)

Rated insulating voltage:
- **690V** for low voltage interlocked socket-outlets (types SQ, SQE)
- **500V** for interlocked socket-outlets (SQV types), limited by the fuse cartridge installed
- **50V** for extra-low voltage (SQT 16220 type), limited by extra-low voltage socket-outlets and safety transformer

Minimum surface insulation distance: 10 mm (EN 60309-1)
Minimum air insulation distance: 8 mm (for rated operating voltages higher than 500V)

1) The switchgear linked to the interlock is a series Z switch-disconnector (ZG 32)
2) The switchgear linked to the interlock is an ILME switch-disconnector-fuse ZF 32 series for industrial fuses (not supplied) sized 10x38, in accordance with EN 60269-3-1, type gG, up to 25A.
3) The 24V output is interlocked by means of a microswitch that disconnects the primary circuit of the transformer if the plug is not inserted. The safety transformer is automatically protected by a self-resetting device and must be used to supply Class III portable lamps only.

Breaking capacity:
Socket-outlets have mechanical interlocks that prevent the plug being removed while voltage is present or from being mated when the socket-outlet is live. This explains why no breaking capacity is required. The socket-outlets parts (inserts and female contacts) are the same as those of the PLUSO series and have therefore a breaking capacity 1.25 times the rated current at 1.1 times the rated operating voltage.

Mechanical features

- **Mechanical resistance**
  Verified with the provisions of Clause 24 of standard EN 60309-1 (IEC 60309-1)
- **Degree of protection**
  IP44 and IP55, in accordance with EN 60529
- **Resistance to glow-fire**
  Compliant with IEC 60695-2-11: 850 °C for enclosures; 960 °C for inserts
- **Temperature**
  Ambient: -25 °C / +40 °C; limit of materials: -40 °C / +125 °C
- **Self-extinguishing capacity**
  UL 94 classification: 94V-2 for enclosures and inserts
- **ILME ZG 32 switch-disconnectors**
  (on SQ and SQE socket-outlets) and ILME ZF 32 switch-disconnector-fuses with 10x38 fuses (on SQV socket-outlets). Compliant with EN 60947-3, AC-22A utilization category.

Materials

- Enclosures and inserts in insulating thermoplastic material
- Anti-aging elastomer gaskets
- Self-centring socket contacts in brass with galvanised steel pressure spring
- Zinc-plated mounting screws
- Terminals with zinc-plated screws retained in their seats when unscrewed
- 32A socket-outlets with two fixing screws per terminal, provided as protection against accidental loosening

The package

The socket-outlets are supplied with:
- Oil-proof and anti-aging gaskets
- Self-threading fixing screws for flush-mounting

The following may be supplied on request:
- Single box for wall- or flush-mounting, with tubes gland, gaskets, lock nuts, sealing plugs and self-threading screws
- Rubber frame for flush-mounting on boxes **(SQC 923 CS)** of SQE, SQV and SQT socket-outlets
- ILME enclosures for FC and FM distribution boards

Selecting socket-outlets

Socket-outlets should be selected taking into account the following parameters:

• Rated frequency of the device to be supplied with the plug and socket-outlet coupling
• Rated supply voltage and type of distribution (single or three-phase, with or without neutral) to determine the number of poles and clock hour position.
The 1 hour position is available for all > 50V voltages and voltage ranges and for frequencies and frequency ranges not covered by standards.
• Installation location for the determination of the degree of protection (IP44 or IP55) and of the rated voltage (in some areas installation standards require a safety extra-low voltage).

SQ and SQ... socket-outlets have an **IP44 and IP55 degree of protection.** Socket-outlets with IP55 degree of protection have a bayonet fastening cover, traditionally defined as "watertight", and must be used with with IP67 plugs (with locking ring and gasket) to guarantee a high protection of the connected equipment (IP55). All equipment must be installed following state-of-the-art procedures and in compliance with the manufacturer's assembly instructions. If components with various degrees of protection are installed, the protection of the resulting distribution board corresponds to that of the unit with the lowest degree of protection.

This has been assessed and applies:
- To socket-outlets when a plug with equivalent degree of protection is mated and locked or the cover is closed
- To enclosures, when all covers are closed

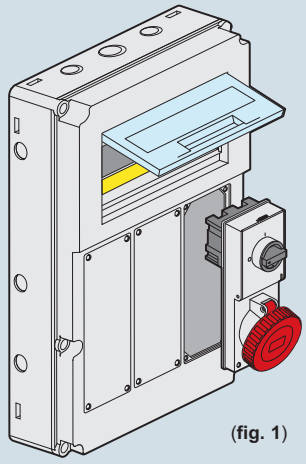
ILME accessories for SQ and SQ... socket-outlets

ILME offers the following range of socket-outlets and plugs for SQ and SQ... socket-outlets:
- Simple socket-outlets for industrial use in two versions with **IP44** and **IP67 degree of protection** (**PE** and **PEW** types)
- Enclosures for distribution boards for assemblies with **IP55 degree of protection** (**FM** and **FC** types)
- Enclosures for empy or assembled construction site boards (**QM, QP** and **QG** types)
- Simple enclosures for the individual assembly of socket-outlets with **IP55 degree of protection** (**SQC 1114 CS** and **SQC 923 CS** types)

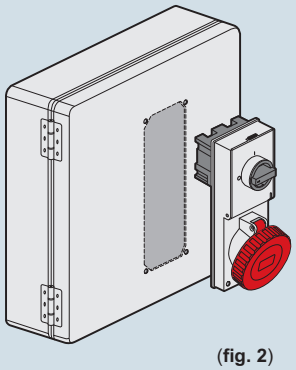
All enclosures and socket-outlets cover the installation requirements specified in standard CEI 64-8 (series Cenelec HD 60364, IEC 60364).

Type of installation

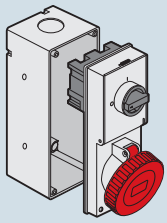
The structure of SQ and SQ... socket-outlets is designed to allow them to be mounted in four different configurations as illustrated below:
- In FM and FC enclosures (**Figure 1**)
- On equipment or pre-assembled enclosures (**Figure 2**)
- In boxes for wall-mounting (**Figure 3**)
- In boxes for flush-mounting (**Figure 4**)



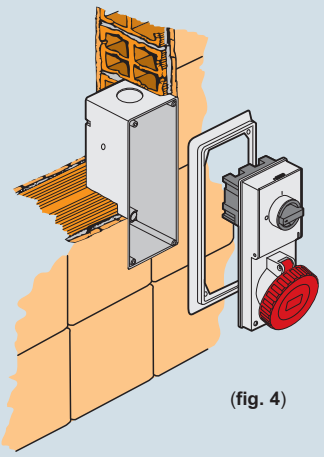
(**fig. 1**)



(**fig. 2**)



(**fig. 3**)



(**fig. 4**)

Protection against indirect contact by total insulation*) ⧈

Article 8.4 of standard EN 61439-1 defines the protective measures against electric shocks that have to be incorporated in the distribution boards. Protection against indirect contacts can be guaranteed only by totally insulating the installation ⧈ which implies complying with the following:

a) The apparatus shall be completely enclosed in insulating material which is equivalent of double or reinforced insulation. The enclosure shall carry the symbol ⧈ which shall be visible from the outside.
b) The enclosure shall at no point be pierced by conducting parts in such a manner that there is the possibility of a fault voltage being brought out of the enclosure. This means that metal parts, such as actuator shafts which for constructional reasons have to be brought through the enclosure, shall be insulated on the inside or the outside of the enclosure from the live parts for the maximum rated insulation voltage and the maximum rated impulse withstand voltage of all circuits in the ASSEMBLY. If an actuator is made of metal (whether covered by insulating material or not), it shall be provided with insulation rated for the maximum rated insulation voltage and the maximum impulse withstand voltage of all circuits in the ASSEMBLY. If an actuator is principally made of insulating material, any of its metal parts which may become accessible in the event of insulation failure shall also be insulated from live parts for the maximum rated insulation voltage and the maximum rated impulse withstand voltage of all circuits in the ASSEMBLY.
c) The enclosure, when the ASSEMBLY is ready for operation and connected to the supply, shall enclose all live parts, exposed conductive parts and parts belonging to a protective circuit in such a manner that they cannot be touched. The enclosure shall give at least the degree of protection IP2XC (see IEC 60529). If a protective conductor, which is extended to electrical equipment connected to the load side of the ASSEMBLY, is to be passed through an ASSEMBLY whose exposed conductive parts are insulated, the necessary terminals for connecting the external protective conductors shall be provided and identified by suitable marking. Inside the enclosure, the protective conductor and its terminal shall be insulated from the live parts and the exposed conductive parts in the same way as the live parts are insulated.
d) Exposed conductive parts within the ASSEMBLY shall not be connected to the protective circuit, i.e. they shall not be included in a protective measure involving the use of a protective circuit. This applies also to built-in apparatus, even if they have a connecting terminal for a protective conductor.
e) If doors or covers of the enclosure can be opened without the use of a key or tool, a barrier of insulating material shall be provided that will afford protection against unintentional contact not only with the accessible live parts, but also with the exposed conductive parts that are only accessible after the cover has been opened; this barrier, however, shall not be removable except with the use of a tool.

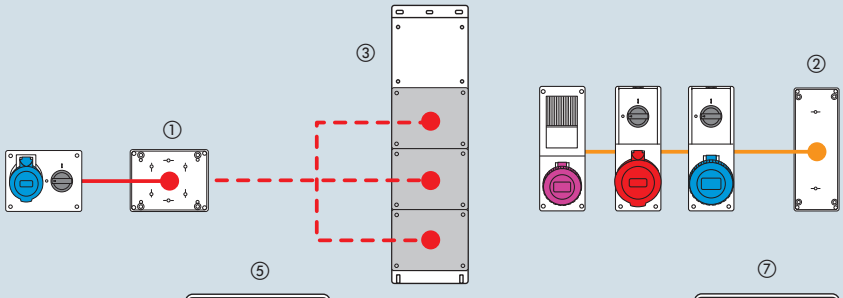
The metal screws used for the assembly of socket-outlets of enclosures for FM and FC distribution boards are not connected with the interior of the board. If the units are wall-mounted using the blanking plugs supplied and in accordance with the above provisions, the assembled equipment will provide protection against indirect contacts.

*) According to sub-clause 413.2.1.1 of standard IEC 60364-4-41, it is equal to that of equipment of class II, see standard IEC 60536.

Enclosures for SQ and SQ... interlocked switched socket-outlets

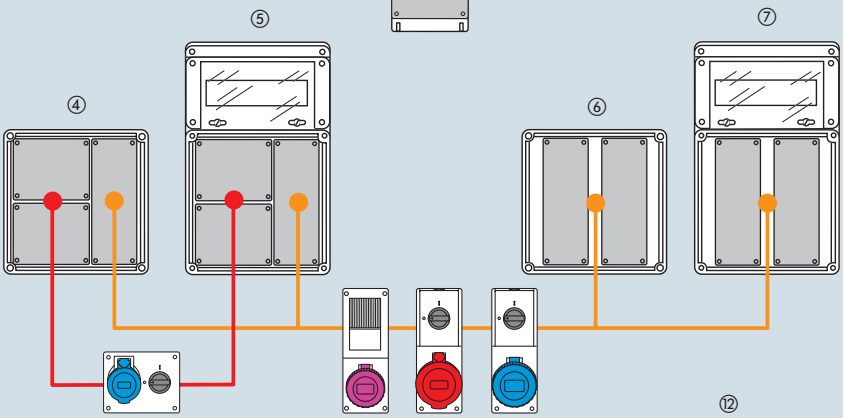
To allow the configuration of practical and functional distribution systems with SQ and SQ.. interlocked socket-outlets, ILME has developed a special range of enclosures specifically designed to satisfy all possible installation needs.
Three series of enclosures are illustrated in this catalogue:
- Single boxes (for the individual assembly of socket-outlets) and back plates for boxes with socket-outlets
- FC series (extremely compact and robust medium-sized enclosures)
- FM series (small, medium and large-sized enclosures)

The sections that follow illustrate all the possible assembly combinations of socket-outlets on currently available enclosures.



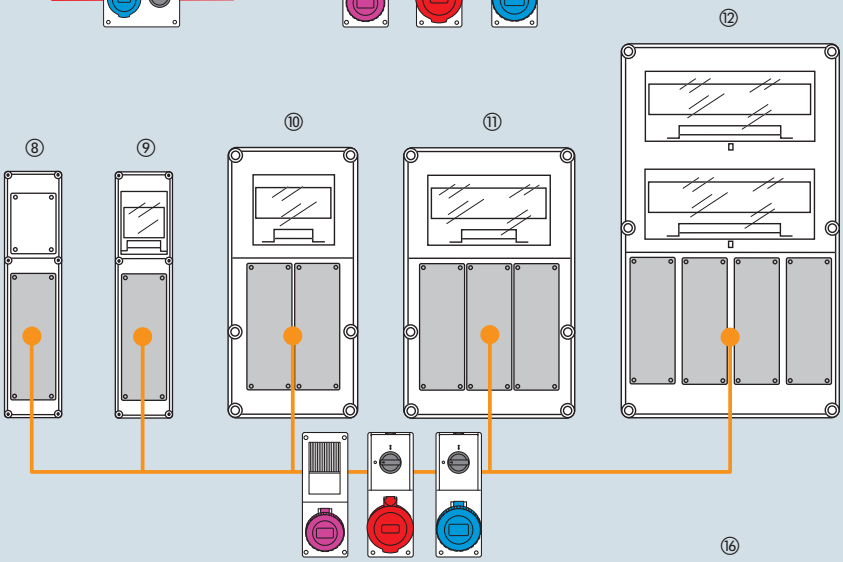
Single boxes with support plate

① **SQC 1114 CS** (see page 14)
② **SQC 923 CS** (see page 14)
③ **FC 1453 TB**



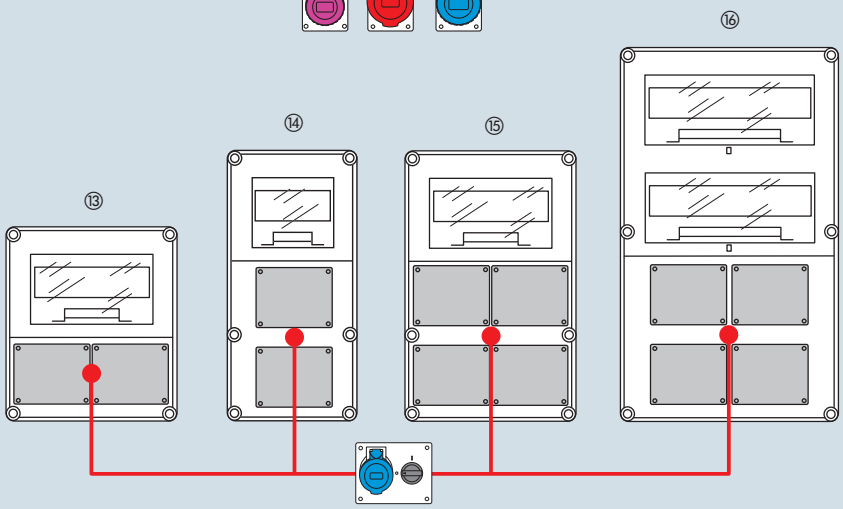
FC series enclosures
(BM and QV types)

④ **FC 2525 BM** (see page 49)
⑤ **FC 2542 BM e FC 2542 BMT** (see page 49)
⑥ **FC 2525 QV** (see page 48)
⑦ **FC 2542 QV and FC 2542 QVT** (see page 48)



FM series enclosures
(SQV and DSQV types)

⑧ **FM 1043 DSQV** (see page 23)
⑨ **FM 1043 SQV** (see page 23)
⑩ **FM 2451 SQV and FM 2451 DSQV** (see page 27)
⑪ **FM 3251 SQV and FM 3251 DSQV** (see page 29)
⑫ **FM 4272 SQV** (see page 31)



FM enclosures
(SQ types)

⑬ **FM 3236 SQ** (see page 25)
⑭ **FM 2451 SQ** (see page 27)
⑮ **FM 3251 SQ** (see page 29)
⑯ **FM 4272 SQ** (see page 31)

SQE - interlocked switched socket-outlets without fuse carrier

- Compliant with standards EN 60309-1, -2 and -4
- Enclosures and inserts in insulating, self-extinguishing thermoplastic material, RAL 7035 grey
- Spring lid colour coded according to rated voltage, simple fastening
- Switch knob lockable in both on/off positions
- Mechanical interlock that prevents: the switch from being turned on without the plug inserted, the plug from being removed while the switch is turned on, and the socket-outlet from being removed from the board when the plug is inserted
- IP44 degree of protection (EN 60529)
- Suitable for mounting on FC, FM, QM, QP and QG enclosures or on SQC 923 CS single boxes
- Provided with fixing screws in galvanized steel
- ⓜ With Italian Quality Mark

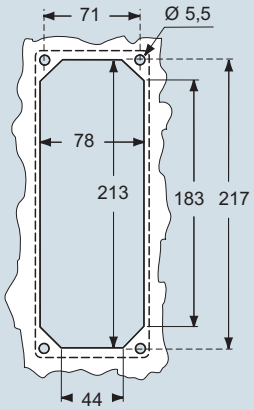
Legend
A.V. = Colour according to voltage
***)** Green may be used together with the colour of the operating range for frequencies above 60 Hz and up to a maximum of 500 Hz

Without box - 16A
IP44 degree of protection

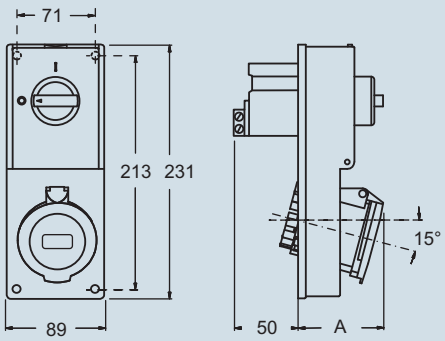
Without box - 32A
IP44 degree of protection

Poles	Frequency Hz	Voltage V	Earthing contact position h	Part No.	Colour	Part No.	Colour
2P+⏚	50 and 60	100 - 130	4	**SQE 1643** ⓜ		**SQE 3243** ⓜ	
	50 and 60	200 - 250	6	**SQE 1663** ⓜ		**SQE 3263** ⓜ	
	50 and 60	380 - 415	9	**SQE 1693** ⓜ		**SQE 3293** ⓜ	
	50 and 60	480 - 500	7	**SQE 1673** ⓜ		**SQE 3273** ⓜ	
	50 and 60	ins. transformer	12	**SQE 16123** ⓜ	A.V.	**SQE 32123** ⓜ	A.V.
	> 300 - 500	> 50	2	**SQE 1623** ⓜ	*)	**SQE 3223** ⓜ	*)
	d.c.	> 50 - 250	3	**SQE 1633**	A.V.		
3P+⏚	50 and 60	100 - 130	4	**SQE 1644** ⓜ		**SQE 3244** ⓜ	
	50 and 60	200 - 250	9	**SQE 1694** ⓜ		**SQE 3294** ⓜ	
	50 and 60	380 - 415	6	**SQE 1664** ⓜ		**SQE 3264** ⓜ	
	60	440 - 460	11	**SQE 16114** ⓜ		**SQE 32114** ⓜ	
	50 and 60	480 - 500	7	**SQE 1674** ⓜ		**SQE 3274** ⓜ	
	50	380	3	**SQE 1634** ⓜ		**SQE 3234** ⓜ	
	60	440	3	**SQE 1634** ⓜ		**SQE 3234** ⓜ	
	100 - 300	> 50	10	**SQE 16104** ⓜ	*)	**SQE 32104** ⓜ	*)
	> 300 - 500	> 50	2	**SQE 1624** ⓜ	*)	**SQE 3224** ⓜ	*)
3P+N+⏚	50 and 60	57/100 - 75/130	4	**SQE 1645** ⓜ		**SQE 3245** ⓜ	
	50 and 60	120/208 - 144/250	9	**SQE 1695** ⓜ		**SQE 3295** ⓜ	
	50 and 60	200/346 - 240/415	6	**SQE 1665** ⓜ		**SQE 3265** ⓜ	
	50 and 60	277/480 - 288/500	7	**SQE 1675** ⓜ		**SQE 3275** ⓜ	
	60	250/440 - 265/460	11	**SQE 16115** ⓜ		**SQE 32115** ⓜ	
	50	220/380	3	**SQE 1635** ⓜ		**SQE 3235** ⓜ	
	60	250/440	3	**SQE 1635** ⓜ		**SQE 3235** ⓜ	
	> 300 - 500	> 50	2	**SQE 1625** ⓜ	*)	**SQE 3225** ⓜ	*)

Panel cut-out in mm
(flush-mounting on panel)

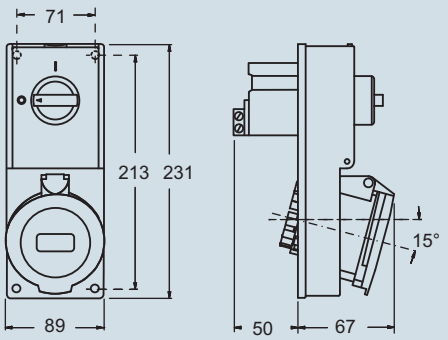


Dimensions in mm



SQE		A
16A	**2P+⏚**	64
	3P+⏚	65
	3P+N+⏚	67

Dimensions in mm



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Dimensions indicated are not binding and may be changed without prior notice.

SQE - interlocked switched socket-outlets without fuse carrier

- Compliant with standards EN 60309-1, -2 and -4
- Enclosures and inserts in insulating, self-extinguishing thermoplastic material, RAL 7035 grey
- Spring lid colour coded according to rated voltage, with bayonet fastening and gasket
- Switch knob lockable in both on/off positions
- Mechanical interlock that prevents: the switch from being turned on without the plug inserted, the plug from being removed while the switch is turned on, and the socket-outlet from being removed from the board when the plug is inserted
- IP55 degree of protection (EN 60529)
- Suitable for mounting on FC, FM, QM, QP and QG enclosures or on SQC 923 CS single boxes
- Provided with fixing screws in stainless steel
- ⓜ With Italian Quality Mark

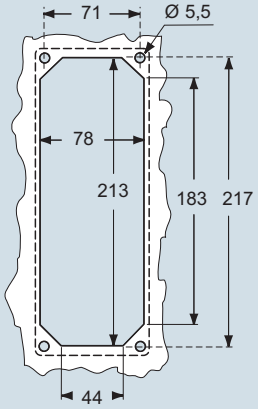
Legend
A.V. = Colour according to voltage
***)** Green may be used together with the colour of the operating range for frequencies above 60 Hz and up to a maximum of 500 Hz

Without box - 16A
IP55 degree of protection

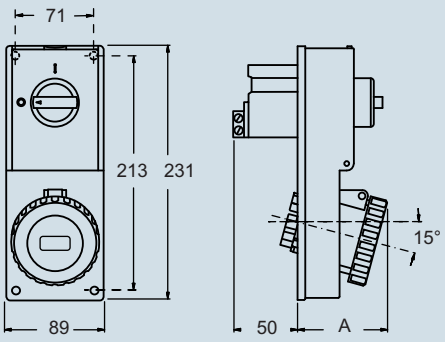
Without box - 32A
IP55 degree of protection

Poles	Frequency Hz	Voltage V	Earthing contact position h	Part No.	Colour	Part No.	Colour
2P+⏚	50 and 60	100 - 130	4	SQE 1643.5 ⓜ		SQE 3243.5 ⓜ	
	50 and 60	200 - 250	6	SQE 1663.5 ⓜ		SQE 3263.5 ⓜ	
	50 and 60	380 - 415	9	SQE 1693.5 ⓜ		SQE 3293.5 ⓜ	
	50 and 60	480 - 500	7	SQE 1673.5 ⓜ		SQE 3273.5 ⓜ	
	50 and 60	ins. transformer	12	SQE 16123.5 ⓜ	A.V.	SQE 32123.5 ⓜ	A.V.
	> 300 - 500	> 50	2	SQE 1623.5 ⓜ	*)	SQE 3223.5 ⓜ	*)
	d.c.	> 50 - 250	3	SQE 1633.5	A.V.		
3P+⏚	50 and 60	100 - 130	4	SQE 1644.5 ⓜ		SQE 3244.5 ⓜ	
	50 and 60	200 - 250	9	SQE 1694.5 ⓜ		SQE 3294.5 ⓜ	
	50 and 60	380 - 415	6	SQE 1664.5 ⓜ		SQE 3264.5 ⓜ	
	60	440 - 460	11	SQE 16114.5 ⓜ		SQE 32114.5 ⓜ	
	50 and 60	480 - 500	7	SQE 1674.5 ⓜ		SQE 3274.5 ⓜ	
	50	380	3	SQE 1634.5 ⓜ		SQE 3234.5 ⓜ	
	60	440	3	SQE 1634.5 ⓜ		SQE 3234.5 ⓜ	
	100 - 300	> 50	10	SQE 16104.5 ⓜ	*)	SQE 32104.5 ⓜ	*)
	> 300 - 500	> 50	2	SQE 1624.5 ⓜ	*)	SQE 3224.5 ⓜ	*)
3P+N+⏚	50 and 60	57/100 - 75/130	4	SQE 1645.5 ⓜ		SQE 3245.5 ⓜ	
	50 and 60	120/208 - 144/250	9	SQE 1695.5 ⓜ		SQE 3295.5 ⓜ	
	50 and 60	200/346 - 240/415	6	SQE 1665.5 ⓜ		SQE 3265.5 ⓜ	
	50 and 60	277/480 - 288/500	7	SQE 1675.5 ⓜ		SQE 3275.5 ⓜ	
	60	250/440 - 265/460	11	SQE 16115.5 ⓜ		SQE 32115.5 ⓜ	
	50	220/380	3	SQE 1635.5 ⓜ		SQE 3235.5 ⓜ	
	60	250/440	3	SQE 1635.5 ⓜ		SQE 3235.5 ⓜ	
	> 300 - 500	> 50	2	SQE 1625.5 ⓜ	*)	SQE 3225.5 ⓜ	*)

Panel cut-out in mm
(flush-mounting on panel)

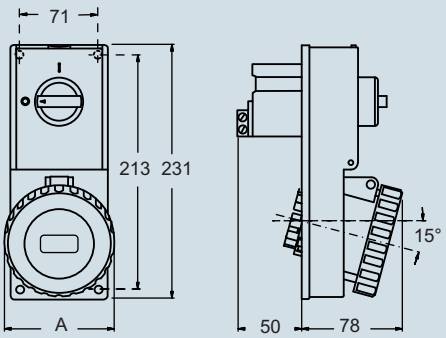


Dimensions in mm



SQE.5		A
16A	2P+⏚	67
	3P+⏚	67
	3P+N+⏚	70

Dimensions in mm



SQE.5		A
32A	2P+⏚	92
	3P+⏚	92
	3P+N+⏚	100

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Dimensions indicated are not binding and may be changed without prior notice.

