

Power Xpert CXH™

Motor control and power distribution center

Delivering the reliability
you expect and the
safety you deserve



EATON

Powering Business Worldwide

A high-performance solution for low

Eaton's Power Xpert CXH™ IEC motor control and power distribution center is designed for your most critical applications. At Eaton, our focus is on developing the latest in motor control and protection technologies that optimize the performance of your process, while keeping your personnel and equipment safe from harm.



With the Power Xpert CXH motor control center (MCC), we showcase the power of Eaton's heritage of expertise and industry-leading control and protection component technology. This feature-rich MCC ensures minimum process interruptions and promises increased reliability.

The CXH was designed to be fully scalable, enabling you to create a fit-for-purpose low voltage switchgear system. With ratings up to 6300 A, this system provides reliable power distribution and motor control for industrial applications.



With this new design, Eaton now offers a global platform built to one-design standard in our manufacturing facilities around the world. This model gives us the ability to meet challenging delivery times and offer enhanced global support and service wherever you need it. It also enables you to standardize on one product platform across your global enterprise, enabling consistency that simplify your processes, including procurement. You can also use the same operation and maintenance procedures, reducing spare part inventory requirements.



Best-in-class testing program

No matter where the system is manufactured around the world, rigorous testing is standard. Beginning in the design phase, the CXH has been type tested to all relevant IEC standards. As a part of the testing control plan, each individual assembly, including all cubicles, circuit breakers, control and logic components and current transformers are

tested during manufacturing and again at the end of production for proper function. In addition, all manufacturing processes in Eaton's ISO 9001 certified locations are in accordance with DIN EN 9001. Once the entire installation has been assembled, a further visual inspection is carried out, together with mechanical, functional and electrical testing.

voltage motor control and power distribution

Basic design

The construction of the Power Xpert CXH MCC is modular in nature. It is built custom to application parameters and has a broad feature-set that can be tailored to meet your reliability and safety requirements.

The CXH platform has three major sections:

- **The busbar compartment**
Located at the top of the structure where the horizontal and vertical busbars are found.
- **The equipment section**
At the front where the functional units are fitted.
- **The cabling section**
Located in a separate fully segregated cable chamber housing both control and power cable terminations.

The CXH is designed for added flexibility. The system can be placed in the middle of a switch room, either as a 'single line of structures' giving all around access to panels and cabling, or flush against a wall (a 10 cm clearance is required for ventilation).



9



8



1. Air circuit breaker (ACB) incoming section
2. Main busbar compartment
3. Cabling section
4. MCC section
5. Distribution section
6. High density drawers
7. Standard drawers
8. Horizontal wireway
9. Power Xpert C445 motor management relay

Safety first



With proven technologies that offer best-in-class safety of operation and maintenance, the Power Xpert CXH MCC is designed with safety in mind.

Arc flash hazards are among one of the many safety concerns faced in industrial environments. When it comes to protecting your personnel, equipment and process, you don't want to simply mitigate the risk of injury, you want to prevent it.

To that end, the CXH was designed to prevent arc flash hazards, going far beyond the requirements of IEC/TR 61641. Its fully insulated and segregated power path, including insulated busbars and terminal

barriers, was specifically designed to eliminate the threat of arc flash. While the CXH was designed for prevention, you can never be too cautious when lives are at risk. So, should human error lead to an arc flash event, the CXH has advanced features designed to **confine the impact to a single functional unit.**

The IEC/TR 61641 standard addresses arc flash hazards when working on or near energized electrical equipment,

but it doesn't cover the same hazards when undertaking maintenance to the system. In the design of the CXH, not only was 'normal operation' of the system considered, but it was also designed to address the dangers personnel face during and after maintenance operations.

The Power Xpert CXH not only adheres to the design verification standards of IEC 61439, but – to ensure maximum possible operator and engineer safety – it is also live tested both by Eaton and Dekra (formerly KEMA). Dekra has provided independent confirmation that the CXH complies with the highest test standards in electrical equipment, including seismic (IBC zone 4, with continuation of power) testing.



Arc flash mitigation through breaker design

The incoming air circuit breaker in the CXH is equipped with Eaton's unique Arc Flash Reduction Maintenance System™, which reduces fault clearing time. Because it is enabled only for the time required to perform maintenance, it preserves overcurrent coordination under normal operating conditions.

The system is controlled by a door-mounted lockable switch, or through network communications to the breaker's trip unit, which activates a separate circuit for faster tripping times and reduces the incident energy level of downstream equipment. A step that, if added to your lock-out-tag-out procedure, maximizes operator safety.

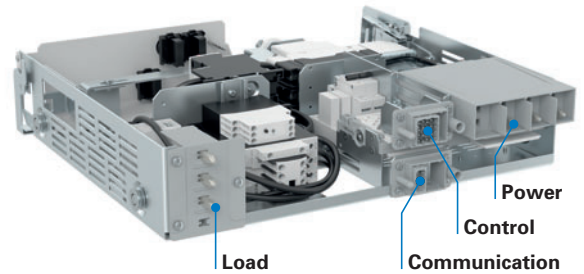


Eaton's Series NRX® air circuit breaker equipped with the Arcflash Reduction Maintenance System.

Safety through withdrawable technology

In a withdrawable design, all electrical and network connections are plugged in one action – racking. Many accidents happen after maintenance is completed and the equipment is put back in place and powered up for

operation. The withdrawable units of CXH can be re-inserted into the “live” panel while compartment doors are closed and locked, protecting people and equipment during this process step.



Plug-and-play exchange of withdrawable units.

Error-free installation supports personnel safety

The Power Xpert CXH MCC is designed to protect personnel and ensure correct equipment installation.

The CXH uses an optional coding system to ensure that withdrawable units are installed in the correct shelf. Each drawer is assigned to a particular shelf with five fixable metal rollers that are located both on the shelf and the underside of the unit. Affixed to the appropriate positions, the unit can only be inserted into its rightful place,



making it impossible to position equal-height withdrawable units incorrectly – protecting people and the process.

