xEnergy - LV Switchgear & MCC

XEnergy make up a product family that cover the entire range of applications, but with focus on Power Distribution and Motor Control respectively. The xEnergy platforms are fully scalable and complementary, enabling you to create a fit-for-purpose low voltage system comprising entirely Eaton components.

XEnergy is Eaton's IEC high-performance Motor Control and distribution center up to 6300 A. The system provides reliable motor control and power distribution functionality for applications that have the highest requirement for reliability and safety. xEnergy is a reliable solution for applications where the motor control is vital.

Basic Design

xEnergy is modular in construction. It is a self - supporting sheetsteel structure, consisting of profiles and sheet - steel side walls and covers.

The xEnergy panels have three major sections:

1. **The busbar section**
   The fully segregated main busbar chamber can be located in the back (top/ bottom position) of the structure or available as a top configuration (top/ middle/ bottom position).
2. **The cabling section**
   Located in a separate fully segregated cable chamber at the rear or besides the equipment section.
3. **The equipment section**
   Located at the front where the functional units are fitted.

The system is designed for 'front cable access' for applications where the panels must be located adjacent to a rear wall.

Alternatively the system can be arranged for rear access, a 'single line of structures' giving all around access to panels for operation and cabling.

Arrangements for 'back to back' configurations are possible.

Busbar Back Configuration

Distribution Panel (example)
Busbar Back Design

1. Outgoing Cable Connection Compartment
2. Main Incoming Feeder Unit
3. Flushed key lockable door handles
4. Mounting Plinth
5. High Density Outgoing Feeder
6. Outgoing Cable Connection Compartment
7. Outgoing Feeder
8. Empty Compartment
9. Ventilation

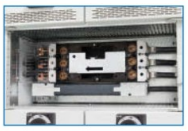
Busbar Top Configuration

Distribution Panel (example)
Busbar Top Design

1. Main Busbars
2. Incoming or Outgoing Feeder Unit
3. Outgoing Feeder
4. Main Busbars
5. Riser panel
6. Mounting Plinth

NRX Air Circuit Breakers.

NZM2 circuit breaker with removable neutral link.



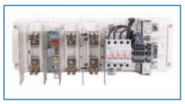
Plug-in adapter.

Power Sections

- Incoming, outgoing and bus coupling solutions
- Air Circuit Breakers, Moulded Case Circuit Breakers and Switch Disconnectors
- Safety due to internal separation up to Form 4
- Flexibility by choice of cable and busbar trunking connection from the top or bottom

Fixed Outgoing Sections

- Power Distribution feeders with NZM circuit breakers up to 630A
- Internal separation ranging from Form 2b up to Form 4b (type 6 and 7)
- Toggle and rotary operation
- Available with Plug-in adapter



Fused Combination Switch, QSA 400A, Form 4a compartment.

Withdrawable compartment.

15 kW DOL Motor Starter.

Removable Outgoing Sections

Busbar Back configuration only

- Power Distribution feeders with removable NZM circuit breakers and QSA Fused Combination Switches up to 630 A
- Internal separation up to Form 4
- Easy maintenance and reduced down times

Withdrawable Outgoing Sections

- Power distribution feeders with NZM circuit breakers up to 630 A
- Motor starters up to 250 KW
- Drawers can be replaced under live-line working conditions ensuring minimum down times
- Internal separation up to Form 4
- Remote monitoring and control with Smart-Wire DT and C440 based communicating solutions

SmartWire DT - Connectivity

Eaton's SmartWire-DT communication system is used in xEnergy to record information from motor starters, soft starters and variable frequency drives. The retrieved information is transferred via standard fieldbus protocols to the higher-level PLC. In a power distribution assembly SmartWire -DT collects all relevant breaker information in BreakerVisu.

Thanks to the use of intelligent SmartWire-DT switchgear, this not only consists of digital signals for switching or monitoring of positions or overload information but also analogue values such as the actual current or the condition of a trip unit can be determined and evaluated.

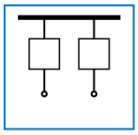
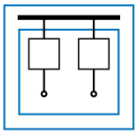
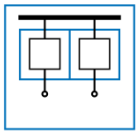
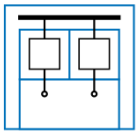
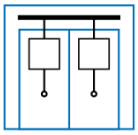
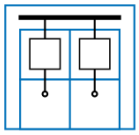
Form of Internal Separation

xEnergy panels are designed around three different areas:

1. The main busbar and distribution busbar section segregated from the equipment section.
2. The cabling section located in a separate fully segregated cable chamber for feeding cables to the functional sections and/or housing control and power cable terminations, depending on the form of
3. The equipment section at the front where the functional units are fitted.

IEC 61439-2 defines the various forms of internal separation. The form of internal separation determines how busbars, functional units and terminals are separated from each other. xEnergy is designed to provide separation in Form 2b, 3b, 4a and 4b solutions.

