

Masterpact™ NW Low-Voltage Power/Insulated Case Circuit Breaker—User Guide

Class 0613

Instruction Bulletin

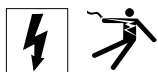
0613IB1204 R06/15
06/2015

Retain for future use.



Hazard Categories and Special Symbols

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service or maintain it. The following special messages may appear throughout this bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

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

⚠ WARNING

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

NOTICE

NOTICE is used to address practices not related to physical injury. The safety alert symbol is not used with this signal word.

NOTE: Provides additional information to clarify or simplify a procedure.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

FCC Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. This Class A digital apparatus complies with Canadian ICES-003.

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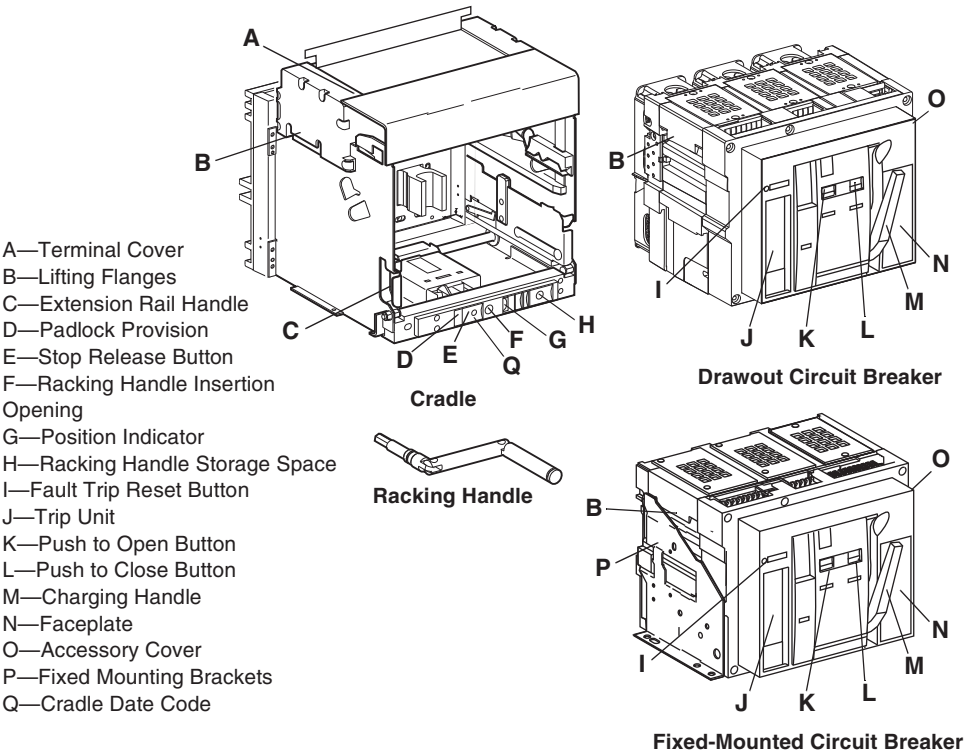
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Section 1— General Information

Introduction

The Masterpact NW low-voltage power circuit breaker¹ and insulated case circuit breaker are designed to mount in a drawout cradle, using rear-mounted, plug-on pressure connections to provide electrical connection to the cradle. A fixed-mounted circuit breaker is also available.

Figure 1 – Circuit Breaker and Cradle



These circuit breakers comply with the following standards.

Low-Voltage Power Circuit Breaker (Drawout/Fixed-Mounted)	Insulated Case Circuit Breaker (Drawout/Fixed-Mounted)
ANSI C37.13 ANSI C37.16 ANSI C37.17 ANSI C37.50 UL1066 ¹ CSA C22.2 No 31 ¹ NEMA SG3	UL 489 ² NEMA AB1 CSA C22.2 No. 5-02 ³

¹ cULus.

² UL® Listed.

³ CSA® Certified.

¹ In this manual the phrase “circuit breaker” means circuit breaker and switch.

Type L1F 800–2000 A low-voltage power circuit breakers and Type LF 800–2000 A insulated case circuit breakers are tested to show the arc-flash hazard risk category as referenced by NFPA 70E or CSA Z462.

This bulletin provides operating information for Masterpact NW circuit breakers. Tripping functions are controlled by the Micrologic™ trip unit. For information on the trip unit, see the trip unit manual.

For additional information see the following user guides available on the Schneider Electric™ website:

- Bulletin HRB28361: *Masterpact™ NW Low-Voltage Power/Insulated Case Circuit Breaker Installation*
- Bulletin 0613IB1205: *Masterpact™ NW Dimensional Drawings*
- Bulletin 0613IB1202: *Masterpact™ NT and NW Field Testing and Maintenance Guide*
- Bulletin 48049-136-05: *Micrologic 2.0A, 3.0A, 5.0A, and 6.0A Electronic Trip Units*
- Bulletin 48049-330-03: *Micrologic 5.0H and 6.0H Electronic Trip Units*
- Bulletin 48049-137-05: *Micrologic 5.0P and 6.0P Electronic Trip Unit*
- Bulletin 48049-207-05: *Micrologic 2.0, 3.0 and 5.0 Electronic Trip Units*
- Bulletin 1040IB1401: *IFE Ethernet Interface for LV Circuit Breakers User Guide (UL)*
- Bulletin 0613IB1317: *IO Module - Input/Output Interface for LV Circuit Breakers - User Guide*
- Bulletin DOCA0037EN: *FDM128 - Display for 8 LV Devices User Guide*
- Bulletin DOCA0088EN: *FDM121 - Display for LV Circuit Breaker User Guide*
- Bulletin 48940-329-01: *ULP (Universal Logic Plug) System User Guide*
- Bulletin 0613IB1313: *Masterpact NT/NW and PowerPact P- and R-Frame Modbus User Guide*
- Bulletin NHA67346: *Energy Reduction Maintenance Setting (ERMS) Installation*

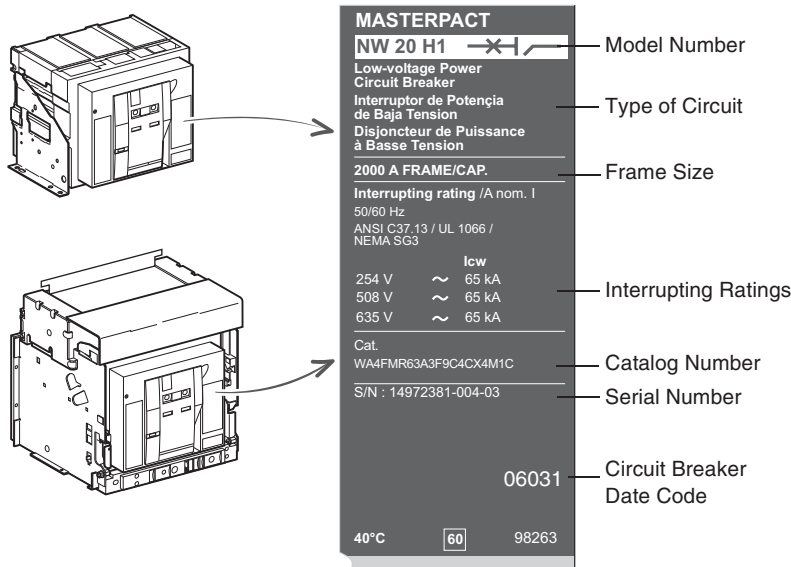
To access the website go to: <http://www.schneider-electric.com>

For application assistance, please call 1-888-778-2733.

Labeling

Information about a specific circuit breaker can be found on the faceplate label on the front of the circuit breaker.

Figure 2 – Faceplate Information



Information about the accessories installed in the circuit breaker can be found on the accessory label on the right side of the circuit breaker.

For complete information on available circuit breaker models, frame sizes, interrupting ratings, sensor sizes and trip units, see 0613CT1001, *Masterpact NT and NW Universal Power Circuit Breakers* on the Schneider Electric website.

Frame Sizes and Interrupting Ratings

Available frame sizes and ratings are shown in Table 1. For complete information on available circuit breaker and switch models, frame sizes, interrupting ratings, sensor sizes and trip units, see the Masterpact NW catalog.

Table 1 – Frame Sizes and Interrupting Rating

UL1066 Listed (ANSI C37.50)						UL489 Listed					
Frame Size	Type ¹	Model Number	254 Vac	508 Vac	635 Vac	Frame Size	Type ¹	Model Number	240 Vac	480 Vac	600 Vac
800 A	N1	NW08N1	42 kA	42 kA	42 kA	800 A	N	NW08N	65 kA	65 kA	50 kA
	H1, HA	NW08H1/HA	65 kA	65 kA	65 kA		H, HF	NW08H/HF	100 kA	100 kA	85 kA
	H2	NW08H2	85 kA	85 kA	85 kA		L, HB	NW08L/HB	200 kA	150 kA	100 kA
	H3, HF	NW08H3/HF	100 kA	100 kA	85 kA		LF	NW08LF	200 kA	150 kA	100 kA
	L1, HC	NW08L1/HC	200 kA	200 kA	130 kA	1200 A	N	NW12N	65 kA	65 kA	50 kA
	L1F	NW08L1F	200 kA	200 kA	130 kA		H, HF	NW12H/HF	100 kA	100 kA	85 kA
1600 A	N1	NW16N1	42 kA	42 kA	42 kA		L, HB	NW12L/HB	200 kA	150 kA	100 kA
	H1, HA	NW16H1/HA	65 kA	65 kA	65 kA	1600 A	LF	NW12LF	200 kA	150 kA	100 kA
	H2	NW16H2	85 kA	85 kA	85 kA		N	NW16N	65 kA	65 kA	50 kA
	H3, HF	NW16H3/HF	100 kA	100 kA	85 kA		H, HF	NW16H/HF	100 kA	100 kA	85 kA
	L1, HC	NW16L1/HC	200 kA	200 kA	130 kA		L, HB	NW16L/HB	200 kA	150 kA	100 kA
	L1F	NW16L1F	200 kA	200 kA	130 kA		LF	NW16LF	200 kA	150 kA	100 kA
2000 A	H1, HA	NW20H1/HA	65 kA	65 kA	65 kA	2000 A	N	NW20N	65 kA	65 kA	50 kA
	H2	NW20H2	85 kA	85 kA	85 kA		H, HF	NW20H/HF	100 kA	100 kA	85 kA
	H3, HF	NW20H3/HF	100 kA	100 kA	85 kA		L, HB	NW20L/HB	200 kA	150 kA	100 kA
	L1, HC	NW20L1/HC	200 kA	200 kA	130 kA		LF	NW20LF	200 kA	150 kA	100 kA
	L1F	NW20L1F	200 kA	200 kA	130 kA	2500 A	H, HF	NW25H/HF	100 kA	100 kA	85 kA
3200 A	H1, HA	NW32H1/HA	65 kA	65 kA	65 kA		L, HB	NW25L/HB	200 kA	150 kA	100 kA
	H2	NW32H2	85 kA	85 kA	85 kA	3000A	H, HF	NW30H/HF	100 kA	100 kA	85 kA
	H3, HF	NW32H3/HF	100 kA	100 kA	85 kA		L, HB	NW30L/HB	200 kA	150 kA	100 kA
	L1, HC	NW32L1/HC	200 kA	200 kA	130 kA	4000 A	H, HF	NW40H/HF	100 kA	100 kA	85 kA
4000 A ² (W-Frame)	H1, HA	NW40BH1/HA	65 kA	65 kA	65 kA		L, HB	NW40L/HB	200 kA	150 kA	100 kA
	H2	NW40BH2	85 kA	85 kA	85 kA	5000 A	H, HF	NW50H/HF	100 kA	100 kA	85 kA
	H3, HF	NW40BH3/HF	100 kA	100 kA	85 kA		L, HB	NW50L/HB	200 kA	150 kA	100 kA
4000 A	H2, HA	NW40H2/HA	85 kA	85 kA	85 kA	6000 A	H, HF	NW60H/HF	100 kA	100 kA	85 kA
	H3, HF	NW40H3/HF	100 kA	100 kA	85 kA		L, HB	NW60L/HB	200 kA	150 kA	100 kA
	L1, HC	NW40L1/HC	200 kA	200 kA	130 kA						
5000 A	H2, HA	NW50H2/HA	85 kA	85 kA	85 kA						
	H3, HF	NW50H3/HF	100 kA	100 kA	85 kA						
	L1, HC	NW50L1/HC	200 kA	200 kA	130 kA						
6000 A	H2, HA	NW60H2/HA	85 kA	85 kA	85 kA						
	H3, HF	NW60H3/HF	100 kA	100 kA	85 kA						
	L1, HC	NW60L1/HC	200 kA	200 kA	130 kA						

¹ N, H, L, N1, H1, H2, H3, L1, LF, L1F: Circuit Breaker

NA, HA: Non-Automatic Switch

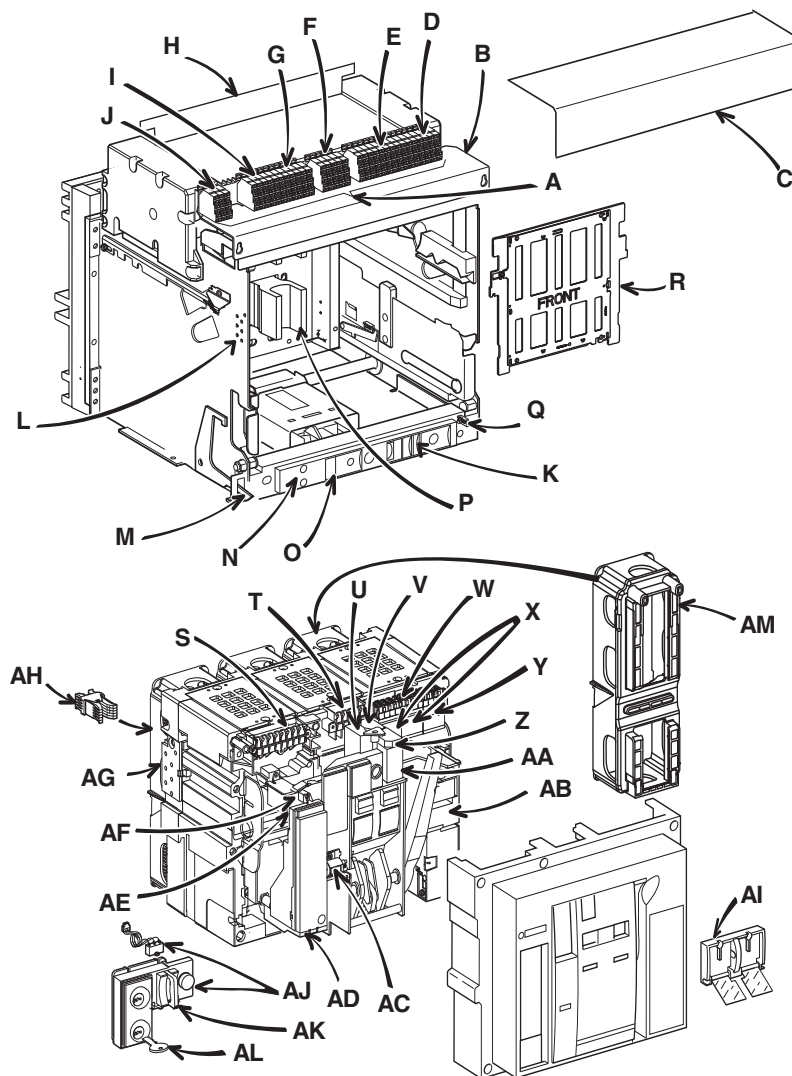
HB, HC, HF: Automatic Switch

² 4000 A W-frame (standard width) circuit breaker is not available in L1 interrupting rating or in drawout construction. See Bulletin 0613IB1205: Masterpact NW Dimensional Drawings for dimensions.

