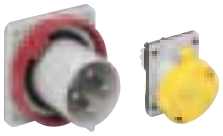
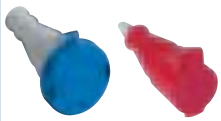
the products

plugs and couplers	with interlock	main application fields
Pluso page 11 to page 37	**SQ and SQ...** page 131 to page 143	
		domestic - services sector - construction sites - shopping centres - agriculture and livestock breeding - light industry
	**PK, KI, PB...T1 and T2** page 67 to page 87	
		services sector - construction sites - exhibition centres - tourist resorts, recreational centres, sports and entertainment centres - shopping centres - agriculture and livestock breeding - light and heavy industry
	**TM** page 39 to page 65	services sector - construction sites - exhibition centres - tourist resorts, recreational centres, sports and entertainment centres - shopping centres - agriculture and livestock breeding - light and heavy industry
		
	BE, BK, BA, BP, BI, BT and BC page 150 to page 156	
		hospitals - large-scale catering - harbour and naval works - agriculture and livestock breeding - chemical industry - light and heavy industry
		
		
		steel industry - large works - shipyards - large industries

systems

FM
cases for distribution boards

light, resistant, compact and easy to handle structures with a large number of possible combinations

page 105 to page 129

may be combined with:
the Pluso series
the SQ and SQ... series

FC
supports and cases for distribution boards

strong, modular and articulated structure, supports for the groups

page 89 to page 104

may be combined with:
the Pluso series
the SQ and SQ... series
the PK, KI series, PB...T1 and T2

BK
modular system for distribution boards

especially strong structures for use in severe, highly aggressive conditions with degree of protection IP67

page 145 to page 161

may be combined with:
the Pluso series

PK...PB5, PK...LL, PB...A1 and A2
socket-outlets in die-cast metallic enclosures

strong structures for use in extremely severe ambients

pages 78-79-81-82

may be combined with:
the Pluso series

TM
interlocked switched socket-outlets and accessories for distribution boards and batteries

strong structures for use in extremely severe ambients with degree of protection IP66/IP67

page 39 to page 65

may be combined with:
the Pluso series

standards for low voltage plugs, socket-outlets and distribution boards

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 **CEEel**, This is why still today this system of industrial sockets and plugs is traditionally called by many "EEC". 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 EN 60309-1 and EN 60309-2. In 1999 the fourth editions of the IEC publications were adopted as EN by the CENELEC and published in Italy in 2000.
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 the 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.

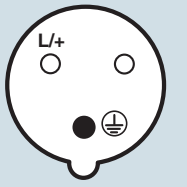
In the "low voltage" versions, the safety system is based on two references:
- a guiding groove on the socket that corresponds to a nib on the plug;
- an earthing contact of increased capacity with respect to the other contacts, and located in different hour positions according to the voltages used.

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

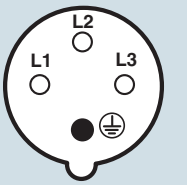
Hour Position (h)

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 earth contact at the 6 o'clock position.

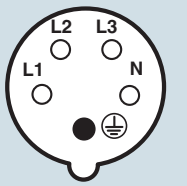
Socket - front view



major key



major key



major key

Low voltage over 50V up to 690V

Number of poles	frequency	rated operating voltage	hour position (h) earthing contact (*)		colour
	Hz	V	16A and 32A	63A and 125A	
2P+⏚	50 and 60	100 - 130	4	4	yellow
	50 and 60	200 - 250	6	6	blue
	50 and 60	380 - 415	9	9	red
	50 and 60	480 - 500	7	7	black
	50 and 60	supply from isol. transf.	12	12	(**)
	100 ÷ 300	> 50	-	-	(***)
	> 300 ÷ 500	> 50	2	-	(***)
	direct current	> 50 - 250	3	3	(**)
	direct current	> 250	8	8	(**)
3P+⏚	50 and 60	100 - 130	4	4	yellow
	50 and 60	200 - 250	9	9	blue
	50 and 60	380 - 415	6	6	red
	60	440 - 460 ☆	11	11	red
	50 and 60	480 - 500	7	7	black
	50 and 60	600 - 690	5	5	black
	50 60	380 440 ❄	3	-	red
	100 ÷ 300	> 50	10	-	(***)
	> 300 ÷ 500	> 50	2	-	(***)
3P+N+⏚	50 and 60	57/100 - 75/130	4	4	yellow
	50 and 60	120/208 - 144/250	9	9	blue
	50 and 60	200/346 - 240/415	6	6	red
	50 and 60	277/480 - 288/500	7	7	black
	50 and 60	347/600 - 400/690	5	5	black
	60	250/440 - 265/460 ☆	11	11	red
	50 60	220/380 250/440 ❄	3	-	red
	100 ÷ 300	> 50	-	-	(***)
	> 300 ÷ 500	> 50	2	-	(***)
all types	all rated operating voltages and/or frequencies not covered by other configurations		1	1	(**)

☆ Mainly for marine installations
❄ Only for refrigerated containers (standardised by ISO)
(*) The positions indicated with dashes "-" are not standardised
(**) Colour according to voltage
(***) 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

The Provisions of the Standards

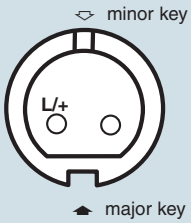
Each model of plug and socket is unique and has a specific use. Each model has safety devices that make it impossible to insert a plug into a socket made for a different capacity, voltage, frequency and number of poles.

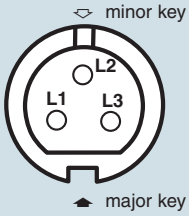
In the "extra-low voltage" versions with no earthing contact, the safety system is based on two references:
- a guiding groove (key way) on the plug that corresponds to a nib on the socket (major key) that is fixed at the 6 o'clock position
- another groove on the plug (minor key) and a nib on the socket (minor key) that can be positioned on different hours, according to the operating requirements.

Hour Position (h)

This position is determined by looking at the front of the socket and placing the major key way at the 6 o'clock position and noting the hour position of the minor key. Following are examples of two different polarities with the minor key at the 12 o'clock position.

Socket - front view





Extra low voltage up to 50V

Number of poles	frequency	rated operating voltage	hour position (h) minor key position (*)	colour	
	Hz	V	16A and 32A		
2P	50 and 60	20 - 25	no key way		violet
	50 and 60	40 - 50	12		white
	> 100 ÷ 200	20 - 25 and 40 - 50	4		(**)
	300	20 - 25 and 40 - 50	2		(**)
	400	20 - 25 and 40 - 50	3		(**)
	> 400 ÷ 500	20 - 25 and 40 - 50	11		(**)
	d.c.	20 - 25 and 40 - 50	10		white
3P	50 and 60	20 - 25	no key way		violet
	50 and 60	40 - 50	12		white
	> 100 ÷ 200	20 - 25 and 40 - 50	4		(**)
	300	20 - 25 and 40 - 50	2		(**)
	400	20 - 25 and 40 - 50	3		(**)
	> 400 ÷ 500	20 - 25 and 40 - 50	11		(**)

(*) Positions 1, 8 and 9 are reserved for future standardisation. For constructional reasons, positions 5, 6 and 7 cannot be used.

(**) If necessary, green may be used together with the colour of the operating voltage for frequencies higher than 60 Hz up to 500 Hz inclusive.

Size of connectable conductors according to EN 60309-1

Conductor cross-sections in mm² usable in socket-outlets and plugs

rated operating voltage	rated current	fixed plugs* (rigid or semi rigid conductors)		plugs and couplers (rigid or semi fixed plugs rigid conductors)	
		min	max	min	max
over 50V up to 690V	16A	1. 5	4	1	2.5
	32A	2.5	10	2.5	6
	63A	6	25	6	16
	125A	25	70	16	50
up to 50V	16A	4	10	4	10
	32A	4	10	4	10

For pilot contacts (63A ad 125A socket-outlets and plugs), refer to the conductors which can be used in the 16A socket-outlets and plugs with a rated voltage of over 50V.

* It is also possible to connect flexible conductors to fixed sockets and plugs. The equivalent section of the flexible conductor is generally one size smaller than the rigid or the semi rigid conductor. Please refer to EN 60309-1 and -2 norms.

Use of multipolar cables according to EN 60309-1

Min. and max. diameters of cables which clamped in couplers and plugs

rated operating voltage	rated current	approximate external cable ø in mm (cables type HO5 RR-F and HO7 RN-F)	
		min	max
over 50V up to 690V	16A	8.1	15.3
	32A	11.5	21.3
	63A	17.3	31.3
	125A	26.0	48.8
up to 50V	16A	13.5	22.8
	32A	13.5	22.8

EN 60439-1[1] and EN 60439-3 standards

The low voltage distribution boards, known as "*assemblies*" by the definitions in EN 60439 standard, contain the switchgear (for isolation, switching), protective devices (automatic circuit-breakers, fuses), and controlgear (for command, control and measurement), and are rarely suitable for mass-production.
The mass-production of these boards is not cost-effective, given the great number of installation possibilities which are unlikely to fall within a limited number of models.
In the past the board (defined a gswitchgear and controlgear assemblyh) used to be more often a typical custom-built production. The electrical, thermal and mechanical coordination requirements, with the exception of the implementation of anti-accident measures, were completely neglected, given the lack of technical standards which would define the state of the art.
The concept of state of the art was introduced as a legal term of reference (in Italy by law no. 186 of 1968) but for gassembliesh it was left to the free judgement of the designer, the manufacturer and the installer of the board itself.

The Technical Committee 17 (Switchgear and Controlgear) of the Italian National Electrotechnical Committee (CEI) tried to compensate for this lack of reference with the first edition of the CEI 17-13 (1980) Italian standard, although this one only covered the "factory-built assemblies", i.e. those mass-produced assemblies for which it was technically feasible and economically acceptable to introduce a series of type tests. For the first time. the board was considered a product and not a miniature system.

The standardisation of the board equipment (switchgear and controlgear such as switches, disconnectors, automatic circuit-breakers, contactors, etc.) has in the meantime reached such level as to make the "modular" construction of the boards possible. The electrical, thermal and mechanical performance of these structures can be estimated by calculation within acceptable limits, thus avoiding costly tests and certifications.
Hence the need for a detailed standard, also applicable to custom-built boards, obtained by assembling components whose behaviour can be inferred by what is declared by their manufacturers or may refer to a prototype submitted to a full cycle of type tests.

The second edition of the Italian standard for gassembliesh CEI-17-13 of 1991 is now a harmonised European Norm known as EN 60439-1. It introduced the classification of boards into **TTA** type-tested assemblies (more likely mass-produced [2]) and **PTTA**, partially type-tested assemblies (more likely custom-built in small quantity or in a single unit [3]). For the first of these (**TTA**), the standard prescribed costly and technically difficult laboratory tests, while for the second (**PTTA**), it prescribed checks consisting of simple instrumental measurements accessible to small manufacturers and/or installers, and of deductions gathered from the data of the manufacturers of the components (switchgear and controlgear devices and enclosures). The third edition of the EN 60439-1 standard (CEI 17-13/1, 1995), and more recently the fourth edition, improved this strategy[4]. At the same time deductive methods were introduced for the PTTA boards to avoid carrying out the most difficult tests (technical report CEI17-52[5], short-circuit withstand; publication CEI 17-43[6], heating) starting from data of similar systems which have been submitted to type-tests (TTA boards). The standard bestows equal value to the boards tested by the manufacturer using type tests and those deriving from the latter, verified via calculations.

For the a.c. enclosed distribution boards **(DBU)** to be used indoors, with voltage to earth up to 300V a.c., which are stationary, intended to be used either in domestic (household) applications or in places where unskilled persons have access for their use, the particular prescriptions of standard EN 60439-3 of 1992 are applied, integrated by amendment EN 60439-3 A1 of 1995 and by the more recent amendment EN 60439-3/A2: 2001-10.
This norm deals with small and medium distribution boards of the type referred to above with input rated current up to 250A and currents on single output circuits up to 125A, and only of the fully type-tested type (also referred to as mass-produced) with type tests (TTA), but declared itself not applicable to PTTA boards.

If the general standard EN 60439-1 therefore allows fully type-tested assemblies (TTA) and partially type-tested assemblies (PTTA), the particular standard EN 60439-3 is stricter for DBU distribution boards with the aim of enhancing the safety of "unskilled persons", or (IEC 64 8/2) those classified as instructed (with the necessary knowledge to prevent risk from an electric system) and advised (who have received the necessary information from an instructed person with the aim of preventing risk).

A distribution board to be classified as DBU, which may be used by a person who has not been instructed or advised, loses this negative feature simply by preventing its use by locking it up and giving the key to a trained person.
In this way, in homes and similar places, where a DBU board would be necessary, it is possible to install a PTTA board with suitably restricted access to the controls.
But the manufacturer of PTTA distribution boards lacks a set of reference standards except for EN 60439-1, that is, the general part.

The experimental Italian standard CEI 23-51

Given the need to define safety prescriptions for PTTA distribution boards in order for them to be considered as gstate of the arth in accordance with the Italian law (a need that in Italy has stemmed from law no. 46 of 1990 dealing with the safety of installations of any kind in buildings) SC23B/C of the Italian National Electrotechnical Committee CEI, based upon standard CEI 23-48[8] drew up two experimental standards, namely **CEI 23-49** [9] and **CEI 23-51** [10].

With CEI 23-51, in force in Italy since April 1st 1996 and recently extended to its second edition, the scope of CEI 23-48 is widened than in the original one which includes shunt boxes and flush-mounting boxes to hold switches and household socket-outlets, to cover also boxes for the so-called exchanges for household and similar installations (I_{nq} **< 32A**) and distribution boards with three-phase power greater than 90 kW.

In fact, this standard applies to switchgear and controlgear assemblies with input rated current I_{ne} not greater than 125A[11], to be used in alternate current with rated voltage no greater than 440V, with prospective rated short-circuit current not exceeding 10 kA, or protected by current limiters with limited current not exceeding 15 kA at their rated breaking capacity.

This standard establishes the prescriptions for the production, checking and testing of stationary distribution boards for household and similar use, consisting of an enclosure and one or more devices. In particular, it provides a deductive method for the check of the temperature-rise limits (30˚K) knowing the maximum power dissipated by the enclosure P_{inv} and that dissipated by the devices incorporated.
To make boards which include equipment with non-negligible thermal dissipation, the standard entails the use of enclosures complying with the experimental Italian standard CEI 23-49.

Standard CEI 23-49 adds to the safety prescriptions of the general standard CEI 23-48[12] on enclosures for boards for household or similar use, the performance prescriptions, which oblige the manufacturer of the enclosure to verify and declare the maximum dissipating power of the enclosure P_{inv} for the 30˚C maximum permissible temperature gradient.

[1] A radical review of the IEC 60439 standards is already at an advanced stage, and will be allocated the numbering IEC 61439 .

[2] **TTA** = type-tested assemblies

[3] **PTTA** = partially type-tested assemblies

[4] The fourth edition of standard **CEI EN 60439-1** has been in force since 1 January 2001, but up to 1 August 2002 it remained in force together with the 3rd edition. The few changes made relate to:
- details of the four segregation forms, useful to differentiate cases of access to the board for maintenance purposes, thus improving protection against direct contacts;
- specification of the direction of manoeuvre of the equipment to be determined on the basis of the risk of manoeuvring errors;
- exemption from the short circuit test for board circuits whose top current is limit ed to below 17 kA (previously 15 kA) with regard to the assumed maximum short circuit current at the terminals of the board's entry circuit;
- resistance between the protective earthing circuit and the board's exposed con ductive parts below 0.1 Ω

[5] **CEI 17-52** (1994, reprinted in 1997-08) *A method of assessing the ability of partially type-tested assemblies (PTTA) to withstand short-circuits.* It is equivalent to IEC 61117: 1992-2.

[6] **CEI 17-43** (2000-08) *A method of temperature-rise assessment by extrapolation for partially type-tested assemblies (PTTA) of low voltage switchgear and controlgear. It is equivalent to technical report IEC/TR3 60890:1987-07 + IEC/TR3 60890 EC:1988-03 + IEC/TR3 60890/A1:1995-05 and to document CENELEC HD 528 S2:1997-01.*

[7] Reprinted by CEI in consolidated form as CEI EN 60439-3 (1997-07) , booklet 3445 C.

[8] **CEI 23-48** (1998-02) Enclosures for stationary equipment for household and similar use - Part 1: General prescriptions. This is the non-amended reprint of the first edition 1995-12. It was published in Italy, with the authorisation of CENELEC, owing to the delay in the advancement of the European project prEN 60670 (equivalent to IEC 60670:1989-11 + IEC 60670/A1:1994-07). It was recently ratified by CENELEC, and therefore the new, equivalent standard **EN 60670-1**: 2004 will soon be published with amendments to standard IEC 60670-1:2002-12.

[9] **CEI 23-49** (1996-03) Enclosures for stationary equipment for household and similar use - Part 2: Specific prescriptions for enclosures designed to contain protection devices and equipment which disperse considerable power during normal use. It is integrated by amendments CEI 23-49;V1 (2001-12) and CEI 23-49;V2 (2003-06).

[10] **CEI 23-51** (2004-02, 2ª Ed.) Prescriptions for the production, checking and testing of stationary distribution boards for household and similar use. Published experimentally due to the CENELEC prohibition to publish autonomous national standards without prior notification to CENELEC. The regulations it contains are therefore valid only in Italy.

[11] Sum of the rated current of all the protective and/or switching devices placed at the input, intended to be used simultaneously, multiplied by the simultaneity factor K_e assumed equal to 0.85.

[12] In the interest of safety, therefore of the presumed conformity to the Low Voltage directive 73/23/EEC and further modifications, conformity to standard CEI 23-48 is sufficient.

Normal service conditions for electrical equipment

The standard EN 60439-1 applies to *low-voltage switchgear and controlgear assemblies*, commonly known as low-voltage boards, with rated voltage not exceeding 1000V (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 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 which is to be expected [13].

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

[13] 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.

[14] The **IP66/IP67** degree of protection will officially be introduced in the next amendment 1 of the 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 IP degree of protection is regulated by the CEI 64-8 installation standards (inclusion of the harmonisation documents of the CENELEC HD384 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 and 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 gstate of the arth 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:
- 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).
- for cases, when all the covers are adequately 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 (1stdigit) 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 meter (2nd digit).

The socket-outlets with IP55 degree of protection and those with double degree of protection IP66/IP67 [14] 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 characteristic numeral
Personal protection against contact with hazardous parts

IP	External solid foreign bodies	Protection
0		none
1		against solid foreign objects with Ø greater or equal to 50 mm (e.g. hand)
2		against solid foreign objects with Ø greater or equal to 12 mm (e.g. finger)
3		against solid foreign objects with Ø greater or equal to 2.5 mm (e.g. tools and wires)
4		against solid foreign objects with Ø greater or equal to 1 mm (e.g. fine tools and wires)
5		dust-protected
6		dust-tight

2nd characteristic numeral
Protection of materials against harmful penetration of water

IP	Tests	Protection
0		none
1		against vertical drops of water
2		against drops of water at an angle of 15°
3		against drops of water at an angle of 60°
4		against water sprayed from all directions
5		against jets of water from all directions
6		against powerful jets of water (such as sea waves)
7		against the effect of temporary immersion in water at a depth of 1 metre
8		against the effects of continuous immersion in water

guide to the selection of the socket-outlets, plugs and distribution board enclosures

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
Pluso plugs and socket-outlets																		
precode **PE, PEW, PB**	●	●	X	X	X	X	●	○	●	●	●	●	●	●	●	●	●	○
precode **SIP, SIPW**	●	●	X	●	●	●	X	○	●	X	○	○	○	○	○	○	○	●
precode **PEM**	●	●	X	X	X	X	●	●	●	○	●	●	●	●	●	●	●	○
interlocked switched socket outlets **SQ, SQx series,** socket-outlets with safety transformer **SQT**																		
precodes **SQ** and **SQ**x and **SQT**	●	●	●	●	○	○	●	○	○	○	○	○	○	○	○	○	○	○
interlocked switched socket outlets in insulated enclosure, **PK, KI series** , and plugs with safety transformer in insulated enclosure **PB**																		
series **PK...EB**	●	●	X	●	○	○	X	○	○	X	●	○	○	○	●	●	○	X
series **KI...RI5** and **KI...IB5**	●	●	●	●	○	●	●	○	○	●	○	●	●	○	●	●	○	○
series **PK...IA**	●	●	●	●	○	●	●	○	○	●	●	●	●	●	●	●	○	●
series **PB...T1** and **T2**	●	●	X	●	○	○	X	○	○	X	●	○	○	○	●	●	○	X
interlocked switched socket outlets in metallic enclosure, **PK series**, and plugs with safety transformer in metallic enclosure **PB**																		
series **PK...PB5**	●	●	○	●	X	○	●	○	X	●	●	●	●	●	●	●	○	○
series **PK...LL**	●	●	○	●	X	○	●	○	X	●	●	●	●	●	●	●	○	○
series **PB...A1** and **A2**	●	●	○	●	X	○	●	○	X	●	●	●	●	●	●	●	○	●
group support plates																		
codes **FC...TB**	●	●	○	●	○	●	●	X	X	●	●	○	○	X	○	○	X	X
distribution enclosures and **FC** modular equipment for groups																		
codes **FC...DB / DB5** and **GB5**	●	●	●	●	●	●	●	○	○	●	○	●	●	○	●	●	○	○
FC board components																		
FC series enclosures	●	●	○	●	○	●	●	X	X	●	●	○	○	X	○	○	X	X
FM board components																		
FM series enclosures	●	●	●	●	○	○	●	○	○	○	○	○	○	○	○	○	○	○
BK board components																		
items of the **BK** series , except [1]	●	●	○	●	●	●	●	●	●	○	●	●	●	●	●	●	●	●
TM series																		
all the items of the **TM** series	●	●	●	●	●	●	●	○	●	●	●	●	●	●	●	●	●	●

[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.

