

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



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, 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.

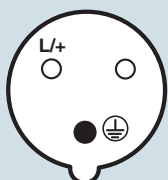
The 63A and 125A plugs have a pilot contact for operating an electric interlock.

Hour Position (h)

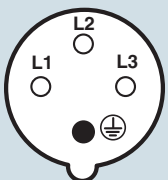
This position is determined by looking at the front of the socket and placing the major guiding groove at the 6 o'clock position and noting the hour position of the earthing contact.

Following are examples of three different polarities with the earth contact at the 6 o'clock position.

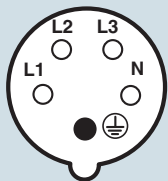
Socket - front view



▲ 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
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
	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.

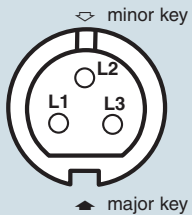
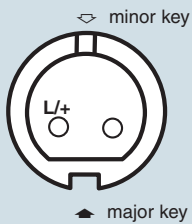
In the "extra-low voltage" versions with no earthing contact, the safety system is based on two references:

- 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 60439-1¹⁾ 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 switchgear and controlgear assembly) 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 gassemblies 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 gassemblies 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-produced²⁾ and **PTTA**, partially type-tested assemblies (more likely custom-built in small quantity or in a single unit³⁾). 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 strategy⁴⁾. At the same time deductive methods were introduced for the **PTTA** boards to avoid carrying out the most difficult tests (technical report CEI17-52⁵⁾, short-circuit withstand; publication CEI 17-43⁶⁾, 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 23-48⁹⁾ 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_{ng} < 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 125A¹¹⁾, 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 23-48¹²⁾ 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 limited 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 conductive 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, 2^a 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_g** 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 state of the art rules and must comply with any manufacturer's assembly instructions. When components of different degrees of protection are assembled, the resulting board or distribution system will assume the lowest degree of protection of the mounted components.

This has been assessed and applies:

- 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 (1st digit) and protected against the *dangerous effects of water jets* with a nozzle from all directions (2nd digit).

IP66: total protection against *dust* and access to *dangerous parts* with an accessibility calibre of Ø 1 mm (1st digit), and protected against *powerful water jets* such as sea waves (2nd digit).

IP67: Total protection against *powder* and against *access to dangerous parts* with an access calibre of Ø 1 mm (1st digit) and protected against the *effects of temporary immersion* (30') in water at a maximum depth of 1 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

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 ₂ O (t up to 23 °C)	Watery saline solution	Acids		Bases		Solvents			Ethyl alcohol (ethanol)	Oils			Fats		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	Animal organic solution	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 SQx 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	
distribution enclosures and FC modular equipment for groups																		
codes FC...DB / DB5 and GB5	●	●	●	●	●	●	●	○	○	●	○	●	●	○	●	○	○	
FC board components																		
FC series enclosures	●	●	○	●	○	●	●	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 Directive¹⁾, 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 + B²⁾ 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 gas³⁾;
- 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 64-2⁵⁾
- 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 1-7-2003⁶⁾

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 64-2⁷⁾, 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.

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 socket-outlets with safety transformer	IP55	code PK...IA, PK...LL	○
	IP44	code PB...T, PB...A	●
	IP55	code SQT 16220	○
	IP67	code BT 16220, BT 16380	○
FC distribution enclosures	IP66/IP67	code TM 16220 T1/ST1 ²⁾	○
	IP44	code FC 1114 DB, FC 1414 DB	●
cases for modular equipment	IP55	code FC 1114 DB5, FC 1414 DB5	○
	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.**

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. BK enclosures for boards are made with a IP67 degree of protection. No further verification is needed if you install enclosures with an IP67 or higher class of protection and use covers with related gaskets, along with cable glands and pipe glands with an IP67 or higher class of protection. All equipment must be installed following state-of-the-art procedures and in compliance with the manufacturer's assembly instructions. If components with varying degrees of protections are installed, the degree of protection 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 BK systems

ILME offers the following range of socket-outlets for enclosures:

- Simple socket-outlets without interlock for industrial use in standard version with **IP67 degree of protection (PEW types)**
- Interlocked socket-outlets for industrial use in standard version with **IP67 degree of protection:**
 - With switch (BE types)
 - With switch-disconnector (BK types)
 - With magnetothermal circuit breaker (not supplied) (BA types)
 - With safety transformer \square SELV (BT types)

Socket-outlets with IP67 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 (IP 67). All enclosures, plugs and socket-outlets cover the installation requirements specified in standard CEI 64-8 (series Cenelec HD 384, IEC 60364).

Protection against indirect contacts complete insulation ¹⁾ \square

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 \square (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 \square 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) The enclosure must have a degree of protection equivalent to at least IP3XD.
- 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 metallic screws used for the assembly of socket-outlets and covers on enclosures for BK distribution boards are not connected to the inside of the board. If the wall mounting is carried out using suitable external metallic clamps (optional) or by internally installing the blanking plugs supplied, BK enclosures complying with the above prescriptions enable to configure systems that guarantee a full protection against indirect contacts.

¹⁾ 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.

Application of the Italian "draft" standard CEI 23-51

The maximum power that can be dissipated P_{inv} has been tested for each box in the most severe operating conditions using the method described in the Italian 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

Item	Description	Number of modules	$P_{inv}^{1)}$ (W) wall-mounting	$P_{inv}^{1)}$ (W) flush-mounting
BC 1123 CS ²⁾	Single box	4.5 units	10	13
BC 4034 T3	Triple box	16 units	18	26

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

²⁾ This standard does not apply to single boxes with industrial socket-outlets that have been tested only according to EN 60309-1 and -2. Data referred to single boxes apply only to installations with BR modules.

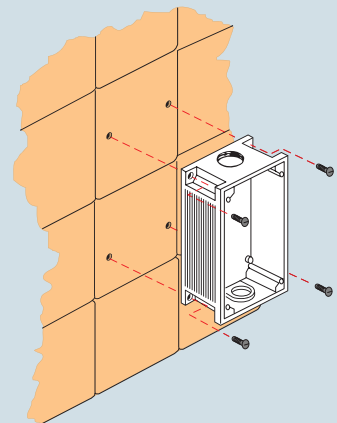


Figure 1 - Example of external mounting using the slots on the box.

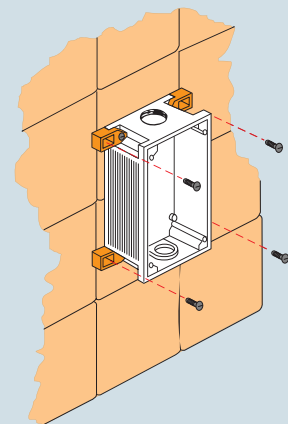


Figure 2 - Example of external mounting using the slots on the box. The brackets (optional), suitable to be mounted vertically and horizontally (recommended for triple boxes) simplify wall anchoring.