Accessories and Accessory Connections

Figure 3 – Accessories and Accessory Connections

- A. Auxiliary or secondary terminals
- B. Wiring terminal cover
- C. Terminal cover (optional)
- D. Position indicating contact terminal block
- E. Auxiliary contact terminal block
- F. Accessory control terminal block
- G. Position indicating contact terminal block
- H. Tool shield
- I. Trip unit terminal block
- J. Position indicating contact terminal block
- K. Shutter lock
- L. Cradle rejection feature
- M. Door interlock
- N. Key interlock
- O. Padlock provision
- P. Primary connectors
- Q. Racking interlock for open door
- R. Shutters
- S. Trip unit connection to overcurrent trip switch
- T. Auxiliary control connection
- U. MX2 shunt trip or MN undervoltage trip device
- V. MX1 shunt trip
- W. Auxiliary contact connections
- X. Two blocks of four additional OF switches or combined "connected, closed" EF switches
- Y. Block of four form C auxiliary contacts (OF)
- Z. XF shunt close
- AA. PF ready-to-close contact
- AB. MCH spring-charging motor
- AC. Operation counter
- AD. Sensor plug
- AE. SDE1 overcurrent trip switch
- AF. SDE2 overcurrent trip switch or RES electric reset
- AG. Rejection pin plate
- AH. Cluster
- AI. Push button padlockable cover
- AJ. BPFE electrical close push button
- AK. Padlock attachment
- AL. Key interlock
- AM. Cluster Shield



Operating Conditions

Masterpact circuit breakers can be used:

- At ambient temperatures between -13°F (-25°C) and 158°F (70°C)
Mechanical closing of the circuit breaker (by pushbutton) is possible down to -31°F (-35°C)
- Altitude ≤ 13,000 ft. (3900 m)

Operating at other than 104°F (40°C) and at altitudes greater than 6600 ft. (2000 m) may require re-rating, overbussing, heating, or cooling. See Tables 2 and 3 for re-rating values for both UL 489 and UL 1066 (ANSI C37.50) Listed circuit breakers. For 122°F (50°C) overbussing with no derating, contact the field office.

Masterpact circuit breakers have been tested for operation in industrial atmospheres. It is recommended that the equipment be cooled or heated to the proper operating temperature (max. 104°F [40°C]) and kept free of excessive vibration and dust.

Table 2 – Temperature Re-rating Values (per ANSI C37.20.1)

Maximum Ambient Temperature

°F	140	122	104	86	77	68	50	32	14	-4	-22
°C	60	50	40	30	25	20	10	0	-10	-20	-30
Current	0.83	0.92	1.00	1.07	1.11	1.14	1.21	1.27	1.33	1.39	1.44

Table 3 – Altitude Re-rating Values (per ANSI C37.20.1 Table 10)

Altitude	≤ 6600 ft. (≤ 2000 m)	8500 ft. (2600 m)	13000 ft. (3900 m)
Voltage	1.00	0.95	0.80
Current	1.00	0.99	0.96

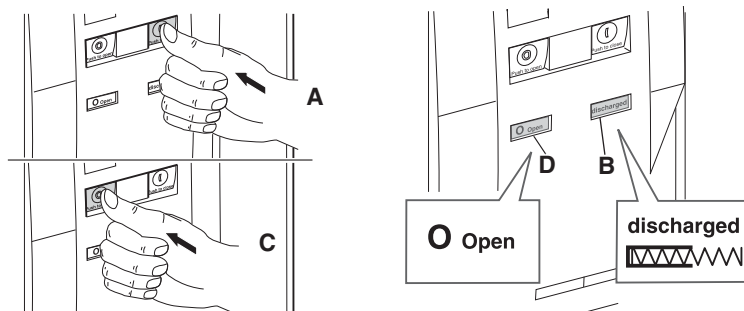
Before Working on Circuit Breaker

- Turn circuit breaker off:

Press “Push to close” button (**Figure 4, A**) to discharge spring, as indicated by window (**B**).

Press “Push to open” button (**C**) to open contacts, as indicated by window (**D**).

Figure 4 – Turn Off Circuit Breaker



- Disconnect power from circuit breaker.

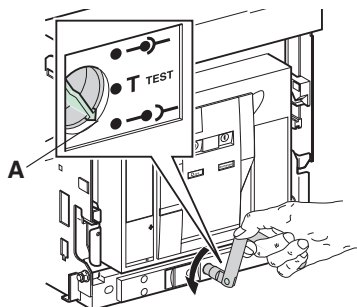
⚠ DANGER**HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH**

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- This equipment must only be installed and serviced by qualified electrical personnel.

Failure to follow these instructions will result in death or serious injury.

- For drawout circuit breaker: rack circuit breaker to disconnected position (**Figure 5, A**). See Drawout Circuit Breaker Disconnection, page 24.

Figure 5 – Disconnect Drawout Circuit Breaker

**⚠ DANGER****HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH**

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors and covers before turning on power to this equipment.

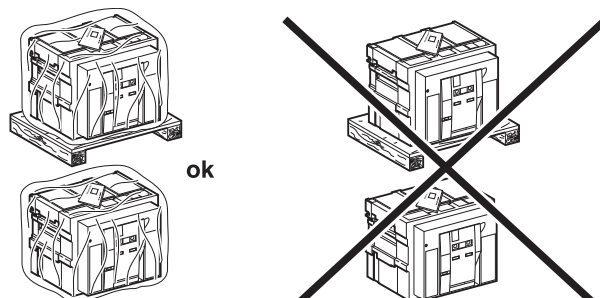
Failure to follow these instructions will result in death or serious injury.

For fixed-mounted circuit breaker: turn off all power supplying equipment before working on or inside equipment.

Storage

Store circuit breaker in original shipping carton or other protective weatherproof covering.

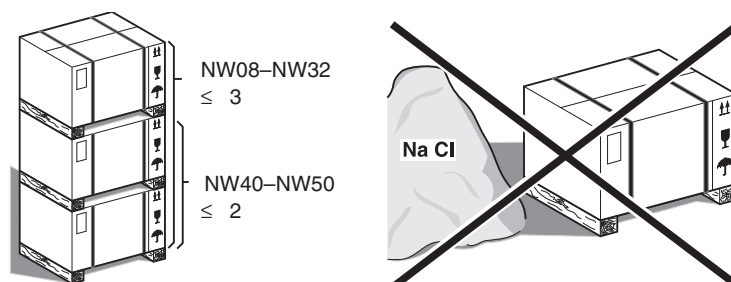
Figure 6 – Storing Circuit Breaker



Do not overstack circuit breakers.

Do not store circuit breaker in corrosive or salt-air environment.

Figure 7 – Storing Circuit Breaker

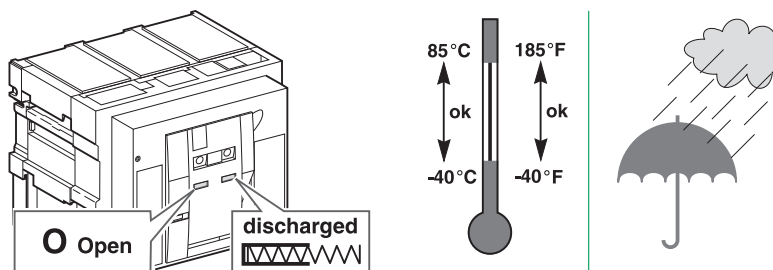


Store circuit breaker with main contacts open and spring discharged.

Store circuit breaker without trip unit at -40° F (-40°C) to +185° F (+85°C).

Store circuit breaker with trip unit and trip units at -13°F (-25°C) to +185°F (+85°C).

Figure 8 – Storing Circuit Breaker



Section 2— Lifting and Transporting

Both the circuit breaker and cradle have lifting flanges for lifting. To lift circuit breaker, use an overhead lifting device attached to the lifting flanges, following the directions given in this section.

⚠ DANGER

HAZARD OF DEVICE FALLING

- Be sure lifting equipment has lifting capacity for the unit being lifted.
- Follow manufacturer's instructions for use of lifting equipment.
- Wear hard hat, safety shoes and heavy gloves.

Failure to follow these instructions will result in death or serious injury.

Weights

Table 4 – Weights

Frame Rating	Connector Type ¹	Weights (lbs./kg.)								
		Circuit Breaker		Cradle		Connector		Pallet	Total	
		3 Pole	4 Pole	3 Pole	4 Pole	3 Pole	4 Pole		3 Pole	4 Pole
800–2000 A, Drawout	FCF	109/50	142/65	97/44	116/53	42/19	55/25	17/8	265/121	330/151
	FCT	109/50	142/65	97/44	116/53	84/38	109/50	17/8	307/140	384/176
	RCTH/RCTV	109/50	142/65	97/44	116/53	17/8	22/10	17/8	240/110	297/136
800–2000 A, Fixed-Mounted	FCF	109/50	142/65	—	—	42/19	55/25	17/8	168/77	214/98
	FCT	109/50	142/65	—	—	84/38	109/50	17/8	210/96	268/123
	RCTH/RCTV	109/50	142/65	—	—	17/8	22/10	17/8	143/66	181/83
2500–3000 A, Drawout	RCTH/RCTV	127/58	165/75	124/57	149/68	26/12	34/15	17/8	294/135	365/166
	FCT	127/58	165/75	124/57	149/68	80/36	104/47	17/8	348/159	435/198
2500–3000 A, Fixed-Mounted	FCT	127/58	165/75	—	—	80/36	104/47	17/8	224/102	286/130
	RCTH/RCTV	127/58	165/75	—	—	26/12	34/15	17/8	170/78	216/98
2000 A L1/L1F & 3200 A, Drawout	RCOV	127/58	165/75	124/57	149/68	100/46	130/59	17/8	368/169	461/210
3200 A, Fixed-Mounted	RCOV	127/58	165/75	—	—	100/46	130/59	17/8	244/112	312/142
4000 A, (W-Frame) Fixed-Mounted	RCOV (Special)	127/58	165/75	—	—	115/52	145/66	17/8	259/118	327/149
3200 A L1 & 4000 A, Drawout	FCF	227/103	295/134	278/126	334/152	84/38	109/50	39/18	628/285	777/354
	FCT	227/103	295/134	278/126	334/152	168/76	218/99	39/18	712/324	886/403
	RCTH/RCTV	227/103	295/134	278/126	334/152	52/24	68/31	39/18	596/271	736/335
4000 A, Fixed-Mounted	RCTH/RCTV	227/103	295/134	—	—	52/24	68/31	39/18	318/145	402/183
5000 A, Drawout	FCT	227/103	295/134	278/126	334/152	168/77	218/99	39/18	712/324	886/403
	RCTH/RCTV	227/103	295/134	278/126	334/152	52/24	68/31	39/18	596/271	736/335
5000 A, Fixed-Mounted	RCTH/RCTV	227/103	295/134	—	—	52/24	68/31	39/18	318/145	402/183
6000 A, Drawout	RCTV	227/103	295/134	278/126	334/152	396/180	528/240	39/18	940/427	1196/544
6000 A, Fixed-Mounted	RCTV	227/103	295/134	—	—	396/180	528/240	39/18	662/301	862/392

¹FCF = Front-connected flat connector.

FCT = Front-connected “T” connector.

RCTH = Rear-connected “T” horizontal connector.

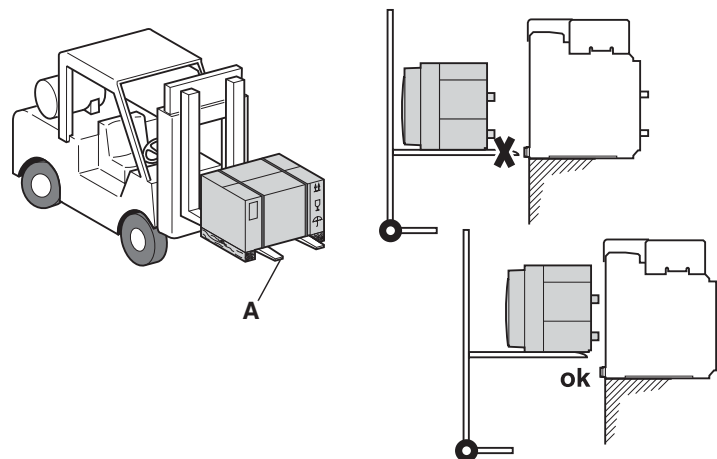
RCTV = Rear-connected “T” vertical connector.

RCOV = Rear-connected offset vertical.

Using a Platform Lift

When using a platform lift, lift flanges (**Figure 9, A**) should not extend beyond back of circuit breaker.

Figure 9 – Using a Platform Lift



Lifting

Lifting Drawout Circuit Breaker

NOTICE

HAZARD OF EQUIPMENT DAMAGE

Cradle must be secured before installing or removing circuit breaker.

Failure to follow these instructions can result in equipment damage.

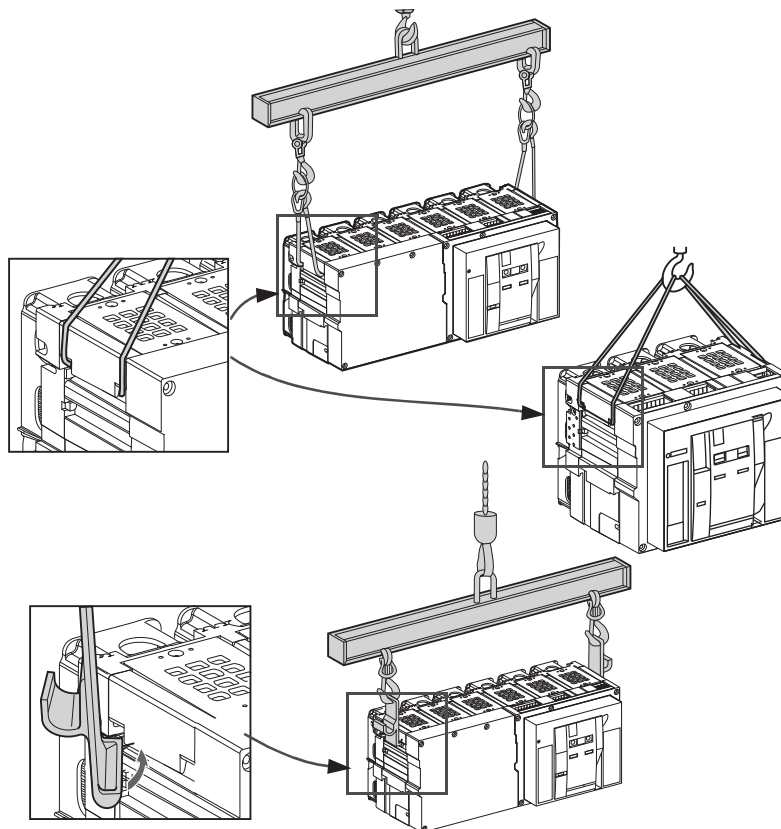
Lift using lifting flanges on sides of circuit breaker, lifting hooks and crossbar.