Other safety features:

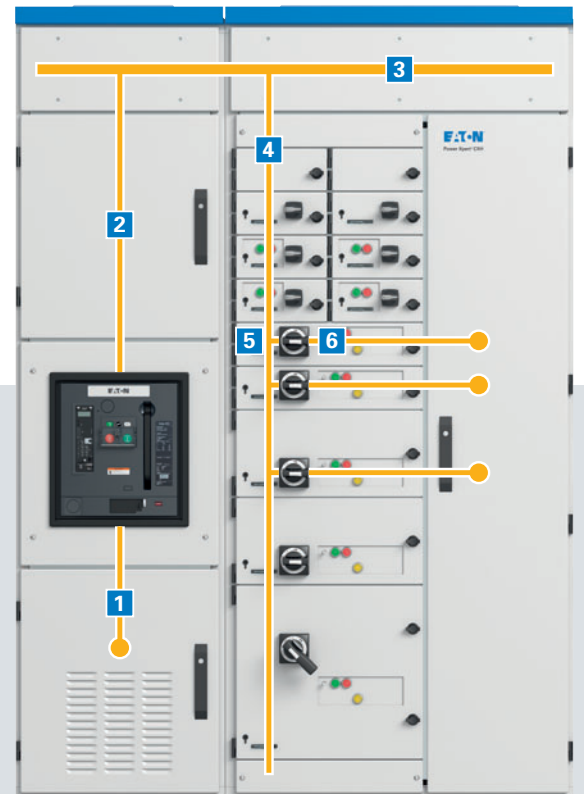
- Racking behind closed doors**
 Enables operation of the drawer from disconnect to test to connect, all behind closed doors for operator safety. This means that the door is closed when the connection with the vertical busbar is made.
- Withdrawable drawer with mechanical test position**
 In test position, the function of the unit can be tested without the main power on. This means that while the drawer is not connected to the bus, the control and communication wires are connected for testing.
- Passive interlocking**
 Mechanical interlocking of doors and operating handles prevent unauthorized use and ensures safe positions for operation, disconnect and testing. To switch on, the drawer must first be inserted, closed and the protective device handle turned OFF before the drawer can be racked in.
- Insulation of main busbars and incoming terminals of the ACB (optional)**
 The incoming side of the ACB and the main busbar can be insulated with a powder coating layer.



The operator can move the withdrawable unit with a spindle (1) from disconnected to test and connected positions. The position of the drawer is clearly indicated with colors and symbols (2).



The mechanical interlocking does not allow the operator to insert the spindle unless the door is closed and the protective device is in the OFF position. The spindle needs to be taken out before operation of the protective device.



Arc-free and arc-proof zones

Eaton's philosophy is that the best way to mitigate the risks of internal arcing is to prevent the arc from happening in the first place.

- 1 Arc-proof connection points and copper bars
- 2 Arc-free copper bars and connectors
- 3 Arc-free main busbar system
- 4 Arc-free distribution busbar system
- 5 Arc-free connection from vertical bus to protective device
- 6 Arc-proof functional unit

Zones 1 and 6 have been DEKRA witness tested for forced arc ignition and passed in categories 1 to 7.

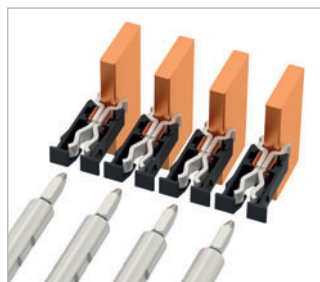
Ensuring maximum uptime with reduced maintenance



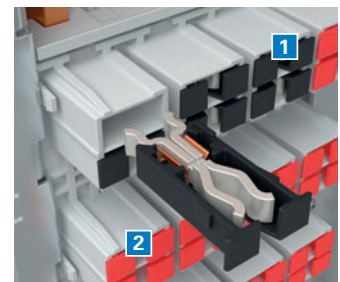
Safety is critical to uptime, but so is the reliability of your control and power distribution equipment. As a part of the design for the Power Xpert CXH MCC, our engineers identified the possible failure points of traditional motor control centers and set their sights on designing a platform with features that focus on improving uptime and eliminating costly maintenance.

Features:

- **Prevent contact wear**
Eaton's patented silver-plated scissor clamps, used for the connection of the outgoing units to the vertical busbar, eliminate contact wear on the bus itself. A special contact design ensures that there is no welding to the vertical bus in the event of high starting or short circuit currents.
- **Decrease maintenance frequency**
The low-resistance contact for vertical busbar connection and the drawout unit means that heat dissipation won't lead to hot spots and subsequent system failures. Rated for 1,000 mechanical and electrical operations (inserting and withdrawing the drawer in the cabinet), the CXH withdrawable technology is designed to last the lifetime of the equipment.
- **Safe maintenance without power shutdown**
The withdrawable units of the CXH can be modified without a shut-down or power-off. Even under live conditions, the design provides maximum protection for personnel and enables rapid interchangeability of the functional units, without requiring isolation of the entire system. This means replacements and additions to the system can be carried out without stopping your process.
- **Operate after short circuit faults**
The CXH meets Type 2 coordination for contactors and motor starters, certifying that the device is able to continue operation after a short circuit fault for improved uptime of your system.



Eaton's scissor clamps eliminate contact wear on the vertical busbar by functioning as an intermediate between the power stab and vertical busbar.



Silver-plated scissor clamps can be exchanged from the front and are equipped with black plugs (1). Spare holes are covered with red plugs (2) for touch safety.



Power Xpert CXH drawers are tested to 1,000 connections to the distribution busbars for enhanced reliability.

Intelligence is uptime

Because motor failure has the potential to cause production downtime, costly repair bills and numerous safety concerns for plant personnel, motor protection is a core element of a reliable and safe system.

Equipped with the intelligence of the Power Xpert C445 motor management relay, the Power Xpert CXH MCC enables you to see inside your system, giving you the information you need to keep your process running smoothly.

The C445 provides the highest level of monitoring accuracy and protection for your system – from the incoming power

source feeding the motor all the way to the individual load. It enables upstream networking for process control, monitoring and preventative maintenance. And with a breadth of network options, including Profibus, Modbus or Ethernet protocols, it is designed to fit into your existing schema, not redefine it.