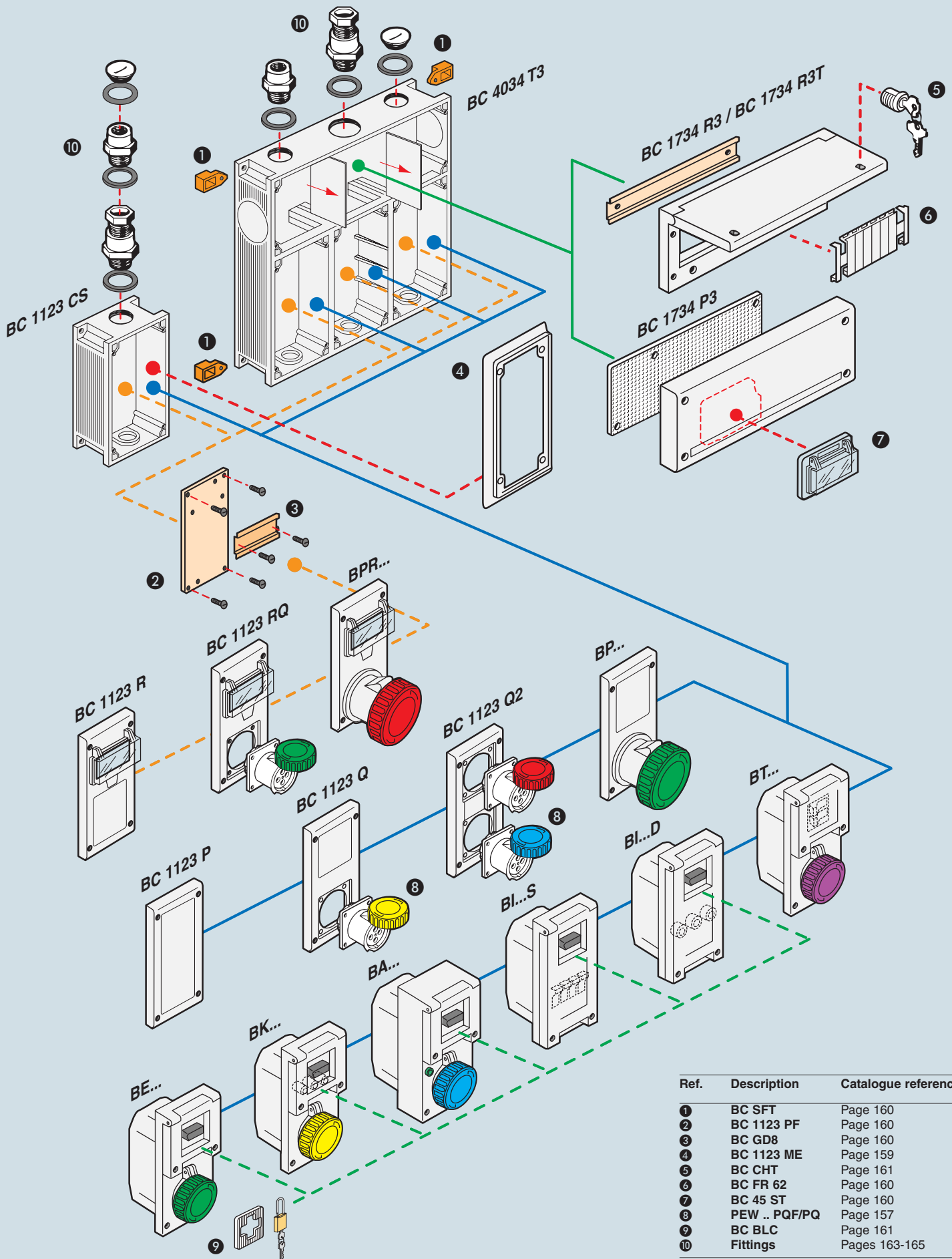


Table of the characteristics of covers and modular equipment

Types of covers and modules		BC 1123 P	BC 1734 P3	BC 1734 R3/R3T	BC 1123 Q	BC 1123 Q2	BC 1123 R	BC 1123 RQ	BP...	BPR...	BE...	BK...	BA...	Bl...S - Bl...D	BT...
Description															
Simple cover		X	X												
Cover with panel				X											
Cover for simple straight flush-mounting socket-outlets					X	X		X							
Cover with simple straight socket-outlets									X	X					
Cover with compartment for modular units							X	X		X					
Interlocked socket-outlets										X					
Interlocked socket-outlets with fuse carrier												X			
Socket-outlets with circuit breaker													X		
Switches-disconnectors with fuse carrier														X	
Socket-outlets with safety transformer															X
For boxes	Single	X			X	X	X	X	X	X	X	X	X	X	X
	Triple	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Rated current	16A				X ¹⁾	X ¹⁾		X ¹⁾			X	X	X		X ²⁾
	20A and 25A													X	
	32A				X ¹⁾	X ¹⁾		X ¹⁾			X	X	X		
	63A								X	X					
In this catalogue on page		159	159	159	156	156	156	156	153	153	150	151	152	154	155

¹⁾ Using simple flush-mounting PQ and PQF socket-outlets (16A and 32A)

²⁾ Limited to 6A by the transformer power (144VA)

Selecting socket-outlets

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

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

BK systems have an IP67 degree of protection. Socket-outlets with IP67 or higher class of protection have a bayonet fastening cover, traditionally defined as “water tight”, and must be used with IP67 plugs (with locking nut and gasket). All equipment must be installed following state-of-the-art procedures and in compliance with the manufacturer’s assembly instructions. If components with varying degrees of protections are installed, the degree of protection of the resulting distribution board corresponds to that of the unit with the lowest degrees of protection.

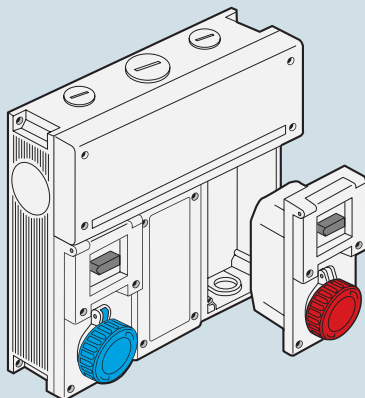
This has been assessed and applies:

- To socket-outlets when a plug with equivalent class is inserted or the cover is closed
- To enclosures, when all covers are closed

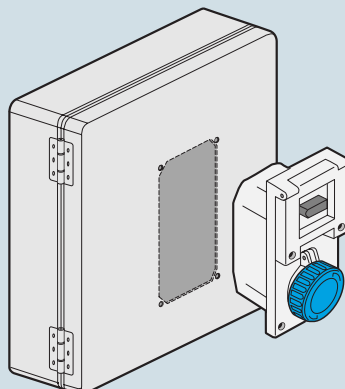
Type of installation

BK systems can be installed in four different types of configurations, as illustrated below:

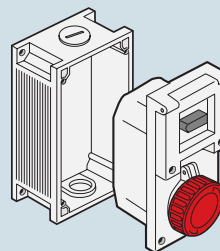
- In triple boxes (Figure 1)
- On equipment or pre-assembled enclosures (Figure 2)
- In boxes for wall-mounting (Figure 3)
- In boxes for flush-mounting (Figure 4)



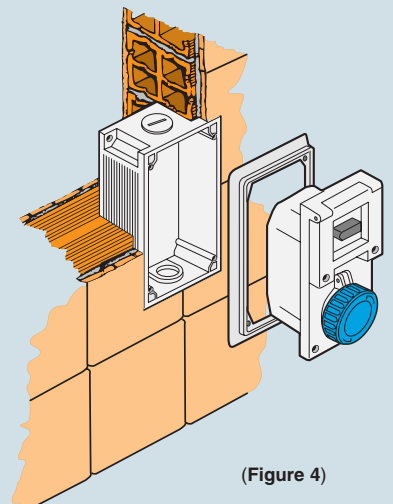
(Figure 1)



(Figure 2)



(Figure 3)



(Figure 4)

