

M-BOX

Outdoor Kiosk
Shelter or Container execution



according to



3B Energy can propose a huge number of Products related to Energy sector. We are active in the whole world of Power Transmission and Distribution. Medium Voltage switchgears, Medium Voltage switches, Low Voltage PC, Low Voltage MCCs with fix and withdrawable units, Transformers, Cabinets; 3B Energy can propose a wide range of Products for fulfilling any request and need.

3B Energy is very active and smart in assisting customers for finding Solutions related to Energy sector. We can support the customer during engineering phase of the plant, during purchasing steps, for the supply and after-sales services. 3B Energy is a real "turnkey" Solution provider; Package Substations, Transformer Substations, Mobile Cabinets; we can propose a complete solution set for letting the customer have one player only for his whole plant.

3B Energy can propose a complete and detailed list of Services which can cover each step of Engineering phase. Our technical staff is highly expert and professional and can support the customer starting from the base design of a single component till a complete apparatus for electrical application. We can design and project every component the customer may need: a single contact or a complete switching device, we can develop and engineer the technology for any product or application of Energy sector



Contents

<u>About us</u>	2
<u>General Characteristics</u>	4
<u>Structure Description</u>	5
<u>Accessories</u>	6
<u>Note</u>	11

GENERAL

The prefabricated electrical cabins for outdoor use, series SHELTER, are made up of a self-supporting framework on which there are mounted horizontal and vertical buffers provided with suitable openings. Inside the framework, if required, there are located technological systems for the electric feeding of the user equipment, for the internal environment conditioning and for the monitoring and protection against fire and intrusions. The constructive features guarantee against bad weather, intrusions and they also assure specific performances of mechanical strength and the thermal as well as acoustic insulation.

All the elements used for the cabin construction are chosen and treated in order to guarantee the highest stability in the course of time under very bad environmental conditions, both at the outside and at the inside of the manufactured product.



Structure description of the outdoor cabin



The carpentry is made of panels and steel sheet sections, with thickness 15/10, hot-dipped galvanized according to the rules UNI 5753-75, which ensure a perfect zinc anchoring on steel (200 gr/mq) and pre-painted on the exposed side, according to the system Magona 3000/80, with high stability pigments after the phosphating process and a layer of primer apply on both sides, in order to have a dry film protection with thickness 25 ± 3 microns on the exposed surface and 3 microns on the not exposed one, of white and red color.

The assembly of the various units (floor, covering, buffer walls, etc.) is made exclusively by using screws, bolts and riveting of high tensile steel and joined with angulars in non-ferrous material. This solution, besides the extreme solidity of the assembly, ensures that any oxidation point is not formed.

Roof, floor and vertical panel walls are designed to carry non-recurrent loads (snow, ice, wind) and operating loads (equipment, systems and people) according to the requirements of the technical specifications and existing law. The insulation of the roof and of the vertical walls are guaranteed by the interposition of sandwich panels, with thickness of 30 mm, made of pre-painted steel and polyurethane foam joined by adhesive at the inside.

Vertical panel walls



The vertical walls of the cabin are realized with prefabricated panels, made of zinc-coated steel sheets and pre-painted with a thickness of 1.5 mm. The closing panels are able to accomplish the structural lifting and closing functions, and guarantee:

- high compactness of the walls;
- water-proof;
- wind resistance ;
- impact strength;
- weather-proof;
- transport resistance;
- resistance to breaking through.

STRUCTURE DESCRIPTION OF THE OUTDOOR CABIN

Covering

The cabin covering is realized with panels of press-formed steel sheets, with interposing of insulation layer, characterized by a structure with specific ribs to obtain a suitable carrying and water-proof capacity. The external surfaces of the cabin covering panels are well-finished, the carrying capacity of the roof is suitable for the fixing of the cable channels and eventual lighting systems or other limited weight equipment (~ 60 kg).

Floor

The cabin floor is realized by a series of overlapped structures in order to ensure the best carrying, comfort and duration of time conditions. Consequently the floor is made up a series of corrugated steel sheets placed side by side with a thickness of 2 mm or in any case adequate to the design loads and coated by suitable insulating mat.

Doors

The access to the cabin is made possible through a door positioned on the frontal side for the entrance to the operator closet. The door is realized with press-formed steel sheets to assure suitable compactness and non-deformability. The hinges are of the not removable type from the outside .

