PacT Series

Master**PacT** MTZ1 IEC Circuit Breakers
From 630 to 1600 A
With MicroLogic Active Control Unit

User Guide

PacT Series offers world-class breakers and switches.

DOCA0284EN-03
09/2025

Legal Information

The information provided in this document contains general descriptions, technical characteristics and/or recommendations related to products/solutions.

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Table of Contents

Safety Information

Important Information

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 documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this 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, **could result in** death or serious injury.

⚠ CAUTION

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

NOTICE

NOTICE is used to address practices not related to physical injury.

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.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

About the Document

Document Scope

The aim of this guide is to provide users, installers, and maintenance personnel with technical information needed to operate MasterPacT™ MTZ1 circuit breakers with MicroLogic™ Active control units in compliance with IEC standards.

Validity Note

This guide applies to MasterPacT MTZ1 circuit breakers with MicroLogic Active control units with firmware version 004.000.000 or greater.

Online Information

The characteristics of the products described in this document are intended to match the characteristics that are available on www.se.com. As part of our corporate strategy for constant improvement, we may revise the content over time to enhance clarity and accuracy. If you see a difference between the characteristics in this document and the characteristics on www.se.com, consider www.se.com to contain the latest information.

Product Related Information

⚠⚠WARNING

HAZARD OF ELECTRIC SHOCK

Do not use MasterPacT MTZ circuit breakers with MicroLogic Active control units:

- On power systems with IT grounding system with voltage above 600 Vac.
- On power systems with other grounding system with voltage above 690 Vac.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠CAUTION

HAZARD OF BURNS

Apply appropriate personal protective equipment (PPE) when the MasterPacT MTZ circuit breaker ambient temperature is above 50 °C (122 °F).

Failure to follow these instructions can result in injury or equipment damage.

General Cybersecurity Information

In recent years, the growing number of networked machines and production plants has seen a corresponding increase in the potential for cyber threats, such as unauthorized access, data breaches, and operational disruptions. You must, therefore, consider all possible cybersecurity measures to help protect assets and systems against such threats.

To help keep your Schneider Electric products secure and protected, it is in your best interest to implement the cybersecurity best practices as described in the Cybersecurity Best Practices document.

Schneider Electric provides additional information and assistance:

- Subscribe to the Schneider Electric security newsletter.
- Visit the Cybersecurity Support Portal web page to:
  - Find Security Notifications.
  - Report vulnerabilities and incidents.
- Visit the Schneider Electric Cybersecurity and Data Protection Posture web page to:
  - Access the cybersecurity posture.
  - Learn more about cybersecurity in the cybersecurity academy.
  - Explore the cybersecurity services from Schneider Electric.

Product Related Cybersecurity Information

⚠WARNING

POTENTIAL COMPROMISE OF SYSTEM AVAILABILITY, INTEGRITY, AND CONFIDENTIALITY

- Change default PIN codes and passwords at first use to help prevent unauthorized access to device settings, controls, and information.
- Disable unused ports/services and default accounts to help minimize pathways for malicious attackers.
- Place networked devices behind multiple layers of cyber defenses (such as firewalls, network segmentation, and network intrusion detection and protection).
- Use cybersecurity best practices (for example, least privilege, separation of duties) to help prevent unauthorized exposure, loss, modification of data and logs, or interruption of services.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

For information about cybersecurity for MicroLogic Active control unit refer to DOCA0122•• *MasterPacT, ComPacT, PowerPacT - Cybersecurity Guide*, page 8.

Environmental Data

For product compliance and environmental information, refer to the Schneider Electric Environmental Data Program.

Available Languages of the Document

The document is available in these languages:

- English (DOCA0284EN), original language
- Spanish (DOCA0284ES)
- Chinese (DOCA0284ZH)

Related Documents

Title of documentation	Reference number
MasterPacT MTZ - MicroLogic Active Control Unit - User Guide	DOCA0265EN DOCA0265ES DOCA0265ZH
MasterPacT MTZ IEC Circuit Breakers with MicroLogic Active Control Unit - Maintenance Guide	DOCA0305EN DOCA0305ES DOCA0305ZH
MasterPacT MTZ with MicroLogic Active Control Unit - Catalog	LVPED225010EN
MasterPacT MTZ1 - Fixed IEC Circuit Breaker with MicroLogic Active Control Unit - Instruction Sheet	PKR4242702
MasterPacT MTZ1 - Drawout IEC Circuit Breaker with MicroLogic Active Control Unit - Instruction Sheet	PKR4242802
Breaker Communication and Isolation Module (BCIM) for MicroLogic Active Control Unit - User Guide	DOCA0387EN DOCA0387ES DOCA0387ZH
MasterPacT, ComPacT, PowerPacT Circuit Breakers - Modbus Communication - User Guide	DOCA0384EN DOCA0384ES DOCA0384FR DOCA0384ZH
ULP (Universal Logic Plug) System - User Guide	DOCA0093EN DOCA0093ES DOCA0093FR DOCA0093ZH
Enerlin'X IFE - Ethernet Switchboard Server - User Guide	DOCA0084EN DOCA0084ES DOCA0084FR DOCA0084ZH
Enerlin'X IFE - Ethernet Interface for One Circuit Breaker - User Guide	DOCA0142EN DOCA0142ES DOCA0142FR DOCA0142ZH
Enerlin'X EIFE - Embedded Ethernet Interface for One MasterPacT MTZ Drawout Circuit Breaker - User Guide	DOCA0106EN DOCA0106ES DOCA0106FR DOCA0106ZH
Enerlin'X FDM121 - Front Display Module for One Circuit Breaker - User Guide	DOCA0088EN DOCA0088ES DOCA0088FR DOCA0088ZH
Enerlin'X FDM121 - Front Display Module for One Circuit Breaker - Firmware Release Notes	DOCA0150EN
MasterPacT, ComPacT, PowerPacT - Cybersecurity Guide	DOCA0122EN

Title of documentation	Reference number
	DOCA0122ES DOCA0122FR DOCA0122ZH
EcoStruxure Panel Server - User Guide	DOCA0172EN DOCA0172ES DOCA0172FR DOCA0172DE DOCA0172IT DOCA0172PT
MasterPacT MTZ1 - IEC Switch-Disconnectors and Circuit Breakers with MicroLogic X Control Unit - User Guide	DOCA0100EN DOCA0100ES DOCA0100FR DOCA0100ZH

You can download these technical publications and other technical information from our website at www.se.com/ww/en/download/.

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MasterPacT MTZ1 with MicroLogic Active Description

What's in This Part

PacT Series Master Range

Future-proof your installation with Schneider Electric's low-voltage and medium-voltage PacT Series. Built on legendary Schneider Electric innovation, the PacT Series comprises world-class circuit breakers, switches, residual current devices and fuses, for all standard and specific applications. Experience robust performance with PacT Series within the EcoStruxure-ready switchgear, from 16 to 6300 A in low-voltage and up to 40.5 kV in medium-voltage.

MasterPacT MTZ1 Range

The MasterPacT MTZ1 range of circuit breakers is made of:

- Circuit breakers with MicroLogic X control unit, described in DOCA0100•• *MasterPacT MTZ1 - IEC Switch-Disconnectors and Circuit Breakers with MicroLogic X Control Unit - User Guide* , page 8.
- Circuit breakers with MicroLogic Active control unit described in this guide.

MasterPacT MTZ1 Circuit Breakers with MicroLogic Active Control Unit

The range of MasterPacT MTZ1 circuit breakers with MicroLogic Active control unit offers current ratings from 630 A to 1,600 A for AC power systems up to 690 Vac.

NOTE: For AC power systems with IT grounding system, the voltage is limited to 600 Vac.

MasterPacT MTZ1 circuit breakers with MicroLogic Active control unit are available:

- In one frame size.
- In the following power systems:
  - 3-pole (3P)
  - 4-pole (4P)
- In the following installation types:
  - Fixed-mounted circuit breakers
  - Drawout circuit breakers

Circuit Breakers

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Do not install a MicroLogic Active control unit with version number 004.000.000 in a MasterPacT MTZ circuit breaker with performance level L1 or H3.

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

MasterPacT MTZ1 circuit breakers with MicroLogic Active control unit are available with the following performance levels:

- H1: standard short-circuit level (42 kA) with total selectivity
- H2: high short-circuit level (50 kA) with high selectivity (42 kA)
- H3: very high short-circuit level (66 kA) with very high selectivity (50 kA)
- L1: extremely high short-circuit level (150 kA) with strong current limitation and selectivity (10 kA)

NOTE: The values above correspond to a 415 Vac network, for higher voltage levels the values can be different. Refer to LVPED225010EN *MasterPacT MTZ with MicroLogic Active Control Unit - Catalog* in **Related Documents** at the beginning of this guide.

For full information about available circuit breaker models, interrupting ratings, sensor ratings, and control units, refer to LVPED225010EN *MasterPacT MTZ with MicroLogic Active Control Unit - Catalog*, page 8.

Circuit breakers are fitted with a MicroLogic Active control unit.

For full information about MicroLogic Active control unit, refer to DOCA0265•• *MasterPacT MTZ - MicroLogic Active Control Unit - User Guide*, page 8.

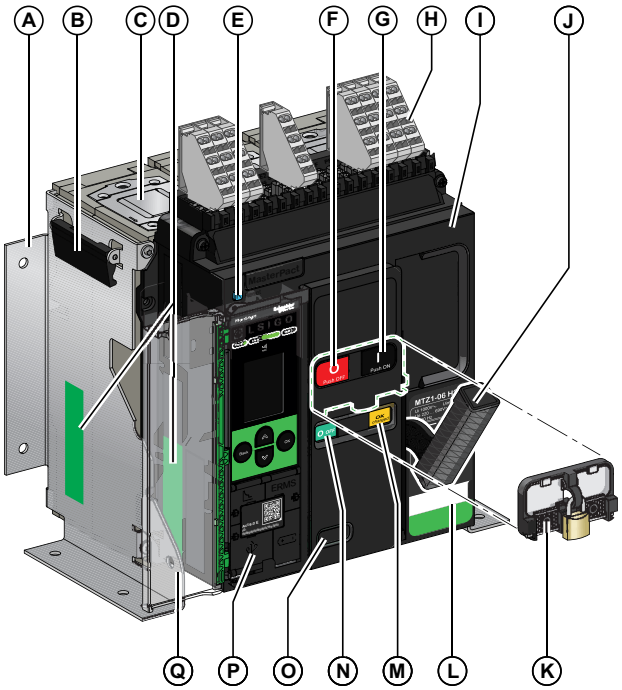
Neutral Position on 4P Circuit Breakers

On 4P circuit breakers, the neutral is on the left side as standard. A right side neutral version is not available for circuit breakers.

Fixed Circuit Breaker

Fixed Circuit Breaker Description

The following image shows the standard version of the fixed circuit breaker (no optional accessories).



A Mounting side plate

B Carrying grip

C Arc chute

D Product identification label, with manufacturing date

E Blue fault-trip reset button

F Opening pushbutton

G Closing pushbutton

H Terminal blocks for standard accessories

I Front cover

J Spring charging handle

K VBP pushbutton locking cover (optional)

L Rating plate

M Spring charged and ready-to-close indicator

N Main-contact position indicator

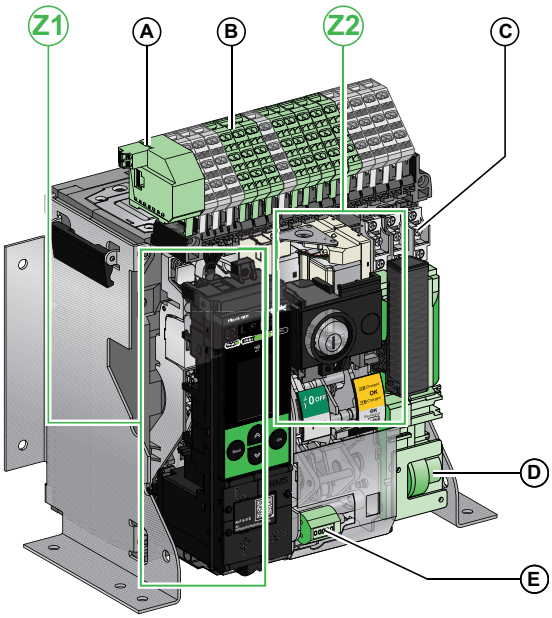
O Window to read the (optional) CDM mechanical operation counter

P Control unit

Q Control unit transparent cover

Fixed Circuit Breaker Accessories Description

The following image shows the accessories available for the fixed circuit breaker.



A ULP port module

B Terminal blocks for optional accessories

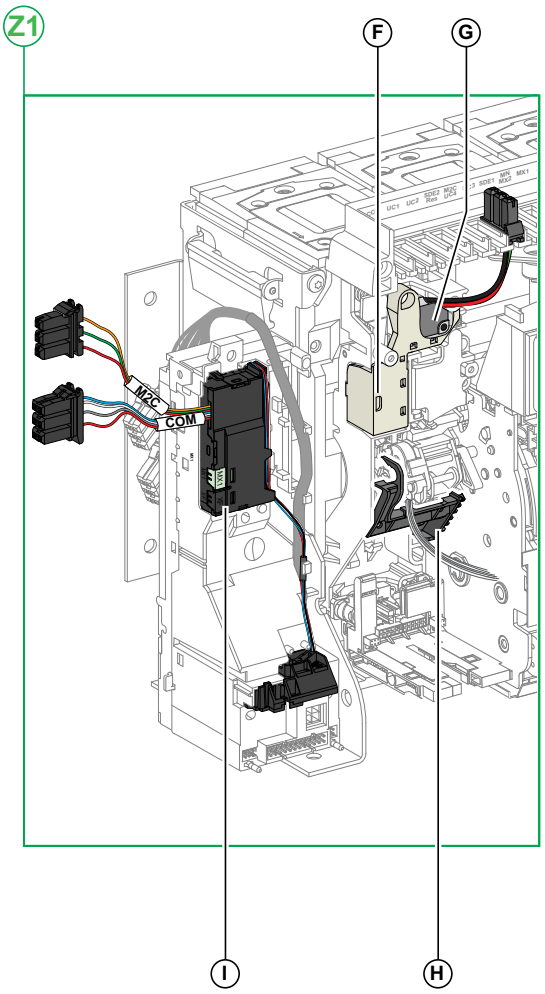
C Four OF indication contacts (delivered as standard)

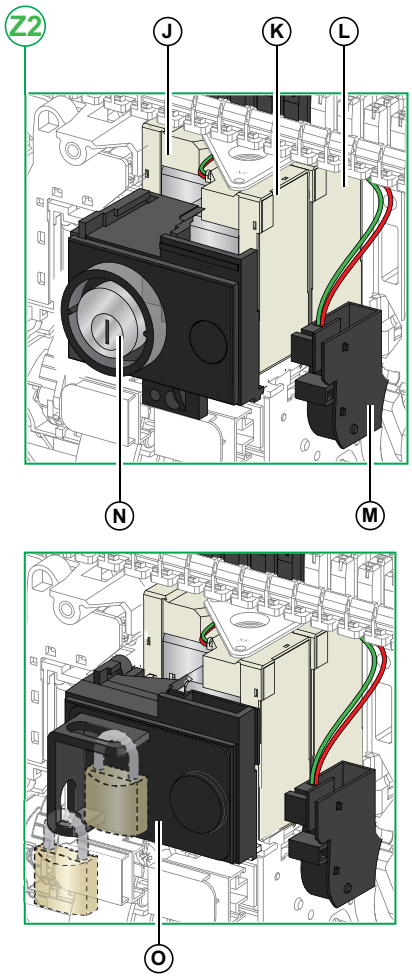
D MCH gear motor

E CDM mechanical operation counter

Z1, Z2 See following images

The following images zoom in on the accessories for the fixed circuit breaker:





F Standard SDE1 fault-trip indication contact

G Optional SDE2 fault-trip indication contact or RES electrical remote reset

H Microswitch

I BCIM module

J MN undervoltage release or MX2 opening voltage release

K XF closing voltage release

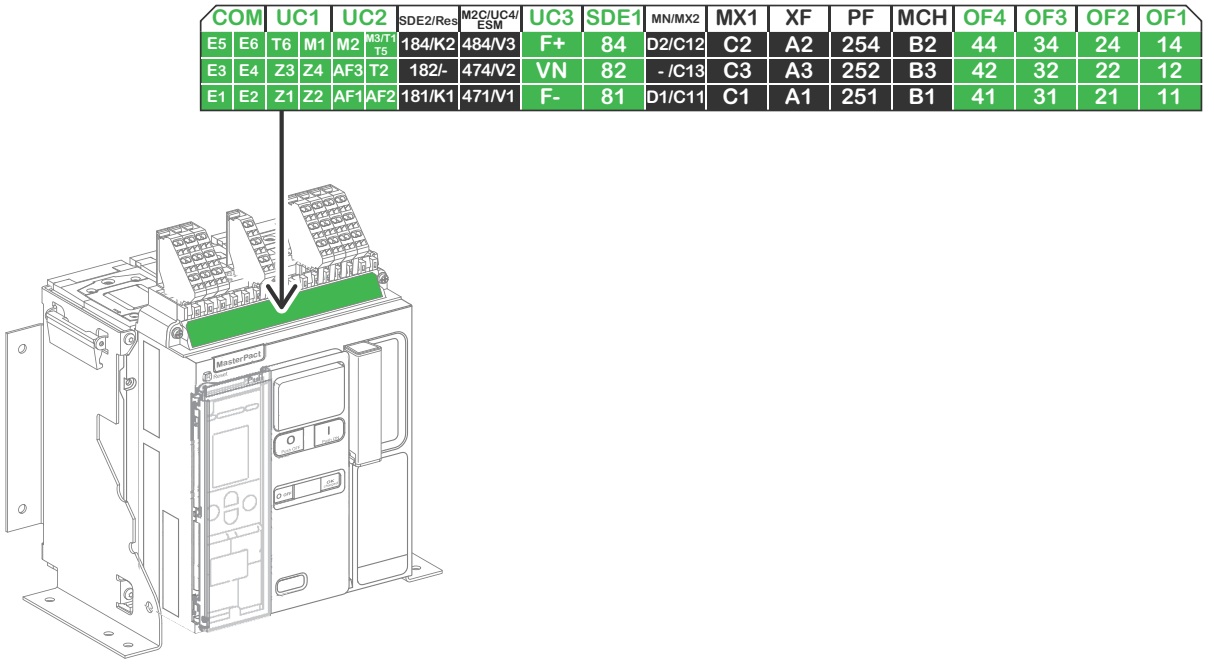
L MX1 opening voltage release

M PF ready-to-close contact

N VSPO OFF-position locking by keylocks

O VCPO OFF-position locking by padlocks

Fixed Circuit Breaker Terminal Block Description



Terminal block supplied as standard on the circuit breaker

Terminal block for optional accessories on the circuit breaker

Assignment of Terminal Blocks

⚠⚠DANGER

HAZARD OF ELECTROCUTION FOR VOLTAGES ABOVE 480 VAC

If a voltage greater than 480 Vac is connected to a terminal, it is forbidden to connect adjacent terminals to a 24 Vdc SELV (Safety Extra Low Voltage) power supply in order to observe the insulation distances. For example, if you connect a 690 Vac supply to the UC4 terminal block, you must not connect a 24 Vdc SELV supply to the SDE2 terminal block.

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

The following table describes the assignment and the availability of the terminal blocks for fixed circuit breakers:

- Standard terminal blocks and the associated accessories are delivered with the circuit breaker.
- Optional terminal blocks are delivered with the circuit breaker only if the associated optional accessories are installed in the circuit breaker.

Marking	Description	Availability
COM	MicroLogic Active without BCIM module: • Terminal block for the external power supply of the MicroLogic Active control unit MicroLogic Active with BCIM module: • Terminal block for the connection of the BCIM module to ULP modules, by using the circuit breaker ULP cord • or ULP port module for the connection of the BCIM module to ULP modules, by using a ULP cord	Standard Optional
UC1	Zone selective interlocking (ZSI)	Standard

Marking	Description	Availability
UC2	Neutral external sensor	Standard
SDE2/RES	SDE2 additional fault-trip indication contact or RES electrical remote reset	Optional
M2C/UC4/ESM	External phase voltage	Optional
UC3	MicroLogic Active without BCIM module: • External neutral voltage MicroLogic Active with BCIM module: • External neutral voltage and external power supply of the MicroLogic Active control unit	Standard on 3P circuit breakers Optional on 4P circuit breakers
SDE1	SDE1 fault-trip indication contact	Standard
MN/MX2	MN undervoltage release or MX2 opening voltage release	Optional
MX1	MX1 opening voltage release	Optional
XF	XF closing voltage release	Optional
PF	PF ready-to-close contact	Optional
MCH	MCH gear motor	Optional
OF1-OF4	4 OF indication contacts	Standard

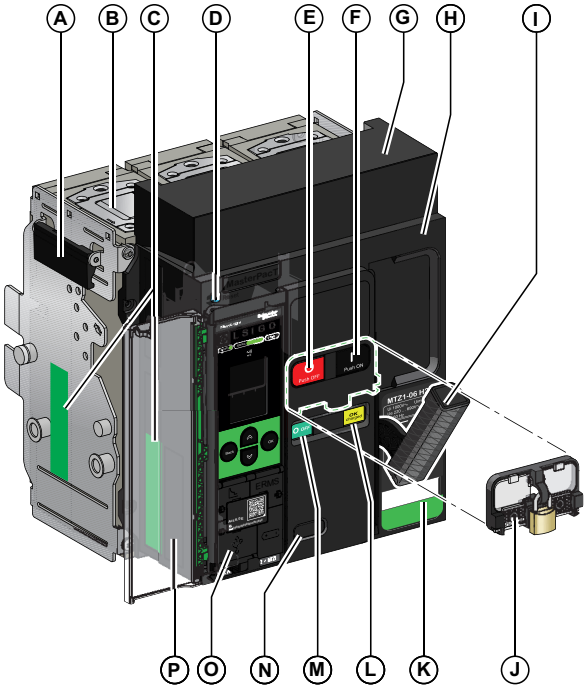
Drawout Circuit Breaker

Definition

A drawout circuit breaker is composed of the moving part (also called the circuit breaker) and the fixed part (or chassis).

Drawout Circuit Breaker Moving Part Description

The following image shows the standard version of the moving part of a drawout circuit breaker (no optional accessories).



A Carrying grip

B Arc chute

C Product identification label, with manufacturing date

D Blue fault-trip reset button

E Opening pushbutton

F Closing pushbutton

G Disconnectable contact block cover

H Front cover

I Spring charging handle

J VBP pushbutton locking cover (optional)

K Rating plate

L Spring charged and ready-to-close indicator

M Main-contact position indicator

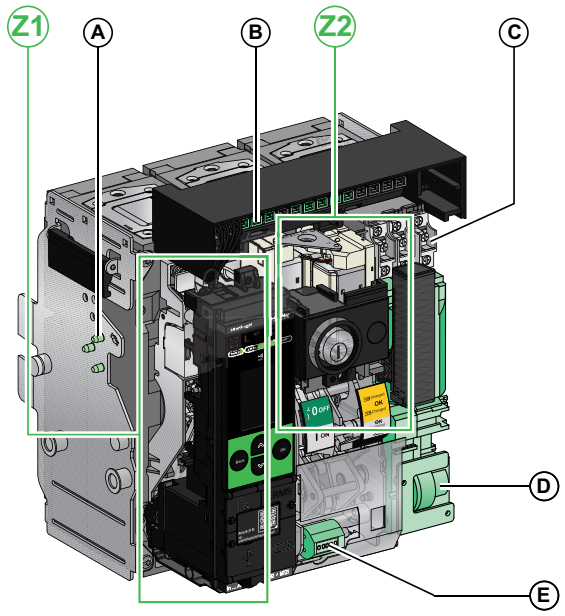
N Window to consult the (optional) CDM mechanical operation counter

O Control unit

P Control unit transparent cover

Drawout Circuit Breaker Accessories Description

The following image shows the accessories available for the moving part of a drawout circuit breaker.



A VDC mismatch protection

B Disconnectable contact block

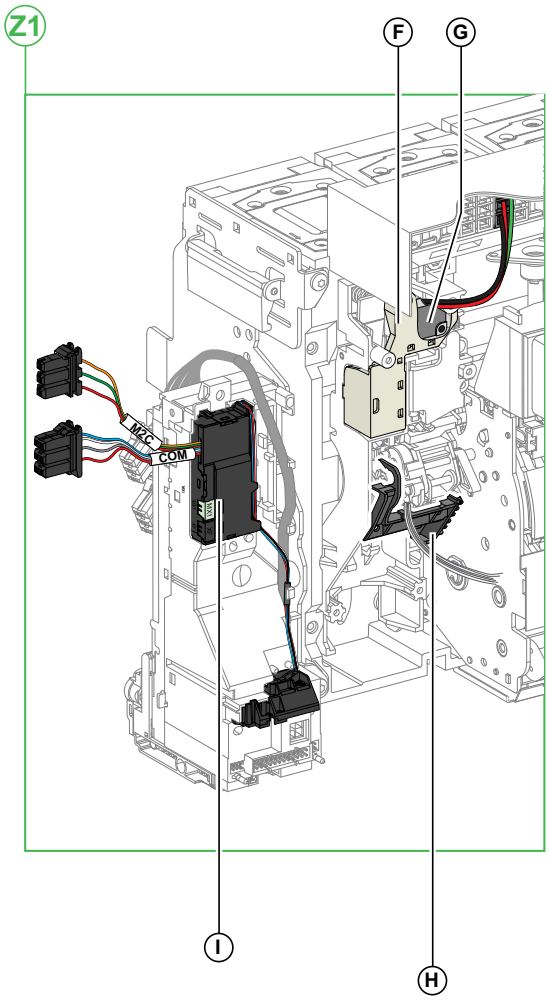
C Four OF indication contacts (delivered as standard)

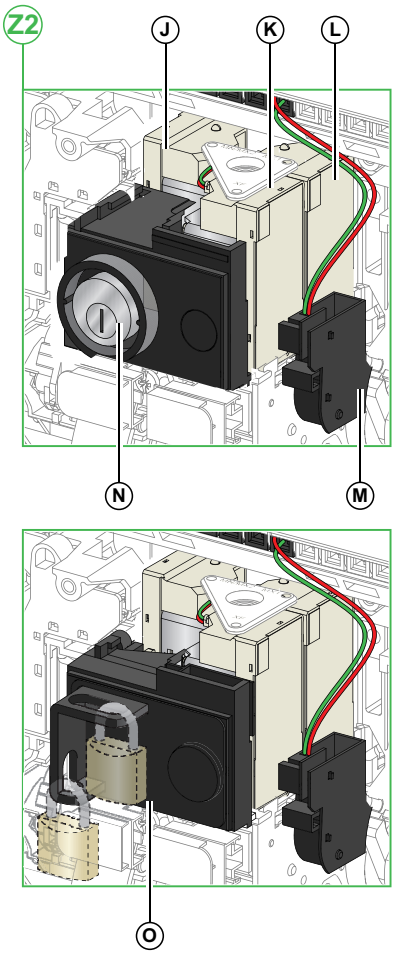
D MCH gear motor

E CDM mechanical operation counter

Z1, Z2 See following images

The following images zoom in on the accessories for the moving part of a drawout circuit breaker.





F Standard SDE1 fault-trip indication contact

G Optional SDE2 fault-trip indication contact or RES electrical remote reset

H Microswitch

I BCIM module

J MN undervoltage release or MX2 opening voltage release

K XF closing voltage release

L MX1 opening voltage release

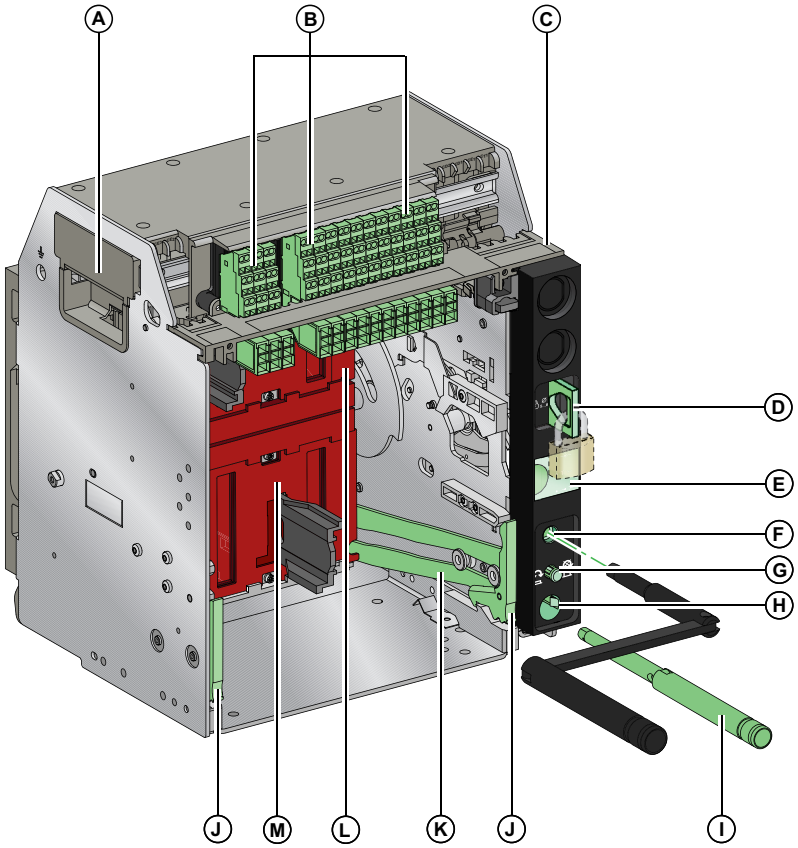
M PF ready-to-close contact

N VSPO OFF-position locking by keylocks

O VCPO OFF-position locking by padlocks

Chassis Description

The following image shows the standard version of the chassis (no optional accessories).