SQV - interlocked switched socket-outlets with fuse carrier

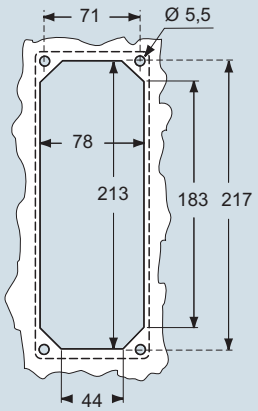
- Compliant with standards EN 60309-1, -2 and -4
- Enclosures and inserts in insulating, self-extinguishing thermoplastic material, RAL 7035 grey
- Spring lid colour coded according to rated voltage, simple fastening
- Switch knob lockable in both on/off positions
- Mechanical interlock that prevents: the switch from being turned on without the plug inserted, the plug from being removed while the switch is turned on, and the socket-outlet from being removed from the board when the plug is inserted
- IP44 degree of protection (EN 60529)
- Fuse carrier for cylindrical cartridges 10 x 38 mm (not included), accessed via a panel that opens only with the switch off
- Suitable for mounting on FC, FM, QM, QP and QG enclosures or on SQC 923 CS single boxes
- Provided with fixing screws in galvanized steel
- ⓜ With Italian Quality Mark

Without box - 16A
IP44 degree of protection

Without box - 32A
IP44 degree of protection

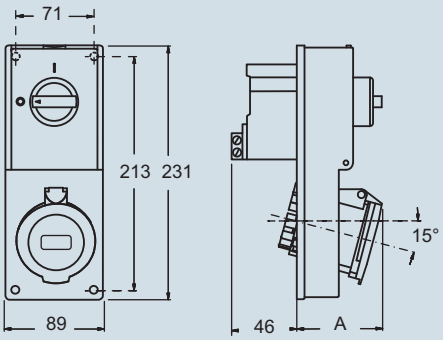
Poles	Frequency Hz	Voltage V	Earthing contact position h	Part No.		Colour	Part No.		Colour
2P+⏚	50 and 60	100 - 130	4	SQV 1643 ⓜ			SQV 3243 ⓜ		
	50 and 60	200 - 250	6	SQV 1663 ⓜ			SQV 3263 ⓜ		
	50 and 60	380 - 415	9	SQV 1693 ⓜ			SQV 3293 ⓜ		
	50 and 60	480 - 500	7	SQV 1673 ⓜ			SQV 3273 ⓜ		
	50 and 60	ins. transformer	12	SQV 16123 ⓜ	A.V.		SQV 32123 ⓜ	A.V.	
	> 300 - 500	> 50	2	SQV 1623 ⓜ	*)		SQV 3223 ⓜ	*)	
	d.c.	> 50 - 250	3						
3P+⏚	50 and 60	100 - 130	4	SQV 1644 ⓜ			SQV 3244 ⓜ		
	50 and 60	200 - 250	9	SQV 1694 ⓜ			SQV 3294 ⓜ		
	50 and 60	380 - 415	6	SQV 1664 ⓜ			SQV 3264 ⓜ		
	60	440 - 460	11	SQV 16114 ⓜ			SQV 32114 ⓜ		
	50 and 60	480 - 500	7	SQV 1674 ⓜ			SQV 3274 ⓜ		
	50	380	3	SQV 1634 ⓜ			SQV 3234 ⓜ		
	60	440	3	SQV 1634 ⓜ			SQV 3234 ⓜ		
	100 - 300	> 50	10	SQV 16104 ⓜ	*)		SQV 32104 ⓜ	*)	
	> 300 - 500	> 50	2	SQV 1624 ⓜ	*)		SQV 3224 ⓜ	*)	
3P+N+⏚	50 and 60	57/100 - 75/130	4	SQV 1645 ⓜ			SQV 3245 ⓜ		
	50 and 60	120/208 - 144/250	9	SQV 1695 ⓜ			SQV 3295 ⓜ		
	50 and 60	200/346 - 240/415	6	SQV 1665 ⓜ			SQV 3265 ⓜ		
	50 and 60	277/480 - 288/500	7	SQV 1675 ⓜ			SQV 3275 ⓜ		
	60	250/440 - 265/460	11	SQV 16115 ⓜ			SQV 32115 ⓜ		
	50	220/380	3	SQV 1635 ⓜ			SQV 3235 ⓜ		
	60	250/440	3	SQV 1635 ⓜ			SQV 3235 ⓜ		
	> 300 - 500	> 50	2	SQV 1625 ⓜ	*)		SQV 3225 ⓜ	*)	

Legend
A.V. = Colour according to voltage
*) Green may be used together with the colour of the operating range for frequencies above 60 Hz and up to a maximum of 500 Hz



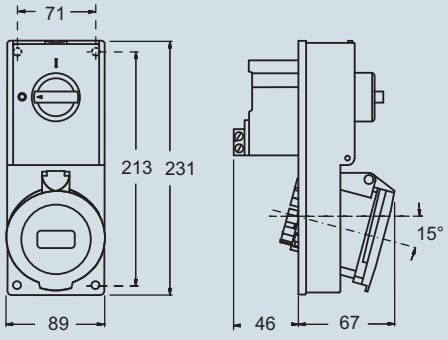
Panel cut-out in mm (flush-mounting on panel)

Dimensions in mm



SQV		A
16A	2P+⏚	64
	3P+⏚	65
	3P+N+⏚	67

Dimensions in mm



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FM 2451 DSQV

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Dimensions indicated are not binding and may be changed without prior notice.

SQV - interlocked switched socket-outlets with fuse carrier

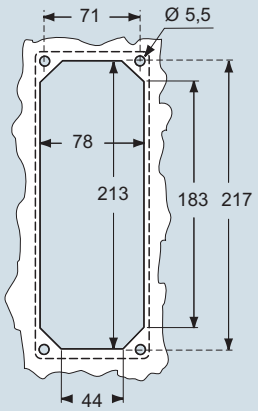
- Compliant with standards EN 60309-1, -2 and -4
- Enclosures and inserts in insulating, self-extinguishing thermoplastic material, RAL 7035 grey
- Spring lid colour coded according to rated voltage, with bayonet fastening and gasket
- Switch knob lockable in both on/off positions
- Mechanical interlock that prevents: the switch from being turned on without the plug inserted, the plug from being removed while the switch is turned on, and the socket-outlet from being removed from the board when the plug is inserted
- IP55 degree of protection (EN 60529)
- Fuse carrier for cylindrical cartridges 10 x 38 mm (not included), accessed via a panel that opens only with the switch off
- Suitable for mounting on FC, FM, QM, QP and QG enclosures or on SQC 923 CS single boxes
- Provided with fixing screws in stainless steel
- ⓜ With Italian Quality Mark

Without box - 16A
IP55 degree of protection

Without box - 32A
IP55 degree of protection

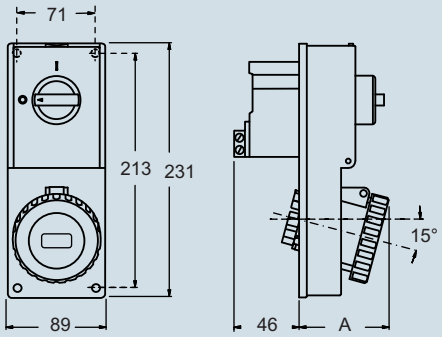
Poles	Frequency Hz	Voltage V	Earthing contact position h	Part No.		Colour	Part No.		Colour
2P+⏚	50 and 60	100 - 130	4	SQV 1643.5 ⓜ			SQV 3243.5 ⓜ		
	50 and 60	200 - 250	6	SQV 1663.5 ⓜ			SQV 3263.5 ⓜ		
	50 and 60	380 - 415	9	SQV 1693.5 ⓜ			SQV 3293.5 ⓜ		
	50 and 60	480 - 500	7	SQV 1673.5 ⓜ			SQV 3273.5 ⓜ		
	50 and 60	ins. transformer	12	SQV 16123.5 ⓜ		A.V.	SQV 32123.5 ⓜ		A.V.
	> 300 - 500	> 50	2	SQV 1623.5 ⓜ		*)	SQV 3223.5 ⓜ		*)
	d.c.	> 50 - 250	3						
3P+⏚	50 and 60	100 - 130	4	SQV 1644.5 ⓜ			SQV 3244.5 ⓜ		
	50 and 60	200 - 250	9	SQV 1694.5 ⓜ			SQV 3294.5 ⓜ		
	50 and 60	380 - 415	6	SQV 1664.5 ⓜ			SQV 3264.5 ⓜ		
	60	440 - 460	11	SQV 16114.5 ⓜ			SQV 32114.5 ⓜ		
	50 and 60	480 - 500	7	SQV 1674.5 ⓜ			SQV 3274.5 ⓜ		
	50	380	3	SQV 1634.5 ⓜ			SQV 3234.5 ⓜ		
	60	440	3	SQV 1634.5 ⓜ			SQV 3234.5 ⓜ		
	100 - 300	> 50	10	SQV 16104.5 ⓜ		*)	SQV 32104.5 ⓜ		*)
	> 300 - 500	> 50	2	SQV 1624.5 ⓜ		*)	SQV 3224.5 ⓜ		*)
3P+N+⏚	50 and 60	57/100 - 75/130	4	SQV 1645.5 ⓜ			SQV 3245.5 ⓜ		
	50 and 60	120/208 - 144/250	9	SQV 1695.5 ⓜ			SQV 3295.5 ⓜ		
	50 and 60	200/346 - 240/415	6	SQV 1665.5 ⓜ			SQV 3265.5 ⓜ		
	50 and 60	277/480 - 288/500	7	SQV 1675.5 ⓜ			SQV 3275.5 ⓜ		
	60	250/440 - 265/460	11	SQV 16115.5 ⓜ			SQV 32115.5 ⓜ		
	50	220/380	3	SQV 1635.5 ⓜ			SQV 3235.5 ⓜ		
	60	250/440	3	SQV 1635.5 ⓜ			SQV 3235.5 ⓜ		
	> 300 - 500	> 50	2	SQV 1625.5 ⓜ		*)	SQV 3225.5 ⓜ		*)

Legend
A.V. = Colour according to voltage
*) Green may be used together with the colour of the operating range for frequencies above 60 Hz and up to a maximum of 500 Hz



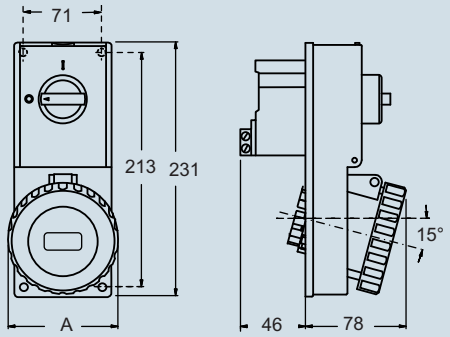
Panel cut-out in mm (flush-mounting on panel)

Dimensions in mm



SQV.5		A
16A	2P+⏚	67
	3P+⏚	67
	3P+N+⏚	70

Dimensions in mm



SQV.5		A
32A	2P+⏚	92
	3P+⏚	92
	3P+N+⏚	100

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Dimensions indicated are not binding and may be changed without prior notice.

SQ - interlocked switched socket-outlets without fuse carrier

- Compliant with standards EN 60309-1, -2 and -4
- Enclosures, inserts and box in insulating, self-extinguishing thermoplastic material, RAL 7035 grey
- Spring lid colour coded according to rated voltage
- Switch knob lockable in both on/off positions
- Mechanical interlock that prevents:
  The plug from being removed when the switch is off
  The socket-outlet from being removed from the board when the plug is inserted
- Degree of protection (EN 60529) IP44
- Suitable for mounting on FC, FM, QM, QP and QG enclosures or on SQC 923 CS single boxes
- Provided with fixing screws in galvanized steel
- ⓜ With Italian Quality Mark

Without box - 16A
IP44 degree of protection

Poles	Frequency Hz	Voltage V	Earthing contact position h	Part No.	Colour
2P+⏚	50 and 60	100 - 130	4	**SQ 1643** ⓜ	
	50 and 60	200 - 250	6	**SQ 1663** ⓜ	
	50 and 60	380 - 415	9	**SQ 1693** ⓜ	
	50 and 60	480 - 500	7	**SQ 1673** ⓜ	
	50 and 60	ins. transformer	12	**SQ 16123** ⓜ	A.V.
	> 300 - 500	> 50	2	**SQ 1623** ⓜ	*)
	d.c.	> 50 - 250	3	**SQ 1633** ⓜ	A.V.
3P+⏚	50 and 60	100 - 130	4	**SQ 1644** ⓜ	
	50 and 60	200 - 250	9	**SQ 1694** ⓜ	
	50 and 60	380 - 415	6	**SQ 1664** ⓜ	
	60	440 - 460	11	**SQ 16114** ⓜ	
	50 and 60	480 - 500	7	**SQ 1674** ⓜ	
	50	380	3	**SQ 1634** ⓜ	
	60	440	3	**SQ 1634** ⓜ	
	100 - 300	> 50	10	**SQ 16104** ⓜ	*)
	> 300 - 500	> 50	2	**SQ 1624** ⓜ	*)
3P+N+⏚	50 and 60	57/100 - 75/130	4	**SQ 1645** ⓜ	
	50 and 60	120/208 - 144/250	9	**SQ 1695** ⓜ	
	50 and 60	200/346 - 240/415	6	**SQ 1665** ⓜ	
	50 and 60	277/480 - 288/500	7	**SQ 1675** ⓜ	
	60	250/440 - 265/460	11	**SQ 16115** ⓜ	
	50	220/380	3	**SQ 1635** ⓜ	
	60	250/440	3	**SQ 1635** ⓜ	
	> 300 - 500	> 50	2	**SQ 1625** ⓜ	*)

Legend

A.V. = Colour according to voltage

***)** Green may be used together with the colour of the operating range for frequencies above 60 Hz and up to a maximum of 500 Hz

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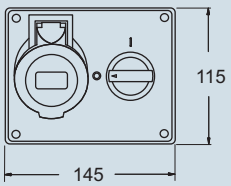
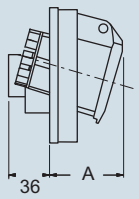
Dimensions indicated are not binding and may be changed without prior notice.

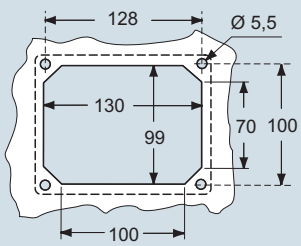
Dimensions in mm





SQ		A
16A	**2P+⏚**	59
	3P+⏚	63
	3P+N+⏚	63

Panel cut-out in mm
(flush-mounting on panel)



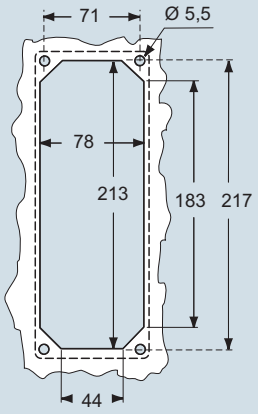
SQT - socket-outlets with safety transformer

- Compliant with standards EN 60309-1, -2 and -4
- Enclosures, inserts and box in insulating, self-extinguishing thermoplastic material, RAL 7035 grey
- Bayonet fastening cover colour coded according to rated voltage
- Toroidal self-protected safety transformer for the supply of Class III portable lighting equipment, compliant with EN 61558-2-9
- Degree of protection (EN 60529) IP55
- Suitable for mounting on FC, FM, QM, QP and QG enclosures or on SQC 923 CS single boxes
- Provided with fixing screws in stainless steel

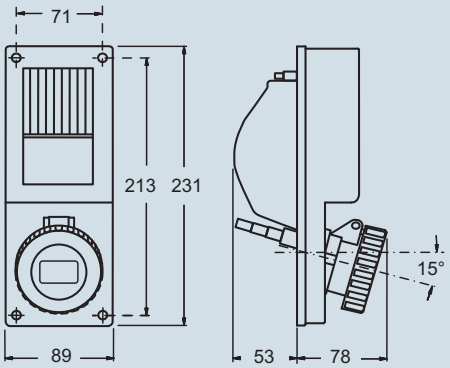
Without box - 16A
IP55 degree of protection

Description	Part No.	Colour
Socket-outlet without box **16A - 2P** - 230/24V ~ - 144VA - Continuous duty	**SQT 16220**	

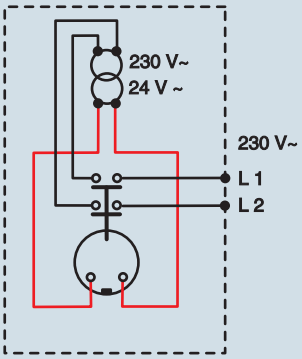
Panel cut-out in mm
(flush-mounting on panel)



Dimensions in mm



Wiring diagram



FM 1043 SQV

FM 1043 DSQV
page 23

FM 2451 DSQV

FM 2451 SQV
page 27

FM 3251 DSQV

FM 3251 SQV
page 29

FM 4272 SQV
page 31


FC 2542 QV
FC 2542 QVT
page 48


FC 2525 QV
page 48

SQC 923 CS
page 14

QM V S2
page 48


QP V - QG V
page 39

SQC 923 CS
page 14

Dimensions indicated are not binding and may be changed without prior notice.

SQC - enclosures for wall-mounting SQ and SQ... socket-outlets

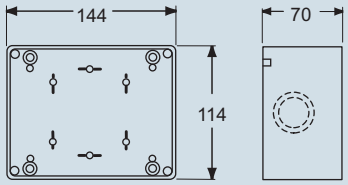
- Box in insulating self-extinguishing thermoplastic material, RAL 7035 grey
- IP55 (EN 60529) or IP44 degree of protection (the degree of protection of the box varies in function of the type of socket-outlet used)

SQC enclosures for wall-mounting SQ socket-outlets

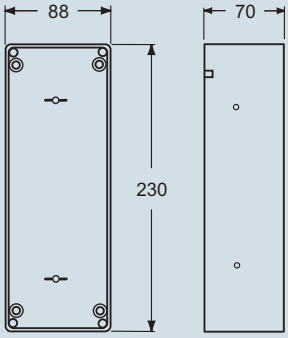
SQC enclosures for wall-mounting SQE, SQV, SQA and SQT socket-outlets

Description	Part No.	Part No.
Enclosure for SQ socket-outlets With: - Pg 21 cable gland, lock nut and gasket	**SQC 1114 CS**	
Enclosure for SQE, SQV, SQA and SQT sockets With: - Pg 21 and Pg 29 pipe glands, gaskets and lock nuts - Sealing plugs		**SQC 923 CS**
Rubber frame for SQC 923 CS enclosures for flush-mounted socket-outlets in niches with non uniform edges or on tiled surfaces		**SQC 923 ME**

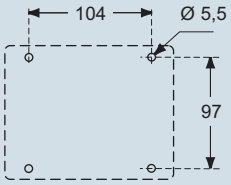
Dimensions in mm



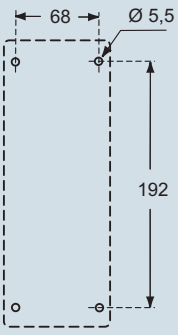
Dimensions in mm



Panel cut-out in mm (wall-mounting)



Panel cut-out in mm (wall-mounting)



Dimensions indicated are not binding and may be changed without prior notice.

General characteristics

This chapter illustrates the technical characteristics of FM enclosures for distribution boards and of ILME industrial socket-outlets for which these enclosures are designed.

It is possible to use SQ interlocked socket-outlets for industrial use (with or without protection devices), simple flush-mounting Pluso socket-outlets (without interlock) and compartments for modular units.

These components enable to configure a wide range of distribution boards suitable to meet all possible installation needs.

FM enclosures for distribution boards offer tested reliability and can be used, in combination with FM socket-outlets for industrial use, as integrated modular systems to configure distribution boards for industrial socket-outlets. Distribution boards with ILME enclosures and socket-outlets can be installed in:

- Industrial applications
- Services applications (commercial, exhibitions, etc.)
- Agricultural and livestock breeding applications
- Residential and similar applications (i.e. common areas of condominiums, cellars, garages, community buildings, kitchens, etc.).

Several covers are available for the base boxes to allow the configuration of enclosures for a wide range of distribution boards, which differ only by type and number of socket-outlets.

SQ and SQV come with covers designed to allow the installation of SQ interlocked socket-outlets for industrial use (SQ, SQV, SQE, SQA and SQT types).

PI, PIN and PQ enclosures come with covers designed for the assembly of Pluso non interlocked socket-outlets for industrial use (PE/PEW..PI/PIF, PE/PEW..PQ/PQF types).

Each compartment has its own cover with gasket that enables future expansion. **CL** enclosures have a lower front smooth cover with a rear alveolated surface designed to simplify the drilling of customized holes for the installation of different socket-outlets or special units like instrumentation.

The upper front section of the covers has one or more compartments for modular units and a **padlockable transparent cover** (except for the small model). These compartments can be used to install modular units (the base module has a size of 17.5 mm x 45 mm, in accordance with DIN 43880, and 53-68-83-98.5 mm projections) with sized **DIN-rail EN 60715 adjustable in height** and back plates, to ensure perfect alignment with the above-mentioned projections.

The **FM 3221** supplementary enclosure, which can be used alone or with medium-sized (FM 3236 types) and large (FM 3251 types) enclosures, is designed to provide additional space for the installation of modular units.

Boards configured with FM enclosures can be wall- or flush-mounted. If fitted with the **accessory handle**, they can also be used as portable units. FM 3236, FM 3251 and FM 2451 types can be fitted with an **edge-masking frame** for flush-mounting on brick walls.

Boards can be wall-mounted internally using the drilling template and the backing plugs to ensure **full insulation** ⧈ in accordance with EN 61439-1 (class. CEI 17-13/1 and EN 61439-4 (class. CEI 17-13/4), or externally using the special **metal brackets** (available on request).

Except for small enclosures, all enclosures have **hinges in insulating material**, which can be fitted on the right or left side. The release device enables to quickly disassemble the enclosure, while the perfect closing of the cover is ensured by the use of **insulating, fast-pitched and retained screws**. The walls of boards have centering guides for multi-diameter drills to ensure the drilling of accurate cable entries or to simplify the connection of several boards.

All enclosures and related parts have an **IMQ** mark (standard CEI 23-48 and CEI 23-49). However, it is useful to remember that the installer is fully responsible for the compliance of the complete configuration of the board with the applicable technical standards, which should be consulted for more detailed information on operating procedures.

FM enclosures can generally be used in environments with high fire hazard (CEI 64-8/7).

Mechanical features

- **Mechanical resistance**
  Verified with the provisions of experimental standard CEI 23-49
- **Degree of protection**
  IP55, according to EN 60529
- **Maximum power that can be dissipated by the cases**
  See **Table 1** (on page 17)
- **Resistance to glow-fire**
  Compliant with IEC 60695-2-11: 850 °C for enclosures
- **Temperature**
  ambient: -25 °C / +40 °C; limit of materials: -40 °C / +125 °C
- **Self-extinguishing capacity** (UL 94 classification)
  94V-2 enclosures

Materials

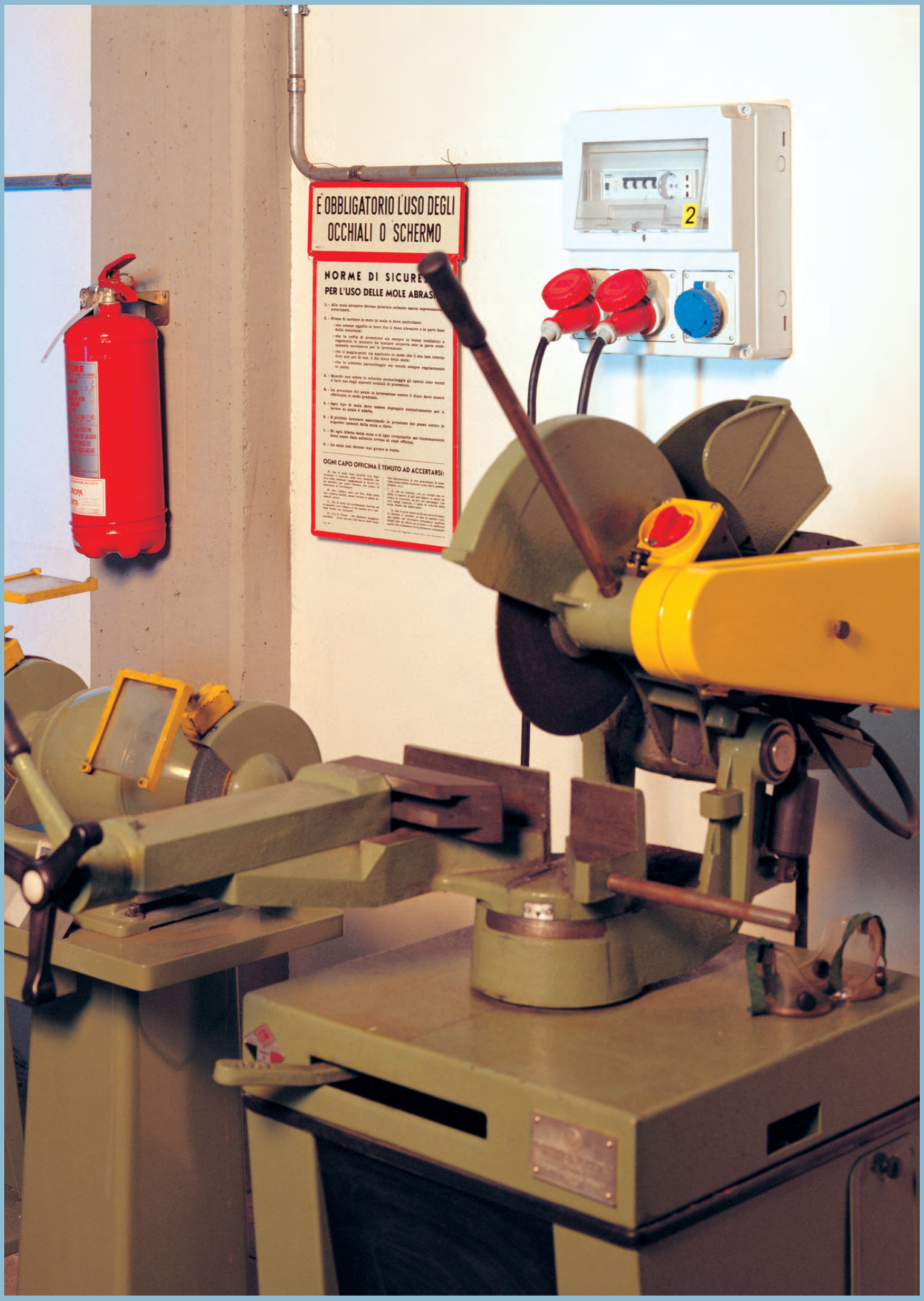
- Enclosures and covers in self-extinguishing thermoplastic resin, RAL 7035 grey
- Fixing screws in synthetic material (except FM1043)
- Anti-aging elastomer gaskets
- Zinc-plated fixing screws for covers

Supply extension

All boards are supplied with:
- Sized DIN-rail EN 60715 RoHS2 conform galvanized, with back plates and fixing screws
- Dividable plates to close unused modular spaces
- Insulated hinges (not available for small boards)
- Blanking plugs to close internal fixing holes

Optional components available on request:
- **for all boards, except small FM 1043 board**
  - Frames for flush-mounting, for FM 2451, FM 3236 and FM 3251 boards
  - Brackets for external wall-mounting
  - Carrying handle
  - Insulated terminal block with several screw clamping devices for neutral and/or ground, in accordance with CEI 23-21, stackable, 3 poles - 25 mm^2 + 10 poles - 10 mm^2
- **for all boards**
  - Covers with gasket and fixing screws
  - Adhesive label for the identification of modular units
  - Cable gland with lock nut, gasket and grommet for tube entry

Accessory socket-outlets
A wide range of socket-outlets can be assembled on FM enclosures:
- Straight and/or inclined flush-mounting socket-outlets
- Interlocked socket-outlets with or without fuse carrier
- Socket-outlets with interlock and magnetothermal circuit breaker (MCBs)
- Socket-outlets with safety transformer for extra-low voltage


È OBBLIGATORIO L'USO DEGLI
OCCHIALI O SCHERMO
NORME DI SICURE
PER L'USO DELLE MOLE ABRASI
OGNI CAPO OFFICINA È TENUTO AD ACCERTARSI:
2

Degree of protection

The degree of protection should be chosen according to installation standard CEI 64-8 (that implements harmonized documents CENELEC HD 60364 and IEC 60364), whose section 7 refers to specific types of installations, such as: construction and demolition sites, structures designed for agricultural or livestock breeding activities, restricted conductor areas, caravans and caravan sites, environments with higher fire hazards, public performance and entertainment areas, pools and fountains, and marinas and harbour areas.
FM enclosures for boards have an IP55 protection class. No further verification is needed if you install enclosures with an IP55 or higher degree of protection and use covers with related gaskets, along with cable glands and pipe glands with an IP55 or higher degree of protection.
All equipment must be installed following state-of-the-art procedures and in compliance with the manufacturer's assembly instructions. If components with varying classes of protections are installed, the protection class of the resulting distribution board corresponds to that of the unit with the lowest degree of protection.

This has been assessed and applies:
- To socket-outlets when a plug with equivalent class is inserted or the cover is closed
- To plugs inserted in socket-outlets with an equivalent protection class.

ILME complementary parts for FM enclosures

ILME supplies the following plugs and socket-outlets for the FM cases:
- Simple non interlocked plugs and socket-outlets for industrial use in two versions with **IP44** and **IP67 degree of protection** (**PE** and **PEW types)**
- Interlocked socket-outlets for industrial use in two versions with **IP44** and **IP55 degree of protection**:
  - With switch-disconnector (**SQ** and **SQE** types)
  - With switch-disconnector and fuses (**SQV** types)
  - With magnetothermal circuit breaker (**SQA** types)
  - With SELV safety transformer (**SQT 16220** types)

Socket-outlets with IP55 degree of protection have a bayonet fastening cover, traditionally defined as "watertight", and must be used with with IP67 plugs (with locking ring and gasket) to guarantee a high protection of the connected equipment (IP55). All enclosures and socket-outlets cover the installation requirements specified in standard CEI 64-8 (series Cenelec HD 60364, IEC 60364).

Protection against indirect contact by total insulation*) ⧈

Article 8.4 of standard EN 61439-1 defines the protective measures against electric shocks that have to be incorporated in the distribution boards. Protection against indirect contacts can be guaranteed only by totally insulating the installation ⧈ which implies complying with the following:

a) The apparatus shall be completely enclosed in insulating material which is equivalent of double or reinforced insulation. The enclosure shall carry the symbol ⧈ which shall be visible from the outside.

b) The enclosure shall at no point be pierced by conducting parts in such a manner that there is the possibility of a fault voltage being brought out of the enclosure. This means that metal parts, such as actuator shafts which for constructional reasons have to be brought through the enclosure, shall be insulated on the inside or the outside of the enclosure from the live parts for the maximum rated insulation voltage and the maximum rated impulse withstand voltage of all circuits in the ASSEMBLY. If an actuator is made of metal (whether covered by insulating material or not), it shall be provided with insulation rated for the maximum rated insulation voltage and the maximum impulse withstand voltage of all circuits in the ASSEMBLY. If an actuator is principally made of insulating material, any of its metal parts which may become accessible in the event of insulation failure shall also be insulated from live parts for the maximum rated insulation voltage and the maximum rated impulse withstand voltage of all circuits in the ASSEMBLY.

c) The enclosure, when the ASSEMBLY is ready for operation and connected to the supply, shall enclose all live parts, exposed conductive parts and parts belonging to a protective circuit in such a manner that they cannot be touched. The enclosure shall give at least the degree of protection IP2XC (see IEC 60529). If a protective conductor, which is extended to electrical equipment connected to the load side of the ASSEMBLY, is to be passed through an ASSEMBLY whose exposed conductive parts are insulated, the necessary terminals for connecting the external protective conductors shall be provided and identified by suitable marking. Inside the enclosure, the protective conductor and its terminal shall be insulated from the live parts and the exposed conductive parts in the same way as the live parts are insulated.

d) Exposed conductive parts within the ASSEMBLY shall not be connected to the protective circuit, i.e. they shall not be included in a protective measure involving the use of a protective circuit. This applies also to built-in apparatus, even if they have a connecting terminal for a protective conductor.

e) If doors or covers of the enclosure can be opened without the use of a key or tool, a barrier of insulating material shall be provided that will afford protection against unintentional contact not only with the accessible live parts, but also with the exposed conductive parts that are only accessible after the cover has been opened; this barrier, however, shall not be removable except with the use of a tool.