The Power Xpert C445 can be mounted in both standard and high density withdrawable units.

Take a closer look at the Power Xpert C445



With integrated power quality and energy usage analytics, the Power Xpert C445 was designed to give you the data you need to better manage your energy consumption, save significant energy costs and keep personnel safe. With advanced diagnostics like performance trending, fault analysis and high-accuracy data monitoring, you can prioritize your maintenance schedule to address your most critical energy management challenges – before a failure occurs – reducing unscheduled downtime and the potential for personnel injury.

- 0.3 - 800 A, up to 690 Vac (20 - 80 Hz)
- Full line, load and motor system coverage, including advanced monitoring and protection algorithms
- Separate monitoring and control functionality modules enables custom mounting configuration for application flexibility
- Small size enables easy retrofitting into existing systems
- Eaton's Power Xpert *inControl*™ programming software for easy configuration and parameter setting
- Access, monitor and configure data parameters within the device without opening the panel door via a standard USB port on the front of the user interface or remotely through network operations for enhanced operator safety

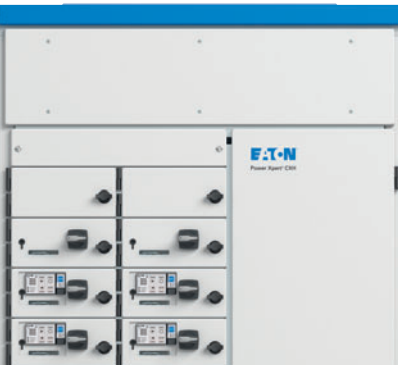
Flexibility in a small footprint



The flexibility to design and configure the Power Xpert CXH MCC to your specific needs helps to ensure it is built for your application.

You can specify different sizes of copper or aluminum busbars; air insulation or epoxy coating; top or bottom cable entry; and fuse or breaker solutions. Plus, its optimized footprint helps improve your overall bottom line. Space inside commercial and industrial facilities is at a premium. We understand that you'd rather use that valuable space for your process, so we looked at the best ways to design our electrical equipment to maximize your space savings.

- The patented scissor clamp mechanism virtually eliminates maintenance of the associated components, which means there is no requirement to access the rear to maintain the vertical busbar. This can save up to 1 m² per section
- Rear access to the compartments allows for a narrower footprint, which means less copper and less cost, while adding depth
- All maintenance can be carried out from the front or top of the CXH panel, so it can stand "flush" against a wall (10 cm needed for ventilation purposes)
- Dual drawer configurations, in one compartment, also help to minimize footprint by providing high-function density



Power Xpert CXH high density panels only need one cable compartment.

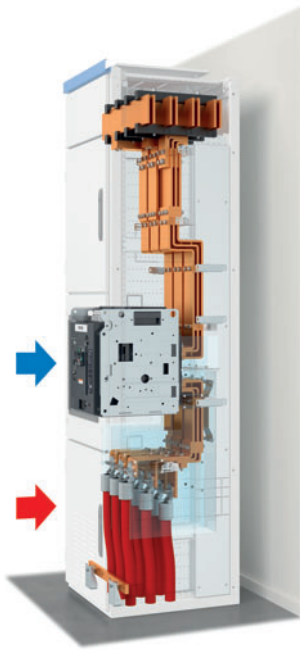
Small footprint with high technical capabilities

When the vertical section is modified, i.e. adding spare drawers, a diversity factor of 1.0 implies that the user does not have to worry about overloading the vertical busbar or heat dissipation of components. The IEC standard only requires 0.8 for MCC, which means that it is up to the user to calculate maximum load on the vertical busbar or maximum heat losses.

- Rated diversity factor (RDF) of 0.8 means that the feeder can operate at 80% of capacity
- 28 high density drawers x 18.5 kW x 0.8 RDF = 414 kW per section
- High diversity factor prevents overheating due to overload after modifications

Rated diversity factor	IEC 61439 standard	CXH With-drawable	CXH Fixed
Motors/ MCC	0.8	0.8	1.0
Distribution	0.6	0.8	1.0

Options for top and bottom cable entry

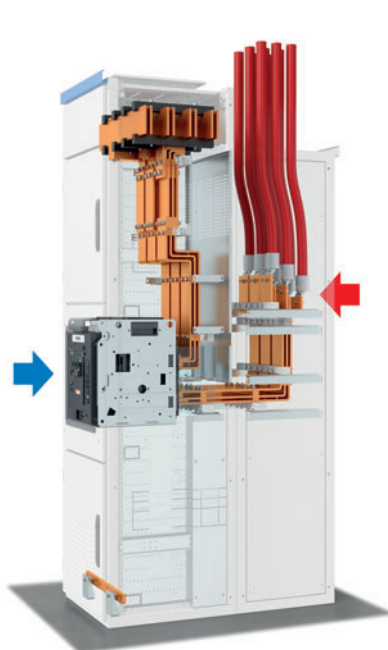


Front operation with front cable access

Cable bottom feed

- Placed against wall

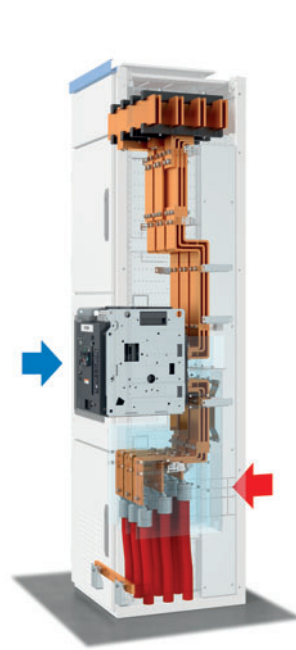
Insulated busbars are also available.