A Carrying grip

B Terminal blocks for standard accessories

C Terminal block identification plate

D Chassis locking by padlocks

E Moving part position indicator

F Racking handle socket

G Position release button

H Racking handle storage space

I Racking handle

J Drawout grip

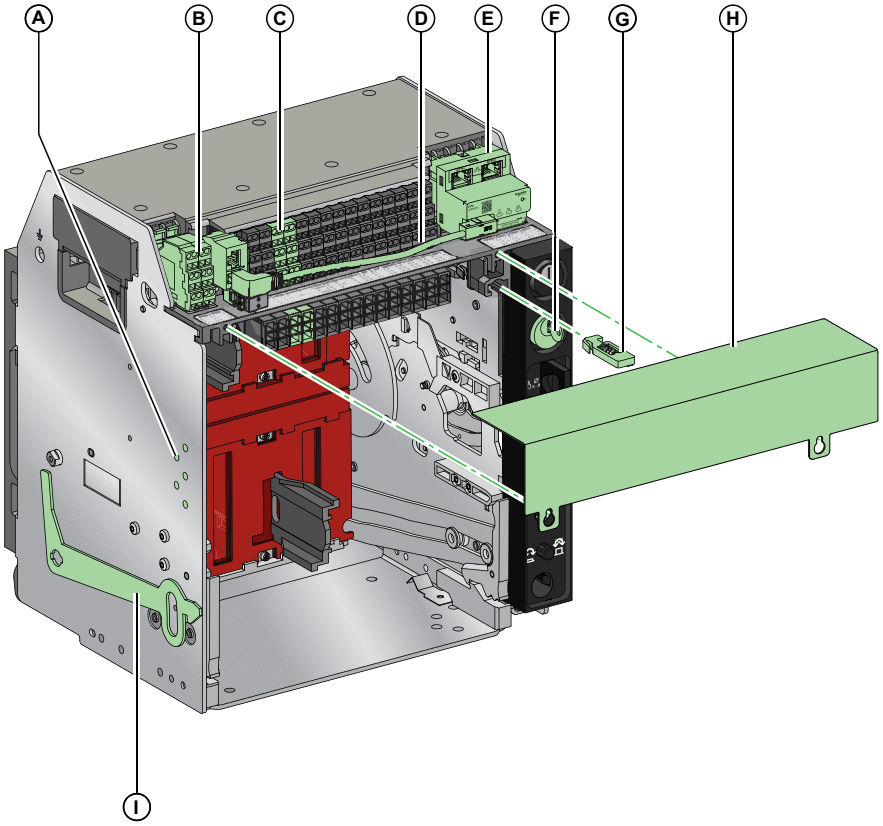
K Extension rail

L Top safety shutter

M Bottom safety shutter

Chassis Accessories Description

The following image shows the accessories available for the chassis.



A VDC mismatch protection

B Drawout device position contacts

C Terminal blocks for optional accessories

D ULP cord

E EIFE embedded Ethernet interface

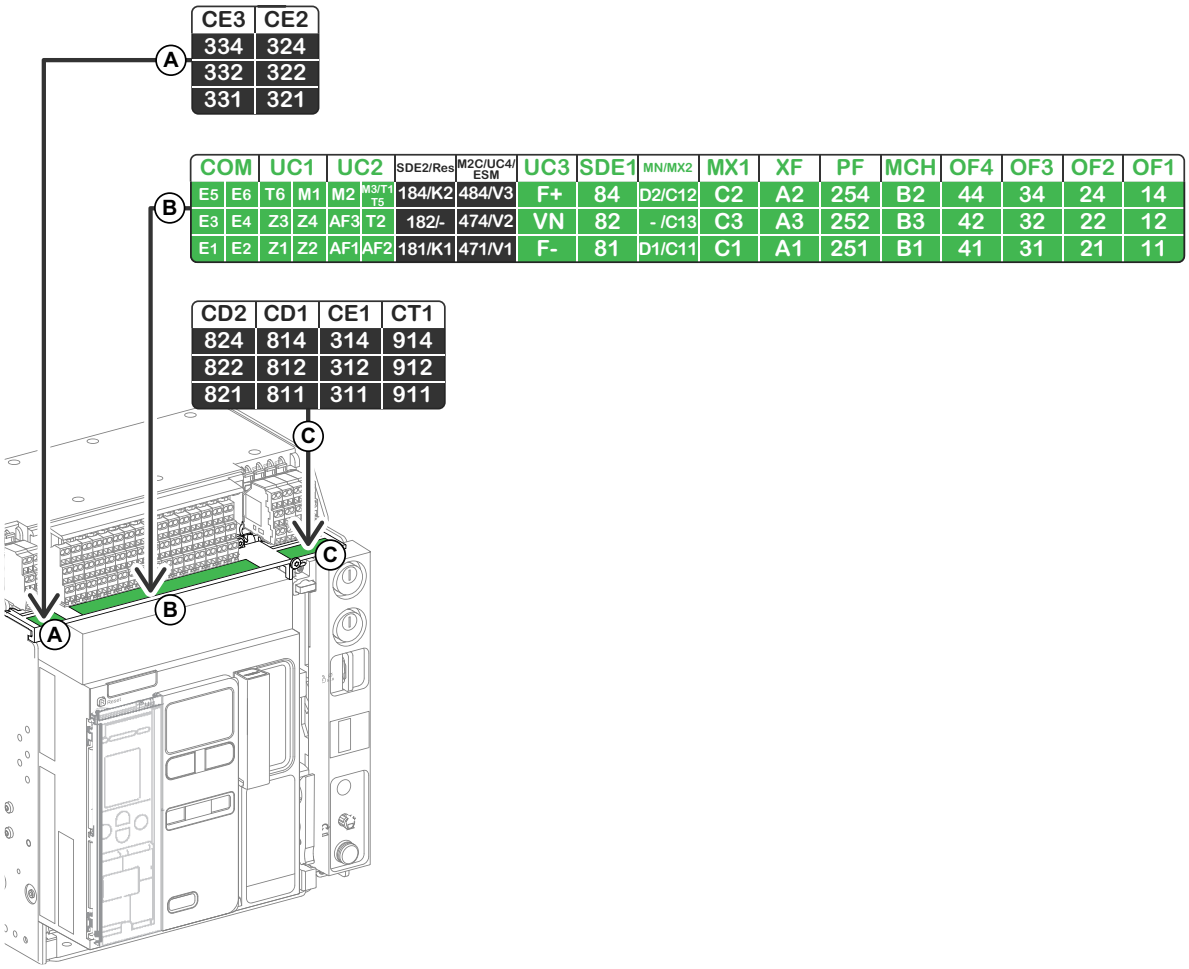
F VSPD chassis locking by keylocks

G VPOC open-door racking interlock

H Circuit breaker auxiliary terminal shield

I VPEC door interlock

Chassis Terminal Block Description



Terminal block supplied as standard on the chassis

Optional terminal block on the chassis

Assignment of Chassis Terminal Blocks

⚠⚠DANGER

HAZARD OF ELECTROCUTION FOR VOLTAGES ABOVE 480 VAC

If a voltage greater than 480 Vac is connected to a terminal, it is forbidden to connect adjacent terminals to a 24 Vdc SELV (Safety Extra Low Voltage) power supply in order to observe the insulation distances. For example, if you connect a 690 Vac supply to the UC4 terminal block, you must not connect a 24 Vdc SELV supply to the SDE2 terminal block.

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

The following table describes the assignment and the availability of the terminal blocks for drawout circuit breakers:

- Standard terminal blocks are delivered on the chassis, even if the associated accessories are not installed in the circuit breaker.
- Optional terminal blocks are delivered on the chassis only if the associated optional accessories are installed in the circuit breaker.

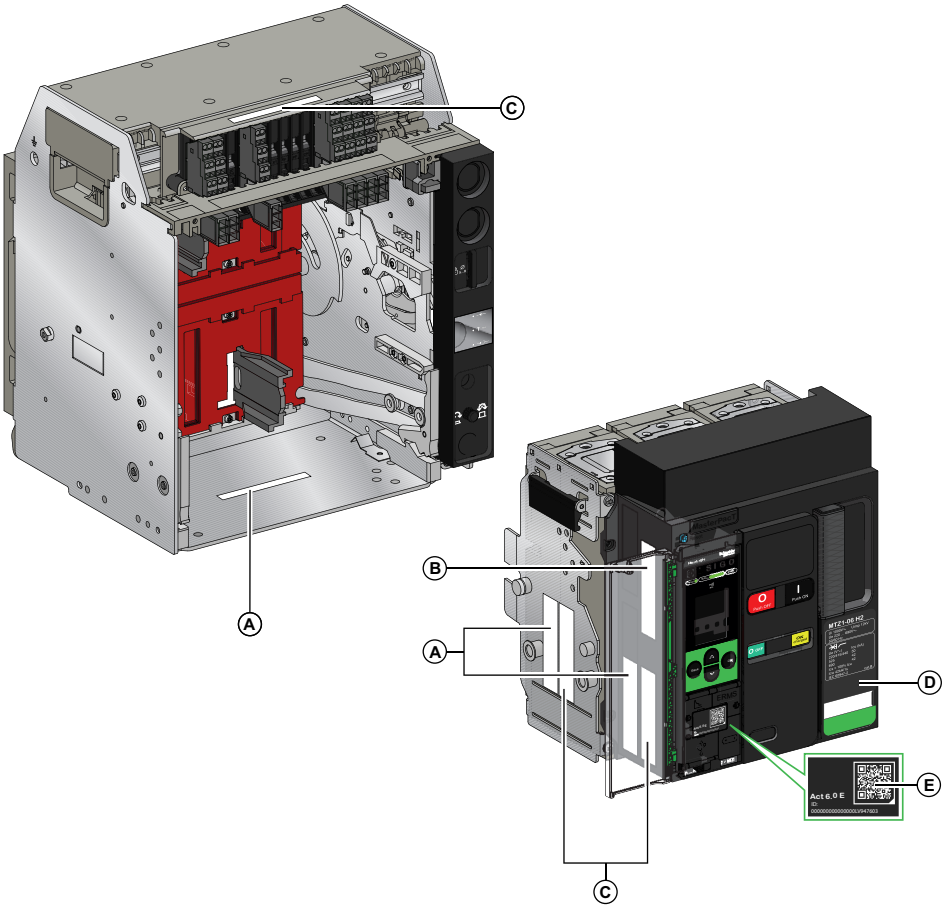
Block	Marking	Description	Availability
A	CE2-CE3	2 CE connected position contacts	Optional
B	COM	MicroLogic Active without BCIM module: • Terminal block for the external power supply of the MicroLogic Active control unit MicroLogic Active with BCIM module: • Terminal block for the connection of the BCIM module to ULP modules, by using the circuit breaker ULP cord • or ULP port module for the connection of the BCIM module to ULP modules, by using a ULP cord	Standard Optional
	UC1	Zone selective interlocking (ZSI)	Standard
	UC2	Neutral external sensor	Standard
	SDE2/RES	SDE2 additional fault-trip indication contact or RES electrical remote reset	Optional
	M2C/UC4/ESM	External phase voltage	Optional
	UC3	MicroLogic Active without BCIM module: • External neutral voltage MicroLogic Active with BCIM module: • External neutral voltage and external power supply of the MicroLogic Active control unit	Standard on 3P circuit breakers Optional on 4P circuit breakers
	SDE1	SDE1 fault-trip indication contact	Standard
	MN/MX2	MN undervoltage release or MX2 opening voltage release	Standard
	MX1	MX1 opening voltage release	Standard
	XF	XF closing voltage release	Standard
	PF	PF ready-to-close contact	Standard
	MCH	MCH gear motor	Standard
	OF1-OF4	4 OF indication contacts	Standard
C (without EIFE interface)	CD1-CD2	2 CD disconnected position contacts	Optional
	CE1	1 CE connected position contact	
	CT1	1 CT test position contact	
C (with EIFE interface)	EIFE	EIFE embedded Ethernet interface	Optional

Circuit Breaker Identification

Identification

The MasterPacT MTZ1 circuit breaker can be identified in the following ways:

- Rating plate on circuit breaker
- QR code located on the front face of the control unit of the circuit breaker
- Identification labels on the circuit breaker and on the chassis



A Product identification label

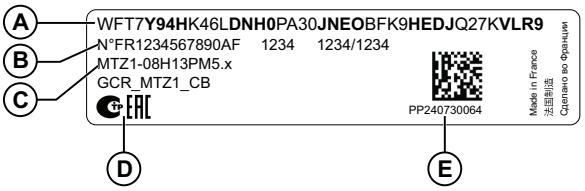
B Product checked label

C Accessory voltages label

D Rating plate

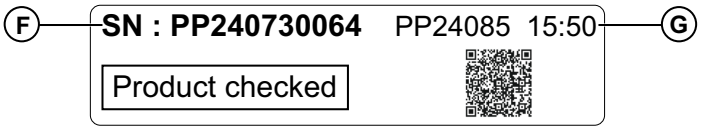
E QR code to access product information

Product Identification Label



Legend	Description	Explanation
A	Product code	The product code is a line of code representing the complete configuration of a MasterPacT circuit breaker. It is automatically generated for each MasterPacT circuit breaker after completing the configuration by using the Product Selector configuration tool. The product code appears on the invoice and on the delivery documents as well as on the MasterPacT circuit breaker and packaging labels. The product code can be entered in the Product Selector configuration tool, which generates the complete configuration of the MasterPacT circuit breaker.
B	Schneider Electric internal identification numbers	–
C	Description of circuit breaker	The description of the circuit breaker, specifies the following characteristics: • Range • Rating • Performance level • Number of poles • Control unit type
D	Certification logos	The logos of the mandatory certifications of the circuit breaker.
E	Circuit breaker serial number	The circuit breaker serial number is coded PPYYWWDNNNN, where: • PP: Plant code • YY: Year of manufacture • WW: Week of manufacture • D: Day of the week of manufacture (Monday = 1) • NNNN: The production number of the circuit breaker on the day. Ranges from 0001 to 9999. For example, PP240730064 is the sixty-fourth circuit breaker manufactured at plant PP on Wednesday, February 14, 2024.

Product Checked Label



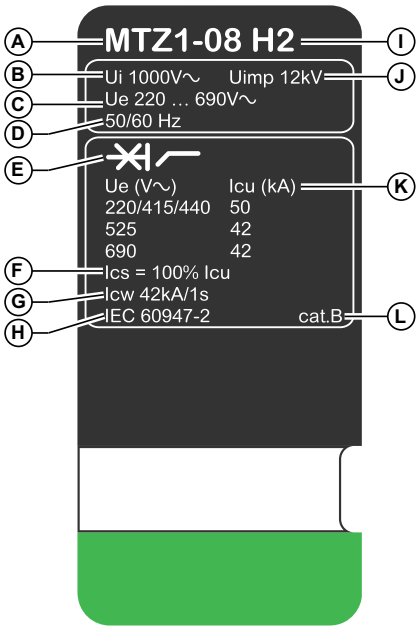
Legend	Description	Explanation
F	Circuit breaker serial number	See explanation in preceding table.
G	Circuit breaker test date code	The circuit breaker test date code is coded PPYYWWD HH:MM, where: • PP: Plant code • YY: Year of test • WW: Week of test • D: Day of the week of test (Monday = 1) • HH:MM: The time of test in hours and minutes

Accessory Voltages Label

The accessory voltages label gives the voltage of the accessories which are installed in the circuit breaker and which need to be connected to a power supply.

Rating Plate

The rating plate with the circuit breaker information is located on the front cover of the circuit breaker.



A Circuit breaker size and rated current x 100 A

B Ui: rated insulation voltage

C Ue: rated operational voltage

D Frequency

E Type of circuit breaker, suitable for insulation

F Ics: rated service short-circuit breaking capacity

G Icw: rated short-time withstand current

H Standards

I Performance level

J Uimp: rated impulse withstand voltage

K Icu: rated ultimate short-circuit breaking capacity

L Selectivity category as per IEC 60947-2

QR Code

When the QR code on the front face of a MasterPacT MTZ circuit breaker is scanned with a smartphone running a QR code reader and connected to the Internet, the Go2SE landing page is displayed, page 29.

The landing page displays:

- Information about the MicroLogic Active control unit, including traceability information.
- Zigbee ID and installation code for MicroLogic Active AP/EP control unit.
- A list of menus.

Go2SE Landing Page

Presentation

When the QR code on the front face of a MasterPacT MTZ circuit breaker is scanned with a smartphone running a QR code reader and connected to the Internet, the Go2SE landing page is displayed.

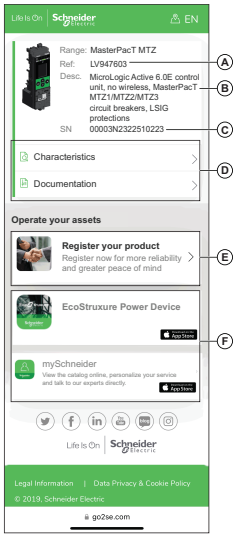
The landing page displays:

- Information about the MicroLogic Active control unit, including traceability information.
- Zigbee ID and installation code for MicroLogic Active AP/EP control unit.
- A list of menus.

Landing Page Description

The landing page is accessible from Android and iOS smartphones. It displays the same list of menus with slight differences in presentation.

The following example shows the landing page displayed on an Android smartphone:



A. Commercial reference of MicroLogic Active control unit
B. Type of MicroLogic Active control unit
C. Serial number of the MicroLogic Active control unit
D. Landing page menus. See the following menu descriptions for details.
E. Link to Schneider Electric Product Registrations to register your product
F. Downloadable applications

Serial Number

The serial number provides traceability by encoding the manufacturing date and location of the MicroLogic Active control unit.

Zigbee ID and Installation Code

Click on **More details** to get the Zigbee ID and installation code. If using selective discovery, the Zigbee ID is used to discover a MicroLogic Active AP/EP control unit with a Panel Server.

The Zigbee ID (IEEE address) is a hexadecimal number with 16 characters, for example 8C6FB9FFFEF7A574.

The installation code is a hexadecimal number with 36 characters, for example 1F4A547964BC254A1F4A547964BC254ABC12.

Characteristics

Selecting this menu gives access to a product datasheet with detailed information about the MicroLogic Active control unit.

Documentation

Selecting this menu gives access to MasterPacT MTZ and MicroLogic Active technical publications, including:

- Certificates
- Declaration of conformity
- How to videos
- Instruction sheets
- User guides

mySchneider App

Selecting this application gives access to the Schneider Electric customer care mobile application **mySchneider** app that can be downloaded on Android and iOS smartphones. For smartphone compatibility, check on your application store. The customer care application offers self-service instructions and easy access to expert support and information.

Operating Conditions

Introduction

MasterPacT MTZ circuit breakers are designed and tested for operation in industrial atmospheres. It is recommended that equipment is cooled or heated to the proper operating temperature and kept free of excessive vibration and dust.

Ambient Temperature

MasterPacT MTZ circuit breakers can operate under the following temperature conditions:

- Electrical and mechanical characteristics specified for an ambient temperature of -25 °C to +70 °C.
- Circuit-breaker closing specified down to -35 °C by manual operation with closing pushbutton.

Storage conditions are as follows:

- -40 °C to +85 °C for the circuit breaker without the control unit.
- -25 °C to +85 °C for the control unit.

Extreme Atmospheric Conditions

MasterPacT MTZ circuit breakers have successfully passed tests for extreme atmospheric conditions, defined by the following standards:

Standard	Title
IEC 60068-2-1	Dry cold, at -40 °C
IEC 60068-2-2	Dry heat, at +85 °C
IEC 60068-2-30	Damp heat (temperature +55 °C, relative humidity 95%)
IEC 60068-2-52 level 2	Salt mist

Industrial Environments

MasterPacT MTZ circuit breakers can operate in the industrial environments defined by IEC 60947 (pollution degree up to 3).

It is advisable to check that circuit breakers are installed in suitably cooled switchboards without excessive dust.

Conditions	Standard
Corrosive industrial atmospheres	Category 3C3 compliant with IEC 60721-3-3
Sea salts 0.8 to 8 mg/m² day average over the year	Compliant with IEC 60721-2-5
Mechanically active substances	Category 3S3 compliant with IEC 60721-3-3

Beyond these conditions, MasterPacT MTZ circuit breakers must be installed inside switchboards with an IP rating equal to or greater than IP54.

Vibration

MasterPacT MTZ circuit breakers have successfully passed tests for the following vibration levels, in compliance with IEC 60068-2-6 and IEC 60068-2-27:

- 2 Hz to 13.2 Hz: amplitude +/- 1 mm.
- 13.2 Hz to 100 Hz: constant acceleration of 0.7 g.

Vibration testing to these levels is required by merchant marine inspection organizations (for example, Veritas, Lloyd's).

MasterPacT MTZ circuit breakers have also been successfully tested according to:

- Annex Q - IEC 60947-1: Special tests – damp heat, salt mist, vibration and shock
- IEC 60947-1 - Category D: Environment subject to temperature, humidity and vibration

Altitude

MasterPacT MTZ circuit breakers are designed and tested to operate at altitudes below 2,000 m.

At altitudes above 2,000 m, the characteristics of the ambient air (electrical resistance, cooling capacity) lower product characteristics as follows:

Characteristics	**Altitude**			
	2,000 m	**3,000 m**	**4,000 m**	**5,000 m**
Impulse withstand voltage Uimp (kV)	12	11	10	8
Rated insulation voltage (Ui) (V)	1,000	900	780	700
Maximum rated operational voltage 50/60 Hz Ue (V)	690	690	630	560
Rated current (A) at 40 °C	1 x In	0.99 x In	0.96 x In	0.94 x In

NOTE: Intermediate values can be obtained by interpolation.

Electromagnetic Disturbances

MasterPacT MTZ circuit breakers have protection against:

- Overvoltages caused by circuit breakers that generate electromagnetic disturbance.
- Overvoltages caused by atmospheric disturbance or by a distribution-system outage (for example, a lighting system failure).
- Circuit breakers emitting radio waves (for example, radio transmitters, walkie-talkies, or radar).
- Electrostatic discharge produced by users.

MasterPacT MTZ circuit breakers have successfully passed the electromagnetic-compatibility tests (EMC) defined by the following international standards:

- IEC 60947-2, appendix F.
- IEC 60947-2, appendix B (control units with earth-leakage function).

The circuit breakers have passed the above tests and therefore:

- No nuisance tripping occurs.
- Tripping times are respected.

MasterPacT MTZ1 Normal Operation

What's in This Part

Circuit Breaker Operating Actions

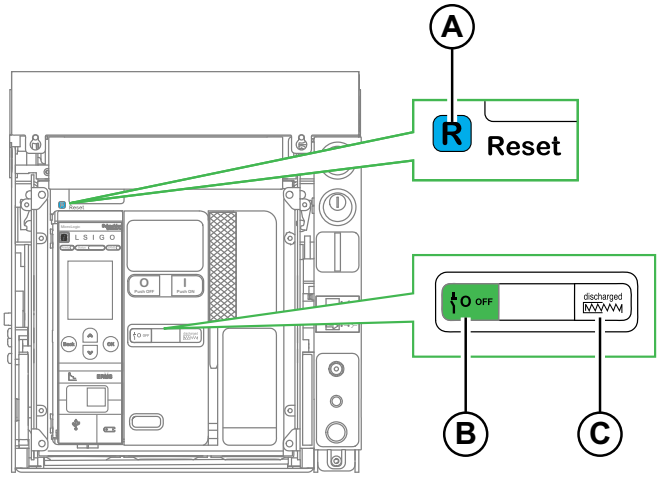
What's in This Chapter

Operating the Circuit Breaker

Circuit Breaker Status

The indicators on the front of the circuit breaker show the following information:

- Blue fault-trip reset button:
  - In: the circuit breaker is closed or open voluntarily (not tripped)
  - Out: the circuit breaker has tripped
- Position indicator of main contacts: ON or OFF.
- Closing spring and ready-to-close indicator. The state can be one of the following:
  - Discharged (no energy to close the circuit breaker)
  - Charged not ready-to-close
  - Charged ready-to-close



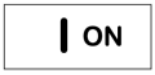
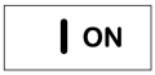
A Blue fault-trip reset button

B Position indicator of main contacts

C Closing spring and ready-to-close indicator

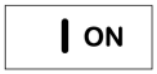
The combination of both indicators gives the circuit breaker status:

Position indicator of main contacts	Closing spring and ready-to-close indicator	Circuit breaker status description
		Circuit breaker is off (main contacts are open) and closing spring is discharged.
		Circuit breaker is off (main contacts are open) and closing spring is charged. The circuit breaker is not ready-to-close because at least one of the following conditions is true: • The circuit breaker has tripped and must be reset. • The MX opening voltage release is energized. • The MN undervoltage release is not energized. • The circuit breaker is mechanically locked in the open position by using padlock or keylock or by using an interlocking system.
		Circuit breaker is off (main contacts are open) and closing spring is charged. The circuit breaker is ready-to-close.

Position indicator of main contacts	Closing spring and ready-to-close indicator	Circuit breaker status description
		Circuit breaker is on (main contacts are closed) and closing spring is discharged.
		Circuit breaker is on (main contacts are closed) and closing spring is charged. The circuit breaker is not ready-to-close because it is already closed.

Circuit Breaker Indication Contacts

The position of the circuit breaker main contacts is indicated by OF indication contacts.

Name	Contact number	Position of indicators and contacts		
Circuit breaker status	–	ON	OFF	Tripped (by MicroLogic Active control unit)
Position indicator of main contacts	–			
Main contact position	–	Closed	Open	Open
Blue fault-trip reset button position	–	IN	IN	OUT
OF indication contact position	1–2	Open	Closed	Closed
	1–4	Closed	Open	Open
SDE indication contact position	1–2	Closed	Closed	Open
	1–4	Open	Open	Closed

Anti-Pumping Function

MasterPacT MTZ circuit breakers provide a mechanical anti-pumping function. In the event of simultaneous maintained opening and closing orders, the standard mechanism blocks the main contacts in the open position. After a trip due to an electrical fault or intentional opening using the manual or electrical controls, the closing order must first be discontinued, then reactivated to close the circuit breaker. This prevents a cycle of closing and opening.

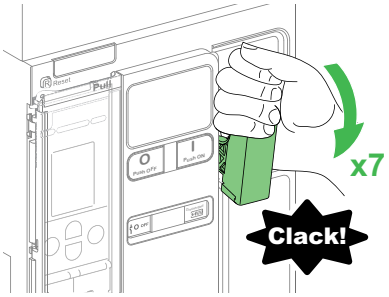
When remote operation features are used, allow at least four seconds for the MCH gear motor to charge the circuit breaker closing spring completely before the XF closing voltage release is actuated.

To prevent the circuit breaker from closing prematurely, the PF ready-to-close contact can be series connected with the XF closing voltage release.