The thickness of the access door is adequate to the thickness of the cabin walls and is equipped with a suitable blocking system by opening through compass fitting, in order to avoid casual closings due for instance to gusts of wind. The lock will be of antipanic 3 spongings type, with safety key that allows the opening from the inside, through shackle, even if the lock is closed from the outside

Thermal acoustic insulation

The thermal cabin isolation is ensured by sandwich type panels with internal isolating material composed of expansive polyurethane resins, at an average density of 40 kg/m³ toll. +/- 10%. The thickness, the thermal acoustic insulation features and the panel surfaces are suitable to guarantee self-supporting, insulation, water tightness, leak tightness and resistance, especially in the joints, and are a pleasant aesthetic solution, both for the outside and for the inside. All the panels are able to preserve in the course of time their flatness and their physical-mechanic features, without material deterioration nor adhesion loss between material and containment surfaces.

Rust-inhibitive protection of the constructive elements against atmospheric agents

All the surfaces of the steel elements are designed for both external and internal use, of smooth type or variously conformed, will be protected against the corrosion phenomena with proper treatment processes accordingly to their particular exposure condition. The fixing elements will generally be of stainless steel type, galvanized passivated, chromed or in any case treated against corrosion before the use in the cabin. For the metal panels there will be preferably chosen pre-painted steel sheets realized with methods and features depending on the used thicknesses and the installation (outside or inside). The manufacturer will provide the technico-chromatic specifications for any little additional touches. For the steel sheets with a thickness superior than 3÷3.5 mm, for the materials expected elsewhere and on explicit customer's demand, as well as for eventual small surfaces of press-formed or section steel sheets, there will be executed "spray" painting on sandblasted base and/or however suitably prepared by adequate primer treatment.

GENERAL FEATURES OF THE ACCESSORIES

Air conditioning system

A conditioning system can be foreseen in order to make the working environment healthy and comfortable. The proposed conditioner allows the temperature control (cooling), the maintenance of the relative moisture (between 40% and 60%) and for the upkeep of the air cleanness from dusts and/or pollens. This system is of monosplit type and in the main has a low noisiness according to the anti-noise pollution rules.

Supply and distribution of energy

The distribution is foreseen in low voltage LV with the following features:

Feeding:

single-phase system 230V

net frequency: 50 Hz

Distribution:

Single-phase system 230V

net frequency: 50 Hz

Ambient temperature:

External -10 °C ÷ +50 °C

Average internal variable from +22 °C up to +27 °C



Required performances

The intervention aims to satisfy the demands required by the type of specific activity and the requirements of reliability, safety and compliance to the "rules of the trade" imposed by the norms in force.

The goal is pursued through:

- the finding of norms and provisions of the law in subject;
- the proper dimensioning of the equipment and the choice of materials in order to make the handmade work them, reliable and sure;
- the realization of elaborates which allow to locate the position, the features of the equipment and of the accessories, so that the systems can easily be maintained;
- the finding of suitable technical and system solutions.

Protection pipes

The protection pipes used are in self-extinguishing PVC, not spreading the blaze (CEI 23-14 / 23-8) and marked with the Italian Quality Mark (IMQ) or equivalents. They have an internal diameter of at least 1,3 times greater than the conductors bundle contained.

Channels

The channel is composed of closed envelope with cover that assures the mechanical protection of the cables and allows their laying without pulling. The channels used are in self-extinguishing PVC plastic material, with min. protection degree IP40 and removable cover by means of a tool in conformity with the norm CEI 23-32.

GENERAL FEATURES OF THE ACCESSORIES

Main norm references

DPR 547-55	Norms for the prevention of industrial accidents
Law 5th March 1990 N° 46	Norms for the systems safety
DPR 6th December N° 447	Regulation giving effect to the law of 5th March 1990 N° 46 about systems safety
Norms CEI 64-8 IV edition	Electrical systems using rated voltage not higher than 1000 V at alternating current and 1500 V in direct current.
Norms CEI 17-13	Equipment provided with protection unit and low voltage switching (LV-switchboards)

Cables

LV energy (low voltage) The cables are chosen between the following ones, according to the requirements.

N07V-K	Flexible unipolar cable isolated in PVC, not spreading the blaze (CEI 20-20 / 20-22)
FROR 470/750V	Multipolar cable with isolation and PVC sheathed, not spreading the blaze undergoing control IMQ (CEI 20-2- / 20-22)
N1W-K	Unipolar or multipolar flexible cable with insulation and PVC sheathed, not spreading the blaze (CEI 20-14 / 20-22)
FG7R 0.6/1kV	Unipolar cable, rubber isolated of quality G7, PVC sheathed, not spreading the blaze (CEI 20-13 / 20-22)
FG7OR 0.6/1kV	Multipolar cable, rubber isolated of quality G7, PVC sheathed, not spreading the blaze (CEI 20-13 / 20-22)
H05SJ-K 300/500V	Silicon isolated, unipolar cable (CEI 20-19).