The metal screws used for the assembly of boards and covers in the enclosures for FM distribution boards are not connected with the interior of the board. If the units are wall-mounted using the (optional) external brackets or the blanking plugs supplied, FM enclosures compliant with the requirements listed above enable to configure complete assemblies capable of providing protection against indirect contacts.

*) According to sub-clause 413.2.1.1 of standard IEC 60364-4-41, it is equal to that of equipment of class II, see standard IEC 60536.

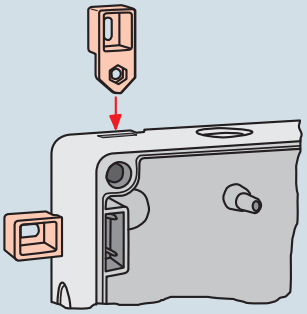


Figure 1 - Example of use of (optional) brackets, which can be mounted vertically or horizontally to externally fix the board to the walls.

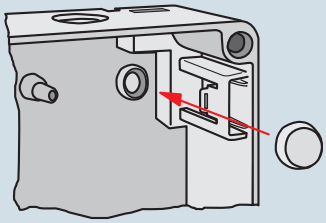


Figure 2 - Example of the use of blanking plugs (supplied) for internal holes and for the internal wall-mounting of boards.

Application of the *experimental* standard CEI 23-51

The maximum power that can be dissipated, P_{inv} , has been verified for each enclosure in the most severe operating conditions using the method described in the experimental standard CEI 23-49. Results are shown in **Table 1**.

Maximum power that can be dissipated in box P_{inv} (CEI 23-49)

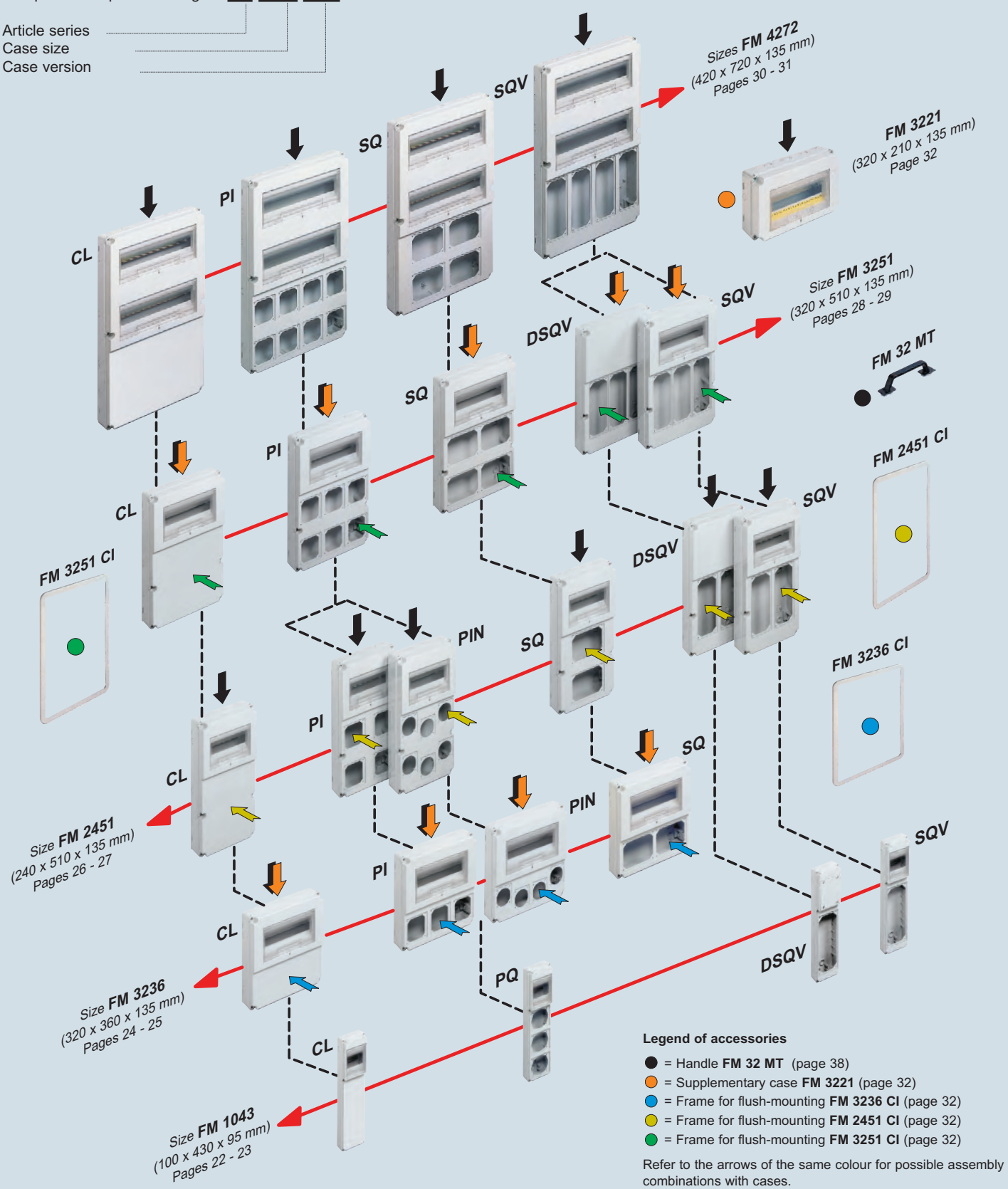
Table 1

Article	Description	Number of units	P_{inv} 1) (W) wall-mounting	P_{inv} 1) (W) flush-mounting
FM 1043 types	100 x 430 x 95 mm box	4 units	9	Not applicable
FM 3236 types	320 x 360 x 135 mm box	12 units	21	27
FM 3221 types	320 x 210 x 135 mm box	12 units	20	Not applicable
FM 2451 types	240 x 510 x 135 mm box	9 units	16	20
FM 3251 types	320 x 510 x 135 mm box	12 units	21	27
FM 4272 types	420 x 720 x 135 mm box	16 units	38	Not applicable

1) Determined for each enclosure size under the most severe load conditions provided for in the standard.

Composition of part no.: e.g. **FM 4272 SQV**

Article series
Case size
Case version



Legend of accessories

- = Handle **FM 32 MT** (page 38)
- = Supplementary case **FM 3221** (page 32)
- = Frame for flush-mounting **FM 3236 CI** (page 32)
- = Frame for flush-mounting **FM 2451 CI** (page 32)
- = Frame for flush-mounting **FM 3251 CI** (page 32)

Refer to the arrows of the same colour for possible assembly combinations with cases.

FM cases - versions

CL	= With smooth front, alveolated rear and compartment for modular devices with door
PI, PIN, PQ	= With compartments for simple socket-outlets and compartment for modular devices with door
SQ	= With compartments for interlocked sockets and compartment for modular devices with door
SQV	= With compartments for interlocked sockets and/or socket-outlets with safety transformer and compartment for modular devices with door
DSQV	= With compartments for interlocked socket-outlets and/or socket-outlets with safety transformer and compartment for connections and/or shunts

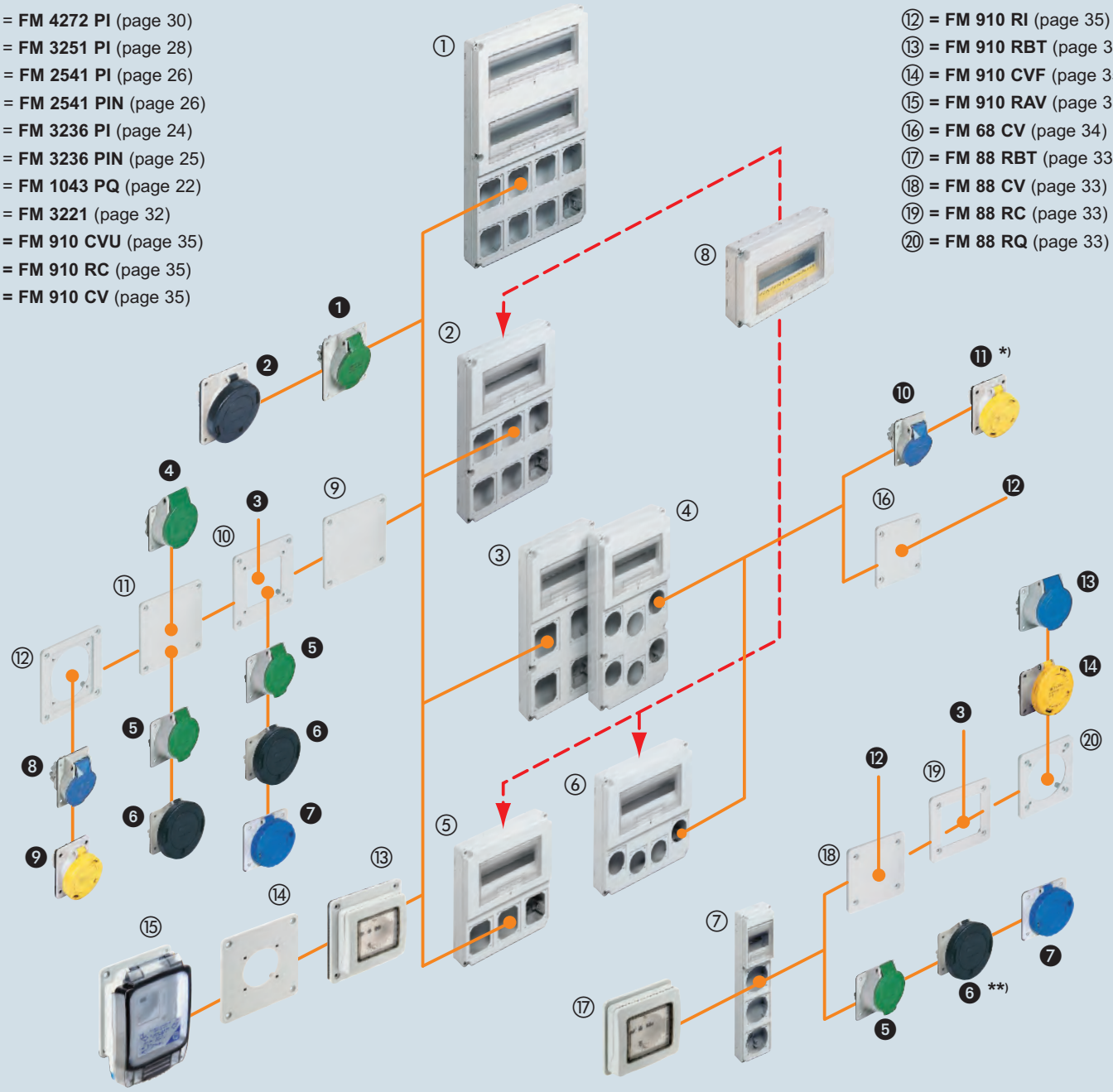
Overview of FM accessories for PI, PIN and PQ cases

Compartment covers

① = **FM 4272 PI** (page 30)
② = **FM 3251 PI** (page 28)
③ = **FM 2541 PI** (page 26)
④ = **FM 2541 PIN** (page 26)
⑤ = **FM 3236 PI** (page 24)
⑥ = **FM 3236 PIN** (page 25)
⑦ = **FM 1043 PQ** (page 22)
⑧ = **FM 3221** (page 32)
⑨ = **FM 910 CVU** (page 35)
⑩ = **FM 910 RC** (page 35)
⑪ = **FM 910 CV** (page 35)

FM series cases

⑫ = **FM 910 RI** (page 35)
⑬ = **FM 910 RBT** (page 35)
⑭ = **FM 910 CVF** (page 35)
⑮ = **FM 910 RAV** (page 35)
⑯ = **FM 68 CV** (page 34)
⑰ = **FM 88 RBT** (page 33)
⑱ = **FM 88 CV** (page 33)
⑲ = **FM 88 RC** (page 33)
⑳ = **FM 88 RQ** (page 33)



Complementary parts

ref.	Type	With fixing distance between centres (mm)	Field of application	Part No.	Rated current	Degree of protection	Catalogue index
❶	Inclined socket-outlets	77 x 85 Ⓑ	Low voltage	**PE...PIF/PI** types	16A and 32A	IP44	Page 42-43
❷	Inclined socket-outlets	77 x 85 Ⓑ	Low voltage	**PEW...PIF/PI** types	16A and 32A	IP67	Page 43
❸	Domestic appliance carrier	60 x 60 Ⓓ	Low voltage	***GW 27401 and BT CQ 25502*** *type*	---	---	---
❹	Straight outlet-sockets	45 x 45 Ⓔ	Extra-low voltage	**PB...PI** types	16A and 32A	IP44	Page 41
❺	Straight outlet-sockets	60 x 60 Ⓓ	Low voltage	**PE...PQF/PQ** types	16A and 32A	IP44	Page 44-45
❻	Straight outlet-sockets	60 x 60 Ⓓ	Low voltage	**PEW...PQF/PQ** types	16A and 32A	IP67	Page 45
❼	Straight socket-outlets	60 x 60 Ⓓ	Low voltage	**PEW 216 PQF** types	10/16A	IP67	Page 41
❽	Inclined socket-outlets	52 x 60 Ⓐ	Low voltage	**PE...PI types**	16A and 32A	IP44	Page 42
❾	Inclined socket-outlets	52 x 60 Ⓐ	Low voltage	**PEW...PI** types	16A and 32A	IP67	Page 43
❿	Inclined socket-outlets	52 x 60 Ⓐ	Low voltage	**PE...PI** types	16A	IP44	Page 42
⓫	Inclined socket-outlets	52 x 60 Ⓐ	Low voltage	**PEW...PI** types	16A	IP67	Page 43
⓬	Straight socket-outlets	38 x 38 -	Low voltage	**Schuko**® type (compact)	10/16A	IP44	---
⓭	Straight socket-outlets	52 x 52 Ⓒ	Low voltage	**PE...PQ** types	16A	IP44	Page 44
⓮	Straight socket-outlets	52 x 52 Ⓒ	Low voltage	**PEW...PQ** types	16A	IP67	Page 45

***)** Two 16A socket-outlets, 3P+⏚, IP67, cannot be mounted side by side.
****)** Two 32A socket-outlets, 3P+N+⏚, IP67, cannot be mounted side by side.

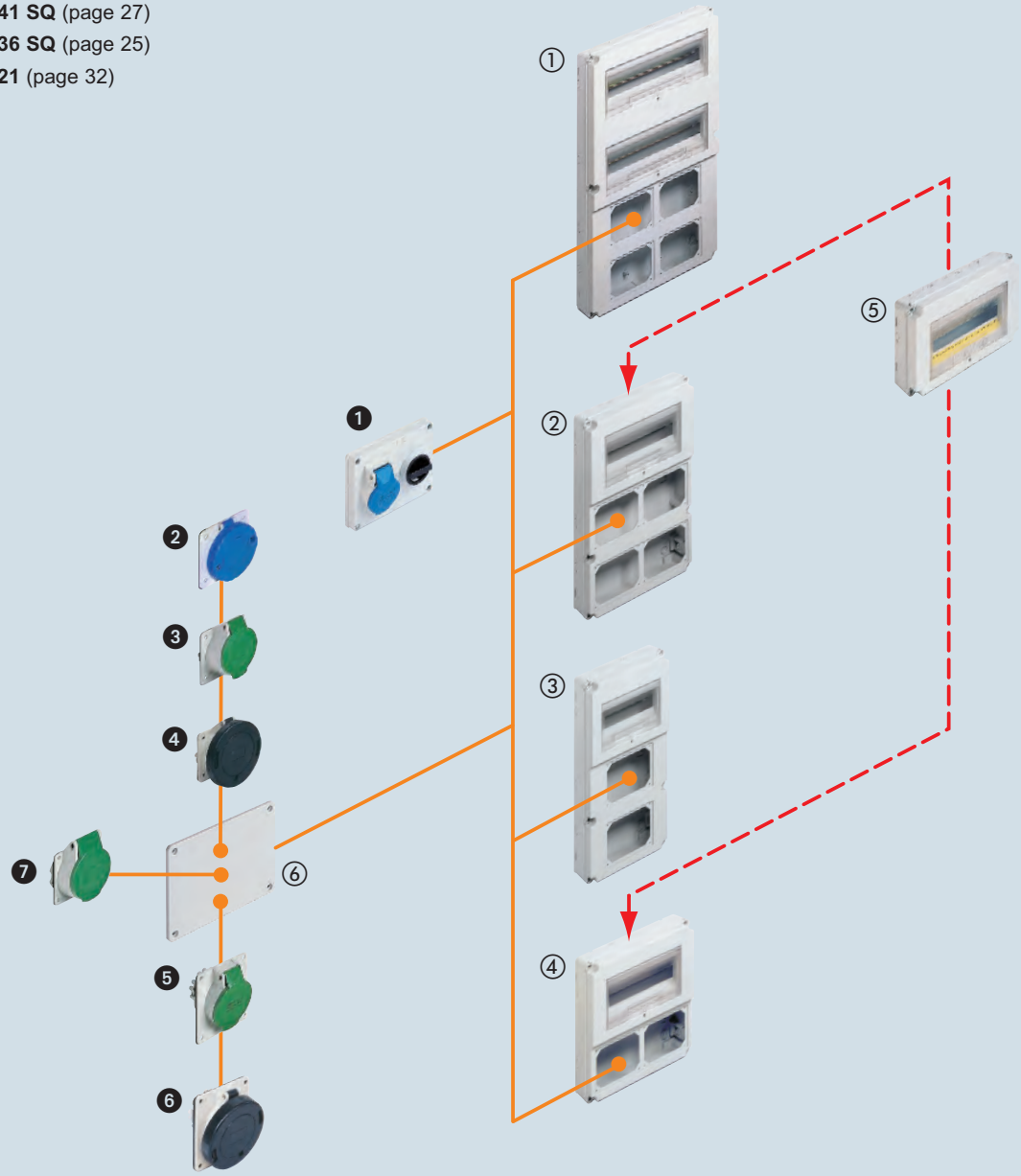
FM accessories for SQ cases

FM series cases

① = **FM 4272 SQ** (page 31)
② = **FM 3251 SQ** (page 29)
③ = **FM 2541 SQ** (page 27)
④ = **FM 3236 SQ** (page 25)
⑤ = **FM 3221** (page 32)

Compartment covers

⑥ = **FM 1114 CV** (page 36)



Complementary parts

ref.	Type	Field of application	Part No.	Rated current	Degree of protection	Catalogue index
❶	Interlocked socket-outlets Without fuse carrier	Low voltage	**SQ** types	16A	IP44	Page 21

ref.	Type	With fixing distance between centres (mm)	Field of application	Part No.	Rated current	Degree of protection	Catalogue index
❷	Straight socket-outlets	60 x 60 Ⓓ	Low voltage	**PEW 216 PQF** type	10/16A	IP67	Page 41
❸	Straight outlet-sockets	60 x 60 Ⓓ	Low voltage	**PE...PQF/PQ** types	16A and 32A	IP44	Page 44-45
❹	Straight outlet-sockets	60 x 60 Ⓓ	Low voltage	**PEW...PQF/PQ** types	16A and 32A	IP67	Page 45
❺	Inclined socket-outlets	77 x 85 Ⓑ	Low voltage	**PE...PIF/PI** types	16A and 32A	IP44	Page 42-43
❻	Inclined socket-outlets	77 x 85 Ⓑ	Low voltage	**PEW...PIF/PI** types	16A and 32A	IP67	Page 43
❼	Straight outlet-sockets	45 x 45 Ⓔ	Extra-low voltage	**PB...PI** types	16A and 32A	IP44	Page 41

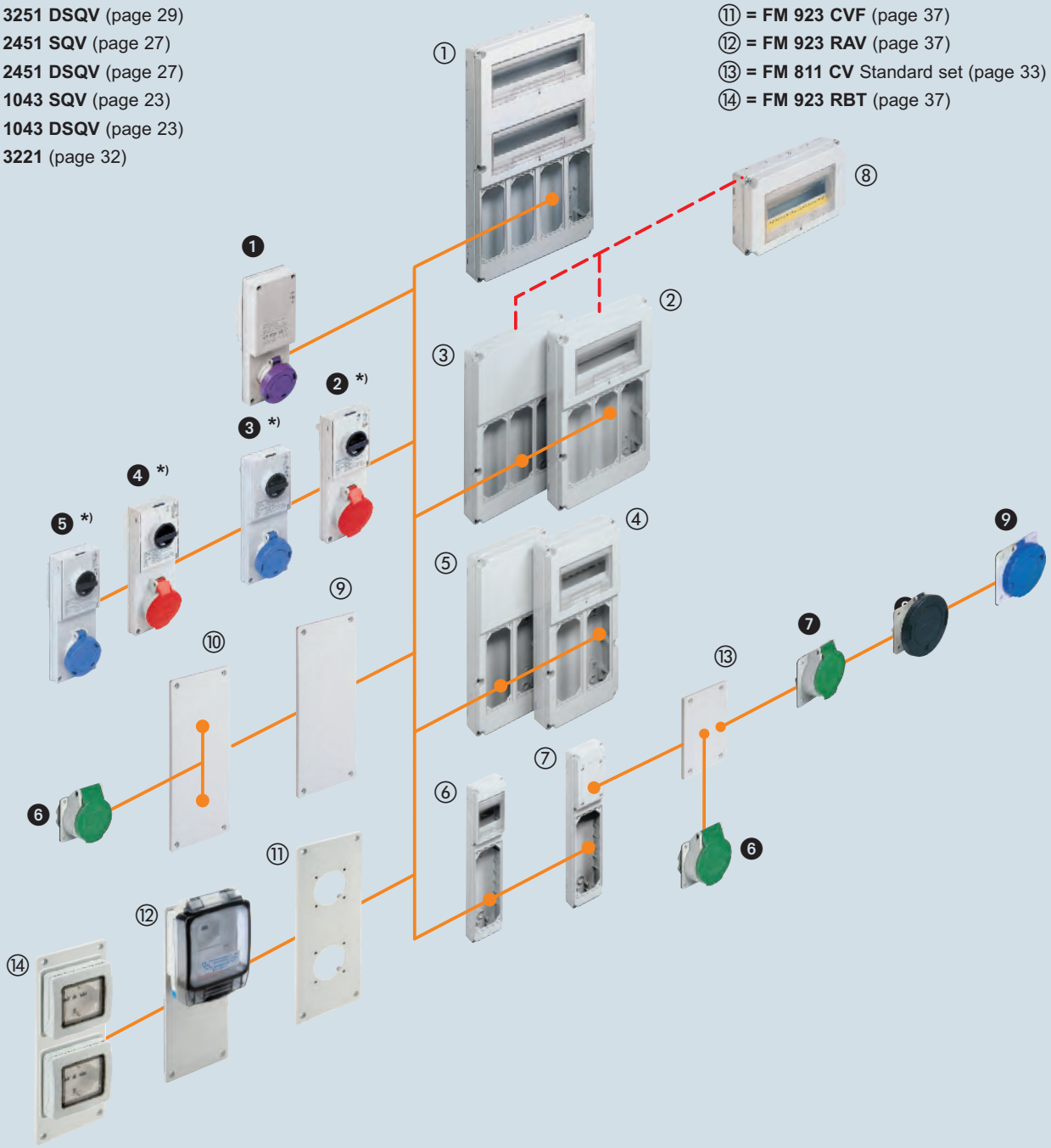
FM accessories for SQV and DSQV cases

FM series cases

① = **FM 4272 SQV** (page 31)
② = **FM 3251 SQV** (page 29)
③ = **FM 3251 DSQV** (page 29)
④ = **FM 2451 SQV** (page 27)
⑤ = **FM 2451 DSQV** (page 27)
⑥ = **FM 1043 SQV** (page 23)
⑦ = **FM 1043 DSQV** (page 23)
⑧ = **FM 3221** (page 32)

Compartment covers

⑨ = **FM 923 CVU** (page 37)
⑩ = **FM 923 CV** (page 37)
⑪ = **FM 923 CVF** (page 37)
⑫ = **FM 923 RAV** (page 37)
⑬ = **FM 811 CV** Standard set (page 33)
⑭ = **FM 923 RBT** (page 37)



Complementary parts

ref.	Type interlocked socket-outlets	Field of application	Part No.	Rated current	Degree of protection	Catalogue index
❶	With safety transformer	Extra-low voltage	**SQT 16220** type	16A	IP55	Page 13
❷	Without fuse carrier	Low voltage	**SQE** types	16A and 32A	IP44	Page 8
❸	Without fuse carrier	Low voltage	**SQE .5** types	16A and 32A	IP55	Page 9
❹	With fuse carrier	Low voltage	**SQV** types	16A and 32A	IP44	Page 10
❺	With fuse carrier	Low voltage	**SQV .5** types	16A and 32A	IP55	Page 11

*) 32A socket-outlets, IP55, cannot be mounted side by side.

ref.	Type	With fixing between centres (mm)	Field of application	Part No.	Rated current	Degree of protection	Catalogue index
❻	Straight socket-outlets	45 x 45 Ⓔ	Extra-low voltage	**PB...PI** types	16A	IP44	Page 41
❼	Straight socket-outlets	60 x 60 Ⓓ	Low voltage	**PE...PQF/PQ** types	16A and 32A	IP44	Page 43-44
❽	Straight socket-outlets	60 x 60 Ⓓ	Low voltage	**PEW...PQF/PQ** types	16A and 32A	IP67	Page 44
❾	Straight socket-outlets	60 x 60 Ⓓ	Low voltage	**PEW 216 PQF** type	10/16A	IP67	Page 41

FM distribution box systems

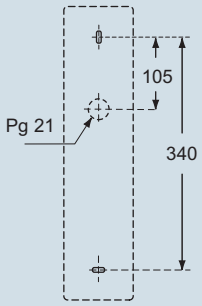
- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian experimental standard CEI 23-49
- Enable to configure boards with total insulation ⧈ (CEI 64-8), suitable for installation in areas exposed to high fire hazards
- Made in self-extinguishing thermoplastic resin, RAL 7035 grey
- For wall- or flush-mounting
- Covers fixed in place with screws
- Compartment for modules with transparent inspection door
- Boards are supplied with sized DIN-rail EN 60715 and closing hardware
- IP55 degree of protection (EN 60529)
- ⓜ With Italian Quality Mark (CEI 23-48 and CEI 23-49)

CL enclosure
size 100 x 430 x 95

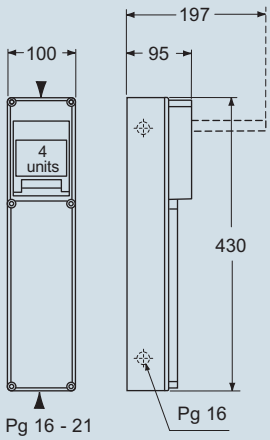
PQ enclosure
size 100 x 430 x 95

Description	Part No.	Part No.
Box system with smooth lid, alveolated on the rear - Compartment for modular equipment (4 units)	**FM 1043 CL** ⓜ	
Box for straight flush-mounting socket-outlets - With compartment for modular equipment (4 units) - With three compartments (81 x 85 mm) for PQF-PQ socket-outlets or for FM 88 CV/RC/RQ covers (page 31)		**FM 1043 PQ** ⓜ

Panel cut-out in mm

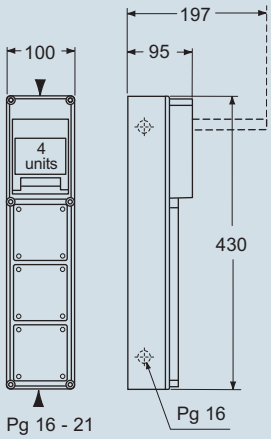


Dimensions in mm



▲ = Cable entry (diameter Pg)

Dimensions in mm



▲ = Cable entry (diameter Pg)

These box systems are suitable for:

Three straight flush-mounting socket-outlets, 16A and 32A, IP44 and IP67
- PQ type with 52 x 52 mm fixing distance between centers + optional FM 88 RQ cover (see page 44-45)
- PQF-PQ with 60 x 60 mm fixing distance between centres (see page 44-45)
- PEW 216 PQF type with 60 x 60 mm fixing distance between centres (see page 41)
- Reduction for domestic use with FM 88 RC cover + BT CQ 25502 cover or GW 27401 cover

N.B.
Two 32A socket-outlets, 3P+N+⏚, IP67 cannot be mounted side by side

Dimensions indicated are not binding and may be changed without prior notice.