Charging the Closing Spring

The closing spring must be charged with sufficient energy to close the MasterPacT MTZ circuit breaker:

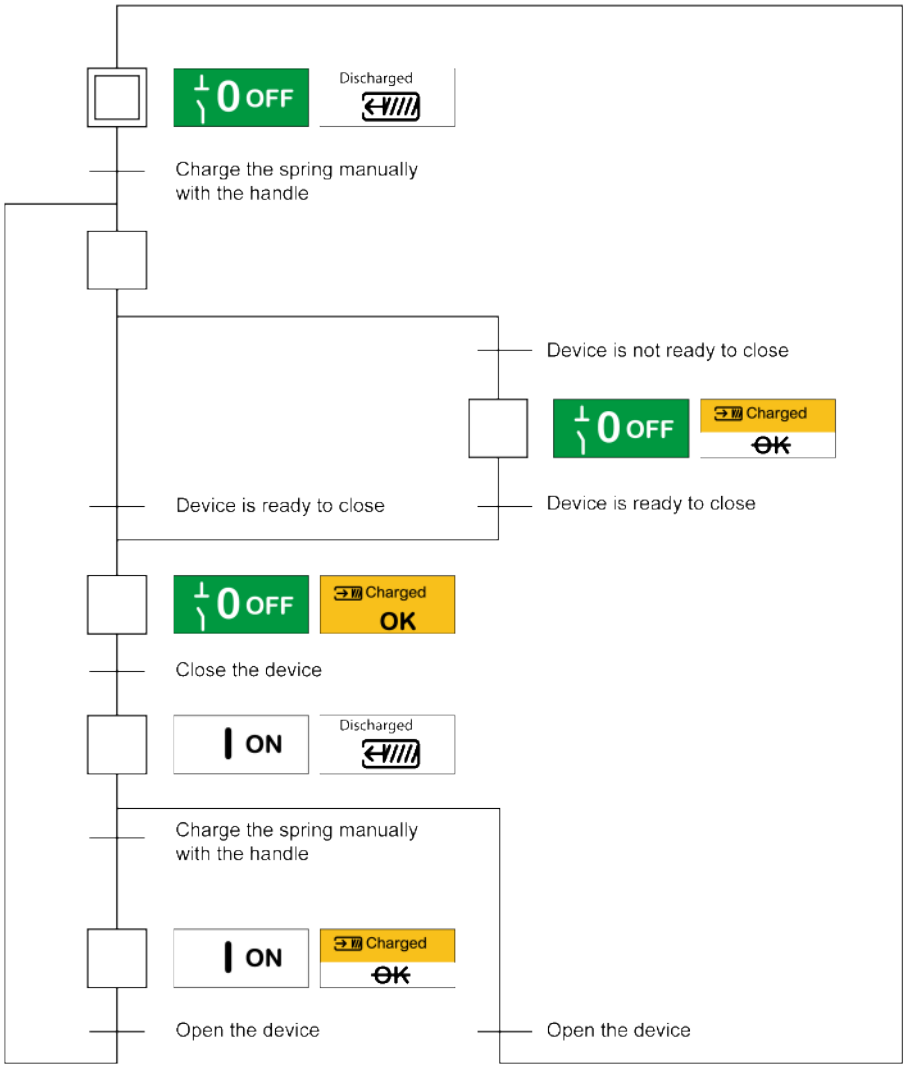
- Manual charge: Charge the mechanism by pulling the spring charging handle down seven times.



- Automatic charge: If the optional MCH gear motor is installed, the spring is automatically charged after closing.

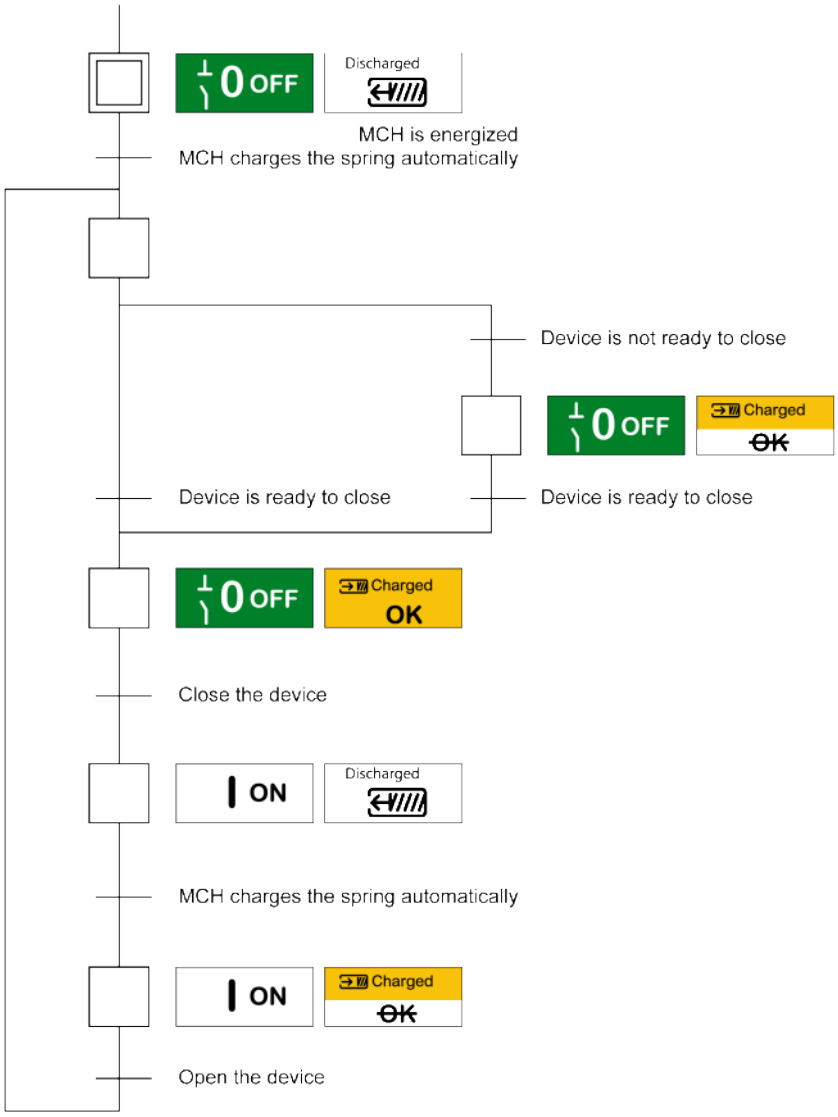
Manual Operation Cycle with the Spring Charging Handle

The following image shows an Open/Close/Open (OCO) cycle for manually charged circuit breakers without MCH gear motor:



Electrical Operation Cycle with an MCH Gear Motor

The following image shows an Open/Close/Open (OCO) cycle for electrically charged circuit breakers using an MCH gear motor:



Control Modes

Presentation

The circuit breaker control mode is a MicroLogic Active setting which defines the source of orders to control circuit breaker operations.

Three control modes are available: Manual, Auto Local and Auto Remote control mode. The control mode is configured on the MicroLogic Active display screen, from the tree navigation menu, at **Configuration > Communication**.

In Manual control mode operation orders are only accepted from one of the following:

- The mechanical buttons on the front of the circuit breaker.
- The external pushbutton connected to the MN/MX/XF voltage releases.

In Auto Local control mode the operator needs to be close to the circuit breaker to establish communication. In addition to the sources accepted in Manual control mode, operation orders are accepted from the FDM121 display.

In Auto Remote control mode the operator does not need to be next to the circuit breaker to establish communication, and orders are accepted when sent from a remote source through the wired communication network.

In addition to the sources accepted in Manual control mode, the following sources of operation orders are accepted in Auto Remote control mode:

- IFE, EIFE or IFM interfaces
- IFE/EIFE webpages

The control mode factory setting is Manual control mode.

Enabling Operation Orders Through Communication

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Do not use MX1 and XF voltage releases of power supply above 250 Vac/dc, with the BCIM module.
- Do not use MicroLogic Active remote control functions in a safety chain.

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

In order to enable operation orders through wired communication:

- The prerequisites for using ULP wired connection must be met.
- The MicroLogic Active control unit must be in Auto Local control mode or Auto Remote control mode.
- Control of the MX/XF communicating voltage releases by the BCIM module must be enabled. This is done on the MicroLogic Active display screen, from the tree navigation menu, at **Configuration > BCIM**.

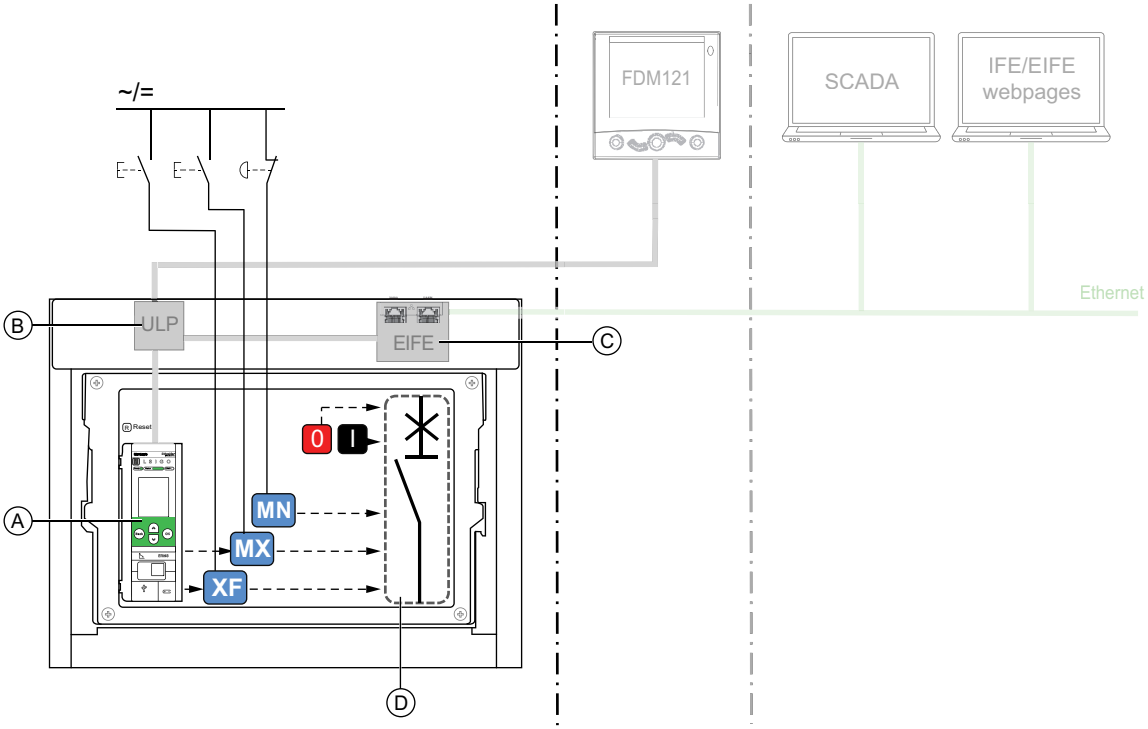
Source of Operation Orders According to Control Mode

The following table summarizes the available sources of operation orders, depending on the control mode:

Control mode	Type of order and delivery method				
	Mechanical	Electrical	Through wired communication		
	Pushbutton	Point to point (voltage release)	FDM121 display	Communication network	IFE/EIFE Webpages
Manual	✓	✓	–	–	–
Auto Local	✓	✓	✓	–	–
Auto Remote	✓	✓	–	✓	✓

Operation in Manual Control Mode

The following example shows available control paths in Manual control mode in a system consisting of a MicroLogic Active control unit, ULP port module and EIFE interface.



A MicroLogic Active control unit

B ULP port module

C EIFE embedded Ethernet interface

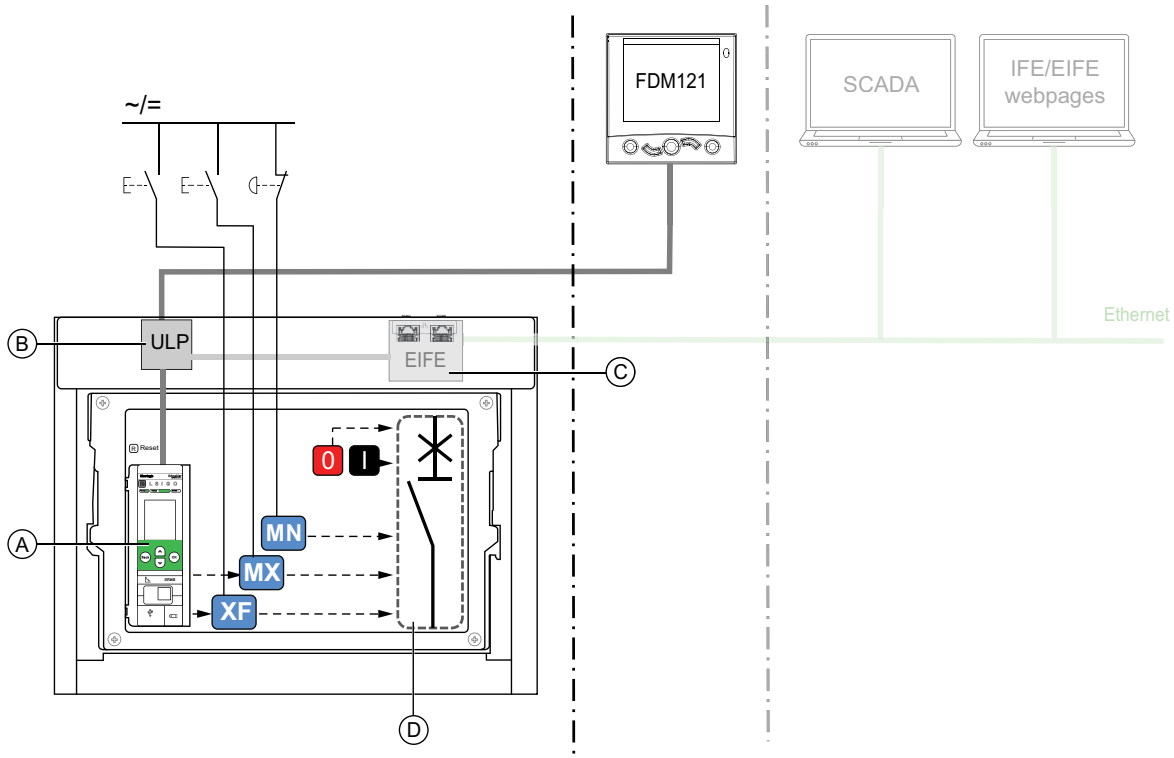
D Circuit breaker mechanism

Opening and closing operations available in Manual control mode:

- 0: mechanical opening pushbutton
- 1: mechanical closing pushbutton
- External pushbuttons wired by customer, and connected to:
  - XF: standard, reinforced, or communicating closing voltage release
  - MX: standard, reinforced, or communicating opening voltage release
  - MN: standard or reinforced undervoltage release

Operation in Auto Local Control Mode

The following example shows available control paths in Auto Local control mode in a system consisting of a MicroLogic Active control unit, ULP port module and EIFE interface.



A MicroLogic Active control unit with BCIM module

B ULP port module

C EIFE embedded Ethernet interface

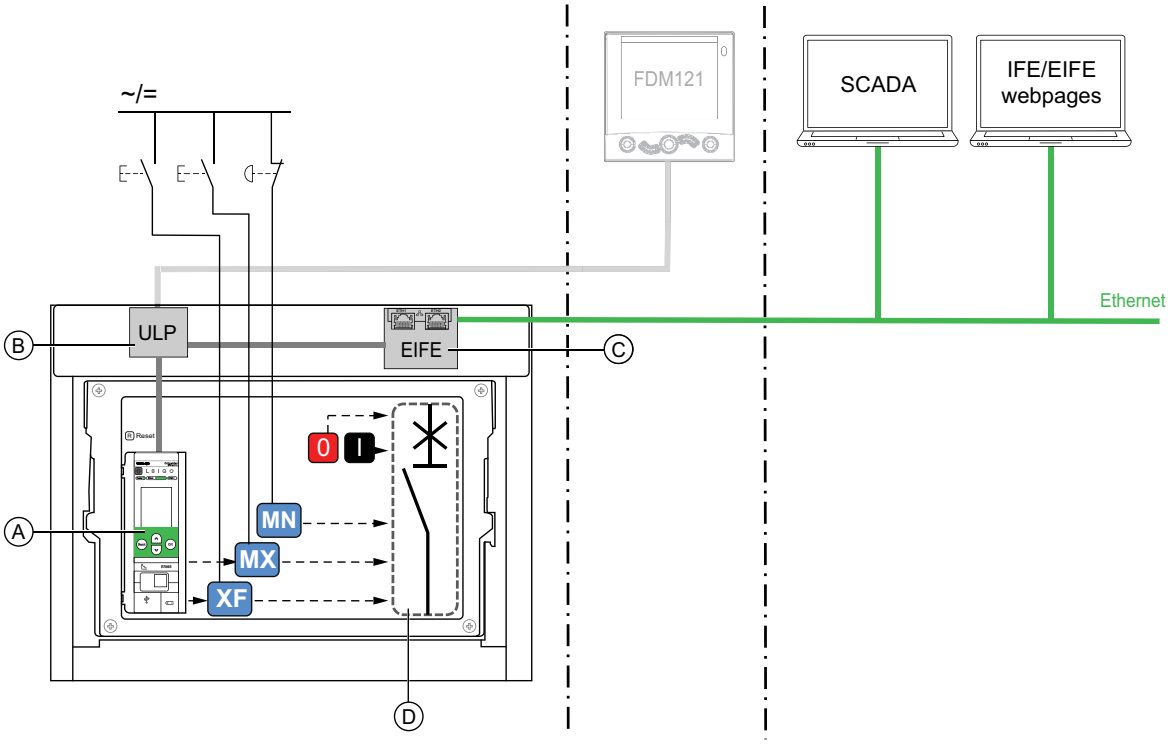
D Circuit breaker mechanism

Opening and closing operations available in Auto Local control mode:

- 0: mechanical opening pushbutton
- 1: mechanical closing pushbutton
- External pushbuttons wired by customer, and connected to:
  - XF: communicating closing voltage release
  - MX: communicating opening voltage release
  - MN: standard or reinforced undervoltage release
- FDM121 display

Operation in Auto Remote Control Mode

The following example shows available control paths in Auto Remote control mode in a system consisting of a MicroLogic Active control unit, ULP port module and EIFE interface.



A MicroLogic Active control unit with BCIM module

B ULP port module

C EIFE embedded Ethernet interface

D Circuit breaker mechanism

Opening and closing operations available in Auto Remote control mode:

- 0: mechanical opening pushbutton
- 1: mechanical closing pushbutton
- External pushbuttons wired by customer, and connected to:
  - XF: communicating closing voltage release
  - MX: communicating opening voltage release
  - MN: standard or reinforced undervoltage release
- Wired communication network
- Remote command through IFE/EIFE Webpages

Setting and Displaying the Control Mode

The control mode is set and displayed on the MicroLogic Active display screen from the tree navigation menu, at **Configuration > Communication > Control Mode**.

Predefined Events

Changing the control mode settings generates the following events:

Code	Event	History	Severity
0x1002 (4098)	**Manual mode enabled**	Operation	Low
0x1004 (4100)	**Local mode enabled**	Operation	Low

Opening the Circuit Breaker

Opening Conditions

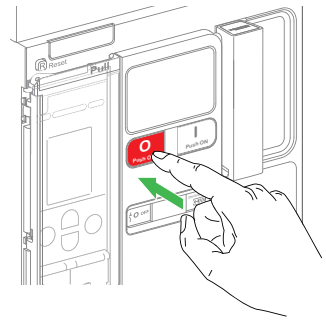
To open the circuit breaker, the circuit breaker must be closed (**I**).

NOTE: An opening order always takes priority over a closing order.

Opening the Circuit Breaker

The following tables present the different ways to open the circuit breaker in the different control modes available.

The circuit breaker can be opened in the following ways in all control modes:

Opening type	Accessories	Opening action	
Mechanical	–	Press the opening pushbutton on the front of the circuit breaker. This opening action is possible at any time.	
Automatic	MN undervoltage release, with or without MN delay unit	The MN undervoltage release opens the circuit breaker automatically in the case of voltage drop.	
By external pushbutton	• External pushbutton wired by customer • One of the following accessories: ◦ MX opening voltage release ◦ MN undervoltage release, with or without MN delay unit	Press the external pushbutton which is connected to the MX opening voltage release or to the MN undervoltage release via the customer terminal block. When the MN undervoltage release is connected to the MN delay unit, the circuit breaker opens with the corresponding time delay.	

Additionally, the circuit breaker can be opened in the following ways when Auto Local or Auto Remote control mode is configured:

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Do not operate the circuit breaker without confirming that doing so will not create a hazardous situation.
- Do not allow any person to work on the electrical network without physically validating the successful execution of the local or remote software actions for opening the circuit breaker or switching off the electrical circuit.

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

Opening type	Control mode	Accessories	Opening action
Through FDM121 display	Auto Local	• BCIM module • MX communicating opening voltage release • ULP port module	Send a command to open the circuit breaker from FDM121 display connected locally to the circuit breaker through the ULP system. This opening action is only allowed when Auto Local is configured.
Through Modbus communication	Auto Remote	• BCIM module • MX communicating opening voltage release • ULP port module • IFE, EIFE, or IFM interface, or IFE server	Send a command to open the circuit breaker through the Modbus communication network. This opening action is only allowed when Auto Remote control mode is configured. Refer to DOCA0384•• *MasterPacT, ComPacT, PowerPacT Circuit Breakers - Modbus Communication - User Guide* in **Related Documents** at the beginning of this guide.
Through IFE/ EIFE webpages	Auto Remote	• BCIM module • MX communicating opening voltage release • ULP port module • IFE or EIFE interface, or IFE server	Send a command to open the circuit breaker from the IFE/EIFE control webpage. This opening action is only allowed when Auto Remote control mode is configured. Refer to the relevant document in **Related Documents** at the beginning of this guide: • DOCA0084•• *Enerlin'X IFE - Ethernet Switchboard Server - User Guide* • DOCA0142•• *Enerlin'X IFE - Ethernet Interface for One Circuit Breaker - User Guide* • DOCA0106•• *Enerlin'X EIFE - Embedded Ethernet Interface for One MasterPacT MTZ Drawout Circuit Breaker - User Guide*

If the circuit breaker does not open, refer to MasterPacT MTZ Troubleshooting, page 133.

Closing the Circuit Breaker

Closing Conditions

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

- Circuit breaker is open (**O**).
- Closing spring is charged.
- The circuit breaker is ready to close, **OK** is displayed.

NOTE: An opening order always takes priority over a closing order. The circuit breaker cannot be closed while an opening order is being received. If **OK** is crossed-out on the ready-to-close indicator, an order to open is being received (either electrically or mechanically) and must be ended before **OK** can be displayed.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

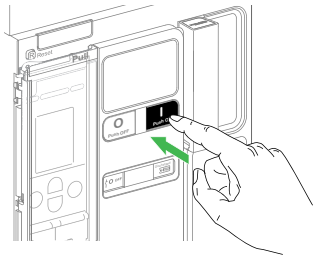
Do not re-close the circuit breaker on an electrical fault. First inspect and, if necessary, repair the downstream equipment.

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

Closing the Circuit Breaker

The following tables present the different ways to close the circuit breaker in the different control modes available.

The circuit breaker can be closed in the following ways in all control modes:

Closing type	Accessories	Closing action	
Mechanical	–	Press the closing pushbutton on the front of the circuit breaker. The closing action is possible when the closing conditions are met.	
External pushbutton	• External pushbutton wired by customer • XF closing voltage release • MCH gear motor	Press the external pushbutton, which is connected to the XF closing voltage release through the customer terminal block.	

Additionally, the circuit breaker can be closed in the following ways when Auto Local or Auto Remote control mode is configured.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Do not operate the circuit breaker without confirming that doing so will not create a hazardous situation.
- Do not allow any person to work on the electrical network without physically validating the successful execution of the local or remote software actions for closing the circuit breaker or switching on the electrical circuit.

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

Closing type	Control mode	Accessories	Closing action
Through FDM121 display	Auto Local	• BCIM module • XF communicating closing voltage release • MCH gear motor • ULP port module	Send a command to close the circuit breaker from FDM121 display connected locally to the circuit breaker through the ULP system. This closing action is only allowed when Auto Local is configured.
Through Modbus communication	Auto Remote	• BCIM module • XF communicating closing voltage release • MCH gear motor • ULP port module • IFE, EIFE, or IFM interface, or IFE server	Send a command to close the circuit breaker through the Modbus communication network. This closing action is only allowed when Auto Remote control mode is configured. Refer to DOCA0384•• *MasterPacT, ComPacT, PowerPacT Circuit Breakers - Modbus Communication - User Guide* in **Related Documents** at the beginning of this guide.
Through IFE/ EIFE webpages	Auto Remote	• BCIM module • XF communicating closing voltage release • MCH gear motor • ULP port module • IFE or EIFE interface, or IFE server	Send a command to close the circuit breaker from the IFE/EIFE control webpage. This closing action is only allowed when Auto Remote control mode is configured. Refer to the relevant document in **Related Documents** at the beginning of this guide: • DOCA0084•• *Enerlin'X IFE - Ethernet Switchboard Server - User Guide* • DOCA0142•• *Enerlin'X IFE - Ethernet Interface for One Circuit Breaker - User Guide* • DOCA0106•• *Enerlin'X EIFE - Embedded Ethernet Interface for One MasterPacT MTZ Drawout Circuit Breaker - User Guide*

If the device does not open, refer to MasterPacT MTZ Troubleshooting, page 133.

Resetting the Circuit Breaker

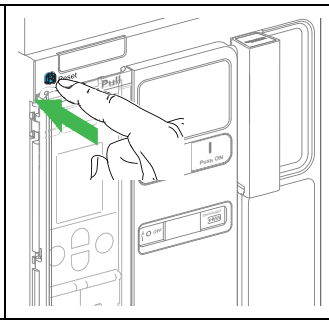
Resetting Conditions

After a trip, the circuit breaker must be reset before closing it.

Resetting is possible in all control modes.

Resetting the Circuit Breaker

The circuit breaker can be reset in different ways, according to the circuit breaker configuration and its accessories:

Type of resetting	Accessories	Resetting action
Mechanical with the blue fault-trip reset button	–	Push in the blue fault-trip reset button on the front of the circuit breaker. This resetting action is always possible. Pushing in the blue fault-trip reset button resets the SDE fault-trip indication contact, and allows the circuit breaker to be closed. 
Automatic (RAR automatic reset option)	• XF closing voltage release • MCH gear motor	After a trip, RAR automatic reset allows the circuit breaker to be closed without the blue fault-trip reset button being pushed in. The use of XF closing voltage release is compulsory with this option. The mechanical indicator and the SDE fault-trip indication contact remain in detected fault position. To reset the SDE fault-trip indication contact and the mechanical indicator, push in the blue fault-trip reset button.
Electrical with external pushbutton	• External pushbutton wired by customer • RES electrical remote reset • XF closing voltage release • MCH gear motor	Press the external pushbutton which is connected to the RES electrical remote reset via the customer terminal block. The use of XF closing voltage release is compulsory with this option. The RES electrical remote reset resets the SDE fault-trip indication contact and the mechanical indicator, and allows the circuit breaker to be closed. **NOTE:** The RES electrical remote reset is not compatible with the SDE2 option.

Engaging/Disengaging the ERMS Function

Presentation

The ERMS function is used to reduce protection settings so that the circuit breaker trips as soon as possible when an electrical fault occurs. Minimizing the time between the electrical fault and circuit breaker trip helps to reduce the risk of injury when qualified electrical personnel are near energized equipment.

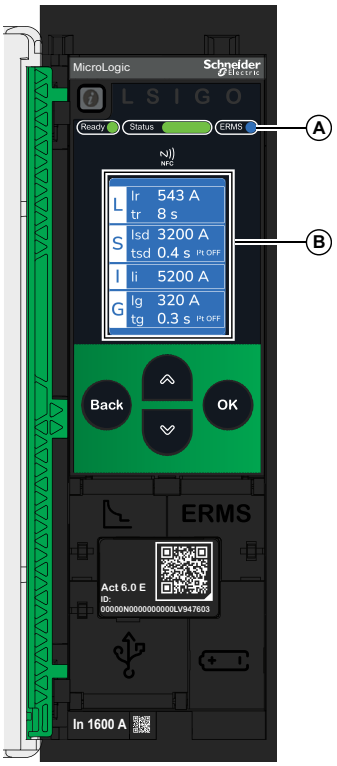
When the ERMS function is engaged, the ERMS protection settings replace the standard protection settings.

Availability

The ERMS function is available on MicroLogic Active 2.0, 5.0 and 6.0 control units for IEC standard.

Operating Principle

The ERMS function can be engaged or disengaged by using the **ERMS** button.



While the ERMS function is engaged:

- The ERMS LED (A) is lit in blue.
- The LSIG home screen (B) is blue.
- The Quick View screens are blue.
- All other screens are not blue.

For more information about the ERMS function, and how to engage and disengage the ERMS function, refer to DOCA0265•• *MasterPacT MTZ - MicroLogic Active Control Unit - User Guide*, page 8.

Operating Accessories

XF, MX, and MN Voltage Releases

⚠⚠WARNING

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Do not use MicroLogic Active remote control functions in a safety chain.
- Limit communicating voltage releases to 250 V.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

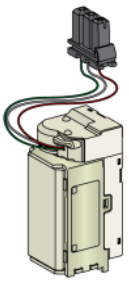
XF, MX, and MN voltage releases are optional accessories mounted inside the device. They can be of standard type, reinforced type, or communicating type:

- Standard voltage releases are designed to receive either pulse-type or maintained voltage operating orders. For installation information, consult instruction sheet 51201007AA on the Schneider Electric website.
- Reinforced voltage releases sustain overvoltage on coil control at 15% of control nominal voltage. They are used for electrical networks with a high overvoltage level. For installation information, consult instruction sheet NVE40749 on the Schneider Electric website.
- Communicating voltage releases are reinforced voltage releases designed to receive opening and closing orders from the wired communication network. For installation information, consult instruction sheet NVE40766 on the Schneider Electric website.

