

# Synchronizing Panel Board Data sheet

# Synchronizing Panel Board

Synchronizing Panels supply a large amount of power by using multiple generators working in parallel on load sharing.

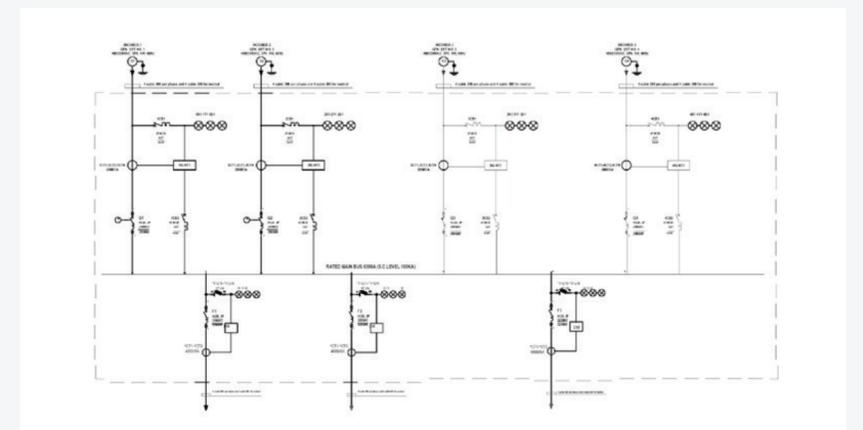
These panels function both manually and with an automatic synchronizing function for one or more generators or breakers. They are widely used in synchronizing generators and offering multiplex solutions.

Our high quality range synchronizing panels are available with capacities that reach 12000 A, and are fabricated using high quality electrical components including copper bus bar, insulation, wires/cable, PVC channels, transformers, meters and switches.

In an alternating current electric power system, synchronization is the process of matching the speed and frequency of a generator or other source to a running network. An AC generator cannot deliver power to an electrical grid unless it is running at the same frequency as the network.

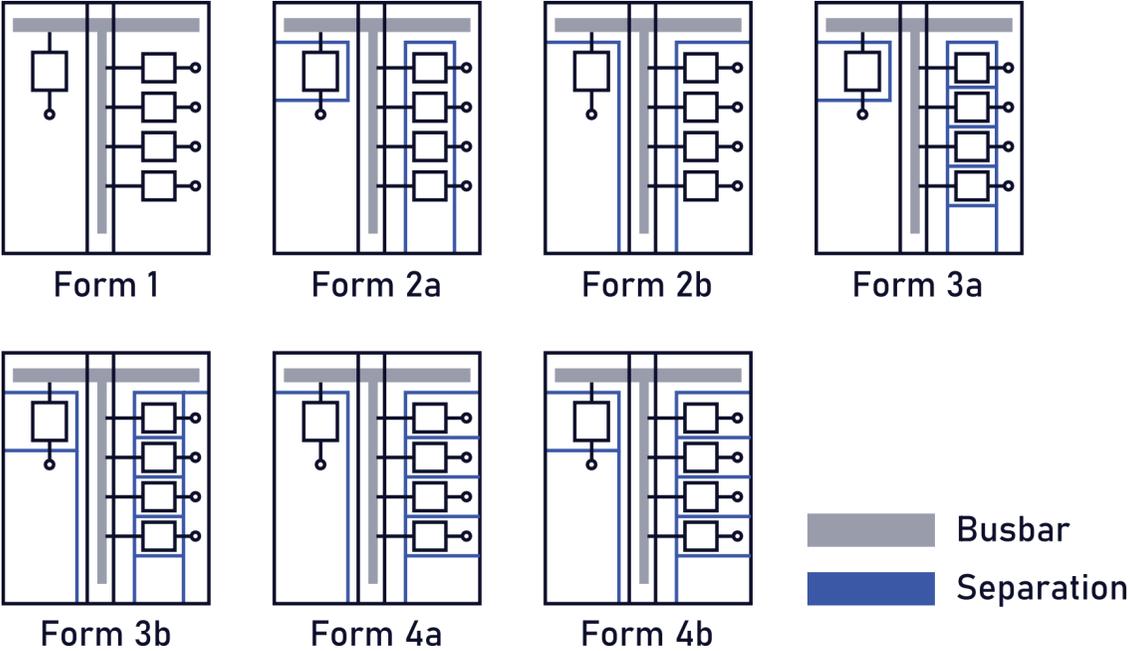


- Rated insulation voltage 1000V
- Main busbars rated up to 12,000A
- Protection Class up to IP55
- Ambient temperature up to 40 °C
- Silver / tin plated / PVC sleeved copper busbars
- RAL 7035 color as standard, other colors on request
- Accessible from front / rear
- Cable/bus duct entry from top or bottom, with removable gland plat



