

Industrial Motors
Commercial &
Appliance Motors
Automation
**Digital &
Systems**
Energy
Transmission &
Distribution
Coatings

ELECTRICAL PANELS

**Safety for your
processes.**

Modularity for
your projects.



Driving efficiency and sustainability



SUMMARY

CCM06 - Low voltage motor control center

6

MTW - Medium voltage switchgear

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CCW07 - Medium voltage switchgear

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TTW01 - Type-tested assemblies

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LCW - Low voltage load center

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Safety for your processes. Modularity for your projects.

WEG Electrical Panels are designed to meet the demands of a wide range of market segments, ensuring high standards of **quality and performance**. Those products offer easy assembly, installation, maintenance, **future expansions and interchangeability**.

With technology fully developed in-house, WEG's electrical panel solutions are designed by engineers and technicians who are continuously engaged in research, development, and the design of new products using state-of-the-art technologies. These solutions offer customers a high degree of reliability, efficiency, and durability.

Applications



Steel &
Metallurgy



Mining &
Cement



Chemical &
Petrochemical Industries



Pulp &
Paper



Food &
Beverage



Plastic and Rubber



Automotive Industry



Ceramic



Textil



Refrigeration

CCM06

Low voltage motor control center

Developed to adapt to your **needs**

The CCM06 line was developed to meet the needs of different market segments, meeting stringent quality and performance requirements. Designed with a high standardization level, the CCM06 motor control center offers easy assembly, installation, maintenance, future expansions and interchangeability among units of the same model, size and function.

Certified according to IEC 61439-1/2 and coordination type 1 and type 2 according to IEC 60947, the CCM06 ensures highly reliable operation and totally safe maintenance.

Applications

The CCM06 has a wide range of applications in low voltage systems from many different segments:



Steel &
Metallurgy



Mining &
Cement



Pulp &
Paper



Food &
Beverage



Plastic & Rubber



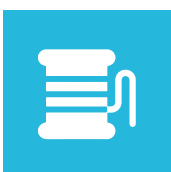
Chemical & Petrochemical Industries



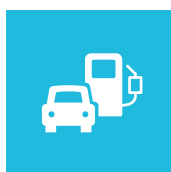
Automotive Industry



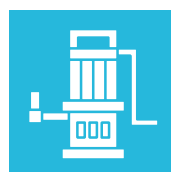
Water & Wastewater



Textil



Sugar & Ethanol



Pumping stations



Low voltage motor starters

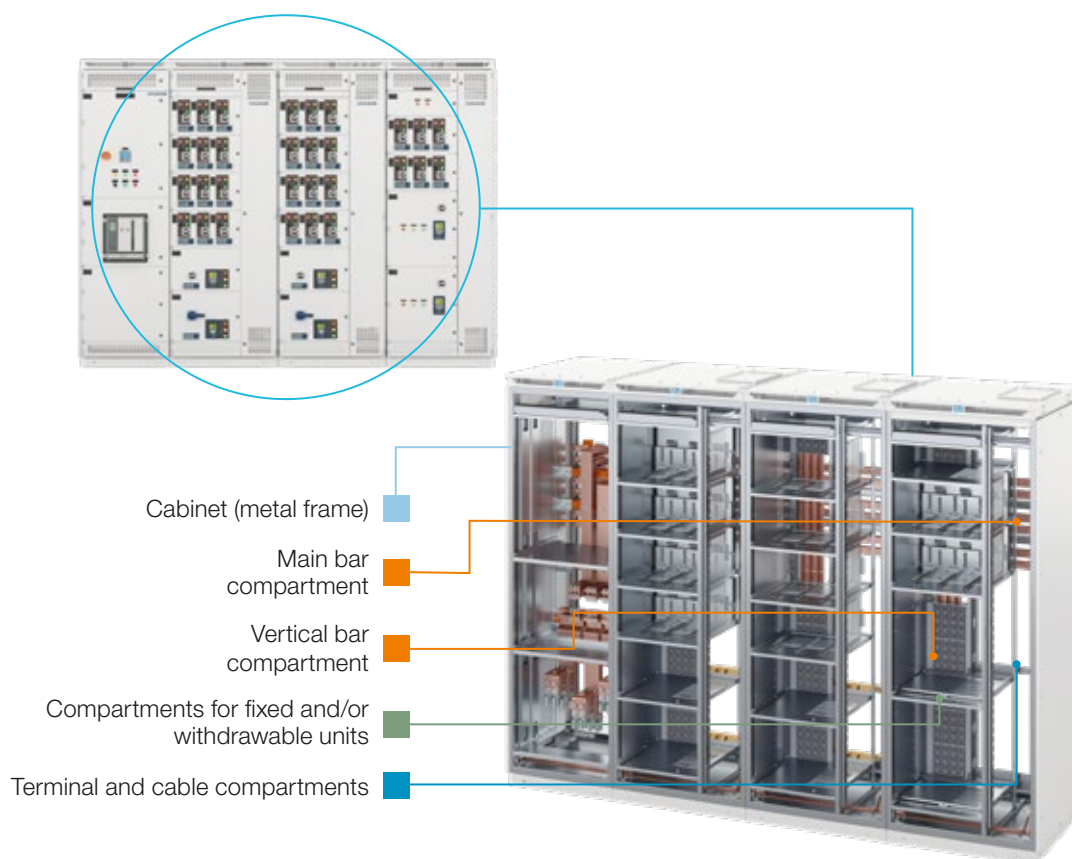
Construction features

The CCM06 is built with a modern structure composed of modular and robust sections, capable of withstanding the thermal and dynamic stresses generated by the installations.

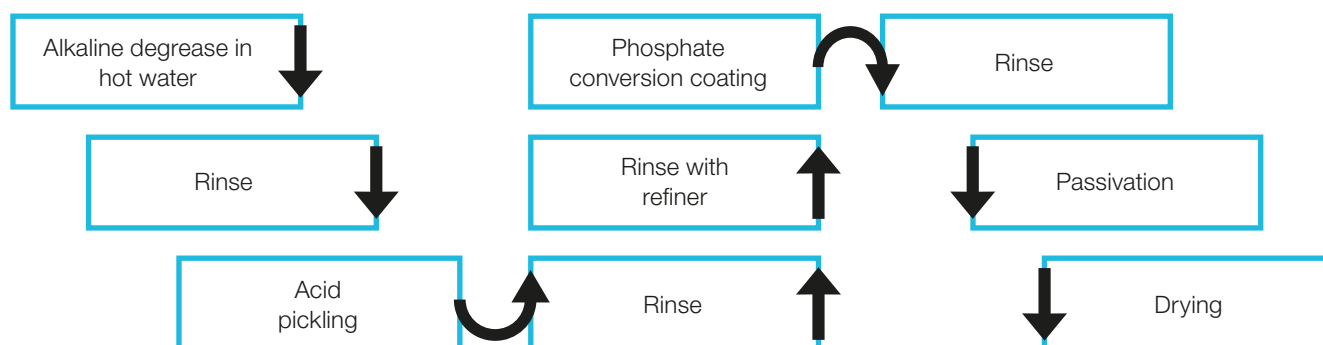
Each module or column is divided into: frame, shielding, terminal compartment, cable compartment, control and communication compartment, functional units, main busbar, vertical busbar and optional components.

They are especially suited for:

- Control and protection of a large number of motor starters
- Load distribution units (feeders)
- Installation in centralized locations (to simplify operation and maintenance)
- Command and control in general, among others



Surface treatment process of the metal sheets prior to final painting

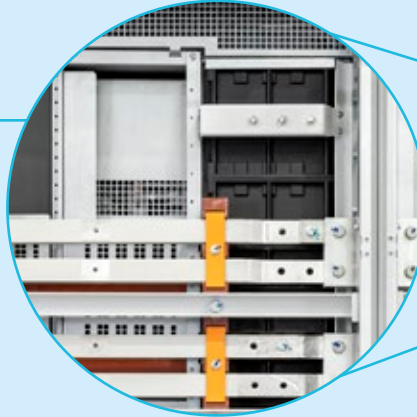


Construction features

Busbars

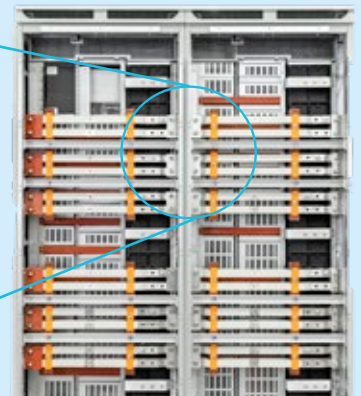
Vertical busbars

Located at the back of the columns, the vertical bars have up to forty outputs to connect the power clamps of the functional units, available in versions up to 1,400 A.



Horizontal busbars (main)

With standard bars for currents up to 6,300 A, the CCM06 is supplied with the main bars positioned horizontally at the back or on top of the panel with access through closing covers at the front or at the back.



The vertical busbar has insulating brackets that prevent accidental or inadvertent touch when the units are removed from the compartments. These brackets ensure the IP2X protection rating required by IEC 61439-1/2.



Control and protection bars (ground bar)

The CCM06 may be supplied with up to four control bars with a 10x3 mm cross section, enabling power supply through a source outside or inside the MCC by means of control transformers.

The ground bar allows connecting the protective conductors of the electrical components so as to ensure electrical bonding of the exposed conductive parts.



Construction features

Functional units (drawers)

One of the main characteristics of the CCM06 is the physical separation among their functional units, also referred to as drawers.

These units are available in the fixed (GWF), compact (GWC/GWD), plug-in (GWP) and withdrawable (GWE) versions, allowing for various unit combinations per column.

- Front access to units and compartments
- Possibility of using up to three padlocks with the module door closed
- Thermographic measurements can be taken at the power terminals without de-energizing the unit

- Tilting control console for access to the components without extracting the functional unit from its compartment
- Functional units with several types of circuits:
 - Feeder
 - Direct online starter
 - Reversing starter
 - Soft-starter
 - Frequency inverter

Fixed units (GWF)

The components are assembled on a fixed mounting plate in each compartment, and they can be supplied in up to 16 different sizes according to the table below.

Drawer	Drawer height (mm)	Maximum number per column
GWF-15	150	13
GWF-20	200	10
GWF-25	250	8
GWF-30	300	6
GWF-40	400	5
GWF-50	500	4
GWF-60	600	3
GWF-70	700	2
GWF-80	800	2
GWF-90	900	2
GWF-100	1,000	2
GWF-120	1,200	1
GWF-140	1,400	1
GWF-160	1,600	1
GWF-180	1,800	1
GWF-200	2,000	1



Construction features

GWC/GWD compact units

This line of withdrawable units has a compact and efficient design concept with fewer mechanical parts, and yet keeping the safety standards in the extracted, test and inserted positions. The compact units are intended for direct online motor starters up to 18.5 kW at 690 V, in the conventional or smart versions, which can be supplied in different sizes for installing up to four functional units per compartment.



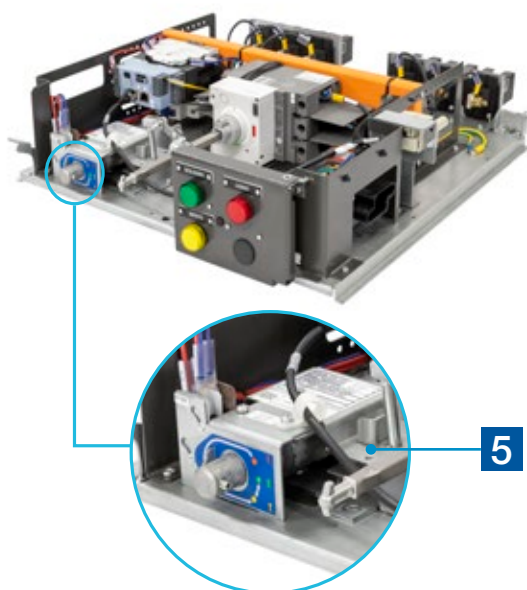
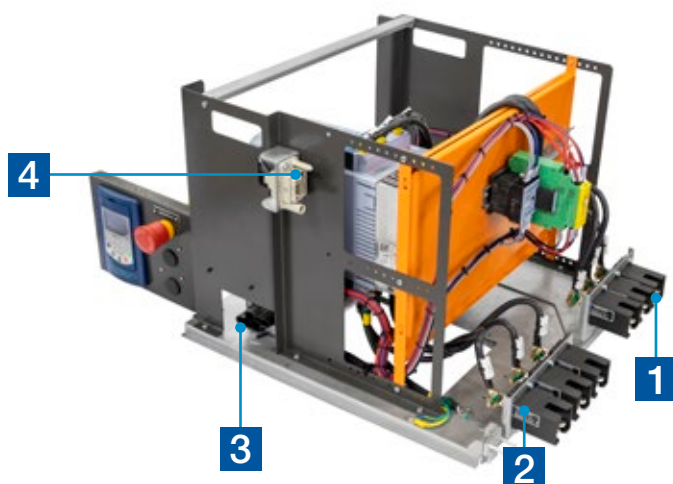
Compact withdrawable drawer	Drawer height (mm)	Maximum number of compartments with 1,000 mm wide column	Maximum number of compartments with 1,000 mm wide column
GWC-20	200	4	40
GWC-25	250	4	32
GWC-30	300	4	24
GWC-35	350	4	20
GWD-20	200	2	20
GWD-25	250	2	16
GWD-30	300	2	12
GWD-35	350	2	10

Compact withdrawable drawer	Drawer height (mm)	Maximum number of compartments with 850 mm wide column	Maximum number of compartments with 850 mm wide column
GWC-20	200	3	30
GWC-25	250	3	24
GWC-30	300	3	18
GWC-35	350	3	15
GWD-20	200	1	10
GWD-25	250	1	8
GWD-30	300	1	6
GWD-35	350	1	5

Construction features

Withdrawable units (GWE)

The components are assembled in a functional unit that allows the full extraction of the unit from the MCC and can be supplied in up to twelve different sizes. The power clamps (power supply) are extracted/inserted by means of a rotating device which drives the power clamps. The GWE withdrawable units are manufactured in accordance with the requirements of IEC 61439-1/2 standard, which regulates the extraction and locking system of the unit.



1 Input clamps with protection for the connections

2 Output clamps

3 Command outlet

4 Network outlet

5 Rotating drawer extraction system

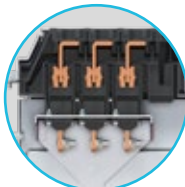
Withdrawable drawer	Drawer height (mm)	Maximum number per column
GWE-15	150	13
GWE-20	200	10
GWE-25	250	8
GWE-30	300	6
GWE-35	350	5
GWE-40	400	5
GWE-45	450	4
GWE-50	500	4
GWE-60	600	3
GWE-70	700	2
GWE-80	800	2
GWE-90	900	2

Construction features

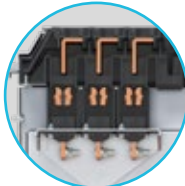
Withdrawable units (GWE)



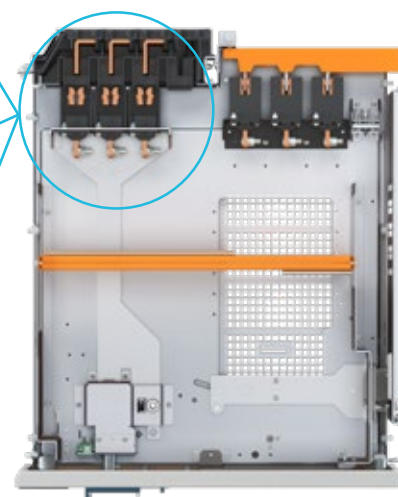
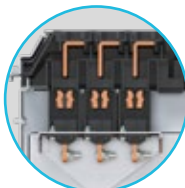
1 INSERTED position (I): Power clamps (power supply) and control circuits connected to the unit ready for operation. It is not possible to change to the Test (T) position without first turning off the main switching device of the unit.



2 TEST position (T): Power clamps (power supply) disconnected, and control circuit connected. In this position, it is possible to carry out tests on the functional unit, but without voltage in the power circuits.



3 EXTRACTED position (E): Power clamps (power supply) and control circuit fully disconnected. In this position it is possible to fully extract the functional unit from the compartment with total safety for the operator.

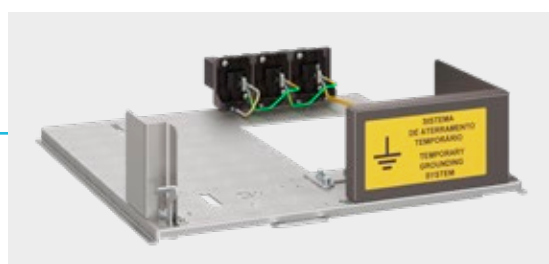


Grounding devices/optional

To enable the provisional grounding during maintenance jobs on the functional units, WEG offers the device below as an accessory item that is installed on the MCCs.

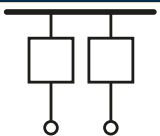
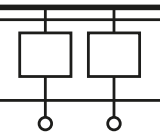
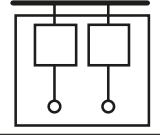
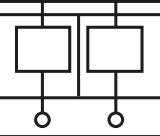
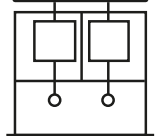
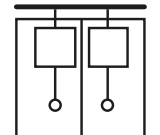
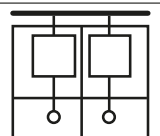
Temporary grounding

By means of a universal unit for any compartment size.