Use in electric systems in areas at risk of explosion

The electric systems which have come into existence since 1-7-2003 in work areas at risk of explosion due to the presence of gas, fumes, smoke or dangerous powders (excluding mines) must comply with European Directive 99/92/EC (a.k.a. ATEX 137). This is the so called "social" part of the ATEX Directive[1], adopted within the general directive 89/391/EC on the subject of safety at work, implemented in Italy as the well know Law Decree n. 626/94 which merged with Law Decree n. 233/03 under Title VIII-bis.
According to this directive (art. 8) employers must, among other things, develop and keep up to date the "Document regarding protection against explosions" in which they must state:
- that all explosion risks have been identified;
- what measures will be taken to avoid the danger of explosions;
- that the zones have been identified and classified (table A);
- that the work equipment is suited to the type of area and that it is used and maintained in adequate working order. The Directive specifies (art. 9) the implementation timescale: The minimum provisions of Attachment II, part A apply to any equipment already existing as at 30-6-2003; as regards work areas already in use as at 30-6-2003, said minimum provisions must be adapted by 30-6-2006. Finally, compliance with the provisions of Attachment II, Part A + B [2] is required as regards equipment purchased after 30-6-2003 and new work areas in which explosive atmospheres may form.
The Directive does not apply to medical areas, gas equipment, explosive substances, mines and land, river or air transport vehicles (vehicles intended for use in explosive atmospheres are not excluded).
As regards equipment installed in the abovementioned locations, as from 1-7-2003 these must comply with Directive 94/9/EC (a.k.a. ATEX 95 and implemented in Italy as Presidential Decree n. 126 dated 23-3-1998). This applies to all equipment and protection systems intended for use in potentially explosive atmospheres (including mines). Two equipment groups are envisaged: group 1, intended for underground mine use or for overground mine works (firedamp and/or combustible dust); group 2, all other locations.
Attachment 1 of Directive 94/9/EC defines categories M 1 and M 2 for group 1 equipment, and the following three categories for group 2 equipment:
- category 1 equipment (very high level of protection - zones 0 or 20);
- category 2 equipment (high level of protection - zones 1 or 21);
- category 3 equipment (normal level of protection - zones 2 or 22);

Ex material sold or installed after 30-6-2003 must be marked EC and be accompanied by the EC conformity declaration, on the basis of this directive.

Standard CEI 64-2 (1990-11, 4th edition, Booklet 1431) governed applications in locations at risk of explosions in a mainly industrial context. So far the following European Standards have been published in an effort to harmonise said standard throughout Europe:
HAZARDOUS AREAS DUE TO THE PRESENCE OF INFLAMMABLE FUMES OR GAS (ex class C1 and C3 areas)
- CEI EN 60079-10 (2004-01, class CEI 31-30, 2nd Ed.) "Electrical assemblies aimed at explosive atmospheres due to the presence of gas - Part 10: Classification of hazardous locations", in force, regarding the classification of hazardous places due to the presence of inflammable fumes or gas [3];
- CEI EN 60079-14 (2004-05, class CEI 31-33) "Electrical assemblies aimed at explosive atmospheres due to the presence of gas - Part 14: Electrical systems in areas at risk of explosions due to the presence of gas (other than mines)" in force, regarding provisions concerning electrical systems in areas at risk of explosion due to the presence of gas (other than mines)[4];

HAZARDOUS AREAS DUE TO THE PRESENCE OF COMBUSTIBLE DUST (ex class C2 areas)
- CEI EN 50281-3 (2003-06, class CEI 31-52) "Assemblies aimed at explosive atmospheres due to the presence of combustible dust - Part 3: Classification of areas where combustible dust is or could be present", in force since 1-7-2003, regarding the ex class C2 areas of standard CEI 64-2[5]
- CEI EN 50281-1-2 (1999-09, class CEI 31-36) called "Electrical assemblies aimed at explosive atmospheres due to the presence of combustible dust - Part 1-2: Electrical assemblies protected by enclosures - Selection, installation and maintenance", definitively in force since 1-7-2003[6]

These are the first of a large collection of CENLEC standards regarding electrical systems in areas at risk of explosion. They will be followed by other standards regarding the classification of actually or potentially explosive areas due to the presence of explosives (ex class C0 area of standard CEI 64-2) and by standards regarding the safety requirements of relating electrical systems, currently being developed by IEC and CENELEC. In particular, as from 1-1-1998 the definition of class C1 and C3 areas containing inflammable substances such as gas or inflammable liquids - i.e. excluding inflammable dust (class C2) and explosives (class C0) - is no longer in force: the relating chapters 3 and 5 of standard CEI 64-2 have been abolished and replaced by the abovementioned standard CEI EN 60079-10. This introduces zone classifications, thus replacing the existing quantitative differentiation by a more analytical approach based on the degree of emission (three levels: continuous, primary or secondary) and on the degree of ventilation (three levels: high, medium or low, with three further sublevels: good, average or poor). Zone extensions are determined through application guidelines and calculations.
Zone 0: area with a continuous or prolonged explosive atmosphere due to the presence of gas
Zone 1: area where an explosive atmosphere due to the presence of gas may occur in normal operational conditions
Zone 2: area where it is impossible for an explosive atmosphere due to the presence of gas to occur in normal operational conditions or where, should this occur, it may only occur infrequently and for short spaces of time. Standard CEI EN 60079-14 replaced standard CEI 64-2 as regards the requirements of the electrical systems installed in areas containing gas or inflammable liquids. In particular, since 30-11-1999 it has abolished chapters VII (AD-PE systems), VIII (AD-SI systems), IX (AD-I systems), XI (AD-FE systems) and XIII (AD-S systems), resulting therefore in the disappearance of the above types of safety electrical systems as described and defined by standard CEI 64-2. Standard CEI EN 50281-3 (2003-06, 1st ed.) resulted in the further abolishment of chapter IV of standard CEI 64-2[7], with standard EN 50281-1-2 (1999-09, 1st ed.) substituting all parts of the chapters I, II, VI, X, XII and XIV regarding provisions for areas where combustible dust is or may be present (class C2 areas). Therefore only chapters I, II, VI, X, XII and XIV of standard CEI 64-2 remain in force, concerning specific provisions for the presence or development of explosive substances (class C0) while awaiting corresponding European standards.
Standard CEI 64-2/A was abolished in 1-9-2001 with the publication of Guides CEI 31-35 (2001-01, 2nd ed.) and CEI 31-35/A (2001-01, 2nd ed.).
Therefore it is no longer possible to use withstanding functional safety systems (AD-FT) in ex C2 areas (ex chapter XII).
Most of the situations that used to allow this installation solution are classified as non-explosive (NE), in line with the new area classification. Therefore, in these cases no particular adjustment is required either for new systems or for those existing before 30-6-2003, as these do not fall within Ex zone classifications in line with the latest ATEX directives.
As regards areas that would now need to be classified as Ex in line with the abovementioned ATEX Directive 137 (99/92/EC) in force since 1-7-2003, such as zone 2 or 22, new systems require category 3 Ex electrical material, whereas systems existing before 30-6-2003 need to be adapted using said ATEX certified material by 30-6-2006.
Given that in any case existing electrical systems constructed in line with the provisions of standard CEI 64-2 provide the same level of safety as those constructed in line with the new standard CEI EN 60079-14, the table below contains indications for selecting AD-FT system components, exclusively for class C0 areas (presence of explosive substances), as inferred from standard CEI 64-2. Said table will remain valid until the publication of standards that abolish chapters I, II, VI, X, XII and XIV regarding said areas.

1) ATEX = ATmosphere Explosive.
2) Attachment II - Part B = equipment category selection criteria on the basis of the zone classification: zones 0 or 20 require category 1 equipment; zones 1 or 21 require category 1 or 2 equipment; zones 2 or 22 require category 1, 2, or 3 equipment.
3) The 1st 1996-10 edition, in force since 1-11-1996, will remain simultaneously in force until 1-10-05.
4) The 1st 1998-01 edition, in force since 1-03-1998, will remain simultaneously in force until 1-6-06.
5) Should be replaced with the European Standard prEN 61241-10 project "Electrical apparatus for use in the presence of combustible dust - Part 10: Classification of areas where combustible dust is or may be present", based on a similar IEC project.
6) Integrated by amendment EN 50281-1-2/A1 (2004-06), it should be replaced by the European Standard prEN 61241-14 project "Electrical apparatus for use in the presence of combustible dust - Part 14: Selection and installation"
7) Already reprinted by the CEI in March 2001, once again as 4th edition, Booklet 5964 C.

guide to the selection of the socket-outlets, plugs and distribution board enclosures

Tables for selecting the type of environment

class of the hazardous area (Italian standard CEI 64-2, Edition IV, 2001-03)	**C0**
qualification of the "AD" area [1]	**C0ZR**
Minimum IP required by the standard	**IP44**

product series	**degree of protection**	**items**	**product eligibility (see notes)**
PLUSO socket-outlets	**IP44**	precode **PE, SIP**	● *)
	IP67	precode **PEW, SIPW**	○ *)
SQ... interlocked switched socket-outlets	**IP44**	precode **SQ, SQE, SQV, SQA**	●
	IP55	code **SQE....5, SQV...5, SQA...5**	○
PK / **KI** interlocked switched socket-outlets	**IP44**	code **PK..EB**	●
	IP55	code **KI..RI5, KI..IB5, PK..PB5**	○
BK interlocked switched socket-outlets	**IP67**	precode **BK, BE, BA**	○
TM interlocked switched socket-outlets	**IP66/IP67**	code **TM...IT/IS/IR/SP/KIS/KIR/KSP**	○
TM interlocked switched socket-outlets	**IP66/IP67**	code **TM...SIT/SIS/SIR/SSP/KSIS/KSIR/KSSP**[2]	○
PK socket-outlets with electric interlock	**IP55**	code **PK...IA, PK...LL**	○
socket-outlets with safety transformer	**IP44**	code **PB...T, PB...A**	●
	IP55	code **SQT 16220**	○
	IP67	code **BT 16220, BT 16380**	○
	IP66/IP67	code **TM 16220 T1/ST1**[2]	○
FC distribution enclosures	**IP44**	code **FC 1114 DB, FC 1414 DB**	●
	IP55	code **FC 1114 DB5, FC 1414 DB5**	○
cases for modular equipment	**IP55**	code **FC...GB5**	○
FC series cases and components	**IP55**	**all**	○ **)
FM series cases and components	**IP55**	**all**	○ **)
BK series cases and modules	**IP67**	codes **BC...**	○
TM series cases and modules	**IP66/IP67**	codes **TM...**	○

1) Locations with explosion risks and the relating AD areas are classified by standard CEI 64-2, 4th edition.
2) When assembled on TM series ILME box (single, double or triple).

Notes
*) plugs usable together with interlocked sockets of eligible degree of protection
**) only types for assembling interlocked socket-outlets, in the event of creating distribution boards with sockets

Legend
● = eligible
○ = greater than the requirement
X = not eligible

According to standard CEI 64-2, so far devices with degree of protection IP44 or IP55 have been used in class 2 locations (presence of dust). In line with the new standards, we have introduced further requirements, such as thermal constraints, and the manufacturer must certify the device as an Ex product, according to the procedure indicated in the latest ATEX directive (94/9/CE, implemented in Italy as DPR 23-3-1998 no. 126).
Standard **EN 50281-1-2**(class. CEI 31-36) relates to electrical assemblies protected by enclosures, due to the presence of dust, and contains the following zone classification:

Zone 20: area where an explosive atmosphere, in the form of a combustible dust cloud in the air, is present permanently or for long periods of time
Zone 21: area where an explosive atmosphere, in the form of a combustible dust cloud in the air, is likely to be occasionally present during normal operations
Zone 22: area where an explosive atmosphere, in the form of a combustible dust cloud in the air, is not likely to be occasionally present during normal operations but where, if this were to occur, it would only be present for a short space of time

Construction selection

Electric systems in ex class 3 areas
As we have already mentioned, class 3 locations (presence of gas or of inflammable liquids in small quantities) are no longer covered by the above new European standards. The standards EN 60079-14 (gas) and EN 50281-3 (dust) do not include systems of type AD-FT. With the new classification criteria, all well ventilated areas with second degree emission sources (most of the ex C3Z2 areas, for which the AD-FT system was allowed) are now considered non hazardous areas in terms of explosions (area 2 NE); **for these areas all ILME material indicated in the table is suitable with the new standard.**

The electrical systems in the ex C1ZR areas
The ex C1ZR areas, areas compliant (ZR) with class 1 locations containing gas or inflammable liquids, are no longer envisaged by the European Standard EN 60079-10. In most cases, as these areas are many metres away from the second degree emission sources (ex hazardous centres), in line with the new classification they are now non-hazardous areas in terms of explosions (area 2 NE); **as regards these areas, all ILME material is suitable with the new standard.**

The electrical systems in the ex C1Z2 areas
With the new classification, ex C1Z2 areas surrounding the second degree emission sources often become 2 NE areas. As a result, with the exception of the immediate areas surrounding the point of emission, the area is only dangerous because of "its increased fire risks" (standard CEI 64-8/7 Sez. 751). In this case, **all the ILME material indicated in the table is suitable with the new standard.**

Electric systems in vast areas containing gas or inflammable liquid emission sources
Unlike the old standard CEI 64-2, the latest European Standard EN 60079-10 does not envisage the extension of the AD area to the entire internal area. It specifies dilution volume calculations. As a result, at a certain distance from the emission centres the environment in these vast areas is no longer considered explosive. Here, where previously EEx assemblies were required, **now the ILME materials indicated in the table are suitable with the new standard.**

General characteristics

This chapter describes the technical characteristics of PK and KI interlocked socket-outlets for industrial use and of socket-outlets with PB transformers. Socket-outlets have tested reliability and can be used in combination with ILME socket-outlets for industrial use as modular integrated systems to configure distribution systems for industrial socket-outlets. ILME socket-outlets are designed to be used for:

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

The following types of socket-outlets are available:

With **insulating enclosure** in the following versions:
- **PK...EB** types with interlock and without fuse carrier
- **KI...IB5** types with interlock and fuse carrier
- **KI...RI5** types with interlock and compartment for modular units
- **PB...T1/T2** types with safety transformer for extra-low voltage
- **PK...IA** types with circuit breaker and electric interlock

With **metal enclosure** in the following versions:
- **PK...PB5** types with interlock and fuse carrier
- **PB...A1/A2** types with safety transformer for extra-low voltage
- **PK...LL** types with circuit breaker and electric interlock

Socket-outlets can be wall-mounted. All socket-outlets wtih metal enclosure can be installed using the **special slots**, while insulating enclosures are fixed from the inside. The special **plug-type** covers guarantee the required degree of protection. To ensure the correct electrical connections, socket-outlets are supplied with **threaded holes** and all the required fittings.
Socket-outlets installed in insulating enclosures are also supplied with accessories specifically designed for **distribution systems in group configuration** to meet all possible installation needs**.**
Models can also be supplied with matching **back plates** in two sizes for the assembly of socket-outlets, **connection/distribution boxes** and **compartments for modular units** (i.e. for protection and control equipment).
Socket-outlets and boxes with compartment for modular units can be used to spring-lock modular units (17.5 mm x 45 mm base unit, compliant with DIN 43880) **with sized DIN-rails EN 60715**. 63A and 125A socket-outlets have **nickel-plated** contacts (available also for 16A and 32A socket-outlets on request). For price quotations, please contact our Sales Office.
Socket-outlets can generally be used in environments with high fire hazard (CEI 64-8/7).

Electric characteristics of socket-outlets

Rated frequency:
0 Hz (direct current), and from 50 to 500 Hz

Rated operating voltage
The standard identifies two main types of use:
- Extra-low voltage socket-outlets 8 (and plugs) with SELV protection, in compliance with installation standard CEI 64-8) for max. rms 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 (extra-low voltage, 2P)
- 3, 4 e 5 poles (low voltage, 2P+⏚, 3P+⏚, 3P+N+⏚)

63A and 125A socket-outlets also have a pilot contact.

Rated current:
with 16A, 32A, 63A and 125A (low voltage)
with 16A (extra-low voltage) values.

Rated insulating voltage:
- **690V** for low voltage socket-outlets with interlock (PK...EB and KI...RI5 types)
- **500V** for low voltage socket-outlets with interlock and fuse carrier (KI...IB5 and PK...PB5 types), limited by the fuse cartridge and switch
- **440V** for low voltage socket-outlets with interlock and magnetothermal circuit breaker (PK...IA and PK...LL types), limited by the circuit breaker
- **50V** for extra-low socket-outlets (PB...T1/T2 and PB...A1/A2 types), limited by the safety transformer

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

Breaking capacity:
Tested on socket-outlets without interlock at 1.25 times the rated current, with no-load voltage equal to 1.1 times the rated operating voltage.
The main part (insert + contacts) of the interlocked socket-outlets is the same as that of non interlocked socket-outlets.

Mechanical features

- **Mechanical resistance**
  verified in accordance with the provisions of Article 24 of standard EN 60309-1 (IEC 60309-1)
- **Resistance to chemical agents**
  See table on page 8
- **Class of protection:**
  IP44 and IP55 according to EN 60529
- **Maximum power dissipated by enclosures**
  in accordance with **Table 1** (see page 68)
- **Resistance to glow-wire**
  in accordance with IEC 60695 -1 -2: 750 and 850 °C for enclosures; 960 °C for inserts
- **Temperature**
  ambient: -25 °C - +40 °C; limit of materials: -40 °C - +125 °C
- **Self-extinguishing capacity** (classification UL 94)
  for enclosures: **V2** e **HB**
  for 16A and 32A inserts: **V2**
  for 63A and 125A inserts: **5VA** and **V0**
- **Switch disconnectors**
  compliant with EN 60947-3, category of use AC-22A at rated current

Materials

- Inserts in insulating thermoplastic material
- Enclosures in insulating thermoplastic material or die-cast aluminum
- Anti-aging elastomer gaskets
- Terminals with zinc-plated screws retained in their seats when unscrewed
- Self-centring holes in brass with galvanised steel pressure spring
- 63A and 125A socket-outlet with nickel-plated contacts (also for 16A and 32A socket-outlets on request)
- Zinc-plated steel assembly screws

The supply package

Socket-outlets are supplied with:
- Anti-aging elastomer gaskets
- Caps, cable glands and gaskets
- Cover fixing screws in stainless steel (for metal enclosures) or zinc-plated steel (for insulating enclosures)
- Screw seals for blocking internal holes

The following may be supplied on request:
- Support plates
- Distribution enclosures
- Enclosures for modular equipment
- Simple boards and boards with compartment for modular equipment
- Connections and fittings, cable glands, etc.

Degree of protection

The degree of protection should be chosen according to installation standard CEI 64-8 (that implements harmonized documents CENELEC HD 384 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. **PK and KI interlocked sockets and PB socket-outlets with safety transformers have IP44 and IP55 degrees of protection.** Socket-outlets with IP55 degree of protection have a bayonet fastening cover, traditionally defined as "water-tight", 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 different classes of protection are installed, the degree of protection of the distribution board or system shall be equivalent to the lowest degree of protection of components installed.

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

ILME complementary parts for PK, KI and PB socket-outlets

PK, KI and PB socket-outlets can be used with the following range of plugs, back plates and enclosures:
- Plugs for industrial use in two standard versions with **IP44** and **IP67** degree of protection (**PE, PEW, SIP, SIPW** and **PEM** types)
- Standard back plates (**FC 1141 TB** and **FC 1453 TB** types)
- Back plates with boxes for modular units (**FC...DT** types), with **IP55 degree of protection**
- Boxes for modular units (**FC...GB5** types), with **IP55 degree of protection**
- Distribution boxes (**FC...DB** and **FC...DB5** boxes), with **IP44** and **IP55 degree of protection**
- Alveolated boards for wall-mounting (**FC 2525 MU** and **FC 2542 RA** / **RAT** types), with **IP55 degree of protection**

All plugs, back plates and enclosures cover the installation requirements specified in standard CEI 64-8 (series Cenelec HD 384, IEC 60364).