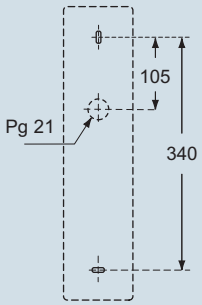
- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian experimental standard CEI 23-49
- Enable to configure boards with total insulation ⧈ (CEI 64-8), suitable for installation in areas exposed to high fire hazards
- Made in self-extinguishing thermoplastic resin, RAL 7035 grey
- For wall- or flush-mounting
- Covers fixed in place with screws
- Compartment for modules with transparent inspection door
- Boards are supplied with sized DIN-rail EN 60715 and closing hardware
- IP55 degree of protection (EN 60529)
- ⓜ With Italian Quality Mark (CEI 23-48 and CEI 23-49)

SQ enclosure
size 100 x 430 x 95

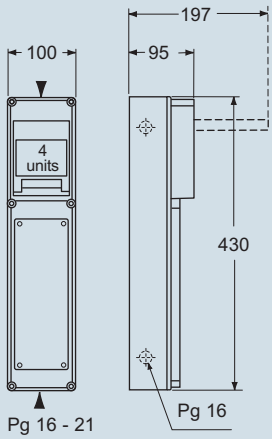
DSQV enclosure
size 100 x 430 x 95

Description	Part No.	Part No.
Box system for interlocked socket-outlet - With compartment for modular equipment (4 units) - With compartment (88 x 230 mm) for SQE-SQV-SQA-SQT socket-outlets or FM 923 CVU or FM 923 CV covers (see page 35)	**FM 1043 SQV** ⓜ	
Box system for interlocked switched socket - With compartment for shunts and connections - With compartment for FM 811 CV cover (see page 33) - With compartment (88 x 230 mm) for SQE-SQV-SQA-SQT socket-outlets or FM 923 CVU or FM 923 CV covers (see page 35)		**FM 1043 DSQV** ⓜ

Panel cut-out in mm



Dimensions in mm



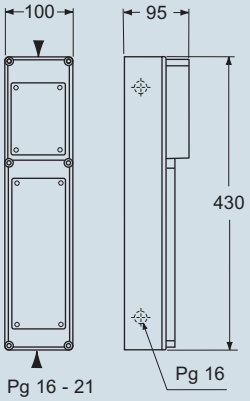
▲ = Cable entry (diameter Pg)

These box systems are suitable for:

One interlocked socket-outlet,
16A and 32A, IP44 and IP55
- Without fuse carrier, SQE type (see pages 8-9)
- With fuse carrier, SQV type (see pages 10-11)

One SELV 16A socket-outlet, 2P, IP55 with safety transformer
- SQT type (see page 12)

Dimensions in mm



▲ = Cable entry (diameter Pg)

These box systems are suitable for:

One interlocked socket-outlet,
16A and 32A, IP44 and IP55
- Without fuse carrier, SQE type (see pages 8-9)
- With fuse carrier, SQV type (see pages 10-11)

One SELV 16A socket-outlet, 2P, IP55 with safety transformer
- SQT type (see page 12)

Dimensions indicated are not binding and may be changed without prior notice.

FM distribution box systems

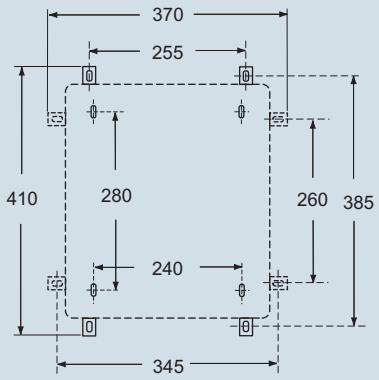
- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian experimental standard CEI 23-49
- Enable to configure boards with total insulation ⧈ (CEI 64-8), suitable for installation in areas exposed to high fire hazards
- Made in self-extinguishing thermoplastic resin, RAL 7035 grey
- For wall- or flush-mounting
- Special handle for transportation (optional)
- Hinged insulating covers designed to be assembled on any of the vertical walls
- Compartment for modular units with padlocked transparent inspection panel
- Boards are supplied with sized DIN-rail EN 60715, back plates, closing plates, hinged cover and fixing/closing hardware (PI), closing hardware (CL)
- IP55 degree of protection (EN 60529)
- ⓜ With Italian Quality Mark (CEI 23-48 and CEI 23-49)

CL enclosure
size 320 x 360 x 135

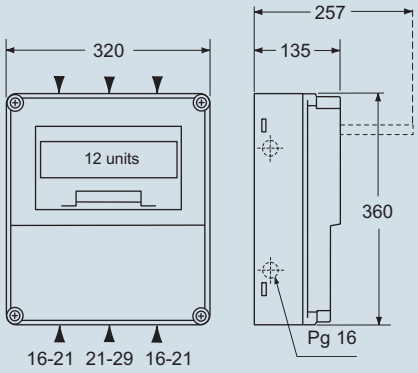
PI enclosure
size 320 x 360 x 135

Description	Part No.	Part No.
Box system with lid, smooth on the front and alveolated on the rear - With one room for modular equipment (12 units)	**FM 3236 CL** ⓜ	
Box system for inclined flush-mounting sockets - With one room for modular equipment (12 units) - With three rooms (92 x 102 mm) for PIF-PI sockets or FM 910 CVU/RC/CV/RI covers (see page 33)		**FM 3236 PI** ⓜ

Panel cut-out in mm

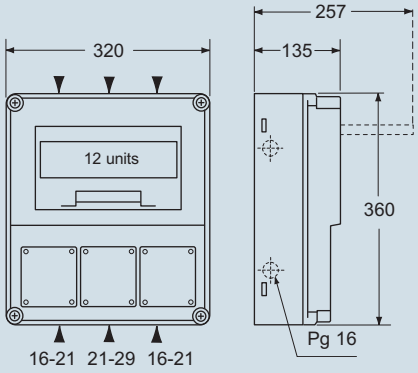


Dimensions in mm



▲ = Cable entry (diameter Pg)

Dimensions in mm



▲ = Cable entry (diameter Pg)

These box systems are suitable for:

Three flush-mounting inclined socket-outlets, 16A and 32A, IP44 and IP67
- PI type with 52 x 60 mm fixing distance between centres + optional FM 910 RI cover
- PIF-PI type with 77 x 85 mm fixing distance between centres
- Reduction for domestic use with FM 910 RC cover + BT CQ 25502 cover or GW 27401 cover (see page 42-43)

Dimensions indicated are not binding and may be changed without prior notice.

FM distribution box systems

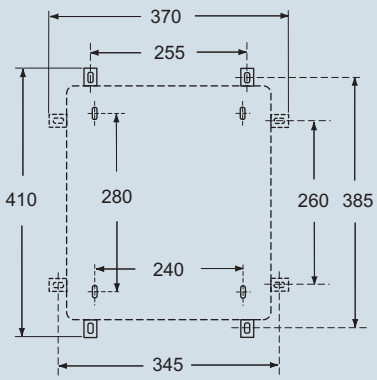
- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian experimental standard CEI 23-49
- Enable to configure boards with total insulation ⧈ (CEI 64-8), suitable for installation in areas exposed to high fire hazards
- Made in self-extinguishing thermoplastic resin, RAL 7035 grey
- For wall- or flush-mounting
- Special handle for transportation (optional)
- Hinged insulating covers designed to be assembled on any of the vertical walls
- Compartment for modular units with padlocked transparent inspection panel
- Boards are supplied with sized DIN-rail EN 60715, back plates, closing plates, hinged cover and fixing/closing hardware (PIN), closing hardware (SQ)
- IP55 degree of protection (EN 60529)
- ⓜ With Italian Quality Mark (CEI 23-48 and CEI 23-49)

PIN enclosure
size 320 x 360 x 135

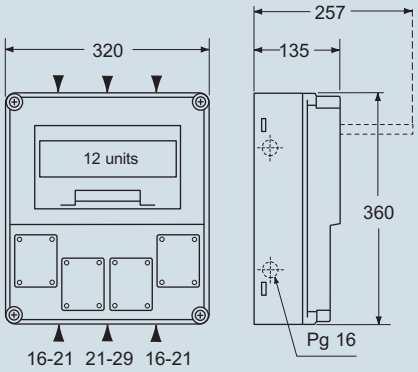
SQ enclosure
size 320 x 360 x 135

Description	Part No.	Part No.
Box system for inclined flush-mounting sockets - With compartment for modular equipment (12 units) - With four compartments (64 x 82 mm) for PI socket-outlets or FM 68 CV covers (see page 32)	**FM 3236 PIN** ⓜ	
Box system for interlocked switched socket-outlets - With compartment for modular equipment (12 units) - With two compartments (115 x 144 mm) for SQ socket-outlets or FM 1114 CV covers (see page 34)		**FM 3236 SQ** ⓜ

Panel cut-out in mm



Dimensions in mm



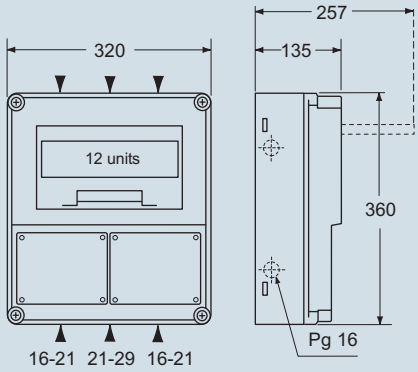
▲ = Cable entry (diameter Pg)

These box systems are suitable for:

Four inclined flush-mounting socket-outlets, 16A, IP44 and IP67
- PI type with 52 x 60 mm fixing distance between centres (see page 42-43)

N.B.
Two 16A socket-outlets, 3P+⏚, IP67 cannot be mounted side by side

Dimensions in mm



▲ = Cable entry (diameter Pg)

These box systems are suitable for:

Two interlocked switched socket-outlets, 16A, IP44
- Without fuse carrier, SQ type (see page 12)

Dimensions indicated are not binding and may be changed without prior notice.

FM distribution box systems

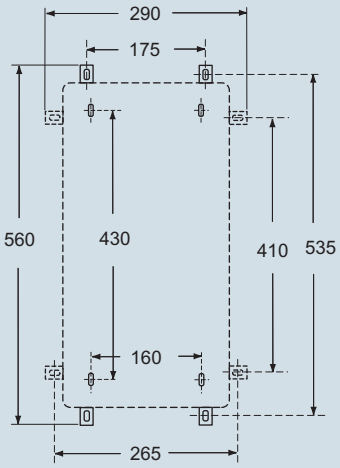
- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian experimental standard CEI 23-49
- Enable to configure boards with total insulation ⧈ (CEI 64-8), suitable for installation in areas exposed to high fire hazards
- Made in self-extinguishing thermoplastic resin, RAL 7035 grey
- For wall- or flush-mounting
- Special handle for transportation (optional)
- Hinged insulating covers designed to be assembled on any of the vertical walls
- Compartment for modular units with padlocked transparent inspection door
- Boards are supplied with sized DIN-rail EN 60715 with back plates, closing plates, hinged covers and fixing/closing hardware (PI-PIN), closing hardware (CL)
- IP55 degree of protection (EN 60529)
- ⓜ With Italian Quality Mark (CEI 23-48 and CEI 23-49)

CL enclosure
size 240 x 510 x 135

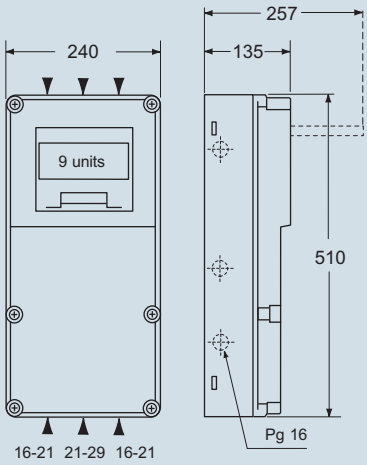
PI enclosure
size 240 x 510 x 135

Description	Part No.	Part No.
Box system with smooth cover, alveolated on the rear - Wtih compartment for modular devices (9 units)	**FM 2451 CL** ⓜ	
Box system for inclined flush-mounting sockets - With 1 compartment for modular devices (9 units) - With 4 compartments (92 x 102 mm) for PIF-PI sockets or FM 910 CVU/RC/CV/RI cover (see page 33)		**FM 2451 PI** ⓜ
Box system for inclined flush-mounting sockets - With 1 compartment for modular devices (9 units) - With 6 compartments (64 x 82 mm) for PI sockets or FM 68 CV covers (see page 32)		**FM 2451 PIN** ⓜ

Panel cut-out in mm



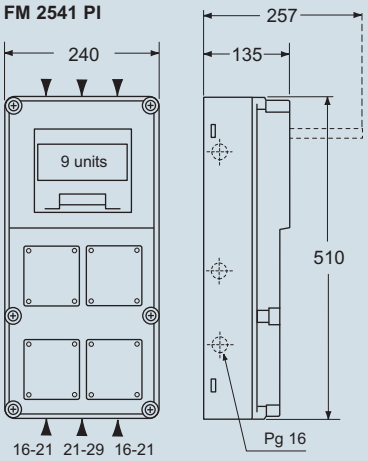
Dimensions in mm



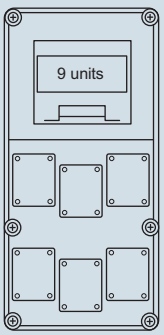
▲ = Cable entry (diameter Pg)

Dimensions in mm

FM 2541 PI



FM 2451 PIN



▲ = Cable entry (diameter Pg)

▲ = Cable entry (diameter Pg)

These box systems are suitable for:

- **FM 2451 PI** type - Four inclined flush-mounting socket-outlets, 16A and 32A, IP44 and IP67; PIF-PI type 77 x 85 mm fixing distance between centres (see page 42-43)
- Reduction for domestic use with FM 88 RC cover + BT CQ 25502 cover or GW 27401 cover
- **FM 2451 PIN** type - Six inclined flush-mounting socket-outlets, 16A, IP44 and IP67; PI type 52 x 60 mm fixing distance between centres (see page 42-43)

Dimensions indicated are not binding and may be changed without prior notice.

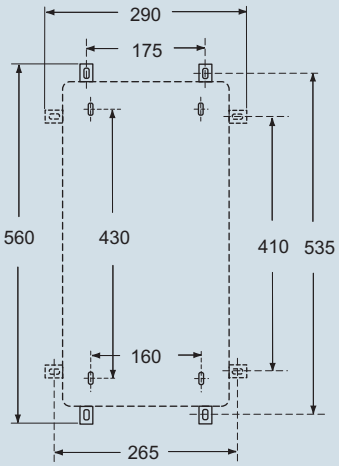
- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian experimental standard CEI 23-49
- Enable to configure boards with total insulation ⧈ (CEI 64-8), suitable for installation in areas exposed to high fire hazards
- Made in self-extinguishing thermoplastic resin, RAL 7035 grey
- For wall- or flush-mounting
- Special handle for transportation (optional)
- Hinged insulating covers designed to be assembled on any of the vertical walls
- Compartment for modular units with padlocked transparent inspection door
- Boards are supplied with sized DIN-rail EN 60715, back plates, closing plates, hinged covers and closing hardware
- IP55 degree of protection (EN 60529)
- ⓜ With Italian Quality Mark (CEI 23-48 and CEI 23-49)

SQ enclosure
size 240 x 510 x 135

SQV and DSQV enclosures
size 240 x 510 x 135

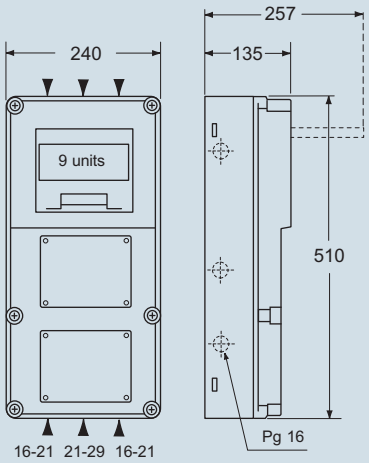
Description	Part No.	Part No.
Box system for interlocked switched sockets - Wtih compartment for modular devices (9 units) - With 2 compartments (115 x 144 mm) for SQ socket-outlets or FM 1114 CV covers (see page 34)	**FM 2451 SQ** ⓜ	
Box system for interlocked switched sockets - With 1 compartment for modular devices (9 units) - With 2 compartments (88 x 230 mm) for SQE-SQV-SQA-SQT socket-outlets or FM 923 CVU or FM 923 CV covers (see page 35)		**FM 2451 SQV** ⓜ
Box system for interlocked switched sockets - With 1 compartment for connections and shunts - With 2 compartments (88 x 230 mm) for SQE-SQV-SQA-SQT socket-outlets or FM 923 CVU or FM 923 CV covers (see page 35)		**FM 2451 DSQV** ⓜ

Panel cut-out in mm



Dimensions indicated are not binding and may be changed without prior notice.

Dimensions in mm

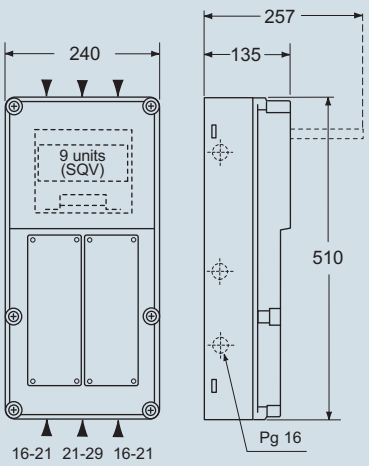


▲ = Cable entry (diameter Pg)

These box systems are suitable for:

Two interlocked switched socket-outlets, 16A, IP44
- Without fuse carrier, SQ type (see page 12)

Dimensions in mm



▲ = Cable entry (diameter Pg)

These box systems are suitable for:

Two interlocked switched socket-outlets, 16A and 32A, IP44 and IP55
- Without fuse carrier, SQE type (see pages 8-9)
- With fuse carrier, SQV type (see pages 10-11)

One SELV 16A socket-outlet, 2P, IP55 with safety transformer
- SQT type (see page 12)

FM distribution box systems

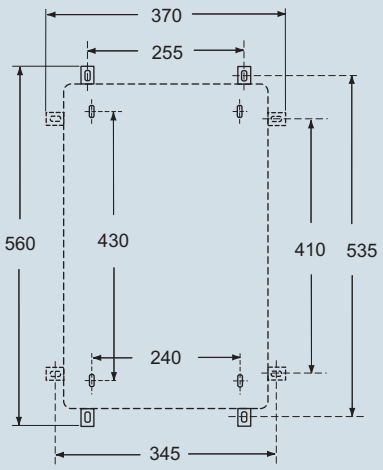
- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian experimental standard CEI 23-49
- Enable to configure boards with total insulation ⧈ (CEI 64-8), suitable for installation in areas exposed to high fire hazards
- Made in self-extinguishing thermoplastic resin, RAL 7035 grey
- For wall- or flush-mounting
- Special handle for transportation (optional)
- Hinged insulating covers designed to be assembled on any of the vertical walls
- Compartment for modular units with padlocked transparent inspection door
- Boards are supplied with sized DIN-rail EN 60715, back plates, closing plates, hinged covers and fixing/closing hardware
- IP55 degree of protection (EN 60529)
- ⓜ With Italian Quality Mark (CEI 23-48 and CEI 23-49)

CL enclosure
size 320 x 510 x 135

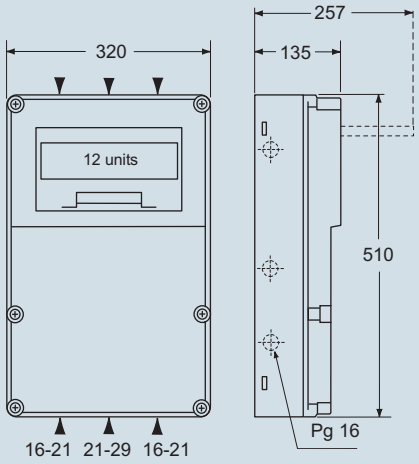
PI enclosure
size 320 x 510 x 135

Description	Part No.	Part No.
Box system with smooth cover, alveolated on the rear - With compartment for modular devices (12 units)	**FM 3251 CL** ⓜ	
Box system for straight flush-mounting sockets - With compartment for modular devices (12 units) - With six compartments (92 x 102 mm) for PIF-PI sockets or FM 910 CVU/RC/CV/RI cover (see page 33)		**FM 3251 PI** ⓜ

Panel cut-out in mm

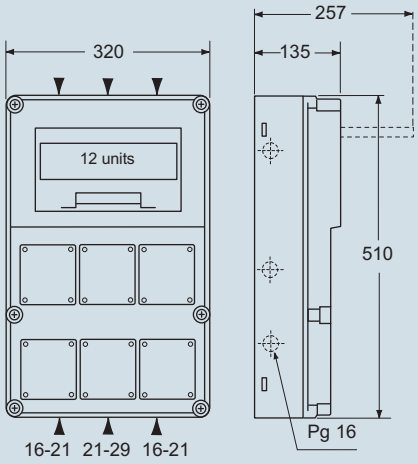


Dimensions in mm



▲ = Cable entry (diameter Pg)

Dimensions in mm



▲ = Cable entry (diameter Pg)

These box systems are suitable for:

Six inclined flush-mounting socket-outlets, 16A and 32A, IP44 and IP67
- PI type with 52 x 60 mm fixing distance between centres + optional FM 910 RI cover
- PIF-PI type with 77 x 85 mm fixing distance between centres
- Reduction for domestic use with FM 910 RC cover + BT CQ 25502 cover or GW 27401 cover (see page 42-43)

Dimensions indicated are not binding and may be changed without prior notice.

FM distribution box systems

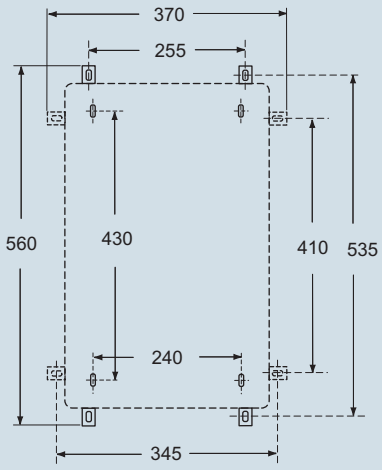
- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian experimental standard CEI 23-49
- Enable to configure boards with total insulation ⧈ (CEI 64-8), suitable for installation in areas exposed to high fire hazards
- Made in self-extinguishing thermoplastic resin, RAL 7035 grey
- For wall- or flush-mounting
- Special handle for transportation (optional)
- Hinged insulating covers designed to be assembled on any of the vertical walls
- Compartment for modular units with padlocked transparent inspection door
- Boards are supplied with sized DIN-rail EN 60715 with back plates, closing plates, hinged covers and fixing/closing hardware
- IP55 degree of protection (EN 60529)
- ⓜ With Italian Quality Mark (CEI 23-48 and CEI 23-49)

SQ enclosure
size 320 x 510 x 135

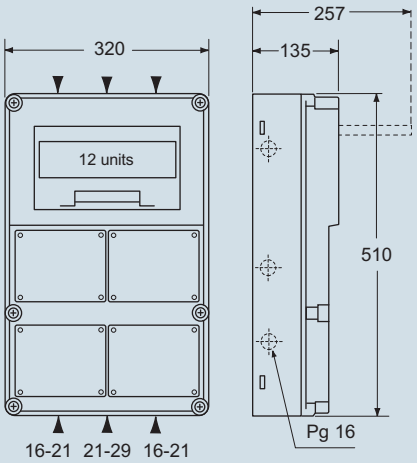
SQV and DSQV enclosures
size 320 x 510 x 135

Description	Part No.	Part No.
Box system for interlocked switched socket-outlets - With compartment for modular devices (12 units) - With four compartments (115 x 144 mm) for SQ sockets or FM 1114 CV covers (see page 34)	**FM 3251 SQ** ⓜ	
Box system for interlocked switcehd socket-outlets - With one compartment for modular devices (12 units) - With three compartments (88 x 230 mm) for SQE-SQV-SQA-SQT socket-outlets or FM 923 CVU or FM 923 CV covers (see page 35)		**FM 3251 SQV** ⓜ
Box system for interlocked switched socket-outlets - With compartment for connections and shunts - With three compartments (88 x 230 mm) for SQE-SQV-SQA-SQT socket-outlets or FM 923 CVU or FM 923 CV covers (see page 35)		**FM 3251DSQV** ⓜ

Panel cut-out in mm



Dimensions in mm

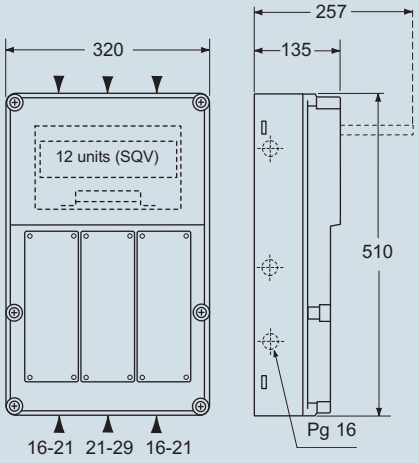


▲ = Cable entry (diameter Pg)

These box systems are suitable for:

Four interlocked switched socket-outlets, 16A, IP44
- Without fuse carrier, SQ type (see page 12)

Dimensions in mm



▲ = Cable entry (diameter Pg)

These box systems are suitable for:

Three interlocked switched socket-outlets, 16A and 32A, IP44 and IP55
- Without fuse carrier, SQE type (see pages 8-9)
- With fuse carrier, SQV type (see pages 10-11)

One SELV 16A socket-outlet, 2P, IP55 with safety transformer
- SQT type (see page 12)

Dimensions indicated are not binding and may be changed without prior notice.

FM distribution box systems

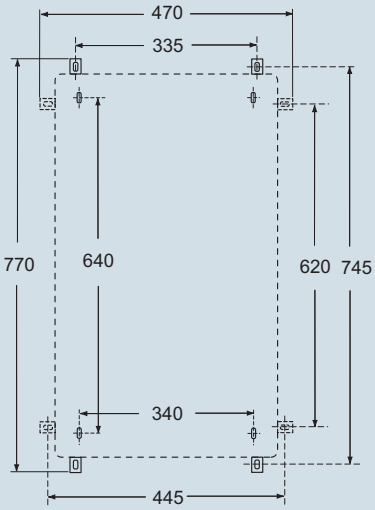
- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian experimental standard CEI 23-49
- Enable to configure boards with total insulation ⧈ (CEI 64-8), suitable for installation in areas exposed to high fire hazards
- Made in self-extinguishing thermoplastic resin, RAL 7035 grey
- For wall- or flush-mounting
- Special handle for transportation (optional)
- Hinged insulating covers designed to be assembled on any of the vertical walls
- Compartment for modular units with padlocked transparent doors
- Boards are supplied with sized DIN-rail EN 60715 with back plates, closing plates, hinged covers and fixing/closing hardware
- IP55 degree of protection (EN 60529)
- ⓜ With Italian Quality Mark (CEI 23-48 and CEI 23-49)

CL enclosure
size 420 x 720 x 135

PI enclosure
size 420 x 720 x 135

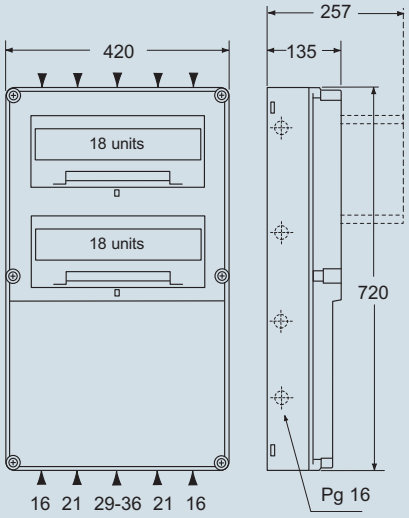
Description	Part No.	Part No.
Box system with lid, smooth on the front and alveolated on the rear - With two rooms for modular devices (18 +18 units)	**FM 4272 CL** ⓜ	
Box system for straight flush-mounting socket-outlets - With two rooms for modular devices (18 +18 units) - With eight rooms (92 x 102 mm) for PIF-PI sockets or for FM 910 CVU/RC/CV/RI covers (see page 33)		**FM 4272 PI** ⓜ

Panel cut-out in mm



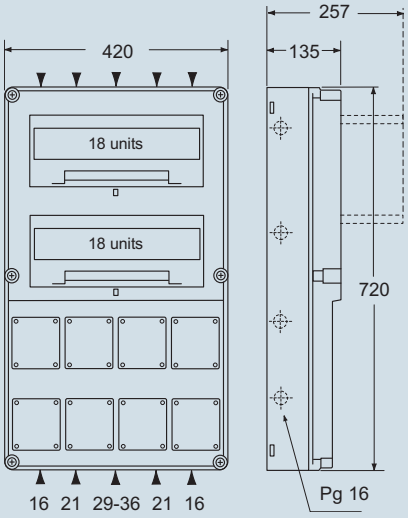
Dimensions indicated are not binding and may be changed without prior notice.