Lifting Hook Kit: S48906

W-Frame Crossbar Kit: S48900

Y-Frame Crossbar Kit: S48901

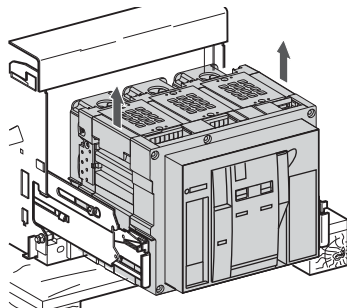
Figure 10 – Lifting Drawout Circuit Breaker



Lifting Cradle or Fixed-Mounted Circuit Breaker

NOTE: If circuit breaker is installed in cradle, remove circuit breaker from cradle before lifting cradle. To remove circuit breaker, see page 17.

Figure 11 – Removing Circuit Breaker From Cradle



Lift using lifting flanges on sides of cradle or circuit breaker, a piece of bar stock through the connectors, lifting hooks and crossbar.

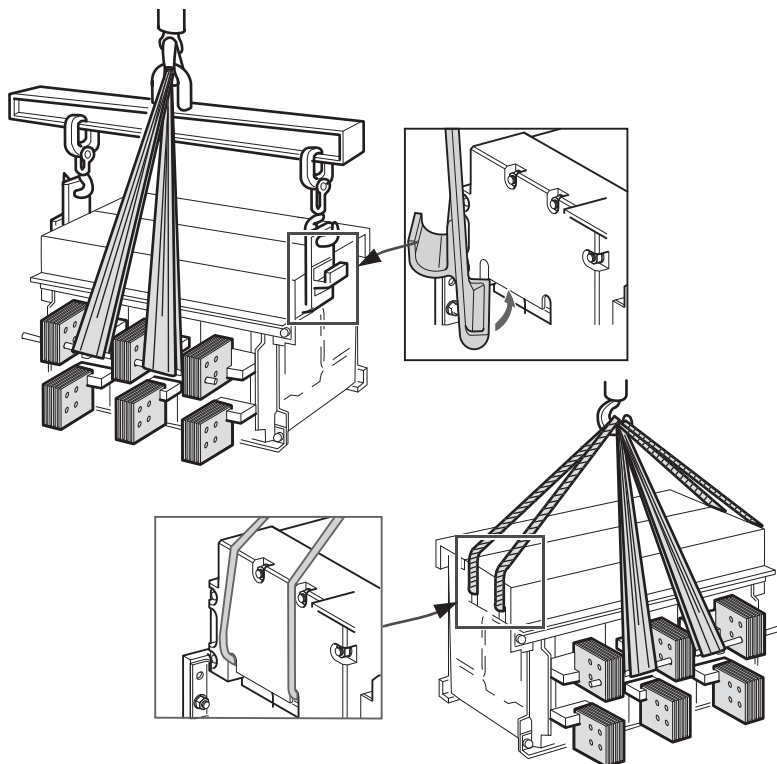
Lifting Hook Kit: S48906

W-Frame Crossbar Kit: S48900

Y-Frame Crossbar Kit: S48901

NOTE: Connectors must be supported while lifting cradle or fixed-mounted circuit breaker.

Figure 12 – Lifting Cradle or Fixed-Mounted Circuit Breaker



Section 3— Trip Unit

Protective functions, measurement functions and communications are controlled by the Micrologic™ trip unit (**Figure 13, A**) installed in the circuit breaker. The trip unit is field replaceable for easy upgrading of functionality.

For complete information on the trip unit, its functions and field replacement, see the trip unit user guide. For complete information on trip unit availability and capabilities, refer to catalog 0613CT1001, Masterpact NT and NW Universal Power Circuit Breakers. Both are available from the Schneider Electric™ website:

<http://www.schneider-electric.com>

Figure 13 – Micrologic Trip Unit

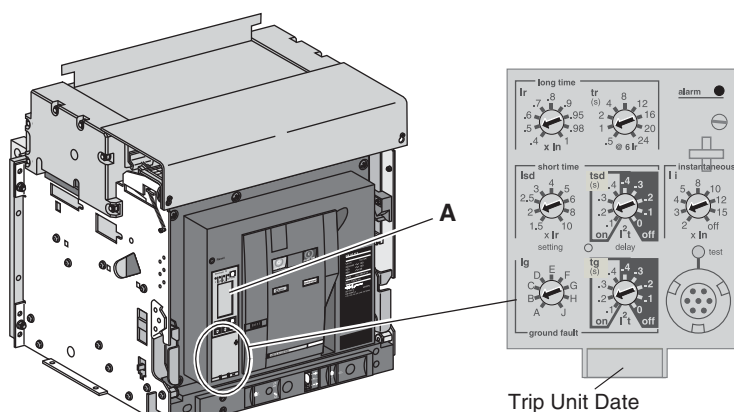


Table 5 describes the features available on the 3.0 and 5.0 standard trip units, the 3.0A, 5.0A, and 6.0A trip units with ammeters, the 5.0P and 6.0P power measurement trip units and the 5.0H and 6.0H harmonic measurement trip units.

Figure 14 – Micrologic Trip Units



Table 5 – Micrologic Trip Unit Features

Feature	Micrologic Trip Unit								
	X = Standard Feature O= Available Option								
	Standard		Ammeter			Power		Harmonics	
	3.0	5.0	3.0A	5.0A	6.0A	5.0P	6.0P	5.0H	6.0H
LI	X		X						
LSI		X		X		X		X	
LSIG/Ground-Fault Trip ²					X		X		X
Ground-Fault Alarm/No Trip ^{1,2}						X		X	
Ground-Fault Alarm and Trip ^{1,2}							X		X
Adjustable Rating Plugs	X	X	X	X	X	X	X	X	X
True RMS Sensing	X	X	X	X	X	X	X	X	X
UL® Listed	X	X	X	X	X	X	X	X	X
Thermal Imaging	X	X	X	X	X	X	X	X	X
Phase-Loading Bar Graph			X	X	X	X	X	X	X
LED for Long-Time Pick-Up	X	X	X	X	X	X	X	X	X
LED for Trip Indication			X	X	X	X	X	X	X
Digital Ammeter			X	X	X	X	X	X	X
Zone-Selective Interlocking				X	X	X	X	X	X
Communications			O	O	O	X	X	X	X
LCD Dot Matrix Display						X	X	X	X
Advanced User Interface						X	X	X	X
Protective Relay Functions						X	X	X	X
Neutral Protection ²						X	X	X	X
Contact Wear Indication						X	X	X	X
Incremental Fine Tuning of Settings						X	X	X	X
Selectable Long-Time Delay Bands						X	X	X	X
Power Measurement						X	X	X	X
Power Quality Measurements								X	X
Waveform Capture								X	X

¹Requires the M2C or M6C programmable contact module.²Requires neutral current transformer for 3-phase, 4-wire system.

Section 4— Operation

Drawout Circuit Breaker Status

⚠ DANGER

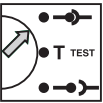
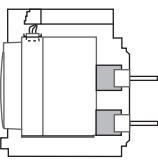
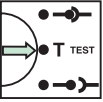
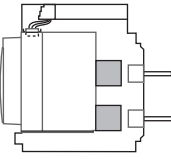
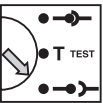
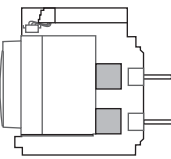
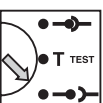
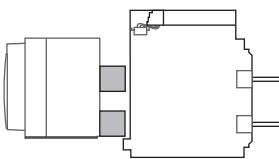
HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- This equipment must only be installed and serviced by qualified electrical personnel.

Failure to follow these instructions will result in death or serious injury.

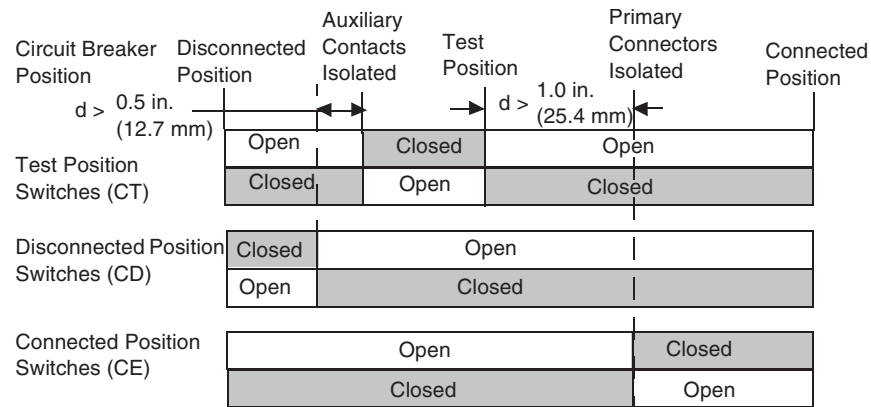
Connection or disconnection of the drawout circuit breaker requires insertion of the racking handle (while pressing “Push to open” button). If interlocks, padlocks or an open door lock are in place, the racking handle cannot be inserted.

Table 6 – Drawout Circuit Breaker Positions

Position Indicator	Connector Position (Cluster shields not shown)	Connectors		Circuit Breaker Status
		Clusters	Secondary (Control)	
Connected 		Engaged	Engaged	Can be operated. Ready for service.
Test 		Disengaged	Engaged	Can be operated. Can have operation and control systems tested.
Disconnected 		Disengaged	Disengaged	Can be operated. Can be removed from carriage.
Withdrawn 		Disengaged	Disengaged	Removed from carriage.

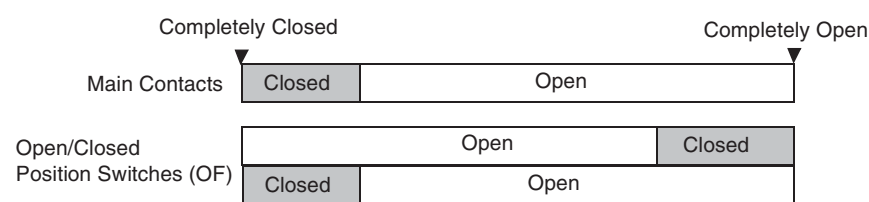
As the circuit breaker position changes, the position contacts change states.

Figure 15 – Device Position Operation



As the circuit breaker main contacts operate, the auxiliary contacts change positions.

Figure 16 – Device Contact Operation



Drawout Circuit Breaker Connection

NOTICE

HAZARD OF EQUIPMENT DAMAGE

- Use racking handle provided to rack circuit breaker into or out of cradle.
- Do not use power tools for racking.
- Do not continue to turn handle after stop release button has popped out.

Failure to follow these instructions can result in equipment damage.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

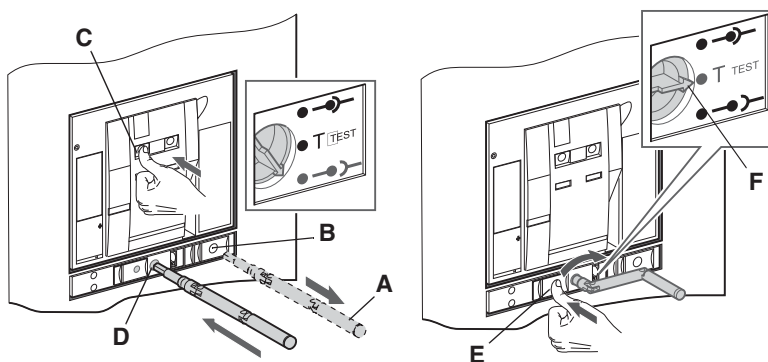
- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- This equipment must only be installed and serviced by qualified electrical personnel.

Failure to follow these instructions will result in death or serious injury.

1. Disconnect the load from the secondary disconnects.
2. Remove the racking handle (Figure 17, A) from its storage hole (B).

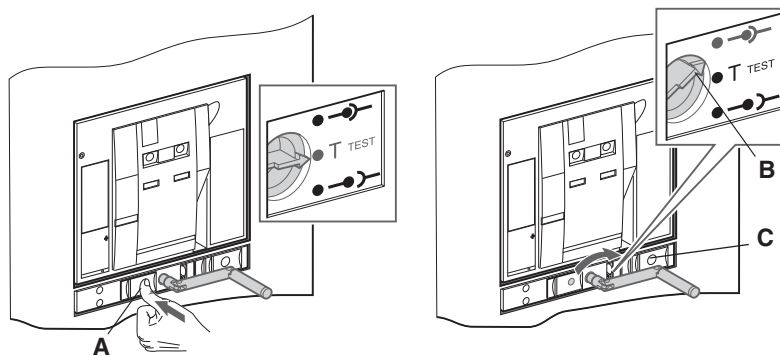
3. While pressing the “Push to open” button (C), insert the racking handle in the racking slot (D).
4. Push the stop release button (E).
5. Turn the racking handle clockwise until the test position (F) is reached. The stop release button will pop out.

Figure 17 – Rack Circuit Breaker to Test Position



6. Push the stop release button (Figure 18, A).
7. Turn the racking handle clockwise until the connected position (B) is reached. The stop release button will pop out. Replace the racking handle in its storage hole (C).
8. Reconnect the load to the secondary disconnects.

Figure 18 – Rack Circuit Breaker to Connected Position



Drawout Circuit Breaker Disconnection

NOTICE

HAZARD OF EQUIPMENT DAMAGE

- Use racking handle provided to rack circuit breaker into or out of cradle.
- Do not use power tools for racking.
- Do not continue to turn handle after stop release button has popped out.

Failure to follow these instructions can result in equipment damage.

⚠ DANGER

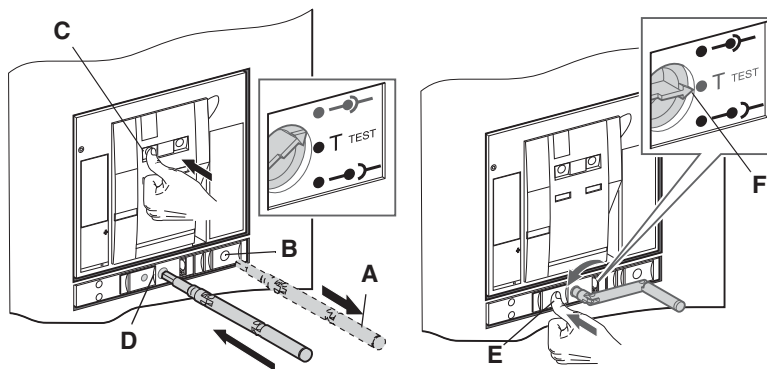
HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- This equipment must only be installed and serviced by qualified electrical personnel.