- Compliant with EN 60309 -1 and -2
- Carrying structure in self-extinguishing, glass fibre reinforced polyester, UL approved, RAL 7035 grey
- Stainless steel retained fixing screws
- Socket-outlet module in insulating self-extinguishing thermoplastic material, UL approved
- Stainless steel pin and spring hinged cover, with bayonet insert, colour coded according to operating voltage
- Factory installed internal wiring
- "Zeta" series switch-disconnector with 32A rating, compliant with standard EN 60947-3, AC-22A
- Mechanical interlock that prevents:
 - The switch from being turned on without the plug inserted,
 - the plug from being removed while the switch is turned on,
 - the switch from being turned on when the panel is open
- The socket outlets mounted on the boxes guarantee the compliance with IP67 degrees of protection requirements (EN 60529)

16A interlocked switched socket-outlets



32A interlocked switched socket-outlets

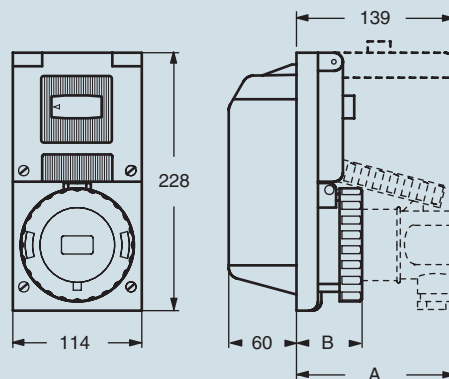


Poles	Frequency Hz	Voltage V	Earthing contact position h	Part No.	Colour	Part No.	Colour	
2P+⊕	50 and 60	100 - 130	4	BE 1643	Yellow	BE 3243	Yellow	
	50 and 60	200 - 250	6	BE 1663	Blue	BE 3263	Blue	
	50 and 60	380 - 415	9	BE 1693	Red	BE 3293	Red	
	50 and 60	480 - 500	7	BE 1673	Black	BE 3273	Black	
	50 and 60	ins. transformer	12	BE 16123	A.V.	BE 32123	A.V.	
	> 300 - 500	> 50	2	BE 1623	(*)	BE 3223	(*)	
	d.c.	> 50 - 250	3	BE 1633	A.V.			
	⚡	⚡	1	BE 1613	A.V.	BE 3213	A.V.	
	3P+⊕	50 and 60	100 - 130	4	BE 1644	Yellow	BE 3244	Yellow
		50 and 60	200 - 250	9	BE 1694	Blue	BE 3294	Blue
50 and 60		380 - 415	6	BE 1664	Red	BE 3264	Red	
60		440 - 460	11	BE 16114	Black	BE 32114	Black	
50 and 60		480 - 500	7	BE 1674	Red	BE 3274	Red	
50		380	3	BE 1634	Black	BE 3234	Black	
60		440	3	BE 1634	Red	BE 3234	Red	
100 - 300		> 50	10	BE 16104	(*)	BE 32104	(*)	
> 300 - 500		> 50	2	BE 1624	(*)	BE 3224	(*)	
⚡		⚡	1	BE 1614	A.V.	BE 3214	A.V.	
3P+N+⊕	50 and 60	57/100 - 75/130	4	BE 1645	Yellow	BE 3245	Yellow	
	50 and 60	120/208 - 144/250	9	BE 1695	Blue	BE 3295	Blue	
	50 and 60	200/346 - 240/415	6	BE 1665	Red	BE 3265	Red	
	50 and 60	277/480 - 288/500	7	BE 1675	Black	BE 3275	Black	
	60	250/440 - 265/460	11	BE 16115	Red	BE 32115	Red	
	50	220/380	3	BE 1635	Black	BE 3235	Black	
	60	250/440	3	BE 1635	Red	BE 3235	Red	
	> 300 - 500	> 50	2	BE 1625	(*)	BE 3225	(*)	
	⚡	⚡	1	BE 1615	A.V.	BE 3215	A.V.	

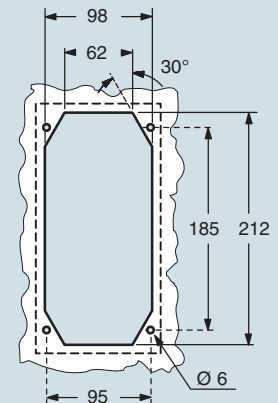
Legend

- ⊕ = With Italian Quality Mark
- ☆ = R.I.Na. certification no. ELE/015260/RBN
- ⚡ = All rated operating voltages and/or frequencies not covered by other configurations
- A.V. = Colour coded 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



Panel cut-out in mm, for panel-mounting



BE	A	B
16A 2P + ⊕	105	50
3P+⊕	105	50
3P + N + ⊕	110	50
32A 2P + ⊕	140	58
3P+⊕	140	58
3P + N + ⊕	140	58

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

- Compliant with EN 60309 -1 and -2
- Carrying structure in self-extinguishing, glass fibre reinforced polyester, UL approved, RAL 7035 grey
- Stainless steel retained fixing screws
- Inserts in insulating self-extinguishing thermoplastic material, UL approved
- Cover with bayonet insert, colour coded according to operating voltage
- Factory installed internal wiring
- "Zeta" series switch with 32A rating
- With plug type fuse carriers for cylindrical cartridges 10 x 38 (fuses not included)
- Mechanical interlock that prevents:
 - access to fuses when the switch is closed
 - the switch from being turned on without the plug inserted,
 - the plug from being removed while the switch is turned on,
 - the switch from being turned on when the panel is open
- The socket outlets mounted on the boxes guarantee the compliance with IP67 degrees of protection requirements (EN 60529)

16A interlocked switched socket-outlets and fuse carrier



32A interlocked switched socket-outlets and fuse carrier

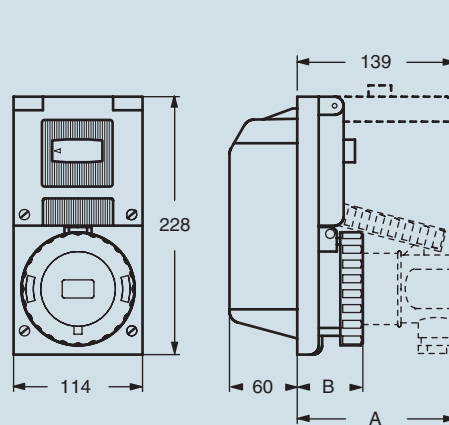


Poles	Frequency Hz	Voltage V	Earthing contact position h	Part No.	Colour	Part No.	Colour	
2P+⊕	50 and 60	100 - 130	4	BK 1643	Yellow	BK 3243	Yellow	
	50 and 60	200 - 250	6	BK 1663	Blue	BK 3263	Blue	
	50 and 60	380 - 415	9	BK 1693	Red	BK 3293	Red	
	50 and 60	480 - 500	7	BK 1673	Black	BK 3273	Black	
	50 and 60	ins. transformer	12	BK 16123	A.V.	BK 32123	A.V.	
	> 300 - 500	> 50	2	BK 1623	(*)	BK 3223	(*)	
	d.c.	> 50 - 250	3					
	⚡	⚡	1	BK 1613	A.V.	BK 3213	A.V.	
	3P+⊕	50 and 60	100 - 130	4	BK 1644	Yellow	BK 3244	Yellow
		50 and 60	200 - 250	9	BK 1694	Blue	BK 3294	Blue
50 and 60		380 - 415	6	BK 1664	Red	BK 3264	Red	
60		440 - 460	11	BK 16114	Black	BK 32114	Black	
50 and 60		480 - 500	7	BK 1674	Red	BK 3274	Red	
50		380	3	BK 1634	Black	BK 3234	Black	
60		440	3	BK 1634	Red	BK 3234	Red	
100 - 300		> 50	10	BK 16104	(*)	BK 32104	(*)	
> 300 - 500		> 50	2	BK 1624	(*)	BK 3224	(*)	
⚡		⚡	1	BK 1614	A.V.	BK 3214	A.V.	
3P+N+⊕	50 and 60	57/100 - 75/130	4	BK 1645	Yellow	BK 3245	Yellow	
	50 and 60	120/208 - 144/250	9	BK 1695	Blue	BK 3295	Blue	
	50 and 60	200/346 - 240/415	6	BK 1665	Red	BK 3265	Red	
	50 and 60	277/480 - 288/500	7	BK 1675	Black	BK 3275	Black	
	60	250/440 - 265/460	11	BK 16115	Red	BK 32115	Red	
	50	220/380	3	BK 1635	Red	BK 3235	Red	
	60	250/440	3	BK 1635	Red	BK 3235	Red	
	> 300 - 500	> 50	2	BK 1625	(*)	BK 3225	(*)	
	⚡	⚡	1	BK 1615	A.V.	BK 3215	A.V.	

