

Standard-conforming rating according to IEC 61439-2

The new IEC 61439 - the standard for the construction of switchgear assemblies - brings changes that affect the planning of a switchgear assembly. In addition, new tasks and responsibilities are awaiting the manufacturer of a switchgear assembly.

Decisive for the optimal functioning of a switchgear assembly under operating conditions is the correct rating of the interface characteristics of the assembly. For this purpose, the assembly is considered as **BLACK-BOX** with four interface characteristics which shall ensure compatibility with the ratings of the circuits to which it is connected and the installation conditions and shall be declared by the assembly manufacturer using the criteria identified below.

Assembly considered as BLACK BOX with the four interface characteristics according to IEC 61439-2



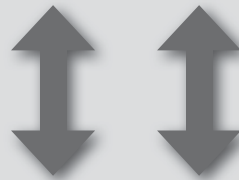
Installation and ambient conditions

- For the protected outdoor installation
- Degree of protection IP 65
- Combinable enclosure system, extendable in all directions
- 6 enclosure sizes in a grid of 150 mm
- EMC compliant busbar system
- Wall-mounting or floor-standing



Operation and maintainance

- Electrical functions intended to be operated by electrotechnical skilled or unskilled persons
- Protection class II up to a rated current of 630 A
- Flexible by standardised and tested kits
- Spacious connection areas



BLACK BOX with 4 interfaces

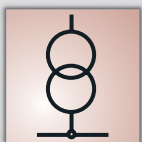


Mi Power Distribution Board (PSC)

Combinable enclosure system, insulation-enclosed, total insulated, degree of protection IP 65, for the assembly of power switchgear and controlgear assemblies (PSC) up to 630 A in accordance with IEC 61439-2.

The requirements for all installed electrical functions within the assembly have been proved compliance with the applicable requirements of IEC 61439-2.

I_{nc} and RDF must be specified in the documentation.



Connection to the electrical network

- Electric circuit / final circuit
- Circuit-breaker up to 630 A
- Switch disconnector up to 630 A
- Fuse switch disconnector up to 630 A
- Bus-mounted fuse base up to 63 A
- Connection with cable from above / from below
- Connection: conductors from copper / aluminium
- Optional connection of CEE sockets according to EN 60309 and sockets with earthing contact



Circuits and consumers

- Rated voltage $U_n = 690$ V a.c. / 1000 V d.c.
- Rated current I_n up to 630 A
- Circuit-breaker up to 630 A
- Switch disconnector up to 630 A
- Fuse switch disconnector up to 630 A
- 5-conductor system
- Connector with cable from above / from below



Changes facing the manufacturer of a switchgear assembly (Panel builder)

IEC 61439 - the standard for the assembly of switchgear assemblies and distribution boards - determines the safety requirements for electrical equipment for the compliance of protection objectives for people and facilities. Requirements for products are more clearly defined and a new terminology is introduced.

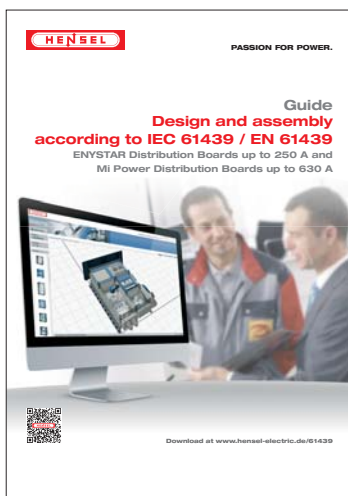
BLACK BOX Specification

The designer specifies a switchgear assembly by defining the interface parameters as BLACK BOX. Based on these interface specifications the manufacturer of a switchgear assembly has to rate and define the structure of the switchgear assembly.

Product presentation in media changed significantly

The standard has an effect as well on the documentation of products. Additional information, such as the rated current of circuits and the number of circuits, are now listed for each product as they are now required by designers and manufacturers for the construction of switchgear assemblies.

The international catalogue presents Mi empty and circuit breaker boxes.