Failure to follow these instructions will result in death or serious injury.

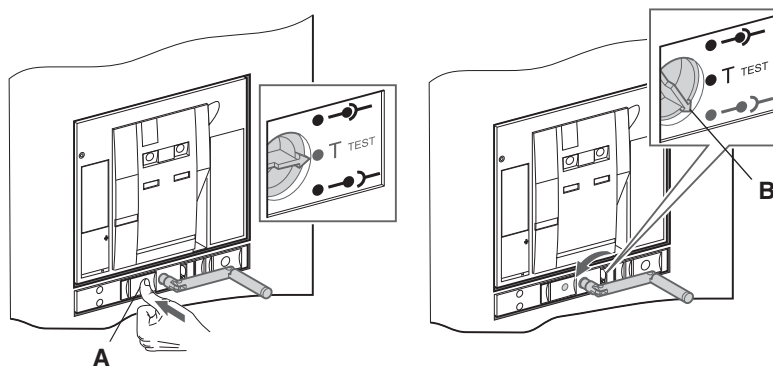
1. Remove the load from the secondary disconnects.
2. Remove the racking handle (**Figure 19, A**) from its storage hole (**B**).
3. While pressing the “Push to open” button (**C**), insert the racking handle in the racking slot (**D**).
4. Push the stop release button (**E**). Turn the racking handle counterclockwise until the test position (**F**) is reached. The stop release button will pop out.

Figure 19 – Rack Circuit Breaker to Test Position



5. Push the stop release button (**Figure 20, A**).
6. Turn the racking handle counterclockwise until the disconnected position (**B**) is reached. The stop release button will pop out. Replace the racking handle in its storage hole.
7. Reconnect the load to the secondary disconnects.

Figure 20 – Rack Circuit Breaker to Disconnected Position



Circuit Breaker Installation and Removal

Circuit Breaker Installation

NOTICE

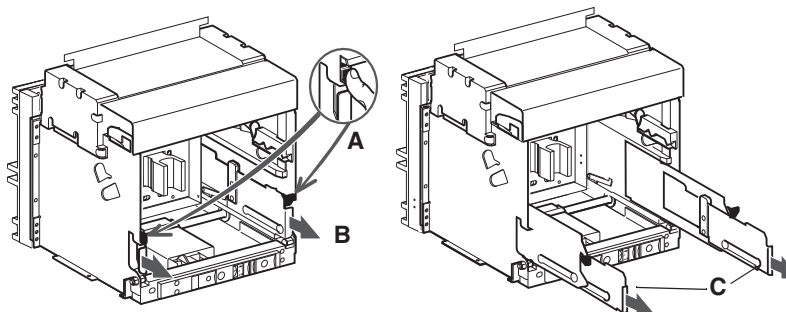
HAZARD OF EQUIPMENT DAMAGE

Cradle must be secured when installing or removing circuit breaker.

Failure to follow these instructions can result in equipment damage.

1. Press the latching tabs (**Figure 21, A**), then pull out the extension rail handles (**B**) until the extension rails (**C**) are fully extended.
2. Inspect the circuit breaker clusters for missing or misaligned clusters. See the bulletin shipped with the circuit breaker for information on checking, installing, and lubricating clusters.

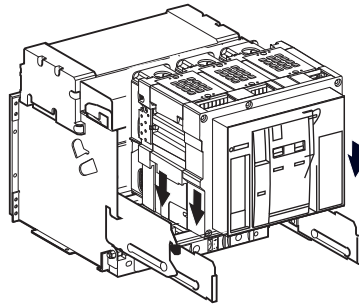
Figure 21 – Pull Out Rails



3. Install the circuit breaker on the extension rails. See page 17 for proper lifting equipment.

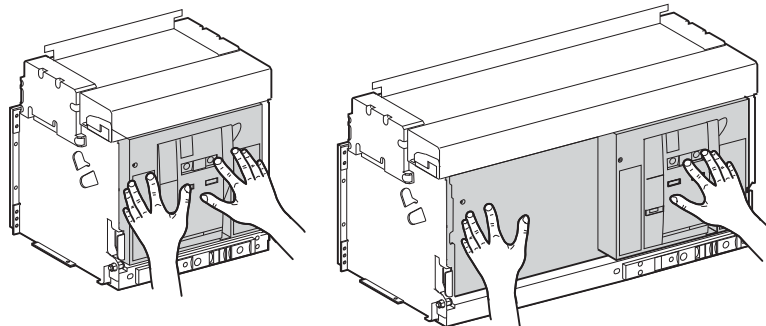
NOTE: The cradle must be secured on a pallet if it is not installed in the equipment prior to installing the circuit breaker.

Figure 22 – Install Circuit Breaker



4. Push in the circuit breaker.
5. Connect the circuit breaker. See page 22, Drawout Circuit Breaker Connection for instructions on connecting the circuit breaker.

Figure 23 – Push In Circuit Breaker



Circuit Breaker Removal

NOTICE

HAZARD OF EQUIPMENT DAMAGE

Cradle must be secured when installing or removing circuit breaker.

Failure to follow these instructions can result in equipment damage.

⚠ DANGER

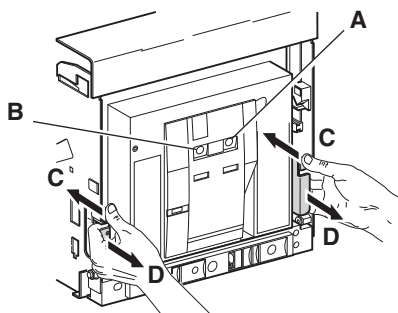
HAZARD OF DEVICE FALLING

- Be sure lifting equipment has lifting capacity for the unit being lifted. Follow manufacturer's instructions for use of lifting equipment.
- Wear hard hat, safety shoes and heavy gloves.

Failure to follow these instructions will result in death or serious injury.

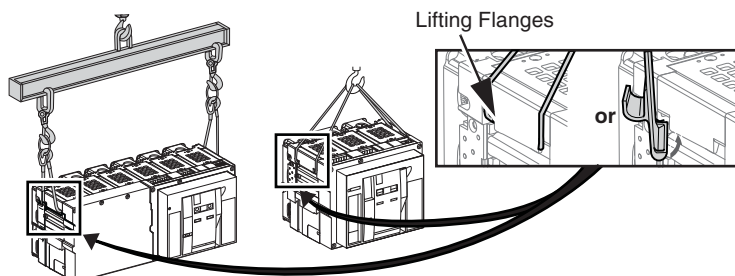
1. Disconnect circuit breaker as detailed on page 24, Drawout Circuit Breaker Disconnection.
2. With the circuit breaker in the disconnected position, press the “push ON” button (**Figure 24, A**) to close the circuit breaker.
3. Press the “push OFF” button (B) to open the circuit breaker.
4. Press latching tabs (C), then pull out extension rail handles (D).

Figure 24 – Circuit Breaker Removal



5. Remove circuit breaker from cradle rails using lifting flanges on sides of circuit breaker, see Section 2—Lifting and Transporting.

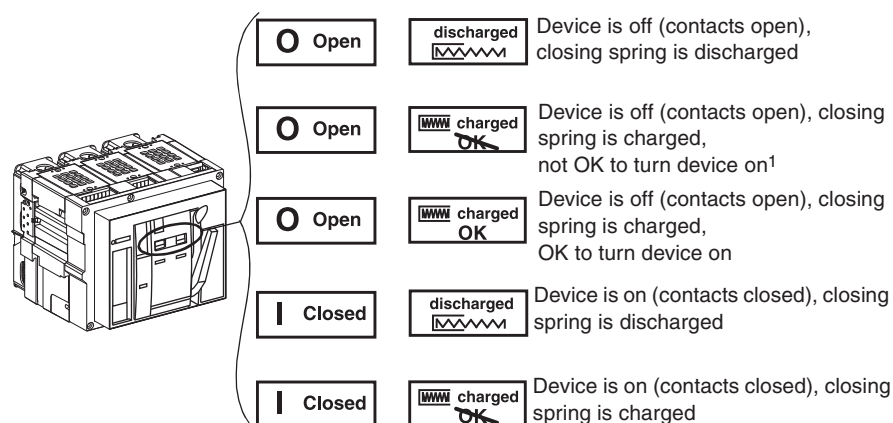
Figure 25 – Overhead Lifting



Circuit Breaker Operation

The circuit breaker is closed by means of a two-step stored energy mechanism. Status indicators on the front of the circuit breaker indicate whether the circuit breaker is open or closed, and whether the closing spring is charged or discharged. Opening springs are automatically charged when the circuit breaker closes.

Figure 26 – Status Indicators



¹It is not OK to turn device on if:

- Shunt trip is energized.
- Circuit breaker is not in connected, test, disconnected or withdrawn position.
- Undervoltage trip is not energized.
- Mechanical interlock is locking mechanism in the open position.

Anti-Pumping Function

The Masterpact circuit breaker is designed to mechanically provide an anti-pumping function. If either the shunt close or shunt trip coil is continuously powered, or both are powered at the same time, the circuit breaker will open and cannot be closed until the power has been removed. This prevents the circuit breaker from cycling between closing and opening (called pumping).

If the circuit breaker is equipped with a communicating-style shunt trip or shunt close (see page 48), the operation of the coil is impulse only. The plungers in the coils do not maintain an interlock on the closing mechanism. An opening signal and a closing signal cannot be sent simultaneously.

When remote operation features are used, make sure there is a minimum of four seconds for the spring charging motor (MCH) to completely charge the circuit breaker closing springs prior to actuating the shunt close (XF) coil. The ready-to-close switch (PF) (see page 47) can be series connected with the shunt close (XF) coil to prevent premature closing.

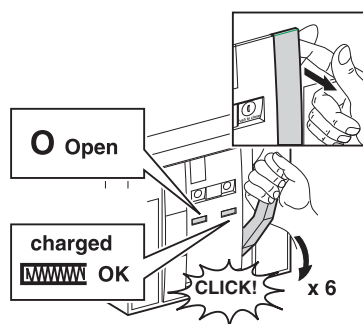
Charging the Closing Spring

To close the circuit breaker, the closing spring must be charged with sufficient energy for closing.

- **Manual Charge:** Use charging handle to charge closing spring.
- **Automatic Charge:** If the optional MCH spring-charging motor is installed, the spring is automatically charged after closing.

NOTE: The closing spring on the drawout circuit breaker will automatically discharge when the circuit breaker is moved from disconnect to withdrawn position.

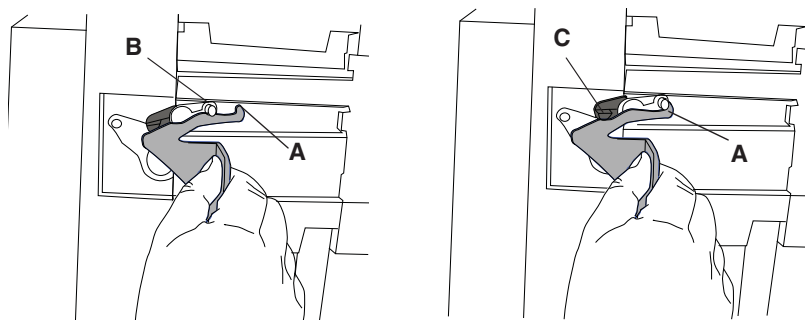
Figure 27 – Manual Spring Charge



NOTE: To close a drawout circuit breaker when it is not installed in the cradle, the cradle interlock must be defeated before the circuit breaker charging spring can be charged. A cradle interlock defeat tool is shipped with every circuit breaker. To install:

1. Slide the interlock defeat tool (**Figure 28, A**) into the groove under the interlock lever (**B**) on the right side of the circuit breaker.
2. Slide the tool toward the front of the circuit breaker and lock it in place under the cradle interlock shaft (**C**).

Figure 28 – Defeating Cradle Interlock



Close Circuit Breaker

To close the circuit breaker, the following conditions must be met:

- The device is open (O).
- The charging spring is charged.
- “OK” is displayed.

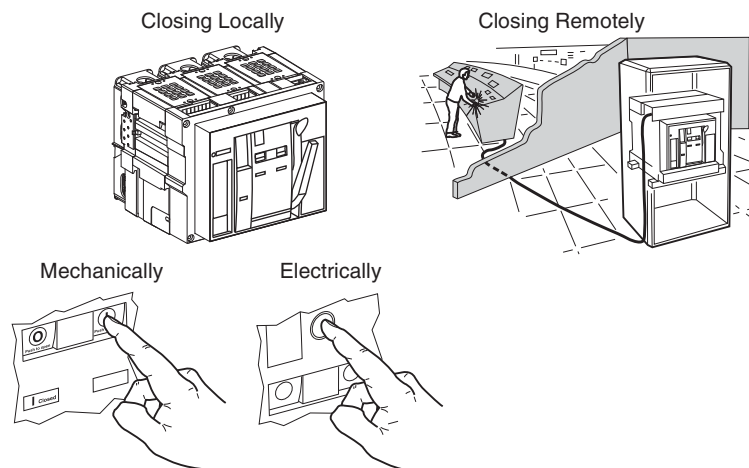
NOTE: The circuit breaker cannot be closed while an opening order is being received. If the “not OK” symbol is displayed, an order to open is being received (electrically or manually) and must be ended before the “OK” will be displayed.

If the above conditions are met, close the device by:

- Mechanically: press the “Push to close” button on the circuit breaker.
- Electrically: if the optional shunt close (XF) is installed, press the optional electrical-close push button (BPFE) on the circuit breaker or a push button at a remote location.

See pages 48 and 49 for more information about these options.

Figure 29 – Close Circuit Breaker

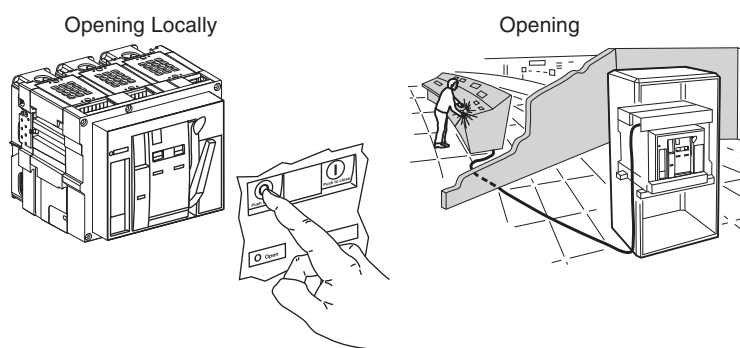


Open Circuit Breaker

- Mechanically: press “Push to open” button on the circuit breaker.
- Electrically: remotely operate using the optional shunt trips (MX1 and MX2), undervoltage trip device (MN), or time-delay module for undervoltage trip accessory (MNR).