Construction features

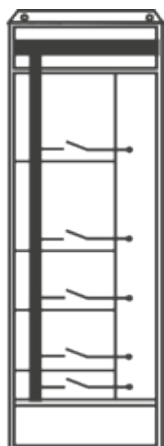
According to item 8.101 of IEC 61439-2, which addresses the forms of internal separation of the sets by means of partitions or barriers (metallic or non-metallic), the typical forms of separation by partitions are presented in the following table:

Main criteria	Sub-criteria	Form	
No separation		Form 1	
Separation between the busbars and functional units	The terminals for the external conductors do not need to be separated from the bars	Form 2a	
	The terminals for the external conductors are separated from the bars	Form 2b	
Separation between the bars and functional units, as well as between all functional units. Separation of the output connection terminals of the units, but not between them	The connection terminals must not be separated from the bars	Form 3a	
	The connection terminals must be separated from the bars	Form 3b	
Separation between the bars of the functional units, as well as between all functional units, including the connection terminals which are integral part of the functional unit	The connection terminals are in the same compartment as the related functional unit	Form 4a	
	The connection terminals are not in the same compartment as the related functional unit, and they must be in an individual and separate compartment	Form 4b	

The form of internal separation of the sets must be an agreement between the manufacturer and the end customer. For the CCM06 line, the available options are 1 to 4b.

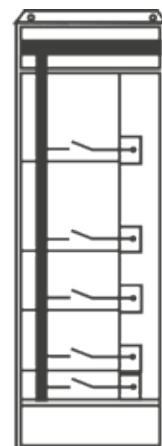
Form 3b

The connection terminals must be separate from the bars and functional units.



Form 4b

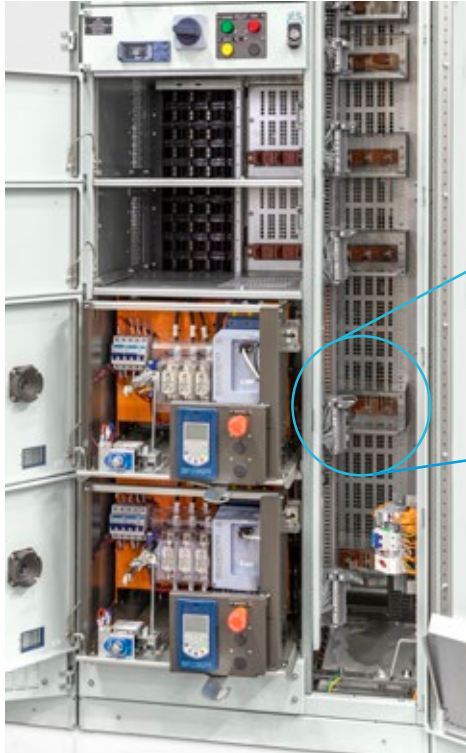
The connection terminals must be separated from the bars and the functional units in an individual and separate compartment.



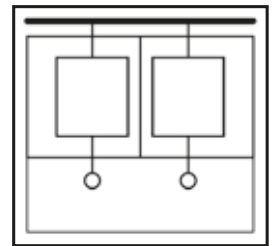
Construction features

Internal separation form 3b

Separation between the bars, output terminals and functional units. Each functional unit is located in a separate compartment.



- The connections of the power conductors are located in the same compartment (terminal and cable compartment)
- Maintenance jobs require care, because, in the same compartment, connections of other units may be energized

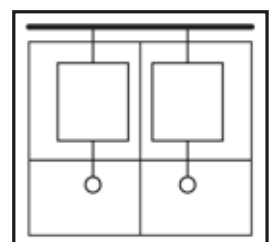


Internal separation form 4b

Separation between the bars, output terminals and functional units. Each functional unit is located in a separate compartment with its output terminals also located in an individual and separate compartment.



- The connections of the power and control conductors are located in different compartments
- Maintenance jobs are totally safe, since the other units that are energized will have their connections protected



Technical features

Rated voltage		690 V _{AC}
Insulation voltage		1,000 V _{AC}
NBI		6 kV, 8 kV and 12 kV (according to component limitation)
Line rated voltage		110 to 690 V
Control voltage		110 or 220 V (other voltages on request)
Rated frequency		50 / 60 Hz
Rated current - input unit		800 A, 1,600 A, 2,500 A, 3,200 A, 4,000 A, 5,000 A, 6,300 A
Horizontal main busbar rated current		800 A, 1,600 A, 3,200 A, 4,000 A, 5,000 A, 6,300 A
Vertical busbar rated current		1,200 A / (1,400 A, on request)
General busbar		65 kA (1s) – 80 kA (1s)
Short-time withstand current		100 kA (1s) – 85 kA (3s)
Rated peak withstand current (I _{pk})		Up to 220 kA
Short-time withstand current (I _{cw})		Up to 148 kA@1s
Vertical busbar		Duct – 65 kA
Short-time withstand current		Duct – 80 kA
Vertical grounding busbar (cable compartment)		Yes
Horizontal grounding busbar		Yes
Protection rating		IP31 / IP41 / IP42 (IP54 on request)
Installation type		Sheltered
Ambient temperature (maximum)		40 °C
Temperature rise		According to table 6 of IEC 61439-1/2
Maximum altitude		2,000 m (others on request)
Internal separation form		1b, 2b, 3b or 4b
Surface treatment		Phosphate conversion coating for the metal sheets
		Electrolytic tin-plating on the busbars
		Galvanizing on other parts
Treated surface finishing		Electrostatic epoxy powder coating
Color		Light gray RAL 7035; other colors on request
		Mounting plates for the galvanized functional units
Metal sheet thickness	Base	4.25 mm – 8 MSG
	Structure	2.66 mm – 12 MSG
	Cladding/doors	1.50 mm – 16 / 14 MSG
	Internal partitions	1.90 mm – 14 MSG (structure) / 1.50 mm – 16 MSG (internal cladding)
	Functional unit	1.90 mm – 14 MSG
Control circuit		NEMA Class II – Type B

Certifications

Manufactured in compliance with the main international standards, such as IEC 61439 and VDE 0660 P-5, the CCM06 was tested in internal and external laboratories to meet the requirements of those standards.

They also offer arc resistant versions manufactured in compliance with Technical Report IEC 61641.

List of tests, according to item 10 of IEC 61439-1 standard:

- Temperature rise limits
- Dielectric properties (NBI)
- Short-circuit withstand current
- Effectiveness of the protection circuit
- Clearance and creepage distance see IEC 61439-2
- Mechanical operation
- Protection rating
- Resistance of materials and parts

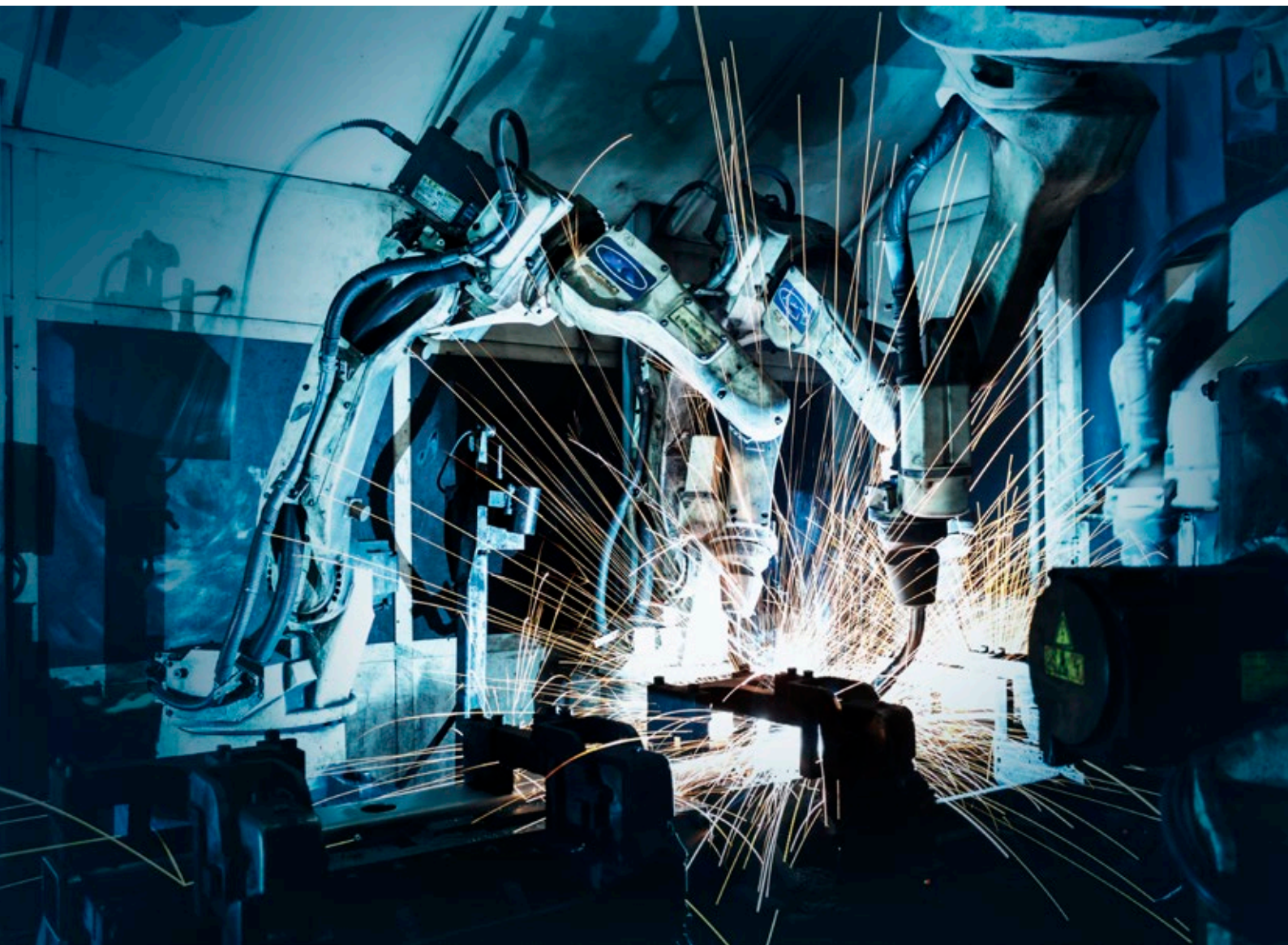


Smart MCCs

The smart system of the MCC may be composed of soft-starters, frequency inverters or smart relays installed in the functional units, called slaves, and a programmable logic controller (PLC) installed in a suitable compartment of the MCC, called master. The PLC data can be inserted by means of a Human-Machine Interface (HMI) or personal computers (PCs) installed in control rooms or on the structure of the MCC.

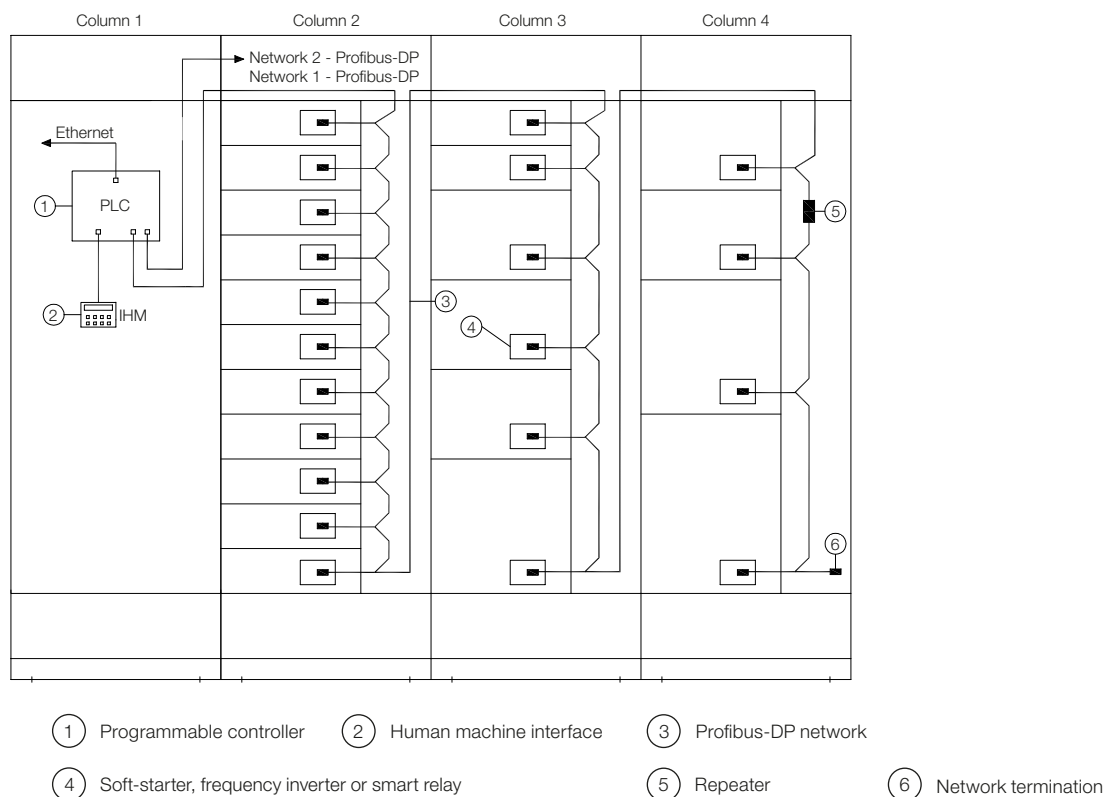
Advantages of using the smart MCC

- Remote monitoring, supervision and control via HMI, PLC, PC or network
- Reliability for process continuity
- Installation in centralized locations to simplify operation and maintenance
- Versatility for control and protection of a great number of motors
- Greater reliability of the protection system
- Reduction of several components of the functional unit, such as time and switching operations counters, conventional overload thermal relays, current transformers etc.
- Reduction of control wiring
- Installation of the smart relay on DIN rail or mounting plate, with remote reset capability, reducing maintenance time
- Fast and accurate defect identification
- Automation of fault records and statistics per unit
- Profibus-DP, DeviceNet, CANopen, Modbus-RTU, Modbus-TCP, EtherNet/IP and PROFINET IO/ PROFINET S2 network
- Communication with other PLCs in open protocol network

