38kV Metal-Clad Switchgear

Powerful 38kV Switchgear Solutions for a Growing World of Applications

Since 1981, Controlled Power has designed and manufactured 38kV metal-clad switchgear for a wide range of customers. Today, CP 38kV switchgear is used by major utilities, petrochemical companies, transit authorities, and by diverse industrial organizations throughout the world, to effectively handle their power distribution requirements. This proven, practical experience has enabled CP to become one of the nation's largest and most experienced independent suppliers of 38kV metal-clad switchgear.

CP's growth and success can be attributed to our continuous product improvement and our willingness to listen and respond to your needs. Our engineers work closely with you, from the initial design through final installation, to help you identify, evaluate, and select the best solution for your application.

CP 38kV metal-clad switchgear is available with Vacuum circuit breakers and can be engineered in several indoor and outdoor configurations, including: single-aisle, common-aisle, utilized in Power Control Centers containing transformers, low voltage AC or DC switchgear and support systems.

CP 38kV metal-clad switchgear is designed, assembled, and tested to all ANSI and other applicable industry standards.

CP 38kV Metal-Clad Switchgear General Features

Dimensions

CP's standard enclosure dimensions are 110" high x 134" deep (indoor). A standard feeder or tie breaker enclosure is only 42" wide. If you require draw out potential transformers with your main breakers, CP can mount them in the same enclosure, but this enclosure must be 48" wide. We do not require a separate auxiliary enclosure for the potential transformers thus saving valuable floor space.

At Controlled Power, we recognize the importance of dependable 38kV switchgear. That is why for over 20 years we have continually striven to produce the safest, most reliable 38kV metal-clad switchgear available in the world. Depending on dimensional width, all CP 38kV metal-clad switchgear features:

Breaker Interchangeability

CP's exclusive 42" wide design 38kV circuit breaker/cell configuration offers the added advantage of total interchangeability. Each breaker can be moved from one cell to another, or to similar CP 38kV lineups. This approach translates into lower spare parts requirements and additional upgrade options.

Standard Cell and Bus Compartments

CP's standardized cell and bus compartment configurations allow greater flexibility in cable routing, external entrance/exit schemes and CT locations.

Copper Bus is Standard

On all CP 38kV switchgear, copper bus is a standard, not an option. CP uses copper on the main bus, feeder bus, disconnects, and even bus duct. Epoxy bus coating insulation is CPC's standard. Porcelain bus supports are an available option.

Increased Safety

CP 38kV metal-clad switchgear is engineered with safety in mind. Positive mechanical indicators clearly display the circuit breaker condition, while interlocks prevent the inappropriate operation of the breaker. In addition, grounded metal shutters inside the circuit breaker enclosure shield the main contacts from operating personnel when the breaker is removed.

CPC 38kV Metal-Clad Switchgear Type HVF Vacuum Circuit Breakers

Breaker Interlocks

Interlocks prevent a closed circuit breaker from being moved into or out of the CONNECTED position and prevent accidental discharge of the closing springs when the breaker is rolled into or removed from the circuit breaker enclosure. Interference plates are supplied.

Breaker Controls

The stored energy operating mechanism on the front of the breaker truck contains high energy closing springs and the ratcheting system for the manual charging of these springs. The operating mechanism also contains all the controls necessary for the operation of the circuit breaker. These controls include the Breaker Contracts Positional Indicator, the Operations Counter, Close Button, Open Button, and the Springs Charged Indicator.

The Springs Charged Indicator displays the charging status of the closing springs. The indicator displays whether the closing springs are fully charged or discharged.

The Breaker Contact Position Indicator shows the position of the breaker contacts. When the breaker is in the closed position, a red indicator with the word "Closed" will be displayed. A green indicator with the word "Open" is displayed, when the breaker is in the open position. The Operations Counter measures the number of close/open cycles by advancing on count for each closing stroke. The breaker is rated for 10,000 operations at rated current.

The Circuit Breaker's spring stored operating mechanism may be changed electrically by the charging motor or manually by means of the manual-charging handle. The speed at which the breaker opens and closes is independent of the method by which the springs are charged. Until the springs are fully charged, the breaker cannot be closed. Once the springs are fully charged, however, the breaker may be operated electrically or manually. The spring charging motor automatically recharges the closing springs when control power is applied.

Contact Assembly

The breaker primary contacts consist of a cluster of silver-plated copper fingers that are spring loaded and free floating to insure positive contact and alignment with the stationary stabs. The secondary contact, which provides the circuit breaker with control power when engaged, is self-

aligning and can be engaged from either the TEST or CONNECTED position. Most other manufacturers' breakers require an umbilical cord or other form of manual operation to connect the breaker's secondary wiring into the breaker cell in the test position.