Dimensions in mm



▲ = Cable entry (diameter Pg)

Dimensions in mm



▲ = Cable entry (diameter Pg)

These box systems are suitable for:

Eight inclined flush-mounting socket-outlets, 16A and 32A, IP44 and 67
- PI types with 52 x 60 mm fixing distance between centres
  + optional FM 910 RI cover
- PIF-PI types with 77 x 85 mm fixing distance between centres
- Reduction for domestic use with FM 910 RC cover
  + BT CQ 25502 cover or GW 27401 cover
  (see page 42-43)

FM distribution box systems

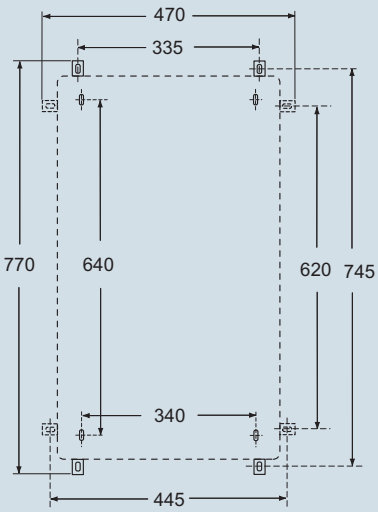
- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian experimental standard CEI 23-49
- Enable to configure boards with total insulation ⧈ (CEI 64-8), suitable for installation in areas exposed to high fire hazards
- Made in self-extinguishing thermoplastic resin, RAL 7035 grey
- For wall- or flush-mounting
- Special handle for transportation (optional)
- Hinged insulating covers designed to be assembled on any of the vertical walls
- Compartment for modular units with padlocked transparent doors
- Boards are supplied with sized DIN-rail EN 60715 with back plates, closing plates, hinged covers and fixing/closing hardware
- IP55 degree of protection (EN 60529)
- ⓜ With Italian Quality Mark (CEI 23-48 and CEI 23-49)

SQ enclosure
size 420 x 720 x 135

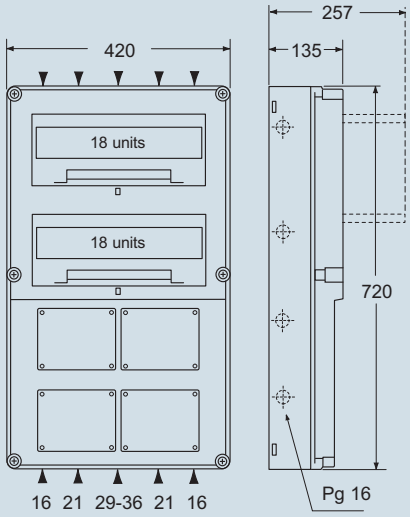
SQV enclosure
size 420 x 720 x 135

Description	Part No.	Part No.
Box system for interlocked switched socket-outlets - With two rooms for modular devices (18 + 18 units) - With four rooms (115 x 144 mm) for SQ socket-outlets or for FM 1114 CV covers (see page 34)	**FM 4272 SQ** ⓜ	
Box system for interlocked switcehd socket-outlets - With two rooms for modular devices (18 + 18 units) - With four rooms (88 x 230 mm) for SQE-SQV-SQA-SQT socket-outlets or for FM 923 CVU or FM 923 CV covers (see page 35)		**FM 4272 SQV** ⓜ

Panel cut-out in mm



Dimensions in mm

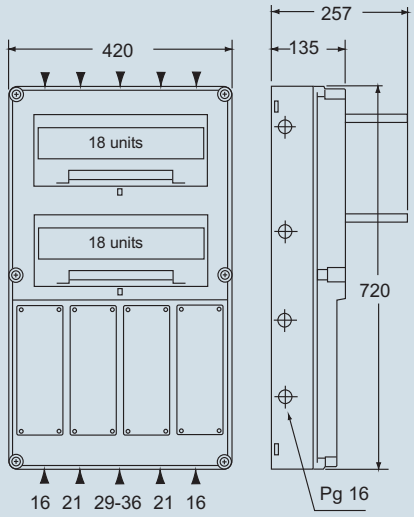


▲ = Cable entry (diameter Pg)

These box systems are suitable for:

Four interlocked switched socket-outlets, 16A, IP44
- Without fuse carrier, SQ type (see page 12)

Dimensions in mm



▲ = Cable entry (diameter Pg)

These box systems are suitable for:

Four interlocked switched socket-outlets, 16A and 32A, IP44 and 55
- Without fuse carrier, SQE type (see pages 8-9)
- With fuse carrier, SQV type (see pages 10-11)

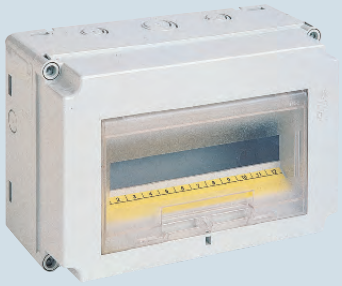
One SELV 16A socket-outlet, 2P, IP55 with safety transformer
- SQT type (see page 13)

Dimensions indicated are not binding and may be changed without prior notice.

FM supplementary box system, frames

- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian experimental standard CEI 23-49
- Can be used to configure total insulated boards ⧈ (CEI 64-8), suitable for installation in areas exposed to high fire hazard
- In insulating, self-extinguishing thermoplastic resin, RAL 7035 grey
- For wall- or flush-mounting
- Special handle for transportation (optional)
- Cover with insulating hinges designed to be fitted on any of the vertical walls
- Compartment for modular units with padlocked transparent inspection panel
- Boards are supplied with sized DIN-rail EN 60715, back plates, closing plates, hinged covers and fixing/closing hardware
- IP55 degree of protection (EN 60529)
- ⓜ With Italian Quality Mark (CEI 23-48 and CEI 23-49)

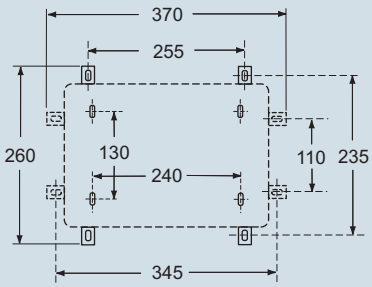
Supplementary enclosures 320 x 210 x 135 mm



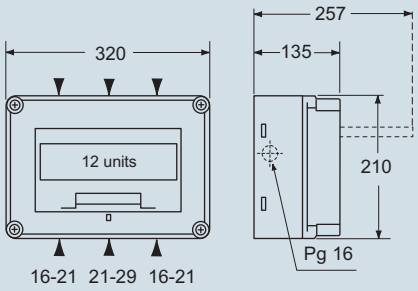
Frames for flush-mounting

Description	Part No.	Part No.
Supplementary box system - With compartment for modular units (12 units)	**FM 3221** ⓜ	
Frames for flush-mounting box systems - size 360 x 400 x 12, for FM 3236 boards - size 280 x 550 x 12, for FM 2451 boards - size 360 x 550 x 12, for FM 3251 boards		**FM 3236 CI** **FM 2451 CI** **FM 3251 CI**

Panel cut-out in mm



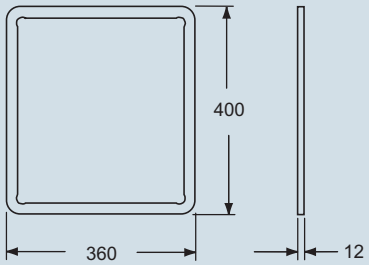
Dimensions in mm



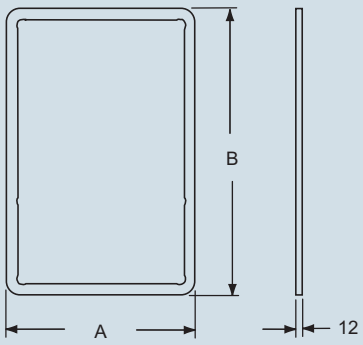
▲ = Cable entry (diameter Pg)

Dimensions in mm

FM 3236 CI



FM 2451 CI
FM 3251 CI



Types	A	B
FM 2451	280	550
FM 3251	360	550

Dimensions indicated are not binding and may be changed without prior notice.

FM covers

● ⓜ With Italian Quality Mark (CEI 23-48 and CEI 23-49)

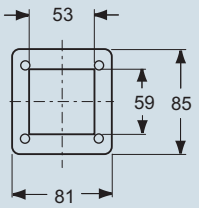
Covers for FM 1043 PQ box systems

Covers for FM 1043 DSQV box systems

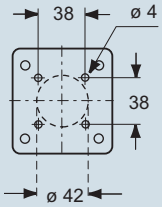
Description	Part No.	Part No.
Size 81 x 85 mm - Reduction for domestic use (tipo GW 27401, BT CQ 25502 or French type socket Legrand 57671) - Smooth, suitable for Schuko® ABL socket or Legrand 90335 - Suitable for straight flush-mounting socket-outlets - With BT CQ 25502 cover and Schuko® socket	**FM 88 RC** ⓜ **FM 88 CV** ⓜ **FM 88 RQ** ⓜ **FM 88 RBT** ⓜ	
Size 83 x 110 mm - Smooth, suitable for straight flush-mounting socket-outlets		**FM 811 CV** ⓜ

Dimensions in mm

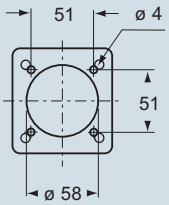
FM 88 RC (rear view)



FM 88 CV (rear view)

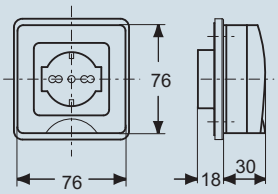


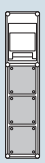
FM 88 RQ (rear view)



Suitable for the assembly of the following socket-outlets:
- PE/PEW...PQ type (52 x 52 fixing distance between centres)

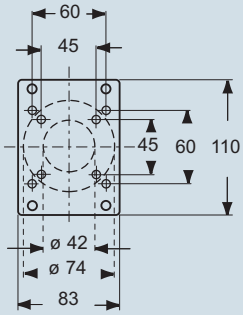
FM 88 RBT (front view)





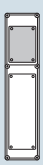
Dimensions in mm

FM 811 CV (rear view)



Suitable (after drilling) for the assembly of:

Straight flush-mounting socket-outlets
- PB...PI type (45 x 45 fixing distance between centres)
- PE/PEW...PQ/PQF type (60 x 60 fixing distance between centres)



Dimensions indicated are not binding and may be changed without prior notice.

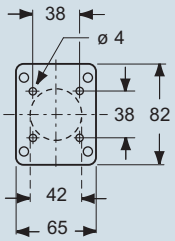
● ⓜ With Italian Quality Mark (CEI 23-48 and CEI 23-49)

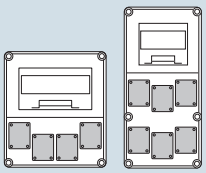
Covers
For FM 3236 PIN and FM 2451 PIN boards box systems

Description	Part No.
Size 65 x 82 mm - Smooth, suitable for Schuko® ABL **sockets**	**FM 68 CV** ⓜ

Dimensions in mm

FM 68 CV (rear view)





Dimensions indicated are not binding and may be changed without prior notice.

● ⓜ With Italian Quality Mark (CEI 23-48 and CEI 23-49)

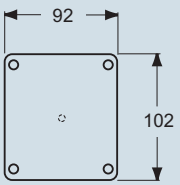
Covers for FM PI boards box systems

Covers for FM PI boards box systems

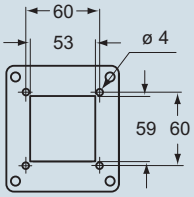
Description	Part No.	Part No.
Size 92 x 102 mm - Smooth, with central hollow - Reduction for domestic use (GW 27401 or BT CQ 25502 type or French type socket Legrand 57671) - Smooth, suitable for straight flush-mounting socket-outlets - Reduction for inclined flush-mounting socket-outlets	**FM 910 CVU** ⓜ **FM 910 RC** ⓜ **FM 910 CV** ⓜ **FM 910 RI** ⓜ	
Size 92 x 102 mm - with BT CQ 25502 cover and Schuko® socket - for Legrand 90335 socket - with Ave 45SP42K cover and Schuko® socket 45590/15TS		**FM 910 RBT** **FM 910 CVF** ⓜ **FM 910 RAV**

Dimensions in mm

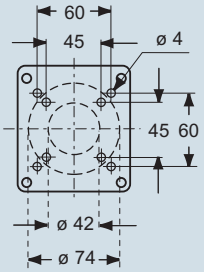
FM 910 CVU (rear view)



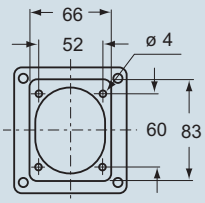
FM 910 RC (front view)



FM 910 CV (rear view)

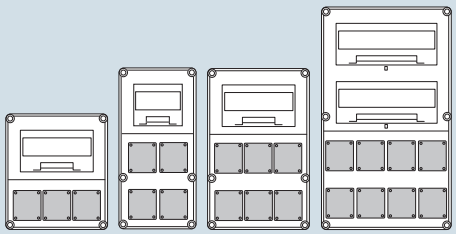


FM 910 RI (front view)



Suitable (after drilling) for the assembly of straight flush-mounting socket-outlets:
- PB...PI type (45 x 45 fixing distance between centers)
- PE/PEW...PQ/PQF type (60 x 60 fixing distance between centres)

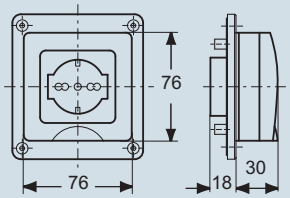
Suitable for the assembly of inclined flush-mounting socket-outlets:
- PE/PEW... PI type (52 x 60 fixing distance between centres)



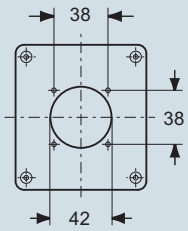
Dimensions indicated are not binding and may be changed without prior notice.

Dimensions in mm

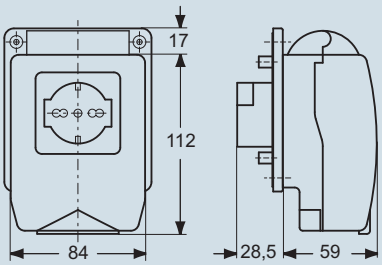
FM 910 RBT (front view)

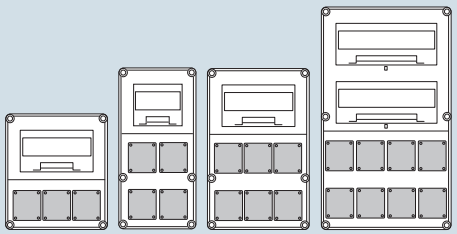


FM 910 CVF (front view)



FM 910 RAV (front view)





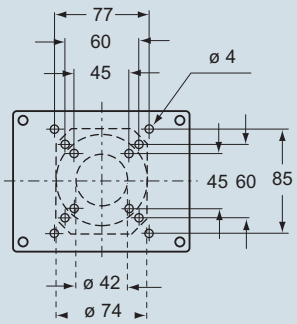
● ⓜ With Italian Quality Mark (CEI 23-48 and CEI 23-49)

Covers
for FM SQ box systems

Description	Part No.
Size 115 x 144 mm - Smooth, suitable for flush-mounting socket-outlets	**FM 1114 CV** ⓜ

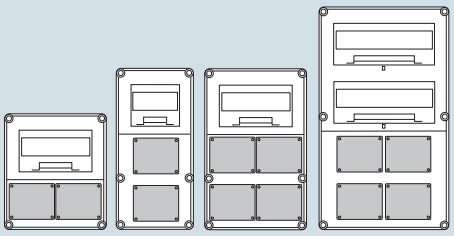
Dimensions in mm

FM 1114 CV (rear view)



Suitable (after drilling) for the assembly of:
Straight flush-mounting socket-outlets
- PB...PI type (45 x 45 fixing distance between centres)
- PE/PEW...PQ/PQF type (60 x 60 fixing distance between centres)

Inclined flush-mounting socket-outlets
- PE/PEW...PI/PIF type (77 x 85 fixing distance between centres)



Dimensions indicated are not binding and may be changed without prior notice.

● ⓜ With Italian Quality Mark (CEI 23-48 and CEI 23-49)

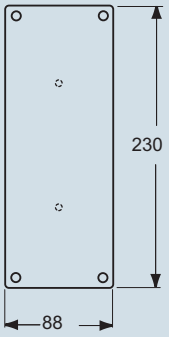
Covers for FM SQV and DSQV box systems

Covers for FM SQV and DSQV box systems

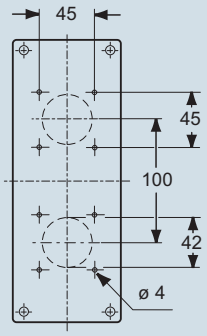
Description	Part No.	Part No.
Size 88 x 230 mm - Smooth, with central hollows - Smooth, suitable for straight flush-mounting socket-outlets	**FM 923 CVU** ⓜ **FM 923 CV** ⓜ	
Size 88 x 230 mm - for Legrand 90335 socket - with Ave 45SP42K covers and 45590/15TS Schuko® socket 45590/15TS - with two BT CQ 25502 covers and Schuko® sockets		**FM 923 CVF** ⓜ **FM 923 RAV** **FM 923 RBT**

Dimensions in mm

FM 923 CVU (rear view)



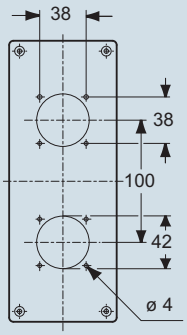
FM 923 CV (rear view)



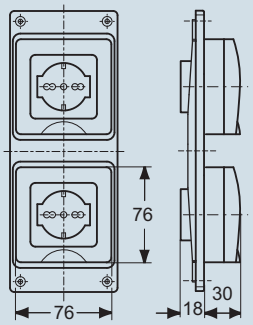
Suitable for (after drilling):
Straight flush-mounting socket-outlets
- PB...PI type (45 x 45 fixing distance between centres)

Dimensions in mm

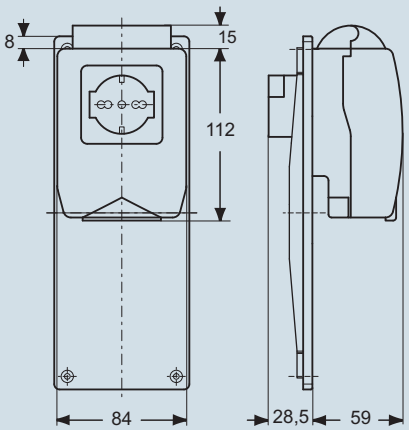
FM 923 CVF (front view)

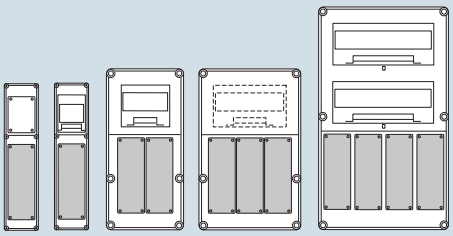


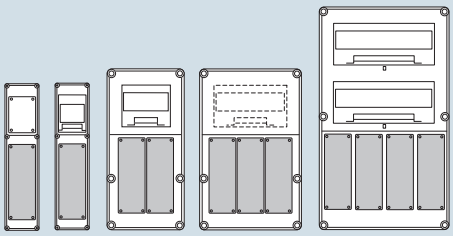
FM 923 RBT (front view)



FM 923 RAV (front view)







Dimensions indicated are not binding and may be changed without prior notice.

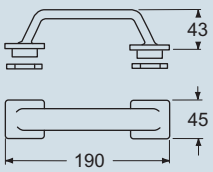
Box system carrying handle
Climbing irons for box fixing

DIN-rail EN 60715 - Insulated terminal block
Collar - Screws kit - Adhesive label

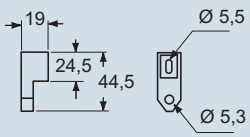
Description	Part No.	Part No.
Box system carrying handle - For 3236, 2451, 3251, 3221 and 4272 boards	**FM 32 MT**	
Climbing irons for external wall mounting - For 3236, 2451, 3251, 3221 and 4272 boards	**BC SFT**	
Sized DIN-rail EN 60715 (35 mm) With back plates for the positioning at different depths and fixing screws - For 2451 boards - For 3236, 3251, 3221 boards - For 4272 boards		**FM GD 18** **FM GD 25** **FM GD 35**
Insulated terminal block, 3 P 25 mm² + 10 P 10 mm² - For neutral and/or ground, compliant with EN 60998-2-1, stackable (up to 2 units)		**FM 2510 MI**
collar - for format 1043 box system		**FM 1043 CO**
screws kit - for mounting sockets PQ-PI-PQF-PIF series		**FM 416**
adhesive label - for the identification of the mounted modular devices		**FM 18 ET**

Dimensions in mm

FM 32 MT

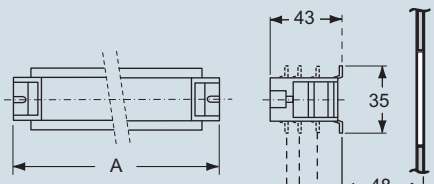


BC SFT



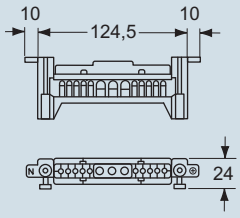
Dimensions in mm

FM GDxx



Part No.	A
FM GD 18	180
FM GD 25	255
FM GD 35	355

FM 2510 MI



Dimensions indicated are not binding and may be changed without prior notice.

Part No.	N° of modules 17,5 mm	dimensions of the modular compartment in mm
QP V	12	215 x 45
QG V	24	215 x 45

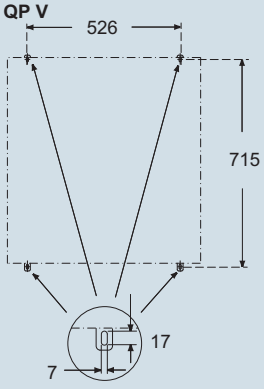
QP site boards assembly kit

QG site boards assembly kit

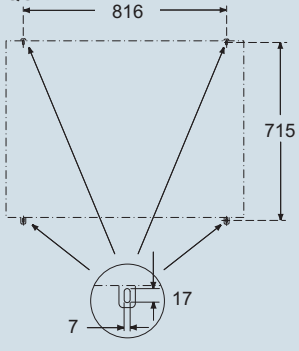
Description	Part No.	Part No.
empty board to be assembled comprising: - 1 top panel (closed) - 1 bottom panel (open) - 2 side panels - 1 rear panel with compartment complete with 2 DIN EN 60715 rails, cable clamp, earth screw - 2 covers (1 smooth QC 2920 P and 1 with door QC 2920 R) to close the branching, connections, protection devices compartment - 1 panel door with triangular key locks - Pg 48 cable gland with gasket - stainless steel screws and small parts for assembly	**QP V**	
empty board to be assembled comprising: - 1 top panel (closed) - 1 bottom panel (open) - 2 side panels - 1 rear panel with compartment complete with 2 DIN EN 60715 rails, cable clamp, earth screw - 3 covers (1 smooth QC 2920 P and 1 with door QC 2920 R) to close the branching, connections, protection devices compartment - 2 panel door with triangular key locks - Pg 48 cable gland with gasket - stainless steel screws and small parts for assembly		**QG V**

fixing interaxes in mm

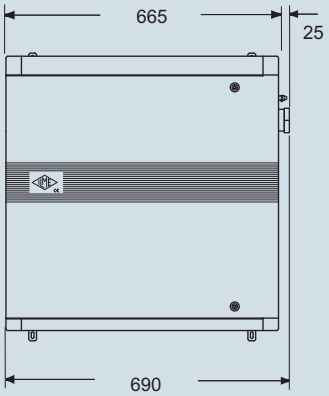
QP V

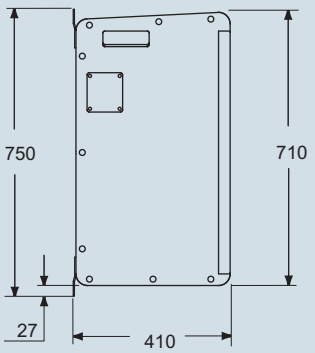


QG V

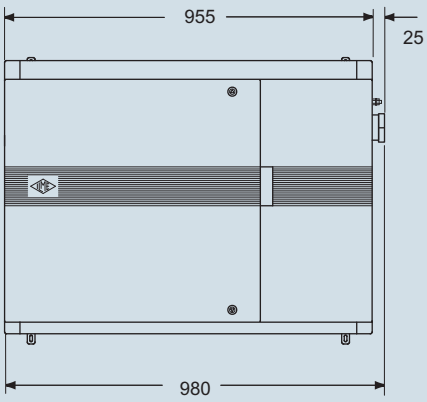


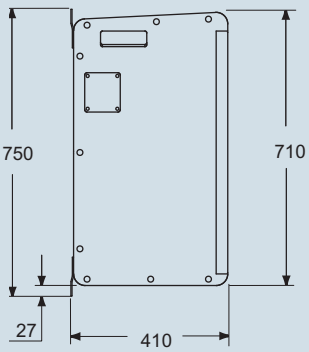
dimensions in mm





dimensions in mm





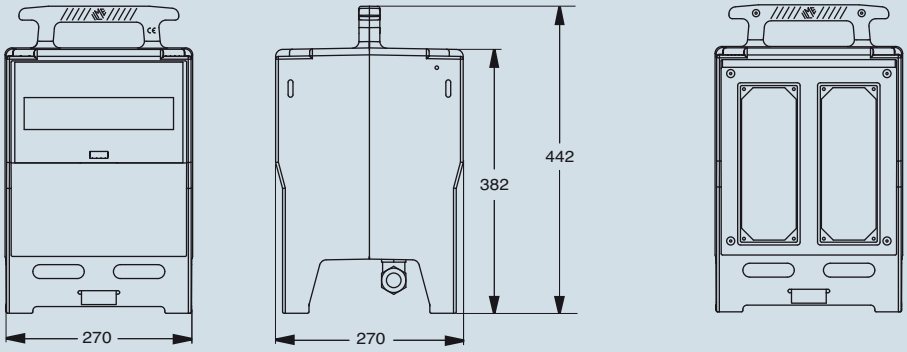
Dimensions indicated are not binding and may be changed without prior notice.

QM V S2 site board assembly kit

description	Part No.
empty board to be assembled: - 2 openings for SQE/SQV/SQT interlocked socket-outlets	**QM V S2**

comprising:
- 1 rail half shell complete with spring hinged cover
- 1 socket-outlet half shell
- 1 DIN EN 60715, 219 mm rail with fastening screws
- 1 Pg 21 IP65 angled cable gland
- 1 25 mm² earth terminal
- 8 self tapping stainless steel screws, suitable for plastics, 3.9x19 mm, mixed cuts / Ph (to fasten socket-outlets)
- 1 cable clamp + 2 screws, 3.9x32 mm + 2 flat washers Ø 4x8 mm to fix the cable clamp
- 6 self tapping screws, 3.9x22 mm with stainless steel flat washers (to fix half shells)
- 2 DIN module blanking units
- 1 plate to be filled with data
- 1 document holder pocket

dimensions in mm



Dimensions indicated are not binding and may be changed without prior notice.

PB - PQF (Schuko®) socket-outlets for FM enclosures

- Enclosure, insert and cover in insulating, self-extinguishing thermoplastic material
- RAL 7035 grey enclosure, cover coded according to operating voltage

- **PB straight flush-mounting socket-outlets**
  - Compliant with EN 60309-1 and -2
  - With gasket for flange
  - Spring lid
  - IP44 degree of protection (EN 60529)
- **PEW 216 PQF straight flush-mounting socket-outlet**
  - Compliant with VDE 0620
  - Manufacturing requirements compliant with DIN 49442
  - With gasket for flange
  - With cover, locking ring and gasket
  - IP67 degree of protection (EN 60529)

Extra-low voltage socket-outlets IP44 for FM boards

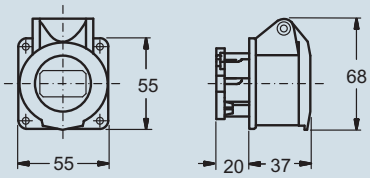
Extra-low voltage socket-outlet (Schuko®) IP67 for FM PQ and PI boards

Description of	Part No.		Colour	Part No.	Cover required
16A - 2P 20 - 25V ~ - 50 and 60 Hz - without reference 40 - 50V ~ - 50 and 60 Hz - 12h 20 - 25V and 40 - 50V ~ - 100 - 200 Hz - 4h 20 - 25V and 40 - 50V ~ - 400 - 500 Hz - 11h 20 - 25V and 40 - 50V - d.c. - 11h	**PB 16002 PI** **PB 16122 PI** **PB 16042 PI** **PB 16112 PI** **PB 16102 PI**	Ⓐ 45 x 45 mm	violet white green (*) green (*) white		
16A - 3P 20 - 25V ~ - 50 and 60 Hz - without reference 40 - 50V ~ - 50 and 60 Hz - 12h 20 - 25V and 40 - 50V ~ - 100 - 200 Hz - 4h 20 - 25V and 40 - 50V ~ - 400 - 500 Hz - 11h	**PB 16003 PI** **PB 16123 PI** **PB 16043 PI** **PB 16113 PI**	Ⓐ 45 x 45 mm	violet white green (*) green (*)		
32A - 2P 20 - 25V ~ - 50 and 60 Hz - without reference 40 - 50V ~ - 50 and 60 Hz - 12h 20 - 25V and 40 - 50V ~ - 100 - 200 Hz - 4h 20 - 25V and 40 - 50V ~ - 400 - 500 Hz - 11h 20 - 25V and 40 - 50V d.c. - 11h	**PB 32002 PI** **PB 32122 PI** **PB 32042 PI** **PB 32112 PI** **PB 32102 PI**	Ⓐ 45 x 45 mm	violet white green (*) green (*) white		
32A - 3P 20 - 25V ~ - 50 and 60 Hz - without reference 40 - 50V ~ - 50 and 60 Hz - 12h 20 - 25V and 40 - 50V ~ - 100 - 200 Hz - 4h 20 - 25V and 40 - 50V ~ - 400 - 500 Hz - 11h	**PB 32003 PI** **PB 32123 PI** **PB 32043 PI** **PB 32113 PI**	Ⓐ 45 x 45 mm	violet white green (*) green (*)		
200 - 250V ~ - 50 and 60 Hz - blue (Schuko®) 10/16A - 2P+⊕ - panel cut-out 60 x 60 mm [1]				**PEW 216 PQF**	FM 910 RC[1]

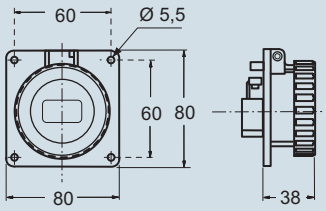
(*) Green may be used together with the colour of the operating range for frequencies above 60 Hz up to a maximum of 500 Hz.