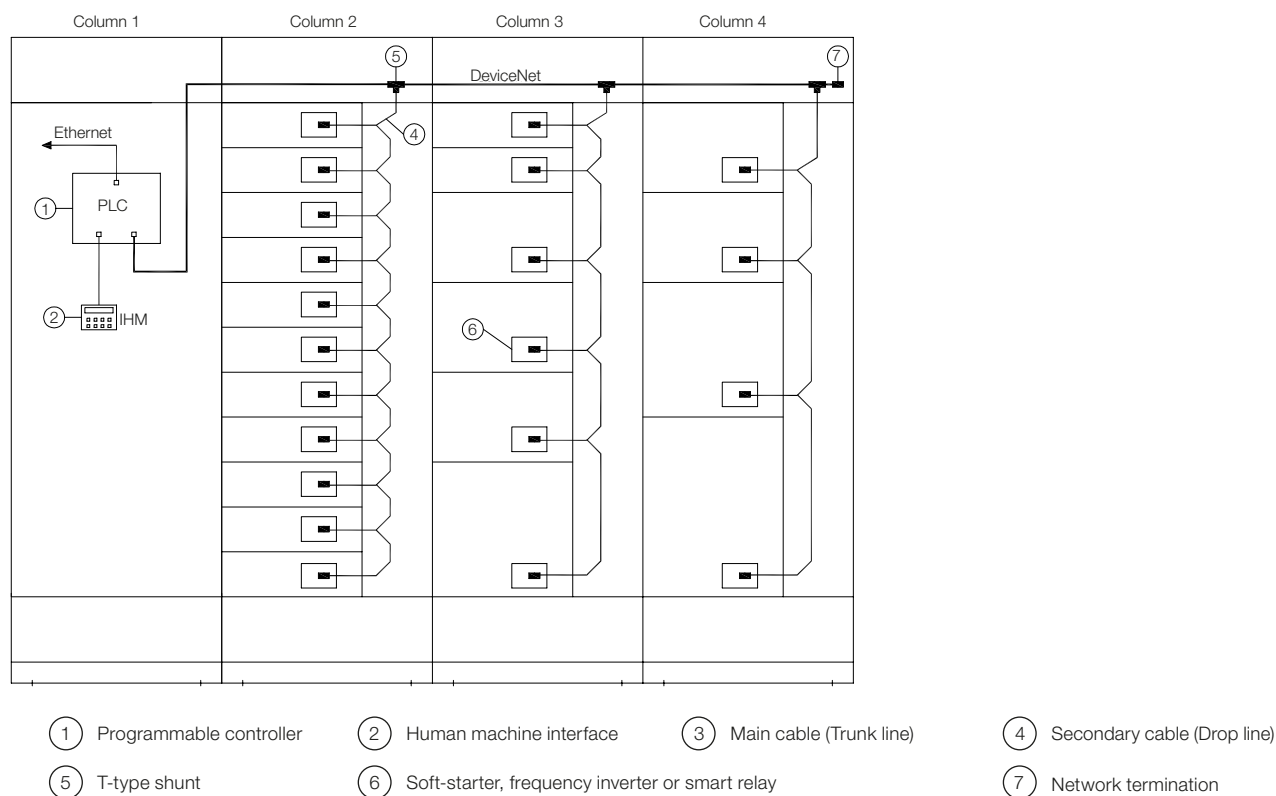


Smart MCCs

Example of smart MCC with Profibus network

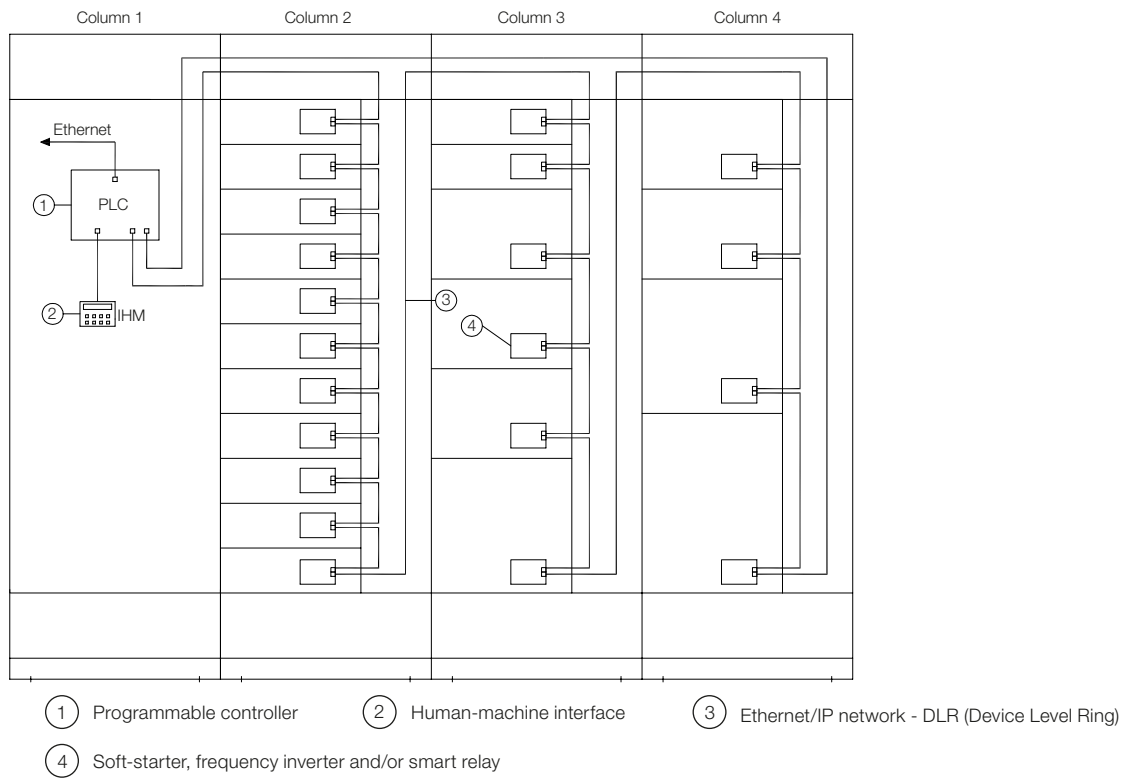


Example of smart MCC with DeviceNet network

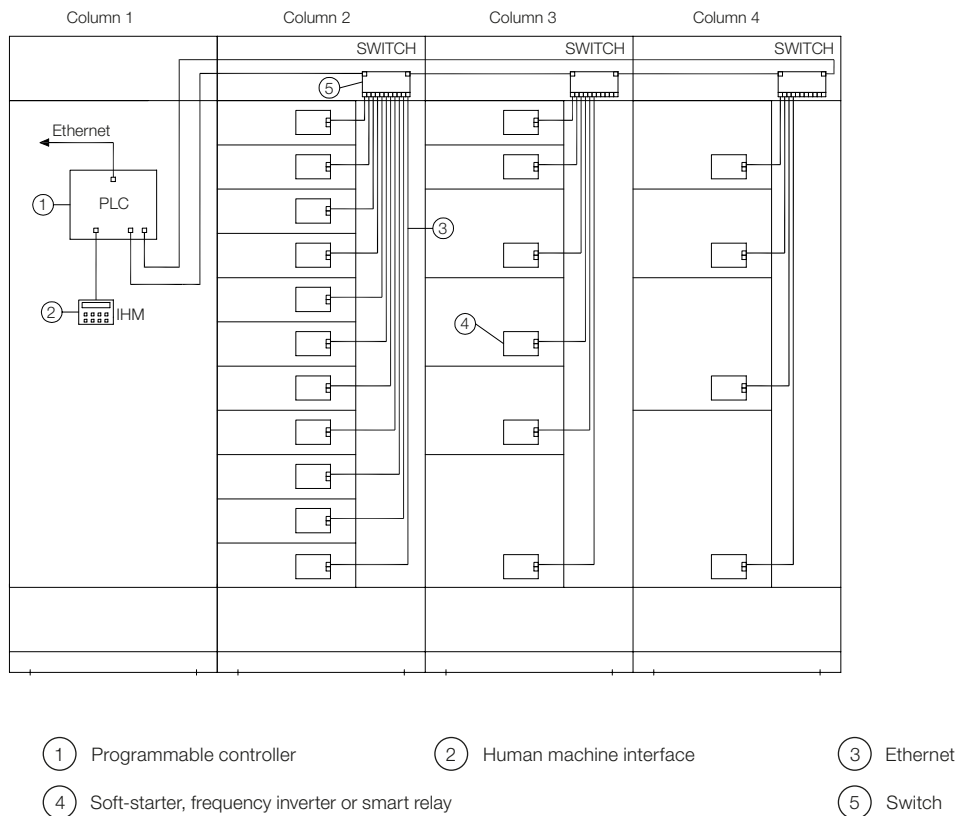


Smart MCCs

Example of smart MCC with Ring Ethernet network



Example of smart MCC with Star Ethernet network



Arc resistant MCCs

The electric arc phenomenon

Electric arc is a phenomenon produced after a discharge that occurs when the electric voltage between two points exceeds the limit of dielectric strength of the air in between. The arc remains active as long as the voltage across its terminals provides sufficient energy to compensate for the heat dissipated and to maintain adequate temperature conditions. If the arc lengthens and cools down, the conditions for its subsistence cease and the arc extinguishes.

Electric arc effects inside a panel

The behavior of an internal arc can typically be divided into four phases:

- Compression phase
- Expansion phase
- Emission phase
- Thermal phase

Additional information

- Pressure: it is estimated that a person standing 60 cm away from an arc fault involving approximately 20 kA may be subjected to a force equivalent to 225 kg. In addition, the sudden pressure wave can cause irreversible damage to the eardrums.
- Temperature: an electric arc can reach temperatures of approximately 7,000 - 8,000 °C
- Sound level: an electric arc can produce noise levels up to 160 dB

Effects of electric arc on personnel

- Burns
- Injuries caused by the ejection of materials
- Hearing damage
- Inhalation of toxic gases

Overview of root causes

Arc faults may result from both technical and non-technical causes. Among the non-technical causes, the most common include:

- Human error, especially during maintenance activities
- Inadequate commissioning procedures
- Poor maintenance, especially in harsh environmental conditions

Technical causes include:

- Insulation failure (75%)
- Surges (15%)
- Manufacturing or design in components (10%)

Standards and regulations

The IEC 61439 standard for low voltage switchgear and controlgear assemblies does not provide specific guidance regarding arc faults. However, it refers to the technical report IEC TR 61641, "Guidelines for testing under conditions of internal arc faults in low voltage switchgear and controlgear assemblies", which outlines the requirements for the classification of assemblies designed to withstand internal arc conditions.

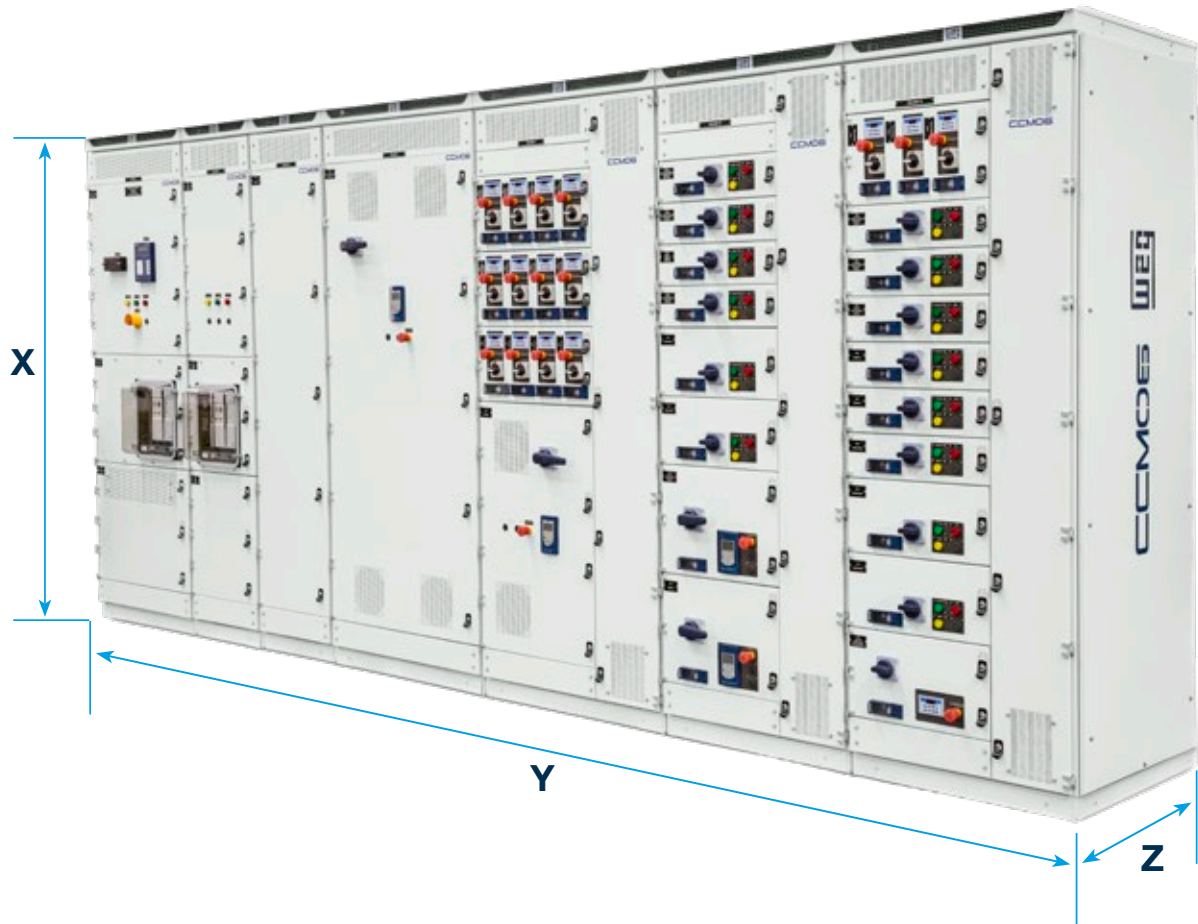
According to IEC TR 61641, a low voltage switchgear assembly designed to withstand internal arc faults must:

- Limit the risk of personal injury/accidents in the event of an internal arc fault
- Restrict damage to the section affected by the fault, allowing unaffected compartments to remain operational for emergency procedures

Designed with a reinforced structure, the CCM06 is mechanically resistant to the internal arc faults. It features an internal, dedicated exhaust path for the high temperature gases produced by the arc, and it is rated as type "C" for performance under internal arc fault conditions.

Dimensions (mm)

Standard MCC/internal arc resistant MCC



Input column				
Cable entry	Internal separation	Height (x)	Width (y)	Depth (z)
Bottom	3b	2,375 ¹⁾	500	800
	4b		1,000	
	3b			
	4b		750	
	3b			
	4b			
Top	3b			
	4b			
Column for fixed or withdrawable functional units				
Cable entry	Internal separation	Height (x)	Width (y)	Depth (z)
Bottom	3b	2,375 ¹⁾	850 1,000	800
	4b			
Top	3b			
	4b			

Note: 1) No base.

MTW

Medium voltage switchgear

Comprehensive energy management

Designed for **voltages from 2.3 kV to 36 kV**, the MTW Medium Voltage Switchgear and Controlgear Assemblies are factory-assembled and tested. They are designed to meet the **requirements of IEC 62271-1 and IEC 62271-200 standards**, while maintaining flexibility to adapt to the different market requirements.

Applications

The MTW line solves a wide range of applications in medium voltage systems, with the main ones being:



Power distribution systems



Unit substations



Main protection and sectioning of factories and industrial facilities



Utility substations



Pumping stations



Plastic & Rubber



Sugar and ethanol



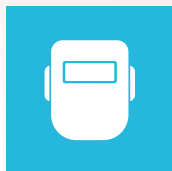
Water and wastewater



Power generation



Marine



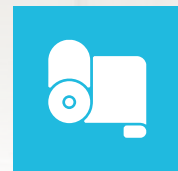
Steel & Metallurgy



Mining & Cement



Chemical & Petrochemical Industries



Pulp & Paper



Food and Beverage



Thermal and hydroelectric power generation plants



Low voltage motor starters

Advantages

- Assemblies developed and manufactured with type tests, according to IEC 62271-1 and 62271-20000
- Versatility and flexibility
- Easy maintenance
- Simplified inspection
- Easy assembly and connection
- Various equipment combination options to meet the customers' needs and demands
- Compact dimensions
- Careful selection of materials
- Standardization
- Fast and easy expansion due to its modular design
- Lower maintenance
- Easy access to the compartments for maintenance by means of removable covers and doors
- Interlocking system to prevent incorrect operations
- High safety level for the operators, with all the main circuit breaker operations executed with the medium voltage door closed
- Fast replacement of the breaker/contactor using the truck for movement and installation
- Personnel safety
- Internal arc resistant
- Air-insulated assemblies, with reduced dimensions, allowing smaller sizes of electric rooms
- No need for insulating gas handling or pressure supervision
- Quality assurance according to ISO 9001
- Assemblies with internal arc rating as per IEC, with front, side and rear access for all short-circuit currents

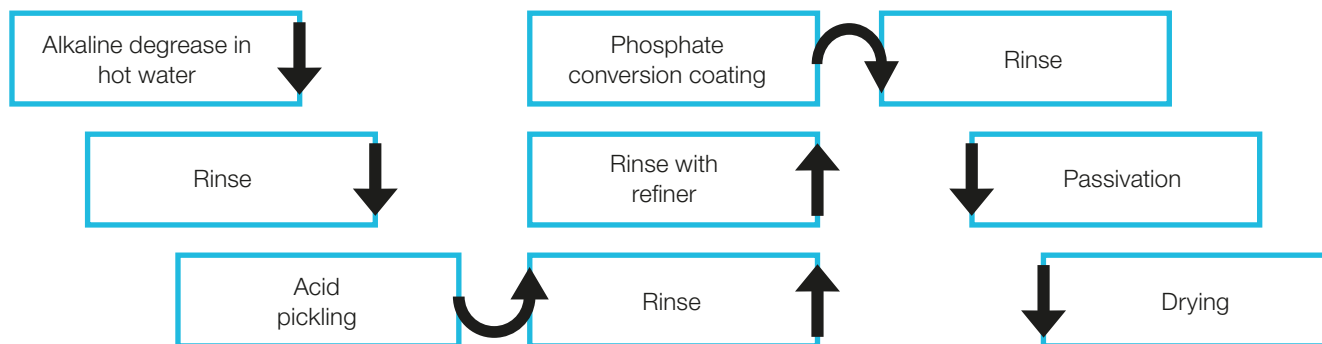
General features

Construction features

The MTW medium voltage assemblies are manufactured with steel sheet profiles, which undergo an alkaline degrease treatment, phosphating and powder coating. Overpressure relief devices on top and side provide pressure relief in case of internal arc. The main busbar consists of one or more rectangular electrolytic copper bars, with tin-plated connections designed to withstand the thermal and dynamic stresses.

The low voltage compartment is located at the top and front, where measurement instruments, protection devices, terminals, thermostats, auxiliary contactors, among others, are installed, and it is completely isolated from the medium voltage compartments by a steel plate.

Surface treatment process of the metal sheets prior to final painting



Safety

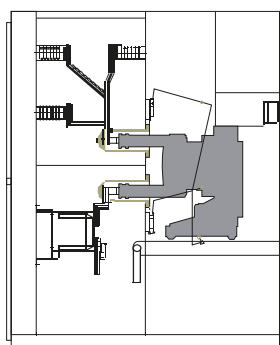
The MTW assemblies are internal arc resistant and manufactured as per the requirements of IEC 62271-200 standard, ensuring total safety in the operation for both operators and installations.

General features

Interlocks

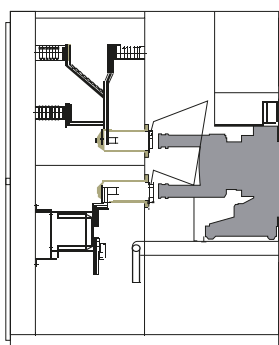
- Interconnections between the circuit breaker/contactors compartment door and the compartment itself prevent access while in the "ON" position
- Interconnections between circuit breaker/contactors and the grounding switch prevent simultaneous operation
- The circuit breaker/contactors can only be moved to the "TEST/EXTRACTED" position when in the "OFF" condition without having to open the assembly door
- The circuit breaker/contactors cannot be operated between the "INSERTED" and "TEST/EXTRACTED" positions
- For the units equipped with contactors, if one of the fuses operates, the contactor will automatically switch off

Position of the circuit breaker/contactors	Interlock
Inserted/Service	Impossible to move the circuit breaker/contactors switched on Impossible to close the grounding disconnector Impossible to open the door of the circuit breaker/contactors compartment
Between the Inserted and Test/Extracted position	Impossible to open the door of the circuit breaker/contactors compartment Impossible to close the circuit breaker/contactors Impossible to close the grounding disconnector Impossible to disconnect the circuit breaker/contactors control plug
Test/Extracted	Impossible to close the circuit breaker/contactors Impossible to connect the circuit breaker/contactors when the grounding disconnector is closed Impossible to close the contactor/circuit breaker compartment door without connecting the circuit breaker/contactors control plug



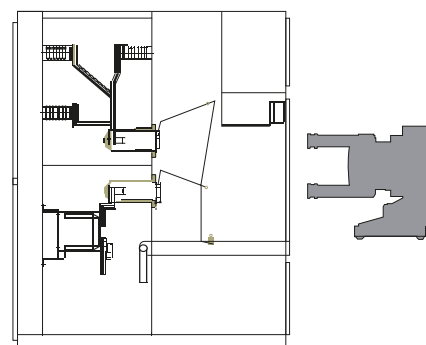
"INSERTED" position

It is impossible to move the circuit breaker/contactors when it is closed.