Internal separation in accordance with IEC 61439-2

	 Form 1	 Form 2b	 Form 3a	 Form 3b	 Form 4a*	 Form 4b*
Busbars (main + distribution) are separated from functional units		✓	✓	✓	✓	✓
Functional units are separated from other functional units			✓	✓	✓	✓
Terminals are external to functional units			✓	✓		✓
Terminations to functional units are separated from each other			✓		✓	✓
Terminals are separated from the busbars		✓		✓	✓	✓

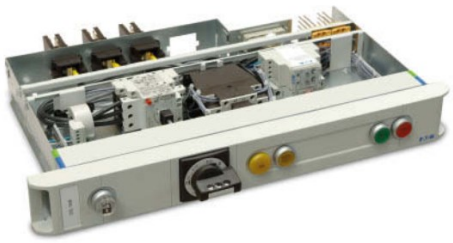
Draw out units

The outgoing units are available in the following heights based on a 75 mm height pitch:

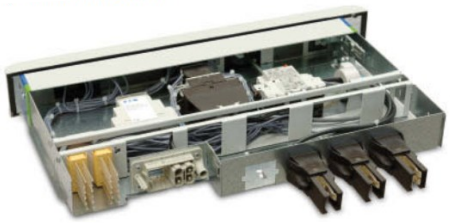
Height of unit	Motor Starter	Feeder
75 mm	15 kW	32 A
150 mm	45 kW	175 A
225 mm	75 kW	200 A
300 mm	90 kW	225 A
450 mm	160 kW	400 A
600 mm	200 kW	630 A
750 mm	250 kW	NA

The units connect directly to the distribution bars and can be additionally protected by an optional automatic shutter. The design of the unit enables auxiliary components to be located in an optimized way because of the innovative use of Eaton's patented DIN Mounting Rail. This allows for maximum usage of the compartment space, enabling a very easy and flexible way to upgrade or make additions to the withdrawable units.The cable connections for main and auxiliary circuits are accessible through the cableway in either a Form 3b or 4b separation solution.

All the withdrawable units are available for distribution and motor control functionality. Up to 25 drawers of 75 mm can be installed in one panel to reduce footprint and maximize density.

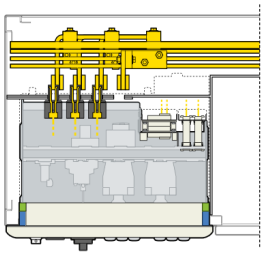


Front view of a withdrawable motor starter unit up to 15 kW

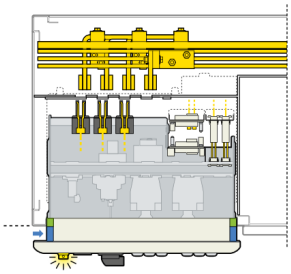


Rear view of a withdrawable motor starter unit up to 15 kW

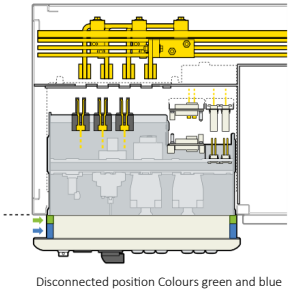
Unique Mechanical Test Position of MCC Withdrawable Units



Connected position - ON



Test position Test button is illuminated and colour blue visible.



Disconnected position Colours green and blue are visible.

Technical Data

Standards/regulations		IEC/EN 60439-1, IEC/EN 61439-2, TR61641, DEKRA (KEMA)
Apply Cu according to		EN 13601-CU-ETP-R250-SH
Ambient temperature	°C	50
Relative humidity	%	50 at 40°C
Protective measure		Protection class I
Degree of protection 1)		IP31, IP42, IP55 according to IEC/EN 60529, IK10
Rated insulation voltage Ui	V	1000
Rated voltage Ue	V	690
Insulation coordination		III/3
Rated impulse withstand voltage Uimp	kV	up to 12
Overvoltage category		IV
Degree of pollution		3
Rated frequency	Hz	40-60
Busbar rated current Ie	A	Up to 5500
Busbar rated impulse withstand current Icw	kA	up to 100 (1s)
Busbar rated peak withstand current Ipk	kA	up to 220
Sheet thickness	mm	Door and frame = 2, rear, side and top panels = 1.5 Metal surfaces Powder-coated
Color		RAL 7035 , other color as by request
Lock mechanism		Espagnolette lock with 2 or 4 point locking and turn-lock 3 mm two-way key bit
Main Busbar Design		Top - Rear, Bottom - Rear, Top - Above
Structure Design		Single, double - front, back to back assembly
Dimensions	mm	Width: 425 – 1350 Height: 2000, 2200, 2400 (optional 100 or 200 mm with plinth) Depth: 400, 600, 800, 1000
Cable Entry		Bottom or Top Entry