XF Closing Voltage Release

The XF closing voltage release closes the circuit breaker instantaneously when powered if the spring mechanism is charged. The minimum duration of the pulse operating order must be 200 ms.

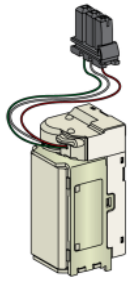
The XF closing voltage release is available in the standard, reinforced, or communicating type.



MX Opening Voltage Release

The MX opening voltage release opens the circuit breaker instantaneously when powered. The minimum duration of the pulse operating order must be 200 ms. The MX opening voltage release locks the circuit breaker in the OFF position if the command is maintained.

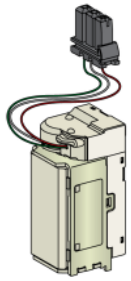
The MX opening voltage release is available in the standard, reinforced, or communicating type.



MN Undervoltage Release

The MN undervoltage release instantaneously opens the circuit breaker when its supply voltage drops to a value between 35% and 70% of its rated voltage. If there is no supply to the release, it is impossible to close the circuit breaker, either manually or electrically. Any attempt to close the circuit breaker has no effect on the main contacts. Circuit breaker closing is enabled again when the supply voltage of the release returns to 85% of its rated value.

The MN undervoltage release is available in the standard or reinforced type.



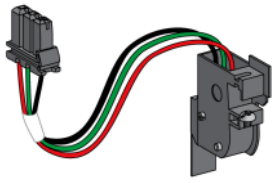
PF Ready-to-close Contact

This is an optional accessory that is mounted inside the circuit breaker.

The PF ready-to-close contact delivers remotely, the indication delivered locally by the ready-to-close indicator.

It consists of a changeover contact indicating remotely that the circuit breaker is ready to close, that is:

- The circuit breaker is in the open position.
- The spring mechanism is charged.
- There is no maintained opening order.

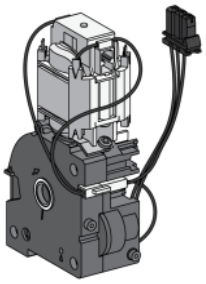


For information on installation, consult instruction sheet NVE35466 on the Schneider Electric website.

MCH Gear Motor

This is an optional accessory that is mounted inside the circuit breaker.

The MCH gear motor automatically charges the spring mechanism when the circuit breaker is closed, allowing instantaneous closing of the circuit breaker following opening.



For information on installation, consult instruction sheet NVE35514 sheet on the Schneider Electric website.

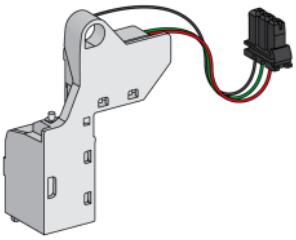
RES Electrical Remote Reset

This is an optional accessory that is mounted inside the circuit breaker.

Following tripping, this function resets the SDE fault-trip indication contact and the mechanical indicator, and enables circuit breaker closing.

The use of an XF closing release is compulsory with this option.

The RES electrical remote reset is not compatible with the SDE2 additional fault-trip indication contact because they are installed in the same physical location.

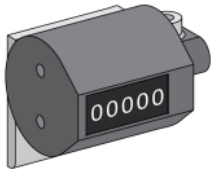


CDM Mechanical Operation Counter

This is an optional accessory that is mounted inside the circuit breaker.

The CDM mechanical operation counter counts the number of operating cycles and is visible on the front panel. It is compatible with manual and electrical control functions.

This option is compulsory for all source-changeover systems.



For information on installation, consult instruction sheet NVE35516 on the Schneider Electric website.

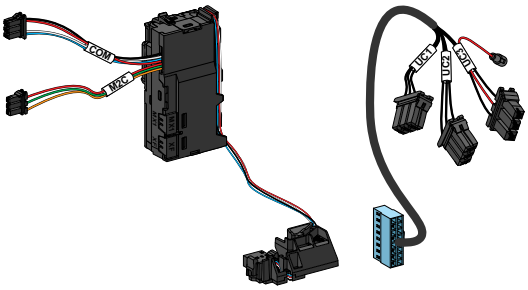
BCIM Breaker Communication and Isolation Module

This is an optional accessory which is mounted on the back of the MicroLogic Active control unit.

The BCIM module is connected to the XF and MX communicating voltage releases in order to provides the means to remotely control the operation of the circuit breaker. It enables communication between the MicroLogic Active control unit and ULP modules such as EIFE interface and IFM interface.

The BCIM module also provides isolation:

- Between the MicroLogic Active control unit and other ULP modules.
- Between the XF and MX communicating voltage releases.



The BCIM module is installed on the back of the MicroLogic Active control unit.

For information on installation, consult the instruction sheet on the Schneider Electric website: BRU4329407.

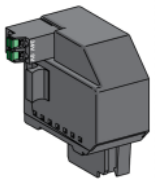
ULP Port Module

The ULP port module is an optional accessory that is mounted with the terminal blocks of the device.

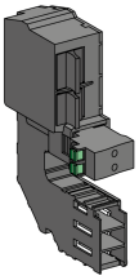
The ULP port module:

- Supplies the BCIM module.
- Integrates the ULP termination.
- Is required for connection to the EIFE Ethernet interface.
- Allows the connection to external ULP modules, such as the FDM121 display or the IFE Ethernet interface.

Fixed circuit breaker:



Drawout circuit breaker:



For information on installation, consult the instruction sheet on the Schneider Electric website:

- ULP port module for fixed MasterPacT MTZ1: NVE40791
- ULP port module for drawout MasterPacT MTZ1: NVE40796

EIFE Embedded Ethernet Interface

This is an optional accessory which is mounted on the chassis of the drawout circuit breaker.

The EIFE embedded Ethernet interface enables drawout MasterPacT MTZ circuit breakers to be connected to an Ethernet network with the Modbus TCP/IP protocol.

It provides digital access to all the data delivered by the MicroLogic Active control unit. In addition, it monitors the position of the device in the chassis: connected, test, and disconnected.

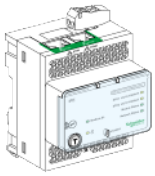
For information on installation, consult the instruction sheet on the Schneider Electric website: NVE23550.

For information on usage, refer to DOCA0106•• *Enerlin'X EIFE - Embedded Ethernet Interface for One MasterPacT MTZ Drawout Circuit Breaker - User Guide* in **Related Documents** at the beginning of this guide.

IFE Ethernet Interface for One Circuit Breaker

The IFE Ethernet interface provides Ethernet access to a single circuit breaker with the Modbus TCP/IP protocol.

The circuit breaker is connected to the IFE interface through the ULP port module and a prefabricated ULP cord.



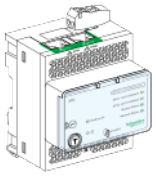
For information on installation, consult the instruction sheet on the Schneider Electric website: HRB49218.

For information on usage, refer to DOCA0142•• *Enerlin'X IFE - Ethernet Interface for One Circuit Breaker - User Guide* in **Related Documents** at the beginning of this guide..

IFE Ethernet Switchboard Server

The IFE Ethernet switchboard server provides Ethernet access to one or several circuit breakers with the Modbus TCP/IP protocol. It allows the following communication architectures:

- One single circuit breaker connected to the IFE server through the ULP port module.
- Up to 11 circuit breakers through IFM Modbus-SL interfaces stacked to the IFE server.



For information on installation, consult the instruction sheet on the Schneider Electric website: HRB49218.

For information on usage, refer to DOCA0084•• *Enerlin'X IFE - Ethernet Switchboard Server - User Guide* in **Related Documents** at the beginning of this guide.

IFM Modbus-SL Interface for One Circuit Breaker

The IFM Modbus-SL interface provides access to a single circuit breaker via a Modbus serial line communication network. The circuit breaker is connected to the IFM interface through the ULP port module or the COM terminal block and a prefabricated ULP cord.

For information on installation, consult the instruction sheet on the Schneider Electric website: NVE85393.

FDM121 Front Display Module for One Circuit Breaker

The FDM121 front display module for one circuit breaker shows the measurements, alarms, and operating assistance data from a single intelligent modular unit with a MasterPacT MTZ circuit breaker.

The FDM121 display with firmware version V004.000.025 or greater is compatible with MicroLogic Active control units. Earlier firmware versions need to be updated.

For information on installation, consult the instruction sheet on the Schneider Electric website: QGH80971.

For information on usage, refer to DOCA0088•• *Enerlin'X FDM121 - Front Display Module for One Circuit Breaker - User Guide* in **Related Documents** at the beginning of this guide.

Drawout Circuit Breaker Racking Actions

What's in This Chapter

Drawout MasterPacT MTZ1 Circuit Breaker Status

Drawout Circuit Breaker Handling Conditions

Connection or disconnection of the drawout circuit breaker requires insertion of the racking handle. When interlocks, padlocks, or an open door lock are in place, the racking handle cannot be inserted.

⚠⚠DANGER

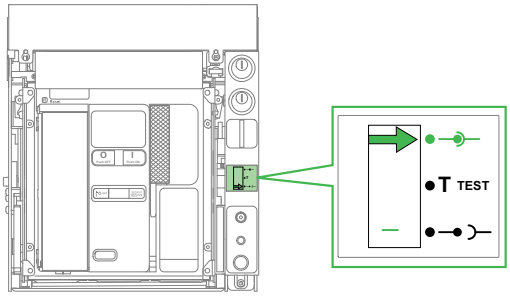
HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

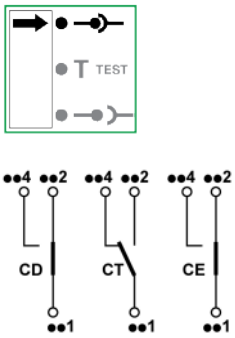
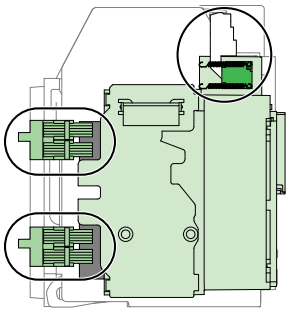
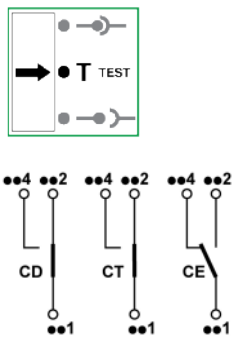
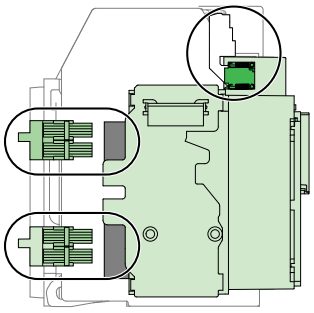
- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462 or local equivalent.
- This equipment must only be installed and serviced by qualified electrical personnel.

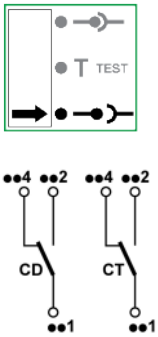
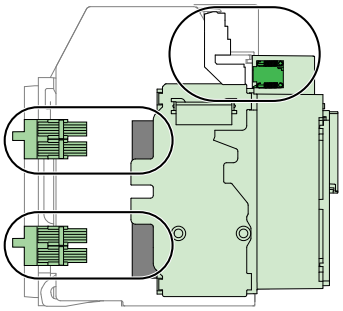
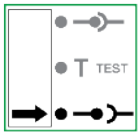
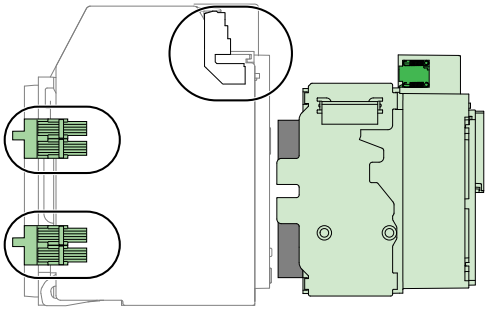
Failure to follow these instructions will result in death or serious injury.

Drawout Circuit Breaker Positions

The indicator located on the front of the chassis locally signals the position of the circuit breaker in the chassis.



Circuit breaker position	Position indicator and position contact state	Connector position	Circuit breaker status
Connected		 • Disconnecting contact clusters: engaged • Control: engaged	• Can be operated. • Ready for service.
Test			• Can be operated. • Can have operation and control systems tested.

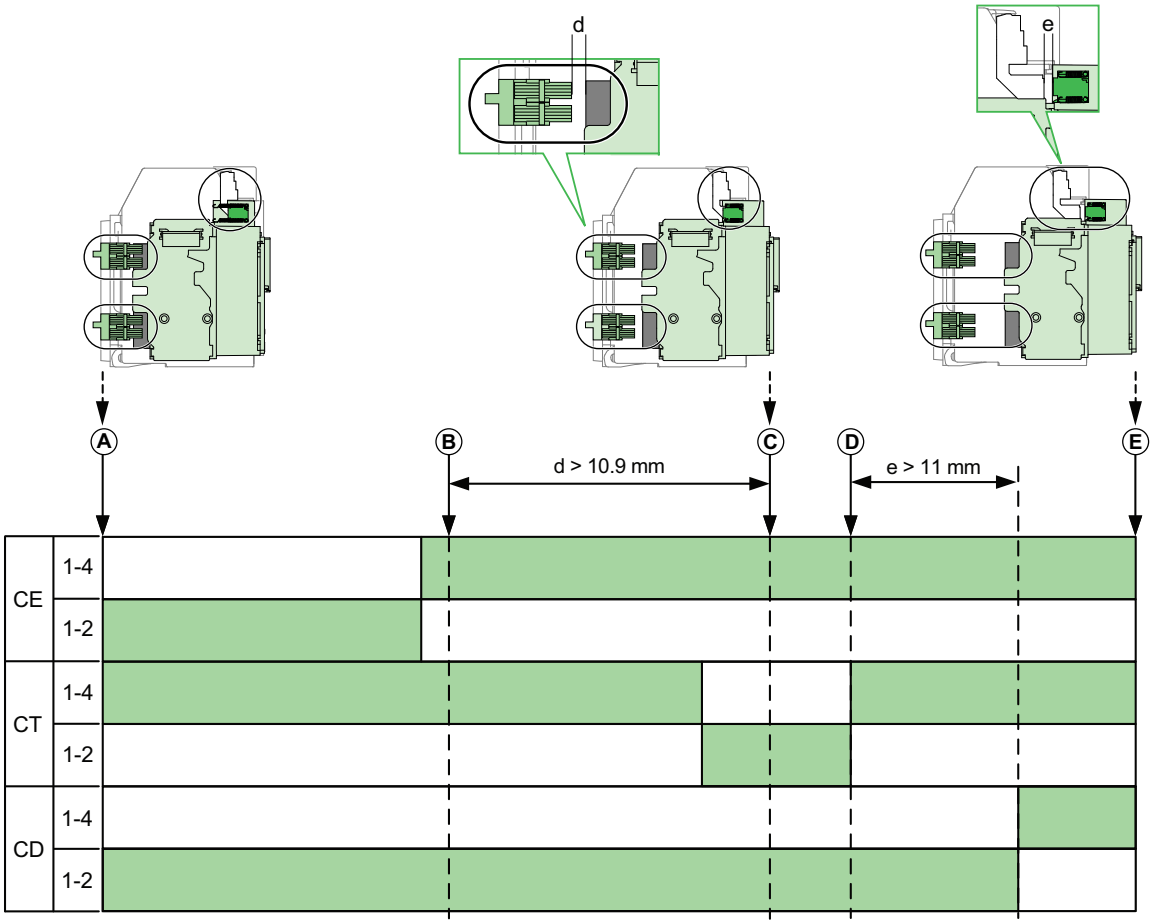
Circuit breaker position	Position indicator and position contact state	Connector position	Circuit breaker status
		• Disconnecting contact clusters: disengaged - the minimum distance between the circuit breaker racking terminals and the chassis clusters is reached. • Control: engaged	
Disconnected		 • Disconnecting contact clusters: disengaged • Control: disengaged	• Can be operated. • Can be removed from chassis.
Withdrawn		 • Disconnecting contact clusters: disengaged • Control: disengaged	Removed from chassis.

Drawout Circuit Breaker Position Contacts

The position of the circuit breaker in the chassis is indicated remotely by the following position contacts:

- CE: connected position
- CT: test position
- CD: disconnected position

The state of the position contacts changes according to the circuit breaker position during racking-in and racking-out operations, as shown in the diagram below.



A Circuit breaker in connected position

B Separation of the main circuits

C Circuit breaker in test position

D Separation of auxiliary circuits

E Circuit breaker in disconnected position

Position contact is open.

Position contact is closed.

Drawout Device Position Contacts Without EIFE Ethernet Interface

Without EIFE Ethernet interface, optional position contacts can be added as follows:

- 2 CD disconnected position contacts
- 3 CE connected position contacts
- 1 CT test position contact

Drawout Device Position Contacts With EIFE Ethernet Interface

With EIFE Ethernet interface, 2 optional CE connected position contacts can be added.

Chassis Management Function

The chassis management function is used to:

- Record and check the position of the moving part of the drawout device in the chassis
- Provide information about preventive maintenance actions
- Notify the remote controller about the position of the drawout device

The chassis management function is performed by the EIFE Ethernet interface. Refer to DOCA0106•• *Enerlin'X EIFE - Embedded Ethernet Interface for One MasterPacT MTZ Drawout Circuit Breaker - User Guide* in **Related Documents** at the beginning of this guide.

Disconnecting the Drawout Circuit Breaker

Drawout Circuit Breaker Handling Conditions

Connection or disconnection of the drawout circuit breaker requires insertion of the racking handle. When chassis locking by keylocks, padlocks, or an open door lock are in place, the racking handle cannot be inserted.

⚠⚠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 or local equivalent.
- This equipment must only be installed and serviced by qualified electrical personnel.

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

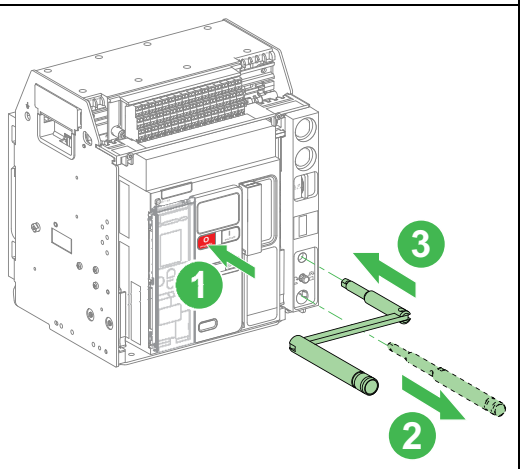
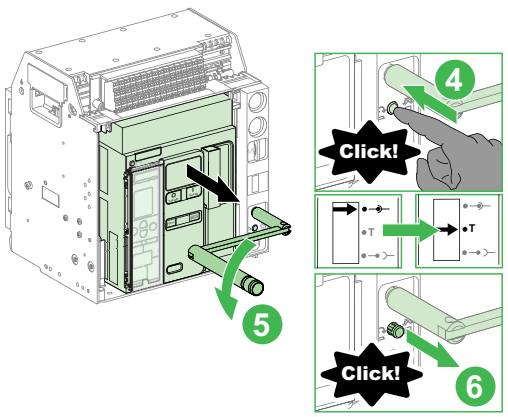
NOTICE

HAZARD OF EQUIPMENT DAMAGE

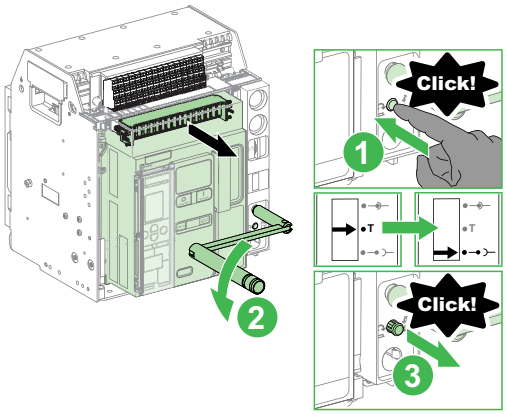
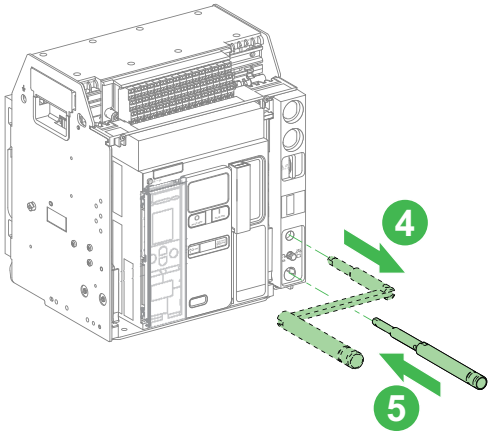
- Use the provided racking handle to rack the device into or out of chassis.
- Do not use power tools for racking.
- Do not turn the handle after position release button has popped out.

Failure to follow these instructions can result in equipment damage.

Racking-out the Circuit Breaker from Connected to Test Position

Step	Action	
1	Press the opening pushbutton to open the circuit breaker.	
2	Remove the racking handle from its storage space.	
3	Insert the racking handle into the racking handle socket.	
4	Push in the position release button.	
5	Turn the racking handle counterclockwise. **Result**: The circuit breaker moves forward in the chassis.	
6	When the test position is reached, the position release button pops out and the mechanism blocks the racking handle. **Result:** The circuit breaker is in the test position.	

Racking-out the Circuit Breaker from Test to Disconnected Position

Step	Action	
1	Push in the position release button.	
2	Turn the racking handle counterclockwise. **Result**: The circuit breaker moves forward in the chassis.	
3	When the disconnected position is reached, the position release button pops out and the mechanism blocks the racking handle. **Result:** The circuit breaker is in the disconnected position.	
4	Remove the racking handle from the racking socket.	
5	Put the racking handle back into its storage space.	

Connecting the Drawout Circuit Breaker

Drawout Circuit Breaker Handling Conditions

Connection or disconnection of the drawout circuit breaker requires insertion of the racking handle. When chassis locking by keylocks, padlocks, or an open door lock are in place, the racking handle cannot be inserted.

⚠⚠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 or local equivalent.
- This equipment must only be installed and serviced by qualified electrical personnel.

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

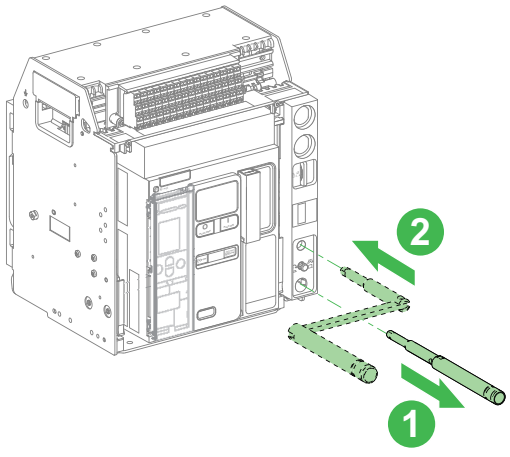
NOTICE

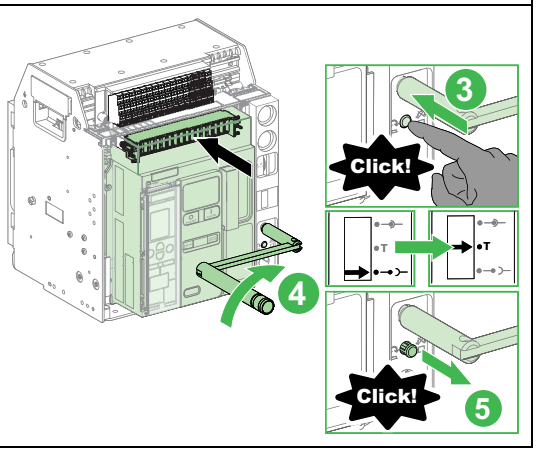
HAZARD OF EQUIPMENT DAMAGE

- Use the provided racking handle to rack the device into or out of chassis.
- Do not use power tools for racking.
- Do not turn the handle after position release button has popped out.

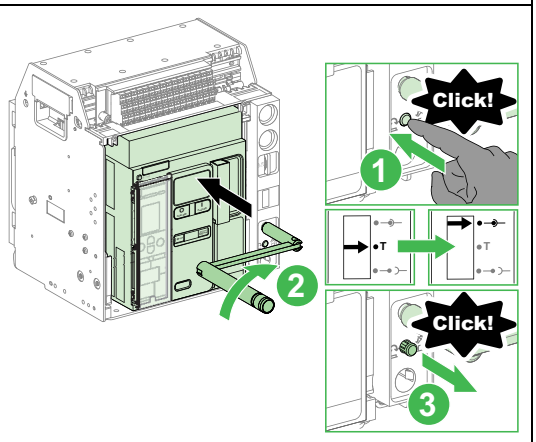
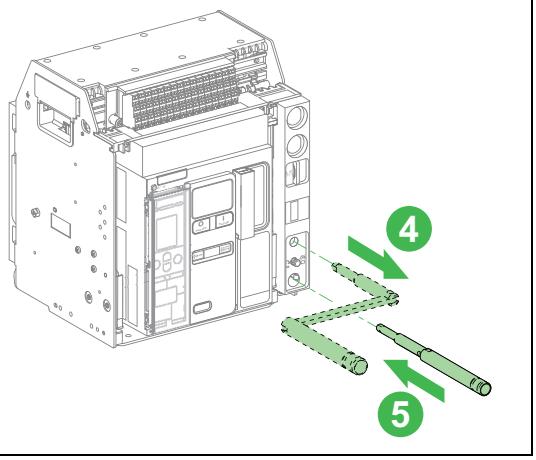
Failure to follow these instructions can result in equipment damage.

Racking-in the Circuit Breaker from Disconnected to Test Position

Step	Action	
1	Remove the racking handle from its storage space.	
2	Insert the racking handle into the racking handle socket.	

Step	Action	
3	Push the position release button.	
4	Turn the racking handle clockwise. **Result**: The circuit breaker moves back in the chassis.	
5	When the test position is reached, the position release button pops out and the mechanism blocks the racking handle. **Result:** The circuit breaker is in the test position.	

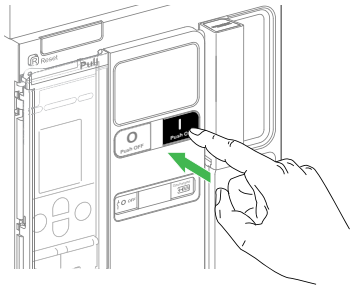
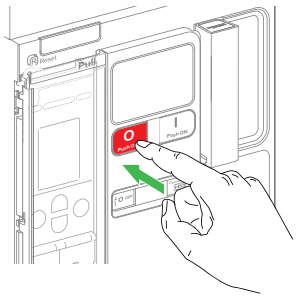
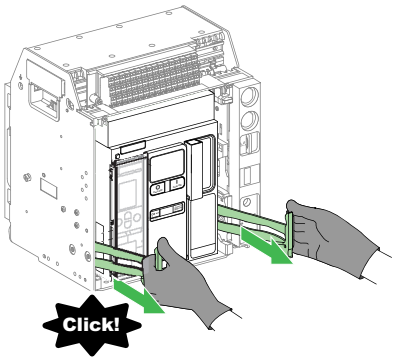
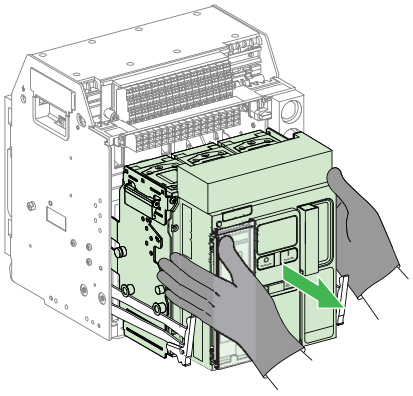
Racking-in the Circuit Breaker from Test to Connected Position

Step	Action	
1	Push the position release button.	
2	Turn the racking handle clockwise. **Result**: The circuit breaker moves back in the chassis.	
3	When the connected position is reached, the position release button pops out and the mechanism blocks the racking handle. **Result:** The circuit breaker is in the connected position.	
4	Remove the racking handle from the racking socket.	
5	Put the racking handle back into its storage space.	

