

Type M3C Single Insulator Disconnect Switch for Distribution Switching




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IMPORTANT!
Keep this manual readily
available for future reference.

Warnings

	⚠ DANGER
	<p>Electrical equipment contains hazardous voltages and high speed moving parts. Contact with these hazards will cause death, serious personal injury or damage equipment.</p> <p>Only qualified personnel shall install, operate and maintain this equipment. Always properly ground equipment and lock out electric power (de-energize) before maintenance. Using non-specified/unauthorized parts or components to repair equipment, or tampering with safety devices/systems will result in dangerous conditions which can cause death, severe personal injury or damage to equipment. Take note of and follow all safety instructions contained in this installation, operation and maintenance manual.</p>

IMPORTANT

These installation, operation and maintenance instructions do not claim to cover all details or variations in equipment. Nor do they provide for all possible conditions encountered while installing, operating or maintaining this equipment. If further information is desired or needed to address any particular installation, operation or maintenance problem not covered in this document, contact your authorized factory representative.

The information in this document does not relieve the user from exercising good judgment in selecting equipment for suitability of application. Nor does it relieve the user from using sound practices in installation, operation and maintenance of the equipment purchased.

Note: Because HUBBELL has a policy of continuous product improvement, we reserve the right to change design and specifications without notice. Should a conflict arise between the general information in this document and the contents of drawings or supplementary material, or both, the latter shall take precedence.

QUALIFIED PERSON

For the purpose of this manual, a qualified person is:

- (a) **familiar with the installation, operation and maintenance** of the subject equipment and the hazards involved with its installation, operation and maintenance.
- (b) **trained** to de-energize, clear, ground, and tag circuits and equipment in accordance with established safety practices.
- (c) **trained** in the proper care and use of protective equipment such as rubber gloves, hard hat, safety glasses or face shields, flash clothing, etc., in accordance with established utility safety practices.
- (d) **trained** to render first aid.

SUMMARY

The information in this document does not claim to cover all details or variations in equipment, nor to provide for every possible contingency encountered with installation, operation, or maintenance. Should further information be needed or problems arise that are not covered sufficiently, contact your authorized factory representative.

The contents of this document are not part of, nor do they modify, any prior or existing agreement, commitment or relationship. Hubbell Power Systems, Inc. terms and conditions of sale constitute the entire obligation of HUBBELL. The warranty in the terms and conditions of sale is the sole warranty of HUBBELL. Any statements in this document do not create new warranties or modify any existing warranty.

Overview

Qualified Person

Only qualified trained and competent personnel that understand proper safety procedures must select, install and service this equipment.

Read and understand these instructions before installing, operating or maintaining this equipment.

This guide is not a substitute for adequate training and experience in safety procedures for this type of equipment.

Signal Words

The signal words "DANGER," "WARNING" and "CAUTION" (along with their assigned symbol) throughout this manual indicate the degree of hazard the user may encounter. These symbols and words are defined as:

DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION

CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

Product

The products covered by this manual are the M3C overhead switches for medium voltage electrical distribution switching.

These products are designed for distribution switching only at their rated capacities. They cannot be field modified for capacities other than what was shipped with the units. If a different capacity is desired, contact your supervisor or factory representative to obtain the appropriate unit.

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Function

These products are non-loadbreak. The M3C switch is a disconnect switch designed to provide a means for disconnecting electrical systems.

General

The M3C Switch is a single-phase hookstick operated switch. It is used for manually connecting or disconnecting electrical service.

The M3C Switch has no inherent current making or breaking capacity but does include loadbreak hooks for use with a loadbreak tool. Also included is a stop for vertical blade open position. Optional selections include mounting brackets, terminal connectors, and captive hardware.

• Mounting Bracket

The switch may be supplied with:

- 1) NEMA "B" Bracket (Option B)
- 2) Extended Bracket (Option X)
- 3) Pole Bracket (Option D)
- 4) No Bracket

If no bracket is supplied with the switch, the user must mount the switch to one of the three types of brackets described above.



Terminal Connectors (3 variations)

1. No Terminal Hardware

The user supplies the terminal connectors and mounting hardware.

2. Terminal Connectors

Fortified cadmium plated aluminum parallel groove terminal connectors (ATC-1343) with terminal pad mounting hardware are supplied. The connectors accommodate conductor sizes ranging from No 2 solid copper thru 500 MCM copper or aluminum.