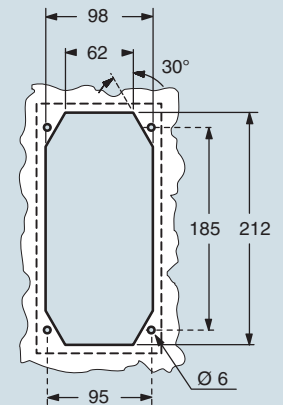
Legend

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- A.V. = Colour coded 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



Panel cut-out in mm, for panel-mounting



BK	A	B	
16A	2P + ⊕	105	50
	3P+⊕	105	50
	3P + N + ⊕	110	50
32A	2P + ⊕	140	58
	3P+⊕	140	58
	3P + N + ⊕	140	58

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

- Compliant with EN 60309 -1 and -2
- Carrying structure in self-extinguishing, glass fibre reinforced polyester, UL approved, RAL 7035 grey
- Stainless steel retained fixing screws
- Inserts in insulating self-extinguishing thermoplastic material, UL approved
- Cover with bayonet insert, colour coded according to operating voltage
- Rear compartment for circuit-breaker snap-in mounting (see below)
- Factory installed internal wiring
- Automatic tripping signal lamp
- Mechanical interlock that prevents:
 - The switch from being turned on without the plug inserted,
 - the plug from being removed while the switch is turned on,
 - the switch from being turned on when the panel is open
- The socket outlets mounted on the boxes guarantee the compliance with IP67 degrees of protection requirements (EN 60529)

16A interlocked socket-outlets and circuit breaker compartment



32A interlocked socket-outlets and circuit breaker compartment



Poles	Frequency Hz	Voltage V	Earthing contact position h	Part No.	Colour	Part No.	Colour	
2P+⊕	50 and 60	100 - 130	4	BA 1643	Yellow	BA 3243	Yellow	
	50 and 60	200 - 250	6	BA 1663	Blue	BA 3263	Blue	
	50 and 60	380 - 415	9	BA 1693	Red	BA 3293	Red	
	50 and 60	480 - 500	7	BA 1673	Black	BA 3273	Black	
	50 and 60	ins. transformer	12	BA 16123	A.V.	BA 32123	A.V.	
	> 300 - 500	> 50	2	BA 1623	(*)	BA 3223	(*)	
	d.c.	> 50 - 250	3	BA 1633	A.V.	BA 3233	A.V.	
	❖	❖	1	BA 1613	A.V.	BA 3213	A.V.	
	3P+⊕	50 and 60	100 - 130	4	BA 1644	Yellow	BA 3244	Yellow
		50 and 60	200 - 250	9	BA 1694	Blue	BA 3294	Blue
50 and 60		380 - 415	6	BA 1664	Red	BA 3264	Red	
60		440 - 460	11	BA 16114	Red	BA 32114	Red	
50 and 60		480 - 500	7	BA 1674	Black	BA 3274	Black	
50		380	3	BA 1634	Red	BA 3234	Red	
60		440	3	BA 1634	Red	BA 3234	Red	
100 - 300		> 50	10	BA 16104	(*)	BA 32104	(*)	
> 300 - 500		> 50	2	BA 1624	(*)	BA 3224	(*)	
❖		❖	1	BA 1614	A.V.	BA 3214	A.V.	
3P+N+⊕	50 and 60	57/100 - 75/130	4	BA 1645	Yellow	BA 3245	Yellow	
	50 and 60	120/208 - 144/250	9	BA 1695	Blue	BA 3295	Blue	
	50 and 60	200/346 - 240/415	6	BA 1665	Red	BA 3265	Red	
	50 and 60	277/480 - 288/500	7	BA 1675	Black	BA 3275	Black	
	60	250/440 - 265/460	11	BA 16115	Red	BA 32115	Red	
	50	220/380	3	BA 1635	Red	BA 3235	Red	
	60	250/440	3	BA 1635	Red	BA 3235	Red	
	> 300 - 500	> 50	2	BA 1625	(*)	BA 3225	(*)	
	❖	❖	1	BA 1615	A.V.	BA 3215	A.V.	

Legend

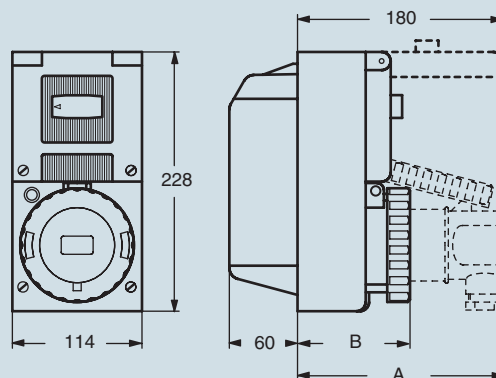
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Circuit breakers

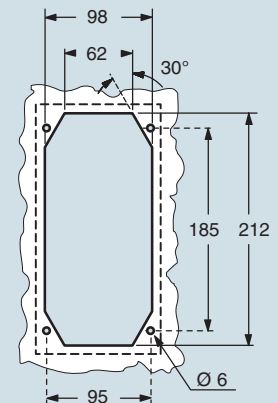
Socket-outlets are equipped with a compartment, DIN-rail EN 60715 and a kit of accessories for snap-in mounting of circuit breakers (not supplied), designed to house up to a maximum of 4 of the following types of units:

- **ABB Elettroconduttore:** series S 240, S 250, S 270 and S 280
- **AEG:** series E 80 - E 80 S
- **BTicino:** series Btdin 45-60-100-250
- **Hager:** series MX-MY-MB-MC-NB-NC
- **Merlin Gerin:** series C60 (all types)
- **Siemens:** series 5SX

Dimensions in mm



Panel cut-out in mm, for panel-mounting



BA	A	B	
16A	2P + ⊕	146	91
	3P+⊕	146	91
	3P + N + ⊕	151	91
32A	2P + ⊕	181	99
	3P + ⊕	181	99
	3P + N + ⊕	181	99

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

- Compliant with EN 60309 -1 and -2
- Carrying structure in self-extinguishing, glass fibre reinforced polyester, UL approved, RAL 7035 grey
- Stainless steel retained fixing screws
- Inserts in insulating self-extinguishing thermoplastic material, UL approved
- Cover with bayonet insert, colour coded according to operating voltage
- Socket-outlet with nickel-plated contacts and pilot contact
- With transparent cover (BPR socket-outlets) in self-extinguishing polycarbonate for the assembly of a maximum of 4/5 modular units, including closing plate, sized DIN-rail EN 60715 and fixing screws, to be placed on mounting plate BC 1123 PF
- The covers with the socket outlets mounted on the boxes guarantee the compliance with IP67 degrees of protection requirements (EN 60529)