Ratings – All Units – ANSI C37.06 & C37.09	
Rated Maximum Voltage (kV)	38
Rated Continuous Current (A)	1200/2000/3000
Rated Voltage Range Factor (K)	1.00
Rated Short Circuit Current at Maximum kV (KA)	31.5 or 40
Close and Latch (KA Crest)	82
Low-Frequency Withstand (kV)	80
Basic Impulse Level (kV)	150
Rated Interrupting Time (Cycle)	5

Breaker Truck Options
TOC Switch Assembly MOC Switch Assembly Shutter Position Indicator Interference Angle Kirk Lock Assembly

Accessories
Fifth Wheel Assembly Racking Lever Assembly Breaker Test Cabinet with Secondary Disconnects

Cell Configurations

Constructed of sheet and structural steel, the CPC 38kV Circuit Breaker Enclosure is designed to protect and provide safe access to the 38kV circuit breaker and contain any damage that may occur during fault interruption.

Enclosure Openings

The rear of each CPC Circuit Breaker Enclosure can be equipped with a full height, swing-out door to allow for easy access to the cable termination area. These doors can then be padlocked to prevent unauthorized access. Other openings are provided, as specified, to allow the entry of power and control cables from the top or bottom of the cubicle.

Safety Features

For increased safety, grounded metal safety shutters, within the cell, shield the primary connections in the circuit breaker compartment. A smooth operating worm screw drive is used to move the breaker within the cell. Closed door racking is standard.

Operating and Alignment Mechanisms

The circuit enclosure is equipped with a secondary disconnect receptacle. The secondary disconnect provides the circuit breaker with control power when the breaker is positioned in either the TEST, DISCONNECT, or CONNECTED positions. As an option, the circuit breaker enclosure may also contain a Truck Operated Cell switch (TOC) or a Mechanism Operated Cell switch (MOC). These provide contacts with which to monitor status of the breaker and truck.

Drawout model 38kV Circuit Breaker Enclosures contain mechanisms that allow the circuit breaker truck to move between the operating and disconnect positions. To prevent

misalignments of the primary and secondary contacts, due to variations in the levelness of the floor or switchgear pad, the circuit breaker enclosure is equipped with alignment rails.

Outdoor Enclosure Configurations

When your 38kV application requires an outdoor enclosure, CP has the experience to provide you with any number of designs, including single-aisle enclosures, common-aisle enclosures, or complete CP Power Control Centers. Every CP outdoor enclosure is designed and tested to all applicable standards and to meet your specific needs.

Single and Common-Aisle Enclosure

All CP single-aisle outdoor enclosures for 38kV switchgear are fabricated from the highest quality sheet and structural steel to construct a solid enclosure. Each outdoor structure is designed to provide complete protection and easy access to your equipment. Aisleways are large enough to permit the interchange of drawout circuit breaker elements. Power and control cables are also easily serviced through openings in the top or bottom of each associated cubicle.
The walls and roof come with baked on porcelain – like dry powder epoxy coating rather than just liquid paint.

CPC Power Control Centers

As an alternative to traditional outdoor configurations, CP Power Control Centers can alleviate many of the scheduling, construction, and cost problems associated with site-built, site-wired, and site-tested buildings. Because each CP Power Control Center is designed, assembled, and tested in our factory, the whole unit can be shipped completely assembled to your location (depending on transportation limitations). This greatly reduces the time and expense usually involved with on-site enclosure construction.

Each Power Control Center can include: medium or low voltage switchgear, motor control centers, transformers, rectifiers, metering, battery system, SCADA panels, and UPS systems. The Power Control Center can also be climate controlled.

Whether your requirements for outdoor enclosures for your 38kV switchgear are as simple as a single-aisle enclosure, or as complex as a Power Control Center, CP has the experience to meet your needs.

Optional Ground & Test Devices / Upper & Lower Stab

Application

A grounding and testing (G&T) device is an auxiliary testing apparatus that is inserted into a metal-clad switchgear housing in place of a circuit breaker to provide access to the primary circuits, and to permit the temporary connection of ground or testing equipment.

Two types of G&T devices are available: the upper stab G&T and lower stab G&T. Either can be used to ground and test line or loadside bus.

Remote Operation and Interlocks

For increased safety, both the Upper and Lower G&T devices can be electrically operated from a minimum of 25 feet away with the use of a remote close and trip push-button station. In addition, the grounding switch can be manually operated while outside of the metal-clad housing by using the manual operating handle.

Three shuttered test ports, each connected to its corresponding primary stud, are located on the front of the G&T device. A key interlock locks the test shutters closed to prevent access to the primary circuits under unsafe conditions.

Key Interlocks and interlocking scheme are provided to prevent the operation of the G&T device by unauthorized personnel.