Removing the Drawout Circuit Breaker

Circuit Breaker Removal

NOTICE
HAZARD OF EQUIPMENT DAMAGE The chassis must be securely fastened when installing or removing the device. **Failure to follow these instructions can result in equipment damage.**

Step	Action	
1	With the circuit breaker in the disconnected position, page 62, discharge the closing spring by pressing the closing pushbutton. If the closing spring is charged, the circuit breaker closes.	
2	Press the opening pushbutton to open the circuit breaker.	
3	Pull out the rails to the maximum by pulling on the drawout grips. The moving part of the drawout circuit breaker stays in disconnected position in the chassis.	
4	Pull out the moving part of the drawout circuit breaker to the maximum, by rolling it along the rails. **Result**: The circuit breaker is supported on the rails, clear of the chassis and ready to be lifted.	

Lifting the Circuit Breaker

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

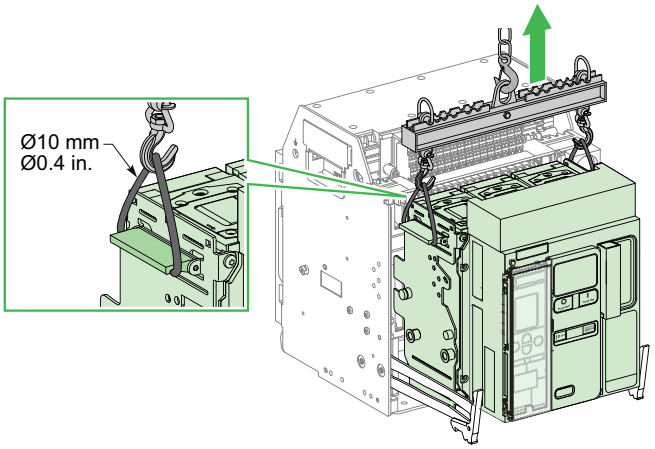
⚠DANGER

HAZARD OF DEVICE FALLING

- Be sure that lifting equipment has lifting capacity for the device 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.

Lift the circuit breaker from the chassis rails by using the carrying grip located on the sides of the circuit breaker.



Circuit Breaker Weights

The following table shows the weights of the different circuit breakers available.

Number of poles	Circuit breaker	MTZ1
3P	Moving part (Drawout)	14 kg
	Chassis	16 kg
	Fixed circuit breaker	14 kg
4P	Moving part (Drawout)	18 kg
	Chassis	21 kg
	Fixed circuit breaker	18 kg

Installing the Drawout Circuit Breaker in the Chassis

Drawout Circuit Breaker Handling Conditions

Connection or disconnection of the drawout circuit breaker requires insertion of the racking handle. When chassis locking by keylocks, padlocks, or an open door lock is in place, the racking handle cannot be inserted.

⚠⚠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 or local equivalent.
- This equipment must only be installed and serviced by qualified electrical personnel.

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

NOTICE

HAZARD OF EQUIPMENT DAMAGE

- Use the provided racking handle to rack the device into or out of chassis.
- Do not use power tools for racking.
- Do not turn the handle after position release button has popped out.

Failure to follow these instructions can result in equipment damage.

Optional Mismatch Protection

Mismatch protection, page 91 allows the installation of a drawout circuit breaker only in a chassis with compatible characteristics.

Installing the Circuit Breaker

⚠DANGER

HAZARD OF DEVICE FALLING

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

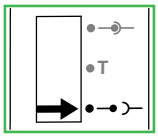
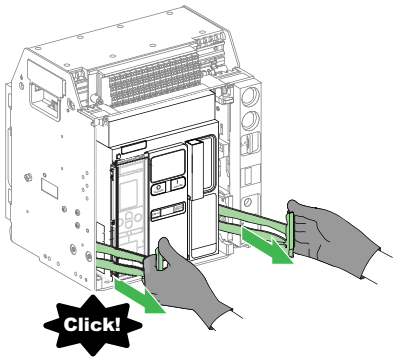
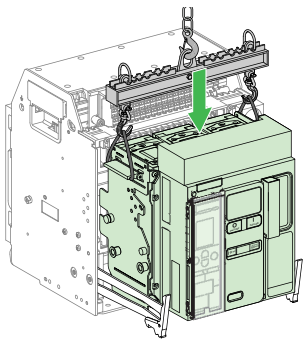
Failure to follow these instructions will result in death or serious injury.

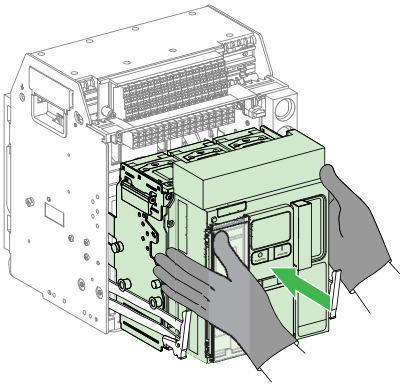
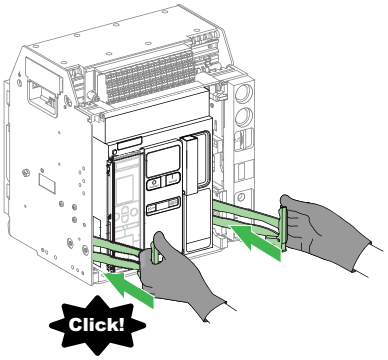
NOTICE

HAZARD OF EQUIPMENT DAMAGE

- Chassis must be securely fastened when installing or removing the device.
- Before mounting the device, make sure that it matches the chassis.

Failure to follow these instructions can result in equipment damage.

Step	Action	
1	If the chassis is not installed yet in a switchboard or panelboard, securely fasten the chassis on a pallet.	
2	Remove the racking handle from its storage space.	
3	Check that the chassis indicator is in the disconnected position:  If the chassis indicator is not in the disconnected position, follow the steps on disconnecting the drawout circuit breaker, page 62.	
4	Pull out the drawout grips until the extension rails are fully extended.	
5	Install the circuit breaker on the extension rails by using appropriate lifting equipment. Check that the four wheels on the sides of circuit breaker are resting on the rails.	
6	Detach the lifting equipment.	
7	Check that the circuit breaker is in the open position.	

Step	Action	
8	Using both hands, push in the circuit breaker to the maximum in the chassis. Take care not to push the control unit. The rails stay extended.	
9	When the circuit breaker is fully inserted into the chassis, lift and push in the rails to the maximum.	

Circuit Breaker Locking Actions

What's in This Chapter

About Locking Actions

A locking action is a manual locking operation made by the user. A number of optional locking accessories are available for the MasterPacT MTZ1 circuit breaker and chassis. For a complete listing of available locks, refer to LVPED225010EN *MasterPacT MTZ with MicroLogic Active Control Unit - Catalog* in **Related Documents** at the beginning of this guide.

Locking the Pushbuttons

Description

The pushbutton locking cover is an optional accessory for the MasterPacT MTZ1 circuit breaker that forbids access to the closing and opening pushbuttons:

- Together or separately.
- By using a padlock (shackle diameter 5–8 mm).
- By using a lead seal.
- By using screws.

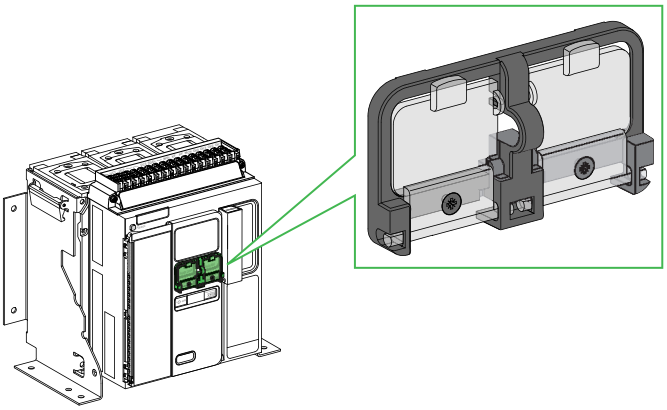
IMPORTANT: The use of the pushbutton locking cover is mandatory to padlock the closing pushbutton when a MasterPacT MTZ1 circuit breaker is used as a transfer switch.

IMPORTANT: When the pushbutton locking cover is locked, the circuit breaker cannot be closed locally with the closing pushbutton, but it can be closed remotely. The pushbutton locking cover cannot be used as a Lock Out Tag Out accessory.

For more information, refer to Mechanical Interlocking for Transfer Switches, page 99.

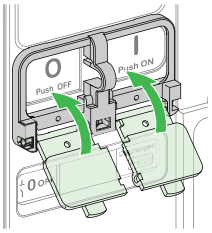
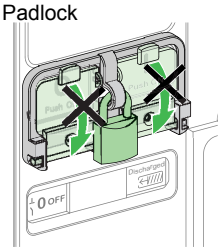
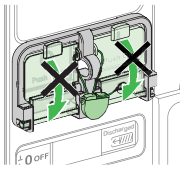
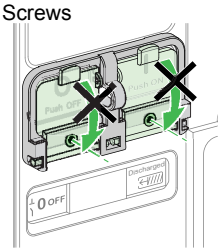
VBP Pushbutton Locking Accessory

The pushbutton locking accessory is an optional transparent cover, mounted on the front cover of the circuit breaker, which covers the closing and opening pushbuttons.



For information on the accessory installation, consult the instruction sheet on the Schneider Electric website: NVE56769.

Locking the Pushbuttons

Step	Action	
1	Close the transparent covers of the locking accessory. **NOTE:** One or both transparent covers of the locking accessory can be closed and locked.	
2	Lock the transparent covers in place by using a padlock, lead seal, or screws.	Padlock  Lead seal  Screws 

Locking the Circuit Breaker in Open Position with Padlocks

Description

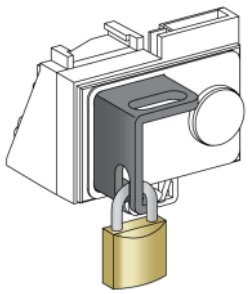
Optional padlocks can be used to lock the MasterPacT MTZ1 circuit breaker in the open position. When locked the circuit breaker cannot be closed, either locally with the closing pushbutton, or remotely.

To use padlocks to lock the circuit breaker in the open position, an optional OFF-position locking accessory is necessary. This accessory allows the use of up to three padlocks with shackle diameter 5–8 mm.

NOTE: This accessory is not compatible with VSPO OFF-position keylock accessory. The two accessories cannot be used at the same time.

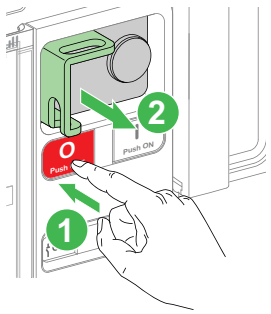
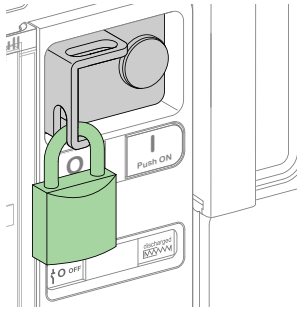
VCPO OFF-Position Locking Accessory

The off-position locking accessory is an optional accessory that is mounted on the front face of the circuit breaker.

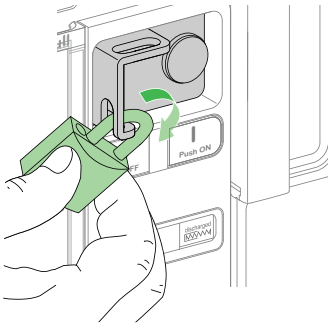
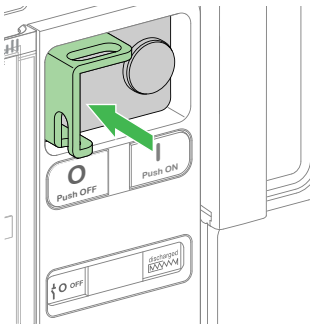
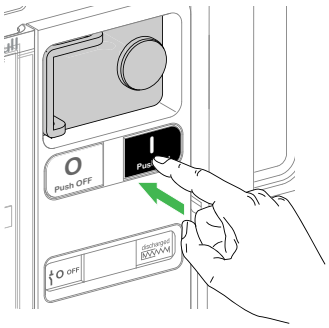


For information on the accessory installation, consult the instruction sheet on the Schneider Electric website: NVE56770.

Locking the Circuit Breaker in the Open Position

Step	Action	
1	Press and hold down the opening pushbutton.	
2	With the opening button pressed, pull out the tab of the off-position padlocking accessory.	
3	Insert the padlock in the tab and close the padlock. Release the opening pushbutton.	

Unlocking the Circuit Breaker

Step	Action	
1	Remove the padlock.	
2	Push back the tab of the OFF-position locking accessory before operating the circuit breaker	
3	Press the closing pushbutton to close the circuit breaker.	

Locking the Circuit Breaker in Open Position with Keylocks

Description

Optional keylocks can be used:

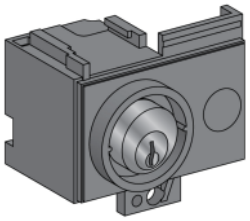
- To lock one MasterPacT MTZ1 circuit breaker in the open position. When locked the circuit breaker cannot be closed, either locally with the closing pushbutton, or remotely.
- To interlock several MasterPacT MTZ1 circuit breakers locked with the same key.

To use keylocks to lock the circuit breaker in the open position, an optional OFF-position locking accessory is necessary.

NOTE: This accessory is not compatible with the VCPO OFF-position padlocking accessory. The two accessories cannot be used at the same time.

VSPO OFF-Position Locking Accessory

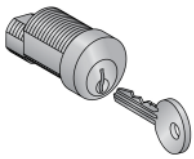
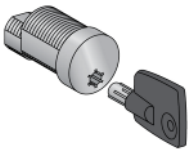
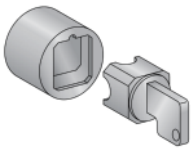
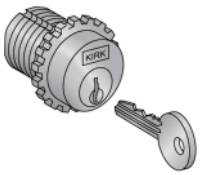
The OFF-position locking accessory is an optional accessory that is mounted on the front of the circuit breaker.



The OFF-position keylocking accessory can be fitted with either:

- One keylock.
- Two keylocks with identical keys or different keys.

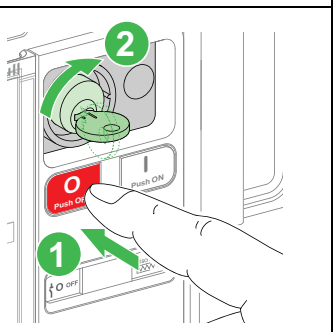
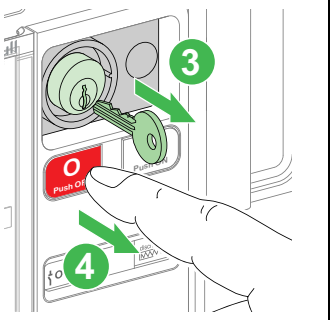
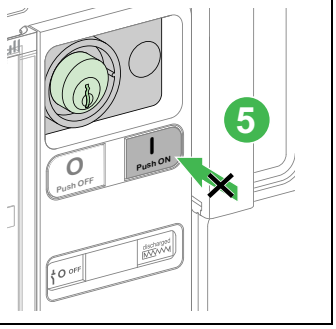
The following types of keylocks can be fitted:

Ronis keylock	Profalux keylock	Castell keylock (keylock not provided)	Kirk keylock (keylock not provided)
			

For information on the accessory installation, consult the instruction sheet on the Schneider Electric website: NVE56770.

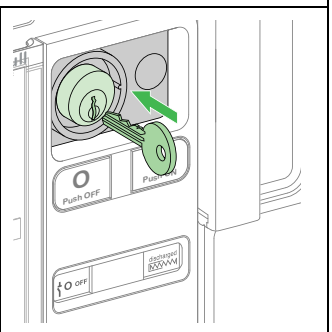
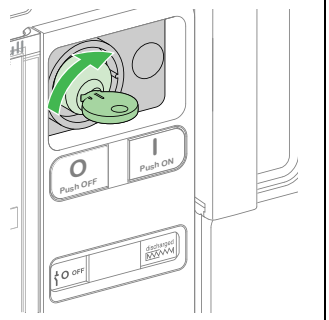
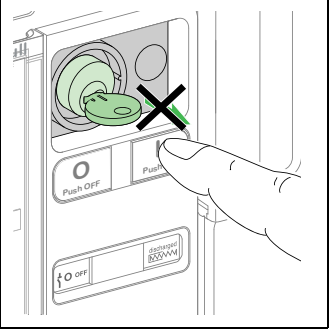
Locking the Circuit Breaker in the Open Position

For circuit breakers equipped with two keylocks, locking with one key is sufficient to lock the circuit breaker in the open position.

Step	Action	
1	Press and hold the opening pushbutton.	
2	With the opening pushbutton pressed, turn the key clockwise to lock the circuit breaker.	
3	Remove the key.	
4	Release the opening pushbutton.	
5	Check that the circuit breaker is locked in the open position and cannot be closed, either locally with the closing pushbutton, or remotely.	

Unlocking the Circuit Breaker

For circuit breakers equipped with two keylocks, both keys must be inserted in the keylocks to unlock the circuit breaker.

Step	Action	
1	Put the key in the keylock.	
2	Turn the key clockwise to unlock the circuit breaker.	
3	Press the closing pushbutton to close the circuit breaker. **NOTE:** The key remains captive in the keylock.	

Chassis Locking in Disconnected Position

Description

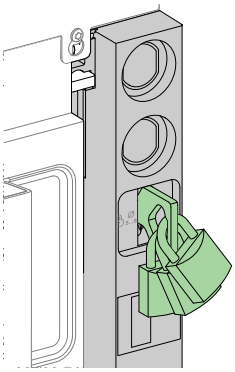
The chassis can be locked in the disconnected position. When the chassis is locked in the disconnected position, the racking handle cannot be inserted.

The chassis can be locked in the disconnected position:

- By up to three padlocks with shackle diameter 5–8 mm.
- By optional keylocks.

Keylocks can be used in addition to padlocks.

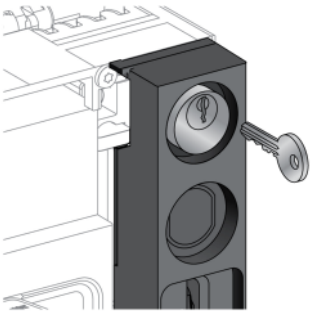
Chassis locking by padlock is always possible and does not require any accessory.

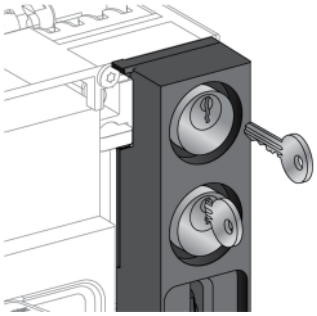


VSPD Chassis Locking by Keylock Accessory

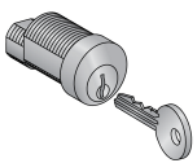
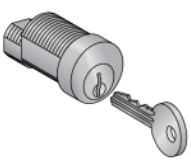
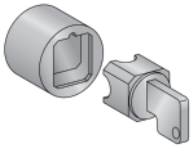
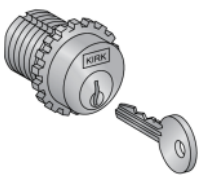
The chassis locking by keylock accessory can be fitted with either:

- One keylock.
- Two keylocks with identical keys or different keys.



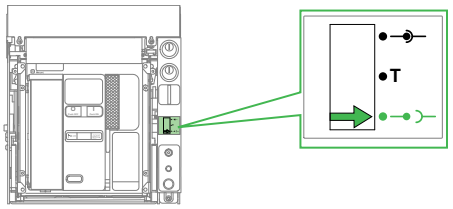
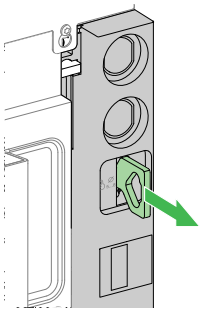
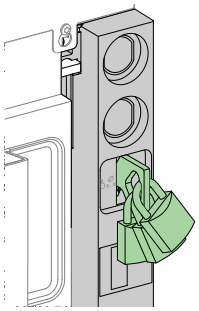
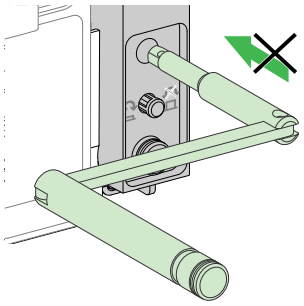


The following types of keylocks can be fitted:

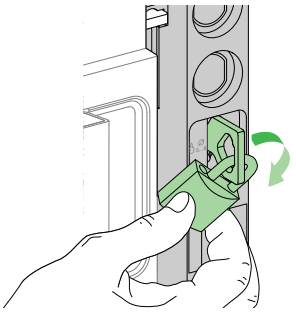
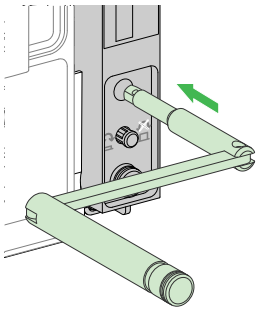
Ronis keylock	Profalux keylock	Castell keylock (keylock not provided)	Kirk keylock (keylock not provided)
			

For information on the accessory installation, consult the instruction sheet on the Schneider Electric website: NVE56768.

Chassis Locking with Padlocks

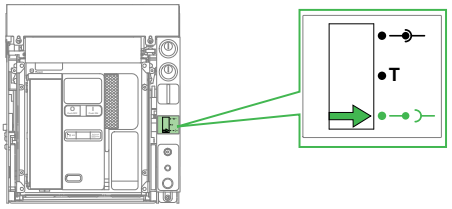
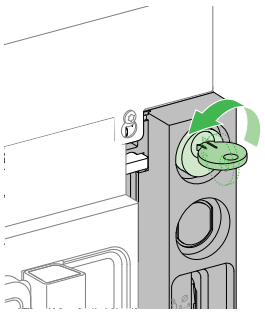
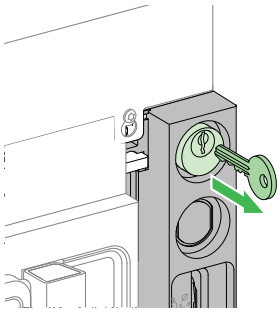
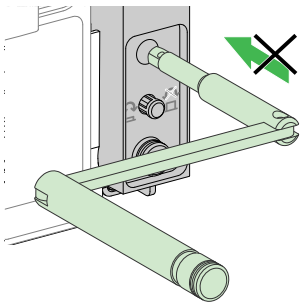
Step	Action	
1	Check that the chassis indicator is in the disconnected position.	
2	Pull out the padlocking tab.	
3	Insert the padlocks in the tab and close the padlocks.	
4	Check that the racking handle cannot be inserted into the racking handle socket.	

Chassis Unlocking with Padlocks

Step	Action	
1	Remove the padlocks. The tab retracts.	
2	Check that the racking handle can be inserted into the racking handle socket.	

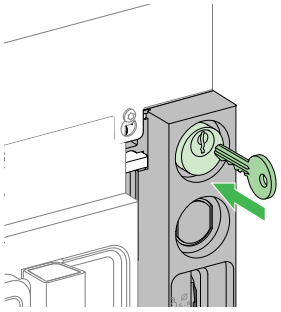
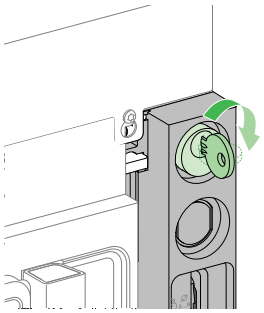
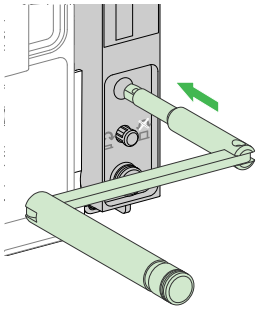
Chassis Locking with Keylocks

For chassis equipped with two keylocks, locking with one key is sufficient to lock the chassis in the disconnected position.

Step	Action	
1	Check that the chassis indicator is in the disconnected position.	
2	Turn the key counterclockwise to lock the chassis.	
3	Remove the key.	
4	Check that the racking handle cannot be inserted into the racking handle socket.	

Chassis Unlocking with Keylocks

For chassis equipped with two keylocks, both keys must be inserted in the keylocks to unlock the chassis.

Step	Action	
1	Put the key in the lock.	
2	Turn the key clockwise to unlock the chassis. **NOTE:** The key remains captive in the keylock.	
3	Check that the racking handle can be inserted into the racking handle socket.	

Chassis Locking in Any Position

Description

The chassis can be locked in any position (connected, test, or disconnected position).

This locking function requires a mechanical adaptation of the chassis, explained in the following procedure.

When the chassis is locked, the racking handle cannot be inserted in the racking handle socket.

The chassis can be locked in any position:

- By up to three padlocks with shackle diameter 5-8 mm as standard.
- By one or two optional keylocks.

Keylocks can be used in addition to padlocks.

VSPD Chassis Locking by Keylock Accessory

The chassis locking by keylock accessory and the locking and unlocking procedures are the same as for the chassis locking in disconnected position., page 79

Adapting the Chassis

⚠DANGER

HAZARD OF DEVICE FALLING

- Be sure that lifting equipment has lifting capacity for the device 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.

NOTICE

HAZARD OF EQUIPMENT DAMAGE

The chassis must be securely fastened when installing or removing the device.

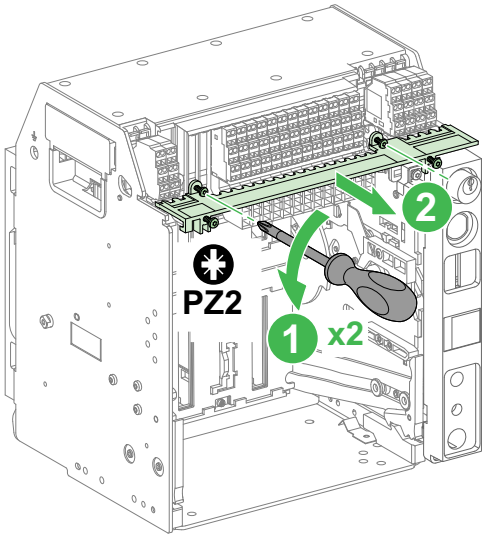
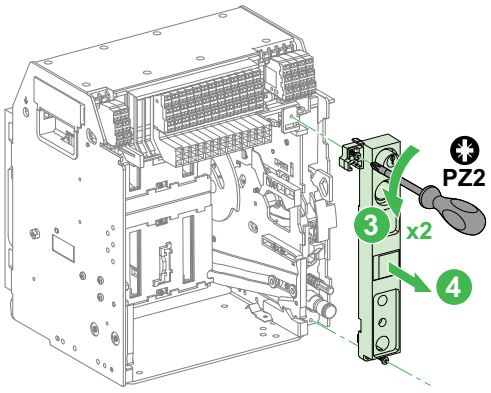
Failure to follow these instructions can result in equipment damage.

Follow this procedure to adapt the chassis locking mechanism so that the chassis can be locked in any position.

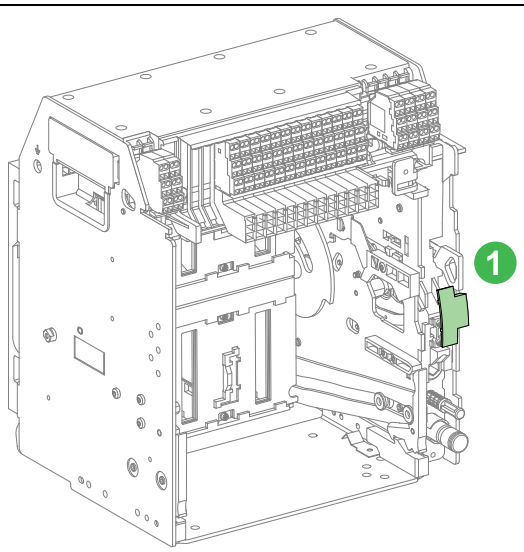
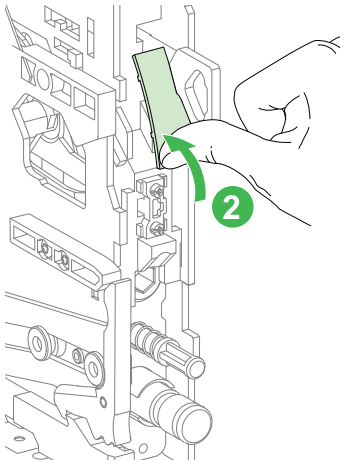
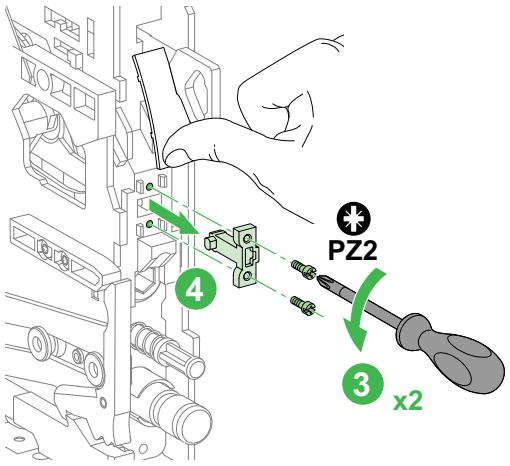
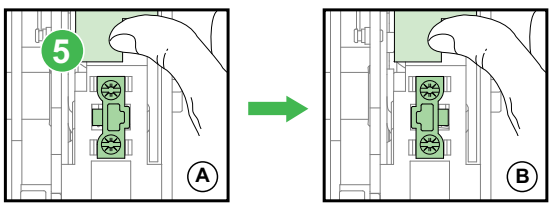
Stage	Description
1	Removing the terminal block identification plate and the chassis front cover. (Refer to the following procedure)
2	Changing the position of the lock, page 86.
3	Reinstalling the chassis front cover and the terminal block identification plate, page 88.