Application of the *draft* standard CEI 23-51

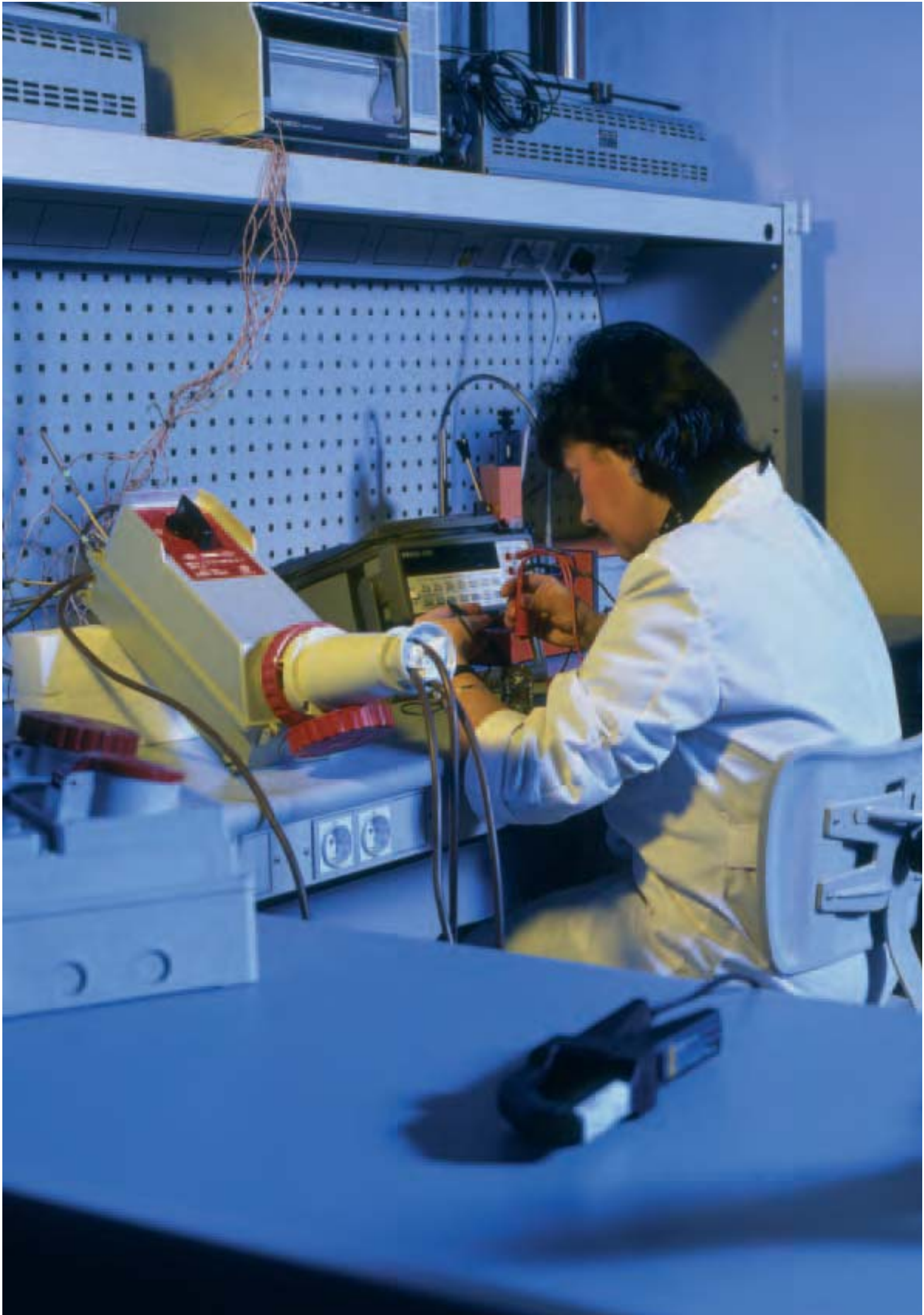
The maximum power that can be dissipated, P_{inv} , has been verified for each enclosure in the most severe operating conditions using the method described in the draft standard CEI 23-49. Results are shown in **Table 1**.

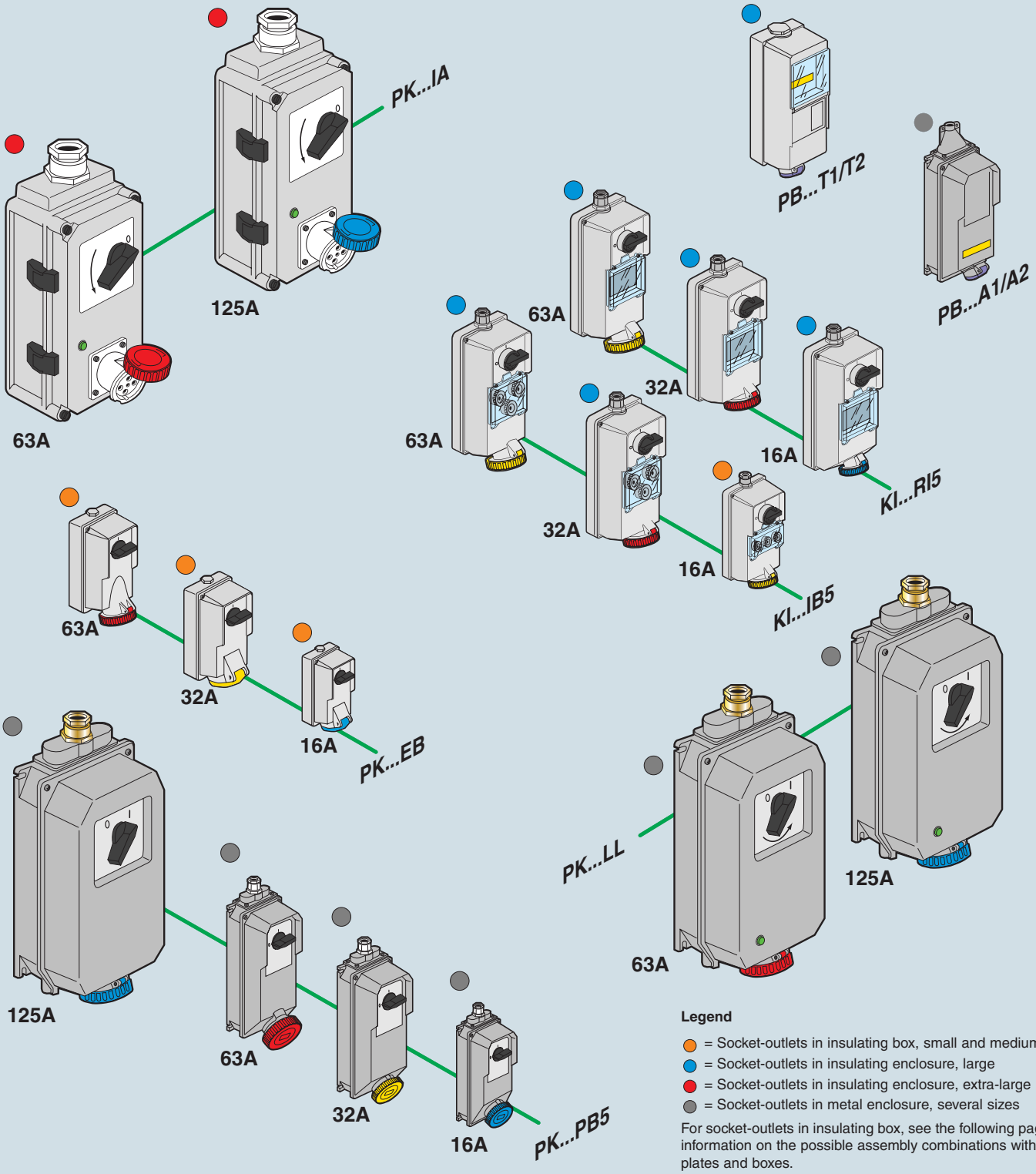
Maximum power that can be dissipated in box P_{inv} (CEI 23-49)

Table 1

Article	Description	Number of units	P_{inv} [1] (W) wall-mounting	P_{inv} [1] (W) flush-mounting
FC 1114 DB/DB5	114 x 144 mm box	5 units	11	Not applicable
FC 1414 DB/DB5	144 x 144 mm box	6 units	13	Not applicable
FC 1114 GB5	114 x 144 mm box	5 units	11	Not applicable
FC 1414 GB5	144 x 144 mm box	6 units	13	Not applicable
FC 2214 GB5	228 x 144 mm box	11.5 units	14	Not applicable
FC 2514 GB5	258 x 144 mm box	13.5 units	16	Not applicable
FC 2814 GB5	288 x 144 mm box	15 units	18	Not applicable
FC 2542 RA/RAT	255 x 420 mm enclosure	10 units	15	18

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





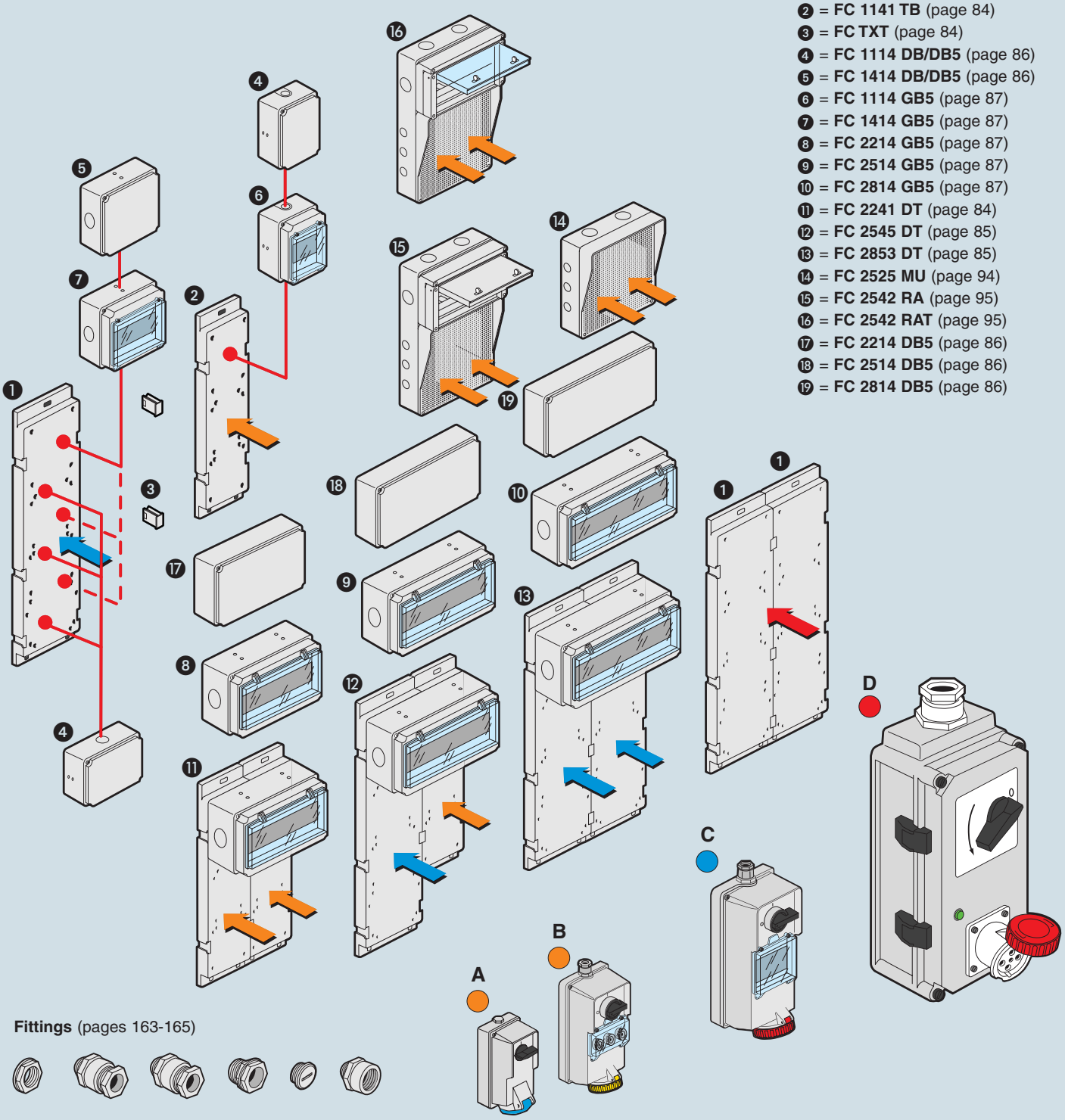
Legend

- = Socket-outlets in insulating box, small and medium
- = Socket-outlets in insulating enclosure, large
- = Socket-outlets in insulating enclosure, extra-large
- = Socket-outlets in metal enclosure, several sizes

For socket-outlets in insulating box, see the following page for information on the possible assembly combinations with back plates and boxes.
Please refer to the colours in the legend.

Characteristics of socket-outlets

Types	Protection class	Description	Enclosure material	Type of assembly	Catalogue reference
PK...EB	IP44	Enclosures with interlock without fuse carrier	Insulated	Single and in group config.	Pages 72-73
KI...IB5	IP55	Enclosures with interlock + fuse carrier	Insulated	Single and in group config.	Pages 76-77
KI...RI5	IP55	Enclosures with interlock + room for modules	Insulated	Single and in group config.	Pages 74-75
PK...IA	IP55	Enclosures with interlock + electric interlock	Insulated	Single and in group config.	Page 80
PB...T1/T2	IP44	Enclosures with safety transformer	Insulated	Single and in group config.	Page 82
PK...PB5	IP55	Enclosures with interlock + fuse carrier	Metal	Single	Pages 78-79
PK...LL	IP55	Enclosures with interlock + electric interlock	Metal	Single	Page 81
PB...A1/A2	IP44	Enclosures with safety transformer	Metal	Single	Page 82



FC complementary parts

1 = **FC 1453 TB** (page 84)
2 = **FC 1141 TB** (page 84)
3 = **FC TXT** (page 84)
4 = **FC 1114 DB/DB5** (page 86)
5 = **FC 1414 DB/DB5** (page 86)
6 = **FC 1114 GB5** (page 87)
7 = **FC 1414 GB5** (page 87)
8 = **FC 2214 GB5** (page 87)
9 = **FC 2514 GB5** (page 87)
10 = **FC 2814 GB5** (page 87)
11 = **FC 2241 DT** (page 84)
12 = **FC 2545 DT** (page 85)
13 = **FC 2853 DT** (page 85)
14 = **FC 2525 MU** (page 94)
15 = **FC 2542 RA** (page 95)
16 = **FC 2542 RAT** (page 95)
17 = **FC 2214 DB5** (page 86)
18 = **FC 2514 DB5** (page 86)
19 = **FC 2814 DB5** (page 86)

Fittings (pages 163-165)

Legend

The list above shows all the possible combinations of socket-outlets, back plates and enclosures that can be used to configure distribution systems. The coloured point near to the socket-outlets indicates their size, while the arrows (in the matching colour) indicate the assembly options. The same colour code is used on the next page to identify each type of socket-outlet.

A = Socket-outlets with 166 x 88 mm fixing base
B = Socket-outlets with 228 x 114 mm fixing base
C = Socket-outlets with 343 x 143 mm fixing base
D = Socket-outlets with 420 x 210 mm fixing base

PK.. EB interlocked socket-outlets without fuse carrier

- Compliant with EN 60309 -1 and -2
- Enclosures and inserts in insulating self-extinguishing thermoplastic material, RAL 7035 grey
- 16A and 32A types with spring lid
- Factory installed internal wiring
- Cable entry with threaded grommet (replaceable with cable gland)
- "Zeta" series switch, with 32A (for 16A socket-outlets) and 80A (for 32A socket-outlets) rating
- Mechanical interlock that prevents: the switch from being turned on without the plug inserted and the plug from being removed while the switch is on
- ⓜ With Italian Quality Mark

16A
IP44 degree of protection

32A
IP44 degree of protection

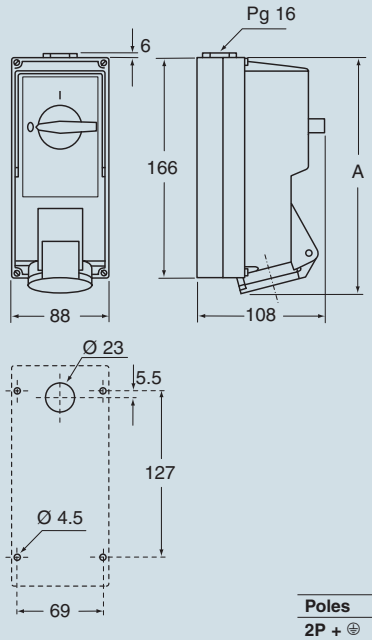
Poles	Frequency Hz	Voltage V	Earthing contact position h	Part No.	Colour	Part No.	Colour
2P+⏚	50 and 60	100 - 130	4	**PK 1643 EB** ⓜ		**PK 3243 EB** ⓜ	
	50 and 60	200 - 250	6	**PK 1663 EB** ⓜ		**PK 3263 EB** ⓜ	
	50 and 60	380 - 415	9	**PK 1693 EB** ⓜ		**PK 3293 EB** ⓜ	
	50 and 60	480 - 500	7	**PK 1673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

Legend

A.V. = Colour according to voltage

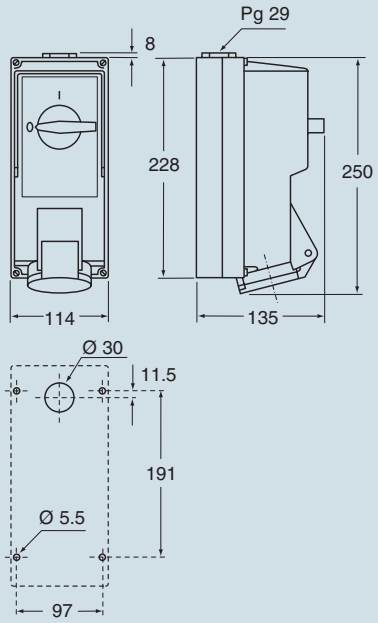
***)** Green may be used together with the colour of the operating range for frequencies above 60 Hz and up to a maximum of 500 Hz

Dimensions in mm



Poles	A
2P + ⏚	182
3P + ⏚	182
3P+N+⏚	187

Dimensions in mm



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

PK..EB

PK.. EB interlocked socket-outlets without fuse carrier

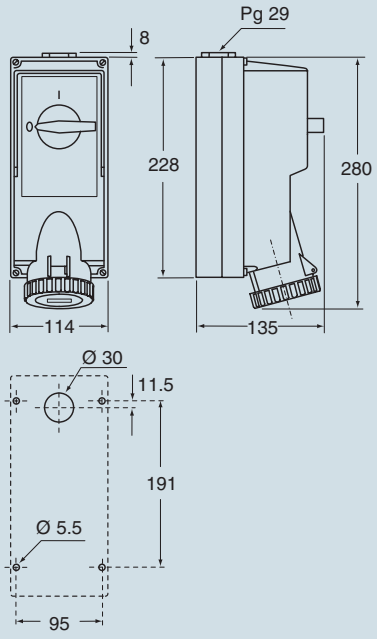
- Compliant with EN 60309 -1 and -2
- Enclosures and inserts in insulating self-extinguishing thermoplastic material, RAL 7035 grey
- Socket-outlets with bayonet fastening cover
- Socket-outlets with pilot contact
- Factory installed internal wiring
- Cable entry with threaded grommet (replaceable with a cable gland)
- "Zeta" series switch with 80A rating
- Mechanical interlock that prevents: the switch from being turned on without the plug inserted and the plug from being removed while the switch is on
- ⓜ With Italian Quality Mark

63A
IP44 degree of protection

Poles	Frequency Hz	Voltage V	Earthing contact position h	Part No.	Colour
2P+⏚	50 and 60	100 - 130	4	**PK 6343 EB** ⓜ	
	50 and 60	200 - 250	6	**PK 6363 EB** ⓜ	
	50 and 60	380 - 415	9	**PK 6393 EB** ⓜ	
	50 and 60	480 - 500	7	**PK 6373 EB** ⓜ	
	50 and 60	ins. transformer	12	**PK 63123 EB** ⓜ	A.V.
	> 300 - 500	> 50	-		
	d.c.	> 50 - 250	-		
3P+⏚	50 and 60	100 - 130	4	**PK 6344 EB** ⓜ	
	50 and 60	200 - 250	9	**PK 6394 EB** ⓜ	
	50 and 60	380 - 415	6	**PK 6364 EB** ⓜ	
	60	440 - 460	11	**PK 63114 EB** ⓜ	
	50 and 60	480 - 500	7	**PK 6374 EB** ⓜ	
	50	380	-		
	60	440	-		
	100 - 300	> 50	-		
	> 300 - 500	> 50	-		
3P+N+⏚	50 and 60	57/100 - 75/130	4	**PK 6345 EB** ⓜ	
	50 and 60	120/208 - 144/250	9	**PK 6395 EB** ⓜ	
	50 and 60	200/346 - 240/415	6	**PK 6365 EB** ⓜ	
	50 and 60	277/480 - 288/500	7	**PK 6375 EB** ⓜ	
	60	250/440 - 265/460	11	**PK 63115 EB** ⓜ	
	50	220/380	-		
	60	250/440	-		
	> 300 - 500	> 50	-		

Legend
A.V. = Colour according to voltage

Dimensions in mm

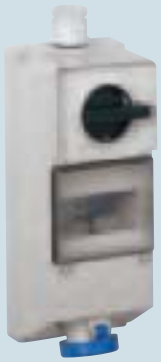


Dimensions indicated are not binding and may be changed without prior notice.