3. Captive Hardware

Provides 1/2" diameter by 1 3/4" long stainless bolt secured into each terminal pad hole. Each bolt is supplied with a hex nut and lock washer. Terminal connectors supplied by the user.



Specifications

Select the proper M3C Switch for each installation with consideration to voltage, lightning impulse withstand, continuous current, short time current withstand, and variations. If there is concern about the use of this switch as rated, consult your supervisor before installation.

- Nominal voltage ratings of 14.4 kV, or 25 kV
- Lightning impulse peak withstand ratings of 110 kV or 125 kV
- Continuous current rating of 600 or 900 amperes
- Short time current withstand rating:
 - 14.4 kV and 25 kV 600 Amp
 - 25 kA symmetrical for 1 second
 - 65 kA peak
 - 14.4 kV and 25 kV 900 Amp
 - 25 kA symmetrical for 3 seconds
 - 65 kA peak



DANGER

Hazardous voltage.

Will cause death, severe personal injury, or property damage.

Only qualified personnel should work on or around this equipment after becoming thoroughly familiar with this document and other publications regarding this equipment.

Receiving & Handling

Inspect Packaging

- Upon receipt, immediately inspect packaging for signs of damage.
- Start inspection with the packaging material and proceed to the equipment within.

- Open carton and look for concealed damage.
- If damage is found, note damage on Bill of Lading prior to accepting delivery.

Note: Documentation of visible shipping damage can determine the outcome of any damage claim. Immediately notifying the carrier of concealed damage is essential to resolving or minimizing unsettled claims. Immediately file your claim and notify your factory representative.

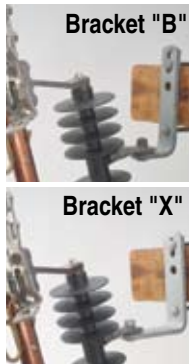
Switch Installation

Install Mounting Bracket

The M3C Switch may be mounted on either a crossarm mounting bracket or a pole mounting bracket

Crossarm Mounting Bracket ("B" or "X")

Determine switch location and install switch mounting bracket to crossarm. Tighten the mounting hardware securely.



Pole Mounting Bracket ("D")

Determine switch location on the pole. Using the mounting bracket as a template, mark and drill two $1\frac{1}{16}$ " dia. thru holes $10\frac{1}{4}$ " apart. Install the switch mounting bracket to the pole using $\frac{5}{8}$ " dia. user supplied hardware in two holes. Tighten the mounting hardware securely.



Install Switch

- Mount the switch on the mounting bracket with the external tooth lockwasher placed between the mounting bracket and the switch support pin.
- Tighten the nut finger tight. Rotate the switch on the mounting bracket to provide maximum clearance for the operator and to provide maximum ease of operation. Tighten carriage bolt nut 60 to 70 ft-lb.

Wiring

Conductors

- Using your company's standard practices, train the conductors to the switch terminal pads.
- Use sufficient conductor length to allow for ease of termination and switch operation.

	CAUTION
	<p>High Voltage Electrical Arc Hazard May cause property damage. Install terminal connectors with bolt heads toward the insulator. Failure to do so may compromise the electrical insulation resulting in an electrical arc.</p>

Connect High Voltage Conductors

- Wire brush mating surfaces of the terminal pads and terminal connectors.
- Wire brush connector surfaces where conductors will be secured.
- Wire brush conductor surfaces.
- Apply a contact sealing paste to the cleaned surfaces (Chance Co. Z.L.N. or equivalent).
- Assemble connectors, conductors and hardware to the terminal pads.
- Ensure bolt heads of the terminal connectors are on the insulator side of the terminal pad as shown.



- Torque user supplied hardware according to your company standards.

- Torque all supplied hardware 35 to 45 ft-lb.