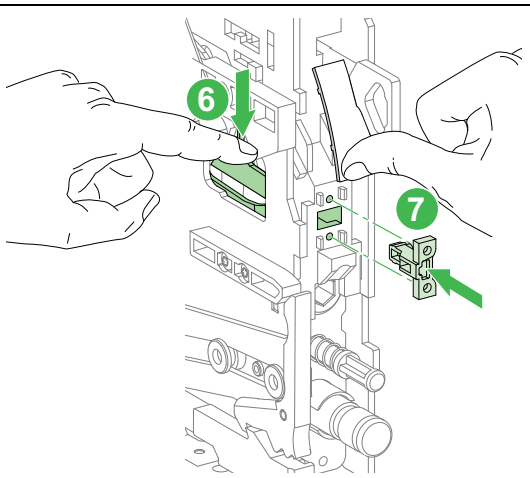
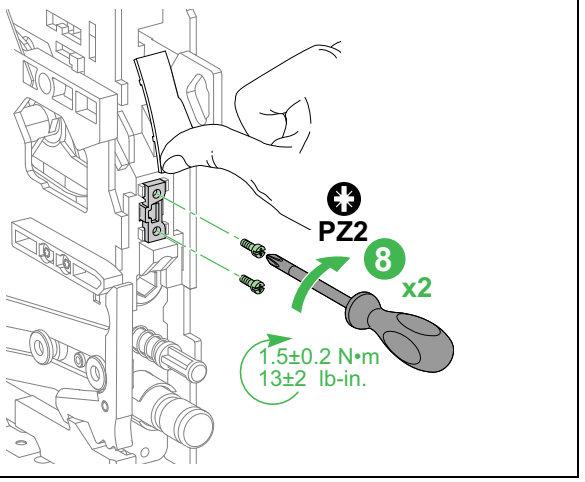
Removing the Terminal Block Identification Plate and the Chassis Front Cover

Before starting the procedure, check that the circuit breaker is in the disconnected position, page 62 and remove the circuit breaker from the chassis.

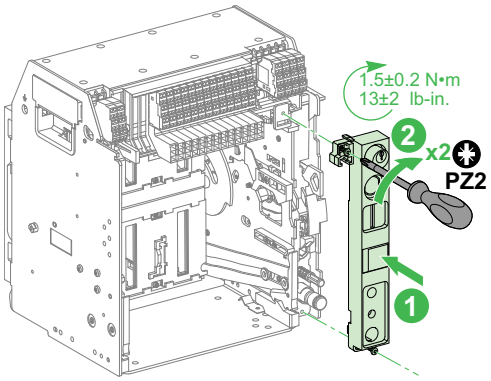
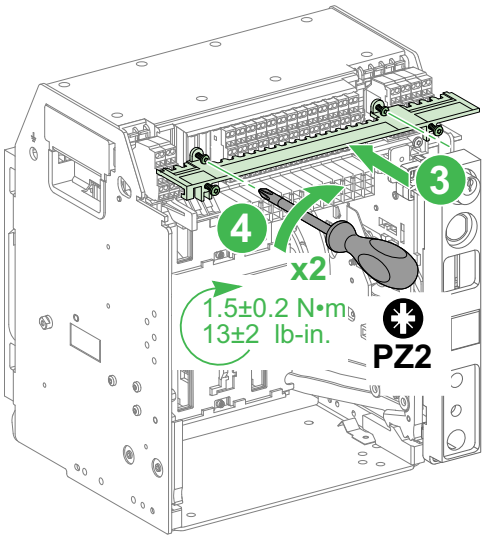
Step	Action	
1	Remove the two screws holding the terminal block identification plate in place, by using a PZ2 screwdriver.	
2	Carefully pull out the terminal block identification plate.	
3	Remove the two screws holding the chassis front cover in place, by using a PZ2 screwdriver.	
4	Pull off the chassis front cover.	

Changing the Position of the Lock

Step	Action	
1	Identify the position of the plastic cover of the lock.	
2	Lift the plastic cover of the lock and hold it up.	
3	Remove the two screws holding the lock in place, by using a PZ2 screwdriver.	
4	Remove the lock.	
5	Rotate the lock through 180° to change from locking in disconnected position (A) to locking in any position (B).	

Step	Action	
6	Use your finger to press down the tab behind the lock slot.	
7	Insert the lock, making sure that the notch is on the left side.	
8	Screw the lock into position with the two screws, by using a PZ2 screwdriver. Release the plastic cover to allow it to drop back into place	

Reinstalling the Chassis Front Cover and the Terminal Block Identification Plate

Step	Action	
1	Reinstall the chassis front cover.	
2	Screw the front cover into position with the two screws, by using a PZ2 screwdriver.	
3	Slide the terminal block identification plate into place.	
4	Screw the terminal block identification plate in with the two screws, by using a PZ2 screwdriver.	

Locking the Safety Shutters

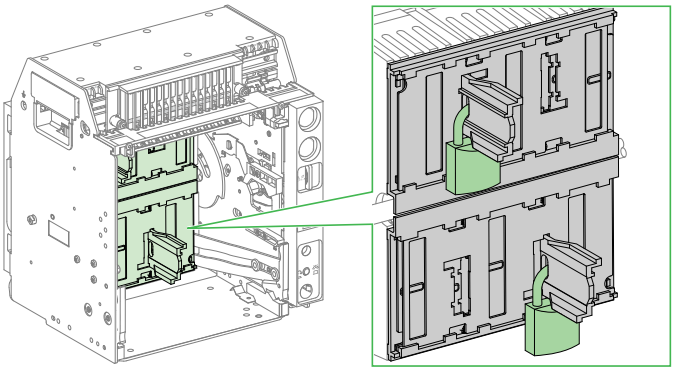
Description

A shutter lock locks the safety shutter in closed position so that a drawout MasterPacT MTZ1 circuit breaker cannot be connected in its chassis.

The top and bottom safety shutters can be locked independently.

Locking the Safety Shutters

Place two padlocks on the top and bottom shutter locking guides to lock the shutters.



For more information, refer to the instruction sheet: NVE35509.

Circuit Breaker Interlocking Actions

What's in This Chapter

About Interlocking Actions

An interlocking action is an automatic locking operation provided by interlocking accessories added to the MasterPacT MTZ1 circuit breaker or chassis.

A number of optional interlocking accessories are available for the MasterPacT MTZ1 circuit breaker and chassis. For a complete listing of available interlocks, refer to LVPED225010EN *MasterPacT MTZ with MicroLogic Active Control Unit - Catalog* in **Related Documents**at the beginning of this guide.

Mismatch Protection

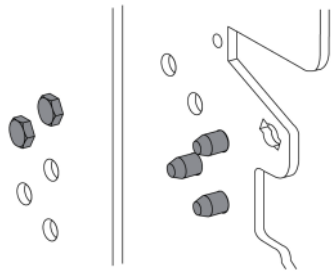
Description

Mismatch protection allows the installation of a MasterPacT MTZ1 circuit breaker only in a chassis with compatible characteristics.

Mismatch protection offers 35 different combinations that can be selected so that a circuit breaker can only be mounted on a chassis with the matching combination.

Accessory

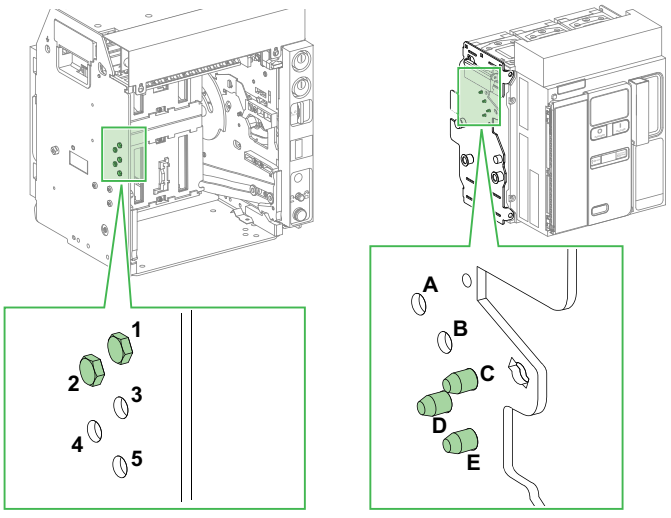
The use of mismatch protection is optional. One mismatch protection accessory is required for each circuit breaker.



For information on the accessory installation, consult the instruction sheet available at Schneider Electric website: NVE35465.

Pin Location of Mismatch Protection

The following illustration shows the pin location on the chassis and circuit breaker, respectively.



The pin combination selected on the chassis must correspond to the pin combination selected on the circuit breaker (see following table). For example, the combination 12 on the chassis corresponds to the combination CDE on the circuit breaker.

Pins on the chassis are labeled 1, 2, 3, 4, 5.

Pins on the circuit breaker are labeled A, B, C, D, E.

Recommended Pin Combinations

The following are the recommended pin combinations:

Pins on chassis	Pins on circuit breaker	Pins on chassis	Pins on circuit breaker
45	ABC	15	BCD
35	ABD	14	BCE
34	ABE	145	BC
345	AB	13	BDE
25	ACD	135	BD
24	ACE	134	BE
245	AC	12	CDE
23	ADE	125	CD
235	AD	124	CE
234	AE	123	DE

VPEC Door Interlock

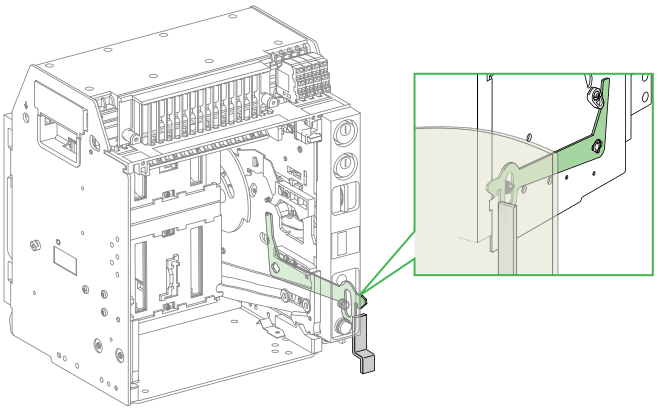
Description

With the door interlock:

- The equipment door is locked and cannot be opened when the drawout circuit breaker is in connected or test position.
- The equipment door can be opened when the drawout circuit breaker is in disconnected position.
- The equipment door can be closed with the drawout circuit breaker in any position.

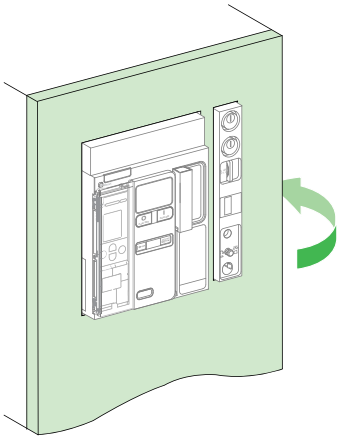
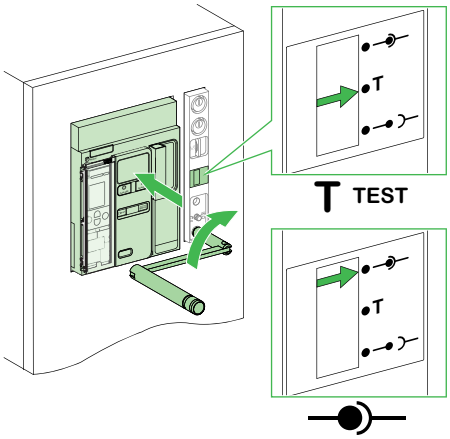
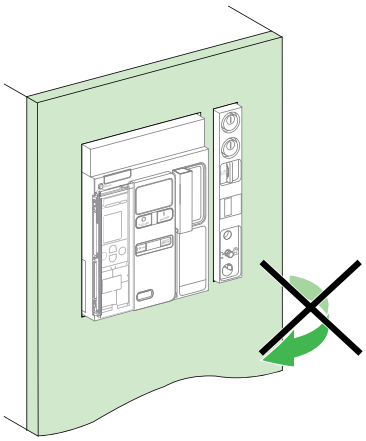
Accessory

The VPEC door interlock accessory is an optional accessory that is mounted on the left side or on the right side of the chassis. One door interlock is necessary for each chassis.

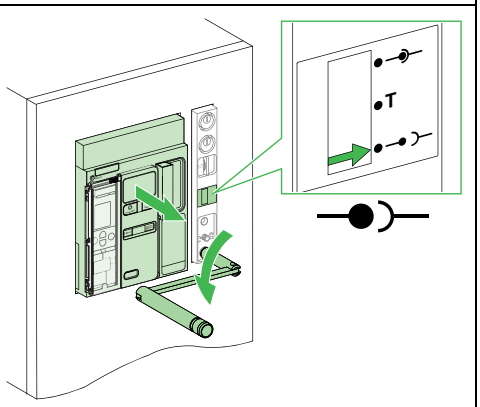
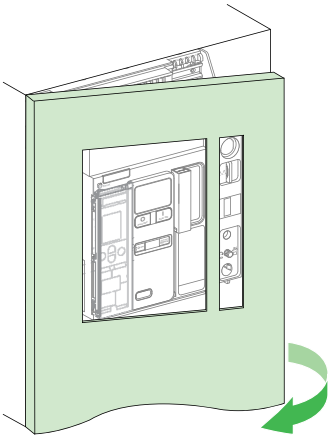


For information on the accessory installation, consult the instruction sheet available at Schneider Electric website: NVE35519.

Locking the Equipment Door

Step	Action	
1	Close the equipment door.	
2	Put the circuit breaker into the test or connected position, page 64.	
3	Check that the equipment door is locked.	

Unlocking the Equipment Door

Step	Action	
1	Put the circuit breaker into the disconnected position, page 62.	
2	Check that the equipment door is unlocked.	

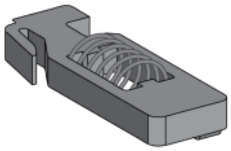
VPOC Open-door Racking Interlock

Description

With the racking interlock installed, a drawout MasterPacT MTZ1 circuit breaker cannot be racked in or out when the equipment door is open because the racking handle cannot be inserted.

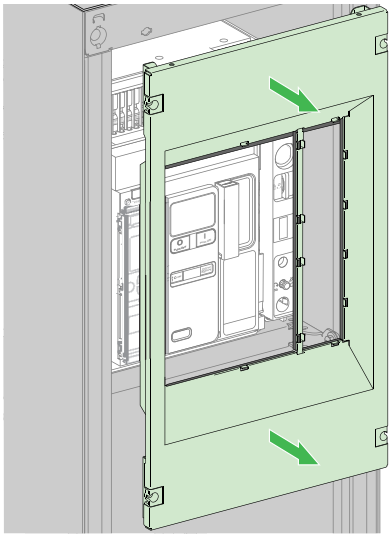
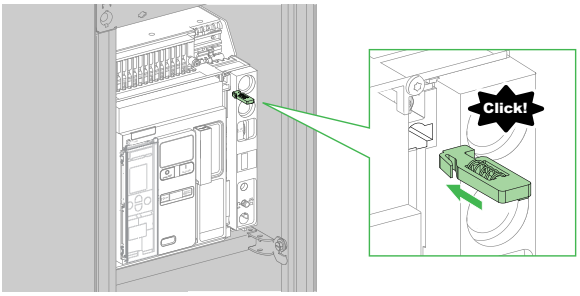
Accessory

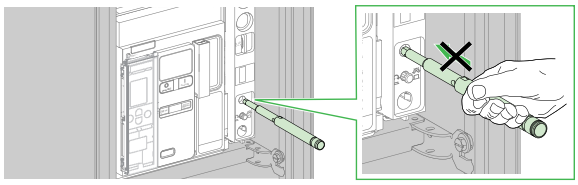
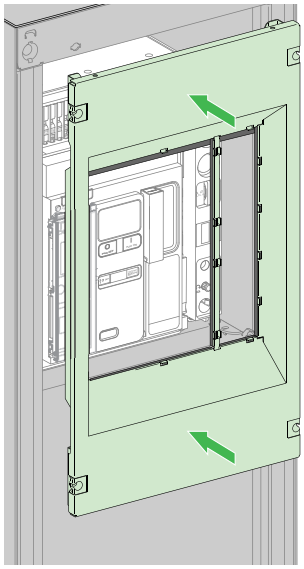
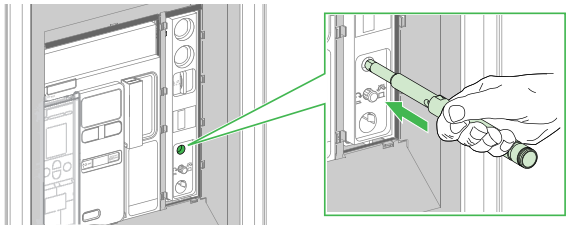
The optional VPOC racking interlock can be installed on the right side of the chassis.



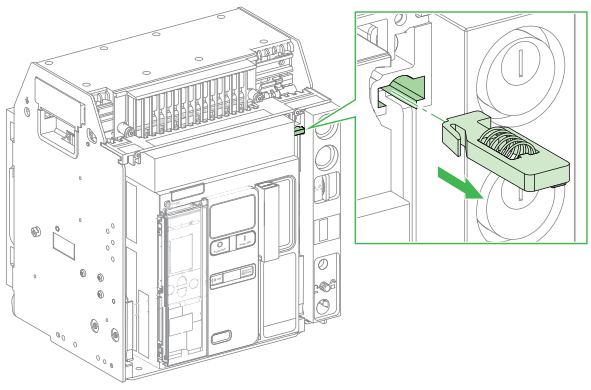
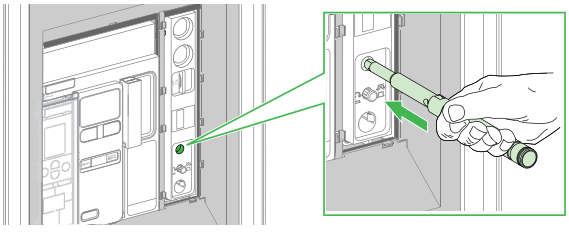
For information on the accessory installation, consult the instruction sheet on the Schneider Electric website: NVE35520.

Activating the Racking Interlock

Step	Action	
1	Remove the door.	
2	Insert the racking interlock.	

Step	Action	
3	Check that the racking handle cannot be inserted into the racking handle socket when the equipment door is open.	
4	Replace the door.	
5	Check that the racking handle can be inserted into the racking handle socket when the equipment door is closed.	

Deactivating the Racking Interlock

Step	Action	
1	Pull out the racking interlock.	
2	Check that the racking handle can be inserted into the racking handle socket when the equipment door is open or closed.	

IPA Cable-type Door Interlock

Description

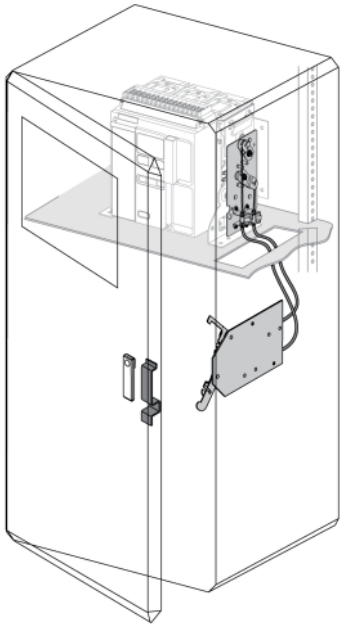
When the cable-type door interlock is installed, the door cannot be opened when the circuit breaker is closed and the circuit breaker cannot be closed when the door is open.

The cable-type door interlock comprises a plate, a lock, and a cable. It is mounted on the right-hand side of the circuit breaker.

When the interlock is installed, the mechanical interlock for transfer switches cannot be implemented.

Accessory

The IPA cable-type door interlock is an optional accessory.



For information on the accessory installation, consult the instruction sheet available on the Schneider Electric website: NVE35521.

Mechanical Interlocking for Transfer Switches

Description

The mechanical interlocking for transfer switches between two MasterPacT MTZ1 circuit breakers prevents the two interlocked circuit breakers from closing at the same time.

VBP Pushbutton Locking Accessory

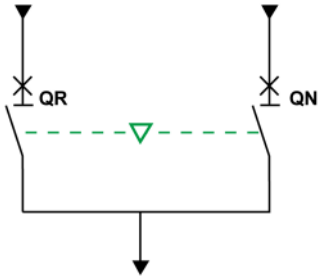
The VBP pushbutton locking accessory provides redundancy in addition to the mechanical interlocking system.

The use of the pushbutton locking cover is mandatory on each interlocked MasterPacT MTZ circuit breaker. The closing pushbuttons of the interlocked circuit breakers must be locked by padlocks sharing one key to help avoid simultaneous closing orders of interlocked circuit breakers.

For more information about the pushbutton locking cover, refer to VBP Pushbutton Locking Accessory, page 72.

Mechanical Interlocking Between Two Circuit Breakers

Two circuit breakers can be mechanically interlocked by cables or by rods so that both circuit breakers cannot be closed at the same time.



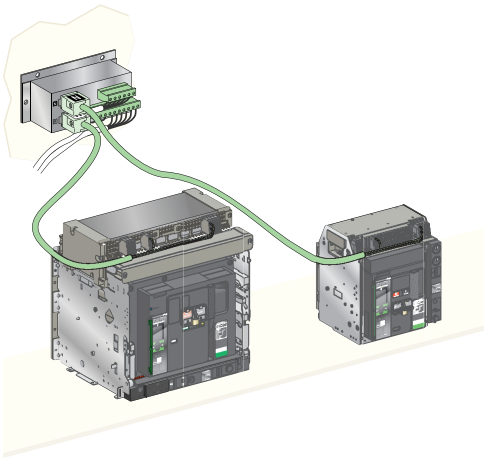
QR	QN
0	0
1	0
0	1

For information on the accessory installation, consult the instruction sheet on the Schneider Electric website:

- For Interlocking by cables: NVE35522
- For Interlocking by rods: NVE35523

IVE Electrical Interlocking Unit

Electrical interlocking between MasterPacT MTZ circuit breakers can be done using the IVE electrical interlocking unit or by using dedicated wiring. The IVE unit is suitable for two circuit breakers only. For three circuit breakers, dedicated wiring is required to perform the electrical interlocking.



For information on the accessory installation, consult the instruction sheet on the Schneider Electric website: 51201201AA

MasterPacT MTZ Critical Cases

What's in This Part

Finding the Cause of a Trip or an Alarm in Critical Cases

Definitions

While operating the circuit breaker, the user may face two critical cases:

- The circuit breaker has tripped automatically, interrupting the power supply.
- The circuit breaker has not tripped, but the MicroLogic Active control unit has detected an alarm:
  - For a high severity alarm, the status bar is red, indicating that urgent corrective action is required.
  - For a medium severity alarm, the status bar is orange, indicating that corrective action needs to be scheduled.

Notification of a Trip or Alarm

A trip or alarm event is signaled:

- On the MicroLogic Active control unit HMI, by the trip cause LEDs or the status bar. When the control unit is powered, a red or orange pop-up message is displayed on the screen.
- By the SDE fault-trip indication contact

Depending on the options installed, a trip or alarm can also be signaled:

- By an additional SDE2 fault-trip indication contact
- By an email sent through IFE or EIFE Ethernet interface
- On a remote controller connected to the communication network (application customized by user)
- On the FDM121 display

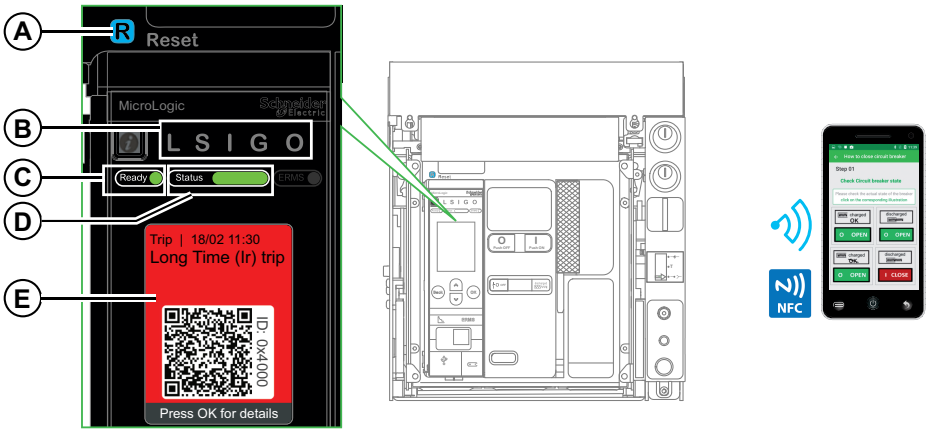
Active alarms can also be consulted in the following ways:

- On a smartphone with EcoStruxure Power Device app connected to the MicroLogic Active control unit through USB OTG connection.
- On EcoStruxure Power Commission software connected to the MicroLogic Active control unit through USB connection.
- On Panel Server webpages and on remote controllers connected to Panel Server, through Zigbee wireless communication (MicroLogic Active AP/EP control unit only).
- On EIFE or IFE webpages.

Identifying the Cause of a Trip or Alarm Using the MicroLogic Active Control Unit

In critical situations, the cause of a trip or an alarm can be identified locally by using one of the following:

- The blue fault-trip reset button on the circuit breaker. When the blue fault-trip reset button is popped out, the trip has occurred.
- The indicators on the MicroLogic Active control unit, page 105.
- A smartphone with EcoStruxure Power Device app installed to get the trip cause, the trip or alarm context, and the circuit breaker ID:
  - Through NFC
  - Through USB OTG connection



A Blue fault-trip reset button

B Trip cause LEDs

C **Ready** LED

D **Status** bar

E MicroLogic Active display screen

Availability of Diagnostic Data After a Trip

Diagnostic data is available when the MicroLogic Active control unit is powered.

If the MicroLogic Active control unit power supply is interrupted, use a Mobile Power Pack to enable access to diagnostic data. Connect the Mobile Power Pack to the MicroLogic Active control unit USB-C port.

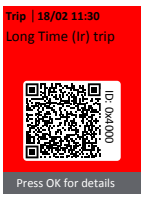
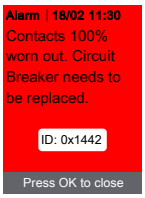
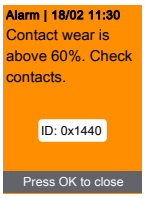
When the MicroLogic Active control unit is powered externally, the availability of diagnostic data depends on the MicroLogic Active state:

- If the MicroLogic Active control unit is operative, all diagnostic data is available.
- If the MicroLogic Active control unit is inoperative, no data is directly available. However, some data can be extracted using the NFC function with the EcoStruxure Power Device app.

The trip cause LEDs are powered by the MicroLogic Active internal battery and remain on for 2 hours when there is no other power to the control unit. To switch on the trip cause LEDs again after 2 hours, press the button.

Trip and Alarm Display Screen Examples

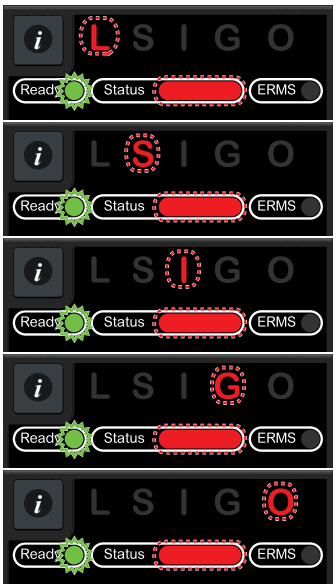
Three types of pop-up message are displayed, depending on the severity of the event.

Message type	Description	Example
Trip	Trip message is displayed on a red screen.	
High severity alarm	Alarm message is displayed on a red screen.	
Medium severity alarm	Alarm message is displayed on an orange screen.	