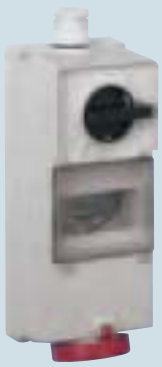
KI.. RI5 interlocked socket-outlets with compartment for modular units

- Compliant with EN 60309 -1 and -2
- Enclosures and inserts in insulating self-extinguishing thermoplastic material, RAL 7035 grey
- 16A and 32A types with bayonet fastening cover
- Factory installed internal wiring
- Cable entry with cable gland
- "Zeta" series switch, with 32A (for 16A socket-outlets) and 80A (for 32A socket-outlets) rating
- Mechanical interlock that prevents: the switch from being turned on without the plug inserted and the plug from being removed while the switch is on
- Padlocked knob
- Compartment for modular units (max. 7 units) with transparent inspection panel, DIN-rail EN 60715 and plates to close the unused sections of the compartment
- ⓜ With Italian Quality Mark

16A
IP55 degree of protection



32A
IP55 degree of protection



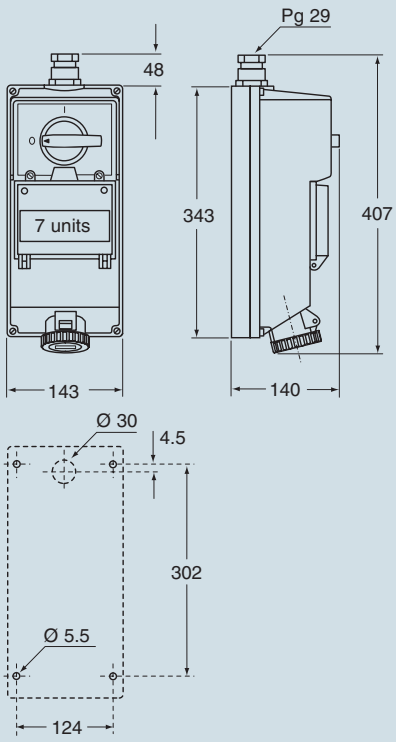
Poles	Frequency Hz	Voltage V	Earthing contact position h	Part No.	Colour	Part No.	Colour
2P+⏚	50 and 60	100 - 130	4	**KI 1643 RI5** ⓜ		**KI 3243 RI5** ⓜ	
	50 and 60	200 - 250	6	**KI 1663 RI5** ⓜ		**KI 3263 RI5** ⓜ	
	50 and 60	380 - 415	9	**KI 1693 RI5** ⓜ		**KI 3293 RI5** ⓜ	
	50 and 60	480 - 500	7	**KI 1673 RI5** ⓜ		**KI 3273 RI5** ⓜ	
	50 and 60	ins. transformer	12	**KI 16123 RI5** ⓜ	A.V.	**KI 32123 RI5** ⓜ	A.V.
	> 300 - 500	> 50	2	**KI 1623 RI5** ⓜ	*)	**KI 3223 RI5** ⓜ	*)
	d.c.	> 50 - 250	3	**KI 1633 RI5** ⓜ	A.V.	**KI 3233 RI5** ⓜ	A.V
3P+⏚	50 and 60	100 - 130	4	**KI 1644 RI5** ⓜ		**KI 3244 RI5** ⓜ	
	50 and 60	200 - 250	9	**KI 1694 RI5** ⓜ		**KI 3294 RI5** ⓜ	
	50 and 60	380 - 415	6	**KI 1664 RI5** ⓜ		**KI 3264 RI5** ⓜ	
	60	440 - 460	11	**KI 16114 RI5** ⓜ		**KI 32114 RI5** ⓜ	
	50 and 60	480 - 500	7	**KI 1674 RI5** ⓜ		**KI 3274 RI5** ⓜ	
	50	380	3	**KI 1634 RI5** ⓜ		**KI 3234 RI5** ⓜ	
	60	440	3	**KI 1634 RI5** ⓜ		**KI 3234 RI5** ⓜ	
	100 - 300	> 50	10	**KI 16104 RI5** ⓜ	*)	**KI 32104 RI5** ⓜ	*)
	> 300 - 500	> 50	2	**KI 1624 RI5** ⓜ	*)	**KI 3224 RI5** ⓜ	*)
3P+N+⏚	50 and 60	57/100 - 75/130	4	**KI 1645 RI5** ⓜ		**KI 3245 RI5** ⓜ	
	50 and 60	120/208 - 144/250	9	**KI 1695 RI5** ⓜ		**KI 3295 RI5** ⓜ	
	50 and 60	200/346 - 240/415	6	**KI 1665 RI5** ⓜ		**KI 3265 RI5** ⓜ	
	50 and 60	277/480 - 288/500	7	**KI 1675 RI5** ⓜ		**KI 3275 RI5** ⓜ	
	60	250/440 - 265/460	11	**KI 16115 RI5** ⓜ		**KI 32115 RI5** ⓜ	
	50	220/380	3	**KI 1635 RI5** ⓜ		**KI 3235 RI5** ⓜ	
	60	250/440	3	**KI 1635 RI5** ⓜ		**KI 3235 RI5** ⓜ	
	> 300 - 500	> 50	2	**KI 1625 RI5** ⓜ	*)	**KI 3225 RI5** ⓜ	*)

Legend

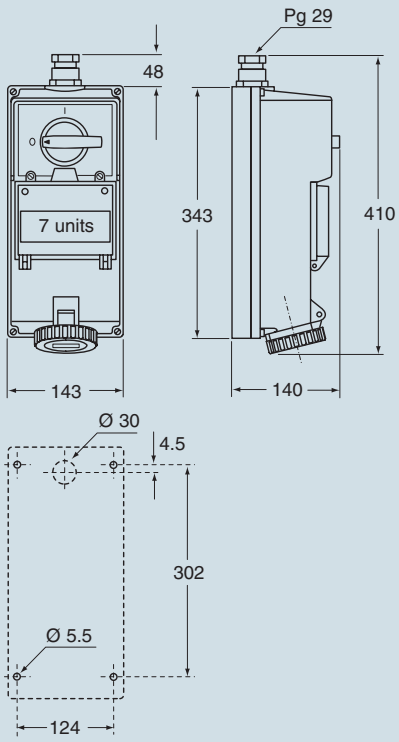
A.V. = Colour according to voltage

***)** 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

Dimensions in mm



Dimensions in mm

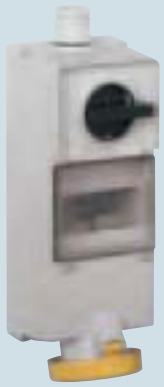


Dimensions indicated are not binding and may be changed without prior notice.

KI.. RI5 interlocked socket-outlets with compartment for modular units

- Compliant with EN 60309 -1 and -2
- Enclosures and inserts in insulating self-extinguishing thermoplastic material, RAL 7035 grey
- Socket-outlets with bayonet fastening cover
- Socket-outlets with pilot contact
- Factory installed internal wiring
- Cable entry with cable gland
- "Zeta" series switch with 80A rating
- Mechanical interlock that prevents: the switch from being turned on without the plug inserted and the plug from being removed while the switch is on
- Padlocked knob
- Compartment for modular units (max. 7 units) with transparent inspection panel, DIN-rail EN 60715 and plates to close the unused sections of the compartment
- ⓜ With Italian Quality Mark

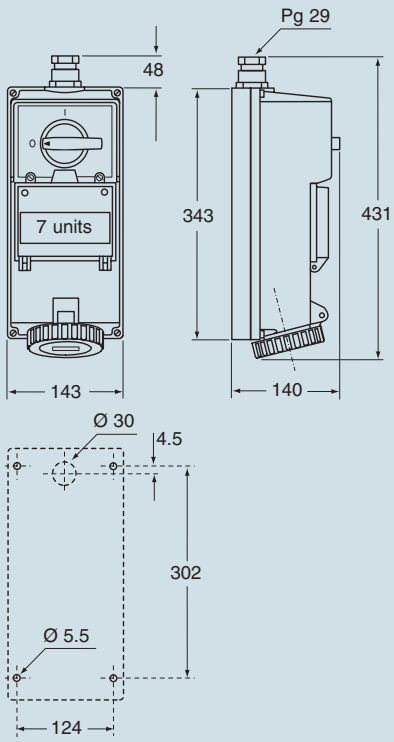
63A
IP55 degree of protection



Poles	Frequency Hz	Voltage V	Earthing contact position h	Part No.	Colour
2P+⏚	50 and 60	100 - 130	4	**KI 6343 RI5** ⓜ	
	50 and 60	200 - 250	6	**KI 6363 RI5** ⓜ	
	50 and 60	380 - 415	9	**KI 6393 RI5** ⓜ	
	50 and 60	480 - 500	7	**KI 6373 RI5** ⓜ	
	50 and 60	ins. transformer	12	**KI 63123 RI5** ⓜ	A.V.
	> 300 - 500	> 50	-		
	d.c.	> 50 - 250	-		
3P+⏚	50 and 60	100 - 130	4	**KI 6344 RI5** ⓜ	
	50 and 60	200 - 250	9	**KI 6394 RI5** ⓜ	
	50 and 60	380 - 415	6	**KI 6364 RI5** ⓜ	
	60	440 - 460	11	**KI 63114 RI5** ⓜ	
	50 and 60	480 - 500	7	**KI 6374 RI5** ⓜ	
	50	380	-		
	60	440	-		
	100 - 300	> 50	-		
	> 300 - 500	> 50	-		
3P+N+⏚	50 and 60	57/100 - 75/130	4	**KI 6345 RI5** ⓜ	
	50 and 60	120/208 - 144/250	9	**KI 6395 RI5** ⓜ	
	50 and 60	200/346 - 240/415	6	**KI 6365 RI5** ⓜ	
	50 and 60	277/480 - 288/500	7	**KI 6375 RI5** ⓜ	
	60	250/440 - 265/460	11	**KI 63115 RI5** ⓜ	
	50	220/380	-		
	60	250/440	-		
	> 300 - 500	> 50	-		

Legend
A.V. = Colour according to voltage

Dimensions in mm



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

KI.. IB5 interlocked socket-outlet with plug-type fuse carrier

- Compliant with EN 60309 -1 and -2
- Enclosures and inserts in insulating self-extinguishing thermoplastic material, RAL 7035 grey
- 16A types with bayonet fastening cover
- Factory installed internal wiring
- Cable entry with cable gland
- "Zeta" series switch with 32A rating (for 16A socket-outlets)
- Mechanical interlock that prevents: the switch from being turned on without the plug being inserted and the plug from being removed while the switch is on
- Padlocked knob
- Compartment with plug-type fuse carrier (fuses not supplied) and transparent inspection panel, which can be opened only when the switch is off
- ⓜ With Italian Quality Mark

16A
IP55 degree of protection

Poles	Frequency Hz	Voltage V	Earthing contact position h	Part No.	Colour
2P+⏚	50 and 60	100 - 130	4	**KI 1643 IB5** ⓜ	
	50 and 60	200 - 250	6	**KI 1663 IB5** ⓜ	
	50 and 60	380 - 415	9	**KI 1693 IB5** ⓜ	
	50 and 60	480 - 500	7	**KI 1673 IB5** ⓜ	
	50 and 60	ins. transformer	12	**KI 16123 IB5** ⓜ	A.V.
	> 300 - 500	> 50	2	**KI 1623 IB5** ⓜ	*)
	d.c.	> 50 - 250	3	**KI 1633 IB5** ⓜ	A.V.
3P+⏚	50 and 60	100 - 130	4	**KI 1644 IB5** ⓜ	
	50 and 60	200 - 250	9	**KI 1694 IB5** ⓜ	
	50 and 60	380 - 415	6	**KI 1664 IB5** ⓜ	
	60	440 - 460	11	**KI 16114 IB5** ⓜ	
	50 and 60	480 - 500	7	**KI 1674 IB5** ⓜ	
	50	380	3	**KI 1634 IB5** ⓜ	
	60	440	3	**KI 1634 IB5** ⓜ	
	100 - 300	> 50	10	**KI 16104 IB5** ⓜ	*)
	> 300 - 500	> 50	2	**KI 1624 IB5** ⓜ	*)
3P+N+⏚	50 and 60	57/100 - 75/130	4	**KI 1645 IB5** ⓜ	
	50 and 60	120/208 - 144/250	9	**KI 1695 IB5** ⓜ	
	50 and 60	200/346 - 240/415	6	**KI 1665 IB5** ⓜ	
	50 and 60	277/480 - 288/500	7	**KI 1675 IB5** ⓜ	
	60	250/440 - 265/460	11	**KI 16115 IB5** ⓜ	
	50	220/380	3	**KI 1635 IB5** ⓜ	
	60	250/440	3	**KI 1635 IB5** ⓜ	
	> 300 - 500	> 50	2	**KI 1625 IB5** ⓜ	*)

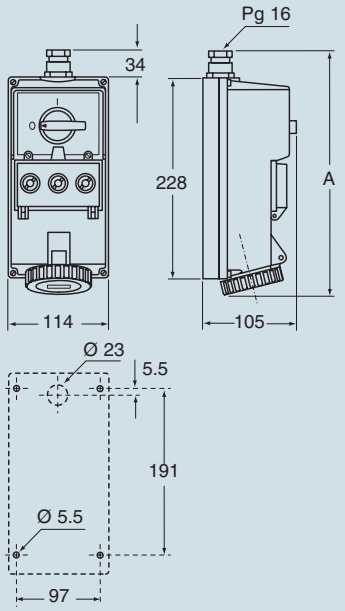
Legend

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

Rated current	Fuse carrier type
16A	E16

Dimensions in mm



Poles	A
2P + ⏚	276
3P + ⏚	280
3P+N+⏚	283

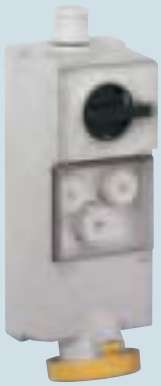
Dimensions indicated are not binding and may be changed without prior notice.

KI.. IB5 interlocked socket-outlet with plug-type fuse carrier

- Compliant with EN 60309 -1 and -2
- Enclosures and inserts in insulating self-extinguishing thermoplastic material, RAL 7035 grey
- 32A and 63A types with bayonet fastening cover
- 63A types with pilot contact
- Factory installed internal wiring
- Cable entry with cable gland
- "Zeta" series switch with 80A rating (for 32A and 63A socket-outlets)
- Mechanical interlock that prevents: the switch from being turned on without the plug being inserted and the plug from being removed while the switch is on
- Padlocked knob
- Compartment with plug-type fuse carrier (fuses not supplied) and transparent inspection panel, which can be opened only when the switch is off
- ⓜ With Italian Quality Mark

32A
IP55 degree of protection

63A
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	**KI 3243 IB5** ⓜ		**KI 6343 IB5** ⓜ	
	50 and 60	200 - 250	6	**KI 3263 IB5** ⓜ		**KI 6363 IB5** ⓜ	
	50 and 60	380 - 415	9	**KI 3293 IB5** ⓜ		**KI 6393 IB5** ⓜ	
	50 and 60	480 - 500	7	**KI 3273 IB5** ⓜ		**KI 6373 IB5** ⓜ	
	50 and 60	ins. transformer	12	**KI 32123 IB5** ⓜ	A.V.	**KI 63123 IB5** ⓜ	A.V.
	> 300 - 500	> 50	2	**KI 3223 IB5** ⓜ	*)		
	d.c.	> 50 - 250	3	**KI 3233 IB5** ⓜ	A.V.		
3P+⏚	50 and 60	100 - 130	4	**KI 3244 IB5** ⓜ		**KI 6344 IB5** ⓜ	
	50 and 60	200 - 250	9	**KI 3294 IB5** ⓜ		**KI 6394 IB5** ⓜ	
	50 and 60	380 - 415	6	**KI 3264 IB5** ⓜ		**KI 6364 IB5** ⓜ	
	60	440 - 460	11	**KI 32114 IB5** ⓜ		**KI 63114 IB5** ⓜ	
	50 and 60	480 - 500	7	**KI 3274 IB5** ⓜ		**KI 6374 IB5** ⓜ	
	50	380	3	**KI 3234 IB5** ⓜ			
	60	440	3	**KI 3234 IB5** ⓜ			
	100 - 300	> 50	10	**KI 32104 IB5** ⓜ	*)		
	> 300 - 500	> 50	2	**KI 3224 IB5** ⓜ	*)		
3P+N+⏚	50 and 60	57/100 - 75/130	4	**KI 3245 IB5** ⓜ		**KI 6345 IB5** ⓜ	
	50 and 60	120/208 - 144/250	9	**KI 3295 IB5** ⓜ		**KI 6395 IB5** ⓜ	
	50 and 60	200/346 - 240/415	6	**KI 3265 IB5** ⓜ		**KI 6365 IB5** ⓜ	
	50 and 60	277/480 - 288/500	7	**KI 3275 IB5** ⓜ		**KI 6375 IB5** ⓜ	
	60	250/440 - 265/460	11	**KI 32115 IB5** ⓜ		**KI 63115 IB5** ⓜ	
	50	220/380	3	**KI 3235 IB5** ⓜ			
	60	250/440	3	**KI 3235 IB5** ⓜ			
	> 300 - 500	> 50	2	**KI 3225 IB5** ⓜ	*)		

Legend

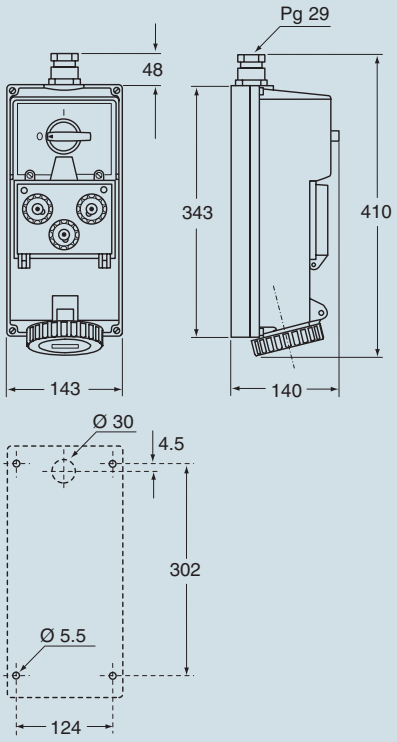
A.V. = Colour according to voltage

***)** 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

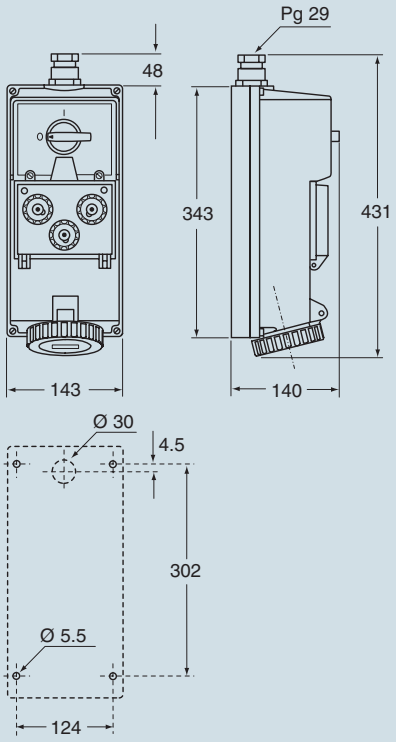
Rated current	Fuse carrier type
32A	E33 - DIII
63A	E33 - DIII

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

Dimensions in mm



Dimensions in mm



KI..IB5

PK.. PB5 interlocked socket-outlet with plug-type fuse carrier

- Compliant with EN 60309 -1 and -2
- Enclosure in die-cast aluminum alloy painted with grey epoxy polyester with anti-corrosive priming
- Inserts in insulating self-extinguishing thermoplastic material
- 16A and 32A types with bayonet fastening cover in insulating material
- Factory installed internal wiring
- Cable entry with cable gland
- "Zeta" series switch with 32A (for 16A socket-outlets) and 80A rating (for 32A socket-outlets)
- Plug-type fuse carrier (fuses not supplied), which can be accessed by tilting the cover and only when the switch is off
- Mechanical interlock that prevents: the switch from being turned on without the plug inserted and the plug from being removed while the switch is on
- ⓜ With Italian Quality Mark

16A
IP55 degree of protection

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	**PK 1643 PB5** ⓜ		**PK 3243 PB5** ⓜ	
	50 and 60	200 - 250	6	**PK 1663 PB5** ⓜ		**PK 3263 PB5** ⓜ	
	50 and 60	380 - 415	9	**PK 1693 PB5** ⓜ		**PK 3293 PB5** ⓜ	
	50 and 60	480 - 500	7	**PK 1673 PB5** ⓜ		**PK 3273 PB5** ⓜ	
	50 and 60	ins. transformer	12	**PK 16123 PB5** ⓜ	A.V.	**PK 32123 PB5** ⓜ	A.V.
	> 300 - 500	> 50	2	**PK 1623 PB5** ⓜ	*)	**PK 3223 PB5** ⓜ	*)
	d.c.	> 50 - 250	3	**PK 1633 PB5** ⓜ	A.V.	**PK 3233 PB5** ⓜ	A.V.
3P+⏚	50 and 60	100 - 130	4	**PK 1644 PB5** ⓜ		**PK 3244 PB5** ⓜ	
	50 and 60	200 - 250	9	**PK 1694 PB5** ⓜ		**PK 3294 PB5** ⓜ	
	50 and 60	380 - 415	6	**PK 1664 PB5** ⓜ		**PK 3264 PB5** ⓜ	
	60	440 - 460	11	**PK 16114 PB5** ⓜ		**PK 32114 PB5** ⓜ	
	50 and 60	480 - 500	7	**PK 1674 PB5** ⓜ		**PK 3274 PB5** ⓜ	
	50	380	3	**PK 1634 PB5** ⓜ		**PK 3234 PB5** ⓜ	
	60	440	3	**PK 1634 PB5** ⓜ		**PK 3234 PB5** ⓜ	
	100 - 300	> 50	10	**PK 16104 PB5** ⓜ	*)	**PK 32104 PB5** ⓜ	*)
	> 300 - 500	> 50	2	**PK 1624 PB5** ⓜ	*)	**PK 3224 PB5** ⓜ	*)
3P+N+⏚	50 and 60	57/100 - 75/130	4	**PK 1645 PB5** ⓜ		**PK 3245 PB5** ⓜ	
	50 and 60	120/208 - 144/250	9	**PK 1695 PB5** ⓜ		**PK 3295 PB5** ⓜ	
	50 and 60	200/346 - 240/415	6	**PK 1665 PB5** ⓜ		**PK 3265 PB5** ⓜ	
	50 and 60	277/480 - 288/500	7	**PK 1675 PB5** ⓜ		**PK 3275 PB5** ⓜ	
	60	250/440 - 265/460	11	**PK 16115 PB5** ⓜ		**PK 32115 PB5** ⓜ	
	50	220/380	3	**PK 1635 PB5** ⓜ		**PK 3235 PB5** ⓜ	
	60	250/440	3	**PK 1635 PB5** ⓜ		**PK 3235 PB5** ⓜ	
	> 300 - 500	> 50	2	**PK 1625 PB5** ⓜ	*)	**PK 3225 PB5** ⓜ	*)