Cover with 63A socket-outlet



Cover with 63A socket-outlet and room for modular control equipment

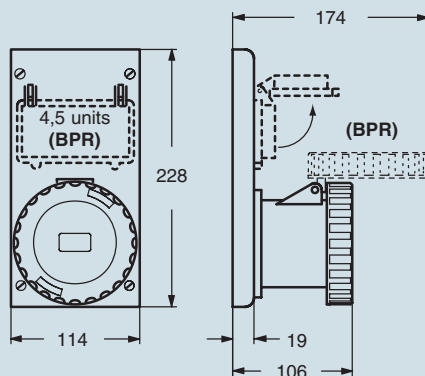


Poles	Frequency Hz	Voltage V	Earthing contact position h	Part No.	Colour	Part No.	Colour
2P+⊕	50 and 60	100 - 130	4	BP 6343		BPR 6343	
	50 and 60	200 - 250	6	BP 6363		BPR 6363	
	50 and 60	380 - 415	9	BP 6393		BPR 6393	
	50 and 60	480 - 500	7	BP 6373		BPR 6373	
	50 and 60	ins. transformer	12	BP 63123		BPR 63123	
	d.c.	> 50 - 250	3	BP 6333		BPR 6333	
	d.c.	> 250	8	BP 6383		BPR 6383	
	❖	❖	1	BP 6313		BPR 6313	
	3P+⊕	50 and 60	100 - 130	4	BP 6344		BPR 6344
50 and 60		200 - 250	9	BP 6394		BPR 6394	
50 and 60		380 - 415	6	BP 6364		BPR 6364	
60		440 - 460	11	BP 63114		BPR 63114	
50 and 60		480 - 500	7	BP 6374		BPR 6374	
50 and 60		600 - 690	5	BP 6354		BPR 6354	
❖		❖	1	BP 6314		BPR 6314	
3P+N+⊕		50 and 60	57/100 - 75/130	4	BP 6345		BPR 6345
	50 and 60	120/208 - 144/250	9	BP 6395		BPR 6395	
	50 and 60	200/346 - 240/415	6	BP 6365		BPR 6365	
	50 and 60	277/480 - 288/500	7	BP 6375		BPR 6375	
	50 and 60	347/600 - 400/690	5	BP 6355		BPR 6355	
	60	250/440 - 265/460	11	BP 63115		BPR 63115	
	❖	❖	1	BP 6315		BPR 6315	

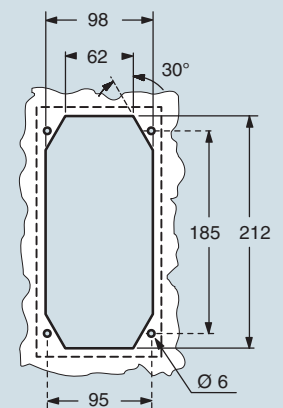
Legend

- ⊕ = With Italian Quality Mark
- ❖ = All rated operating voltages and/or frequencies not covered by other configurations
- A.V. = Colour coded according to voltage

Dimensions in mm



Panel cut-out in mm, for panel-mounting



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

- Compliant with EN 60309 -1 and -2, and CEI EN 61558-2-9
- Carrying structure in self-extinguishing, glass fibre reinforced polyester, UL approved, RAL 7035 grey
- Stainless steel retained fixing screws
- Socket-outlet module in insulating self-extinguishing thermoplastic material, UL approved
- Stainless steel pin and spring hinged cover, with bayonet insert, colour coded according to operating voltage
- Factory installed internal wiring
- safety transformer compliant with standard EN 61558-2-9, 144VA, continuous duty, activated by inserting the plug
- With sectionable fuse carriers for cylindrical cartridges 10 x 38 on the primary (2A) and secondary (6A) circuit of the transformer
- The socket outlets mounted on the boxes guarantee the compliance with IP67 degrees of protection requirements (EN 60529)

Socket-outlets with safety transformer for class III portable lighting apparatus

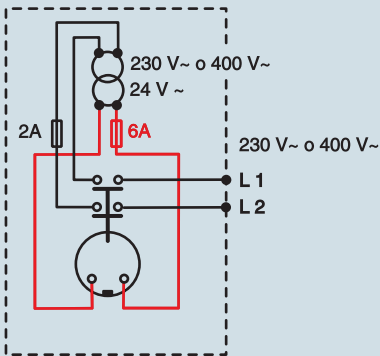


Poles	Frequency Hz	Voltage V	Part No.
2P	50 and 60	230/24	BT 16220
2P	50 and 60	400/24	BT 16380

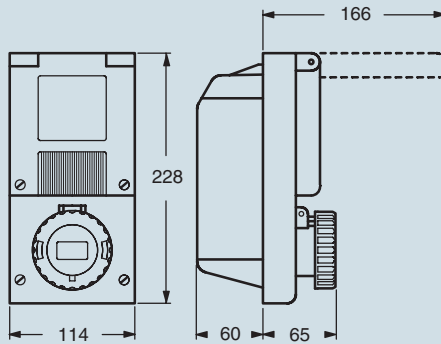
Legend

= With Italian Quality Mark

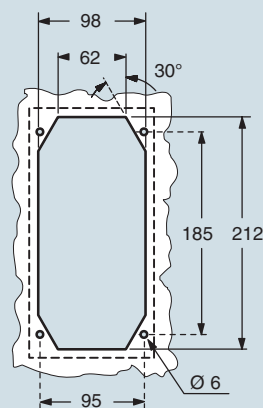
Wiring diagram



Dimensions in mm



Panel cut-out in mm, for panel-mounting



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

- Compliant with CEI 23-48 (IEC 60670) and with draft standard CEI 23-49
- Covers in self-extinguishing glass fibre reinforced polyester, UL approved, RAL 7035 grey
- Threaded seats for assembly of PQF and PQ socket-outlets
- Stainless steel retained fixing screws
- Oil resistant and anti-aging soft rubber gaskets
- Transparent hinged cover in self-extinguishing polycarbonate, with gasket, sized DIN-rail EN 60715, fixing screws and closing plates
- The covers mounted on the boxes guarantee the compliance with IP67 degrees of protection requirements (EN 60529)
- With Italian Quality Mark (CEI 23-48)

Covers with built-in 16A and 32A socket-outlets

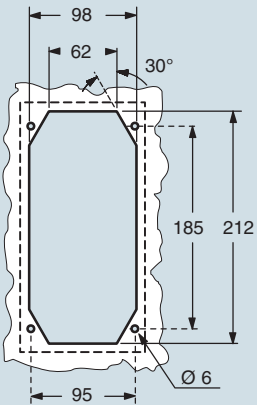


Covers with room for modular control equipment



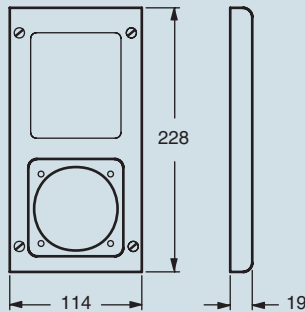
Description	Part No.	Part No.
Cover for one socket-outlet for PQF and PQ straight flush-mounting socket-outlets (see following page)	BC 1123 Q	
Cover for two socket-outlets for PQF and PQ straight flush-mounting socket-outlets (see following page)	BC 1123 Q''	
Cover with compartment and panel for modular units (max. 4-5 units)		BC 1123 R
Cover for one socket-outlet + compartment and panel for modular units (max. 4-5 units) Uses PQF and PQ straight flush-mounting socket-outlets (see following page)		BC 1123 RQ