Front operation with rear cable access

Cable top feed

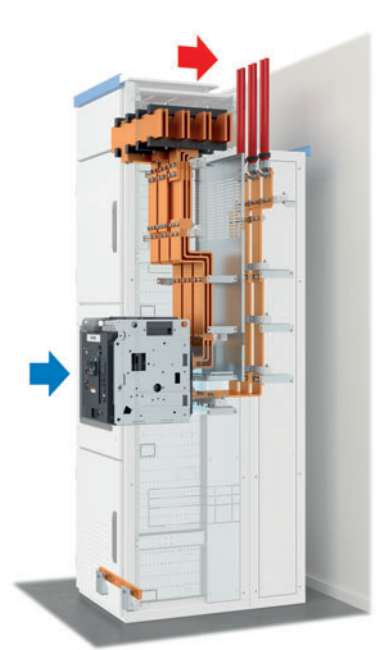
- Free standing arrangement with rear accessibility



Front operation with rear cable access

Cable bottom feed

- Free standing arrangement



Front operation with front cable access

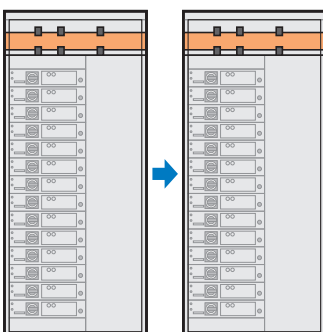
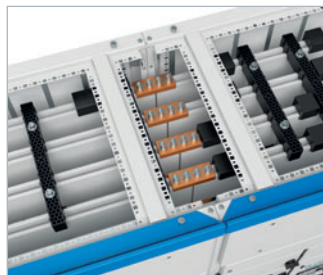
Cable top feed

- Placed against wall

Convenient raised connection points for front access if system is positioned against a wall.

Busbar coupling from the front

With the design of the CXH, you have easy access for busbar coupling from the front of the system. Each CXH section contains busbars and holes have been implemented for easy assembly from the side. The connection points have a plastic cover making the section arc-free and touch-safe.

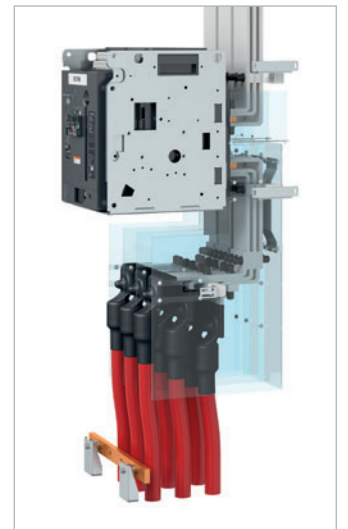


On-site extension of the main busbar system can be done quickly and easily with the appropriate busbar coupling clamps.

Each compartment contains factory installed main busbars that can be connected by coupling clamps installed from the top of the system.

Optional insulation of busbars

The phases of line side connections of the incoming ACB are segregated by plastic barriers. Forced arc ignition tests verify that this design is arc proof. Optionally, the blank copper busbar can be powder coated to provide additional safety.



System design



Front access configuration

Cable bottom entry

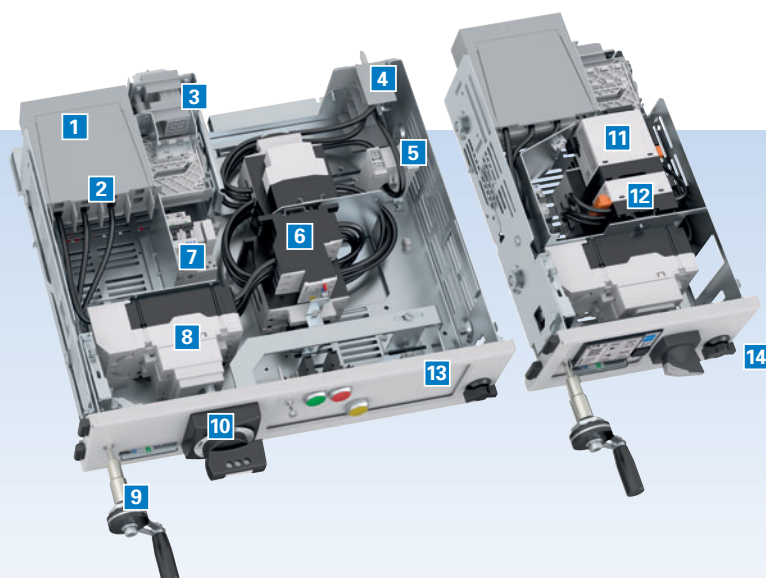
1. Auxiliary equipment compartment and horizontal wireway
2. Air circuit breaker outgoing unit
3. Empty drawer unit
4. Withdrawable motor starter unit up to 18.5 kW, high density drawer
5. Withdrawable motor starter unit up to 22 kW, standard density drawer
6. Withdrawable motor starter unit up to 75 kW, standard density drawer
7. Withdrawable motor starter unit up to 132 kW, standard density drawer
8. Outgoing cable connection compartment at the rear of the panel
9. Key lockable door handles
10. Ventilation



Rear access configuration

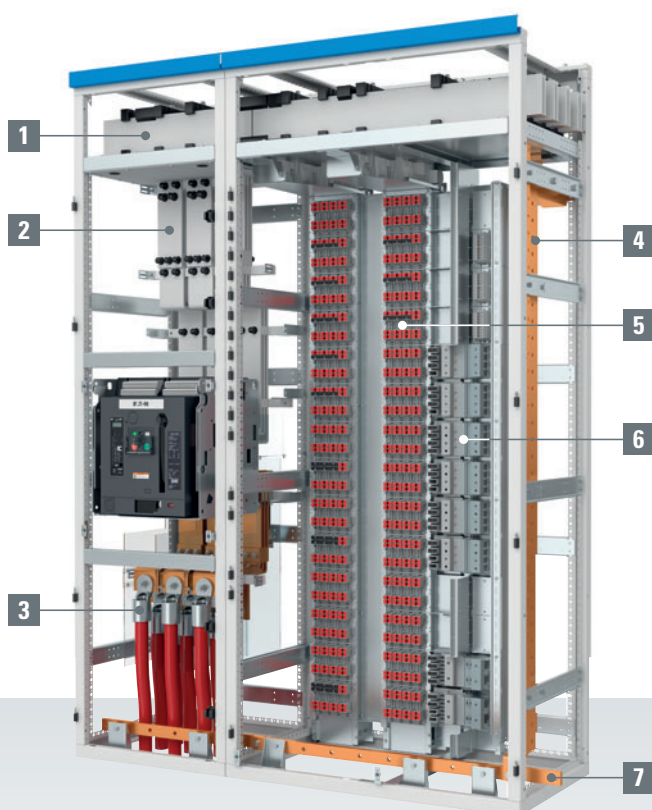
Cable top or bottom entry

1. Cable connections (main power cable entry top or bottom with rear access connection points)
2. Outgoing cable connection compartment at the rear of the panel
3. Key lockable door handles
4. Ventilation