# Separation Forms

## Technical Data



Form	IEC Standard Definition	Specific Recommendations
1	No Internal separation	Protection over busbar for customer safety
2a	Separation of busbars from the functional units	Terminals not separated from busbars
2b	Separation of busbars from the functional units	Terminals separated from busbars
3a	Separation of busbars from the functional units and of all functional units from each other	Terminals not separated from busbars
3b	Separation of busbars from the functional units and of all functional units from each other	Terminals separated from busbars
4a	Separation of busbars from the functional units and of all functional units from each other, also separation of terminals from any functional unit	Terminals in the same compartment as associated functional units
4b	Separation of busbars from the functional units and of all functional units from each other, also separation of terminals from any functional unit	Terminals are not in the same compartment as the associated functional units

# Ingress Protection (IP)

Standard IEC 60529 (February 2001) indicates the degree of protection provided by electrical equipment enclosures against accidental direct contact with live parts and against the ingress of solid foreign objects or water.

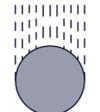
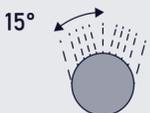
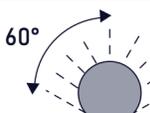
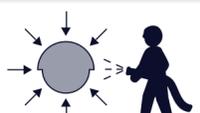
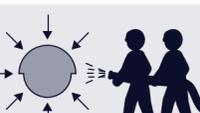
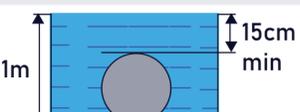
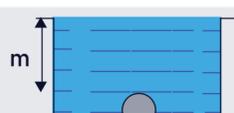
The IP code comprises 2 characteristic numerals and may include an additional letter when the actual protection of persons against direct contact with live parts is better than that indicated by the first numeral.

The first numeral characterizes the protection of the equipment against penetration of solid objects and the protection of people. The second numeral characterizes the protection of the equipment against penetration of water with harmful effects.

## Protection Against Solid Bodies Data Table

Protection of Equipment		Protection of Persons	
No.	Tests	Non-protected	Non-protected
1	$\Phi 50\text{mm}$ 	Protected against the penetration of solid objects having a diameter greater than or equal to 50 mm	Protected against direct contact with the back of the hand (accidental contacts).
2	$\Phi 12.5\text{mm}$ 	Protected against the penetration of solid objects having a diameter greater than or equal to 12.5 mm.	Protected against direct finger contact.
3	$\Phi 2.5\text{mm}$ 	Protected against the penetration of solid objects having a diameter greater than or equal to 2.5 mm.	Protected against direct contact with a $\Phi 2.5\text{ mm}$ tool.
4	$\Phi 1\text{mm}$ 	Protected against the penetration of solid objects having a diameter greater than or equal to 1 mm.	Protected against direct contact with a $\Phi 1\text{ mm}$ wire.
5		Dust protected (no harmful deposits).	Protected against direct contact with a $\Phi 1\text{ mm}$ wire.
6		Dust tight.	Protected against direct contact with a $\Phi 1\text{ mm}$ wire.

## Protection Against Liquids Data Table

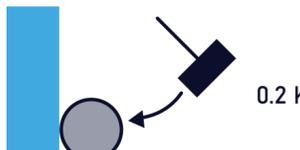
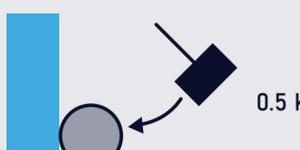
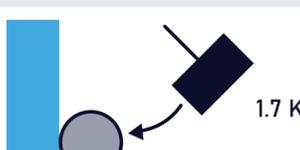
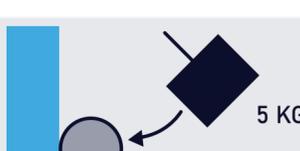
No.	Tests	Non-protected
1		Protected against vertical dripping water, (condensation).
2		Protected against dripping water at an angle of up to 15°.
3		Protected against rain at an angle of up to 60°.
4		Protected against splashing water in all directions.
5		Protected against water jets in all directions.
6		Protected against powerful jets of water and waves.
7		Protected against the effects of temporary immersion.
8		Protected against the effects of prolonged immersion under specified conditions.

## Protected Against Access To Hazardous Parts With

Level	Tests
A	With the back of the hand.
B	With the finger.
B	With a $\phi$ 2.5 mm tool.
C	With a $\phi$ 1 mm tool.

## IK Code “Mechanical Impact Test”

The European standard EN 50102/IEC 62262 defines a coding system (IK code) for indicating the degree of protection provided by electrical equipment enclosures against external mechanical impact.

No.	Tests	Non-protected	
		H (cm)	Energy (J)
01		7.5	0.15
02		10	0.2
03		17.5	0.35
04		25	0.5
05		35	0.7
06		20	1
07		40	2
08		30	5
09		20	10
10		40	20

Standard NF C 15-100 (May 1991 edition), section 512, table 51 A, provides a cross-reference between the various degrees of protection and the environmental conditions classification, relating to the selection of equipment according to external factors.

Practical guide UTE C 15-103 contains tables showing the specifications required for electrical equipment (including minimum degrees of protection), according to the locations in which they are installed.