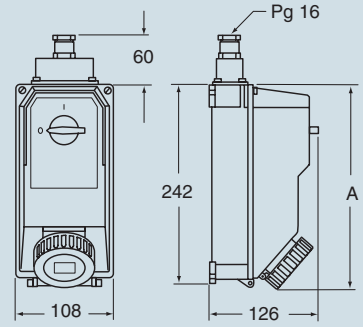
Legend

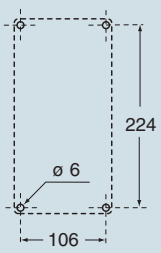
A.V. = Colour according to voltage

***)** 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

Rated current	Fuse carrier type
16A	E16
32A	E33 - DIII

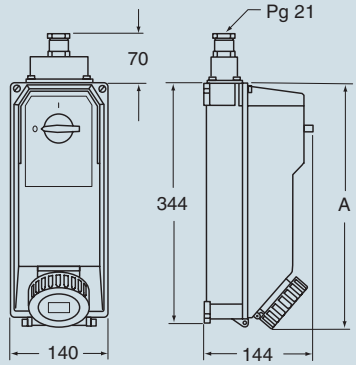
Dimensions in mm

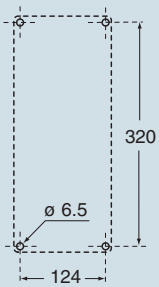




Poles	A
2P + ⏚	260
3P + ⏚	260
3P+N+⏚	270

Dimensions in mm





Poles	A
2P + ⏚	363
3P + ⏚	370
3P+N+⏚	370

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

PK.. PB5 interlocked socket-outlets with fuse carrier

- Compliant with EN 60309 -1 and -2
- Enclosure in die-cast aluminum alloy painted with grey epoxy polyester with anti-corrosive priming
- Inserts in insulating self-extinguishing thermoplastic material
- 63A types with bayonet fastening cover in insulating material, 125A types with bayonet fastening cover in die-cast aluminum alloy
- 63A and 125A types with pilot contact
- Factory installed internal wiring
- Cable entry with cable gland
- "Zeta" series switch, with 80A (for 63A socket-outlets) and 125A (for 32A socket-outlets) rating
- Fuse carriers (fuses not supplied), which can be accessed by tilting the cover and only when the switch is off
- Mechanical interlock that prevents:
  the switch from being turned on without the plug inserted and the plug from being removed while the switch is on

63A
IP55 degree of protection

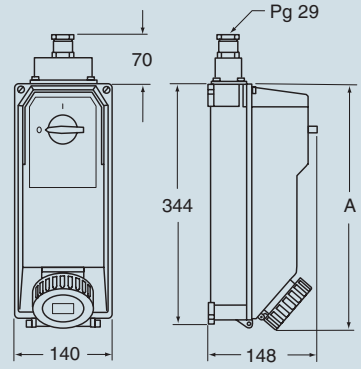
125A
IP55 degree of protection

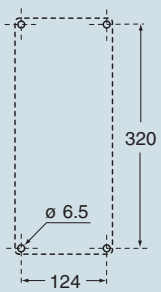
Poles	Frequency Hz	Voltage V	Earthing contact position h	Part No.	Colour	Part No.	Colour
2P+⏚	50 and 60	100 - 130	4	**PK 6343 PB5**		**PK 12543 PB5**	
	50 and 60	200 - 250	6	**PK 6363 PB5**		**PK 12563 PB5**	
	50 and 60	380 - 415	9	**PK 6393 PB5**		**PK 12593 PB5**	
	50 and 60	480 - 500	7	**PK 6373 PB5**		**PK 12573 PB5**	
	50 and 60	ins. transformer	12	**PK 63123 PB5**	A.V.	**PK 125123 PB5**	A.V.
	> 300 - 500	> 50	-				
	d.c.	> 50 - 250	-				
3P+⏚	50 and 60	100 - 130	4	**PK 6344 PB5**		**PK 12544 PB5**	
	50 and 60	200 - 250	9	**PK 6394 PB5**		**PK 12594 PB5**	
	50 and 60	380 - 415	6	**PK 6364 PB5**		**PK 12564 PB5**	
	60	440 - 460	11	**PK 63114 PB5**		**PK 125114 PB5**	
	50 and 60	480 - 500	7	**PK 6374 PB5**		**PK 12574 PB5**	
	50	380	-				
	60	440	-				
	100 - 300	> 50	-				
	> 300 - 500	> 50	-				
3P+N+⏚	50 and 60	57/100 - 75/130	4	**PK 6345 PB5**		**PK 12545 PB5**	
	50 and 60	120/208 - 144/250	9	**PK 6395 PB5**		**PK 12595 PB5**	
	50 and 60	200/346 - 240/415	6	**PK 6365 PB5**		**PK 12565 PB5**	
	50 and 60	277/480 - 288/500	7	**PK 6375 PB5**		**PK 12575 PB5**	
	60	250/440 - 265/460	11	**PK 63115 PB5**		**PK 125115 PB5**	
	50	220/380	-				
	60	250/440	-				
	> 300 - 500	> 50	-				

Legend
A.V. = Colour according to voltage

Rated current	Fuse carrier type
63A	E33 - DIII
125A	NH 00

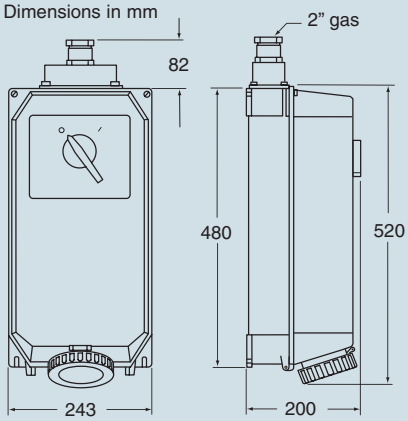
Dimensions in mm

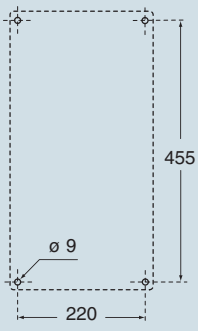




Poles	A
2P + ⏚	360
3P + ⏚	360
3P+N+⏚	382

Dimensions in mm





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

PK.. IA socket-outlets with circuit breaker and electrical interlock

- Compliant with EN 60309 -1 and -2
- Boxes in insulating, self-extinguishing, glass fibre reinforced polyester, RAL 7042 grey
- Inserts in insulating self-extinguishing thermoplastic material
- Socket-outlets with bayonet fastening cover
- Factory installed internal wiring
- Cable entry with box-type flange and cable gland
- Box-type magnetothermal circuit breaker with undervoltage relay, compliant with EN 60947-2
- Electrical interlock based on pilot contact that prevents underload operations and monitors the earthing contact continuity (see diagram)
- Plug-type fuse carriers on the primary and secondary circuits of the transformer

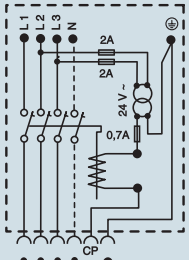
63A
IP55 degree of protection

125A
IP55 degree of protection

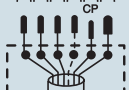
Poles	Frequency Hz	Voltage V	Earthing contact position h	Part No.	Colour	Part No.	Colour
2P+⏚	50 and 60	100 - 130	4	**PK 6343 IA**		**PK 12543 IA**	
	50 and 60	200 - 250	6	**PK 6363 IA**		**PK 12563 IA**	
	50 and 60	380 - 415	9	**PK 6393 IA**		**PK 12593 IA**	
	50 and 60	480 - 500	7	**PK 6373 IA**		**PK 12573 IA**	
	50 and 60	ins. transformer	12	**PK 63123 IA**	A.V.	**PK 125123 IA**	A.V.
	d.c.	> 50 - 250	3	**PK 6333 IA**	A.V.	**PK 12533 IA**	A.V.
3P+⏚	50 and 60	100 - 130	4	**PK 6344 IA**		**PK 12544 IA**	
	50 and 60	200 - 250	9	**PK 6394 IA**		**PK 12594 IA**	
	50 and 60	380 - 415	6	**PK 6364 IA**		**PK 12564 IA**	
	60	440 - 460	11	**PK 63114 IA**		**PK 125114 IA**	
	50 and 60	480 - 500	7	**PK 6374 IA**		**PK 12574 IA**	
3P+N+⏚	50 and 60	57/100 - 75/130	4	**PK 6345 IA**		**PK 12545 IA**	
	50 and 60	120/208 - 144/250	9	**PK 6395 IA**		**PK 12595 IA**	
	50 and 60	200/346 - 240/415	6	**PK 6365 IA**		**PK 12565 IA**	
	50 and 60	277/480 - 288/500	7	**PK 6375 IA**		**PK 12575 IA**	
	60	250/440 - 265/460	11	**PK 63115 IA**		**PK 125115 IA**	

Legend
A.V. = Colour according to voltage

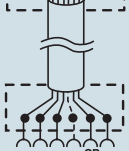
Electric wiring diagram



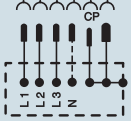
Socket-outlet with electric interlock



Plug



Cable



Coupler socket-outlet

Fixed plug

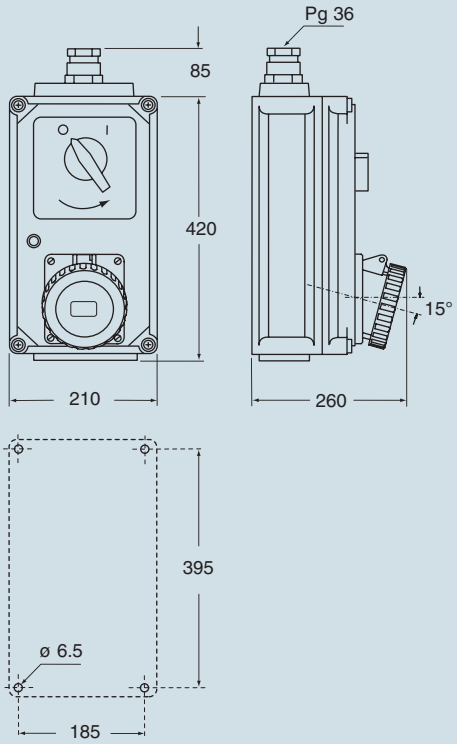
Appliance

Characteristics of circuit breakers

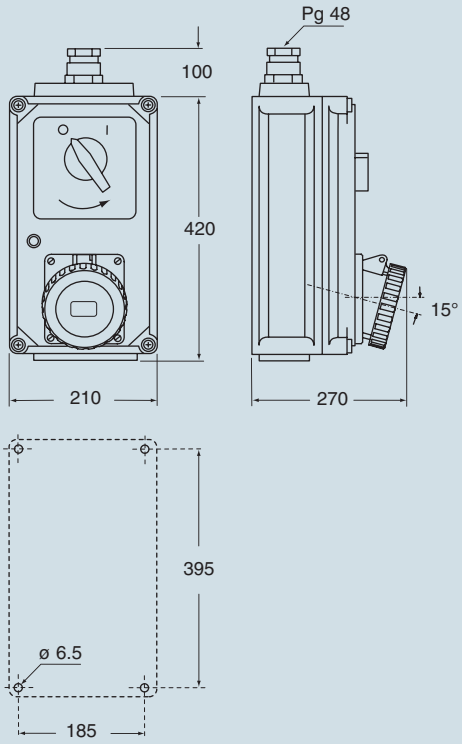
Type	Thermal relay	Magnetic relay	breaking power (cosfi 0.3) 220V	380V	500V
63A	63A	630A	25kA	16kA	8kA
125A	125A	1.250A	40kA	25kA	12kA

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

Dimensions in mm



Dimensions in mm



PK.. LL socket-outlets with circuit breaker and electrical interlock

- Compliant with EN 60309 -1 and -2
- Enclosure in die-cast aluminum alloy painted with grey epoxy polyester with anti-corrosive priming
- Inserts in insulating self-extinguishing thermoplastic material
- 63A types with bayonet fastening cover in insulating material, 125A types with bayonet fastening cover in die-cast aluminum alloy
- Factory installed internal wiring
- Cable entry with box-type flange and cable gland
- Box-type magnetothermal circuit breaker with undervoltage relay, compliant with EN 60947-2
- Electrical interlock based on pilot contact that prevents underload operations and monitors the earthing contact continuity (see diagram)
- Plug-type fuse carriers on the primary and secondary circuits of the transformer

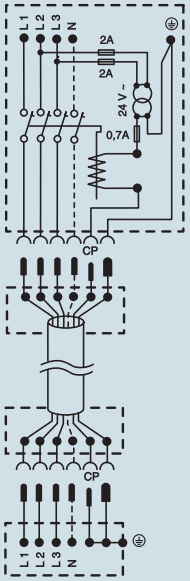
63A
IP55 degree of protection

125A
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	**PK 6343 LL**		**PK 12543 LL**	
	50 and 60	200 - 250	6	**PK 6363 LL**		**PK 12563 LL**	
	50 and 60	380 - 415	9	**PK 6393 LL**		**PK 12593 LL**	
	50 and 60	480 - 500	7	**PK 6373 LL**		**PK 12573 LL**	
	50 and 60	ins. transformer	12	**PK 63123 LL**	A.V.	**PK 125123 LL**	A.V.
	d.c.	> 50 - 250	3	**PK 6333 LL**	A.V.	**PK 125533 LL**	A.V.
3P+⏚	50 and 60	100 - 130	4	**PK 6344 LL**		**PK 12544 LL**	
	50 and 60	200 - 250	9	**PK 6394 LL**		**PK 12594 LL**	
	50 and 60	380 - 415	6	**PK 6364 LL**		**PK 12564 LL**	
	60	440 - 460	11	**PK 63114 LL**		**PK 125114 LL**	
	50 and 60	480 - 500	7	**PK 6374 LL**		**PK 12574 LL**	
3P+N+⏚	50 and 60	57/100 - 75/130	4	**PK 6345 LL**		**PK 12545 LL**	
	50 and 60	120/208 - 144/250	9	**PK 6395 LL**		**PK 12595 LL**	
	50 and 60	200/346 - 240/415	6	**PK 6365 LL**		**PK 12565 LL**	
	50 and 60	277/480 - 288/500	7	**PK 6375 LL**		**PK 12575 LL**	
	60	250/440 - 265/460	11	**PK 63115 LL**		**PK 125115 LL**	

Legend
A.V. = Colour according to voltage

Electric wiring diagram



Socket-outlet with electric interlock

Plug

Cable

Coupler socket-outlet

Fixed plug

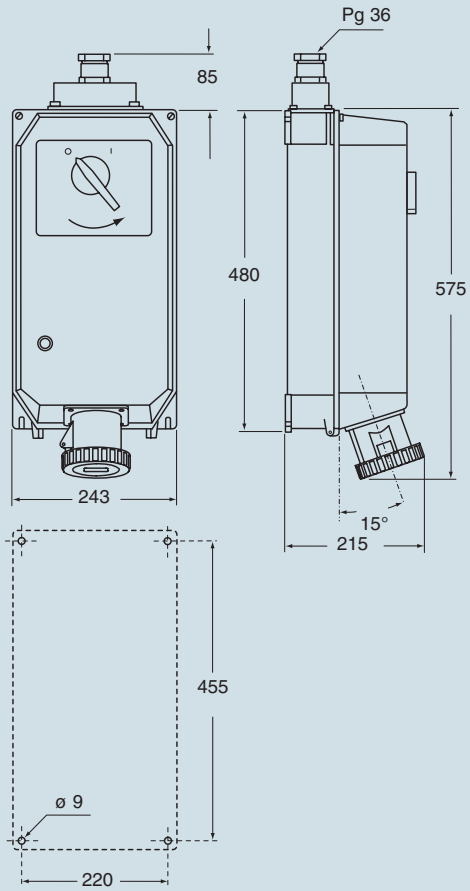
Appliance

Characteristics of circuit breakers

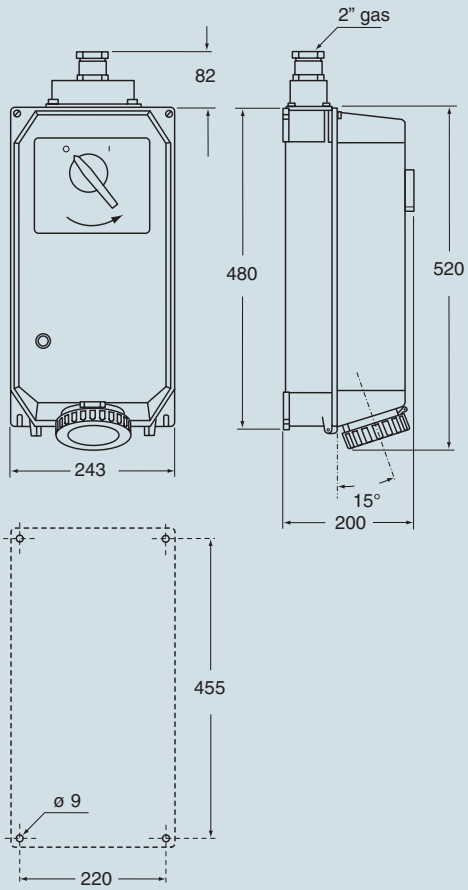
Type	Thermal relay	Magnetic relay	breaking power (cosfi 0.3) 220V	380V	500V
63A	63A	630A	25kA	16kA	8kA
125A	125A	1.250A	40kA	25kA	12kA

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

Dimensions in mm



Dimensions in mm



PK..LL

PB...T and PB...A socket-outlets with safety transformer for portable lamps

- Compliant with EN 60309 -1 and -2
- To supply class III portable lighting devices
- Safety transformer compliant with EN 61558-2-9 - 160VA for continuous duty, enabled by plug insertion
- 10 x 38 sectionable fuses (included) on primary and secondary circuit of transformer
- Inserts in insulating, self-extinguishing thermoplastic material
- Ⓜ With Italian Quality Mark

16A
IP44 degree of protection

16A
IP44 degree of protection

Poles	Frequency Hz	Voltage V	Part No.	Colour	Part No.	Colour
1 Socket-outlet 2P	50 and 60	230 / 24	**PB 16220 T1** Ⓜ		**PB 16220 A1** Ⓜ	
2 socket-outlets 2P	50 and 60	230 / 24	**PB 16220 T2** Ⓜ		**PB 16220 A2** Ⓜ	
2 socket-outlets 2P	50 and 60	400 / 24	**PB 16380 T2** Ⓜ		**PB 16380 A2** Ⓜ	

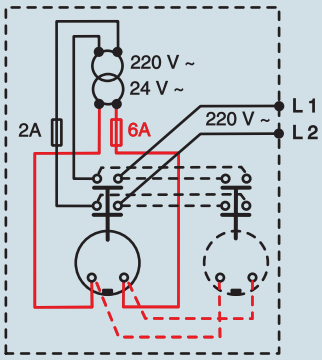
T1 and T2 types

- Class II in accordance with EN 61558-2-9
- Enclosure in insulating, self-extinguishing thermoplastic material, RAL 7035 grey
- Entry with threaded grommet (replaceable with cable gland)
- Transparent fuse carrier cover

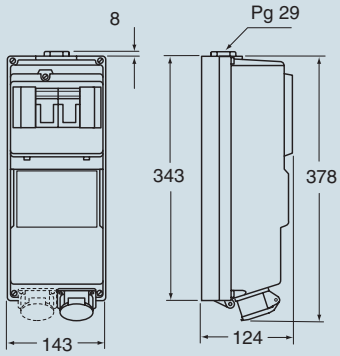
A1 and A2 types

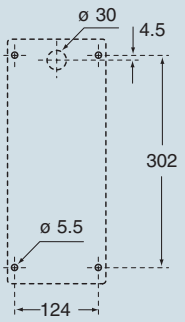
- Class I in accordance with EN 61558-2-9
- Enclosure in die-cast aluminum alloy painted with grey epoxy polyester with anti-corrosive priming
- Cable entry with box-type flange and Pg 21 cable gland