Further enclosures with electrical functions for the assembly of ENYSTAR distribution boards up to 250 A, for example, with built-in busbars, circuit breakers, etc., see at: www.hensel-electric.de

For design and assembly according IEC 61439 / EN 61439 with ENYSTAR Distribution Boards up to 250 A please refer to the guide at www.hensel-elctric.de/61439.

The guide to design and assemble in accordance with EN 61439 for ENYSTAR distribution boards up to 250 A and Mi Power distribution boards up to 630 A can be downloaded:

 www.hensel-electric.de/en

ENYGUIDE

Planning tool Configurator ENYGUIDE at www.enyguide.de

Free planning software ENYGUIDE: allows the quick and easy configuration of distribution boards.



- Dimensional drawings and parts lists are automatically created by ENYGUIDE.
- Representation of the distribution board as a detailed 3D-image or a 2D-drawing.
- Various view planes show the equipment, covers and doors.
- ENYGUIDE determines the necessary accessories such as the number of wall separators independently.
- No time-consuming program installation is needed.

www.enyguide.de

Mi Power distribution boards up to 630 A

combinable enclosure system, insulation-enclosed, total insulated, degree of protection IP 65, for the assembly of power switchgear and controlgear assembly (PSC) up to 630 A in accordance with IEC 61439 Part 2

- Boxes can also be used as a single box
- Degree of protection IP 65: dust-proof and jet water-proof
- Application area: Mi enclosures are suitable for for the protected outdoor installation - harsh environment and /or outdoor.

Material:

- Polycarbonate
- Burning behaviour: Glow wire test in accordance with IEC 60 695-2-11, self-extinguishing, flame-retardant
- UV-resistance in accordance with IEC 61439-1, Clause 10.2.4: The material is examined for UV resistance.
- Toxic behaviour: silicone- and halogen-free
- Chemical resistance:
resistant against acid, lye, benzene and mineral oil

Mi Power distribution boards



Power distribution board (PSC) in accordance with IEC 61439-2



Safe in dust, dirt, moisture and in harsh industrial atmosphere



Dust- and waterresistant:
Mi Distribution Boards can withstand the highest loads



Assembly of Mi Distribution boards in accordance with IEC 61439-2

Enclosure system:

- Enclosures with electrical functions with standardized kits up to 630 A
- Covers made from thermoplastic
- Covers with protected, editable and captive labelling strips
- Cover plates for mounted electrical equipment
- Mounting plates or DIN rails for installation device
- Large wall openings enable the wiring within the distribution boards
- Cable entry via metric knockouts in all box walls, via flanges with metric knockouts or elastic membranes or cable inserts with up to 74 mm cable diameter
- Wall fixing right away in the boxes, via external brackets or via mounting profiles
- Facility for lead seal and locking
- Hinges for lids and heavy-duty hinge joints for operating installation device within a large area

- Connection Box for the installation of devices that must be operated externally, such as plugs, pushbuttons and switches
- Mi empty boxes and single empty boxes conform to the RoHS Directive 2011/65/EC



Assembly instruction
Please request or download information:
www.hensel-electric.de/en -> Downloads

Dependent on the system

Electrical parameters



Electrical parameters

rated voltage: max. 690 V a.c.
rated insulation voltage: 690 V a.c., 1000 V d.c.
rated current: max. 630 A
rated short-time withstand current: max. 21 kA

The design values are possibly reduced by the installed equipment technology, please refer to technical data of the product or index technical data.

System properties



Environmental conditions

Ambient temperature
- for distribution boards
in accordance with IEC 61439:
-5 °C up to 35 °C, max. + 40 °C
Relative humidity: 50% at 40 °C, 100% at 25 °C

- for empty enclosures: - 25 °C up to + 70 °C
The climatic influences and effects on the equipment are to be considered, see technical details / operating and ambient conditions



Application area

The enclosures are suitable for outdoor installation, protected against weather influences.

However, pay attention to the climatic effects on the installed equipment, see operating and ambient conditions in index technical data.



