



## Switchgear and Control Systems

Caterpillar offers a range of integrated switchgear solutions, from standard floor standing LV ACB's breakers 1600A – 5000A to custom solutions. These can include multiple utility sources with multiple generator paralleling applications where complex control philosophies are employed

Our modular LV switchgear enclosure "MSX" (Modularzig Switchgear fleXible) range integrates controls and PLC solutions. Built around 150 mm modules in 3 axes, internally the framework utilises a 25 mm grid allowing a fully configurable system. Enclosure options include form 4 separation, IP54 protection and high ambient capabilities.

### Independently Tested

The MSX switchgear has been independently tested and conforms to the international low voltage switchboard standard IEC 61439-2:2011. It supports a high short circuit fault rating up to 100 kA  $I_{cw}$  for 1 sec and 100 kA  $I_{cc}$ , suitable for demanding primary distribution applications. Assemblies have been temperature rise tested, which also includes both natural and forced air solutions.

MV switchgear and alternator solutions are also available. Typically, MV supplies at 11/12 kV – 200/630A applications can be packaged complete with installed MV cabling.

### A Turnkey Optimised Solution

The complete integrated package can be factory witness tested, thus benefiting the customer with a turnkey optimised solution when delivered to site.

## Technical Summary

Configuration	Modular system enables any configuration Distribution Boards, Motor Control Centers & PLC Control cabinets. Accommodates fixed or withdrawable breakers.
Modes of Operation	Switchgear integration options for multi generator and utility synchronising, load sharing, peak lopping/shaving, AMF, changeover, load bank connection, protection relay etc.
Application	LV 380...480 VAC, 50 Hz, 3-Phase. MV 11 kV, 12 kV to match typical alternators complete with VT sensing.

## Environmental Parameters

Enclosure Rating	IP22 with IP54 option
Operating Temperature	35 °C / 40°C @ 1 hr, option for 0...50°C (32...122°F).
Storage Temperature	-20...60°C (-4...140°F).

## Dimensions

Standard LV switchboard, MSX framework.

- **Standard widths**
  - 600 mm for ABB Emax2 E2 1600 – 2500A
  - 750 mm for ABB Emax2 E4 3200 – 4000A
  - 200 mm for ABB Emax2 E6 4000 – 6300A.
- **Standard heights**

Heights include 100 mm plinth with fork lift pockets.

  - 1900 mm up to 3200A
  - 2200 mm for 5000A
  - 2200 mm for PLC and control cabinets
- **Standard depths**
  - 300, 450 & 750 mm for controls and PLC cabinets
  - 900 mm for fixed breakers
  - 1050 mm for withdrawable breakers.
- **Custom sizes**
  - 2350 mm high for integrated switchboard control sections
  - Two or three section, max for shipping 2400 mm wide.

## Features and Benefits:

- Independently certified to meet IEC 61439-2:2011 international standard.
- Standard ACB breaker range 1600A – 5000A CE & EAC marked
- Standard air circuit breaker fault rating 65 kA ( $I_{cc}$ ), option for 100 kA ( $I_{cc}$ )
- Certified assembly high fault rating option, tested up to 100 kA ( $I_{cw}$ ) for 1s  $I_{cw}$
- Certified standard temperature rise tested
- Design verification to Annex D of IEC 61439-2:2011
- Smaller footprint matched to the generator packaged design
- Innovative cableway management
- Modularity:
  - o Built around 150 mm modules in 3 axes
  - o Framework utilises a 25 mm grid allowing a fully configurable system
  - o Easy to extend and upgrade
- Copper HDHC:
  - o Standard 10 mm copper with 10 mm spacing improves heat rejection
  - o Stainless steel mounted busbar supports,
  - o Fully tinned option
- Breaker options:
  - o Accommodates fixed or withdrawable breakers
  - o 3 or 4 pole option
  - o Manual or motorized option
  - o ACB door selection option
- Enclosure options:
  - o Options up to Form 4b separation
  - o Configurable for top or bottom entry
  - o Plinth with pallet truck pockets fitted as standard
  - o IP54 protection option
  - o High ambient option
  - o Option to integrate generator control CT's & PLC optio
  - o Colour RAL 9001 white powder coated finish
- In house routine testing and integrated factory witness test
- Rating plate
- Cat warranty

## Equipment:

### Standard Equipment

- ABB Emax2 ACB's

### Optional Equipment

- Motor control and monitoring
- Protection relays
- Surge protection
- Generator controllers
- Cooling fans.

Information contained in this publication may be considered confidential. Discretion is recommended when distributing.

Materials and specifications are subject to change without notice.

CAT, CATERPILLAR, LET'S DO THE WORK, their respective logos, "Caterpillar Yellow," the "Power Edge" and Cat "Modern Hex" trade dress as well as corporate and product identity used herein, are trademarks of Caterpillar and may not be used without permission.