Wiring diagram

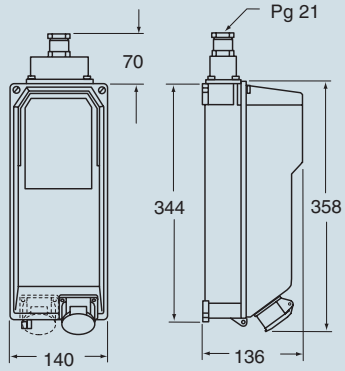


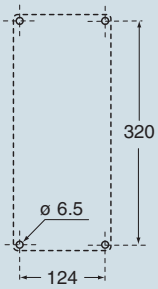
Dimensions in mm



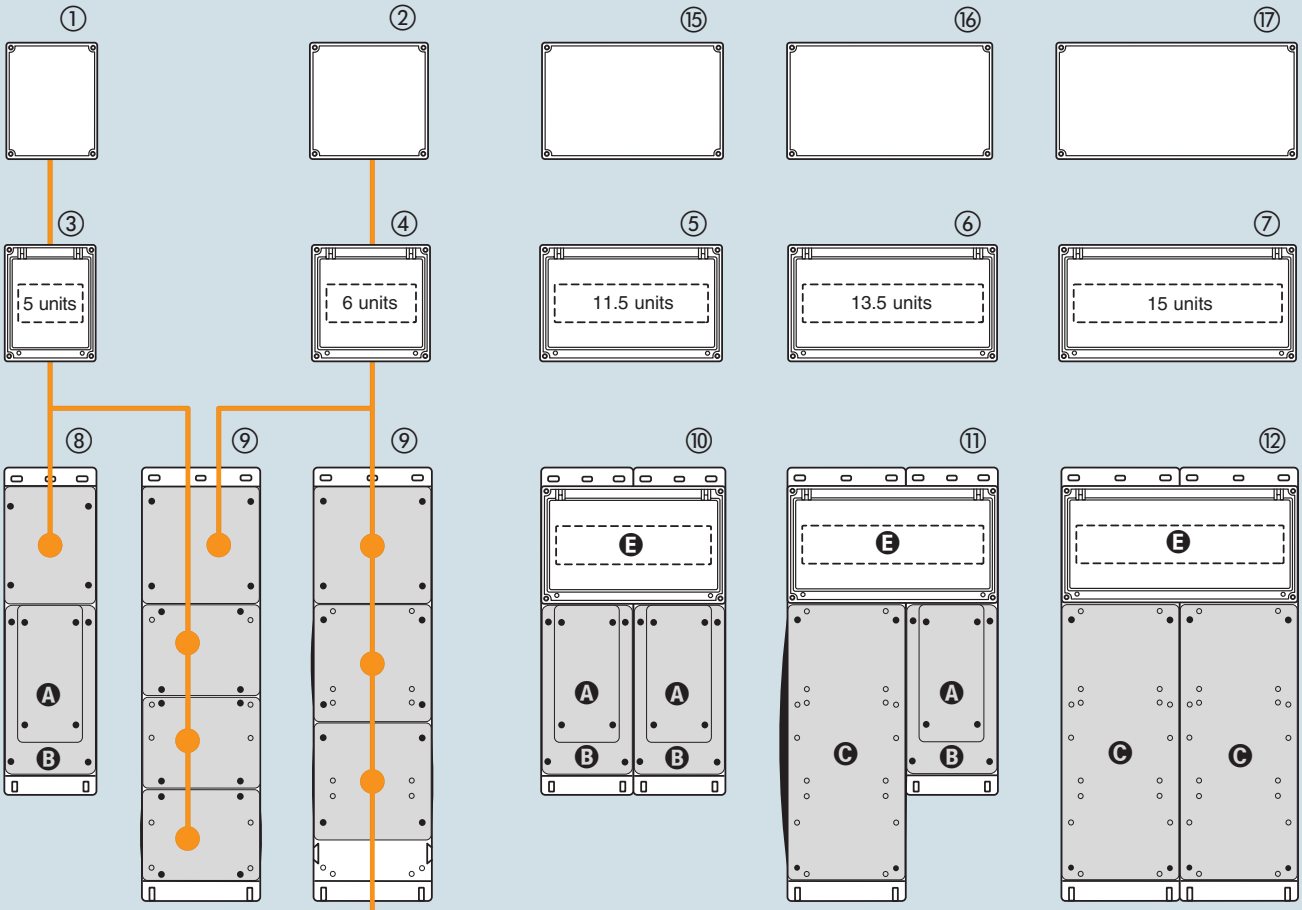


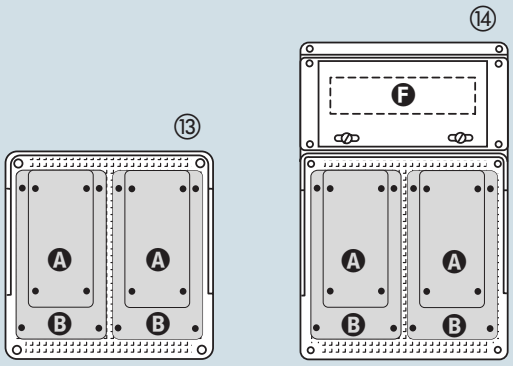
Dimensions in mm





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





FC series distribution boxes

① = **FC 1114 DB/DB5** (page 86)
② = **FC 1414 DB/DB5** (page 86)
③ = **FC 1114 GB5** (page 87)
④ = **FC 1414 GB5** (page 87)
⑤ = **FC 2214 GB5** (page 87)
⑥ = **FC 2514 GB5** (page 87)
⑦ = **FC 2814 GB5** (page 87)
⑮ = **FC 2214 DB5** (page 86)
⑯ = **FC 2514 DB5** (page 86)
⑰ = **FC 2814 DB5** (page 86)

FC series back plates and boxes

⑧ = **FC 1141 TB** small base plate (page 84)
⑨ = **FC 1453 TB** large base plate (page 84)
⑩ = **FC 2241 DT** 2 plates + small box (page 84)
⑪ = **FC 2545 DT** 2 plates + mixed size box (page 85)
⑫ = **FC 2853 DT** 2 plates + large box (page 85)
⑬ = **FC 2525 MU** alveolated box (page 94)
⑭ = **FC 2542 RA / RAT** alveolated box and enclosure for modular units (page 95)

Socket-outlets and accessories for distribution systems in group configuration

Interlocked socket-outlets

Ⓐ = **PK...EB** Interlocked socket-outlets without fuse carrier, 16A, IP44
Ⓑ = **PK...EB** Interlocked socket-outlets without fuse carrier, 32A and 63A, IP44
KI...IB5 Interlocked socket-outlets with fuse carrier, 16A, IP55
Ⓒ = **KI...RI5** Interlocked socket-outlets with enclosures for modular units, 16A, 32A and 63A, IP55
KI...IB5 Interlocked socket-outlets with fuse carrier, 32A and 63A, IP55
PB...T1 and **T2** Socket-outlets with 230/24V~ transformer, 144VA, 16A, IP55
Ⓓ = **PK...IA** Socket-outlets with circuit breakers and electrical interlock, 63 and 125A, IP55

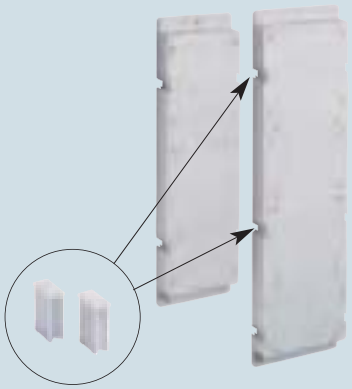
Accessories

Ⓔ = Spring-locked mounting modular devices for DIN-rails EN 60715, enclosure with hinged cover and fixing screws
Ⓕ = Spring-lock mounting modular devices for DIN-rail EN 60715, enclosure with hinged cover and padlocked locking pins

FC.. complementary parts and accessories for groups

- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and with Italian draft standard CEI 23-49
- In self-extinguishing thermoplastic material, RAL 7035 grey
- Plates with fixing plugs and fixing screws for socket-outlets
- Boxes for modular units, with sized DIN-rail EN 60715, closing plates and fittings
- ⓜ With Italian Quality Mark (CEI 23-48)

Modular back plates for the assembly of groups of socket-outlets



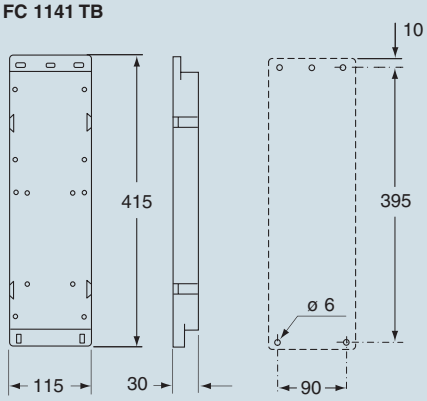
"Small" assembled modular base for two socket-outlets and enclosure for modular units

Description	Part No.	Part No.
Plates with fixing plugs - Small (115 x 415 x 30 mm) - Large (145 x 532 x 30)	**FC 1141 TB** **FC 1453 TB**	
Fixing plugs for plates	**FC TXT**	
Includes: - 2 FC 1141 TB plates - 1 FC 2214 GB5 enclosure for modular units		**FC 2241 DT** ⓜ

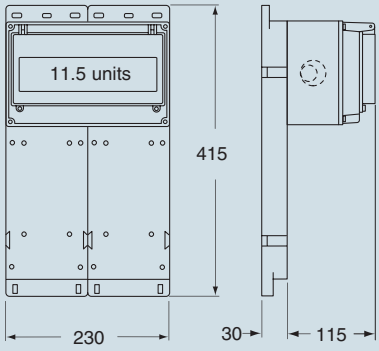
See page 83 for assembly configurations

Dimensions in mm

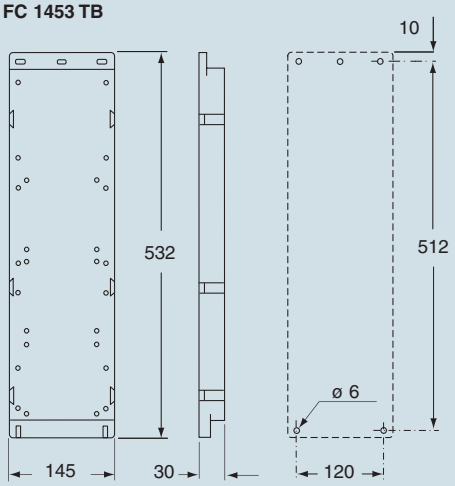
FC 1141 TB



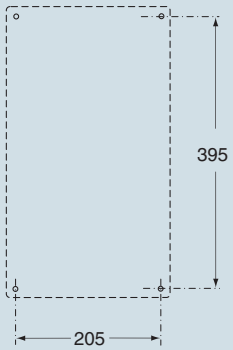
Dimensions in mm



FC 1453 TB



Panel cut-out in mm



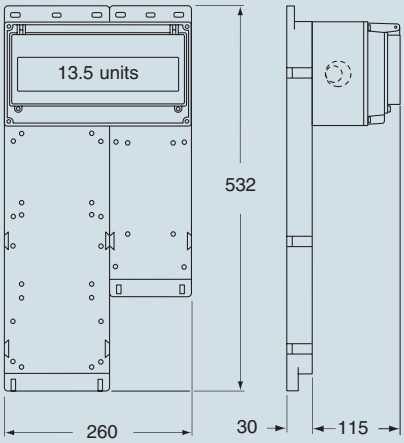
Dimensions indicated are not binding and may be changed without prior notice.

- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and with Italian draft standard CEI 23-49
- In self-extinguishing thermoplastic material, RAL 7035 grey
- Plates with fixing plugs and fixing screws for socket-outlets
- Boxes for modular units, with sized DIN-rail EN 60715, closing plates, fittings and fixing screws
- ⓜ With Italian Quality Mark (CEI 23-48)

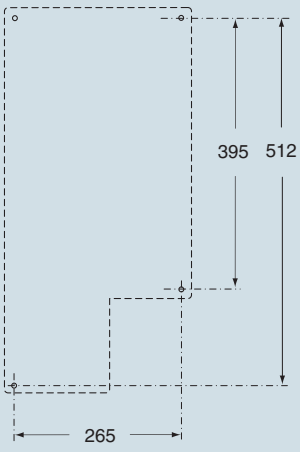
"Mixed" assembled modular base for two socket-outlets and enclosure for modular units

Description	Part No.
Includes: - 1 FC 1453 TB back plate - 1 FC 1141 TB back plate - 1 FC 2514 GB5 enclosure for modular units	**FC 2545 DT** ⓜ

Dimensions in mm



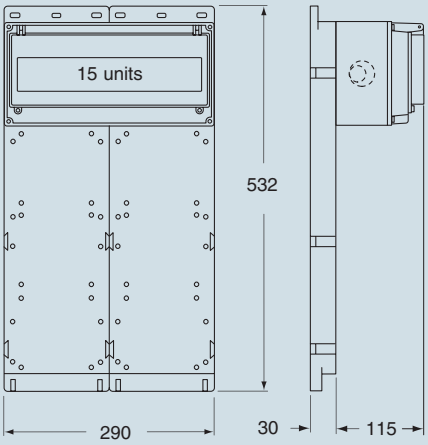
Panel cut-out in mm



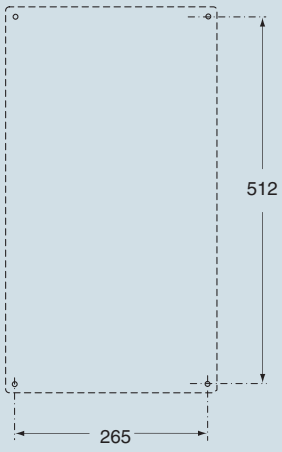
"Large" assembled modular base for two socket-outlets and enclosure for modular units

Description	Part No.
Includes: - 2 FC 1453 TB plates - 1 FC 2814 GB5 enclosure for modular units	**FC 2853 DT** ⓜ

Dimensions in mm



Panel cut-out in mm



See page 83 for assembly configurations

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

FC.. complementary parts and accessories for groups

- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and with Italian draft standard CEI 23-49
- In insulating, self-extinguishing, thermoplastic material, RAL 7035 grey
- Distribution boxes supplied with connections and screws, with possibility of assembling fixing plates
- Fixing plates in zinc-plated steel, with fixing screws
- ⓜ With Italian Quality Mark (CEI 23-48)

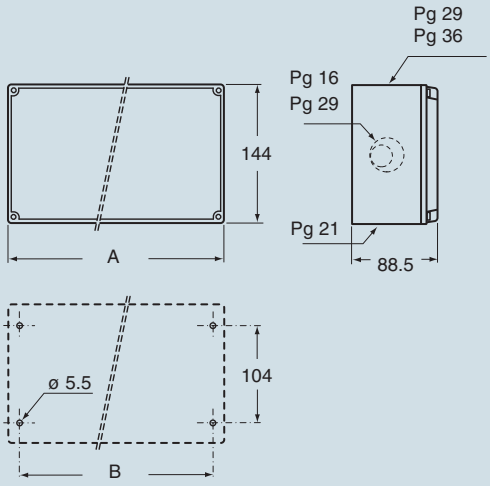
Distribution boxes - IP44 and IP55

Mounting plates for boxes

Description	Part No.	Part No.
For FC 1141 TB and FC 1453 TB plates		
- IP44 degree of protection (EN 60529)	**FC 1114 DB** ⓜ	
- IP55 degree of protection (EN 60529)	**FC 1114 DB5** ⓜ	
For FC 1453 TB plates		
- IP44 degree of protection (EN 60529)	**FC 1414 DB** ⓜ	
- IP55 degree of protection (EN 60529)	**FC 1414 DB5** ⓜ	
For 2 FC 1141 TB plates		
- IP55 degree of protection (EN 60529)	**FC 2214 DB5** ⓜ	
For FC 1141 TB + FC 1453 TB plates		
- IP55 degree of protection (EN 60529)	**FC 2514 DB5** ⓜ	
For 2 FC 1453 TB plates		
- IP55 degree of protection (EN 60529)	**FC 2814 DB5** ⓜ	
Mounting plates for distribution boxes		
- for FC 1114 DB and DB5 distribution boxes		**FC 1114 PF**
- for FC 1414 DB and DB5 distribution boxes		**FC 1414 PF**

See page 83 for assembly configurations

Dimensions in mm

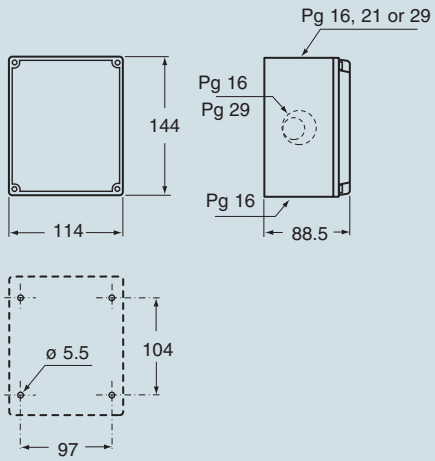


Part No.	A	B
FC 2214 DB5	228	210
FC 2514 DB5	260	239
FC 2814 DB5	290	269

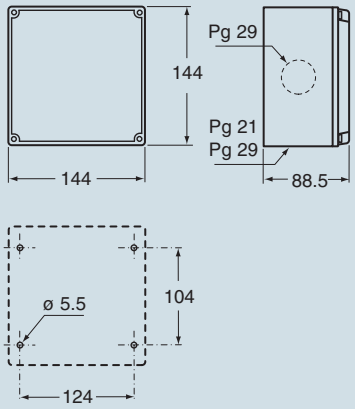
Dimensions indicated are not binding and may be changed without prior notice.

Dimensions in mm

FC 1114 DB/DB5

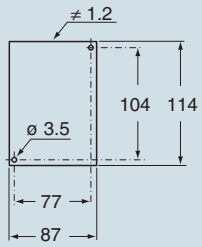


FC 1414 DB/DB5

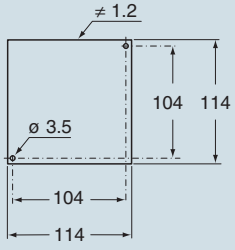


Dimensions in mm

FC 1114 PF



FC 1414 PF

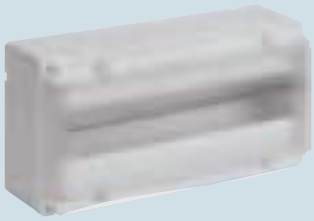


FC.. complementary parts and accessories for groups

- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and with Italian draft standard CEI 23-49
- In insulating, self-extinguishing, thermoplastic material, RAL 7035 grey
- Boxes for modular units, with sized DIN-rail EN 60715, closing plates, fittings and fixing screws
- ⓜ With Italian Quality Mark (CEI 23-48)

Boxes for modular units - IP55 Single

Boxes for modular units - IP55 Double

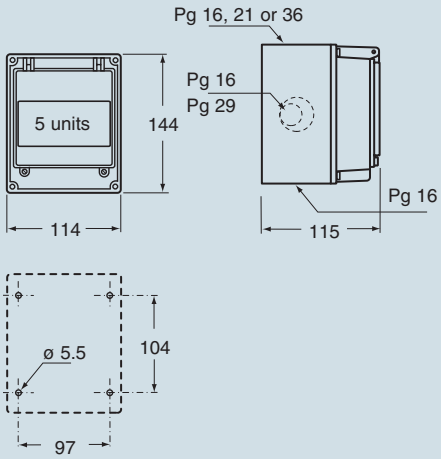


Description	Part No.	Part No.
For FC 1141 TB plates - With enclosure for modular units (5 units)	**FC 1114 GB5** ⓜ	
For FC 1453 TB plates - With enclosure for modular units (6 units)	**FC 1414 GB5** ⓜ	
For 2 FC 1141 TB plates - With enclosure for modular units (11.5 units) **For FC 1141 TB + FC 1453 TB plates** - With enclosure for modular units (13.5 units) **For 2 FC 1453 TB plates** - With enclosure for modular units (15 units)		**FC 2214 GB5** ⓜ **FC 2514 GB5** ⓜ **FC 2814 GB5** ⓜ

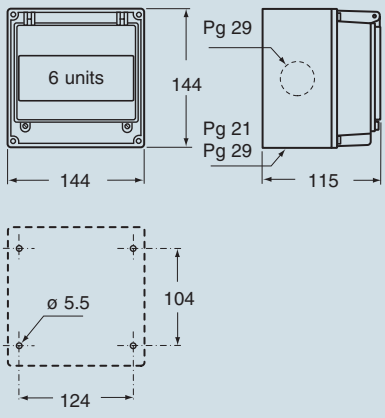
See page 83 for assembly configurations

Dimensions in mm

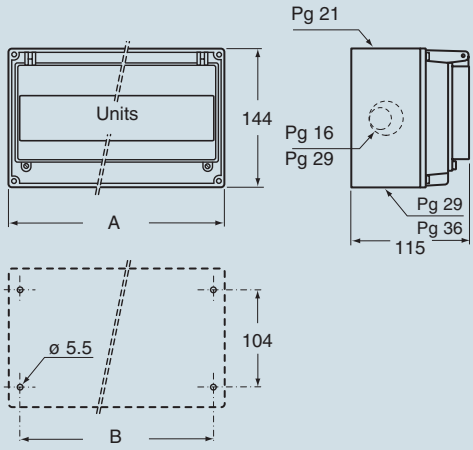
FC 1114 GB5



FC 1414 GB5



Dimensions in mm



Part No.	A	B	Units
FC 2214 GB5	228	210	11.5
FC 2514 GB5	260	239	13.5
FC 2814 GB5	290	269	15

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

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, both mass-produced (ASD) and custom-made (ANS), 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 pages 92 - 93 and 100).
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 60439-1 standard (class. CEI 17-13/1 and EN 60439-4 (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). 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 draft standard CEI 23-49
- **Resistance to chemical agents**
  See table on page 8
- **Degree of protection**
  IP55, according to CEI EN 60529 (see information note on page 7)
- **Maximum power that can be dissipated by the enclosures**
  See **Table 1** (on page 91)
- **Resistance to glow-fire**
  Compliant with IEC 60695 -1 -2: 650 °C for enclosures
- **Temperature**
  ambient: -25 °C - +40 °C; limit of materials: -40 °C - +100 °C
- **Self-extinguishing capacity** (UL 94 classification)
  For HB enclosures

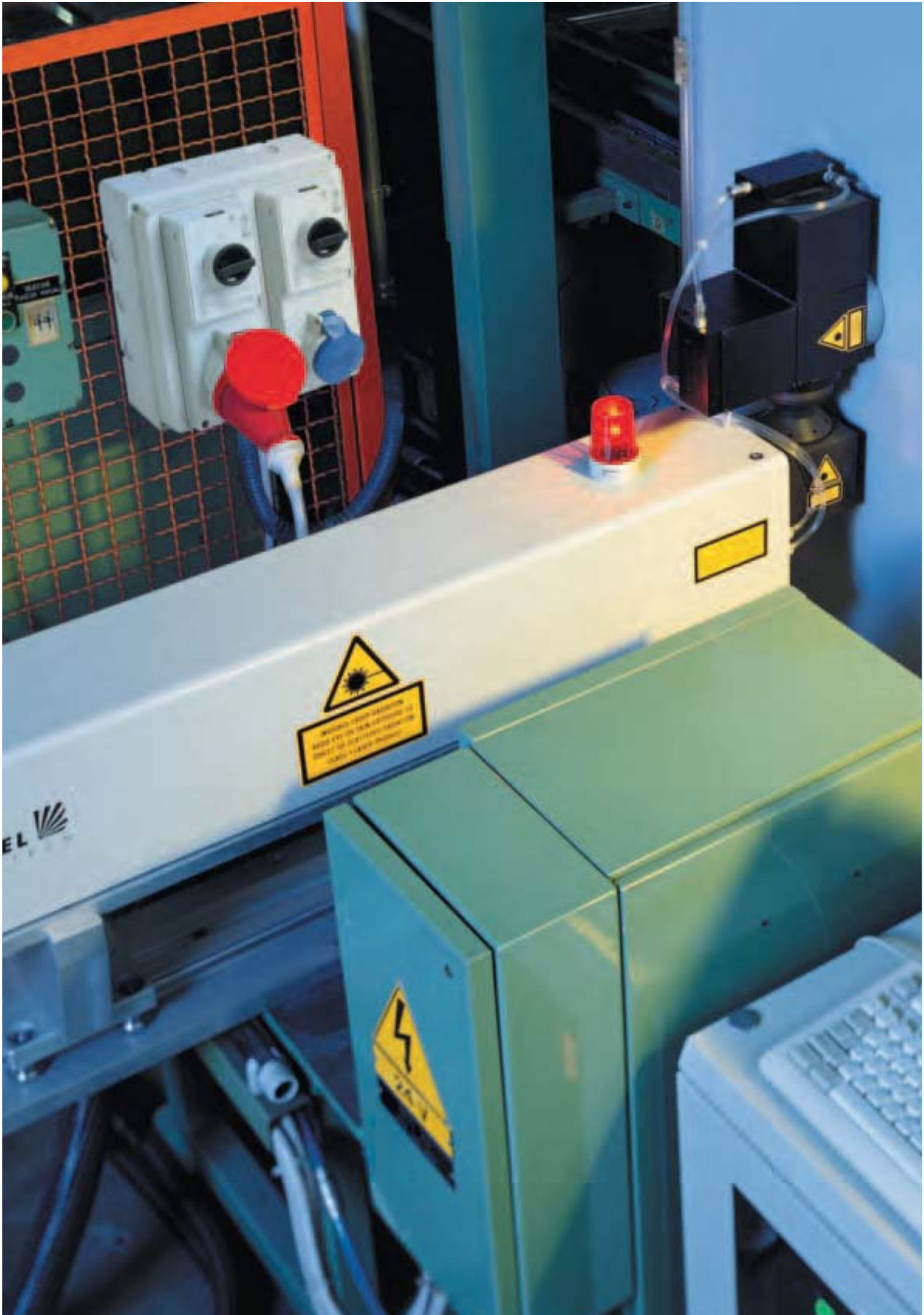
Materials

- 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 384 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 class 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 classes of protections are installed, the protection class of the resulting distribution board corresponds to that of the unit with the lowest class 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 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 class of protection have a bayonet fastening cover, traditionally defined as "water-tight", 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 384, IEC 60364).