See pages 49 and 49 for more information about these options.

Figure 30 – Turn Off Circuit Breaker

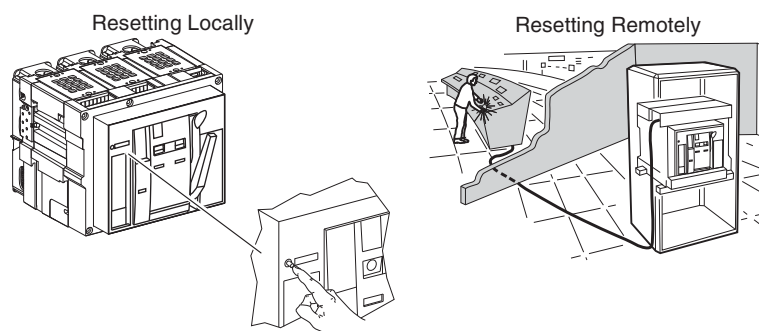


Reset Circuit Breaker

After a fault trip, the circuit breaker must be reset.

- Mechanically: press the “Reset” button located above the trip unit.
- Electrically: use the electrical reset option (RES) after an electrical fault. See page 47 for more information about this option.

Figure 31 – Reset Circuit Breaker



Neutral Protection

Neutral protection protects the neutral conductors against overheating.

- For a three-pole circuit breaker with a P or H trip unit, neutral protection is possible if a neutral current transformer is used.
 - Adjust the neutral using the trip unit keypad of the P or H trip unit.
 - Possible settings are OFF, N/2, N, or 1.6N.
 - Factory setting is OFF.

Oversize neutral protection (1.6N) requires the use of the appropriate oversize neutral current transformer. See price list for correct neutral current transformer.

CAUTION

HAZARD OF EQUIPMENT DAMAGE

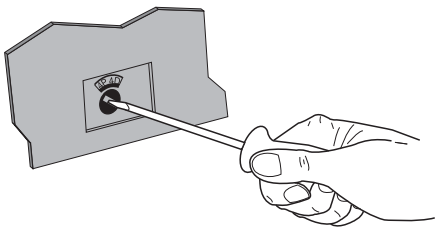
If a four-pole circuit breaker neutral pole switch is set to 4P3D setting, the current in the neutral must not exceed the rated current of the circuit breaker.

For a three-pole circuit breaker with oversize neutral protection (1.6N), select the appropriate oversize neutral current transformer.

Failure to follow these instructions can result in equipment damage.

- For a four-pole circuit breaker, set the system type using the circuit breaker neutral selector dial (see **Figure 32**).
 - With a P or H trip unit, make fine adjustments using the trip unit keypad, with the circuit breaker dial setting providing the upper limit for adjustment.
 - The factory setting is 4P 4D.

Figure 32 – Four-Pole Circuit Breaker Neutral Selector Dial



Neutral Protection Settings for Four-Pole Circuit Breaker

Circuit Breaker Selector Dial	P or H Trip Unit Keypad Setting
4P 3D	Off, N/2, N
3P N/2	N/2
4P 4D	N/2, N

- The neutral protection conductor type has four possible settings:
 - Off (4P 3D)—Neutral protection is turned off.
 - N/2 (3P N/2)—Neutral conductor capacity is one-half that of the line conductors.
 - N (4P 4D)—Neutral conductor capacity is the same as that of the line conductors.
 - 1.6N—Neutral conductor capacity is 1.6 times that of the line conductors. (3P circuit breaker with P or H trip unit only.)

Table 7 – Micrologic™ Trip Unit Conductor Type

Setting	Long-Time Pickup		Short-Time Pickup		Instantaneous		Ground-Fault Pickup	
	Trip Unit	Neutral	Trip Unit	Neutral	Trip Unit	Neutral	Trip Unit	Neutral
OFF	I _r	None	I _{sd}	None	I _i	None	I _g	None
N/2	I _r	1/2 I _r	I _{sd}	1/2 I _{sd}	I _i	I _i	I _g	I _g
N	I _r	I _r	I _{sd}	I _{sd}	I _i	I _i	I _g	I _g
1.6N	I _r	1.6 x I _r	I _{sd}	1.6 x I _{sd} *	I _i	I _i	I _g	I _g

*In order to limit the range, limited to 10 x I_n.

Section 5— Locks and Interlocks

A number of optional locking and interlocking devices are available for the Masterpact circuit breaker and cradle. The operation of most of these devices is described in this section. For a complete listing of available locks and interlocks, see catalog 0613CT1001, *Masterpact NT and NW Universal Power Circuit Breakers* on the Schneider Electric™ website.

For detailed installation instructions on field-installable locks and interlocks, refer to the installation instructions shipped with the devices.

Push Button Lock

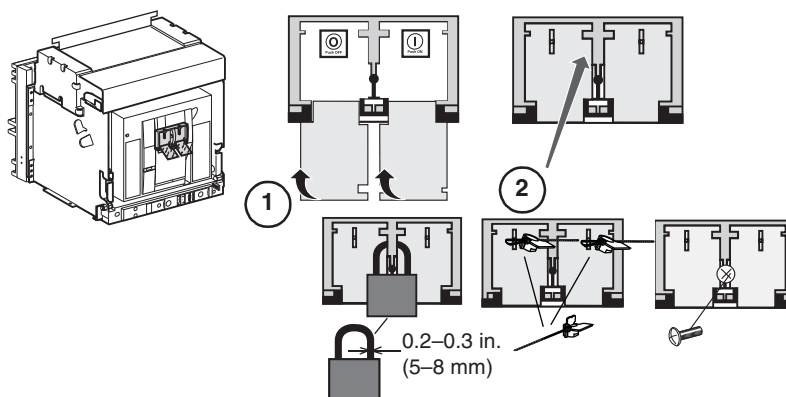
The push button lock prevents the circuit breaker from being opened or closed using the push buttons.

- Optional.
- Can be secured with a padlock, sealing lead or two screws.

To Lock:

1. Install the push button lock over the “Push to open” and “Push to close” buttons.
2. Close the plastic covers of the lock.
3. Lock the plastic cover in place using a padlock, wire seal, or screws.

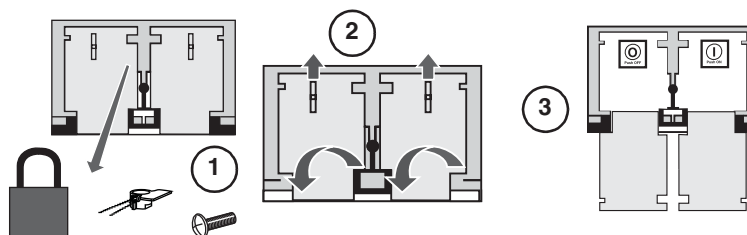
Figure 33 – To Lock Push Buttons



To Unlock:

1. Remove the padlock, wire seal, or screws.
2. Open the plastic covers of lock.
3. The buttons can be pushed.

Figure 34 – To Unlock Push Buttons



Open Position Padlock and Open Position Padlock with Key Lock

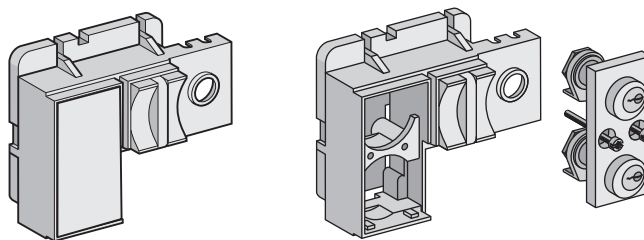
The padlocks prevent the circuit breaker from being closed, either with the push buttons or remotely.

- Optional.
- Secured with one to three padlocks.

The open position padlock and key lock is:

- Optional.
- Available with the Kirk® key lock
- Can be secured with:
 - One padlock;
 - One or two key locks;
 - Or both.

Figure 35 – Open Position Padlock and Open Position Padlock and Key Lock

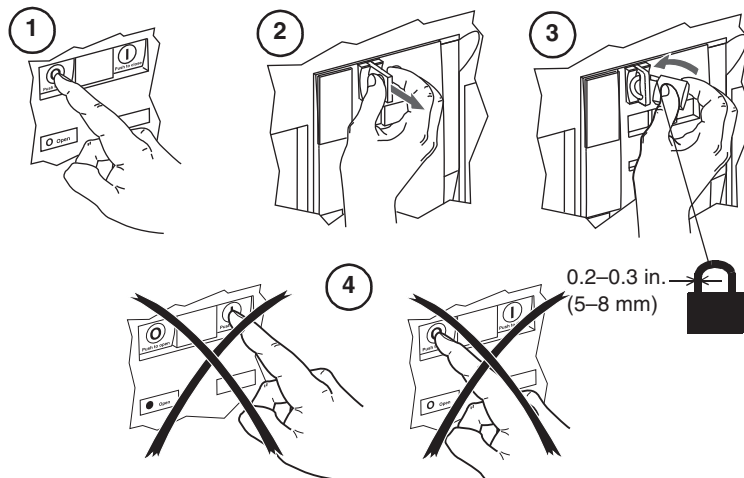


Locking with a Padlock

To Lock (**Figure 36**):

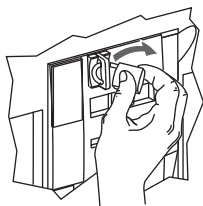
1. Open the circuit breaker.
2. Pull out the tab.
3. Attach the padlock.
4. Verify the controls are disabled.

Figure 36 – Locking with a Padlock



To Unlock (**Figure 37**), remove the padlock.

Figure 37 – Remove the Padlock

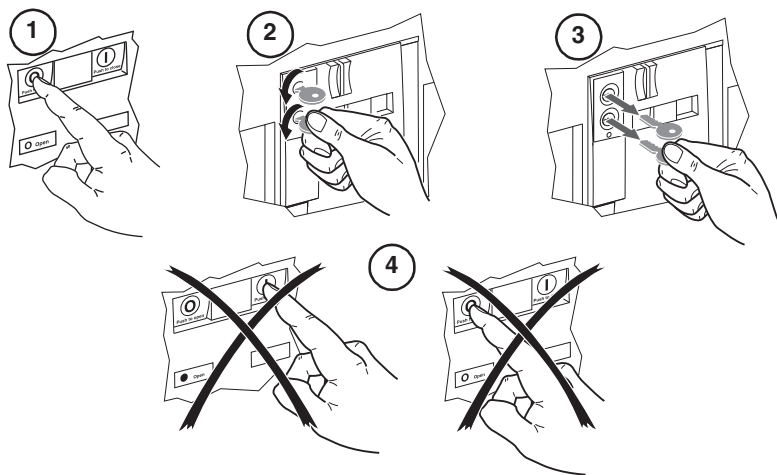


Locking with a Key Lock

To Lock (**Figure 38**):

1. Open the circuit breaker.
2. Turn the key(s).
3. Remove the key(s).
4. Verify the controls are disabled.

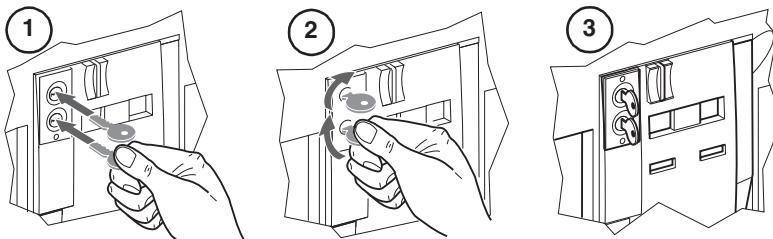
Figure 38 – Locking with Key Lock



To Unlock (**Figure 39**):

1. Insert the key(s).
2. Turn the key(s).
3. Leave the key(s) captive.

Figure 39 – Unlocking the Key Lock



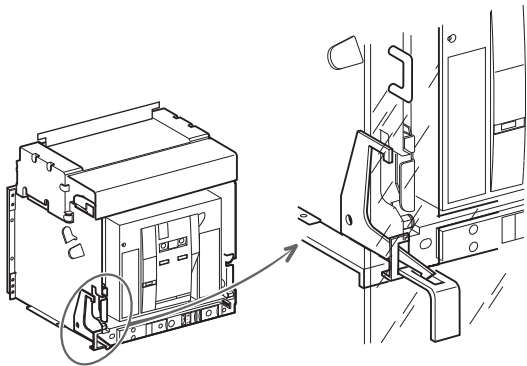
Equipment Door Interlock

If the door lock accessory is installed, the equipment door can only be opened when the circuit breaker is in the disconnected position.

- For drawout circuit breaker only.
- Optional.
- Normally mounts on the right side of the cradle.
- Can be ordered for mounting on the left of the cradle.
- Allows the door to be closed with the circuit breaker in any position.

Table 8 – Door Interlock

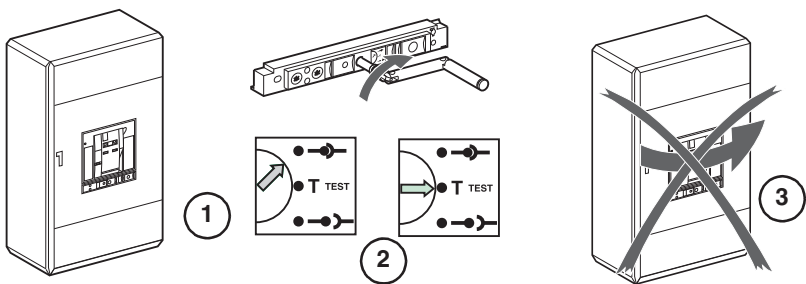
Circuit Breaker Position	Interlock Hook	Door
Connected	Lowered	Locked
Test	Lowered	Locked
Disconnected	Raised	Unlocked



To Lock (**Figure 40**):

1. Close the enclosure door.
2. Move the circuit breaker to the test or connected position.
3. Verify the door is locked.

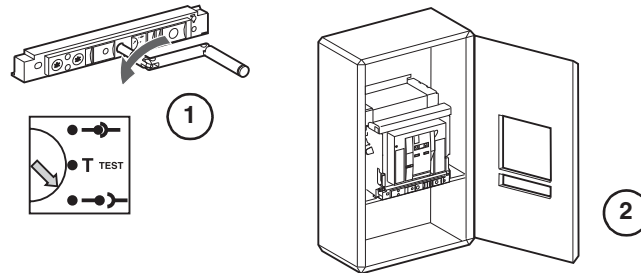
Figure 40 – Locking the Door Interlock



To Unlock (**Figure 41**):

1. Move the circuit breaker to the disconnected position.
2. Verify the door is unlocked.

Figure 41 – Unlocking the Door Interlock

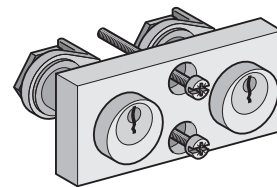


Cradle Locks

The cradle locks prevent the drawout circuit breaker from being racked in or out (by preventing insertion of racking handle) and from being moved from the disconnected position to the fully withdrawn position (by locking the drawout rails).