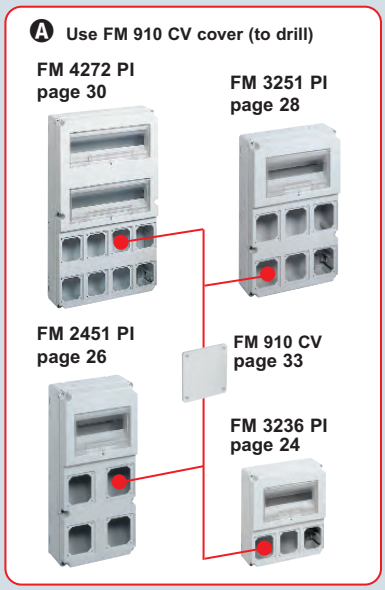
1) Socket-outlet designed for FM 1043 PQ board. For FM 2451, 3236, 3251 and 4272 PI boards, use socket-outlets with a FM 910 RC cover

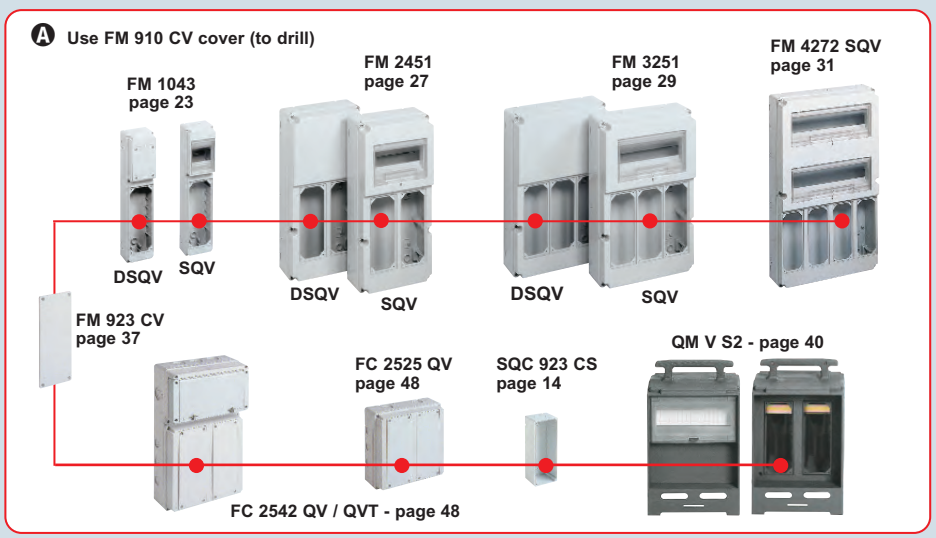
Dimensions in mm



Dimensions in mm







Dimensions indicated are not binding and may be changed without prior notice.

PE...PI - PIF flush-mounting inclined socket-outlets, low voltage from over 50V up to 690V

- Compliant with EN 60309-1 and -2
- Enclosure, insert and cover in insulating self-extinguishing thermoplastic material
- RAL 7035 grey enclosure, spring lid colour coded according to operating voltage
- Flange with anti-aging gasket
- PE...PI/PIF types (IP44), spring lid
- PEW...PI/PIF types (IP67), cover with locking ring and gasket
- Terminals with retained screws
- Nickel-plated contacts, available on request for 16A and 32A (standard on 63A and 125A). For the code of products with nickel-plated contacts (socket holes, plug pins), add "N" to the pre-code of the corresponding standard product code; for example: PE becomes PEN and PEW becomes PEWN.
- IP44 and IP67 degree of protection (EN 60529)
- ⓜ With Italian Quality Mark

16A
IP44 degree of protection

32A
IP44 degree of protection

Legend

A.V. = Colour according to voltage
(*) Green may be used together with the colour of the operating range for frequencies above 60 Hz and up to a maximum of 500 Hz.

Number of poles	Frequency Hz	Voltage V	Earthing contact position h	Part No.	Colour	Part No.	Colour
2P+⏚	50 and 60	100 - 130	4	**PE 1643 PI** ⓜ		**PE 3243 PI** ⓜ	
	50 and 60	200 - 250	6	**PE 1663 PI** ⓜ		**PE 3263 PI** ⓜ	
	50 and 60	380 - 415	9	**PE 1693 PI** ⓜ		**PE 3293 PI** ⓜ	
	50 and 60	480 - 500	7	**PE 1673 PI** ⓜ		**PE 3273 PI** ⓜ	
	50 and 60	ins. transformer	12	**PE 16123 PI** ⓜ	A.V.	**PE 32123 PI** ⓜ	A.V.
	> 300 - 500	> 50	2	**PE 1623 PI** ⓜ	(*)	**PE 3223 PI** ⓜ	(*)
	d.c.	> 50 - 250	3	**PE 1633 PI** ⓜ	A.V.	**PE 3233 PI**	A.V.
	d.c.	> 250	8	**PE 1683 PI**	A.V.	**PE 3283 PI**	A.V.
3P+⏚	50 and 60	100 - 130	4	**PE 1644 PI** ⓜ		**PE 3244 PI** ⓜ	
	50 and 60	200 - 250	9	**PE 1694 PI** ⓜ		**PE 3294 PI** ⓜ	
	50 and 60	380 - 415	6	**PE 1664 PI** ⓜ		**PE 3264 PI** ⓜ	
	60	440 - 460	11	**PE 16114 PI** ⓜ		**PE 32114 PI** ⓜ	
	50 and 60	480 - 500	7	**PE 1674 PI** ⓜ		**PE 3274 PI** ⓜ	
	50 and 60	600 - 690	5	**PE 1654 PI**		**PE 3254 PI**	
	50	380	3	**PE 1634 PI** ⓜ		**PE 3234 PI** ⓜ	
	60	440	3	**PE 1634 PI** ⓜ		**PE 3234 PI** ⓜ	
	100 - 300	> 50	10	**PE 16104 PI** ⓜ	(*)	**PE 32104 PI** ⓜ	(*)
	> 300 - 500	> 50	2	**PE 1624 PI** ⓜ	(*)	**PE 3224 PI** ⓜ	(*)
3P+N+⏚	50 and 60	57/100 - 75/130	4	**PE 1645 PI** ⓜ		**PE 3245 PI** ⓜ	
	50 and 60	120/208 - 144/250	9	**PE 1695 PI** ⓜ		**PE 3295 PI** ⓜ	
	50 and 60	200/346 - 240/415	6	**PE 1665 PI** ⓜ		**PE 3265 PI** ⓜ	
	50 and 60	277/480 - 288/500	7	**PE 1675 PI** ⓜ		**PE 3275 PI** ⓜ	
	50 and 60	347/600 - 400/690	5	**PE 1655 PI**		**PE 3255 PI**	
	60	250/440 - 265/460	11	**PE 16115 PI** ⓜ		**PE 32115 PI** ⓜ	
	50	220/380	3	**PE 1635 PI** ⓜ		**PE 3235 PI** ⓜ	
	60	250/440	3	**PE 1635 PI** ⓜ		**PE 3235 PI** ⓜ	
	> 300 - 500	> 50	2	**PE 1625 PI** ⓜ	(*)	**PE 3225 PI** ⓜ	(*)

A **52 x 60 mm**

FM 2451 PIN
page 26

FM 3236 PIN
page 25

B **77 x 85 mm - OR**

A **52 x 60 mm with adapter FM 910 RI**

FM 4272 PI
page 30

FM 3251 PI
page 28

FM 2451 PI
page 26

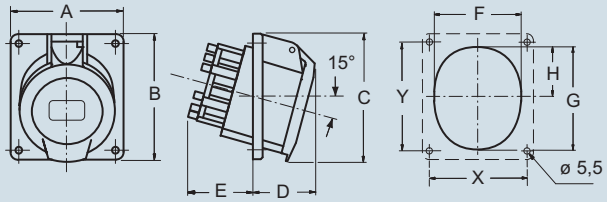
FM 3236 PI
page 24

- available on request sockets type **A** with fixing center distance 77 x 85mm (parts number varies from PI to PIF)

Dimensions indicated are not binding and may be changed without prior notice.

dimensions in mm

(16 / 32A) PE ... PI
(16A) PE ... PIF



PE ... PI		A	B	C	D	E	F	G	H	X	Y
16A	2P+⏚	64	82	82	38	46	52	62	29	52	60
	3P+⏚	64	82	82	42	47	57	65	30	52	60
	3P+N+⏚	92	100	100	43	47	66	78	37,5	77	85
32A	2P+⏚	92	100	100	40	55	68	76	35,5	77	85
	3P+⏚	92	100	100	40	55	68	76	35,5	77	85
	3P+N+⏚	92	102	102	43	55	74	86	39,5	77	85

PE ... PIF		A	B	C	D	E	F	G	H	X	Y
16A	2P+⏚	92	100	100	42	47	52	62	29	77	85
	3P+⏚	92	100	100	42	47	57	65	30	77	85

PE...PI - PIF flush-mounting inclined socket-outlets, low voltage from over 50V up to 690V

16A
IP67 degree of protection

Part No.	Colour
PEW 1643 PI	
PEW 1663 PI	
PEW 1693 PI	
PEW 1673 PI	
PEW 16123 PI	A.V.
PEW 1623 PI	(+)
PEW 1633 PI	A.V.
PEW 1683 PI	A.V.

A 52 x 60 mm

Part No.	Colour
PEW 1644 PI	
PEW 1694 PI	
PEW 1664 PI	
PEW 16114 PI	
PEW 1674 PI	
PEW 1654 PI	
PEW 1634 PI	
PEW 1634 PI	
PEW 16104 PI	(+)
PEW 1624 PI	(+)

A 52 x 60 mm

Part No.	Colour
PEW 1645 PI	
PEW 1695 PI	
PEW 1665 PI	
PEW 1675 PI	
PEW 1655 PI	
PEW 16115 PI	
PEW 1635 PI	
PEW 1635 PI	
PEW 1625 PI	(+)

B 77 x 85 mm

32A
IP67 degree of protection

Part No.	Colour
PEW 3243 PI	
PEW 3263 PI	
PEW 3293 PI	
PEW 3273 PI	
PEW 32123 PI	A.V.
PEW 3223 PI	(+)
PEW 3233 PI	A.V.
PEW 3283 PI	A.V.

B 77 x 85 mm

Part No.	Colour
PEW 3244 PI	
PEW 3294 PI	
PEW 3264 PI	
PEW 32114 PI	
PEW 3274 PI	
PEW 3254 PI	
PEW 3234 PI	
PEW 3234 PI	
PEW 32104 PI	(+)
PEW 3224 PI	(+)

B 77 x 85 mm

Part No.	Colour
PEW 3245 PI	
PEW 3295 PI	
PEW 3265 PI	
PEW 3275 PI	
PEW 3255 PI	
PEW 32115 PI	
PEW 3235 PI	
PEW 3235 PI	
PEW 3225 PI	(+)

B 77 x 85 mm

16A
IP67 degree of protection
increased flange

Part No.	Colour
PE 1643 PIF	
PE 1663 PIF	
PE 1693 PIF	
PE 1673 PIF	
PE 16123 PIF	A.V.
PE 1623 PIF	(+)
PE 1633 PIF	A.V.
PE 1683 PIF	A.V.

B 77 x 85 mm

Part No.	Colour
PE 1644 PIF	
PE 1694 PIF	
PE 1664 PIF	
PE 16114 PIF	
PE 1674 PIF	
PE 1654 PIF	
PE 1634 PIF	
PE 1634 PIF	
PE 16104 PIF	(+)
PE 1624 PIF	(+)

B 77 x 85 mm

16A
IP67 degree of protection
increased flange

Part No.	Colour
PEW 1643 PIF	
PEW 1663 PIF	
PEW 1693 PIF	
PEW 1673 PIF	
PEW 16123 PIF	A.V.
PEW 1623 PIF	(+)
PEW 1633 PIF	A.V.
PEW 1683 PIF	A.V.

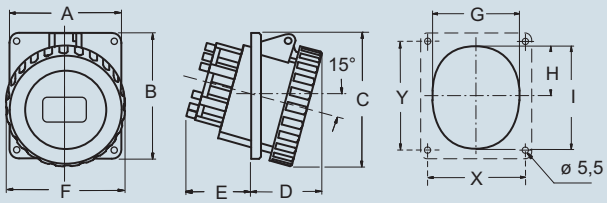
B 77 x 85 mm

Part No.	Colour
PEW 1644 PIF	
PEW 1694 PIF	
PEW 1664 PIF	
PEW 16114 PIF	
PEW 1674 PIF	
PEW 1654 PIF	
PEW 1634 PIF	
PEW 1634 PIF	
PEW 16104 PIF	(+)
PEW 1624 PIF	(+)

B 77 x 85 mm

dimensions in mm

(16 / 32A) PEW ... PI
(16A) PEW ... PIF



PEW ... PI		A	B	C	D	E	F	G	H	I	X	Y
16A	2P+⏚	65	82	83	48	35	70	50	29	58	52	60
	3P+⏚	65	82	87	48	37	78	58	30	65	52	60
	3P+N+⏚	90	100	102	50	38	86	66	35	75	77	85
32A	2P+⏚	90	100	116	50	50	92	68	37	78	77	85
	3P+⏚	90	100	116	50	50	92	68	37	78	77	85
	3P+N+⏚	90	100	118	50	50	100	73	42,5	86	77	85

PEW ... PIF		A	B	C	D	E	F	G	H	I	X	Y
16A	2P+⏚	90	100	102	48	37	70	50	29	58	77	85
	3P+⏚	90	100	102	48	37	78	58	30	65	77	85

PE...PQ - PQF flush-mounting straight socket-outlets, low voltage from over 50V up to 690V

- Compliant with EN 60309-1 and -2
- Enclosure, insert and cover in insulating self-extinguishing thermoplastic material
- RAL 7035 grey enclosure, spring lid colour coded according to operating voltage
- Flange with anti-aging gasket
- PE...PQ/PQF types (IP44) with spring lid
- PEW...PQ/PQF types (IP67), cover with locking nut and gasket
- Terminals with retained screws
- Nickel-plated contacts, available on request for 16A and 32A (standard on 63A and 125A). For the code of products with nickel-plated contacts (socket holes, plug pins), add "N" to the pre-code of the corresponding standard product code; for example: PE becomes PEN and PEW becomes PEWN.
- IP44 and IP67 degree of protection (EN 60529)
- ⓜ With Italian Quality Mark

16A
IP44 degree of protection

32A
IP44 degree of protection

Legend

A.V. = Colour according to voltage
(*) Green may be used together with the colour of the operating range for frequencies above 60 Hz and up to a maximum of 500 Hz.

Number of poles	Frequency Hz	Voltage V	Earthing contact position h	Part No.		Colour	Part No.		Colour
2P+⏚	50 and 60	100 - 130	4	**PE 1643 PQ** ⓜ	**C 52 x 52 mm**		**PE 3243 PQ** ⓜ	**D 60 x 60 mm**	
	50 and 60	200 - 250	6	**PE 1663 PQ** ⓜ			**PE 3263 PQ** ⓜ		
	50 and 60	380 - 415	9	**PE 1693 PQ** ⓜ			**PE 3293 PQ** ⓜ		
	50 and 60	480 - 500	7	**PE 1673 PQ** ⓜ			**PE 3273 PQ** ⓜ		
	50 and 60	ins. transformer	12	**PE 16123 PQ** ⓜ		A.V.	**PE 32123 PQ** ⓜ		A.V.
	> 300 - 500	> 50	2	**PE 1623 PQ** ⓜ		(*)	**PE 3223 PQ** ⓜ		(*)
	d.c.	> 50 - 250	3	**PE 1633 PQ** ⓜ		A.V.	**PE 3233 PQ**		A.V.
	d.c.	> 250	8	**PE 1683 PQ**		A.V.	**PE 3283 PQ**		A.V.
3P+⏚	50 and 60	100 - 130	4	**PE 1644 PQ** ⓜ	**C 52 x 52 mm**		**PE 3244 PQ** ⓜ	**D 60 x 60 mm**	
	50 and 60	200 - 250	9	**PE 1694 PQ** ⓜ			**PE 3294 PQ** ⓜ		
	50 and 60	380 - 415	6	**PE 1664 PQ** ⓜ			**PE 3264 PQ** ⓜ		
	60	440 - 460	11	**PE 16114 PQ** ⓜ			**PE 32114 PQ** ⓜ		
	50 and 60	480 - 500	7	**PE 1674 PQ** ⓜ			**PE 3274 PQ** ⓜ		
	50 and 60	600 - 690	5	**PE 1654 PQ**			**PE 3254 PQ**		
	50	380	3	**PE 1634 PQ** ⓜ			**PE 3234 PQ** ⓜ		
	60	440	3	**PE 1634 PQ** ⓜ			**PE 3234 PQ** ⓜ		
	100 - 300	> 50	10	**PE 16104 PQ** ⓜ		(*)	**PE 32104 PQ** ⓜ		(*)
	> 300 - 500	> 50	2	**PE 1624 PQ** ⓜ		(*)	**PE 3224 PQ** ⓜ		(*)
3P+N+⏚	50 and 60	57/100 - 75/130	4	**PE 1645 PQ** ⓜ	**D 60 x 60 mm**		**PE 3245 PQ** ⓜ	**D 60 x 60 mm**	
	50 and 60	120/208 - 144/250	9	**PE 1695 PQ** ⓜ			**PE 3295 PQ** ⓜ		
	50 and 60	200/346 - 240/415	6	**PE 1665 PQ** ⓜ			**PE 3265 PQ** ⓜ		
	50 and 60	277/480 - 288/500	7	**PE 1675 PQ** ⓜ			**PE 3275 PQ** ⓜ		
	50 and 60	347/600 - 400/690	5	**PE 1655 PQ**			**PE 3255 PQ**		
	60	250/440 - 265/460	11	**PE 16115 PQ** ⓜ			**PE 32115 PQ** ⓜ		
	50	220/380	3	**PE 1635 PQ** ⓜ			**PE 3235 PQ** ⓜ		
	60	250/440	3	**PE 1635 PQ** ⓜ			**PE 3235 PQ** ⓜ		
	> 300 - 500	> 50	2	**PE 1625 PQ** ⓜ		(*)	**PE 3225 PQ** ⓜ		(*)

D 60 x 60 mm - OR

C 52 x 52 mm with adapter FM 88 RQ
page 33

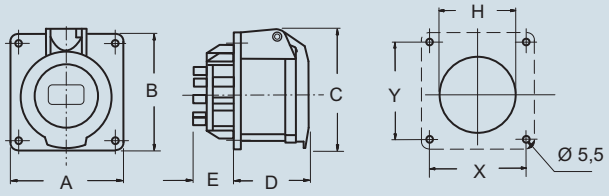
FM 1043 PQ
page 22

- available on request sockets type C with fixing center distance 60 x 60 mm (parts number varies from PQ to PQF)

Dimensions indicated are not binding and may be changed without prior notice.

dimensions in mm

(16/32A) PE ... PQ
(16A) PE ... PQF



PE ... PQ		A	B	C	D	E	H	X	Y
16A	2P+⏚	65	65	71	52	27	60	52	52
	3P+⏚	65	65	75	53	27	61,5	52	52
	3P+N+⏚	80	80	86	53	27	70	60	60
32A	2P+⏚	80	80	87	62	28	68	60	60
	3P+⏚	80	80	87	62	28	68	60	60
	3P+N+⏚	80	80	92	62	28	73	60	60

PE ... PQF		A	B	C	D	E	H	X	Y
16A	2P+⏚	80	80	71	52	27	60	60	60
	3P+⏚	80	80	75	53	27	61,5	60	60

PEW...PQ - PQF flush-mounting straight socket-outlets, low voltage from over 50V up to 690V

16A
IP67 degree of protection

Part No.	Colour	
PEW 1643 PQ		
PEW 1663 PQ		
PEW 1693 PQ		
PEW 1673 PQ		
PEW 16123 PQ		
PEW 1623 PQ		
PEW 1633 PQ		
PEW 1683 PQ		
	C 52 x 52 mm	
PEW 1644 PQ		
PEW 1694 PQ		
PEW 1664 PQ		
PEW 16114 PQ		
PEW 1674 PQ		
PEW 1654 PQ		
PEW 1634 PQ		
PEW 1634 PQ		
PEW 16104 PQ		
PEW 1624 PQ		
	C 52 x 52 mm	
PEW 1645 PQ		
PEW 1695 PQ		
PEW 1665 PQ		
PEW 1675 PQ		
PEW 1655 PQ		
PEW 16115 PQ		
PEW 1635 PQ		
PEW 1635 PQ		
PEW 1625 PQ		
	D 60 x 60 mm	

32A
IP67 degree of protection

Part No.	Colour	
PEW 3243 PQ		
PEW 3263 PQ		
PEW 3293 PQ		
PEW 3273 PQ		
PEW 32123 PQ		
PEW 3223 PQ		
PEW 3233 PQ		
PEW 3283 PQ		
	D 60 x 60 mm	
PEW 3244 PQ		
PEW 3294 PQ		
PEW 3264 PQ		
PEW 32114 PQ		
PEW 3274 PQ		
PEW 3254 PQ		
PEW 3234 PQ		
PEW 3234 PQ		
PEW 32104 PQ		
PEW 3224 PQ		
	D 60 x 60 mm	
PEW 3245 PQ		
PEW 3295 PQ		
PEW 3265 PQ		
PEW 3275 PQ		
PEW 3255 PQ		
PEW 32115 PQ		
PEW 3235 PQ		
PEW 3235 PQ		
PEW 3225 PQ		
	D 60 x 60 mm	

16A
IP67 degree of protection
increased flange

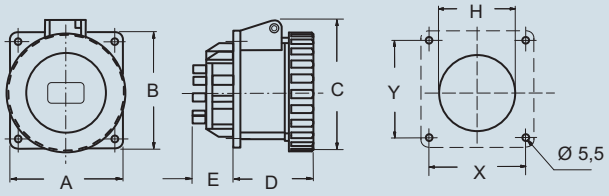
Part No.	Colour	
PE 1643 PQF		
PE 1663 PQF		
PE 1693 PQF		
PE 1673 PQF		
PE 16123 PQF		
PE 1623 PQF		
PE 1633 PQF		
PE 1683 PQF		
	D 60 x 60 mm	
PE 1644 PQF		
PE 1694 PQF		
PE 1664 PQF		
PE 16114 PQF		
PE 1674 PQF		
PE 1654 PQF		
PE 1634 PQF		
PE 1634 PQF		
PE 16104 PQF		
PE 1624 PQF		
	D 60 x 60 mm	

16A
IP67 degree of protection
increased flange

Part No.	Colour	
PEW 1643 PQF		
PEW 1663 PQF		
PEW 1693 PQF		
PEW 1673 PQF		
PEW 16123 PQF		
PEW 1623 PQF		
PEW 1633 PQF		
PEW 1683 PQF		
	D 60 x 60 mm	
PEW 3244 PQF		
PEW 3294 PQF		
PEW 3264 PQF		
PEW 32114 PQF		
PEW 3274 PQF		
PEW 3254 PQF		
PEW 3234 PQF		
PEW 3234 PQF		
PEW 32104 PQF		
PEW 3224 PQF		
	D 60 x 60 mm	

dimensions in mm

(16/32A) PEW ... PQ
(16A) PEW ... PQF



PEW ... PQ		A	B	C	D	E	H	X	Y
16A	2P+⏚	65	65	77	52	27	60	52	52
	3P+⏚	65	65	85	52	27	61,5	52	52
	3P+N+⏚	80	80	93	52	27	70	60	60
32A	2P+⏚	80	80	98	62	28	68	60	60
	3P+⏚	80	80	98	62	28	68	60	60
	3P+N+⏚	80	80	105	62	28	73	60	60

PEW ... PQF		A	B	C	D	E	H	X	Y
16A	2P+⏚	80	80	77	52	27	60	60	60
	3P+⏚	80	80	85	52	27	61,5	60	60

General characteristics

This chapter illustrates the technical characteristics of **FC** enclosures and components.

The **FC** series includes products for the configuration of distribution boards like SQ or PK..., or KI... interlocked socket-outlets for industrial use, Pluso standard flush-mounting socket-outlets (without interlock) and templates for the assembly of modular units. These components enable to configure a wide range of distribution boards suitable to meet all possible installation needs.

The enclosures for FC distribution boards offer tested reliability and can be used, along with ILME socket-outlets for industrial use, as modular integrated systems to configure distribution boards for industrial socket-outlets.

Distribution boards with ILME enclosures and socket-outlets can be used for:

- Industrial applications
- Services applications (commercial, exhibitions, etc.)
- Agricultural and livestock breeding applications
- Residential and similar applications (i.e. common areas of condominiums, cellars, garages, community buildings, kitchens, etc.).

Base boxes come in two sizes. The bottom of the box always has an alveolated structure designed to allow equipment to be assembled in any location. The wide range of covers, half-covers and frames enables to select any configuration (for an overview of products, see page 50).

Covers and frames have insulated hinges that can be assembled on different sides of the boxes, as required, thus enabling the board to be oriented in any direction.
The range includes the following types of components:

- Alveolated covers and half-covers for the assembly of several types of devices
- Frame for two or three interlocked socket-outlets
- Half-covers for modular units with protection cover
- Smooth or drilled half-covers for standard flush-mounting socket-outlets

Modular devices can be spring-locked into the half-covers for modular units (the base module measures 17.5 mm. x 45 mm., in accordance with standard DIN 43880), **using the sized DIN-rail EN 60715**.

The boards for FC enclosures can be wall- or flush-mounted.

Total insulation ⧈ is guaranteed, in accordance with EN 61439-1 standard (class. CEI 17-13/1 and EN 61439-4 (class. CEI 17-13/4) by means of the supplied blanking plugs (fixed internally) with IP55 protection class.

All covers, half-covers and frames have **sealing gaskets** designed to provide an IP55 protection class and can be assembled on base boxes by means of zinc-plated screws retained in brass seats.

To ensure correct electric connections, all the walls of the boxes have **drilling templates** for holes (Pg 16 / 29).

Almost all the enclosures and related parts have an **IMQ** mark (standard CEI 23-48 and CEI 23-49). However, it is useful to remember that the installer is fully responsible for the compliance of the complete configuration with the applicable technical standards, which should be consulted for more detailed information on operating procedures.

FC enclosures can generally be used in environments with high fire hazard (CEI 64-8/7).

Mechanical features

- **Mechanical resistance**
  Verified with the provisions of experimental standard CEI 23-49
- **Resistance to chemical agents**
  See table on page 61
- **Degree of protection**
  IP55, according to CEI EN 60529 (see information note on page 60)
- **Maximum power that can be dissipated by the enclosures**
  See **Table 1** (on page 47)
- **Resistance to glow-fire**
  Compliant with IEC 60695-2-11: 650 °C for enclosures
- **Temperature**
  ambient: -25 °C / +40 °C; limit of materials: -40 °C / +100 °C
- **Self-extinguishing capacity** (UL 94 classification)
  94HB

Materials

- Enclosures in self-extinguishing thermoplastic resin, RAL 7035 grey
- Anti-aging elastomer gaskets
- Zinc-plated screws for the fixing of covers and half-covers
- Brass seats for the fixing screws of covers and half-covers

The package

The boards and components package comprises:
- Covers with gasket and fixing screws (for the covers of interlocked outlet-sockets)
- Sized DIN-rail EN 60715 with back plates and fixing screws (for the half-covers of modular units)
- Dividable plates to close unused modular spaces (for the half-covers of modular units)
- Insulated hinges
- Pg threaded cable glands with lock but, gasket and grommet for tube entry
- Blanking plugs to close internal mounting holes

The following may be supplied on request:
- Straight flush-mounting socket-outlets
- Interlocked socket-outlets with or without fuse carrier
- Socket-outlets with interlock and magnetothermal circuit breaker
- Socket-outlets with safety transformer for extra-low voltage

Degree of protection

The class of protection should be chosen according to installation standard CEI 64-8 (that implements harmonized documents CENELEC HD 60364 and IEC 60364), whose section 7 refers to specific types of installations, such as: construction and demolition sites, structures designed for agricultural or livestock breeding activities, restricted conductor areas, caravans and caravan sites, environments with higher fire hazards, public performance and entertainment areas, pools and fountains, and marinas and harbour areas. **FC enclosures have an IP55 degree of protection**. No further verification is needed if you install enclosures with an IP55 or higher class of protection and use covers with related gaskets, along with cable glands and pipe glands with an IP55 or higher class of protection. All equipment must be installed following state-of-the-art procedures and in compliance with the manufacturer's assembly instructions. If components with varying degrees of protections are installed, the degree of protection class of the resulting distribution board corresponds to that of the unit with the lowest degree of protection.

This has been assessed and applies:
- To socket-outlets when a plug with equivalent degree of protection is inserted or the cover is closed
- To enclosures, when all covers are closed

ILME accessories for the FC enclosures

ILME offers the following range of socket-outlets and plugs:
- Standard non interlocked plugs and socket-outlets for industrial use in two versions with **IP44** and **IP67** degree of protection (**PE** and **PEW** types)
- Interlocked socket-outlets for industrial use in two versions with **IP44** and **IP55** degrees of protection:
  - With switch-disconnector (**SQ, SQE and PK..EB** types)
  - With switch-disconnector and fuses (**SQV and KI..IB5** types)
  - With magnetothermal circuit breaker (**SQA** types)
  - With safety transformer ⧈ SELV (**SQT 16220** type)

Socket-outlets with IP55 degree of protection have a bayonet fastening cover, traditionally defined as "watertight", and must be used with with IP67 plugs (with locking ring and gasket) to guarantee a high protection of the connected equipment (IP55). All enclosures and socket-outlets cover the installation requirements specified in standard CEI 64-8 (series Cenelec HD 60364, IEC 60364).