Complete insulation to guarantee protection against indirect contacts*) ⧈

Article 7.4 of standard EN 60439-1 (class. 17-13/1) defines the protection measures against electric shocks that have to be incorporated in the boards. Protection against indirect contacts can be guaranteed only by completely insulating the installation ⧈ (Art.7.4.3.2.2), which implies complying with the following:

a) Units should be completely enclosed in insulated material. Enclosures should be marked with the ⧈ symbol, which must always been visible from the outside.
b) Enclosures must be made in insulating material suitable to withstand the mechanical, electric and thermal stresses to which they may be exposed during ordinary or extraordinary operating conditions and must be age-proof and flame resistant.
c) Enclosures should have no conducting parts to prevent fault voltages from being transmitted outside the unit.
d) Enclosures should have at least an IP3XD class of protection
e) Exposed conductive parts inside the unit should not be connected to the protective earth conductor. These parts must always be connected to a protection system that implies the use of a protective conductor. This also applies to built-in units, even if they have a connection terminal for the protective earth circuit.
f) Doors and covers that can be opened without the use of wrenches or other tools must be protected by a barrier in insulating material in order to prevent accidental contact with accessible live parts and with units that are accessible only after the covers have been removed. This barrier must be removable with the use of specific tools only.

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.

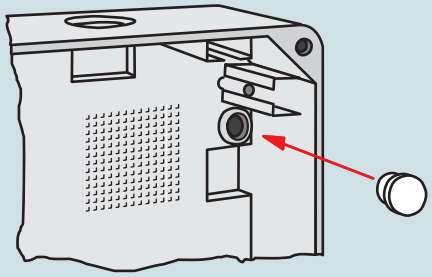


Figure 1 - Example of the use of plugs (supplied) to close the internal fixing holes.

Application of the *draft* 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 draft standard CEI 23-49. Results are shown in **Table 1**.

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

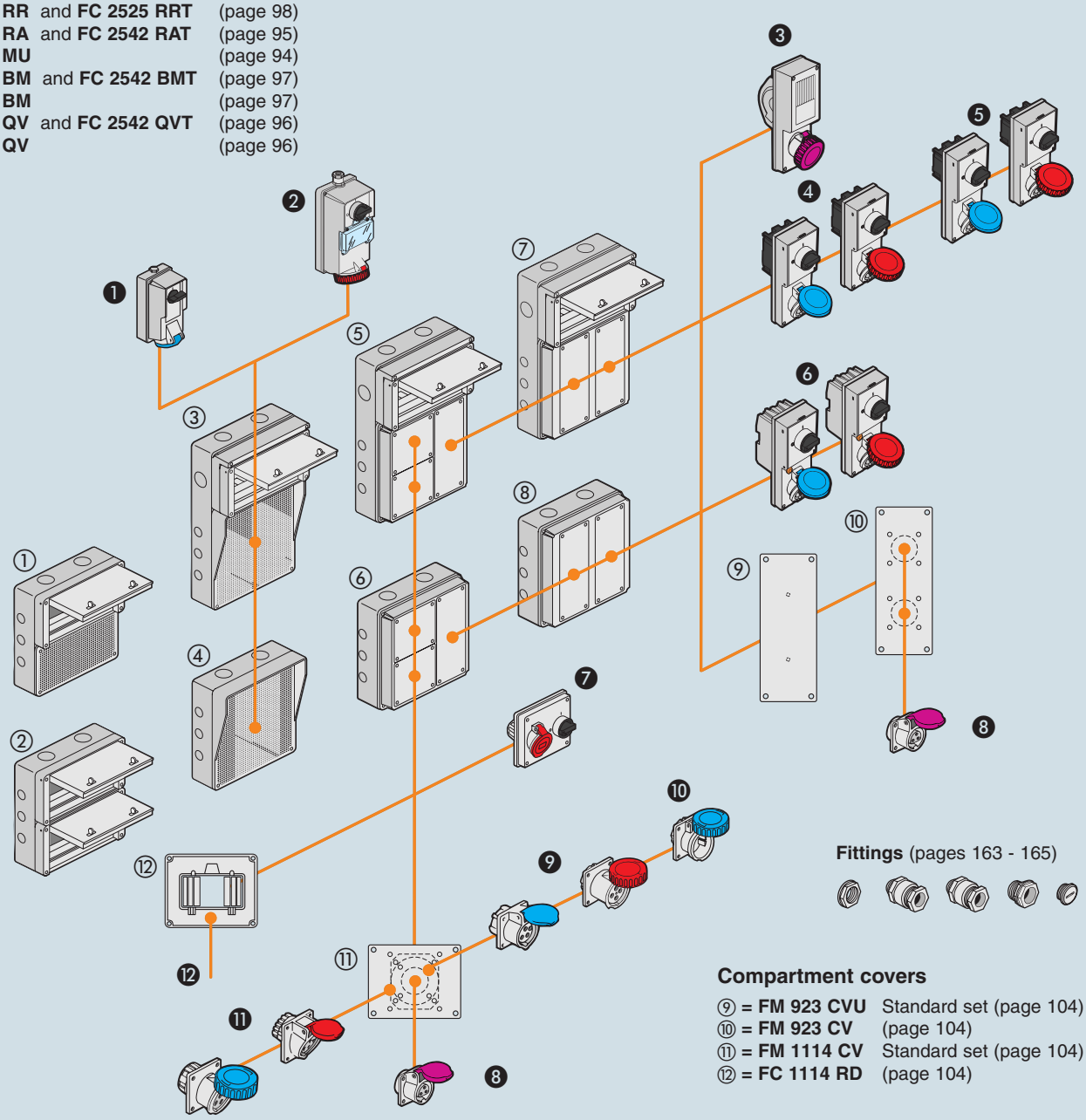
Table 1

Article	Description	Number of modules	P_{inv} 1) (W) wall-mounting	P_{inv} 1) (W) flush-mounting
FC 2525 RP*x*	255 x 255 mm box	10 units	11	14
FC 2525 RR*x*	255 x 255 mm box	10 units	20	24
FC 2525 BM	255 x 255 mm box	10 units	14	17
FC 2542 RA*x*	255 x 420 mm box	10 units	12	15
FC 2542 QV*x*	255 x 420 mm box	10 units	15	18
FC 2542 BM*x*	255 x 420 mm box	10 units	15	18

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

FC enclosures

① = **FC 2525 RA** and **FC 2525 RAT** (page 94)
② = **FC 2525 RR** and **FC 2525 RRT** (page 98)
③ = **FC 2542 RA** and **FC 2542 RAT** (page 95)
④ = **FC 2525 MU** (page 94)
⑤ = **FC 2542 BM** and **FC 2542 BMT** (page 97)
⑥ = **FC 2525 BM** (page 97)
⑦ = **FC 2542 QV** and **FC 2542 QVT** (page 96)
⑧ = **FC 2525 QV** (page 96)



Fittings (pages 163 - 165)

Compartment covers

⑨ = **FM 923 CVU** Standard set (page 104)
⑩ = **FM 923 CV** (page 104)
⑪ = **FM 1114 CV** Standard set (page 104)
⑫ = **FC 1114 RD** (page 104)

Accessories

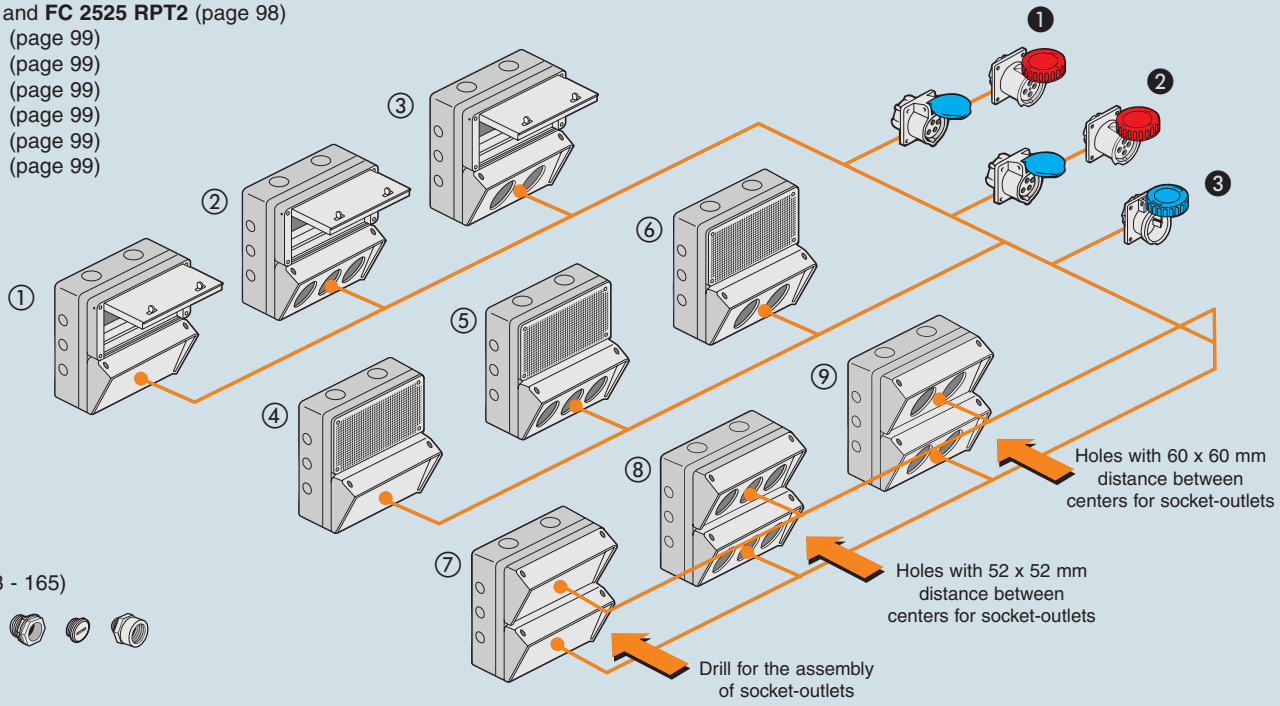
ref.	Type of interlocked socket-outlets	Application field	Part No.	Rated current	Degree of protection	Catalogue article
❶	Without fuse carrier	Low voltage	**PK...EB** types	16A, 32A and 63A	IP44	PK and KI
❷	With fuse carrier	Low voltage	**KI...IB5** types	16A	IP44 and IP55	PK and KI
❸	With safety transformer	Extra-low voltage	**SQT 16220** types	16A	IP55	FM
❹	With fuse carrier	Low voltage	**SQV and SQV .5** types	16A and 32A	IP44 and IP55	FM
❺	Without fuse carrier	Low voltage	**SQE and SQE .5** types	16A and 32A	IP44 and IP55	FM
❻	With magnetothermal circuit breaker (Siemens)	Low voltage	**SQA and SQA .5** types	16A and 32A	IP44 and IP55	FM / SQA
❼	Without fuse carrier	Low voltage	**SQ** types	16A	IP44	FM

ref.	Type of simple socket-outlets	With fixing distance in mm	Application field	Part No.	Rated current	Degree of protection	Catalogue article
❽	Straight socket-outlets	45 x 45	Extra-low voltage	**PB...PI** types	16A and 32A	IP44	Pluso / FM
❾	Straight socket-outlets	60 x 60	Low voltage	**PE/PEW...PQF/PQ** types	16A and 32A	IP44 and IP67	Pluso / FM
❿	Straight socket-outlets	60 x 60	Low voltage	**PEW 216 PQF** types	10/16A	IP67	Pluso / FM
⓫	Inclined socket-outlets	77 x 85	Low voltage	**PE/PEW...PIF/PI** types	16A and 32A	IP44 and IP67	Pluso / FM

⓬ Cover for modular units (5 units), IP55 protection class

FC enclosures

① = **FC 2525 RP** and **FC 2525 RPT** (page 98)
② = **FC 2525 RP3** and **FC 2525 RPT3** (page 98)
③ = **FC 2525 RP2** and **FC 2525 RPT2** (page 98)
④ = **FC 2525 AP** (page 99)
⑤ = **FC 2525 AP3** (page 99)
⑥ = **FC 2525 AP2** (page 99)
⑦ = **FC 2525 PP** (page 99)
⑧ = **FC 2525 PP3** (page 99)
⑨ = **FC 2525 PP2** (page 99)



Fittings (pages 163 - 165)

Complementary parts

ref.	Type of simple socket-outlets	With fixing distance in mm	Application field	Part No.	Rated current	Degree of protection	Catalogue article
❶	Straight outlet-sockets	52 x 52	Low voltage	**PE/PEW...PQ** types	16A	IP44 and IP67	Pluso / FM
❷	Straight outlet-sockets	60 x 60	Low voltage	**PE/PEW...PQF/PQ** types	16A and 32A	IP44 and IP67	Pluso / FM
❸	Straight socket-outlets	60 x 60	Low voltage	**PEW 216 PQF** types	10/16A	IP67	Pluso / FM

FC boxes for distribution boards

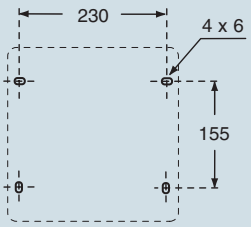
- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian draft standard CEI 23-49
- Box, covers, frame and accessories in self-extinguishing thermoplastic resin, RAL 7035 grey
- Boxes are designed for wall- or flush-mounting and are supplied with all the necessary accessories
- 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
- IP 55 degree of protection (EN 60529)
- With Italian Quality Mark (CEI 23-48)

Box for interlocked switched socket-outlets PK...EB, KI...IB5

Mixed box for modular devices and alveolated structures

Description	Part No.	Part No.	Part No.
Consisting of: - FC 2525 MS base box - FC 2525 CR alveolated cover	**FC 2525 MU**		
Base components - FC 2525 MS base box - FC 2525 TS frame - 1 FC 1225 SA alveolated half-cover ***Optional components:*** - 1 FC 1225 SR * or SRT** half-cover		**FC 2525 RA***	**FC 2525 RAT****

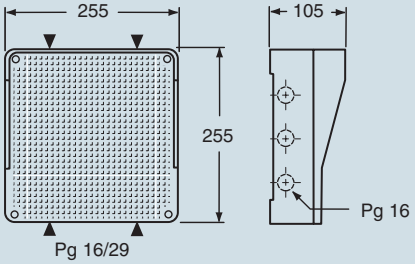
Panel cut-out in mm



Legend:

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

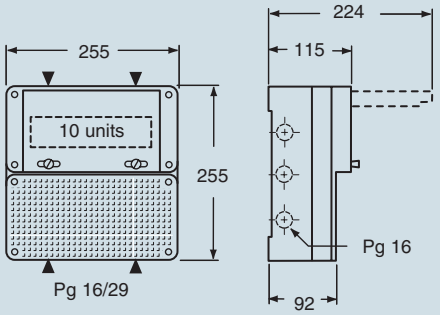
Dimensions in mm



Designed for mounting:

Two interlocked socket-outlets
- KI..IB5 types, 16A, IP55, with fuse carrier
- PK..EB types, 16A, 32A and 63A, IP44, without fuse carrier

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)
- Several devices for the connection to the alveolated structure

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

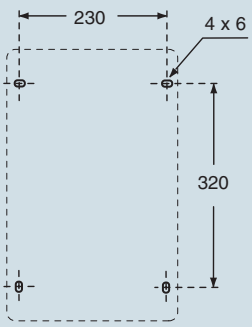
FC boxes for distribution boards

- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian draft 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
- IP 55 degree of protection (EN 60529)
- ⓜ With Italian Quality Mark (CEI 23-48)

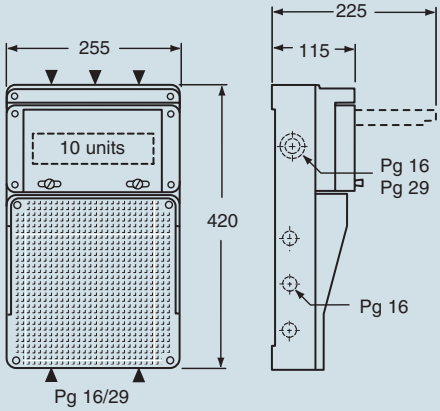
Mixed boxes for interlocked switched socket-outlets and modular equipment

Description	Part No.	Part No.
Base components - FC 2542 MS base box - FC 2525 CR alveolated cover ***Optional components:*** - 1 FC 1225 SR * or SRT** half-cover	**FC 2542 RA*** ⓜ	**FC 2542 RAT**** ⓜ

Panel cut-out in mm



Dimensions in mm



Legend:

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

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
- KI..IB5 types, 16A, IP55, with fuse carrier
- PK..EB types, 16A, 32A and 63A, IP44, without fuse carrier

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

FC boxes for distribution boards

- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian draft 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
- IP 55 degree of protection (EN 60529)
- Ⓜ With Italian Quality Mark (CEI 23-48)

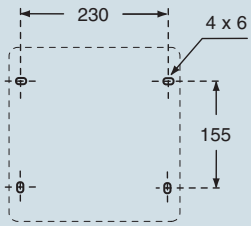
Box for interlocked SQ.. socket-outlets

Mixed box for interlocked switched socket-outlets and modular devices

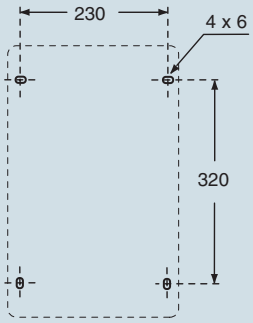
Description	Part No.	Part No.	Part No.
Consisting of: - FC 2525 MS base box - FC 2525 TS2 frame	**FC 2525 QV** Ⓜ		
Base components - FC 2542 MS base box - FC 2525 TS2 frame ***Optional components*** - 1 FC 1225 SR * or SRT** half-cover		**FC 2542 QV*** Ⓜ	**FC 2542 QVT**** Ⓜ

Panel cut-out in mm

FC 2525 BM



FC 2542 ...

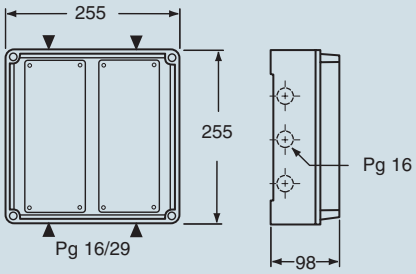


Legend:

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

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

Dimensions in mm

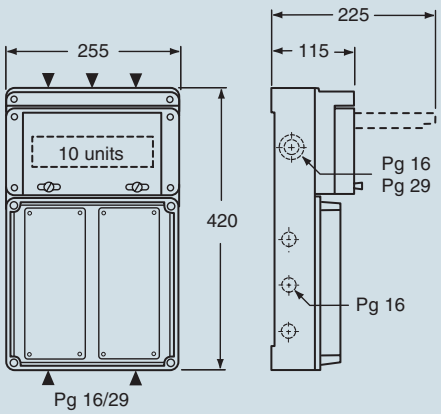


Designed for mounting:

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
- SQA types, 16A and 32A, IP44 and IP55 with magnetothermal switch

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
- SQA types, 16A and 32A, IP44 and IP55 with magnetothermal switch

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 draft 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
- IP 55 degree of protection (EN 60529)
- ⓜ With Italian Quality Mark (CEI 23-48)

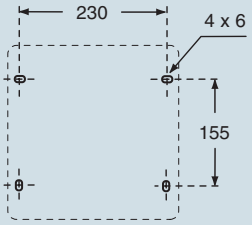
Box for interlocked switched socket-outlets

Switched mixed box for interlocked socket-outlets and modular devices

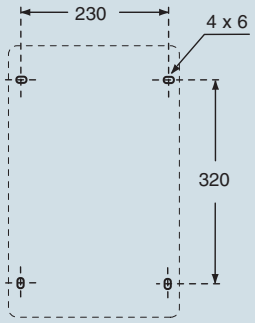
Description	Part No.	Part No.	Part No.
Consisting of: - FC 2525 MS base box - FC 2525 TS2 frame	**FC 2525 BM** ⓜ		
Base components - FC 2542 MS base box - FC 2525 TS3 frame ***Optional components*** - 1 FC 1225 SR * or SRT** half-cover		**FC 2542 BM*** ⓜ	**FC 2542 BMT**** ⓜ

Panel cut-out in mm

FC 2525 BM



FC 2542 ...