- Secured with one to three padlocks (standard) and/or with one or two key locks (optional).
- Keylocks are available with the Kirk key lock.
- Allows the cradle to be locked in any position (connected, test, and disconnected).
- Mounted on the cradle.

Figure 42 – Optional Key Interlock



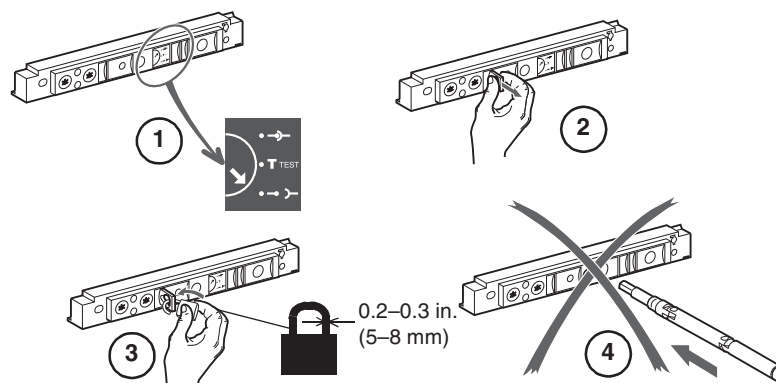
Locking Cradle with a Padlock (Standard)

To Lock (**Figure 43**):

1. Make sure the cradle indicator is in the disconnected, test, or connected position.
2. Pull out the tab.
3. Attach the padlock(s).
4. Verify racking handle cannot be inserted.

NOTE: If circuit breaker is padlocked in disconnected position, the circuit breaker cannot be pulled out from the disconnected position to the fully withdrawn position.

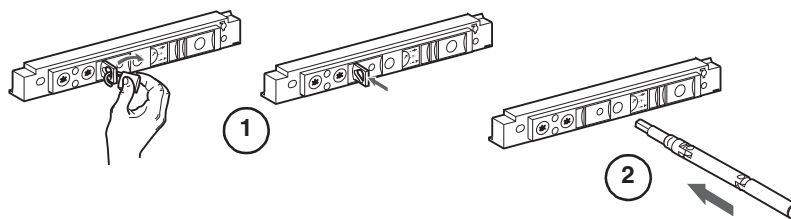
Figure 43 – Locking Cradle With a Padlock



To Unlock (**Figure 44**):

1. Remove the padlock(s).
2. Verify the racking handle can be inserted.

Figure 44 – Unlocking Cradle Padlock

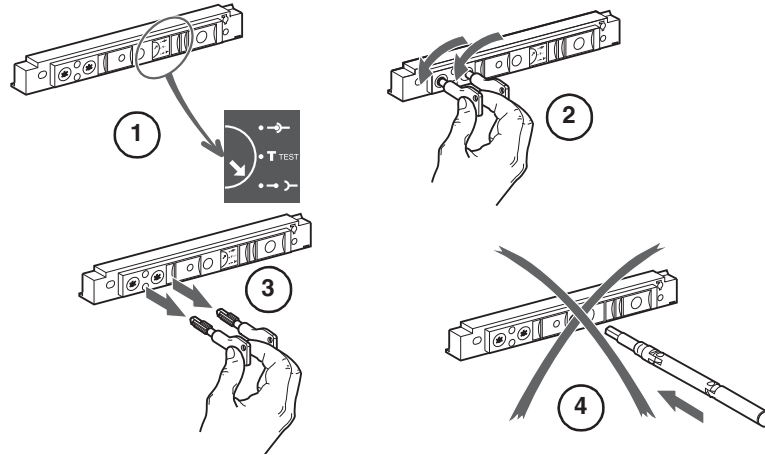


Locking Cradle with a Key Lock

To Lock (**Figure 45**):

1. Make sure the cradle indicator is in the disconnected, test, or connected position.
2. Turn the key(s).
3. Remove the key(s).
4. Verify the racking handle cannot be inserted.

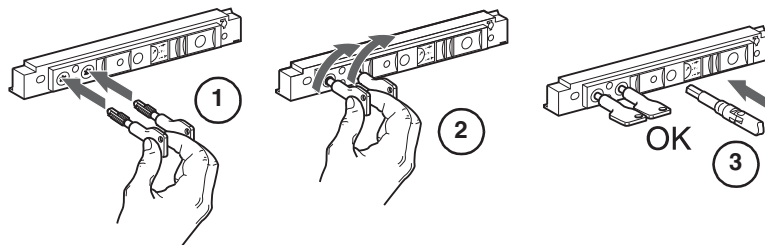
Figure 45 – Locking Cradle with a Key Lock



To Unlock (**Figure 46**):

1. Insert the key(s).
2. Turn the key(s).
3. Leave the key(s) captive.

Figure 46 – Unlocking Cradle Key Lock



Cradle in Any Position Locks

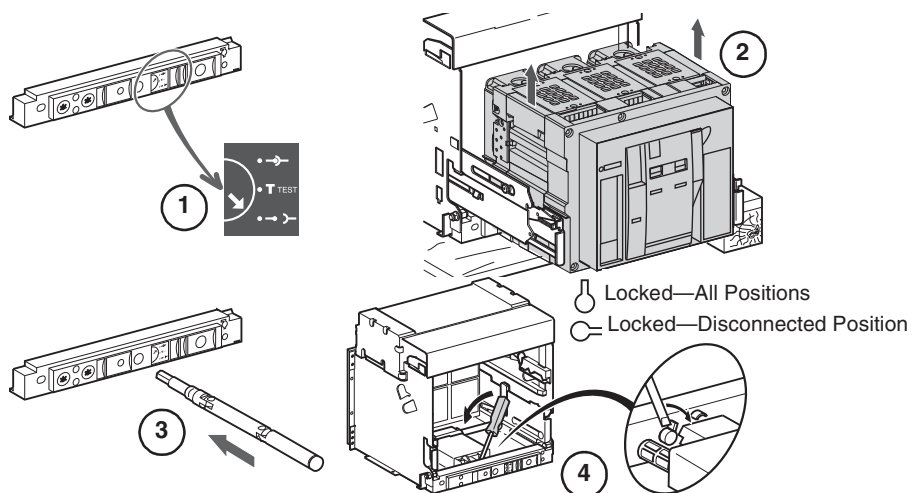
Padlocks and/or key locks used to lock the cradle in the disconnected position can be converted to lock the device in any position (connected, test, or disconnected).

To convert the lock (**Figure 47**):

1. Make sure cradle indicator is in the disconnected position.
2. Remove the circuit breaker from the cradle. (See circuit breaker removal instructions).
3. Insert the racking handle.
4. Rotate the latch to the left. The cradle can now be locked in any position.

NOTE: To return cradle to locking only in the disconnected position, rotate latch to the right.

Figure 47 – Convert Cradle Lock



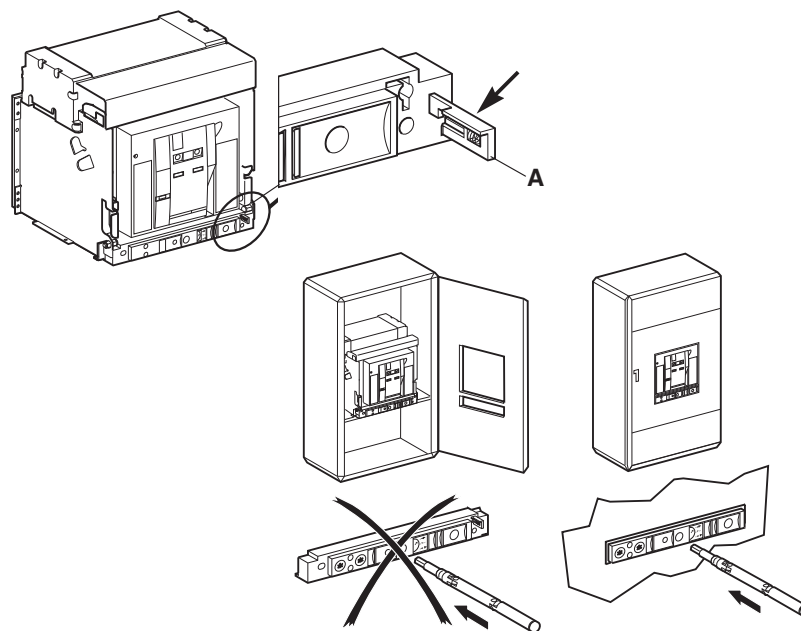
Open Door Racking Interlock

The open door racking interlock prevents the racking handle from being inserted if the equipment door is open.

- Optional.
- Mounts on the right side of the cradle.

To deactivate, pull out the interlock (**Figure 48, A**).

Figure 48 – Interlocking Cradle Position

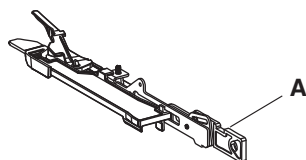


Shutter Lock

The shutter lock (**Figure 49, A**) is used to prevent connection of the circuit breaker by locking the shutter in the closed position.

- Optional.
- Allows the shutter to be padlocked.

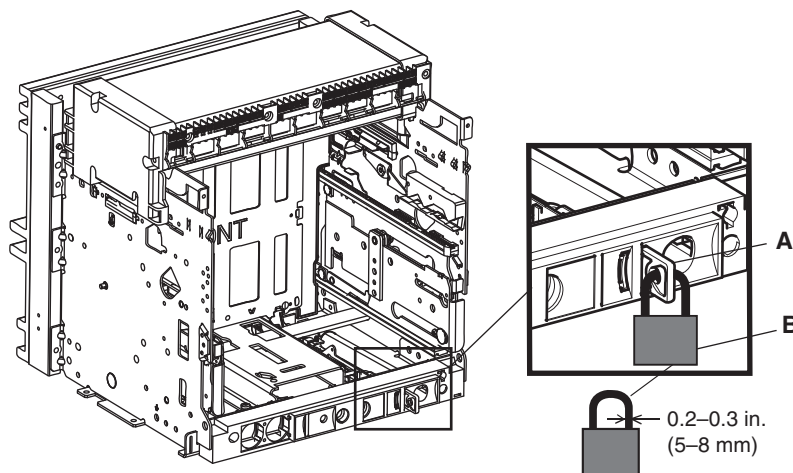
Figure 49 – Shutter Lock



To Lock:

Pull end of shutter indicator arm out of shutter indicator slot (Figure 50, A). Insert padlock (B) through padlock hole.

Figure 50 – Locking the Shutters

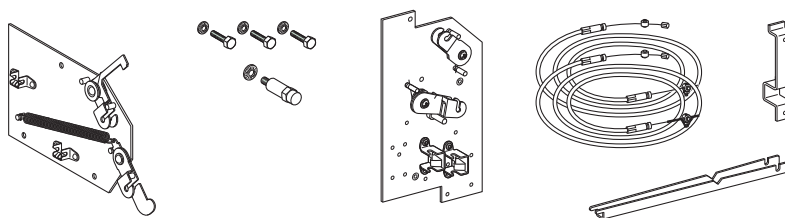


Cable Door Interlock

The cable door interlock prevent the panel door from being opened if the circuit breaker is closed.

- Optional.
- Must be installed after the circuit breaker is installed in the enclosure.

Figure 51 – Cable Door Interlock Kit



Source Changeover Interlock

The source changeover interlock kit provides interlocking between three circuit breakers.

- Kit S48608 provides interlocking between two “main” circuit breakers connected to the same power source and a third circuit breaker connected to a generator power source.
 - Four interlocking positions are possible.
 - The generator circuit breaker is “locked open” when either or both of the main circuit breakers are closed.
- Kit S48609 provides interlocking between two “main” circuit breakers connected to the same power source and one “tie” or external source circuit breaker.
 - The tie circuit breaker can be in first, second or third position.
 - Two of the three circuit breakers can be in the closed position at any given time.
- Kit S48610 provides interlocking between three “main” circuit breakers connected to a single power source.
 - Only one of the three circuit breakers can be in the closed position at any give time.
 - The other two circuit breakers will be held in the “locked open” position.

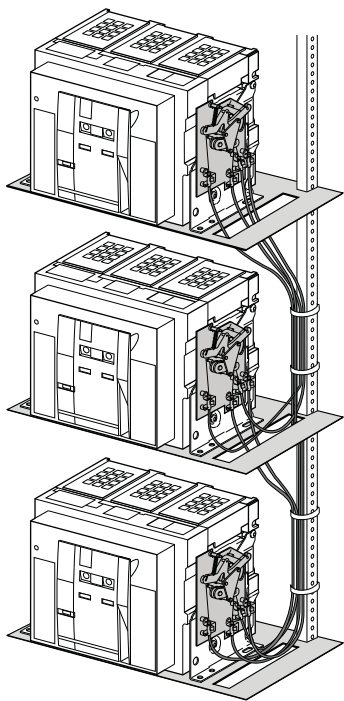


Table 9 – Possible Interlock Configurations

	Vertical Configuration		Horizontal Configuration	
	W-Frame	Y-Frame	W-Frame	Y-Frame
W-Frame	3	3	3	2 x W-Frame 1 x Y-Frame
Y-Frame	3	3	2 x W-Frame 1 x Y-Frame	Contact the Field Sales Office

Section 6— Accessories

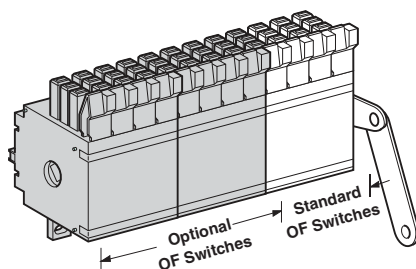
This section describes commonly used accessories. For a complete listing of available accessories, see catalog 0613CT1001, *Masterpact NT and NW Universal Power Circuit Breakers* on the Schneider Electric™ website.

Auxiliary Switches (OF)

Auxiliary switches (OF) change state when the minimum isolating distance between the main contacts is reached.

- Standard, four switches per circuit breaker, rated 10 A.
- Optional additional OF switches available, rated 6 A:
 - Two blocks of four additional OF switches are available with push-in terminal blocks.
 - One block of four additional OF switches are available with ring terminal blocks.
- Indicates the position of the main contacts on the circuit breaker.
- Form C contacts, NO/NC with common neutral.

Figure 52 – Switches (OF)

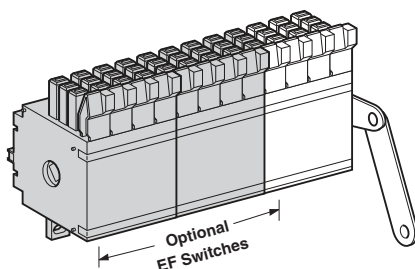


Connected/Closed Switches (EF)

Connected/closed switches (EF) combine “connected device” and “closed device” information, indicating “the circuit is closed.”