Insulation

insulated enclosures (protection class II)



Impact strength

degree of protection against mechanical load IK 08 (5 Joule) in accordance with IEC 62262



Protection against foreign solid objects and direct contact

dust-proof degree of protection IP 65



Protection against ingress of water with harmful effects

protected against water degree of protection IP 65

Single enclosures without any flanges and components mounted in the lid have degree of protection IP 66

Dependent on material

Material properties: polycarbonate



Burning behaviour

glow wire test 960 °C
in accordance with IEC 60695-2-11
flame-retardant, self-extinguishing



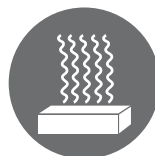
UV resistance

UV resistance according to IEC 61439-1, Section 10.2.4: the material is examined for UV resistance



Chemical resistance

resistance against acid 10% and alkaline 10%, petrol and mineral oil



Toxic behaviour

silicone- and halogen-free

Tested and certified
by ASTA



Suitable also for typical
devices or the installation
of armoured cables with
earth connections

Application:
**Motor Control Centre based
on Mi System**

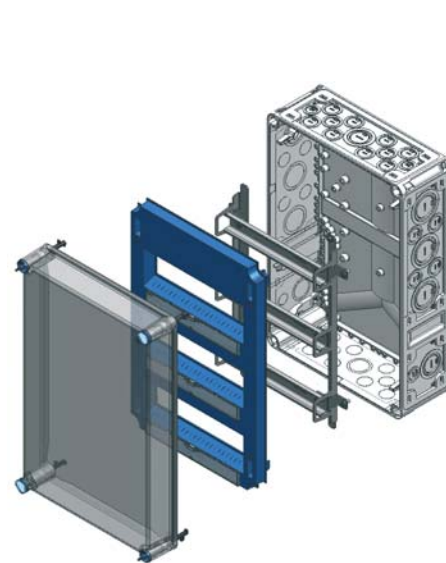
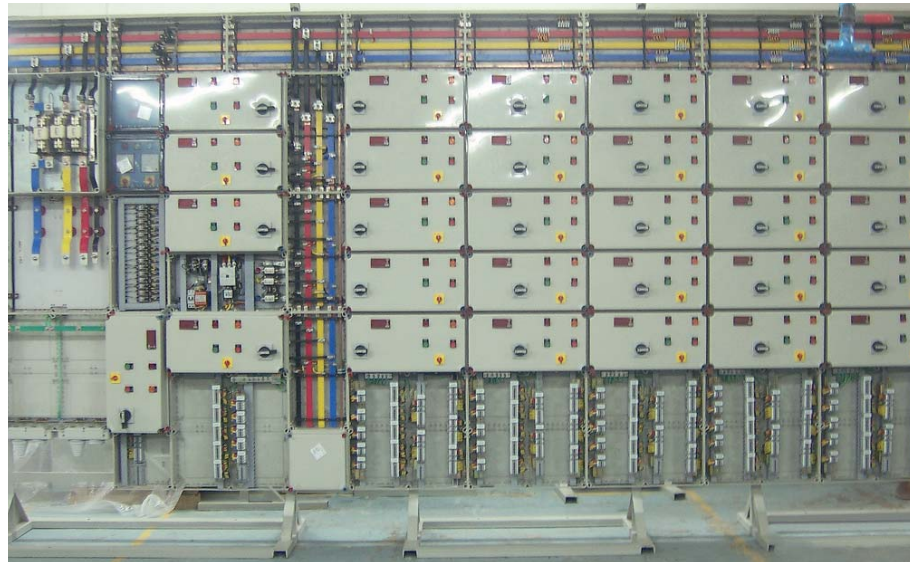
This Motor Control Centre installed in a big paper mill consists of 33 feeders ranging from 2.2 kW to 50 kW including complete wiring with main incomer of 630 A.

Application:
Removable DIN rail rack for integrated earth bounding in each Mi Circuit breaker box.

Cable entry for armoured cables via metal glands for earth connection according to British Standards.