"TEST/EXTRACTED" position

The circuit breaker/contactors is extracted or inserted with the compartment door closed.



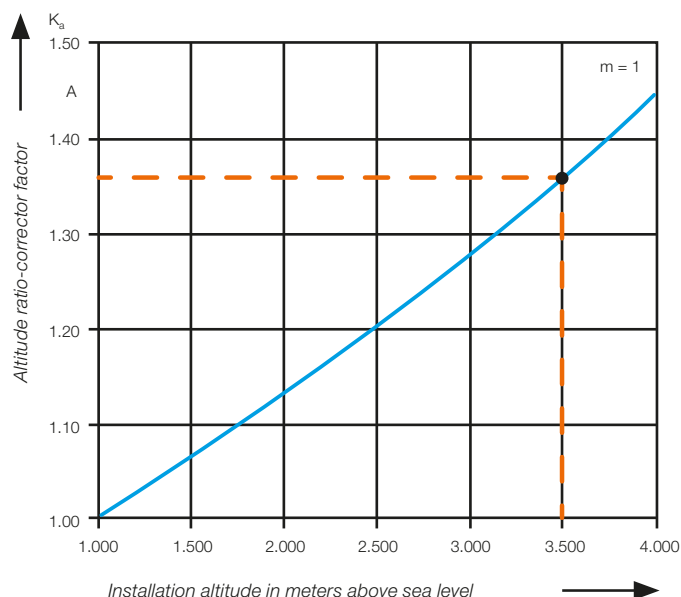
"REMOVED" position

The automatic shutters protect against contact when the circuit breaker/contactors is extracted.

Technical data

Altitude ratio-corrector factor K_a

For installation altitudes higher than 1,000 m above sea level, the altitude ratio-corrector factor K_a is applied to the rated lightning impulse withstand voltage (BIL), depending on the installation altitude above sea level, as shown in the chart below:



Example

For installation at 3,500 meters above sea level, with a 7.2 kV rated voltage of the cubicle and 60 kV of rated lightning-impulse withstand voltage (BIL):

$$\text{Rated lightning-impulse withstand voltage (BIL) to be selected} = 60 \text{ kV} \cdot 1.36 = 81.6 \text{ kV}$$

Result

We need to select a cubicle with a rated lightning-impulse withstand voltage (BIL) equal to or greater than the result (81.6 kV). According to the dielectric strength table below, you should select a cubicle for a rated voltage of 17.5 kV with a rated lightning-impulse withstand voltage (BIL) of 95 kV.

Dielectric strength table							
Rated voltage	kV	3.6	7.2	12	17.5	24	36
Rated lightning-impulse withstand voltage (BIL)							
Between phases and ground	kV	40	60	75	95	125	170

Technical data

Main standards

Device	Description	IEC Standard
Switchgear	MTW	IEC 62271-200
	Degree of protection	IEC 60694
Devices	Power circuit breakers	IEC 62271-100
	Power contactors	IEC 62271-106
	Switch disconnectors and earthing switches	IEC 62271-102
	Switch disconnector/fuses	IEC 62271-105
	Fuses	IEC 60282-1
Measurement transformers	Current transformers	IEC 61869-2
	Voltage transformers	IEC 61869-3

Concepts

Internal arc classification		
General designation	IAC (Internal Arc Classified)	
Accessibility types	A	Restricted to authorized personnel
	B	Unrestricted, including public in general
	C	Restricted per installation
Sides of the enclosure	F	Front
	L	Side
	R	Rear
Testing values	I _{cc} (kA) - t (s)	

Example

IAC AFLR 40 kA 1s: internal arc resistant equipment, access restricted to authorized personnel by all the sides (front, side and rear), with a rating of 40 kA for one second.

IAC BF ALR 25 kA 1s: internal arc resistant equipment, unrestricted access, including general public, to the front of the switchgear; however, the access to the other sides (side and rear) is restricted to authorized personnel, with a rating of 25 kA for one second.

Loss of service continuity class	
It defines the possibility of keeping the other compartments and/or functional units energized when opening one compartment of the main circuit	
LSC 1	Switchgear assembly without compartmentalization between the medium voltage equipment
LSC 2A	Safe access to the compartment of the functional unit With energized busbars, or with adjacent energized units, medium voltage cables must be grounded
LSC 2B	Safe access to the functional unit compartment With energized busbars, or with adjacent energized units The medium voltage cables must be in a separate compartment Functional unit cable in maintenance may remain energized

Partition classes	
PM	All divisions between compartments must be metallic and will be properly grounded, ensuring safe access
PI	Divisions between compartments may be partial or totally made of insulating materia

MTW05 switchgear



- Rated voltage up to 17.5 kV
- Rated current up to 2,500 A
- Symmetrical three-phase short-circuit current (I_{cc}) up to 31.5 kA

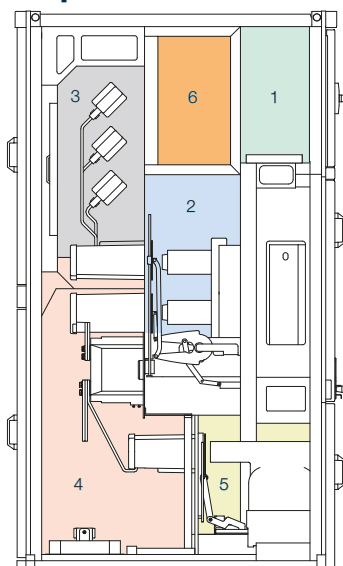
Technical features			
Electrical			
Rated voltage	kV	7.2	17.5
Rated current	A	630 - 1,250 - 1,600 - 2,000 - 2,500	
Rated lightning-impulse withstand voltage (BIL)	kV	60	95
Rated withstand voltage at industrial frequency	kV	20	38
Symmetrical three-Phase short-circuit current (Icc) (1s)	kA	31.5 kA 1s	
Internal arc testing classification	IAC BF ALR 31.5 kA 1s		
Mechanical			
Protection rating ¹⁾	IP41		
Height	mm	2,300 (duct for the exit of gases included)	
Width	mm	600 (≤1,250 A)	
		750 (≤2,000 A)	
		950 (2,500 A)	
Depth	mm	1,300 (cable entry/exit from the bottom) - version with gas duct	
		1,600 (cable entry/exit from the top) - version with gas duct	
		1,450 - version with top flap	
Approximate weight	kg	1,000 (≤1,250 A)	
		1,150 (≤2,000 A)	
		1,300 (2,00 A)	
Metal sheet thickness	Structure	mm (MSG)	3.00 (11)
	Cladding		1.90 (14)
	Front door		3.0 (11) + 1.90 (14)
Loss of service continuity class	LSC 2B		
Separation class	PM ou PI ³⁾		
Seismic zone ²⁾	UBC-4 - Horizontal acceleration of 0.6 g and vertical acceleration of 0.36 g		
Ambient temperature	-5 °C...+40 °C		
Installation altitude	Up to 1,000 masl (for higher levels, see page 26)		

Notes: 1) Other degrees of protection on request.

2) By means of computer simulation (Modal Analyses).

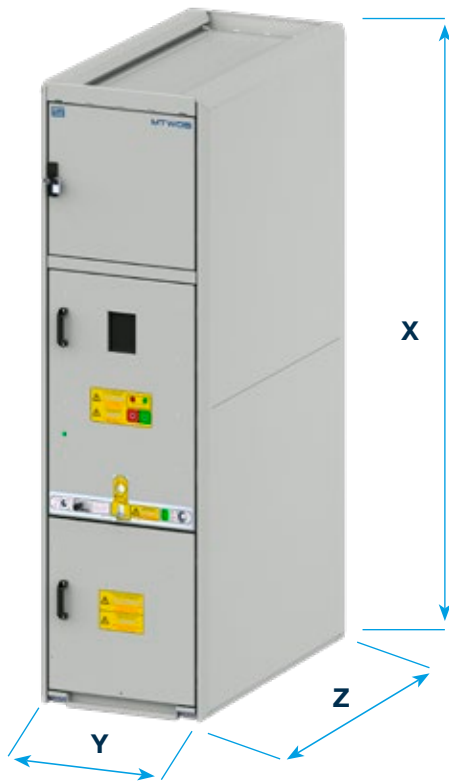
3) All compartments are PM, only the circuit breaker compartment has a PI rating as it uses isolation knife switches.

Compartmentalization



- 1 - Low voltage compartment
- 2 - Circuit breaker compartment
- 3 - Main busbar compartment
- 4 - CT compartment and output cables
- 5 - PT compartment
- 6 - Gas exhaust duct

Dimension



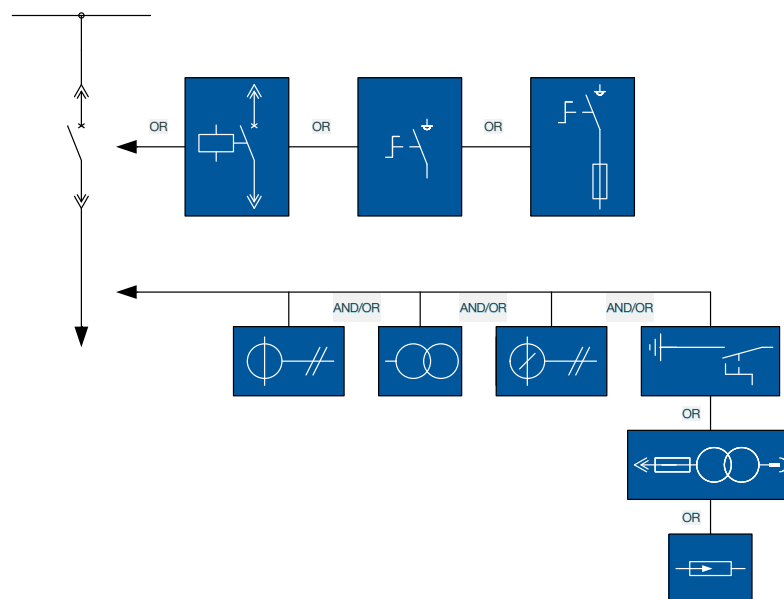
Dimensions (mm)				
Cable entry	Current (A)	Height (X)	Width (Y)	Depth (Z)
Bottom	$\leq 1,250$ A	2,300	600	1,300 / 1,850 ¹⁾
Bottom	1,600 A a 2,000 A	2,300	750	1,300 / 1,850 ¹⁾
Bottom	$\geq 2,500$ A	2,300	950	1,300 / 1,850 ¹⁾

Note: 1) The flap version has a deflector on top, with a total depth of 1,850 mm.

Version with flap



Possible configurations



MTW04 switchgear

- Rated voltage up to 17.5 kV
- Rated current up to 4,000 A
- Symmetrical three-phase short-circuit current (I_{cc}) up to 50 kA

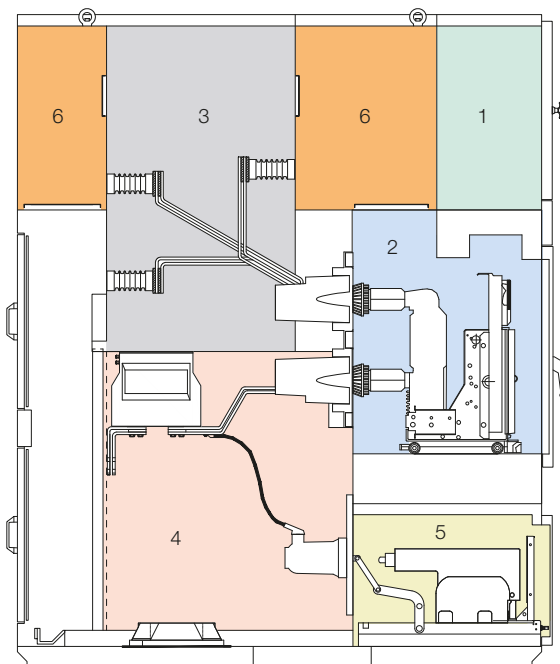


Technical features			
Electrical			
Rated voltage	kV	7.2	17.5
Rated current	A	630 - 1,250 - 1,600 - 2,000 - 2,500 - 3,150 - 4,000	
Rated lightning-impulse withstand voltage (BIL)	kV	60	95
Rated withstand voltage at industrial frequency	kV	20	38
Symmetrical three-phase short-circuit current (Icc) (1s)	kA	40 - 50	
Internal arc testing classification	IAC AFLR 50 kA 1s		
Mechanical			
Protection rating ¹⁾	IP4X		
Height	mm	2,500 (duct for the exit of gases included)	
Width	mm	750 (≤2,000 A)	
		1,000 (2,500 A)	
Depth	mm	2,000 (lower cable inlet/outlet)	
		2,500 (cable entry/exit from the top)	
Approximate weight	kg	1,400 (≤2,000 A)	
		1,900 (≥2,500 A)	
Metal sheet thickness	Structure	mm (MSG)	3.00 (11)
	Cladding		3.00 (11)
	Front door		3.00 (11)
Loss of service continuity class		LSC 2B	
Separation class		PM	
Seismic zone ²⁾		UBC-4 - Horizontal acceleration of 0.6 g and vertical acceleration of 0.36 g	
Ambient temperature		-5 °C...+40 °C	
Installation altitude		Up to 1,000 masl (for higher values, see page 26)	

Notes: 1) Other degrees of protection on request.

2) By means of computer simulation (Modal Analyses).

Compartmentalization



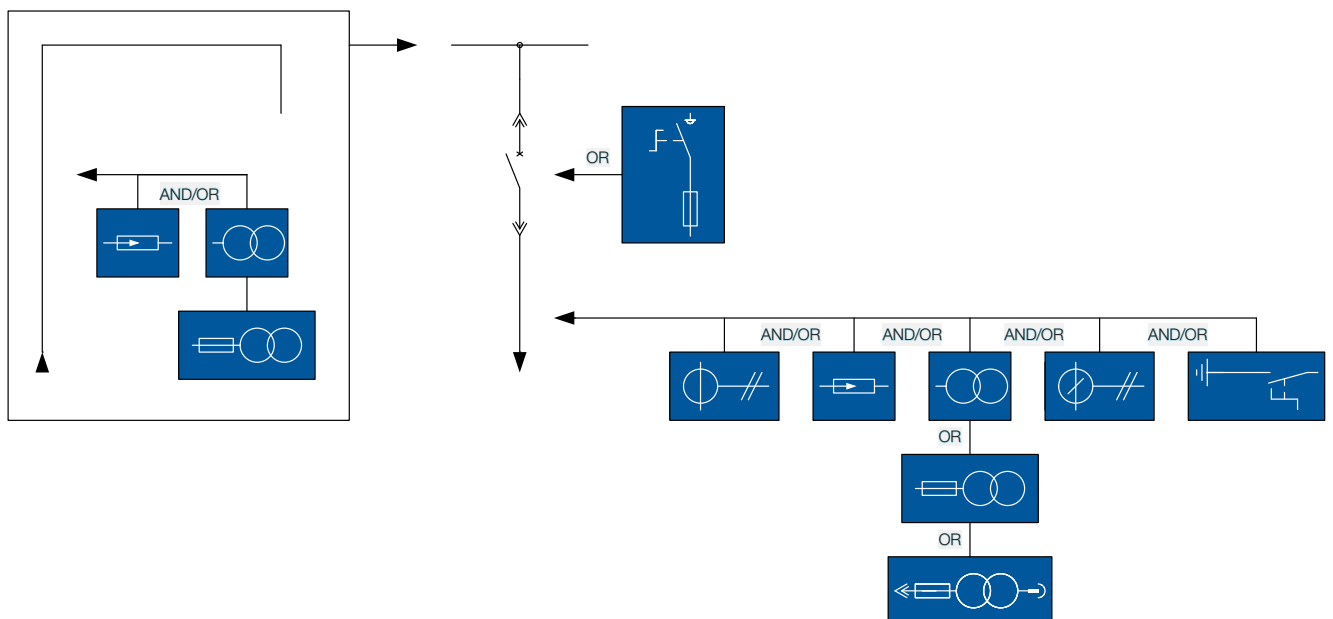
- 1 - Low voltage compartment
- 2 - Circuit breaker compartment
- 3 - Main busbar compartment
- 4 - CT compartment and output cables
- 5 - PT compartment
- 6 - Gas exhaust duct

Dimension



Dimensions (mm)				
Cable entry	Current (A)	Height (X)	Width (Y)	Depth (Z)
Bottom	$\leq 2,000$ A	2,500	750	2,000
	$\geq 2,500$ A		1,000	
Top	$\leq 2,000$ A		750	2,500
	$\geq 2,500$ A		1,000	

Possible configurations



MTW04 switchgear - MV MCC version

- Rated voltage up to 12 kV
- Rated current up to 4,000 A
- Symmetrical three-phase short-circuit current (I_{cc}) 50 kA

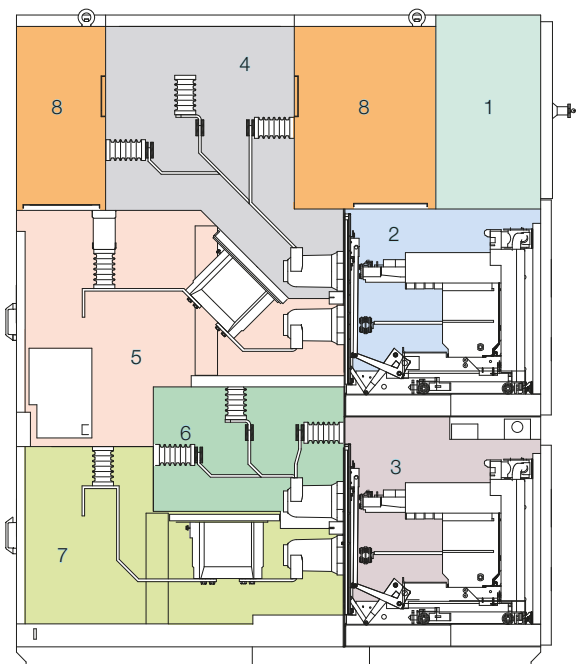


Technical features			
Electrical			
Rated voltage	kV	7.2	12
Rated current	A	630 - 1,250 - 1,600 - 2,000 - 2,500 - 3,150 - 4,000	
Rated lightning-impulse withstand voltage (BIL)	kV	60	75
Rated withstand voltage at industrial frequency	kV	20	38
Symmetrical three-phase short-circuit current (Icc) (1s)	kA	25 - 31.5 - 40 - 50	
Internal arc testing classification	IAC BF ALR 31.5 kA 1s / IAC AFFLR 50 kA 1s		
Mechanical			
Protection rating ¹⁾	IP4X		
Height	mm	2,500 (duct for the exit of gases included)	
Width	mm	900 (for two contactors of 400 A)	
Depth	mm	2,000 (lower cable inlet/outlet)	
		2,200 (cable entry / exit from the top)	
Approximate weight	kg	1,500	
Metal sheet thickness	Structure	mm (MSG)	3.00 (11)
	Cladding		3.00 (11)
	Front door		3.00 (11)
Loss of service continuity class	LSC 2B		
Separation class	PM		
Seismic zone ²⁾	UBC-4 - Horizontal acceleration of 0.6 g and vertical acceleration of 0.36 g		
Ambient temperature	-5 °C...+40 °C		
Installation altitude	Up to 1,000 masl (for higher levels, see page 26)		

Notes: 1) Other degrees of protection on request.