- Optional.
- Maximum of eight switches per circuit breaker with push-in terminal blocks.
- Each switch becomes associated with an OF switch when installed in its connector location.
- Form C contacts, NO/NC with common neutral.
- Not available with ring terminal connector.

Figure 53 – Switches (EF)



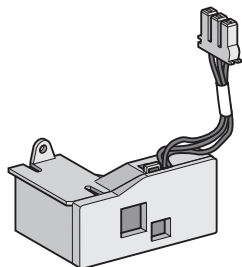
Overcurrent Trip Switch (SDE)



The overcurrent trip switch (SDE) provides remote indication that the circuit breaker has opened because of an electrical fault.

- Standard
- Not available on non-automatic switches
- One form C contacts, NO/NC with common neutral

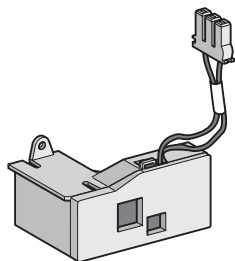
Additional Overcurrent Trip Switch (SDE2)



The additional overcurrent trip switch (SDE2) provides remote indication that the circuit breaker has opened because of an electrical fault.

- Optional.
- Not available on non-automatic switches
- Not compatible with RES option
- One form C contact, NO/NC with common neutral

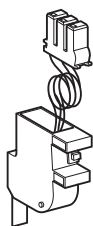
Electric Reset (RES)



The electric reset (RES) resets the circuit breaker remotely after an electrical fault.

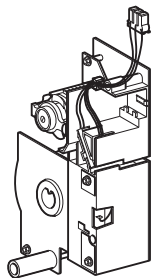
- Optional
- Not compatible with SDE2 option

Ready-to-Close Switch (PF)



- The ready-to-close switch (PF) indicates that the following conditions are met and the circuit breaker can be closed:
 - The circuit breaker is open.
 - The closing springs are charged.
 - The circuit breaker is not locked/interlocked in open position.
 - There is no standing closing order.
 - There is no standing opening order.
- Optional.
- One form C contacts used for push-in connector, NO/NC with common neutral.
- NO contact used for ring terminal connector.

Spring-Charging Motor (MCH)



The spring-charging motor (MCH) charges the closing springs automatically after the circuit breaker closes.

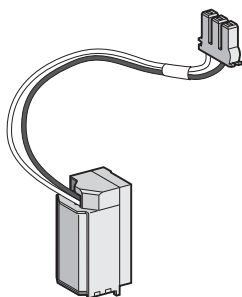
- Optional
- Charging time: 4 seconds maximum
- Operating rate: 3 cycles/minute, maximum
- Minimal voltage: 0.85–1.1 of rated voltage
- Maximum power consumption: 180 VA

Spring-Charged Contact (CH)

The spring-charged contact (CH) indicates that the circuit breaker is charged.

- Standard with the spring-charging motor
- Form C contacts, NO/NC with common neutral

Shunt Trip (MX1 / MX1-COM / MX2) Shunt Close (XF / XF-COM)



Shunt trip: opens the circuit breaker when energized.

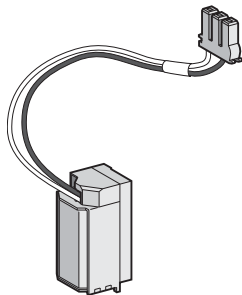
Shunt close: closes the circuit breaker when energized, if the device is ready to close.

NOTE: For a circuit breaker having a circuit breaker communications module (BCM) installed, order MX1-COM and/or XF-COM. These will have three wires instead of the two shown in the illustration.

- Optional.
- One or two shunt trips per circuit breaker.
- One shunt close per circuit breaker.
- Shunt trip and shunt close are the same coil, their action is determined by the location of the coil.
- Circuit breaker response time
 - MX1, MX1-COM and MX2 opening time:
50 ms $\pm$ 10 ms
 - XF and XF-COM closing time:
70 ms $\pm$ 10 ms for NW $\leq$ 4000 A
80 ms $\pm$ 10 ms for NW > 4000 A
- **NOTE:** Shunt trip (MX1) and shunt close (XF) circuits must be energized for a minimum of 200 ms.
- Operating thresholds:
 - MX1, MX1-COM, and MX2:
0.7 to 1.1 x rated voltage
 - XF and XF-COM:
0.85 to 1.1 x rated voltage
- Continuous power supply possible (continuous duty).
For MX1-COM/XF-COM use the comm command for continuous duty. The bypass circuit through terminal C2/A2 is only for momentary duty (0.5 sec. max).
- Maximum power consumption: 4.5 VA maintained, 200 VA inrush.
- MX1-COM can be operated remotely by the circuit breaker communication module (BCM).

XF-COM can be operated remotely by either the electrical close button (BPFE) or the circuit breaker communication module (BCM).

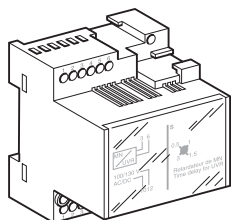
Undervoltage Trip (MN)



The undervoltage trip (MN) opens the circuit breaker when its supply voltage drops below the threshold voltage.

- Optional
- Not compatible with the MX2 shunt trip
- Response time: 90 ms (+5 ms/-5 ms)
- Operating thresholds:
 - Opening: 0.35 to 0.7 x rated voltage
 - Closing: 0.85 x rated voltage
- Continuous power supply required to keep circuit breaker closed
- Maximum power consumption: 20 VA

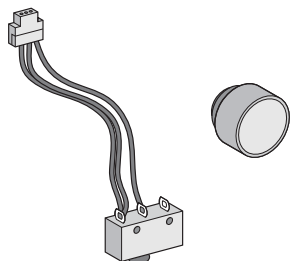
Time-Delay Module for Undervoltage Trip (MNR)



The time-delay module for the undervoltage trip (MNR) can be used to set an adjustable time delay before the undervoltage trip opens the circuit breaker in order to prevent nuisance tripping from a momentary voltage drop. The time-delay mechanism is connected in series with the undervoltage trip (MN) and is installed outside of the circuit breaker.

- Optional
- Available in fixed or adjustable delay versions:
 - Delay time: 0.5 s, 1 s, 1.5 s, 3 s
 - Fixed time: 0.25 s

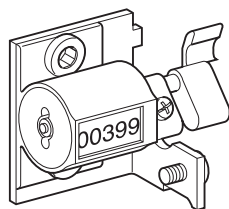
Electrical Closing Push Button (BPFE)



The electrical closing push button (BPFE) closes the circuit breaker electrically using the shunt close (XF).

- Optional
- Located on accessory cover of circuit breaker
- Requires installation of shunt close (XF-COM)
- Cannot be used in combination with a communication module

Operations Counter (CDM)



The operations counter (CDM) registers the total number of operating cycles for the circuit breaker.

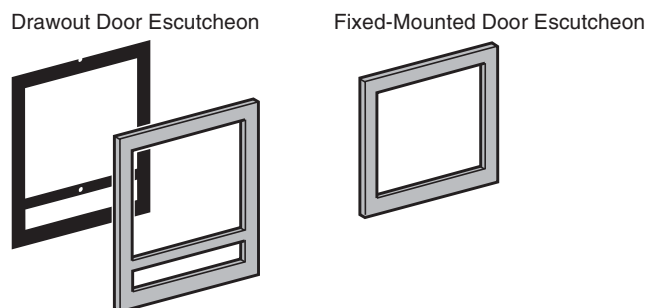
- Optional
- Can be installed on circuit breaker with or without spring charging motor

Door Escutcheon (CDP)

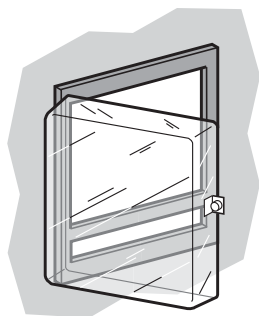
The door escutcheon (CDP) provides an IP40, IK07 (equivalent to NEMA 1) seal for the door.

- Standard

Figure 54 – Door Escutcheon (CDP)



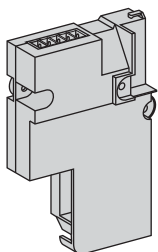
Transparent Cover (CCP)



Mounted on the door escutcheon (CDP), the transparent cover (CCP) provides a IP55, IK10 (equivalent to NEMA 3R/12) seal.

- Optional
- Drawout circuit breaker only

Circuit Breaker Communication Module (BCM)



The circuit breaker communications module (BCM) provides communication between circuit breaker trip unit and the communication network.

- Optional on 3.0A, 5.0A, and 6.0A trip units.
- Standard on 5.0P, 6.0P, 5.0H, and 6.0H trip units.
- Not compatible with the 3.0 or 5.0 trip units.
- Dedicated switches can be used to read status of circuit breaker.
- Actuators (MX/XF) can be used to control the circuit breaker.

I/O (Input/Output) Module



The I/O (input/output) application module for low-voltage circuit breakers links the communication network with the circuit breaker communication module. It connects the Masterpact circuit breaker to a ULP (Universal Logic Plug) system with built-in functions and applications.

- Delivered with the drawout circuit breakers ordered with the COM option for cradle management.
- Must be installed on a DIN rail near the device.
- Must be connected to the ULP system and to the position contacts (CD, CT, CE) that transmit the position of the device in the cradle.
- Compliant with the ULP system specifications.
- Two I/O application modules can be connected in the same ULP network.

The I/O application module resources are:

- Six digital inputs that are self powered for either NO and NC dry contact or pulse counter.
- Three digital outputs that are a bistable relay (5 A maximum).
- One analog input for PT100 temperature sensor.

Ethernet Interface Module (IFE)



The IFE interface and IFE interface + gateway enable Masterpact NW circuit breakers to be connected to an Ethernet network.

- Provides an Ethernet access to one or several LV circuit breakers.
- Functions:
 - Interface: connects one circuit breaker to the IFE interface using its ULP port.
 - Gateway: connects several circuit breakers on a Modbus network using the IFE interface + gateway master Modbus port.
- Dual 10/100 Mbps Ethernet port for simple daisy chain connection.
- Device profile web service for discovery of the IFE interface, IFE interface + gateway on the LAN.
- ULP compliant for placing the IFE interface in the switchboard.
- Ethernet interface for Masterpact circuit breakers.
- Gateway for Modbus-SL connected devices (IFE interface + gateway only).
- Embedded set-up web pages.
- Embedded monitoring web pages.
- Embedded control web pages.
- Built-in e-mail alarm notification.

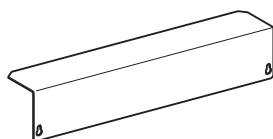
Modbus Interface Module (IFM)



An IFM Modbus communication interface is required for connection of a Masterpact circuit breaker to a Modbus network.

- Requires the circuit breaker be provided with a ULP port. The port is available on the BCM embedded module.
- The IFM is defined as an IMU (Intelligent Modular Unit) in the ULP connection system documentation.
- Connects the circuit breaker as a slave to the Modbus master. Its electrical values, alarm status, open/close signals can be monitored or controlled by a Programmable Logic Controller or any other system.

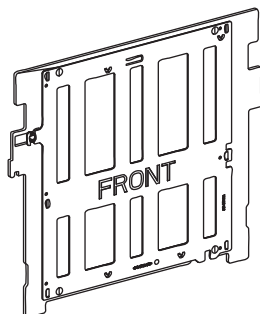
Terminal Cover (CB)



The terminal cover (CB) prevents access to the accessory terminal blocks.

- Drawout circuit breaker only
- Optional
- Mounts on the cradle

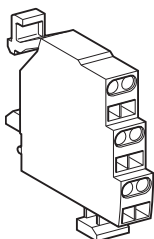
Shutters



The shutters automatically block access to the primary connectors when the circuit breaker is in the test or disconnected position.

- Drawout circuit breaker only
- Optional
- For information on locking the shutters, see page 42

Cradle Position Switch (CE, CD, and CT)



The cradle position switch (CE, CD, or CT) indicates the circuit breaker position in the cradle.

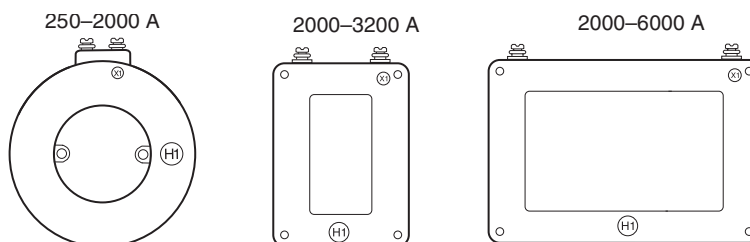
- Drawout circuit breaker only
- Optional
- One to three position switches for each type:
 - CE: Connected
 - CD: Disconnected
 - CT: Test
- Normally-open and normally-closed contacts
- Available as push-in connector switch (shown) or ring tongue terminal connector switch

Metering Current Transformers

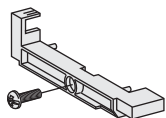
The metering current transformer is used to scale line currents down to usable values for measuring or control purposes.

- Optional (for drawout circuit breaker only)
- Mounts inside the cradle
- Accurate with the 0.3% accuracy class
- Five ampere output at full load
- A standard wiring harness is provided when metering current transformers are factory mounted

Figure 55 – Metering Current Transformers



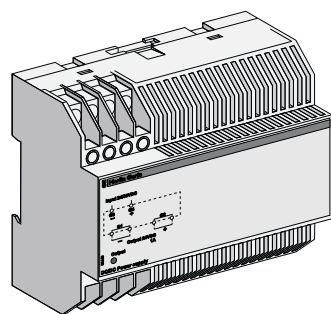
Sensor Plugs



The sensor plug is used to set the current sensor rating (I_n) of the circuit breaker.

- Standard
- Field replaceable

External Power Supply Module



The external power supply module is used with the Micrologic™ A, P, and H trip units to provide external power to the trip unit.

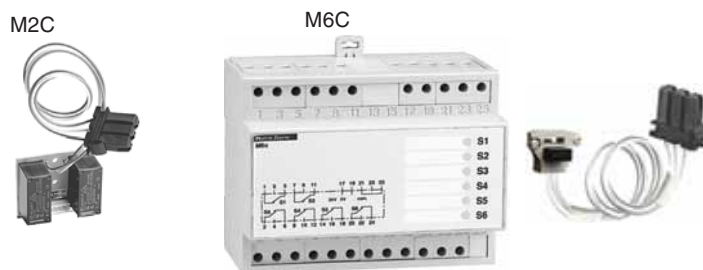
- Optional
- Makes it possible to:
 - Display currents less than 20% of sensor (I_n)
 - Maintain display of last trip unit status even after opening of circuit breaker
 - Store in memory the value of the interrupted current and time-stamp event (P and H trip units only)
- Provides power to the circuit breaker communication module and the cradle communication module
- Field replaceable
- Output:
 - voltage: 24 Vdc
 - current: 1 A
 - ripple < 5%.
- Input Voltage:
 - Vac: 110–130, 200–240, 380–415
 - Vdc: 24–30, 48–60, 100–125
 - 10 VA/10 W consumption

Programmable Contact Modules (M2C and M6C)

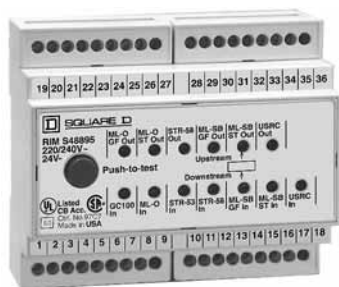
Programmable contact modules (M2C and M6C) are used to indicate the type of fault and the instantaneous and delayed threshold overruns.