Drawer components

1. Line contacts
2. Arc-free power wiring
3. Load contacts and auxiliary contacts
4. Load contacts
5. Measurement control transformer (CT)
6. C440 overload relay
7. Auxiliary components
8. Circuit breaker
9. Mechanism operating handle
10. Circuit breaker rotary handle
11. Power Xpert C445 motor management relay
12. Power Xpert C445 measurement module
13. Steel door, hinge left
14. Door lock



Main busbar system

The Power Xpert CXH main busbars are arranged in a separate compartment to ensure the required form of separation and internal degree of protection.

The main busbar system is fully separated from the equipment and cable compartments. The busbars are rated up to 6300 A - 100 kA / 1 s.

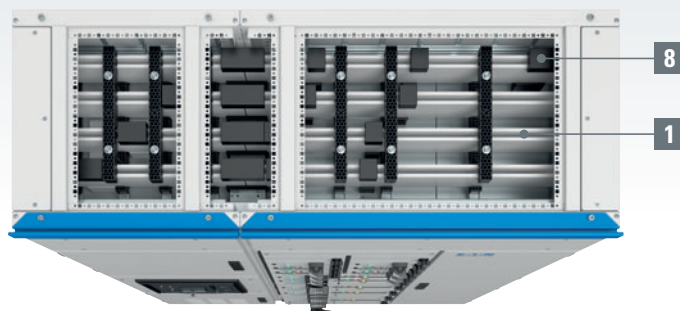
The material specification of the busbars is copper: EN 13601-Cu-ETP-R250.

On-site extension of the main busbar system can be easily and quickly accomplished with the appropriate busbar coupling clamps; no drilling is required.

Busbar system

Cable bottom entry

1. Main busbars
2. ACB connection to busbar
3. Bottom cable connections (front access)
4. Neutral bar
5. Distribution busbars, isolated ducts
6. Connection terminals
7. Earth bars
8. Protective covers



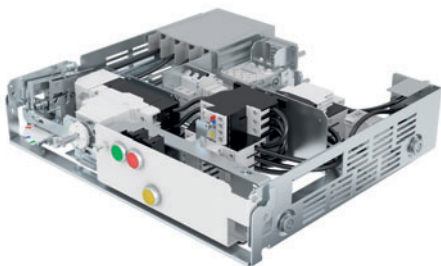
Ratings and cross-sections of available main busbars

Maximum permissible load current	Type	Short circuit capacity I_{pk} / I_{cw}	Busbar cross section Phases / N / PEN
1000 A	Al/Cu	Up to 35 kA - 1 s.	1 x 40 x 10 mm
1250 A	Al/Cu	Up to 50 kA - 1 s.	1 x 40 x 10 mm
1600 A	Al/Cu	Up to 65 kA - 1 s.	2 x 40 x 10 mm
2000 A	Al/Cu	Up to 80 kA - 1 s.	2 x 60 x 10 mm
2500 A	Al/Cu	Up to 80 kA - 1 s.	2 x 80 x 10 mm
3150 A	Cu	Up to 100 kA - 1 s.	2 x 100 x 10 mm
4000 A	Cu	Up to 100 kA - 1 s.	2 x 120 x 10 mm
5000 A	Cu	Up to 100 kA - 1 s.	4 x 100 x 10 mm
6300 A	Cu	Up to 100 kA - 1 s.	4 x 120 x 10 mm

Motor starter and feeder units

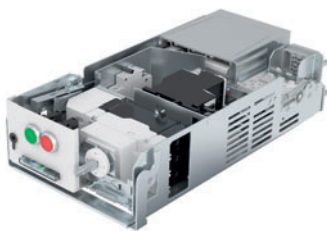
The Power Xpert CXH MCC is available for starter and feeder units up to 250 kW

Motor starter drawout units



Standard density drawer

Front view of a withdrawable motor starter unit up to 22 kW.



High density drawer

Front view of a withdrawable motor starter unit up to 18.5 kW, high density version.

Drawer dimensions

Type	Mounting	Height	Width
C012	Withdrawable	125 mm	300 mm*
C01	Withdrawable	125 mm	600 mm
C02	Withdrawable	250 mm	600 mm
C04	Withdrawable	500 mm	600 mm
CF4	Fixed	2000 mm**	425 mm
CF6	Fixed	2000 mm**	600 mm

* High density version.

** Full height of functional compartment.

Breaker motor starters

Type	Max rating	Height	Width
C012	18.5 kW	125 mm	300 mm*
C01	22 kW	125 mm	600 mm
C02	75 kW	250 mm	600 mm
C04	132 kW	500 mm	600 mm
CF4	250 kW (DOL)	2000 mm**	425 mm
CF6	250 kW (FR)	2000 mm**	600 mm

Fused switch-disconnector motor starters 415 V

Type	Max rating	Height	Width
C012	15 kW	125 mm	300 mm*
C01	15 kW	125 mm	600 mm
C02	45 kW	250 mm	600 mm
C03	75 kW	375 mm	600 mm
C04	132 kW	500 mm	600 mm
CF4	132 kW	2000 mm**	425 mm
CF6	250 kW	2000 mm**	600 mm

Breaker feeder units

Type	Breaker frame rating	Height	Width
C012	63 A	125 mm	300 mm*
C01	125 A	125 mm	600 mm
C02	250 A	250 mm	600 mm
C04	630 A	500 mm	600 mm
CF6	1600 A	2000 mm**	600 mm