Using the Display Screen and LEDs to Find the Cause of a Trip

The circuit breaker has tripped automatically, interrupting the power supply, and the blue fault-trip reset button has popped out.

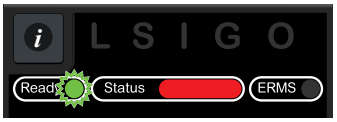
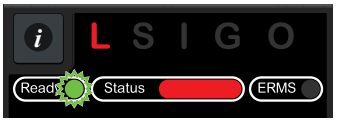
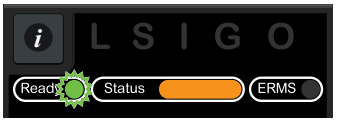
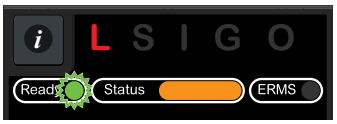
The related trip cause LEDs blink in red.

Description	Display screen	Status and Trip cause LED display	Status and Trip cause LED description
Electrical fault on the network, page 107	Trip message is displayed on a red screen.		Ready LED: green flashing Status bar: red blinking ERMS LED: off Related trip cause LED: red blinking
Major MicroLogic Active control unit incident detected during self-test, page 110	Trip message is displayed on a red screen.		Ready LED: off Status bar: red blinking ERMS LED: off All trip cause LEDs: red blinking

Using the Display Screen and LEDs to Find the Cause of an Alarm

The circuit breaker has not tripped, but the MicroLogic Active status bar is on.

The L trip cause LED may be red.

Description	Display screen	Status and Trip cause LED display	Status and Trip cause LED description
High severity alarm, page 113	Alarm message is displayed on a red screen.		Ready LED: green flashing Status bar: red on ERMS LED: off All trip cause LEDs off
Overload alarm: phase current > 105% Ir	Alarm message is displayed on a red screen.		Ready LED: green flashing Status bar: red on ERMS LED: off L trip cause LED: on
Medium severity alarm, page 115	Alarm message is displayed on an orange screen.		Ready LED: green flashing Status bar: orange on ERMS LED: off All trip cause LEDs off
Overload pre-alarm: 90% Ir < Current < 105% Ir	Alarm message is displayed on an orange screen.		Ready LED: green flashing Status bar: orange on ERMS LED: off L trip cause LED: red on

Resetting the Circuit Breaker After a Trip Due to an Electrical Fault

Reset Sequence

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Do not re-close the circuit breaker on an electrical fault. First inspect and, if necessary, repair the downstream equipment.

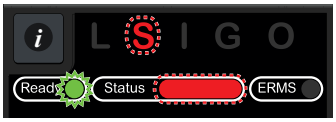
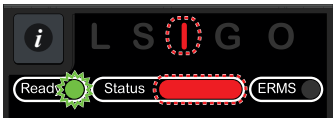
Failure to follow these instructions will result in death or serious injury.

The table shows the sequence of actions to follow after a trip due to an electrical fault. Further explanation of each action is given in the following paragraphs.

Step	Action
1	Identify the trip cause on the pop-up trip message and trip cause LEDs.
2	Press **OK** to: • Acknowledge and close the pop-up trip message. • Open the trip context screen. **NOTE:** If the pop-up trip message is not acknowledged within the event timeout, the pop-up is displayed again.
3	Consult the trip context screen for: • Name and settings of the tripping protection, date and time of the trip. • Current values recorded before the trip.
4	Press **OK** to close the trip context screen.
5	Clear the electrical fault on the network.
6	Inspect the circuit breaker and switchboard after a short circuit.
7	Reset the circuit breaker, page 48.
8	Press the i button for 3 seconds to: • Reset the latched events. • Switch off the trip cause LEDs and revert the **Status** bar to green. • Return to the tree navigation menu.
9	When the circuit breaker is ready-to-close, re-close it, page 46.

NOTE: You can bypass steps 3, 4 and 8, by pressing the i button instead of **OK** in step 2.

Identifying the Trip Cause

Description	Display screen	Status and Trip cause LED display	Status and Trip cause LED description
Trip due to the long-time overcurrent protection. Valid for MicroLogic Active 2.0, 5.0 and 6.0	Trip message is displayed on a red screen.		Ready LED: green flashing Status bar: red blinking ERMS LED: off L trip cause LED: red blinking.
Trip due to the short-time overcurrent protection. Valid for MicroLogic Active 5.0 and 6.0	Trip message is displayed on a red screen.		Ready LED: green flashing Status bar: red blinking ERMS LED: off S trip cause LED: red blinking.
Trip due to the instantaneous overcurrent protection. Valid for MicroLogic Active 2.0, 5.0 and 6.0	Trip message is displayed on a red screen.		Ready LED: green flashing Status bar: red blinking ERMS LED: off I trip cause LED: red blinking.
Trip due to the ground-fault protection. Valid for MicroLogic Active 6.0	Trip message is displayed on a red screen.		Ready LED: green flashing Status bar: red blinking ERMS LED: off G trip cause LED: red blinking.
Trip due to other, customized protection. Valid for MicroLogic Active 2.0, 5.0 and 6.0	Trip message is displayed on a red screen.		Ready LED: green flashing Status bar: red blinking ERMS LED: off O trip cause LED: red blinking.

Clearing the Electrical Fault

⚠⚠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 or local equivalent.
- This equipment must be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before performing maintenance inspections.Assume that all circuits are live until they are de-energized, tested, grounded, and tagged. Consider all sources of power, including the possibility of backfeeding and control power.
- Always use a properly rated voltage sensing device to confirm that power is off.
- Replace all devices, doors, and covers before turning on power to this equipment.
- Beware of potential hazards and carefully inspect the work area for tools and objects that may have been left inside the equipment.

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

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Do not re-close the circuit breaker on an electrical fault. First inspect and, if necessary, repair the downstream equipment.

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

The feed must be isolated before inspecting the electrical equipment downstream of the protection.

The fact that a circuit breaker has tripped does not remedy the cause of the electrical fault detected on the downstream electrical equipment.

Inspecting the Circuit Breaker and Switchboard After a Trip on Short Circuit

After a trip on short circuit due to short-time or instantaneous protection, the circuit breaker and switchboard must be inspected for smoke deposits or cracks in the circuit breaker casing.

Refer to DOCA0305•• *MasterPacT MTZ IEC Circuit Breakers with MicroLogic Active Control Unit - Maintenance Guide*, page 8, and contact your Schneider Electric Services representative.

Resetting the Circuit Breaker After a Trip Due to an Incident Detected by MicroLogic Active Self-tests

Reset Sequence

The following table shows the sequence of actions to take after a trip due to an incident detected by the MicroLogic Active control unit. Further explanation of each action is given in the following paragraphs.

Step	Action
1	Identify the trip cause on the pop-up trip message and trip cause LED.
2	Consult the list of possible detected incidents, page 111 and perform the actions recommended.
3	Press **OK** to acknowledge and close the pop-up trip message.
4	Reset the circuit breaker, page 48.
5	Press the i button for 3 seconds to: • Reset the latched events. • Switch off the trip cause LEDs and revert the **Status** bar to green. • Return to the tree navigation menu.
6	When the circuit breaker is ready to close, re-close it, page 46.

NOTE: You can combine steps 3 and 5 by pressing the i button instead of **OK** in step 3.

Identifying the Trip Cause

Description	Display screen	Status and Trip cause LED display	Status and Trip cause LED description
Major MicroLogic Active control unit incident detected during self-test., page 111	Trip message is displayed on a red screen.		Ready LED: off Status bar: red blinking ERMS LED: off All trip cause LEDs: red blinking

Recommended Actions

The following table indicates what action to perform according to the trip message after a trip due to an incident detected by MicroLogic Active self-tests.

For more information about event messages, refer to DOCA0265•• *MasterPacT MTZ - MicroLogic Active Control Unit - User Guide*, page 8.

Code	Trip message	Description	Recommended action
0x4005	**Control unit over temperature trip.**	The temperature of the control unit is above the maximum temperature threshold.	Decrease ambient temperature near the circuit breaker.
0x4006	**Ultimate self-protection (SELLIM) trip)**	The circuit breaker tripped due to SELLIM protection.	Reset the circuit breaker.
0x4007	**Self diagnostic trip. Replace control unit**	The circuit breaker tripped following a control unit internal event.	Replace the MicroLogic Active control unit. Contact Schneider Electric support.
0x400A	**ENCT disconnected trip.**	The control unit self-test detected the disconnection of the external neutral current sensor of the circuit breaker.	Check internal/external wiring of External Neutral Current Sensor (ENCT)
0x401D	**Ultimate self-protection (DIN/DINF) trip**	The circuit breaker tripped due to DIN/DINF protection.	Reset the circuit breaker.
0x401E	**Ig test trip**	The circuit breaker tripped due to the ground-fault protection test.	Reset the circuit breaker.
0x4033	**Current sensor loss. Replace circuit breaker.**	The control unit self test detected the disconnection of an internal sensor of the circuit breaker.	Replace the circuit breaker. Contact Schneider Electric support.
0x4035	**Ii test trip**	The circuit breaker tripped due to the instantaneous protection test.	Reset the circuit breaker.

Contact your Schneider Electric Services representative for more information about who can carry out the recommended actions.

Diagnosing Alarms

Diagnosis Sequence

The following table shows the sequence of actions to take after an alarm is detected by the MicroLogic Active control unit. Further explanation of each action is given in the following paragraphs.

Step	Action
1	Identify the alarm detected.
2	Consult the list of alarm messages in the following tables and perform the actions recommended.
3	Press **OK** to acknowledge the alarm.
4	Press the  button for 3 seconds to reset the latched events, switch off the trip cause LEDs and revert the status bar to green.

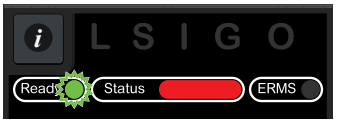
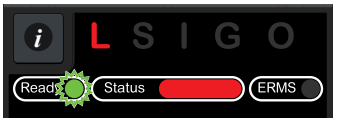
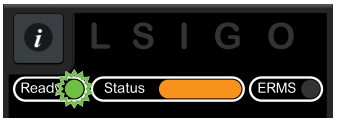
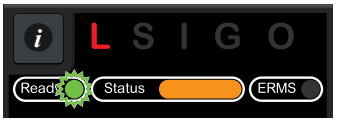
Identifying the Alarm Detected

The MicroLogic Active control unit indicates alarms with:

- The **Ready** LED (flashing green or off)
- The **Status** bar (red or orange)
- The L trip cause LEDs (red or orange)
- A pop-up alarm screen (red or orange)

Two levels of alarm are detected and indicated by the color of the status bar:

- Red for high-severity detected alarms.
- Orange for medium-severity detected alarms.

Description	Display screen	Status and Trip cause LED display	Status and Trip cause LED description
High severity alarm, page 113	Alarm message is displayed on a red screen.		Ready LED: green flashing Status bar: red on ERMS LED: off All trip cause LEDs off
Overload alarm: phase current > 105% Ir	Alarm message is displayed on a red screen.		Ready LED: green flashing Status bar: red on ERMS LED: off L trip cause LED: on
Medium severity alarm, page 115	Alarm message is displayed on an orange screen.		Ready LED: green flashing Status bar: orange on ERMS LED: off All trip cause LEDs off
Overload pre-alarm: 90% Ir < Current < 105% Ir	Alarm message is displayed on an orange screen.		Ready LED: green flashing Status bar: orange on ERMS LED: off L trip cause LED: red on

Recommended Action After Detection of High Severity Alarms

The following table indicates what action to perform according to the alarm message.

For more information about event messages, refer to DOCA0265•• *MasterPacT MTZ - MicroLogic Active Control Unit - User Guide*, page 8.

Code	Alarm message	Alarm description	Recommended action
0x1400	**Self-test 1. Replace control unit.**	The control unit self test detected a major internal event in the control unit operation.	Replace the MicroLogic Active control unit. Contact Schneider Electric support.
0x1402	**Current sensor loss. Replace circuit breaker.**	The control unit self test detected the disconnection of an internal sensor of the circuit breaker.	Replace the circuit breaker. Contact Schneider Electric support.
0x1403	**ENCT disconnected**	The control unit self-test detected the disconnection of the external neutral current sensor of the circuit breaker.	Check internal/external wiring of External Neutral Current Sensor (ENCT)
0x1404	**Control unit over temperature**	The temperature of the control unit is above the maximum temperature threshold.	Decrease ambient temperature near the circuit breaker.
0x1405	**Self-test 3. Replace control unit.**	The control unit self test detected a major internal event in the control unit operation.	Replace the MicroLogic Active control unit. Contact Schneider Electric support.
0x1406	**Self-test 4. Replace control unit.**	The control unit self test detected a major internal event in the control unit operation.	Replace the MicroLogic Active control unit. Contact Schneider Electric support.
0x1409	**Unable to read sensor plug**	The control unit is unable to read the value of the sensor plug.	Check connection of the sensor plug and performer plugs. If the connection is good but it fails again, replace the sensor plug or the MicroLogic Active control unit.
0x1413	**Ig test - no trip**	The circuit breaker did not trip during the ground-fault protection test.	Restart the test. If it fails again, replace the MicroLogic Active control unit.
0x151B	**Ii test - no trip**	The circuit breaker did not trip during the instantaneous protection test.	Restart the test. If it fails again, replace the MicroLogic Active control unit.
0x1416	**Mitop disconnected. Call Schneider Electric support**	The circuit breaker Mitop is disconnected.	Contact Schneider Electric support before restarting
0x1430	**Protection settings reset to factory values.**	If the control unit is switched off due to an internal event, protection settings are reset to default protection settings at the next reboot.	Update the MicroLogic Active control unit firmware with EcoStruxure Power Commission software. Otherwise, plan to replace the MicroLogic Active control unit.
0x1442	**Contact wear > 100%. Replace circuit breaker**	The contact wear indicator reached the threshold of 100%.	Replace the circuit breaker. Consult contact wear interpretation in MicroLogic Active control unit user guide in order to estimate the circuit breaker ability to isolate, withstand rated duty, operate, trip.
0x150F	**Iron CT loss. Replace circuit breaker.**	The control unit self test detected an event in all internal current power supply sensors of the circuit breaker.	Replace the circuit breaker.
0x1518	**Self-test 6. Replace control unit.**	The control unit self test detected a major internal event in the control unit operation.	Replace the MicroLogic Active control unit. Contact Schneider Electric support.
0x6200	**Ir start (I > 105% Ir)**	The long time protection prealarm started: at least one of the phase or neutral currents is above the 105% Ir threshold. The circuit breaker is operating close to Ir threshold.	No action required. For information only.

For more information about the maximum number of operations for individual parts, refer to DOCA0305•• *MasterPacT MTZ IEC Circuit Breakers with MicroLogic Active Control Unit - Maintenance Guide*, page 8.

Contact your Schneider Electric Services representative for more information about who can carry out the recommended actions.

Recommended Action After Medium Severity Alarms

The following table indicates what action to perform according to the alarm message.

For more information about event messages, refer to DOCA0265•• *MasterPacT MTZ - MicroLogic Active Control Unit - User Guide*, page 8.

Code	Alarm message	Alarm description	Recommended action
0x03F5	**Ir pre-alarm (I > 90% Ir)**	The long time protection prealarm started: at least one of the phase or neutral currents is above the 90% Ir threshold. The circuit breaker is operating close to Ir threshold.	Check the load.
0x0D09	**Firmware discrepancy within control unit**	The control unit self-test detected a discrepancy between the firmware versions of control unit processors.	Check the firmware version of the MicroLogic Active control unit with EcoStruxure Power Commission software. If not latest, update the firmware of the MicroLogic Active control unit.
0x140F	**Protection settings not accessible 1.**	The control unit cannot access the protection settings.	Plan to replace the MicroLogic Active control unit.
0x1421	**Invalid PowerTag communication**	Invalid communication with the Power Tag.	Reboot control unit by simultaneously pressing the 5 buttons, **OK**, **Back**, **Up**, **Down**. If this does not work, contact Schneider Electric Support.
0x142F	**Last protection settings have not been applied.**	The control unit did not apply the last modification.	Apply again the protection settings.
0x1440	**Contact wear > 60%. Check contacts.**	The contact wear indicator reached or is above the threshold of 60%.	Inspect visually the arc chute and main contacts at the next scheduled maintenance.
0x1441	**Contact wear > 95%. Plan circuit breaker replacement.**	The contact wear indicator reached or is above the threshold of 95%.	Plan to replace the circuit breaker.
0x1473	**Internal access loss. Reboot control unit**	Internal access. Reset control unit	Internal access loss. Reboot control unit by simultaneously pressing the 5 buttons, **OK**, **Back**, **Up**, **Down**.
0x1474	**Protection settings not accessible 2.**	The control unit cannot access the protection settings.	Reboot control unit by simultaneously pressing the 5 buttons, **OK**, **Back**, **Up**, **Down**.
0x1482	**Sched. Manufact. maintenance within 3 months**	A manufacturer maintenance program should be performed within three months.	Plan to schedule the manufacturer preventive maintenance program within three months. To plan, edit report and track maintenance intervention, you may use EcoStruxure Facility Expert app.
0x1122	**Communication lost with EIFE or IFE module**	The control unit lost communication with the EIFE or IFE communication interface.	Check the power supply of the EIFE or IFE communication interface. Check the ULP cable connection.
0x1123	**Communication lost with IFM module**	The control unit lost communication with the IFM communication interface.	Check the power supply of the IFM communication interface. Check the ULP cable connection.
0x1460	**Invalid self test - MX1 voltage release**	The control unit self-test of the MX1 voltage release detected an invalid result with minor impact.	Plan to replace the MX1 voltage release.
0x1461	**MX voltage release not detected**	The control unit lost communication with the MX voltage release.	Check the connection of the MX voltage release.
0x1462	**Invalid self test - XF voltage release**	The control unit self-test of the XF voltage release detected an invalid result with minor impact.	Plan to replace the XF voltage release.
0x1463	**XF voltage release not detected**	The control unit lost communication with the XF voltage release.	Check the connection of the XF voltage release.
0x1800	**Communication lost with BCIM**	The control unit lost communication with the BCIM module.	Check the power supply of the BCIM module. Check the ULP cable connection.

Code	Alarm message	Alarm description	Recommended action
0x1802	**BCIM in Critical Status. Replace BCIM**	The BCIM module is in a critical condition.	Replace BCIM module.
0x1803	**BCIM in non-Critical Status. Restart BCIM power supply.**	The BCIM module is in a non-critical condition.	Disconnect and connect again BCIM 24 Vdc Power supply.
0x0D00	**Critical hardware modules discrepancy**	A critical hardware discrepancy has been detected.	Check which module is in critical hardware discrepancy with the EcoStruxure Power Commission software Firmware menu. Replace the module.
0x0D01	**Critical firmware modules discrepancy**	A critical firmware discrepancy has been detected.	Check which module is in critical firmware discrepancy with the EcoStruxure Power Commission software. Update the module.
0x0D02	**Non-critical hardware modules discrepancy**	A non-critical hardware discrepancy has been detected.	Check which module is in non-critical hardware discrepancy with the EcoStruxure Power Commission software Firmware menu. Plan to replace the module.
0x0D03	**Non-critical firmware modules discrepancy**	A non-critical firmware discrepancy has been detected.	Check which module is in non-critical firmware discrepancy with the EcoStruxure Power Commission software. Plan to update the module.

MasterPacT MTZ Commissioning

What's in This Part

Introduction to Commissioning

Overview

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E, CSA Z462, NOM 029-STPS, or local equivalent.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Unless specified otherwise in the commissioning procedures, all operations (inspection, test, and preventive maintenance) must be carried out with the device, the chassis, and the auxiliary circuits de-energized.
- Check that the device and the chassis are de-energized on the upstream and downstream terminals.
- Always use a properly rated voltage sensing device to confirm that the device, the chassis, and the auxiliary circuits are de-energized.
- Install safety barriers and display a danger sign.
- During the tests, it is strictly forbidden for anyone to touch the device, the chassis, or the conductors while voltage is applied.
- Before putting the equipment back into operation, it is mandatory to check that all connections are made with the correct tightening torque, there are no tools or objects inside the equipment, all devices, doors, and protective covers are in position, and the device is open (OFF position).

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

This part details the testing and commissioning procedure which must be performed on the MasterPacT MTZ circuit breaker with MicroLogic Active control unit, before the circuit breaker can be accepted as fit for service and connected to a power supply.

The commissioning procedure must be done by an authorized commissioning engineer with appropriate training and experience:

- Only qualified electrical personnel with training and experience on low voltage circuits must perform the work described in this part.

  Personnel must understand the hazards involved in working with or near low-voltage equipment. Such work must be performed only after reading the complete set of instructions.
- Some inspections or procedures require that certain parts of the electrical system remain energized at hazardous voltage during the procedure. Observe all safety messages (Danger, Warning, Caution) throughout this part and the corresponding instruction notices.
- Wear personal protective equipment, recognize potential hazards, and take adequate safety precautions when performing the procedures outlined in this part and the corresponding instruction notices.

The commissioning procedure assumes that the following conditions are met at the start of the procedure:

- The circuit breaker is not connected to a power system or a control system.
- A drawout circuit breaker is in the disconnected position.
- The circuit breaker is not connected to a communication network.

The results of all observations, tests, adjustments, together with any relevant comments must be recorded on the appropriate form, if applicable.

Wherever possible, testing must be done without disconnecting or disturbing existing wiring.

Scope

The commissioning procedure applies to the MasterPacT MTZ intelligent modular unit (IMU), made up of MasterPacT MTZ circuit breaker with its MicroLogic Active control unit and optional ULP modules:

- One IFE, EIFE or IFM communication interface
- One FDM121 display
- One BCIM module

The associated information, which must be read with this procedure, includes specific schematic diagrams, connections, and trip levels for the circuit breakers covered by this document.

Equipment

The following equipment is required to do the tests detailed in the commissioning procedure:

- Insulation resistance tester
- Multimeter
- A PC equipped with the latest version of EcoStruxure Power Commission software
- A USB-A to USB-C cable to connect the PC to the MicroLogic Active control unit:
  - Supplier: RS PRO
  - Cable reference: 182-8848

Test Form

A test form, page 130 is proposed to guide you through the commissioning procedure and to record the results of the commissioning tests. Each test is described in detail in the Commissioning part.

Only do the tests required, depending on the MasterPacT MTZ type and the functions in use.

Inspection and MicroLogic Active Settings

Visual Inspection

Step	Action
1	Record the equipment identification, including substation name, switchboard name, MasterPacT MTZ circuit breaker type, MicroLogic Active model type and serial number, MicroLogic Active type, and protection settings.
2	Check that the circuit breaker is undamaged, correctly mounted, and securely fastened in the switchboard.
3	Check the 3-phase clearance at terminal blocks.
4	Check that there is no debris remaining at the back of the circuit breaker housing/ enclosure.
5	Check that the ground terminals of the circuit breaker are securely connected with the correct grounding cables.
6	Check that all external surfaces are undamaged.
7	Rectify any non-conformities, if possible. All equipment non-conformities must be referred to asset management.

Condition of Connections and Auxiliaries

Check circuit breaker mounting in the switchboard and the tightness of all connections (main connection and auxiliary wiring).

Check that all auxiliaries and accessories are correctly installed:

- Electrical auxiliaries
- Terminal blocks
- Connections of auxiliary circuits

Check Firmware Compatibility

By using the latest version of EcoStruxure Power Commission software, check that the firmware of the MicroLogic Active control unit and the BCIM module are up-to-date and compatible with each other.

NOTE: The firmware update procedures of the other ULP modules are described in DOCA0093•• *ULP (Universal Logic Plug) System - User Guide* in **Related Documents** at the beginning of this guide.

Step	Action
1	Connect a PC running EcoStruxure Power Commission software by using a cable connected to the USB-C port on the front face of the MicroLogic Active control unit.
2	Establish a connection. EcoStruxure Power Commission software reads the parameters of the control unit.
3	On EcoStruxure Power Commission software, use the Overall System firmware status/ compatibility matrix to display: • The installed firmware version of the MicroLogic Active control unit and the BCIM module. • The latest firmware version of the devices that are available on the Schneider Electric System Updates Internet site. • The recommended actions to obtain a compatible system. For more information, refer to *EcoStruxure Power Commission Online Help*.
4	Follow the recommended actions to get a compatible system.

MicroLogic Active Settings

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- The circuit breaker must only be configured and set by qualified personnel, using the results of the installation protection system study.
- During commissioning of the installation and following any modification, check that the MicroLogic Active configuration and protection function settings are consistent with the results of this study.
- MicroLogic Active protection functions are set by default to the minimum value.

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

Check the settings with EcoStruxure Power Commission software connected to the MicroLogic Active control unit.

Step	Action
1	Connect a PC running EcoStruxure Power Commission software by using a cable connected to the USB-C port on the front face of the MicroLogic Active control unit.
2	Establish a connection. EcoStruxure Power Commission software reads the parameters of the control unit.
3	Check that the settings read in the control unit match the requirements of the application. If necessary, correct the settings with EcoStruxure Power Commission software: • The protection settings must be defined according to the installation protection system study. • Other settings must be defined according to the application.
4	Check that the date and time are set. If necessary, set them by using the MicroLogic Active HMI.
5	Complete the project and circuit breaker data.
6	Generate the project report with EcoStruxure Power Commission software, and save or print the project report as needed.

NOTE: The protection functions available depend on the type of MicroLogic Active control unit.

Zigbee Wireless Communication Commissioning

MicroLogic Active AP/EP Control Unit Discovery with Panel Server

The prerequisites to discovering a MicroLogic Active AP/EP control unit with a Panel Server are:

- The control unit must be a MicroLogic Active AP/EP control unit.
- The Panel Server must be turned on.
- The MicroLogic Active AP/EP control unit and Panel Server must be in close proximity.

It is recommended to perform the commissioning of Zigbee wireless devices in a place secure from rogue radio transmitters, such as an administrator room. For more information, refer to DOCA0122•• *MasterPacT, ComPacT, PowerPacT - Cybersecurity Guide* in **Related Documents** at the beginning of this guide.

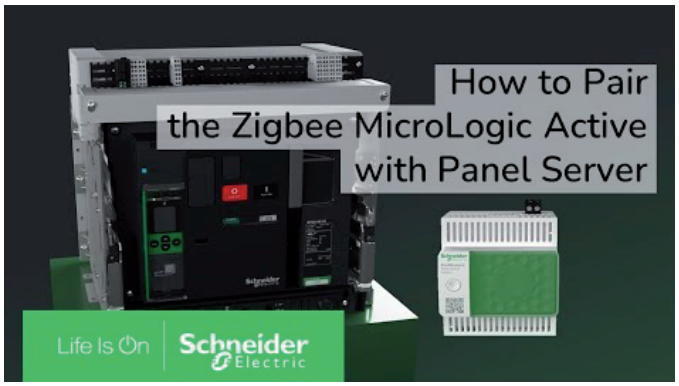
Follow the procedure below to discover a MicroLogic Active AP/EP control unit with a Panel Server:

Step	Action
1	Turn on the Panel Server.
2	Follow the discovery procedure described in *EcoStruxure Panel Server - User Guide* in **Related Documents**, at the beginning of this guide.
3	When prompted to do so, connect the MicroLogic Active AP/EP control unit to a Zigbee network. Do this by selecting **Connect** on the MicroLogic Active display screen, from the tree navigation menu, at **Configuration** > **Communication** > **IEEE 802.15.4** > **Status**.
4	At the end of the discovery procedure, the MasterPacT MTZ circuit breaker with MicroLogic Active AP/EP control unit appears in the list of discovered devices on Panel Server webpages.

NOTE: It is recommended that the MicroLogic Active AP/EP control unit is powered by an external 24 Vdc power supply, to avoid communication loss if the load falls below 20% of the rated current In.

Zigbee Wireless Communication Discovery Video

To access a demonstration video about discovery of the MicroLogic Active AP/EP control unit with Panel Server, click here, scan the QR code, or copy and paste the link to your Web browser:



https://youtu.be/NdarsVhb8TY

Zigbee Wireless Communication Test

After discovery of the MasterPacT MTZ circuit breaker with MicroLogic Active AP/EP control unit, you can check Zigbee wireless communication and microswitch installation.

Step	Action
1	Select the **Monitoring & Control** menu on Panel Server webpages.
2	Select the MasterPacT MTZ circuit breaker with MicroLogic Active AP/EP control unit to test, from the list of discovered devices.
3	Check the circuit breaker status.
4	If the circuit breaker status (open or closed), displayed on Panel Server webpages does not match the actual status of the circuit breaker, contact your Schneider Electric Services representative.

