Quadro + energy distribution system

1600 A
Form 2b

Specific technical specifications (CCTP)

Contents

Low-voltage switchboards up to 1600 A

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This document contains all the technical specifications required to build a low-voltage switchboard, up to a maximum current of 1600 A, with form 2b.

1. Field of application

The Quadro + energy distribution system is a switchgear assembly tested and certified in line with the IEC 61439-1 & 2 standard.

The system enables low-voltage distribution equipment to be created up to a current of 1600 A, with form 2b, for tertiary applications:

- commercial premises and hotels,
- industrial and public or private administrative buildings,
- hospitals, road and rail infrastructure.

This energy distribution system is designed to create low-voltage switchboards and distribution boards.

2. Description

2.1. The system

The low-voltage energy distribution board will be created using Quadro + enclosures which are made from steel panelling in RAL 9010. These cells can be joined together side by side and back to back, and can be adapted to meet the customer's requirements.
The enclosures are available in widths of 450/700/900 and 1000 mm, and in depths of 400, 600, 800 or 1000 (600+400) mm for a height of 1900 mm and 2100 mm. Baseplates 100 mm or 2x100 mm high are available as part of the offering.
These assemblies are designed to be installed and used indoors in electrical rooms in a fixed position as per section 7.1 of the IEC 61439-1 standard.

The enclosure body and all the trim pieces are treated with an electrophoretic coating and painted, then covered with an epoxy polyester powder, hot-polymerised to create a smooth finish.
Trim in RAL 9010, baseplates in RAL 7042.

2.2. Enclosure body

The enclosure body is composed of an upper and lower frame which define the width and depth of the enclosure. An enclosure height of 1900 or 2100 mm can be obtained by adding uprights.
The system allows the cells to be joined side by side and back to back.

The enclosure system adapts very easily to the configuration of the rooms. Angled enclosures enable "U" or "L" shaped switchboards to be built.

The enclosures allow a double chassis to be integrated for assembling the switchgears back to back.

The cells can be equipped with kits for electrical distribution, busbar systems, or cable ducts. They also enable modular switchgears to be fitted.

The enclosures will retain their rigidity after the kits are installed and the cables connected.

They are closed with a 7 mm male triangle type key lock; other locking systems are available. Prefitted hinges on either side of the uprights allow the door opening direction to be switched.

The enclosures have a protection rating of IP30 without a door, and IP55 with a door.

2.3. Cable inlets

The switchboard is designed to allow the cables to be fed in either at the top or at the bottom.
It comes with solid cable gland plates or plates with adjustable openings which can be fitted at the top or bottom.

2.4. Busbars

2.4.1. Horizontal busbar

The horizontal busbar must be able to withstand the high electrodynamic and thermal loads created by a short circuit. The rated short-circuit current withstand value of a switchboard must be greater than the short-circuit current value calculated for the switchboard.

Together, both the principal and secondary busbars are used to transport and guarantee the distribution of current and connect the units. The cross sections of the copper bars must be suited to the current to be transported for a given thermal load, and the assembly must contribute to the proper functioning of the switchboard.

The horizontal busbars may be positioned at the top or bottom or in the middle of the enclosure.

The distance between supports depends on the short-circuit current; the distance between phases may be adapted based on the depth of the enclosure.

2.4.2. Vertical busbar

The vertical busbar can be fitted either on the left or right of the cell.

The vertical busbar allows feeders to be connected across the entire usable height and to all bars.

3. Form 2b cell compartments

Each cell may be equipped with a compartment for horizontal and vertical busbars.

4. Equipment kit for switchgears

The equipment kits are supplied with a mounting plate for attaching the switchgear and a faceplate enabling a protection rating of IP30 to be obtained. The faceplates can be equipped with hinges enabling opening to the left or to the right. The closure screws also allow the faceplate to be earthed.

The supports for modular switchgears are clipped onto the functional uprights, with no screws needed. The plates for non-modular switchgears rated up to 630 A are secured onto the functional uprights using screws and cage nuts.
Above 630 A, the mounting plates are secured to the structure of the enclosures using screws and cage nuts.

Partial functional uprights are used to integrate all the types of mounting within a single enclosure.

Mounting templates are provided as standard with the kits and indicate the precise position of the plate mounting points on the functional upright or the enclosure structure.

5. Design tool

The hagercad.T software can be used to calculate and configure the switchboard based on the electrical distribution diagram.

6. Technical specifications

Rated operational voltage	Ue:	400 V
Rated insulation voltage	Ui:	690 V
Rated impulse withstand voltage	Uimp:	8 kV
Switchboard rated current	InA:	1600 A
Rated conditional short-circuit current	Icc:	50 kA
Rated peak withstand current Ipk:	105 kA	
Rated short-time withstand current	Icw:	50 kA 1s
Rated frequency	fn:	50/60 Hz
Switchboard protection rating	IP:	55
Internal separation	form	2b

Rated operational voltage	*Ue: :*	*400 V*
Rated insulation voltage	*Ui:*	*690 V*
Rated impulse withstand voltage	*Uimp:*	*8 kV*
Switchboard rated current	*InA:*	*1600 A*
Rated conditional short-circuit current	*Icc:*	*50 kA*
Rated peak withstand current	*Ipk:*	*105 kA*
Rated short-time withstand current	*Icw:*	*50 kA 1s*
Rated frequency	*fn:*	*50/60 Hz*
Switchboard protection rating	*IP:*	*55*
Internal separation	*form:*	*2b*