2) By means of computer simulation (Modal Analyses).

Compartmentalization



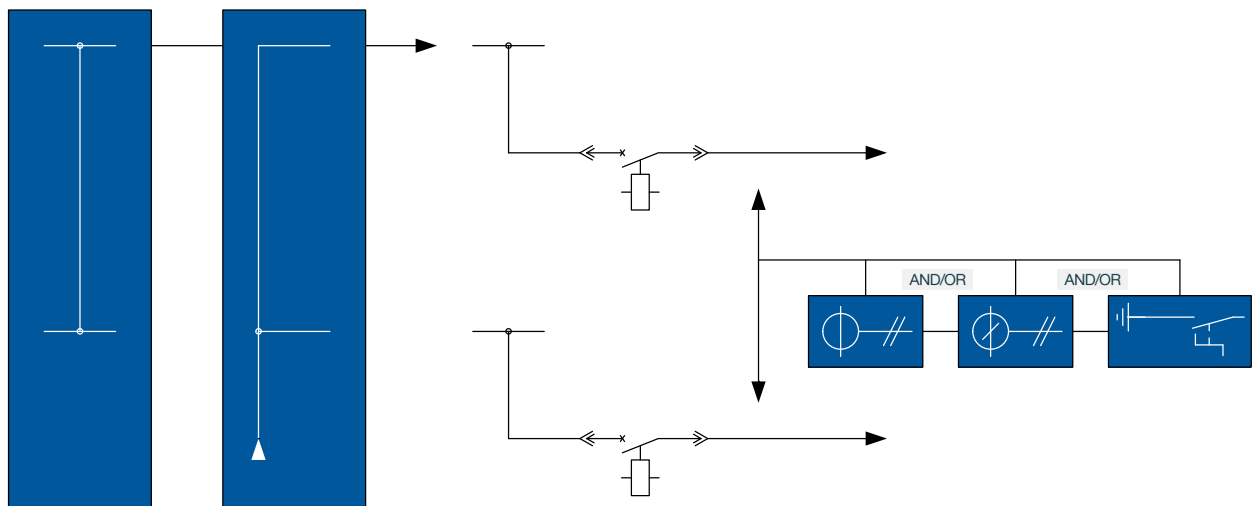
- 1 - Low voltage compartment
- 2 - Contactor compartment 1
- 3 - Contactor compartment 2
- 4 - Main busbar compartment 1
- 5 - CT compartment and output cables 1
- 6 - Main busbar compartment 2
- 7 - CT compartment and output cables 2
- 8 - Gas exhaust duct

Dimension



Dimensions (mm)				
Cable entry	Current (A)	Height (X)	Width (Y)	Depth (Z)
Bottom	≤400 A	2,500	900	2,000
Top	≤400 A		900	2,200

Possible configurations



MTW04 switchgear - 24 kV



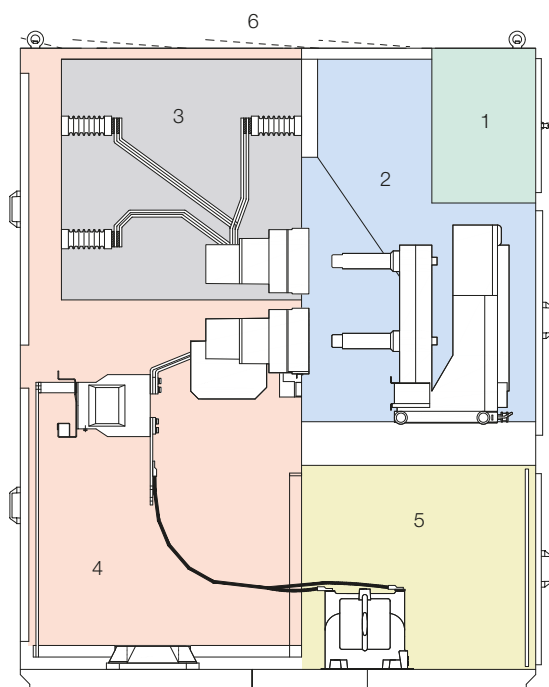
- Rated voltage up to 24 kV
- Rated current up to 1,250 A
- Symmetrical three-phase short-circuit current (I_{cc}) up to 25 kA

Technical features			
Electrical			
Rated voltage	kV	24	
Rated current	A	630 - 1,250	
Rated lightning-impulse withstand voltage (BIL)	kV	125	
Rated withstand voltage at industrial frequency	kV	50	
Symmetrical three-phase short-circuit current (I _{cc}) (1s)	kA	25	
Internal arc testing classification	IAC BF ALR 25 kA 1s		
Mechanical			
Protection rating ¹⁾	IP4X		
Height	mm	2,500 (pressure relief on top)	
		2,850 (with top duct for the exit of gases)	
Width	mm	800	
Depth	mm	2,000	
Approximate weight	kg	2,000	
Metal sheet thickness	Structure	mm (MSG)	1.90 (14)
	Cladding		3.00 (11)
	Front door		3.00 (11)
Loss of service continuity class		LSC 2B	
Separation class		PM	
Seismic zone ²⁾		UBC-4 - Horizontal acceleration of 0.6 g and vertical acceleration of 0.36 g	
Ambient temperature		-5 °C...+40 °C	
Installation altitude		Up to 1,000 masl (for higher values, see page 26)	

Notes: 1) Other degrees of protection on request.

2) By means of computer simulation (Modal Analyses).

Compartmentalization



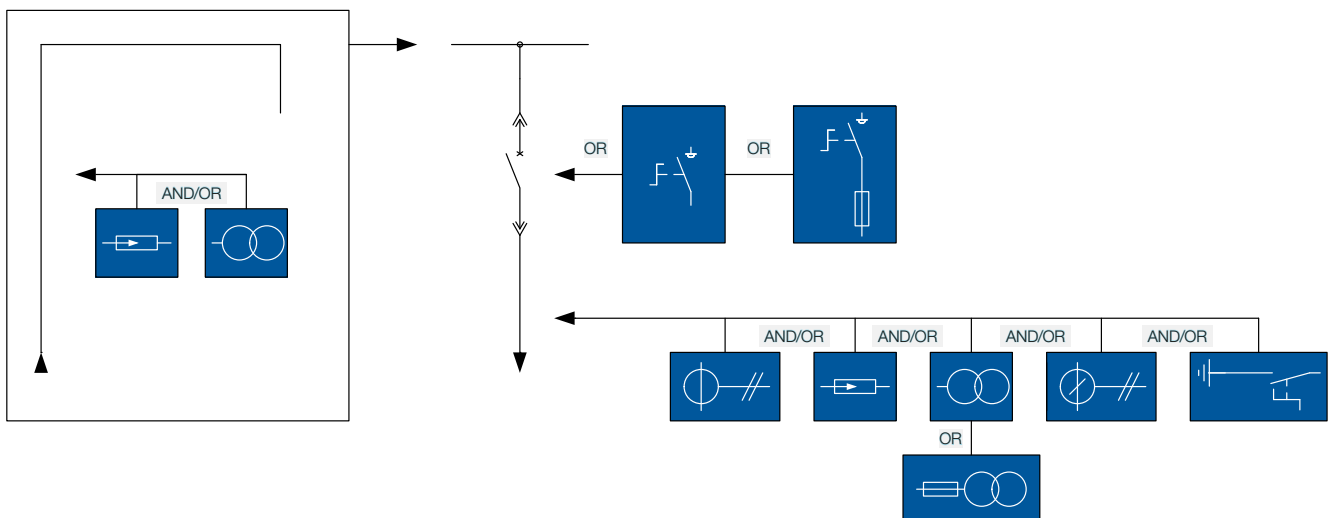
- 1 - Low voltage compartment
- 2 - Circuit breaker compartment
- 3 - Main busbar compartment
- 4 - CT compartment and output cables
- 5 - PT compartment
- 6 - Flaps for evacuation of the gases

Dimension



Dimensions (mm)				
Cable entry	Current (A)	Height (X)	Width (Y)	Depth (Z)
Bottom	1,250 A	2,500	1,200	2,000
Top	≤1,250 A		1,200	2,500

Possible configurations



MTW04 switchgear - 36 kV

- Rated voltage up to 36 kV
- Rated current up to 2,500 A
- Symmetrical three-phase short-circuit current (I_{cc}) up to 31.5 kA



Technical features			
Electrical			
Rated voltage	kV	36	
Rated current	A	630 - 1,250 - 1,600 - 2,000 - 2,500 ¹⁾	
Rated lightning-impulse withstand voltage (BIL)	kV	170	
Rated withstand voltage at industrial frequency	kV	70	
Symmetrical three-phase short-circuit current (I _{cc}) (1s)	kA	25	31.5
Internal arc testing classification		IAC AFLR 25 kA 1s	IAC AFLR 31.5 kA 1s ²⁾
Mechanical			
Protection rating ³⁾	IP4X		
Height	mm	2,750 (pressure relief on top)	
		3,000 (with top duct for the exit of gases)	
Width	mm	1,200	
Depth	mm	2,600	4,200 (with deflector)
Approximate weight	kg	2,200	
Metal sheet thickness	Structure	mm (MSG)	3.00 (11)
	Cladding		3.00 (11)
	Front door		1.90 (14)
Loss of service continuity class	LSC 2B		
Separation class	PM		
Seismic zone ⁴⁾	UBC-4 - Horizontal acceleration of 0.6 g and vertical acceleration of 0.36 g		
Ambient temperature	-5 °C...+40 °C		
Installation altitude	Up to 1,000 masl (for higher values, see page 26)		

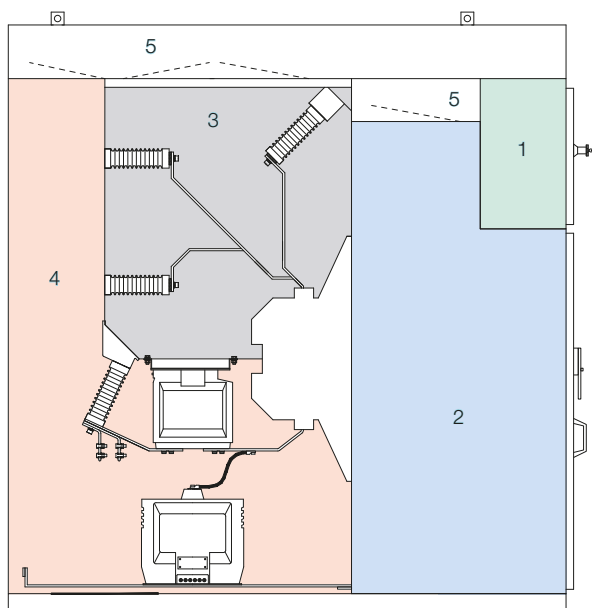
Notes: 1) Other currents on request.

2) Deflector and covers for pressure relief.

3) Other degrees of protection on request.

4) By means of computer simulation (Modal Analyses).

Compartmentalization



- 1 - Low voltage compartment
- 2 - Circuit breaker compartment
- 3 - Main busbar compartment
- 4 - Output cable, PT and CT compartment
- 5 - Flaps/ducts for evacuation of the gases

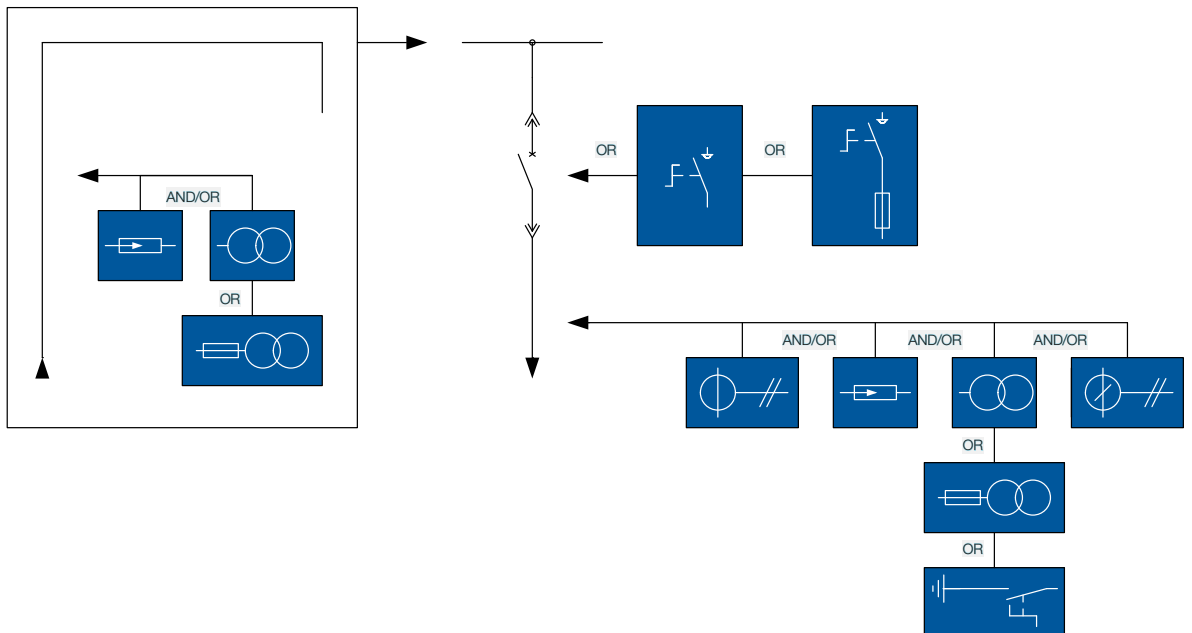
Dimension



Dimensions (mm)					
Cable entry	Icc (kA)	Current (A)	Height (X)	Width (Y)	Depth (Z)
Bottom	25	≤2,500 A	2,750	1,200	2,600
Top		≤2,500 A			2,850
Bottom	31.5	≤2,500 A			2,850 / 4,200 ¹⁾
Top		≤2,500 A			

Note: 1) The 31.5 kA version has a deflector on top, with a total depth of 4,200 mm.

Possible configurations



MTW03 switchgear

- Rated voltage up to 17.5 kV
- Rated current up to 3,150 A
- Symmetrical three-phase short-circuit current (I_{cc}) up to 31.5 kA



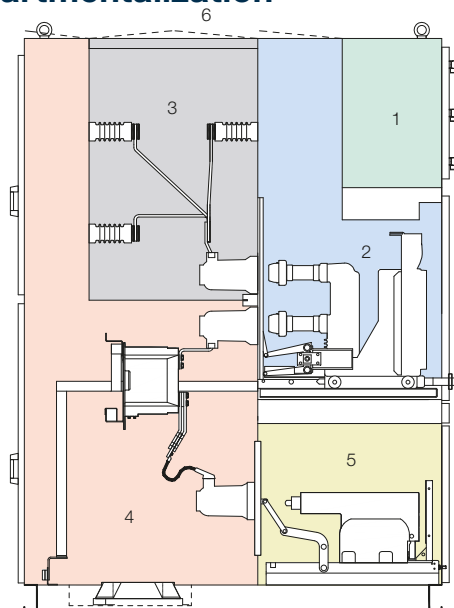
Technical features			
Electrical			
Rated voltage	kV	7.2	17.5
Rated current	A	630 - 1,250 - 1,600 - 2,000 - 2,500 - 3,150	
Rated lightning-impulse withstand voltage (BIL)	kV	60	95
Rated withstand voltage at industrial frequency	kV	20	38
Symmetrical three-phase short-circuit current (Icc) (1s)	kA	25 - 31.5	
Internal arc testing classification	IAC BF ALR 31.5 kA 1s		
Mechanical			
Protection rating ¹⁾	IP4X		
Height	mm	2,300 (pressure relief on top)	
		2,650 (with top duct for the exit of gases)	
Width ²⁾	mm	650 (≤1,250 A)	
		1,000 (≥1,600 A)	
Depth	mm	1,680 (lower cable inlet/outlet)	
		1,980 (cable entry/exit from the top)	
Approximate weight	kg	1,200 (≤1,250 A)	
		1,400 (≥1,600 A)	
Metal sheet thickness	Structure	mm (MSG)	3.00 (11)
	Cladding		2.60 (12)
	Front door		2.60 (12)
Loss of service continuity class		LSC2B and LSC 1	
Separation class		PM	
Seismic zone ³⁾		UBC-4 - Horizontal acceleration of 0.6 g and vertical acceleration of 0.36 g	
Ambient temperature		-5 °C...+40 °C	
Installation altitude		Up to 1,000 masl (for higher values, see page 26)	

Notes: 1) Other degrees of protection on request.