Tests

Overview

The tests to do while commissioning a MasterPacT MTZ circuit breaker are described in this section:

- Functional checks
- Check of MCH gear motor (if fitted)
- Check of electrical continuity
- Check of high-voltage insulation
- Check of MicroLogic Active internal battery
- Check of MicroLogic Active **Ready** LED status
- Test of the tripping mechanism on the MicroLogic Active display screen
- Automatic trip curve test with EcoStruxure Power Commission software

Only do the tests required, depending on the MasterPacT MTZ type and the functions in use, and record the results on the test form, page 130. In the event of non-conformance, the result must be recorded and the MasterPacT MTZ circuit breaker must not be accepted into service.

Functional Checks

Follow this procedure to check the operation of the MasterPacT MTZ circuit breaker and record the results on the test form.

Step	Action
1	Manually charge the mechanism by pulling the spring charging handle down.
2	Close the circuit breaker. Check the closing of the circuit breaker in each of the different means designed for the application.
3	Open the circuit breaker. Check the opening of the circuit breaker in each of the different means designed for the application.

If the circuit breaker does not close or does not open, refer to *Troubleshooting*, page 134.

Check of MCH Gear Motor (if Fitted)

Follow this procedure to check the operation of the MCH gear motor and record the results on the test form.

Step	Action
1	Remove the MCH gear motor power supply.
2	Do an opening/closing/opening cycle to discharge the mechanism.
3	With the circuit breaker in the open position and the mechanism discharged, check electrical continuity between terminals B1 and B2, and electrical non-continuity between terminals B1 and B3.
4	Manually charge the mechanism.
5	Reconnect the MCH gear motor power supply. The circuit breaker closes and the mechanism is automatically charged.
6	Check electrical continuity between terminals B1 and B3.
7	Operate the circuit breaker several times to check that the spring mechanism automatically recharges after every closing operation.

Check of Electrical Continuity

Follow this procedure to check electrical continuity using a multimeter or continuity checker and record the results on the test form.

Step	Action
1	Close the circuit breaker.
2	Check electrical continuity, for each of the phases, between the upper and lower power terminals: • For fixed circuit breaker: on the power terminals • For the drawout circuit breaker: on the chassis power terminals, with the circuit breaker in the connected position

Check of High-Voltage Insulation

Dielectric tests (high potential and insulation resistance tests) are used to check the insulation between phases, and insulation between each phase and ground. The equipment used to conduct these tests creates a high potential voltage (thousands of volts) to check dielectric or insulation integrity.

Before conducting any high-voltage insulation tests, unplug any cables from the USB-C port on the front face of the MicroLogic Active control unit.

Follow this procedure to check insulation resistance and record the results on the test form.

Step	Action
1	Unplug any cables from the USB-C port on the front face of the MicroLogic Active control unit.
2	Close the MasterPacT MTZ circuit breaker.
3	Measure the insulation resistance using a 500 Vdc insulation resistance tester between one of the phases and the other two phases grounded. Repeat for each phase.
4	Open the MasterPacT MTZ circuit breaker by pressing the opening pushbutton.
5	Measure the insulation resistance using a 500 Vdc insulation resistance tester between one of the phases and ground, with all other phases grounded. Repeat for each phase.
6	Check that the insulation resistance is above 5 MΩ in each case. If this result is not obtained, contact your Schneider Electric Services representative.

Check of MicroLogic Active Internal Battery

Follow this procedure to check the functioning of the MicroLogic Active internal battery.

Step	Action
1	Press and hold the  button for less than 3 seconds to test the internal battery.
2	Check that the trip cause LEDs switch off for one second, and then switch on. If the trip cause LEDs: • Blink sequentially: the battery is near the end of its life. Replace the battery. For information about internal battery replacement and installation, consult the instruction sheet on the Schneider Electric website: PKR4244002 *MicroLogic Active - Spare Battery - Instruction Sheet*. • Do not light: check that the battery strip has been removed. If it has, replace the battery. If the battery strip has not been removed, remove it as indicated in the circuit breaker instruction sheet. Refer to Related Documents, page 8.

Check of MicroLogic Active Ready LED Status

Follow this procedure to check the functioning of the MicroLogic Active control unit and record the results on the test form.

Step	Action
1	Provide power to the MicroLogic Active control unit, for example, by connecting a PC or Mobile Power Pack to the USB-C port on the front face.
2	Check that the MicroLogic Active **Ready** LED is flashing green. The **Ready** LED flashes green to indicate that: • The sensors are correctly wired. • The tripping mechanism is functioning correctly. • The MicroLogic Active control unit is functioning correctly.
3	If the **Ready** LED is not flashing green, refer to Critical Cases, page 101.

Test of the Tripping Mechanism on the MicroLogic Active Display Screen

Follow this procedure to test the tripping mechanism of the circuit breaker and record the results on the test form.

Step	Action
1	Close the circuit breaker.
2	Select **Maintenance > Protection Test** on the MicroLogic Active display screen.
3	Enter the pin code.
4	Press **OK** to confirm that you want to start the protection test and trip the circuit breaker.
5	• For MicroLogic Active 2.0 and 5.0 control unit, check that the **I** trip cause LED is blinking red. • For MicroLogic Active 6.0 control unit, check that the **G** trip cause LED is blinking red.
6	• For MicroLogic Active 2.0 and 5.0 control unit, check that the **Ii test trip** pop-up trip message is displayed. • For MicroLogic Active 6.0 control unit, check that the **Ig test trip** pop-up trip message is displayed.
7	Check that the circuit breaker is open.
8	Check that the blue fault-trip reset button has popped out.
9	Check that the SDE contacts have switched.
10	Press **OK** to close the pop-up trip message.
11	Press and hold the  button for more than 3 seconds to reset the trip cause LEDs.
12	Manually charge the mechanism by pulling the spring charging handle down six times. When the spring charging handle no longer resists, the mechanism is charged.
13	If the circuit breaker is equipped with an MN undervoltage release, either connect it to the power supply with its rated voltage or remove the MN undervoltage release.
14	Press the closing pushbutton. The circuit breaker must not close.
15	After the test, reset the circuit breaker by pressing the blue reset button.
16	Press the closing pushbutton. The circuit breaker closes.

Automatic Trip Curve Test With EcoStruxure Power Commission Software

Follow this procedure to run the automatic trip curve test and record the results on the test form.

Step	Action
1	Close the circuit breaker.
2	If the circuit breaker is equipped with an MN undervoltage release, either connect it to the power supply with its rated voltage or remove the MN undervoltage release.
3	Connect a PC running EcoStruxure Power Commission software by using a cable to the USB-C port on the front face of the MicroLogic Active control unit.
4	On EcoStruxure Power Commission software, select the circuit breaker and connect to it.
5	Select the **Automatic Trip Test** section.
6	Select **Preconfigured test point**.
7	Select the overcurrent protection to be tested.
8	Click **Run Test**.
9	Check that the circuit breaker trips.
10	Check that the blue fault-trip reset button has popped out
11	Check that the related trip cause LED is blinking red.
12	Check the SDE contacts have switched.
13	After the test, reset the circuit breaker.

Wired Communication Tests

Wired communication tests are required for MasterPacT MTZ circuit breakers with MicroLogic Active control unit and BCIM module.

Communication Network Test

Use the Modbus end-user client to test the communication network between the communicating devices of the project:

- Circuit breakers connected to the Ethernet network through an IFE or EIFE Ethernet interface.
- Circuit breakers connected to a Modbus serial line network from an IFM interface.
- Circuit breakers connected to a Modbus serial line network through an IFM interface stacked to an IFE Ethernet server.

Step	Action
1	With the circuit breaker in the closed position, read the Modbus Circuit Breaker Status register to check that the circuit breaker status indicates closed.
2	Press the opening pushbutton on the front of the circuit breaker.
3	Read the Modbus Circuit Breaker Status register to check that the circuit breaker status indicates open.

Refer to DOCA0384•• *MasterPacT, ComPacT, PowerPacT Circuit Breakers - Modbus Communication - User Guide* in **Related Documents** at the beginning of this guide.

Remote Control Tests

If the MasterPacT MTZ circuit breaker with MicroLogic Active control unit can be opened and closed remotely through the wired communication network, use the following test to check for the correct operation of remote control:

Step	Action
1	With the circuit breaker in the closed position, read the Modbus Circuit Breaker Status register to check that the circuit breaker status indicates closed.
2	Send a Modbus remote control command to open the circuit breaker.
3	Read the Modbus Circuit Breaker Status register to check that the circuit breaker status indicates open.

Refer to DOCA0384•• *MasterPacT, ComPacT, PowerPacT Circuit Breakers - Modbus Communication - User Guide* in **Related Documents** at the beginning of this guide.

Final Checks and Reporting

Final Checks

After completing the commissioning tests, check the following:

Step	Action
1	Check that connections are made with the correct tightening torque, that there are no tools or objects inside the equipment, and that all circuit breakers, doors, and protective covers are in position.
2	Check that the circuit breaker is open (OFF position) and the closing spring is charged.

Project Report Generated by EcoStruxure Power Commission Software

EcoStruxure Power Commission software generates a project report with a list of the circuit breakers for that project. For each MasterPacT MTZ circuit breaker it provides the following information:

- The circuit breaker identification data
- The MicroLogic Active identification data
- The list of accessories including internal accessories and external modules
- The protection settings for the MicroLogic Active control unit
- The alarm settings
- The IFE, EIFE or IFM communication interface settings
- The BCIM module settings

MasterPacT MTZ Test Form

How to Use the Test Form

Print this test form to record the results of the commissioning tests.

Check the box (✓) when the test has been made and is conclusive.

This test form, the project report, and the communication test report should be left on-site in a plastic wallet and in an easily accessible, safe place.

Each test is described in detail in the Commissioning part.

Only do the tests required, depending on the MasterPacT MTZ type and the functions in use.

When all the tests have been satisfactorily completed, sign and date the test form.

Identification

Workstation		**Tests conducted on:**	**By:** **Signature:**
Substation name		Comments:	
Substation number			
Switchboard name			
Voltage			
MasterPacT MTZ circuit breaker			
Manufacturer		Schneider Electric	
Type of MasterPacT MTZ circuit breaker			
Serial number			
Hardware version			
MicroLogic Active control unit			
MicroLogic Active type		CT ratio	
Firmware version			
BCIM module			
Hardware version			
Firmware version			

Preliminary Checks

Type of check	**(✓)**
Visual inspection satisfactory (for example, no visible signs of damage).	
Grounding satisfactory.	
Connection tightness checked.	

Type of check	(✓)
Firmware compatibility satisfactory.	
MicroLogic Active settings applied.	
Project report generated.	

Functional and Interlock Checks

Type of check	(✓)
Mechanism charges when spring charging handle is pulled.	
MasterPacT MTZ circuit breaker closes.	
MasterPacT MTZ circuit breaker opens.	
Mechanism charges automatically after closing when the device is fitted with an MCH gear motor.	
FDM121 display functions correctly.	
Interlocking systems of the circuit breaker function correctly.	
Interlocking systems between two or three circuit breakers function correctly.	

Electrical Continuity Check

MasterPacT MTZ circuit breaker status	Tested terminals		Electrical continuity
	Incoming side	Outgoing side	
Closed	L1	L1	Ω
Closed	L2	L2	Ω
Closed	L3	L3	Ω

MasterPacT MTZ Insulation Test

MasterPacT MTZ circuit breaker status	Terminals under test	Voltage	Insulation resistance
Closed	L1, with L2 and L3 grounded	500 Vdc	MΩ
Closed	L2, with L1 and L3 grounded	500 Vdc	MΩ
Closed	L3, with L1 and L2 grounded	500 Vdc	MΩ
Open	L1, with L1, L2, L3 grounded on the other side	500 Vdc	MΩ
Open	L2, with L1, L2, L3 grounded on the other side	500 Vdc	MΩ
Open	L3, with L1, L2, L3 grounded on the other side	500 Vdc	MΩ

Check of MicroLogic Active Ready LED

Type of check	(✓)
MicroLogic Active **Ready** LED flashes green.	

Test of the Tripping Mechanism on the MicroLogic Active Display Screen

Type of check	(✓)
With the circuit breaker closed, force the circuit breaker to trip by using the MicroLogic Active display screen.	
Check that the circuit breaker is open.	
Check that the blue fault-trip reset button has popped out.	
• For MicroLogic Active 2.0 and 5.0 control unit, check that the **I** trip cause LED is blinking red. • For MicroLogic Active 6.0 control unit, check that the **G** trip cause LED is blinking red.	
Check that the SDE contacts have switched.	

Automatic Trip Curve Test

Type of check	(✓)
Check that the circuit breaker trips.	
Check that the blue fault-trip reset button has popped out.	
Check that the related trip cause LED is blinking red.	
Check that the SDE contacts have switched.	

Wired Communication Tests

Type of check	(✓)
Check that the circuit breaker can be opened and closed remotely through the wired communication network.	

Final Checks

Type of check	(✓)
All doors and protected covers are in position.	
The circuit breaker is open (OFF position) and the closing spring is charged.	

MasterPacT MTZ Troubleshooting

What's in This Part

Introduction to Troubleshooting

Presentation

This part contains information for troubleshooting problems in a working system. It assumes that the system is correctly installed and that all the commissioning tests have been completed successfully. The troubleshooting operations are described under the following headings:

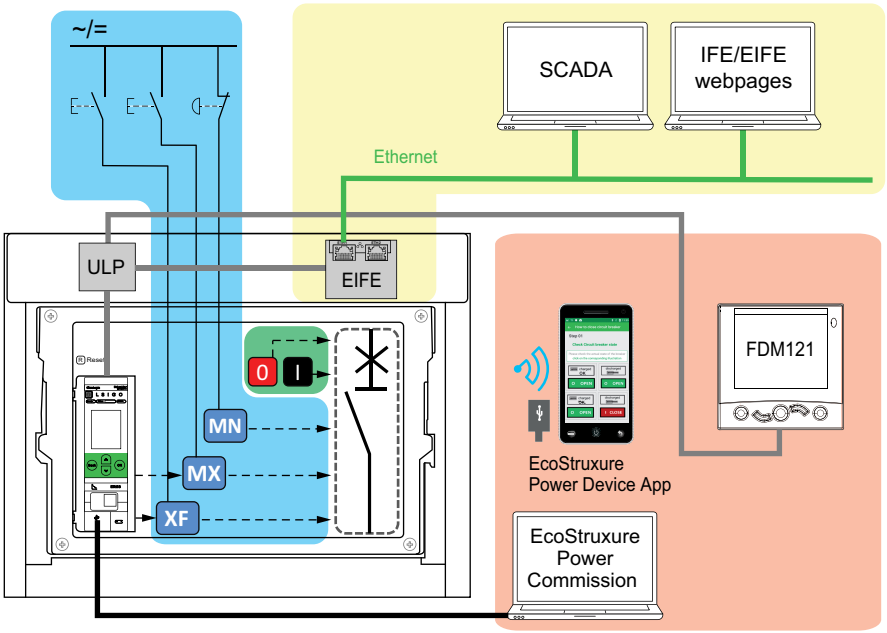
- Chassis operation
- Unexpected tripping
- Mechanical control operations
- Electrical control operations
- Control operations from FDM121 display
- Control operations from IFE/EIFE webpages
- Control operations from communication network

Layer Model

When troubleshooting the device, it is useful to consider a layer model. There are three layers:

- Communication network
- Direct communication
- Electrical
- Mechanical

The following diagram shows the layers in the device:



Communication network

Direct communication

Electrical

Mechanical

If the troubleshooting actions for a layer are not successful, go to the next layer until you reach the Mechanical layer. If you cannot solve the problem after troubleshooting the Mechanical layer, contact your Schneider Electric Services representative.

Maintenance of the Device

Schneider Electric recommends a preventive maintenance program to ensure that devices retain the operating and technical characteristics specified in the catalogs during their service life. Maintenance must be carried out by trained and qualified personnel.

For information about the preventive maintenance program and maintenance procedures, refer to DOCA0305•• *MasterPacT MTZ IEC Circuit Breakers with MicroLogic Active Control Unit - Maintenance Guide* in **Related Documents** at the beginning of this guide.

Troubleshooting: Chassis Operation

Definition

Chassis operation includes the following:

- Racking in and racking out the drawout circuit breaker
- Locking and unlocking the chassis

Troubleshooting

Problem description	Probable causes	Solutions
Impossible to insert the racking handle in connected, test, or disconnected position.	A padlock or keylock is present on the chassis or a door interlock is present.	Disable the locking function.
Impossible to turn the racking handle.	The position release button is not pushed in and so the racking handle cannot be rotated.	Push the position release button.
Circuit breaker cannot be removed from chassis.	Circuit breaker is not in the disconnected position.	Turn the racking handle until the circuit breaker is in the disconnected position and the position release button pops out.
	Rails are not completely extended.	Pull out the rails of the chassis.
Circuit breaker cannot be connected (racked in).	Chassis and circuit breaker do not match (mismatch protection).	Check that the chassis corresponds with the circuit breaker.
	Safety shutters are locked.	Remove the locks.
	Disconnecting contact clusters are incorrectly positioned.	Reposition the disconnecting contact clusters.
	Chassis is locked in the disconnected position.	Disable the chassis locking function.
	The position release button is not pushed in and so the racking handle cannot be rotated.	Push the position release button.
	Circuit breaker has not been sufficiently inserted in the chassis.	Insert the circuit breaker completely so that it is engaged in the racking mechanism.
Circuit breaker cannot be locked in the disconnected position.	Circuit breaker is not in the correct position.	Check the circuit breaker position by checking that the position release button is popped out.
	Racking handle is still in the chassis.	Remove the racking handle and store it.
Circuit breaker cannot be locked in the connected, test, or disconnected position.	Locking in any position is not enabled.	Adapt the chassis locking mechanism so that the chassis can be locked in any position.
	Circuit breaker is not in the correct position.	Check the circuit breaker position by checking that the position release button is out.
	Racking handle is still in the chassis.	Remove the racking handle and store it.
The racking handle cannot be inserted to connect or disconnected the circuit breaker.	Rails are not completely in.	Push the rails all the way in.
The right-hand rail (chassis alone) or the circuit breaker cannot be drawn out.	Racking handle is still in the chassis.	Remove the racking handle and store it.

Troubleshooting: Unexpected Tripping

Definition

Unexpected tripping is tripping that is not caused by a protection function during normal operation or by tests.

Troubleshooting

Problem description	Symptom	Probable causes	Solutions
Circuit breaker opened without any over-current electrical fault.	The blue fault-trip reset button is not popped out and no trip cause LED is lit.	Drop in voltage to below the threshold detected by MN undervoltage release.	Check the voltage and the MN supply circuit (V > 0.85 Un).
		An order (for example load-shedding) sent to the MX opening voltage release by another circuit breaker.	Check the parameters of the circuit breaker that sent the order.
		Unnecessary opening order from the MX opening voltage release.	Determine the origin of the order and cancel it.
Circuit breaker trips in a shorter time than expected after attempt to close the circuit breaker.	The blue fault-trip reset button is popped out and the L trip cause LED is blinking red.	Thermal memory is still active and current on the line is above the Ir threshold.	Check whether there is still an overload on the line. If necessary, make a correction. For details of thermal memory, refer to DOCA0265•• *MasterPacT MTZ - MicroLogic Active Control Unit - User Guide* in **Related Documents** at the beginning of this guide.
	The blue fault-trip reset button is popped out, the I trip cause LED is lit, and the ERMS LED is lit.	ERMS is active so circuit breaker opens at lower protection settings.	The ERMS function applies reduced protection settings for use during maintenance. Check whether maintenance is in progress. If ERMS is no longer necessary, disengage it to revert to normal protection settings.
Immediate tripping after an attempt to close the circuit breaker.	The blue fault-trip reset button is popped out and the L trip cause LED is blinking red.	Transient overcurrent when closing.	• Modify the distribution system or the control unit settings. • Check the condition of the circuit breaker before putting it back into service.
Immediate tripping after an attempt to close the circuit breaker with activation of the blue fault-trip reset button.	–	Closing on a short-circuit.	Refer to MasterPacT MTZ critical cases.
Nuisance tripping of the circuit breaker with activation of the blue fault-trip reset button.	–	Blue fault-trip reset button is not pushed-in completely.	Push in the blue fault-trip reset button completely.

Troubleshooting: Mechanical Control Operations

Definition

Mechanical control operations are operations that are made using the opening or closing pushbuttons.

Circuit Breaker Cannot be Closed by Using the Mechanical Closing Pushbutton

Symptom	Probable causes	Solutions
The blue fault-trip reset button is popped out.	The blue fault-trip reset button has not been reset.	• Clear the fault. • Push the blue fault-trip reset button.
–	Circuit breaker is padlocked or keylocked in the open position.	Unlock the circuit breaker.
–	Circuit breaker is interlocked mechanically in a mechanical interlocking system.	• Check the position of the other circuit breaker in the changeover system. • Modify the situation to release the interlock.
The closing spring and ready-to-close indicator shows that the mechanism is discharged. 	Stored energy mechanism is not charged.	• Charge the mechanism manually. • If the circuit breaker is equipped with an MCH gear motor, check the supply of power to the motor. If the problem persists, replace the MCH gear motor.
The closing spring and ready-to-close indicator shows that the mechanism is charged but the circuit breaker is not ready to close. 	MX opening voltage release is permanently powered.	As there is an opening order, determine the origin of the order. The order must be canceled before the circuit breaker can be closed.
	MN undervoltage release is not powered due to an opening order.	As there is an opening order, determine the origin of the order. The order must be canceled before the circuit breaker can be closed.
	MN undervoltage release is not powered due to insufficient voltage power supply.	Check the voltage and the MN supply circuit (V > 0.85 Un). If the problem persists, replace the MN undervoltage release.
Recurring undervoltage trip.	The measured voltage remains at 0 V.	Set the undervoltage behavior parameter, Vmin behavior, to **Force to Off when CB is open**. For more information, refer to DOCA0265•• *MasterPacT MTZ - MicroLogic Active Control Unit - User Guide* in **Related Documents** at the beginning of this guide.
The position release button on the chassis of the drawout circuit breaker is pushed in.	Circuit breaker is not correctly connected.	Terminate racking in (connection) of the circuit breaker, making sure that it is fully inserted in the chassis, to the connected position. Check that the position release button is popped out.

Circuit Breaker Cannot be Opened by Using the Mechanical Opening Pushbutton

Probable causes	Solutions
Operating mechanism incident or welded contacts.	Contact your Schneider Electric Services representative.

Troubleshooting: Electrical Control Operations

Definition

Electrical control operations are operations that are made by an electrical order through a voltage release or by an external pushbutton that is directly connected to a voltage release.

Troubleshooting Voltage Releases

Troubleshooting depends on the type of voltage release, as follows:

- For communicating voltage releases, consult the MicroLogic Active event messages and then refer to MasterPacT MTZ Critical Cases.
- For standard or reinforced voltage releases, follow the troubleshooting instructions given in the following tables. If the problem persists, replace the voltage release.

Circuit Breaker Cannot be Closed by Using an External Pushbutton/Electrical Order

Symptom	Probable causes	Solutions
–	Circuit breaker is padlocked or keylocked in the open position.	Unlock the circuit breaker.
–	Electrical closing order not executed by the XF closing voltage release due to insufficient voltage power supply.	Check the voltage and the XF supply circuit (0.85–1.1 Un). If the problem persists, replace the XF closing voltage release.
The closing spring and ready-to-close indicator shows that the mechanism is charged but the circuit breaker is not ready to close. 	MX opening voltage release is permanently powered.	As there is an opening order, determine the origin of the order. The order must be canceled before the circuit breaker can be closed.
	MN undervoltage release is not powered due to an opening order.	As there is an opening order, determine the origin of the order. The order must be canceled before the circuit breaker can be closed.
	MN undervoltage release is not powered due to insufficient voltage power supply.	Check the voltage and the MN supply circuit (V > 0.85 Un). If the problem persists, replace the MN undervoltage release.
–	XF closing voltage release is continuously supplied, but circuit breaker was not ready-to-close when the closing order was sent (XF closing voltage release is not wired in series with PF ready-to-close contact).	• Remove the power supply to the XF closing voltage release. • Only if the circuit breaker is ready-to-close, send the closing order again via the XF closing voltage release.

Circuit Breaker Cannot be Opened by Using an External Pushbutton/Electrical Order

Probable causes	Solutions
Opening order is not executed by the MN undervoltage release.	Drop in voltage insufficient or residual voltage (V > 0.35 Un) across the terminals of the MN undervoltage release. If the problem persists, replace the MN undervoltage release.
Opening order is not executed by the MX opening voltage release.	Check the voltage and the MX supply circuit (0.7–1.1 Un). If the problem persists, replace the MX opening voltage release.

Circuit Breaker Cannot be Reset by Using RES Electrical Remote Reset

Symptom	Probable causes	Solutions
The blue fault-trip reset button is popped out.	Insufficient supply voltage for the RES electrical remote reset.	Check the voltage and the RES supply circuit (0.7–1.1 Un). If the problem persists, replace the RES electrical remote reset.

Additional Checks

If the troubleshooting actions described above do not work, refer to the troubleshooting information for Mechanical Control Operations, page 138.

Troubleshooting: Control Operations from FDM121 Display

Definition

Control operations include commands to open and close the device from the FDM121 display.

For information about control operations from the FDM121 display, refer to DOCA0088•• *Enerlin'X FDM121 - Front Display Module for One Circuit Breaker - User Guide* in **Related Documents** at the beginning of this guide.

Device Cannot be Controlled from the FDM121 Display

Problem description	Symptom	Probable causes	Solutions
The FDM121 display does not display any data when connected to the MicroLogic Active control unit.	The FDM121 display screen blinks continuously, indicating a conflict in the IMU.	The FDM121 firmware version is not compatible with the MicroLogic Active control unit.	1. Disconnect the MasterPacT circuit breaker from the IMU in which the FDM121 display is installed. 2. Update the FDM121 firmware to the latest version by using EcoStruxure Power Commission software. 3. Connect the MasterPacT device in the IMU again. For more information about updating the firmware, see DOCA0150•• *Enerlin'X FDM121 - Front Display Module for One Circuit Breaker - Firmware Release Notes* in **Related Documents** at the beginning of this guide.
Device cannot be opened or closed.	–	The device control mode is set to Manual or Auto Remote.	Change the control mode to Auto Local.

Additional Checks

If the troubleshooting actions described above do not work, refer to the troubleshooting information for Mechanical Control Operations, page 138 and Electrical Control Operations, page 139.

Troubleshooting: Control Operations from IFE/EIFE Webpages

Definition

Control operations include commands to open and close the device from IFE or EIFE webpages.

For information about control operations from IFE or EIFE webpages, refer to the following guides in **Related Documents** at the beginning of this guide:

- DOCA0084•• *Enerlin'X IFE - Ethernet Switchboard Server - User Guide*
- DOCA0142•• *Enerlin'X IFE - Ethernet Interface for One Circuit Breaker - User Guide*
- DOCA0106•• *Enerlin'X EIFE - Embedded Ethernet Interface for One MasterPacT MTZ Drawout Circuit Breaker - User Guide*

Device Cannot be Controlled from IFE or EIFE Webpages

Problem description	Symptom	Probable causes	Solutions
Device cannot be opened or closed.	The **Close** and **Open** buttons are not displayed on the webpage.	Application control is not enabled in the IFE interface.	Enable application control by pressing the Test button on the front of the IFE interface for 10–15 s.
	Message on webpage: **Breaker operation not successful: actuator is in manual mode. Remote breaker commands are not allowed**	The device control mode is set to Manual.	Change the control mode to Auto Remote.
	Message on webpage: **Breaker operation is not successful: Operation mode is Local (Operation via remote control is not allowed)**.	The device control mode is set to Auto Local.	Change the control mode to Auto Remote.
	Message on webpage: **Close has failed**. **NOTE:** There is no message if opening action fails.	The remote control commands are disabled by the locking pad on the front of the IFE interface.	Move the locking pad on the front of the IFE interface to the Unlocked position.

Additional Checks

If the troubleshooting actions described above do not work, refer to the troubleshooting information for Mechanical Control Operations, page 138 and Electrical Control Operations, page 139.

Troubleshooting: Control Operations from Wired Communication Network

Definition

Control operations include commands to open and close the device from the wired communication network.

For information about control operations from the wired communication network, refer to DOCA0384•• *MasterPacT, ComPacT, PowerPacT Circuit Breakers - Modbus Communication - User Guide* in **Related Documents** at the beginning of this guide.

Device Cannot be Controlled with a Remote Controller Connected from IFE, EIFE or IFM Interface

Problem description	Symptom	Probable causes	Solutions
Device cannot be opened or closed.	–	The device control mode is set to Manual or Auto Local.	Change the control mode to Auto Remote.
	–	The remote control commands are disabled by the locking pad on the front of the IFE interface.	Move the locking pad on the front of the IFE interface to the Unlocked position.

Additional Checks

If the troubleshooting actions described above do not work, refer to the troubleshooting information for Mechanical Control Operations, page 138 and Electrical Control Operations, page 139.

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