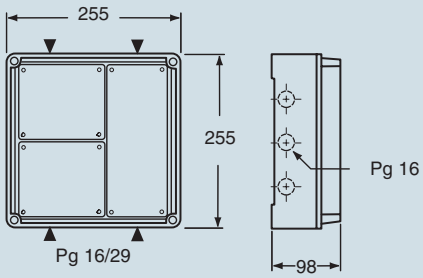


Legend:

*** = 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:

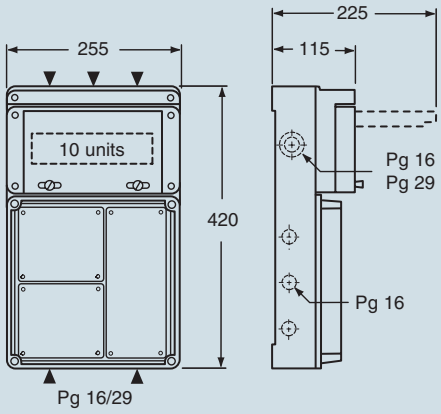
Two interlocked socket-outlets
- SQ types, 16A, IP44, without fuse carrier

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
- SQA types, 16A and 32A, IP44 and IP55 with magnetothermal switch

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
- SQA types, 16A and 32A, IP44 and IP55 with magnetothermal switch

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

FC boxes for distribution boards

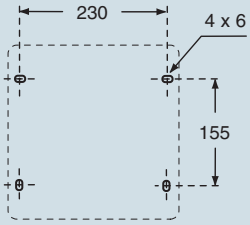
- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian draft standard CEI 23-49
- Box, covers, frame and accessories in self-extinguishing thermoplastic resin, RAL 7035 grey
- Boxes are designed for wall- or flush-mounting and are supplied with all the necessary accessories
- 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
- Half-covers in the same size designed to be mounted at the top or bottom
- IP 55 degree of protection (EN 60529)
- ⓜ With Italian Quality Mark (CEI 23-48)

Box for modular devices

Mixed box for modular devices - flush-mounting socket-outlets

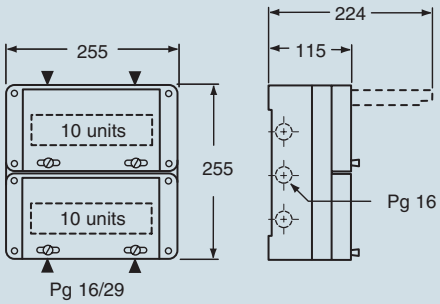
Description	Part No.	Part No.	Part No.	Part No.
Base components - FC 2525 MS base box - FC 2525 TS frame - 2 FC 1225 SR* or FC 1225 SRT** half-covers	**FC 2525 RR*** ⓜ	**FC 2525 RRT**** ⓜ		
Base components - FC 2525 MS base box - FC 2525 TS frame - 1 FC 1225 SR* or FC 1225 SRT** half-cover ***Optional components*** - 1 smooth FC 1225 SP half-cover - 1 FC 1225 SF3 half-cover with 3 holes - 1 FC 1225 SF3 half-cover with 2 holes			**FC 2525 RP*** ⓜ **FC 2525 RP3*** ⓜ **FC 2525 RP2*** ⓜ	**FC 2525 RPT**** ⓜ **FC 2525 RPT3**** ⓜ **FC 2525 RPT2**** ⓜ

Panel cut-out in mm



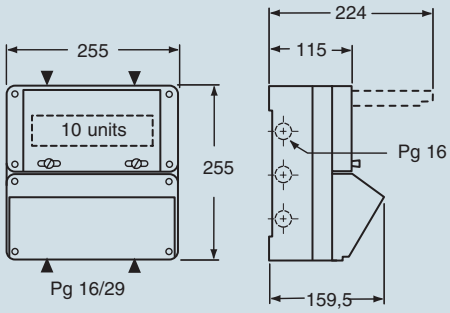
Dimensions in mm

FC 2525 RR and FC 2525 RRT
See note (a x 2)

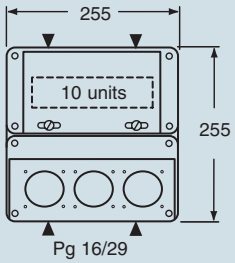


Dimensions in mm

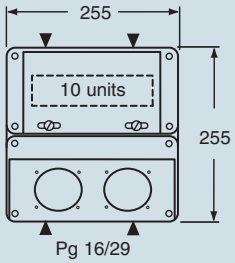
FC 2525 RP and FC 2525 RPT
See note (a)



FC 2525 RP3 and FC 2525 RPT3
See note (a+b)



FC 2525 RP2 and FC 2525 RPT2
See note (a+c)



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 straight flush-mounted socket-outlets (52x52 mm fixing distance between centres)
- PE/PEW..PQ types, 16A, IP44 and IP67

(c)
Two straight flush-mounted socket-outlets (60x60 mm fixing distance between centres)
- PE/PEW..PQF/PQ types, 16A and 32A, IP44 and IP67
- PEW 216 PQF type (Schuko®), 10/16A, IP67

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

FC boxes for distribution boards

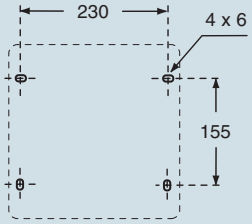
- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian draft standard CEI 23-49
- Box, covers, frame and accessories in self-extinguishing thermoplastic resin, RAL 7035 grey
- Boxes are designed for wall- or flush-mounting and are supplied with all the necessary accessories
- 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
- Half-covers in the same size designed to be mounted at the top or bottom
- IP 55 degree of protection (EN 60529)
- ⓜ With Italian Quality Mark (CEI 23-48)

Mixed box devices and built-in socket-outlets

Box for built-in socket-outlets

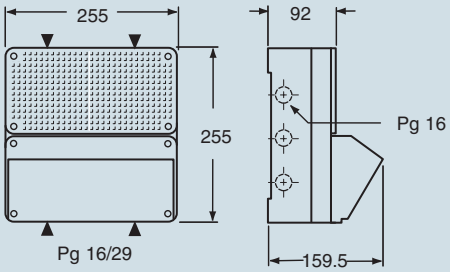
Description	Part No.	Part No.
Base components - FC 2525 MS base box - FC 2525 TS frame - 1 FC 1225 SA alveolated half-cover ***Optional components*** - 1 smooth FC 1225 SP half-cover - 1 FC 1225 SF3 half-cover with 3 holes - 1 FC 1225 SF3 half-cover with 2 holes	**FC 2525 AP** ⓜ **FC 2525 AP3** ⓜ **FC 2525 AP2** ⓜ	
Base components - FC 2525 MS base box - FC 2525 TS frame ***Optional components*** - 2 smooth FC 1225 SP half-covers - 2 FC 1225 SF3 half-covers with 3 holes - 2 FC 1225 SF2 half-covers with 2 holes		**FC 2525 PP** ⓜ **FC 2525 PP3** ⓜ **FC 2525 PP2** ⓜ

Panel cut-out in mm

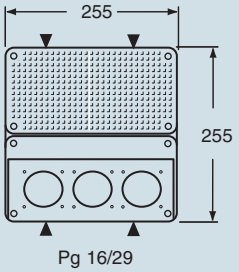


Dimensions in mm

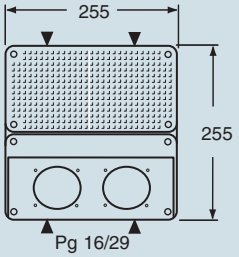
FC 2525 AP



FC 2525 AP3
See note (a)

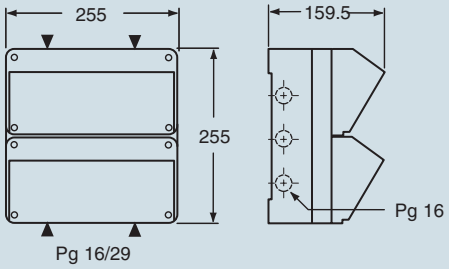


FC 2525 AP2
See note (b)

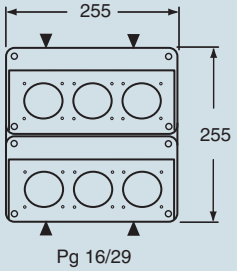


Dimensions in mm

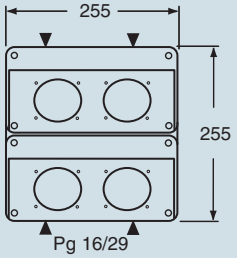
FC 2525 PP



FC 2525 PP3
See note (a x 2)



FC 2525 PP2
See note (b x 2)



Notes:
assembly layouts

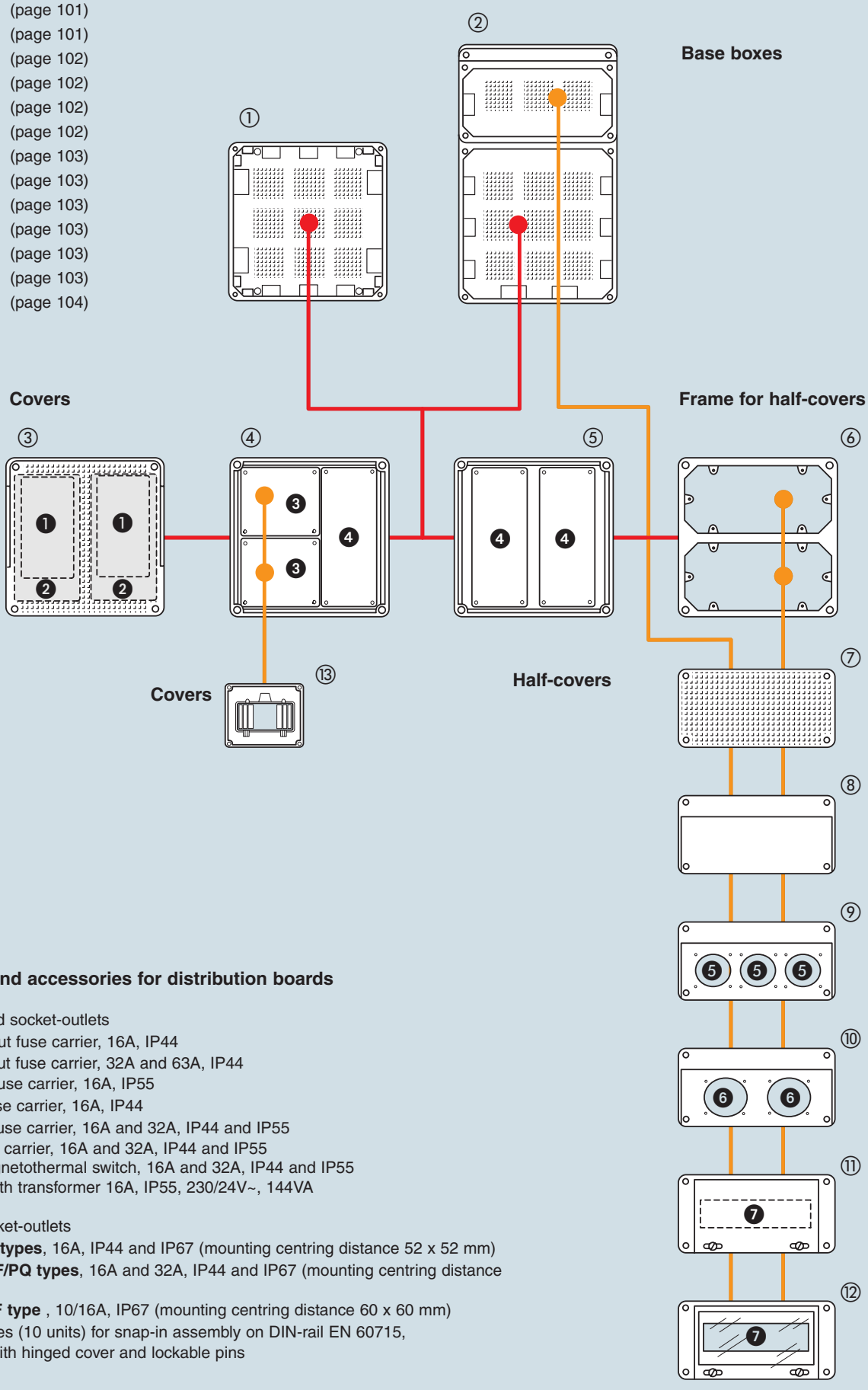
(a)
Three straight flush-mounted socket-outlets
(52x52 mm fixing distance between centers)
- PE/PEW..PQ types, 16A, IP44 and IP67

(b)
Two straight flush-mounted socket-outlets
(60x60 mm fixing distance between centers)
- PE/PEW..PQF/PQ types, 16A and 32A, IP44 and IP67
- PEW 216 PQF type (Schuko®), 10/16A, IP67

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

FC components for distribution boards

① = **FC 2525 MS** (page 101)
② = **FC 2542 MS** (page 101)
③ = **FC 2525 CR** (page 102)
④ = **FC 2525 TS3** (page 102)
⑤ = **FC 2525 TS2** (page 102)
⑥ = **FC 2525 TS** (page 102)
⑦ = **FC 1225 SA** (page 103)
⑧ = **FC 1225 SP** (page 103)
⑨ = **FC 1225 SF3** (page 103)
⑩ = **FC 1225 SF2** (page 103)
⑪ = **FC 1225 SR** (page 103)
⑫ = **FC 1225 SRT** (page 103)
⑬ = **FC 1114 RD** (page 104)



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
SQA with magnetothermal switch, 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

- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian draft standard CEI 23-49
- Box in self-extinguishing thermoplastic material, RAL 7035 grey
- IP 55 (EN 60529) degree of protection for boxes with cover or frame for half covers
- ⓜ With Italian Quality Mark (CEI 23-48)

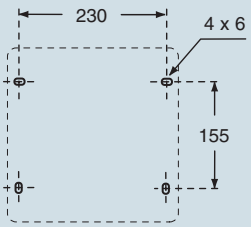
Small base box

Large base box

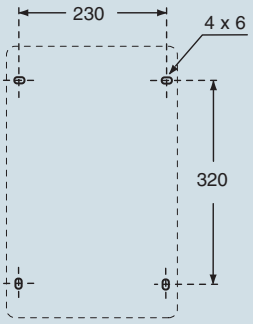
Description	Part No.	Part No.
Dimensions 255 x 255 - For series FC 2525...boxes	**FC 2525 MS** ⓜ	
Dimensions 255 x 420 - For series FC 2542...boxes		**FC 2542 MS** ⓜ

Panel cut-out in mm

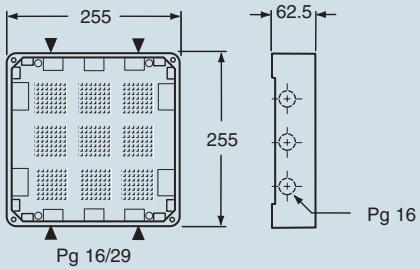
FC 2525 MS



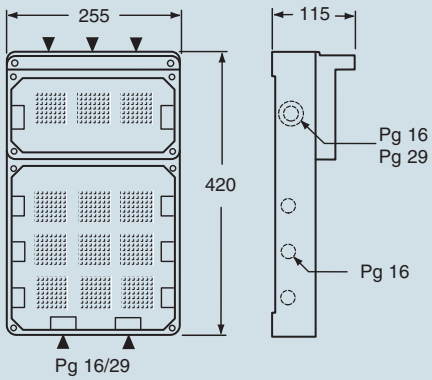
FC 2542 MS



Dimensions in mm



Dimensions in mm



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

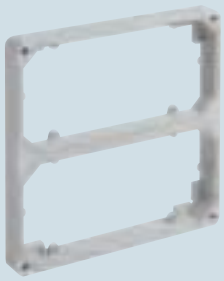
components

FC components for distribution boards

- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian draft 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)

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
- SQA types, 16A and 32A, IP44 and IP55 with magnetothermal switch

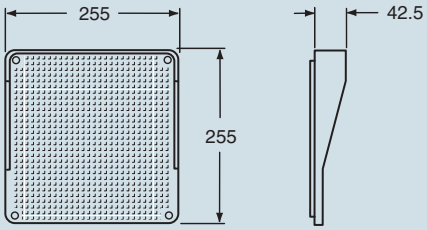
or one socket-outlet with transformer
- SQT 16220 type, 16A, IP55, 230/24V~, 144VA

(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
- SQA types, 16A and 32A, IP44 and IP55 with magnetothermal switch

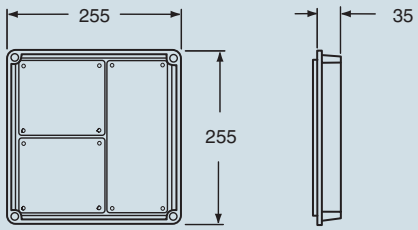
Socket-outlets with transformer
- SQT 16220 type, 16A, IP55, 230/24V~, 144VA

Dimensions in mm

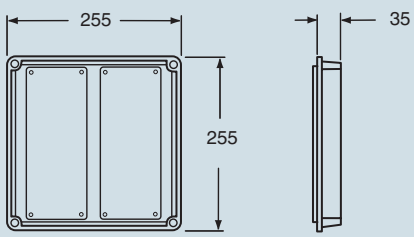
FC 2525 CR
See note (a)



FC 2525 TS3
See note (b)

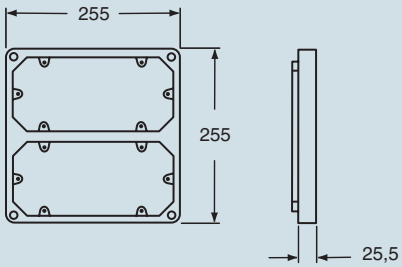


FC 2525 TS2
See note (c)



Dimensions in mm

FC 2525 TS



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

- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian draft 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)

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)

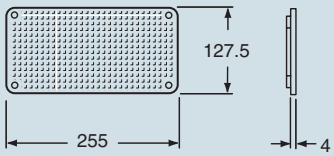
(b)
Three built-in straight socket-outlets
(mounting centring distance 52x52 mm);
- PE/PEW..PQ types, 16A, IP44 and IP67

(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

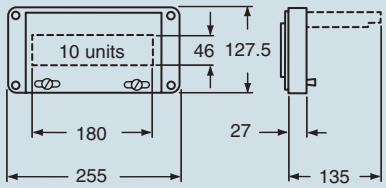
Dimensions indicated are not binding and may be changed without prior notice.

Dimensions in mm

FC 1225 SA

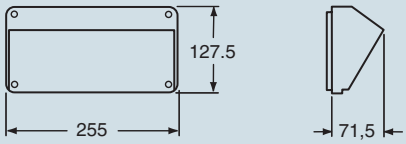


FC 1225 SR and FC 1225 SRT
See note (a)

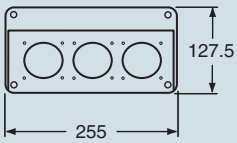


Dimensions in mm

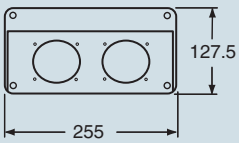
FC 1225 SP



FC 1225 SF3
See note (b)



FC 1225 SF2
See note (c)



components

- Compliant with international standard IEC 60670 (Italian standard CEI 23-48) and Italian draft standard CEI 23-49
- Cover in self-extinguishing thermoplastic resin, RAL 7035 grey
- IP 55 degree of protection (EN 60529)
- ⓜ With Italian Quality Mark (CEI 23-48)

Compartment covers for boxes FC....BM

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

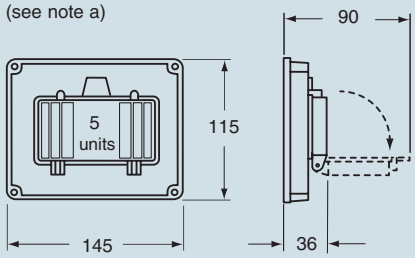
Description	Part No.	Part No.
Cover for boxes FC ... BM - For modular units (see note a) - Smooth, suitable for flush-mounted socket-outlets	**FC 1114 RD** ⓜ **FM 1114 CV**	
Cover for boxes FC ... BM/QV - Smooth, with central hollows - Smooth, designed for flush-mounted socket-outlets		**FM 923 CVU**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

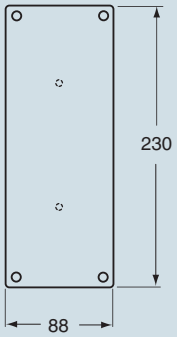
Dimensions in mm

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

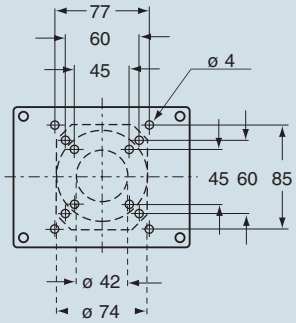


Dimensions in mm

FM 923 CVU (rear view)

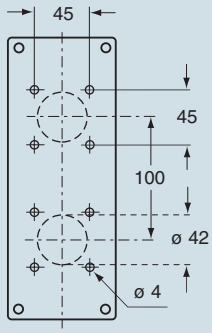


FM 1114 CV (rear view)



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 (mounting centring distance 45 x 45)

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