Fused switch-disconnector feeder units

Type	Switch frame rating	Height	Width
C012	63 A	125 mm	300 mm*
C01	63 A	125 mm	600 mm
C02	400 A	250 mm	600 mm
C04	630 A	500 mm	600 mm
CF4	630/1000 A	2000 mm**	425 mm
CF6	1250 A	2000 mm**	600 mm

Air circuit breaker panels

Feeder panel dimensions

Breaker	Poles	Frame rating	Width	Depth
Series NRX NF	3	1600 A	425 mm	600 mm
Series NRX NF	4	1600 A	600 mm	600 mm
Series NRX RF	3	2500 A	600 mm	600 mm
Series NRX RF	4	3200 A	800 mm	600 mm
Series NRX RF	3/4	4000 A	1000 mm	800 mm
Magnum DN	3	4000 A	800 mm	600 mm
Magnum DN	4	4000 A	1000 mm	800 mm
Magnum DW	3	6300 A	1350 mm	1000 mm
Magnum DW	4	6300 A	1350 mm	1000 mm

Feeder characteristics

Breaker	Poles	Frame rating	Icu	Ics	Icw
Series NRX NF	3/4	630 - 1600 A	65 kA	50 kA	42 kA
Series NRX RF	3/4	800 - 4000 A	105 kA	105 kA	85 kA
Magnum DN	3/4	4000 A	100 kA	100 kA	100 kA
Magnum DW	4/4	6300 A	100 kA	100 kA	100 kA



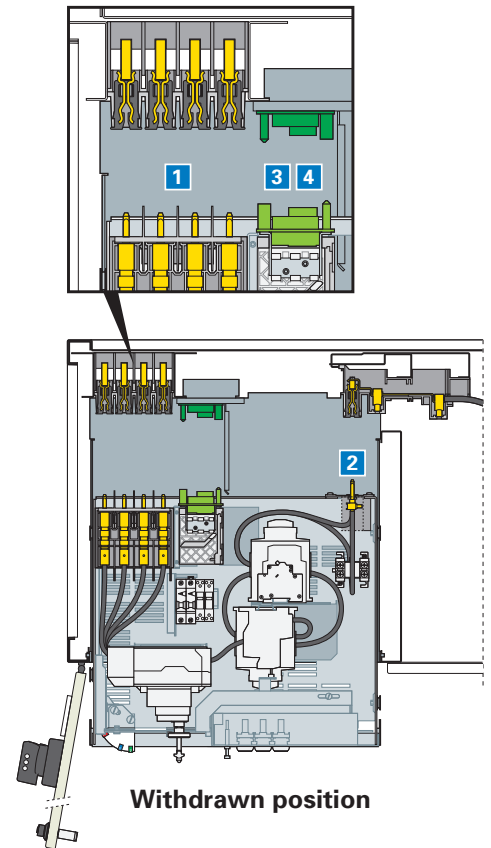
Racking behind closed doors

with explicit drawer position indication

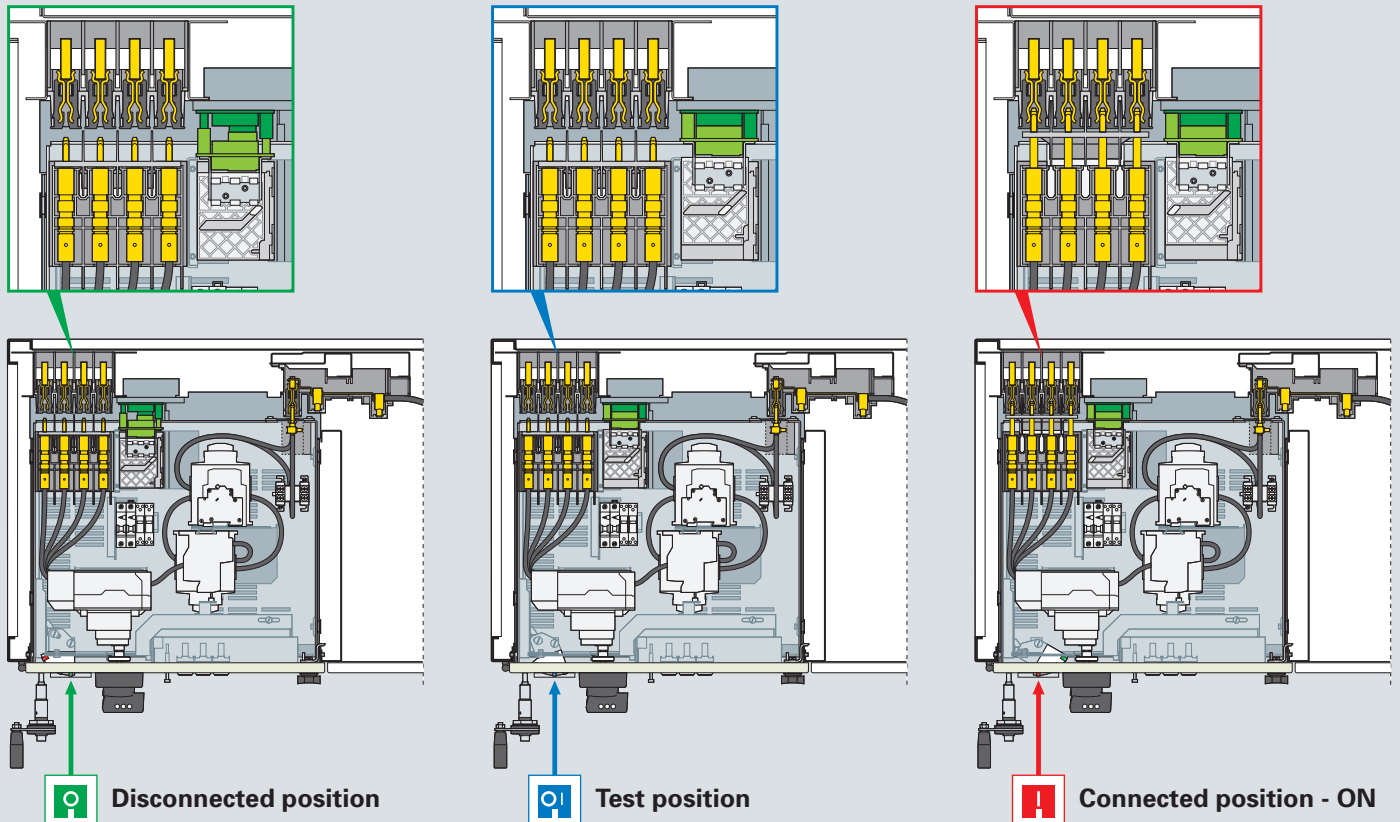
	Withdrawn position	Disconnected position	Test position	Connected position
Line power	Disconnected	Disconnected	Disconnected	Connected
Load power	Disconnected	Connected	Connected	Connected
Communication 24 Vdc	Disconnected	Connected	Connected	Connected
Control wiring	Disconnected	Disconnected	Connected	Connected