Panel cut-out in mm, for panel-mounting

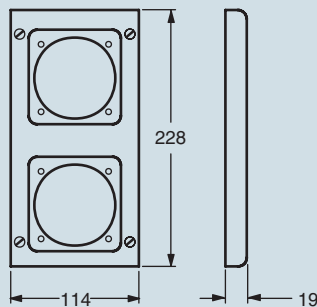


Dimensions in mm

BC 1123 Q

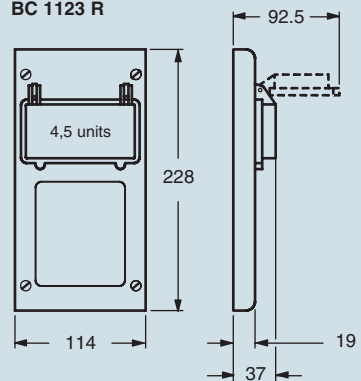


BC 1123 Q2

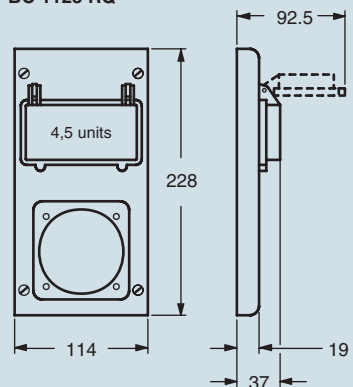


Dimensions in mm

BC 1123 R



BC 1123 RQ



Notes:
articles BC 1123 R and BC 1123 RQ include the BC 1123 PF assembly plate

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

- Compliant with EN 60309-1 and -2
- Enclosure, insert and cover in insulating thermo-plastic self-extinguishing material
- RAL 7035 grey enclosure, cover colour coded according to operating voltage
- Cover with locking ring and gasket
- Flange with anti-aging gasket
- Terminals with retained screws
- With Italian Quality Mark

16A
IP67 degrees of protection



32A
IP67 degrees of protection



Description	Part No.	Part No.
-------------	----------	----------

100 - 130V ~ - 50 and 60 Hz - Yellow

- 16A - 2P+ - 4h - Panel cut-out 60 x 60 mm
- 16A - 3P+ - 4h - Panel cut-out 60 x 60 mm
- 16A - 3P+N+ - 4h - Panel cut-out 60 x 60 mm

- PEW 1643 PQF
- PEW 1644 PQF
- PEW 1645 PQ

200 - 250V ~ - 50 and 60 Hz - Blue

- 16A - 2P+ - 6h - Panel cut-out 60 x 60 mm
- 16A - 3P+ - 9h - Panel cut-out 60 x 60 mm
- 16A - 3P+N+ - 9h - Panel cut-out 60 x 60 mm

- PEW 1663 PQF
- PEW 1694 PQF
- PEW 1695 PQ

380 - 415V ~ - 50 and 60 Hz - Red

- 16A - 2P+ - 9h - Panel cut-out 60 x 60 mm
- 16A - 3P+ - 6h - Panel cut-out 60 x 60 mm
- 16A - 3P+N+ - 6h - Panel cut-out 60 x 60 mm

- PEW 1693 PQF
- PEW 1664 PQF
- PEW 1665 PQ

480 - 500V ~ - 50 and 60 Hz - Black

- 16A - 3P+ - 7h - Panel cut-out 60 x 60 mm
- 16A - 3P+N+ - 4h - Panel cut-out 60 x 60 mm

- PEW 1674 PQF
- PEW 1675 PQ

100 - 130V ~ - 50 and 60 Hz - Yellow

- 32A - 2P+ - 4h - Panel cut-out 60 x 60 mm
- 32A - 3P+ - 4h - Panel cut-out 60 x 60 mm
- 32A - 3P+N+ - 4h - Panel cut-out 60 x 60 mm

- PEW 3243 PQ
- PEW 3244 PQ
- PEW 3245 PQ

200 - 250V ~ - 50 and 60 Hz - Blue

- 32A - 2P+ - 6h - Panel cut-out 60 x 60 mm
- 32A - 3P+ - 9h - Panel cut-out 60 x 60 mm
- 32A - 3P+N+ - 9h - Panel cut-out 60 x 60 mm

- PEW 3263 PQ
- PEW 3294 PQ
- PEW 3295 PQ

380 - 415V ~ - 50 and 60 Hz - Red

- 32A - 2P+ - 9h - Panel cut-out 60 x 60 mm
- 32A - 3P+ - 6h - Panel cut-out 60 x 60 mm
- 32A - 3P+N+ - 6h - Panel cut-out 60 x 60 mm

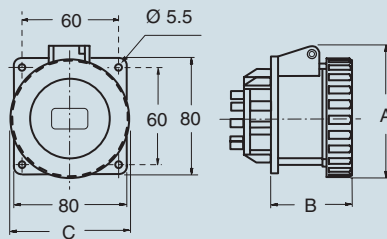
- PEW 3293 PQ
- PEW 3264 PQ
- PEW 3265 PQ

480 - 500V ~ - 50 and 60 Hz - Black

- 32A - 3P+ - 7h - Panel cut-out 60 x 60 mm
- 32A - 3P+N+ - 4h - Panel cut-out 60 x 60 mm

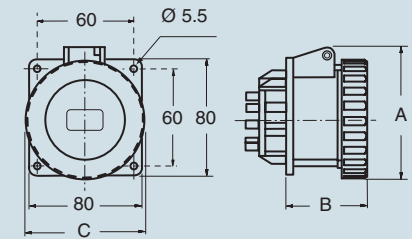
- PEW 3274 PQ
- PEW 3275 PQ

Dimensions in mm



Types		A	B	C
PQF 16A	2P+	82	52	70
	3P+	86	52	78
PQ 16A	3P+N+	93	52	86

Dimensions in mm



Types		A	B	C
PQ 32A	2P+	98	62	92
	3P+	98	62	92
	3P+N+	105	62	100

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
- Boxes in self-extinguishing, glass fibre reinforced polyester, UL approved, RAL 7035 grey
- Boxes can be wall- or flush-mounted
- Sides have threaded entry/exit holes
- Threaded seats in brass for assembly of covers and socket-outlets
- Boxes are supplied with closing plugs, cable glands, reduction nipples, gaskets and small parts
- IP67 class of protection (EN 60529)
- With Italian Quality Mark (CEI 23-48)

Single box



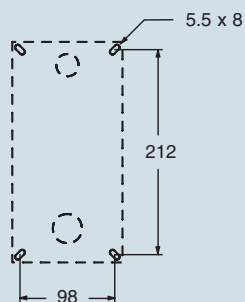
Triple box



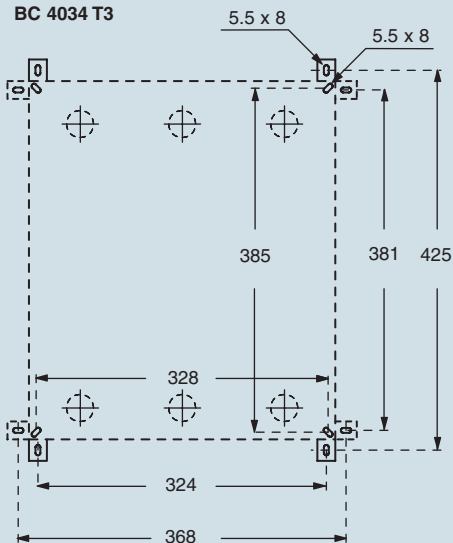
Description	Part No.	Part No.
Single box equipped with: - ARD 21 and ARD 29 plugs - Pg 21 and Pg 29 cable glands - ARE 2134 (Pg 21 - 3/4" gas) and ARE 291 reduction nipples (Pg 29 - 1" gas)	BC 1123 CS	
Single box equipped with: - ARD 29 and ARD 36 plugs - Pg 29 and Pg 36 cable glands - Insulating separators - ARE 291 (Pg 29 - 1" gas) and ARE 3612 reduction nipples (Pg 36 - 1" 1/2 gas) - Climbing irons for external box mounting		BC 4034 T3