2) For assemblies with disconnector (630 or 1,250 A), width of 1,000 mm.

3) By means of computer simulation (Modal Analyses).

Compartmentalization



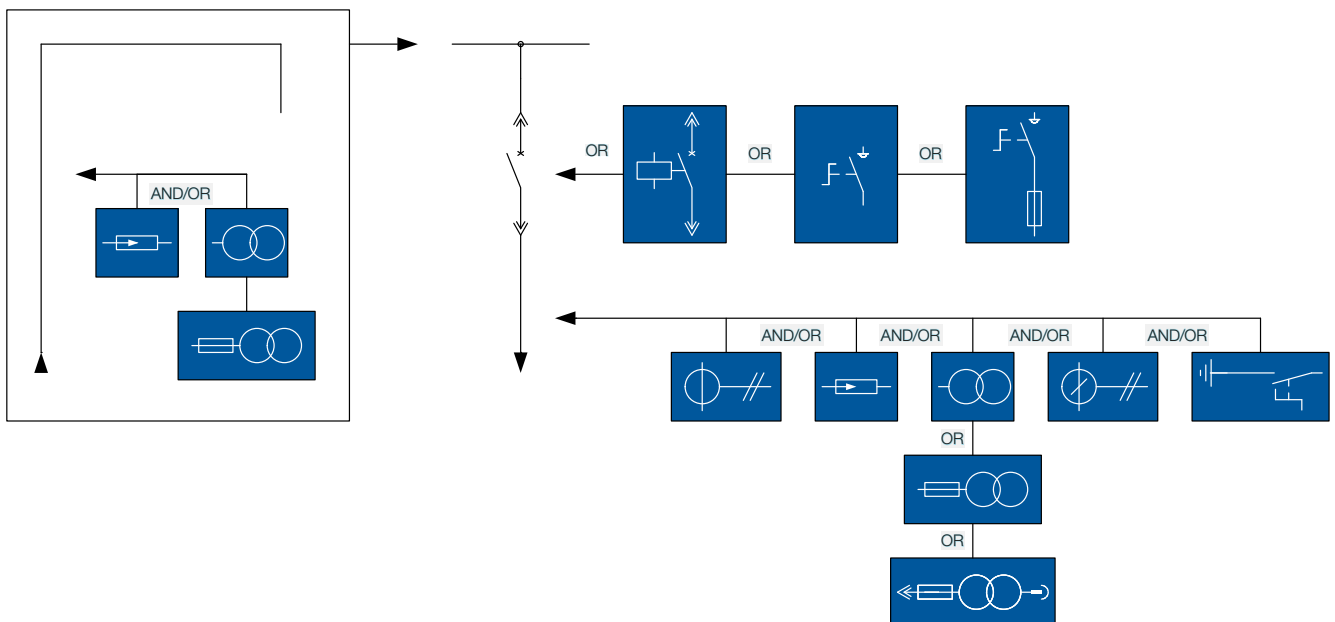
- 1 - Low voltage compartment
- 2 - Circuit breaker/contactors compartment
- 3 - Main busbar compartment
- 4 - CT compartment and output cables
- 5 - PT compartment
- 6 - Flaps for evacuation of the gases

Dimension


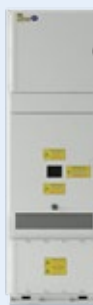





Dimensions (mm)				
Cable entry	Current (A)	Height (X)	Width (Y)	Depth (Z)
Bottom	$\leq 1,250$ A	2,300	650	1,680
	$\geq 1,600$ A		1,000	
Top	$\leq 1,250$ A		650	1,980
	$\geq 1,600$ A		1,000	

Possible configurations



General comparison

Designation	MTW03		MTW04			MTW05	
							
Rated voltage (Vr)							
	7.2	17.5	7.2	17.5	24	36	7.2
Rated current (A)							
	3,150	3,150	4,000	4,000	1,250	2,500	2,500
Symmetrical three-phase short circuit current (Icc) 1s (kA)							
	31.5	31.5	50	50	25	31.5	31.5
Exit of gases due to internal arc	Pressure relief covers (top)		Side duct	Pressure relief covers (top)		Side duct	
Internal arc testing classification	IAC BF ALR		IAC AFLR	IAC BF ALR	IAC AFLR	IAC BF ALR	





CCW07

Medium voltage switchgear
up to 24 kV 20 kA

Versatility and safety for your applications

Compactness, operational safety and modularity are the main features of the CCW07 Medium Voltage Switchgear. These arc resistant and air-insulated cubicles comply with IEC 62271-200 standard. The standardized columns provide great flexibility to economically meet different configurations, topologies and requirements of utility companies.

Main features

- Vacuum or gas circuit breaker, gas-insulated disconnecter (load break operation)
- Three-position disconnecter: open, closed and grounded (with grounding closing capability)
- Compact dimensions: widths of 375, 500, 750 and 1,000 mm
- Easy access to devices (CTs, PTs and lightning arresters)



Benefits



Maintenance-free
switch disconnector



Air insulation from
the other live parts



Possibility of
expansion

Applications

Intended for sheltered or outdoor installations, the CCW07 operates up to 24 kV and is designed for the entry, metering/billing and protection of primary voltage (MV) electrical circuits. Typical applications for the CCW07 include shopping malls, hospitals, hotels, ports, airports, residential buildings, commercial buildings and industries.



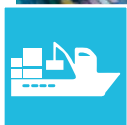
Shopping malls



Hospitals



Hotels



Ports



Airports



Residential buildings



Commercial buildings



Small industries



Technical data

Characteristics				
Rated voltage (Ur)	kV	12	17.5	24
Lightning impulse withstand voltage (UP)	kV	75	95	125
Power frequency withstand voltage (Ud)	kV	28	38	50
Rated frequency (fr)	Hz	50-60		
Rated continuous current (In)	A	630/800 ¹⁾		630
Rated short-time permissible current (Ik)	kA	20 ²⁾		
Rated short circuit duration (tk)	s	1		
Rated peak withstand current (Ip)	kA	63	50	
Protection rating (IP code)				
Metal sheet thickness	Structure	mm (MSG)	1.9 mm (#14)	
	Cladding		1.9 mm (#14)	
	Shield		1.9 mm (#14)	
For enclosure		IP3X ⁴⁾		
For the switch-disconnector command				
Internal arc resistance (IAC)				
Internal arc withstand current (kA)	Duration (s)		Accessible sides ³⁾	
12.5	1		A-FL	
16	1		A-FLR	
21	1		A-FLR	

Notes: 1) 800 A: contact WEG.

2) 21 kA/52.25 kAp: contact WEG.


3) A: restricted to authorized persons; F: Front; L: Side; R: rear.


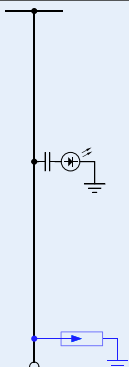
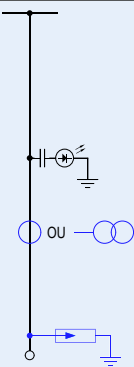
4) Outdoor installation on request.


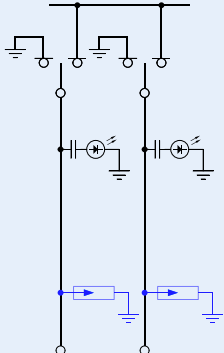
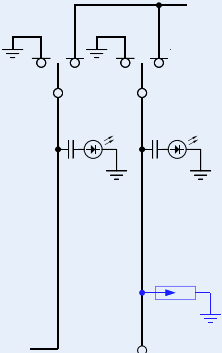
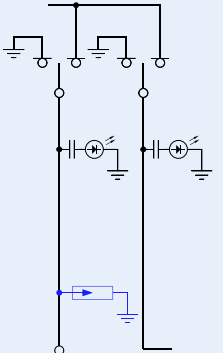
Typical units and dimensions

Acronym	Description	Width				
		190 mm	375 mm	500 mm	750 mm	1,000 mm
ICTL ICTR	Cable entry unit, left/right	✓				
ICB	Cable entry unit - bottom		✓	✓		
ISD	Cable entry unit with double switch-disconnector				✓	
MI MR MU	Incoming/TIE/omega metering unit				✓	✓
BR	Busbar transition unit		✓	✓		
FS	Unit with switch-disconnector		✓	✓	✓	
FSE	Unit with switch-disconnector - input		✓	✓		
FST	Unit with switch-disconnector - TIE		✓	✓		
FIF	Unit with switch-disconnector and fuses		✓	✓	✓	
FIFT	Unit with switch-disconnector and fuses - TIE		✓	✓		
FSMR	Metering unit with switch-disconnector				✓	
FIF+TP	Metering unit with switch-disconnector fuses + PT			✓		
FCBE FCBI FCBU	Unit with circuit breaker and switch-disconnector E = Input; I = Industry; U = Utility Company				✓	
FCBT	Unit with circuit breaker and switch-disconnector - TIE				✓	
FCBT+FS	Unit with circuit breaker and double switch-disconnector - TIE				✓	

Typical units


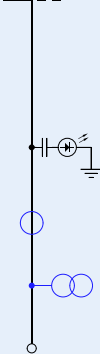
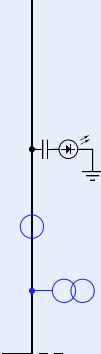
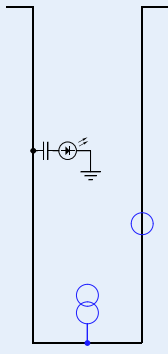
ICTL: Cable entry unit - left ICTR: Cable entry unit - right				ICTL	ICTR
Dimensions and weights ¹⁾					
L (mm)	H (mm)	P (mm)	Weight (kg)		
190	1,700	1,170	80		


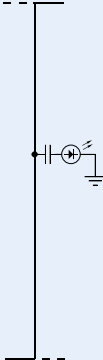
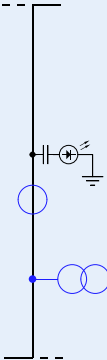
ICB: cable entry unit - bottom					Single line diagram	
Dimensions and weights					L: 375 mm ICB	L: 500 mm ICB + TC / TP
	L (mm)	H (mm)	P (mm)	Weight (kg)		
	375	1,700 2,000	1,170	120		
	500			135		


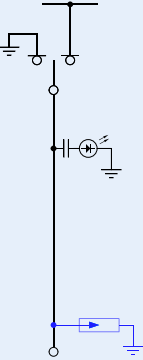
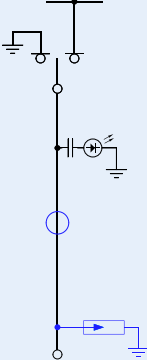
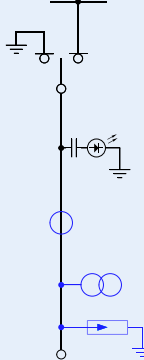
ISD: cable entry unit with double switch-disconnector					Single line diagram		
Dimensions and weights					ISD Double input	ISD TIE left	ISD TIE right
	L (mm)	H (mm)	P (mm)	Weight (kg)			
	750	1,700 2,000	1,170	400			

Note: the colored components refer to optional equipment.

Typical units


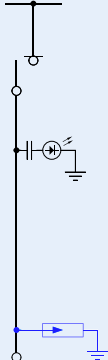
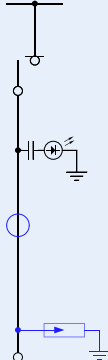
MI: metering unit - incoming MR: metering unit - TIE MU: metering unit - omega					Single line diagram		
Dimensions and weights					MI	MR	MU
	L (mm)	H (mm)	P (mm)	Weight (kg)			
	750	1,700 2,000	1,170	200			
	1,000			230			


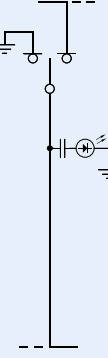
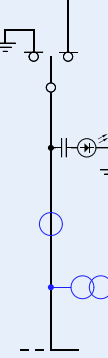
BR: busbar transition unit					Single line diagram	
Dimensions and weights					L: 375 mm BR	L: 500 mm BR + TC + TP
	L (mm)	H (mm)	P (mm)	Weight (kg)		
	375	1,700 2,000	1,170	120		
	500			135		


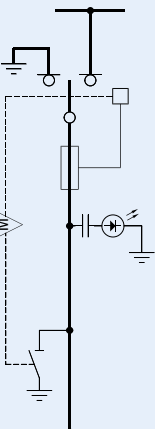
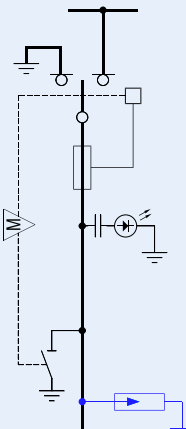
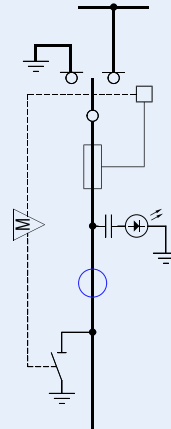
FS: unit with switch-disconnector					Single line diagram		
Dimensions and weights					L: 375 mm FS	L: 500 mm FS + TC / TP	L: 750 mm FS + TC + TP
	L (mm)	H (mm)	P (mm)	Weight (kg)			
	375	1,700 2,000	1,170	140			
	500			160			
	750			185			

Note: the colored components refer to optional equipment.

Typical units


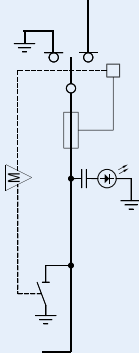
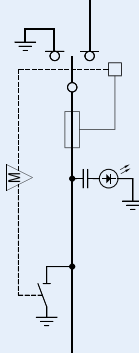
FSE: unit with switch-disconnector - input					Single line diagram	
Dimensions and weights					L: 375 mm FSE	L: 500 mm FSE + TC
	L (mm)	H (mm)	P (mm)	Weight (kg)		
	375	1,700 2,000	1,170	140		
	500			160		


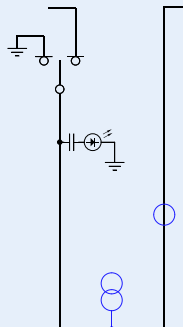
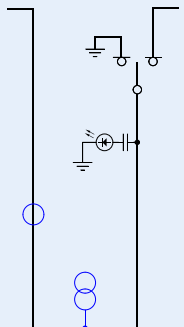
FST: unit with switch-disconnector - TIE					Single line diagram	
Dimensions and weights					L: 375 mm FST	L: 500 mm FST + TC + TP
	L (mm)	H (mm)	P (mm)	Weight (kg)		
	375	1,700 2,000	1,170	145		
	500			165		


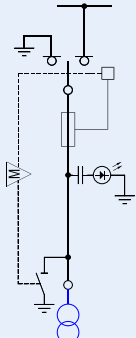
FIF: unit with switch-disconnector and fuses					Single line diagram		
Dimensions and weights					L: 375 mm FIF	L: 500 mm FIF	L: 750 mm FIF + TC
	L (mm)	H (mm)	P (mm)	Weight (kg)			
	375	1,700 2,000	1,170	145			
	500			165			
	750			190			

Note: the colored components refer to optional equipment.

Typical units


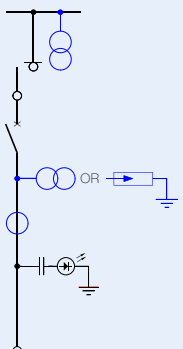
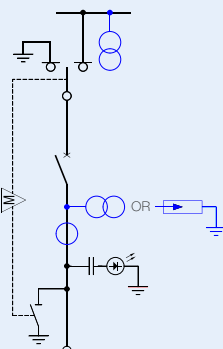
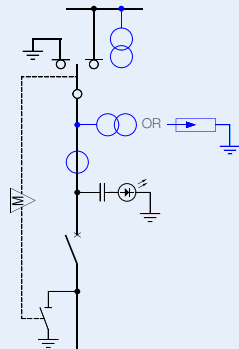
FIFT: unit with switch-disconnector and fuses - TIE					Single line diagram	
Dimensions and weights					L: 375 mm FIFT	L: 500 mm FIFT
	L (mm)	H (mm)	P (mm)	Weight (kg)		
	375	1,700	1,170	155		
	500	2,000		170		


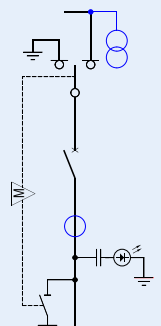
FSMR: metering unit with switch-disconnector					Single line diagram	
Dimensions and weights					FSMR Left switch-disconnector	FSMR Right switch-disconnector
	L (mm)	H (mm)	P (mm)	Weight (kg)		
	750	1,700	1,170	270		


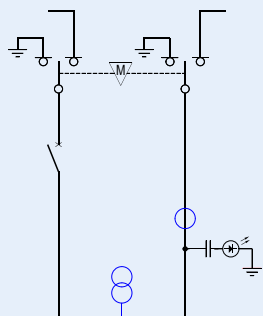
FIF + PT: metering unit with switch-disconnector and fuses + PT					Single line diagram	
Dimensions and weights					FIF + TP	
	L (mm)	H (mm)	P (mm)	Weight (kg)		
	500	1,700	1,170	165		

Note: the colored components refer to optional equipment.