Position of contacts in drawer

1. Line power
2. Load power
3. Communication contacts (lower)
4. Control contacts (upper)



Operating positions can be adjusted with a spindle



Main components for MCC and distribution

The Power Xpert CXH uses only the best components. A system is only as strong as its weakest link, so the quality of the individual components determines the performance and quality of the system as a whole.

Eaton power control and protection components are among the best in the world. The CXH is designed with the option of Eaton air or molded case circuit breakers or a fused combination switch.

Understanding the interaction of each individual component and how they operate within a

complete system is essential to delivering a fully type-tested, reliable and efficient power distribution and motor control system. All the critical components used in the CXH are proven Eaton components – from the main incoming feeders to the pushbuttons and indicator lights.

Air circuit breakers



Magnum and Series NRX air circuit breakers

- Tested according to IEC 60947-2
- Ranging up to 6300 A - 100 kA / 1 s
- Comprehensive and innovative electronic Digitrip™ trip unit range (LSIG)
- Fixed and withdrawable mounting
- Complete with extensive range of accessories
- Zone selective interlocking
- Arcflash Reduction Maintenance System

Moulded case circuit breakers and motor circuit protectors



NZM molded case circuit breakers

- Only 4 frame sizes cover up to 1600 A - 100 kA
- Up to 690 V - 80 kA
- Wide range of field installable accessories
- In the event of a short circuit, a repelling magnetic power pushes the contacts apart in a fraction of a sine wave
- Switching capacities up to 150 kA and operational voltages up to 690 V can be managed without difficulty. The simultaneous reduction in heat dissipation creates benefits for use in control panels



Series G® EG-frame molded case circuit breakers

- One of the most compact breakers with true 480 V performance
- Up to 65 kA @ 480 V
- Up to 100 kA @ 415 V - I_{cs} 100%
- Wide range of field installable accessories
- Contact design features high-speed “blow-open” action, resulting in superior performance
- Circuit breakers significantly outperform the calculations listed in IEEE standard 1584-2002, Guide for Performing Arc Flash Hazard Calculations

Contactors and switch-disconnectors

Eaton type DILM contactors



- Tested according to IEC 60947-2 for a complete range of motor starter combinations, including direct on-line, forward-reverse and star-delta
- Type 2 co-ordination motor starter combination with PKZ, PKE and NZM circuit breakers

Dumeco switch-disconnectors



- Compact, robust, switch-disconnector ranges
- Available 3P, 3P+SN and 4P-configurations
- Type DMM, frame rating 125 - 160 A, 690 Vac
 - Short circuit rating up to 50 kA
- Type DMV, frame rating 160 - 2000 A, 690 Vac
 - Short circuit rating up to 100 kA at 415 V

Soft starters and variable frequency drives

S811+ soft starters



- Designed to control the acceleration and deceleration of three phase motors
- Intelligent pump algorithm to eliminate water hammer effect
- Compact footprint to replace wye-delta starters
- Comprehensive protections and diagnostic capabilities to ensure the highest reliability
- Rated up to 560 kW



PowerXL™ variable frequency drives

- DC1 compact drive for fans, pumps and conveyor systems (ratings from 0.37 to 11 kW)
- DG1 general purpose drive for commercial and industrial systems (ratings from 0.75 to 160 kW)
- DA1 advanced machinery drive (ratings from 0.75 to 250 kW)
- Compliant with IE2, IE3, and future IE4 energy efficiency standards

C400 series electronic overload relays

C440 electronic overload relay



- 0.3 - 1500 A, up to 690 Vac (50/60 Hz)
- Selectable trip class (10 A, 10, 20, 30), earth fault and phase imbalance protections
- Flexible communication options for both monitoring and control
- PROFIBUS, Modbus RTU, Modbus TCP, EtherNet/IP, and DeviceNet



Power Xpert C445 electronic overload relays

- 0.3 - 800 A, up to 690 Vac (20 - 80 Hz)
- Full line, load and motor system coverage including advanced monitoring and protection algorithms
- Multiple predefined operating modes with corresponding control station options reduces complexity
- Modbus RTU, PROFIBUS, Modbus TCP, and EtherNet/IP

Electrical Data

System	Power Xpert CXH
Rated operational voltage	415, 480, 690 V
Rated frequency	50 / 60 Hz
Main busbar data	
Rated insulation voltage	1000 V
Rated impulse withstand voltage	12 kV
Rated current	800 - 6300 A
Rated short-time withstand current	50 - 100 kA / 1 s and 50 - 66 kA / 3 s
Rated peak withstand current	220 kA
Vertical distribution busbar data	
Rated insulation voltage	1000 V
Rated impulse withstand voltage	up to 12 kV
Application	Fixed / Withdrawable
Rated current	800 - 2500 A
Rated short-time withstand current	35 - 100 / kA 1 s
Rated peak withstand current	176 kA
Enclosure data	
Degree of protection	IP42 / IP55
Form of separation	Form 4a & 4b Form 4a type 2 / Form 4b type 6
Entry of cables	Top and / or bottom
Access	Front or rear
Standard Colour	RAL 7035