Colours

neutral: light blue
 earthing conductor, protection or equipotential: yellow-green
 other conductors: grey, brown and black

Switching and signalling

The cables are chosen between the following ones, according to the requirements.

H05V-K

Unipolar cable and PVC sheathed (CEI 20-20)

H05RN-F

Flexible multipolar cable, rubber isolated with polychloroprene sheath (CEI 20-35)

FROR 300/500V

Multipolar cable, PVC isolated and PVC sheathed, undergoing control IMQ (CEI 20-20 / 20-22)

H03VV-F

Flexible multipolar cable and PVC isolated (CEI 20-20)

H03RN-F

Flexible multipolar cable, rubber isolated with polychloroprene sheath (CEI 20-19 / 20-35)

Colours

neutral: light blue

earthing conductor, protection or equipotential: yellow-green

other conductors: grey, brown and black



GENERAL FEATURES OF THE ACCESSORIES

Switching appliances

The switching circuit breakers for the light circuits are of the bipolar type and are applied on the phase conductors with suitable ambient protection degree.

The laying of the ducts

By duct we intend the group of electrical conductors, of the elements which assure their isolation, their protection and their fitting.

The protection pipes, the cases and the boxes of the energy system, must be kept separated from other ducts.

By the laying of the ducts we respect the following recommendations:

- the pipes and the wall channels must have an horizontal, vertical or parallel course at the wall edge, even if they are concealed.
- the protection pipes of underfloor type or folded tube buĐer type can have any kind of course
- the bending radius of the pipes must have at least a 3 times bigger diameter than the one of the pipe itself in order to enable the introduction of the cables and to avoid their damage; the course variations of the channels must be carried out with the proper connection accessories.
- the ducts have not to be installed near sources of heat, smoke or vapour and in case this cannot be avoided, they have to be properly protected.



Connections

The splices and the derivations are made up with specific connection devices (terminals with or without screw), which have a protection degree IPXXB (CEI 64-8 /526).

All the connections are accessible for the inspection, the tests and the maintenance.

The connections are executed exclusively inside of foreseen boxes; the connections inside the metallic or plastic channels are tolerated, respecting the space factor and for the minimum connections required. The enter – exit on the connector and lamps terminals is admitted provided that there are double terminals or these are sized in order to receive the total of the conductors to be connected.

Magnetic-thermal and differential circuit breakers

The modular equipment, installed inside the switchboards, are of industrial type with tripping C-features (from 5 to 10 In) and with fix calibration of the thermal relay and of the residual current. In order permit the start of the motors, with elevated breakaway starting currents, there are applied switches with D-features (from 10 to 20 In) or in alternative switches with C-features with higher rated current.

GENERAL FEATURES OF THE ACCESSORIES

Switchboards

All switchboards are in compliance with the norm CEI 17-13. The switchboards have a rating plate, on which there are reported the manufacturer's data, the main features of the switchboard and the identification number.

Lighting system

The system is provided with a suitable lighting system to give comfort during the stay in the surroundings, to guarantee safety in the technical zones, to allow the maintenance of the equipment and the specific activities of the system itself. The internal lighting system will be carried out with fluorescent lamps properly placed and sized.

In general about earthing system

By earthing system we mean a group of ground electrodes, earthing conductors, earthing collectors, protection and equipotential bonding conductors designed to realize the grounding of protection and /or correct operation.

The system is made up of the following elements:

Ground electrode is composed of the group of dispersing elements that can be:

- Ground electrodes of fact constituted from the irons of the foundations in reinforced concrete (beams, plinths, continuous beams, pillars, posts, etc.); the metallic shirts of the pools can be used too, but not the pipelines of the public aqueduct.
- Intentional ground electrodes constituted by metallic bodies in direct contact with the land, which stakes, ropes or tapes of suitable dimensions, which scope is to guarantee the necessary resistance against corrosion and mechanical stress (the sump is not required).

The requirements for the ground electrodes are the following:

- Mechanical strength in order to be able to resist against the solicitations during installing operations and against those due to land settling;
- Good continuity of the electrical connections between several elements that constitute the ground electrode;
- Resistance against chemical aggression of the land.

Earthing conductor: it connects the dispersing system to the earthing collector and the ground electrodes among themselves; if it is bare and buried it has the same function of a ground electrode. In case it is isolated and placed in a heavy PVC protection pipe, it must have the same features of the protection conductor; in absence of protection pipe the minimum section must be of 16mm²; the table indicates the minimum sections of the earth conductors.

Documentation supplied with the product

At the delivery the product will be supplied with the technical documentation as indicated in D.P.R. 459/96 with modifications and integrations (diagram of connection, declaration of conformity of the manufacturer, etc.).





Note



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