Panel cut-out in mm

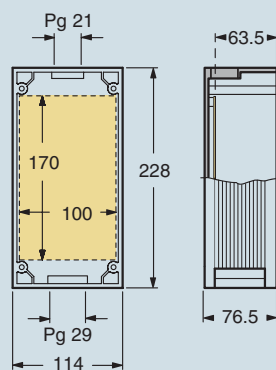
BC 1123 CS



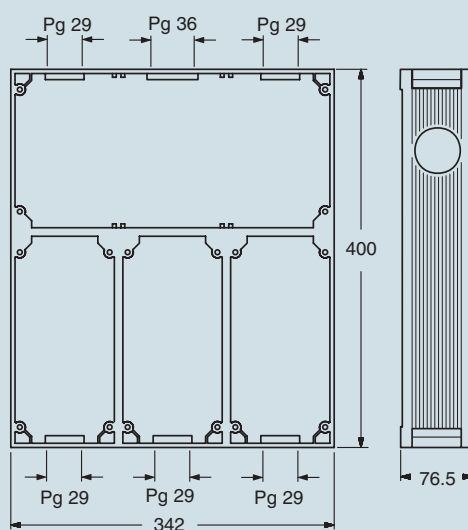
BC 4034 T3



Dimensions in mm



Dimensions 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 Italian draft standard CEI 23-49
- Covers in self-extinguishing, glass fibre reinforced polyester, UL approved, RAL 7035 grey
- Stainless steel retained fixing screws
- External metallic parts (pins, springs, etc.) in stainless steel
- Oil resistant and anti-aging soft rubber gaskets
- The covers mounted on the boxes guarantee the compliance with IP67 degrees of protection requirements (EN 60529)
- With Italian Quality Mark (CEI 23-48)

Cover for single and triple boxes joint cover plate



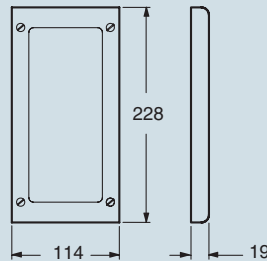
Cover for triple box and cover for modular control equipment



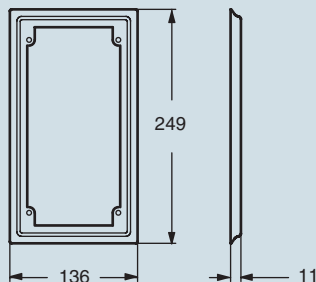
Description	Part No.	Part No.
Smooth cover for closing unused spaces or as support for accessories outside the box	BC 1123 P	
Joint cover plate for wall flush-mounting of single modules on non uniform walls or tiled surfaces	BC 1123 ME	
Smooth cover Closes the top of the triple box Supplied with alveolated bottom		BC 1734 P3
Cover with tilting panel Cover with clear tilting panel for the assembly of modular units (16) Supplied with 35 mm DIN-rail EN 60715, with closing plates for unused spaces		BC 1734 R3 BC 1734 R3T

Dimensions in mm

BC 1123 P

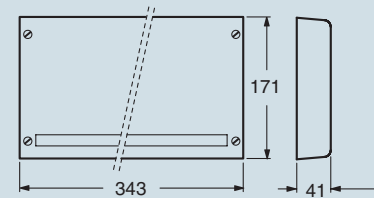


BC 1123 ME

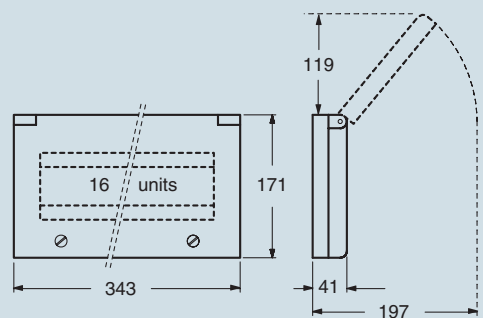


Dimensions in mm

BC 1734 P3



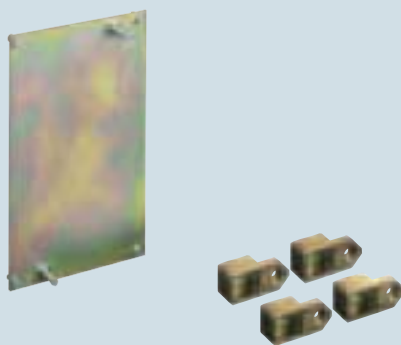
BC 1734 R3 and BC 1734 R3T



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

- Assembly plate in zinc-plated steel with earth connections, threaded inserts and fixing screws on the bottom of the boxes
- Metal alloy brackets with screws for mounting on boxes
- Cover in self-extinguishing polycarbonate with transparent inspection panel and gasket
- Closing plates including half modules (6 $\frac{3}{4}$ + 2 $\frac{1}{4}$ of module)
- DIN-rail EN 60715, in zinc-plated steel, sized, with fixing screws

Mounting plate Climbing irons for wall-mounting



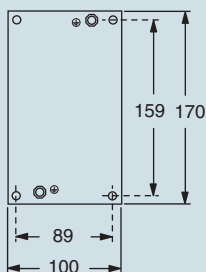
DIN-rail EN 60715 cover with panel closing plates



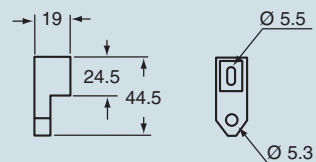
Description	Part No.	Part No.
Mounting plate for single or triple boxes	BC 1123 PF	
Climbing irons for external wall mounting for single and triple boxes	BC SFT	
DIN-rail EN 60715 For BC 1123 PF assembly plates		BC GD8
Cover with panel for modular units (max. 4-5 units)		BC 45 ST
Closing plates for unused modular openings		BC FR 62

Dimensions in mm

BC 1123 PF

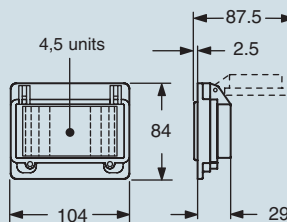


BC SFT

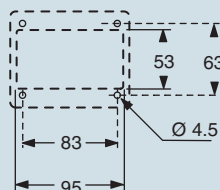


Dimensions in mm

BC 45 ST



Panel cut-out in mm, for panel-mounting



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

- BC CHT
 - Safety padlock that prevents access to the door closing screws
 - Supplied with two sets of keys
- BC BLC
 - Kit comprising insert and padlock that enables to lock controls in open or closed position
 - Supplied with two sets of keys

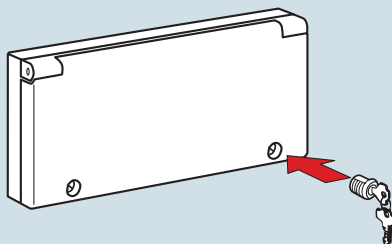
Safety padlock with key Safety padlock for controls



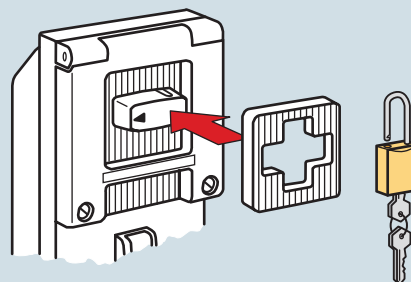
Description	Part No.
Safety padlock for the door of BC 1734 R3 covers	BC CHT
Safety device For BE, BK and BA socket-outlets and BI switches	BC BLC

Dimensions in mm

BC CHT



BC BLC



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



A series of horizontal lines for writing notes, spanning the width of the page.