Protection against indirect contact by total insulation*) ⧈

Article 8.4 of standard EN 61439-1 defines the protective measures against electric shocks that have to be incorporated in the distribution boards. Protection against indirect contacts can be guaranteed only by totally insulating the installation ⧈ which implies complying with the following:

a) The apparatus shall be completely enclosed in insulating material which is equivalent of double or reinforced insulation. The enclosure shall carry the symbol ⧈ which shall be visible from the outside.

b) The enclosure shall at no point be pierced by conducting parts in such a manner that there is the possibility of a fault voltage being brought out of the enclosure. This means that metal parts, such as actuator shafts which for constructional reasons have to be brought through the enclosure, shall be insulated on the inside or the outside of the enclosure from the live parts for the maximum rated insulation voltage and the maximum rated impulse withstand voltage of all circuits in the ASSEMBLY. If an actuator is made of metal (whether covered by insulating material or not), it shall be provided with insulation rated for the maximum rated insulation voltage and the maximum impulse withstand voltage of all circuits in the ASSEMBLY. If an actuator is principally made of insulating material, any of its metal parts which may become accessible in the event of insulation failure shall also be insulated from live parts for the maximum rated insulation voltage and the maximum rated impulse withstand voltage of all circuits in the ASSEMBLY.

c) The enclosure, when the ASSEMBLY is ready for operation and connected to the supply, shall enclose all live parts, exposed conductive parts and parts belonging to a protective circuit in such a manner that they cannot be touched. The enclosure shall give at least the degree of protection IP2XC (see IEC 60529). If a protective conductor, which is extended to electrical equipment connected to the load side of the ASSEMBLY, is to be passed through an ASSEMBLY whose exposed conductive parts are insulated, the necessary terminals for connecting the external protective conductors shall be provided and identified by suitable marking. Inside the enclosure, the protective conductor and its terminal shall be insulated from the live parts and the exposed conductive parts in the same way as the live parts are insulated.

d) Exposed conductive parts within the ASSEMBLY shall not be connected to the protective circuit, i.e. they shall not be included in a protective measure involving the use of a protective circuit. This applies also to built-in apparatus, even if they have a connecting terminal for a protective conductor.

e) If doors or covers of the enclosure can be opened without the use of a key or tool, a barrier of insulating material shall be provided that will afford protection against unintentional contact not only with the accessible live parts, but also with the exposed conductive parts that are only accessible after the cover has been opened; this barrier, however, shall not be removable except with the use of a tool.

The metal screws used for the assembly of boards and covers in the enclosures for FC distribution boards are not connected with the interior of the board. If the units are wall-mounted using the blanking plugs supplied and in accordance with the above provisions, the assembled equipment will provide protection against indirect contacts.

*) According to sub-clause 413.2.1.1 of standard IEC 60364-4-41, it is equal to that of equipment of class II, see standard IEC 60536.

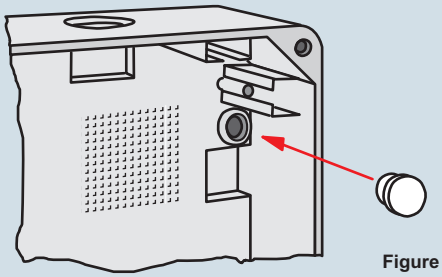


Figure 1 - Example of the use of plugs (supplied) to close the internal fixing holes.

Application of the experimental standard CEI 23-51

The maximum power that can be dissipated, P_{inv} , has been verified for each enclosure in the most severe operating conditions using the method described in the experimental standard CEI 23-49. Results are shown in **Table 1**.

Maximum power that can be dissipated in box P_{inv} (CEI 23-49)

Table 1

Article	Description	Number of modules	P_{inv} [1] (W) wall-mounting	P_{inv} [1] (W) flush-mounting
FC 2525 RP*x* / **RA***x*	255 x 255 mm box	10 units	11	14
FC 2525 RR*x* / **RA***x*	255 x 255 mm box	10 units	16	21
FC 2542 RA*x*	255 x 420 mm box	10 units	12	15
FC 2542 QV*x*	255 x 420 mm box	10 units	12	15
FC 2542 BM*x*	255 x 420 mm box	10 units	12	15

[1] **Determined for each size of enclosure under the most severe load condition provided for in the standard**

FC boxes for distribution boards

- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian experimental standard CEI 23-49
- Box, covers, frame and accessories in self-extinguishing thermoplastic resin, RAL 7035 grey
- Boxes are designed for wall- or flush-mounting and are supplied with all the necessary accessories
- The bottom of the box has an alveolated structure that allows devices to be installed in any position
- Sides with break-out entry holes Pg 16 / Pg 29
- IP55 degree of protection (EN 60529)
- ⓜ With Italian Quality Mark (CEI 23-48 and CEI 23-49)

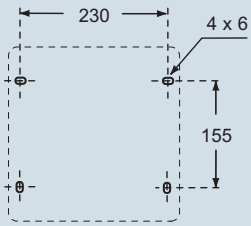
Box for interlocked SQ... socket-outlets

Mixed box for interlocked switched socket-outlets and modular devices

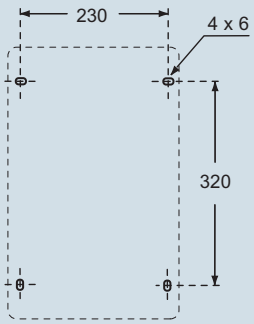
Description	Part No.	Part No.	Part No.
Consisting of: - FC 2525 MS base box - FC 2525 TS2 frame	**FC 2525 QV** ⓜ		
Base components - FC 2542 MS base box - FC 2525 TS2 frame ***Optional components*** - 1 FC 1225 SR * or SRT** half-cover		**FC 2542 QV*** ⓜ	**FC 2542 QVT**** ⓜ

Panel cut-out in mm

FC 2525 QV



FC 2542 ...

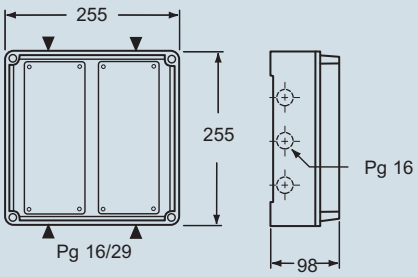


Legend:

* = **With opaque hinged cover**
** = **With transparent hinged cover**

Dimensions indicated are not binding and may be changed without prior notice.

Dimensions in mm

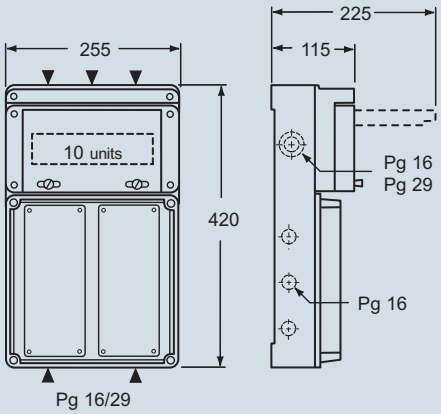


Designed for mounting:

Interlocked socket-outlets
- SQE types, 16A and 32A, IP44 and IP55 with fuse carrier
- SQV types, 16A and 32A, IP44 and IP55 with fuse carrier

Socket-outlet with transformer
- SQT 16220 type, 16A, IP55, 230/24V~, 144VA

Dimensions in mm



Designed for mounting:

Modular devices (10 units) in compartment with hinged cover and spring lockable pins, including sized DIN-rail EN 60715 (35 mm)

Interlocked socket-outlets
- SQE types, 16A and 32A, IP44 and IP55 with fuse carrier
- SQV types, 16A and 32A, IP44 and IP55 with fuse carrier

Socket-outlet with transformer
- SQT 16220 type, 16A, IP55, 230/24V~, 144VA

FC boxes for distribution boards

- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian experimental standard CEI 23-49
- Box, covers, frame and accessories in self-extinguishing thermoplastic resin, RAL 7035 grey
- Boxes are designed for wall- or flush-mounting and are supplied with all the necessary accessories
- The bottom of the box has an alveolated structure that allows devices to be installed in any position
- Sides with break-out entry holes Pg 16 / Pg 29
- Cover hinges mountable on all sides, to allow the opening of the cover to be oriented according to requirements
- IP55 degree of protection (EN 60529)
- ⓜ With Italian Quality Mark (CEI 23-48 and CEI 23-49)

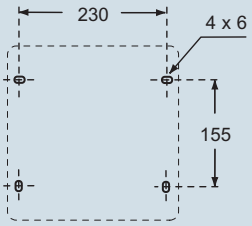
Box for interlocked switched socket-outlets

Mixed box for interlocked switched socket-outlets and modular devices

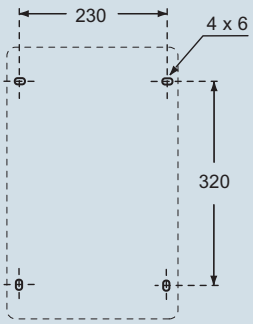
Description	Part No.	Part No.	Part No.
Consisting of: - FC 2525 MS base box - FC 2525 TS2 frame	**FC 2525 BM** ⓜ		
Base components - FC 2542 MS base box - FC 2525 TS3 frame ***Optional components*** - 1 FC 1225 SR * or SRT** half-cover		**FC 2542 BM*** ⓜ	**FC 2542 BMT**** ⓜ

Panel cut-out in mm

FC 2525 BM



FC 2542 ...

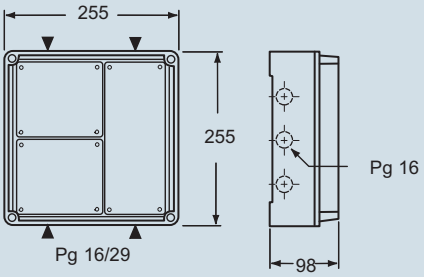


Legend:

* = **With opaque hinged cover**
** = **With transparent hinged cover**

Dimensions indicated are not binding and may be changed without prior notice.

Dimensions in mm



Designed for mounting:

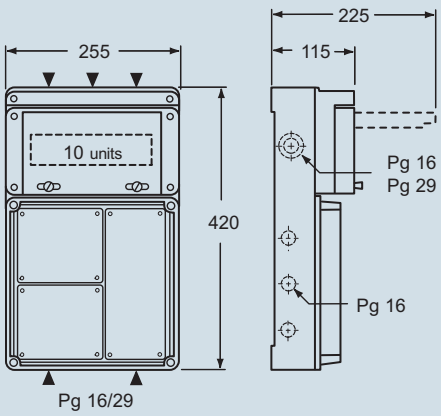
Two interlocked socket-outlets
- SQ types, 16A, IP44, without fuse carrier

Two covers
- FC 1114 RD for modular units

One interlocked socket-outlet;
- SQE types, 16A and 32A, IP44 and IP55 without fuse carrier
- SQV types, 16A and 32A, IP44 and IP55 with fuse carrier

or one socket-outlet with transformer
- SQT 16220 type, 16A, IP55, 230/24V~, 144VA

Dimensions in mm



Designed for mounting:

Modular devices (10 units) in compartment with hinged cover and spring lockable pins, including sized DIN-rail EN 60715 (35 mm)

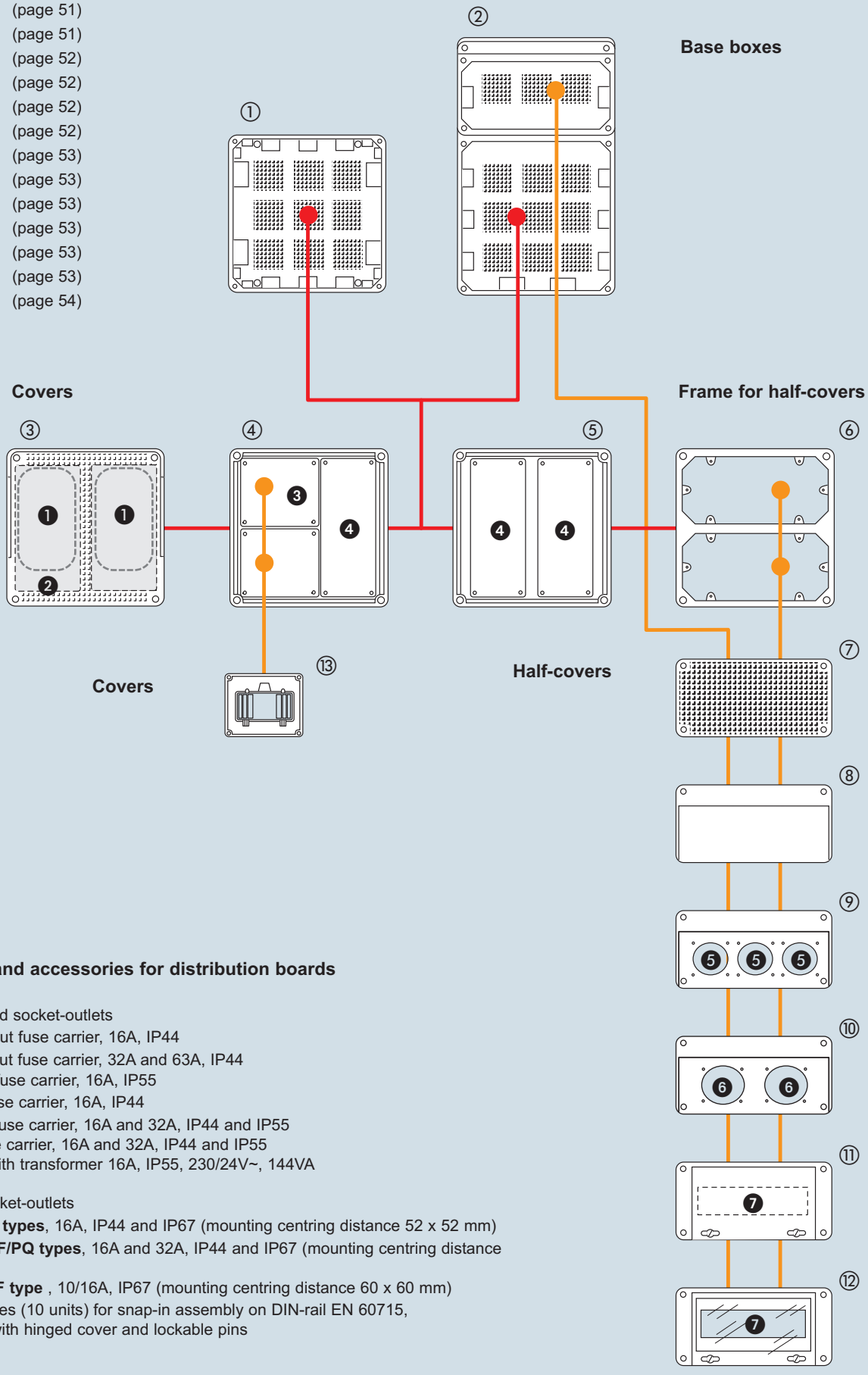
Two interlocked socket-outlets
- SQ types, 16A, IP44, without fuse carrier

Two covers
- FC 1114 RD for modular units

One interlocked socket-outlet;
- SQE types, 16A and 32A, IP44 and IP55 without fuse carrier
- SQV types, 16A and 32A, IP44 and IP55 with fuse carrier

or one socket-outlet with transformer
- SQT 16220 type, 16A, IP55, 230/24V~, 144VA

FC components for distribution boards



Socket-outlets and accessories for distribution boards

Interlocked switched socket-outlets

❶ = **PK...EB** without fuse carrier, 16A, IP44
❷ = **PK...EB** without fuse carrier, 32A and 63A, IP44
KI...IB5 With fuse carrier, 16A, IP55
❸ = **SQ** without fuse carrier, 16A, IP44
❹ = **SQE** without fuse carrier, 16A and 32A, IP44 and IP55
SQV with fuse carrier, 16A and 32A, IP44 and IP55
SQT 16220 with transformer 16A, IP55, 230/24V~, 144VA

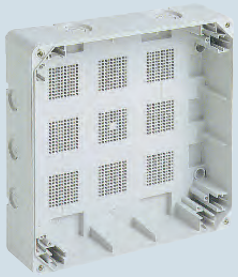
Straight built-in socket-outlets

❺ = **PE/PEW...PQ types**, 16A, IP44 and IP67 (mounting centring distance 52 x 52 mm)
❻ = **PE/PEW...PQF/PQ types**, 16A and 32A, IP44 and IP67 (mounting centring distance 60 x 60 mm)
PEW 216 PQF type , 10/16A, IP67 (mounting centring distance 60 x 60 mm)
❼ = Modular devices (10 units) for snap-in assembly on DIN-rail EN 60715, in enclosure with hinged cover and lockable pins

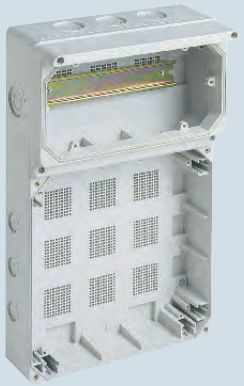
FC components for distribution boards

- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian experimental standard CEI 23-49
- Box in self-extinguishing thermoplastic material, RAL 7035 grey
- IP55 (EN 60529) degree of protection for boxes with cover or frame for half covers
- ⓜ With Italian Quality Mark (CEI 23-48 and CEI 23-49)

Small base box



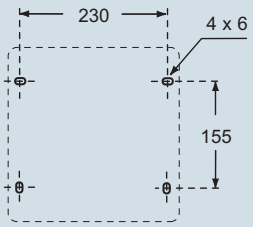
Large base box



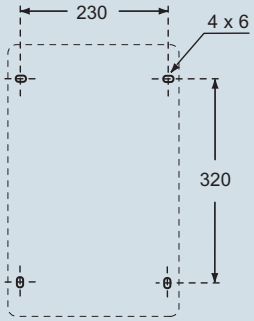
Description	Part No.	Part No.
Dimensions 255 x 255 - For series FC 2525...boxes	**FC 2525 MS** ⓜ	
Dimensions 255 x 420 - For series FC 2542...boxes		**FC 2542 MS** ⓜ

Panel cut-out in mm

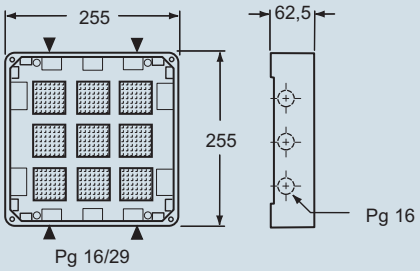
FC 2525 MS



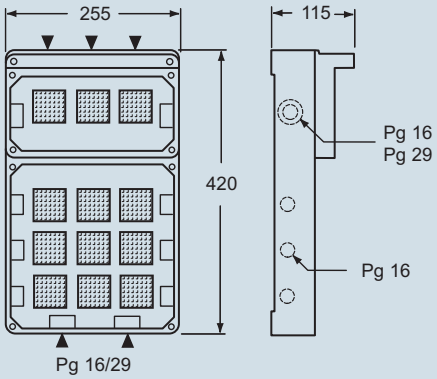
FC 2542 MS



Dimensions in mm



Dimensions in mm



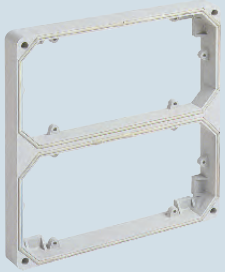
Dimensions indicated are not binding and may be changed without prior notice.

FC components for distribution boards

- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian experimental standard CEI 23-49
- Covers and frame in self-extinguishing thermoplastic resin, RAL 7035 grey
- IP55 (CEI EN 60529) degree of protection for covers and frame fitted with boxes and half-covers
- Ⓜ With Italian Quality Mark (CEI 23-48 and CEI 23-49)

Cover with alveolated structure
Covers for interlocked socket-outlets

Frame
for half-covers



Description	Part No.	Part No.
Alveolated cover Designed for the assembly of: (see note a)	**FC 2525 CR** Ⓜ	
Cover for three interlocked socket-outlets Designed for the assembly of: (see note b)	**FC 2525 TS3** Ⓜ	
Cover for two interlocked socket-outlets Designed for the assembly of: (see note c)	**FC 2525 TS2** Ⓜ	
Frame For the assembly of two half-covers		**FC 2525 TS** Ⓜ

Notes:
Assembly layouts

(a)
Two socket-outlets with nterlocked switch;
- KI..IB5 types, 16A, IP55, with fuse carrier
- PK..EB types, 16A, 32A and 63A, IP44, without fuse carrier

(b)
Two socket-outlets with nterlocked switch;
- SQ types, 16A, IP44, without fuse carrier

Two covers
- FC 1114 RD for modular units

One socket-outlet with nterlocked switch;
- SQE types, 16A and 32A, IP44 and IP55 without fuse carrier
- SQV types, 16A and 32A, IP44 and IP55 with fuse carrier

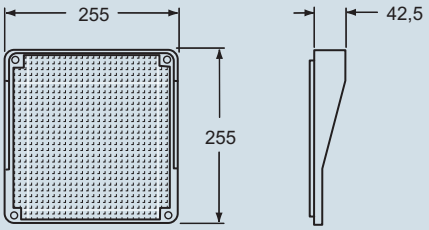
or one socket-outlet with transformer
- SQT 16220 type, 16A, IP55, 230/24V~, 144VA

(c)
One socket-outlet with nterlocked switch;
- SQE types, 16A and 32A, IP44 and IP55 without fuse carrier
- SQV types, 16A and 32A, IP44 and IP55 with fuse carrier

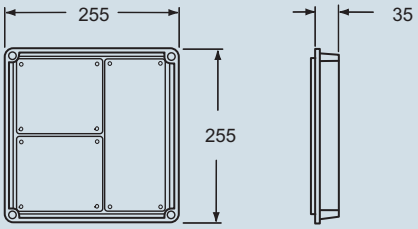
Socket-outlets with transformer
- SQT 16220 type, 16A, IP55, 230/24V~, 144VA

Dimensions in mm

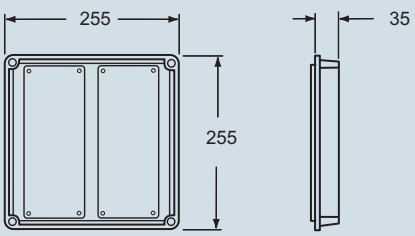
FC 2525 CR
See note (a)



FC 2525 TS3
See note (b)

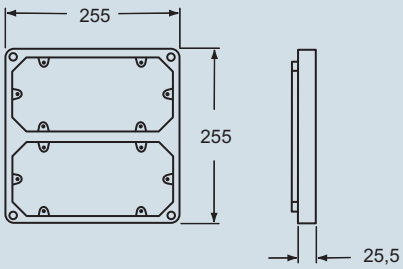


FC 2525 TS2
See note (c)



Dimensions in mm

FC 2525 TS



Dimensions indicated are not binding and may be changed without prior notice.

FC components for distribution boards

- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian experimental standard CEI 23-49
- Half-covers in self-extinguishing thermoplastic resin, RAL 7035 grey
- IP55 (EN 60529) degree of protection for half-covers with boxes and frame
- ⓜ With Italian Quality Mark (CEI 23-48 and CEI 23-49)

Half-cover with alveolated structure
Half-covers for modular devices

Half-covers
for buil-in socket-outlets

Description	Part No.	Part No.	Part No.
Alveolated half-cover For closing or assembly of several types of units	**FC 1225 SA** ⓜ		
Half-cover for modular units Designed for the assembly of: (see note a)	**FC 1225 SR*** ⓜ	**FC 1225 SRT**** ⓜ	
Smooth half-cover for socket-outlets To drill			**FC 1225 SP** ⓜ
Pre-drilled half-cover for three socket-outlets Designed for the assembly of: (see note b)			**FC 1225 SF3** ⓜ
Pre-drilled half-cover for two socket-outlets Designed for the assembly of: (see note c)			**FC 1225 SF2** ⓜ

Legend
*** = With opaque hinged cover**
**** = With transparent hinged cover**

Notes:
assembly layouts

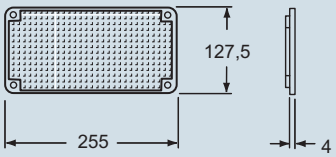
(a)
Modular devices (10 units) in compartment with hinged cover and spring lockable pins, including sized DIN-rail EN 60715 (35 mm)

(b)
Three built-in straight socket-outlets
(mounting centring distance 52x52 mm);
- PE/PEW..PQ types, 16A, IP44 and IP67

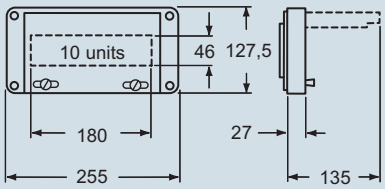
(c)
Two built-in straight socket-outlets
(mounting centring distance 60x60 mm);
- PE/PEW..PQF/PQ types, 16A and 32A, IP44 and IP67
- PEW 216 PQF type (Schuko®), 10/16A, IP67

Dimensions in mm

FC 1225 SA

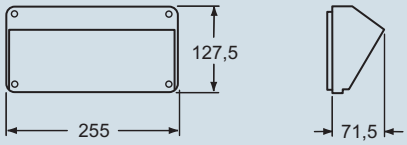


FC 1225 SR e FC 1225 SRT
See note (a)

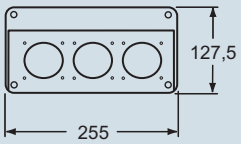


Dimensions in mm

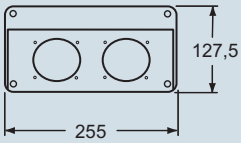
FC 1225 SP



FC 1225 SF3
See note (b)



FC 1225 SF2
See note (c)



Dimensions indicated are not binding and may be changed without prior notice.

- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian experimental standard CEI 23-49
- Cover in self-extinguishing thermoplastic resin, RAL 7035 grey
- IP55 degree of protection (EN 60529)
- ⓜ With Italian Quality Mark (CEI 23-48 and CEI 23-49)

Compartment covers for boxes FC....BM

Compartment covers for boxes FC....BM and QV

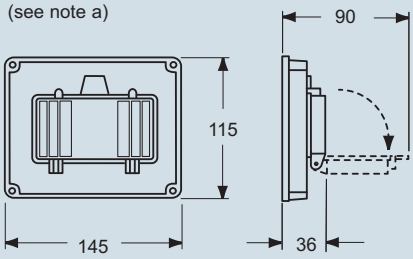
Description	Part No.	Part No.
Cover for boxes FC ... BM - For modular units (see note a) - Smooth, suitable for flush-mounted socket-outlets	**FC 1114 RD** ⓜ **FM 1114 CV** ⓜ	
Cover for boxes FC ... BM/QV - Smooth, with central hollows - Smooth, designed for flush-mounted socket-outlets		**FM 923 CVU** ⓜ **FM 923 CV** ⓜ

Notes:
assembly layouts

(a)
Modular devices (5 units) in compartment with hinged cover and spring lockable pins, including sized DIN-rail EN 60715 (35 mm)

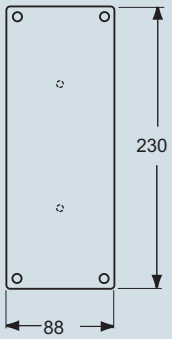
Dimensions in mm

FC 1114 RD (front view)
(see note a)

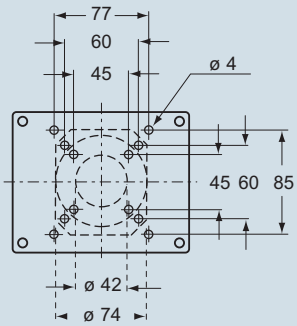


Dimensions in mm

FM 923 CVU (rear view)

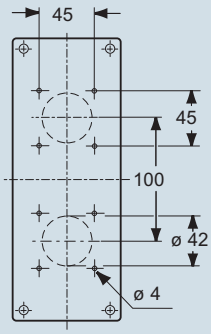


FM 1114 CV (rear view)



Suitable (after drilling) for:
straight built-in socket-outlets;
- PB...PI types (mounting centring distance 45 x 45)
- PE/PEW...PQ/ PQF type (mounting centring distance 60 x 60)
- PE/PEW...PI/PIF (mounting centring distance 77 x 85)

FM 923 CV (rear view)



Suitable for (after drilling):
straight built-in socket-outlets;
- PB...PI types (mountingcentring distance 45 x 45)

Dimensions indicated are not binding and may be changed without prior notice.