Standards

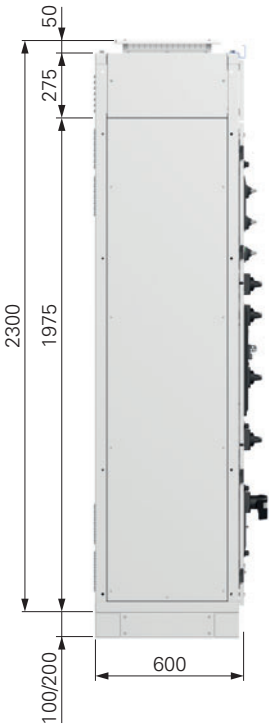
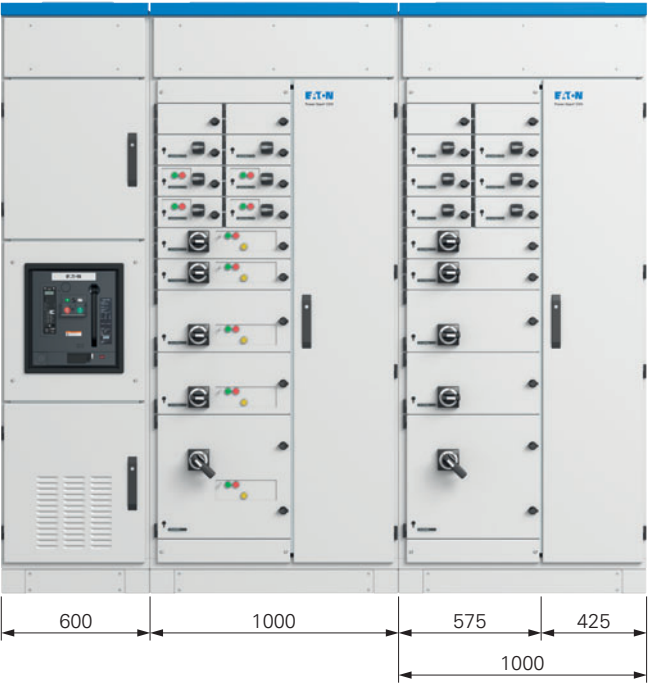
Power Xpert CXH complies with the following international standards	
IEC 61439-1	General rules
IEC 61439-2 ed.2: 2011 - "verification by test"	Power switchgear and controlgear assemblies
EN 61439-2 ed.2: 2011	Power switchgear and controlgear assemblies
BS-EN 61439-2 ed.2: 2011	Power switchgear and controlgear assemblies
IEC/TR 61641 Ed 2.0: 2008 - criteria 1-7	Enclosed low-voltage switchgear and controlgear assemblies - Guide for testing under conditions of arcing due to internal fault
IEC 60529	Degrees of protection (IP Code)
IEC 60068-3-3: 1991	Environmental testing - Part 3: Guidance. Seismic test methods for equipment
IBC/CBC (in acc. with AC 156)	International Building Code (IBC) Californian Building Code (CBC)
UBC	Uniform Building Code (UBC)

Optional standards

- Vibration test IEC 60068-2-6 (part of Lloyd's Register ENV 3)
- Maritime Classification: Lloyd's Register ENV 3



Dimensions (mm)



Form of internal separation

IEC 61439-2 defines the various forms of internal separation.

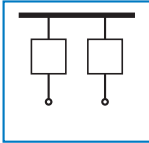
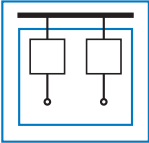
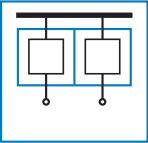
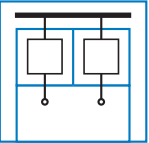
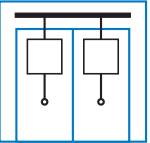
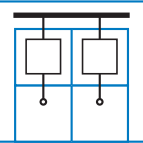
The form of internal separation determines how busbars, functional units and terminals are separated from each other. CXH is designed to provide separation in both Form 3b and 4b solutions.

Form 3b and 4b are defined as: *the separation of the busbars from each functional unit and the separation of each functional unit from each other.*

The difference between Form 3b and Form 4b is based on how the terminals for outgoing conductors are separated from each other.

Form 3b solution is defined as: *the separation of terminals for external conductors from the functional units, but not from those of other functional units, i.e. a common cable chamber where all outgoing terminals are grouped together. Internal separation in accordance with IEC 61439-2*

Form 4b solution is defined as: *the separation of the terminals for external conductors associated with a functional unit from those of any other functional unit and the busbars. i.e individual separation of each functional units outgoing terminals from each other.*

Internal separation in accordance with IEC 61439-2						
	<div></div> <div>Form 1</div>	<div></div> <div>Form 2b</div>	<div></div> <div>Form 3a</div>	<div></div> <div>Form 3b</div>	<div></div> <div>Form 4a</div>	<div></div> <div>Form 4b</div>
Busbars (main + distribution) are separated from functional units		<div>✓</div>	<div>✓</div>	<div>✓</div>	<div>✓</div>	<div>✓</div>
Functional units are separated from other functional units			<div>✓</div>	<div>✓</div>	<div>✓</div>	<div>✓</div>
Terminals are external to functional units			<div>✓</div>	<div>✓</div>		<div>✓</div>
Terminations to functional units are separated from each other			<div>✓</div>		<div>✓</div>	<div>✓</div>
Terminals are separated from the busbars	<div>✓</div>			<div>✓</div>	<div>✓</div>	<div>✓</div>
Power Xpert CXH supported forms of separation				<div>✓</div>		<div>✓</div>



Power Xpert CXH supports forms of separation 3b and 4b.

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Oil and gas



Mining



Power generation



Marine



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- **Aerospace solutions** that make aircraft lighter, safer and less costly to operate, and help airports operate more efficiently
- **Vehicle drivetrain and powertrain solutions** that deliver more power to cars, trucks and buses, while reducing fuel consumption and emissions

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Specifications are subject to change without notice. Features and functionality may vary depending on selected options. Please refer to the technical data sheets, user manual and test reports for detailed specifications.