Key benefits

Material	Thermoplastic material
Corrosion-proof	yes
Degree of protection	IP 65 (dust proof, water proof)
Protection against mechanical impact	no lasting deformations, elastic
Weight	"light"
Subsequent handling (such as openings)	"easy"
Transparent lids	standard offer
Operating area	partial opening range via lids of individual enclosures
Adaptability to location	by arrangement of modular enclosures
Combinability / Expandability	in all directions by combinable enclosures including electrical functions
Availability in the market	immediately with standard modules and accessories



Integrated earth bounding in each circuit breaker box



Cable entry for armoured cables via metal glands

Combinable and
extendable in all directions

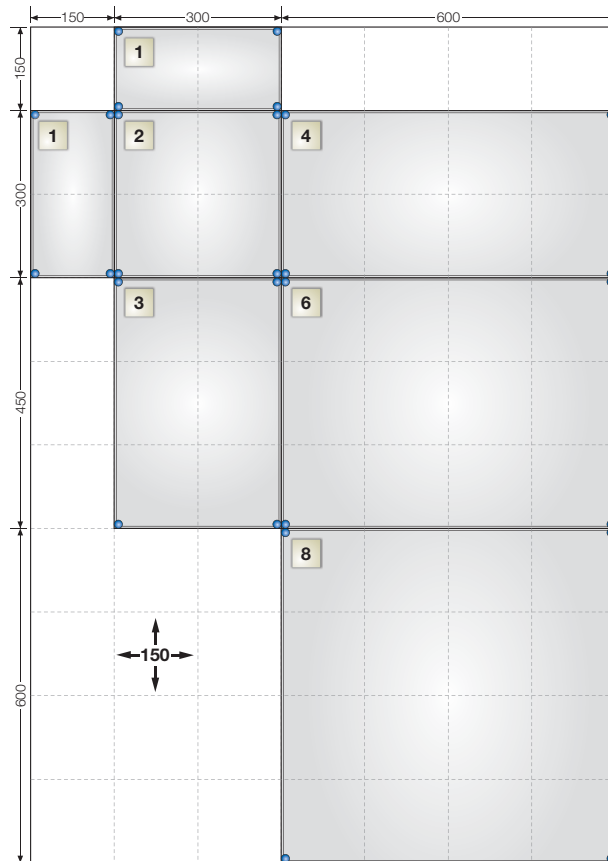
Application examples



Mi Distribution boards

- modular enclosure system in grid of 150 mm
- 5 kapslingsstorlekar: 150 x 300 mm, 300 x 300 mm, 450 x 300 mm, 600 x 300 mm, 600 x 450 mm eller 600 x 600 mm
- for the assembly of power switchgear and controlgear assemblies (PSC) up to 630 A
- Enclosures can be used as well as single boxes.

The **modular design** in a basic grid of 150 mm allows free design of the outer form. The enclosures can be combined in all directions. Obstacle easily circumvented.



Different enclosure depths

allow the installation of equipment of different heights (Fig. 1).

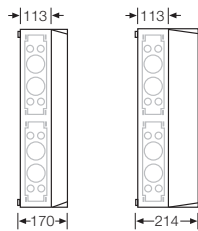


figure 1

With an extension frame the depth of the enclosure sizes 4 and 8 can be extended by 85 mm (Fig. 2).

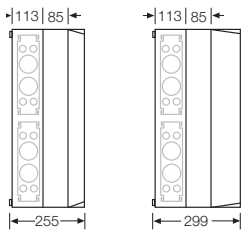
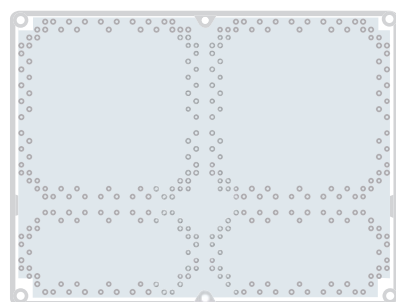


figure 2

Enclosure size 6 (600x450 mm)

Due to an enlarged terminal compartment directly in the housing, some electrical functions can be installed more economical.

An additional enclosure for wiring is not necessary.



Combinable distribution boards with door



Empty enclosures



Empty enclosures with hinged lid



Circuit breaker box



Mi enclosures can be assembled to distribution boards.



Empty enclosures for the installation of electrical equipment via mounting plates or DIN rails

Example:
Mi hinges for lids enable to operate installation device within a large area



Example:
Locking option with triangle prevents unauthorized access