AS...AR-AF insulating cable glands

- AS..I IP68 degree of protection (EN 60529)
- ARP/AFP IP67 degree of protection (EN 60529)
- temperature range -25 °C / +100 °C
- metric thread according to EN 60423 and EN 50262
- Pg thread according to DIN 40430 and DIN 46320
- anti-aging rubber gaskets
- AS C/AS M grey RAL 7001, AS C11I / AS M 20I grey RAL 7035, AS C11IN / AS M20IN black RAL 9005

complete insulating cable gland

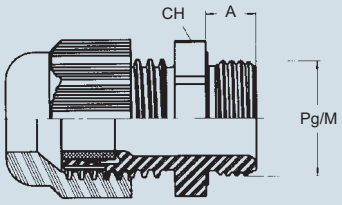
complete insulating cable gland

Description	Part No.			Part No.	
- for cable Ø 3,5 - 10 mm *	**AS C11I**	grey	Pg 11		
- for cable Ø 3,5 - 10 mm *	**AS C11IN**	black	Pg 11		
- for cable Ø 5 - 12 mm *	**AS C13I**		Pg 13,5		
- for cable Ø 7 - 14 mm	**AS C16I**		Pg 16		
- for cable Ø 9 - 18 mm	**AS C21I**		Pg 21		
- for cable Ø 14 - 25 mm	**AS C29I**		Pg 29		
- for cable Ø 18 - 32 mm	**AS C36I**		Pg 36		
- for cable Ø 24 - 38,5 mm	**AS C42I**		Pg 42		
- for cable Ø 5 - 12,5 mm	**AS M20I**	grey	M 20		
- for cable Ø 5 - 12,5 mm	**AS M20IN**	black	M 20		
- for cable Ø 9 - 18 mm	**AS M25I**		M 25		
- for cable Ø 14 - 25 mm	**AS M32I**		M 32		
- for cable Ø 18 - 32 mm	**AS M40I**		M 40		
- for cable Ø 24 - 38,5 mm	**AS M50I**		M 50		
- rubber hole Ø 7,5-10-12,5 mm *				**ARP 11**	11
- rubber hole Ø 7,5-10-12,5 mm *				**ARP 13**	13,5
- rubber hole Ø 7,5-10-12,5-15 mm				**AFP 16**	16
- rubber hole Ø 10-13-16-19 mm				**AFP 21**	21
- rubber hole Ø 18-21-24-27 mm				**AFP 29**	29
- rubber hole Ø 24-27-30-33 mm				**AFP 36**	36
- rubber hole Ø 30-33-36-39 mm				**ARP 42**	42

* Not suitable for all walls

dimensions in mm

AS C..I - AS M..I

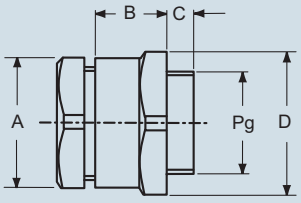


AS C..I	A	CH
11	8	22
13	9	24
16	10	27
21	11	33
29	11	42
36	13	53
42	13	60

AS M..I	A	CH
20	10	24
25	10	33
32	10	42
40	10	53
50	12	60

dimensions in mm

ARP / AFP



Part No.	A	B	C	D	Pg
ARP 11	19	20	9	24	11
ARP 13.5	22	19,5	9	26	13,5
AFP 16	24	21	10	29	16
AFP 21	30	26	10	39	21
AFP 29	41	29,5	10	50	29
AFP 36	50	33,5	10	58	36
ARP 42	54	28	12,5	60	42
ARP 48	64	41,5	13,5	77	48

Dimensions indicated are not binding and may be changed without prior notice.

AR...AS insulating cable glands

- in thermoplastic material
- anti-aging rubber gasket
- metric thread according to EN 60423 and EN 50262
- Pg thread according to DIN 40430 and DIN 46320

insulating sealing plugs

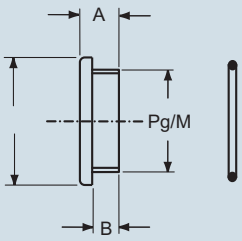
lock nuts

Description	Part No.		Part No.	
- for Pg 11 thread*	**ARD 11**	Pg 11		
- for Pg 13.5 thread*	**ARD 13**	Pg 13.5		
- for Pg 16 thread*	**ARD 16**	Pg 16		
- for Pg 21 thread	**ARD 21**	Pg 21		
- for Pg 29 thread	**ARD 29**	Pg 29		
- for Pg 36 thread	**ARD 36**	Pg 36		
- for Pg 48 thread	**ARD 48**	Pg 48		
- for M 20 thread	**AS M20D**	M 20		
- for M 25 thread	**AS M25D**	M 25		
- for M 32 thread	**AS M32D**	M 32		
- for M 40 thread	**AS M40D**	M 40		
- for M 50 thread	**AS M50D**	M 50		
- for Pg 11 thread			**ARC 11**	Pg 11
- for Pg 13.5 thread			**ARC 13**	Pg 13.5
- for Pg 16 thread			**ARC 16**	Pg 16
- for Pg 21 thread			**ARC 21**	Pg 21
- for Pg 29 thread			**ARC 29**	Pg 29
- for Pg 36 thread			**ARC 36**	Pg 36
- for Pg 48 thread			**ARC 48**	Pg 48
- for M 20 thread			**AS M20L**	M 20
- for M 25 thread			**AS M25L**	M 25
- for M 32 thread			**AS M32L**	M 32
- for M 40 thread			**AS M40L**	M 40
- for M 50 thread			**AS M50L**	M 50

* Not suitable for all walls

dimensions in mm

ARD - AS M..D

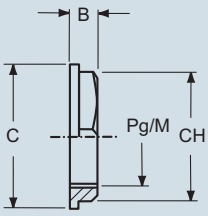


Part No.	A	B
ARD 11	7,5	6
ARD 13.5	7,5	6
ARD 16	7,5	6
ARD 21	10	8
ARD 29	10	8
ARD 36	12	10
ARD 48	14	12

Part No.	A	B
AS M20D	10,5	8
AS M25D	11	8
AS M32D	13,5	10
AS M40D	14	10
AS M50D	17	12

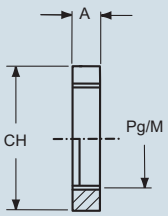
dimensions in mm

ARC



Part No.	CH	B	C
ARC 11	24	5	26
ARC 13.5	27	6	29
ARC 16	30	6	33
ARC 21	36	7	39
ARC 29	46	7	50
ARC 36	60	8	66
ARC 48	70	8	78

AS M..L

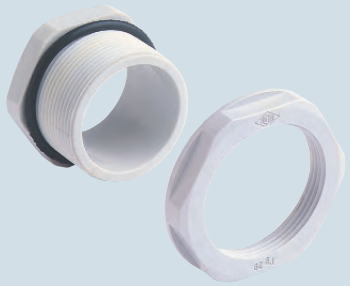


Part No.	CH	A
AS M20L	24	5
AS M25L	30	6
AS M32L	38	7,5
AS M40L	50	8
AS M50L	60	9

Dimensions indicated are not binding and may be changed without prior notice.

- in thermoplastic material RAL 7035 gray
- Anti-aging rubber gasket

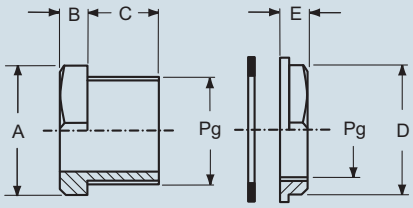
Union nipples including gasket and lock nut



Description	Part No.
Union nipples	
- For holes Pg 16*	**FC NP 16**
- For holes Pg 21	**FC NP 21**
- For holes Pg 29	**FC NP 29**
- For holes Pg 36	**FC NP 36**

* Not suitable for all walls

dimensions in mm



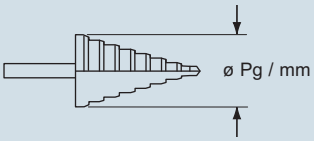
Part No.	A	B	C	D	E	Pg
FC NP 16	24	6	14	30	6	16
FC NP 21	30	7	17	36	7	21
FC NP 29	41	8	20	46	7	29
FC NP 36	50	10	23	60	8	36

Dimensions indicated are not binding and may be changed without prior notice.

Board perforation kit

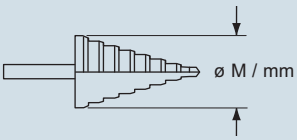
Description	Part No.
Board perforation kit comprising: - Countersink tool - Cutter for holes from Pg 7 to Pg 29 - Cutter for holes from M 6 to M 40	**FC KFQ**

Dimensions in mm



Perforation diameter

Pg	7	9	11	13,5	16	21	29
mm	13,5	16	18,8	21,5	24	29,5	38,0



Perforation diameter

M	6	8	10	12	14	16	20	25	32	36	40
mm	6,5	8,5	10,5	12,5	14,5	16,5	20,5	25,5	32,5	36,5	40,5

Dimensions indicated are not binding and may be changed without prior notice.

EN 60309-1 and EN 60309-2 standards

In 1990, **CENELEC** (European Electrotechnical Standards Committee) introduced the provisions of the international publications IEC 60309-1 and IEC 60309-2 into the two corresponding European standards EN 60309-1 and EN 60309-2 (classification CEI 23-12/1 and 23-12/2). **IEC** (*International Electrotechnical Commission*), the worldwide organisation for electrotechnical standardisation, had adopted these publications basing them almost entirely on the EEC 17 Publication of 1958, now withdrawn, issued by the now dissolved organisation **CEEél**. This is why still today this system of industrial sockets and plugs is traditionally called "EEC" by many. The European standards EN 60309-1 and -2 were then compulsorily adopted as national standards by all the CENELEC member states (which as from 1 May 2004, with the expansion of the EU, include Austria, Belgium, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Iceland, Iceland, Italy, Latvia, Lithuania, Luxembourg, Malta, Norway, Holland, Poland, Portugal, United Kingdom, Czech Republic, Slovakia, Slovenia, Spain, Sweden, Switzerland and Hungary). All conflicting national standards have at the same time been abolished.

Today, therefore, the manufacture of plugs and socket-outlets for industrial use has been harmonised throughout Europe. Before its termination, CEEel's members also included Bulgaria, Israel, former Yugoslavia (today Bosnia, Croatia, Macedonia, Serbia with Montenegro, Slovenia) and the former Soviet Union (today the Russian Federation).

In virtue of the correspondence with the IEC publications, this industrial plugs and socket-outlets system is widely known and appreciated in leading non-European countries such as Argentina, Australia, Brazil, Canada, China, Korea, Egypt, Japan, India, South Africa, Turkey and the USA.
In Italy the above harmonisation is regulated by standards CEI EN 60309-1 and CEI EN 60309-2. In 1999, the fourth editions of the IEC publications were adopted as EN by CENELEC and published in Italy in 2000.

In 2007, Amendment EN 60309-1/A1 (IEC 60309-1 Amd 1, implemented by CEI in February 2008 and in force as from 1st November 2009) introduced technical updates, such as:
- addition of construction and test requirements for terminals and screwless terminals (spring type) and IDC terminals for 16 A accessories (prior to their development) and compliance with the requirements of SC 23F standards (EN 60999-1, EN 60999-2);
- cancellation of the "drop" and "triangle" symbols and the confirmed use of only IPdegrees of protection provided for by standard EN 60529;
- introduction of possible alternative nominal current values to the classic 16A, 32A, 63A, 125A and 250A: 6A, 10A, 25A, 40A, 50A, 80A, 90A, 150A, 160A and updating, where necessary, of all test requirements in order to take into account the new nominal capacities;
- restriction on sizes of metric cables and conductors with ban on North American AWG/MCM sizes.

Again in 2007, the Amendment EN 60309-2/A1 extended the construction requirements and tests regarding accessories with screwless terminals (springs) or IDC terminals up to 32A nominal current, though only for Italy and Germany. A "versatile" degree of protection has been introduced, IP66/IP67 (fastenings, covers, retainers with degree of protection IP67), and for very low voltage ≤ 50V socket-outlets and plugs, the 8h position for accessories at 25V - 32A for portable electric incubators has been standardised, for use at 12V d.c. or 24V d.c. aboard ambulances or helicopters (covered by the relative ISO standard).

In 2012, Amendment EN 60309-1/A2 (IEC 60309-1 Amd 2) implemented by CEI in November 2012, in force as from 1st December 2012 – for existing products as from 13-07-2015, introduced further technical modifications in numerous points, the more important being: an increase in the max nominal voltage from 690V d.c. or a.c. to 1 000V d.c. or a.c.; an increase in the max nominal voltage from 250A to 800A, with the relative extensions regarding the sizes of the connectable conductors for the new preferential nominal current values of 315A, 400A, 630A and 800A; the restriction as regards the installation of these devices exclusively by informed personnel (IEV 60050-195:1998, Amendment 1:2001, definition 195-04-02) or appropriately trained personnel (IEC 60050-195:1998, Amendment 1:2001, definition 195-04-01); the extension of the usability of the screwless terminals (spring or IDC type) from 16A up to 32A for the series (that allowed in the EU by CENELEC); update of all test methods required to cover the above amendments.

Still in 2012, Amendment EN 60309-2/A2 2012-04, published by CEI in August 2012 and in force as from 1st September 2012, introduced an amendment to art. 1 "Field of application", in particular to raise the max voltage to 1 000 V a.c. or d.c., art. 3 "Reference standards", Table 104, introducing a supplementary paragraph 16.101 and modifying standardisation Sheets 2-I, 2-II, 2-III and 2-IIIa, 2-IVa, as well as Attachment ZA.

The technical notes below and the products illustrated in the present booklet refer to series 1 versions, used in Europe on the basis of said European Standards and in countries of European technical-cultural origin (e.g. most of Latin America, Australia, South Africa). A series 2 also exists, which differs for its rated current, voltage and frequency values and for its polarity and pole marking, adapting to North American installation standards and those of countries that have adopted this system (e.g. Mexico, Japan).

The provisions of standards

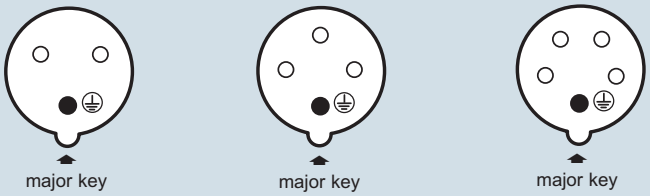
Each model of plug and socket is unique and has a specific use. Each model has safety devices that make it impossible to insert a plug into a socket made for a different capacity, voltage, frequency and number of poles. In the "low voltage" versions, the safety system is based on two references:
- a guiding groove on the socket that corresponds to a nib on the plug;
- an earthing contact of increased capacity with respect to the other contacts, and located in different hour positions according to the voltages used.

The 63A and 125A plugs have a pilot contact for operating an electric interlock.

Hour position (h)

This position is determined by looking at the front of the socket and placing the major guiding groove at the 6 o'clock position and noting the hour position of the earthing contact. Following are examples of three different polarities with the earthing contact at the 6 o'clock position.

Socket - front view



Low voltage over 50V up to 1000V

Number of poles	*Frequency (Hz)*	*Rated operating voltage (V)*	*Hour position (h) earthing contact* [1] *16A and 32A*	*63A and 125A*	*Colour*
2P+⏚	50 and 60	100 ÷ 130	4	4	yellow
		200 ÷ 250	6	6	blue
		380 ÷ 415	9	9	red
	50 and 60	480 ÷ 500	7	7	black
		supply from ins. transf.	12	12	[5]
	100 ÷ 300	> 50	10	10	[4]
	> 300 ÷ 500	> 50	2	2	[4]
	direct current	> 50 ÷ 250 [6]	3	3	[5]
		> 250	8	8	[5]
3P+⏚		supply from ins. transf.	12	12	[5]
	50 and 60	100 ÷ 130	4	4	yellow
		200 ÷ 250	9	9	blue
		380 ÷ 415	6	6	red
	60	440 ÷ 460 [2]	11	11	red
	50 and 60	480 ÷ 500	7	7	black
		600 ÷ 690	5	5	black
	50	380	3	3	red
	60	440 [3]	3	3	red
	50 and 60	1000	—	8	black
	100 ÷ 300	> 50	10	10	[4]
	> 300 ÷ 500	> 50	2	2	[4]
3P+N+⏚		57/100 ÷ 75/130	4	4	yellow
		120/208 ÷ 144/250	9	9	blue
	50 and 60	200/346 ÷ 240/415	6	6	red
		277/480 ÷ 288/500	7	7	black
		347/600 ÷ 400/690	5	5	black
	60	250/440 ÷ 265/460 [2]	11	11	red
	50	220/380	3	3	red
	60	250/440 [3]	3	3	red
	50 and 60	supply with insul. transf.	12	12	[5]
	100 ÷ 300	> 50	10	10	[4]
	> 300 ÷ 500	> 50	2	2	[4]
all types	All rated operating voltages and/or frequencies not covered by other configurations. In addition, this hour position can be used in special applications where a distinction is required with respect to the other standardised positions.		1	1	[5]

[1] The positions indicated with dashes "-" are not standardised.
[2] Mainly for marine installations.
[3] Only for refrigerated containers (standardised by ISO).
[4] If necessary, green may be used together with the colour of the operating voltage for frequencies of over 60 Hz up to 500 Hz inclusive.
[5] Colour according to voltage.
[6] This configuration must have an earthing contact as it covers voltages higher than the upper limits of the ELV (d.c.) according to IEC 60364-4-41.

Normal service conditions for electrical equipment

The standard EN 61439-1 applies to low-voltage switchgear and control gear assemblies, commonly known as low-voltage boards, with rated voltage not exceeding 1000V eff. a.c. (with frequency not exceeding 1 kHz, although boards for greater frequencies are allowed under further specific prescriptions) or 1500V in d.c.

This standard defines the equipment (boards) for indoor and outdoor use in accordance with the installation conditions. The normal service conditions are in fact defined for indoor and outdoor use.
These normal conditions are also used as reference in standard EN 60664-1 (basic safety publication) for the coordination of insulation. This coordination consists of the definition of the rated insulation values (the air and surface distances between conductors of different voltages) of electrical equipment and the corresponding components relating to:

- dielectric characteristics of the insulating materials used
- degree of pollution in the environment where they are to be used
- overvoltage category of the point at which they are connected to the network (distance from the generating centres).

1. Ambient air temperature
In normal indoor service conditions, the temperature should not be lower than -5 ˚C or greater than +40 ˚C and the average value over 24 h should not exceed +35 ˚C. For outdoor installations the minimum value is -25 ˚C in mild climates and -50 ˚C in Arctic climates (with the possibility of an agreement between manufacturer and user in the latter case).

2. **Altitude**
The altitude of the installation site should not exceed 2000 m. For equipment to be used at higher altitudes, it is necessary to consider the reduction of dielectric rigidity and the cooling effect of the air. For installations in different conditions, refer to the manufacturer.

3. Atmospheric conditions:

Humidity and pollution
The relative humidity of the air should not exceed 50% at a maximum temperature of 40 ˚C. Higher relative humidity values are allowed at lower temperatures, for example: 90% at +20 °C. For outdoor installations, the relative humidity may reach 100% at a maximum temperature of +25 ˚C.

Degrees of pollution

The pollution degrees define the environmental conditions. To go in more detail, standard IEC 60664-1 clarifies that pollution is defined as any contribution of foreign matter, whether a solid, liquid or gaseous (ionised gas), that may negatively affect the dielectric strength of the surface resistivity of the insulating material.

Four degrees of pollution are defined and are described by conventional numbers based on the quantity of polluting agent or on the frequency with which the phenomenon occurs that reduces the dielectric strength and/or the surface resistivity.

- **pollution degree 1**: no pollution or only dry non-conductive pollution. The pollution has no influence.
- **pollution degree 2**: only non-conductive pollution except that occasionally a temporary conductivity caused by condensation is to be expected.
- **pollution degree 3**: conductive pollution occurs or dry non conductive pollution occurs which becomes conductive due to condensation [7].

The **pollution degree 2** refers to a household or similar environment.
The **pollution degree 3** refers to an industrial or similar environment.

The third edition and the forthcoming fourth edition of EN 60309-1 standard (IEC 60309-1) specifies that the normal use environment for the industrial plugs and socket-outlets complying with this standard has a pollution degree 3 according to standard IEC 60664-1.

[7] Pollution degree 4 was eliminated in the new standard edition as clearly illogical: conditions of persistent conductivity caused for example by conductive dust, rain or snow are definitely to be avoided throughout the project, and no isolating distance is capable of withstanding them.

[8] The **IP66/IP67** degree of protection has been introduced in the Amendment 1 of standards EN 60309-1 and EN 60309-2 (and of the relating IEC standards). It is already accounted for in the IP degree of protection standard EN 60529 as a "versatile" form of protection, covering the fact that the temporary immersion resistance test (protection IPX7) does not automatically comply with the two lower degrees of protection IPX6 and IPX5, tested with the respective jet tests. If the end user requires the equipment to resist both against temporary immersions and pressurized water jets, declaredly IP66/IP67 devices with double marking must be selected.

IP degree of protection and the EN 60529 standard

The minimum IPdegree of protection is regulated by the CEI 64-8 installation standards (inclusion of the harmonisation documents of the CENELEC HD 60364 series and the IEC 60364 publication) which, in part 7, cover a number of special environments: construction and demolition sites, structures designed for agricultural or livestock breeding use, restricted conductor areas, caravans and caravan sites, environments with a greater risk in case of fire, public performance and entertainment areas, pools and, in the future, fountains, marinas and harbour areas. The standard is applicable to enclosures for electric materials with a rated power no greater than 72.5 kW.
All the equipment must be installed according to state of the art rules and must comply with any manufacturer's assembly instructions. When components of different degrees of protection are assembled, the resulting board or distribution system will assume the lowest degree of protection of the mounted components.
This has been assessed and applies to:
- socket-outlets, when a plug of the same degree of protection is inserted or when the cover is closed (with counternuts tightened for IP67).
- plugs (with counternuts tightened for IP67).
- enclosures, when all covers are closed

The range of ILME products presented in this catalogue offers the following range of protection:

IP44: protection against the *penetration of solid foreign objects* with a diameter equal to or greater than 1 mm for protection against the intrusion of dangerous parts with an access calibre of Ø 1 mm (1st digit), and protected against the *dangerous effects of water spray* from all directions (2nd digit).
IP55: Protection against the *penetration of harmful quantities* of powder and against *access to dangerous* parts with an access calibre of Ø 1 mm (1st digit) and protected against the *dangerous effects of water jets* with a nozzle from all directions (2nd digit).
IP66: total protection against *dust* and access to *dangerous parts* with an accessibility calibre of Ø 1 mm (1st digit), and protected against powerful *water jets* such as sea waves (2nd digit).
IP67: total protection against *powder* and against *access to dangerous parts* with an access calibre of Ø 1 mm (1st digit) and protected against the *effects of temporary immersion* (30') in water at a maximum depth of 1 metre (2nd digit).
IP69: total protection against *dust* and access to *dangerous parts* with an accessibility calibre of Ø 1 mm (1st digit), and protected against powerful *water jets, such as sea waves, and high temperatures* (2nd digit).

The socket-outlets with IP55 degree of protection and those with double degree of protection IP66/IP67 [8] have a bayonet jointed lid, traditionally defined as "water-tight" and require plugs with IP67 degree of protection (with counternut and gasket) to preserve the degree of protection marked on the apparatus.

1st digit
Personal protection against contact with hazardous parts

IP	External solid objects	Protection
		none
		against solid foreign objects with Ø greater or equal to 50 mm (e.g. hand)
		against solid foreign objects with Ø greater or equal to 12 mm (e.g. finger)
		against solid foreign objects with Ø greater or equal to 2.5 mm (e.g. tools and wires)
		against solid foreign objects with Ø greater or equal to 1 mm (e.g. fine tools and wires)
		against dust (no harmful deposit)
		total against dust

2nd digit
Protection of materials against harmful penetration of water

IP	Tests	Protection
		none
		against vertical drops of water
		against drops of water with an inclination of 15° from the vertical
		against drops of water with an inclination of 60° from the vertical
		against splashing water from all directions
		against jets of water from all directions
		against powerful jets of water (such as sea waves)
		against the effect of temporary immersion in water at a depth of 1 metre
		against the effect of prolonged immersion in water (duration and/or depth according to requirements)
		against jets of water at high pressure and high temperature

Resistance to chemical agents

The information given below is valid for conditions of application at environmental temperatures no greater than 40 °C.
The data provided in the table should be considered merely as a guide because the resistance of technopolymers that come upon contact with chemical agents depends upon the concentration of the agent, the temperature at the time of contact, the mechanical stress involved and the duration of the contact.
If the accessories and equipments are to be used in the presence of acids, bases, solvents or high concentration oils, contact our Technical Service Department.

Table of reactions to chemical agents

chemical agents / items	H_2O (t up to 23 °C)	Watery saline solution	Acids		Bases		Solvents			Ethyl alcohol (ethanol)	Oils			Fats		Animal organic solution	Fuels	
			Concentrates	Diluted 15% max	Concentrated	Diluted 15% max	Aliphatic hydrocarbons (hexane)	Aromatic hydrocarbon (benzene)	Chlorinated hydrocarbons and acetone (ketones)		Silicone	Mineral	Vegetable	Animal	Synthetic		Unleaded	Diesel
interlocked switched socket-outlets **SQ, SQx series,** socket-outlets with safety transformer **SQT**																		
precodes **SQ** and **SQ**x and **SQT**	●	●	●	●	○	○	●	○	○	○	○	○	○	○	○	○	○	○
FC board components																		
FC series enclosures	●	●	○	●	●	●	●	X	X	●	●	○	○	X	○	○	X	X
FM board components																		
FM series enclosures	●	●	●	●	○	○	●	○	○	○	●	○	○	○	○	○	○	○

[1] BP, BPR, Q, Q2 and RQ type modules (see reactions of the Pluso socket-outlets); BC 1734 R3T (see reactions of FM series).

Legend

● = resistant
○ = limited resistance
X = not resistant

Corrosion and resistance to rust

The new edition of standard EN 60309-1 recommends for corrosion and resistance to rust the use of IP67 plugs and socket-outlets wherever corrosion could create problems on electrical parts and advises the manufacturer to consider the product specifically in terms of resistance to corrosion under specific operating conditions.
To this end, socket-outlets and plugs with nickel-plated contacts are available upon request for applications in permanently dusty environments (e.g. cement and tile factories) or in environments with animal organic liquids (e.g. farms, agricultural and food processing industries). **These socket-outlets and plugs and sockets have a greater resistance to corrosion** and greater sliding capacity, allowing the plug to be removed from the socket even under difficult conditions.
Contact our sales offices for availability and price quotes.

Best quality-price balance

IB6/FC Series

- IP66 degree of protection
- mechanical resistance: IK 10
- insulating enclosure
- 16A, 32A, 63A models
- installation: single wall mount or with FC series
- cable entry: top or rear
- bottom plug entry
- versions: without fuses; with fuses; with transformer

SQV/FM Series

- IP44/IP55 degree of protection
- mechanical resistance: 6 J
- insulating enclosure
- 16A, 32A models
- installation: wall / flush mount
- cable entry: top or rear
- plug entry 15° angled
- versions: without fuses; with fuses; with transformer

FM PI/PQ Series

- IP44 and IP55 degree of protection
- mechanical resistance: 6 J
- insulating enclosure
- 16A, 32A, Schuko®
- modular

PB5 Series, die-cast aluminium alloy

- IP55 degree of protection
- mechanical resistance: IK 10
- die-cast aluminium alloy enclosure
- 16A, 32A, 63A,125A models
- installation: wall mount
- cable entry: top or rear
- bottom plug entry
- versions: without fuses; with fuses; with transformer

Extremely robust

TM Series

- IP66/IP67 degree of protection
- mechanical resistance: IK 10
- insulating enclosure, robust construction
- 16A, 32A, 63A models
- installation: wall / flush mount
- cable entry: top, bottom or rear
- bottom plug entry
- versions: without fuses; with fuses; with transformer

TM Ex Series

- IP66/IP67 degree of protection
- mechanical resistance: IK 10
- insulating enclosure, robust construction
- 16A, 32A, 63A models
- installation: wall mount
- cable entry: top or rear
- bottom plug entry
- versions: without fuses; with fuses

TM PI Series

- IP44 and IP66/IP67 degree of protection
- mechanical resistance: IK 10
- insulating enclosure, robust construction
- 16A, 32A models
- installation: wall / flush mount
- cable entry: top, bottom or rear
- plug entry 15° angled
- versions: standard PLUSO plugs

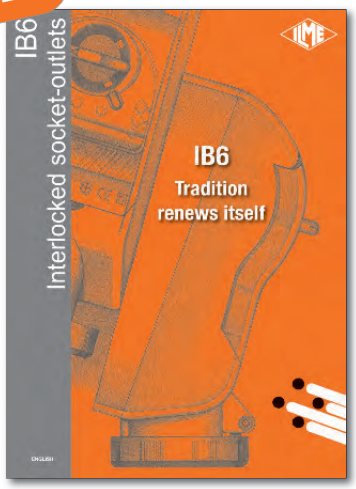
BK Series

- IP66/IP67 degree of protection
- mechanical resistance: IK 10
- UL 94 V0 insulating enclosure
- 16A, 32A, 63A models
- installation: wall / flush mount
- cable entry: top, bottom or rear
- plug entry: front
- versions: without fuses; with fuses; with transformer

NEW

PES
Save time - Squich® connection

NEW



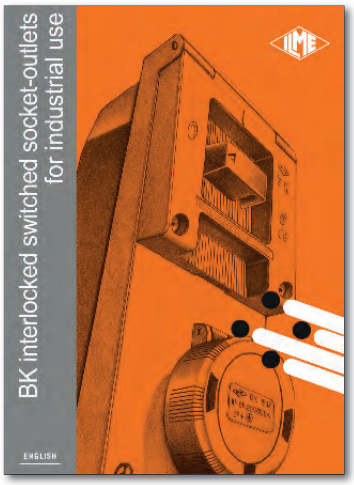
IB6
Tradition renews itself

NEW

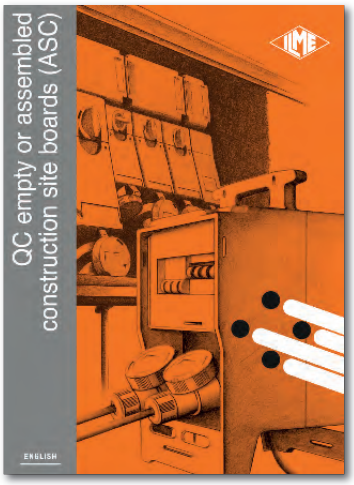
TM ATEX
Potentially explosive atmospheres

PLUSO
Sockets and Plugs

SQV
Interlocked switched socket-outlets



BK
Interlocked switched socket-outlets



QC
Site boards

TM
Interlocked switched sockets

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