- Optional
- For Micrologic P and H trip units only
- Programmable via the trip unit or through the communications network
- Requires 24 Vdc power supply
- Contact ratings:
 - 5 A/240 Vac
 - 1.8 A/24 Vdc
 - 1.5 A/48 Vdc
 - 0.4 A/125 Vdc

Figure 56 – Programmable Contact Modules (M2C and M6C)



Restraint Interface Module (RIM)



The restraint interface module (RIM) allows zone-selective interlocking communications between circuit breakers with Micrologic trip units and other select devices.

- Optional
- For Micrologic A, P, and H trip units only
- Requires external power supply:
 - 120 Vac or 24 Vdc
 - 220/240 Vac or 24 Vdc

Ground-Fault Interface Module (MDGF/SGR)

The ground-fault interface module provides interface between trip unit types A, P, or H (with MDGF or SGR) and MDGF sensor(s).

- Optional
- Field installable
- For use on circuit breakers with 400 A or higher sensor.

Figure 57 – Ground-Fault Interface Module (MDGF/SGR) and Sensor



Hand-Held Test Kit



The hand-held test kit is used to verify trip unit operation and the tripping and pole-opening sequence.

- Optional
- Can also be used to:
 - Inhibit thermal imaging for primary injection testing
 - Inhibit ground fault for primary injection testing
 - Self-restrain zone-selective interlocking (ZSI)
 - Supply control power to the trip unit for settings via the keypad when the circuit breaker is open (Micrologic A, P, and H trip units only)

Full-Function Test Kit



The full-function test kit is used to verify LSIG functionality.

- Optional
- Can be used to check trip unit operation, for example:
 - Display of settings
 - Operating tests on the electronic component
 - Automatic and manual tests on protection functions (trip curve verification)
 - Tests on the zone-selective interlocking (ZSI) functions
 - Inhibit thermal imaging for primary injection testing
 - Inhibit ground fault for primary injection testing
 - Self-restrain zone-selective interlocking (ZSI)
- Can also be used to:
 - Check mechanical operation of the circuit breaker
 - Check the electrical continuity of the connection between the MITOP (tripping coils) and the trip unit

Print the trip unit and circuit breaker test report when used in conjunction with a PC (FFTK Report Generator software, Catalog No. FFTKRPT-V1-0, is required

Section 7— Installing Accessories

Accessories can be installed in an installed circuit breaker or an installed cradle.

Installing Circuit Breaker Accessories

Drawout Circuit Breaker

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- This equipment must only be installed and serviced by qualified electrical personnel.

Failure to follow these instructions will result in death or serious injury.

Place circuit breaker in disconnect position. See Drawout Circuit Breaker Disconnection, page 24, for instructions on disconnecting the circuit breaker.

Fixed-Mounted Circuit Breaker

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors and covers before turning on power to this equipment.

Failure to follow these instructions will result in death or serious injury.

Turn off all power supplying this equipment before working on or inside equipment.

Install Circuit Breaker Accessories

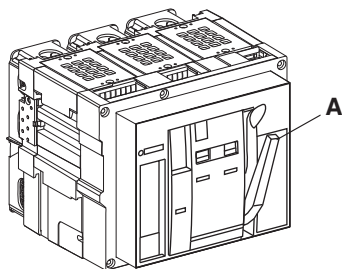
NOTICE

HAZARD OF EQUIPMENT DAMAGE

Use caution when removing or replacing the circuit breaker accessory cover. The spring-charging handle (**Figure 58, A**) extends through the circuit breaker accessory cover and can be damaged when removing the accessory cover.

Failure to follow these instructions can result in equipment damage.

Figure 58 – Spring Charging Handle



If installing electrical accessories, remove the accessory cover.

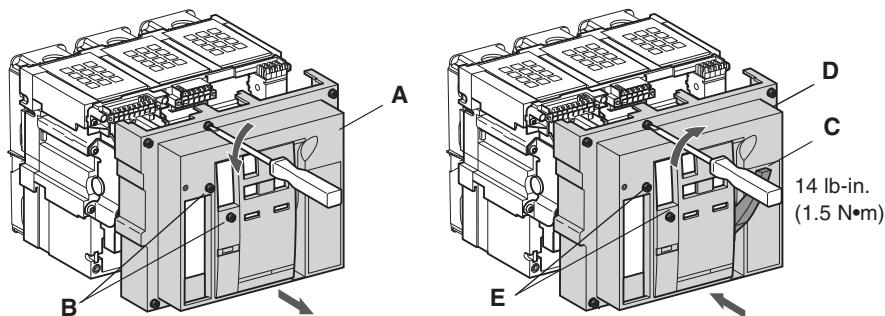
1. Loosen the accessory cover screws and remove the accessory cover (**Figure 59, A**).

NOTE: Screws (**B**) are for Type L, LF, L1 and L1F circuit breakers only.

2. Install accessories as instructed in the instructions packed with the individual accessory.
3. Replace the accessory cover by pulling the spring-charging handle (**C**) forward and sliding the circuit breaker accessory cover (**D**) down over the handle. Tighten the accessory cover screws.

NOTE: Screws (**E**) are for Type L, LF, L1 and L1F circuit breakers only.

Figure 59 – Install Accessories



Drawout Circuit Breaker

The drawout circuit breaker can now be placed back in connected position. See Drawout Circuit Breaker Connection, page 22 for instructions on connecting the circuit breaker.

Fixed-Mounted Circuit Breaker

The fixed-mounted circuit breaker can now be placed back in service.

Installing Cradle Accessories

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors and covers before turning on power to this equipment.

Failure to follow these instructions will result in death or serious injury.

1. Turn off all power supplying this equipment before working on or inside equipment.
2. If circuit breaker is installed in cradle, remove it following the instructions in “Circuit Breaker Removal” on page 27.
3. Install each accessory as instructed in the instructions packed with the individual accessory.
4. Replace the circuit breaker in the cradle, see “Circuit Breaker Installation” on page 25.

The drawout circuit breaker can now be placed back in connected position. See Drawout Circuit Breaker Connection, page 22 for instructions on connecting the circuit breaker.

Section 8— Testing, Maintenance and Troubleshooting

For information on field testing, maintenance, and troubleshooting see bulletin 0613IB1201, *Masterpact NT and NW Field Testing and Maintenance Guide*, which can be found on the Schneider Electric™ website:

<http://www.schneider-electric.com>

For application assistance, please call 1-888-778-2733.

Section 9— Repacking

Materials Required

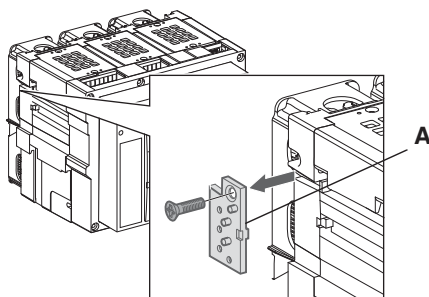
- Pallet
- Packing Carton
- Shipping Brackets, insert nuts and bolts
- Four Carriage Bolts, 3/8 x 12, 2 in. (50 mm) long minimum
- Four Washers, 3/8 in.
- Four Nuts, 3/8 x 12

Repacking

Repacking Circuit Breaker

1. If drawout circuit breaker is installed in the cradle, remove it following the instructions in “Circuit Breaker Removal” on page 27.
If fixed-mounted circuit breaker is installed in equipment, remove it following the instructions in the bulletin shipped with the circuit breaker.
2. Remove the rejection pin plate (**Figure 60, A**) from side of the circuit breaker, if installed.

Figure 60 – Remove Rejection Pin Plate



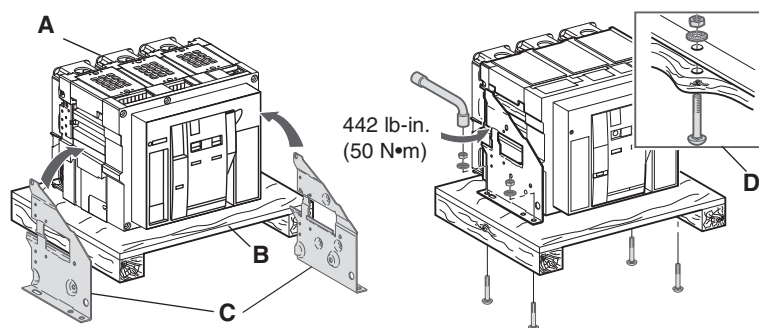
NOTICE**HAZARD OF EQUIPMENT DAMAGE**

Circuit breaker must be secured to the pallet with shipping brackets.

Failure to follow these instructions can result in equipment damage.

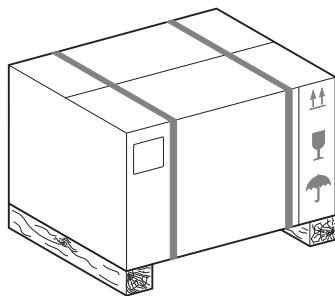
3. Place the circuit breaker (**Figure 61, A**) onto the pallet (**B**).
4. For drawout circuit breakers, place the shipping brackets (**C**) on the circuit breaker. If shipping brackets are needed, consult the local field office. Bolt the shipping brackets to the circuit breaker. (Fixed-mounted circuit breakers use the mounting bracket installed on the circuit breaker as the shipping bracket.)
5. Secure the shipping brackets to pallet with four bolts, nuts and washers (**D**).

Figure 61 – Secure Circuit Breaker



6. Place the packing carton over the circuit breaker and secure with tape.

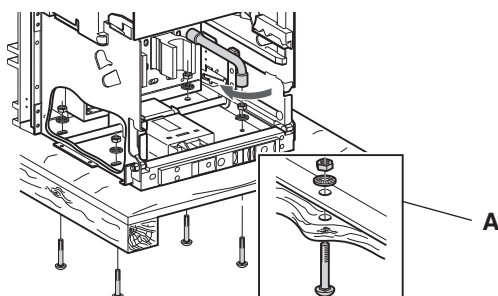
Figure 62 – Secure Packing Carton



Repacking Cradle

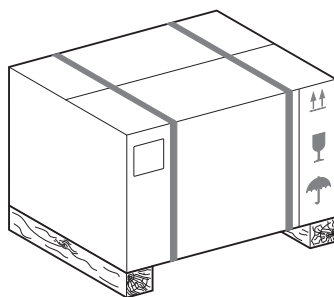
1. If the cradle is installed in equipment, remove it following the instructions in the installation bulletin shipped with the circuit breaker.
2. Secure the cradle to the pallet using four bolts, nuts and washers (**Figure 63, A**).

Figure 63 – Secure Cradle



3. Place the packing carton over the cradle and secure with tape.

Figure 64 – Secure Packing Carton

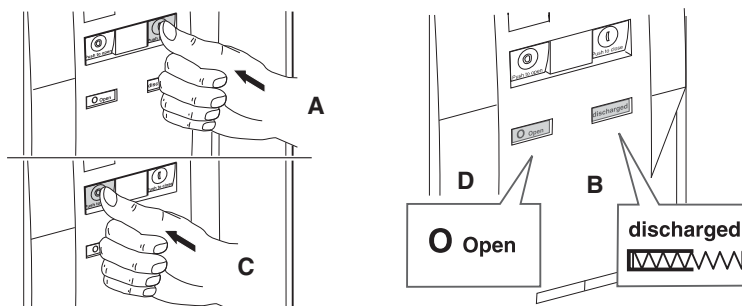


Repacking Circuit Breaker and Cradle

NOTE: 3200 A L1 and all 4000, 5000 and 6000 A circuit breaker and cradle units must be shipped separately.

1. Press the “Push to close” button (**Figure 65, A**) to discharge the spring (**B**).
2. Press the “Push to open” button (**C**) to open contacts (**D**).

Figure 65 – Turn Off Circuit Breaker



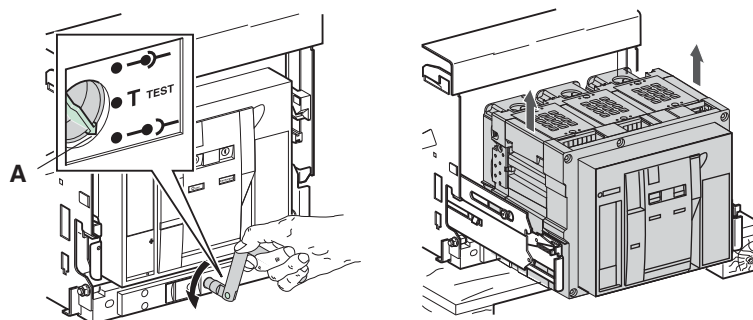
NOTICE**HAZARD OF EQUIPMENT DAMAGE**

Cradle must be secured when installing or removing circuit breaker.

Failure to follow these instructions can result in equipment damage.

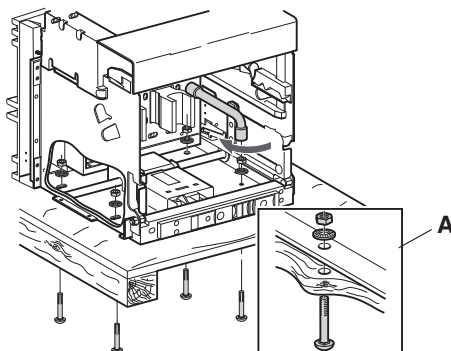
3. Rack the circuit breaker to the disconnected position (Figure 66, A) (refer to Drawout Circuit Breaker Disconnection, page 24).
4. Remove the circuit breaker following the instructions in “Circuit Breaker Removal” on page 27.

Figure 66 – Remove Circuit Breaker



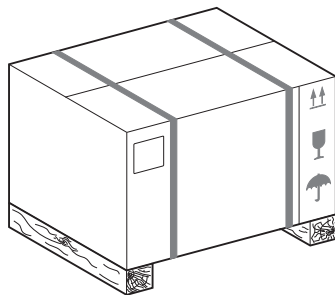
5. If the cradle is installed in equipment, remove it following the instructions in the installation bulletin shipped with the circuit breaker.
6. Secure the cradle to the pallet using four bolts, nuts and washers (Figure 67, A).
7. Replace the circuit breaker in the cradle following the instructions in “Circuit Breaker Installation” on page 25.

Figure 67 – Remove Circuit Breaker and Secure Cradle



8. Place the packing carton over cradle and secure carton with tape.

Figure 68 – Secure Packing Carton



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