● In insulating thermoplastic material, grey RAL 7035

Counternut



Pipe gland



Description	Part No.	Part No.
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Counter nuts

- Threading Pg 11
- Threading Pg 13.5
- Threading Pg 16
- Threading Pg 21
- Threading Pg 29
- Threading Pg 36
- Threading Pg 42
- Threading Pg 48

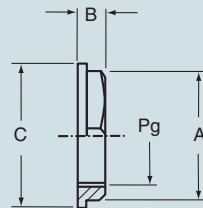
- ARC 11**
- ARC 13.5**
- ARC 16**
- ARC 21**
- ARC 29**
- ARC 36**
- ARC 42**
- ARC 48**

Pipe glands

- Threading Pg 16 - Rubber hole Ø 5-10 mm
- Threading Pg 21 - Rubber hole Ø 5-10-15 mm
- Threading Pg 29 - Rubber hole Ø 5-10-15-21 mm
- Threading Pg 36 - Rubber hole Ø 10-15-21-26-31 mm

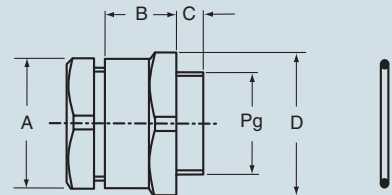
- AFT 16**
- AFT 21**
- AFT 29**
- AFT 36**

Dimensions in mm



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

Dimensions in mm



Part No.	A	B	C	D	Pg
AFT 16	24	21	10	29	16
AFT 21	30	26	10	39	21
AFT 29	41	29.5	10	50	29
AFT 36	50	33.5	10	58	36

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

- In insulating thermoplastic material, grey RAL 7035
- Anti-aging rubber gasket

Cable gland



Union nipples including gasket and counternut



Description

Part No.

Part No.

Cable glands

- Threading Pg 11 - Rubber hole Ø 7.5-10-12.5 mm
- Threading Pg 13.5 - Rubber hole Ø 7.5-10-12.5 mm
- Threading Pg 16 - Rubber hole Ø 7.5-10-12.5-15 mm
- Threading Pg 21 - Rubber hole Ø 10-13-16-19 mm
- Threading Pg 29 - Rubber hole Ø 18-21-24-27 mm
- Threading Pg 36 - Rubber hole Ø 24-27-30-33 mm
- Threading Pg 42 - Rubber hole Ø 30-33-36-39 mm
- Threading Pg 48 - Rubber hole Ø 36-39-42-45 mm

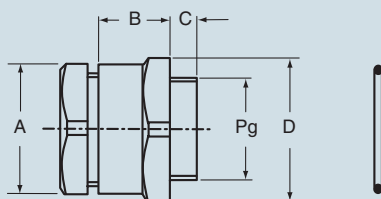
- ARC 11**
- ARC 13.5**
- AFT 16**
- AFT 21**
- AFT 29**
- AFT 36**
- ARC 42**
- ARP 48**

Union nipples

- For holes Pg 16
- For holes Pg 21
- For holes Pg 29

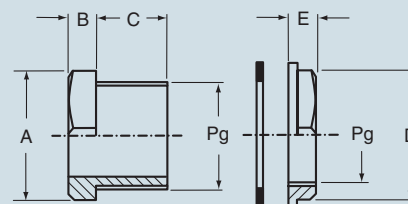
- FC NP 16**
- FC NP 21**
- FC NP 29**

Dimensions in mm



Part No.	A	B	C	D	Pg
ARP 11	19	20	9	24	11
ARP 13.5	22	19.5	9	26	13.5
AFP 16	24	21	10	29	16
AFP 21	30	26	10	39	21
AFP 29	41	29.5	10	50	29
AFP 36	50	33.5	10	58	36
ARP 42	54	28	12.5	60	42
ARP 48	64	41.5	13.5	77	48

Dimensions in mm



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

- In insulating thermoplastic material, grey RAL 7035
- Anti-aging rubber gasket

Sealing plugs including gasket

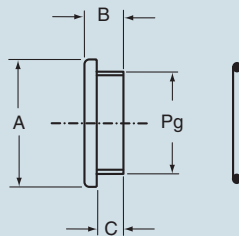


Reduction nipples including gasket



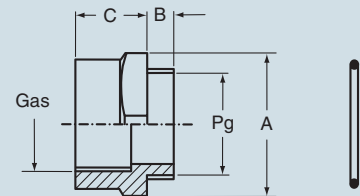
Description	Part No.	Part No.
Sealing plugs - For holes Pg 11 - For holes Pg 13.5 - For holes Pg 16 - For holes Pg 21 - For holes Pg 29 - For holes Pg 36 - For holes Pg 42 - For holes Pg 48	ARD 11 ARD 13.5 ARD 16 ARD 21 ARD 29 ARD 36 ARD 42 ARD 48	
Reduction nipples Pg - gas - Threading Pg 21 - Ø 3/4" gas pipes - Threading Pg 29 - Ø 1" gas pipes - Threading Pg 36 - Ø 1 1/2" gas pipes		ARE 2134 ARE 291 ARE 3612
Reduction nipples Pg - MB - Threading Pg 21 - Ø M25 pipes - Threading Pg 29 - Ø M32 pipes - Threading Pg 36 - Ø M40 pipes		ARE 2125 ARE 2932 ARE 3640

Dimensions in mm

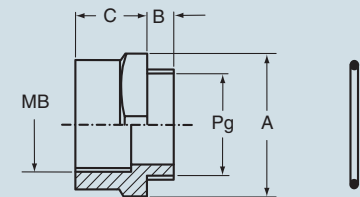


Part No.	A	B	C	Pg
ARD 11	22	7.5	6	11
ARD 13.5	24	7.5	6	13.5
ARD 16	26	7.5	6	16
ARD 21	35	10	8	21
ARD 29	44	10	8	29
ARD 36	54	12	10	36
ARD 42	64	14	12	42
ARD 48	70	14	12	48

Dimensions in mm



Part No.	A	B	C	Pg	Gas
ARE 2134	36	11	24	21	3/4"
ARE 291	46	12	28	29	1"
ARE 3612	60	12	32	36	1 1/2"



Part No.	A	B	C	Pg	MB
ARE 2125	36	11	24	21	M25
ARE 2932	46	12	28	29	M32
ARE 3640	60	12	32	36	M40

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

Board perforation kit



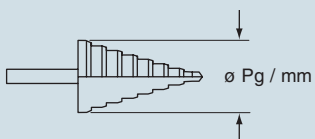
Description

Part No.

Board perforation kit comprising:
 - Countersink tool
 - Cutter for holes from Pg 7 to Pg 29
 - Cutter for holes from M 6 to M 40

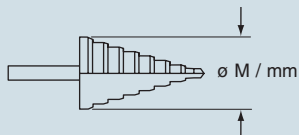
FC KFQ

Dimensions in mm



Perforation diameter

Pg	7	9	11	13.5	16	21	29
mm	13.5	16	18.8	21.5	24	29.5	38.0



Perforation diameter

M	6	8	10	12	14	16	20	25	32	36	40
mm	6.5	8.5	10.5	12.5	14.5	16.5	20.5	25.5	32.5	36.5	40.5