Operation

General

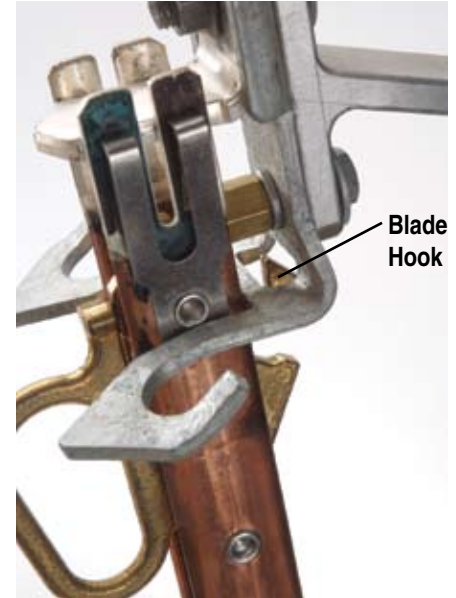
Operate the M3C Switch with a hook stick as follows.

- Position yourself below and slightly to the front of the switch's hook stick pull ring.
- Position feet and body in a manner that provides good stability and allows for hook stick use without losing a steady footing.
- Under ice conditions, be prepared to use greater force to overcome the additional

resistance.

- Allow a minimum of 24 inches (610 mm) clearance from the bottom of the hook stick to the ground or other objects for uninterrupted hookstick travel.

Closing Switch




- To close the M3C Switch, place a hookstick in the pull ring on the blade and rotate the blade to an intermediate position as shown.
- Turn head and look away from the switch.
- **Quickly, firmly and without hesitation** drive the switch blade into the closed position.
- Carefully remove the hookstick from the pull ring to avoid opening the switch.
- The M3C Switch is properly closed when the blade hook is fully engaged with the latch portion of the blade stop as shown.
- Visually check switch blade for proper latching.

Operation

Hookstick Opening Switch



- To open the M3C switch, place a hookstick in the pull ring as shown.
- Turn head and look away from the switch.
- **Quickly, firmly and without hesitation** pull the switch blade to open position.

	⚠ WARNING
	High Voltage Electric Arc Hazard. Opening an energized disconnect switch without a loadbreak tool will create an electrical arc. Can cause death, severe personal injury or property damage. Use appropriately rated loadbreak tool to open a switch that is carrying load current



- Once the switch blade is open, continue blade travel to stop position.
- Carefully remove the hookstick from the pull ring.

Operation

Loadbreak Tool

Opening Switch

- The M3C switch is equipped with loadbreak hooks for use with a loadbreak tool for the switching of load, capacitor, line/cable charging and magnetizing currents.
- To open blade of an energized disconnect switch, use only an approved loadbreak tool designed for use with switches.
- Follow the instructions provided with such tools.



Opening sequence begins with loadbreak tool connected to switch loadbreak hook and blade pull ring.



Loadbreak tool pulled to trip and interrupt position



Loadbreak tool disconnected from loadbreak hook and ready to be disconnected from blade pull ring


Maintenance


General

Prolong the life of the M3C Switch with a periodic inspection and maintenance program. Although the switch is designed for long-term exposure in all weather conditions, certain environments may reduce its life without periodic maintenance. Following these minimum inspection and maintenance procedures will help ensure long service life.

Note: It is recommended that all switches go through a maintenance check at least once a year; more frequently if located in a contaminated area.

For additional recommendations, refer to ANSI C37.35 "IEEE Guide for the Application, Installation, Operation, And Maintenance of High Voltage Air Disconnect Switches."

	⚠ DANGER
	Hazardous voltage. Contact with energized lines will result in death, personal injury or property damage. All maintenance work should be performed on de-energized switches. If work must be performed on live lines, follow your company's standard safe operating procedures.

	⚠ WARNING
	Hazardous voltage. Can cause death, severe personal injury. Contact with the switch mounting, hardware or crossarm could result in electrical shock. Ground the switch mounting hardware prior to maintenance.

Switch

Operate the switch periodically to clean contact surfaces to keep parts moving freely.

- Check for burned or pitted contacts and replace if necessary. Lubricate if necessary with Dow Corning FS-1292 grease.
- Check the hinge bolt for looseness. If loose, clean bolt threads, apply Loctite®-271 and torque to 40-in-lb.
- Inspect the mounting hardware and tighten securely.
- Clean insulator if heavily contaminated.
- Consult your authorized factory representative for authorized replacement insulator and parts.

Conductors

- Be sure all conductors are routed so they do not interfere with switch operation.
- Inspect all conductors to be sure terminations are tight and corrosion free.
- If necessary, clean and apply contact sealing paste (Chance Z.L.N. or equivalent) and retighten terminations.