Typical units

FCBE: unit with circuit breaker and switch-disconnector - input FCBI: unit with circuit breaker and switch-disconnector - industrial					Single line diagram		
Dimensions and weights					FCBE	FCBI	FCBU
	L (mm)	H (mm)	P (mm)	Weight (kg)			
	750	1,700 2,000	1,170	335			

FCBT: unit with circuit breaker and switch-disconnector - TIE					Single line diagram		
Dimensions and weights					FCBT		
	L (mm)	H (mm)	P (mm)	Weight (kg)			
	750	1,700 2,000	1,170	355			

FCBT + FS: unit with circuit breaker and double switch-disconnector - TIE					Single line diagram		
Dimensions and weights					FCBT + FS		
	L (mm)	H (mm)	P (mm)	Weight (kg)			
	750	1,700 2,000	1,170	430			

Note: the colored components refer to optional equipment.

Main components

Vacuum circuit breaker VD4/R/L (*)

The VD4/R/L vacuum circuit breakers feature a compact, robust and lightweight design. They use a stored-energy operating mechanism that ensures operating speed independent of the operator. The vacuum interrupter bottles are encapsulated in an insulating material and feature an operating cycle of O-0.3s-CO-15s-CO, requiring no maintenance throughout their service life. They comply with IEC 62271-100 and CEI EN 62271-100 standards.

Standard equipment

- Close button
- Open button
- Operation counter
- Mechanical open/close indicators
- Manual lever for spring charging
- Mechanical indicator for charged/discharged status of the closing springs
- Motor for spring charging

VD4/R/L technical data

Rated voltage	kV	12	17.5	24
Rated frequency	Hz	50/60	50/60	50/60
Rated impulse-withstand voltage	kV	75	95	125
Rated power-frequency withstand voltage	kV	28	38	50
Rated current	A	630	630	630
Breaking capacity	kA	20	20	20
Short circuit duration	s	3	3	3
Pole spacing	mm	230	230	230

SF6 gas switch-disconnector type GSec (*)

The GSec is a three-position load break switch-disconnector (closed - open - grounded). Its enclosure consists of two parts: an upper resin part and a lower stainless-steel part, which provides both metallic shielding and grounding between the main busbar compartment and the cable entry compartment.

This design maintains operator safety during interventions in the cable compartment—such as fuse replacement or cable connection inspection—even when the main busbar remains energized.

The switch-disconnector can be used in combination with withdrawable circuit breakers or with fuses for transformer protection.

Main characteristics

- Rated current of 630 A for the voltages of 12 kV, 17.5 kV and 24 kV
- Load-break capability in all modules
- PM metal partitioning
- Operation up to 3,000 m altitude
- Maintenance-free switch-disconnector

Available accessories

4 line + 4 ground
auxiliary contacts
(standard)



Shunt opening
release (optional)



Shunt closing
release (optional)



Undervoltage
release (optional)



Motor operation
(optional)



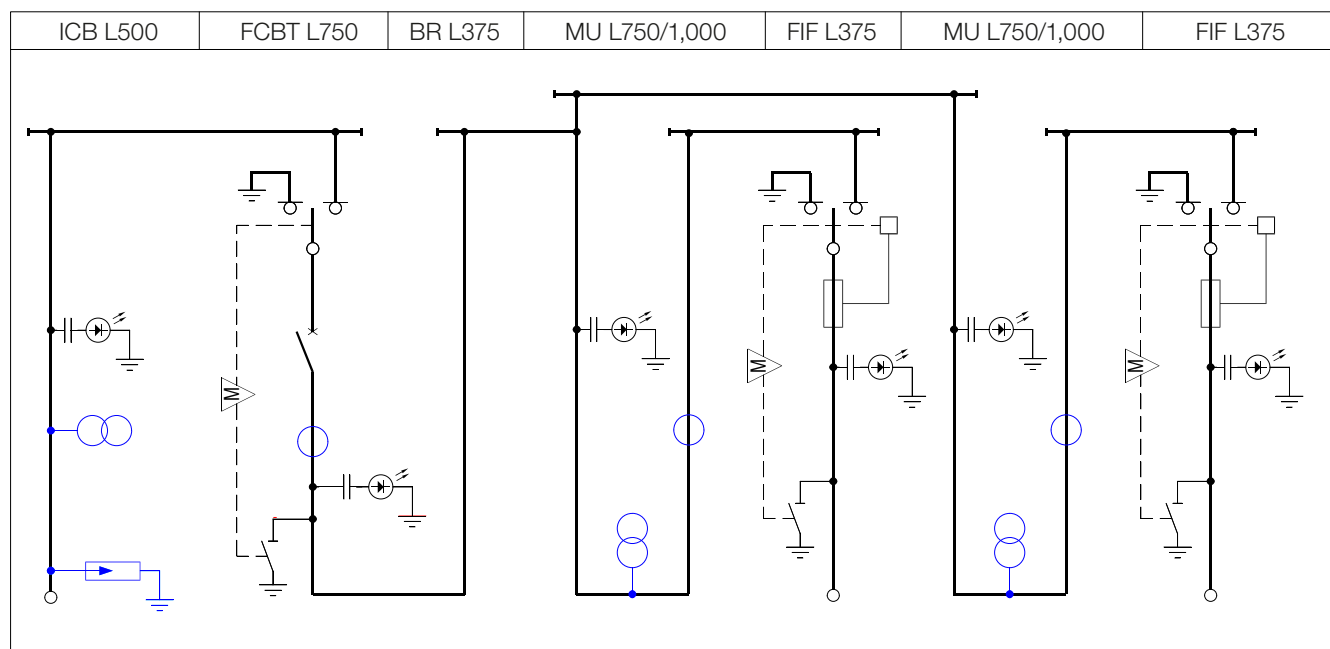
Note: (*) Manufacturer.



Multi-metering

In some medium voltage substations with a single incoming power line, it is necessary to supply more than one consumer unit. Each consumer unit requires individual metering, and switchgear assemblies configured to meet this requirement are known as multi-metering switchgear assemblies. This configuration is commonly found in shopping malls and is designed to serve multiple consumers.

The standard CCW07 units can be configured to meet these requirements:



Note: the colored components refer to optional equipment.

Internal arc resistance

The internal arc resistance requirements defined in IEC 62271-200 are intended to ensure operator safety in the event of an internal arc fault. In practice, arc fault tests are conducted in each compartment using a current level and duration declared by the manufacturer, as well as the accessibility types specified in the test—such as front, lateral and rear access.

The CCW07 switchgear units are designed to meet various internal arc classification applications for accessibility type A (authorized personnel access).

CCW07 classifications

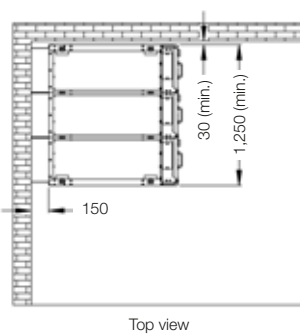
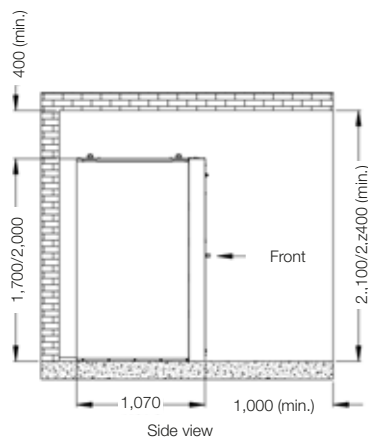
- IAC AFL 12.5 kA 1s ■ IAC AFLR 21 kA 1s
- IAC AFLR 16 kA 1s

Installation information

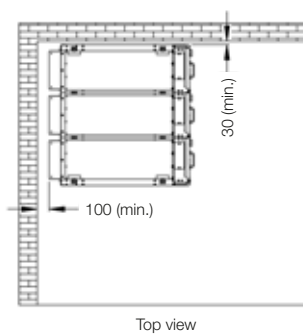
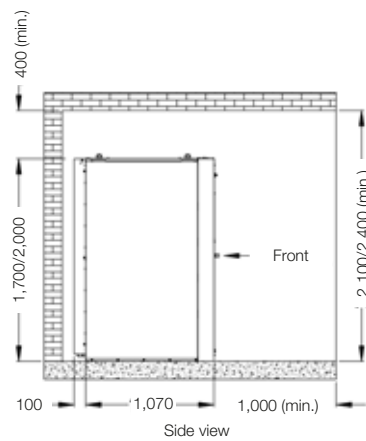
Installation location

The installation site must be prepared according to the dimensions and version of the assembly. Compliance with the recommended distances ensures the correct and safe operation of the equipment.

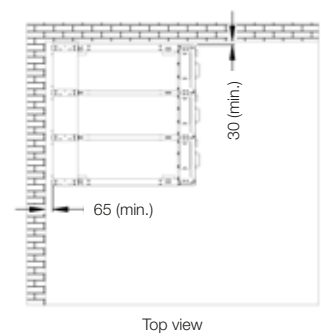
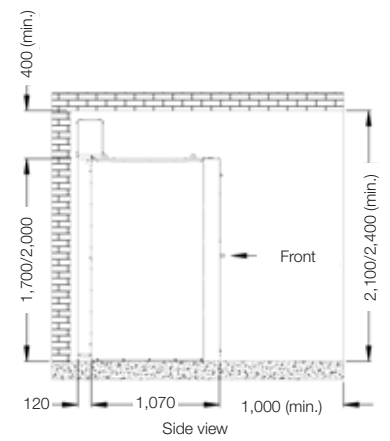
IAC AFL 12.5 kA



IAC AFLR 16 kA



IAC AFLR 21 kA



TTW01

Type tested assemblies

Flexibility and safety in electric energy distribution for your business

Designed for all types of applications, TTW01 panels are suitable for industrial and commercial installations with current ratings up to 5,000 A. Safety, robustness, flexibility and efficiency are key features of this IEC 61439-1/2 compliant design. Manufactured according to the requirements of IEC 61439, WEG panels offer the ideal solution for distribution, protection and control of electrical installations.



Simplified
installation and
operations



Unique reliability
of type-tested
assemblies



Robust and
compact frame



In compliance with
the applicable safety
standards

Design in parts and components

The TTW01 was designed to be supplied in parts and components, divided into four main items:

1. Structures

Manufactured within the strictest quality standards, with steel section frame and metal sheet walls, they are divided into 2 types:



The functional units are protected by modular and standardized enclosures.

For 300 or 700 mm wide columns, the depth may be 600 or 800 mm.

For 850 mm wide columns, the depth is always 800 mm.

Frame, base and top are pre-assembled at the factory, saving time and labor. The 200 mm high base is composed of removable covers, providing flexibility for the routing of incoming/outgoing cables.

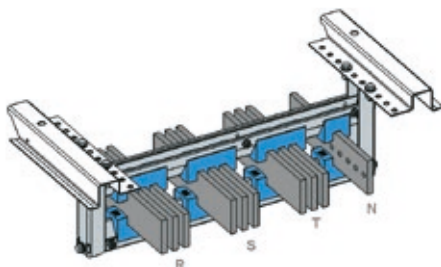
Design in parts and components

2. Busbars

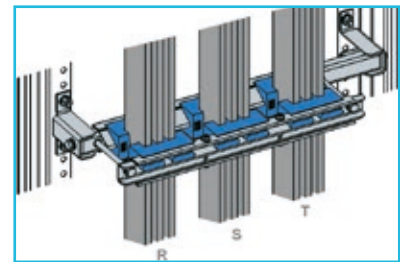
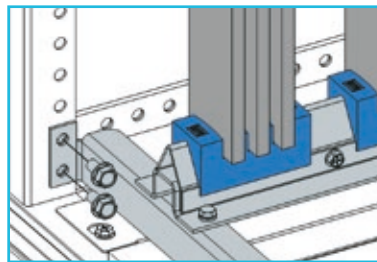
The TTW01 busbars were sized for 1,000, 2,000, 3,150, 4,000 and 5,000 A. The connections between the vertical busbar and the functional units are made without holes, providing a quick and flexible assembly of the set.

The standardization of the busbars observes the following concepts:

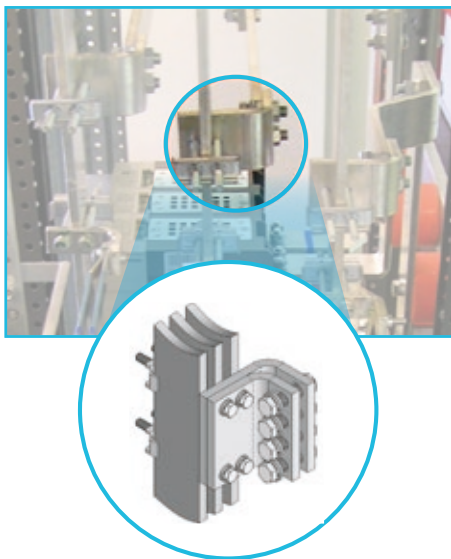
- Connections above 250 A are made via pre-assembled busbars
- Connections equal to or below 250 A via cables made by the TTW panel builder (WEG does not supply the cables)



Main horizontal busbar



Main vertical busbar



Connections to the main busbars do not require holes



Note: the busbars are made of electrolytic copper (99.9% pure) with 8 μ m tin-coating. This coating allows an additional 15 degrees of temperature variation in bar-to-bar connections. This addition to the final busbar temperature increases the performance assurance of the connections. In addition, special care is taken when making the connections. For example, application of paste or a similar product to eliminate the presence of oxygen in copper-to-copper connections, avoiding oxidation. Oxidation on copper creates an insulating film that compromises electrical connections.

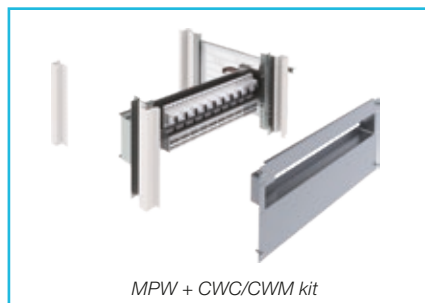
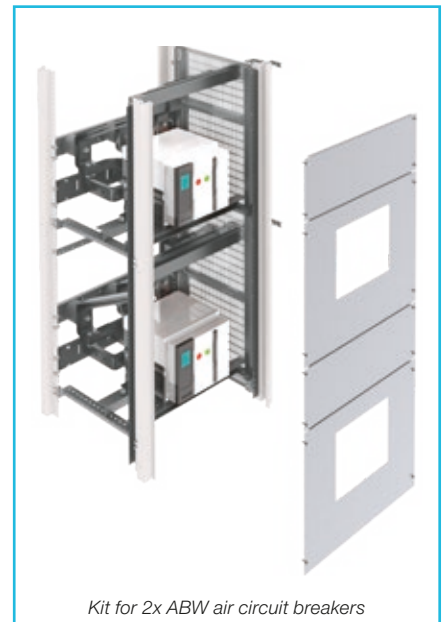
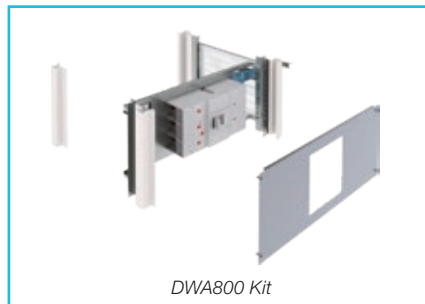
Design in parts and components

3. Mechanical assembly kits and accessories

Several customized arrangements are available for installing controlgear, switchgear and circuit protection devices.

Some configurations available:

- Mounting kits for DWA/DWB circuit breakers mounted vertically and horizontally
- Mounting kits for ACW 100 to 800 circuit breakers
- Blank plates for mounting equipment that does not have standardized kits
- Kits for ABW air circuit breakers in various configurations
- Kits for installing MMW multimeters, PFW01 automatic power factor controllers and other measuring equipment like ammeters and voltmeters
- Motor protection and control assembly kits as described below:
 - MPW16 + CWC7 9, 12, 16
 - MPW25 + CWM9 25, 32
- Mounting kits for lighting circuits and sockets with miniature circuit breakers, surge suppressors and residual current devices
- Dedicated power factor correction kits configured to install capacitors, circuit breakers or fuse-switch-disconnectors and contactors



4. Mounting plate kits

Developed in several sizes, for installing non-standard equipment.



Benefits

Structure and finish

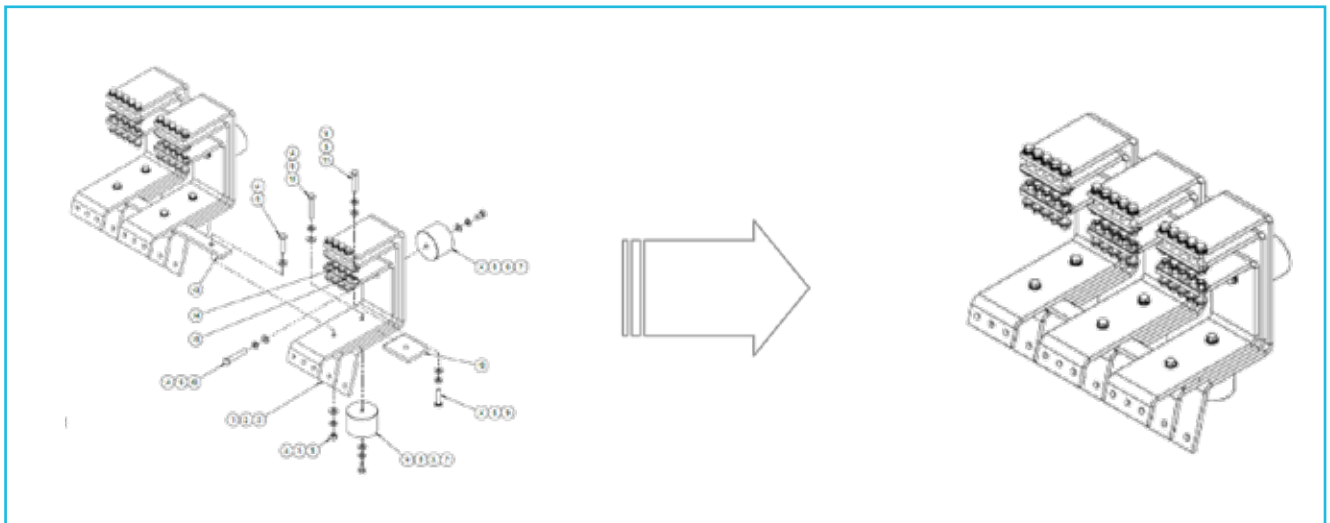
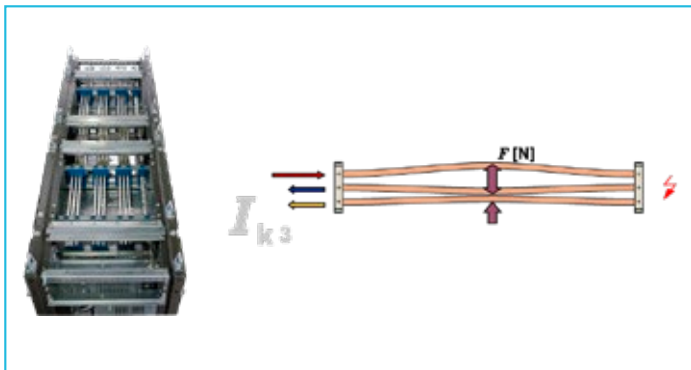
- Frame supplied assembled by WEG: reduced preparation time of the panels for electrical assembly
- Protection rating up to IP55: performance assurance in different environments—commercial and/or industrial
- Modularity and flexibility to choose the best panel size
- Customized mechanical kits for assembling WEG electrical components:
 - Easy and quick installation of the components
 - Shorter assembly time
- Complete mechanical kits composed of brackets, screws, nuts, washers: simple installation without requiring additional assembly materials, reducing costs and assembly time
- Polyester powder coating applied by electrostatic process, minimum thickness of 80 µm: guaranteed quality and durability of the set
- Painting plan according to specific standard requirements—adhesion grade (ISO 16276-2), resistance deionized water immersion (ASTM D870), salt spray test (ASTM B117), resistance to SO₂ (DIN 50018) and Resistance to UV-A (ASTM D4587):
 - Ensures longer service life without peeling or loss of coating over time
 - Panel protected against corrosive agents
 - Excellent protection in industrial environments
 - Ensures panel protection in case of exposure to the sun
- Standard color (RAL 7035) and optional colors Gray RAL 7032, Gray MUNSELL N6.5 and White RAL 9003: flexibility to choose the topcoat color
- Antimicrobial painting: certified according to JIS Z 2801:2012 (Japanese Industrial Standards: Antimicrobial products – Test for antimicrobial activity and efficacy)
 - Ensures the reduction and non-proliferation of microorganisms that can be harmful to humans
 - Application: hospital environments and food processing industries



Benefits

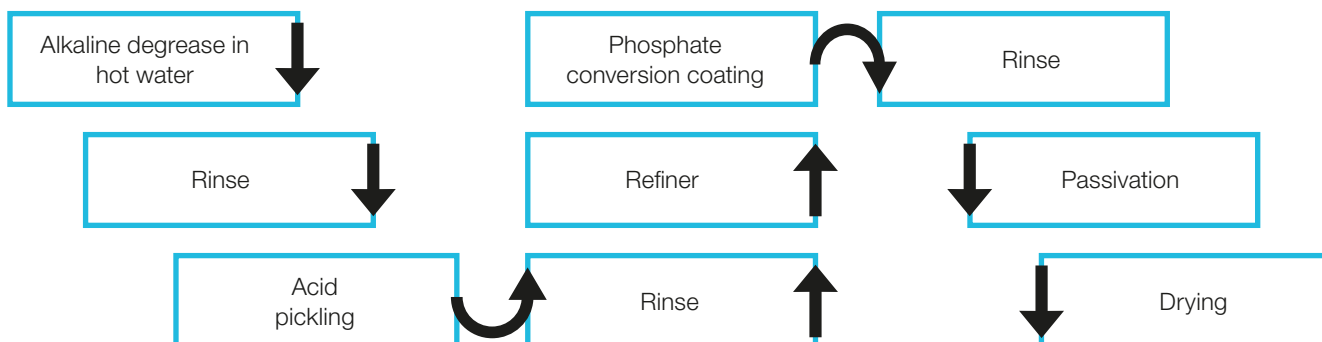
WEG busbar kits

- Tin-coated busbars:
 - Improved performance of electrical connections
 - Prevents copper oxidation
- Customized busbars (holes, bends and the exact dimension for assembly):
 - Eliminates losses and waste during the assembly process
 - Reduces the assembly time by up to 70%
 - Reduces material and labor costs
- Optimized and specially sized insulators and fasteners for the panel
 - Ensures the panel performance against the dynamic effects of short-circuit currents
 - Reduces labor costs



Preparation and topcoat

Executed within strict quality control, it follows the procedure:



The quality, strength and durability of the coating are guaranteed by the following tests:



Adhesion grade

Testing reference and standard: ISO 16276-2
Acceptance criteria: X1Y1
Purpose: identify paint adhesion flaws



Salt spray test

Testing reference and standard: ASTM B117
Acceptance criteria: 500 hours
Purpose: evaluate the paint performance under accelerated corrosion condition



Resistance to SO₂

Testing reference and standard: DIN 50018
Acceptance criteria: 15 cycles / 24 hours
Purpose: evaluate the paint performance in industrial atmospheres



Resistance to immersion in distilled water

Testing reference and standard: ASTM B117
Acceptance criteria: 24 hours
Purpose: evaluate the resistance of the paint in deionized water



Resistance to UV-A

Testing reference and standard: ASTM D4587
Acceptance criteria: 500 hours
Purpose: evaluate the resistance of the painting to sun exposure

Topcoat

Panel type	Structure	Door	Cladding	Assembly kits	Faceplates
Self-supported	RAL 7035	RAL 7035	RAL 7035	Galvanized metal sheet	Aluzinc metal sheet

Note: optional colors: gray RAL 7032, gray Munsell N6.5 and white RAL 9003.

Applications

With innovative technology and modern design, the TTW01 is ideal for your requirements. Its flexible design allows assemblies that meet different electrical system requirements.



Shopping malls



Hospitals



Commercial



Large buildings

TTW01 configurator

As a complementary design tool of the TTW01, WEG developed the TTW01 configurator, which allows sizing all the mechanics of the panel.

Easy to access and use, it is a free tool available on our website to all TTW panel builders.

This configuration software allows the TTW panel builder to design the panel and have a bulletin of materials and a layout of the panel. Thus, errors are eliminated and the characteristics required by standard are maintained.



The TTW configurator is accessed directly on the website www.weg.net.

It is necessary to be a TTW panel builder and be registered in the WEG e-commerce system with the respective login to access the TTW configurator.

When you have finished configuring a TTW panel, the following are available:

- Bulletin of materials - mechanical and electrical parts
- Technical data
- 2D drawings in .dwg
- Transfer of the TTW materials and other electrical components to the e-commerce procurement system. Quote or purchase of these materials

Technical features

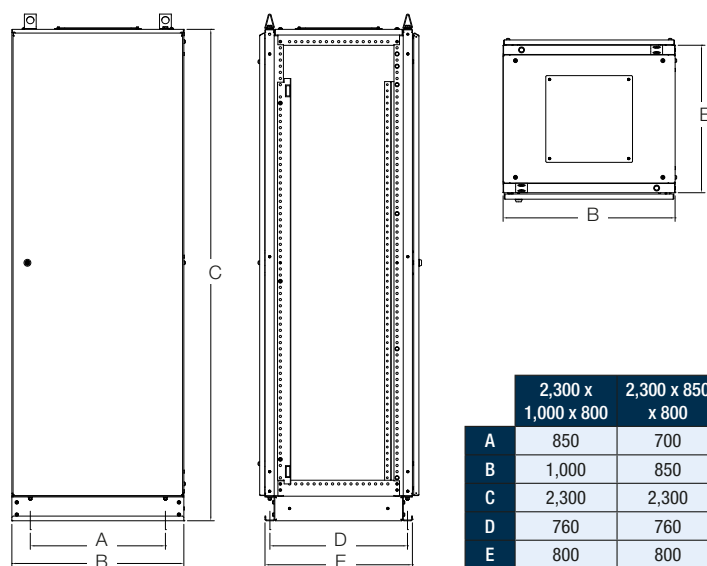
Technical data

Rated insulation voltage (Ui)		1,000 V _{AC}
Rated short-time withstand current (I _{cw})		65 kA rms/1s; 80 kA rms/0.3s
Rated continuous duty current (I _n)		Up to 5,000 A
Access		Front and rear
Internal separation forms		1, 2b and 3b
Dimensions	Width	300, 700, 850 and 1,000 mm
	Depth	600, 800 mm and 1,000 mm
	Height	2,000 mm (with 100 mm base) 2,300 mm (with 100 mm base)
Rated operational voltage (U _e)		220, 380, 440, 460, 69 V _{AC}
Rated impulse withstand voltage (U _{imp}) 1.2/50 μs		Panel with miniature circuit breakers = 4 kV
		Panel with manual motor protector = 6 kV
		Panel with molded-case and air circuit breakers = 8 kV
Dielectric voltage withstand test, 60 Hz 1min		Panel with miniature circuit breakers = 1,890 V
		Panel without miniature circuit breakers = 2,200 V
Applicable standards		IEC 61439-1/2
Topcoat	Frame: epoxy powder coating RAL 7035 (80 μm)	
	Cladding: epoxy powder coating RAL 7035 (80 μm)	
	Internal brackets and faceplates: aluzinc plate	
Protection rating		IP20, IP30, IP42, IP55
Resistance to mechanical shocks		IK10
Ambient temperature		Maximum 40 °C

Plate thicknesses

Panel type	Frame (mm)	Door (mm)	Rear wall (mm)	Side walls (mm)	Internal faceplates (mm)
TTW01 - Coluna H = 2,000 mm	1.5 (16 MSG)	1.9 (14 MSG)	0.9 (20 MSG)	1.5 (16 MSG)	1.5 (16 MSG)
TTW01 - Coluna H = 2,300 mm	1.9 (14 MSG)	1.9 (14 MSG)	0.9 (20 MSG)	1.5 (16 MSG)	0.9 (20 MSG)

Dimensions



	2,300 x 1,000 x 800	2,300 x 850 x 800	2,300 x 700 x 800	2,300 x 300 x 800	2,300 x 700 x 600	2,300 x 300 x 600	2,000 x 700 x 600	2,000 x 300 x 600
A	850	700	550	200	550	200	550	200
B	1,000	850	700	300	700	300	700	300
C	2,300	2,300	2,300	2,300	2,300	2,300	2,000	2,000
D	760	760	760	760	560	560	560	560
E	800	800	800	800	600	600	600	600

LCW

Low voltage Load Centers

Complying with international quality and safety standards, the LCW low voltage Load Centers have been developed to meet market demands for panelboards designed for high current loads, elevated short-circuit levels and compartmentalization of switching and protection devices.

Designed with a high level of standardization, the LCW is equipped with fixed, plug-in, or withdrawable circuit breakers and/or fixed switch-disconnector, allowing for easy assembly, installation, maintenance and future expansions.

Advantages



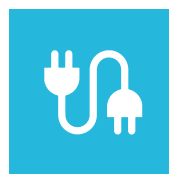
Lower risk of accidents with operators



Fast and easy maintenance



Modular system enables easy expansion



Easy rear access to the electric cable terminals



Greater reliability of the protection system



Applications



Steel &
Metallurgy



Mining &
Cement



Pulp &
Paper



Chemical &
Petrochemical



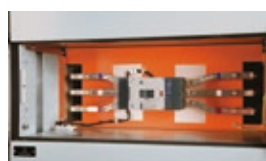
Medium and
large-sized
industries

Protections

- Direct: through the built-in tripping devices of the circuit breakers
- Secondary: through the secondary protection relays and CTs (IECs), which can be connected to network (Modbus, DeviceNet, Profibus, IEC 61850)

Construction features

- The compartments for molded-case circuit breaker are classified by current and size
- Space at the rear for accessories (current transformers)
- Control busbars are housed in independent compartments in the upper part
- Opening of the doors up to 180°
- General supply can be in the upper or lower part
- Equipment for electrical measurements is housed in independent compartments
- Main horizontal and vertical busbars are fastened by means of insulating plates of high mechanical and electrical strength
- Independent neutral (optional) and ground busbar
- Internal shields with degree of protection at least IP2X
- The panel has a vertical channel to route control cables
- Each compartment has independent lateral supply cable exits
- The copper bars can be epoxy-coated all along their length (optional)
- Access to the horizontal busbars through the top cover or rear door



- Specific channel for control cables
- Upper compartment for control bars



- Gas expansion duct for special applications



Technical features

Electrical	Rated voltage	1,000 V
	Frequency	50/60 Hz
	Ambient temperature	40 °C (other temperatures on request)
	Cable entries and exits	Top/bottom
	Admissible rated short-time withstand current (1s)	50, 65 and 80 kA (on request)
	TTA tests	As per IEC 60439-1
	Rated currents	Main busbars up to 6,300 A and vertical busbars up to 3,200 A
	Busbar treatment	Tin-plated (standard) and others on request
	Busbar insulation	Bare copper (standard), epoxy or heat shrink (optional)
	Special tests	Internal arc 65 kA (IEC 61641:2008)
	Optional accessory components	Skid base - Hand rail - Arc and temperature monitoring
Mechanical	Maximum altitude	2,000 meters above sea level ¹⁾
	Basic insulation level (BIL)	12 kV
	Protection rating	IP42 (others on request)
	Installation	Sheltered
	Metal sheet thickness	Structure: 12 MSG Doors: 14 MSG Cladding/shields: 14 MSG Mounting base: 11 MSG
	Column dimensions (mm)	Height: 2,300 Width: 600 to 1,400 Depth: 800 to 1,200
	Internal separation form	4B

Note: 1) Meters above sea level.

Compartmentalized functional units

The useful space available in a column for partitioning (fixed units) is 1,800 mm high, and it can be divided as per the table below:

Compartment	Maximum number	Height (mm)
LC - 200	9	200
LC - 300	6	300
LC - 400	4	400
LC - 600	3	600
LC - 800	2	800
LC - 1,800	1	1,800



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[illegible]



Global presence

is essential, as much
as understanding
your needs.

Global Presence

With more than 47,000 employees worldwide, WEG is one of the largest electric motors, electronic equipments and systems manufacturers. We are constantly expanding our portfolio of products and services with expertise and market knowledge. We create integrated and customized solutions ranging from innovative products to complete after-sales service.

WEG's know-how guarantees our **Electrical Panels** are the right choice for your application and business, assuring safety, efficiency and reliability.



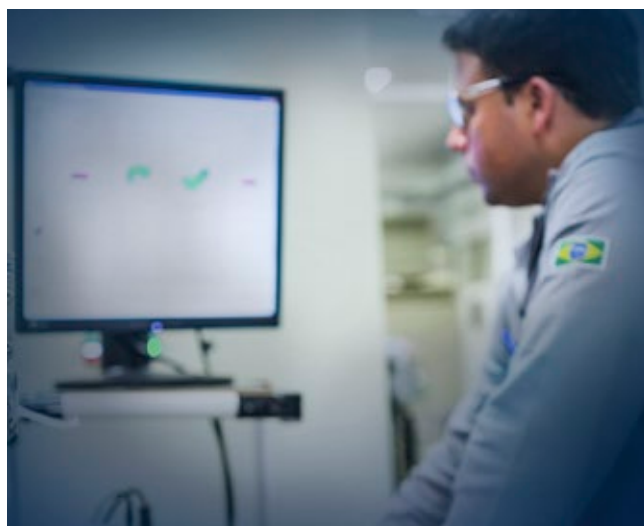
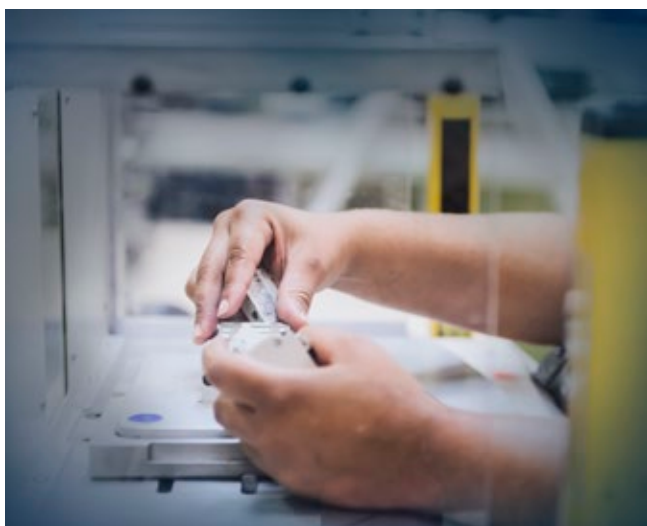
Availability is to have a global support network



Partnership is to create solutions that suits your needs



Competitive edge is to unite technology and innovation



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The values shown are subject to change without prior notice.
The information contained is reference values.